REQUEST FOR PROPOSAL (RFP)

DESIGN BUILD SERVICES

SPORTS FIELD AT PEMBERTON FARM ROAD EAST

RFP No. #2018-02

February 2018

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VILLAGE OF PEMBERTON
REQUEST FOR PROPOSAL (RFP)
DESIGN BUILD SERVICES
SPORTS FIELD AT PEMBERTON FARM ROAD EAST
RFP No. #2018- 02

The Village is seeking Proposals from design-build teams to undertake the detailed design, specification, construction and construction inspection for a new sports field located at Pemberton Farm Road East.

The Village is interested in a full size sand-based natural grass field or a full-sized multi-purpose synthetic turf field, however subject to budget limitations, the Village may also consider a reduced size synthetic turf field. Proponents are invited to submit a Proposal for one, some or all of the sport field options.

Three (3) copies of the Proposal are to be submitted, of which one will be unbound. For the synthetic turf option(s) a representative sample(s) of the synthetic turf system(s) being proposed should also be included. 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, March 16, 2018, to the attention of:

Manager of Operations & Development Services - Mr. Tim Harris
7400 Prospect, Village of Pemberton, BC, V0N 2L0

Sealed Proposals are to be marked as follows:

Design Build Proposal
Sports Field at Pemberton Farm Road East
RFP No. #2018-02
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:

Tim Harris, Manager of Operations & Development Services
Phone: (604) 894.6135 ext. 240
e-mail: tharris@pemberton.ca

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 Proposals, and to waive informalities in any or all Proposals.

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 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 first 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 synthetic turf or 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 $900,000 excluding GST for this project.

The Village is interested in a full size multi-purpose synthetic turf field, however, subject to budget limitations, the Village may also consider a reduced size synthetic turf field, or alternatively a sand-based natural grass field.

4.3 SCOPE OF WORK

The scope of work for each option, in order of priority in terms of most desirable, is indicated below:

Option 1 – Full Size Synthetic Field (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 the road to the collector
- Temporary Stormwater management pond
- Permeable aggregate base
- Drainage/shock pad
- Synthetic turf including infill
- Concrete edge anchor around the field
- Chainlink fencing around the field with pedestrian gates at each corner and one maintenance vehicle gate.
- Fence to be 1.2 m high except at the end zones where it is to be 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
- Electrical service from the road to the field lighting to include timers and/or key turn system.

Option 2 – Reduced Size Synthetic Field (minimum 55 m wide X 70 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 the road to the collector
- Temporary Stormwater management pond
- Permeable aggregate base
- Drainage/shock pad
- Synthetic turf including infill
- Concrete edge anchor around the field
- Chainlink fencing around the field with pedestrian gates at each corner and one maintenance vehicle gate.
- Fence to be 1.2 m high except at the end zones where it is to be 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

Option 3 – 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 the road to the collector
- 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 for primary well connection and secondary municipal connection
- Natural grass turf including establishment
- Chainlink fencing behind the soccer goal area minimum 4.8 m high (40 m long, each end)
- Electrical service for the irrigation system

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 October 15, 2018.

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 (enter your 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 (provide separate pricing for each option)

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):

Synthetic 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 & Close-Out	
	Construction Services	
2.1	Mobilization	
2.2	Site Preparation	
2.3	Drainage - Field	
2.4	Permeable Aggregates	
2.5	Fencing	
2.6	Asphalt and Concrete	
2.7	Electrical & Lighting including As Built & Schematics	
2.8	Turf and Shock Pad	
2.9	Drainage and Electrical Service Connections	
2.10	Miscellaneous	
	Total Contract Price (excluding GST):	**$**

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 & Close-Out	
	Construction Services	
2.1	Mobilization	
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 Service including As Built & Schematics	
2.8	Grass Installation & Establishment	
2.9	Miscellaneous	
	Total Contract Price (excluding GST):	**$**

TIME LINE									
PROGRESS	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEPT**	**OCT**
Design Phase									
Mobilization									
Site Prep.									
Drainage									
Irrigation									
Field Construction									
Lighting System									
Turf Installation									
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 describing 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 (as applicable)
  e) Information on the equipment and materials to be incorporated into the project including synthetic turf, shock pad, 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

BINNIE
The people behind your infrastructure.
TEL 604 420 1721 BINNIE.com

0 1:2000 80m

TITLE :
AREA MAP

DATE :	11/20/2017
DWG. No. :	SK–1
SCALE : 1:2000	REV.

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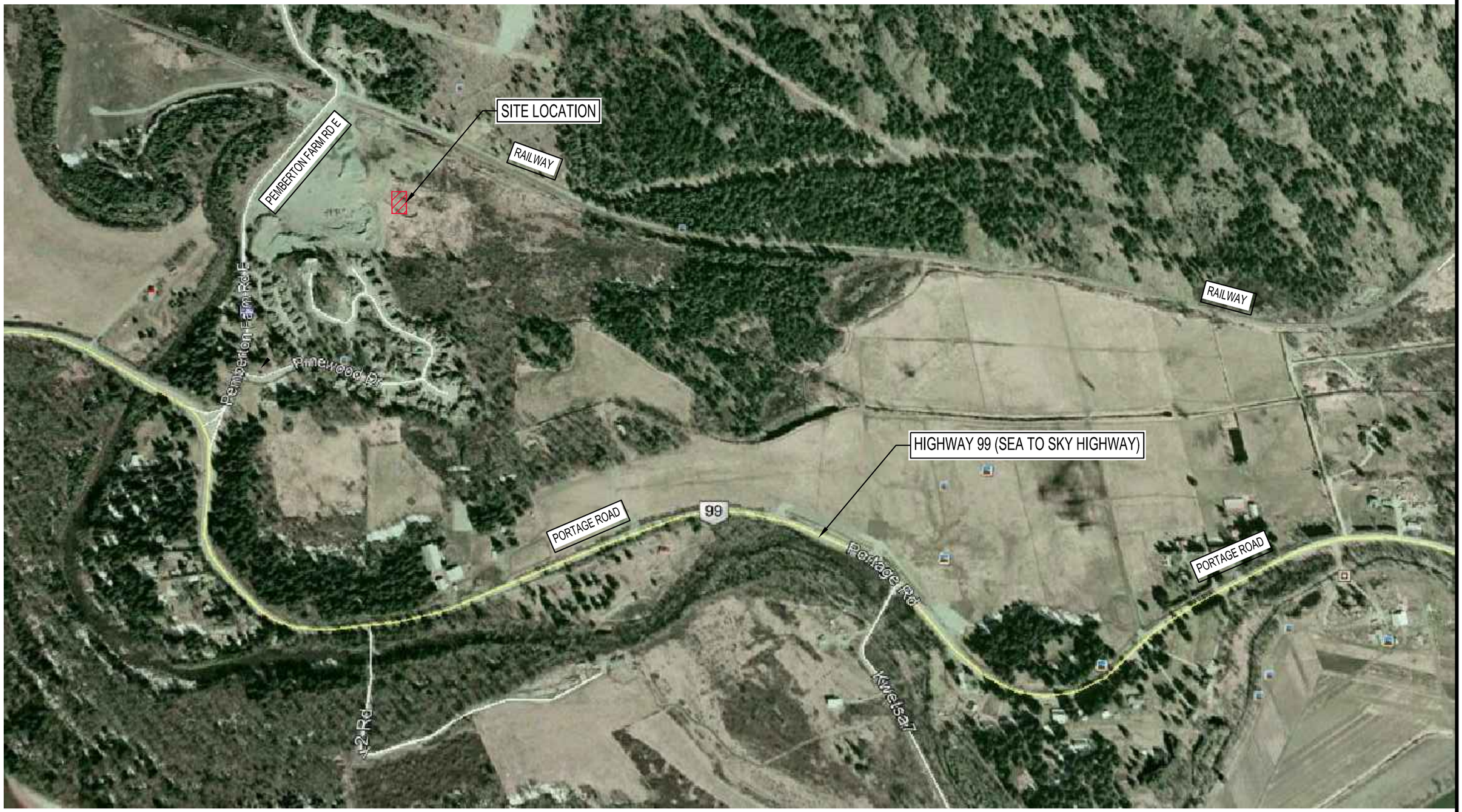

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BINNIE
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TITLE :
SITE LOCATION

DATE : 11/20/17
DWG. No. : SK-2
SCALE :
REV.

WATER, STORM DRAINAGE & ELECTRICAL SERVICES AVAILABLE OF PEMBERTON FARM ROAD EAST.

APPROXIMATE LOCATION OF PROPOSED SPORTS FIELD.

N

Future Commercial Site

Railway

Future Road to Sunstone Ridge & School

Pemberton Farm Road

Friendship Trail

Stormwater Management

Fieldhouse/ Gymnasium Phase -1

Gymnastics Future Phase

Arena Future Phase

Aquatics Future Phase

Entry Drive

Parking

Entry Plaza

Reception/ Admin Phase 1 Future

Drop-off/ Bus

Disabled Parking

Service

Children's Play Area

Field#1 Grass or Turf Future Phase

Field#2 Grass Phase -1

Recreation Site
7.97ha (19.7 ac)

Slow Pitch Field-A

Slow Pitch Field-B

Shelter

Small-side Field#3A Grass

Field#3 Grass Future Phase

Small-side Field#3A Grass

Community Garden

Sunstone Ridge Entry

School Entry

Future Residential Site

210

215

220

205

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FILE: O:\PROFESSIONAL SERVICES GROUP\LASR\VILLAGE OF PEMBERTON - SPORTS FIELD-CE\DWGS\RECREATION CENTRE CONCEPT PLAN.DWG USER: RDEJESUS

BINNIE
The people behind your infrastructure.
TEL 604 420 1721 BINNIE.com

0 1:2000 80m

TITLE :
RECREATION CENTRE CONCEPT PLAN

DATE : 11/20/2017
DWG. No. : SK-3
SCALE : 1:2000
REV.

APPENDIX B - DRAFT CONTRACT

Appendix B – Draft Contract

VILLAGE OF PEMBERTON – SUPPLEMENTARY GENERAL CONDITIONS

These Supplementary General Conditions contain modifications or additions to the Definitions and General Conditions of the Design-Build Stipulated Price Contract CCDC No 14, 2013 edition and form a part of this Contract. Where any part of the Definitions or General Conditions are modified or deleted by the Supplementary General Conditions, the unaltered provisions remain in effect.

AGREEMENT

ARTICLE A-4 CONTRACT PRICE

1. Refer to Article A-4:

Add the following:

"4.6 The *Contract Price* which is set out in Appendix B, includes all costs of the *Design Services* and of the *Work*, including, without limitation, all costs incurred in the design and construction of the Design Services and *Work*, whether foreseen or unforeseen, save and except for those costs which are the responsibility of the *Owner* as specifically set out in this *Contract*, and the *Contract Price* shall include, without limitation:

.1 all professional design, engineering and construction services and products reasonably necessary to properly perform the Design Services and *Work* and to permit the *Project* to operate as contemplated following *Substantial Performance of the Work*;

.2 all labour and materials;

.3 all *Products* incorporated into the *Work* including all other items such as machinery, equipment and fixtures incorporated into the *Work* as and where specified;

.4 all permits, fees, licenses and certificates of inspection and insurance in connection with the *Work* required by all authorities having jurisdiction including commercial builder licensing fees, the building permit, the plumbing, electrical, sewer, water, and gas connections permits, and the gas, electric, Village and telephone service connection fees;

.5 all inspections required for specific warranty conditions;

.6 all inspections by all authorities having jurisdiction;

.7 all material testing required under bylaws, ordinances, rules, regulations, orders and approvals of all public authorities having jurisdiction;

.9 all required soils reports;

.10 a *Project* sign mutually agreed to between the *Owner* and the *Design-Builder*;

.11 all warranties required under the *Contract*;

.12 all bonds required under the *Contract*;

.13 completed certificate of insurance acceptable to the *Owner*; and

.14 the construction or installation of all off site services or payments in lieu thereof as may be required by all authorities having jurisdiction to be constructed or installed as a condition of the construction of the *Project*.

ARTICLE A-5 PAYMENT

2. Refer to Article A-5.1:

Insert “ten” and “10” respectively in the two blanks.

3. Refer to Article A-5.3:

Delete Article A-5.3, including all of 5.3.1 and 5.3.2, in its entirety.

4. New Article A-9:

“ARTICLE A-9 THE CONSULTANT AND OTHER CONSULTANTS

9.1 The *Design-Builder* will provide the architectural and engineering services required for the *Project* through the *Consultant* and the *Other Consultants*. The *Consultant* is identified in paragraph 1.2 of Article A-1 of the *Agreement – DESIGN SERVICES* AND THE *WORK*. *Other Consultants*, as applicable, will be:

Consultant/Other Consultant	**Full Legal Name**
Civil Engineer (if not the *Consultant*)	
Electrical Engineer	
Geotechnical Engineer	
Landscaping Consultant	
Surveyor	
Construction and Project Manager	

9.2 The *Design-Builder* shall not change the *Consultant* or any *Other*

Consultant without cause and without the written consent of the *Owner*, which consent will not be unreasonably withheld. "

5. New Article A-10:

"ARTICLE A-10 LATE COMPLETION

10.1 If *Completion of the Work* is not completed within the *Contract Time,* the *Design-Builder* shall pay to the *Owner* an amount equal to all costs and damages incurred by the *Owner* as a result of the failure of the *Design-Builder* to attain *Completion of the Work* within the *Contract Time,* whether the costs and damages are a direct or indirect result of a default by the *Design-Builder*. The costs and damages suffered by the *Owner* are understood by the *Design-Builder* to include, without limitation:

.1 The interest costs incurred by the *Owner* under any loan or borrowing it incurs to finance the Project for each day from and including the date that Completion of the *Work* was required to be completed under the Contract Documents until a Certificate for Payment has been issued in accordance with GC5.7 – FINAL PAYMENT;

.2 Consequential losses and pure economic losses suffered by the *Owner* as a direct or indirect result of the default of the *Design-Builder*;

10.2 Notwithstanding anything to the contrary contained in the *Contract*, the *Owner* shall have the right to set off against any amount owing by the *Owner* to the *Design-Builder* pursuant to the *Contract* any and all costs and damages due to the *Owner* by the *Design-Builder* pursuant to paragraph 10.1 of this Article A-10 - LATE COMPLETION."

6. NEW ARTICLE A-11:

"**ARTICLE A-11 CONTRACT DOCUMENTS REQUIREMENTS**

"11.1 Within 15 days of receipt of the *Owner's* letter of intent the *Design-Builder* shall deliver to the *Owner*:

.1 Proof of all necessary permits, licences, certificates and other authorizations required by all municipal, provincial or federal authorities, for the *Design Services and the Work* and proof of payment of all applicable fees;

.2 A finalized critical path construction schedule, generally in the form attached to the Form of Proposal,

.3 A Performance Bond and a Labour and Material Payment Bond, each in the amount of

50% of the *Contract Price*, issued by a surety licensed to carry on the business of suretyship in the province of British Columbia, and in a form acceptable to the *Owner*;

.4 A detailed traffic management plan addressing vehicular and pedestrian movement, safety and access with specific detailing on methods, building and maintenance of temporary structures signage and materials used to maintain *Place of the Work* operations; and access to staff and public users of the *Place of the Work* site;

.5 A detailed *Place of the Work* specific safety and health plan addressing as a high-level overview the health and safety issues including, but not limited to hazards, mitigation measures, site orientations, safety meetings, first aid attendant requirements, and training requirements and record keeping;

.6 A WorkSafeBC "clearance letter" and Prime Contractor Designation letter indicating that the *Design-Builder* is in WorksafeBC compliance;

.7 A copy of the insurance policies as specified in GC11.1 indicating that all such insurance coverage is in place; and

.8 Village of Pemberton or Intermunicipal Business License

DEFINITIONS

7. <u>Refer to Paragraph Subcontractor</u>:

Add at the end of this definition:

"which has been approved by *Owner's Advisor."*

8. <u>New Paragraph</u>:

Add the following:

"**Approved Prices**
Approved Prices has the meaning set out in GC 4.1.8."

9. <u>New Paragraph</u>:

Add the following:

"Cash Allowance
Cash Allowance has the meaning set out in Article A-4."

10. <u>New Paragraph</u>:

Add the following:

"**Design Services and Work Schedule**
Design Services and Work Schedule means the schedule prepared by the *Design-Builder* for the performance of the *Design Services* and *Work* as set out in Appendix C attached hereto including any amendments to the *Design Services* and *Work Schedule* made pursuant to the *Contract Documents*."

11. <u>New Paragraph</u>

Add the following:

Final Acceptance
In addition to all other prior requirements, *Final Acceptance* will not occur until the *Work*
has passed all inspections and testing requirements.

12. <u>New Paragraph</u>:

Add the following:

"**Overhead**

Overhead means all costs associated with management, supervision, insurance, bonding, as-build preparation and warranty, administration and supervision at the *Place of the Work* (including the provision of and maintaining office coordination, office costs, supervision, site trailer, telephone service, and long distance charges) courier, permits, insurance and bonding costs (including premium increases), small tools and general office supplies as required for the performance of the *Work*."

13. New Paragraph:

Add the following:

"**Owner's Representative**

The *Owner's Representative* is the person, firm or corporation appointed by the Owner and identified by the *Owner* in writing to the *Design-Builder*. The *Owner's Representative* may be the *Owner's* Engineer, other employee or officer, or may be an outside consultant."

14. New Paragraph:

Add the following:

"**Total Performance of the Work**

Total Performance of the Work means when all *Work*, including all deficiencies but excluding any correction of completed *Work* that appears during the 1 year warrantee period or other on-going warranty or guarantee obligations as provided by the *Contract Documents*, has been performed as required by the *Contract Documents*, as certified by the *Owner's Advisor*."

15. New Paragraph:

Add the following:

"**Value Added Taxes**

Value Added Taxes means such sum as shall be levied upon the *Contract Price* for Goods and Services Tax (GST) or Harmonized Sales Tax (HST) as may be applicable pursuant to the *Excise Tax Act."*

CONTRACT PART 1

GENERAL PROVISIONS

GC 1.1 CONTRACT DOCUMENTS

16. Refer to GC 1.1.6:

Delete entirely and substitute the following:

"1.1.6 If there is a conflict within the *Contract Documents*:

.1 the order of priority of documents, from highest to lowest, shall be
- Agreement between *Owner* and the *Design-Builder,*
- Definitions in this *Contract,*
- Addenda,
- Supplementary General Conditions of the *Contract,*
- General Conditions,
- Appendix A - *Owner's Statement of Requirements*, *Drawings*, Specifications and Reports.
- Appendix B - Components of the *Contract Price,*
- Appendix C - *Design Services and Work Schedule,*
- Appendix D - Replacement Costs,
- Appendix E - Ongoing Maintenance Costs,
- Appendix F - Energy Usage Costs,
- Appendix G - Village of Pemberton, "Contractor Health & Safety Expectations – Responsibility
- Appendix H - Prime Contractor Designation Letter,
- Appendix I - Detailed Safety and Health Plan, including Key Personnel,
- Appendix J - Detailed Traffic Management Plan,
- Appendix K - Leadership in Energy & Environment Design (LEED) Requirements,
- Appendix L- Village of Pemberton Insurance Policy, and
- Appendix M- Design-Builder's Certificate of Insurance.

.2 later dated documents shall govern over earlier documents of the same type, and

.3 amendments to documents shall govern over documents so amended."

17. New GC 1.1.11:

Add the following:

"1.1.11 The *Design-Builder* will provide to the *Owner or the Owner's Advisor* within 5 calendar days of a request from the *Owner*, without charge, four (4) sets of the *Contract Documents* for construction purposes. The *Owner* may obtain additional sets of *Contract Documents* at the *Design-Builder's* cost of printing, handling and shipping and taxes."

GC 1.3 RIGHTS AND REMEDIES

18. New GC 1.3.3:

Add the following:

"1.3.3 The *Design-Builder* shall at all times be fully responsible to the *Owner* for any errors, omissions, or deficiencies in

the *Contract Documents*, including any revisions and addenda thereto and shall be fully liable for all direct, consequential and additional costs incurred by the *Owner* as a direct or indirect result of such errors, omissions or deficiencies."

19. New GC 1.3.4:

Add the following:

"1.3.4 No inspection, review, approval, consent or any other act or omission on the part of the *Owner* or the *Consultant* shall relieve the *Design-Builder* of any obligations under the *Contract* to complete the *Design Services* or of the *Work* strictly in conformance with all *Contract Documents.*"

GC 1.4 ASSIGNMENT

20. Refer to GC 1.4.1:

"1.4.1 Neither party to the *Contract* shall assign all or any part of the *Contract* without the written consent of the other, which consent may be unreasonably withheld."

GC 1.5 CONFIDENTIALITY

21. Refer to GC 1.5.1**:**

"1.5.1 The *Owner* and the *Design-Builder* shall keep confidential all matters respecting legal issues relating to or arising out of the *Work* or the performance of the *Contract* and shall not, without the prior written consent of the other party, disclose any such issues, except in strict confidence to its professional advisors."

PART 2 OWNER'S RESPONSIBILITIES

GC 2.4 ROLE OF THE PAYMENT CERTIFIER

22. Refer to GC 2.4.9:

Delete GC 2.4.9 in its entirety.

GC 2.6 WORK BY OWNER OR OTHER CONTRACTORS

23. Refer to GC 2.6.4:

In line 2, after the words "*Design-Builder* shall" insert the words "as part of the *Work*, without additional cost to the *Owner*".

PART 3 DESIGN-BUILDER'S RESPONSIBILITIES

GC 3.1 CONTROL OF THE DESIGN SERVICES AND THE WORK

24. Refer to GC 3.1.1:

After the words "*Contract Documents*" in line 2, insert the words "in a good and workmanlike manner and in accordance with accepted industry practice".

25. Refer to GC 3.1.11 to 3.1.14:

Delete entirely and substitute the following:

"3.1.11 The *Design-Builder* is solely responsible for ensuring that the *Design Services* and the *Work* is performed in accordance with the requirements of the *Contract Documents*. The *Design-Builder* shall perform or cause to be performed all tests, inspections and approvals of the *Design Services* and of the *Work* as required by the *Contract Documents*, and if a test, inspection or approval requires a representative sample of materials or workmanship the *Design-Builder* shall at the *Design-Builder's* own cost supply the labour and materials necessary to provide the sample.

3.1.12 If any portion of the *Work* is designated for special tests, inspections or approvals (either as a requirement in the *Contract Documents*, or by the *Owner's Advisor's* instructions, or by the laws or regulations applicable to the *Place of the Work*), then:

(a) if the *Owner's Advisor* is to perform or arrange for the test, inspection or approval the *Design-Builder* shall give the *Owner's Advisor* timely notice requesting such test, inspection or approval; and

(b) if other authorities are to perform the test, inspection or approval the *Design-Builder* shall arrange for such test, inspection or approval and shall give the *Owner's Advisor* timely notice of the date and time for such test, inspection or approval.

3.1.13 The *Design-Builder* will comply with any orders or directions given by the *Owner's Advisor* for inspection or testing that was not called for in the *Contract Documents*, and have such inspection or testing undertaken:

(a) If the *Design-Builder* orders that such inspection or testing, that was not called for in the *Contract Documents*, be carried out in advance of the *Work*, then it shall be treated as a Change Order; and

(b) If the *Owner's Advisor* orders that such inspection or

testing, that was not called for in the *Contract Documents*, be carried out on *Work* that is completed then the following applies: if the inspection or testing determines that the *Work* is not in accordance with the requirements of the *Contract Documents*, then the *Design-Builder* shall correct such *Work* and pay the costs of the inspection and testing and all costs of the correction and the restoration; if the inspection or testing determines that the *Work* is in accordance with the requirements of the *Contract Documents*, then the *Owner* shall pay all costs of the inspection and testing and the restoration.

3.1.14 If the *Design-Builder* disagrees with the *Owner's Advisor's* determination of the *Work* not meeting the *Specifications* based on the results of inspection or testing required in the *Contract Documents* or ordered by the *Owner's Advisor*, the *Design-Builder* may elect to carry out such further inspection or testing which the *Owner's Advisor* agrees is acceptable for the purpose of determining whether the *Work* complies with the requirements of the *Contract Documents*. If such further inspection or testing determines that the *Work* is not in accordance with the requirements of the *Contract Documents*, then the *Design-Builder* shall correct such *Work* and pay the costs of the inspection and testing including all costs of the correction and further testing. If such further inspection or testing determines that the *Work* is in accordance with the requirements of the *Contract Documents*, then the *Owner* shall pay all costs of the inspection and testing.

3.1.15 If the *Design-Builder* covers or permits to be covered the *Work* that has been designated for special tests, inspections or approvals before such special tests, inspections or approvals are made, given or completed, the *Owner's Advisor* may direct the *Design-Builder* to uncover such *Work*, in order that the inspections or tests may be satisfactorily completed, and make good such *Work* at the *Design- Builder's* own expense, and the *Design-Builder* shall comply with such direction.

3.1.16 The *Design-Builder* shall promptly provide the *Owner's Advisor* with 2 copies of all certificates, inspection and testing reports required by the Contract Documents or ordered by the *Owner's Advisor*. Neither the performance of tests or inspections by the *Owner* or the *Owner's Advisor*, nor the arranging for performance of tests or inspections by the *Owner* or by the *Owner's Advisor* nor the acceptance of the *Work* by the *Owner* or the *Owner's Advisor* shall relieve the *Design-Builder* of its responsibility for the proper performance of the *Work* or make the *Owner*

of the *Owner's Advisor* liable for inspections or testing or for the *Work* if it is subsequently determined that the *Work* as performed does not comply with the requirements of the *Contract Documents*.

3.1.17 The *Design-Builder* shall not undertake any *Work* outside of the working hours, as specified in the *Contract Documents* (if so specified), which under the *Contract Documents* requires tests, inspection, or approval by the *Owner's Advisors* unless the *Design-Builder* obtains the *Owner's Advisor's* prior approval. The *Design-Builder* shall reimburse the *Owner* for any additional costs incurred to provide tests, inspections or approvals outside such specified working hours."

GC 3.3 ROLE OF THE CONSULTANT

26. Refer to GC 3.3.1:

After the words "have prepared." add the following words:

"Notwithstanding any other provision in the *Contract Documents*, any interpretation, finding, determination, ruling or decision of any kind made by the *Consultant* or *Other Consultants* will not be final and may be disputed by the *Owner* pursuant to Part 8 – DISPUTE RESOLUTION."

GC 3.4 OTHER CONSULTANTS, SUBCONTRACTORS AND SUPPLIERS

27. Refer to GC 3.4.2:

Add the following at the end:

"The *Design-Builder* shall not employ any *Subcontractor* or *Supplier*, or change a *Subcontractor* or *Supplier* without the written approval of the *Owner*, which approval will not be unreasonably withheld."

28. Refer to GC 3.4.4:

In line 2 after the words "required change",

add the following words

"provided the parties shall

not dispute."

29. New GC 3.4.6:

Add the following:

"3.4.6 The *Design-Builder* will provide only personnel who have qualifications, experience, and capabilities to perform the *Work*."

GC 3.6 DESIGN SERVICES AND WORK SCHEDULE

30. Refer to GC 3.6:

Delete entirely and substitute the following:

"3.6.1 The *Design-Builder* shall:

.1 commence the *Design Services* and *Work* promptly following the date of execution of this *Contract*; and

.2 pursue the *Design Services* and *Work* diligently to ensure that each of the milestone events for the completion of each component of the *Design Services* and of the *Work* as identified in the *Design Services* and *Work Schedule*, as amended from time to time in accordance with paragraph 3.6.2 is achieved at or before the time specified therefore in the *Design Services* and *Work Schedule*.

3.6.2 The *Design Services* and *Work Schedule* sets out the schedule in accordance with which the *Design-Builder* is to carry out the *Design Services* and *Work* provided for in the *Design Services and Work Schedule*.

3.6.3 The *Design-Builder* may submit to the *Owner* or the *Owner's Advisor* from time to time an update of the *Design Services* and *Work Schedule* to amend the milestone events for the completion of the relevant *Design Services* and *Work* provided that no such amendment of the *Design Services* and *Work Schedule* shall amend the *Contract Time* (except to reflect any extension of the *Contract Time* agreed to in writing by the *Owner*).

3.6.4 If in the reasonable opinion of the *Owner, the Owner's Advisor or the Design-Builder* at any time that the actual progress of the *Design Services* and *Work* does not conform with the *Design Services* and *Work Schedule*, then, within 10 *Working Days* the *Design-Builder* shall:

.1 provide the *Owner* and the *Owner's Advisor* with a report identifying the reasons for such nonconformity with the *Design Services* and *Work* Schedule;

.2 submit to the *Owner* and the *Owner's Advisor* for review a revised *Design Services* and *Work Schedule*, which shall:

(1) be in accordance with good industry practice;

(2) satisfy the design and construction requirements

of the *Contract Documents*; and provide for the *Design Services* and *Work* to be pursued diligently in accordance with Paragraph 3.6.1.

3.6.5 The *Owner or the Owner's Advisor* may at any time as a *Change* request a revision to the *Design Services and Work Schedule* to accelerate the performance of the Design Services and *Work* or any component thereof.

3.6.6 The *Owner* or the *Owner's Advisor* may, at any time, give written direction to the *Design-Builder* for the *Design-Builder* to accelerate the *Design Services and Work*, in which event the *Design-Builder* will use reasonable best efforts to proceed with the *Design Services and Work* more quickly, which may include hiring additional labour and equipment and/or working additional hours or shifts. If at the time of such direction by the *Owner* or *Owner's Advisor* the *Design-Builder* is behind the approved *Design Services and Work Schedule* due to a cause within the *Design-Builder's* control, then the cost of such acceleration shall be borne by the *Design-Builder*. If at such time the *Design-Builder* is not behind the *Design Services and Work Schedule*, or is not behind due to a cause within the *Design-Builder's* control, then the cost of such acceleration shall be for the account of the *Owner*."

GC 3.7 SUPERVISION

31. Refer to GC 3.7.1:

Delete entirely and substitute the following:

"3.7.1 The *Design-Builder* shall employ a competent senior representative at the *Place of the Work* (the "*Superintendent*") who shall have the responsibility to ensure that the *Work* is performed in compliance with the *Contract Documents*. The *Design-Builder* shall also employ necessary assistants for the *Superintendent* and the *Superintendent* and assistants shall be in attendance at the *Place of the Work* while *Work* is being performed."

32. Refer to GC 3.7.2:

Delete entirely and substitute the following:

"3.7.2 The *Superintendent* shall represent the *Design-Builder* at the *Place of the Work* and instructions given to the *Superintendent* by the *Owner* or the *Owner's Advisor* shall be held to have been given to the *Design-Builder*."

33. New GC 3.7.3:

Add the following:

"3.7.3 If the competence or performance of the *Superintendent* is not satisfactory to the *Owner* or the *Owner's Advisor* then, on written request from the *Owner's Advisor*, the *Design-Builder* shall provide a satisfactory replacement. The *Design-Builder* shall not change the *Superintendent* without the consent of the *Owner* or the *Owner's Advisor*, such consent not to be unreasonably withheld."

34. New GC 3.7.5:

Add the following:

"3.7.5 If the *Design-Builder* breaches GC 3.7 – SUPERVISION then the *Owner* or the *Owner's Advisor* may refuse to issue any certificates referred to in GC 5.3 –PROGRESS PAYMENT until an appointed representative (Superintendent) acceptable to the *Owner* or the *Owner's Advisor* has returned to the *Place of the Work*."

GC 3.8 LABOUR AND PRODUCTS

35. Refer to GC 3.8.2:

Delete entirely and substitute the following:

"3.8.2 *Products* provided shall be new unless otherwise specified in the *Contract Documents*. *Products* that are not specified shall be of a quality best suited to their purpose and use, as approved by the *Owner* or *Owner's Advisor.*"

36. Refer to GC 3.8.3:

Delete entirely and substitute the following:

"3.8.3 The *Design-Builder* shall maintain good order and discipline among the *Design- Builder's* employees and the *Subcontractors* engaged in the *Work*. The *Design-Build* shall not employ, or permit *Subcontractors* to employ, workers who are not skilled in the assigned task. The *Design-Builder* shall employ sufficient workers to perform the *Work* in compliance with the *Design Services* and *Work* schedule."

37. New GC 3.8.4:

Add the following:

"3.8.4 The *Owner* and the *Design-Builder* acknowledge and agree that the beneficial ownership of any portion of the *Products* required by the *Contract Documents* to be incorporated and form part of the *Work* shall pass to the *Owner* immediately upon payment therefore or upon incorporation thereof as part of the *Work*, whichever first occurs. For greater certainty, title to *Products* delivered, but not installed, shall pass to the *Owner* when paid for (subject to any applicable holdback). The *Design-Builder* agrees to promptly execute and deliver to the *Owner*, from time to time as the *Owner* may require, any further documentation required to identify, evidence, perfect or protect the *Owner's* beneficial, or registered interest in the *Products*. Notwithstanding the foregoing, the *Design-Builder* acknowledges and agrees that it shall continue to bear all risk of loss or damage with respect to the *Work* until the date of acceptance of the *Work* by the *Owner* in accordance with the *Contract Documents*."

38. <u>New GC 3.8.5</u>:

Add the following

"3.8.5 All *Products* shall be used strictly according to manufacturers' printed directions or recommendations unless specifically stated otherwise in the specifications. All *Products* shall be properly packed for delivery, must be delivered in their original containers, crates or wrappings, etc. as applicable and must be clearly identified with manufacturers' name and address, product type and name. All *Products* shall be stored as recommended by the manufacturer and kept dry at the recommended temperature where applicable. Any damaged *Products* shall be rejected and the *Design-Builder* shall remove such *Products* from the *Place of the Work* at the *Design-Builder's* own expense."

39. <u>New GC 3.8.6</u>:

Add the following

"3.8.6 The *Design-Builder* shall provide to the *Owner or Owner's Advisor* at least 2 weeks prior to the *Design-Builder's* deadline for choices, or such earlier time as is agreed between the *Owner* and the *Design-Builder*, for approval by the *Owner or Owner's Advisor* such manufacturer's standard samples as the *Owner or Owner's Advisor* may reasonably require. Samples shall be labelled as to origin and intended use in the *Work* and shall conform to the requirements of the *Contract Documents*."

GC 3.10 SHOP DRAWINGS

40. Refer to GC 3.10:

Delete entirely and substitute the following:

"3.10.1 The *Design-Builder* shall arrange for the preparation of all required *Shop Drawings* and submission of them to the *Owner* or the *Owner's Advisor*.

3.10.2 Unless specifically required by the *Contract Documents*, it is intended that the *Drawings* provided by the *Design-Builder* are sufficiently complete to permit the *Design-Builder* to proceed with the *Design Services* and *Work*, and that *Shop Drawings* are required to show details such as fabrication methods, connections or other details that are not customarily included in *Drawings* provided by an owner for work similar to the *Design Services* and *Work*.

3.10.3 The *Owner's Advisor* may require that a *Shop Drawing* be stamped by a registered Professional Engineer with appropriate skill and knowledge indicating that the *Shop Drawing* has been prepared in compliance with applicable codes and design standards and good engineering practice.

3.10.4 If the *Owner* or the *Owner's Advisor* requires the review and stamping by a Professional Engineer of *Shop Drawings* that are of a type which, according to usual construction practice, are not so reviewed and stamped, then the cost of such review and stamping shall be paid by the *Owner*.

3.10.5 The *Design-Builder* shall submit *Shop Drawings* to the *Owner* or the *Owner's Advisor* in a timely way and in an orderly sequence so as to permit the *Owner* or the *Owner's Advisor* a reasonable opportunity to review the *Shop Drawings* without causing a delay to the *Design Services* and *Work* or to the work of other contractors. The *Owner* or the *Owner's Advisor* and the *Design-Builder* shall cooperate to establish a schedule for the submission and review of *Shop Drawings*. The *Design-Builder* and the *Owner* or the *Owner's Advisor* shall agree on the number of copies of each *Shop Drawing* to be submitted.

3.10.6 Prior to submission to the *Owner* or the *Owner's Advisor* the *Design-Builder* shall review all *Shop Drawings*, and shall indicate such review by dating and stamping them. By this review the *Design-Builder* represents that the *Design-Builder* has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data and that the *Design-Builder* has checked and coordinated each *Shop Drawing* with the requirements of the *Design Services* and *Work* and the *Contract Documents*. At the time of

submission, the *Design-Builder* shall specifically draw the attention of the *Owner* or the *Owner's Advisor* in writing to any deviations in the *Shop Drawings* from the requirement of the *Contract Documents*.

3.10.7 Unless otherwise specified in other provisions of the *Contract Documents* the *Shop Drawings* may be drawn by hand, in CAD format, or other format at the selection of the *Design-Builder*.

3.10.8 The *Owner* or the *Owner's Advisors* will review the *Shop Drawings* submitted by the *Design-Builder* and return them in accordance with an agreed-to schedule, or otherwise with reasonable promptness so as not to cause delay to the *Design Services* and *Work*.

3.10.9 The *Design-Builder* shall make any changes in *Shop Drawings* which the *Owner* or the *Owner's Advisor* may require consistent with the *Contract Documents* and resubmit unless otherwise directed by the *Owner* or the *Owner's Advisor* in writing of any revisions other than those requested by the *Owner* or the *Owner's Advisor*.

3.10.10 When a submitted *Shop Drawing* is acceptable to the *Owner* or the *Owner's Advisor* as provided by this GC then the *Owner* or the *Owner's Advisor* shall date and mark the *Shop Drawing* as "Reviewed" and return it to the *Design-Builder*. The *Owner* or the *Owner's Advisor* shall date and mark the number of copies submitted.

3.10.11 The *Design-Builder* may proceed with the *Design Services* and *Work* shown on any *Shop Drawing* which the *Owner* or the *Owner's Advisor* has marked "Reviewed". In no event shall the *Design-Builder* proceed with the performance of the *Design Services* and *Work* utilizing *Shop Drawings* which have not been marked "Reviewed" by the *Owner* or the *Owner's Advisor* as provided by this GC.

3.10.12 The *Design-Builder* is responsible for any errors or omissions in the *Shop Drawings* and the *Owner* or the *Owner's Advisor's* review shall not relieve the *Design-Builder* of that responsibility. The *Owner* or the *Owner's Advisor's* review of the *Shop Drawings* will normally be to see if they are in general conformance with the *Contract Documents* but the *Owner* or the *Owner's Advisor* may, as the *Owner* or the *Owner's Advisor* may decide, review a *Shop Drawing* in greater or lesser detail.

3.10.13 The *Owner* or the *Owner's Advisor's* authority to review the *Shop Drawings* shall be for the benefit of the *Owner* or the *Owner's Advisor* and such authority shall not give rise to any duty or responsibility on the *Owner's Advisor* or the *Owner* to the *Design-Builder*, *Subcontractors*, or their agents, employees or

other persons performing any of the *Design Services* and *Work*.

3.10.14 The *Owner's* or the *Owner's Advisor's* review shall not relieve the *Design-Builder* of responsibility for errors or omissions in the *Shop Drawings* or of responsibility for meeting all requirements of the *Contract Documents* unless a deviation on the *Shop Drawings* has been approved in writing by the *Owner* or the *Owner's Advisor*."

GC 3.11 NON-CONFORMING DESIGN AND DEFECTIVE WORK

41. Refer to GC 3.11.2:

Delete entirely and substitute the following:

"3.11.2 If for any reason, including poor workmanship, defective *Products* or materials, and damage to completed *Work,* the *Owner's Advisor* rejects *Work* because it fails to conform to the *Contract Documents*, then the *Design-Builder* shall at the *Design- Builder's* expense promptly remove such *Work* from the *Place of the Work* and replace re-execute it in accordance with the requirements of the *Contract Documents*. Such remedial work shall include any re-testing reasonably required to establish that the completed *Work* complies with the *Contract Documents*. This provision applies to all materials, *Products* and portions of the *Work* whether or not incorporated into the *Work* as a whole."

42. Refer to GC 3.11.4:

Delete entirely and substitute the following:

"3.11.4 If, in the opinion of the *Owner* or the *Owner's Advisor* it is not expedient to correct such defective *Work* or *Work* not performed in accordance with the *Contract Documents*, then the *Owner* or the *Owner's Advisor* may direct that such *Work* be left and the *Owner* may deduct from the monies otherwise due to the *Design-Builder* the difference in value to the *Owner*, considering the *Owner's* intended use of the *Work*, between the *Work* as performed and that called for by the *Contract Documents*. The amount of such deduction will be determined in the first instance by the *Owner* upon the recommendation of the *Owner's Advisor.* If such amount as determined by the *Owner* is not acceptable to either party, then the provisions of GC 8.1 shall apply.

43. New GC 3.11.5:

"3.11.5 The *Design-Builder* shall complete the deficient and incomplete work speedily and at the discretion and convenience of the *Owner*. Acceptance of the *Work* or occupancy of the *Project* or any portion thereof by the *Owner* or the *Consultant* shall not relieve the *Design-Builder* from the obligation of correcting deficiencies which are missed at the time of drawing up the list of deficient and incomplete items of work or those hidden deficiencies."

44. New GC 3.12:

"GC 3.12 USE OF THE WORK

"3.12.1 The *Owner* reserves the right to take possession of and use any completed or partially completed portion of the building, regardless of the time of completion of the entire *Work*, providing that doing so does not interfere with the *Design-Builder's Work*. Such taking possession or use of the building or parts thereof shall not be construed as *Substantial Performance of the Work* or part thereof, or as final certificate for payment, or as an acknowledgement of fulfilment of the *Contract*.

"3.12.2 The *Design-Builder* shall schedule the operations for completion of portions of the *Work* as designated for the *Owner's* occupancy, prior to *Substantial Performance of the Work*. There will only be on date of *Substantial Performance of the Work* for the *Contract*."

45. New GC 3.13:

"GC 3.13 CLEAN-UP

3.13.1 Upon attaining *Substantial Performance* the *Design-Builder* shall remove all surplus products, tools, construction machinery and equipment relating to the Work that is not required for the performance of the remaining *Work*. The *Design-Builder* shall also remove waste, debris and waste products other than that caused by the *Owner* or other contractors, and leave the *Place of the Work* clean and suitable for occupancy by the *Owner* unless otherwise specified in the *Contract Documents* or directed by the *Owner's Advisor*.

3.13.2 If the *Design-Builder* fails or refuses to remove all such *Products*, materials, equipment and waste within a reasonable amount of time after achieving *Substantial Performance* then, on written notice from the *Owner's Advisor* to the *Design-Builder* specifying reasonable time to remedy such failure or refusal, the *Owner* may do or cause to be done the removal

and all reasonable resulting costs incurred by the *Owner* may be deducted from any amounts owing by the *Owner* to the *Design- Builder*."

PART 4 ALLOWANCES

GC 4.1 CASH ALLOWANCES

46. Refer to GC 4.1.2**:**

Delete entirely and substitute the following:

"4.1.2 The *Contract Price*, which includes the *Cash Allowances*, includes the *Design- Builder's Overhead* and profit."

47. New GC 4.1.8:

Add the following:

"4.1.8 The components of the *Contract Price* set out in Appendix B – *Contract Price*, are substantially as follows:

.1 the total scope of *Design Services* and the *Work* has been divided into the line items as set out in column #2 of Appendix B – *Contract Price*. All elements of the *Design Services* and the *Work* will be allocated, without duplication, to one of the line items, regardless of the description listed in column #2;

.2 a cash allowance (each a "*Cash Allowance*") has been determined for certain line items as set out in column #3 of Appendix B – *Contract Price*, which represents the parties' best estimate for the cost of performing the *Design Services* and the *Work* related to a line item;

.3 the *Design-Builder* will not proceed with the *Design Services* and the *Work* related to a given *Cash Allowance* line item without the *Owner's* prior written approval, and will not be entitled to any payment for such *Cash Allowance* line item prior to the *Owner* agreeing to an approved fixed price (the "*Approved Price*") for that line item;

.4 expenditure of *Cash Allowances* is to be directed as per GC 6.2 *Change Order* or GC 6.3 – *Change Directive*, at the *Owner's* directive. All *Design Services and Work* under *Cash Allowances* are to be competitively bid (generally at least 3 quotations) unless directed by the *Owner*. The *Design-Builder* shall keep records and submit a monthly update on expenditures towards the *Cash Allowance* including unallocated amounts;

.5 when *Cash Allowance* are converted to *Approved Prices* any documents, *Drawings*, *Specifications* that are the basis of the solicitation revising *Cash Allowances* to

Approved Prices are listed in the *Change Order* as an addition to the *Contract Documents*;

.6 the *Approved Prices*, when approved, will be inserted into column 4 of Appendix B – *Contract Prices*, and as full payment for the performance of such *Design Services* and the *Work*, the *Approved Price* will be included in the *Contract Price* (in substitution for the *Cash Allowance* for that line item), and paid by the *Owner* in accordance with the terms of this *Contract*. For certainty the *Cash Allowances* are intended to be indicative and the *Design-Builder* will not be entitled to payment of any *Cash Allowance* amount; for certainty an *Approved Price* may change the *Contract Price* but does not change the *Contract Time*; and

.7 the *Owner* agrees to use its best commercial efforts to review and agree on proposed *Approved Prices* within fifteen (15) *Working Days* of submission for approval by the *Design Builder*."

PART 5 PAYMENT

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

48. Refer to GC 5.1:

Delete entirely.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

49. Refer to GC 5.2.3:

Add the following at the end:

"The *Design-Builder* will identify separately, with reference to the applicable *Change Order*, any application for payment for *Design Services* and *Work* performed pursuant to a *Change Order*. No payment for extras or changes of the *Design Services* and *Work* will be made before the issuance of the applicable *Change Order*."

50. New GC 5.2.9:

"5.2.9 Prior to making an application for payment, the *Design-Builder* will provide a updated *Design Services and Work Schedule* in accordance with paragraph 3.6.1.2 of GC 3.6 – *DESIGN SERVICES AND WORK SCHEDULE*."

GC 5.3 PROGRESS PAYMENT

51. Refer to GC 5.3.1.3:

Delete entirely and substitute the following:

".3 The *Owner* will make payment to the *Design-Builder* on account as provided in Article A-5 of the Agreement – PAYMENT, on or before 30 days after the date on which the invoice is delivered to the *Owner."*

52. New GC 5.3.2, GC 5.3.3, GC 5.3.4 and GC 5.3.5:

Add the following:

"5.3.2 Builder's Lien Holdback: The *Owner* shall hold back 10%, or other percentage as required by the *Builders Lien Act*, of any amounts due to the *Design-Builder* as a builders lien holdback.

5.3.3 Defects and Deficiencies: In addition to other holdbacks as provided by the *Contract Documents*, when considering *Substantial Performance of the Work*, the *Owner* may hold back from payments otherwise due to the Design-Builder 200% of a reasonable estimate, as determined by the *Owner's Advisor*, on account of deficient or defective *Work* already paid for. This holdback may be held, without interest, until such deficiency or defect is remedied. The items of defect or deficiency and the amounts of related holdback shall be listed separately on the certificate for payment.

5.3.4 Incomplete *Work*: If after *Substantial Performance of the Work* is achieved the *Design-Builder* is unable to complete any of the *Work* because of climatic or other conditions beyond the *Design-Builder's* reasonable control then the Owner may hold back from payments otherwise due to the *Design-Builder* the amount as estimated by the *Owner's Advisor* in consultation with the *Design-Builder* by which the cost to have others complete the *Work* exceeds the estimated *Contract Price* for such *Work*.

5.3.5 Filed Builder's Liens: The *Owner* may, in addition to other holdbacks as provided by the *Contract Documents*, hold back an amount equal to any lien which has been filed with respect to the *Work*, plus 15% as security costs. The *Owner* may, at its option, after 5 calendar days written notice to the *Design-Builder*, pay such amount into court to discharge the lien. If the lien is discharged without

payment of the holdback into court, then the *Owner* shall pay such holdback to the *Design- Builder*, without interest."

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

53. Refer to GC 5.4.1:

Delete entirely and substitute the following:

"5.4.1 When the *Design-Builder* considers that there has been *Substantial Performance of the Work*, the *Design-Builder* shall prepare and submit to the *Payment Certifier* appropriate documents as required by the *Contract Documents* together with a written application for a review by the *Payment Certifier* to establish *Substantial Performance of the Work*. In particular, the *Design-Builder* shall submit the following documents with its request for review by the *Payment Certifier* to establish *Substantial Performance of the Work.*

.1 The list of all deficient and incomplete items of *Work* including the estimated value of each item;

.2 Complete reports including a balancing report for the mechanical system and certification by all testing, cleaning or inspection authorities or associations as specified in the *Contract Documents*;

.3 A complete demonstration of all mechanical and electrical systems and electrically-operated devices to the *Owner*'s operating and maintenance staff and any training required by the specifications, to the *Owner*'s satisfaction;

.4 All maintenance manuals, operating instructions, maintenance and operating tools, replacement parts or materials and warranties as specified in the *Contract Documents*;

.5 A complete set of marked up construction *Drawings* and *Shop Drawings* and other data in the form specified in the *Contract Documents*, or as required by the *Payment Certifier*, for the production of as built *Drawings* to show all significant changes to the *Work* made during construction;

.6 Current certification by the *Workers' Compensation Board* that the *Design-Builder* and all *Subcontractors* are in good standing;

.7 A statement that all claims and demands for extra work or otherwise, under or in connection with the *Contract*, have been presented to the *Payment Certifier* and that the *Design-Builder* expressly releases the *Owner* from all claims and demands except those made in writing prior to that date and still unsettled;

.8 The requirement to provide documents and other items listed in sub-paragraphs .1 through .9 does not limit the *Design-Builder's* obligations for *Completion of the Work* noted elsewhere in the *Contract*.

5.4.6 No later than 25 calendar days following issuance of the *Certificate of Substantial Performance of the Work*, the *Design-Builder* shall provide to the *Owner* all service contracts, manufacturer's inspections, certifications, guarantees and warranties and assignments of all guarantees and warranties as specified in the *Contract Documents*.

These requirements do not limit the *Design-Builder's* obligations for *Substantial Performance* noted elsewhere in the *Contract*.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

54. Refer to GC 5.5.3:

Delete entirely.

GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK

55. New GC 5.6.4:

Add the following:

"5.6.4 The *Design-Builder* will provide all necessary documentation reasonably required by the *Owner* or the *Owner's Advisor* to determine amounts of such subcontract work and verify substantial performance of such subcontract work."

GC 5.7 FINAL PAYMENT

56. Refer to GC 5.7.2:

At the end of the first sentence add:

"The application by the *Design-Builder* for payment upon *Total Performance* of the *Work* shall only be made after the inclusion of the following:

(1) a Statutory Declaration, completed in duplicate, that all accounts due have been paid;

(2) a letter from the Workers' Compensation Board confirming that the *Design-Builder* is in good standing."

57. Refer to GC 5.7.4:

Delete "no later than 5 calendar days after the issuance of a final certificate for payment" and substitute with "no later than 30 calendar days after the *Owner* receives the final certificate of payment".

PART 6 CHANGES IN THE CONTRACT

GC 6.2 CHANGE ORDER

58. New GC 6.2.4:

Add the following:

"6.2.4 If the method of valuation, measurement, change in the *Contract Price* and change in the *Contract Time* cannot be promptly agreed upon and the change is required to be proceeded with, then the *Owner's Advisor* in the first instance will determine the method of valuation, measurement, the change in the *Contract Price* and *Contract Time* and the *Design-Builder* shall promptly proceed with the change. The *Design-Builder* may dispute the *Owner Advisor's* determinations as specified in GC 8.1."

59. New GC 6.2.5:

Add the following:

"6.2.5 The *Design-Builder* will not be entitled to any *Overhead* or profit on *Change Orders* dealing with *Cash Allowances* specified in the *Contract*."

60. New GC 6.2.6:

Add the following:

"6.2.6 the value of a change in the *Design Services* or the *Work* shall be determined by one or more of the following methods:

(a) by estimate and acceptance of a lump sum; or

(b) by unit prices set out in the *Contract* or subsequently agreed upon; or

(c) by actual cost and an allowance for *Overhead* and profit as follows:

1. *Design-Builder's Overhead* and profit on expenditures from *Cash Allowances*, shall be included in the *Contract Price*, except the *Design-Builder* is entitled to additional *Overhead* and profit only on the portion of the change greater than the *Cash Allowance*. If the change is less than the *Cash Allowance* the *Contract Price* shall be decreased by the amount of the change without adjustment for the *Design-Builder's Overhead* and profit;

2. for changes in the *Design Services and the Work* not covered by *Cash Allowances*:

(i) if there is no increase or decrease in the *Contract Price* the *Design-Builder* is not entitled to any *Overhead* and profit on the change,

.1 if the *Contract Price* is increased, the *Design-Builder* is entitled to additional:

.2 10% *Overhead* and profit on *Work* performed directly by the *Design-Builder*, and

.3 5% on *Work* performed by *Subcontractor*, only on the portion of the increase in the *Contract Price*, and

.4 0% on *Design Services and Work* performed by the *Design-Builder's Consultants*;

(ii) if the *Contract Price* is decreased by the change the *Design-Builder* is not entitled to *Overhead* and profit

on the reduction in the *Contract Price*;

3. the *Subcontractor* or the sub-subcontractor *Overhead* and profit shall be 5% of the actual cost of all *Subcontractor's* or sub-subcontractor's changes in the *Work*; and
4. where the change involves the substitution of one type of *Design Services and Work and/*or *Product* for another the actual cost of the change, shall be the net difference in the actual cost without any entitlement to *Overhead* and profit.'

GC 6.3 CHANGE DIRECTIVE

61. Refer to GC 6.3.6:

Delete entirely.

62. Refer to GC 6.3.7:

Delete line 1 (which for reference reads "The cost of performing…actual cost of the following:") insert the words "without markup for *Overhead* and profit" between the words "cost of".

63. Refer to GC 6.3.7.7:

Delete entirely.

GC 6.5 DELAYS

64. Refer to GC 6.5.4:

Add the following:

> "No claim for additional payment arising from a delay will be payable to the *Design- Builder* unless the *Design-Builder* has prepared, or caused to be prepared, records of all *Design Services* and *Work* and the costs of the *Design Services* and *Work*, on a daily basis as the *Design Services* and *Work* proceeds, and submits such records in support of the claim."

65. New GC 6.5.6:

Add the following:

"6.5.6 In the event of a delay which results in a stoppage of the *Work*, the *Design-Builder* will take all reasonable steps to protect the *Work* for the entire period of the delay. The cost of such

protection shall be paid by the *Owner* unless and to the extent the delay was caused by the *Design-Builder*."

GC7.2 OWNER'S RIGHT TO TERMINATE THE DESIGN BUILDER'S RIGHT TO CONTINUE WITH THE DESIGN SERVICES OR WORK, OR TERMINATE THE CONTRACT

66. New GC 7.2.7:

"7.2.7 If the *Owner* terminates the *Design-Builder's* right to continue with the *Work* in whole or in part or terminates the *Contract*, the *Design-Builder* shall at the *Design-Builder's* expense, safeguard the *Work* then completed and the materials and equipment then delivered to the *Place of the Work* and do such other extra work as may be ordered by the *Owner* or *Owner's Advisor* for the purpose of leaving the *Work* in a safe and useful condition."

PART 8 DISPUTE RESOLUTION

GC 8.1 NEGOTIATION, MEDIATION AND ARBITRATION

67. Refer to GC 8.1.8:

"8.1.8 If both parties consent in writing to settle the dispute by arbitration then either party may refer the dispute to be finally resolved by arbitration under the Rules for Arbitration of Construction Disputes as provided by CCDC 40 in effect as of the date of the Contract. The arbitration will be conducted in British Columbia. If the parties do not both consent to arbitration then either party will be free to enforce its rights by litigation."

68. Refer to GC 8.1.9:

Delete entirely.

69. Refer to GC 8.1.10:

Delete entirely.

GC 8.2 RETENTION OF RIGHTS

70. Refer to GC 8.2.2:

Delete all words following "…jurisdiction of the *Place of the Work*".

PART 9 PROTECTION OF PERSONS AND PROPERTY GC9.1 PROTECTION OF WORK AND PROPERTY

71. Refer to GC 9.1.1:

Delete entirely and substitute the following:

"9.1.1 The *Design-Builder* shall protect the *Work* and the *Owner's* property and property adjacent to the *Place of the Work* from damage which may arise as a result of the *Design-Builder's* operations under the *Contract*, and the *Design-Builder* shall be responsible for such damage as provided for in the *Contract*."

GC9.2 TOXIC AND HAZARDOUS SUBSTANCES AND MATERIALS

72. Refer to GC 9.2.1:

Delete entirely and substitute the following:

"For the purposes of applicable environmental legislation, the *Owner* will be responsible for toxic or hazardous substances and materials present at the *Place of the Work* at the commencement of the *Work*. The *Design-Builder* will be responsible for toxic or hazardous substances brought onto the *Place of the Work* after commencement of the *Work*."

73. Refer to GC 9.2.2:

Delete entirely.

74. Refer to GC 9.2.3:

Delete entirely.

75. Refer to GC 9.2.4:

Delete entirely.

76. Refer to GC 9.2.5:

Delete entirely and substitute the following:

"9.2.5 If the *Design-Builder*

.1 encounters toxic or hazardous substances at the *Place of the Work*; or

.2 has reasonable ground to believe that toxic or

hazardous substances are present at the *Place of the Work;*
which were not identified in the *Contract Documents* then the *Design-Builder* will:

(1) take all reasonable steps, including stopping the *Work* if necessary, to ensure that no person's exposure to any toxic or hazardous substances exceeds the exposure permitted by applicable law; and

(2) immediately report the circumstances in writing to the *Consultant* and the *Owner and the Owner's Advisor* in writing."

77. Refer to GC 9.2.6:

Delete entirely and substitute the following:

"9.2.6 The *Owner* in consultation with the *Design-Builder* will retain a qualified independent expert to investigate and provide an opinion on:

.1 the necessary steps required by applicable legislation to remove and dispose of any toxic or hazardous substances at the *Place of the Work* that must be moved in order to proceed with the *Work;* and

.2 whether such toxic or hazardous substances were present prior at the *Place of the Work* prior to the commencement of the *Work*, or whether they were brought to the *Place of the Work* by the *Design-Builder.*"

78. Refer to GC 9.2.7:

Delete entirely and substitute the following:

"9.2.7 If the *Owner* and *Design-Builder* agree, or if the expert referred to in GC 9.2.6 determines, that the toxic or hazardous substances were not brought onto the *Place of the Work* by the *Design-Builder* or anyone for whom the *Design-Builder* is responsible:

.1 the *Design-Builder* will within ten (10) *Working Days,* prepare and deliver to the *Owner or the Owner's Advisor*, with a copy to the *Consultant*, a plan for the safe removal from the *Place of the Work* and disposal of the toxic or hazardous substances and the *Owner* will, within five (5) *Working Days* of receipt of such plan, approve the plan or provide reasons to the *Design-Builder* why the *Owner* or Owner's Advisor did not approve the plan, or such dates as otherwise agreed to;

.2 having received approval from the *Owner or the Owner's Advisor*, the *Design- Builder* will promptly take all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to safely remove and dispose of the toxic or hazardous substances in accordance

with the approved plan;

.3 the *Design-Builder* will make good any damage to the *Work*, the *Owner's* property or property adjacent to the *Place of the Work* as provided in GC 9.1.3 of GC 9.1 – PROTECTION OF *WORK* AND PROPERTY;

.4 the *Owner* will reimburse the *Design-Builder* for the costs of all steps taken pursuant to GC 9.2.5 and 9.2.7; and

.5 the *Owner* will extend the *Contract Time* for such reasonable time as the *Owner's Advisor* may recommend in consultation with the *Consultant* and *Design-Builder* and the expert referred to in GC 9.2.6 and reimburse the *Design-Builder* for reasonable costs incurred as a result of the delay, if any.

79. Refer to GC 9.2.8:

Delete entirely and substitute the following:

"9.2.8 If the *Owner* and *Design-Builder* agree, or if the expert referred to in GC 9.2.6 determines, that the toxic or hazardous substances were brought onto the *Place of the Work* by the *Design-Builder* or anyone for whom the *Design-Builder* is responsible the *Design-Builder* will:

.1 within ten (10) *Working Days,* to prepare and deliver to the *Owner*, with a copy to the *Owner's Advisor*, a plan for the safe removal from the *Place of the Work* and disposal of the toxic or hazardous substances and the *Owner* will, within five (5) *Working Days* of receipt of such plan, approve the plan or provide reasons to the *Design-Builder* why the *Owner or the Owner's Advisor* did not approve the plan, or such dates as otherwise agreed to;

.2 having received approval from the *Owner or the Owner's Advisor*, promptly take all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to safely remove and dispose of the toxic or hazardous substances in accordance with the approved plan;

.3 make good any damage to the *Work*, the *Owner's* property or property adjacent to the *Place of the Work* as provided in paragraph 9.1.3 of GC 9.1 – PROTECTION OF WORK AND PROPERTY; and

.4 reimburse the *Owner* for reasonable costs incurred by the *Owner* with regard to the expert under paragraph 9.2.6.

GC9.4 CONSTRUCTION SAFETY

80. New GC 9.4.2:

Add the following:

"9.4.2 The *Design-Builder* shall remove forthwith from the *Place of the Work* any person who engages in misconduct or is incompetent or negligent in the performance of any duties, or whose presence on the site is otherwise undesirable."

GC 9.5 MOULD

81. Refer to GC 9.5.3:

In line 2, after the words "*Design-Builders* operations under the *Contract*" insert the words "or the operations of any *Subcontractor* or any person for whom the *Design-Builder* is responsible in law,"

82. Refer to GC 9.5.4:

Delete entirely and substitute the following:

"9.5.4 If the *Owner* and *Design-Builder* agree, or if the expert referred to in paragraph 9.5.2 determines, that the presence of mould at or within the *Place of the Work* was not caused by the *Design–Builders* operations under the *Contract*, or the operations of any *Subcontractor* or any person for whom the *Design-Builder* is responsible in law:

.1 the *Design-Builder* shall take all reasonable and necessary steps to safely remediate or dispose of the mould;

.2 the *Design-Builder* shall make good any damage to the *Work*, the *Owner's* property or property adjacent to the *Place of the Work* as provided in paragraph 9.1.3 of GC 9.1 – PROTECTION OF *WORK* AND PROPERTY;

.3 the *Owner* shall reimburse the *Design-Builder* for the costs of all steps taken pursuant to paragraphs 9.5.4.1 and 9.5.4.2; and

.4 the *Owner* shall extend the *Contract Time* for such reasonable time as the *Consultant and Owner's Advisor* may recommend in consultation with the *Design- Builder* and the expert referred to in paragraph 9.2 and reimburse the *Design- Builder* for reasonable costs incurred as a result of the delay.

PART 10

GOVERNI

NG REGULATIONS

GC10.1 TAXES

AND DUTIES

83. New GC 10.1.3:

Add the following:

"10.1.3 Where documentation may be required for tax refund purposes, the *Design- Builder* shall be responsible for providing the *Owner* with such invoices and records as may be necessary to substantiate the amount of tax paid during the performance of the *Work* for which the *Owner* may lawfully claim exemption."

GC10.2 LAWS, NOTICES, PERMITS AND FEES

84. Refer to GC 10.2.3:

In the first line delete the words "the building permit and other".

In the second line delete the words "at the time of the proposed closing or bid closing".

85. New GC 10.2.8:

"10.2.8 The *Owner* shall obtain and pay for the building permit."

86. New GC 10.2.9:

"10.2.9 The *Design-Builder* shall obtain, pay for and maintain throughout the term of the *Contract* a valid Village of Pemberton business license."

PART 11 INSURANCE AND CONTRACT SECURITY

GC11.1 INSURANCE

87. To delete GC 11.1 INSURANCE and substitute the following:

11.1.1 The *Design-Builder* shall provide, maintain and pay for the insurance coverages listed in this General Condition unless otherwise stipulated:

.1 The *Design-Builder* will procure and, during the progress of the *Work*, maintain Wrap-up Commercial General Liability Insurance adding the Village of Pemberton as additional insureds. The *Design-Builder* will also procure a Builder's Risk Policy for losses to property during the construction project. A valid Certificate of Insurance, approved by the *Owner's* Risk Management Division, shall be provided prior to the commencement of the *Design Services* and *Work*.

.2 The *Design-Builder* shall notify the *Owner's* Risk Manager immediately where an incident occurs that may give rise to a claim. Where an accident occurs that gives rise to a claim, the *Design-Builder* shall, at the *Design-Builder's* cost, provide notices, proofs of loss and such other documentation as the insurer may require for processing the claim under the CGL.

.3 Wrap-up Commercial General Liability Insurance

(i) The *Design-Builder* will obtain Wrap-up Commercial General liability (CGL) coverage for losses arising out of operations of the *Design-Builder* and all *Subcontractors* including bodily injury (including death resulting there from) and personal injury sustained by any person or persons, or because of injury to or destruction of property arising out of any operations in connection with the *Contract*, in an amount not less than $10,000,000 per occurrence and in the aggregate with respect to products and completed operations and provide coverage for, among other things, such general categories as:

a) Broad Form Property Damage Liability
b) Premises and Operations Liability
c) Elevator and Hoist Liability (as applicable)
d) Broad Form Products and Completed Operations Liability
e) Blanket Contractual Liability
f) Contingent Employer's Liability
g) Non-owned Automobile Liability
h) Cross Liability Clause
i) Employees as additional insureds
j) Sudden and Accidental Pollution Liability ($2,000,000)
k) Medical Payments Coverage
l) Fire Fighting Expense Coverage
m) Excavation, pile driving, shoring, blasting, underpinning and/or demolition work included

(ii) The Wrap-up policy will also include 36 months of completed operations coverage which will commence upon Substantial Completion of the project.

(iii) The deductible under such insurance shall not exceed $25,000 per occurrence.

.4 Builder's Risk Policy

(i) The *Design-Builder* will procure and maintain a Builders Risk Policy in an amount not less than the *Contract Price*, covering the replacement value of property insured. This policy shall remain in force until Substantial Completion, or until the *Owner* has arranged to have this completed project added to their property policy.

(ii) This policy shall contain the DE5 – Design Exclusion.

(iii) For property insured under the Builders Risk Policy stored at an off-site location or in transit, a limit of not less than the total of all values stored at any single location or the value of the largest single shipment transported by land to the *Place of the Work* if such shipment by land is not covered by marine cargo insurance.

(iv) Either the Builders Risk Policy, pursuant to its terms or by an endorsement to the Builders Risk Policy, or a separate "Riggers/Hook Liability" policy procured by the *Owner*, will cover and insure the full value of material and equipment lifted on *Place of the Work* by cranes during the performance of the *Work*.

(v) Either the Builders Risk Policy, pursuant to its terms or by an endorsement to the Builders Risk Policy, or a separate "Machinery Breakdown Insurance" policy procured by the *Owner* will cover testing and commissioning for the full value of material and equipment which has been installed in the permanent position into the project and including for a period of one hundred and twenty days (120) days after testing and commission is complete and the equipment is in operation or the project is accepted whichever comes first.

(vi) All deductibles will be paid by the *Design-Builder*.

.5 Professional Liability Insurance

The *Consultant* shall provide evidence of Professional Liability Insurance in an amount not less than Three Million Dollars ($3,000,000) per claim and in the aggregate insuring against all insured loss or damage including coverage for third party property damage, bodily injury or death arising out of the professional services rendered by the *Design-Builder*, consultant, architects, designers, engineers, surveyors and their sub-contractors, employees and servants who perform normal services to the Design-Builder under the Agreement. In addition, the Geotechnical Consulting Engineer shall provide a minimum of Five Million Dollars ($5,000,000) in Professional Liability Insurance per claim and in the aggregate.

(i) Coverage will be maintained for a period of at least 3 years after the completion of the project.

.6 Design-Builders Equipment

(i) The *Design-Builder* and each *Subcontractor* shall, at its own expense, obtain and maintain until completion of the *Contract* "all risks" insurance covering all construction equipment owned or rented by them for which they may be responsible.

.7 Aircraft and Watercraft

(i) If Aircraft are used in connection with the *Work* performed under the *Contract*, the *Design-Builder* shall obtain, and provide evidence to the *Owner*, that Aircraft Liability Insurance is carried on all owned and non-owned aircraft used by the *Design-Builder* with limits of liability of not less than $5,000,000 inclusive per occurrence for bodily injury (including passengers), personal injury, death and/or damage to or destruction of property, including loss of use thereof. Such Aircraft Liability Insurance shall contain a cross liability clause by which the liability of any one

insured to another insured will be covered as though separate policies were issued to each.

(ii) If any Watercraft are used in connection with the *Work* performed under the *Contract* and such watercraft are not small watercraft as defined in and included under the CGL Policy procured by the *Owner*, the *Design-Builder* shall obtain, and provide evidence to the *Owner*, that (1) Protection and Indemnity Insurance including Pollution Liability and (2) Hull and Machinery Insurance is carried on all owned or non-owned watercraft used by the *Design-Builder* with Limits of Liability of not less than $5,000,000 inclusive per occurrence.

(iii) The *Design-Builder* shall ensure the *Design-Builder*, the Owner, the Owner's *Advisor*, and their respective officers, directors, employees, consultants and agents, are added as Additional Insureds to both these policies.

.8 Marine Cargo Insurance (if applicable)

(i) Except to the extent that the *Owner* in its sole discretion otherwise expressly agrees in writing to procure some or all marine cargo insurance, if ocean marine cargo is used the *Design-Builder* and each *Subcontractor* shall insure all materials, equipment or other property to be supplied pursuant to the *Contract*, or used in the performance of the *Contract*, and which requires to be transported as ocean marine cargo for their full

replacement value subject to the conditions of the Institute Cargo Clauses (All Risks), including war and strikes extension, and including transits and storage where applicable. In addition, if an entire vessel is chartered for shipping equipment then Charterer's Liability insurance shall be provided, in amounts sufficient to protect and indemnify the *Design-Builder* and its *Subcontractors* of all liability arising out of the chartering of such vessel.

.9 Motor Vehicles

(i) The *Design-Builder* and each *Subcontractor* shall, at its own expense, obtain and maintain until completion of the *Contract* such insurance as will protect such *Design-Builder* or *Subcontractor* (and others driving any motor vehicles with their consent) against the liability imposed by law upon such *Design- Builder* or *Subcontractor* or other person, for loss or damage including without limitation property damage, personal injuries and death arising from the ownership, use or operation of any motor vehicle used or to be used in connection with the *Work*, on and off the *Place of the Work*, whether owned, rented, leased, borrowed or otherwise by such *Design-Builder* or *Subcontractor*.

(ii) Without restricting the generality of the foregoing, the *Design- Builder* and all *Subcontractors* shall provide Standard *Owner's* Form Automobile Policy providing Third Party Liability and Accident Benefits Insurance as provided by the Insurance Corporation of British Columbia ("ICBC") in accordance with the Automobile Insurance Act, with minimum inclusive limits for bodily injury and property damage (third party) of not less than
$3,000,000. If the *Design-Builder* or its *Subcontractors* have equivalent insurance from an insurer other than ICBC, such insurance shall provide no less coverage than that provided by ICBC in accordance with the foregoing.

(iii) A confirmation of Insurance (APV47), or equivalent form acceptable to the *Owner,* shall be provided by the *Design-Builder* and each *Subcontractor*.

.10 Other Insurance

(i) The *Design-Builder* and each *Subcontractor* shall provide, at its own cost, any additional insurance which it is required by law to provide or which it considers

necessary.

(ii) The *Design-Builder* at its cost shall procure such excess insurance to the Commercial General Liability policy, and Builders Risk policy procured by the *Owner* as the *Design-Builder* considers necessary to fully protect and indemnify the *Design- Builder* against any liability in excess of the coverage provided pursuant to the aforesaid policies procured by the *Owner*.

.11 Additional Insureds and Waiver of Subrogation

a) All insurance provided by the *Design-Builder* and the *Subcontractors*, other than Workers' Compensation, Automobile insurance and professional errors and omissions insurance, shall:

b) have added as additional insureds the *Owner*, the *Owner's Advisor*, the *Design-Builder* and their respective consultants and subcontractors engaged in any part of the performance of the *Contract*, and their respective directors, officers, employees, servants, agents, partners, parents, subsidiaries, affiliated or related firms;

c) contain a waiver of subrogation as against all Additional Insureds;

d) contain a breach of warranty provision whereby a breach of a condition by the *Design-Builder* or any *Subcontractor* will not eliminate or reduce coverage for any other insured; and

e) except for any excess Commercial General Liability insurance, be primary insurance with respect to any similar coverage provided by insurance procured by or available to the *Owner*.

.12 Cancellation

(i) All insurance provided by the *Design-Builder* and the *Subcontractors*, other than

workers' compensation and automobile insurance, shall contain endorsements on the following terms:

(ii) "NOTICE: It is hereby understood and agreed that this policy will not be cancelled or reduction in applicable limit without the Insurer(s) giving at least thirty (30) days prior written notice by Registered Mail to the *Owner* **(add the Village's contact name and address here)**."

GC 11.2 CONTRACT SECURITY

88. Refer to GC 11.2.2:

Delete entirely.

89. New GC 11.2.3, GC 11.2.4, GC 11.2.5, GC 11.2.6, GC 11.2.7 and GC 11.2.8:

Add the following:

"11.2.3 The *Design-Builder* shall furnish a performance bond in an amount equal to 50% of the *Contract Price*, to cover the faithful performance of the *Contract* including the corrections after final payment as provided for in the *Contract Documents* and the payment of all obligations arising under the *Contract* or as a result of any default, delay, neglect, or wrongful act of the *Design-Builder* and including the payment of all resulting legal and engineering expenses incurred by the *Owner* in the event of any default, delay, neglect or wrongful act by the *Design-Builder.*

11.2.4 The *Design-Builder* shall, throughout the term of the *Contract*, advise the surety of all changes to the *Contract Price* or the nature of the *Work* so that the bond may be revised if necessary. The *Design-Builder* shall furnish the *Owner* with a copy of each revision to the bond

11.2.5 The performance bond shall be in the Standard Construction Document form CCDC 221, as amended from time to time, of the Canadian Construction Documents Committee and issued in favour the *Owner* by a surety who is

approved by the *Owner* and who is licensed to transact the business of a surety in British Columbia.

11.2.6 At the time of the *Contract* is executed, the *Design-Builder*

shall deliver to the *Owner* a fully executed labour and material payment bond in an amount equal to 50% of the *Contract Price*.

11.2.7 The labour and material payment bond shall be in the Standard Construction Document form CCDC 222, as amended from time to time, of the Canadian Construction Documents Committee and issued in favour of the *Owner* by a surety who is approved by the *Owner* and who is licensed to transact the business of a surety in British Columbia.

11.2.8 The cost of the performance bond and the cost of the labour and material payment bond shall be included in the *Contract Price*."

PART 12 INDEMNIFICATION, LIMITATION OF LIABILITY, WAIVER OF CLAIMS, AND WARRANTY GC 12.5 WARRANTY

90. New GC 12.5.9:

Add the following:

"12.5.9 Where specific warranties or guarantees are required by the *Contract Documents* relating to the *Work* and including without limitation those relating to any fixtures, improvements, appliances, equipment or other chattels for the *Project*, the *Design-Builder* shall secure such warranties or guarantees from the *Subcontractors* and *Product* suppliers and they shall be assigned to or addressed to and in favour of the *Owner*. The *Design-Builder* shall cooperate and assist in the enforcement of such warranties or guarantees. The *Design- Builder* shall deliver the originals plus two copies of such warranties or guarantees to the *Owner* upon *Substantial Performance of the Work.*

91. New GC 12.5.10:

Add the following:

"12.5.10 The *Design-Builder* warrants and represents to the *Owner* that the replacement costs, ongoing maintenance costs, and energy usage costs of the new facility will not exceed the replacement costs as set out in Appendix D, ongoing maintenance costs as set out in Appendix E, and energy usage costs as set out in Appendix F. A letter of credit (LoC) shall be provided by the *Design-Builder* to provide security in this regard. The LoC shall:

(i) Be provided at least 6 months prior to *Substantial Performance of the Work*;
(ii) Be issued directly to the *Owner* from a major financial institution, as approved by the *Owner*;
(iii) Be irrevocable for a period of 28 months from the date of *Substantial Performance of the Work;* and
(iv) Have a minimum value of $500,000.

12.5.11 Within 24 months after *Substantial Performance of the Work*, the *Owner* will engage an independent consultant, mutually approved by the *Design-Builder*, who shall determine if the requirements for replacement costs, ongoing maintenance costs,

and energy usage costs have been met. The consultant shall consider the actual climatic data and the actual facility operation, in comparison to the design assumptions. If replacement costs, ongoing maintenance costs, and energy usage costs requirements have been achieved in full, the LoC shall be returned to the *Design-Builder*. If replacement costs, ongoing maintenance costs, and energy usage costs requirements have not been fully achieved, the LoC shall be drawn upon to fund a facility retrofit that enables the contracted replacement costs, ongoing maintenance costs, and energy usage costs requirements to be achieved, as determined solely by the *Owner*.

"12.5.12 The actual operating/maintenance costs shall be measured for a 1 year period, between 12 and 24 months after *Substantial Performance of the Work*. The *Design- Builder* shall provide, as part of the BMS system, the means for electronically tracking and recording **all** operating costs for the facility for 24 months, including:
(i) Energy consumption recording, and provision of a remotely monitored energy dashboard; and
(ii) All equipment servicing and maintenance costs.

- END OF DOCUMENT

APPENDIX C - PERFORMANCE SPECIFICATIONS

A.1- PERFORMANCE SPECIFICATIONS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The scope of Work includes the provision of all labour, material, equipment, transportation and other services to install a complete new vertically draining infilled synthetic turf surface on one field. The synthetic turf surfacing system and related work included in this Contract is to be as specified in this RFP, including, but not specifically limited to, the following:

.1 Design, manufacture and install a new synthetic turf surface to accommodate in the order of 3,000 hours of organized sport related use per year. The surfacing shall be a vertically draining, non-directional, tufted, monofilament infilled synthetic turf system installed on a shock pad.

.2 The synthetic turf system shall be designed to meet the minimum performance testing requirements outlined in the Specifications and Technical Product Data Sheets. A portion of the technical requirements includes meeting minimum testing equivalent to a FIFA Two Star rating. Note that FIFA Two Star certification will not be required, and that additional requirements supplemental to the FIFA Two Star requirements will be required (as defined herein and elsewhere in the RFP).

.3 Unless at the time of Contract Award, the Owner has agreed to specific modification(s), the synthetic turf system shall meet the following key minimum qualities:

- Infilled synthetic turf with crumb rubber and silica sand infill;
- Synthetic grass fibre height minimum of 60 mm (2.4 inches);
- Infill depth of 45 mm (1.75 inches), based on the final, settled-in depth;
- Infill composition (by volume) consisting of a maximum of 80% crumb rubber (from truck tires) and a minimum of 20% silica sand;
- Product and quality control test criteria meeting or exceeding FIFA Two Star standards;
- Rolls are to be sewn together, not glued (except for inlaid lines and markings).

.4 Coordination and cooperation with all other trades relating to and affecting the installation of the synthetic turf systems and related work, in particular, the Owner-retained contractor responsible for installing the permeable aggregate base, concrete edge anchor and field drainage systems (as applicable). Review and acceptance or certification of installed work of other trades directly affecting the Work of this Contract, especially of the gravel base as it applies to installation of turf plus Warranty implementation.

.5 Supply and installation of a complete vertically draining infilled monofilament synthetic turf surfacing system. Complete infilled turf systems will include the supply and installation of the synthetic turf including all infill material and other items described in the Specifications. The approximate total surface area of the new synthetic surface is as shown on the Plans. This area refers to the finished surface area of the turf (as measured at the face of the concrete edge anchor) and does not account for any additional material required for either joining seams, inlaying lines and markings or anchoring the turf around the edges of the fields. The amount quoted will apply provided the actual total surface area of the synthetic turf field at completion is within 1% (one percent) of the field area as described above.

.6 Installation and final survey of all tufted in and inlaid (as applicable) field sport lines and markings in accordance with the Specifications.

.7 Provide extra turf materials to the Owner for future repair and protective purposes as described in the Specifications.

.8 Provide maintenance and operating manual (in electronic format) on a compact disk, as described in the Specifications.

.9 Hire an independent testing agency approved by the Owner to complete all laboratory testing in accordance with the Specifications.

.10 Provide one four hour (minimum) workshop for Owner staff for the purposes of routine maintenance training and instruction on minor turf repairs. The workshop will be held at a location provided by the Owner on a date and time determined by the Owner. The Contractor will supply any equipment needed for the workshop and will also provide at least one experienced synthetic turf installer to demonstrate proper turf repair methods. Efforts will be made to accommodate any reasonable requests of the Contractor with respect to scheduling of the workshop.

.11 Provide full replacement, non-prorated, minimum eight year Warranty in accordance with the requirements of the Warranty section of this document.

1.2 STANDARD SPECIFICATIONS FOR RULES

A. Federation Internationale de Football Association (FIFA) – Soccer

B. British Columbia Soccer Association – Small-Sided Soccer (ie. Mini Soccer)

1.3 STANDARD SPECIFICATIONS

A. American Standard Testing Materials, (ASTM)

B. Synthetic Turf Council Suggested Guidelines for the Essential Elements of Synthetic Turf Systems

1.4 FIBER MANUFACTURERS

A. The synthetic turf manufacturer shall furnish written documentation in the form of a signed affidavit certifying the source of the fiber used for the field including both green and any other colors used for the lines and markings.

1.5 PROJECT SUBMITTALS

A. Key Personnel: Submit a listing of the key members of the Contractor's team. This shall include the Project manager, Project construction superintendent, quality control representative, testing agency, and any other important Project participants. The list shall include phone and fax numbers for each team member and 24-hour emergency telephone number for contacting job responsible personnel in an emergency.

B. Field Shop Drawing Submittal: Submit the field Shop Drawings to the Consultant for review and approval. The submittal shall include an electronic copy of the plans and the Specifications. The plans shall include field edging details, insert details, seam details, seam layout, gluing patterns, provisions for goals, dimensional Shop Drawing for all field lines, markings and boundaries.

C. Schedule: Submit a schedule for all activities indicating dates and locations of specific tasks to be completed. Provide clarification and additional information as directed by Consultant. Update as needed and submit corrected schedule to the Consultant prior to dates altered on the schedule.

1.6 CONSTRUCTION SUBMITTALS

A. Submit the following synthetic turf samples to the Consultant for approval prior to commencing with the production of the synthetic turf field:

1. Two 50 cm x 50 cm samples each of green turf showing backing with perforations.

2. Two 50 cm x 50 cm samples each of turf showing method of seam makeup with perforations. One sample to have example of inlaid lines.

3. Two 20 cm x 30 cm samples each of the other colors proposed for use on the field for lines and markings.

4. Two 1-kg samples of the proposed infill materials, each type.

B. Submit the synthetic turf Warranty package and a computer diskette (CD) containing the operation and maintenance manual to the Consultant for approval prior to commencing with the field construction. Provide descriptions of any equipment required or recommended for field area conversions, maintenance and repair, citing specific vendors for each unit. Provide a separate section stating the approved activity usage for the turf and activities not recommended, all relative to the Warranty. Include maintenance recommendations including recommended coverings for special events, small repair procedures, minor seam repair, discussion of precautions to be practiced, general maintenance, and uses to avoid to protect turf surface and to maintain installation's Warranty.

C. Synthetic Turf Testing and Quality Control: Submit to the Consultant results certified by an independent testing laboratory experienced in synthetic turf testing for the following tests performed on the synthetic field surfacing system:

Pile Yarn Type	FTIR Spectrograph
Yarn Denier	ASTM D1577
Yarn Breaking Strength	ASTM D2256
Yarn Melting Point	ASTM D789
Pile Height	ASTM D5823-13
Pile Weight	ASTM D5848-10e1
Total Weight	ASTM D5848-10e1
Backing Perforations	Perforation Diameter and Spacing
Tuft Bind (without infill)	ASTM D1335
Grab Tear Strength	ASTM D5034-09
Impact Attenuation	ASTM D355
Pill Burn Test	ASTM D2859
Permeability (with infill)	ASTM WK22081 (or approved in-lab test)
Total Lead Content	ASTM F2765 - 09
Gradation Analysis (infill only)	ASTM D5644-01 (2008)

D. Site Acceptance: Submit a letter confirming that an inspection of the finished field base has been conducted, noting all discrepancies, problems and conflicts. If no problems are found, this shall be so indicated. The Contractor's inspection shall include acceptance of the field base materials for both planarity and permeability, as well as any other factors the Contractor considers relevant to the synthetic turf installation. The Contractor's certification letter shall also include acceptance of the field subgrade and base as being totally suitable for the application of the Work, with the assurance that the synthetic turf installation work carried out on the field's subgrade and base will result in a "superior quality" athletic surface, fully warranted for the period and conditions specified herein. The Owner will provide permeability testing results conducted on the field bases to the Contractor for the Contractor's review and acceptance. The Consultant will produce a field base planarity inspection report summarizing the field's planarity. This planarity report will be provided to the Contractor for the Contractor's review and acceptance. Note that the Contractor will not be held responsible for any hidden substandard field subgrade and base conditions, or for the repair of field's subgrade and base work installed by others outside of the Contract (unless expressly provided for in the Contract).

1.7 PRE-INSTALLATION CONFERENCE

A. The Consultant will conduct a conference at the Project site. The following issues shall be discussed at this meeting:

1. Schedule.
2. Submittal and approval of materials.
3. Coordination issues with other contractors.
4. Stockpiling of materials.
5. Testing and inspection of materials and installation.
6. Coordination with turf supplier.
7. Acceptance of work area from other contractors.
8. Field protection during and upon completion of surface installation.
9. Turnover to Owner.

1.8 QUALITY CONTROL

A. Submit to the Consultant for approval a quality control plan. The plan shall designate a quality control representative for the Contractor's team. The plan shall also clearly specify the testing procedures for the field materials.

B. Prior to shipment of the synthetic turf material for the field to the job site, synthetic turf material from every sixth roll shall be randomly sampled and then tested by an independent testing laboratory experienced with testing synthetic turf materials. The testing laboratory shall be completely independent with no ties to the turf manufacturer. The testing shall include the following:

Item	ASTM	Property
1.	FTIR Spectrograph	Pile Composition
2.	D5848-10e1	Pile Weight
3.	D5848-10e1	Total Weight
4.	D5823-13	Pile Height
5.	D418	Backing Perforation Diameter and Spacing
6.	D1335	Tuft Bind (without infill)
7.	D5034-09	Grab/Tear Strength.

C. Copies of the test results shall be transmitted to the Owner and Consultant directly from the testing laboratory. The synthetic turf materials shall not be shipped to the site without written authorization from the Consultant after the Owner and Consultant have approved the test results.

D. Samples of the synthetic turf material tested from every sixth roll shall also be transmitted to the Consultant for approval by the independent testing laboratory prior to shipment of the synthetic turf materials to the job site. Sample size shall be minimum 20 cm x 20 cm.

E. Infill Testing: At least three weeks prior to the installation of the synthetic turf, the infill material shall be delivered to the site for the purposes of environmental testing by a by an ISO/IEC 17025 accredited laboratory retained and paid for by the Contractor. The infill material will be sampled, tested and pass the maximum limits stated below:

- Extractable Heavy Metals including Aluminum, Antimony, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Selenium, Strontium, Tin and Zinc; Chromium (III) and Chromium (VI). Test methods and maximum standards to comply with EN 71-3 – Safety of Toys Part 3 Migration of Certain Elements.
- Polycyclic Aromatic Hydrocarbons, Phthalates, Benzene, and Phenols. Test limits and standards to comply with the British Columbia Ministry of Environment's soil characterization limits for Commercial land use.

F. All fees and costs associated with the pre-shipment sampling and testing shall be paid by the Contractor.

1.9 CONSTRUCTION SUPERINTENDENCE

A. The Contractor shall at all times employ personnel who are skilled in their respective work areas. Incompetent, careless or negligent employees or agents shall be forthwith discharged upon written request of the Consultant.

B. All Work under the Contract shall be performed under the continuous on-site supervision of a competent superintendent who is thoroughly experienced in the class of work specified. There shall be on site at all times Work is being performed, a designated superintendent in the employ of the Contractor, and approved by the Consultant, in responsible charge, managing the Project construction. The superintendent shall have the authority to make decisions for the Contractor.

C. The superintendent shall be satisfactory to the Consultant in all respects, and Consultant shall have the right to require the Contractor to dismiss from the Project any superintendent whose performance is not satisfactory to Consultant, and to replace such superintendent with a superintendent satisfactory to Consultant. The lack of proper supervision by the Contractor or supervisory personnel shall, at the Owner's sole discretion, be just cause for suspension of the Work or termination of the Contract by the Owner.

1.10 TRAFFIC REGULATION

A. Conduct operations in such a manner to avoid unnecessary interference to existing traffic. Minimize heavy vehicle traffic to and from site during peak traffic hours. Do not park vehicles in traffic lanes. Provide flag persons as required. Conform to Owner traffic control requirements.

B. Contractor shall be responsible for all traffic control and emergency call outs resulting from Contractor operations.

C. Maintain fire lanes, roadways and alleys to existing buildings continuously, as required by the fire department having jurisdiction.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: Deliver products in original unopened packaging with legible manufacturer's identification.

B. Storage and Protection:
   1. Comply with manufacturer's recommendations.
   2. Store in dry place out of direct sunlight.
   3. Protect from damage by the elements and construction procedures.

C. Bulk Materials: Deliver materials in clean, washed and covered trucks to eliminate contamination during transportation. Onsite stockpiling location is to be coordinated with Consultant. Stockpile only in areas free of debris and away from drainage routes. Cover with plastic or geotextile if material is to be stockpiled for more than 24 hours.

1.12 FIELD SYSTEM HOLD HARMLESS

A. The Contractor shall hold the Owner, and Consultant, harmless from infringement of any current or future patent issued for the synthetic field surfacing system, pad system (if applicable), installation methods and vertical draining characteristics of the synthetic turf system.

1.13 FIELD DIMENSIONS AND LAYOUT

A. The Contractor will be responsible for furnishing, setting and marking of all line, grade and location stakes, including offsets and general construction staking.

B. The Contractor shall have on site at all times when work requiring control is being performed, all necessary equipment, supplies and instruments related thereto. A qualified technician must be assigned to the crew for this Work. The equipment and technician must be available, at no additional cost, to the Consultant for checking, verifying and certifying construction control on site.

1.14 PROTECTION OF UTILITIES AND STRUCTURES

A. The Contractor shall take special care to protect any existing structures and utilities.

1.15 CONSTRUCTION RECORD "AS-BUILT" DRAWINGS AND SPECIFICATIONS

A. An accurately marked construction record set of Drawings and Specifications shall be kept on site as the job progresses. All changes or deviations from the original Contract Documents shall be recorded in red thereon for Work under the Contract.

B. The record set shall be kept up-to-date at all times and shall be submitted periodically to the Consultant covering all Work for which progress payment is being requested. Failure to have the record set up-to-date shall, at the discretion of the Consultant, be reason to withhold payment until such information is recorded or submitted.

C. Upon completion of the Project and prior to final payment, the Contractor shall forward a complete record set of Drawings and Specifications showing the as-built notations to the Consultant.

1.16 WARRANTY OF SYNTHETIC TURF SYSTEM

A. Refer to the attached Form of Warranty for the detailed requirements of the synthetic turf system warranty.

B. The warranty is to be provided in the same format as specified in the attached Form of Warranty. Any changes are to be agreed to by the Owner prior to execution of the Contract.

C. The warranty shall be signed by a principal of the applicable firm(s), duly authorized to make contracts at the same time as the Contract is executed.

D. If the firm manufacturing and supplying the synthetic turf system is not the same entity as the Contractor, the warranty shall be co-signed by the turf manufacturer/supplier. Should the warranty be co-signed by the turf manufacturer/supplier, both the Contractor and the turf manufacturer/supplier will be jointly and equally liable for all commitments made under the warranty.

E. The warranty period shall be a minimum of eight years from date of acceptance of the installed system by the Owner.

1.17 FORM OF WARRANTY OF SYNTHETIC TURF SYSTEM

A. Contractor hereby warrants to the Owner, subject to the limitations and conditions set forth below, that its synthetic turf system consisting of synthetic turf described as _____, and the adhesives used in the installation, are free from defects in material and workmanship and shall, for a period of eight years from the date of acceptance by the Owner, remain serviceable for multiple sports activities.

B. Contractor warrants to the Owner that its synthetic turf materials shall not fade, fail, shrink, wrinkle, or reflect excessive wear. Contractor shall, at the Contractor's sole expense and cost, replace such areas of the synthetic turf system not performing to these standards for the life of the Warranty.

C. Definitions

I. The term "not fade" in the context of this Warranty shall mean that the synthetic turf material shall remain a uniform shade of green, or other colors installed, with no significant loss of color.

II. The term "not fail" or "excessive wear" as used in the context of this Warranty shall mean that the length and weight of the face yarn or pile material in the synthetic turf surface above the infill materials shall not have been decreased by more than 10% per year according to ASTM D418, nor exceed 50% during the Warranty period. In the event that the synthetic turf system does not retain its fiber height or shock absorbency and is consequently no longer serviceable during the Warranty period, the Contractor shall, at their sole expense, replace such portion of the system that is no longer serviceable.

III. The term "serviceable" in the context of this Warranty shall mean that the synthetic turf system shall have a maximum "G" value according to ASTM F1936-98 and Procedure A, ASTM F355, not to exceed 130G's at any location upon installation and shall not exceed 175G's throughout life of the Warranty period. This shall be determined by conducting dynamic cushioning tests at the locations designated in ASTM F1936-98 and at corners of the soccer penalty boxes at opposite sides of the field. Any increase shall be at a relative uniform rate not to exceed 10 G's in any single yearly period.

D. Where applicable, the fabric seams shall remain attached to the underlying surface over the Warranty period and shall not separate or become unglued or unattached, as applicable.

E. Contractor warrants to the Owner that the permeable synthetic system shall drain vertically a minimum of 250mm of precipitation per hour without visible surface ponding or saturation of the infill material.

F. Contractor warrants to the Owner that the synthetic turf system (synthetic turf fibre, backing, infill, adhesives and all other components) will meet all Canadian environmental regulations (for public sports field/playground use) with respect to contaminants such as lead and other hazardous materials upon installation and throughout the life of the Warranty.

G. Contractor shall replace with new materials, at their sole expense, any damage to the synthetic turf system that extends more than 1 meter beyond the location of foreign combustibles, which may ignite and fire-damage the synthetic turf system.

H. The Contractor shall not be held liable for any incidental or consequential damages. These warranties and the Contractor's obligations here-under are expressly conditioned upon;

I. The Owner making all minor repairs to the synthetic turf system upon the discovery of the need for such repairs;
II. The Owner maintaining and properly caring for the synthetic turf system in accordance with the Contractor's maintenance manual and instructions;
III. C. The Owner complying with the dynamic and static load specifications established by the Contractor.

I. The Warranty is not to cover any defect, failure, damage, or undue wear in or to, the synthetic turf system caused by, or connected with, abuse, neglect, deliberate acts, act of God, casualty, static or dynamic loads exceeding Contractor's recommendations, footwear having metal cleats, metal spikes, or similar projections other than conventional baseball, football, soccer, or rugby shoes having cleats of not more than 13 mm in length, and other conventional running track shoes having spikes of not more than 7 mm in length, or use of improper cleaning methods.

J. Contractor shall be allowed to examine the synthetic turf system regarding any claim that the Owner makes, to be present at any time, to analyze the results of all tests conducted by the Owner or others, and to conduct such tests of their own. Except where expressly provided for in the Warranty, the Contract or other binding agreement between the Contractor and the Owner, the Contractor shall not be responsible for any costs or expenses incurred by the Owner or others with respect to such tests, except the Contractor shall pay for costs of all tests and analysis conducted or directed by their representative.

K. In the event the Contractor does not respond to the Owner’s written notice within 10 days of receipt of notice or does not submit, schedule and execute corrective work within 30 days, the Owner has the option of having the work performed at the expense of the Contractor.

L. Sample form of Warranty included herein is the form to be used by the Contractor. Manufacturer’s standard form of Warranty will not be acceptable. Any amendments, exclusions or additional conditions proposed to the form of Warranty by the Contractor must be submitted in writing for the Owner’s consideration within 7 days of being notified of Contract award.

1.18 WARRANTY TESTING

A. The turf is to be tested, at the Contractor's expense, for dynamic cushioning ("G" Test) by an experienced independent testing laboratory acceptable to the Consultant or Owner at the following times:

   I. Completion of the installation, shortly prior to acceptance of the Work by the Owner/Consultant (testing completed at the Contractor's expense)

   II. At the anniversary date of the first year (testing completed at the Contractor's expense)

   III. 60 days prior to the anniversary date of the second year (testing completed at the Contractor's expense)

   IV. The anniversary date of the fourth year (testing completed at the Owner's expense)

   V. The anniversary date of the sixth year (testing completed at the Owner's expense)

   VI. 60 days prior to the anniversary date of the Warranty expiration (ie. eighth year) (testing completed at the Owner's expense).

B. The City may choose to complete additional dynamic cushioning tests at their own cost.

C. If test results from either the Warranty tests or any additional tests completed by the City indicate that the conditions of the Specifications and/or Warranty are not met, the Contractor has the option of corrective work or replacement. In the event corrective work does not meet the requirements of the Specifications after a second attempt to bring the system within these limits, then the Contractor is to replace non-conforming areas or sections, solely at the Owner's discretion and direction.

D. Tests shall be performed in accordance with ASTM F-1936-98 and F355.

E. Test locations as designated in F-1936-98, Paragraph 8.1. Included in the report shall be the measured depth of the infill material at all test locations.

F. All costs for the stated testing shall be paid by the Contractor, unless specifically stated otherwise.

G. After the completion of corrective work arising out of failed testing, the Contractor shall re-test the field in the area of the corrective work within 10 days of the corrective work being completed. The re-testing shall be completed to the same standards as the Warranty testing requirements. All costs for re-testing shall be paid for by the Contractor.

H. If the Contractor does not have the tests performed within 10 days of specified times listed, the Owner has the option of ordering the testing work at the expense of the Contractor.

AS EVIDENCED WHEREOF, the Contractor has executed this Warranty on the day and year written below:

_____

Contractor (please print)

_____ _____

Signature of Contractor (Signing Officer) Date

_____

Name and Title (please print)

PART 2 - MATERIALS

2.1 GENERAL

A. The field shall be comprised of vertically draining infilled synthetic turf system. The turf system shall consist of a synthetic grass like monofilament surface pile that shall be tufted into a synthetic backing.

B. Infill material shall consist of clean crumb rubber and silica sand (unless the Contract provides for an alternate infill material).

C. The complete synthetic turf system shall be constructed of materials that minimize environmental impacts and risk to human health to the greatest extent feasible.

D. All backing layers and coatings shall be firmly bonded together. Coating materials must be completely cured and bonded to the other backing layers. Synthetic turf panels or rolls that do not meet this requirement will be rejected.

E. The entire system shall be resistant to weather, insects, rot, mildew, and fungus growth, and be non-allergenic and non-toxic. The entire system shall be constructed to maximize dimensional stability, to resist damage and normal wear and tear from its designated use, and to minimize ultraviolet degradation.

F. All adhesives used in bonding the system together shall be resistant to moisture, bacterial and fungus attacks, and resistant to ultraviolet rays at any location upon installation.

2.2 DYNAMIC CUSHIONING REQUIREMENTS

A. The dynamic cushioning of the system shall not exceed a maximum value of 110 G's per ASTM, F1936-98 and ASTM, F355, procedure A at any location upon installation.

2.3 PERMEABILITY REQUIREMENTS OF THE SYNTHETIC TURF SYSTEM

A. The system shall drain vertically a minimum of 750 mm precipitation per hour without visible surface ponding.

2.4 SYNTHETIC TURF PILE SURFACE

A. The pile surface shall provide good traction in all types of weather with the use of conventional "sneaker-type shoes" and composition, molded-sole athletic shoes.

B. The pile surface shall be suitable for both temporary and permanent line markings using rubber-base paint where applicable.

C. Pile surface shall be nominally uniform in length for all portions of the field. Synthetic turf panels or rolls with irregular pile heights or with “J hooked” fibers that extend more than 5 mm above the surrounding fibers will be rejected.

D. The colour shall be uniform with no visible deviations in shade permitted. Rolls that do not meet this requirement will be rejected.

E. The grass fibre height, as measured from the top of the backing layers shall be a minimum of 60 mm or such greater height as indicated in the Technical Product Data Sheet. If a shock pad is provided, the grass fibre height may be reduced to the height indicated in the Technical Product Data Sheet.

2.5 SYNTHETIC TURF FABRIC SURFACE

A. The fabric surface shall be constructed and installed in minimum 4.57 meter (15-foot) widths with no longitudinal or transverse seams, except for head or tee seams at field boundaries and inlaid lines within a finished roll assembly. The seams shall be 4.57 meter (15'-0") spacing.

B. Rolls that do not lay evenly and with full dimension width will be rejected. No fitted pieces will be allowed to true alignment.

2.6 SYNTHETIC TURF SYSTEM MATERIAL COMPONENTS

A. Pile fibers shall resemble freshly-grown natural grass in appearance, texture and colors.

B. Fabric backing for the infilled synthetic turf system can be loose laid and anchored at the perimeter of the field as shown in the details or adhered to the base.

C. All turf seams for field areas shall be sewn with high strength, polyester fiber cord or nylon. For inlaid lines and markings where cemented seams are necessary, cemented with a supplemental backing material and/or, use supplemental backing material. If a non-permeable backing material exceeds 25 cm in width, it shall be perforated in accordance with clause 2.7 of this section. Perforations shall be drilled from the surface after the adhesive has set.

2.7 SYNTHETIC TURF PERFORATIONS

A. If a permeable backing is utilized, perforations are not required. Certified independent test results indicating a minimum drainage rate of 750 mm per hour must be provided for the backing and infill material.

B. Synthetic turf with tufted fibers and a coated backing must include perforations in the backing for vertical drainage.

C. Perforations in turf backing to be a minimum of 5 mm diameter clear opening and shall be spaced a maximum of 100 mm uniformly on-center.

D. The turf shall be perforated with a minimum of 95% integrity over entire surface. Holes must be full diameter, completely through the underside of the turf backing with no material residue or fragmented fibers remaining.

E. The Consultant shall approve the turf perforations prior to shipment, upon shipment onsite, or during on-site perforating operations, as applicable.

F. Any rolls delivered to the site that lack sufficient perforations, or have incomplete perforations shall be remediated or replaced with a roll that meets the requirements. Replacement will be of full rolls only (not partial rolls or sections of turf). Remediation measures include onsite manual perforation using a hot iron capable of burning a 5 mm diameter perforation in the turf.

2.8 INFILL MATERIALS

A. Crumb rubber shall be derived from used whole vulcanized commercial truck tires. Buffings, bladders and tubes shall not be used as feedstock.

B. Crumb rubber infill shall have a specific gravity range from 1.1 minimum to 1.2 maximum as determined by ASTM D 297.

C. Crumb rubber infill shall have an ash content of between 5 and 15% as determined by ASTM D 297.

D. Crumb rubber infill shall not contain more than .01% liberated fibre (no more than 0.2 lbs per ton: equivalent to 3.2 ounces of fibre per 2,000 lb 'supersack') tested per ASTM D 5603. The liberated fibre remaining in the CRI shall be free flowing and not agglomerated into clumps of fibre as received at the job site.

E. Crumb rubber infill shall be dry and free flowing.

F. Crumb rubber infill shall be produced cryogenically, ambiently, or a combination.

G. Where crumb rubber/sand blend infill is utilized, the materials shall consist of a blend of clean crumb rubber and silt-free silica sand. The infill composition ratio shall be 80% crumb rubber and 20% sand by volume.

H. Sieve gradation specification shall be as indicated in the Technical Product Data Sheet.

2.9 LINES AND MARKINGS

A. A complete field lining, marking and field boundary system shall be provided prior to installation of the surfacing system. Layouts shall be accurately surveyed and marked prior to installation. The lines and markings shall comply with the following standards (all where applicable):

- Federation Internationale de Football Association (FIFA) – Soccer
- British Columbia Soccer Association – Small-Sided Soccer (ie. Mini Soccer)

B. The colour of the lines and markings shall be as shown on the Plans.

C. The lines and markings shall include all lines and markings shown on the Plans.

D. All lines and field markings shall be tufted or installed as synthetic turf inlays. Wherever possible, lines shall be tufted into the turf panels in lieu of inlays. All markings shall be uniform in color, providing a sharp contrast with the turf color, and shall have sharp and distinct edges. Markings shall be true and shall not vary more than 1 cm from specified width and location, except that no line or marking shall be uniformly smaller or larger than specified.

E. Manufacturer shall guarantee that synthetic turf is adaptable to painted lines in the event painting is utilized in the future.

F. For cemented seams, the supplemental backing material shall bridge all inlaid lines and markings a minimum of 10 cm on each side of the seam. Supplemental backing material that is greater than 30 cm in width shall be perforated in accordance with clause 2.7 of this section. Perforations shall be drilled from the surface after the adhesive has set.

G. The fiber used for the lines and markings shall be of the same composition as that used for the green field areas.

2.10 MINIMUM SPECIFICATIONS FOR SYNTHETIC TURF SYSTEM MATERIALS

A. The minimum material standards shall be as established by Specifications and the Technical Product Data Sheets provided by the Contractor prior to Contract execution. These standards will be verified and enforced and will be the basis for the Owner's testing. Material that fails to meet these minimum standards will be rejected. The Contractor, or the manufacturer of the synthetic turf fiber and fabric may elect to exceed these Specifications to insure compliance with all requirements and the Warranty as specified in this section.

B. The maximum deviation with respect to the individual test results and the target standard tested against shall be plus or minus 5%, except that the material shall not be uniformly low.

C. The minimum material standards for all synthetic turf materials must also meet or exceed those of the Synthetic Turf Council Suggested Guidelines for the Essential Elements of Synthetic Turf Systems. The minimum material standards will therefore be those combined requirements of the Technical Product Data Sheets, Contract Specifications, and the Synthetic Turf Council Suggested Guidelines for the Essential Elements of Synthetic Turf Systems.

D. Where there is a conflict between the standards, the order of priority shall be the (1) Technical Product Data Sheets, (2) the Specifications and (3) the Synthetic Turf Council Suggested Guidelines for the Essential Elements of Synthetic Turf Systems.

2.11 DRAINAGE/SHOCK PAD – MINIMUM PERFORMANCE QUALITIES

A. Drainage/Shock Pad shall provide impact attenuation and drainage conveyance as follows:

- Impact Attenuation – 135 max (tested without turf), 110 max (tested with turf)
- Drainage Conveyance - In-plane water flow capacity at a slope of 1% shall be a minimum of 0.155 l/s.m (0.75 gpm/ft), as tested per EN-ISO 12958 at a load of 2 kPa (0.3 psi)

B. Product to meet the specified performance drainage and shock attenuation criteria under temperatures ranging from -20 degree Celsius to +40 degrees Celsius.

C. Product thickness is to be uniform without any deviations.

D. Product shall include continuous drainage channels to provide for unobstructed

subsurface flow across adjacent panels in the direction of the field slope.

E. Provide a full replacement, non-prorated twenty (20) year warranty for the Drainage/Shock Pad covering defects in products and workmanship. The warranty will cover the following:

- Infiltration rate throughout the warranty period to be at least 85% of the specified infiltration rate at installation.
- Product thickness (depth) throughout the warranty period to be not less than 70% of the specified depth at installation.
- Product to remain flat and true to the underlying granular surface and not exhibit any signs of warping or buckling of joints and edges.
- Product to not split, crack or otherwise deteriorate.

F. Shock pad warranty is to identify the specific synthetic turf system installed over the Drainage/Shock Pad with a statement confirming the compatibility of the pad and turf system selected.

G. Shock pad warranty is to be signed by the Drainage/Shock Pad manufacturer.

H. Pre-approved shock pad products include the following:

- Schmitz Foam Products- ProPlay Sport 23D
- Brock International – Powerbase PB2000B
- Brock International – Powerbase YSR
- Thermagreen - HD25SL-NW3-SG

PART 3 - EXECUTION

3.1 CERTIFICATION OF FIELD BASE INSTALLATION

A. The Contractor shall perform an inspection of the field base and submit written certification of acceptance of the base for the installation of the synthetic turf system. The inspection and certification shall be completed at least two working days prior to turf installation. When planning the installation schedule, the Contractor shall allow for minor field base restoration work to be performed by the field base contractor.

B. Summary of certification shall include, but not be limited to:

1. Acceptance of the base construction "finish surfaces" (planarity, granular surface stability, etc.) as being totally suitable for the application of Work specified under this section, and with the assurance that the synthetic turf installation work carried out on the field subgrade and base will result in a "superior quality" athletic surface, fully warranted for the period and conditions specified herein. The Consultant will produce a field base planarity inspection report summarizing the field planarity. This planarity report will be provided to the Contractor for the Contractor's review and acceptance.

2. Verification and certification of the infiltration and permeability rates of the permeable base as applying to the Warranty. The Owner will provide permeability testing results conducted on the field base to the Contractor for the Contractor's review and acceptance.

C. All discrepancies between the required materials, application and tolerance requirements noted by the Contractor shall be brought immediately to the attention of the Consultant. Failure of the Contractor to immediately inform the Consultant of any prior work that does not meet the required Specifications will result in the turf installer being required to perform any work needed to bring the base to acceptable condition. Note that the Contractor will not be held responsible for any hidden substandard field subgrade and base conditions.

3.2 SYNTHETIC TURF INSTALLATION

A. Perform all Work in strict accordance to the Drawings, Shop Drawings and manufacturer's specifications and instructions.

B. Verification: The Contractor is responsible for inspecting, verifying, and accepting all installed Work of this section.

C. Environmental Conditions: Do not apply adhesive materials or infill material when:

1. Ambient air temperature is below 10 degrees C
2. Material temperatures are below 10 degrees C.
3. Rain is falling or pending.
4. Conditions exist, or are pending, that will be unsuitable to the installation of the system.

D. Preparation:

1. Accept bases onto which the synthetic turf surfacing system and the anchoring

system(s) are to be applied, as specified above.

2. Immediately prior to application of the synthetic turf, the bases shall be thoroughly cleaned of all foreign material, soil, or any other substances that may be detrimental to permeability and the installation of the turf system.

3.3 INSPECTION OF MATERIALS

A. Prior to installation, and immediately upon delivery of synthetic turf system materials to the Project site, the Contractor shall inspect material as follows:

1. General inspection for damaged or defective items;
2. Measure turf pile height and thickness of each roll;
3. Measure backing perforation diameter and spacing;
4. Reject damaged materials and all materials out of tolerance with the Specifications.
5. Conduct such additional inspections as are required to ensure quality control is maintained to a high level.

B. After installation, inspect Project area for acceptable seaming, adhesive bonding, uniformity of color of turf, bubble-free surface smoothness as laid, field lines and markings, insert installations, edge details. Remove and/or repair deficient workmanship prior to requesting the Consultant's inspection pursuant to completion and acceptance of the Work.

3.4 OWNER'S TEST

A. Owner may have samples of the turf submitted and tested for verification of conformance to Specifications. Turf system acceptance is subject to the results of these tests.

B. Any material so tested and found not conforming to the Specifications will be rejected and replaced with material conforming to the Specifications at the Contractor’s expense. Re-submittal shall be required.

3.5 IN-FILLED SYNTHETIC TURF INSTALLATION

A. The fabric surface shall be constructed and installed in 4.57 meter (15 –foot) minimum widths with no longitudinal or transverse seams, except for head or tee seams at each field’s boundaries and inlaid lines within a finished roll assembly.

B. No head seams shall be permitted inside of the soccer field boundaries. A single head seam will be permitted in the quarter turned panels outside of the soccer sidelines.

C. Rolls that do not lay evenly and with full dimension width will be rejected. No fitted pieces will be allowed to true alignment.

D. Bonding of Material Surfaces: The bonding or fastening of all system material components shall provide a permanent, tight, secure and hazard-free, athletic playing surface. System material components include:

1. Bonding all seams and inlaid line and markings.
2. Bonding and seaming must maintain their integrity for total length of Warranty period.

E. Seams (Joint)

1. All turf seams shall be sewn with high strength polyester fiber cord or nylon.
2. Where cemented seams are required for inlaid lines and markings, the supplemental backing material shall bridge all seams a minimum of 100 mm on each side of the seam. Supplemental backing material that is greater than 250 mm in width shall be perforated in accordance with paragraph 2.7 of this section. Perforations shall be drilled from the surface after the adhesive has set.
3. Backing layers must lie flat on the field base to provide a uniform pile surface.
4. The width between fiber rows at the seam locations shall not exceed that of the tufting gauge of the turf materials.
5. All sewn seams shall be brushed to provide full coverage of fiber over the thread.
6. All cemented seams shall be brushed to eliminate any adhesive materials from the fibers.

F. Turf Edges: Turf edges to be as shown on the edge fastening detail and specified herein.

3.6 LINING / MARKING INSTALLATION

A. Complete field markings shall be provided with the initial installation of the surfacing system. The Contractor shall provide lines and markings in conformance with these Specifications. Layouts shall be accurately surveyed and marked prior to installation.

B. If overlapping backing materials are utilized for the inlaid lines and markings resulting in a non-permeable surface in excess of 250 mm wide, the backing materials shall be perforated in conformance with section 2.7 from the surfacing after gluing and prior to installation of the infill material.

3.7 INFILL INSTALLATION

A. The infill material shall be applied in a dry condition and when the synthetic turf is dry.

B. Infill materials will be installed with a minimum of 8 applications.

C. The infill installation shall not result in fiber material trapped below the surface of the infill material. If fiber is trapped below the surface, a portion or all of the infill material must be removed and reinstalled.

D. The infill material shall be installed at a uniform depth across each entire field area. Infill depths shall not vary by more than 5 mm across each field area, with no areas uniformly high or low.

E. The brushing of the infill material shall provide fiber fibrillation resulting in a natural surface appearance.

F. The infill materials shall be water settled to provide accelerated consolidation of the infill material prior to use by the Owner. The Contractor shall utilize portable sprinkler heads to evenly apply a minimum of 20 mm of water over each entire field area for water settlement. Upon completion of the initial water settlement, each surface will be inspected by the Owner and Consultant for footing stability and infill consolidation. The Contractor shall provide any additional water settling as required by the Owner and Consultant to achieve the desired level of infill stability and consolidation.

3.8 CLEANING

A. The Contractor shall remove all excess materials of all types, equipment, debris, etc., from the site immediately after completion of the Work. Remove all stains and other blemishes from all finished surfaces. Leave Work in a clean, new appearing condition, ready for use by Owner.

B. The Contractor shall inspect each entire field area with a hand held metal detector to identify any construction materials or tools left on the field. All such materials shall be removed prior to Owner occupancy of the fields.

3.9 PROTECTION

A. Adequate protection of materials and Work from damage will be the responsibility of the Contractor during installation and until acceptance of the Work. The Contractor will be responsible for protection after the acceptance of the Work until final acceptance of all Contract Work by the Owner. All material damaged or stolen prior to acceptance by the Owner shall be replaced at no cost to the Owner.

3.10 EXTRA MATERIALS

A. Deliver to Owner all extra materials herein specified. Receive Owner's written receipt for all materials. Deliver receipt to Consultant.

B. Infill Materials: Provide four (4) 120-litre rubber trash containers with lids of each infill material used.

C. Turf for Future Repairs: Material may be roll ends or cutoffs; however, each piece of fabric shall be at least 2 meters x 3 meters. At least one green turf piece shall be at least 3 meters x 4.5 meters. The following are minimum areas for the extra synthetic turf materials to be provided by Contractor to the Owner:

1. Green Turf: 100 square meters
2. Yellow Turf: 30 lineal meters of 120 mm wide lines
3. White Turf: 30 lineal meters of 100 mm wide lines

- END OF SECTION -

APPENDIX A1.1 – FIFA TECHNICAL PRODUCT DATA SHEET (PAGE 1)

Property	Test Method	Test Conditions			Two Star Req's	One Star Req's	**Results**
		Preparation	T◦C	Cond.			
Vertical ball rebound	FIFA 01 & FIFA 09	Pre-Cond.	23◦	Dry	0.60 – 0.85m	0.60 – 1.0m	
				Wet			
		Sim. Wear 5,200 cycles			0.60 – 0.85m	NA	
		Sim. Wear 20,200 cyc.			NA	0.60 – 1.0m	
Angle ball rebound	FIFA 02	Pre-cond.	23◦	Dry	45 - 60%	45 - 70%	
				Wet	45 - 80%		
Ball Roll	FIFA 03	Pre-cond.	23◦	Dry	4 – 8m	4 – 10m	
				Wet			
Shock absorption	FIFA 04a & FIFA 09	Pre-cond.	23◦	Dry	60 - 70%	55 - 70%	
				Wet			
		Sim. Wear 5,200 cycles		Dry	60 - 70%	NA	
		Sim. Wear 20,200 cyc.			NA	55 - 70%	
		Pre-cond.	40◦	Dry	60 - 70%	55- 70%	
	FIFA04a 1st impact	-	-5◦	Frozen	60 - 70%	55- 70%	

Proposed product is to perform to the minimum testing requirements equivalent to FIFA Recommended Two Star. FIFA Certification is NOT required.

APPENDIX A1.1 – FIFA TECHNICAL PRODUCT DATA SHEET (PAGE 2)

Property	Test Method	Test Conditions			Two Star Req's	One Star Req's	Results
		Preparation	T◦C	Cond.			
Vertical deformation	FIFA 05a & FIFA 09	Pre-cond.	23◦	Dry	4 – 10mm	4 – 11mm	
		Pre-cond.		Wet			
		Sim. Wear 5,200 cycles		Dry	4 – 10mm	NA	
		Sim. Wear 20,200 cyc.			NA	4 – 11mm	
Rotational resistance	FIFA 06 & FIFA 09	Pre-cond.	23◦	Dry	30 – 45Nm	25 – 50Nm	
				Wet			
		Sim. Wear 5,200 cycles		Dry	30 – 45Nm	NA	
		Sim. Wear 20,200 cyc.			NA	25 – 50Nm	
Linear friction – Stud Decel. Value	FIFA 07	Pre-cond.	23◦	Dry	3.0 – 5.5g	3.0 – 6.0g	
				Wet			
Linear friction – Stud Slide Value		Pre-cond.	23◦	Dry	130 - 210	120 - 220	
				Wet			
Skin / surface friction	FIFA 08	Pre-cond.	23◦	Dry	0.35 – 0.75		
Skin abrasion	FIFA 08	Pre-cond.	23◦	Dry	±30%		

Proposed product is to perform to the minimum testing requirements equivalent to FIFA Recommended Two Star. FIFA Certification is NOT required.

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)

PROJECT RECORD DOCUMENTS **SECTION 01 33 01**

Add the following:

1.7 Recording Actual Site Conditions

.5 The Contractor is responsible to provide to the Consultant one complete set of red line as-built drawings showing all underground utilities and surface features such as manholes, catch basins, hydrants, light poles, etc. The drawings shall be neatly marked in red ink with all changes from the design inverts and/or locations of the constructed works.

In addition, the Contractor is responsible to retain an independent qualified Surveyor to conduct an as-built survey of all manholes (location, rim and invert elevations), water valve boxes, junction boxes, light poles, field corner locations and elevations, catch basins and lawn basins (location, rim and invert elevations) and any other significant project feature typically located during an as-constructed survey. The as-built survey information shall be supplied to the Consultant in a suitable digital format.

1.9 Testing and Inspections

.1 The Contractor will be responsible for conducting all quality control and quality assurance testing for the Contractor's own purposes and as required to comply with the materials testing requirements of the Contract, including any such testing required to comply with the Electrical Code and BC Building Code.

.2 All costs for testing shall be included in the contract price and no separate payment will be made for testing of work in this contract. The minimum testing frequency for various components of the Contract is outlined below.

.3 Testing Agencies

.1 All compaction testing and materials testing shall be completed by a certified testing agency approved by the consultant.

.2 All video inspection is to comply with MMCD 33 01 30.1 CCTV Inspection of Pipelines.

.4 Testing Standards

.1 The standards for compaction, gradation, strength of materials, etc. are included within the specifications relating to each of the various materials and types of civil works.

.5 Frequency of Testing

.1 Hot Mix Asphalt

.1 Marshall Test – 1 for every 500 tonnes, minimum 1 per day

.2 Pavement core samples – 1 every 300 square metres of pavement surface, minimum 1 per day

.2 Concrete

.1 Cylinder tests – take samples every 40 cubic metres, minimum one per day

.2 Slump, air, etc. – every 40 cubic metres

.3 Aggregates and Subgrade

.3 Sieve Analysis and Proctor – provide for pre-approval one sample sieve analysis (by independent testing laboratory) for every type of aggregate used. See additional requirements for permeable aggregates in Specification Sections. Take samples and provide sieve analysis and proctor for every 500 tonnes of material placed, including permeable aggregates.

.4 Compaction – complete density testing on subgrade, subbase and base aggregates separately at a frequency of one every 200 square metres. Trenches compaction tests are to be one density test per 100 lineal metres per 300mm lift.

.5 Proof-roll – proof-roll all subgrade before placing aggregates. Proof roll to be completed using a fully loaded single or dual axle dump truck. All proof roll to be witnessed and approved by the civil consultant. Defective subgrade to be removed and replaced with suitable material.

.6 Infiltration Testing – Refer to Specifications Sections for sand and other permeable aggregates (and any other material) infiltration testing.

.7 Video Inspection

.1 Storm Sewer Mainline – The storm mainline pipes shall be video inspected and approved. All lines must be cleaned and flushed prior to inspection.

.2 Video inspection of catch basin, perforated lateral lines and lawn basin connections will not be required.

END OF SECTION

TEMPORARY FACILITIES **SECTION 01 53 01**

1.6 Hoarding **(add new clauses 1.6.2 and 1.6.3 as follows)**

.2 The Contractor shall be responsible to construct all site hoarding shown on the Plans and as necessary to ensure that the site work area is completed secured and protected from adjacent students and the general public. The cost of hoarding shall be considered incidental to the payment for work and no separate payment or extra compensation will be due to the Contractor for constructing or removing hoarding or for the materials needed to construct hoarding.

.3 Site hoarding shall consist of 1.8 m high chain link fencing installed to a temporary standard. Fence posts (except for gate posts and corner posts) need not be concrete encased, however, the hoarding must be sturdy enough to resist noticeable deflections or breach of the fencing system with moderate force.

Standard ModuLok and equivalent types of temporary construction fencing will also be acceptable for use as hoarding.

END OF SECTION

TRAFFIC CONTROL, VEHICLE ACCESS AND PARKING SECTION 01 55 00

1.2 Temporary Access Roads (add new clause 1.2.2 as follows)

.2 The Contractor shall be responsible to construct any, and all, haul roads necessary to complete the work of the Contract. The cost of haul roads shall be considered incidental to the payment for work and no separate payment or extra compensation will be due to the Contractor for constructing or removing haul roads or for the materials needed to construct haul roads. The location of all haul roads constructed must be pre-approved by the Contract Administrator. Upon removal, the area under the haul roads must be repaired, if necessary, and restored to the original condition prior to construction of the haul road. The haul road shall be constructed with a surface that allows construction traffic to keep tires clean and leave the site without tracking sediment onto municipal roads.

END OF SECTION

ENVIRONMENTAL PROTECTION **SECTION 01 57 01**

Add the following:

1.2 Temporary Erosion and Sediment Controls

.5 Prior to construction, develop and implement a sediment control strategy. Maintain all proposed and sediment control features as specified on the Contract Drawings or as required to effectively manage sediment and erosion, including any drainage ditches, slope protection and silt fencing and related work. Comply with all requirements of the Municipality's Erosion and Sediment Control bylaw and policies, and any permit issued thereof.

.6 The Contractor shall be responsible for cleaning sediment and other construction debris from the existing road surfaces used by site construction traffic on a daily basis during the construction period or as deemed necessary by the Contract Administrator.

END OF SECTION

CONCRETE WALKS, CURBS AND GUTTERS **SECTION 03 30 20**

Add the following:

1.0 GENERAL

.2 Section 03 30 20 refers to cast in place portland cement concrete slabs on grade including concrete pads for player's benches, bleachers and goal storage areas, plaza areas and other miscellaneous concrete surfaces.

3.9 Expansion Joints

.5 Form expansion joints at a maximum spacing of 9 m for cast in place concrete slabs on grade including for players benches, bleachers and goal storage areas, plaza areas and other miscellaneous concrete surfaces.

.6 Expansion joint patterns shown on the Plans take precedence over the standard spacing indicated herein.

3.10 Control Joints

.5 Unless shown otherwise on the Plans, for 100 mm and 125 mm thick concrete slabs construct control joints at maximum 3.0 m (100 mm) and 4.0 m (125 mm) spacing respectively. For all other unreinforced slabs on grade, construct control joints at a maximum of 30 to 36 times the thickness of the concrete surface.

.6 The resulting panels created by control joints are to be as square as possible. The length to width ratio of the panels formed by control joints is not to exceed 1.5 L to 1.0W.

.7 Control joints are to be as equally spaced as possible within adjacent area of concrete surfacing and be square as possible.

.8 Align joints with joints for adjacent concrete work including curbs, turf edge anchor and trench drain surround. Avoid 'T' intersections of joints to the extent practical to do so.

.9 Control joint patterns shown on the Plans take precedence over the standard spacing indicated herein.

END OF SECTION

SITE FITMENTS **SECTION 11 68 00**

1.0 GENERAL

.1 Include all labor, material, equipment, transportation, and services to install, complete, all sports field fixtures, fitments and equipment as shown on the plans and as specified herein. Athletic equipment shall include, but is not limited to:

.1 Boot Brush Basins

1.1 Related Work

.1 Examine contract documents for requirements that affect work of this section. Other specification sections that directly relate to the work of this section include, but are not limited to:

.1 Section 31 23 01 – Excavating, Trenching and Backfilling
.2 Section 32 18 23.26– Natural Grass Sports Field
.3 Section 03 30 53 – Cast-in-Place Concrete

1.2 References

.1 Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

.1 Canadian Collegiate Athletic Association (CCAA)
.2 American Sports Builders Association (ASBA)
.3 Manufacturers Data and Recommended Installation Requirements

1.3 Submittals

.1 Manufacturers Product Data

.1 Provide manufacturers product data prior to actual field installation work, for Owner's representative's review.

.2 Shop Drawings

.1 Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work, for Owner's representative's review.

1.4 Quality Assurance

1. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements.

1.5 Delivery and Storage

.1 Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported to the

Owner's representative. Replacements, if necessary, shall be immediately re-ordered, so as to minimize any conflict with the construction schedule. All athletics equipment shall be stored above ground under protective cover or indoors so as to provide proper protection.

2.0 PRODUCTS

.1 **Boot Brush Debris Basins**

.1 As manufactured by:
ACO Markant
P 877-226-4255
www.acocan.ca

.2 Model: DrainMat

- 1000mm x 500mm x 80mm Polymer concrete basin. Two (2) per boot brush station. c/w integral grate frame
- Does not included manufacturer's grate. See detail for grate specification.
- Drain: 100mm knockout for drain connection.

Installation

- Install Boot brush footing and frame per details
- Excavate area large enough to fit DrainMat base and bedding material, compact well.
- Install outlet pipework.
- Install formwork for CIP concrete apron as shown on drawings
- Place DrainMat and centre within forms ensuring a minimum 100mm concrete apron on all sides. Connect drain outlet pipe.
- Level base unit. Backfill surround with concrete and finish surface as desired.
- Ensure finished surface is 1/8" higher than the DrainMat to assist water drainage. Fit galvanized grate into finished installation

3.0 INSTALLATION OF EQUIPMENT

.1 All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings.

.2 All park furniture shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings.

END OF SECTION

AGGREGATES AND GRANULAR MATERIALS **SECTION 31 05 17**

Add the following:

1.3 Approvals

.5 Prior to beginning placement of field base aggregates, submit a written plan of the methods and equipment to be used in placing the permeable field aggregate.

1.5 Inspection and Testing

.2 For each type of aggregate to be used including drain rock, sieve analysis by an independent testing company shall be submitted and approved by the Consultant prior to bringing any aggregates on-site. Sample for sieve analysis must be taken from stockpile of actual material to be used. Cost of these sieve analysis are to be borne by the Contractor.

.3 For all field aggregates and subgrade, each surface shall be tested by the Contractor and approved by the Consultant prior to proceeding with placement of the next material. In each case, the Contractor shall supply laser survey equipment and set up the equipment for use by the Consultant to check vertical tolerances of the subgrade or aggregate placed. The Contractor shall also be present during the inspection of each material.

.4 For each aggregate, the entire stockpile of required material must be manufactured before acceptance and delivery to the site.

.5 Summary of aggregate approval process:

.1 Submit sieve analysis of proposed material for preapproval by consultant.

.2 Manufacture complete stockpile of material needed.

.3 Submit further sieve analysis of random samples taken from the manufactured stockpile to confirm compliance with gradation requirements.

.4 For permeable aggregates -Upon approval of the stockpile, bring adequate material to the site for infiltration test.

.5 For permeable aggregates -Upon approval of the infiltration test results, deliver material to the site.

.6 Separate infiltration testing for each permeable aggregate shall be completed at the contractors cost by an independent testing company approved by the Consultant using the following method:

.1 Deliver adequate pre-approved aggregate supply to the site to construct a 200 millimeter thick compacted aggregate pad, 3.0 meters by 3.0 meters in size. The aggregate pad will be centered over one of the new field drain lateral trenches.

.2 Compact the aggregate pad with a static drum roller and test. Compaction to be minimum 95% of maximum dry density based on ASTM D698.

.3 Embed a 200 millimeter inside diameter cylinder into the compacted aggregate to at least a 75-millimeter depth. Re-compact any disturbed aggregates inside and outside the cylinder edge with a hand tamper.

.4 Evenly apply one liter of water to the area inside the ring by pouring water on the aggregate surface, taking care to prevent disturbance of the aggregate surface. Maintain a constant head of water on the aggregate surface of not more than 5 millimeters in depth. Use a timer to measure the time needed to absorb the one liter of water.

.5 Immediately repeat the procedure described in item (.4) above. Repeat the procedure until the time required to absorb one liter of water becomes constant for each successive test.

.6 Calculate the flow over the area of the cylinder using the average time of the final two tests. The minimum flow rate based on the test is 2,000 millimeters per hour.

.7 Post Construction Permeability Testing: Upon completion of the finished surface, Contractor to complete the following permeability testing.

.1 Synthetic Field
ASTM F2898-11 – Non-Confined Area Flood Test

2.1 Materials General

.3 Permeable Aggregates

Permeable aggregates shall be a product manufactured by using **clean** crushed rock (less than 2% fines) and washed concrete sand (less than 2% fines). Bank sand is not an acceptable component for use in the mixture.

2.13 Field Subsurface – Drain Rock

.1 To be clean, washed, uniformly graded pea gravel conforming to the following gradations:

Sieve Designation	Percent Passing
19mm	- 100
15.8mm	85 - 100
12.5mm	15 - 85
9.5mm	0 - 15
4.75mm	0 - 5
2.36mm	0 - 4
0.150mm	0 - 2

2.14 Field Base Course - Permeable Aggregate

.1 To be open-graded, fractured conforming to the following gradations:

Sieve Designation	Percent Passing
32mm	- 100
25mm	90 - 100
19mm	80 - 100
12.5mm	50 - 80
9.5mm	40 - 60
4.75mm	20 - 40
2.36mm	15 - 30
0.600mm	10 - 20
0.150mm	2 - 10
0.075mm	0 - 2
0.053mm	0 - 1

.2 Aggregate to be a minimum of 75% fractured with at least one fractured face by mechanical means on each individual particle larger than 6.4mm.

.3 Aggregate to be clean and shall have a minimum infiltration rate of 2,000 mm per hour in accordance with the test procedure set out in Supplementary Specification Section 31 05 17, - 1.5 Inspection and Testing

.4 Compact to 95% of maximum dry density as per ASTM D698.

2.15 Field Top Course - Permeable Aggregate

.1 To be open-graded, fractured conforming to the following gradations:

Sieve Designation	Percent Passing
19mm	-100
12.5mm	60 - 100
9.5mm	40 - 90
4.75mm	30 - 80
2.36mm	10 - 60
0.600mm	10 - 20
0.150mm	2 - 5
0.075mm	0 - 2
0.053mm	0 - 1

.2 Aggregate to be a minimum of 75% fractured with at least one fractured face by mechanical means on each individual particle larger than 6.4mm.

.3 Aggregate to be clean and shall have a minimum infiltration rate of 2,000 mm per hour. In accordance with the test procedure set out in Supplementary Specification Section 31 05 17 - 1.5 Inspection and Testing.

.4 Compact to 95% of maximum dry density as per ASTM D698.

Add the following:

3.2 Handling of Base and Top Course Aggregates

.1 Subgrade and drain trenches must be accepted by the Consultant before placement of any permeable aggregates. Remove any contamination from the drain rock trenches before placing base aggregates.

.2 Place geosynthetic fabric and cover immediately with base course aggregate. Do not allow equipment on fabric.

.3 No trucks or equipment to drive over drain rock trenches until after a minimum of 200 millimeters of compacted base aggregate is covering the drain rock.

.4 Keep moisture content of permeable aggregates at 3% to 5% in the stockpile and add water at site as required to achieve same moisture content.

.5 When material is dumped on-site minimize distance material is pushed. After material is dumped from the truck, mix material with excavator bucket to eliminate segregation as directed by the Consultant.

.6 Place base aggregate in one lift of specified thickness.

.7 Do not place base aggregate if water is ponded on subgrade.

.8 Remove and dispose of material which becomes segregated as a result of construction process. This applies both during placement of material and surface segregation after final grading.

.9 Compact base and top course to 95% of maximum dry density as per ASTM D698. Use static roller for compaction.

3.3 Finished Tolerances – Synthetic Field

.1 Field base course and Plus or minus 10 millimeters from specified grade but not uniformly high or low. No irregularities exceeding 10 millimeters when checked with a 3 meter straight edge placed in any direction.

.2 Field top course plus or minus 3 millimeters from specified grade but not uniformly high or low. No irregularities exceeding 6 millimeters when checked with a 3 meter straight edge placed in any direction.

.3 All grading of subgrade and field aggregates to be controlled using laser survey equipment.

END OF SECTION

RESHAPING EXISTING SUBGRADE SECTION 31 22 16.1

Add the following:

3.4 Finished Tolerances .4 The subgrade of the field is to be a uniform, true surface relative to finish grade and is to be controlled using laser controlled equipment. The subgrade is to have no irregularities exceeding 20 mm when checked with a 3 meter straight edge in any direction. Tolerances will be checked using a laser. All subgrade must be at design grade or lower.

END OF SECTION

EXCAVATION, TRENCHING AND BACKFILLING SECTION 31 23 01

Add the following:

1.0 GENERAL

.2 It is intended that material excavated for utility trenches can be reused as backfill in areas soft landscaped outside of any areas of synthetic turf surfacing, concrete, asphalt and other hard surfaces. The pipe bedding zone will be imported material as detailed in the specifications.

END OF SECTION

GEOSYNTHETICS **SECTION 31 32 19**

Add the following:

2.1 Geosynthetic

.6 Fabric to be 100% Polypropylene, non-woven, needle-punched engineering fabric. Material to be AMOCO 4546 or approved equal.

.1 Fabric to have the following hydraulic properties:
- .1 Apparent size opening US SIEVE (ASTM-D4751) - 70
- .2 Permittivity Sec-1 (ASTM-D4491) - 2.0
- .3 Flow rate gal/min/sq.ft. (ASTM-D4491) - 145

.2 Fabric to have the following physical properties:
- .1 Grab Tensile Strength lbs. (ASTM-D4632) - 100
- .2 Grab Tensile Elongation % (ASTM-D4632) - 50
- .3 Mullen Burst PSI (ASTM-D3786) -225
- .4 Puncture lb. (ASTM-D4833) - 65
- .5 Trapezoid Tear lb. (ASTM-D4533) - 45
- .6 UV Resistance % (ASTM-D4355 500 hours) -70

.7 Fabric to be placed with a minimum width of 4.0 meters and a minimum continuous length of 50 meters. When the length of fabric is not continuous, the lateral seam shall have a minimum overlap of 0.60 meters. The fabric shall not be folded or turned up along the edges.

END OF SECTION

CHAIN LINK FENCES AND GATES SECTION 32 31 13

PART 1 GENERAL

Add the Following:

1.0 General

.3 This section shall govern the construction of all fencing, gates and backstops as detailed as well as restoration of the general working areas surrounding each work site. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein. Refer to attached plans for the layout and details for the indicated fences, gates and backstops.

1.2 Related Work

.2 Section 321216 - Hot-Mix Asphalt Concrete Paving

1.6 Inspection and Testing

.2 Contractor shall be responsible for the provision of test results, for all tests of work described in this section, to the Contract Administrator and as required by the Owner.

.3 Testing, if required, will be at the Contractor's expense. The Owner may retain an independent materials testing firm to carry out the following tests.

.1 Concrete compressive strength, weld strength and integrity and zinc rich coating application adherence.

.2 Such other testing as may be requested by the Contract Administrator. The materials testing firm shall be requested to submit one set of test results directly to the Contractor.

1.7 Acceptance

.1 Obtain approval from the owner or representative (Contract Administrator) of layout of chain link fences, gates and backstops prior to their installation. Contractor is responsible for locating all reference points necessary to establish layout of fences to all grades and alignments as per plan and to satisfaction of the Contract Administrator.

.2 Chain link fences, gates and backstops will be accepted only when the following conditions have been met:

.1 All metal pipe, fasteners, fittings and fabric are properly installed and are as called for in the specifications and as indicated on the drawings and details and are to the satisfaction of the owner.

.2 All asphalt mowing strips, dugout pads and bleacher pads are as specified and provide positive drainage (1% min., 2% max. grade) away from the backstop.

.3 Obtain approval from the owner or representative (Contract Administrator) of all stages of layout, installation, and finish prior to completion of each stage.

1.8 Guarantee

.1 All material and workmanship shall be guaranteed, for a period of one (1) year following substantial completion, to remain true to grade, dimension, remain plumb and be free of other defects.

.2 The guarantee does not include defects that are a result of vandalism.

.3 All work deemed to be unsatisfactory or defective shall be repaired immediately following notification of the defect. Repair work shall be as per the original specification and shall be guaranteed for one full year from the date of the repair.

PART 2 PRODUCTS

Replace the Following:

2.1.3 Materials - Fabric

.1 Chain link fabric shall be 5.00mm (6 gauge) galvanized, mild steel woven wire material, as specified and/or shown on the layout drawings and details. All material shall be delivered on site with manufacturer's tags or wrappings intact, free from damage, imperfections or flaws.

.2 50mm (2") mesh is required for all fencing.

.1 The gauge of fabric used shall be as indicated on the drawings and details, and is determined by the height of the fence.

Add the Following:

2.1.4 Materials - Posts and Rails

.1 Posts and Rails: CAN/CGSB – 138.2-96, Schedule 40, hot dip galvanized

Fence Height	0.9m	1.2m	1.8m	3.0m - 4.8m	6.0m
Mesh Gauge	6 ga	6 ga	6 ga	6 ga	6 ga
Mesh Fabric	Galvanized	Galvanized	Galvanized	Galvanized	Galvanized
Line Post Ø	60 x3.91	60 x3.91	60 x3.91	75 x5.16	89 x5.49
Corner Post Ø	75 x5.16	75 x5.16	75 x5.16	75 x5.16	89 x5.49
End Post Ø	75 x5.16	75 x5.16	75 x5.16	75 x5.16	89 x5.49
Gate Post	89 x5.49	89 x5.49	89 x5.49	89 x5.49	NA
Top Rail Ø	60 x3.91	60 x3.91	42 x3.56	42 x3.56	42 x3.56
Mid Rail Ø	42 x3.56	42 x3.56	42 x3.56	42 x3.56	42 x3.56
Mid Rail Location	As shown on Fence Elevation APL10				
Bottom Rail Ø	42 x3.56	42 x3.56	42 x3.56	42 x3.56	42 x3.56
Post Foundation Depth	1000 (300Ø)	1000 (300Ø)	1000 (450Ø)	1000 (450Ø)	1500 (450Ø)

2.1.5 Materials – Bottom Tension Wire

.5 Not applicable

2.1.6 Materials – Tie Wire

.6 Tie wire shall be 6 gauge steel

2.1.8 Materials - Tension Bar Bands

.8 Tension bar bands/clamps shall be 3mm x 20mm galvanized steel

2.1.9 Materials – Gate Frames

.9 Gate frames: to ASTM A53, Schedule 40 galvanized steel pipe, 42 mm nominal outside diameter pipe for outside frame, 35 mm outside diameter pipe for interior bracing; or as otherwise shown on Contract Drawings.

.1 Fabricate gates with electrically seal-welded joints, and paint with zinc pigmented paint after welding.

.2 Fasten fence fabric to gate with twisted selvage at top.

.3 Furnish gates with galvanized malleable iron hinges, heavy duty cast iron, drop latch and catch with provision for padlock which can be attached and operated from either side of installed gate.

.1 All gate latches and catches to be welded to post and gate. Installation of set screws permitted.

.4 Furnish double gates with chain hook to hold gates open and centre rest with drop bolt for closed position.

.5 All gates to have mid rail support

.6 Double swing gates to have locking centre pin, with tack welded pin stop

2.1.10 Materials – Fittings and Hardware

.10 Fittings and hardware: cast aluminum alloy, steel or malleable or ductile cast iron. All fittings and hardware to be galvanized. Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail. Overhang tops to provide waterproof fit, to hold top. Post caps to be tack welded to post. Turnbuckles to be drop forged.

2.1.11 Materials – Organic Zinc Rich Coating

.2 Contractor shall supply and install zinc rich coatings over all satisfactorily cleaned and approved field welds. All welds to be ground smooth.

2.3 Concrete

.1 Concrete shall conform to CSA A23. The mix design shall include the following:

.1 Minimum compressive strength - 20 Mpa at 28 days.
.2 Minimum cement content - 310 kg per cubic meter.
.3 Maximum aggregate size - 20 mm.
.4 Slump - not exceeding 100 mm.
.5 Air entrainment - 4% to 6%

PART 3 EXECUTION

3.3 Workmanship

.1 Fencing, gates and backstops shall be constructed in accordance with the layout plan and details provided, and under the direction of the Contract Administrator. Fabrication and finishing shall be in accordance with the commonly accepted standards of welding and fence installation and shall produce a high-quality, attractive end product.

3.4 Alignment and Grade

.1 Fencing shall be installed parallel to surfaces and grades of established finish grade.

3.5 Notification

.1 The Contract Administrator shall be notified at least 24 hours in advance of any planned installation of fencing or backstops.

3.6 Fence Frame

.1 All posts shall be set true and plumb in concrete footings as detailed and to the spacing, height and alignment shown on the plan and details. Tops of footings for all fence and backstop posts shall be not less than 150 mm below finish grade surfaces of pavement and not less than 50 mm below finish grade of any unpaved areas. Footings shall not be permitted to be visible, nor should they

telegraph their location, at finish asphalt level upon substantial completion or during the period of the guarantee.

.2 Place concrete in post holes then embed posts into concrete to depths shown on Contract Drawings. Extend concrete 40 mm above subgrade level and slope to drain away from posts. Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

.3 The fence frame shall be welded post and rail construction throughout with all pipe cut on a contour (radius cut) at joints (not flattened).

.1 Continuous top rail construction for all fencing.

.2 All top rail splice welds/joints to be completed at post intersections. Mid rail splices between posts are not permitted.

.4 Posts less than 2.0 meters in height must be fabricated from one continuous piece of pipe, scabbing on pieces of pipe to achieve specified heights is not permitted.

.5 Grind excess material from all welded joints and paint with zinc rich paint.

.6 Bottom rails to be fabricated from galvanized pipe only, use of tension wire is not permitted.

.7 All pipe fittings and fastenings shall be galvanized and all field cuts or joints shall be painted thoroughly with two coats of zinc-rich paint subsequent to being ground clean of all spatter, clinker, burns, etc.

3.7 Fence Fabric

.1 Fence fabric shall be stretched and mounted to the manufacturer's recommended installation specifications, with the knuckled selvage on top. Tension bars shall be used at all corner, terminal and gate posts. Tension bands shall be spaced maximum 380mm O.C. and not less than 5 bands shall be used with each bar.

.2 Fabric for 1.2 meter height or lower fencing to be tied every knuckle on top rail and every other knuckle on bottom rail, every 150mm O.C. for all other horizontal rails. Ties to vertical posts shall be spaced at 150mm O.C. maximum.

.3 Fabric to be tied every knuckle for ball control backstops to a 3.0 meter height. Above 3.0 meter height, tie every third knuckle.

.4 Where there is a change in mesh sizing, the upper mesh is to overlap the lower level by three diamonds on the active sport side of the backstop fencing. Mesh to be tied every knuckle. Mesh overlap to be located at a cross rail.

.5 Do not install fence fabric until five days after concrete has cured for a minimum of 5 days and until the Contract Administrator has approved all asphalt paving installations.

.6 Trim or bend down sharp, protruding and excess wire tie ends to remove hazard

.7 Ends of runs of chain link fabric shall be secured with tension bands and tension bars.

3.8 Post Caps

.1 Post caps shall be installed where specified and tack-welded in place to prevent unauthorized removal.

.2 Post caps shall be galvanized malleable iron with water shedding overhang.

3.9 Gates

.1 Install gates in locations as shown on Contract Drawings.

.2 Level contours between gate posts and set gate bottom approximately 40 mm above ground surface.

.3 Determine position of centre gate rest for double gate. Cast gate rest in concrete as directed. Dome concrete above ground level to shed water.

.4 Install gate stops where specified.

END OF SECTION

TOPSOIL AND FINISH GRADING **SECTION 32 91 21**

As per MMCD, but add the following:

1.0 GENERAL

1.1 Related Work

.6 Furnish all labour, materials, and equipment necessary for the supply, placement, and amendment of the growing medium for all landscape areas.

1.3 Source Quality Control

.3 Advise Landscape Architect of sources of topsoil to be utilized seven days in advance of starting work.

.4 Soil shall meet Canadian Landscape Standard, latest edition, unless otherwise specified.

.5 Contractor is responsible for soil analysis and requirements for amendments to topsoil as specified. The Contractor shall submit the soil analysis report to the Owner's Representative prior to commencement of work. The recommendations of the laboratory will be the basis of requirements for soil acceptance and soil amendments.

.6 Testing shall be carried out by Pacific Soil Analysis Inc., at #5 - 11720 Voyager Way, Richmond, B.C. (Ph. 604 - 273-8226), or an equal approved prior identified prior to closing of tender. Soil sampling, testing and analysis to be in accordance with Provincial regulations and standards.

2.0 PRODUCTS

2.1 GENERAL

.2 Topsoil for planted and grassed areas: mixture of mineral particulates, microorganisms and organic matter, which provides suitable medium for supporting intended plant growth.

.1 Soil texture based on The Canadian System of Soil Classification. Refer to Table 1 for properties for different applications.

.3 Soil for rain gardens: Provide level 2P (BC Landscape Standard) growing media but with a sand content of 60-80% (percent dry weight of growing media). Minimum saturated hydraulic conductivity shall be 50mm/hr in place.

TABLE 1: PROPERTIES OF GROWING MEDIUM FOR DIFFERENT APPLICATIONS

TURF SOIL: soil in areas where sod or seed are designated as per the design drawings.
PLANTING SOIL: soil in areas where trees, shrubs and/or ground covers are designated as per the design drawings.

PROPERTIES	TURF SOIL	PLANTING SOIL
TEXTURE: Particle Size Classes by the Canadian System of Soil Classification	Percent of Dry Weight Mineral Fraction (%)	
Gravel greater than 2 mm less than 75 mm	0	0
Sand greater than 0.05 mm less than 0.5 mm	80 - 90	50 - 70
Silt greater than 0.002 mm less than 0.5 mm	5 - 15	10 - 30
Clay less than .002 mm	0 - 5	0 - 20
Clay & Silt combined (Fines)	max. 15%	max. 30%
ACIDITY (pH):	6.0 - 6.5	5.0 - 6.0
DRAINAGE: Minimum saturated hydraulic conductivity (cm/hr) in place	7.0	2.0
ORGANIC CONTENT: Percent of Dry Weight (%)	3 - 5	10 - 15

2.10	Growing Medium	.18	Contain no toxic levels of elements or growth inhibiting materials. If unexplained plant loss occurs before the warranty period expires, soil will be tested for toxicity and if toxicity is determined the contractor will be responsible for replacement, at his expense, of plant material and soil.
		.19	Free from: .1 Debris and stones over 50 mm diameter. .2 Coarse vegetative material, 10 mm diameter and 25 mm length, occupying more than 2% of soil volume.
		.20	Consistency: friable when moist.

3.0 EXECUTION

3.2	Preparation of Subgrade	.6	When planting directly on existing grade, coarse cultivate entire area that is to receive topsoil to depth of 150 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.
		.7	This does not apply to new understory areas, where the subgrade is not to be disturbed. Plants are to be planted in the native soil and no imported topsoil is required.
3.4	Placing Growing Medium	.6	Commercial processing and mixing of growing medium components shall be done thoroughly by a mechanized screening process. No hand mixing shall occur unless specifically approved by the Owner's representative.
		.7	Place topsoil after Landscape Architect has accepted sub grade.
		.8	Spread topsoil in uniform layers not exceeding 150 mm, over unfrozen sub grade free of standing water.
		.9	For sodded areas keep topsoil 15 mm below finished grade.
		.10	Unless otherwise specified on the design drawings, spread topsoil to following minimum depths after settlement and 80% compaction: .1 150 mm for grassed areas .2 300 mm for ground cover areas .3 450 mm for shrub areas .4 300 mm to sides of rootball for tree pits
3.6	Finish Grading	.3	Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.

.4 Consolidate topsoil to required bulk density using equipment approved by Landscape Architect. Leave surfaces smooth, uniform and firm against deep footprints.

3.10 Surplus Material .1 Dispose of materials not required off site.

END OF SECTION

HYDRAULIC SEEDING SECTION 32 92 19

As per MMCD, but add the following:

1.0 GENERAL

.3 Submit product data in accordance with Section 01 33 01 Product Record Documents.

.4 Provide product data for:

.1 Seed.
.2 Mulch.
.3 Tackifier.
.4 Fertilizer.
.5 Humectant

.5 Submit in writing to Owner's Representative 14 days prior to commencing work:

.1 Volume capacity of hydraulic seeder in litres.
.2 Amount of material to be used per tank based on volume.
.3 Number of tank loads required per hectare to apply specified slurry mixture per hectare.

1.3 Scheduling

.4 Schedule hydraulic seeding to coincide with completion of preparation of soil surface.

2.0 PRODUCTS

2.1 Grass Seed

.6 **Seed:** "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.

.7 **Grass Seed:** (by Premier Pacific Seeds)

Turf Grass (Passive Lawn Areas)
60% Perennial Rye Grass
40% Festuca rubra var. commutata,
Chewing's Fescue Longfellow 3

2.2 Hydraulic Mulch

.4 **Mulch:** specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:

Type I mulch: 100% Canfor virgin wood fibre or pre-approved equal.
.1 Made from wood cellulose fibre.
.2 Organic matter content: 95% plus or minus 0.5%.
.3 Value of pH: 6.0.
.4 Potential water absorption: 800-900%.

2.4 Fertilizer

.2 Shall have a ratio of 18-18-18 and will be 50% slow release polymer sulfur coated urea. Owner's Representative to review soil conditions on site and determine fertilizer requirements prior to mixing of slurry. In cases where turf starter or turf maintenance fertilizer are required, formulation will be as follows:

.1 Turf starter mix shall have a ratio of 13-26-6 (or approved alternate).

.2 Turf maintenance fertilizer shall have a ratio of 23-3-23 (or approved alternate).

2.5 Tackifier

.1 Water dilutable, liquid dispersion, containing polyvinyl acetate terpolymer emulsion.

3.0 EXECUTION

3.1 Finish Grade Preparation

.6 Fine grade areas to be seeded free of humps and hollows. Ensure areas are free of deleterious and refuse materials.

.7 Cultivated areas identified as requiring cultivation to depth of 25mm.

.8 Ensure areas to be seeded are moist to depth of 150mm before seeding.

.9 Obtain Owner's Representative's approval of grade and topsoil depth before starting to seed.

3.2 Seeding General

.3 Do not spray onto structures, signs, guiderails, fences, plant material, utilities and other than surfaces intended.

.4 Clean-up immediately, any material sprayed where not intended, to satisfaction of Owner's Representative.

.5 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.

.6 Protect seeded areas from trespass until grass is established.

3.3 Equipment

.3 Slurry Equipment

.1 Slurry tank: minimum 4500 L.

.2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and mechanical agitation method.

.3 Pumps capable of maintaining continuous non-fluctuating flow of solution.

.4 Supplied with not less than 6 spray pattern nozzles.

.5 Capable of seeding by 50m hand operated hoses and appropriate nozzles.

3.4 Protection

.4 Protect seeded areas from trespass satisfactory to Owner's Representative.

3.5 Application for Hydraulic Seeding

.8 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.

.9 Blend application 300mm into adjacent grass areas or sodded areas previous applications to form uniform surfaces.

.10 Preparation of Slurry

.1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Owner's Representative. Supply equipment required for this work.

.2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.

.3 After all other material is in the seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry.

.11 Application Rates For Hydraulic Seeding

.1 **Mulch:** 100% Virgin Wood Fibre (Canfor or approved equivalent) @ 1,800 – 2,500kg/ha Organic Tackifier @ 50 – 80kg/ha

.2 **Fertilizer:** (Analysis to suit soil conditions) @ 400 kg/ha

.3 **Turf Grass Seed:** Canada #1 Turf @ 5 kg per $100m^2$ (seed mix as specified in Product section - 2.1.2 above) Humectant – Viscous @ 20kg/ha

3.9 Conditions for Total Performance

.8 Areas seeded in fall will be accepted in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

END OF SECTION

SODDING **SECTION 32 92 23**

Add the following:

1.0 General

.3 All turfgrass areas to be constructed to “Class 2”, as outlined in the British Columbia Landscape Standard, Latest Edition, utilizing “No.2 Standard Grade” quality sod

Replace the following:

1.2 References

.1 British Columbia Landscape Standard, Latest Edition.

Add the following:

1.7 Measurement for Payment

.3 Grass cutting will be considered incidental to turfgrass installation, unless identified otherwise in the Form of Tender

1.10 Protection

.1 Contractor required to install temporary fencing around all newly installed turfgrass areas, and maintain fencing until Total Performance is reached.

2.0 PRODUCTS

2.1 Sod

.8 Netted sod not permitted.

.9 Turfgrass species and quality to conform to British Columbia Landscape Standard, Latest Edition.

2.4 Soil Amendments

.1 Limestone:

.1 Limestone, such as Spread Easy Dolomite @ 100 lbs/1000.

.2 Fertilizer:

.1 Evergro Quick Start 13.26.6 at 61 lbs/1000.

Replace the following:

3.1 Finish Grade Preparation

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove and dispose of weeds; debris; soil contaminated by oil, gasoline and other deleterious materials; to approved off-site disposal area. Remove debris which protrudes more than 25 mm above surface.

.4 Coarse cultivate entire area which is to receive sod by means of thorough scarification, disking or harrowing to minimum 150 mm

depth. Cross cultivate all areas where equipment used for hauling and spreading has compacted soil.

Add the following:

.6 Finish grade shall be flush to all adjacent horizontal surfaces and shall follow a level line at edges. Slopes shall be constant unless directed otherwise.

3.2 Sodding

.13 Soils shall be moist, 25%-75% of field capacity, but not wet when placed. Placement shall be handled to avoid damage to concrete structures or asphalt pavement.

3.3 Clean-up

.2 Wash all soil and debris resulting from sodding operations from paved surfaces using a 3000 PSI pressure washer with a 25 degree tip.

Replace the following:

3.4 Grass Maintenance

.1 Turfgrass maintenance to be completed under Section 32 93 90 – Establishment Maintenance

3.5 Conditions for Total Performance

.1 Contract Administrator will issue Certificate of Total Performance only when following conditions exist:

(Replace the following)

.5 Sodded areas have been mown at least four times, to a height of 38 mm, last mowing being within 48 hours of inspection for acceptance.

(Add the following)

.8 Finish grade shall be smooth and of uniform depth with positive drainage.

END OF SECTION

ESTABLISHMENT MAINTENANCE SECTION 32 93 90

PART 1 GENERAL

1.0 Intent

.1 The intent of "establishment" maintenance is to define sufficient care to newly installed plant material for a relatively short period of time to ensure or increase the long-term success of the planting. The objective is the adaptation of plants to a new site in order to obtain the desired effect from the planting while reducing the rate of failure and unnecessary work associated with improper establishment. Establishment maintenance procedures apply to all vegetation, including the following:

.1 New trees and shrubs.

.2 New grass and sod.

1.1 References

.1 B.C. Landscape Standard, Latest Edition, jointly published by the B.C. Society of Landscape Architects and the B.C. Landscape and Nursery Association, all Sections.

1.2 Maintenance Period

.1 Provide maintenance of installed landscaping for MINIMUM 12 months following issuance of Substantial Performance of the Contract Work, or from date of Planting Completion, whichever comes first.

1.3 Maintenance Level

.1 Maintain the landscape according to the B.C. Landscape Standard, Maintenance Level "3" - Moderate.

1.4 Scheduling

.1 Frequency of site visits, as outlined below, or as needed based on weather and conditions:

January to February	Monthly visits
March to October	Weekly visits
November to December	Monthly visits

.2 Litter and Debris: Remove all litter and debris from all areas during each site visit.

1.5 Payment

.1 Payment for establishment maintenance will be lump sum at completion of the maintenance period and acceptance. Monthly or partial maintenance claims will not be approved.

PART 2 PRODUCTS

2.1 Materials

.1 As specified in the Construction Contract Documents.

2.2 Fertilizers

.1 Comply with the requirements of the B.C. Landscape Standard. Formulations and application rates as required by soil testing.

PART 3 EXECUTION

3.1 Plant Material

.1 Watering

.1 During the first growing season, water new plants at least every ten (10) days between April 1st and July 31st, and every twenty (20) days between August 1st and September 15th. Minimum 25 gallons per tree per application. All tanks, hoses, probes or other necessary equipment shall be free of deleterious substances that can cause injury or harm to plants or pose a residual environmental risk in the soil.

.2 During the second growing season, water new plants at least every twenty (20) days between April 1 and July 31 and once between August 1 and September 1.

.3 Apply water at an application rate and duration such that the water content reaches field capacity to the full depth of the growing medium. The next application shall take place when the water content reaches 25% of field capacity.

.4 Monitor soil moisture during the growing season. Scheduled applications of water shall be missed only when rainfall has penetrated the soil fully as required.

.2 Mulching

.1 Maintain mulch in the original areas and to the original depths, from original supplier

.3 Weed Control

.1 Comply with B.C. Landscape Standards, Weed Control Standards-Level 3 - Moderate

.2 Frequency: Comply with B.C Landscape Standards. Remove all weeds from all areas at least once per month throughout the year, every two weeks during the growing season and more frequently in the spring, as required, by hoeing or cultivation to a maximum depth of 80mm or by hand-pulling.

.4 Pest and Disease Control

.1 Inspect all planted areas for pests and diseases periodically and at least every two months during the growing season by an experienced person. Carry out treatment for pests or diseases promptly and consistently for maximum effectiveness. Comply with all B.C. Pesticide Control Act and municipal requirements.

.5 Tree Support

.1 Maintain stakes, guy wires and ties as shown in Tree Planting Detail. Check ties at least every two months to ensure that they are not causing a depression in the bark, loosen, repair or replace as necessary. All flagging of guy wires shall be visible and in good repair.

.2 Newly planted replacement trees shall be supported as follows:

.1 Use two 2”diameter”x 7’ stakes. Set stakes minimum 2’ in soil. Do not drive stake through root ball.

.2 Maintain tree in a vertical position.

.3 Tie with Pre-approved, commercial flat woven fabric belt, minimum width 50 mm (2.0”).

.3 All tree plantings to be as shown in Tree Planting Detail.

.6 Pruning

.1 Comply with BC Landscape Standard, Latest Edition

.2 Limit pruning to that necessary to remove dead or injured branches and to correct structural weakness.

.3 Maintain the natural shape of the plant.

.7 Fertilizing

.1 Once during the twelve-month period of establishment maintenance fertilize shrubs, trees and groundcovers according to soil or foliar tissue analysis requirements.

.8 Plant Replacement

.1 Promptly remove and replace dead plants and plants not in a healthy condition. Replacement plants to be as per original plantings shown on Planting Plan. (It is not acceptable to wait until the end of the Maintenance period to replace dead plants.)

3.2 Grass Areas

.1 Maintenance shall include all measures necessary to establish and maintain grass in a vigorous growing condition including, but not limited to, the following:

.1 Mowing shall be carried out at regular intervals as required, to maintain grass at a maximum height of 60 mm. Not more than 1/3 of the blade shall be cut at any one mowing. Edges of sodded and seeded areas shall be neatly trimmed. Heavy clippings shall be removed immediately after mowing and trimming.

.2 Watering shall be carried out when required and with sufficient quantities to prevent grass and underlying soils from drying out.

.3 Any sodded or seeded areas that show deterioration or bare spots shall be repaired immediately. All sodded areas showing shrinkage die to lack of watering shall be top dressed and seeded with a seed mix that matches the original seed mix, when conditions allow.

.4 All seeded and sodded areas shall be adequately protected with warning signs, temporary fencing or other necessary means. Temporary fencing must be adequate for site conditions, snow fencing may be used in light traffic situations, while 1.8m chain link fencing is to be used in high traffic situations, (note – Moduloc-type fencing or equivalent is acceptable.)Fencing shall be maintained in good condition to provide a continuous barrier until Acceptance, at which time, unless otherwise agreed, fencing shall be removed from the site.

.2 Weed Control

.1 Comply with B.C. Landscape Standards, Weed Control Standards-Level 3 – Moderate, must also comply with all B.C. Pesticide Control Act and municipal requirements.

.2 Undertake weed control when density of weeds reaches 10 broadleaf weeds or 50 annual weeds or weedy grasses per 40 m^2 and reduce density of weeds to zero.

.3 Weed control, whether manual or chemical, shall reduce the density of weeds to zero.

.3 Fertilization

.1 Fertilization application frequency will comply B.C. Landscape Standards-Maintenance Level 3 - Moderate. Fertilizer formulation as required by soil testing.

.2 Application rates: frequency of fertilization every 6 weeks in the growing season, April – October, for duration of the maintenance period.)

END OF SECTION

STORM SEWERS **SECTION 33 40 01**

Add the following:

3.16 Field Subdrain

.1 Move excavated material to designated area on-site or dispose of offsite. Do not spread on subgrade.

.2 After drain is installed re-compact area between trenches leaving no loose material on the subgrade.

.3 Allow inspection of perforated pipe by Consultant before covering pipe with drain rock.

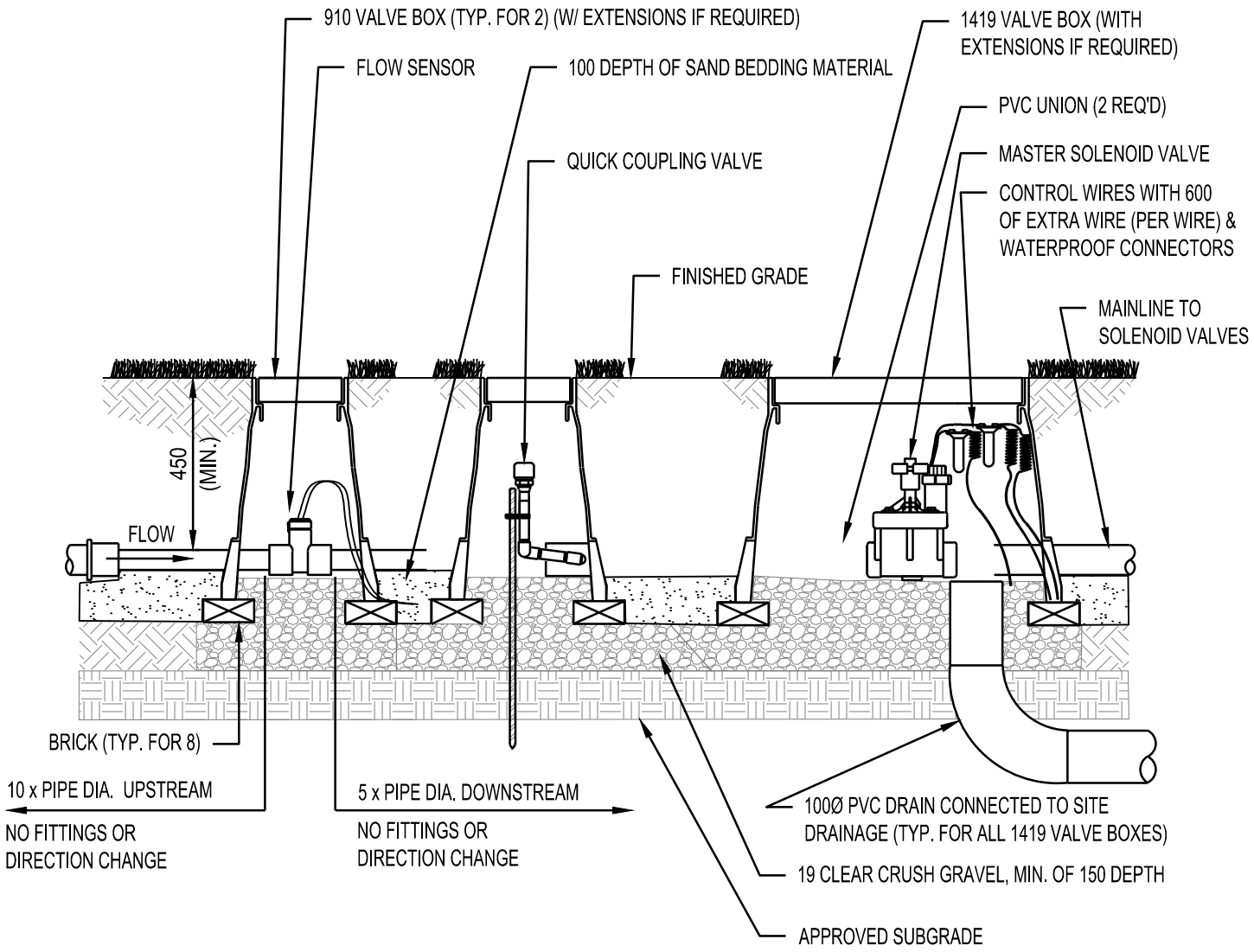
.4 Do not drive trucks over trenches after drain rock is placed. Where truck traffic crosses completed trenches the backfill shall be removed to allow re-inspection of the pipe.

.5 Horizontal and vertical tolerances for drain pipe to be in accordance with Section Clause 3.6.3

.6 Pipe joints shall be constructed with rubber gaskets or solvent weld, as applicable to the style of pipe and the manufacturer's recommendations for non-perforated pipe joint construction.

END OF SECTION

APPENDIX D - TYPICAL DETAIL DRAWINGS



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.

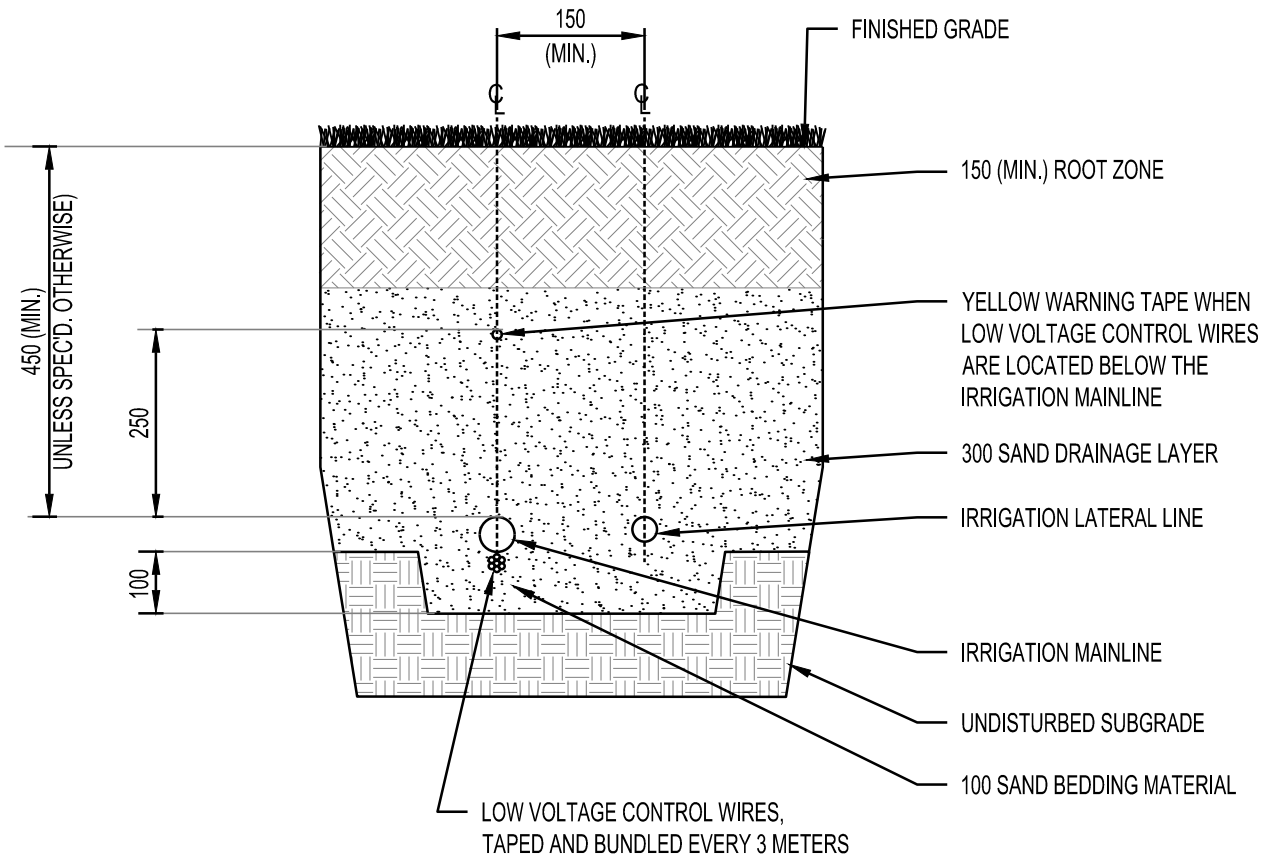
IR02 - FLOW SENSOR, QUICK COUPLING VALVE & MASTER VALVE

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
FLOW SENSOR, QUICK COUPLING VALVE & MASTER VALVE

DATE : 2016-11-22
DWG. No. : IR02
SCALE : AS SHOWN



NOTES:

1. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
2. IRRIGATION PIPING TO BE SLEEVED AT ALL LOCATIONS WHERE INSTALLED UNDER PAVED SURFACES.
3. IRRIGATION LINES SHALL BE TRENCHED INTO SAND BEDDING MATERIAL.

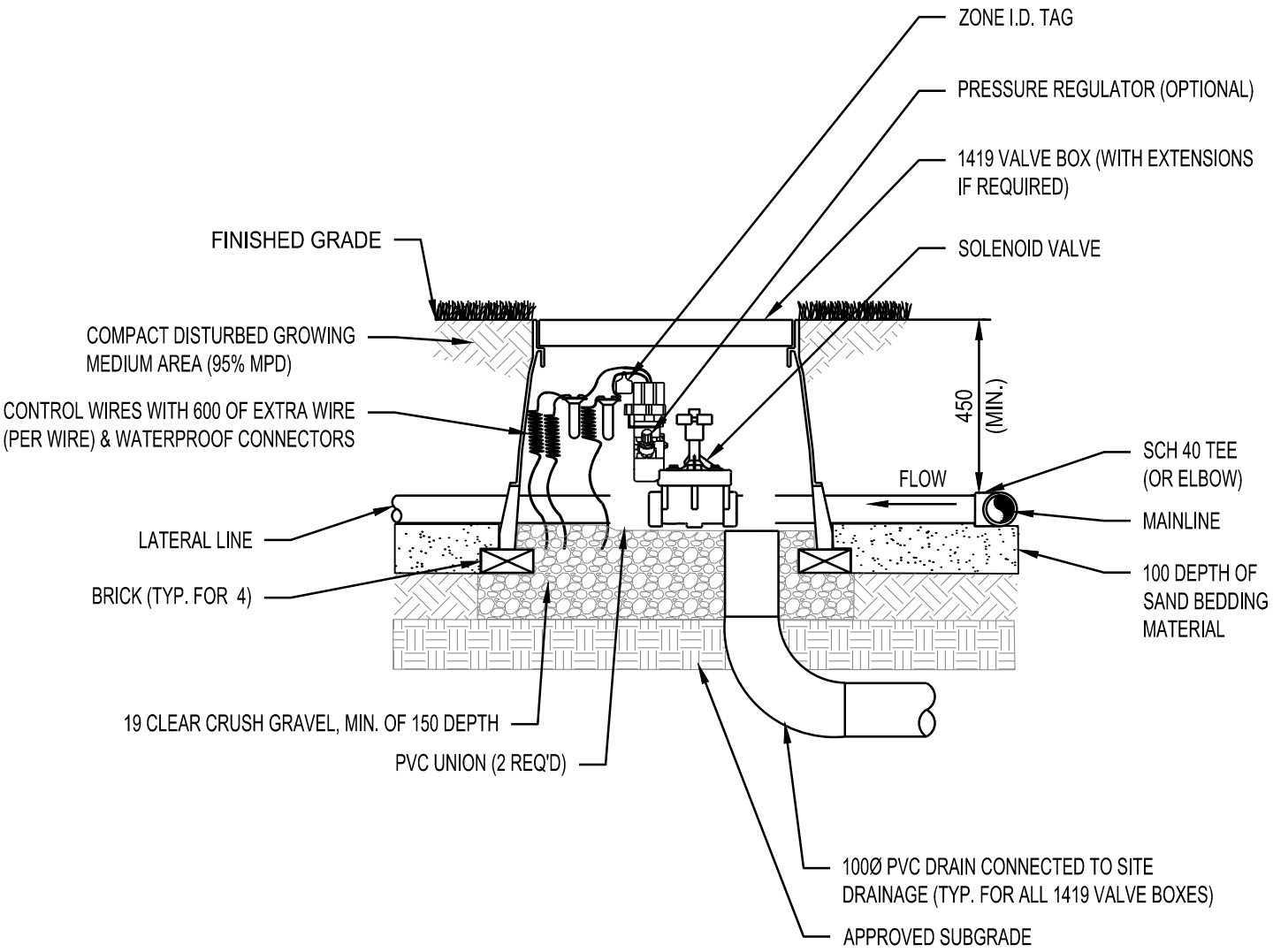
IR03 - IRRIGATION MAINLINE AND LATERAL LINE TRENCH

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
IRRIGATION MAINLINE AND LATERAL LINE TRENCH

DATE : 2016-11-22
DWG. No. : IR03
SCALE : AS SHOWN



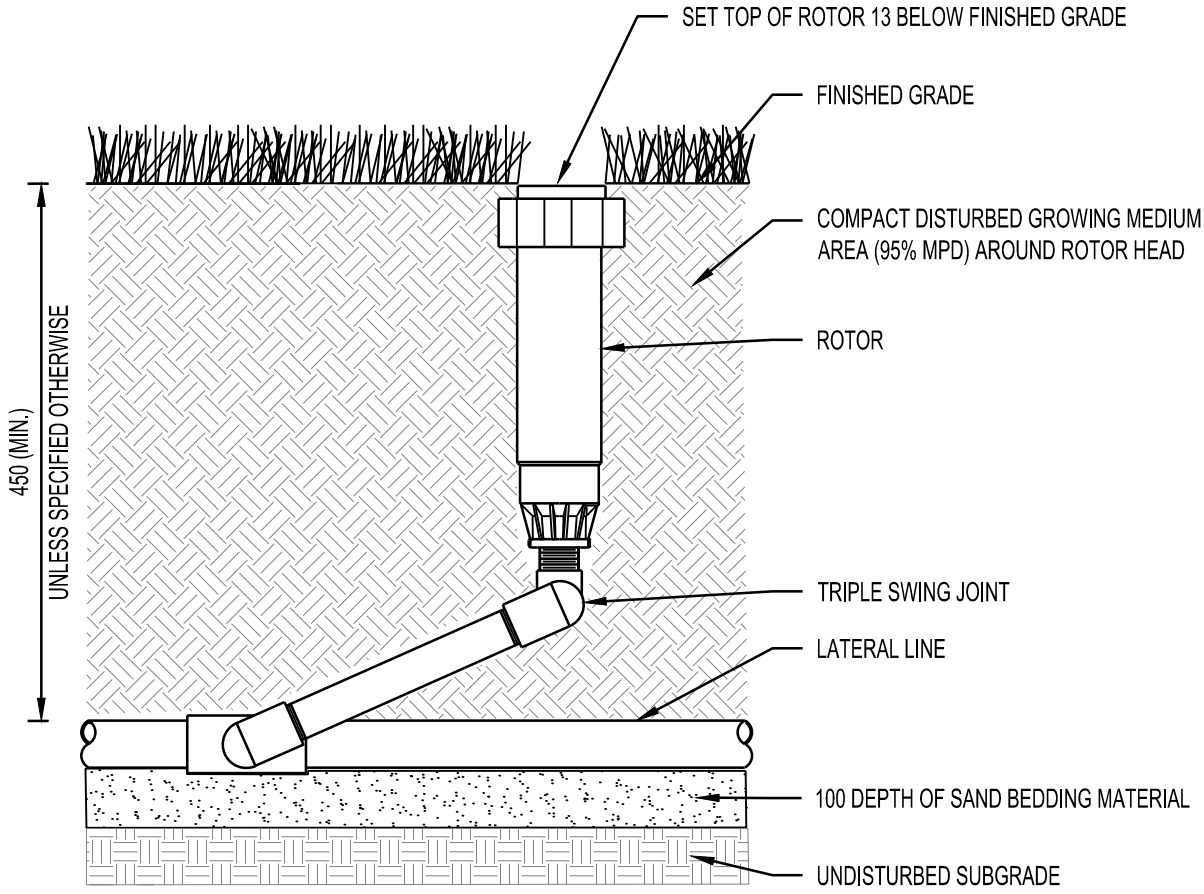
IR04 - ZONE SOLENOID VALVE

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
ZONE SOLENOID VALVE

DATE : 2016-11-22
DWG. No. : IR04
SCALE : AS SHOWN



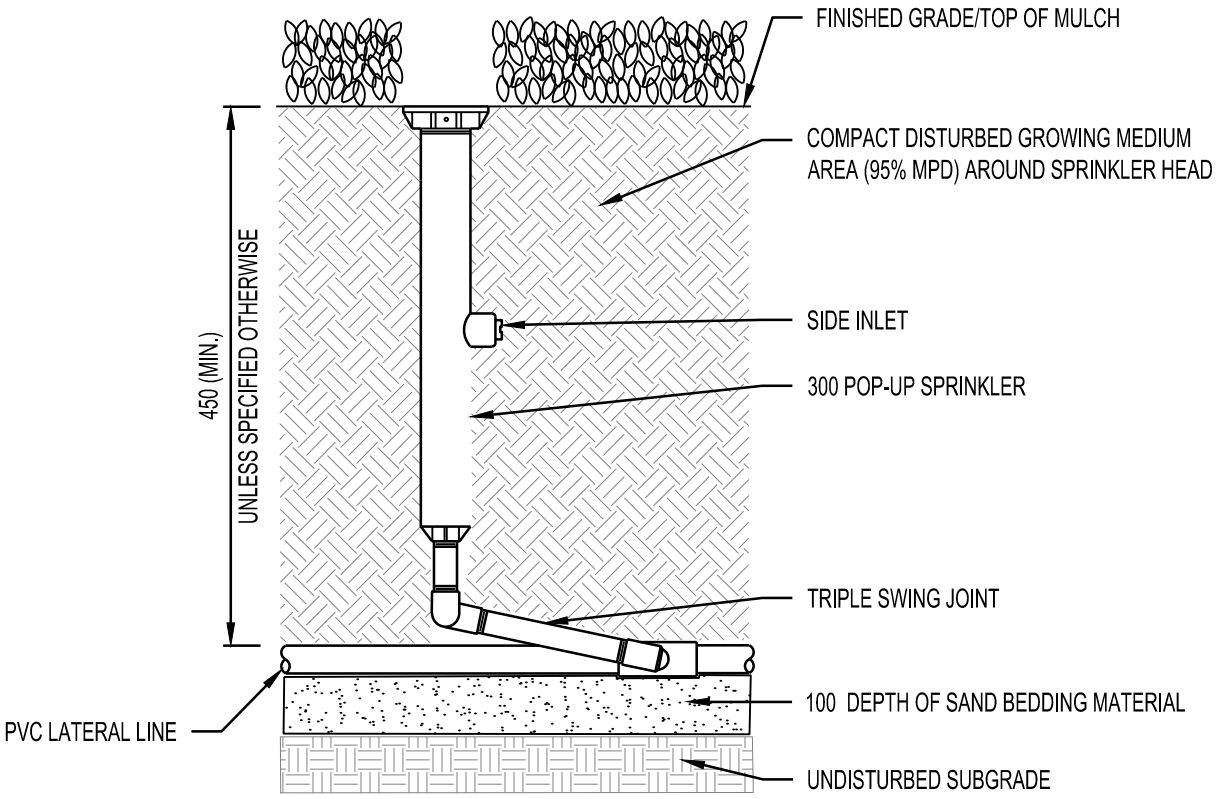
IR05 - ROTOR

SCALE N.T.S.

BINNIE

Your Challenges. Our Solutions. Build with Binnie.

TITLE : ROTOR	DATE : 2016-11-22
	DWG. No. : IR-05
	SCALE : AS SHOWN



NOTE:

1. SIDE INLET CONNECTION SHOULD NOT BE USED IN FREEZING CLIMATES.

IR06 - 300 (12") POP-UP SPRINKLER

SCALE N.T.S.

BINNIE

Your Challenges. Our Solutions. Build with Binnie.

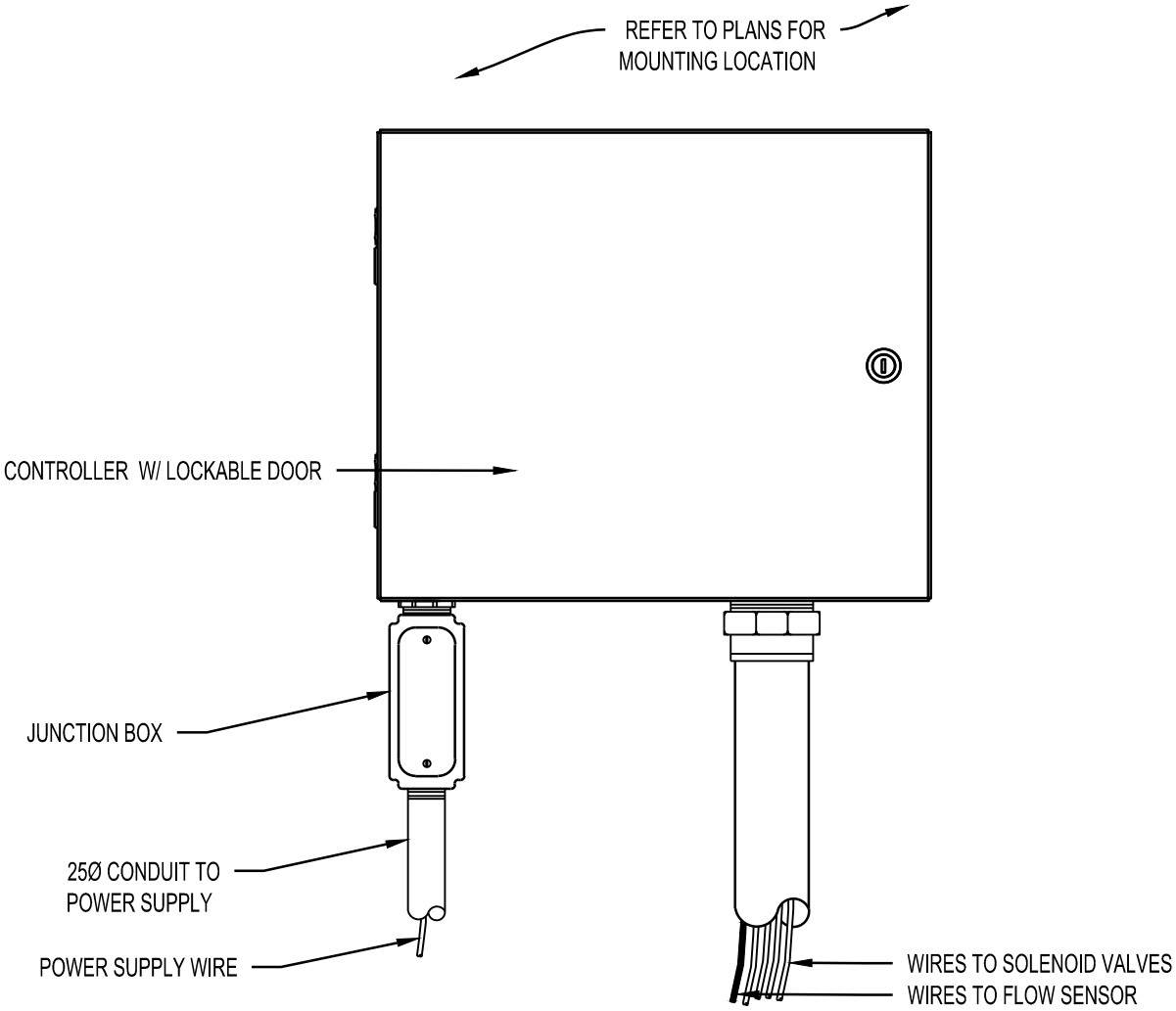
TITLE :

12INCH POP-UP SPRINKLER

DATE : 2016-11-22

DWG. No. : IR-06

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.

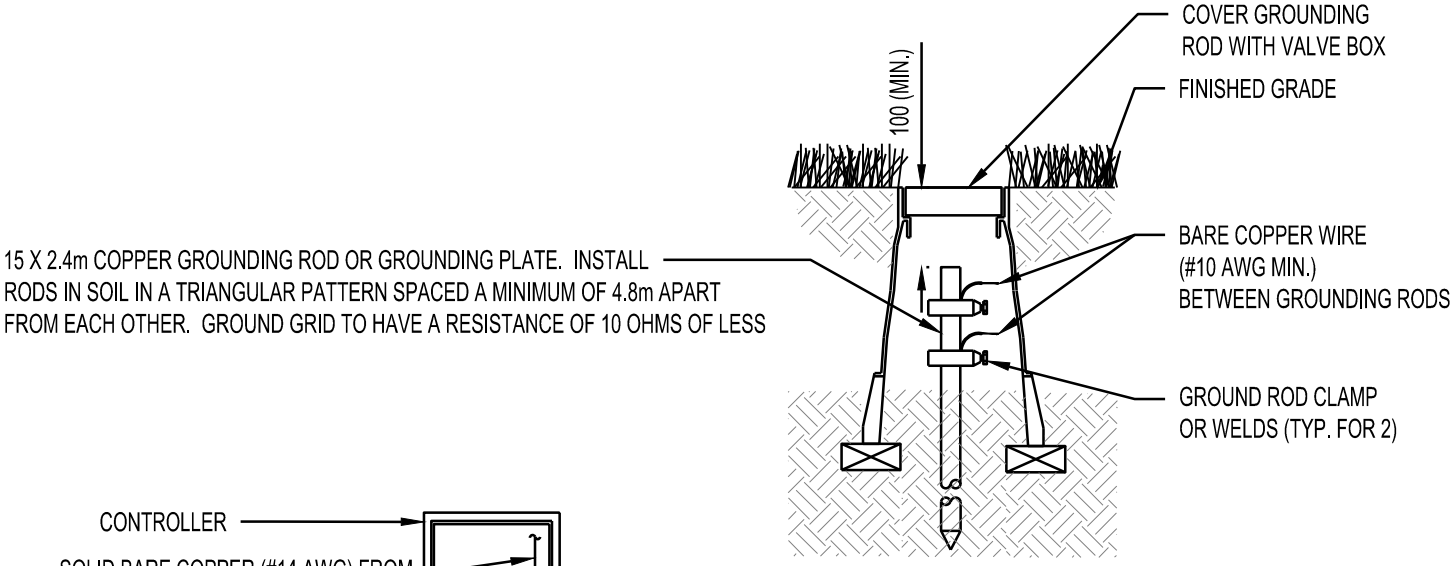
IR07 - COMMERCIAL CONTROLLER

SCALE N.T.S.

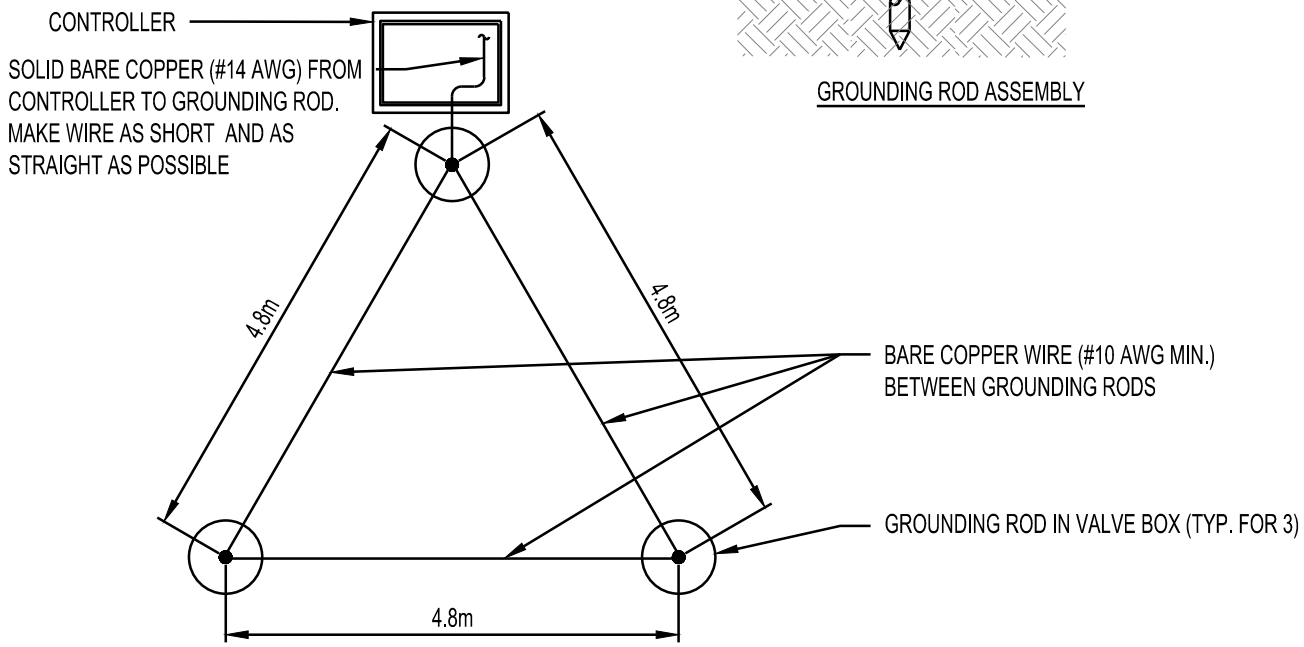
BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
COMMERCIAL CONTROLLER

DATE : 2016-11-22
DWG. No. : IR07
SCALE : AS SHOWN



GROUNDING ROD ASSEMBLY



GROUNDING ROD LAYOUT

NOTES:

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

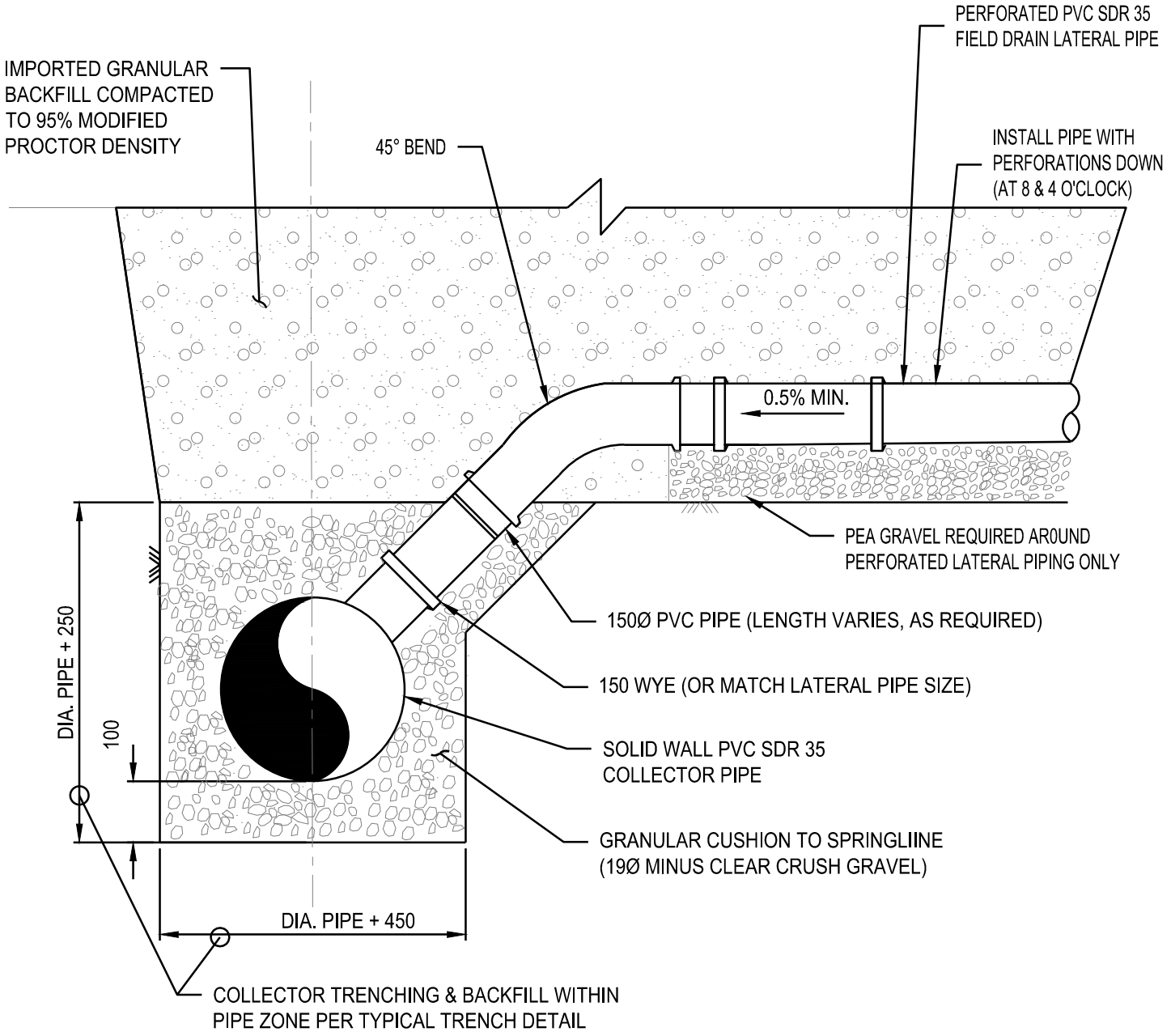
IR08 - CONTROLLER GROUNDING GRID

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
CONTROLLER GROUNDING GRID

DATE : 2016-11-22
DWG. No. : IR08
SCALE : AS SHOWN



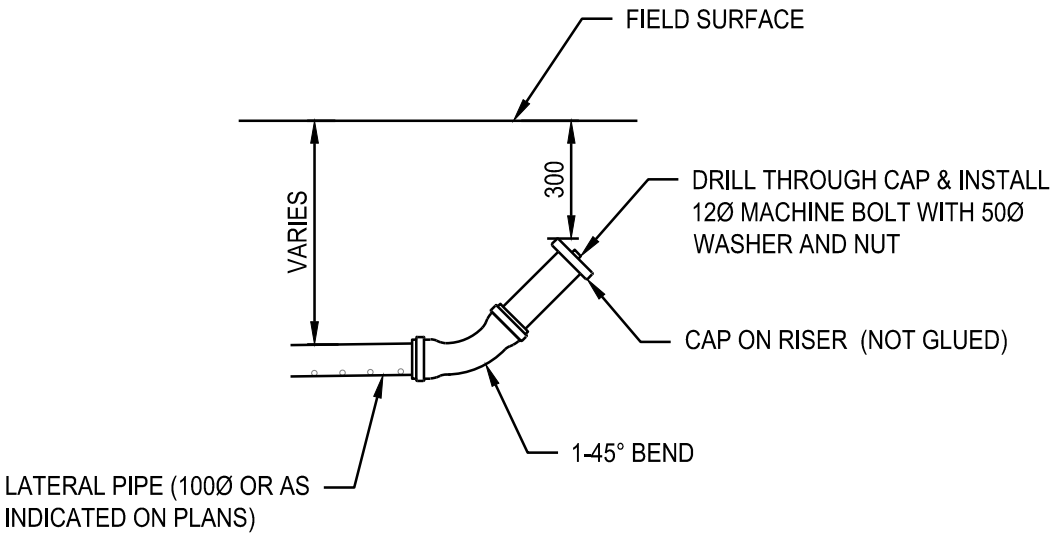
SD01- FIELD LATERAL COLLECTOR CONNECTION

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
FIELD LATERAL COLLECTOR CONNECTION

DATE : 2016-11-22
DWG. No. : SD01
SCALE : AS SHOWN



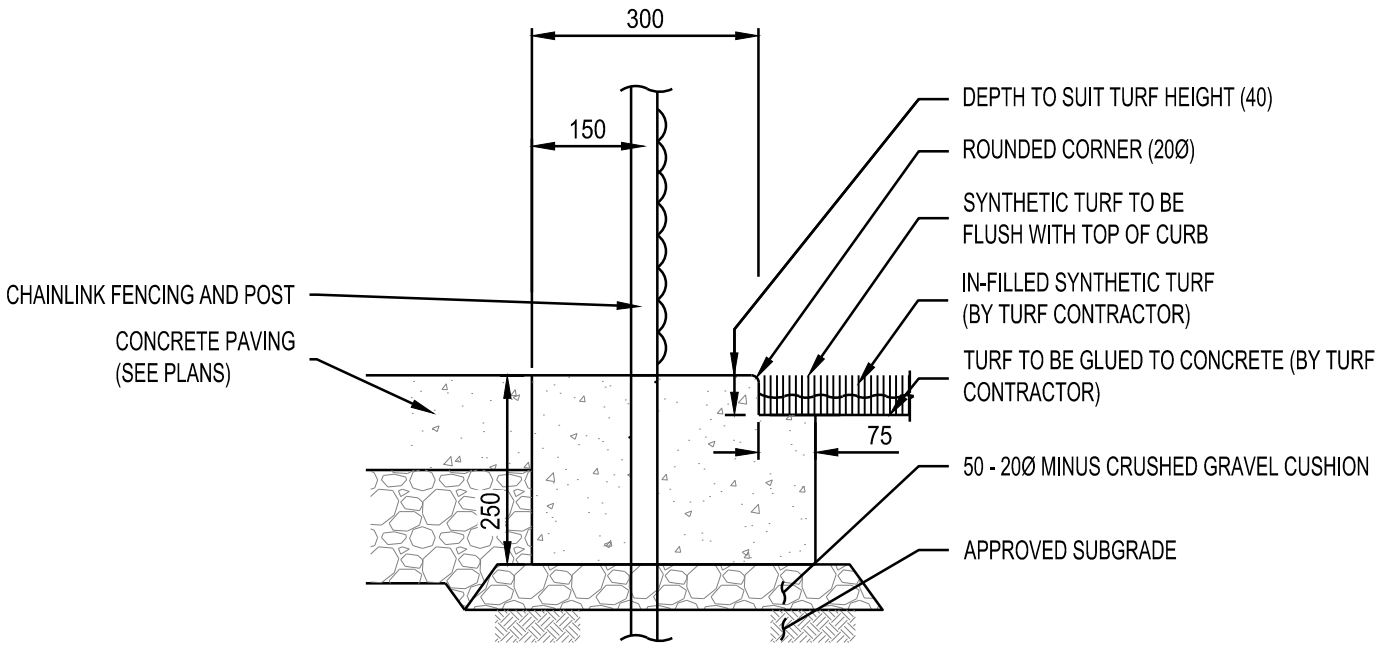
SD07- PERFORATED LATERAL END CLEANOUT

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
PERFORATED LATERAL END CLEANOUT

DATE : 2016-11-22
DWG. No. : SD07
SCALE : AS SHOWN



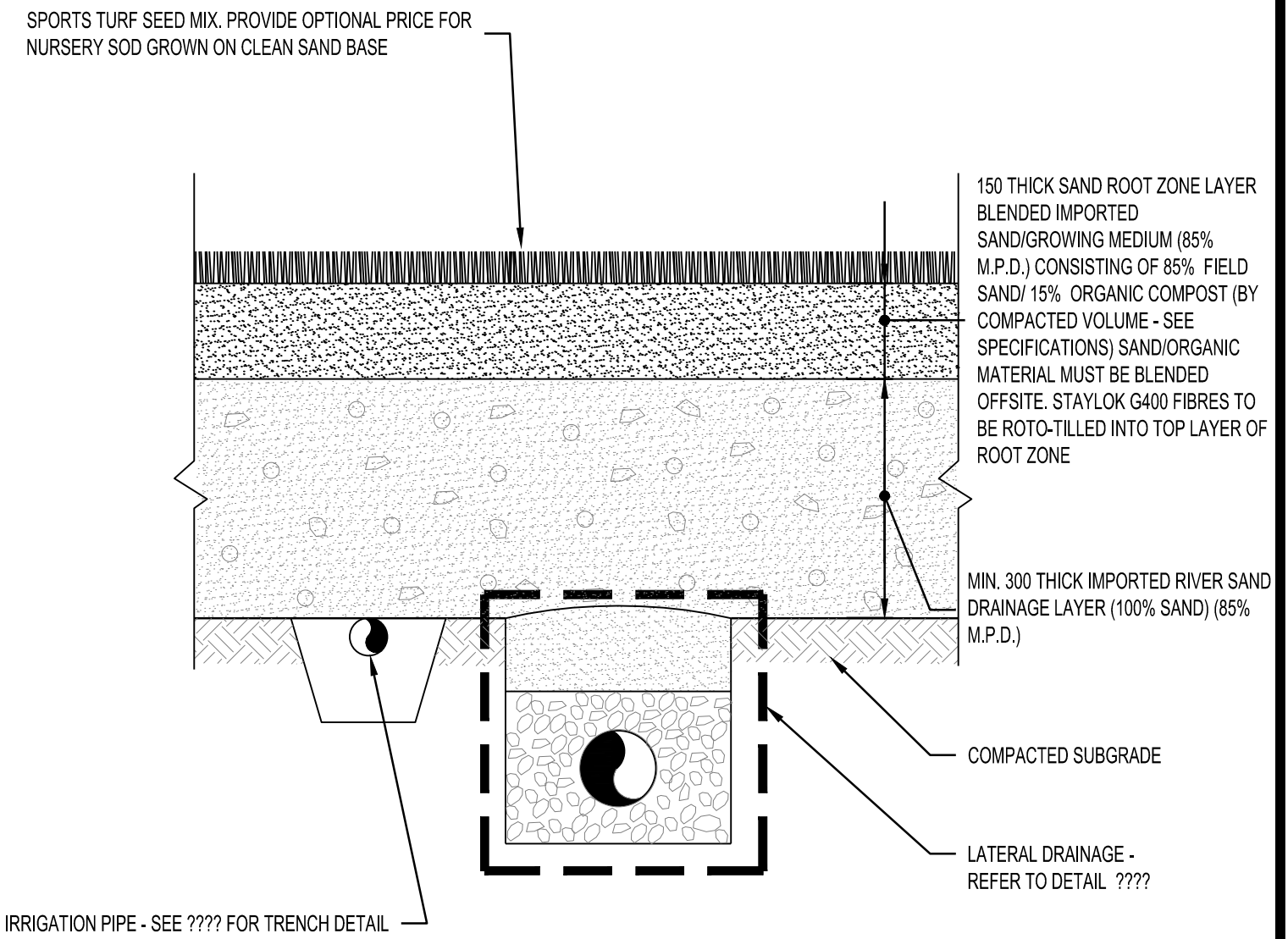
SF01-CONCRETE EDGE ANCHOR

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
CONCRETE EDGE ANCHOR

DATE : 2017-03-10
DWG. No. : SF01
SCALE : AS SHOWN



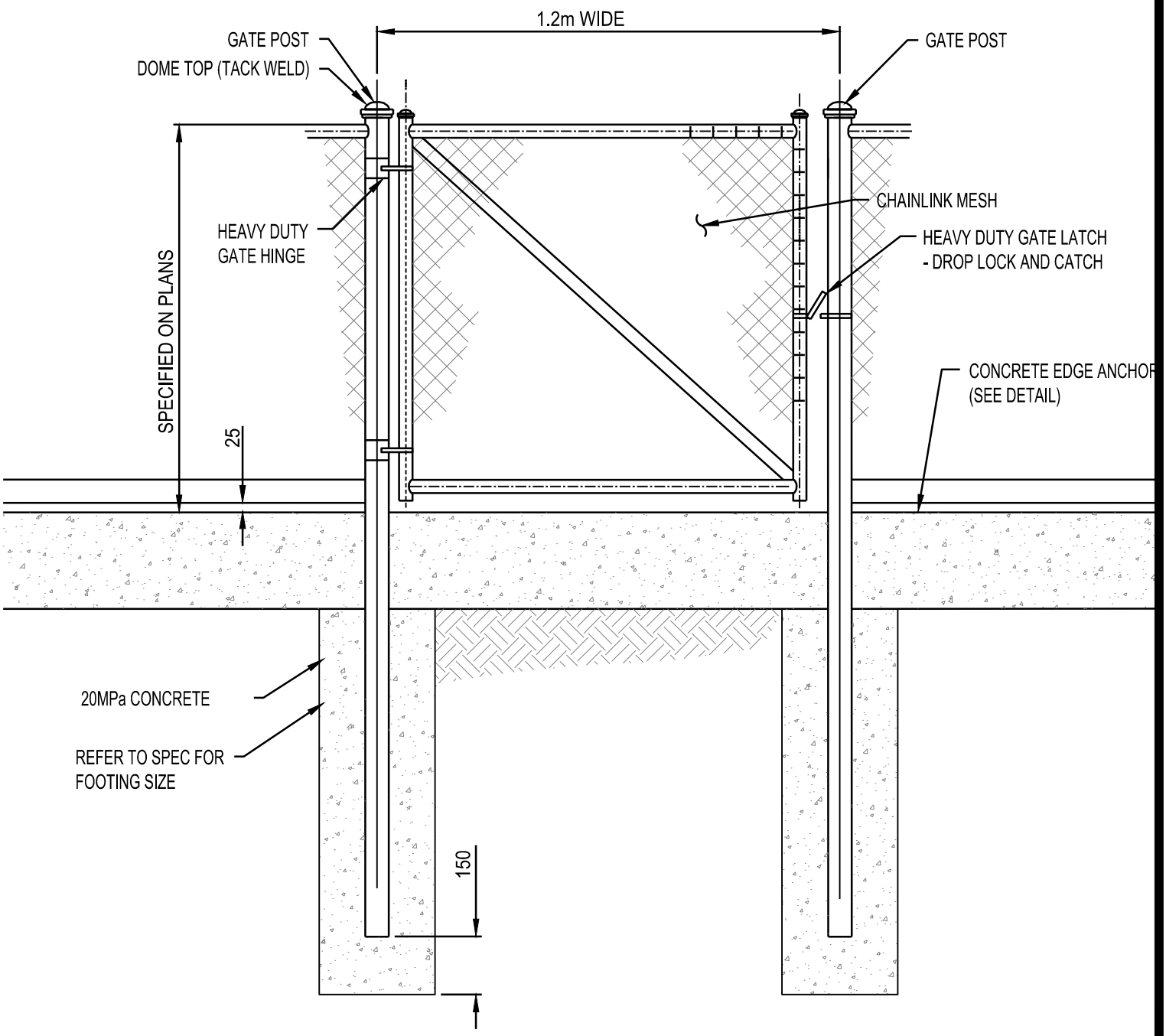
SF04- TYPICAL SECTION NATURAL GRASS FIELD

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
TYPICAL SECTION NATURAL GRASS FIELD

DATE : 2017-03-10
DWG. No. : SF04
SCALE : AS SHOWN



SF12 - PEDESTRIAN GATE

SCALE N.T.S.

BINNIE

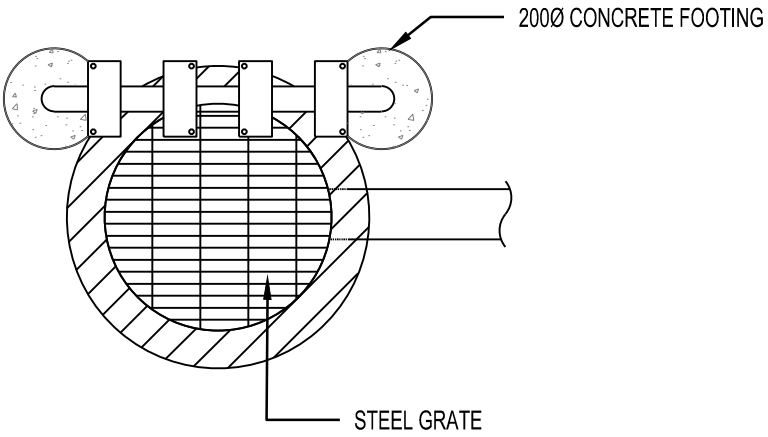
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
PEDESTRIAN GATE

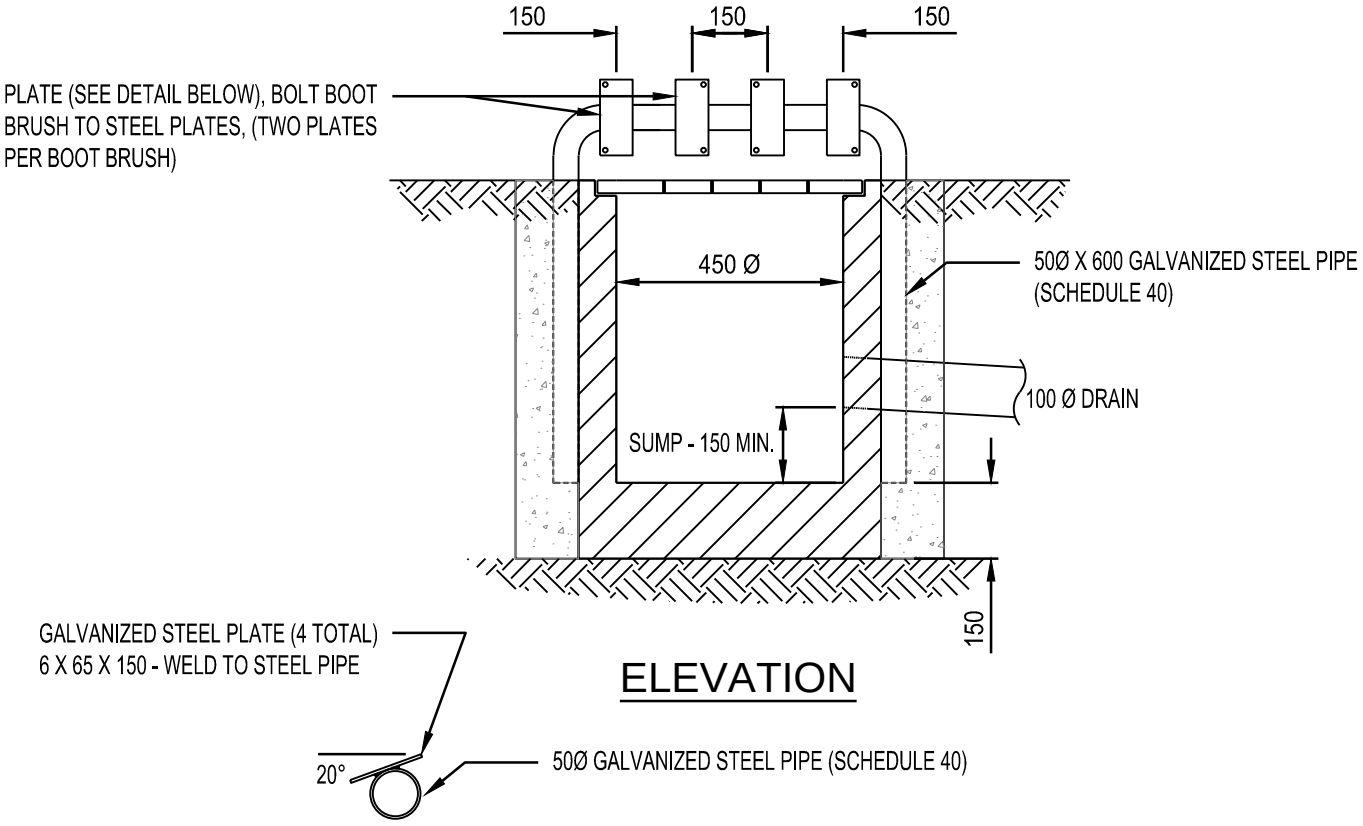
DATE : 2017-03-10

DWG. No. : SF12

SCALE : AS SHOWN



PLAN



ELEVATION

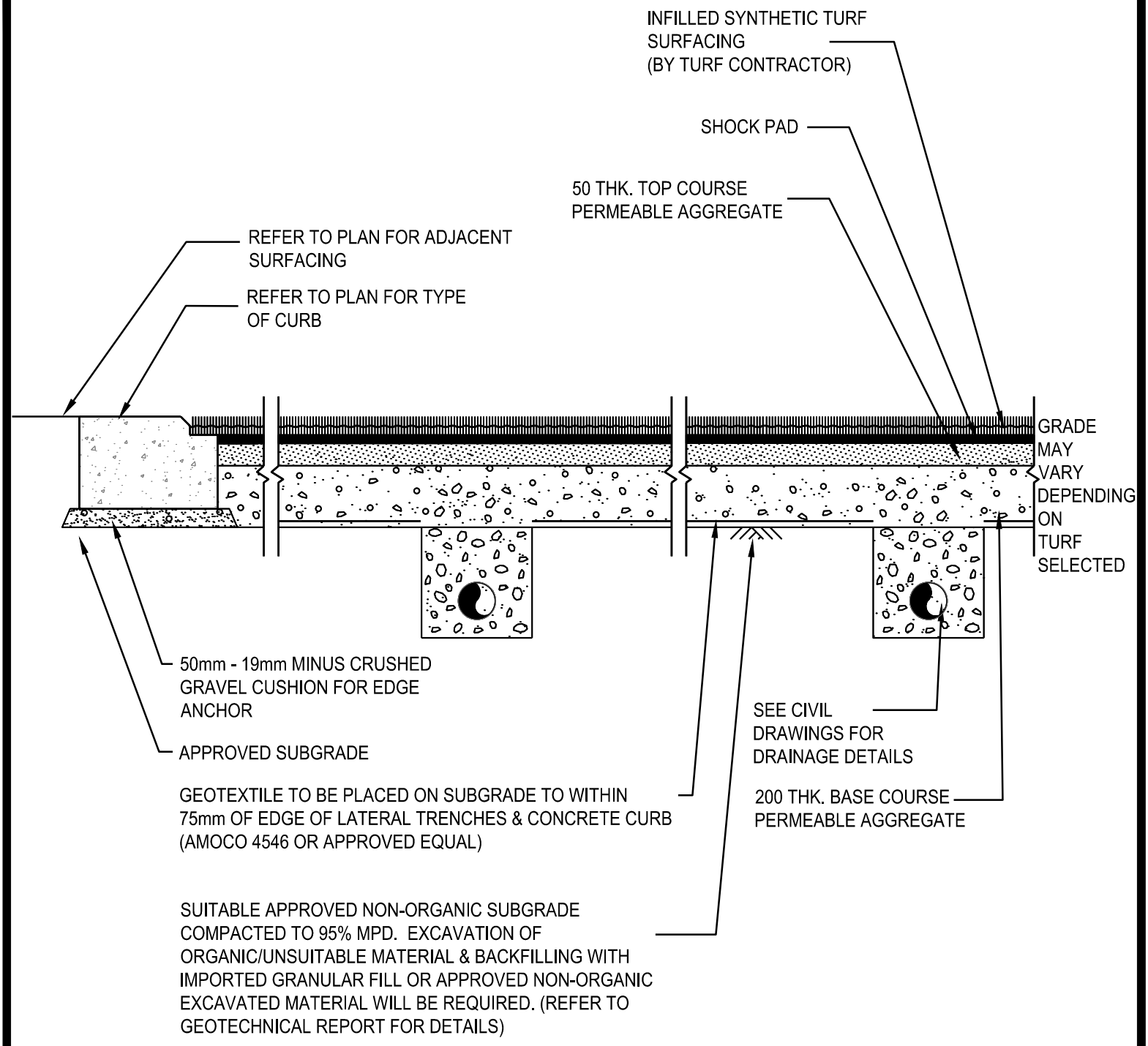
SF17- BOOT BRUSH STATION

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
BOOT BRUSH STATION

DATE : 2017-03-10
DWG. No. : SF17
SCALE : AS SHOWN



CS15 -TYPICAL SECTION - SYNTHETIC TURF FIELD WITH SHOCK PAD

SCALE N.T.S.

BINNIE
Your Challenges. Our Solutions. Build with Binnie.

TITLE :
TYPICAL SECTION SYNTHETIC TURF FIELD WITH SHOCK PAD

DATE : 2016-11-22
DWG. No. : CS15
SCALE : AS SHOWN

APPENDIX E - 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)

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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.

6.0 ALTERNATE REPORT FORMAT

When **exp** submits both electronic file and hard copies of reports, drawings and other documents and deliverables (**exp**'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 **exp** 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 **exp** shall be deemed to be the overall original for the Project.

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
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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.

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

ES/es

FIELD MEMO

65189

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

CLIENT: ~~Gem~~ 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.

"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

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA E. G. SYKES

March 8, 2016

Signature

NOTE: PRELIMINARY INFORMATION ONLY – SUBJECT TO CONFIRMATION

Distribution: White – Client Canary – Field Pink – File Golden Rod - Book

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.

This report was prepared for the exclusive use of **exp**'s client, 580049 BC Ltd., 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.

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

1. STANDARD OF CARE

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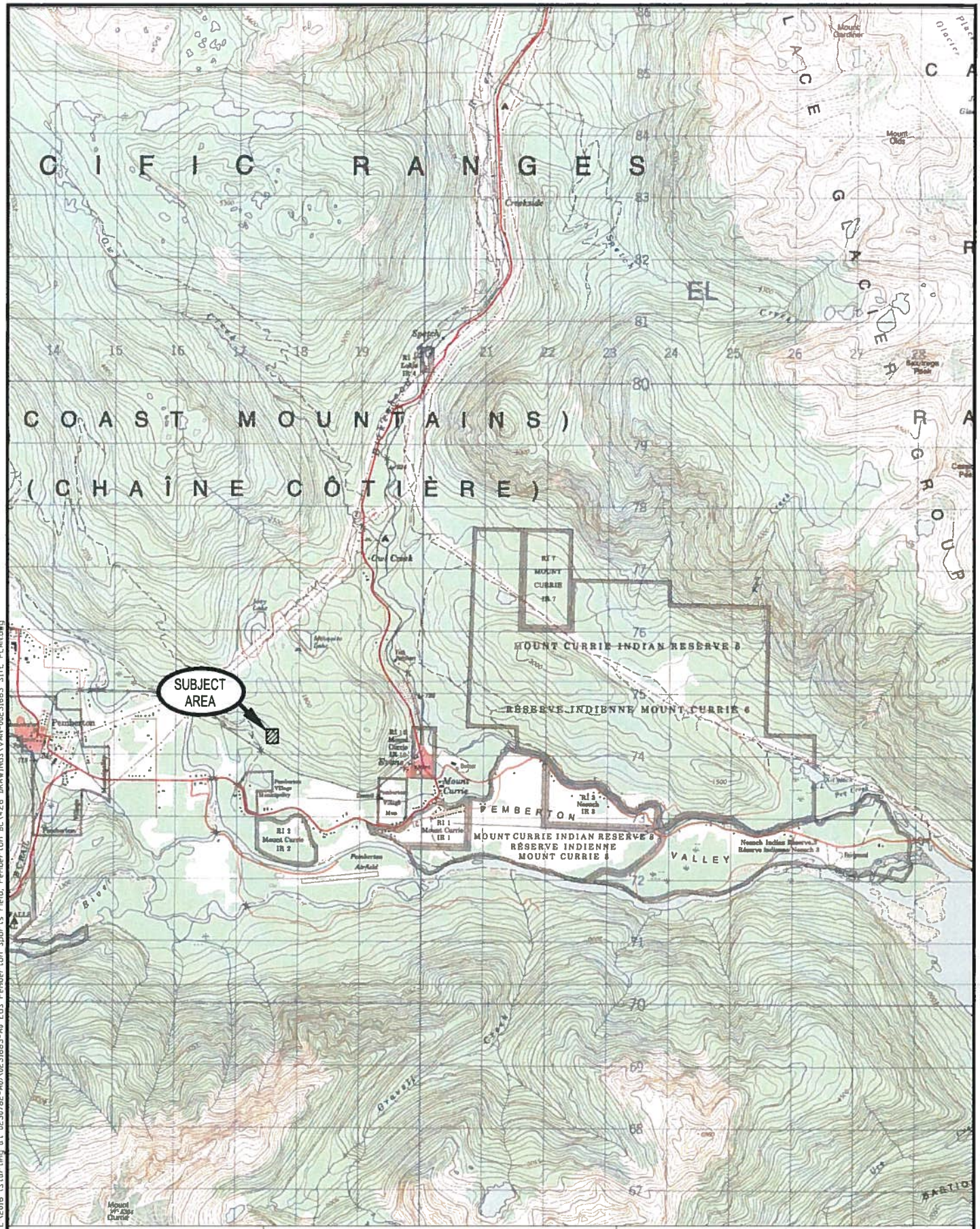
c. To avoid misunderstandings, **exp** Services Inc. (**exp**) should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by **exp**. 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.

6.0 ALTERNATE REPORT FORMAT

When **exp** submits both electronic file and hard copies of reports, drawings and other documents and deliverables (**exp**'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 **exp** 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 **exp** shall be deemed to be the overall original for the Project.

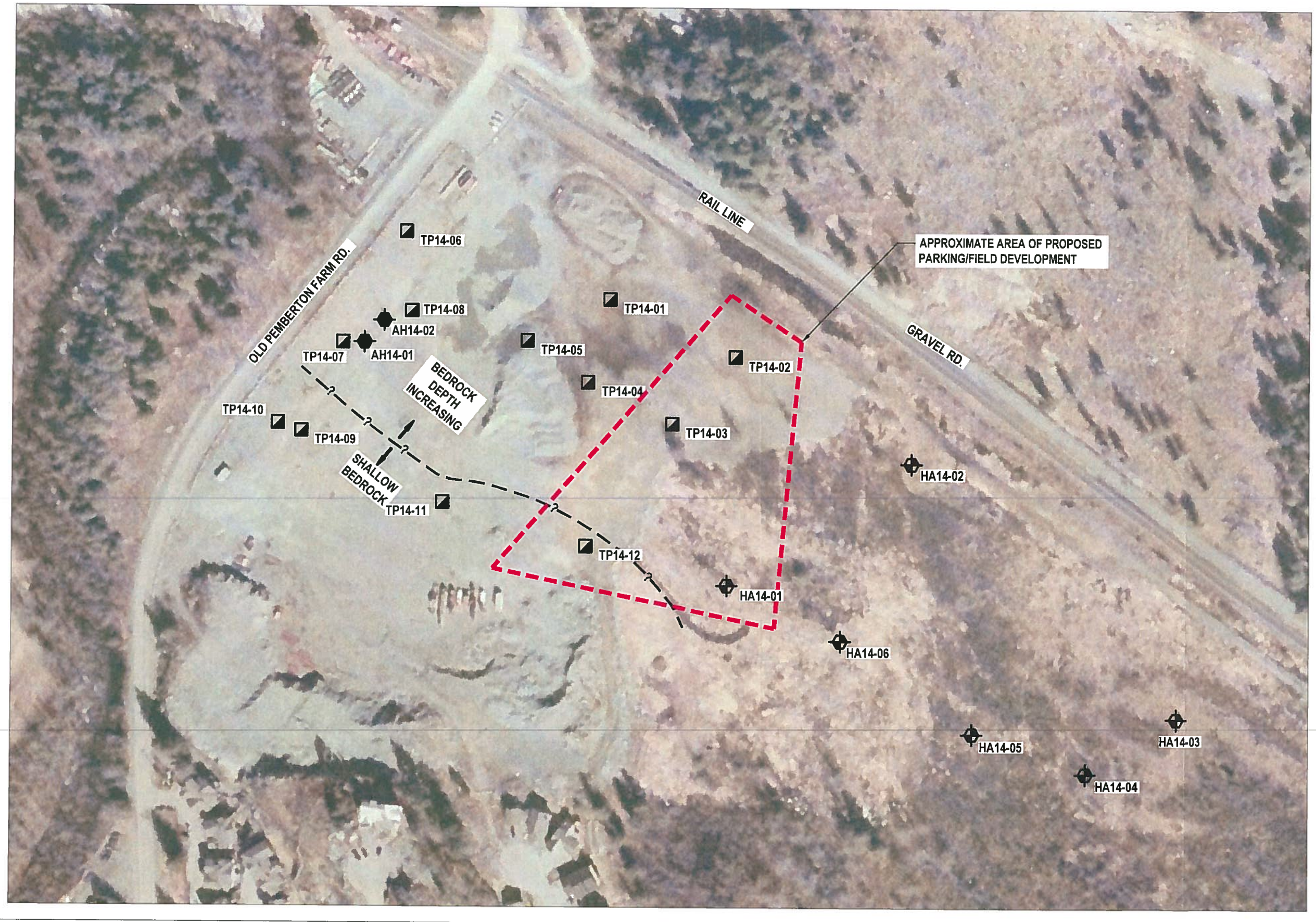
The Client agrees that both electronic file and hard copy versions of **exp**'s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except **exp**. The Client warrants that **exp**'s instruments of professional service will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



Tuesday, February 23, 2016 9:07:30 AM
L:\2016 (Starting at 0230782-A0\0231683-A0 EGS Pemberton Sports Field, Pemberton BC\426 DRAWINGS\VAN-00231683 SITE PLAN.dwg

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	



N

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)\00231683-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

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 (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 Services Inc.
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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
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				27.3

Bottom of test pit at 3.5m.

(Continued Next Page)

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Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

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

Figure TP14-02.2

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)
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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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
-

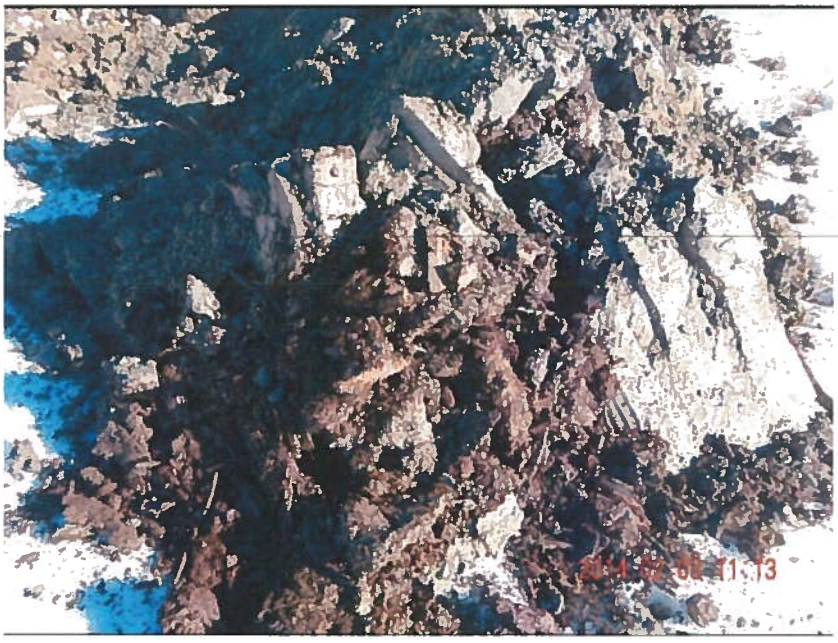


Figure TP14-03.2
-

exp 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

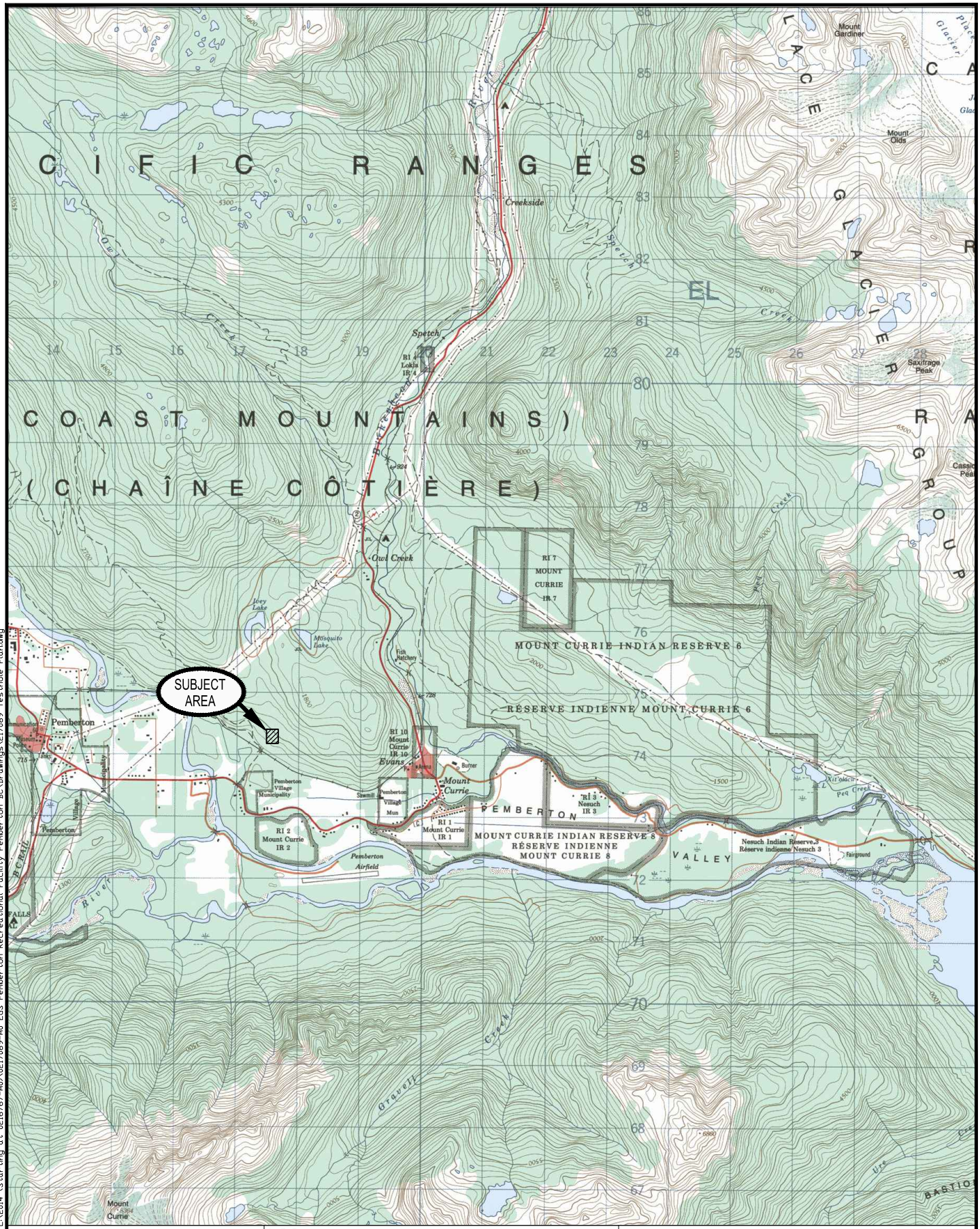
RECORD OF TEST PIT : TP14-12

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

PHOTOS

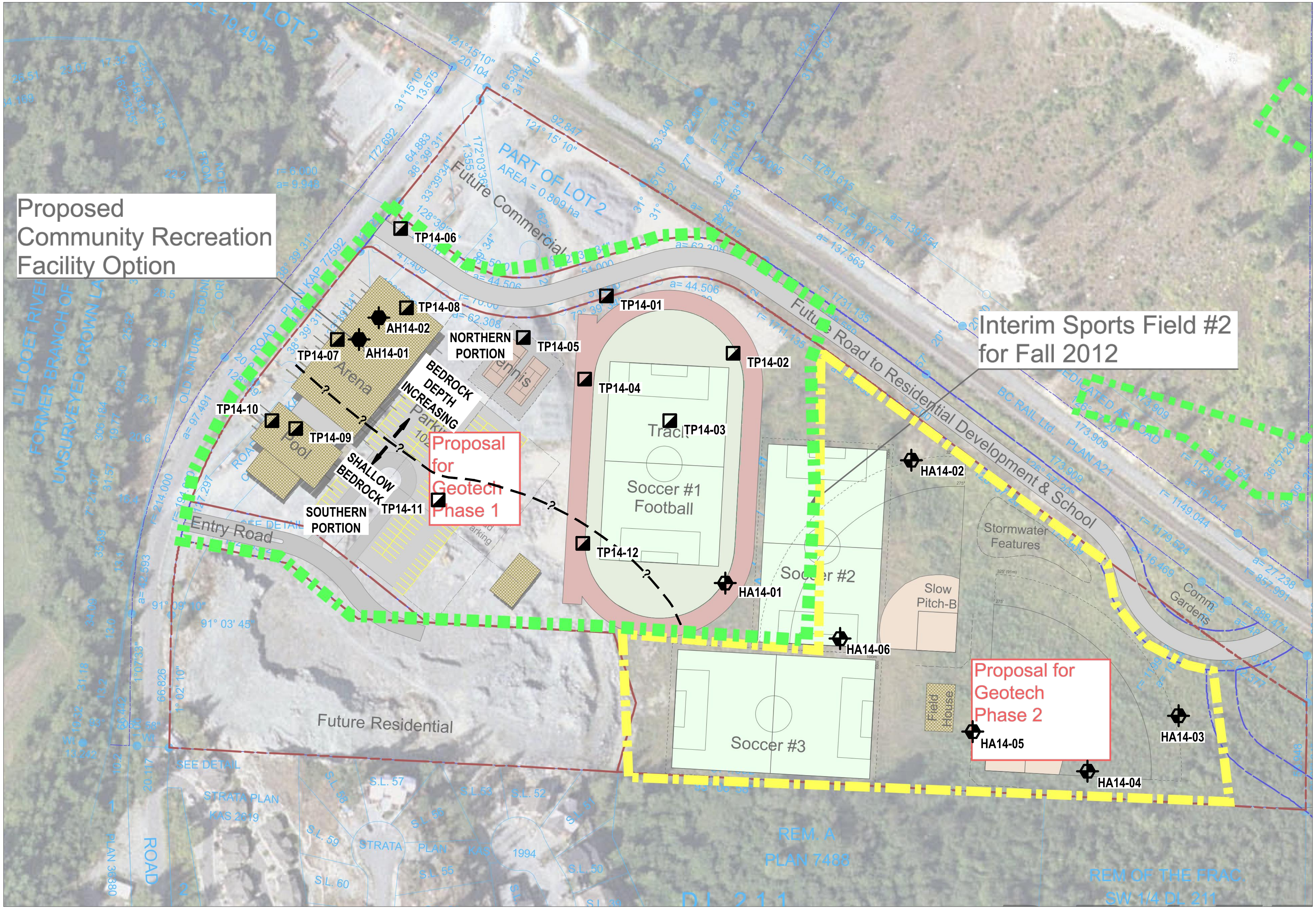
Figure TP14-12.1
-

Figure TP14-12.2
-



Wednesday, February 26, 2014 4:32:45 PM
L:\2014 CS\starting 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


Proposed
Community Recreation
Facility Option
Interim Sports Field #2
for Fall 2012
Proposal
for
Geotech
Phase 1
Proposal for
Geotech
Phase 2
PART OF LOT 2
AREA = 0.809 ha
Future Commercial
Future Road to Residential Development & School
Future Residential
Entry Road
NORTHERN
PORTION
SOUTHERN
PORTION
BEDROCK
DEPTH
INCREASING
SHALLOW
BEDROCK
Arena
Pool
Track
Soccer #1
Football
Soccer #2
Soccer #3
Slow
Pitch-B
Stormwater
Features
Field
House
Comm.
Gardens
TP14-01
TP14-02
TP14-03
TP14-04
TP14-05
TP14-06
TP14-07
TP14-08
TP14-09
TP14-10
TP14-11
TP14-12
AH14-01
AH14-02
HA14-01
HA14-02
HA14-03
HA14-04
HA14-05
HA14-06
LILLOOET RIVER
FORMER BRANCH OF
UNSURVEYED CROWN LAND
BC RAIL Ltd.
PLAN A21
REM. A
PLAN 7488
REM OF THE FRAC.
SW 1/4 DL 211
D.L. 211
STRATA PLAN
KAS 2819
SEE DETAIL
N

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.	MG	
DSGN.	DS	
CHK.	EGS	

REVISIONS

No.	DESCRIPTION	DATE

CLIENT: VILLAGE OF PEMBERTON

PROJECT: PEMBERTON RECREATIONAL FACILITY
OLD PEMBERTON FARM ROAD, PEMBERTON, B.C.

PROJECT NO.: VAN-00217089-A0

TITLE: TESTHOLE LOCATION PLAN

DATE	SCALE:	DWG NO.
2014-02-14	1:2000	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.

Sincerely,

exp Services Inc.

Evan Sykes, P.Eng.
Senior Engineer

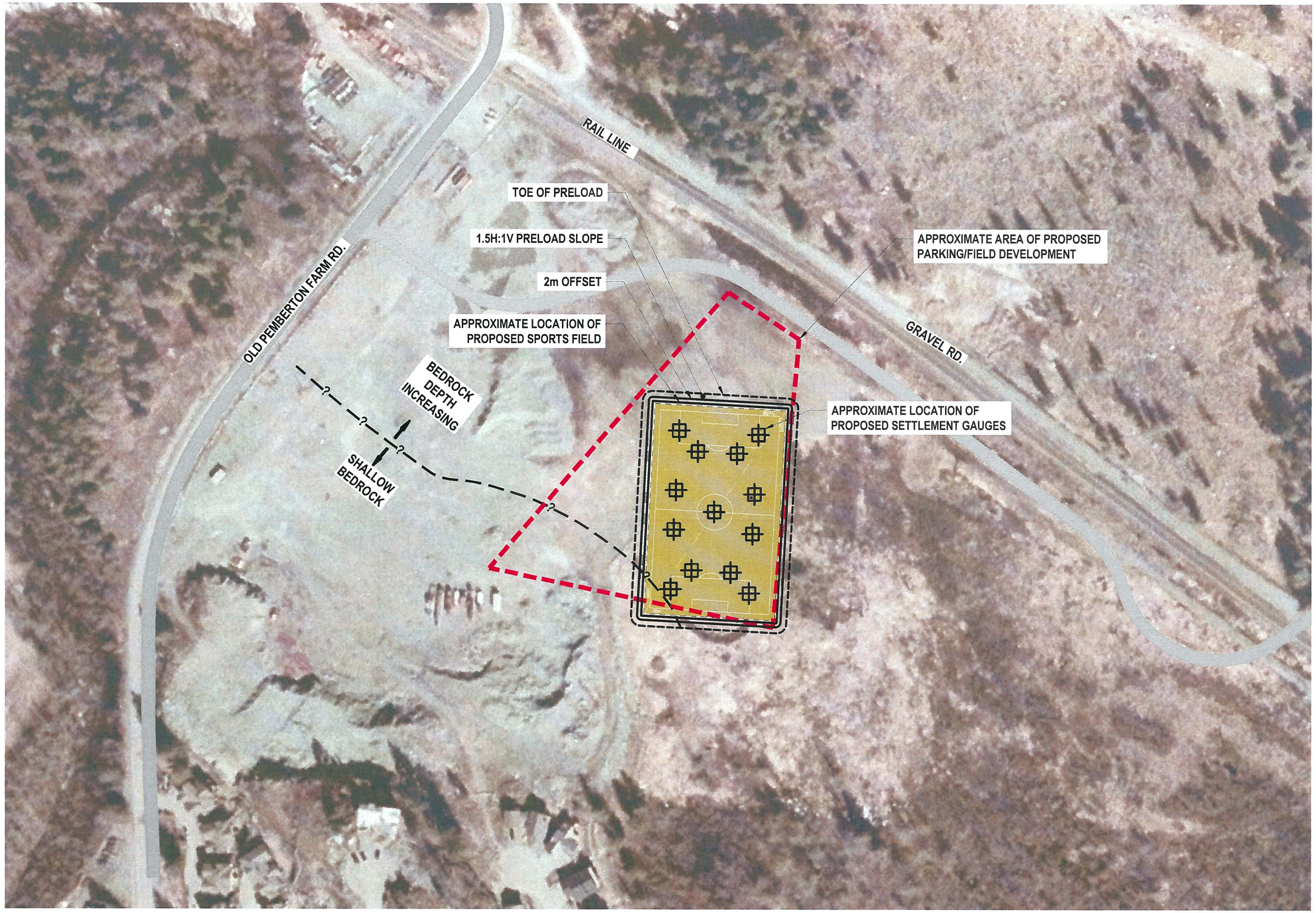
Reviewed by:

Matthew Yip, P.Eng.
Senior Engineer

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

ES/es

Exp ME 2016 07 28 Preload Recommendations



N

LEGEND

- TEST PIT
- AUGERHOLE
- HAND AUGER

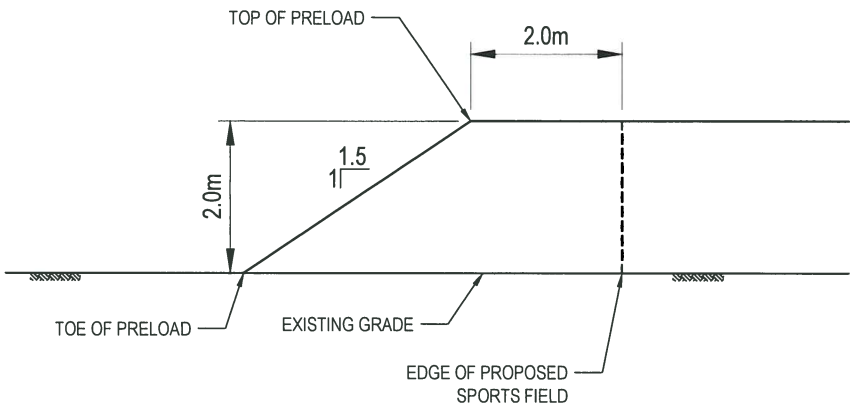
REFERENCE DRAWING FROM CROSLAND DOAK LANDSCAPE ARCHITECTURE + BUILDING DESIGN DATED 2012-04-24

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.	LOCATION PLAN PRELOAD AND SETTLEMENT GAUGES		
DSGN. DS				PROJECT 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 1

Jul 28, 2016 - 12:02pm L:\2016 (Starting at 0230782-A0)\0231683-A0 EGS Pemberton Sports Field, Pemberton BC\4.26 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

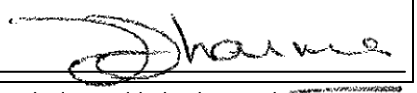
DENSITY NUMBER	LOCATION	LAB REFERENCE AND MATERIAL TYPE	MOISTURE		OVERSIZE MATERIAL	DRY DENSITY		COMPACTION %
			FIELD	OPTIMUM		FIELD	LAB	
1	NE CORNER	Proctor 1	4.0	8.5	27.0	1910	1990	96
2	SE CORNER	Proctor 1	3.9	8.5	27.0	1927	1990	97
3	SW CORNER	Proctor 1	3.8	8.5	27.0	1951	1990	98
4	SE CORNER	Proctor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

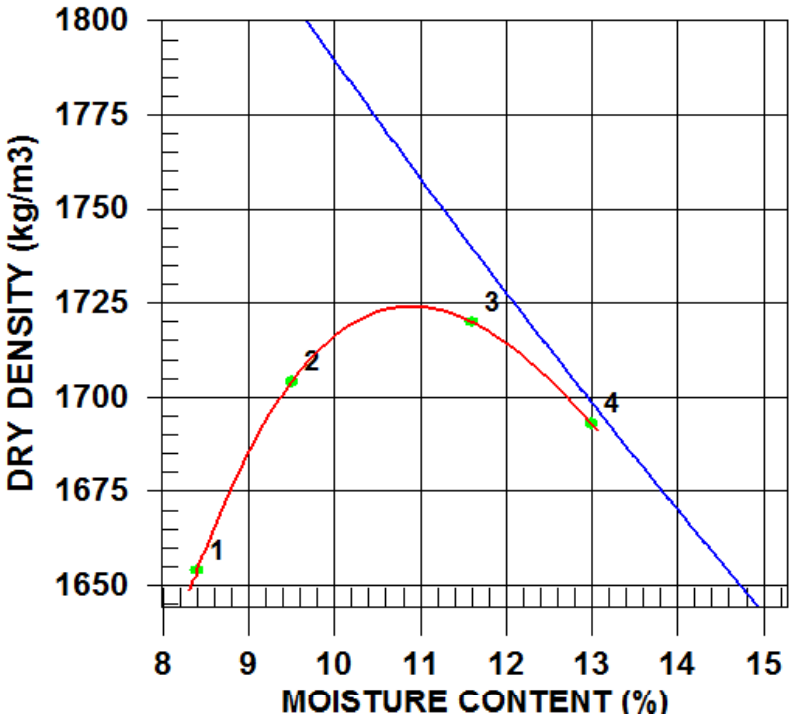
ATTN: MR. CAM McIVOR

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

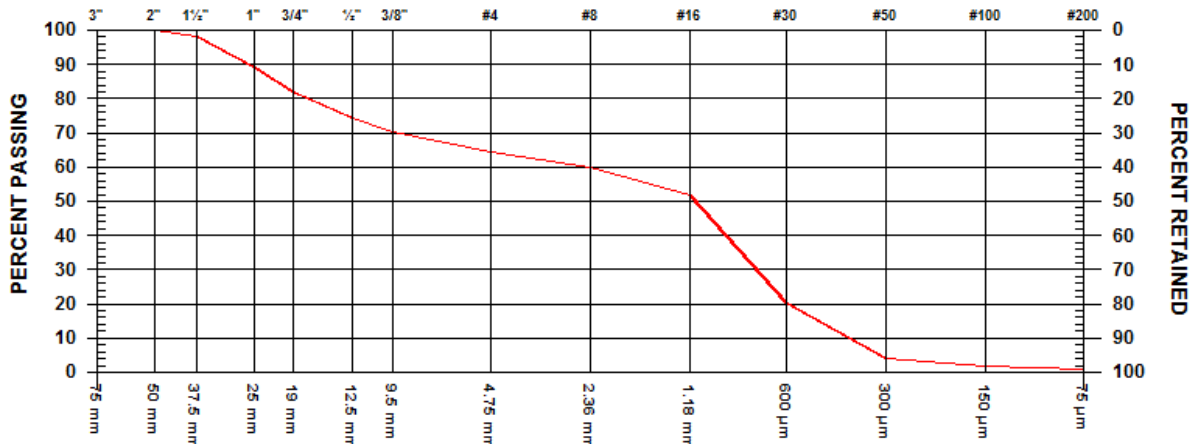
PROJECT PEMBERTON SPORTS FIELD
SOILS:OTHERS.
PEMBERTON FARM ROAD
PEMBERTON

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

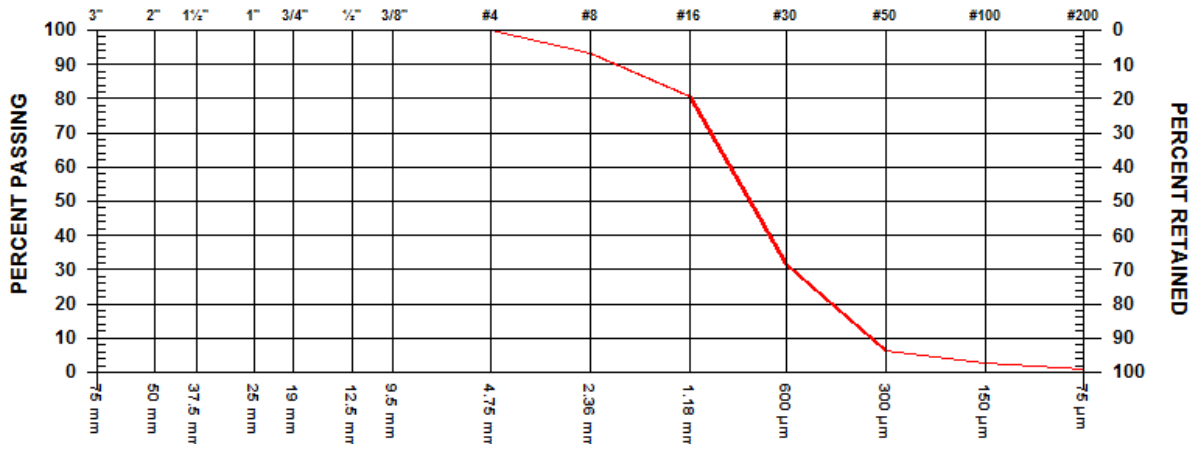
PROJECT PEMBERTON SPORTS FIELD
SOILS:OTHERS.
PEMBERTON FARM ROAD
PEMBERTON

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 LILLOOET

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	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL
		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
				S10	GB				43
5									

(Continued Next Page)

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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
6		SANDY SILT, trace peat, mottled brown and grey, wet, (firm)	5.5	S12	GB				42

Refusal at 6.4m.

NOTES: Refusal on bedrock

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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)

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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

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RECORD OF HAND AUGER : HA14-01

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 (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
1		SILT to ORGANIC SILT, some sand, some rootlets, some organics, brownish grey with rust inclusions, moist to wet, (soft to firm) slight plastic ▽							
		-becomes sandier with depth		S17	GB				54
2		ORGANIC SILTY PEAT, fibrous, brown, wet, (soft to firm)	1.4						
		PEAT, fibrous, blackish brown, wet, (soft to firm)	2.0	S18	GB				256

Refusal at 2.3m.

NOTES: Refusal on wood

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RECORD OF HAND AUGER : HA14-02

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 ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / 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.

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RECORD OF HAND AUGER : HA14-03

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.

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RECORD OF HAND AUGER : HA14-04

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)
		PEAT, fibrous, dark brown, wet, (soft to firm)							
1									
2									
		SILT, light brown, wet, (firm)	2.7						

Bottom of hole at 2.9m.

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RECORD OF HAND AUGER : HA14-05

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

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

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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	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL
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						20 40 60 80	20 40 60 80
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

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 PL MC LL
		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.

(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 ▲ / 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 & 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 NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
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							
1		SAND, trace silt, grey, wet, (compact) fine grained	0.6						
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
-

Figure TP14-04.2
-

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Telephone: 604.422.2152

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 NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
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 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		SILTY SAND, trace roots, grey, moist, (compact) fine grained	0.9	S9	GB				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 -grades to ORGANIC SILT, some sand by 2.6m	2.4						
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 NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
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						
2		ORGANIC SILT, some sand, layers of peat, grey with brown inclusions, (soft to very soft)	2.0	S12	GB				31
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.

(Continued Next Page)

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RECORD OF TEST PIT : TP14-07

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

PHOTOS

Figure TP14-07.1
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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 NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
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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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: 5171162
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 NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
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)

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RECORD OF TEST PIT : TP14-10

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

PHOTOS

Figure TP14-10.1
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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	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL
		BOULDERS, some sand, some gravel, light brownish grey, (loose to compact)						20 40 60 80	20 40 60 80
1		-abundant voids between boulders from surface to final depth; voids generally filled with sand and gravel.							

Refusal at 1.2m.

▽

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 : TP14-11

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

PHOTOS

Figure TP14-11.1
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Figure TP14-11.2
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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.

(Continued Next Page)

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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
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Figure TP14-12.2
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