Invitation to Tender No. 22-028
Jack Bagley Community Park Site Work & Sports Courts

Information for Tenderers

The Regional District of Nanaimo, hereinafter referred to as the "Regional District", invites Tenders for the Jack Bagley Community Park Site Work & Sports Courts.

SCOPE: Brief description of the project:

a) Demolition of existing site works
b) Installation of utilities, including water line to project site
c) Installation of landscape stairs, ramp, walls, and site furnishings
d) Installation of sports courts and other paved surfacing
e) Installation of planting (lawn and grasses)

The work is requested to be completed by September 2, 2022.

Tender documents may be downloaded directly from the Regional District of Nanaimo website at www.rdn.bc.ca or the BC Bid website at www.bcbid.gov.bc.ca

Tenders are to be submitted **via email** in PDF format with "22-028 Jack Bagley Park" as the subject line to Carolyn Kennedy at ckennedy@rdn.bc.ca bearing the name of the firm bidding on or before on or before **3:00:00 p.m. local time on the 31 day of March, 2022** (the "Tender Closing"). The Owner will not be responsible for any technological delays. It is the Tenderer's sole responsibility to ensure their Tender is received when, where and how it is specified in this document. Tenders received in any other manner will not be accepted.

Tenderers are responsible to visit the site on their own to familiarize themselves with the site conditions prior to submitting a tender.

All enquiries related to this Tender are to be directed in writing to, **Carolyn Kennedy, Parks Planner, Regional District of Nanaimo at** ckennedy@rdn.bc.ca

Tenders will not be opened in public. The Regional District will endeavor to post unverified bid results by 10:00 a.m. the business day following the Tender Closing.

Each Tender Form received from a Tenderer must be accompanied by a **verifiable digital E-Bid Bond** in the amount equal to TEN PERCENT (10%) of the TOTAL AMOUNT OF TENDER and a **verifiable digital Consent of Surety** as defined by the Surety Association of Canada. https://suretycanada.com/SAC/Surety-Bonds/E-Bonding.aspx

The successful Tenderer will be required to submit a 50% Labour & Materials Bond and a 50% Performance Bond.

Tenders must remain valid for sixty (60) days following the closing time and date.

The Owner reserves the right to reject any or all tenders, to accept the tender deemed most favourable in the interests of the Owner. The lowest or any tender may not necessarily be accepted.

This procurement is subject to Chapter 5 of the Canadian Free Trade Agreement. The Regional District's language in its procurement documents shall be English.

This project is contingent on required Building Permits and MOTI permits to be obtained by RDN. The MOTI permit is attached to this document.

Regional District of Nanaimo

Invitation to Tender No. 22-028

Jack Bagley Community Park Site Work & Sports Courts

Issue Date: March 4, 2022

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PART 1 INVITATION

1.1 INVITATION TO TENDER

The Regional District of Nanaimo (the "Regional District") invites tenders for the Jack Bagley Community Park Site Work & Sports Courts.

1.2 DESCRIPTION OF WORK

- Demolition of existing site works
- Installation of utilities, including water line to project site
- Installation of landscape stairs, ramp, walls, and site furnishings
- Installation of sports courts and other paved surfacing
- installation of planting (lawn and grasses)

1.3 TENDER SUBMISSION

1.3.1 Tenders will be submitted **via email** in PDF format with "22-028 Jack Bagley Park" as the subject line to Carolyn Kennedy at ckennedy@rdn.bc.ca bearing the name of the firm bidding on or before on or before **3:00 p.m. local time on the 31 day of March, 2022** (the "Tender Closing"). The Owner and the Consultant will not be responsible for any technological delays. It is the Tenderer's sole responsibility to ensure their Tender is received when, where and how it is specified in this document.

1.3.2 Electronically submitted Tenders will be deemed to be successfully received at the time as posted on the incoming email on the RDN's server.

1.3.3 Tenders received after the Tender Closing date and time will not be considered by the Regional District.

1.3.4 The submission of a Tender constitutes the agreement of the Tenderer to be solely responsible for all costs and expenses incurred by it in preparing and submitting its Tender, including any costs incurred by the Tenderer after the Tender Closing.

PART 2 TENDER DOCUMENTS

2.1 Documents may be viewed and obtained directly from the Regional District of Nanaimo website at www.rdn.bc.ca or the BC Bid website at www.bcbid.gov.bc.ca

PART 3 PRE-TENDER ENQUIRIES AND ADDENDA

3.1 Enquiries should be addressed to:

Carolyn Kennedy, Parks Planner, Regional District of Nanaimo
Email: ckennedy@rdn.bc.ca

Please Note: The Project Manager named above is the only valid contact for enquiries. No explanation, interpretation, or clarification of the Tender Documents by any other person whatsoever shall bind the Regional District in the interpretation of the Tender Documents.

3.2 Any requests for explanations, interpretations or clarifications made by Tenderers should be submitted in writing to the Regional District at least seven (7) calendar Days before Tender Closing to allow enough time for a response.

3.3 If the Regional District, in the Regional District's sole discretion, determines that a clarification, addition, deletion or revision of the Tender Documents is required then the Regional District will issue a written addendum. Notice of the issuance of a written addendum, and the issued written addendum, will be posted on the Regional District of Nanaimo website www.rdn.bc.ca and the BC Bid website www.bcbid.gov.bc.ca. It is the sole responsibility of all prospective Tenderers to check for any addenda prior to submitting their Tender.

3.4 All Addenda issued by the Regional District shall be incorporated into and become part of the Tender Documents.

3.5 If a Tenderer finds any errors, omissions, or discrepancies in the Tender Documents, it shall immediately notify the Regional District in writing.

3.6 No oral explanation, interpretation, or clarification of the Tender Documents by any person whatsoever shall bind the Regional District in the interpretation of the Tender Documents.

PART 4 INSPECTION OF SITE

4.1 It is the responsibility of the Tenderer to examine the Work Site before submitting a Tender. It is the Tenderer's responsibility to be familiar with and allow for all site conditions which might affect the Work and the Tender. The Regional District will not grant, and the Tenderer will not be entitled to any additional payments or extensions of time due to site conditions which were or would have been reasonably foreseeable upon a proper inspection of the Work Site by the Tenderer.

4.2 The submission of a Tender by the Tenderer shall be deemed to be an acknowledgement that the Tenderer has relied and is relying on its own examination of the Work Site, and all other matters related to the completion of Work.

4.3 The Tenderer shall comply with all applicable regulations of the Workers' Compensation Board of British Columbia while attending the Work Site.

PART 5 COMPLETION OF TENDER DOCUMENTS

5.1 The Tenderer should complete the Tender Form in ink or in type.

5.2 All prices are to be in Canadian currency. Prices shall include all necessary costs including but not limited to supply, fabrication and finishing, conveyance and delivery to the Work Site, packing, crating, freight, cartage, shipping charges, unloading, installation, overhead, profit and all tariffs, duties, and taxes (excluding GST) unless otherwise indicated, including British Columbia Provincial Sales Tax. The applicable Federal Goods and Services Tax shall be shown as a separate item in the Tender Price.

PART 6 BID SECURITY

6.1 The Tenderer shall submit, with its Tender, a deposit in the form of **a verifiable digital bid bond** (the "Bid Bond") in favour of the Regional District of Nanaimo signed and sealed by the Tenderer and the Tenderer's Surety. The form of Bid Bond shall be in the form acceptable to the Regional District. The Bid Bond shall equal ten percent (10%) of the Tender Price. A **verifiable digital Consent of Surety** shall also be submitted with the Tender. https://suretycanada.com/SAC/Surety-Bonds/E-Bonding.aspx

6.2 The Regional District will retain the Bid Bond of the successful Tenderer until:

(1) the successful Tenderer has executed the Agreement;

(2) the successful Tenderer has provided all bonding and documentation in accordance with Section 00100, Clauses 15.2 and 15.3.

6.3 All bonds and documentation required by Section 00100, Part 6 shall be issued by a company licensed to transact business in the Province of British Columbia. **All required bonds and documentation should be verifiable and in a digital format as defined by the Surety Association of Canada. https://suretycanada.com/SAC/Surety-Bonds/E-Bonding.aspx. Scanned photocopies and facsimiles, including those under seal, may result in the rejection of the Tender.**

PART 7 BID RIGGING

7.1 The Tenderer's attention is directed to the Competition Act which provides that bid-rigging as defined in the Act is an indictable offence punishable upon conviction by a fine or imprisonment or both.

7.2 The Tenderer shall not engage in collusion of any sort and shall ensure that no person or other legal entity, other than the bidder has an interest in the bidder's tender and prepare the tender without any knowledge of, comparison of figures with, or arrangement with any other person or firm preparing a Tender for the same work.

PART 8 SOLICITATION

8.1 The Tenderer may not make any representations or solicitations to any director, officer, or employee of the Regional District with respect to the Tender either before or after submission of the Tender except as provided herein. If any director, officer, employee, agent sub-contractor, supplier or other representative of the Tenderer communicates with any director, officer or employee of the Regional District or any consultant engaged by the Regional District in connection with this Invitation to Tender about this Invitation to Tender, other than the person named under Part 3 – Pre-Tender Enquiries and Addenda, the Regional District shall have the unfettered right, regardless of the nature of the communication, to reject the Tender submitted by the Tenderer.

PART 9 CONDITIONS OF TENDER

9.1 Tenders which contain qualifying conditions or otherwise fail to conform to the requirements of the Tender Documents may be disqualified or rejected. The Regional District may, however, in its sole discretion, reject or retain for its consideration Tenders which are non-conforming because they do not contain the content or form required by the Tender Documents or for failure to comply with the process for submission set out in this Section 00100.

PART 10 SUBMISSION OF TENDER

10.1 Tenders should be submitted **via email** in PDF format with "22-028 Jack Bagley Park" as the subject line to Carolyn Kennedy at ckennedy@rdn.bc.ca bearing the name of the firm bidding on or before on or before **3:00 p.m. local time on the 31 day of March, 2022** (the "Tender Closing").

10.2 All Tenders shall be signed by authorized officers in the case of the Corporate Firm and in the case of an individual partnership or non-incorporated organization, shall be signed and witnessed.

10.3 It is solely the responsibility of the Tenderer to ensure that it has obtained, prior to the Tender Closing, all Addenda issued by the Regional District.

10.4 The Regional District may not accept an amendment to a previously submitted Tender unless:

(1) it is in writing;

(2) it is electronically received via email prior to the Tender Closing with the email entitled: "22-028 Jack Bagley Park—Tenderer's Name".

(3) it indicates a change to a Tender already submitted; and

(4) it is signed by the person or persons who signed the original Tender.

10.5 Tenderers shall be solely responsible for the completion and delivery of Tenders and any amendments in the manner and time specified by Section 00100, Part 10. No extension of the Tender Closing will be given to accommodate Tenderers or amendments to Tenders that do not comply with the requirements of Section 00100, Part 10.

PART 11 VARIATION TO TENDER DOCUMENT

11.1 If the Tenderer wishes to propose any variations to the specifications and/or terms and conditions, it should submit the proposed variations to the contact person for enquiries as identified in Section 00100, Clause 3.1 at least seven (7) calendar Days before the Tender Closing, otherwise the variations may not be considered by the Regional District. The acceptability of any such variations will be at the Regional District's sole and unfettered discretion.

11.2 Requested variations should be submitted in sufficient detail to facilitate evaluation by the Regional District.

11.3 Approved variations will be incorporated in the specifications and/or terms and conditions by the issuance of Addenda posted on the RDN website and BC Bid website.

11.4 Unless otherwise expressly stated in the Tender, the Tenderer agrees to accept without reservation or amendment, the whole of the specifications and Tender Documents.

11.5 Variations to the specifications not submitted in accordance with 11.1 above will only be considered if they are: (a) submitted by the otherwise wholly compliant and lowest bidder; (b) in sufficient detail and in the same format as the original specification, including cost implications, to facilitate evaluation by the Regional District; and (c) acceptable to the Regional District. Variations to the specifications not submitted in accordance with 11.1 and not in accordance with (a), (b) and (c) above will not be considered.

11.6 If the Regional District stipulates a completion date herein, and the Tenderer is unable to commit to this date, the Tenderer may submit a Tender stating the Tenderer's best possible completion date (Section 00200 Schedule 3 - Tenderer's Proposed Construction Schedule). The acceptability of such completion date will be at the Regional District's sole and unfettered discretion and may be justification for rejecting the Tender.

PART 12 IRREVOCABILITY OF OFFER

12.1 The Tender submitted by the Tenderer shall be irrevocable and remain open for acceptance by the Regional District for a period of 60 Days from the Tender Closing, whether another Tender has been accepted or not. If at any time after 60 Days from the

Tender Closing, the Tenderer has not revoked its Tender in writing, the Regional District may accept the Tender.

12.2 If a Tenderer, for any reason whatsoever, purports to revoke its Tender within 60 Days from the Tender Closing, or if for any reason whatsoever a successful Tenderer does not execute and deliver the Agreement in accordance with Section 00100, Clause 15.1, the Regional District, without limiting any other remedy it may have under the Tender Documents or otherwise, shall be entitled to:

(1) exercise its rights under any Bid Bond and retain the amount payable to the Regional District under the Bid Bond as liquidated damages; or

(2) require the Tenderer to pay to the Regional District an amount equal to the difference between the Tender price of its Tender and any other Tender which is accepted by the Regional District, if such other Tender is for a greater price, plus the total of all costs, expenses, and damages, including legal fees on a solicitor and own client basis, incurred by the Regional District because of or related to such revocation or failure by the Tenderer.

PART 13 TENDER OPENING

13.1 **Tenders will not be opened in public.** The Regional District of Nanaimo will endeavour to make available the unevaluated results of the Tender to Bidders by 10:00 a.m. the business day following the Tender Closing. The Regional District of Nanaimo wishes to thank all Tenderers for their effort in responding to this bidding opportunity.

PART 14 ACCEPTANCE AND REJECTION OF TENDERS

14.1 Notwithstanding any other provision in the Tender Documents, any practice or custom in the construction industry, or the procedures and guidelines recommended for use on publicly funded construction projects, the Regional District, in its sole discretion, shall have the unfettered right to:

(1) accept any Tender;

(2) reject any Tender;

(3) reject all Tenders;

(4) accept a Tender which is not the lowest Tender;

(5) reject a Tender even if it is the only Tender received by the Regional District;

(6) accept all or any part of a Tender; and

(7) award all or a portion of the Work to any Tenderer.

14.2 If a Tender contains a defect or fails in some way to comply with the requirements of the Tender Documents, which in the sole and unfettered discretion of the Regional

District is not material, the Regional District may waive the defect and accept the Tender.

14.3 Awards shall be made on Tenders that will, in the opinion of the Regional District, give the greatest value based on quality, service and price. In determining what constitutes greatest value, the Regional District may consider its previous experience with the Tenderer. Without limiting the generality of the foregoing, the Regional District may consider: the quality of work; the timeliness of completion; the number, scope, and reasonableness of requested change orders; public impact; compliance with applicable health, safety, labour, and environmental laws; environmental and social practices; and the number and reasonableness of any claims. The Regional District's previous experience with the Tenderer regarding its competence and cooperation may also be taken into consideration in determining greatest value. The Regional District reserves the right to rely upon its records, references, and recollections in this regard. The Regional District may also obtain references other than those provided by the Tenderer and may use these references in determining greatest value.

14.4 The Regional District, in its sole discretion, reserves the right to reject the Tender in the event the Regional District determines, acting reasonably on the information available to it, that the Tenderer is in material non-compliance with, or has been convicted of a material offence or violation of, health, safety, labour or environmental laws. The Regional District's judgment in this regard will be final.

14.5 The Regional District will notify the successful Tenderer in writing that its Tender has been accepted (the "Notice of Intent to Award").

14.6 No information about an award of a contract will be given out between the time of opening and the time an award has been made.

PART 15 SUCCESSFUL TENDERER REQUIREMENTS:

15.1 The successful Tenderer should execute and deliver the Agreement to the Regional District within ten (10) business days after it has received the Agreement from the Regional District such time limit being extended only with the written approval of the Owner.

15.2 The successful Tenderer should submit to the Regional District of Nanaimo the following original documentation (facsimile or photocopy copies not acceptable) within seven (7) business days of the notification of the successful Tender under Section 00100, Clause 14.5:

(1) Original Performance Bond and Labour and Material Payment Bond (the "Bonds") each of which shall equal fifty percent (50%) of the Contract Price, issued by a Surety licensed to transact the business of suretyship in the Province of British Columbia, in favour of the Regional District, signed and sealed by the

successful Tenderer and the Tenderer's Surety. The form of Performance Bond and Labour and Material Payment Bond shall be in a form acceptable to the Regional District. The Performance Bond shall encompass the Warranty and Guarantee period and shall, in any event, be in effect for no less than two (2) years from the date of issuance of the Notice of Acceptance.

(2) A certificate of General Liability insurance pursuant to "CCDC 41 – CCDC Insurance Requirements" with the Regional District of Nanaimo named as additionally insured.

(3) A Workers' Compensation Board Clearance Letter of Clearance indicating good standing and remittance up to date.

15.3 The successful Tenderer shall not commence the Work until it has received a Notice to Proceed issued by the Regional District.

PART 16 AWARD OF CONTRACT

16.1 All contracts require the approval of the appropriate Regional District authority prior to award. Where a contract requires the approval of the Regional District's Board prior to award, the total price of any Tender and the reason for selecting the successful Tenderer may be released at a regular meeting of the Regional District's Board or a Committee of the Board.

16.2 Notwithstanding Clause 18.1(4) below, the Regional District reserves the right to release to the public the total price of any Tender, regardless of whether it was identified by the Tenderer as confidential. By submitting a Tender, each Tenderer consents to the release of the total price and, where applicable, information disclosable under the Act that is relevant to the selection of the successful Tenderer, to provide transparency in relation to expenditures of this type.

PART 17 FORM OF CONTRACT

17.1 The successful contractor will be expected to enter a CCDC4-2011 Unit Price Contract as amended herein in the "Supplementary General Conditions" section 00500.

PART 18 CONFIDENTIALITY AND SECURITY

18.1 The following conditions apply:

(1) The Tender Documents, or any portion thereof, may not be used for any purpose other than submission of Tenders; and

(2) The successful Tenderer must agree not to divulge or release any information that has been given to it or acquired by it on a confidential basis during the course of carrying out the Work or performing its services.

(3) It is the Regional District's policy to maintain confidentiality with respect to all confidential information related to the Tender, but the Tenderer acknowledges and agrees that the Tender becomes the property of the Regional District and any confidential information disclosed by it to the Regional District may be subject to a request for public disclosure under *the Freedom of Information and Protection of Privacy Act, R.S.B.C. 1996, c.165*, as amended from time to time (in this Clause and Clause 17.2, the "Act").

(4) The Tenderer acknowledges that the Act provides an exemption from disclosure for information as specified in Section 21 of the Act. Accordingly, if any information supplied to the Regional District fits within Section 21 of the Act, the Tenderer must specifically advise the Regional District and request the Regional District not to disclose that information, however confidentiality cannot be guaranteed.

PART 19 DISCLAIMERS/LIMITATIONS OF LIABILITY

19.1 Neither acceptance of a Tender nor execution of an Agreement shall constitute approval of any activity or development contemplated in any Tender that requires any approval, permit, or license pursuant to any federal, provincial, regional district or municipal statute, regulation, or bylaw. It is the responsibility of the Contractor to obtain such prior commencement of the Work.

19.2 The Regional District, its directors, officers, servants, employees, agents, and consultants expressly disclaim all liability for representations, warranties, express or implied or contained in, or for omissions from this Tender or any written or oral information transmitted or made available at any time to a Tenderer by or on behalf of the Regional District. Nothing in this Tender is intended to relieve a Tenderer from forming its own opinions and conclusions in respect of this Tender.

19.3 Except as expressly and specifically permitted in these Instructions to Tenderers, no Tenderer shall have any claim for any compensation of any kind whatsoever, because of participating in this Invitation to Tender, and by submitting a Tender each Tenderer shall be deemed to have agreed that it has no claim.

PART 20 SUSTAINABLE PURCHASING PRACTICE

20.1 It is the Regional District's policy to ensure that procurement decisions for the supply of goods, services and construction consider economic considerations, as well as the Tenderer's environmental and social practices. The Regional District expects that each Tenderer has and will comply with internationally recognized labour conventions and recommendations of the International Labour Organization (ILO), of which Canada is a member, and any applicable legislation pertaining to workplace safety, health, labour and employment, human rights, and the environment. In Canada this includes but is not limited to the latest editions of the following: *Corruption of Foreign Public Officials Act* (Canada), *Human Rights Code* (BC), *Employment Standards Act, Workers Compensation Act* (BC), *Canadian Environmental Protection Act, Fisheries Act* (Canada), *Transportation of Dangerous Goods Act* (BC), *Transportation of Dangerous Goods Act,* (Canada), *Environmental Management Act* (BC).

PART 21 PRIME CONTRACTOR

21.1 The successful Contractor shall be deemed to be the Prime Contractor within the meaning of Part 3, Division 3, Section 118(1) of the Workers Compensation Act. The successful Contractor must be qualified and willing to assume this responsibility.

PART 22 HOURS OF WORK

22.1 No work shall be performed under the Contract between the hours of 6:00 p.m. and 7:00 a.m. of the following day or on Saturdays, Sundays, or statutory holidays except as authorized in writing by the Regional District at the Regional District's sole discretion.

PART 23 CONFLICT OF INTEREST

23.1 The Tenderer declares that it has no financial interest, directly or indirectly in the business of any third party that would be or be seen to be a conflict of interest in carrying out the services. It warrants that neither it nor any of its officers or directors, or any employee with authority to bind the Bidder, has any financial or personal relationship or affiliation with any elected official or employee of the Regional District or their immediate families which might in any way be seen by the Regional District to create a conflict.

PART 24 LITIGATION CLAUSE

24.1 The RDN may, in its absolute discretion, reject a Tender, if the Tenderer, or any officer or director of the Tenderer is or has been engaged either directly or indirectly through another corporation in legal action against the RDN, its elected or appointed officers and employees in relation to:

(a) any other contract for works or services; or
(b) any matter arising from the RDN's exercise of its powers, duties, or functions under the Local Government Act, Community Charter, or another enactment within five years of the date of this Bid Call.

In determining whether to reject a Tender under this clause, the RDN will consider whether the litigation is likely to affect the Tenderer's ability to work with the RDN, its consultants and representatives and whether the RDN's experience with the Tenderer indicates that the RDN is likely to incur increased staff and legal costs in the administration of this Contract if it is awarded to the Tenderer.

PART 25 TENDER IRREGULARITIES

25.1 The Regional District may accept or waive a minor and inconsequential irregularity, or where practicable to do so, the Regional District may, as a condition of bid acceptance, request a Tenderer to correct a minor and inconsequential irregularity with no change in bid price. The determination of what is, or is not, a minor and inconsequential irregularity, the determination of whether to accept, waive, or require correction of an irregularity, and the final determination of the validity of a bid, shall be at the Regional District's sole discretion.

PART 26 COVID-19

26.1 Tenderers are advised that the Regional District of Nanaimo acknowledges both the challenges and uncertainty in managing the Coronavirus (COVID-19) in BC's construction industry going forward. Portions of this tender may contain specific starting and completion dates that may or may not be achievable, depending on future restrictions and the duration of these restrictions. Additional risk may be realized from supply chain issues and potential construction site slowdowns, resulting in a delay in delivery of the project. The successful Tenderer will be required to provide the Owner and Consultant with a COVID-19 management plan including safe work plans that meet current Federal and Provincial Government and WorksafeBC requirements.

END OF SECTION

Section 00200

Tender No. 22-028
Jack Bagley Park Site Work and Sports Courts
TENDER FORM

Date: _____

Company: _____

Address: _____

Telephone:_____ Email: _____

To: Regional District of Nanaimo
Via email to ckennedy@rdn.bc.ca

SCHEDULE 1 – SCHEDULE OF PRICES

Having examined the Project site and having carefully examined all of the tender documents including all Addenda issued as supplements thereto, and having examined and complied with Instructions to Bidders, we hereby offer to perform the Work set forth in the aforesaid documents for the Pricing in Canadian Dollars. Prices include the Contractor's labour, material, equipment, material costs, overhead and profit, all taxes and duties, and shall represent the cost to the RDN of such charges excluding GST which shall be shown separately.

Schedule of Prices

A – Site Works

Item No.	Description	Unit of Measure	Estimated Quantity	Unit Price	Amount
A1	Mobilization and Demobilization	Lump sum	1		
A2	Demolition	Lump sum	1		
A3	Excavation and Grading	Lump sum	1		
A4	Water service (including Nanoose Place Community Centre asphalt removal and replacement)	Lump sum	1		
A5	Drainage Improvements	Lump sum	1		
A6	Electrical conduit	Lump sum	1		
A7	Irrigation sleeving	Lump sum	1		
Subtotal:					

C-Hardscaping

Item No.	Description	Unit of Measure	Estimated Quantity	Unit Price	Amount
C1	Lock Block wall relocation	Lineal meter	62		
C2	Concrete stairs c/w handrails	Lump sum	1		
C3	Furniture concrete footings and pads	Lump sum	1		
C4	Boulders at ramp	Lump sum	1		
C5	Chainlink fences and gates	Lump sum	1		
C6	Asphalt paving	Sq. meter	1400		
C7	Sports courts asphalt coatings	Lump sum	1		
C8	Gravel surfacing	Sq. meter	150		
				Subtotal:	

D –Site Furniture

Item No.	Description	Unit of Measure	Estimated Quantity	Unit Price	Amount
D1	Tennis court posts and net c/w footings	Each	1		
D2	Pickleball court posts and net c/w footings	Each	1		
				Subtotal:	

E – Softscape

Item No.	Description	Unit of Measure	Estimated Quantity	Unit Price	Amount
E1	Growing medium	Cu. meter	115		
E2	Hydroseeding	Sq. meter	850		
				Subtotal:	

UNIT PRICE PRICING (Sections A, C, D, E):

Unit Price Total: $ _____

GST (5%): $ _____

Total Contract Price: $ _____

Total Contract Price will be used to establish low bidder

Provisional Items **(At the sole discretion of the Regional District to accept all, some, or none)**

F – Provisional Items

Item No.	Description	Unit of Measure	Estimated Quantity	Unit Price	Amount
F1	Trenching and asphalt reinstatement at North West Bay Road	Lump sum	1		
F2	Timber stairs c/w handrail	Lump sum	1		
F3	Coloured asphalt at entry plaza	Lump sum	1		
F4	Picnic tables	Each	3		
F5	Benches	Each	5		
F6	Waste receptacles	Each	1		
				Subtotal:	

SCHEDULE 2 – TENDERER'S EXPERIENCE

The successful contractor or team must be regularly engaged in the Work described in the Tender Documents. The team must have completed three similar projects in the last five years. The following is a list of references that demonstrate the Tenderer's successful performance in comparable work. References should be similar in size, type and scope to the Work described in the Tender Documents.

1. Project Name: _____

   Project Location: _____

   Contract Sum: _____

   Date Start: _____ Date Complete: _____

   Owner Name: _____ Contact Ph. No.: _____

   Project Engineer: _____ Contact Ph. No.: _____

   Key Subcontractors Used: _____

   _____

   _____

2. Project Name: _____

Project Location: _____

Contract Sum: _____

Date Start: _____ Date Complete: _____

Owner Name: _____ Contact Ph. No.: _____

Project Engineer: _____ Contact Ph. No.: _____

Key Subcontractors Used: _____

_____

_____

3. Project Name: _____

Project Location: _____

Contract Sum: _____

Date Start: _____ Date Complete: _____

Owner Name: _____ Contact Ph. No.: _____

Project Engineer: _____ Contact Ph. No.: _____

Key Subcontractors Used: _____

_____

_____

SCHEDULE 3 - TENDERER'S PROPOSED CONSTRUCTION SCHEDULE

The following is the schedule of the major phases of Work which the Tenderer intends to follow if awarded the Contract. The Tenderer shall complete the following proposed construction schedule. (Please indicate time proposed to be taken in form of bars). Assume date of Notice of Intent to Award of April 15, 2022.

Key Tasks	April				May					June				July				August				September				
Mobilization																										
Site removals																										
Stormwater drainage system installation																										
Site preparation / rough grading																										
Water line trenching & pipe installation																										
Electrical and irrigation sleeving																										
Sport court fencing																										
Entry stairs and ramp																										
Timber stairs (Provisional item)																										
Asphalt paving																										
Sports court and plaza line painting																										
Site furnishings																										
Hydroseeding																										
Substantial completion																										
Total completion																										
Demoliization																										
(Other)																										
(Other)																										
(Other)																										

ACCEPTANCE

.1 This Bid is open to acceptance for a period of sixty (60) days from the date of bid closing.

.2 Submission of this Bid implies acceptance of the existing conditions at the site.

.3 We understand that the lowest or any Bid will not necessarily be accepted. The RDN may also elect not to proceed with the Project.

.4 The RDN reserves the right to waive minor defects or irregularities in the bid.

.5 The Tenderer agrees to be designated as the Prime Contractor for this project per WorkSafe BC OH&S Regulations Sections 20.2 Notice of Project and 20.3 Coordination of Multiple Employer Workplaces and Workers' Compensation Act, Section 118 Coordination of Multiple-Employer Workplaces (1) and (2). We are qualified and are willing to accept the responsibilities as Prime Contractor for the project.

.6 We can complete the work by September 2, 2022.

Company: _____

Signature: _____
(Authorized Officer)

Printed: _____
(Authorized Officer)

JACK BAGLEY PARK REDEVELOPMENT

SCHEDULE 4 FORCE ACCOUNT Section 200

The following is a list of personnel and associated rates which we may use for force account work:

OCCUPATION	HOURLY RATE	OVERTIME HOURLY RATE

The following is a list of equipment which we may use for force account work:

EQUIPMENT	MAKE AND MODEL	HOURLY RATE

REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

NANAIMO, BC

Construction Specifications

ISL Engineering and Land Services

Issued for Tender

2022.03.04

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TABLE OF CONTENTS

1.0 GENERAL

1.1 General Requirements

.1 The General Conditions of Contract, Division 01 General Requirements and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.

.2 This section, along with the drawings, forms part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts

.3 Submit to Owner and Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.4 Do not proceed with Work affected by submittal until review is complete.

.5 Present shop drawings and product data, in SI Metric units. Where items or information is not produced in SI Metric units converted values are acceptable.

.6 Review submittals prior to submission to Owner. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated, and identified as to specific project will be returned without being examined and considered rejected.

.7 Notify Owner, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.8 Verify field measurements and affected adjacent Work are co-ordinated.

.9 Contractor's responsibility for errors and omissions in submission is not relieved by the Owner’s review of submittals.

.10 Keep one reviewed copy of each submission on site.

1.2 Shop Drawings and Product Data

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit shop drawings bearing stamp and signature of qualified Professional Engineer.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items

will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 10 working days for review of each submission.

.5 Adjustments made on shop drawings by Owner/Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Owner prior to proceeding with Work

.6 Make changes in shop drawings as Owner/Consultant may require, consistent with Contract Documents. When resubmitting, notify Owner/Consultant in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, in duplicate, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each shop drawing, product data and sample.

.5 Other pertinent data.

.8 Submissions include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.5 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions, and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.9 Supplement standard information to provide details applicable to project.

The review of shop drawings by the Owner/Consultant is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that Owner/Consultant approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 Certificates and Transcripts

.1 Immediately after award of Contract, submit WorkSafe BC status.

1.4 Acceptability of Materials

.1 Whenever materials are specified by trade name or by manufacturer's name, the tender must be based on the use of the stated specified materials.

END OF SECTION

1.0 GENERAL

1.1 General Requirements

.1 The General Conditions of Contract, Division 01 General Requirements and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.

.2 This section, along with the drawings, forms part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts

.3 The Contractor has primary responsibility for producing quality results through compliance with plans, specifications, and accepted standards of the industry.

.1 All Sub-Contractors are required to abide by the Contractor's Work and Quality Management Plans.

.4 The Contractor is responsible for the delivery of a facility that meets the standards of quality demanded by the specification as it applies to the workmanship and completed results.

1.2 Reference Standards

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.3 Quality Management Plan

.1 Submit to Owner/Consultant for review and acceptance the Contractor Quality Management Plan (QMP) prior to start of construction activities.

.1 Construction design and construction will be permitted to begin only after acceptance of the QMP or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a QMP or another interim plan containing the additional work.

.2 QMP to cover all construction design and operations, both on and offsite and is to be tailored to the proposed construction design and construction sequence.

1.4 Inspection

.1 Contractor will carry out Quality Control activities including but not limited to inspection, testing, and review of test results and reports during the construction period of the project.

.2 Allow Owner/Consultant unfettered access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.3 Give timely notice to Owner/Consultant requesting inspection if Work is designated for special tests, inspections, or approvals.

.4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections, or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work at no additional cost.

.5 Owner will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, Contractor to correct such Work and pay cost of re-examination and correction.

1.5 Independent Inspection Agencies

.1 Separate Independent Inspection/Testing Agencies may be engaged by Owner/Consultant for purpose of inspecting and/or testing portions of Work required for Owner/Consultant's Quality Assurance activities. Cost of such services will be borne by Owner/Consultant.

.2 When independent inspection/testing agencies are engaged by Owner/Consultant the Contractor is to provide unfettered access to work for any inspections/tests.

.3 Contractors shall be responsible for the appointment and payment of independent testing laboratory services for all the testing and inspection required as per Contractor's Construction Quality Plan and as stated in specifications.

.4 Contractor to provide equipment required for executing inspection and testing by appointed agencies

.5 Owner/Consultant's employment of inspection/testing agencies does not relax responsibility of Contractor to perform Work in accordance with Contract Documents and perform their own testing.

.6 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Contractor to correct defects and irregularities as advised by Owner/Consultant at no additional cost to the contract. Contractor to pay costs for retesting and re-inspection.

1.6 Access to Work

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.7 Procedures

.1 Notify appropriate agency and Owner/Consultant 5 working days in advance of requirement for tests, in order that attendance arrangements can be made.

.1 Provide confirmation again 2 working day prior to scheduled inspection/test.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.8 Rejected Work

.1 Remove defective Work, whether result of poor workmanship,

use of defective products or damage and whether incorporated in Work or not, which has been rejected by Owner/Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Owner/Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner/Consultant will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Owner/Consultant.

.1 All changes from Contract Documents are to be recorded in red line markups by Contractor and progress reports with proper dimensioning/measurements.

1.9 Reports

.1 Submit copies of inspection and test reports in PDF format to Owner/Consultant.

.2 Provide copies to Sub-Contractors of work being inspected or tested and/or manufacturer or fabricator of material being inspected or tested.

1.10 Tests and Mix Designs

.1 Furnish test results and mix designs as requested by Owner/Consultant and/or required by Contract Documents.

.2 Cost of tests and mix designs beyond those called for in Contract Documents and beyond those required by law of Place of Work will be appraised by Owner/Consultant and may be authorized as recoverable.

.3 Except as stated otherwise in the specifications Sections, the Contractor shall provide all sampling and testing under this Contract

.4 Materials testing laboratories must be accredited by a laboratory accreditation and will be required to submit to the Owner/Consultant a copy of the Certification of Accreditation and Scope of Accreditation. The policy applies to the specific laboratory performing the actual testing, not just the Corporate office.

.1 The Owner/Consultant retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in the contract.

.5 The Contractor shall cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the DCC Representative immediately. Test results must be signed by a testing laboratory representative

authorized to sign certified test reports.

END OF SECTION

1 – GENERAL

1.1 SECTION INCLUDES

1. Required demolition of designated existing elements
2. Salvage of designated items

1.2 RELATED DOCUMENTS

1. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

1.3 REFERENCES

1. BC Building Code: Part 8 Safety Measures at Construction and Demolition Sites, Provincial Requirements.

1.4 NOTIFICATION OF OWNERS OF UTILITY LINES AND EQUIPMENT

1. Notify the Owner or local authority owning any conduits, wires, pipes, or equipment affected by demolition work.
2. Arrange for removal or relocation of affected items and pay fees or costs in conjunction with removal or relocation, except as otherwise noted.

1.5 PROTECTION

1. Prior to starting any work on site, provide a safety plan as per BC Building Code Requirements
2. Coordinate the implementation of the safety plan with the owner
3. Prior to starting demolition operations, provide necessary protection of existing spaces and items to remain
4. ACI Publications: Comply with ACI 301, “Specifications for Structural Concrete,” unless modified by the requirements of the Contract Documents.
    1. Conduct demolition work in a manner that will minimize need for disruption of the Owners normal operations.
    2. Provide protective measures as required to provide free and safe passage of Owner's personnel and public to and from occupied portions of the facilities.
    3. Provide minimum of 72 hours advance notice to Owner of demolition activities that will impact Owners normal operations.
        1. Obtain specific approval from Owner for impact.
5. Owner assumes no responsibility for actual condition of items to be demolished.
    1. Owner will maintain conditions at time of commencement of contract insofar as practical.
6. Protect any exposed existing finish work that is to remain during demolition operations.

7. Erect and maintain dust proof partitions, closures, and ventilator system as required preventing the spread of dust or fumes to occupied portions of the building.

    1. Take whatever precautions necessary to minimize impact on occupied areas.

1.6 JOB CONDITIONS

1. Conform to applicable codes for demolition of structures, safety of adjacent structures, dust control, runoff, and erosion control, and disposal of demolished materials.

2. Obtain required permits from authorities having jurisdiction.

3. Notify affected utility companies before starting work and comply with their requirements.

4. Do not close or obstruct roadways, sidewalks, and hydrants, without permits.

5. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

    1. Contact the Consultant and Owner immediately.

6. Test soils around buried tanks for contamination.

7. No demolition will occur during school hours without the written permission of the Owner.

1.7 EXPLOSIVES

1. The use of explosives is strictly prohibited.

2 – PRODUCTS

1. Not applicable.

3 – EXECUTION

3.1 PREPARATION

1. Verify the proper disconnection and capping of all abandoned utilities.

2. Verify that required barricades and other protective measures are in place.

3. Provide necessary shoring, bracing, and other precautions required for proper support of existing structure during cutting and demolition operations.

4. Photograph existing conditions of structure, surfaces, equipment and surrounding spaces that could be misconstrued as damage resulting from selective demolition work; submit photographs and written report of existing damage to Consultant prior to starting work.

5. Contractor shall repair damage caused to existing facilities at no cost to Owner unless they can provide documentation is indicating pre-existing damage

3.2 DEMOLITION OPERATIONS

1. Comply with alteration precautions and procedures specified in Section 01 35 16.

2. Cut and remove elements and equipment as designated on Drawings.

1. Remove elements in their entirety unless otherwise indicated.

3. Execute demolition in a careful and orderly manner with least possible disturbance or damage to adjoining surfaces and structure.

4. Exercise extreme caution in cutting and demolition of portions of existing structure.

    1. Obtain approval of Consultant prior to cutting or removing structural members for any reason.

5. Avoid excessive vibrations in demolition procedures that may transmit through existing structure and finish materials.

6. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning assessment, removal, handling, and protection against exposure or environmental pollution and immediately contact the owner.

3.3 DISPOSAL

1. Materials, equipment, and debris resulting from demolition operations shall become property of Contractor.

    1. Remove demolition debris at least once each day in accordance with applicable bylaws

2. Cover debris in trucks with approved netting to prevent spillage during transportation.

3. Do not store except in approved containers or burn materials on site.

    1. Remove combustible waste materials in a manner approved by local Fire Department.

    2. Remove, handle, and dispose of any hazardous waste and debris in accordance with applicable bylaws

4. Transport demolition debris to off-site disposal area and legally dispose of debris.

5. Use street routes specifically designated by the Owner for hauling debris.

6. When possible dispose of material to recycling centers.

3.4 CLEANING AND REPAIR

1. Leave building broom clean and free of debris, ready to receive new work.

2. Repair demolition performed in excess of that required.

    1. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition.

END OF SECTION

1.0 GENERAL

1.1 General Requirements

.1 The General Conditions of Contract, Division 01 General Requirements and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.

.2 This section, along with the drawings, forms part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts

.3 Cooperate and coordinate with the requirements of other units of work specified in other Sections.

1.2 Section Includes

.1 Section includes, but is not limited to:

.1 Provision for concrete forming and accessories

1.3 Related Sections

.1 03 20 00 Concrete Reinforcing

.2 03 30 00 Cast-in-Place Concrete

1.4 Reference Standards

.1 General

.1 The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.

.2 Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.

.3 Refer to Division 01 General Requirements for the list of applicable regulatory requirements.

.4 Withdrawn or obsolete standards may still apply unless it has been replaced with a different Standard in which case the new Standard shall apply. Report any withdrawn Standards to the Consultant for instructions.

.2 Canadian Standards Association (CSA International)

.1 CSA A23.1-19/A23.2-19, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA O86-19, Engineering Design in Wood.

.3 CSA O121-17, Douglas Fir Plywood.

.4 CSA O151-17, Canadian Softwood Plywood.

.5 CSA O153-19, Poplar Plywood.

.6 CSA O325-21, Construction Sheathing.

.7 CSA O437 Series-93(R2011), Standards for OSB and Waferboard.

.8 CSA S269.1-16(R2021), Falsework and Formwork.

.3 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701-17, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.5 Submittals

.1 Provide submittals in accordance with 01 33 00 Submittal Procedures and as outlined in contract documents.

.2 Submit shop drawings for formwork and falsework.

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.

.3 Co-ordinate submittal requirements and provide submittals required by Contract Documents.

.4 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CAN/CSA-S269.3 for formwork drawings.

.5 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

.6 Indicate sequence of erection and removal of formwork/falsework as directed by Engineer.

1.6 Delivery, Storage and Handling

.1 Store and manage hazardous materials in accordance with Contract Documents and Standards.

2.0 PRODUCTS

2.1 Materials

.1 Materials and resources in accordance with Contract Documents and Standards.

.2 Do verification requirements in accordance with Contract Documents and Standards.

.3 Formwork materials:

.1 For concrete without special architectural features, use wood and wood product formwork materials to CAN/CSA-O86.

.2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.

.3 Rigid insulation board: to CAN/ULC-S701.

.4 Pan forms: removable and steel as indicated.

.5 Form ties:

.1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

.2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.6 Form liner:

.1 Plywood: Douglas Fir to CSA O121, 19 mm thick minimum.

.7 Form release agent: non-toxic, biodegradable.

.8 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, 15 to 25 mm^2/s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.

.9 Falsework materials: to CSA-S269.1

.10 Sealant: to Section 07 92 00 - Joint Sealing.

3.0 EXECUTION

3.1 Fabrication and Erection

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

.2 Obtain Consultant's approval for use of earth forms framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Fabricate and erect falsework in accordance with CSA S269.1.

.5 Refer to architectural drawings for concrete members requiring architectural exposed finishes.

.6 Do not place shores and mud sills on frozen ground.

.7 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.8 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.9 Align form joints and make watertight.

.1 Keep form joints to minimum.

.10 Locate horizontal form joints for exposed columns 2400mm above finished floor elevation.

.11 Use 25mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.

.12 Form chases, slots, openings, drips, recesses, expansion, and control joints as indicated.

.13 Construct forms for architectural concrete, and place ties as directed.

.1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.14 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.15 Line forms for following surfaces:

.1 Outer face of beams.

.2 Soffit of girders and underside of bridge decks if exposed.

.3 Exposed faces of abutments, wingwalls, piers and pylons: do not stagger joints of form lining material and align joints to obtain uniform pattern.

.4 Secure lining taut to formwork to prevent folds.

.5 Pull down lining over edges of formwork panels.

.6 Ensure lining is new and not reused material.

.7 Ensure lining is dry and free of oil when concrete is poured.

.8 Application of form release agents on formwork surface is prohibited where drainage lining is used.

.9 If concrete surfaces require cleaning after form removal, use only pressurized water stream so as not to alter concrete's smooth finish.

.10 Cost of textile lining is included in price of concrete for corresponding portion of Work.

.16 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

.17 When slip forming and flying forms are used, submit details as indicated in PART 1 - SUBMITTALS.

3.2 Removal and Re Shoring

.1 Leave formwork in place for following minimum periods of 5 days time after placing concrete.

.2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

.3 Provide necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.4 Space reshoring in each principal direction at not more than 3000mm apart.

.5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

1.0 GENERAL

.1 The General Conditions of Contract, Division 01 General Requirements and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.

.2 This section, along with the drawings, forms part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts

.3 Cooperate and coordinate with the requirements of other units of work specified in other Sections.

.4 Concrete reinforcing shall conform to the requirements of the reference Standards unless otherwise noted.

1.1 Section Includes

Section includes, but is not limited to:

.1 The provision of steel reinforcing for concrete reinforcing as shown on drawings.

1.2 Related Sections

.1 03 10 00 Concrete Forming and Accessories

.2 03 30 00 Cast-in-place Concrete

1.3 Reference Standards

.1 General

.1 The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.

.2 Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.

.3 Refer to Division 01 General Requirements for the list of applicable regulatory requirements.

.4 Withdrawn or obsolete standards may still apply unless it has been replaced with a different Standard in which case the new Standard shall apply. Report any withdrawn Standards to the Consultant for instructions.

.2 ASTM International

.1 ASTM A143/A143M-07(R2020), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.2 ASTM A775/A775M-19, Standard Specification for Epoxy Coated Reinforcing Steel Bars.

.3 CSA International

.1 CSA A23.1-19/A23.2-19, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA A23.3-19, Design of Concrete Structures.

.3 CSA G30.18-09(R2019), Carbon Steel Bars for Concrete Reinforcement.

.4 CSA G40.20/G40.2-13(R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CAN/CSA G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.

.6 CSA W186-M1990(R2016), Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.4 Submittals

.1 Provide submittals in accordance with 01 33 00 Submittal Procedures and as outlined in contract documents.

.2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.

.3 Submit shop drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia of Canada for concrete reinforcement, bar support and accessories for review by the Consultant and Structural Engineer at least 14 days prior to the placement of rebar.

.4 Clearly indicate placing of reinforcement, including bar sizes, grades, spacing, bar bending details, location and quantities of reinforcing mesh and mechanical splices if approved by Consultant, with identifying code marks to permit correct placement without reference to structural drawings.

.5 Detail lap lengths and bar development lengths to CAN/CSA A23.3, unless otherwise indicated.

.6 Placing drawings and bar lists will be reviewed for number and size of bars only and this review shall in no way relieve the Contractor of his responsibility for carrying for carrying out the Work in accordance with the drawings.

.7 Substitution of imperial reinforcing sizes and grades will only be accepted if placing drawings showing imperial sizes are submitted to the Structural Engineer for review. Approval must be obtained before any work is commenced.

1.5 Quality Assurance

.1 Submit in accordance with Section 01 45 00 Quality Control.

.1 Mill Test Report: upon request, provide Consultant with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.

.2 Upon request submit in writing to Consultant proposed source of reinforcement material to be supplied

1.6 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with Contract Documents and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's

name and address.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

2.0 PRODUCTS

2.1 Materials

.1 Substitute different size bars only if permitted in writing by Consultant.

.2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA G30.18, unless indicated otherwise.

.3 Reinforcing steel: weldable low alloy steel deformed bars to CSA G30.18.

.4 Cold drawn annealed steel wire ties to ASTM A82/A82M.

.5 Deformed steel wire for concrete reinforcement to ASTM A82/A82M.

.6 Welded steel wire fabric to ASTM A185/A185M.

.1 Provide in flat sheets only.

.7 Welded deformed steel wire fabric to ASTM A82/A82M.

.1 Provide in flat sheets only.

.8 Epoxy Coating of non-prestressed reinforcement to ASTM A775/A775M. The bar shall be coated with a primer or a conversion coating to improve adhesion of the epoxy to the bar.

.9 Plastic ties or plastic-coated wires shall be used for tying epoxy-coated reinforcement

.10 Galvanizing of non-prestressed reinforcement to CAN/CSA-G164, ASTM A767M Class I, minimum zinc coating 610 g/m². 10M and smaller reinforcing bars shall have a minimum zinc coating of 915 grams per square meter. 15M and larger reinforcing bars shall have a minimum zinc coating of 1070 grams per square meter.

.1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.

.2 If chromate treatment is carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.

.1 Temperature of solution equal to or greater than 32 degrees and galvanized steels immersed for minimum 20 seconds.

.3 If galvanized steels are at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.

.1 In this case, no restriction applies to temperature of solution.

.11 Hot dip galvanized wire with a minimum core diameter of 1.44 mm (16.5 ga.) shall be used for tying galvanized reinforcement.

.12 Chairs, bolsters, bar supports, spacers: to CSA A23.1/A23.2

.13 Mechanical splices: subject to approval of Consultant.

.14 Plain round bars to CSA G40.20/G40.21.

2.2 Fabrication

.1 Fabricate reinforcing steel in accordance with reviewed shop drawings and Standards.

.2 Reinforcing bars shall be cold bent. Bars shall not be straightened or re-bent.

.3 Obtain Consultant's written approval for locations of reinforcement splices other than those shown on placing drawings.

.4 Upon approval of Consultant, weld reinforcement in accordance with CSA W186.

.5 Ship bundles of bar reinforcement clearly identified in accordance with bar bending details and lists.

.1 Ship epoxy coated bars in accordance with ASTM A775A/A775M.

2.3 Source Quality Control

.1 Upon request, provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.

.2 Upon request, inform Consultant of proposed source of material to be supplied.

3.0 EXECUTION

3.1 General

.1 All phases of concrete reinforcement work shall be in accordance with the Standards unless otherwise specified herein or on the drawings. The Contractor shall ensure that only workers who are skilled and experienced in their trade do the work

.2 The Contractor shall notify the Engineer at least 72 hours before any concrete is placed in order that the Engineer may review the work.

.3 No concrete shall be placed until the Structural Engineer has

completed his/her review of reinforcing in place. The Contractor shall provide a minimum of 48 hours notice of the time when the reinforcement will be substantially in place and ready for the Structural Engineers review.

.4 For galvanized and epoxy coated reinforcing bars, all systems for handling shall have padded contact areas. All bundling bands shall be padded, or suitable banding shall be used to prevent damage to the coating. All bundles of coated bars shall be lifted with a strong back, spreader bar, multiple supports, or a platform bridge to prevent bar-to bar abrasion from sags in the bundles of coated bars. The bars or bundles shall not be dropped or dragged.

3.2 Preparation

.1 Galvanizing to include chromate treatment.

.1 Duration of treatment to be 1 hour per 25mm of bar diameter.

.2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

3.3 Product Delivery, Storage and Handling

.1 Store reinforcement in a manner to prevent excessive rusting and fouling with dirt, grease, form-oil, and other bond-breaking coatings

.2 Reinforcement at the time concrete is placed shall be free from excessive rusting, mud, oil or other coatings that adversely affect its bonding capacity

3.4 Field Bending

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Consultant.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

3.5 Placing Reinforcement

.1 Place reinforcing steel as indicated on placing drawings and in accordance with Standard.

.2 Use plain round bars as slip dowels in concrete.

.1 Paint portion of dowel intended to move within hardened concrete with [one coat of asphalt paint].

.2 When paint is dry, apply thick even film of mineral lubricating grease.

.3 Prior to placing concrete, obtain Consultant's approval of reinforcing material and placement.

.4 Ensure cover to reinforcement is maintained during concrete pour.

.5 Reinforcement shall be secured against displacement within the tolerances permitted in the Standard with chairs, spacers, support bars, hangers or other accessories. Support devices

contacting surfaces exposed to the exterior shall be noncorrosive.

.6 All rebar shall be adequately tied and chaired to maintain it in the specified location during pouring. Lifting of reinforcing or welded wire mesh into specified position during the concrete pour will not be allowed.

.7 Bars that are not part of the structural design or drawings, and whose only function is supporting other reinforcing in lieu of other support accessories, shall be considered as accessories.

.8 Protect epoxy and paint coated portions of bars with covering during transportation and handling.

3.6 Field Touch-Up

.1 Repair coating damage with patching material approved by Structural Engineer and Testing Agency.

.2 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

.3 Repair of coating damage to not exceed 5% of surface area of the bar

.4 Coated bars which do not meet the requirements of this specification shall be rejected. Coated bars having defects shall be replaced or alternately stripped of coating, re-cleaned, and recoated in accordance with the requirements of this specification.

END OF SECTION

1.0 GENERAL

1.1 General Requirements

.1 The General Conditions of Contract, Division 01 General Requirements and all Addenda thereto form an integral part of and must be read in conjunction with the requirements of this Section.

.2 This section, along with the drawings, forms part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts.

.3 Provide all labour, materials, equipment, and services necessary to supply and install cast in place concrete work shown or indicated in all the contract drawings and specifications including concrete toppings, bases, sumps, curbs, posts, manholes, pits, paving, sidewalks, equipment bases or curbs, grouting of baseplates, etc.

.4 Coordinate concrete placement fully with other trades. Ensure other related work such as inserts, dowels, sleeves, reinforcement, etc. is complete before placing concrete.

1.2 Section Includes

.1 Section includes, but is not limited to:

.1 The provision for cast-in-place concrete as shown on drawings.

1.3 Related Requirements

.1	03 10 00	Concrete Forming and Accessories
.2	03 20 00	Concrete Reinforcing
.4	05 50 00	Metal Fabrications

1.4 Reference Standards

.1 General

.1 The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.

.2 Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.

.3 Refer to Division 01 General Requirements for the list of applicable regulatory requirements.

.4 Withdrawn or obsolete standards may still apply unless it has been replaced with a different Standard in which case the new Standard shall apply. Report any withdrawn Standards to the Consultant for instructions.

.2 ASTM International

.1 ASTM C260/260M-10a (2016), Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-19, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M-19, Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM C1017/C1017M-13e1, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.5 ASTM D412-16 (2021), Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.

.6 ASTM D624-00 (2012), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.

.7 ASTM D1751-18, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.8 ASTM D1752-18, Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.4 CSA International

.1 CSA A23.1/A23.2-19, Concrete Materials and Methods of Concrete Construction/ Test Methods and Standard Practices for Concrete.

.2 CSA A283-19, Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000-18, Cementitious Materials Compendium

1.5 Abbreviations and Acronyms

.1 Cement: hydraulic cement or blended hydraulic cement (XXb - where b denotes blended).

.1 Type GU or GUb - General use cement.

.2 Type MS or MSb - Moderate sulphate-resistant cement.

.3 Type MH or MHb - Moderate heat of hydration cement.

.4 Type HE or Heb - High early-strength cement.

.5 Type LH or LHb - Low heat of hydration cement.

.6 Type HS or HSb - High sulphate-resistant cement.

.2 Fly ash:

.1 Type F - with CaO content less than 8%.

.2 Type CI - with CaO content ranging from 8 to 20%.

.3 Type CH - with CaO greater than 20%.

.3 GGBFS - Ground, granulated blast-furnace slag.

1.6 Submittals

.1 Provide submittals in accordance with 01 33 00 Submittal Procedures and as outlined in contract documents.

.2 Keep an accurate record at the job site showing date, time, and place of each pour of concrete, together with a transit-mix delivery slip certifying contents of pour. Make the record available to the Owner for his inspection upon request. Upon completion of this portion of work, submit placing records and delivery slips to the Owner.

.3 Submit details of proposed methods of concrete curing and provisions for weather protection to the Structural Engineer for review

.4 Submit plan locations and details of construction joints for the Structural Engineer's review.

.5 Provide testing, inspection results and reports for review by the Structural Engineer and do not proceed without written approval when deviations from mix design or parameters are found.

.6 Provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in Section 01 45 00 - Quality Control.

.7 Provide concrete hauling time deviations exceeding maximum allowable time of 90 minutes for concrete to be delivered to site of Work and discharged after batching.

1.7 Quality Assurance

.1 Provide Structural Engineer, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.2 Quality Control Plan: provide written report to Structural Engineer verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

1.8 Delivery, Storage and Handling

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 90 minutes maximum after batching.

.1 Do not modify maximum time limit without receipt of prior written agreement from Structural Engineer and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by Structural Engineer.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

2.0 PRODUCTS

2.1 General

.1 Products shall satisfy the requirements of the Standard unless otherwise specified herein or on the drawings.

.2 Provide samples of materials on request

2.2 Materials

.1 Cement to CSA A3001, Type GU unless noted otherwise.

.2 Supplementary cementing materials: with minimum 20% Type F fly ash replacement by mass of total cementitious materials to CSA A3001.

.3 Mixing Water to CSA A23.1.

.4 Air entraining admixture to CAN3-A266.1.

.5 Aggregates to CSA A23.1/A23.2.

.6 Chemical admixtures may be used for specific purposes providing they conform to the Standard and only as approved by the Structural Engineer.

.7 Calcium chloride, either as a raw material or as a constituent in other admixtures, shall not be used.

.8 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2.

.1 Compressive strength: 35 MPa at 28 days.

.2 Net shrinkage at 28 days: maximum 0.1 %.

.9 Non premixed dry pack grout: composition of non-metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 50 MPa at 28 days.

.10 Curing compound: to CSA A23.1/A23.2.

.11 Weep hole tubes: plastic.

.12 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.

.13 Polyethylene film: 6 mil thickness to CAN/CGSB-51.34.

.14 Bonding adhesive to the approval of the Structural Engineer.

.15 Topping to the approval of the Structural Engineer.

2.3 Mix Design

.1 Mix design to be completed by an approved materials testing agency and submitted to the Structural Engineer for approval two weeks prior to concrete being placed.

.2 Concrete mixes shall be proportioned by the supplier to meet the requirements for cement type, compressive strength, class of exposure, maximum aggregate size, slump, air content, and admixtures specified herein.

.3 All concrete shall be normal weight unless noted otherwise. Mix designs shall be as detailed in CSA-A23.1 Table 13, Alternate 1. The property requirements are shown on the structural drawings.

3.0 EXECUTION

3.1 General

.1 All phases of concrete work shall be in accordance with the Standard unless otherwise specified herein or on the drawings. Only workers who are skilled and experienced in their trade shall do the work.

.2 The Contractor shall notify the Structural Engineer at least 24 hours before any concrete is placed to allow the Structural Engineer to review the work.

.3 No concrete shall be placed until the Structural Engineer has completed his/her review of reinforcing in place. The Contractor shall provide a minimum of 24 hours notice of the time when the reinforcement will be substantially in place and ready for the Structural Engineers review.

3.2 Preparation

.1 Obtain Structural Engineer's written approval before placing concrete.

.1 Provide 72 hours minimum notice prior to placing of concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete is permitted only after approval of equipment and mix.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Prior to placing of concrete obtain Structural Engineer's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken

.10 In locations where new concrete is dowelled to existing Work, drill holes in existing concrete.

.1 Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.

.11 Do not place load upon new concrete until authorized by Structural Engineer

3.3 Installation/Application

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

.2 Openings, sleeves, and inserts:

.1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, column capitals or columns, except where indicated or approved by Structural Engineer.

.2 Where approved by Structural Engineer, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.

.3 Sleeves and openings greater than 100 x 100mm not indicated, must be reviewed by Structural Engineer.

.4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Structural Engineer before placing of concrete.

.5 Confirm locations and sizes of sleeves and openings shown on drawings.

.6 Openings and sleeves shown on the structural drawings must be confirmed with mechanical, electrical and architectural drawings.

.7 Openings and sleeves not shown on the structural drawings must be approved by the Structural Engineer.

.8 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

.3 Construction and Control joints:

.1 Construction joints shall conform to the Standard except that for horizontal joints in walls it will be sufficient to place fresh concrete on a clean rough surface unless directed otherwise by the Structural Engineer or otherwise noted on the structural drawings.

.2 Joints in slabs on grade shall be located as indicated on the structural and/or architectural drawings. Unless noted otherwise on the drawings a joint in the slab on grade may be a pour joint, trowelled joint, zip strip, saw cut, or other pre-approved method. The depth of joints shall be a minimum of ¼ of the thickness of the slab. Saw cut joints are to be completed within 24 hr. of placing. Alternative joint details are to be submitted in writing to the Structural Engineer and Consultant.

.3 For vertical joints in walls below grade, see standard detail on structural drawings. For locations, see architectural and structural drawings.

.4 Horizontal construction joints in walls and columns shall occur at the top of slab and at the underside of slab/beam systems unless noted otherwise on the structural drawings.

.5 Construction joints not shown in the drawings or specifications shall be subject to the approval of the Structural Engineer. The Structural Engineer may require keys, or extra reinforcing to be provided at the Structural Engineer's discretion with associated costs borne by the Contractor.

.6 The existing concrete surface at construction joints shall be wetted thoroughly immediately prior to placement of concrete.

.7 All exposed concrete construction joints shall also be approved by the Consultant.

.8 Unless noted otherwise on the drawings, control joints in walls are to be located at a maximum spacing of 12m (40') on centre and detailed as indicated on the structural drawings.

.9 Supply and install premoulded waterstops in construction joints where indicated on the drawings. Weld joints to make watertight. Install waterstops in accordance with manufacturer's printed instructions and to Consultant's approval

.4 Anchor bolts:

.1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.

.2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Structural Engineer.

.1 Formed holes: 100 mm minimum diameter.

.2 Drilled holes: 25 mm minimum diameter larger than bolts used.

.3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.4 Set bolts and fill holes with epoxy grout.

.5 Locate anchor bolts used in connection with expansion shoes, rollers, and rockers with due regard to ambient temperature at time of erection.

.5 Drainage holes and weep holes:

.1 Form weep holes and drainage holes in accordance with Section 03 10 00 Concrete Forming and Accessories. If wood forms are used, remove them after concrete has set.

.2 Install weep hole tubes and drains as indicated.

.6 Dovetail anchor slots:

.1 Install continuous vertical anchor slot to forms where masonry abuts concrete wall or columns.

.2 Install continuous vertical anchor slots at 800 mm on centre where concrete walls are masonry faced.

.7 Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.

.8 Finishing and curing:

.1 Curing procedures shall be in accordance with the Standard. Alternate methods may be used providing they produce concrete that meets the contract document requirements.

.2 Cold and hot weather protection shall comply with the Standard or the requirements on the structural drawings, whichever are more rigorous.

.3 Finish concrete to CSA A23.1/A23.2.

.4 Use procedures as reviewed by Consultant or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.

.5 Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.

.6 Finish concrete floor to CSA A23.1/A23.2. Class.

.7 Provide scratch finish where floor tile is to be applied. Provide depression[s] to accommodate floor file.

.8 Provide float finish unless otherwise indicated.

.9 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

.9 Toppings:

.1 Topping mixture to meet minimum requirements as follows: Monolithic, Bonded overlay 50 mm thick.

.2 Make allowance for monolithic and bonded overlay topping thickness when pouring base course.

.3 Apply cement/sand grout to base course to CSA A23.1/A23.2.

.4 Place bonded topping to CSA A23.1/A23.2 and topping manufacturer's recommendations.

.5 Ensure that joints in topping are of same material as those in base course. Also ensure that their locations precisely match those in base course. Provide dividers as indicated.

.10 PVC Waterstops:

.1 Install waterstops to provide continuous water seal.

.2 Do not distort or pierce waterstop in way as to hamper performance.

.3 Do not displace reinforcement when installing waterstops.

.4 Use equipment to manufacturer's requirements to field splice waterstops.

.5 Tie waterstops rigidly in place.

.6 Use only straight heat-sealed butt joints in field.

.7 Use factory welded corners and intersections unless otherwise approved by Consultant.

.8 In place of a PVC waterstop system, an alternate crystalline and swelling waterstop system may be submitted to the Consultant for review and approval.

.11 Joint fillers:

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant.

.2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.3 Locate and form isolation, construction, and expansion joints as indicated.

.4 Install joint filler.

.5 Use 12mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12mm of finished slab surface unless indicated otherwise.

.12 Dampproof membrane:

.1 Install dampproof membrane under concrete slabs-on-grade inside building.

.2 Lap dampproof membrane minimum 150 mm at joints and seal.

.3 Seal punctures in dampproof membrane before placing concrete.

.4 Use patching material at least 150 mm larger than puncture and seal

3.4 Tolerances

.1 Concrete tolerance to Standard or the requirements on the structural or architectural contract documents, whichever are more rigorous.

3.5 Field Quality Control

.1 Site tests: conduct tests as follows in accordance with Contract Documents and submit report.

.1 Concrete pours.

.2 Slump.

.3 Air content.

.4 Compressive strength at 7 and 28 days.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Consultant for review to CSA A23.1/A23.2.

.1 Ensure testing laboratory is certified to CSA A283.

.3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Consultant.

.4 Testing laboratory will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.5 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

.6 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.6 Rejection of Defective Work

.1 In the event that concrete tests do not conform to the requirements of this specification, or when conditions are such to cause doubt about the safety of the structure, testing of the structure will be undertaken at the direction of the Structural Engineer. This may entail further concrete tests, coring or load testing as per the Standard, or any other test the Structural Engineer deems suitable. Such test shall be made at the expense of the Contractor and to the satisfaction of the Structural Engineer.

.2 Where, in the opinion of the Structural Engineer, material or workmanship fails to meet the requirements of the specification, such work may be rejected. Work rejected shall be replaced or repaired to the approval of the Structural Engineer and at no additional cost to the Owner.

END OF SECTION

BOULDER PLACEMENT

1 GENERAL

1.1 SECTION INCLUDES

1. All materials, labour, equipment, and services to supply and install landscape boulders.

1.2 RELATED SECTIONS

1. Ornamental Stone Section 02380

1.3 DEFINITIONS

1. Boulder: Pre-approved imported or on-site rocks of specified size.

2 PRODUCTS

2.1 MATERIALS

1. On-site Boulders:
    1. May be used if they meet the size specified and are pre-approved by the Consultant.
    2. Approximate size: 750-900mm x 750-900mm x 750-900mm
2. Imported Boulders:
    1. Boulders to be sourced by the Contractor and approved by the Owner's Representative at the source prior to delivery or sample boulder approved by Owner's Representative prior to site delivery of remaining boulders.

3 EXECUTION

3.1 STOCKPILE

1. Boulders delivered to site shall be stockpiled and handled in a manner that prevents breakage and scarring.

3.2 PLACEMENT

1. Boulders shall be placed in horizontal orientation where possible, with 1/3 minimum of the height of the rock below finished grade.
2. Owner's Representative shall be notified by the Contractor at least 48 hours prior to boulder placement.
3. Owner's Representative is to direct on-site boulder placement.
4. Boulders shall be machine placed by use of belts or chains. Boulders shall not be dumped or pushed in place. Boulders heavily damaged by machined delivery and installation (e.g. deep or extensive scrape marks) may be rejected by the Consultant. Rejected boulders are to be replaced with similar sized boulders by the Contractor at no cost to the Owner.

END OF SECTION

1.0 GENERAL

1.1 General Requirements

.1 The General Conditions of the Contract and all Sections of Divisions 00 and 01, shall form an integral part of the requirements of this Section.

.2 All addenda or corrections issued during the time of the bidding process shall also become part of the contract documents and shall be covered in the Trade Contractor's bid.

.3 Cooperate and coordinate with the requirements of other Trade Contractors specified in other Sections.

1.2 Section Includes

.1 Section includes, but is not limited to:

.1 Miscellaneous metal work (ferrous).

1.3 Related Sections

.1 03 20 00 Concrete Reinforcing

.2 03 30 00 Cast-in-Place Concrete

1.3 Reference Standards

.1 General

.1 The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.

.2 Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.

.3 Refer to Division 01 General Requirements for the list of applicable regulatory requirements.

.4 Withdrawn or obsolete standards may still apply unless it has been replaced with a different Standard in which case the new Standard shall apply. Report any withdrawn Standards to the Consultant for instructions.

.2 Aluminum Association Designation System for Painted and Anodized Aluminum Finishes.

.3 AMPP (formerly NACE International and SSPC: The Society for Protective Coatings)

.1 SSPC Paint 20, Zinc-Rich Coating Inorganic and Organic.

.2 SSPC Paint 33, Coal-Tar Mastic Coating, Cold-Applied.

.4 ASTM International Inc.

.1 ASTM A36/A36-19, Standard Specification for Carbon Structural Steel.

.2 ASTM A53/A53M-20, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

.3 ASTM A108-18, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.

.4 ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.5 ASTM A194/A194M-20a, Standard Specification for Carbon, Alloy Steel and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.

.6 ASTM A283/A283M-18, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.

.7 ASTM A307-21, Standard Specification for Carbon Steel Bolts and Studs, and Threaded Rod 60 000 psi Tensile Strength.

.8 ASTM F3125/F3125M-19e2, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 105 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.

.9 ASTM A500/A500M-21, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

.10 ASTM A501/501M-14, Standard Specification for Hot-Formed Welded and Seam less Carbon Steel Structural Tubing.

.11 ASTM A653/A653M-20, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.12 ASTM A780/A780M-20, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

.13 ASTM B221-20, Standard Specification for Aluminum and Aluminum -Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.14 ASTM B221M-13, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric].

.15 ASTM D1187/D1187M -97(2018), Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.

.16 ASTM E935-21, Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.

.17 ASTM F436/F436M-19, Standard Specification for Hardened Steel Washers Inch and Metric Dimensions.

.18 ASTM F1554-20, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

.5 AWS

.1 D1.1/D1.1M:2020, Structural Welding Code – Steel.

.2 A2.4:2020, Standard Symbols for Welding, Brazing, and Nondestructive Examination.

.6 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).

.1 Handbook of Steel Construction – 11th Edition.

.2 Standard 2-75: A Quick-drying Primer for Use on Structural Steel

.7 CSA International

.1 CSA G40.20/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CSA G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA S16-19, Design of steel structures.

.4 CSA S136-16, North American Specification for the Design of Cold Formed Steel Structural Members.

.5 CSA W48-18, Filler Metals and Allied Materials for Metal Arc Welding.

.6 CSA W47.1-19, Certification of Companies for FusionWelding of Steel Structures.

.7 CSA W 55.3-08 (R2018), Certification of Companies for Resistance Welding of Steel and Aluminum.

.8 CSA W59-18, Welded Steel Construction.

.9 CSA W178.1-18, Certification of Welding Inspection Organizations.

.10 CSA W 178.2-18, Certification of Welding Inspectors.

.11 CSA G30.18-09(R2019), Carbon steel bars for concrete reinforcement.

.12 CSA G40.20-13/G40.21-13(R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.13 CSA G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.

.8 NAAMM - National Association or Architectural Metal Manufacturers.

.1 AMP 555-92, Code of Standard Practice for the Architectural Metal Industry (Including Miscellaneous Iron)

.2 AMP 521-01(R2012), Pipe Railing Manual.

.3 MBG 531-17, Metal Bar Grating Manual.

.4 MBG 532-19, Heavy Duty Metal Bar Grating Manual.

.5 AMP 500-06, Metal Finishes Manual.

.9 If requested by the Consultant provide a PDF digital copy of any or all of the Standards above as selected by the Consultant at no additional cost.

1.4 Work Supplied but Installed under other Sections

.1 Supply the following materials specified to be installed under other sections of the specifications:

.1 Anchor bolts, bearing plates, sleeves, restraining straps and other inserts to be built into concrete and masonry elements and required for anchorage and support of fabricated steel components.

.2 Fabricated steel components to be built into concrete or masonry unless specified elsewhere.

.2 Supply instructions and tem plates as required for accurate setting of inserts and components.

1.5 Shop Drawings

.1 Provide submittals in accordance with 01 33 00 Submittal Procedures and as outlined in contract documents.

.2 Clearly indicate materials, components, core thicknesses, finishes, dimensions, connections, joints, method of anchorage, number of anchors, supports, reinforcement, fabrication and installation details and accessories.

.3 Include erection drawings, elevations and details where applicable.

.4 Indicate welded connections using standard welding symbols. Clearly indicate net weld lengths.

1.6 Qualifications

.1 Fabricator and erector must be certified and approved by the Canadian Welding Bureau in conformance with CSA W47.1 Division 1 or 2.2. Perform welding using currently licensed welders only.

.2 Welding Procedures, welders and welding operations shall be qualified in accordance with Canadian Welding Bureau Standards.

.3 All welders employed to weld load-carrying structures in the field must posses a valid "S" classification Class "O" certificates issued by the Canadian Welding Bureau.

1.7 Design

.1 Design details and connections and fabricate in accordance with the requirements of CAN/CSA-S16-01 to resist forces, moments and shears as indicated. Fabricate work of this Section using a fabricator certified in accordance with CSA W47.1.

		.2	Where forces, moments and shears are not indicated, design connections for not less than 100% of the resistance of the member.
		.3	For standard connections, select details from CISC Handbook of Steel Construction to ensure adequacy, unless detailed otherwise.
		.4	Design and fabricate steel stairs, handrails and balustrades to conform with the requirements of the British Columbia Building Code.
1.8	**Product Delivery and Storage**	.1	Schedule delivery of components to site to coincide with installation of Work.
		.2	Store components to prevent dam age and distortion.
		.3	Protect finishes from scratches and soiling.
1.9	**Co-ordination with Other Trades**	.1	Supply necessary instructions, templates and drawings to other trades for setting anchor bolts and other members that are to be built in with Work of other trades. Assist in placing. Supply necessary materials before building in, at the correct time.
1.10	**Field Quality Control**	.1	If considered necessary by the Owner/Consultant, an independent testing laboratory will carry out inspection and testing of the materials and workmanship as designated by the Owner/Consultant.
2.0	**PRODUCTS**		
2.1	**Materials**	.1	Supply new materials, free from defects impairing strength, durability or appearance, of best commercial quality for purposes specified. Where metal fabrications are exposed and painted, ensure that manufacturer's stamps are not visible.
		.2	Miscellaneous and structural steel: to CAN/CSA-G40.21, 300W yield strength.
		.3	Hollow Structural Sections (HSS): To CAN/CSA-G40.21, 350W yield strength, Class C.
		.4	Steel pipe: structural grade pipe, standard schedule 40 black pipe conforming to AST M A53/A53M, grade B, continuous or electric resistance welded; size as indicated on the drawings.
		.5	Bolts: to ASTM F3125, type 1 medium carbon steel bolts, galvanized finish; ASTM A194/A194M, Grade 2H nuts, galvanized finish; ASTM F436, type 1 washers.
		.6	Inserts: Hilti HSL.
		.7	Anchoring System: Hilti Hit HY200 for concrete.
		.8	Shear Connectors: Nelson stud.
		.9	Welding Material: Conforming to the requirements of CSA W59
		.10	Shop galvanizing: hot dipped galvanizing with a minimum zinc coating of 600 g/m2 to CSA-G164.

2.2	**Fabrication**	.1	Perform work to the highest standard of modern shop and field practice, performed by personnel specializing in this work. Accurately fit joints and intersecting members and make in true planes, with adequate fastening. Fabricate work, plum b, true, square, straight, level, accurate to sizes detailed, free from distortion or defects.
		.2	File or grind and sand exposed welds, sharp edges and burrs, smooth and flush. All welds must be ground smooth and flush with adjacent surfaces.
		.3	Fabricate items in accordance with CSA S16, of sizes and profiles indicated on drawings and reviewed shop drawings, of sufficient size and strength to perform function for which they are designed with joints neatly fitted and properly secured.
		.4	Shop assemble in largest practical sections for delivery to site.
		.5	Provide flush butt type hairline exposed joints where mechanically fastened.
		.6	Provide flush countersunk screws or bolts to all exposed mechanical fastenings, located consistent with design.
		.7	Supply all components required for proper anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication.
		.8	Where work of other Sections is to be attached toWork of this Section, prepare work by drilling and tapping holes as required to facilitate installation of such work.
		.9	Verify all dimensions on site prior to fabrication.
		.10	Supply all components in ample time for construction schedule as required, for proper anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication.
		.11	Thoroughly clean all surfaces of rust, scale, grease and foreign matter prior to prime painting or galvanizing.
2.3	**Welding**	.1	Perform welding in accordance with the requirements of CSA W59.
		.2	Perform welding inspection in accordance with the requirements of CSA W178.1 and W178.2.
		.3	Perform resistance welding to CSA W55.3.
		.4	Continuously weld all exterior visible steel connections.
		.5	Continuously weld all exterior visible steel connections.
2.4	**Surface Preparation**	.1	Thoroughly clean and suitably pre-treat steel prior to finishing.
		.2	Remove loose m ill scale, rust, oil, grease, dirt and other foreign matter using SSPC - SP No.6, Commercial Blast Cleaning, followed

			by SSPC - SP No. 1, solvent cleaning.
		.3	Grind and sand all sharp projections smooth.
2.5	**Finishes**	.1	Shop paint items, all miscellaneous metal items with the exception of those which are to be galvanized.
		.2	Prime paint to CSA S16.
		.3	Use primer as prepared by manufacturer without thinning or adding admixtures. Paint on dry surfaces, free from rust, scale, or grease. Do not paint when temperature is lower than 7°C.
		.4	After fabrication, clean, remove rust, mill scale, grease, or extraneous material. Unless specified otherwise, apply to all items, in shop, a full smooth coat of primer (see materials). Work paint into corners and open spaces.
		.5	Apply two (2) coats of primer to parts inaccessible after assembly.
		.6	Apply one (1) coat of primer to steel surfaces except where encased in concrete. Leave these surfaces clean and uncoated.
		.7	Touch-up burnt or scratched surfaces. Touch up bare or worn areas on site after installation, and apply field painting also to field-installed bolts, welds, screws, etc.
		.8	Make good corrosive protection after welding where burnt by welding operations and where rem oved to facilitate welding operations, using 2 coats of zinc rich touch-up primer.
		.9	Back prime with bituminous paint all aluminum surfaces in contact with concrete or masonry.
		.10	Provide hot dipped galvanized finish at all exterior metal fabrications and elsewhere indicated.
2.6	**Angle Lintels and Ledgers**	.1	Provide angle lintels and steel ledger angles with anchors or bolts, as indicated. Fabricate and install level and true to line, to support all superimposed loading.
2.7	**Anchor Bolts, Lag Screws, etc.**	.1	Provide anchor bolts, bolts, bolt washers and nuts, lag screws, expansion shields, toggles, straps, sleeves, brackets, etc. where required and where indicated.
2.8	**Miscellaneous Framing**	.1	Fabricate and install wall mounted supports to vanities and counters as detailed on the drawings and elsewhere as indicated; coordinate with vanity tops and counters specified in Section 06 40 00 Architectural Woodwork.
		.2	Fabricate and install all other metal brackets for millwork as detailed on the drawings; coordinate with Sections 06 40 00 Architectural Woodwork.

.3 Fabricate and install all required bent plate framing, supports and bracing required for overhead doors as indicated on the drawings and reviewed shop drawings.

.4 Refer to structural drawings for miscellaneous metal items which are to be fabricated, supplied, and installed under this Section.

.5 Fabricate all other metal fabrication items or miscellaneous metal items required to complete the project.

3.0 EXECUTION

3.1 Erection

.1 Obtain Owner/Consultant's acceptance prior to site cutting or making adjustments to other work.

.2 Make provision for erection stresses and temporary bracing to keep work in alignment at all times.

.3 Install items rigid and secure, square, and level, accurately fitted, free from distortion or defects detrimental to appearance and performance, in accordance with CSA S16.

.4 Securely anchor components in place. Unless indicated otherwise, anchor components as follows:

.1 To concrete and solid masonry with expansion shields and bolts or as shown on the drawings.

.2 To thin metal with screws or bolts.

.3 To thick metal with bolts or by welding.

.4 To wood with bolts for heavy and medium duty fastenings; with screws for light duty fastenings.

.5 Replace members damaged in course of construction.

.6 Perform required field welding in accordance with CSA W59.

.7 Items required to be cast into concrete, precast concrete or built into masonry to be handed over to the appropriate Section together with all necessary setting tem plates.

.8 After installation touch-up field welds, scratched and dam aged prime painted and galvanized surfaces.

.9 After installation, site clean and refinish damaged finishes, welds, bolt heads and nuts. Refinish with primer to match original finish.

3.2 Locations

.1 A comprehensive schedule of items is not included. Check drawings and specification to obtain all items and quantities.

END OF SECTION

1.0 GENERAL

1.1 Section Includes

.1 All material, labour, equipment, and services to supply and install all carpentry work as noted on the drawings and as specified herein.

In general, work shall include, but not necessarily be limited to, the supply and/or installation (where applicable) of the following

1. Timber steps related finish hardware, fixtures, and fittings.

1.2 Related Requirements

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

Section 061000-Rough Carpentry-all work not exposed to view and for framing exposed to view.

Section 055000-Metal Fabrications for handrails, plates, and assemblies.

1.3 Reference Standards

.1 The latest applicable edition of the following reference standards and codes shall govern all work as appropriate:

General

1. National Lumber Grading Association (NLGA) Standard Grading Rules for Canadian Lumber including supplements
2. CSA B111-1974 (R2003), Wire Nails, Spikes, and staples
3. CSA o112 Series-M1977 (R2001), CSA Standards for Wood Adhesives
4. CAN/CSA-o80 Series-97, Wood Preservation

1.4 Submittals

.1 Provide submittals in accordance with 01 33 00 Submittal Procedures and as outlined in contract documents.

.2 Submit shop drawing for handrails, including all attachments.

.4 Samples for products: For each type of wood product involving selection of colors, profiles, or textures.

.5 Provide testing, inspection results and reports for review by the Structural Engineer and do not proceed without written approval when deviations from mix design or parameters are found.

1.5 Delivery, Storage and Handling

.1 Stack lumber flat with spacers between each bundle to provide air circulation. Store wood in a cool, dry place out of direct sunlight. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings. Elevate wood if stored on ground to prevent condensation.
Field Conditions:

1. Weather Limitations: Proceed with installation only when existing and forecast weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.
2. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.
3. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
4. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and

discoloration.

2.0 PRODUCTS

2.1 General

1. All wood materials to be kiln dried to a uniform moisture content of 6-12%.
2. All lumber to be in accordance with the NLGA Standard Grading Rules and shall bear the registered certification stamp of the association member.
3. All preservative-treated lumber shall be in accordance with CSA requirements and shall bear the stamp of an approved independent inspection agency.
4. Preservative colour to be brown (not green).

2.2 Materials

.1 WOOD

1. Lumber, kiln-dried stock, generally free of cracks, splits, warps, wanes, bows, cups, crooks, or other defects unsuitable for its intended use.
2. Pressure treated Hem-fir, #2 grade or better

.2 FIXINGS

1. Fasteners for Exterior Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 2 inches (51 mm) into wood substrate.
2. Fastenings: Non-corrosive type to ASTM and CSA requirements.
3. Galvanized screws to ASTM requirements
4. Galvanized wire nails, spikes, and staples to CSA B111.

3.0 EXECUTION

3.1 Examination .1

1. Verify all dimensions on site prior to fabrication and installation to ensure a neat and accurate fit. Verify existing openings and other limitations that might affect size, manufacturing of or installation of manufactured units prior to fabrication.
2. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape. Proceed with installation only after unsatisfactory conditions have been corrected.

Clean substrates of projections and substances detrimental to application.

3.2 Installation

1. Do not use materials that are unsound, warped, improperly treated, or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.
2. Do not use manufactured units with defective surfaces, sizes, or patterns.
3. Fabricate and install materials in accordance with AWMAC requirements and manufacturer's recommendations.
4. Cutting and drilling: Pre-drill and counter sink when using screws.
5. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
6. All joints to be accurate, tight, and formed to conceal shrinkage.
7. Running finish to be in long lengths, joined only on solid bearing.
8. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
9. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
10. Coordinate exterior finish carpentry with materials and systems in or adjacent to it. .

3.3 Adjusting

1. Replace exterior carpentry that is damaged or does not comply with requirements. Exterior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.4 Sealing

1. End Sealing: Treat all cut ends with two coats of wood preservative in colour to match uncut pressure treated wood.

3.5 Cleaning .3

1. Lightly scrub with a bristle brush to remove ground-in dirt on wood surfaces. Do not pressure wash wood. Touch up factory-applied finishes to restore damaged or soiled areas.

3.6 Protection

1. Protect installed products from damage from weather and other causes during construction.

END OF SECTION

1.0 GENERAL

1.1 General Requirements

.1 The General Conditions of the Contract and all Sections of Divisions 00 and 01, shall form an integral part of the requirements of this Section.

.2 All addenda or corrections issued during the time of the bidding process shall also become part of the contract documents and shall be covered in the Trade Contractor's bid.

.3 Cooperate and coordinate with the requirements of other Trade Contractors specified in other Sections.

1.2 Section Includes

.1 This section refers to the labour, materials, and equipment necessary for the supply and installation of site furnishings specified herein.

1.3 Related Sections

.1	055000	Metal Fabrications
.2	062013	Exterior Finish Carpentry

1.3 Shop Drawings and Product Data

.1 Submit shop drawings and product data in accordance with Section 013300 Submittal Procedures. All pre-manufactured site furnishing products shall be submitted in full size and in complete form to Consultant 120 days in advance of installation. Consultant must approve sample and any relevant colours, finishes and sizes prior to Contractor placing final order.

.2 Indicate dimensions, sizes, assemblies, anchorage, and installation details for each furnishing specified.

.3 In instances with powdercoat finish or coloured material application; provide a sample of paint chips and coloured samples for review prior to purchase and order of materials.

1.4 Maintenance Data

.1 Provide maintenance data for care and cleaning of site furnishings.

1.5 Quality Assurance

.1 A manufacturer’s warranty is required for all pre-manufactured site furnishing specified in this section.

2.0 PRODUCTS

2.1 Materials

.1 Metals:

1. Nails, spikes, bolts, lag screws, nuts and washers shall be stainless steel or shall be an approved nonferrous type.
2. All connecting steel shall be medium structural steel conforming to CSA-G40.4. All connecting steel shall be hot-dipped galvanized after fabrication.

All painted metals shall be prime coated and then finished with a minimum of two coats of paint.

3.

.2 Site Furnishings:

1. Picnic Table:
    1. Quantity: 3

2. Supplier: Wishbone
3. Model: Bayview Hexagonal, BVHPTWC-84
4. Finish: Frame—Textured silver, Wood slats-Walnut

2. Bench:
   1. Quantity: 5
   2. Supplier: Wishbone
   3. Model: Bayview, BV-6 with armrests
   4. Finish: Frame—Textured silver, wood slats-Walnut

3. Waste Receptacle:
   1. Quantity: 1
   2. Supplier: Haul-All
   3. Model: HBIS Waste/ Recy. BP Container-SP-HBIIS-PY
   4. Finish: Brown

4. Tennis Court Posts and Net:
   1. Supplier: Tomko Sports Systems
   2. Post model: TN-CLASSIC (3” OD, round)
   3. Post quantity: 2
   4. Post Finish: Black
   5. Post sleeve model: TN-GS24 c/w end plugs
   6. Post sleeve quantity: 2
   7. Net model: TN-TN90HT
   8. Net quantity: 1
   9. In-ground center anchor model: TN-ANCHOR
   10. Anchor quantity: 1
   11. Center strap model: TN-QKSET
   12. Strap quantity: 1

5. Pickleball Court Posts and Net:
   1. Supplier: Tomko Sports Systems
   2. Post model: TP-CLASSICPB (3” OD, round)
   3. Post quantity: 2
   4. Post Finish: Black
   5. Post sleeve model: TN-GS24 c/w end plugs
   6. Post sleeve quantity: 2
   7. Net model: TP-HDPN
   8. Net quantity: 1
   9. In-ground center anchor model: TN-ANCHOR
   10. Anchor quantity: 1
   11. Center strap model: TN-QKSET
   12. Strap quantity: 1

2.2 Execution

.1 All materials and/or components damaged or deteriorated during delivery and storage will be rejected and shall be removed from the site and replaced at no cost to the Owner.

.2 All materials and components will be subjected to inspection upon arrival to site. Materials and/or components which do not meet the requirements stated herein shall be rejected and be removed from the site at no cost to the Owner.

.3 All materials and components shall be protected from weather

while in transit to the site.

.4 All materials and components shall be stored off the ground and be adequately protected from weather to prevent deterioration, damage, or impairment of structural or their essential properties.

.5 The Contractor shall be responsible for protection and maintenance of all completed work and finishes from time of completion until acceptance of work and shall make good any damage to work caused during projection and maintenance period at no cost to the Owner.

.6 Installation work shall be carried out in accordance with the drawings, approved shop drawings, and requirements stated herein and as per manufacturer's specifications.

.7 Installation work shall be laid out plumb, true to line and level. Structural supports and members shall be accurately placed in position and securely braced to remain plumb and true until permanently fixed.

.8 Fastening shall be done with nails, bolts, spikes, or framing anchors as detailed and as per manufacturer's specifications. Bolt holes shall be bored 1.5mm larger than the diameter of the bolt.

.9 All cutting and framing where required for the installation of the work shall be executed as shown on the drawings.

.10 Touch-up damaged finished to the approval of the Consultant.

END OF SECTION

1.0 – GENERAL

1.1 GENERAL REQUIREMENTS

1. Section 31 22 01 is a 'Landscaping' Section and refers to those portions of the Works that are unique to the preparation of sub grade, by rough grading and filling to provide a base that will allow placing of growing medium (topsoil) to specified depths. This Section does not apply to grading prior to placement of paved or concreted surfaces. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the Works described herein.

2. This section is based upon the 'British Columbia Landscape Standard' published by the B.C. Society of landscape Architects and the Nursery Trades Association.

1.2 RELATED WORK

1. Section 31 11 00 - Clearing and Grubbing

2. Section 31 23 01 – Excavation and Backfill

3. Section 32 11 23 - Aggregate Base Courses

4. Section 32 91 21 - Topsoil and Finish Grading

5. Section 32 92 13 - Hydraulic Seeding

6. Section 32 92 23 – Turf and Grasses

7. Section 32 92 01 - Planting of Trees, Shrubs and Ornamentals

1.3 REFERENCES

1. Master Municipal Construction Documents (MMCD) Volume II 2009 Edition

2. British Columbia Landscape Standards (current edition)

3. Canadian System of Soil Classification (current edition)

1.4 INTERPRETATION OF THE WORK

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

1.5 PROTECTION

1. Examine site with Owner's Representative/Consultant and obtain approval of previous work prior to commencing Site Grading.

2. Comply with MMCD General Conditions, Clause 4.3 - Protection of Work, Property, and the Public and, MMCD General Conditions, Clause 4.5 - Errors, Inconsistencies or Omissions in the Contract Documents.

3. Protect existing fencing, natural features, benchmarks, existing buildings, existing pavement, sub surface and surface utility lines, and water courses and miscellaneous items noted on contract drawings as to remain.

4. Protect all existing trees, landscape plant beds, miscellaneous plant material and their associated root areas within the area to be rough graded that have been identified to remain on the contract drawings.

5. Protect all existing trees, landscape plant beds, miscellaneous plant material and their associated root areas that are outside of area to be rough graded.

6. Notify the Consultant immediately if any damage occurs.

7. Maintain access routes to prevent accumulation of mud on roads. Use all means necessary to control dust on and near the work caused by operations

8. The Contractor, at no cost to the Owner shall make good all damages incurred during the rough grading operation.

1.6 QUALITY ASSURANCE

1. The Owner's Representative/Consultant is to inspect and approve all stages of the work.

    1. Provide forty-eight (48) hours' notice to the Owner's Representative/Consultant when inspection is required.

2. At the Owner's Representative/Consultant discretion, a licensed testing agency will be retained by the Contractor to perform periodic testing of the sub grade preparation to demonstrate proctor density has been achieved at no extra cost to the Owner.

3. Remove any base materials which are unacceptable for required sub-grade bearing capacities or Corrected Maximum Dry Density (MPD) as specified.

1.7 COORDINATION

1. The work shall include:

    1. Stripping and stockpiling of approved onsite fill material

    2. Importing and placement of fill material in place of unsuitable sub grade material

    3. Grading operation to attain sub grade design grades

    4. Compaction of fill materials

    5. Removal and off-site disposal of unsuitable material.

2. If sub grade non-structural, or structural, fills are required to meet design sub grades, use granular material as per MMCD Section 31 05 17 - Aggregate and Granular Materials.

3. Over Excavation

    1. Based on the Geotechnical Report prepared by the Consultant, the Owner/Consultant does not anticipate need for over excavation unless it is discovered that conditions differ from those encountered at test hole locations. These changes or variations may be one of the following:

        1. Organics or topsoil encountered below the anticipated design sub grade elevations for:

            1. Footings

2. Soft or wet, silty with clay soils within the sub grade.

3. Buried concrete, wood debris or old foundations.

2. If these conditions are encountered the contractor must notify the Owner's Representative/Consultant, prior to over excavation.

3. If unsuitable bearing materials are encountered at indicated elevations, carry excavation deeper and replace excavated material with suitable materials as directed by the Owner's Representative/Consultant.

4. Perform over excavation only by written authorization of the Owner's Representative/Consultant. If additional over excavation is required, Owner's Representative/Consultant shall be notified so that exact quantities can be measured.

4. Unauthorized Excavation

1. Unauthorized excavation shall be any excavation beyond elevations and dimensions indicated, without specific direction by the Owner's Representative/Consultant.

2. The Landscape Contractor shall fill unauthorized excavation with approved fill material, to elevations and dimensions indicated, to the requirements of this section.

3. Unauthorized excavation and remedial work shall be at Landscape Contractor's expense.

1.8 MEASUREMENT AND PAYMENT

1. Measurement and payment for topsoil stripping including, stockpiling for re-use will be made before and after cross sections of stripped area as determined by field measurements on site by the Owner's Representative/Consultant.

2. Measurement and payment for rough site grading shall be by the square meter of area rough grading and, shall include cut and fill excavation and its on-site redistribution and compaction to design elevations and grades for the entire area graded.

3. Measurement and payment for excavation and offsite disposal of unsuitable materials, as determined by the Owner's Representative/Consultant, will be by loose truck box volume.

4. Measurement and payment for removal and off-site disposal of soft or unsuitable material revealed during proof-rolling includes all remedial work, equipment, materials and requirements for over excavation (over the sub grade design elevations) shall be made by loose truck box volume as determined by Owner's Representative/Consultant.

5. Loads removed offsite that are not witnessed by the Owner's Representative/Consultant will not be paid.

6. Measurement and payment for topsoil stripping including, stockpiling for re-use then, placement and spreading of native topsoil previously stockpiled on-site will be made before and after cross sections of stripped area as determined by field measurements on site by the Owner's Representative/Consultant.

2 – PRODUCTS

2.1 MATERIALS

1. Fill Material

1. Soft Landscape Areas: Loose, friable, well drained, native on site fill or imported fill shall be free of rocks and boulders in excess of 100 mm (4") in size. Provide sample for review and approval by the Owner's

Representative/Consultant prior to use or import to site. Use suitable existing inorganic material and compact to at least 80% Standard Proctor maximum dry density.

2. Type

    1. Granular and fill material shall be as identified in:

        1. Section 31 23 01 – Excavating, Trenching and Backfilling

        2. Section 31 05 17 – Aggregate and Granular Materials

        3. Excavated or graded material conforming to the backfill specification may be used as site fill or for grading work after approval by the Owner's Representative/Consultant.

        4. The Owner's Representative/Consultant reserves the right to approve which of the excavated material is to be reused, and which is to be disposed offsite, based upon material quality and suitability for its intended purpose.

        5. Protect approved material from contamination.

        6. Pit Run Gravel

            1. To be well graded granular material, substantially free form clay clumps, organic material and other extraneous material, screened to remove all stones in excess of 75mm. Material to compact to specified density and conform to the following gradations:

Sieve Size (mm)	Percent passing (%)
75	100
50	70-100
25	50-100
4.75	22-100
2.36	10-85
0.075	2-8

        7. Recycled concrete free form contaminated and other extraneous materials conforming to the specified gradations may be used as pit run gravel.

3 – EXECUTION

3.1 ROUGH GRADING OPERATIONS

1. Rough grade site to contours, lines, grades, elevations, and dimensions to the following minimum sub grade depths allowing for depths of finished surface treatment as indicated on contract drawings and to accommodate planting areas shall be as follows:

Depths	Areas
150mm (6")	Lawn
300mm (12")	Perennials, Grasses, and Groundcovers
450mm (18")	Shrub Planting
900mm (36")	Tree Planting

2. Remove and dispose all deleterious material, grass sod, organic material, roots, branches, stones, concrete, asphalt waste, building materials or any other elements which may interfere with the installation of proposed hard landscape components noted on contract drawings. All material shall be disposed of in an approved off site disposal area.

3. Remove and dispose all deleterious material, grass sod, organic material, roots, branches, stones, concrete, asphalt waste, building materials, visible weeds and any other elements which may interfere with the healthy growth of the proposed landscape plant material. All material shall be disposed of in an approved off site disposal area.

4. Shape and roll alternately to obtain smooth, even, and uniformly compacted sub grade surface. Finished sub grade shall have no irregularities exceed 15mm (5/8”) when checked with a 3.0 meter (10’-0”) straight edge placed in any direction.

5. Apply water as necessary during compaction to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is suitable for compaction.

6. Compaction Densities:

    1. Ensure that all rough grade sub grade areas are compacted to the following Modified Proctor Densities (MPD):

        1. Soft Landscape Areas - 80% MPD in compliance with ASTM D1557

        2. Hard Landscape Areas - 95% MPD in accordance with ASTM D1557

7. All landscape areas to be scarified to a depth of 200 mm (8”) after compaction to ensure proper drainage.

8. Remove and dispose offsite all obstructions or debris encountered during excavation before any construction procedures commence to avoid contamination of sub grade.

9. Ensure the sub grade has a minimum gradient for positive subsurface drainage.

10. Re-usable common excavation may be stockpiled but must not cover any on-site stockpiled topsoil or grassed areas.

11. Do not disturb soil or rock below bearing surfaces.

12. Notify Owner’s Representative/Consultant when excavations are complete.

13. Excavation taken below depths shown on the Contract Drawings without the written authorization of the Owner’s Representative/Consultant must be filled at Landscape Contractor's expense.

14. If bearings are unsatisfactory, additional excavation will be authorized by Owner’s Representative/Consultant in writing and paid for as per the contract unit price for common excavation.

15. Dispose of surplus and unsuitable excavated material offsite at an approved disposal area.

16. Do not obstruct flow of surface drainage or water courses.

17. Obtain Owner’s Representative/Consultant approval of completed excavation, backfilling, and rough grading.

18. Hand trim tree exposed roots, remove and make firm areas of loose materials and debris from excavations.

3.2 SHORTAGE AND SURPLUS

1. Supply all necessary fill to meet backfilling and grading requirements.

2. Remove surplus material unsuitable for fill, grading or landscaping from site and dispose at an approved disposal area.

3.3 DEWATERING

1. Keep excavations and construction site area free of water while work is in progress and protect against surface runoff.

2. Provide pumps, piping, temporary drains, trenches, sumps, and related equipment to remove water.

3. Provide settling basins, siltation fences, and or other siltation control facilities to remove suspended solids or other materials before discharging to storm sewers or water courses.

4. Submit for Owner's Representative/Consultant review details of proposed dewatering methods. Maintain groundwater table a minimum of 300mm below elevations for sub grade.

5. Do not use sanitary sewers or private property for discharge of water.

6. Dispose of water in a manner not detrimental to the environment, public and private property, or any portion of work completed or under construction.

3.4 GRADING TOLERANCES

1. General: Uniformly grade site, including adjacent transition areas. Smooth finish surface within specified tolerances of plus/minus 25mm; compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

2. Grade Control: During construction, maintain lines and grades including crown and cross-slope of sub grade course. Grading outside of the line defining the work of this contract shall consist of rough grading to grades indicated.

3. Grading Surface of Fill: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of ± 15 mm when tested with a 3 meter straight edge.

4. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

5. Stripped grade below slabs shall be brought up to required elevation using free draining material in maximum 300 mm lifts and compacted to a minimum 98% Standard Proctor dry density.

3.5 ROUGH GRADING OPERATIONS

1. Fill Placement – Soft Landscape: Place fill materials over acceptable sub grade to elevations and sections shown on contract drawings. Place in maximum 200 mm (8") lifts, compacting each lift to 80% Modified Proctor Density.

2. Fill Placement – Hard Landscape Areas: Place fill materials over acceptable sub grade to elevations and sections shown on contract drawings. Place in maximum150mm (6") lifts. Each lift to be compacted to 95% MPD.

3. Ensure gradients conform to slopes and grades indicated on the contract drawings. Contractor shall inform the Consultant if the following grading guidelines cannot be attained:

Location	Minimum	Maximum
Lawn and Grass	50:1 (2 %)	3:1 (33 %)
Grass Swales	50:1 (2 %)	10:1 (10 %)
Slopes along inverts	6:1 (16 %)	3:1 (33 %)

Side Slopes – Planted areas	50:1 (2 %)	2.5:1 (40 %)

*Unless directed otherwise by Owner's Representative/Consultant

4. Ensure grade transitions are smooth and even and carried out such that ponding will not occur on sub grade surface.

3.6 PROTECTION

1. Maintain finished surfaces in condition conforming to this section until acceptable by Contract Administrator.

2. Polyethylene sheets shall be placed on stockpiled re-usable native material to protect against erosion and contamination.

3. Polyethylene sheets shall be placed on all exposed surfaces to protect against erosion.

    1. Polyethylene sheets shall be pinned to prevent displacement by the wind.

3.7 EQUIPMENT

1. Excavation shall be carried out using an excavator equipped with a clean-up/landscape bucket to minimize disturbance to the sub grade.

2. Compaction equipment must be capable of obtaining required densities in materials on project. Equipment that does not achieve specified densities must be replaced or supplemented.

3.8 FINISH GRADING

1. See Section 32 91 00 – Topsoil and Finish Grading for placement and finish grading of growing medium (topsoil).

END OF SECTION

1 – GENERAL

1.1 GENERAL REQUIREMENTS

1. Section 31 23 01 refers to those portions of the Works that are unique to excavating and backfilling in the areas for hard and softscape infrastructure as shown on Contract Drawings.

2. Excavation and removals, as defined below, are all classified as 'common excavation' and shall be removed by acceptable methods to the design sub grade elevations or, as otherwise directed by the Owner's Representative /Consultant.

3. The Excavation Contractor shall furnish all services, labour, materials, equipment and operations for all common excavation and off-site disposal as specified herein. Refer to Contract Drawings and Details for the extents of the sub grade excavation work. All work shall be completed to the compete satisfaction of the Owner's Representative /Consultant.

4. The cost to load, haul and dispose of any common excavation which is surplus for the needs of on-site grading and backfilling or, is determined by the Owner's Representative /Consultant to be unsuitable for reuse as sub grade fill or back fill shall be included in the tender price shown on the Schedule of Quantities and Prices found in the Form of Tender

5. Measurement and Payment for this section does not include excavation, trenching and backfilling for utility installations including, but not limited to, irrigation, electrical, communications, storm, water, gas, manholes, lawn basins and the like.

6. Excavation, trenching and backfilling for utility installations shall be included in their relevant sections herein these Specifications and as shown on the Schedule of Quantities and Prices found in the Form of Tender.

7. The Contractor shall rough grade to the sub grade design elevations, as indicated on the Contract Drawings, ensuring the sub grade has minimum gradient for positive sub surface drainage.

8. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the Works described herein.

1.2 RELATED WORK

1. Section 01 57 01 - Environmental Protection

2. Section 31 11 01 - Clearing and Grubbing

3. Section 31 22 01 - Site Grading

4. Section 31 05 17 - Aggregate and Granular Materials

5. Section 32 91 21 - Topsoil and Finish Grading

6. Sediment Control - Sediment Control Bylaw

1.3 REFERENCES

1. Master Municipal Construction Documents(MMCD) Volume II 2009 Platinum Edition

2. British Columbia Landscape Standards (current edition)

3. Canadian System of Soil Classification (current edition)

4. ASTM D698-[91(1998)], Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft) (600 kN-m/m).

5. ASTM C 136-92, Method for Sieve Analysis of Fine and Coarse Aggregates.

6. ASTM D422-63(1990), Method for Particle-Size Analysis of Soils.

7. ASTM D4318-84, Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

8. CAN/CGSB-8.2-M88, Sieves, Testing, Woven, Wire, Metric.

9. CAN/CSA-A23.1-[M94], Concrete Materials and Methods of Concrete Construction.

1.4 DEFINITIONS

1. Common Excavation:

    1. Excavation of materials of whatever nature including, but not limited to sod, organic material, underlying and unsuitable materials, dense tills, hard pan, partially cemented materials, clay or frozen materials, boulders and rock which can be ripped, excavated and loaded with heavy construction equipment and disposed at an approved off-site location.

2. Over Excavation:

    1. Excavation below design elevations of bottom of specified bedding and, including backfilling of resultant excavation with specified material, as authorized by the Owner's Representative/Consultant.

3. Removals:

    1. Removal and disposal at an approved location off-site of surface concrete structures and walls, curbs and gutters, manholes, catch basins, pipes, culverts, end walls and any other structures on surface or underground specifically designated on the Contract Drawings for removal. Removals shall include backfilling of resultant excavation with specified material, as authorized by the Owner's Representative /Consultant.

4. Native Material:

    1. Refer to Section 32 91 21 - Topsoil and Finish Grading

1.5 PROTECTION

1. Examine site with Owner's Representative/Consultant and obtain approval of previous work prior to commencing the excavation operation.

2. Comply with MMCD General Conditions, Clause 4.3 - Protection of Work, Property and the Public and, MMCD General Conditions, Clause 4.5 - Errors, Inconsistencies or Omissions in the Contract Documents.

3. Install and maintain all sediment and erosion control features prior to commencing excavation work, as specified, to the complete satisfaction of the Owner's Representative /Consultant.

4. Maintain sediment and erosion control features for the duration of the project.

5. Prior to commencing any excavation work the contractor shall establish the location of any existing active buried utility or service lines, including service entry points. Mark these locations clearly on site to prevent accidental disturbance during the work.

6. Any utility or service which is presently in use, or not established as abandoned but which must be moved or otherwise disturbed, shall be referred to the utility or service company concerned so that they may advise on, co–ordinate and inspect necessary operation for relocation.

7. Costs incurred by any disturbance of existing active utilities and service lines, not called for under the contract documents, shall be borne by the Contractor.

8. Any damage done including settlement or collapse to existing active services caused by inadequate measures taken by the Contractor to prevent such disturbances shall be rectified immediately by the Contractor at no cost to the Owner.

9. Keep excavations clean, free of standing water, and loose soil.

10. Protect existing fencing, natural features, bench marks, existing buildings, existing pavement, sub surface and surface utility lines, and water courses and miscellaneous items noted on contract drawings as to remain.

11. .Protect all existing trees, landscape plant beds, miscellaneous plant material and their associated root areas within the area to be excavated that have been identified on the contract drawings as to remain.

12. Protect all existing trees, landscape plant beds, miscellaneous plant material and their associated root areas that are outside of area to be excavated.

13. Notify the Owner's Representative/Consultant immediately if any damage occurs.

14. Contractor shall be responsible for implementation, maintenance, and decommissioning of vehicle wheel wash facility. Decommissioning of wheel wash facility includes but is not limited to fill and re-grading of affected area to the satisfaction of the Owner's Representative /Consultant.

15. Contractor shall be responsible for cleaning of adjacent municipal streets, private streets and driveways affected by vehicle movements on site or to and from the site.

16. Contractor shall be responsible for implementing and maintaining dust control measures for all on site activities of this section. Dust control measures shall meet all local bylaws and regulations

17. The Contractor, at no cost to the Owner shall make good all damages incurred during the excavation and backfilling operation.

1.6 SAFETY

1. Comply with MMCD General Conditions, Clause 4.2 – Safety.

2. Design and install shoring in accordance with the regulations of WorkSafe BC.

3. Contractor is responsible for complying with all current WorkSafe BC requirements for site safety related to the scope of work in this section. This includes but is not limited to protection of personnel and site safety procedures related to open excavation.

1.7 SITE ACCESS

1. The Contractor shall be responsible for ensuring that there is minimal disruption of vehicle and pedestrian traffic flow on adjacent existing roads during work of this section.

2. The Contractor shall be responsible for providing warning signs, flashing lights, flag people barricades, etc. to ensure vehicle and pedestrian movement associated with the site or adjacent to the site meets all applicable municipal, provincial or federal requirements.

1.8 DISPOSAL

1. Dispose of all surplus spoil from excavations on-site and/or off-site as shown on Contract Drawings or as specified in the Contract Documents.

2. Dumping of spoil on private property will be permitted only upon written approval from property owner and provided all necessary permits and approvals have been obtained.

1.9 LIMITATIONS OF OPEN EXCAVATIONS

1. Excavate only as far in advance as safety, traffic and weather conditions permit and, in no case to exceed 30 m. Before stopping work on last day of work before each weekend or holiday, completely backfill open excavations. If circumstances do not permit complete backfilling of all open excavations, adequately protect all open with approved fencing or barricades and, where required, with flashing lights.

2. Dumping of spoil on private property will be permitted only upon written approval from property owner and provided all necessary permits and approvals have been obtained.

1.10 PERMITS AND APPROVALS

1. Comply with MMCD General Conditions, Clause 20 - Laws, Notices, Permits and Fees.

2. The Contractor shall at no cost to the Owner obtain all damage and/ or crossing deposits required by the municipal, provincial, federal or utility to carry out the work of this section.

1.11 TESTING AND INSPECTIONS

1. The Contractor shall at no cost to the Owner and as part of the work of this section perform, or cause to be performed, all tests, inspections and approvals.

2. Should the test, inspection or approval require a representative sample of the material or workmanship the Contractor shall at no cost to the Owner supply the labour and materials necessary to provide the sample or test.

3. Should the test or inspection indicate that the material or work completed does not conform to the specifications the Contractor shall at no cost to the Owner promptly remove this work, dispose of it off site and re-execute it in accordance with the Contract Documents. The remedial work shall include retesting as required to establish conformance with the Contract Documents.

4. The Owner’s Representative/Consultant is to inspect and approve all stages of the work.

    1. Provide forty-eight (48) hours’ notice to the Owner’s Representative/Consultant when inspection is required.

5. At the Owner’s Representative/Consultant discretion, a licensed testing agency will be retained by the Contractor to perform periodic testing of the sub grade preparation to demonstrate proctor density has been achieved at no extra cost to the Owner.

6. Remove any base materials which are unacceptable for required sub-grade bearing capacities or Corrected Maximum Dry Density (MPD) as specified.

1.12 SUBMITTALS

1. Prior to the start of work for this section the Contractor shall submit the following to the Owner’s Representative /Consultant for review:

    1. Sieve analysis of granular material

2. Source for supply of all materials (source shall be used throughout duration of project). Should a change of material source be proposed during work; provide samples and sieve analysis from proposed source.

3. Company name, address and contact information for material testing company.

1.13 GEOTECHNICAL REPORT

1. A Geotechnical Report has been prepared by the Consultant and is included herein these specifications.

1.14 INTERPRETATION OF THE WORK

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

1.15 COORDINATION

1. Over Excavation

    1. Based on the Geotechnical Report prepared by Consultant, the Owner's Representative/Consultant does not anticipate need for over excavation unless it is discovered that conditions differ from those encountered at test hole locations. These changes or variations may be one of the following:

        1. Organics or topsoil encountered below the anticipated design sub grade elevations for:

            1. Footings

            2. Soft or wet, silty with clay soils within the sub grade.

            3. Buried concrete, wood debris or old foundations.

    2. If these conditions are encountered the contractor must notify the Owner's Representative/Consultant prior to over excavation.

    3. If unsuitable bearing materials are encountered at indicated elevations, carry excavation deeper and replace excavated material with suitable materials as directed by the Owner's Representative/Consultant

    4. Perform over excavation only by written authorization of the Owner's Representative/Consultant. If additional over excavation is required, Owner's Representative/Consultant shall be notified so that exact quantities can be measured.

2. If sub grade non-structural, or structural, fills are required to meet design sub grades, use granular material as per MMCD Section 31 05 17 - Aggregate and Granular Materials.

3. Unauthorized Excavation

    1. Unauthorized excavation shall be any excavation beyond elevations and dimensions indicated, without specific direction by the Owner's Representative/Consultant.

    2. The Contractor shall fill unauthorized excavation with approved fill material, to elevations and dimensions indicated, to the requirements of this section.

3. Unauthorized excavation and remedial work shall be at Contractor's expense.

1.16 MEASUREMENT AND PAYMENT

1. Measurement for common excavation to include sod stripping; underlying organic materials; finish sub grade; grading to design elevations and grades; cut, backfill & compaction; temporary stockpiling and offsite removal of surplus to an approved disposal site. Stockpiling for re-use will be made before and after cross sections of the excavated area, as determined by field measurements on site, by the Owner's Representative/Consultant.

2. Measurement and payment for removal and off-site disposal of surplus, soft or unsuitable material revealed during proof-rolling includes all remedial work, equipment, materials and requirements for over excavation (over the sub grade design elevations) shall be made by loose truck box volume as determined by Owner's Representative/Consultant.

3. Loads removed offsite that are not witnessed by the Owner's Representative/Consultant will not be paid.

4. Measurement for imported fill materials to backfill over excavations, will include all remedial work, materials, requirements and compaction, and will be based on weigh tickets provided to Owner's Representative/Consultant as loads are delivered. Loads delivered that are not witnessed by the Owner's Representative/Consultant will not be paid.

5. Measurement and payment for topsoil stripping including, stockpiling for re-use then, placement and spreading of native topsoil previously stockpiled on-site will be made before and after cross sections of stripped area as determined by field measurements on site by the Owner's Representative/Consultant.

2 – PRODUCTS

2.1 MATERIALS (IF BACKFILL REQUIRED)

1. Backfill

    1. Use suitable existing inorganic material approved by the Owner's Representative/ Consultant and compact to at least 95% Standard Proctor maximum dry density.

    2. Should a Geotechnical Engineer not be part of the project team a Geotechnical Engineer shall be engaged by the Contractor at no cost to the Owner.

        1. Review and approvals by a Geotechnical Engineer engaged by the Contractor shall be signed and sealed and submitted to the Owner's Representative/Consultant prior to use of this material.

2. Type

    1. Granular and fill material shall be as identified in:

        1. Section 31 23 01 - Excavation and Backfill

        2. Section 32 11 23 - Aggregate Base Courses

    2. Excavated or graded material conforming to the backfill specification may be used as site fill or for grading work after approval by the Owner's Representative/Consultant.

    3. The Owner's Representative/Consultant reserves the right to approve which of the excavated material is to be reused, and which is to be disposed offsite, based upon material quality and suitability for its intended purpose.

4. Should a Geotechnical Engineer not be part of the project team a Geotechnical Engineer shall be engaged by the Contractor at no cost to the Owner.

    1. Review and approvals by a Geotechnical Engineer engaged by the Contractor shall be signed and sealed and submitted to the Owner's Representative/Consultant prior to use of this material.

5. Protect approved material from contamination.

6. Recycled Concrete

    1. Recycled concrete free form contaminated and other extraneous materials conforming to the specified gradations may be used as pit run gravel.

7. Pit Run Gravel

    1. To be well graded granular material, substantially free form clay clumps, organic material and other extraneous material, screened to remove all stones in excess of 75mm. Material to compact to specified density and conform to the following gradations:

Sieve Size (mm)	Percent passing (%)
75	100
50	70-100
25	50-100
4.75	22-100
2.36	10-85
0.075	2-8

8. Granular Sub Base

    1. Shall be 75 mm (3") minus, clean, granular material free of organic material conforming to following gradation limits:

Sieve Size (mm)	Percent passing (%)
80	100
75	55-100
4.8	30-100
38	60-100
19	35-80
9.5	26-60
4.75	20-40
2.36	15-30
1.18	10-20
0.6um	5-15
0.3um	3-10
0.075um	0-5

9. Granular Base

    1. The 19 mm (3/4") crushed granular base course shall consist of sound, durable particles, free from clay, organic material, or other deleterious matter, evenly graded, to meet the following gradation requirements:

Sieve Size (mm)	Percent passing (%)
19	100
12.5	75-100
9.5	60-90
4.75	40-70
2.36	27-55
1.18	16-42
0.60	8-30
0.30	5-20
0.15	5-15
0.074	2-8

10. River Sand

    1. River sand to be free of organic material, salt and foreign objects and conform to the following gradation:

Sieve Size (mm)	Percent passing (%)
19	100
4.75	80-100
0.6	20-80
0.15	0-20
0.075	0-8

3 – EXECUTION

3.1 EXCAVATION

1. Prior to commencing excavation the Contractor shall:

    1. Confirm in writing to the Owner's Representative/Consultant that he has verified the locations of all underground services.

    2. Obtained in writing and submitted to the Owner's Representative/Consultant at no Cost to the Owner permission from adjacent property owners to carry out work beyond the property limits of this contract if required to carry out the work of this section.

    3. Notify the Owner's Representative/Consultant for on-site review of sub grade preparation work twenty–four (24) hours prior to commencement of import, placement and grading operations.

2. Excavate to lines, grades, elevations, and dimensions indicated on contract documents or required by the work of this section or related sections.

3. Remove and dispose offsite all grass sod, organic material, wood, concrete, asphalt waste, and any other obstructions or debris encountered before any excavation procedures commence to avoid contamination of sub grade.

4. Ensure that work of this section provides sufficient space to permit erection of forms, site elements and miscellaneous elements of related sections.

5. Excavation shall to ensure that the placement of fill materials are minimized.

6. Contractor shall phase his operation so that a stable slope at the edge of excavation is maintained at all times. Where sloping of the sides of excavations are not possible the Contractor shall implement appropriate safety measures in accordance with current Work Safe BC requirements.

7. All exposed excavation faces shall be protected from weather with appropriate tarps or plastic sheeting as soon as possible after being cut.

8. Remove all boulders, rock and stones larger than 150 mm (6”) in diameter from excavated surfaces encountered during excavation. Fill cavities created with crushed granular base course material compacted to 95% Modified Proctor Density. Boulders with a diameter of 600mm or larger are to be reviewed for form and character by the Owner’s Representative/Consultant to be deemed satisfactory for use on site prior to disposal.

9. Bottom of excavation to be level, free from loose material and debris.

10. Protect excavations against freezing. Frozen areas shall be thawed and protected from further frost until subsequent work has been completed.

11. .All necessary precautions shall be taken to preserve all materials outside the required excavations in an undisturbed condition.

12. Ensure the sub grade has a minimum gradient for positive subsurface drainage.

13. Re-usable common excavation may be stockpiled but must not cover any, on site, stockpiled topsoil or grassed areas.

14. Do not disturb soil or rock below bearing surfaces.

15. Notify Owner’s Representative/Consultant/Geotechnical Engineer when excavations are complete.

16. Excavation taken below depths shown on the Contract Drawings without the written authorization of the Owner’s Representative/Geotechnical Engineer must be filled at Contractor's expense.

17. Excavate trenches to provide uniform continuous bearing and support for specified thickness of pipe bedding material on solid and undisturbed ground.

18. For trench excavation, unless otherwise authorized by Owner’s Representative/ Consultant in writing, do not excavate more than 30 meters of trench in advance of installation operations and do not leave open more than 15 meters at end of day's operation (provide barricades).

19. Excavate for concrete and concrete asphalt paving to sub grade design elevations.

20. If bearings are unsatisfactory, additional excavation will be authorized by the Owner’s Representative/ Geotechnical Consultant in writing and paid for as per the contract unit price for common excavation.

21. Dispose of surplus and unsuitable excavated material offsite.

22. .Install and maintain all sediment and erosion features to control flow of surface drainage. Do not obstruct or alter the flow of water courses.

23. Notify Owner’s Representative/ Geotechnical Engineer when bottom of excavations appears unsuitable and proceed as directed by the Owner’s Representative/ Geotechnical Engineer.

24. Obtain Owner’s Representative/ Geotechnical Consultant approval of completed excavation.

25. Remove unsuitable material from bottom of excavation to extended depth as directed by Owner's Representative/ Geotechnical Engineer. Backfill and compact as directed by Owner's Representative/ Geotechnical Engineer.

26. Hand trim roots, make firm, and remove loose materials and debris from excavations.

27. Costs incurred as a result of deterioration caused by activities or neglect of the Contractor or and fill required for over excavation as a result of action by the Contractor are the responsibility of the Contractor.

3.2 PLACEMENT OF GRANULAR FILL

1. Prior to the backfill operation of site excavation ensure the following actions have been completed;

    1. Concrete foundation walls and footings shall have reached specified strength unless otherwise approved by the Owner's Representative/Geotechnical Engineer.

    2. All backfill materials shall have been inspected and approved by the Owner's Representative/Geotechnical Engineer

    3. Each component of the backfill operation shall have been inspected and approved by the Owner's Representative/Geotechnical Engineer at the time of placement.

    4. Compaction density tests shall have been completed and tests results reviewed and approved by the Owner's Representative/Geotechnical Engineer.

2. Place crushed granular sub–base in maximum 300 mm (1'-0") lifts to depths indicated on drawings. Compact each lift to 95% Modified Proctor Density, ASTM D 698.

3. Place granular base in maximum 150 mm (6") lifts to depths shown on the drawings. Compact each lift to 95% Modified Proctor Maximum Density, ASTM D 698.

4. Place all native material fill in uniform 300 mm (1'-0") compacted lifts to depths indicated on drawings. Compact each lift to 95% Modified Proctor Density, ASTM D 698.

5. Ensure that granular fill material is placed to the full width of the excavation, in uniform lifts, shaping each lift to smooth, even contours.

6. Ensure the placement and compaction of crushed granular sub-base and granular base does not segregate or degrade the aggregate.

7. Apply water as necessary during compaction to obtain specified density. If material is excessively moist aerate by scarifying with suitable equipment until moisture content is suitable for compaction.

8. Mechanical compaction equipment shall be used with extreme caution to prevent any undue pressure on foundation work. Do not use motorized compaction equipment directly adjacent to foundation or retaining walls.

9. Where backfill is required on both sides of foundation walls it shall be placed and compacted simultaneously on both sides of the wall.

10. All sub grade whether disturbed or undisturbed, shall be compacted to 95% Modified Proctor Density, ASTM D 698.

    1. Soft areas or areas that do not meet specified compacted densities shall be over excavated and filled with compacted crushed granular base course as required to obtain the specified compaction density.

3.3 EMBANKMENTS

1. Scarify or bench existing slopes in side hill or sloping sections to ensure proper bond between new materials and existing surfaces. Method used to be subject to prior approval of the Owner's Representative/Geotechnical Engineer.

2. Do not place material which is frozen nor place material on frozen surfaces except in areas authorized.

3. Maintain crowned surface during construction to ensure ready run-off of surface water.

4. Drain low areas before placing material.

5. Place and compact to full width in layers not exceeding 300 mm loose thickness. The Owner's Representative/Geotechnical Engineer may authorize thicker lifts if specified compaction can be achieved and if material contains more than 25% by volume stone and rock fragments larger than 100 mm.

6. Where embankment material consists of rock:

    1. Place to full width in layers of sufficient depth to contain maximum sized rocks, but in no case is layer thickness to exceed 1 m.

    2. Carefully distribute rock material to fill voids with smaller fragments to form compact mass.

    3. Fill surface voids at subgrade level with rock spalls or selected material to form an earth- tight surface.

    4. Do not place boulders and rock fragments with dimensions exceeding 150 mm within 300 mm of subgrade elevations.

    5. Do not place boulders and rock fragments with dimensions exceeding 150 mm within 300 mm of subgrade elevation.

7. Polyethylene sheets shall be placed on all exposed surfaces to protect against erosion.

    1. Polyethylene sheets shall be pinned to prevent displacement by wind.

8. No extra payment shall be made for overbuild to embankments, unless previously authorized by the Owner's Representative/Geotechnical Engineer.

3.4 DISPOSAL AND STOCKPILE

1. Supply all necessary fill to meet backfilling and grading requirements.

2. Remove surplus material unsuitable for fill, grading or landscaping from site and dispose at an approved disposal area.

3. Polyethylene sheets shall be placed on stockpiled re-usable native material to protect against erosion and contamination.

3.5 DEWATERING

1. Keep excavations and construction site area free of water while work is in progress and protect against surface runoff.

2. Provide pumps, piping, temporary drains, trenches, sumps, and related equipment to remove water.

3. Provide settling basins, siltation fences, and or other siltation control facilities to remove suspended solids or other materials before discharging to storm sewers or water courses.

4. Ensure that sediment control devices are in place as per municipal/provincial regulations prior to the start of dewatering operations. Do not divert dewatering effluent to natural water bodies.

5. Submit for Owner's Representative/ Engineer review details of proposed dewatering methods. Maintain groundwater table a minimum of 300mm below elevations for sub grade.

6. Do not use sanitary sewers or private property for discharge of water.

7. Dispose of water in a manner not detrimental to the environment, public and private property, or any portion of work completed or under construction.

3.6 GRADING TOLERANCES FOR SUBGRADE AND GRANULAR FILL

1. General

    1. Uniformly grade site, including adjacent transition areas. Smooth finish surface within specified tolerances of ± 15 mm; compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

2. Grade Control

    2. During construction, maintain lines and grades including crown and cross-slope of sub grade course. Grading outside of the line defining the work of this contract shall consist of rough grading to grades indicated.

3. Grading Surface of Fill

    1. Grade smooth and even, free of voids, compacted as specified, and to required elevation.

    2. Provide final grades within a tolerance of ± 15 mm when tested with a 3 meter straight edge.

4. Compaction

    1. After grading, compact sub grade surfaces to the depth and percentage of maximum density for each area classification.

5. Stripped grade below slabs shall be brought up to required elevation using free draining material in maximum 300 mm lifts and compacted to a minimum 95% Modified Proctor dry density.

6. Shaping of sub grade shall ensure uniform slope transitions with rounded, smooth profiles between changes in elevations

7. Ensure that sub grade preparation allows for depth of granular fill and finished materials as indicated on contract drawings.

3.7 PROTECTION

1. Maintain finished surfaces in condition conforming to this section until acceptable by Owner's Representative/Geotechnical Consultant.

2. Polyethylene sheets shall be placed on stockpiled re-usable native material to protect against erosion and contamination.

3. Polyethylene sheets shall be placed on all exposed surfaces to protect against erosion.

    1. Polyethylene sheets shall be pinned to prevent displacement by the wind.

3.8 EQUIPMENT

1. Excavation shall be carried out using an excavator equipped with a clean-up/landscape bucket to minimize disturbance to the sub grade.

2. Compaction equipment must be capable of obtaining required densities in materials on project.

3. Equipment that does not achieve specified densities must be replaced or supplemented.

3.9 FINISH GRADING

1. See Section 329121 – Topsoil and finish Grading for placement and finish grading of growing medium (topsoil).

3.10 CLEAN UP

1. Clean up and remove from the site, as the work proceeds any debris and waste material or rubbish resulting from the work of this section.

2. Transport all surplus excavated materials, fill materials and debris off site to an approval disposal area.

END OF SECTION

1 – GENERAL

1.2 RELATED SECTIONS

1. Section 31 05 16 - Aggregate Materials
2. Section 32 11 16.01 - Granular Sub-base

1.3 REFERENCES

1. ASTM International
    1. ASTM C117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
    2. ASTM C131, Standard Test Method for Resistance to Degradation of Small- Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
    3. ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
    4. ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft3) (600kN-m/m3).
    5. ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft3) (2,700kN-m/m3).
    6. ASTM D1883, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
    7. ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
2. Canadian General Standards Board (CGSB)
    1. CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
    2. CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

1.4 SUBMITTALS

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

1.5 DELIVERY, STORAGE AND HANDLING

1. Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements
2. Storage and Handling Requirements:
    1. Stockpile minimum 50% of total aggregate required prior to beginning operation.
    2. Replace defective or damaged materials with new.
    3. Store cement in weathertight bins or silos that provide protection from dampness and easy access for inspection and identification of each shipment.

2 – PRODUCTS

2.1 MATERIALS

1. Granular base: material in accordance with Section 31 05 16 - Aggregate Materials and following requirements:

    1. Crushed stone or gravel.

    2. Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1 and CAN/CGSB-8.2.

Gradation Method #1	% Passing	
(1)	75mm Minus	19mm Minus
100 mm		-
75 mm	[100]	-
50 mm	[60-100]	-
37.5 mm		-
25 mm		-
19 mm	[35-80]	[100]
12.5 mm		[75-100]
9.5 mm	[26-60	[60-90]
4.75 mm	[20-40]	[40-70]
2.36 mm	[15-30]	[27-55]
1.18 mm	[10-20]	[16-42]
0.6 mm		[8-30]
0.3 mm		[5-20]
0.075 mm		[2-8]
0.6 um	[5-15]	
0.3 um	[3-10]	
0.075 um	[0-5]	

3 – EXECUTION

3.1 PREPARATION

1. Temporary Erosion and Sedimentation Control:

    1. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment requirements of authorities having jurisdiction.

    2. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

    3. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2PLACEMENT AND INSTALLATION

1. Place granular base after sub-base and/or subgrade surface is inspected and approved in writing by Owner’s Representative/Consultant.

2. Placing:

    1. Construct granular base to depth and grade in areas indicated.

    2. Ensure no frozen material is placed.

3. Place material only on clean unfrozen surface, free from snow and ice.

4. Begin spreading base material on crown line or on high side of one-way slope.

5. Place material using methods which do not lead to segregation or degradation of aggregate.

6. For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.

7. Place material to full width in uniform layers not exceeding 150 mm compacted thickness.

    1. Owner's Representative/Consultant may authorize thicker lifts (layers) if specified compaction can be achieved.

8. Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

9. Remove and replace that portion of layer in which material becomes segregated during spreading.

3. Compaction Equipment:

    1. Ensure compaction equipment is capable of obtaining required material densities.

    2. Efficiency of equipment not specified to be proved at least as efficient as specified equipment at no extra cost and written approval must be received from Owner's Representative/Consultant before use.

    3. Equipped with device that records hours of actual work, not motor running hours.

4. Compacting:

    1. Compact to density not less than 100% corrected maximum dry density ASTM D698.

    2. Shape and roll alternately to obtain smooth, even, and uniformly compacted base.

    3. Apply water as necessary during compacting to obtain specified density.

    4. In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by the Consultant.

    5. Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 SITE TOLERANCES

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

3.4 CLEANING

1. Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

    1. Leave Work area clean at end of each day.

2. Final Cleaning: upon completion remove surplus materials, rubbish, tools, and equipment in accordance with Section 01 74 11 - Cleaning.

3.5 PROTECTION

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

END OF SECTION

1 – GENERAL

1.1 SUMMARY

1. Section Includes:
    1. Hot-mix asphalt patching.
    2. Hot-mix asphalt paving.
2. Hot-mix asphalt overlay.
    1. Related Requirements:
        1. Section 312301 Excavation and Backfill: For subgrade preparation, fill material, unbound- aggregate subbase and base courses, and aggregate pavement shoulders.
        2. Section 321373 "Concrete Paving Joint Sealants: For joint sealants and fillers at pavement terminations.

1.2 PREINSTALLATION MEETINGS

1. Pre-installation Conference: Conduct conference at project site.

1.3 SUBMITTALS

1. Product Data: Contractor is to submit a Design Mix of each mix-type for Owner's Representative/Consultant to review and approve prior to ordering and/or placing on site.
2. Material Certificates: For each paving material. Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.

1.4 QUALITY ASSURANCE

1. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction.

2 - PRODUCTS

2.1 AGGREGATES

1. Coarse Aggregate: ASTM D 692/D 692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag from stone, gravel, cured blast-furnace slag, or combinations thereof.
2. Mineral Filler: ASTM D 242/D 242M or AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.
3. Gradations to be within limits specified when tested to ASTM C136 and ASTM C117.

Sieve Designation	Percent Passing				
	*Lower Course #1	*Lower Course #2	*Upper Course #1	*Upper Course #2	*Fine Mix
25.0 mm	100	--	--	--	--
19.0 mm	--	100	100	--	--
12.5 mm	70-85	84-99	84-99	100	--
9.5 mm	--	73-88	73-88	--	100
4.75 mm	40-65	50-68	50-68	55-75	80-100
2.36 mm	32-53	35-55	35-55	38-58	64-89
1.18 mm	26-44	27-46	27-46	28-47	48-76
0.600 mm	18-36	18-36	18-36	20-36	32-60
0.300 mm	10-26	10-26	10-26	10-26	16-42
0.150 mm	4-17	4-17	4-17	4-17	6-23
0.075 mm	3-8	3-8	3-8	3-8	4-10

***Footnote to asphalt mix-type selection:**
Lower Course #1: Arterial and collector, lower course only.
Lower Course #2 Local, Lower course only.

Upper Course #1 Arterial and collector, upper course only.
Upper Course #2: Local, surface course only.

Fine Mix: Skim patch on existing asphalt surface.

2.2 ASPHALT MATERIALS

1. Asphalt Binder: AASHTO M 320, PG 64-22.

2.3 MIXES

1. Surface Course Limit: Recycled content no more than 10 percent by weight.

2. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types"; and complying with the following requirements:

    1. Provide mixes with a history of satisfactory performance in geographical area where project is located.

    2. Base Course: Lower Course #2 (Refer to table 2.1 D.)

    3. Surface Course: Upper Course #2. (Refer to table 2.1 D.)

3 – EXECUTION

3.1 PATCHING

1. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 300 mm (12 inches) into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

2. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.2 SURFACE PREPARATION

1. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

2. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

3.3 PLACING HOT-MIX ASPHALT

1. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

    1. Spread mix at a minimum temperature of 121 deg C (250 deg F).

    2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

2. Place paving in consecutive strips not less than 3 m (10 feet) wide unless infill edge strips of a lesser width are required.

3. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.4 JOINTS

1. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

    1. Clean contact surfaces and apply tack coat to joints.

    2. Offset longitudinal joints, in successive courses, a minimum of 150 mm (6 inches).

    3. Offset transverse joints, in successive courses, a minimum of 600 mm (24 inches).

    4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

3.5 COMPACTION

1. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

    1. Complete compaction before mix temperature cools to 85 deg C (185 deg F).

2. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

3. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot- mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

    1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent or greater than 96 percent.

4. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

5. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

6. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

7. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 INSTALLATION TOLERANCES

1. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

    1. Base Course: Plus or minus 13 mm (1/2 inch).

    2. Surface Course: Plus 6 mm (1/4 inch), no minus.

2. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 3-m (10-foot) straightedge applied transversely or longitudinally to paved areas:

    1. Base Course: 6 mm (1/4 inch).

    2. Surface Course: 3 mm (1/8 inch).

3.7 FIELD QUALITY CONTROL

1. Replace and compact hot-mix asphalt where core tests were taken.

2. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements

3.8 ENVIRONMENTAL CONDITIONS

1. Do not install hot-mix asphalt concrete pavement, base, or sub-base during heavy rain or snowfall, cool temperatures, or other unsuitable conditions as determined by Staff. Place paving under favourable weather conditions; with temperatures exceeding 4 degrees Celsius. Base and sub-base surface should be dry and stable. Air temperature must be at least 5 degrees Celsius to place asphalt mixtures. (Air temperature must be 10 degrees and rising for tennis and sport courts)

2. Do not install asphalt concrete paving on frozen, wet, muddy, or rutted base(s).

3. Examine substrates and notify Staff of any deficiencies related to compaction or incorrect grades or slopes. Ensure deficiencies are corrected prior to commencement of work of this Section.

4. Use Oil Soak Blotters in catch basin spillways and elsewhere as directed to avoid spilling oil into site drainage system(s) or adjacent watercourses.

5. Allow asphalt concrete paving to completely cure prior to washing the surface to avoid spilling oil into site drainage system(s) or adjacent watercourses.

3.9 WASTE HANDLING

1. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 -Construction Waste Management and Disposal.

END OF SECTION

1 – GENERAL

1.1 GENERAL REQUIREMENTS

1. Section 32 31 13 refers to those portions of the Works that are unique to the supply and installation of chain link fences and gates. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the Works described herein.

2. Industry standards to apply where details and procedures not specified.

1.2 RELATED WORK

1. Section 03 30 53 Cast-in-Place Concrete.

1.3 REFERENCES

1. Master Municipal Construction Documents (MMCD) Volume II 2009 Edition

2. CAN/CGSB-138.1-M80, Fence, Chain Link Fabric.

3. CAN/CGSB-138.2-M80, Fence, Chain Link, Framework, Zinc-Coated, Steel.

4. CAN/CGSB-138.3-M80, Fence, Chain Link Installation.

5. CAN/CGSB-138.4-M82, Fence, Chain Link, Gates.

6. CSA G164-M1981, Hot Dip Galvanizing of Irregularly Shaped Articles.

7. ASTM A90-81, Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.

8. ASTM A53-88a, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

9. CGSB 1-GP-181M-77, Coating, Zinc-Rich, Organic, Ready Mixed.

1.4 INTERPRETATION OF THE WORK

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

1.5 SAMPLES AND SUBMITTALS

1. Prior to the start of the work, submit a 300mm long powder-coated pipe sample that will be representative of the quality of the powder-coating for all powder-coated fencing materials installed as part of the Works.

1.6 QUALIFICATIONS

1. Execute work in this Section only by a Fencing Contractor who has adequate equipment, skilled tradesmen, and materials to perform it expeditiously and to the specifications and who has at least two similar successful installations to that specified over the previous three years. Previous installations must have been installed under the same company ownership and with the same project supervisor proposed for this project.

1.7 SUPERVISOR

1. The Fencing Contractor must provide an experienced on-site supervisor to direct the Works at the site.

1.8 TESTING

1. Refer to MMCD General Conditions, Clause 4.12, Tests and Inspections

2. The surface of the posts and rails will be scratch tested to ensure the finish does not flake. Finishes that flake when scratched will be rejected.

1.9 BONDS, WARRANTIES, AND INSURANCE

1. Provide a company warranty covering products and installation that shall endure for one (1) year starting from the date of Substantial Completion.

2. The company warranty shall cover workmanship, defects in materials, and any other feature that is deemed to be not ordinary wear for chain link fencing.

3. The Contractor shall promptly replace or repair, to the specifications herein, any portions of the chain link fencing that are not performing to the standards of the company warranty within 30 days of being notified by the Owner of the defect(s). All direct and associated costs of the repair work shall be at the sole expense of the Contractor.

1.10 MEASUREMENT AND PAYMENT

1. Payment for chain link fences shall be made by separate items for each height and type of fence as detailed on the Contract Drawings & Details and, as listed in the Schedule of Quantities and Prices.

2. Payment to include post hole digging, offsite disposal of hole digging spoil, concrete supply and installation, chain link fence supply and installation, including, equipment, labour, and materials, and all incidentals required to complete the chain link fence installation work as outlined herein and in the Contract Drawings and Details.

3. Measurement will be made along the surface of the ground for the length of each item of fence installed.

4. Payment for chain link gates shall be made by separate items of each height and type of gate as detailed on the Contract Drawings & Details and as listed in the Schedule of Quantities and Prices. No additional price will be paid for fence gates in the chain link fencing section

5. Payment for chain link fencing using existing onsite re-usable materials will be the same as for chain link fencing using new materials

6. Payment to remove and reinstate fencing will only be made for approved sections of fence which, as decide by the Owner's Representative, are re-useable. Payment of these sections shall include careful removal of existing fence, including gates, posts, mesh and associated hardware, cleaning and storing fence, gates, post, mesh and associated hardware removed and reinstating to same details as previous to removal and all necessary new materials to complete reinstatement.

2 – PRODUCTS

2.1 DELIVERY, STORAGE, AND HANDLING

1. Deliver and store the products in the original manufacturer's packaging with labels intact and store the products where they will be protected from damage. Determine a suitable, Owner's Representative approved, on-site location for products.

2.2 MATERIALS

1. All concrete work to Contract Drawings and Specification Section 03 30 53.
    1. Nominal coarse aggregate size: 19mm.
    2. Compressive strength: 20 MPa minimum at 28 days.
2. Fencing, posts, rails, and fabric is to be constructed as indicated on the Contract Drawings and Specifications herein.
3. Chain-link fence fabric: to CAN/CGSB-138.1.
    1. All chain link fabric is to be galvanized, commercial, and heavy grade with 50mm openings. The widest rolls of fabric are to be employed in the construction of the appropriate fence type (i.e., 1200mm wide rolls for 1200mm high fencing and 2400mm wide rolls for 2400mm high fencing, etc.).
    2. Fabric gauges, fabric opening sizes, fence heights, and post spacing are to be as follows:
        1. 3048mm high with the post spacing 3048mm o.c. and,
        2. Chain link fabric to be 9 gauge (3.55mm diameter) galvanized, commercial grade with 50mm openings.
    3. Posts and rails for all fencing locations are to CAN/CGSB-138.2, schedule 40 galvanized steel pipe. No short lengths, tubing, conduit or open seam material will be permitted.
        1. Post and rail sizes are to be as follows:
            1. Corner and gate posts are to be 90mm nominal outside diameter, standard continuous weld Schedule 40 galvanized steel pipe.
            2. Line posts are to be 60mm nominal outside diameter, standard continuous weld Schedule 40 galvanized steel pipe.
            3. Top and bottom rails and horizontal braces are to be 60mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 galvanized steel pipe.
            4. Bottom tension wire to be single stand, 6-gauge (4.50mm diameter), galvanized steel wire.
4. Tie wire fasteners are to be single strand, galvanized aluminum or steel wire conforming to requirements of fence fabric.
5. All fence connections to be cove fitted and welded construction. Chain link and steel picket fence connections to be all welded construction.
6. Tension bars: 4.76 x 19mm minimum galvanized steel.
7. Tension bar bands: 3 x 20 mm galvanized steel or 5x20mm minimum aluminum.
8. All fastenings and fittings to be hot dip galvanized.
9. All caps to be galvanized and welded in place.
10. Install the chain link fence person gates as indicated on the Contract Drawings.

4. Chain Link Person Gates.

    1. The person gates are to use a closure device operated by securing the gate to the gate post when in the closed position. Closure device must accept a standard padlock.

    2. All hinges are to be welded into place.

2.3 FINISHES

1. Galvanizing:

    1. For chain link fabric: to CAN/CGSB-138.1.

    2. For pipe: 550 g/m2 minimum to ASTM A90.

    3. For other fittings: to CSA G164.

2. Coating:

1. Organic zinc rich Galvicon paint coating: to CGSB 1_GP-181M is to be applied to all joints, welds and damaged areas. Two coats are required. Paint to have a finish and colour to match uncoated surrounding galvanized steel.

3 – EXECUTION

3.1 ENVIRONMENTAL CONDITIONS

1. Work is to commence and continue only if the environmental and site conditions are in accordance with the manufacturer's recommendations for product placement.

3.2 PROTECTION

1. The Contractor is responsible for the protection of all new and existing facilities from damage and/or disfiguration from the processes of the Work and from vandalism. Any damage or disfiguration must be repaired promptly and to the original condition of the facility prior to the damage.

2. Acceptance of the repair work is at the sole discretion of the Consultant. All repairs must be completed and accepted prior to Total Performance of the Work being granted and the release of any deficiency holdback amount.

3. Any deficiency holdback amount will be calculated at two times greater than the actual value of the labour and materials required to correct the deficiencies. The value of the labour and materials required to correct the deficiencies will be determined by the Consultant.

3.3 PREPARATION

1. Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.

2. Clean off dirt, oils, and other debris that may inhibit the application of the product. Ensure that all areas and surfaces are clean and free of debris.

3. Accurately survey and layout the specified work according to the Contract Drawings and Specifications herein.

4. The installation procedures for all materials must be in strict accordance with the manufacturer's specifications and provide for a long-term successful installation of all materials.

3.4 ERECTION OF FENCE

1. Erect fences along lines as indicated on the Contract Drawings and in accordance with CAN/CGSB-138.3.

2. Space straining posts at equal intervals not exceeding 150 metres if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade is greater than 150 metres.

3. Install end posts at end of fence and at changes in fence alignment. Install gate posts on both sides of gate openings.

4. Embed posts into concrete to depths indicated. Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

5. Do not install fence fabric or pickets until concrete has cured a minimum of 5 days.

6. Install intermediate rail between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface. Install intermediate rails on both sides of corner and straining posts in similar manner.

7. Install and weld overhang tops and caps.

8. Install rails between posts and weld securely to terminal posts and secure waterproof caps and overhang tops.

9. Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300mm intervals. Knuckled selvedge at bottom. Twisted selvedge at top.

10. Provide a clearance between bottom of fence and finished grade of 50mm. The clearance under all rails is to be consistent.

11. Secure fabric to rails and posts with tie wires as follows. Give tie wires a minimum of two twists.

    1. At every knuckle for 50mm opening mesh.

    2. At every second knuckle for 38mm opening mesh.

    3. At every fourth knuckle for 25mm opening mesh.

3.5 TOUCH UPS

1. Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of black high gloss organic zinc-rich Galvicon paint to damaged areas, allowing the manufacturer's recommended drying time between coats. Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

2. Wire brush, clean, and paint all welds with two coats of high gloss zinc rich Galvicon paint, allowing the manufacturer's recommended drying time between coats. Use paint colour that matches surrounding powder-coated surfaces.

3.6 SITE CLEAN-UP

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

3.9 MAINTENANCE SUPPLIES

1. .1 Upon completion of the work, the Contractor shall provide the Owner with maintenance materials consisting of the following.

    1. Two (2) 500 ml cans of Galvicon paint in project colour and finish.

    2. Four (4) packages of 50 tie wires.

END OF SECTION

1 – GENERAL

1.1 SECTION INCLUDES

1. All materials, labour, equipment, and services to supply and install all
    1. Planting medium
    2. Finish grade the site

1.2 RELATED SECTIONS

1. Section 31 23 13 — Subgrade Preparation
2. Section 32 05 00 — Common Work Results for Exterior Improvements
3. Section 32 92 23 — Turf and Grasses
4. Section 32 93 53 — Exterior Maintenance

1.3 REFERENCES

1. American Society for Testing and Materials (ASTM):
    1. ASTM C602-95a (2001), Standard Specification for Agricultural Liming Materials
    2. ASTM D5268-92 (1997), Standard Specification for Topsoil Used for Landscaping Purposes
2. Canadian Council of Ministers of the Environment (CCME)
    1. CCME 106E, Guidelines for Compost Quality (1996)
3. Standards Council of Canada
    1. CAN/BNQ 0413-200-M95 Amendement organiques – Compost (Organic Soil Conditioners - Compost)

1.4 DEFINITIONS

1. For the purpose of this specification, the term “planting medium” shall mean a mixture of mineral particulates, micro-organisms and organic matter that provides suitable medium for supporting intended plant growth. Commercially available soils or native site soils, if proposed for use, will be also be subject to landscape soil assessment analysis.

1.5 SOURCE QUALITY CONTROL

1. Advise Consultant of sources of topsoil or manufactured soil 28 days or more in advance of delivery. Provide samples of material in time to allow testing, review of test results and recommendations, and repetition of the testing and approval cycle if materials are rejected, prior to delivery.
2. Provide samples of lime, if required, for laboratory tests, or provide manufacturer’s certified tests of ECCE to the Agrologist.
3. Contractor is responsible for soil analysis, compost analysis, Agrologist recommendations, and requirements for amendments to supply topsoil as specified.

1.6 QUALITY ASSURANCE

1. Soil Testing Laboratory Qualifications: Engage an independent soil testing laboratory, acceptable to the Consultant, with the experience and capability to conduct the testing indicated, that specializes in the types of tests to be performed. The laboratory shall be accredited by the Standards Council of Canada for all specified tests and procedures for which such accreditation is available.

2. Soil Analysis: Furnish soil analysis stating test results for all parameters specified. Include in addition any parameters necessary to determine conformance with applicable referenced standards, and any analyses required by the Agrologist responsible for making recommendations. Indicate test methods used. Test texture and organic content in accordance with ASTM D5268.

3. Compost Analysis: Determine if compost to be used conforms to specified requirements.

4. Lime Analysis: Determine ECCE of lime, if lime is required, by testing or manufacturer's certification.

5. Recommendations: Provide a report based on the soil and compost analyses, and with reference to the contract documents, prepared by an accredited and approved professional Agrologist.

    1. Report suitability of soil for lawn and woody plant growth.

    2. State all aspects of the soil analysis that indicate the soil does not conform to referenced standards.

    3. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory soil for lawns and other plantings indicated or specified.

    4. Take into account and adjust recommendations for soil depths indicated and amendments already specified.

6. The cost of soil testing and Agrologist's reports is included in the Contract.

7. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of lawns and grasses.

8. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when exterior planting is in progress.

9. Pre-installation Meeting: Conduct meeting at Project site to address quality of materials, inspection schedule and samples including, but not limited to, the following:

    1. Protection of existing trees and facilities.

    2. Landscape materials and installation procedures.

    3. Verification of required soil depths at turfgrass and meadow grass area locations prior to installation of topsoils/ manufactured soils.

1.7 SUBMITTALS

1. Provide submittals and wait for Consultant's review and acceptance, prior to placement of any materials on site.

2. Submit product data for each type of product indicated.

3. Submit product certificates for soil amendments and fertilizers, signed by product manufacturer.

4. Submit soil analysis report and Agrologist's recommendations indicating recommended amendments.

5. Resubmit samples of soil amended as recommended by report for verification of compliance with specified requirements.

6. Submit one copy of all new soil reports to Consultant until approval.

1.8 DELIVERY, STORAGE, AND HANDLING

1. Stockpile topsoil off-site, in a location dedicated to this project, or in a location on site approved by the Owner.

2. If stockpile is accessible to the public, never leave a slope that is steeper than the angle of repose unattended.

3. Stockpile materials in bulk form in paved area(s) approved by Consultant. Tale all precautions to prevent contamination of basic materials from wind-blown soil particles, weed seeds and insects. Contamination of ingredients shall result in their rejection for use. Where paved surfaces are not available, prevent contamination by on-site soil or sub-soil or construction materials.

4. Store fertilizer and chemical ingredients in the manufacturer's original containers.

2 – PRODUCTS

2.1 MATERIALS

1. Topsoil: Natural A-horizon soil imported to the site from natural or agricultural sites in the region, with or without added sand, conforming to the following requirements when tested to ASTM D562;

    1. Organic Material 5% - 10% by dry mass

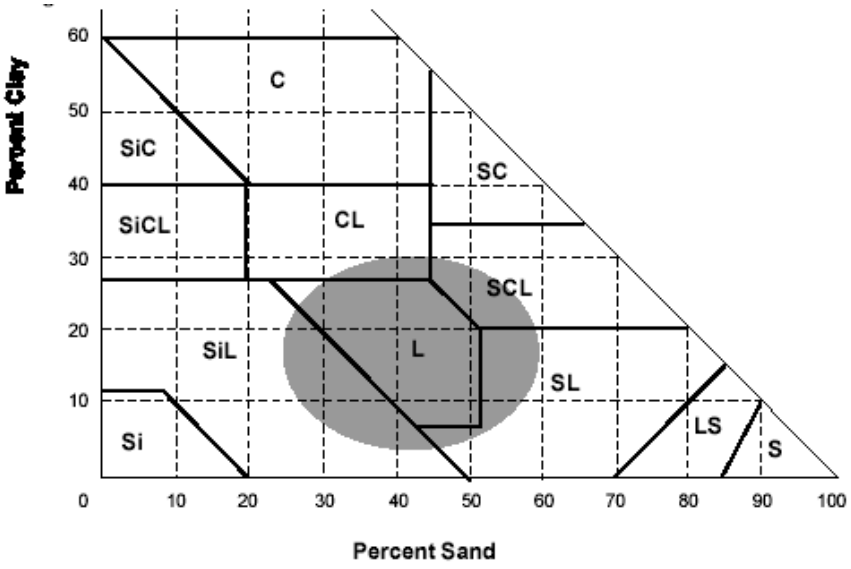
    2. Toxic Chemicals: None

    3. Specific Conductivity 1.5 dS/m maximum

    4. pH 6.0 - 7.5

    5. Sodium Adsorption Ratio < 6

2. Texture of topsoil: "Clay Loam" with maximum 30% of Clay, or "Loam", as defined by percentages of sand, silt, and clay particles as fractions of the dry mass of material passing a 2mm sieve, excluding organic matter, in the following diagram:



3. Compost: Conforming to CCME Guidelines, Category A requirements, including:

    1. Trace elements

    2. Foreign matter (also conforming to CAN/BNQ 0413-M95, Type A)

    3. Pathogenic organism content

4. Peat Moss: Decomposed plant material, fairly elastic and homogeneous, of good horticultural quality, free of decomposed colloidal residue, wood, sulphur, iron, foreign material, lumps, ice, clay, soil, rocks, and weeds, pulverized to pass a 30mm screen, with the following properties when tested:

    1. Organic matter, by dry mass: 60% minimum

    2. pH 4.5 to 6.0

    3. Specific conductance: 2.0 dS/m maximum

    4. Sulphate content: 200 ppm maximum

    5. Lime content: nil

5. Sand: Hard, granular sharp coarse sand, washed, and free of gravel and very fine material, free of impurities, chemical or organic matter. Reasonable care in the selection of material in a pit shall be used to produce a uniform product.

6. Sand gradation: Uniform (well graded), and within the following limits:

Sieve Size (mm)	Minimum % Passing, by mass
No. 8 (2.5 mm)	100 %
No.16 (1.25 mm)	90 – 100 %
No. 20 (0.8 mm)	80 – 90 %
No. 50 (0.315mm)	60 – 80 %
No. 100 (0.16 mm)	2 – 10 %
No. 200 (0.63 mm)	1 % maximum

7. Lime: Ground agricultural limestone, dry, free-flowing, conforming to ASTM C602, with a minimum effective calcium carbonate equivalent (ECCE) of 60.

8. Sulphur: Finely crushed agricultural elemental sulphur, free of impurities.

9. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4% nitrogen and 20% phosphoric acid.

2.2 TOPSOIL MIXES

1. For maintained lawns, use topsoil with amendments recommended by the Agrologist, without added sand, peat or compost.

2. For tree pits, tree trenches, and planting beds for trees, shrubs, and ornamental grasses, mix topsoil with sand, peat and or compost specified as soil mix.

    1. .Soil mix: 3 parts topsoil, 1 part either peat or compost, and 1 part sand, measured by volume.

3 – EXECUTION

3.1 VERIFICATION OF CONDITIONS

1. Verify that subgrade is ready to receive soil in accordance with Section 31 23 13 — Subgrade Preparation, and do not proceed until it is.

2. Check subgrade compaction, and ensure that the density is as specified, or if unspecified then at least 95% of standard density (Modified Proctor). Verify that compaction is uniform.

3.2 PROTECTION OF EXISTING WORK

1. Prevent damage to fencing, trees, landscaping, natural features, bench marks, existing buildings, existing pavement, culverts and utility lines which are to remain. Make good any damage.

3.3 PREPARATION OF SUBGRADE

1. Locate utility lines before commencement of work and protect from damage.

2. Remove foreign material, undesirable plants, roots, stones in excess of 25mm diameter, debris, and soil contaminated with oil or gasoline, from site. Do not bury foreign material beneath areas to be landscaped.

3. Grade subgrade to eliminate uneven areas, low spots and ensure positive drainage.

4. Maintain maximum 1:1 slope from back of curb faces and pavement edges. Do not excavate vertically at pavements and curbs so as to compromise the structural integrity of adjacent sub base material.

5. Cultivate clayey or silty subsoil, if present, to depth of 100 mm. Rip top 100mm of granular soil.

6. Immediately prior to spreading of topsoil for lawns, broadcast bonemeal onto the subsoil at a rate recommended by the Agrologist.

7. Re-cultivate clayey or silty subsoil compacted during hauling or spreading.

8. Place the soil to the following depths:

    1. Lawn (seeded): 150mm min.

    2. Meadow grass: 100mm min.

3.4 SOIL CONDITIONING

1. Apply lime, peat moss, sulphur or other recommended soil conditioning at rates recommended by the Agrologist.

3.5 CLEAN-UP

1. Keep roadway, walkway, and surrounding areas free of soil and debris as a result of work done under this section at the end of each working day or as directed by the Owner.

2. Dispose of surplus soil not required for fine grading and landscaping off site.

3. Restore stockpile sites on site to "rake clean" condition acceptable to the Owner.

4. Dispose of unacceptable soil material off site.

END OF SECTION

1 – GENERAL

1.1 RELATED SECTIONS

1. Section 32 91 21 - Topsoil and Finish Grading
2. Section 31 23 13 – Subgrade Preparation

1.2 SUBMITTALS

1. Comply with requirements of Division 01.
2. Submit to Consultant 500g sample of each seed mixture intended to be used. Label sample to include Name, Project and date. Confirm that seed mix represents tested seed lots.
3. Certificate(s) of analysis with each seed sample. Seed analysis report to be current and show specie and variety of seed, date, and results of all tests.
4. Copy of purchase order and invoice/receipt from seed supplier indicating all seeds, quantity and lots acquired and all original seed package labels. Submit at completion of seeding, when requested by Consultant, to confirm total quantity of seed purchased and used on project. Contractor shall ensure all original seed labels are preserved and maintained during seeding operations.
5. Fiber mulch and tackifier manufacturer's product data, installation instructions and application rate for approval.
6. Written documentation for approval before commencing work regarding:
    1. Type and volume capacity of hydraulic seeding and mulching equipment in litres.
    2. Amount of each material in kilograms and including water in litres to be used per tank based on volume to achieve required application rate.
    3. Number of tankloads required per hectare to apply specified slurry mixture per hectare.

1.3 TESTING

1. Owner may appoint and pay for services of testing laboratory to verify seed conformance to specified requirements.

1.4 DELIVERY AND STORAGE

1. Fertilizer:
    1. Deliver and store in original sealed waterproof packages showing net mass, analysis and manufacturer.
    2. Store on pallets in dry location and protect from the elements.
2. Grass seed: deliver in original package and store in dry location protected from the elements and rodents. Each seed package to contain suppliers label indicating:
    1. Analysis of seed mixture.
    2. Percentage of pure seed by weight.
    3. Year of production.

4. Net mass.

5. Date tagged and location of seed supplier.

3. Mulching material: deliver and store in original packages and protect from the elements.

1.5 SCHEDULING

1. Schedule hydraulic seeding to coincide with preparation of soil surface.

1.6 MAINTENANCE PERIOD

1. Maintain seeded areas from time of seeding until one year after date of Substantial Completion the Work.

2 – PRODUCTS

2.1 MATERIALS

1. Fertilizer:

    1. To Canada "Fertilizers Act" and "Fertilizers Regulations".

    2. Complete commercial granular fertilizer, minimum of 50% of elements derived from organic sources.

    3. Consultant may adjust specified fertilizer analysis after topsoil test analysis results are received, with no change in Contract Price.

2. Grass seed: Certified Canada No. 1 seed, free of disease, weed seeds or other foreign materials in accordance with the Canada “Seeds Act” and “Seeds Regulations” for forage mixtures, having minimum purity of 97% and germination of 75%.

3. Water: clean water free of contaminants that my inhibit germination and plant growth.

    1. Water for water hauling equipment: supplied and paid for by Contractor.

    2. Water for hydraulic seeding and mulching equipment: supplied and paid for by Contractor.

4. Hydraulically Applied Growth Medium:

    1. Flexterra Flexible Growth Medium as manufactured by Profile Products LLC, 750 Lake Cook Rd, Suite 440, Buffalo Grove, IL 60089 and supplied by Brett Young, ph: (780) 985-7308 or approved alternate.

    2. Composition:

        1. Free of growth or germination inhibiting ingredients.

        2. Specially manufactured for use in hydraulic seeding and mulching equipment.

        3. Minimum organic matter content of 74.5%.

        4. Interlocking fiber content of 5%.

        5. Minimum moisture content of 10.5%.

        6. Water absoption potential; 1500%.

7. Tackifier: non-toxic, water dilutable, liquid dispersion, mulch binder free of growth or germination inhibiting factors.

5. Inoculants: inoculant containers to be tagged with expiry date.

2.2 GRASS SEED MIXTURE

1. Turf Grass Seed mixture:

    1. Turfgrass seed to be 30% Kentucky Blue, 30% Fescue, 40% Perennial Rye

2. Meadow Grass Seed mixture:

    1. Meadow grass seed mixture to be ‘Premier Coastal Reclamation Mix’ as supplied by Premier Pacific Seeds Ltd. (19315 96th Ave, Surrey BC V4N 4C4 Ph: 604-552-3960) or approved alternate.

3. Substitutions to specified seed species and variety require approval of Consultant before sowing. Contractor shall submit documentation from seed supplier verifying unavailability of any specified seed specie and variety with recommendations.

4. Consultant may adjust specified seed mixture after topsoil test analysis results are received, with no change in Contract Price.

3 – EXECUTION

3.1 WORKMANSHIP

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

2. Clean up immediately, any material sprayed where not intended, to satisfaction of Consultant.

3. 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.

4. Hydroseed only when conditions are favourable for successful seed germination.

5. Protect seeded areas from trespass until plants are established.

3.2 PREPARATION OF SURFACES

1. Prepare soil to receive hydraulic seeding in accordance with Section 32 01 90.33.01 - Topsoil Preservation.

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

3. Cultivated areas identified by the Consultant as requiring cultivation to depth of 25 mm.

4. Ensure areas to be seeded are moist to depth of 100 mm before seeding.

5. Obtain Consultant's approval of grade and topsoil depth before starting to seed.

3.3 FERTILIZING

1. Apply fertilizer only after final grade has been approved by Consultant.

2. Apply 12-51-0 fertilizer at 3kg/100 m2 evenly with calibrated mechanical distributor. Adjust fertilizer analysis to meet agrologist's recommendations as specified under Section 32 01 90.33.01 - Topsoil Preservation.

    1. Fertilizer application may be combined with hydro seeding operations.

3. Mix thoroughly into upper 50mm of topsoil.

3.4 PREPARATION OF SLURRY

1. Measure quantities of materials by weight or weight calibrated volume measurement in accordance with manufacturers written instructions. 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.

3.5 SLURRY APPLICATION

1. Hydraulic seeding equipment:

    1. Slurry tank.

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

    3. Capable of seeding by 50 metre hand operated hoses and appropriate nozzles.

2. Slurry mixture application rates, generally:

    1. Seed: Grass mixture 3 kg/100m2.

    2. Mulch: 3400 kg/ha.

    3. Tackifier: In accordance with growth medium manufacturer's written instructions.

    4. Water: In accordance with growth medium manufacturer's written instructions.

3. Apply seed and mulch using Two-Step Hydraulic seeding and mulching methods in accordance with growth medium manufacturer's written instructions.

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

    1. Using correct nozzle for application.

    2. Using hoses for surfaces difficult to reach and to control application.

5. Using hydraulic hydro mulching equipment, mix grass seed, fertilizer, water and a small amount of fiber mulch in accordance with growth medium manufacturer's written instructions.

6. Apply fiber mulch immediately following seeding. Mix fiber mulch in water for minimum application of 3400 kg/ha and to form a uniform and strong moisture retaining mat.

7. Blend applications of seed and mulch 300 mm into adjacent grass areas to form uniform surfaces.

8. Agitate slurry mixes constantly during spraying to keep it homogeneous and avoid blockage to pipes.

9. Re apply where application is not uniform.

10. Remove slurry from items and areas not designated to be sprayed.

11. Area seeded and mulched shall not exceed area which can be mulched on same day.

12. Clean and remove mulch sprayed where not intended.

3.6 PROTECTION OF SEEDED AREAS - GENERAL

1. Immediately after seeding, provide protection satisfactory to Consultant against erosion, pedestrian, and vehicular traffic damages.

2. Remove protection after seed areas become when directed by Consultant.

3.7 MAINTENANCE

1. Apply water in sufficient quantities to maintain optimum soil moisture level for germination and continued healthy growth of grass. Control watering to prevent washouts. Promptly repair and reseed any damage that occurs through washout of soil.

2. Areas with no irrigation system: supply labour, hoses and attachments necessary to provide adequate watering to prevent grass and underlying soil from drying out.

3. Provide clean water and water hauling vehicle with proper attachments to provide efficient and adequate watering of seeded areas when necessary.

4. Cut native grass at regular intervals and maintain minimum height of 80 to 100 mm or as directed by Consultant. Do not cut more than 30% of blade at any one mowing. Remove clippings that will smother grass.

5. Provide weed control in newly seeded areas by mowing when required or directed by Consultant. Cut and maintain weed growth to height of 100 mm. Remove weed clippings.

6. Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.

7. Re seed areas which show root growth failure, deterioration, bare or thin spots, or which have been damaged by any means or cause, including replacement operations. Overseed areas that show inadequate or improper sowing of seed with brillion or other methods.

8. Fertilize seeded areas during establishment period, minimum six weeks after seeding, with 27 14 0 fertilizer or as directed by Consultant. Spread evenly at rate of 3 kg/100 m2, water in well.

9. Postpone fertilizing until spring if application falls after August 15th.

10. Maintain daily maintenance log throughout contract. Submit copy of log data to Consultant each week for verification. Record all maintenance activities performed on site.

11. Consultant may extend maintenance period at no additional cost when Contractor fails to: maintain an accurate log; submit log when required; or when unsatisfactory and inadequate maintenance occurs.

3.8 ACCEPTANCE

1. Seeded areas will be accepted by Consultant at end of maintenance period provided:

1. Seeded areas are properly, uniformly and well established.

2. Turf is free of bare and dead spots and weeds.

3. Minimal surface soil is visible when grass cut to height of 80 mm.

4. Required applications of fertilizer have been completed.

5. All submittals, installation and maintenance requirements have been provided.

6. Satisfactory seed test results have been received from seed testing laboratory, if seed tests were performed.

3.9 CLEAN UP

1. Clean up immediately any soil and debris spilled onto pavement or concrete.

2. Broom clean pavement and sidewalks. Clear soil and rubble from underground or surface storm sewer lids.

3. Leave site in neat and clean condition free of all litter. Remove and dispose of grass clippings, weeds, debris, and excess materials at approved disposal site.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 31 23 10-Excavating, Trenching and Backfilling.

.2 Section 33 31 13-Public Sanitary Utility Sewerage Piping.

.3 Section 33 41 00-Storm Utility Drainage Piping.

1.2 References

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM A 48/A 48M, Standard Specification for Gray Iron Castings.

.2 ASTM C 117, Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing.

.3 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM C 139, Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.

.5 ASTM C 478M, Standard Specification for Precast Reinforced Concrete Manhole Sections [Metric].

.6 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-A23.1/A23.2-[04], Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.1 CSA-A3001, Cementitious Materials for Use in Concrete.

.2 CSA-A3002, Masonry and Mortar Cement.

.3 CAN/CSA-A165 Series, CSA Standards on Concrete Masonry Units (Consists of A165.1, A165.2 and A165.3).

.4 CAN/CSA-G30.18, Billet Steel Bars for Concrete Reinforcement.

.5 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

1.3 Delivery, Storage and Handling

.1 Packing, shipping, handling, and unloading:

.1 Deliver, store, and handle materials in accordance with manufacturer's written instructions.

PART 2 PRODUCTS

2.1 Materials

.1 Cast-in-place concrete:

.1 Cement: to CAN/CSA-A3001, Type GU 50.

.2 Concrete mix design to produce 30 MPa minimum compressive strength at 28 days and containing 25mm maximum size coarse aggregate, with water/cement ratio to CAN/CSA-A23.1.

.1 Air entrainment to CAN/CSA-A23.1.

.2 Precast manhole units: to ASTM C 478M, circular or oval.

.1 Top sections eccentric cone or flat slab top type with opening offset for vertical ladder installation.

.3 Precast catch basin sections: to ASTM C478M.

.4 Joints: made watertight using rubber rings to ASTM C443 or cement mortar.

.5 Mortar:

.1 Aggregate: to CSA A82.56.

.2 Masonry Cement: to CAN/CSA-A8.

.6 Ladder rungs: to CAN/CSA-G30.18, No.25M billet steel deformed bars, hot dipped galvanized to CAN/CSA-G164.

.1 Rungs to be safety pattern (drop step type).

.7 Adjusting rings: to ASTM C 478.

.8 Concrete Brick: to CAN3-A165 Series.

.9 Drop manhole pipe: same as sewer pipe.

.10 Galvanized iron sheet: approximately 2 mm thick.

.11 Steel gratings, I-beams, and fasteners: as indicated.

.12 Frames, gratings, covers to dimensions as indicated and following requirements:

.1 Metal gratings and covers to bear evenly on frames.

.1 Frame with grating or cover to constitute one unit.

.2 Assemble and mark unit components before shipment.

.2 Cast iron manhole & catchbasin frames and covers must conform to ASTM A48 and be designed to withstand H2O loading.

.1 Must bear manufacturer identification on castings.

.13 Granular bedding and backfill: in accordance with Section 31 05 16 - Aggregate Materials.

.14 Unshrinkable fill: in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Excavation and Backfill

.1 Excavate and backfill in accordance with Section 31 23 10 - Excavating Trenching and Backfilling and as indicated.

3.3 Installation

.1 Construct units in accordance with details indicated, plumb and true to alignment and grade.

.2 Dewater excavation to approval of Departmental Representative and remove soft and foreign material before placing concrete base.

.3 Set precast concrete base on 100 mm minimum of granular bedding compacted to 95%. Modified proctor density in compliance with ASTM D1557.

.4 Precast units:

.1 Set bottom section of precast unit in bed of cement mortar and bond to concrete slab or base.

.2 Make each successive joint watertight with Departmental Representative's approval rubber ring gaskets, bituminous compound, cement mortar, epoxy resin cement, or combination of these materials.

.3 Clean surplus mortar and joint compounds from interior surface of unit as work progresses.

.4 Plug lifting holes with concrete plugs set in cement mortar or mastic compound.

.5 For sewers:

.1 Place stub outlets and bulkheads at elevations and in positions indicated.

.2 Bench to provide smooth U-shaped channel.

.1 Side height of channel to be 0.75 times diameter of sewer.

.2 Slope adjacent floor at 1 in 20.

.3 Curve channels smoothly.

.4 Slope invert to establish sewer grade.

.6 Compact granular backfill to 95% Modified Proctor Density.

.7 Place unshrinkable backfill in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.

.8 Installing units in existing systems:

.1 Where new unit is installed in existing run of pipe, ensure full support of existing pipe during installation, and carefully remove that portion of existing pipe to dimensions required and install new unit as specified.

.2 Make joints watertight between new unit and existing pipe.

.3 Where deemed expedient to maintain service around existing pipes and when systems constructed under this project are ready for operation, complete installation with appropriate break-outs, removals, redirection of flows, blocking unused pipes or other necessary work.

.9 Set frame and cover to required elevation on no more than three courses of brick.

.1 Make brick joints and join brick to frame with cement mortar.

.2 Parge and make smooth and watertight.

.10 Clean units of debris and foreign materials.

.1 Remove fins and sharp projections.

.2 Prevent debris from entering system.

.11 Install safety platforms in manholes having depth of 6 m or greater, as indicated.

3.4 Adjusting Tops of Existing Units

.1 Remove existing gratings, frames, and store for re-use at locations designated by Departmental Representative.

.2 Sectional units:

.1 Raise or lower straight walled sectional units by adding or removing precast sections as required.

.2 Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section.

.1 When amount of raise is less than 300mm use standard manhole brick, moduloc or grade rings.

.3 Monolithic units:

.1 Raise monolithic units by roughening existing top to ensure proper bond and extend to required elevation with mortared brick course for 150 mm or less alteration.

.2 Lower monolithic units with straight wall by removing concrete to elevation indicated for rebuilding.

.3 When monolithic units with tapered upper section are lowered more than 150 mm, remove concrete for entire depth of taper plus as much straight wall as necessary, then rebuild upper section to required elevation with cast-in-place concrete.

.4 Install additional manhole ladder rungs in adjusted portion of units as required.

.5 Re-use existing gratings, frames, and I-beams.

3.5 Sealing Over Existing Units

.1 Fill with material approved by Departmental Representative.

3.6 Field Quality Control

.1 Leakage Test:

.2 Install watertight plugs or seals on inlets and outlets of each new sanitary sewer manhole and fill manhole with water.

.3 Leakage not to exceed 0.3% per hour of volume of manhole.

.4 If permissible leakage is exceeded, correct defects.

.5 Repeat until approved by Departmental Representative.

.6 Departmental Representative will issue Test Certificate for each manhole passing test.

3.7 Cleaning

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 – GENERAL

1.1 SECTION INCLUDES

.1 Materials and installation for water mains, hydrants, valves, valve boxes, and valve chambers, including service connections.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures].

.2 Section 01 78 00 - Closeout Submittals.

.3 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.4 Section 03 20 00 - Concrete Reinforcing.

.5 Section 03 30 00 - Cast-in-Place Concrete.

1.3 REFERENCES

.1 American National Standards Institute/American Water Works Association (ANSI/AWWA)
.1 ANSI/AWWA B300-[99], Hypochlorites.
.2 ANSI/AWWA C153/A21.53-11, Ductile-Iron Compact Fittings for Water Service.
.3 ANSI/AWWA C500-09, Metal-Seated Gate Valves for Water Supply Service
.4 ANSI/AWWA C651-14, Disinfecting Water Mains.
.5 ANSI/AWWA C800-12, Underground Service Line Valves and Fittings
.6 ANSI/AWWA C900-16, Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 Inch through 60 Inch (100 mm - 1200 mm

.2 American Society for Testing and Materials International, (ASTM)

.3 American Water Works Association (AWWA)/Manual of Practice
.1 AWWA M17-2006, Installation, Field Testing, and Maintenance of Fire Hydrants.

.4 Canadian General Standards Board (CGSB)

.5 Canadian Standards Association (CSA International)

1.4 SUBMITTALS

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

.2 Submit complete construction schedule for water mains. Include method for installation of water main.

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

.4 Contractor to provide to the Department Representative for approval 1 week prior to start of laying pipe the results of a sieve analysis of the proposed bedding materials.

.5 Submit manufacturer's pipe certification

.6 Pipe certification to be on pipe.

1.5 CLOSEOUT SUBMITTALS

.1 Provide record drawings, including directions for operating valves, list of equipment required to operate valves, details of pipe material, location of air and vacuum release valves, hydrant details, maintenance, and operating instructions in accordance with Section 01 78 00 - Closeout Submittals.

.1 Include top of pipe, horizontal location of fittings and type, valves, valve boxes, valve chambers and hydrants.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Handle and dispose of hazardous materials in accordance with the Canadian Environmental Protection Act (CEPA), Transportation of Dangerous Good Act (TDGA), Regional and Municipal regulations.

.4 Ensure emptied containers are sealed and stored safely.

.5 Divert unused materials from landfill to metal recycling facility.

.6 Divert unused concrete materials from landfill to local facility.

.7 Divert unused aggregate materials from landfill to facility for reuse.

.8 Dispose of unused disinfection material at official hazardous material collections site.

.9 Do not dispose of unused disinfection material into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard.

.10 Fold up metal banding, flatten and place in designated area for recycling.

1.7 SCHEDULING OF WORK

.1 Schedule Work to minimize interruptions to existing services.

.2 Submit schedule of expected interruptions to Department Representative for approval and adhere to interruption schedule as approved by Department Representative.

.3 Notify Department Representative a minimum of 48 h in advance of interruption in service.

.4 Do not interrupt water service for more than 4 hours.

.5 Notify fire department of any planned or accidental interruption of water supply to hydrants.

.6 Provide "Out of Service" sign on hydrant not in use.

.7 Advise local police department of anticipated interference with movement of traffic.

PART 2 - PRODUCTS

2.1 PIPE, JOINTS AND FITTINGS

.1 Polyvinyl chloride pressure pipe: to ANSI/AWWA C900, pressure class 150, DR 18, 1 MPa gasket bell end
.1 CSA-B137.3, PVC series 160, 1.1 MPa elastomeric gasket [coupling].
.2 Ductile Iron fittings: to ANSI/AWWA C153/A21.53-06.

2.2 VALVES AND VALVE BOXES

.1 Valves to open counterclockwise.

.2 Gate valves: to ANSI/AWWA C500, standard iron body, bronze mounted valves with non-rising stems, suitable for 1 Pa with mechanical, flanged, push-on, grooved type joints.

.3 Air and vacuum release valves: heavy duty combination air release valves employing direct acting kinetic principle.
.1 Fabricate valves of cast iron body and cover, with bronze trim, stainless steel floats with shock-proof synthetic seat suitable for [2] MPa working pressure.
.2 Valves to expel air at high rate during filling, at low rate during operation, and to admit air while line is being drained.
.3 Valve complete with surge check unit.
.4 Ends to be flanged to ANSI/AWWA.

2.3 TRACER WIRE

.1 Direct Burial #12 AWG Solid (.0808” diameter), steel core hard drawn extra high strength tracer wire, 1150# average tensile break load, 45 mil high molecular weight-high density polyethylene jacket complying with ASTM-D-1248, 30-volt rating.

.2 Tracer Box shall include:
.1 Tube material shall be of high-grade ABS, or equivalent rigid plastic that meets or exceeds ASTM D-1788, Type 1 requirements.
.2 Lid material shall be of cast iron or ductile iron. Tensile strength or ductility of such material shall be equal or superior to hi-tensile cast iron ASTM A126-B requirements.
.3 Lid-locking bolt material shall be made of aluminum material equal or superior to ASTM B253.
.4 Lid-locking mechanism material shall be made of plastic to meet or exceed ASTM A126-B requirements.
.5 Box shall be designed to be easily detected by magnetic and electronic locators even when box is covered by a minimum of 100mm of soil, sod and / or paving material.
.6 A magnet shall be securely attached at the top of the upper tube of the box for locating purposes.

2.4 VALVE CHAMBERS

.1 Concrete and reinforcing steel to Section 03 30 00 - Cast-in-Place Concrete and Section 03 20 00 - Concrete Reinforcing.

.2 Precast concrete sections to ASTM C478M. Cast ladder rungs

integral with unit; field installation not permitted.

.3 Valve chamber frames and covers:
.1 Design and dimensions as indicated.
.2 Cover to be marked "WATER"/"EAU" .

.5 Ladder rungs for valve chambers: 20 mm diameter deformed rail steel bars to CAN/CSA-G30.18, hot-dipped galvanized after fabrication to CAN/CSA-G164. Rungs to be safety pattern.

2.5 SERVICE CONNECTIONS

.1 Copper tubing: to ASTM B 88M type K, annealed.

.2 Polyethylene pressure pipe:
.1 To CSA-B137.1, type PE, series 160, ASTM F714, Type PE, series DR 11.
.2 90 mm to 1600 mm: to CGSB 41-GP-25M, type PE, series 250.

.3 Copper tubing joints: compression type suitable for 1 MPa working pressure.

.4 Polyethylene pipe joints: thermal butt fusion welded

.5 Brass corporation stops: compression type having threads to ANSI/AWWA C800.

.6 Brass inverted key-type curb stops: compression type with drains.
.1 Curb stops to have adjustable bituminous coated cast iron service box with stem to suit depth of bury.
.2 Top of cast iron box marked "WATER"/"EAU".

.7 Polyethylene tapping tees or multi-saddle tees: for Polyethylene pipe. Tees to be socket fused to pipe.

.8 Service connections for PVC pipe:
.1 Service connections less than 100 mm: Corporation stop, tapped to main using AWWA threads, complete with stainless service saddle. Service saddle to consist of circumferential band type complete with side bars and fingers, keeper bar, stud bolts, nuts, washers and gaskets.
.2 Service connections 100 mm and over: Use tee fitting or tapping valve and sleeve.

.9 Bronze type service clamps: for PVC pipe service connections.
.1 Service clamps to be of strap-type, with confined "O" ring seal cemented in place.
.2 Clamps to be tapped with threads to ANSI/AWWA C800.

.10 Tee connections: for services 100mm diameter and above. Tee connections to be fabricated of same material and to same standards as specified pipe fittings and to have ends matching pipe to which they are joined.

2.6 YARD HYDRANTS

.1 Yard Hydrants: Terminal City self-draining stand pipe, factory assembled unit:

.1 Hydrants to open threads to local standard, Provide metal caps and chains.
.2 Yard Hydrant to be manufactured with bronze operating and draining components.
.3 The stuffing box and draining mechanism to have “O” ring rubber gaskets for sealing purposes.
.4 Polyurethane anti-score seating material is used for the valve disc facing.
.5 Provide key operated gate valve located 1m from hydrant.
.6 Depth of bury 1.2 m.

.2 Hydrant paint: exterior enamel to CAN/CGSB-1.88,MPI #96.

2.6 PIPE BEDDING AND SURROUND MATERIAL

.1 Granular material to: Section 31 05 16 - Aggregate Materials and following requirements:
.1 Crushed or screened stone, gravel or sand.
.2 Table

Sieve Designation	Percent Passing	
	Type 1*	Type 2*
25.0mm	100	100
19.0mm	90-100	90-100
12.5mm	65-85	70-100
9.5mm	50-75	-
4.75mm	25-50	40-70
2.36mm	10-35	25-52
1.18mm	6-26	15-38
0.600mm	3-17	6-27
0.300mm	-	3-20
0.075mm	0-5	0-8
*Type 1: Standard Gradation *Type 2: To be used only in dry trench conditions and with prior approval of Department Representative.		

2.7 BACKFILL MATERIAL

.1 In accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

2.8 PIPE DISINFECTION

.1 Sodium hypochlorite to ANSI/AWWA B300 to disinfect water mains.

.2 Undertake disinfection of water mains in accordance with ANSI/AWWA C651.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Clean pipes, fittings, valves, hydrants, and appurtenances of accumulated debris and water before installation.
.1 Inspect materials for defects to approval of the Department Representative.
.2 Remove defective materials from site as directed by Department Representative.

3.2 TRENCHING

.1 Do trenching work in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling.

.2 Trench depth to provide cover over pipe of not less than 1.2 m from finished grade or as indicated.

.3 Trench alignment and depth require Department Representative approval prior to placing bedding material and pipe.

3.3 CONCRETE BEDDING AND ENCASEMENT

.1 Do concrete work in accordance with Section 03 30 00 - Cast-in-Place Concrete.

.2 Place concrete to details as indicated.

.3 Do not backfill over concrete within 24 hours after placing.

3.4 GRANULAR BEDDING

.1 Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness to depth of 150mm below bottom of pipe.

.2 Do not place material in frozen condition.

.3 Shape bed true to grade to provide continuous uniform bearing surface for pipe.

.4 Shape transverse depressions in bedding as required to suit joints.

.5 Compact each layer full width of bed to at least 95% modified proctor density to ASTM D1557.

.6 Fill authorized or unauthorized excavation below design elevation of bottom of specified bedding in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling.

3.5 PIPE INSTALLATION

.1 Lay pipes to manufacturer's standard instructions and specifications. Do not use blocks except as specified.

.2 Join pipes in accordance with manufacturer's recommendations.

.3 Bevel or taper ends of PVC pipe to match fittings.

.4 Handle pipe by methods recommended by pipe manufacturer. Do not use chains or cables passed through pipe bore so that weight of pipe bears on pipe ends.

.5 Lay pipes on prepared bed, true to line and grade.
.1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
.2 Take up and replace defective pipe.
.3 Correct pipe which is not in true alignment or grade or pipe which shows differential settlement after installation greater than 10 mm in 3 m.

.6 Face socket ends of pipe in direction of laying. For mains on grade of 2% or greater, face socket ends up-grade.

.7 Do not exceed one half of permissible deflection at joints as recommended by pipe manufacturer.

.8 Keep jointing materials and installed pipe free of dirt and water and other foreign materials.
.1 Whenever work is stopped, install a removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.

.9 Position and join pipes with equipment and methods approved by Department Representative.

.10 Cut pipes in approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.

.11 Align pipes before jointing.

.12 Install gaskets to manufacturer's recommendations. Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.

.13 Avoid displacing gasket or contaminating with dirt or other foreign material.
.1 Remove disturbed or contaminated gaskets.
.2 Clean, lubricate and replace before jointing is attempted again.

.14 Complete each joint before laying next length of pipe.

.15 Minimize deflection after joint has been made.

.16 Apply sufficient pressure in making joints to ensure that joint is completed to manufacturer's recommendations.

.17 Ensure completed joints are restrained by compacting bedding material alongside and over installed pipes or as otherwise approved by the Department Representative.

.18 When stoppage of work occurs, block pipes in an approved manner to prevent creep during down time.

.19 Recheck plastic pipe joints assembled above ground after placing in trench to ensure that no movement of joint has taken place.

.20 Install tracer wire along entire length of watermain with Test boxes located at maximum 1000m separation.

.21 Do not lay pipe on frozen bedding.

.22 Do hydrostatic and leakage test and have results approved by the Department Representative before surrounding and covering joints and fittings with granular material.

.23 Backfill remainder of trench.

3.6 VALVE INSTALLATION

.1 Install valves to manufacturer's recommendations at locations as indicated.

3.7 VALVE CHAMBERS

.1 Use precast units as approved by the Department Representative.

.2 Construct units as indicated, plumb and centered over valve nut, true to alignment and grade, and not resting on pipe.

.3 Clean surplus mortar and joint compounds from interior surface of valve chamber as work progresses.

.4 Plug lifting holes with precast concrete plugs set in cement mortar.

.5 Place frame and cover on top section to elevation indicated. If adjustment is required use concrete ring.

.6 Clean valve chambers of debris and foreign materials; remove fins and sharp projections.

3.8 SERVICE CONNECTIONS

.1 Terminate building water service 1 m outside building wall or as indicated opposite point of connection to main. Locate point of connection in advance and advise Department Representative.
.2 Cap or seal end of pipe and place temporary marker to locate pipe end.

.2 Do not install service connections until satisfactory completion of hydrostatic and leakage tests of water main.

.3 Construct service connections at right angles to water main unless otherwise directed.

.4 Tappings on ductile iron mains 2000mm or greater in diameter may be threaded with service clamps provided specified pipe wall thickness is sufficient to confirm to ANSI/ASME B1.20.1 for at least 3 threads as shown in Appendix A to AWWA C151.

.5 Tappings in ductile iron mains smaller in diameter than 200mm; or ductile iron mains with wall thickness which will not allow at least 3 full threads; or tap size beyond those shown in the following table are to be made using double strap saddles

Pipe Diameter (mm)	Maximum Tap Without Clamp (mm)	Maximum Tap With Clamp (mm)
100	19	25
150	25	32
200	25	50
250	25	50
300	32	75

.5 Tappings in PVC mains to AWWA C900 pipe to be with services saddles. Nuts on servce saddle stapes to be tighted to torque range specified by manufacturer and in no case in excess of that torque. Use core-out type bit, provide coupons to Departmental Representative.

.6 Tappings on PVC pipe to be either PVC valve tees or bronze type

service clamps, strap type with "O" ring seal cemented in place.

.7 Tappings for PE pipe: PE tapping tees or multi-saddle tees.

.8 Employ only competent persons equipped with suitable tools to carry out tapping of mains, cutting and flaring of pipes.

.9 Install single and multiple tap service connections on top half of main, between 45 degrees and 90 degrees measured from apex of pipe.

.10 Install multiple corporation stops, 30 degrees apart around circumference of pipe and minimum of 500mm apart along pipe.

.11 Tap main at 2:00 o'clock or 10:00 o'clock position only; not closer to joint nor closer to adjacent service connections than recommended by manufacturer, or 1 m, whichever is greater.

.12 Leave corporation stop valves fully open.

.13 In order to relieve strain on connections, install service pipe in "Goose Neck" form "laid over" into horizontal position.

.14 Install rigid stainless steel liners in small diameter plastic pipes with compression fittings.

.15 Install curb stop with corporation box on services NPS 2 or less in diameter.
.1 Equip larger services with gate valve and cast iron box.
.2 Set box plumb over stop and adjust top flush with final grade elevation.
.3 Leave curb stop valves fully closed.

.16 Place temporary location marker at ends of plugged or capped unconnected water lines.
.1 Each marker to consist of 38 x 89 mm stake extending from pipe end at pipe level to 600 mm above grade.
.2 Paint exposed portion of stake red with designation "WATER SERVICE LINE" in black.

3.9 HYDRANTS

.1 Install hydrants at locations as indicated.

.2 Install hydrant assemblies in accordance with AWWA M17 and in accordance with standard details on the drawings.

.3 Set hydrants plumb, with hose outlets parallel with edge of pavement with outlet facing roadway. Flange set at elevation of 50 to 150mm above finish grade

.4 Place concrete thrust blocks as indicated and specified ensuring that drain holes are unobstructed.

.5 To provide proper draining for each hydrant, excavate pit measuring not less than 1 x 1 x 0.5 m deep and backfill with coarse gravel or crushed stone to level 150 mm above drain holes.

.4 Place appropriate sign on installed hydrants indicating whether or not they are in service during construction.

3.10 THRUST BLOCKS AND RESTRAINED JOINTS

.1 For thrust blocks: do concrete Work in accordance with Section 03 30 00 - Cast-in-Place Concrete.

.2 Place concrete thrust blocks between valves, tees, plugs, caps, bends, changes in pipe diameter, reducers, hydrants and fittings and undisturbed ground as indicated or as directed by Department Representative.

.3 Keep joints and couplings free of concrete.

.4 Do not backfill over concrete within 24 hours after placing.

.5 For restrained joints: only use restrained joints approved by Department Representative

3.11 HYDROSTATIC AND LEAKAGE TESTING

.1 Do tests in accordance with ANSI/AWWA C600.

.2 Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.

.3 Notify Department Representative at least 24 hours in advance of proposed tests.
.1 Perform tests in presence of Department Representative.

.4 Where section of system is provided with concrete thrust blocks, conduct tests at least 5 days after placing concrete or 2 days if high early strength concrete is used.

.5 Test pipeline in sections not exceeding 365 m in length, unless otherwise authorized by the Department Representative.

.6 Upon completion of pipe laying and after Department Representative has inspected Work in place, surround and cover pipes between joints with approved granular material placed as directed by Department Representative.

.7 Leave hydrants, valves, joints, and fittings exposed.

.8 When testing is done during freezing weather, protect hydrants, valves, joints and fittings from freezing.

.9 Strut and brace caps, bends, tees, and valves, to prevent movement when test pressure is applied.

.10 Open valves.

.11 Expel air from main by slowly filling main with potable water.
.1 Install corporation stops at high points in main where no air-vacuum release valves are installed.
.2 Remove stops after satisfactory completion of test and seal holes with plugs.

.12 Thoroughly examine exposed parts and correct for leakage as necessary.

.13 Apply hydrostatic test pressure of 1035 kPa based on elevation of lowest point in main and corrected to elevation of test gauge, for period of 1 hours.

.14 Examine exposed pipe, joints, fittings and appurtenances while system is under pressure.

.15 Remove joints, fittings and appurtenances found defective and replace with new sound material and make watertight.

.16 Repeat hydrostatic test until defects have been corrected.

.17 Define leakage as amount of water supplied in order to maintain test pressure for 2 hours.

.18 Locate and repair defects if leakage is greater than amount specified.

.19 Repeat test until leakage is within specified allowance for full length of water main.

3.12 PIPE SURROUND

.1 Upon completion of pipe laying and after Department Representative has inspected Work in place, surround and cover pipes as indicated.

.2 Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated.

.3 Place layers uniformly and simultaneously on each side of pipe.

.4 Do not place material in frozen condition.

.5 Compact each layer from pipe invert to mid height of pipe to at least 95% maximum density to ASTM D 698.

.6 Compact each layer from mid height of pipe to underside of backfill to at least 95% maximum density to ASTM D 698.

3.13 BACKFILL

.1 Place backfill material, above pipe surround, in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

.2 Do not place backfill in frozen condition.

.3 Under roadways and pathways, compact backfill to at least 95% maximum density to ASTM D 698.

3.14 PAINTING OF HYDRANTS

.1 After installation, paint hydrants red.

.2 After hydrant flow tests, paint caps and ports to meet colour selections approved by authority having jurisdiction.

3.15 FLUSHING AND DISINFECTING

.1 Flushing and disinfecting operations: witnessed by Department Representative.

.1 Notify Department Representative at least 4 days in advance of proposed date when disinfecting operations will begin.

.2 Flush water mains through available outlets with a sufficient flow of potable water to produce velocity of 1.5 m/s, within pipe for minimum 10 minutes, or until foreign materials have been removed and flushed water is clear. The contractor shall supply all water for flushing and testing.

.3 Flushing flows as follows:

Pipe Diameter	Flow (L/s) Minimum
150mm and below	38
200mm	75
250mm	115
300mm	150

.4 Provide connections and pumps for flushing as required.

.5 Open and close valves, hydrants and service connections to ensure thorough flushing.

.6 When flushing has been completed to Department Representative approval, introduce strong solution of chlorine as approved by Department Representative into water main and ensure that it is distributed throughout entire system.

.8 Rate of chlorine application to be proportional to rate of water entering pipe.

.9 Chlorine application to be close to point of filling water main and to occur at same time.

.10 Operate valves, hydrants and appurtenances while main contains chlorine solution.

.11 Flush line to remove chlorine solution after 24 hours.

.12 Measure chlorine residuals at extreme end of pipe-line being tested.

.13 Perform bacteriological tests on water main, after chlorine solution has been flushed out.

.1 Take samples daily for minimum of two days.

.2 Should contamination remain or recur during this period, repeat disinfecting procedure.

.3 Specialist contractor to submit certified copy of test results.

.14 Take water samples at hydrants and service connections, in suitable sequence, to test for chlorine residual.

.15 After adequate chlorine residual not less than 50 ppm has been obtained leave system charged with chlorine solution for 24 hours.

.1 After 24 hours, take further samples to ensure that there is still not less than 10 ppm of chlorine residual remaining throughout system.

3.16 SURFACE RESTORATION	.1	After installing and backfilling over water mains, restore surface to original condition as approved by the Department Representative.

END OF SECTION

PART 1 GENERAL

1.1 Section Includes

.1 Materials and installation for gravity sewers.

1.2 Related Sections

.1 Section 31 05 16-Aggregate Materials.

.2 Section 31 23 10-Excavating, Trenching and Backfilling.

.3 Section 33 05 13-Manholes and Catch Basin Structures.

1.3 References

.1 American National Standards Institute/American Water Works Association (ANSI/AWWA)

.1 ANSI/AWWA C111/A21.11-00, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.2 American Society for Testing and Materials International, (ASTM)

.1 ASTM C 14M-99, Standard Specification for Concrete Sewer, Storm Drain and Culvert Pipe (Metric).

.2 ASTM C 76M-02, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (Metric).

.3 ASTM C 117-95, Standard Test Method for Material Finer Than 75 MU m (No. 200) Sieve in Mineral Aggregates by Washing.

.4 ASTM C 136-01, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.5 ASTM C 443M-02, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric).

.6 ASTM C 700-02, Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated.

.7 ASTM C 828-01, Standard Test Method for Low-pressure Air Test of Vitrified Clay Pipe Lines.

.8 ASTM D 698-00a, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).

.9 ASTM D 2680-01, Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.

.10 ASTM D 3034-00, Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

.11 ASTM D 3350-02, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.4 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-98, Cementitious Materials Compendium (Consists of A5-98, A8-98, A23.5-98, A362-98, A363-98, A456.1-98, A456.2-98, A456.3-98).

.1 CAN/CSA-A5-F98, Portland Cement.

.2 CAN/CSA-A257 Series-M92(R1998, Standards for Concrete Pipe.

.3 CSA-B70-02, Cast Iron Soil Pipe, Fittings, and Means of Joining.

.4 CSA B1800-02, Plastic Non-pressure Pipe Compendium - B1800 Series (Consists of B181.1, B181.2, B181.3, B181.5, B182.1, B182.2, B182.4, B182.6, B182.7, B182.8 and B182.11).

.1 CSA B182.1-02, Plastic Drain and Sewer Pipe and Pipe Fittings.

.2 CSA B182.2-02, PVC Sewer Pipe and Fittings (PSM Type).

.3 CSA B182.6-02, Profile Polyethylene Sewer Pipe and Fittings for Leak-Proof Sewer Applications.

.4 CSA B182.11-02, Recommended Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings.

1.4 Definitions

.1 Pipe section is defined as length of pipe between successive manholes and/or between manhole and any other structure which is part of sewer system.

1.5 Submittals

.1 Certification to be marked on pipe.

1.6 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with manufactures recommendations.

1.7 Waste Management and Disposal

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused concrete materials from landfill to local facility as approved by Departmental Representative.

.3 Divert unused aggregate materials from landfill to facility for reuse as approved by Departmental Representative.

.4 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.5 Dispose of unused asbestos cement pipe in accordance with regulations governing the disposal of hazardous materials.

.6 Fold up metal banding, flatten and place in designated area for recycling.

1.8 Scheduling

.1 Schedule Work to minimize interruptions to existing services and to maintain existing flow during construction.

.2 Submit schedule of expected interruptions for approval and adhere to approved schedule.

PART 2 - PRODUCTS

2.1 Concrete Pipe

.1 Non-reinforced circular concrete pipe and fittings: to ASTM C 14M as indicated, designed for flexible rubber gasket joints to ASTM C 443M.

.2 Reinforced circular concrete pipe and fittings: to ASTM C 76M as indicated, designed for flexible rubber gasket joints to ASTM C 443M.

.3 Lifting holes:
.1 Pipe 900mm and less diameter: no lift holes.
.2 Pipe greater than 900mm diameter: lift holes not to exceed two in piece of pipe.
.3 Provide prefabricated plugs to effectively seal lift holes water tight after installation of pipe.

2.2 Plastic Pipe

.1 Polyvinyl chloride pipe up to 675mm in diameter, DR35. Pipe to have minimum pipe stiffness (F/Y) of 320 kPa at 5.0% deflection, ASTM D2412. Pipe to be manufactured to specification for pipe size ranges as follows:
.1 100mm dia. – 375mm dia. to ASTM D3034
.2 450mm dia. – 1200mm dia. to ASTM F679.

.2 Pipes to be certified by Canadian Standards Association to standards for pipe size ranges below.
.1 100mm dia. – 1200mm dia. to CSA B182.2

.3 Joint: Pipe to include integral bell and spigot ends with stiffened wall section and formed groove for a rubber gasket; joints to conform to ASTM D3212, gaskets to ASTM F477.

.4 Normal pipe length joint to joint to be 4m.

.5 Maximum installed deflection not to exceed 7.5% of the base inside diameter.

2.3 Service Connections

.1 Sanitary sewer service connections to be 100mm minimum diameter; maximum diameter as specified on Contract Drawings.

.2 Sanitary sewer service connections 100mm and 150mm diameter to be PVC type DR28 sewer pipe.

.3 100mm and 150mm DR28 PVC sanitary service connection pipe to have a minimum pipe stiffness of 625kPa. Pipe to be manufactured to ASTM D3034 and certified by Canadian Standards Association to CSA B182.2

.4 Sanitary sewer service connections greater than 150mm diameter to be of size and material specified on Contract Drawings and to conform to applicable specifications for mainline pipe.

.5 Manufactured connections to non-reinforced or reinforced concrete mainline pipe to be made using sanded PVC pipe male end stub with integral bell by either:
.1 Stub grouted into neatly chipped hole in pipe wall by concrete pipe manufacturer. Grout to be Portland cement-based grout.
.2 Stub epoxy resin cemented into neatly cored hole in pipe wall by concrete pipe manufacturer.

.6 Stub and bell orientation to be 45˚ to centerline of mainline 2pipe (wyes) for concrete pipe less than 1050mm diameter. Orientation may be 90˚ to centerline of mainline pipe (tees) for concrete pipe 1050mm diameter or larger. No section of service stubs to protrude past inside of concrete pipe wall.

.7 Manufactured wye connections to PVC mainline pipe to be made with extrusion moulded PVC or fabricated PVC fittings manufactured to ASTM D3034 and CSA B182.2

.8 Field installed tees and wyes:
.1 In-situ installation of tees and wyes into concrete or PVC mainline pipe shall be made with approved PVC swaddle installed to the manufacturers specifications into a neatly cored hole in the pipe wall.
.2 Connections to ribbed PVC pipe to be made with a preformed tee and wye fitting when

connection is up to two sizes smaller than mainline pipe. For these pipes, in-situ installation of tees or wyes involving cutting across pipe ribs not permitted. For connections more than two sizes smaller than mainline pipe, an insertable tee for ribbed PVC pipe is permitted. When an insertable is used, hole cut into mainline pipe to cut as few ribs as possible.

.9 PVC service connection pipe and fitting joints: push-on type comprised of integral bell with single elastomeric gasket to ASTM D3212 and ASTM F477. Normal pipe laying length joint to joint to be 4.0m.

.10 Pipe and fitting joints for service connection pipe materials other than PVC type PSM sewer pipe to be as specified for applicable mainline pipe.

2.4 Cement Mortar

.1 Portland cement: to CAN/CSA-A5.

.2 Mix mortar one part by volume of cement to two parts of clean, sharp sand mixed dry.
- .1 Add only sufficient water after mixing to give optimum consistency for placement.
- .2 Do not use additives.

2.5 Pipe Bedding and Surround Material

.1 Granular material in accordance with Section 31 05 16 - Aggregate Materials

.2 Concrete mixes and materials for bedding, cradles, encasement, supports: in accordance with Cast-in-Place Concrete.

2.6 Backfill Material

.1 As indicated.

.2 In accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.

PART 3 - EXECUTION

3.1 Preparation

.1 Clean pipes and fittings of debris and water before installation and remove defective materials from site to approval of Departmental Representative.

.2 Obtain Departmental Representative approval of pipes and fittings prior to installation.

3.2 Trenching

.1 Do trenching Work in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.

.2 Do not allow contents of sewer or sewer connection to flow into trench.

.3 Trench alignment and depth to approval of Departmental Representative prior to placing bedding material and pipe.

3.3 Concrete Bedding And Encasement

.1 Do concrete Work in accordance with Cast-in-Place Concrete. Place concrete to details as indicated.

.2 Position pipe on concrete blocks to facilitate placing of concrete.
- .1 When necessary, rigidly anchor or weight pipe to prevent flotation when concrete is placed.

.3 Do not backfill over concrete within 24 h after placing.

3.4 Granular Bedding

.1 Place bedding in unfrozen condition.

.2 Place granular bedding material in uniform layer[s] not exceeding 150mm compacted thickness to depth as indicated.

.3 Shape bed true to grade and to provide continuous, uniform bearing surface for pipe. Do not use blocks when bedding pipes.

.4 Shape transverse depressions as required to suit joints.

.5 Compact each layer full width of bed to at least 95% Modified Proctor Density in compliance with ASTM D1557.

.6 Fill excavation below bottom of specified bedding adjacent to manholes or structures with compacted bedding material.

3.5 Installation

.1 Lay and join pipe in accordance with manufacturer's recommendations and to approval of Departmental Representative.

.2 Handle pipe using methods approved by Departmental Representative.
.1 Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.

.3 Lay pipes on prepared bed, true to line and grade with pipe inverts smooth and free of sags or high points.
.1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.

.4 Begin laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.

.5 Lay corrugated steel pipe:
.1 With outside circumferential laps facing upgrade and longitudinal laps or seams at side or quarter points.
.2 With longitudinal centre line of paved invert coinciding with flow line.

.6 Do not exceed maximum joint deflection recommended by pipe manufacturer.

.7 Keep jointing materials and installed pipe free of dirt, water, and other foreign materials. Do not allow water to flow through pipes during construction except as may be permitted by Departmental Representative.

.8 Whenever Work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.

.9 Install plastic pipe and fittings in accordance with CSA B182.11.

.10 Joints:
.1 Install gaskets as recommended by manufacturer.
.2 Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and

maintain concentricity until gasket is properly positioned.
.3 Align pipes before joining.
.4 Maintain pipe joints free from mud, silt, gravel, and other foreign material.
.5 Avoid displacing gasket or contaminating with dirt or other foreign material. Remove disturbed or dirty gaskets; clean, lubricate and replace before joining is attempted.
.6 Complete each joint before laying next length of pipe.
.7 Minimize joint deflection after joint has been made to avoid joint damage.
.8 Apply sufficient pressure in making joints to ensure that joint is complete as outlined in manufacturer's recommendations.

.11 When any stoppage of Work occurs, restrain pipes as directed by Departmental Representative, to prevent "creep" during down time.

.12 Plug lifting holes with Departmental Representative approved prefabricated plugs, set in shrinkage compensating grout.

.13 Cut pipes as required for special inserts, fittings, or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.

.14 Make watertight connections to manholes.
.1 Use shrinkage compensating grout when suitable gaskets are not available.

.15 Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes.
.1 Joint to be structurally sound and watertight.

.16 Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

3.6 Pipe Surround

.1 Place surround material in unfrozen condition.

.2 Upon completion of pipe laying, and after Departmental Representative has inspected pipe joints, surround and cover pipes as indicated.
.1 Leave joints and fittings exposed until field testing is completed.

.3 Hand place surround material in uniform layers not exceeding 150mm compacted thickness as indicated.
.1 Do not dump material within 1 m of pipe.

.4 Place layers uniformly and simultaneously on each side of pipe.

.5 Compact each layer from pipe invert to underside of backfill to minimum 95% Modified Proctor Density.

.6 When field test results are acceptable to Departmental Representative, place surround material at pipe joints.

3.7 Backfill

.1 Place backfill in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.

.2 Compaction: place backfill and compact to following Modified Proctor densities in compliance with ASTM D1557. (all following references to density imply compliance with ASTM D1557)
.1 Boulevards and easements to minimum 90%
.2 Roads, driveways, shoulders, re-shaped ditches, and sidewalks to minimum 95%.

.3 Use caution in pipe zone to ensure no damage to pipe.

3.8 Service Connections

.1 Install pipe to CSA B182.11 and manufacturer's instructions and specifications.

.2 Maintain grade for services as indicated on Contract Drawings unless directed otherwise by Departmental Representative.

.3 Service connections to main sewer: Wye fittings or Departmental Representative approved saddles.
.1 Do not use break-in and mortar patch-type joints.

.4 Service connection pipe: not to extend into interior of main sewer.

.5 Make up required horizontal and vertical bends from 45 degrees bends or less, separated by straight section of pipe with minimum length of four pipe diameters.
.1 Use long sweep bends where applicable.

.6 Plug service laterals with watertight caps or plugs as approved by Departmental Representative.

.7 Install inspection chamber at specified location set plumb and to specified elevation. If inspection chamber located in driveway, lane or paved surface install cover or lid as shown on Contract Drawings.

.8 Place location marker at ends of plugged or capped unconnected sewer lines.
.1 Each marker: 40 x 90 mm stake extending from pipe end at pipe level to 0.6 m above grade.
.2 Paint exposed portion of stake red with designation SAN SWR LINE in black.

3.9 Field Testing

.1 Repair or replace pipe, pipe joint or bedding found defective.

.2 When directed by Departmental Representative, draw tapered wooden plug with diameter of 50mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.

.3 Remove foreign material from sewers and related appurtenances by flushing with water.

.4 Upon completion of cleaning and flushing of each section carry out leakage testing. Tests may include one or more of the following:
.1 Low Pressure Air Test
.2 Exfiltration test – using water
.3 Infiltration test

Testing to be completed as soon as practicable after jointing and bedding are complete, and service connections have been installed. All tests shall be performed in the presence of a Department Representative.

.5 Carry out tests on each section of sewer between successive manholes including service connections.

.6 Install watertight bulkheads in suitable manner to isolate test section from rest of pipeline.

.7 Low Pressure Air Test:
.1 Low pressure air test to include testing of sewer main and service connections in each section. Test manholes by either exfiltration test utilizing water or by low pressure air as specified.
.2 Wet inside perimeter of concrete pipes in test section then increase pressure in test section prior to conducting air tests. Then increase pressure in test section to 24 kPa above average groundwater

pressure and observe rate of pressure drop.

.3 Maintain 25 kPa above average ground water pressure for at least 5.0 minutes before commencing internal air pressure test. Regulate air pressure to prevent pressure inside test section from exceeding 35 kPa above average ground water pressure.

.4 Commence test period when pressure decreases to 24.0 kPa above average groundwater pressure and end when pressure decreases to 20.5 kPa above average groundwater pressure. Do not add air to test section during test period. If test period is less than:

- 2 minutes and 32 seconds for 100mm pipe
- 3 minutes and 50 seconds for 150mm pipe
- 5 minutes and 6 seconds for 200mm pipe
- 6 minutes and 22 seconds for 250mm pipe
- 7 minutes and 39 seconds for 300mm pipe

Sewer shall be deemed to have failed test. Retest upon completion of repair to any leaks.

.5 Department Representative reserves right to withdraw permission to use this test procedure at any time and to require Contractor to carry out exfiltration test utilizing water.

.8 Exfiltration test:

.1 Fill test section with water to displace air in line. Maintain under nominal head for 24 hours to ensure absorption in pipe wall is complete before test measurements are begun.

.2 Immediately prior to test period add water to pipeline until there is head of 1.2 m over interior crown of pipe measured at highest point of test section or water in manhole is 1.2 m above static ground water level, whichever is greater.

.3 Duration of exfiltration test: 3 hours.

.4 Water loss at end of test period: not to exceed maximum allowable exfiltration over any section of pipe between manholes.

.9 Infiltration test:

.1 Conduct infiltration test in lieu of exfiltration test where static ground water level is 750 mm or more above top of pipe measured at highest point in line to be used.

.2 Do not interpolate a head greater than 750 mm to obtain an increase in allowable infiltration rate.

.3 Install watertight plug at upstream end of pipeline test section.

.4 Discontinue pumping operations for at least 3 days before test measurements are to begin and during this time, keep thoroughly wet at least one third of pipe invert perimeter.

.5 Prevent damage to pipe and bedding material due to flotation and erosion.

.6 Place 90 degrees V-notch weir, or other measuring device approved by Departmental Representative in invert of sewer at each manhole.

.7 Measure rate of flow over minimum of 1 hour, with recorded flows for each 5 min interval.

.10 Exfiltration allowable leakage from pipe will be calculated using following formula:

$$\text{Allowable Leakage (L)} = \frac{H \times D \times L}{K}$$

Where: H = duration of test in hours,
D = pipe diameter in millimeters
L = length of test section in metres
K = 840

.11 Where service connections exist along test section allowable leakage from service connections to be calculated by use of above formula and added to that of main sewer leakage to arrive at total allowable leakage. No additional leakage allowance to be made for manholes in test section.

.12 Infiltration allowable leakage to be same as that calculated for exfiltration less 10% if external head is 600mm or less. Above infiltration limits to constitute maximum total allowable infiltration for section.

.13 Repair and retest sewer line as required, until test results are within limits specified.

.14 Repair visible leaks regardless of test results.

.15 Television and photographic inspections:

.1 Carry out inspection of installed sewers by television camera, photographic camera or by other related means.

.2 Provide means of access to permit Departmental Representative to do inspections.

.3 Payment for inspection services in accordance with payment procedures in PART 1.

END OF SECTION

PART 1 GENERAL

1.1 Section Includes

.1 Materials and installation for storm sewer.

1.2 Related Sections

.1 Section 31 05 16-Aggregate Materials.

.2 Section 31 23 10-Excavating, Trenching and Backfilling.

.3 Section 33 05 13-Manholes and Catch Basin Structures.

1.3 Measurement Procedures

.1 All work included in this section shall be included in the lump sum bid for all materials, equipment and labour for the scope of work shown on the plans and specifications.

1.4 References

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM C 14M, Standard Specification for Concrete Sewer, Storm Drain and Culvert Pipe (Metric).

.2 ASTM C 76M, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (Metric).

.3 ASTM C 117, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.4 ASTM C 136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

.5 ASTM C 443M, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric).

.6 ASTM C 506M, Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain and Sewer Pipe.

.7 ASTM C 507M, Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe (Metric).

.8 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.9 ASTM D 1056, Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.

.10 ASTM D 2680, Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.

.11 ASTM D 3034, Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

.12 ASTM F 405, Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings.

.13 ASTM F 667, Standard Specification for Large Diameter Corrugated Polyethylene Tubing and Fittings.

.14 ASTM F 794, Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

.3 CAN/CGSB-34.9, Asbestos-Cement Sewer Pipe.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A5-98, A8-98, A23.5-98, A362-98, A363-98, A456.1-98, A456.2-98, A456.3-98).

.1 CAN/CSA-A5, Portland Cement.

.2 CAN/CSA-A257 Series-[M92(R1998)], Standards for Concrete Pipe.

.3 CSA B1800-[02], Plastic Non-pressure Pipe Compendium - B1800 Series (Consists of B181.1, B181.2, B181.3, B181.5, B182.1, B182.2, B182.4, B182.6, B182.7, B182.8 and B182.11).

.1 CSA B182.2, PVC Sewer Pipe and Fittings (PSM Type).

.2 CSA B182.4, Profile PVC Sewer Pipe and Fittings.

.3 CSA B182.11, Recommended Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings.

.4 CSA-G401, Corrugated Steel Pipe Products.

.4 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.5 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA)

1.5 Definitions

.1 A pipe section is defined as length of pipe between successive catchbasins and/or manholes.

1.6 Submittals

.1 Certification to be marked on pipe.

1.7 Waste Management and Disposal

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused concrete materials from landfill to local facility as approved by Departmental Representative.

.3 Divert unused aggregate materials from landfill to facility for reuse as approved by Departmental Representative.

.4 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.5 Dispose of unused asbestos cement pipe in accordance with regulations governing the disposal of hazardous materials.

.6 Fold up metal banding, flatten and place in designated area for recycling.

1.8 Scheduling

.1 Schedule Work to minimize interruptions to existing services and to maintain existing flow during construction.

.2 Submit schedule of expected interruptions for approval and adhere to approved schedule.

PART 2 PRODUCTS

2.1 Concrete Pipe

.1 Non-reinforced circular concrete pipe and fittings: to ASTM C 14M as indicated, designed for flexible rubber gasket joints to ASTM C 443M.

.2 Reinforced circular concrete pipe and fittings: to ASTM C 76M as indicated, designed for flexible rubber

gasket joints to ASTM C 443M.

.3 Reinforced concrete arch pipe: to ASTM C 506M.

.4 Reinforced concrete elliptical pipe: to ASTM C 507M.

.5 Lifting holes:

.1 Pipe 900mm and less diameter: no lift holes.

.2 Pipe greater than 900mm diameter: lift holes not to exceed two in piece of pipe.

.3 Provide prefabricated plugs to effectively seal lift holes after installation of pipe.

2.2 Plastic Pipe

.1 Type PSM Poly Vinyl Chloride (PVC): to ASTM D 3034 CSA-B182.2.

.1 Standard Dimensional Ratio (SDR): 35.

.2 Separate gasket and integral bell system.

.3 Nominal lengths: 4 m.

.2 Large diameter, ribbed PVC sewer pipe and fittings: to CSA B182.4 ASTM F 794.

2.3 Pipe Bedding and Surround Material

.1 Granular material in accordance with Section 31 05 16 - Aggregate Materials

.2 Concrete mixes and materials for bedding, cradles, encasement, supports: in accordance with Cast-in-Place Concrete.

2.4 Backfill Material

.1 As indicated.

2.5 Joint Mortar

.1 Portland cement: to CAN/CSA-A5.

.2 Mortar: one-part Portland cement to two parts clean sharp sand mixed with minimum amount of water to obtain optimum consistency for use intended. Do not use additives.

PART 3 EXECUTION

3.1 Preparation

.1 Clean pipes and fittings of debris and water before installation and remove defective materials from site to approval of Departmental Representative.

3.2 Trenching

.1 Do trenching Work in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.

.2 Do not allow contents of sewer or sewer connection to flow into trench.

.3 Trench alignment and depth to approval of Departmental Representative prior to placing bedding material and pipe.

3.3 Concrete Bedding and Encasement

.1 Do concrete work in accordance with Cast-in-Place Concrete. Place concrete to details as indicated.

.2 Position pipe on concrete blocks to facilitate placing of concrete.

.1 When necessary, rigidly anchor or weight pipe to prevent flotation when concrete is placed.

.3 Do not backfill over concrete within 24 h after placing.

3.4 Granular Bedding

.1 Place bedding in unfrozen condition.

.2 Place granular bedding material in uniform layer[s] not exceeding 150mm compacted thickness to depth as indicated.

.3 Shape bed true to grade and to provide continuous, uniform bearing surface for pipe. Do not use blocks when bedding pipes.

.4 Shape transverse depressions as required to suit joints.

.5 Compact each layer full width of bed to at least 95% Modified Proctor Density in compliance with ASTM D1557.

.6 Fill excavation below bottom of specified bedding adjacent to manholes or catch basins with compacted bedding material.

3.5 Installation

.1 Lay and join pipe in accordance with manufacturer's recommendations and to approval of Departmental Representative.

.2 Handle pipe using methods approved by Departmental Representative.

.1 Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.

.3 Lay pipes on prepared bed, true to line and grade with pipe inverts smooth and free of sags or high points.

.1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.

.4 Begin laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.

.5 Do not exceed maximum joint deflection recommended by pipe manufacturer.

.6 Do not allow water to flow through pipes during construction except as may be permitted by Departmental Representative.

.7 Whenever work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.

.8 Install plastic pipe and fittings in accordance with CSA B182.11.

.9 Joints:

. 1 Install gaskets as recommended by manufacturer.

.2 Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.

.3 Align pipes before joining.

.4 Maintain pipe joints free from mud, silt, gravel, and other foreign material.

.5 Avoid displacing gasket or contaminating with dirt or other foreign material. Remove disturbed or dirty gaskets; clean, lubricate and replace before joining is attempted.

.6 Complete each joint before laying next length of pipe.

.7 Minimize joint deflection after joint has been made to avoid joint damage.

.8 Apply sufficient pressure in making joints to ensure that joint is complete as outlined in manufacturer's recommendations.

.10 When any stoppage of Work occurs, restrain pipes as directed by Departmental Representative, to

prevent "creep" during down time.

.11 Plug lifting holes with Departmental Representative approved prefabricated plugs, set in shrinkage compensating grout.

.12 Cut pipes as required for special inserts, fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.

.13 Make watertight connections to manholes and catch basins.

.1 Use shrinkage compensating grout when suitable gaskets are not available.

.14 Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes.

.1 Joint to be structurally sound and watertight

.15 Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

3.6 Pipe Surround

.1 Place surround material in unfrozen condition.

.2 Upon completion of pipe laying, and after Departmental Representative has inspected pipe joints, surround and cover pipes as indicated.

.1 Leave joints and fittings exposed until field testing is completed.

.3 Hand place surround material in uniform layers not exceeding 150mm compacted thickness as indicated.

.4 Place layers uniformly and simultaneously on each side of pipe.

.5 Compact each layer from pipe invert to mid height of pipe to at least 95% Modified Proctor Density.

.6 When field test results are acceptable to Departmental Representative, place surround material at pipe joints.

3.7 Backfill

.1 Place backfill material in unfrozen condition.

.2 Place backfill material, above pipe surround, in uniform layers not exceeding 150mm compacted thickness up to grades as indicated.

.3 Under paving and walks, compact backfill to at least 95% Modified Proctor Density.

3.9 Field Testing

.1 Repair or replace pipe, pipe joint or bedding found defective.

.2 When directed by Departmental Representative, draw tapered wooden plug with diameter of 50mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.

.3 Remove foreign material from sewers and related appurtenances by flushing with water.

.4 Television and photographic inspections:

.1 Carry out inspection of installed sewers by television camera, photographic camera or by other related means.

.2 Provide means of access to permit Departmental Representative to do inspections.

END OF SECTION

REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

POWDER POINT ROAD, NANAIMO BC

2022-03-04

ISSUED FOR TENDER

OWNER

REGIONAL DISTRICT OF NANAIMO
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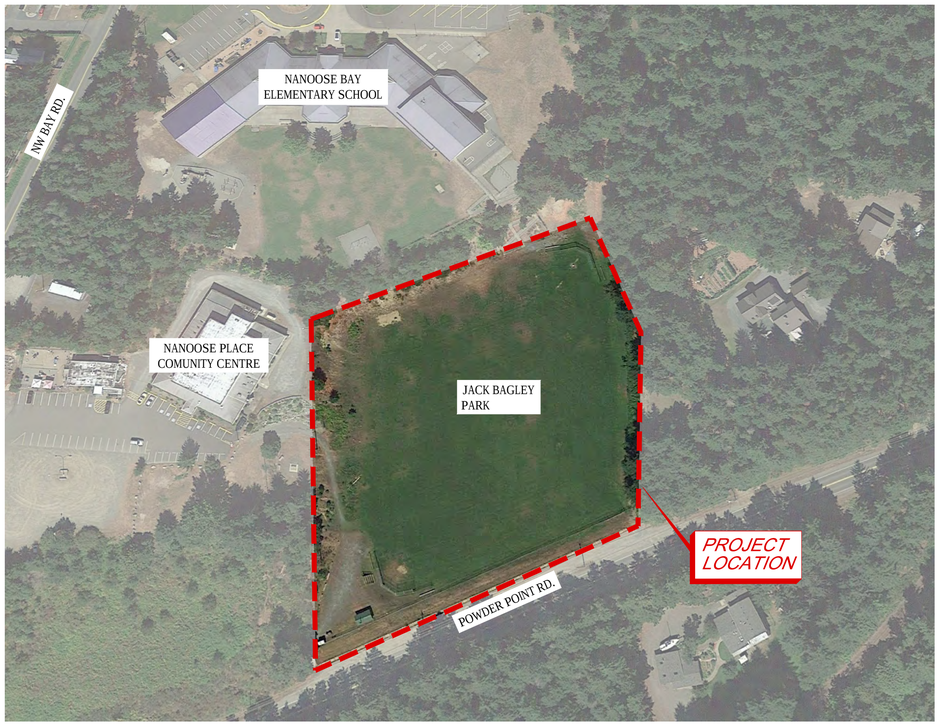
x 241

Discipline	Sheet No.	Sheet Title
LANDSCAPE	00	COVER
	L-01	LANDSCAPE NOTES
	L-02	EXISTING CONDITIONS & DEMOLITION PLAN
	L-03	DETAIL KEY PLAN
	L-04	GRADING PLAN
	L-05	LAYOUT PLAN
	L-06	PLANTING PLAN
	L-07	DETAILS - SURFACING
	L-08	DETAILS - WALLS, RAMP, STEPS
	L-09	DETAILS - FENCES
	L-10	DETAILS - FURNISHINGS
	L-11	DETAILS - PLANTING
CIVIL	C-01	CIVIL SITE SERVICING PLAN 1
	C-02	CIVIL SITE SERVICING PLAN 2
	C-03	NOTES AND DETAILS
ELECTRICAL	EL-01	ELECTRICAL CONDUITS PLAN AND DETAILS
IRRIGATION	IR-01	IRRIGATION SLEEVING PLAN
	IR-02	FIELD IRRIGATION PLAN AND NOTES



PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	XJ	AR

OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

COVER

STAMP

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE		DATE	Mar-04
DRAWN BY	JO	DESIGN BY	AR
CHECKED BY	AR	APPROVED BY	AR
		REV.	E

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LANDSCAPE NOTES:

1. GENERAL

1.1. CONTRACTOR TO ENSURE DRAWINGS AND SPECIFICATIONS HAVE BEEN REVIEWED (COMPLETE) AND THAT SUB-CONTRACTORS ARE PROVIDED WITH COMPLETE INFORMATION AT TIME OF BIDDING, MOBILIZATION UPON AWARD, AND DURING SITE CONSTRUCTION.

1.2. CONTRACTOR TO VERIFY ALL UNITS AND QUANTITIES SHOWN.

1.3. CONTRACTOR TO IMMEDIATELY NOTIFY CONTRACT ADMINISTRATOR OF ANY DISCREPANCIES BETWEEN DRAWINGS AND SPECIFICATIONS PRIOR TO COMMENCING WORK. DO NOT COMMENCE WORK UNTIL DISCREPANCY IS CLARIFIED OR RESOLVED.

1.4. CONTRACTOR TO IMMEDIATELY NOTIFY CONTRACT ADMINISTRATOR OF ANY SCHEDULE DELAYS IMPOSED BY UNFORESEEN ISSUES. SUBMIT WRITTEN NOTICE.

1.5. CONTRACTOR TO SUBMIT RFI'S THROUGH EMAIL FOR FORMAL RECORD.

1.6. CONTRACTOR TO SUBMIT REQUESTS FOR REVIEW BY CONSULTANTS MINIMUM 72HRS IN ADVANCE OF REBAR AND FORM WORKS, ELECTRICAL AND CIVIL ENGINEERING RELATED UTILITY TRENCHING, AND GENERAL PREPARATIONS PRIOR TO LARGE CONCRETE POURS.

1.7. CONTRACTOR WILL RECEIVE THE ISSUE FOR CONSTRUCTION DRAWING SET IN DIGITAL PDF FORMAT AT THE TIME OF AWARD. MAINTAIN ONE COPY ON SITE IN CLEAN CONDITION. MAINTAIN REGULAR SITE NOTES AND REDLINES REGARDING SITE CHANGES ON THE COPY. PROVIDE THE REDLINE DRAWING SET AND A MARKED UP PDF SET FOR PROJECT RECORDS AT THE TIME OF SUBSTANTIAL COMPLETION.

1.8. INCLUDE A STATUTORY DECLARATION OF PROGRESS PAYMENT AND WCB SUBMITTAL WITH EACH PROGRESS CLAIM. FAILURE TO PROVIDE THESE SUBMITTALS WILL INHIBIT THE CONTRACT ADMINISTRATOR FROM REVIEWING A CLAIM OR PREPARING A PAYMENT CERTIFICATE.

2. SCHEDULE

2.1. COMPLETE WORK FOR CRITICAL SCHEDULE MILESTONES.

3. WARRANTY

3.1. THE PROJECT REQUIRES A ONE YEAR WARRANTY ON ALL HARD AND SOFTSCAPE WORK.

3.2. THE WARRANTY PHASE WILL COMMENCE AT THE TIME OF SUBSTANTIAL COMPLETION OF THE TOTAL CONTRACT.

4. FIELD LAYOUT AND SURVEY COORDINATION

4.1. SITE LAYOUT TO BE BASED ON TSS (TOTAL STATIONING SURVEY) OR APPROVED EQUAL GPS METHOD TO ENSURE ACCURACY IN LAYOUT.

4.2. SITE LAYOUT AND SURVEY FILES CAN BE PROVIDED TO THE CONTRACTOR IN AUTOCAD FORMAT AT THE TIME OF CONSTRUCTION START-UP.

5. SITE MOBILIZATION, STAGING, AND SAFETY

5.1. PROVIDE MOD-U-LOCK FENCE OR APPROVED EQUAL AROUND THE LIMIT OF CONSTRUCTION AND PROTECT THE SITE AT ALL TIMES FROM PUBLIC ACCESS.

5.2. PROVIDE INFORMATION ON INTENDED SITE STORAGE AND STAGING AREA(S) AND HAULING AT CONSTRUCTION START-UP. IF STORAGE OR STAGING AREA(S) ARE TO BE MOVED BETWEEN DIFFERENT PHASES OF WORK, INFORM OWNER AND CONTRACT ADMINISTRATOR AT CONSTRUCTION START-UP WITH MARKED UP PLANS.

5.3. PROVIDE PROOF OF A BC-ONE (BC-1) CALL AT THE TIME OF CONSTRUCTION START-UP MEETING.

5.4. ENSURE ESC (EROSION AND SEDIMENT CONTROL) MEASURES HAVE BEEN REVIEWED PRIOR TO COMMENCING DEMOLITION OR EXCAVATION WORKS OF THE SITE. AMEND ANY ESC RELATED REQUESTS FROM THE PROJECT ENVIRONMENTAL CONSULTANT IMMEDIATELY. PROVIDE PHOTO PROOF AND EMAIL CONFIRMATION TO THE CONTRACT ADMINISTRATOR AND ENVIRONMENTAL CONSULTANT FOR APPROVAL PRIOR TO COMMENCING WORK.

5.5. ENSURE TREE PROTECTION FENCING HAS BEEN REVIEWED PRIOR TO COMMENCING WORK.

6. SITE CLEANLINESS

6.1. MAINTAIN THE SITE IN A CLEAN AND ORDERLY FASHION AND FOLLOWING BEST PRACTICES WITH CURRENT WCB SAFETY REQUIREMENTS.

6.2. RECYCLE CARDBOARD AND WASTE MATERIALS AS PER WASTE MANAGEMENT AND DISPOSAL PROCEDURES DEFINED UNDER DIVISION 1 OF THE SPECIFICATIONS.

6.3. ENSURE A POWER WASH AND CLEAN-UP HAS BEEN PROVIDED PRIOR TO THE SUBSTANTIAL COMPLETION REVIEW.

6.4. ENSURE CLEAN ROADS AND SITE ENTRY/EXIT THROUGH THE ENTIRE COURSE OF CONSTRUCTION.

7. HARDSCAPES

7.1. GENERAL REQUIREMENTS

7.1.1. ENSURE THAT HARDSCAPES MEET FLUSH WITH ADJOINING SURFACES UNLESS NOTED OTHERWISE.

7.1.2. PROVIDE MOCK-UPS OF HARDSCAPE ELEMENTS AS PER PROJECT SPECIFICATIONS.

7.1.3. MOCK-UPS TO INCLUDE A SAMPLE OF JOINT QUALITY, INCLUDING ANY FILLERS OR SEALANTS SPECIFIED. REFER TO SPECIFICATIONS.

7.1.4. ENSURE JOINT SEALANTS SPECIFIED ARE INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS.

7.1.5. INSTALL FILLERS (I.E. MORTAR, GROUT) OR SEALANTS A MINIMUM 48 HOURS PRIOR TO REVIEW OF SITE MOCK-UPS TO ENSURE COLOUR IN PRODUCTS HAS SET TO TRUE FINISH.

7.1.6. ENSURE THAT TRENCHING HAS BEEN REVIEWED AND ACCEPTED PRIOR TO BACKFILLING OF MATERIALS.

7.1.7. PROVIDE COPIES OF ELECTRICAL TRENCHING REPORTS AND PLUMBING REPORTS PROVIDED BY BUILDING INSPECTION DEPARTMENT TO THE CONTRACT ADMINISTRATOR AND OWNER.

7.1.8. ENSURE BACKFILL MATERIALS ARE AS PER SPECIFICATIONS.

7.1.9. PROVIDE SIEVE TESTS AND AFFILIATED SUBMITTALS OF ALL GRANULARS, SANDS AND BACKFILL MATERIALS FOR APPROVAL PRIOR TO ORDER AND INSTALLATION. REFER TO SPECIFICATIONS.

7.1.10. WHEN MEETING A NEW HARD SURFACE TO AN EXISTING HARD SURFACE, PROVIDE NOTICE TO THE CONTRACT ADMINISTRATOR OF ANY CONDITIONS WHERE THE JOINT WILL RESULT IN MORE THAN A 6MM DIFFERENTIAL (*I.E. A NEW CONCRETE SIDEWALK IS MEETING AGAINST AN EXISTING ASPHALT SIDEWALK THAT HAS A SMALL DEPRESSION*). DO NOT COMMENCE WORK UNTIL THE CONTRACT ADMINISTRATOR HAS CLARIFIED IF RECTIFICATION OF THE EXISTING SURFACE IS NEEDED TO AVOID A TRIPPING HAZARD.

7.1.11. CONFIRM DESIGN GRADES HAVE BEEN CHECKED PRIOR TO POURING, LAYING OR INSTALLING ANY HARD SURFACE MATERIALS OVER PREPARED BACKFILL.

7.1.12. REPORT ANY GRADES THAT CONTRADICT BEST CONSTRUCTION PRACTICES IMMEDIATELY TO THE CONTRACT ADMINISTRATOR (*I.E WATER FLOWS TOWARDS A BUILDING OR IS GOING TO PUDDLE IN AN AREA, OR AN AREA OF SURFACE APPEARS FLAT*). DO NOT PROCEED UNTIL SLOPES AND DESIGN HAVE BEEN CLARIFIED.

7.1.13. PROVIDE ANY SURVEY SHOTS OR SPOT GRADE CHECKS AS REQUESTED BY CONTRACT ADMINISTRATOR.

7.1.14. REFER TO CIVIL ENGINEERING DRAWINGS AND GEOTECHNICAL REPORT FOR ADDITIONAL HARDSCAPE REQUIREMENTS.

7.2. CONCRETE PAVING

7.2.1. PROVIDE A MOCK-UP AS NOTED ABOVE. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

7.2.2. ENSURE CONCRETE PAVING MAINTAINS THE SAME CONTROL AND EXPANSION JOINT PATTERNS AS SHOWN IN DESIGN DRAWINGS.

7.2.3. IN AREAS WITHOUT CUSTOM CONTROL OR EXPANSION JOINT PATTERNING, PROVIDE:

7.2.4. EXPANSION JOINTS EVERY 9.0M MAXIMUM ON CENTRE.

7.2.5. CONTROL JOINTS EVERY 3.0M MAXIMUM ON CENTRE.

7.2.6. CONFIRM LOCATIONS WITH CONSULTANT PRIOR TO COMMENCING FORMWORK.

7.2.7. ALL HORIZONTAL FLAT CONCRETE TO HAVE A MEDIUM BROOM FINISH UNLESS NOTED OTHERWISE.

7.2.8. CONCRETE THAT IS REINFORCED MUST BE REVIEWED PRIOR TO POURING. ENSURE REBAR IS 'CHAIRED' AND SUSTAINED IN AN UPRIGHT POSITION.

7.2.9. REFER TO CIVIL ENGINEERING DRAWINGS FOR CONCRETE PAVING REQUIREMENTS FOR SIDEWALKS AND LETDOWNS.

7.2.10. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

7.3. ASPHALT PAVING

7.3.1. PROVIDE A MOCK-UP AS NOTED ABOVE. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

7.3.2. PROVIDE SUBMITTALS THAT DEMONSTRATE UPPER OR LOWER COURSE MIX TYPE AS SPECIFIED.

7.3.3. ENSURE ASPHALT APPLICATION IS PROVIDED IN A SAFE AND CLEAN MANNER, SUCH AS TO NOT TRANSFER OR SMEAR BITUMEN THAT COULD POTENTIALLY STAIN THE SITE ELEMENTS.

8. WALLS

8.1. GENERAL REQUIREMENTS

8.1.1. PROVIDE MOCK-UP FOR REVIEW OF FORM, QUALITY AND FINISH PRIOR TO INSTALLING ADDITIONAL WORK. REFER TO SPECIFICATIONS.

8.1.2. MOCK-UPS TO INCLUDE A SAMPLE OF JOINT QUALITY, INCLUDING ANY FILLERS, EPOXIES OR SEALANTS SPECIFIED.

8.1.3. ENSURE JOINT EPOXIES AND SEALANTS SPECIFIED ARE INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS.

8.1.4. MOCK-UPS TO INCLUDE ANY GEO-GRID OR SUPPORTING ANCHOR SYSTEM REQUIREMENTS. SUBMIT MATERIAL PRODUCT INFORMATION FOR APPROVAL PRIOR TO COMMENCING MOCK-UP.

8.1.5. INSTALL FILLERS (I.E. MORTAR, GROUT) OR SEALANTS A MINIMUM 48 HOURS PRIOR TO REVIEW OF SITE MOCK-UPS TO ENSURE COLOUR IN PRODUCTS HAS SET TO TRUE FINISH.

8.1.6. ENSURE REINFORCING HAS BEEN REVIEWED BY CONSULTANT STRUCTURAL ENGINEER.

8.1.7. ENSURE THAT TRENCHING HAS BEEN REVIEWED AND ACCEPTED PRIOR TO BACKFILLING OF MATERIALS.

8.1.8. ENSURE BACKFILL MATERIALS ARE AS PER SPECIFICATIONS.

8.1.9. PROVIDE SIEVE TESTS AND AFFILIATED SUBMITTALS OF ALL SANDS, GRANULARS AND BACKFILL MATERIALS FOR APPROVAL PRIOR TO ORDER AND INSTALLATION. `

8.1.10. REPORT ANY ISSUES THAT CONTRADICT BEST CONSTRUCTION PRACTICES IMMEDIATELY TO THE CONTRACT ADMINISTRATOR. DO NOT PROCEED UNTIL DESIGN HAS BEEN CLARIFIED.

8.1.11. PROVIDE ANY SURVEY SHOTS OR SPOT GRADE CHECKS AS REQUESTED BY CONTRACT ADMINISTRATOR.

8.1.12. REFER TO CIVIL ENGINEER, STRUCTURAL ENGINEER AND ELECTRICAL ENGINEER'S DRAWINGS FOR ADDITIONAL REQUIREMENTS, AS WELL AS GEOTECHNICAL REPORT. REPORT DISCREPANCIES IMMEDIATELY TO CONTRACT ADMINISTRATOR.

8.1.13. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

8.2. SEGMENTED CONCRETE WALLS:

8.2.1. PROVIDE A MOCK-UP. REFER TO SPECIFICATIONS.

8.2.2. PROVIDE SUBMITTALS AS PER SPECIFICATIONS.

8.2.3. CONFIRM PRODUCT COLOUR AND FINISH PRIOR TO PREPARING MOCK-UP.

8.2.4. GEO-SYNTHETIC SUPPORT: ENSURE PRODUCT IS REVIEWED PRIOR TO ORDER. CONFIRM SIZE AND DEPTH OF MATERIAL. INSTALL AS PER MANUFACTURER'S SPECIFICATIONS. IMMEDIATELY CONTACT CONTRACT ADMINISTRATOR IF BACKFILL DEPTH OR MATERIAL SHOWN IN MANUFACTURER'S SPECIFICATIONS CONTRADICTS REQUIREMENTS SHOWN IN CONSULTANT'S DRAWINGS OR GEOTECHNICAL REPORT.

8.2.5. REBAR SUPPORT: ENSURE REBAR IS REVIEWED BY CONSULTANT PRIOR TO MORTAR SACKING OR ALTERNATE FORM OF CONCEALMENT.

8.2.6. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

9. METALS

9.1. SUBMIT SHOP DRAWINGS FOR METAL WORKS (I.E. FENCES, ATTACHMENT PLATES, SKATE DETERRENTS). REFER TO SPECIFICATIONS.

9.2. TREAT METAL WORK FOR PROTECTION FROM CORROSION AND ABRASION. STEEL TO BE GALVANIZED OR STAINLESS. ALUMINUM TO BE ANODIZED. THIS APPLIES TO FASTENERS.

9.3. ENSURE ANCHOR PLATES AND AFFILIATED FASTENER JOINING MATERIALS MEET FLUSH BETWEEN JOINING SURFACES WITHOUT GAPS, UNLESS OTHERWISE SPECIFIED.

9.4. COMPLETE METAL BONDING (I.E. WELDING, SOLDERING) SUCH THAT WORK IS TREATED FOR PROTECTION AND WILL NOT CORRODE.

9.5. CONCEAL BONDING WORK IN THE FINISHING OF THE METAL WORK.

9.6. ENSURE SMOOTH FINISH WITH SANDING OR OTHER APPLICABLE HANDWORK NEEDED TO PROVIDE SMOOTH AND CONSISTENT APPEARANCE.

9.7. INSTALL A GROUNDING ROD FOR ALL VERTICAL METAL ELEMENTS TALLER THAN 1800MM IN HEIGHT.

9.8. ENSURE SHOP DRAWINGS WITH PICKETS OR RAILINGS COMPLY WITH BC BUILDING CODE REQUIREMENTS (I.E. RAILING HEIGHT, PICKET SPACING).

9.9. POWDERCOAT APPLICATIONS: ENSURE METAL IS PRETREATED (I.E. GALVANIZED) OR ALTERNATE PROTECTION PROCESS PRIOR TO POWDER COATING. CONFIRM VIA SHOP DRAWING.

9.10. REFER TO PROJECT SPECIFICATIONS FOR FURTHER INFORMATION.

10. WOOD

10.1. SUBMIT SHOP DRAWINGS FOR WOOD WORKS (I.E. BENCHES AND DECKING). REFER TO SPECIFICATIONS..

10.2. SUBMIT ONE (1) SAMPLE OF THE WOOD TYPE SPECIFIED FOR THE PROJECT FOR CONFIRMATION OF COLOUR AND FINISH PRIOR TO FABRICATION AND INSTALLATION.

10.3. ENSURE WOOD DOES NOT CRACK OR SPLINTER WITH FASTENER CONNECTIONS. PRE-DRILL AND COUNTERSINK AS NEEDED TO PROVIDE SMOOTH CONNECTIONS, UNLESS SPECIFIED OTHERWISE.

10.4. ENSURE WOOD IS FREE OF SPLINTERS, SLIVERS, AND INCONSISTENCIES.

10.5. ENSURE WOOD IS FREE OF DEFECTS THAT COULD IMPACT STRUCTURAL INTEGRITY.

10.6. ENSURE WOOD HAS NO EXPOSED SHARP EDGES. SAND SMOOTH UNLESS SPECIFIED OTHERWISE.

10.7. TREAT CUTS WITH SPECIFIED WOOD PRESERVATIVE SOLUTION OR APPROVED ALTERNATE.

10.8. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

11. DRAINAGE

11.1. SUBMIT SHOP DRAWINGS FOR REVIEW OF ALL SPECIFIED DRAINAGE FEATURES. THIS APPLIES TO PRE-MANUFACTURED PRODUCTS AND CUSTOM DETAILS. INCLUDE INSTALLATION GUIDES WHEN AVAILABLE BY MANUFACTURER.

12. SITE FURNISHINGS

12.1. SUBMIT SHOP DRAWINGS FOR REVIEW OF ALL SPECIFIED SITE FURNISHINGS. THIS APPLIES TO PRE-MANUFACTURED PRODUCTS AND CUSTOM DETAILS. INCLUDE COLOUR AND FINISH INFORMATION WITH DRAWINGS, INCLUDING INFORMATION ON ALL FASTENERS. INCLUDE INSTALLATION GUIDES WHEN AVAILABLE BY MANUFACTURER.

13. SOFT LANDSCAPES

13.1. SOFT LANDSCAPE SUPPLY, SUBMITTALS, PREPARATION AND EXECUTION TO COMPLY WITH CANADIAN LANDSCAPE STANDARD (BRITISH COLUMBIA). FULL DOCUMENT APPLIES.

13.2. ENSURE CONTRACTOR INSTALLING SOFT LANDSCAPES HAS A CURRENT COPY OF THE CANADIAN LANDSCAPE STANDARD (BRITISH COLUMBIA) PRESENT ON SITE.

13.3. SUBMIT REQUEST FOR REVIEW BY CONSULTANT OF SITE SOFT LANDSCAPE FINE GRADING PRIOR TO INSTALLATION OF SOD OR SEED.

13.4. PLANTS AND TREES:

13.4.1. PROVIDE CONSULTANT WITH OPPORTUNITY TO REVIEW PLANT STOCK AT NURSERY PRIOR TO SHIPMENT TO SITE. CONSULTANT RESERVES RIGHT TO REJECT STOCK ON SITE WHEN INCONSISTENT FROM NURSERY SAMPLE STOCK. PROVIDE CONSULTANT OPPORTUNITY TO REVIEW TREES AT NURSERY AND TAG PREFERRED TREE STOCK FOR THE PROJECT THAT COMPLIES WITH DRAWING SIZE, SPECIES, AND FORM. ONE (1) WEEK NOTICE IS REQUIRED FOR NURSERY REVIEW.

13.4.2. GROWING MEDIUM TO BE "LEVEL 2 GROOMED, 2P" AS PER CHART T-6.3.5.1 IN CHAPTER 6 OF THE CANADIAN LANDSCAPE STANDARD. GROWING MEDIUM DEPTHS AS PER CONSTRUCTION DETAILS.

13.4.3. SUBMIT GROWING MEDIUM REPORT FOR REVIEW PRIOR TO ORDER OR INSTALLATION. REPORT TO MATCH TABLE 6.3.5.3 "PROPERTIES OF GROWING MEDIA FOR LEVEL 2 "GROOMED" AREAS". ADDITIONAL GROWING MEDIUM REPORT REQUIREMENTS ARE PROVIDED IN PROJECT SPECIFICATIONS.

13.5. MULCH:

13.5.1. TO BE COMPOSTED BARK, BROWN (NOT RED) IN COLOUR.

13.5.2. MULCH TO BE COMPLIANT WITH CANADIAN LANDSCAPE STANDARDS, PAGE 132, TABLE T-10.1.

13.5.3. A ONE (1) LITRE MULCH SUBMITTAL IS REQUIRED FOR APPROVAL PRIOR TO PURCHASE AND INSTALLATION.

13.5.4. DEPTH OF MULCH TO BE 75MM AFTER SETTLEMENT WITH COMPLETE COVERAGE.

13.5.5. PROVIDE MULCH RING OF 1.2M DIAMETER AND COMPLIANT WITH BC LANDSCAPE STANDARDS FOR EACH NEW TREE.

13.5.6. PROVIDE CONTINUOUS MULCH FOR SHRUB AND GROUNDCOVER BEDS SO THAT PLANTS HAVE 100% COMPLETE COVERAGE OF ROOT ZONES, COMPLETE FROM PLANT TO PLANT.

13.5.7. DO NOT BURY PLANTS WITH MULCH. KEEP MULCH AWAY FROM SHRUB STEMS AND TREE TRUNKS.

13.6. LAWNS:

13.6.1. SUBMIT SEED CERTIFICATES FOR REVIEW PRIOR TO PURCHASE. SEED MIX TO BE "CHAFER BEETLE RESISTANT LAWN MIX" UNLESS SPECIFIED OTHERWISE. ENSURE SEED IS NO. 1 TURFGRASS AND NO 1. CANADIAN SEED AS PER CANADIAN LANDSCAPE STANDARD (BRITISH COLUMBIA).

13.6.2. UNLESS OTHERWISE SPECIFICED, GROWING MEDIUM TO BE "LEVEL 2 GROOMED, 2P" AS PER CHART T-6.3.5.1 IN CHAPTER 6 OF THE CANADIAN LANDSCAPE STANDARD. MINIMUM 150MM DEPTH REQUIRED FOR INSTALLATION UNLESS NOTED OTHERWISE.

13.6.3. SUBMIT GROWING MEDIUM REPORT FOR REVIEW PRIOR TO ORDER OR INSTALLATION. REPORT TO MATCH TABLE 6.3.5.3 "PROPERTIES OF GROWING MEDIA FOR LEVEL 2 "GROOMED" AREAS". ADDITIONAL GROWING MEDIUM REPORT REQUIREMENTS ARE PROVIDED IN PROJECT SPECIFICATIONS.

13.6.4. ENSURE AREAS AT EDGE OF LIMIT OF CONSTRUCTION ARE APPROPRIATELY BLENDED TO MEET EXISTING UNDISTURBED LAWNS. PROVIDE A MINIMUM 50MM IMPORTED GROWING MEDIUM TO BLEND PROPERLY. PROVIDE ADDITIONAL GROWING MEDIUM AS NEEDED.

13.6.5. COMPLETE ESTABLISHMENT (MINIMUM TWO CUTS) REQUIRED AS PER CANADIAN LANDSCAPE STANDARD (BRITISH COLUMBIA).

13.7. THE CONSULTANT MAY REQUEST, AT THE CONTRACTOR'S EXPENSE, UP TO TWO TESTS OF GROWING MEDIUM IF SUSPECTED INCONSISTENCIES APPEAR. TESTS SAMPLES WILL BE SUBMITTED TO PACIFIC SOIL ANALYSIS INC. IN RICHMOND BC. SUITE 5 11720 VOYAGUER WAY, RICHMOND, BC, V6X 3G9 OR ANOTHER APPROVED TESTING AGENCY.

13.8. ESTABLISHMENT MAINTENANCE AND WATERING: REFER TO SECTION 3.0 OF THESE LANDSCAPE NOTES. REFER TO EXTERIOR MAINTENANCE SPECIFICATION.

13.9. WARRANTY: REFER TO SECTION 3.0 OF THESE LANDSCAPE NOTES.

13.10. REFER TO SPECIFICATIONS AND DRAWINGS FOR ADDITIONAL INFORMATION.

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	XJ	AR

OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

LANDSCAPE NOTES

STAMP

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE		DATE	Mar-04
DRAWN BY	JO	DESIGN BY	AR
CHECKED BY	AR	APPROVED BY	AR

DWG. NO. L-01 OF 18

REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

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ALL EXISTING TREES IN PHASE 1 AREA TO BE RETAINED AND PROTECTED DURING CONSTRICTION UNLESS OTHERWISE INDICATED

PROJECT SCOPE AREA:
ALL EXISTING SITE ELEMENTS TO BE REMOVED TO ACCOMMODATE PROPOSED SITE WORKS
NOTE: SITEWORK INCLUDES INSTALLATION OF WATER AND SANITARY LINES, PART OF WHICH ARE OFF-SITE. REFER TO CIVIL DWGS FOR EXTENT OF WORK.

50mm WATER LINE FROM EXISTING PUMP SHED TO SCHOOL -TO BE REMOVED WITHIN PROJECT SCOPE AREA

EXISTING SIGN REMOVED AND RELOCATED ON SITE AS DIRECTED BY OWNER

EXISTING ROCK GARDEN TO BE RETAINED AND DISTURBED ONLY AS ABSOLUTELY REQUIRED FOR NEW SITE WORKS

EXISTING CONCRETE STEPS TO BE REMOVED

EXISTING CONCRETE TRAFFIC BARRIERS TO BE DISPOSED OFF SITE

EXISTING WELL CULVERT TO REMAIN IN PLACE

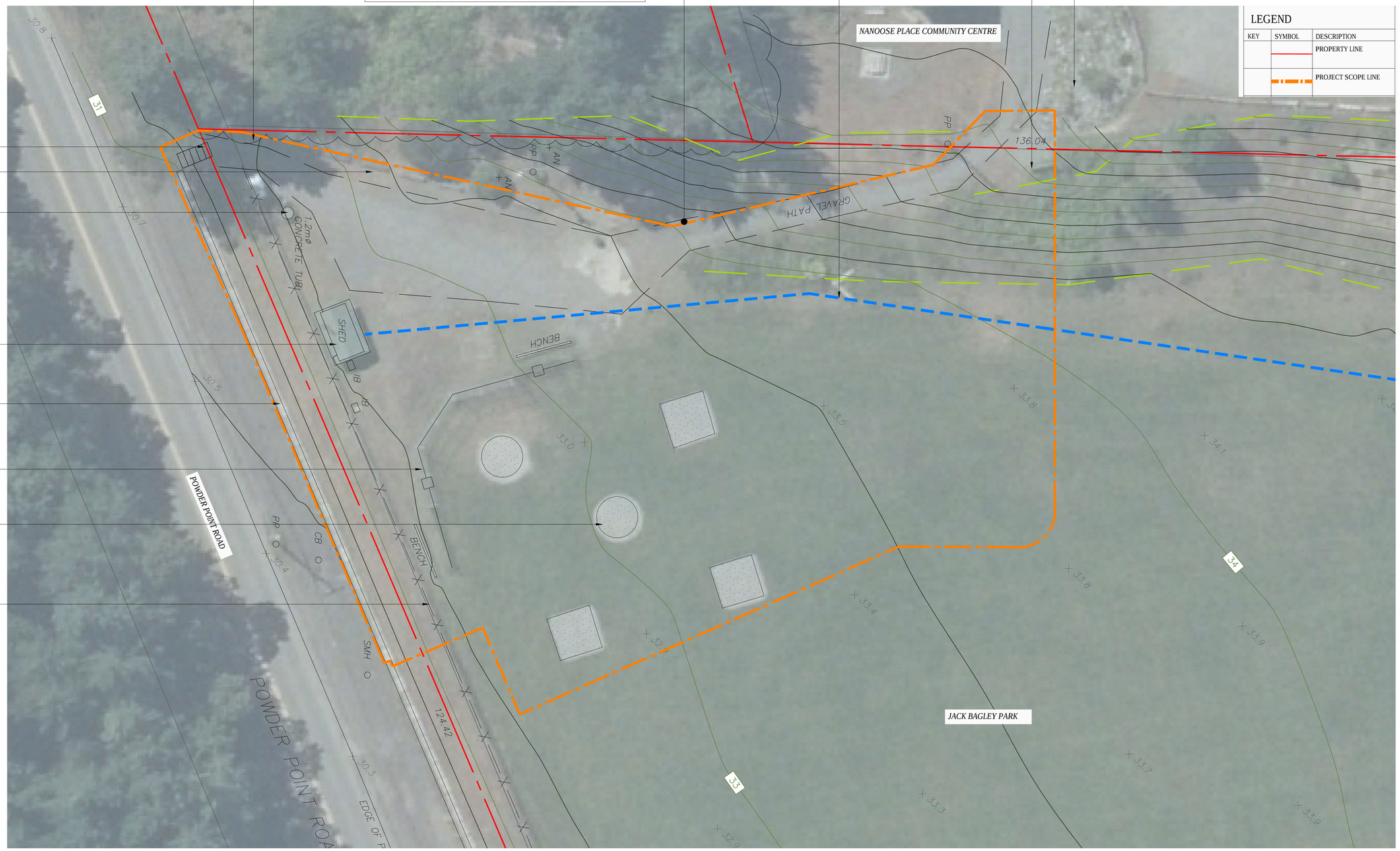
EXISTING SHED TO BE DEMOLISHED
---3 WATER TANKS TO BE RETURNED TO RDN - ALL OTHER EQUIPMENT TO BE DISPOSED OFF-SITE

EXISTING LOCK-BLOCK WALL WITHIN PROJECT EXTENTS TO BE REMOVED AND REUSED ON SITE

EXISTING BASEBALL BACKSTOP FENCE AND BENCHES TO BE DEMOLISHED AND DISPOSED OFF SITE

REMOVE BASEBALL GRANULAR MOUNDS FOR LAWN RESTORATION

EXISTING CHAIN LINK FENCE WITHIN PROJECT EXTENTS TO BE REMOVED AND DISPOSED OFF SITE



LEGEND

KEY	SYMBOL	DESCRIPTION
		PROPERTY LINE
		PROJECT SCOPE LINE

N

1 / L-02 EXISTING CONDITIONS/ DEMOLITION PLAN
PLAN

SCALE 1:200

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	XJ	AR

OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

EXISTING CONDITIONS-DEMOLITION PLAN

STAMP

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REV. E

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SPORTS COURT POSTS (2) (PICKLEBALL) 2 L-09

LOCK BLOCK RETAINING WALL 4 L-08

GRAVEL SURFACING, TYP. 6 L-07

SPORTS COURT POSTS (2) (TENNIS) 2 L-09

CHAINLINK FENCE 1 L-09

TIMBER STEPS 3 L-08

SPORTS COURTS

ASPHALT PAVING, TYP. 3 L-07

ENTRY PLAZA

CONCRETE STEPS 1 L-08

PARK SIGN -NOT IN CONTRACT

RAMP 2 L-08

LOCK BLOCK RETAINING WALL RETURN

N

LEGEND

KEY	SYMBOL	DESCRIPTION
		PROPERTY LINE
		PROJECT SCOPE LINE
1-2 L-07		CIP CONCRETE PAVING
3 L-07		ASPHALT PAVING
4 L-07		ASPHALT PAVING WITH ACRYLIC COATING
6 L-07		GRAVEL SURFACING
1 L-11		TURFGRASS
2 L-11		MEADOW GRASS
3 L-08		TIMBER STEPS
1 L-08		CONCRETE STEPS
1 L-09		CHAIN LINK FENCE WITH GATE
4 L-08		LOCK BLOCK WALL
2 L-10		BENCH
1 L-10		PICNIC TABLE
3 L-10		WASTE RECEPTACLE

1 L-03 DETAIL KEY PLAN
PLAN

SCALE 1:200

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
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DETAIL KEY

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DWG. NO. L-03 OF 18 REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

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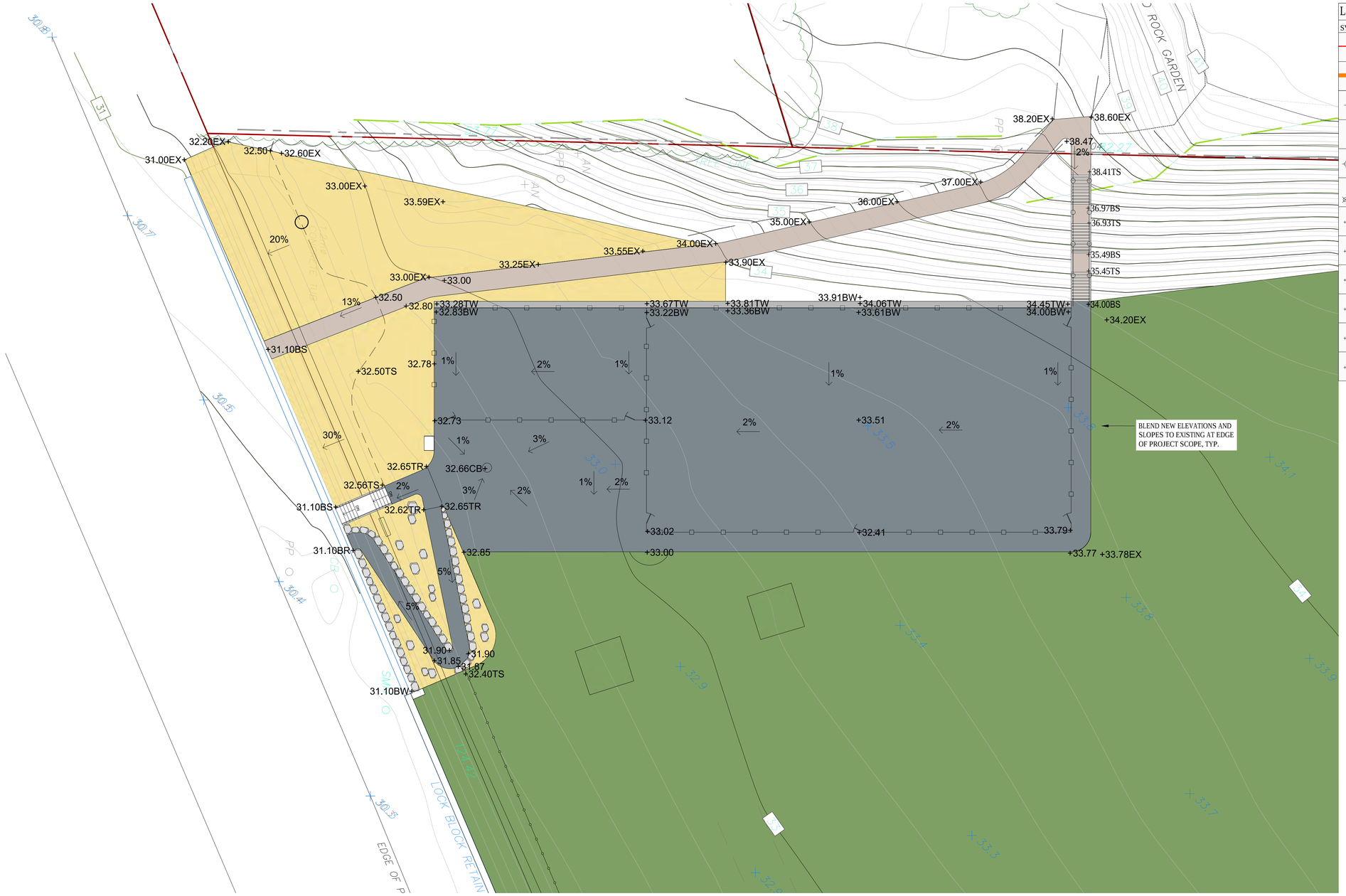

1 L-04 GRADING PLAN

PLAN

SCALE 1:200

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
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OWNER: REGIONAL DISTRICT OF NANAIMO

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GRADING PLAN

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SCALE	1:200	DATE	Mar-04
DRAWN BY	JO	DESIGN BY	AR
CHECKED BY	AR	APPROVED BY	AR

DWG. NO. L-04 OF 18 REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

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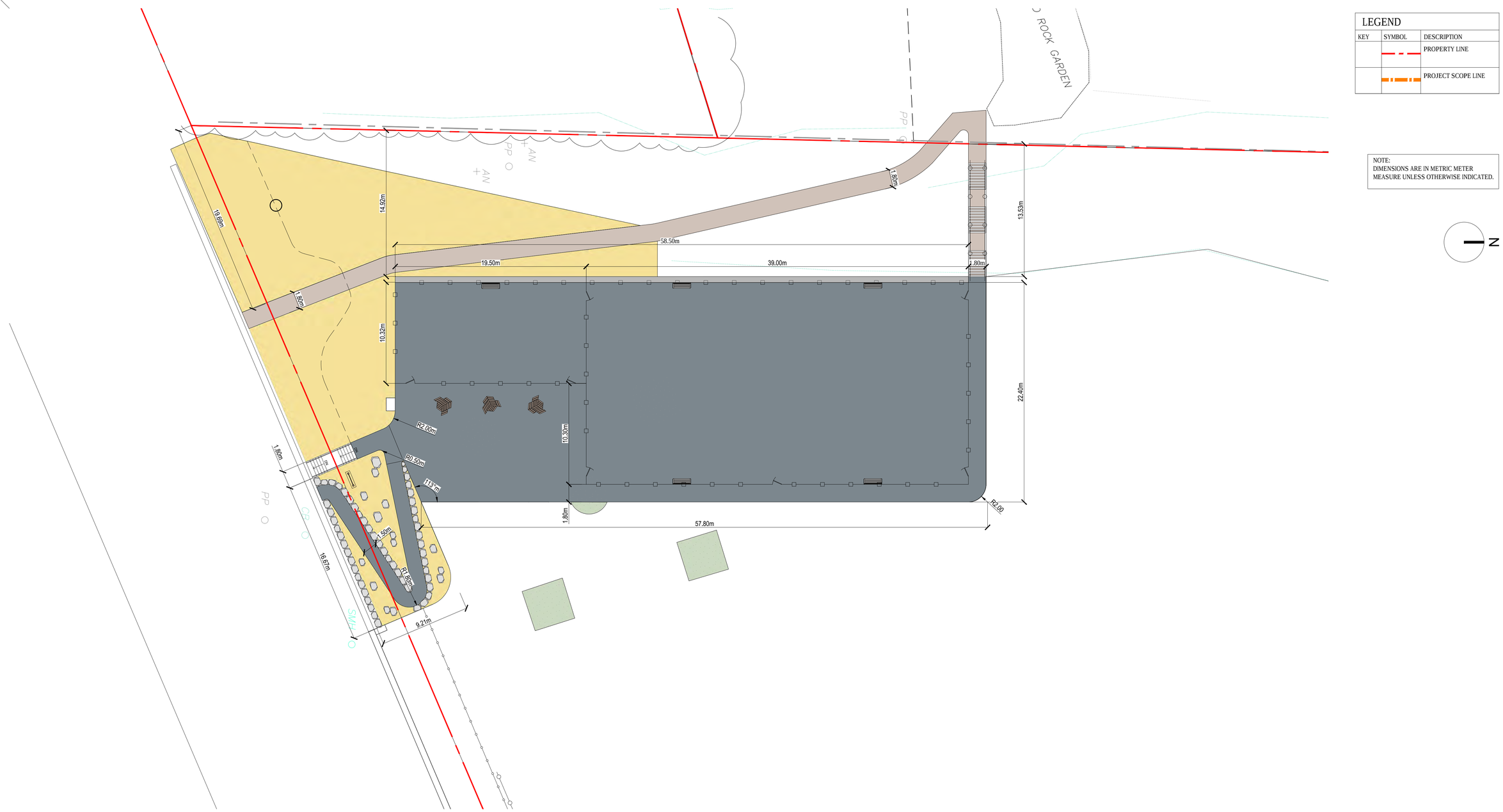

LEGEND

KEY	SYMBOL	DESCRIPTION
		PROPERTY LINE
		PROJECT SCOPE LINE

NOTE:
DIMENSIONS ARE IN METRIC METER
MEASURE UNLESS OTHERWISE INDICATED.

N

1 / L-05 LAYOUT PLAN
PLAN

SCALE 1:200

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	XJ	AR

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LAYOUT PLAN

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CHECKED BY	AR	APPROVED BY	AR

DWG. NO. L-05 OF 18
REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

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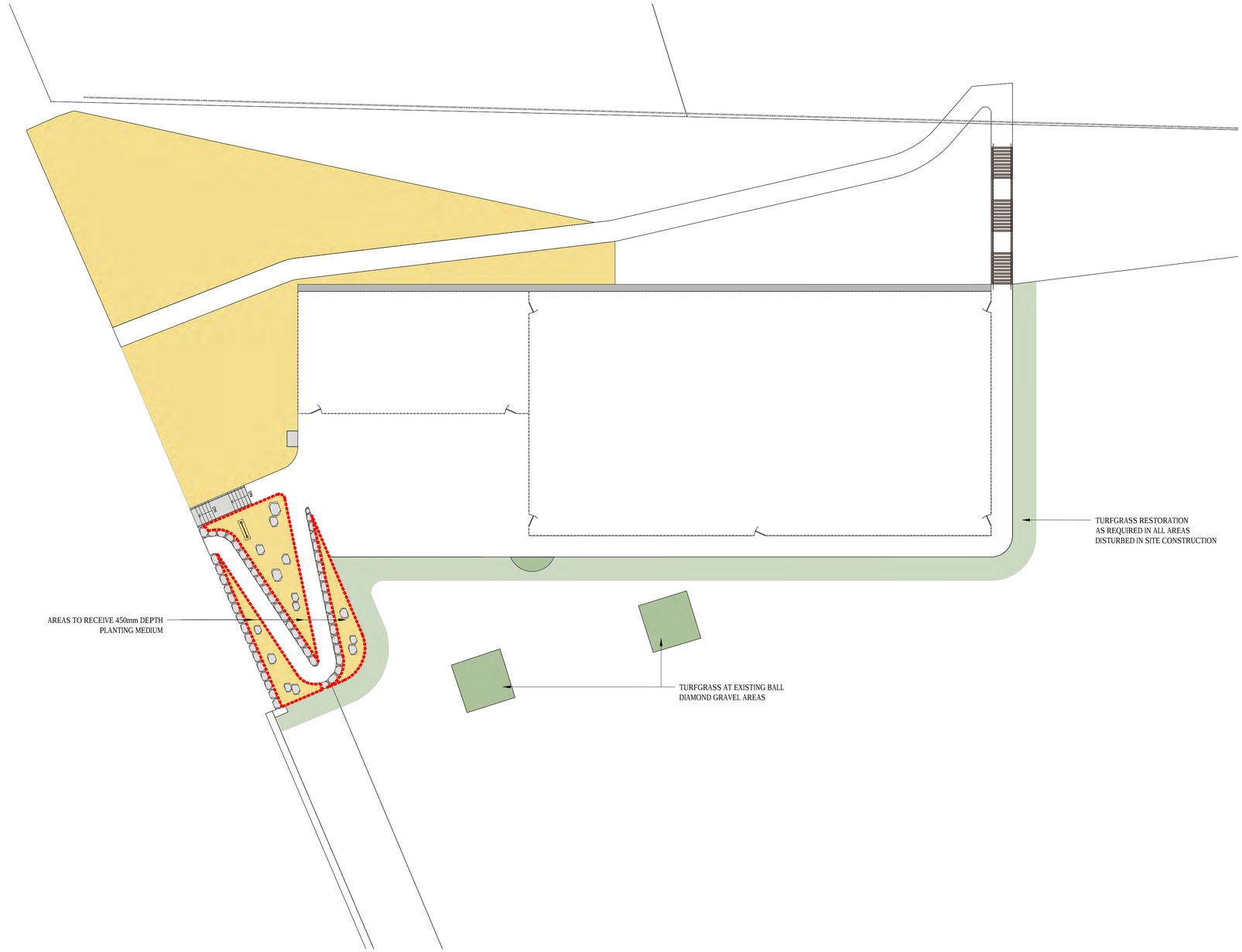

LEGEND

KEY	SYMBOL	DESCRIPTION
		PROPERTY LINE
		PROJECT SCOPE LINE
3 / L-11		TURFGRASS
3 / L-11		MEADOW GRASS

N

1 / L06 PLANTING PLAN
PLAN

SCALE 1:200

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
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OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

PLANTING PLAN

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SCALE	1:200	DATE	Mar-04
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DWG. NO. L06 OF 18
REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

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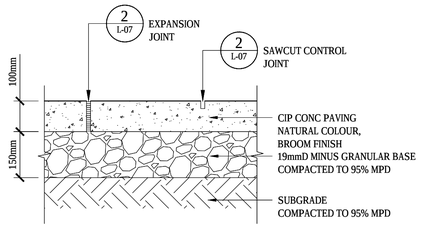
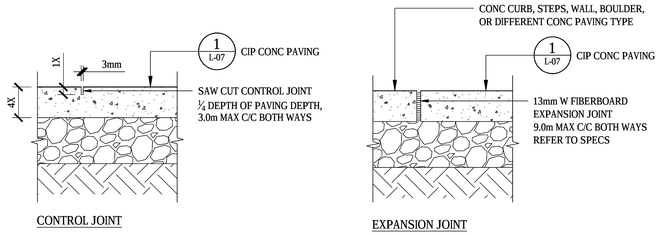
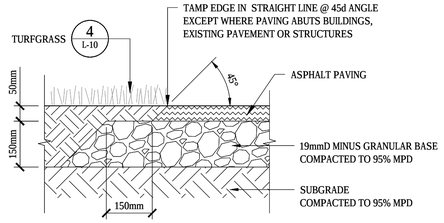


1 L-07 CONCRETE PAVING
SECTION SCALE 1:10



2 L-07 CONTROL AND EXPANSION JOINTS
SECTION SCALE 1:10



3 L-07 ASPHALT PAVING
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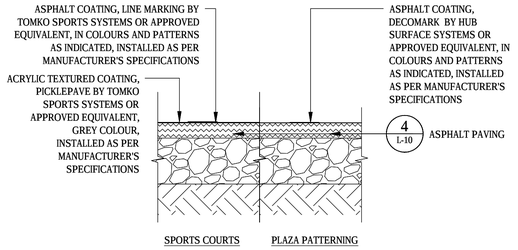
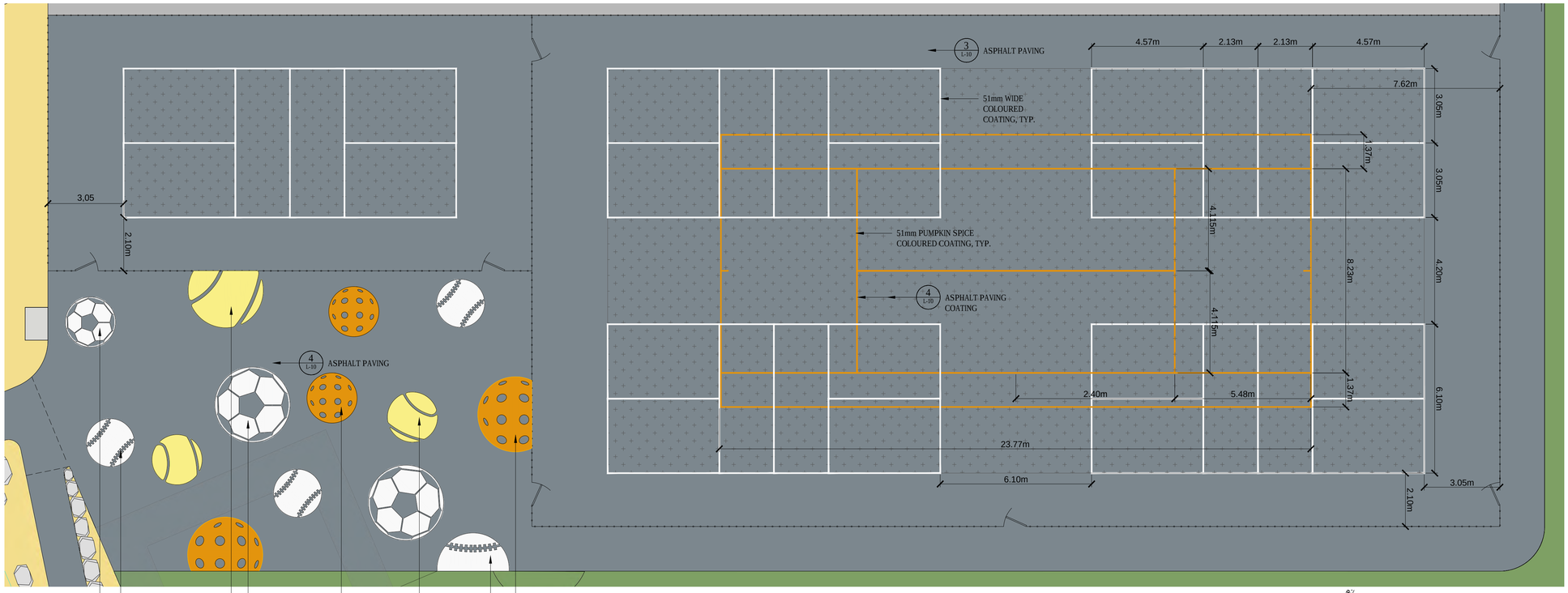
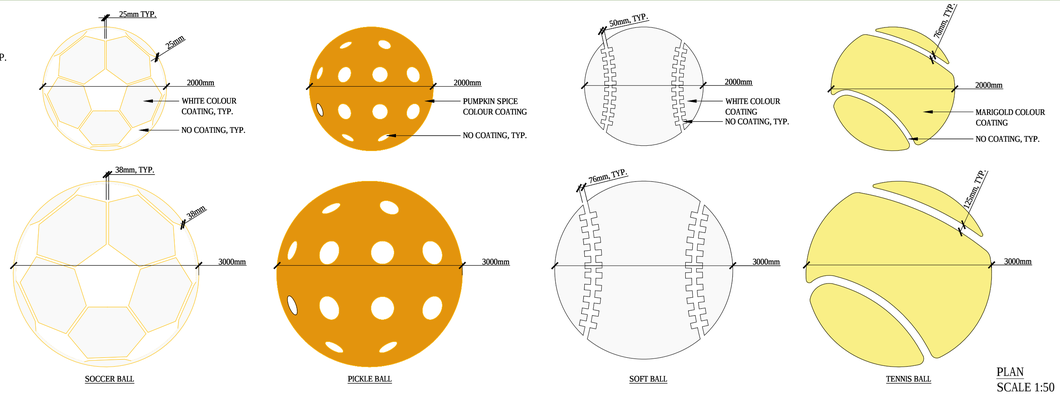


4 L-07 ASPHALT PAVING COATING
SECTION SCALE 1:10

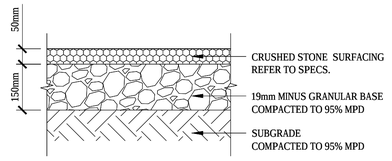


PLAN
SCALE 1:100



PLAN
SCALE 1:50

5 L-07 ASPHALT PAVING COATING PATTERNS
PLAN



6 L-07 GRAVEL SURFACING
SECTION SCALE 1:10

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	XJ	AR

OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

DETAILS - SURFACING

STAMP

ISL
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SCALE	VARIES	DATE	Mar-04
DRAWN BY	JO	DESIGN BY	AR
CHECKED BY	AR	APPROVED BY	AR

DWG. NO. L-07 OF 18
REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

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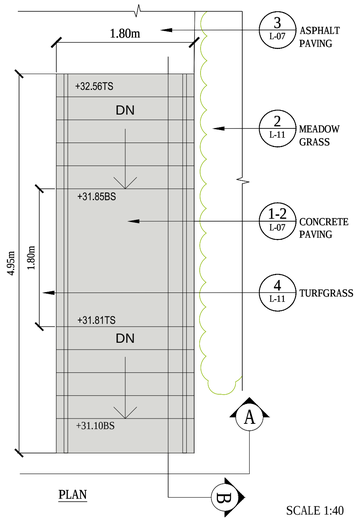
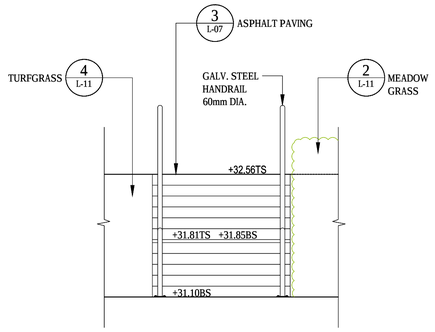
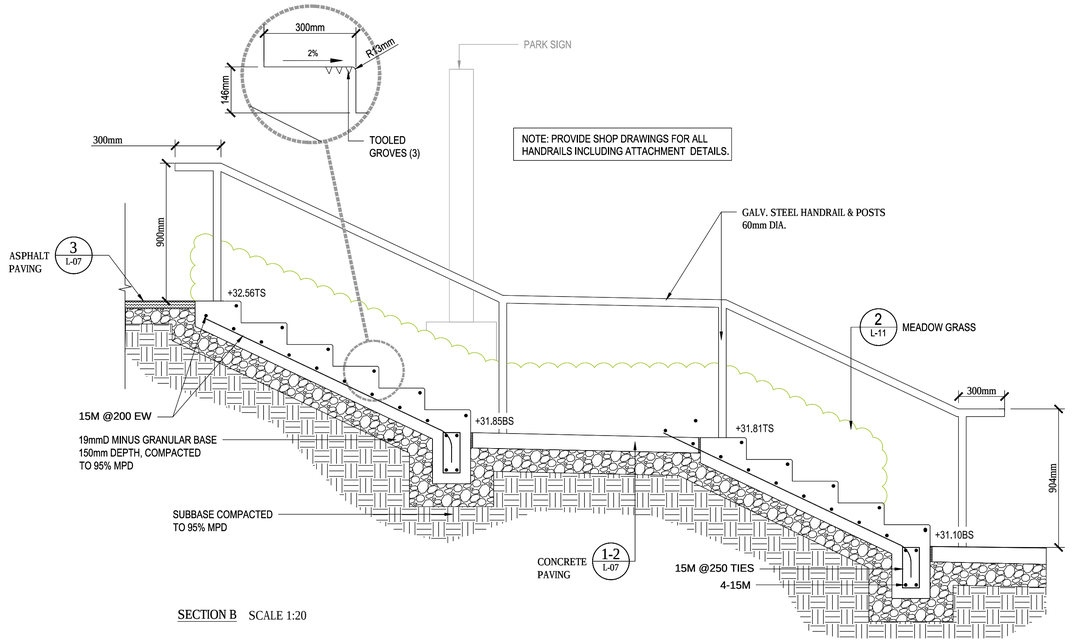


PLAN SCALE 1:40



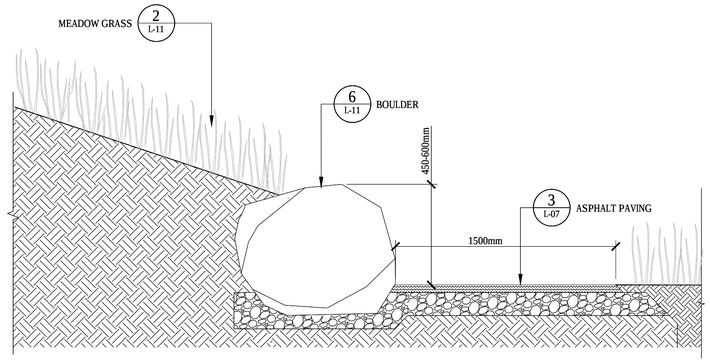
ELEVATION A SCALE 1:40



SECTION B SCALE 1:20

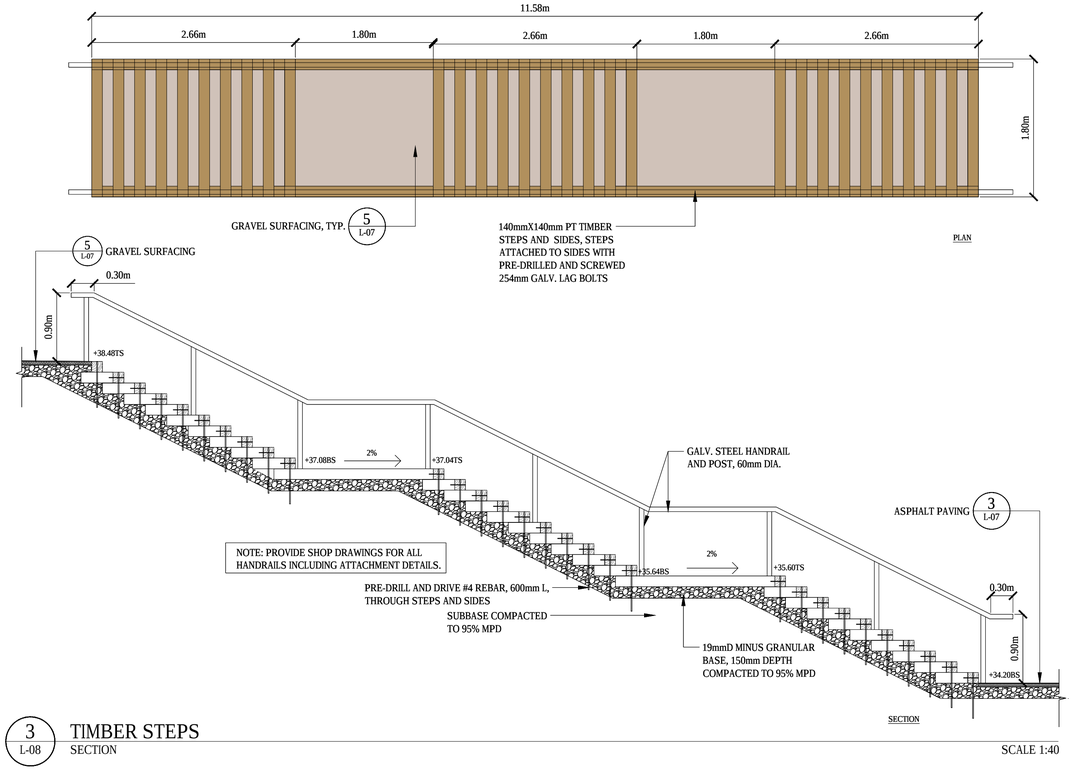
1 L-08 CONCRETE STEPS

PLAN/ SECTION/ ELEVATION



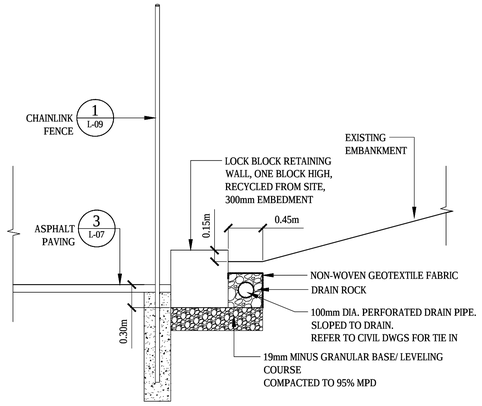
2 L-08 RAMP

SECTION SCALE 1:20



3 L-08 TIMBER STEPS

SECTION SCALE 1:40



4 L-08 LOCK BLOCK WALL

SECTION SCALE 1:40

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PLOT DATE: March 3, 2022

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	XJ	AR

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JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

DETAILS - STEPS, RAMP, WALLS

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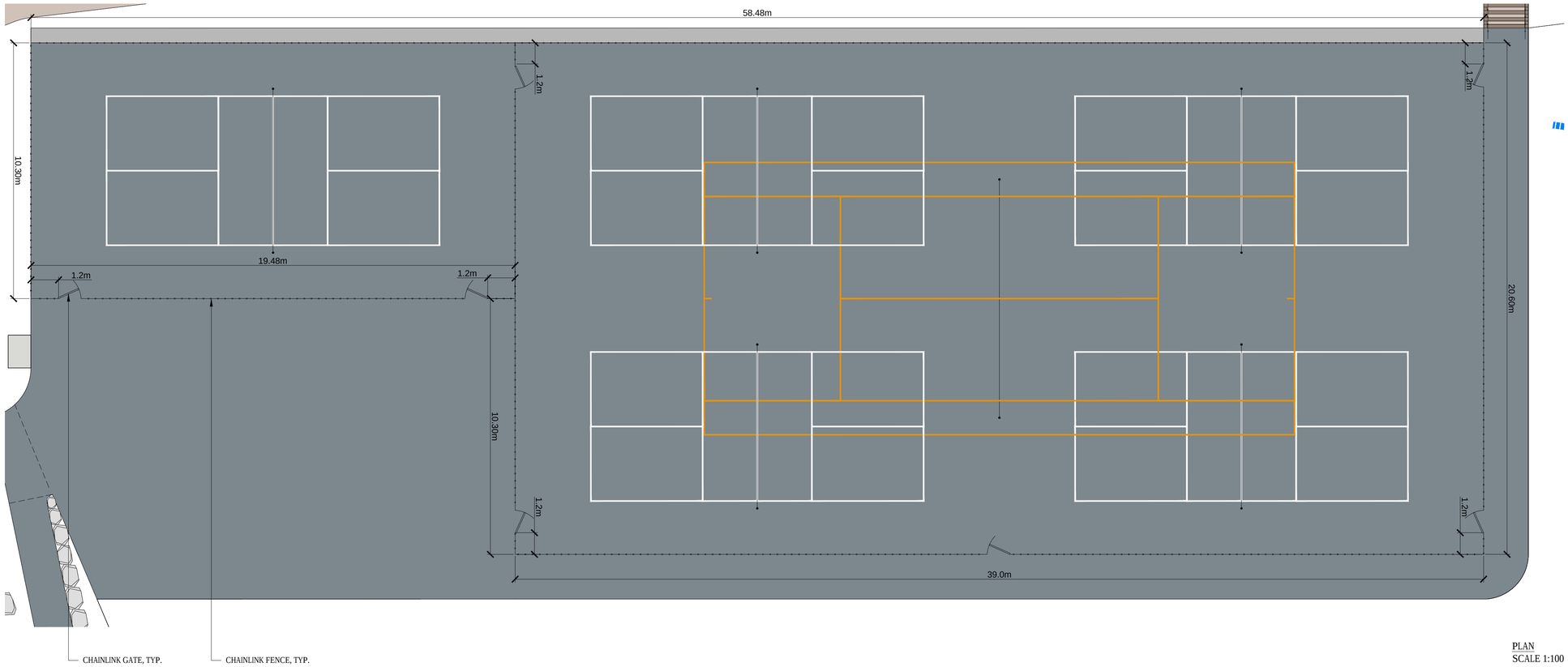
SCALE	VARIES	DATE	Mar-04
DRAWN BY	JO	DESIGN BY	AR
CHECKED BY	AR	APPROVED BY	AR

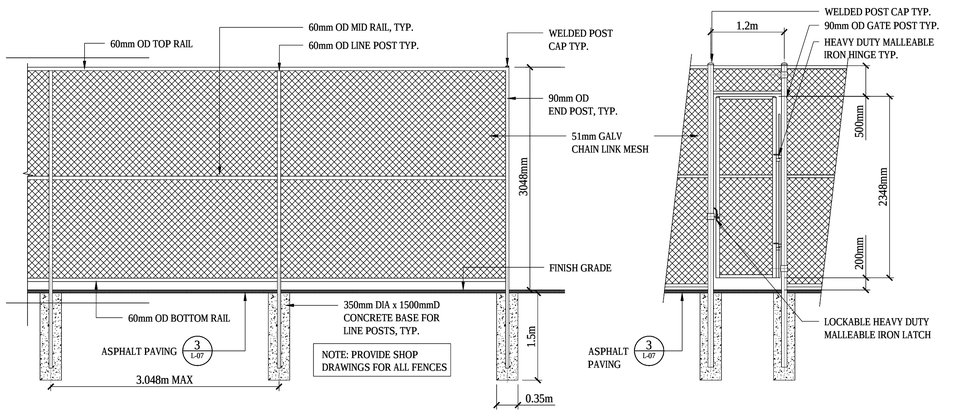
DWG. NO. L-08 OF 33

REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

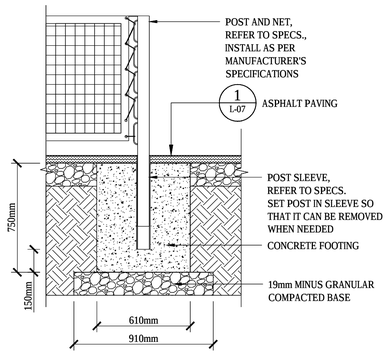


PLAN
SCALE 1:100



ELEVATION
SCALE 1:50

1
L-09
CHAINLINK FENCE: SPORTS COURTS
PLAN/ ELEVATION



2
L-09
SPORTS COURTS POSTS
SECTION 1:20

PLOT DATE: March 3, 2022

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	XJ	AR

OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS
DETAILS - FENCES

STAMP

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CHECKED BY	AR	APPROVED BY	AR

DWG. NO. L-09 OF 18
REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

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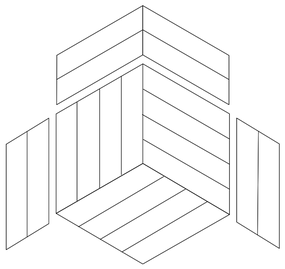
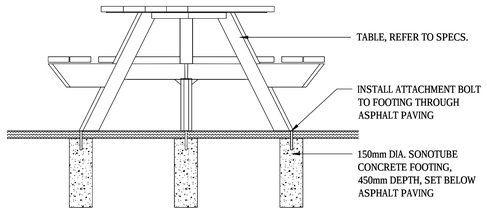


TOP VIEW

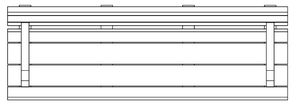


SIDE ELEVATION

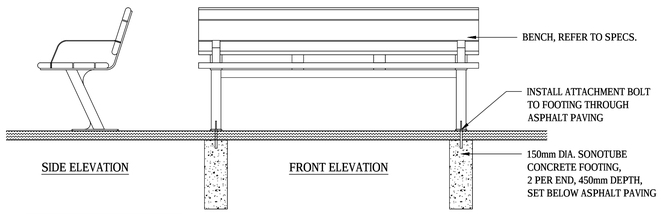
SUPPLIER: WISHBONE
MAKE: BAYVIEW HEXAGONAL PICNIC TABLE W/C
MODEL: BVHPTWC-84

1 PICNIC TABLE
L-10 PLAN - SECTION - ELEVATION NTS

ISOMETRIC VIEW



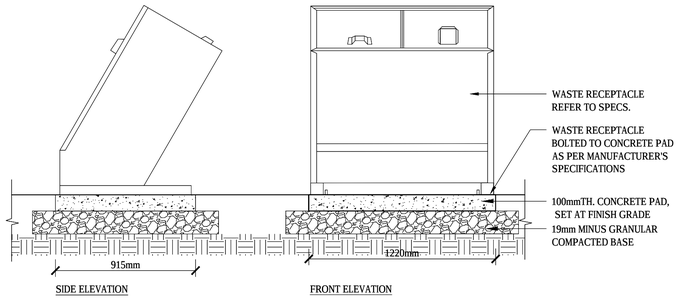
TOP VIEW



SIDE ELEVATION FRONT ELEVATION

SUPPLIER: WISHBONE
MAKE: BAYVIEW PARK BENCH
MODEL: BV-6 WITH ARMRESTS

2 BENCH
L-10 PLAN - SECTION - ELEVATION NTS



SIDE ELEVATION FRONT ELEVATION

SUPPLIER: HAUL-ALL
MAKE & MODEL: SP-HBIIS-PY

3 WASTE RECEPTACLE
L-10 ELEVATION SCALE 1:20

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PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	XJ	AR

OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

DETAILS - FURNISHINGS

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CHECKED BY	AR	APPROVED BY	AR

DWG. NO. L-10 OF 18

REV. E

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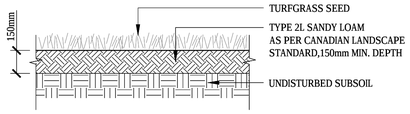
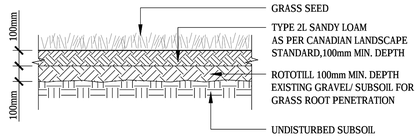
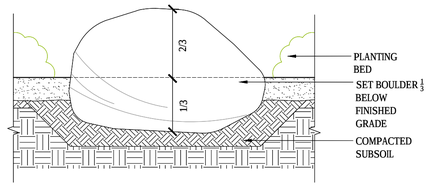


1 L-11 **TURFGRASS**
SECTION SCALE 1:20



2 L-11 **MEADOW GRASS**
SECTION SCALE 1:20



3 L-11 **BOULDER**
SECTION SCALE 1:20

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
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DETAILS - PLANTING

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DWG. NO. L-11 OF 18
REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

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ISSUED FOR TENDER

DESIGN NO. 33078

PLOT DATE: March 3, 2022

REV NO	REVISIONS	DATE	DRAWN	APPR'D
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OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

CIVIL SITE SERVICING PLAN 2

STAMP

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DWG. NO. C-01 OF 18

REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

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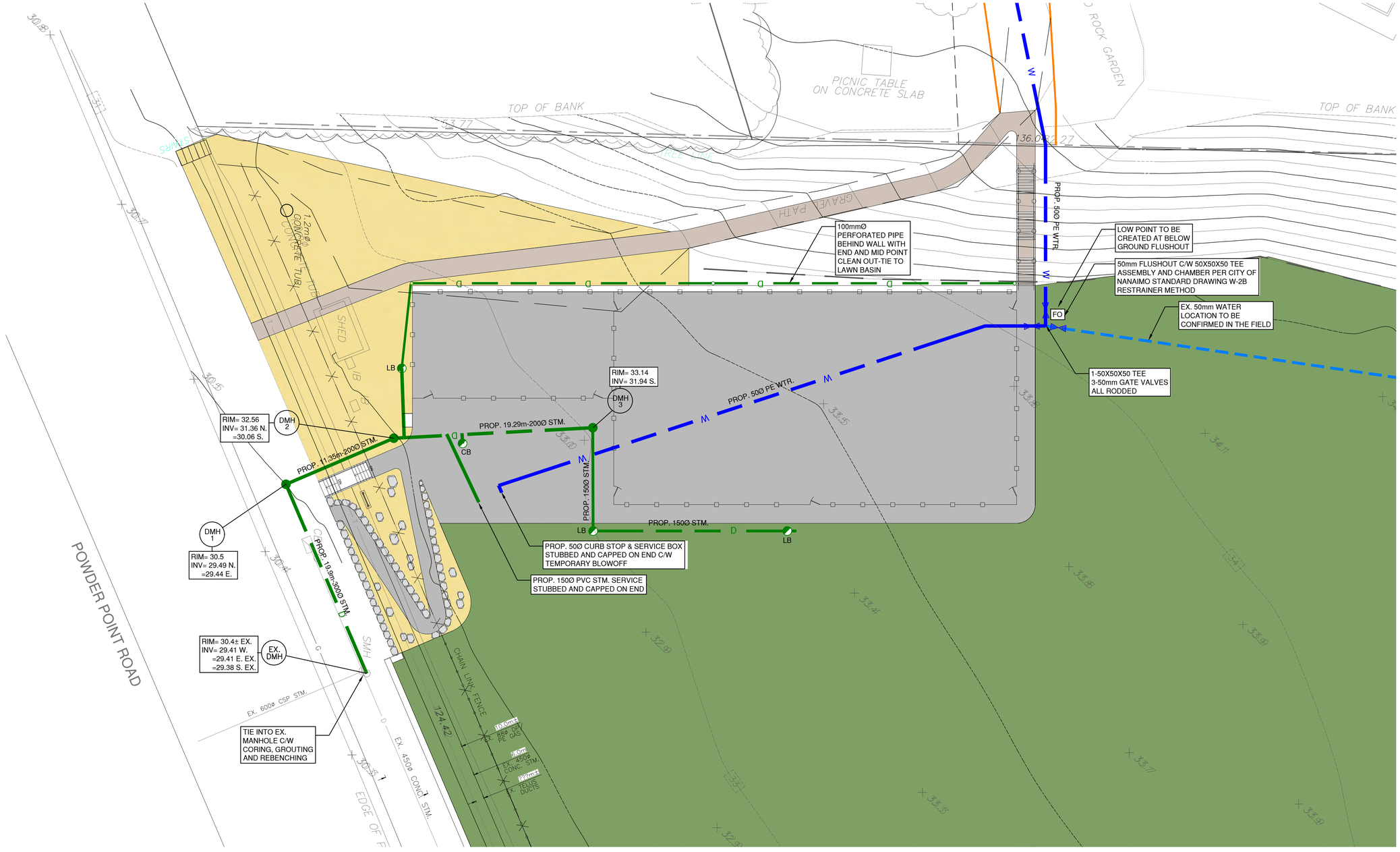

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	NL	IM

OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

CIVIL SITE SERVICING PLAN 2

ISL
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SCALE	1:250	DATE	Mar-04
DRAWN BY	NL	DESIGN BY	IM
CHECKED BY	IM	APPROVED BY	IM
		REV.	E

DWG. NO. C-02 OF 18

DESTROY ALL PRINTS BEARING PREVIOUS NO.

File: G:\Projects\32000\32300\32345_RDoN_Jack_Bagley_Park_Redevelopment\02_CAD\D20_Drafting\204_Civil\32345_CIVIL_Layout.dwg

GENERAL NOTES:

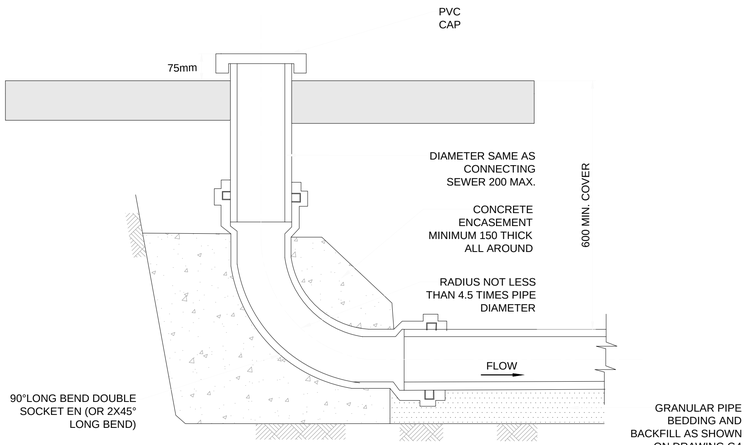
1. THE CONTRACTOR SHALL OBTAIN ALL PERMITS TO UNDERTAKE THE WORKS FROM APPLICABLE AUTHORITIES.
2. ALL DAMAGED OR DISTURBED AREAS OUTSIDE OF THE WORK ZONE TO BE REPAIRED OR REPLACED TO EXISTING OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
3. ALL SHOP DRAWINGS AND MATERIAL SPECIFICATIONS TO BE PROVIDED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION OR ORDERING. FABRICATION OR ORDERING SHALL NOT PROCEED WITHOUT REVIEWED SHOP DRAWINGS.
4. ALL DIMENSIONS IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE. ALL ELEVATIONS ARE GIVEN IN METERS (m) UNLESS NOTED OTHERWISE. COORDINATES ARE GROUND LEVEL (UTM NAD 83) AND ALL ELEVATIONS ARE TO GEODETIC DATUM.
5. ANY ALTERNATIVES TO SPECIFIED MATERIALS TO BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
6. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT SURVEY.

STORM AND SANITARY NOTES:

1. MINIMUM COVER ON SERVICES AND LEADS TO BE 0.6m. MINIMUM COVER ON STORM MAINS TO BE 1.2m.
2. CATCHBASIN LEADS TO HAVE MINIMUM 2.0% GRADE. CATCHBASIN LEAD TO BE 150Ø DR28 PVC.
3. ALL LAWN BASIN LEADS AND SERVICE CONNECTIONS TO BE 100Ø DR28 PVC UNLESS NOTED OTHERWISE ON THE DRAWINGS. LAWN BASIN AND SERVICE CONNECTION LEADS TO HAVE A MINIMUM 1.0% GRADE.
4. ALL SANITARY SERVICE CONNECTIONS TO BE 100Ø DR28 PVC UNLESS NOTED OTHERWISE. SANITARY SERVICE CONNECTIONS TO HAVE A MINIMUM 2.0% GRADE.
5. ALL CONNECTIONS TO NEW PIPES SHALL BE ACCOMPLISHED WITH MANUFACTURED WYE BRANCHES. SERVICE CONNECTIONS FOUND AFTER STORM MAIN INSTALLATION AND ALL CONNECTIONS TO EXISTING PIPES SHALL BE ACCOMPLISHED WITH INSERT A-TEE, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
6. ALL COUPLERS FOR PIPES UNDER 200Ø TO BE MADE WITH STAINLESS SHEAR BAND TYPE.
7. ALL NEW STORM MAIN OVER 200Ø TO BE VIDEO INSPECTED.
8. ALL STORM MANHOLES ARE TO HAVE 500mm SUMPS UNLESS NOTED OTHERWISE

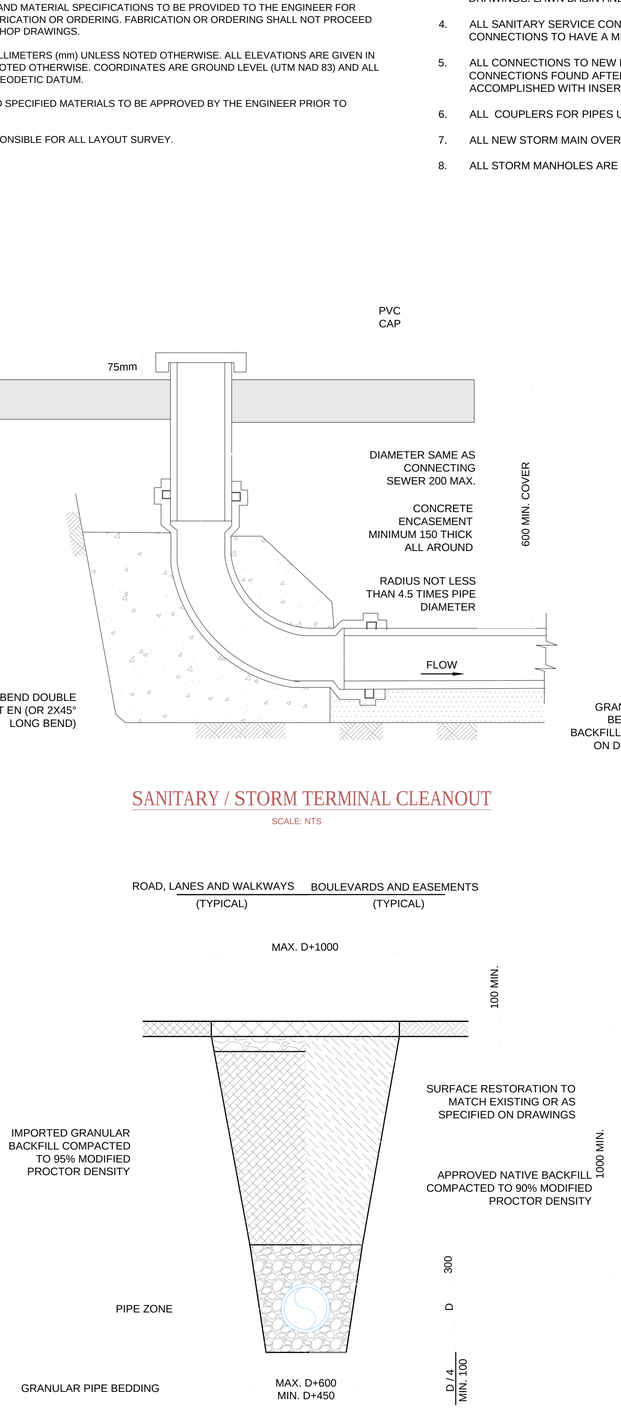
WATER NOTES:

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE MASTER MUNICIPAL CONSTRUCTION DOCUMENT AND STANDARD DETAIL DRAWINGS (MMCD 2009), PLATINUM EDITION AND THE REGIONAL DISTRICT OF NANAIMO (RDN) SPECIFICATIONS AND DETAILED DRAWINGS UNLESS OTHERWISE NOTED.
2. MINIMUM COVER OVER WATER SERVICES TO BE 1.00m UNLESS OTHERWISE NOTED.
3. ALL SERVICE CONNECTIONS TO BE POLYETHYLENE TUBING, PRESSURE CLASS 200. SERVICE CONNECTIONS TO BE 25mm DIAMETER UNLESS NOTED OTHERWISE.
4. ALL WATERMAIN JOINTS WITHIN 3.0m HORIZONTAL OR 0.45m VERTICAL SEPARATION FROM SANITARY OR STORM DRAIN MAINS AND WHERE NOTED ON THE DRAWINGS TO BE PROTECTED BY SHRINK WRAP OR PETROLEUM TAPE.
5. MAXIMUM BEND RADIUS TO $\frac{1}{2}$ x MANUFACTURER'S SPECIFICATIONS.
6. THE CONTRACTOR IS NOT TO OPERATE THE WATER SYSTEM (INCLUDING OPERATING ANY VALVES), ANY WATER SHUT DOWNS ARE TO BE COORDINATED WITH THE ENGINEER AND RDN WATER OPS.
7. CONNECTIONS TO LIVE AND EXISTING WATER SYSTEMS ARE TO BE MADE UNDER THE SUPERVISION OF THE ENGINEER AND RDN.
8. ALL TIE-IN LOCATIONS AND ELEVATIONS ARE TO BE CONFIRMED IN THE FIELD BY THE CONTRACTOR.
9. ALL NEW WATER SERVICES TO UNDERGO PRESSURE AND LEAKAGE TEST WITH A MINIMUM APPLIED PRESSURE OF 1380 Kpa FOR 2 HOURS AS PER AWWA C605.
10. ALL NEW WATER SERVICES TO BE DISINFECTED AND FLUSHED AS PER AWWA C651.



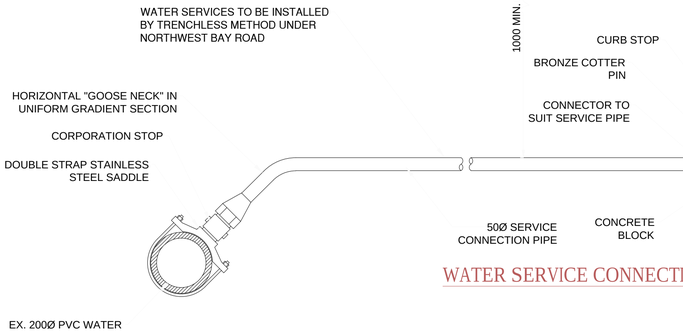
SANITARY / STORM TERMINAL CLEANOUT

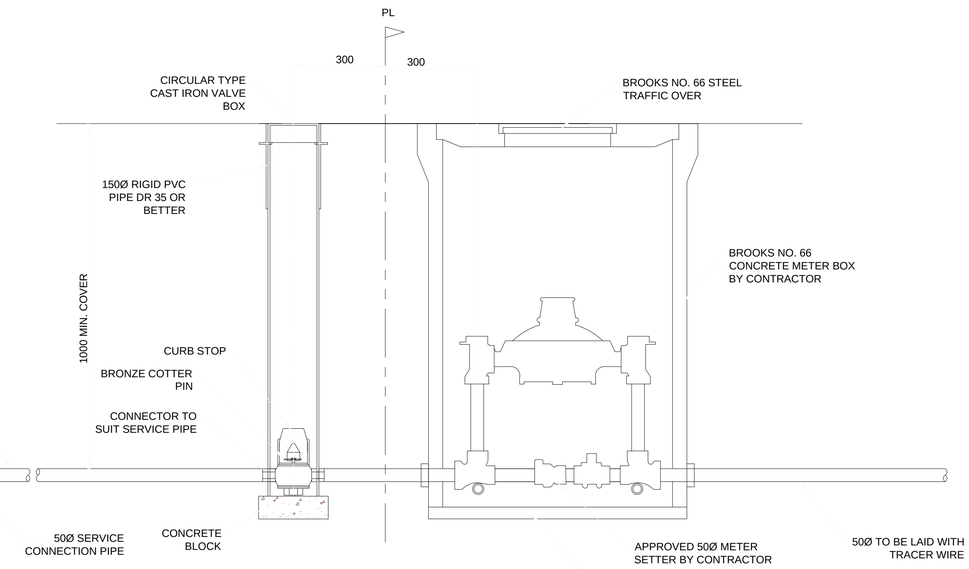
SCALE: NTS



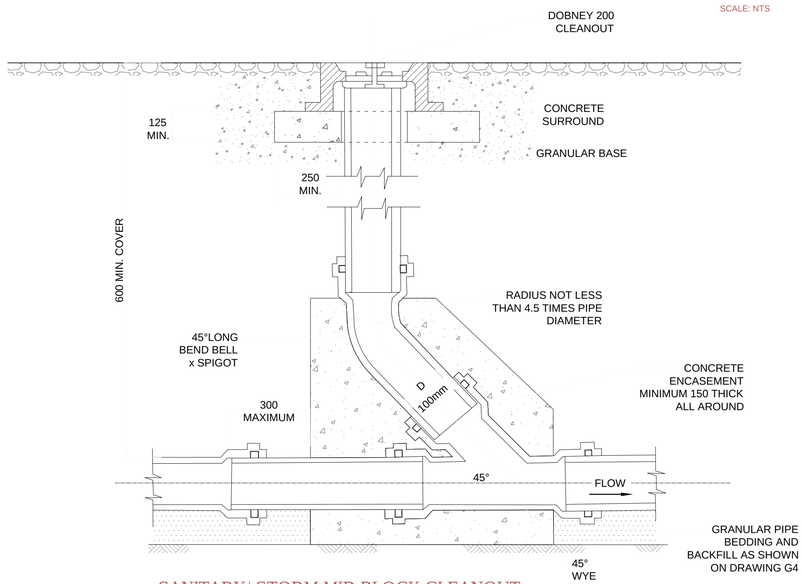
UTILITY TRENCH

SCALE: NTS





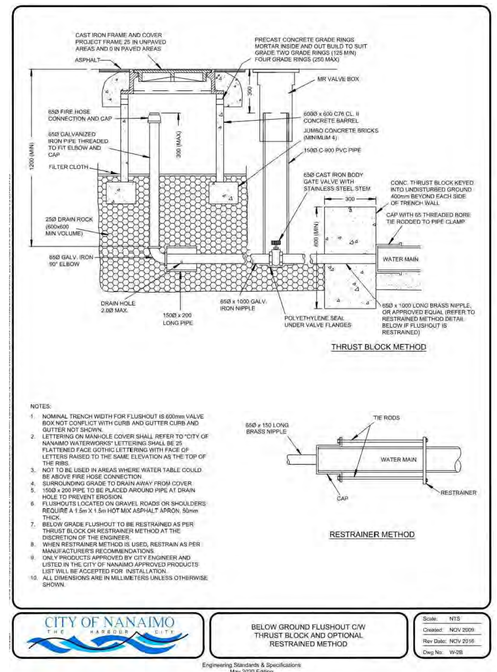
WATER SERVICE CONNECTION CURB STOP VALVE



SCALE: NTS

SANITARY/ STORM MID BLOCK CLEANOUT

SCALE: NTS



BELOW GROUND FLUSHOUT

SCALE: NTS

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	NL	IM

OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS

NOTES AND DETAILS

STAMP

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T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	DATE	Mar-04
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CHECKED BY	IM	APPROVED BY	IM

DWG. NO. C-03 OF 18 REV. E

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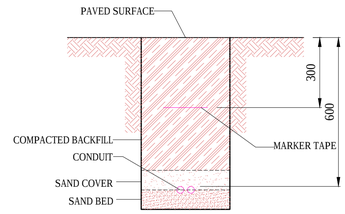
1 EL-01 100mm RPVC CONDUIT
STUBBED AND CAPPED AT BOTH ENDS WITH PULL STRING

1 EL-01 ELECTRICAL CONDUITS PLAN
PLAN

SCALE 1:200



NOTES:
1. SAND BED AND COVER AS PER SPECIFICATIONS.
2. COMPACTION AS PER SPECIFICATIONS.
3. TRENCH WIDTH AS PER SPECIFICATIONS OR AS REQUIRED.
4. RESTORE SURFACE TO ORIGINAL CONDITION.

2 EL-01 TYPICAL TRENCH DETAIL
SECTION

File: G:\Projects\32000\32300\32345_RDoN_Jack_Bagley_Park_Redevelopment\02_CADD\20_Drafting\201_Production_Sheets\32345-EL.dwg

PLOT DATE: March 3, 2022

ISSUED FOR TENDER DESIGN NO. 33078

REV NO	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUED FOR TENDER	2022-03-04	XJ	AR

OWNER: REGIONAL DISTRICT OF NANAIMO

JACK BAGLEY PARK: SITE WORK AND SPORTS COURTS
ELECTRICAL CONDUITS PLAN AND DETAIL

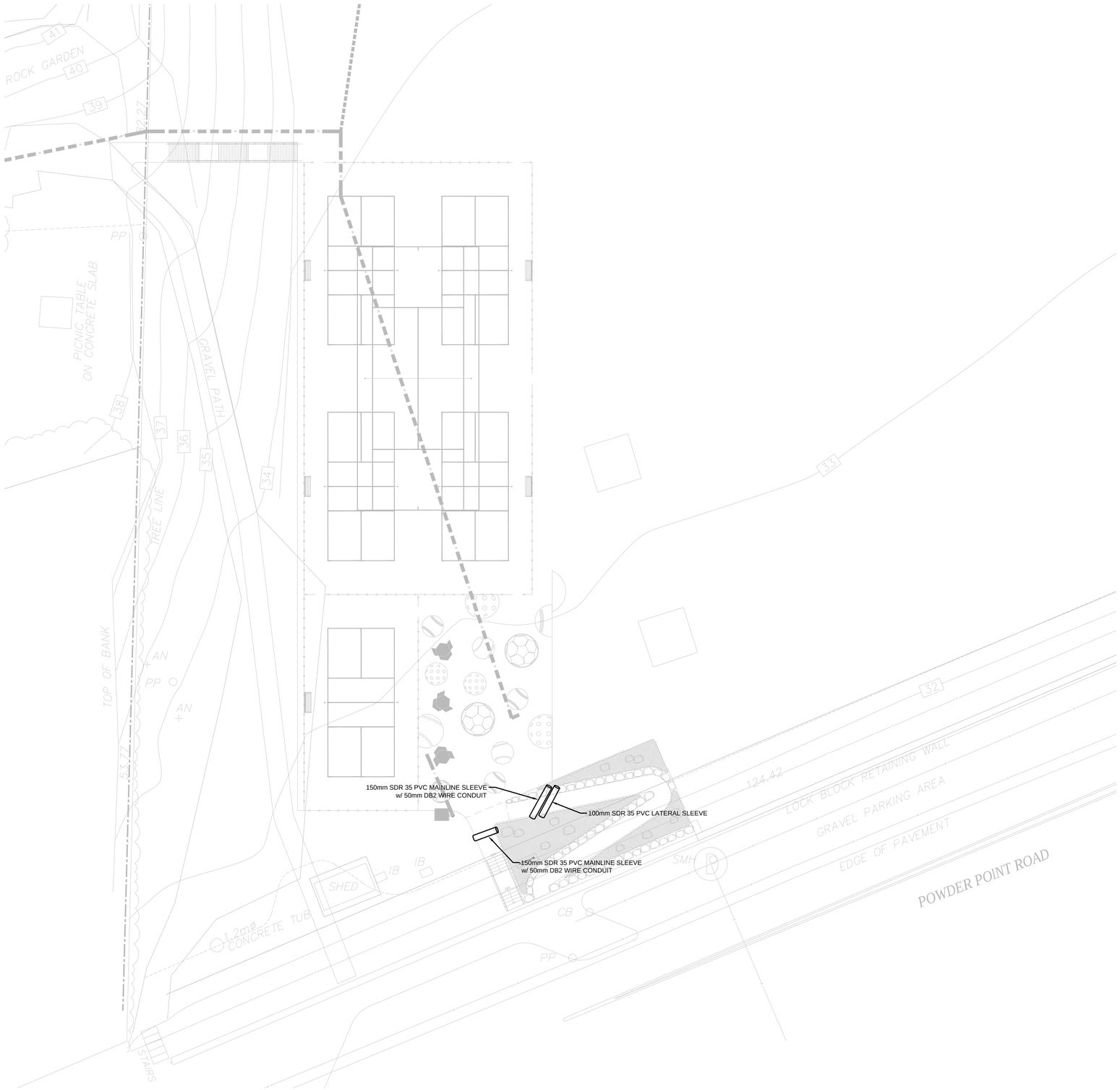
STAMP

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	----	DATE	Mar-04
DRAWN BY	AG	DESIGN BY	AG
CHECKED BY	AR	APPROVED BY	AR

DWG. NO. EL-01 OF 18
REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.



IRRIGATION LEGEND:

SDR 35 PVC SLEEVE (SIZE AS PER DRAWING) @ 300mm - 450mm DEPTH BELOW FINISH GRADE. 50mm DB2 WIRE CONDUIT TO BE INSTALLED ADJACENT TO ALL MAINLINE SLEEVES. INSTALL AS PER *CITY OF NANAIMO, ENGINEERING STANDARDS AND SPECIFICATIONS, SECTION 14.46 - LANDSCAPE, 2020*

QUANTITIES
- 10m: 150mm SDR 35 PVC MAINLINE SLEEVE
- 5m: 100mm SDR 35 PVC LATERAL SLEEVE
- 10m: 50mm DB2 WIRE CONDUIT

NOTES:

1. ALL PRODUCTS, MATERIALS, AND CONSTRUCTION METHODS USED IN THIS LANDSCAPE RENOVATION PROJECT SHALL CONFORM TO AS PER *CITY OF NANAIMO, ENGINEERING STANDARDS AND SPECIFICATIONS, SECTION 14.0 - LANDSCAPE, 2020.*
2. THE INFORMATION SHOWN ON THESE DRAWINGS IS SCHEMATIC IN NATURE. PLANT MATERIAL, STRUCTURES, AND LANDSCAPE FEATURES TAKE PRECEDENCE OVER IRRIGATION. CONFIRM ANY LAYOUT REVISIONS WITH THE CONSULTANT.
3. CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION, AND TYPE OF ALL UNDERGROUND UTILITIES AND SERVICES PRIOR TO COMMENCING ANY CONSTRUCTION OR DEMOLITION ACTIVITIES.
4. PRODUCTS LISTED IN THE LEGEND PROVIDE THE MINIMUM STANDARDS FOR WHICH ALL PRODUCT SUBSTITUTION REQUESTS MUST ATTAIN TO BE CONSIDERED.
5. WATER LINES AND WIRE SHALL NOT SHARE THE SAME SLEEVE.
6. ALL SLEEVE ENDS ARE TO BE CAPPED AND STAKED UNTIL SUCH TIME AS IRRIGATION PIPE IS INSTALLED.

1 / IR-01 IRRIGATION SLEEVING PLAN
1:200

PLOT DATE: March 3, 2022

DESIGN NO. ISSUED FOR TENDER

REV	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUE FOR TENDER	03-04-22	DB	CM

OWNER

JACK BAGLEY PARK : SITE WORK AND SPORTS COURTS
IRRIGATION SLEEVING PLAN

STAMP

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698
ion irrigation management inc.

SCALE	AS SHOWN	DATE	03-04-2022
DRAWN BY	DB	DESIGN BY	DB
CHECKED BY	CWM	APPROVED BY	CWM

DWG. NO. IR-01 OF 18 REV. E

DESTROY ALL PRINTS BEARING PREVIOUS NO.

File: I:\proj\0022 ISL\39 Jack Bagley Park\Drawings\dwg\Jack Bagley Park Phase 1A irrigation Plan. Feb 22_22.dwg

IRRIGATED AREA BOUNDARY

IRRIGATION POINT OF CONNECTION IS TO CONNECT ONTO THE 50mm PE WATER SERVICE SUPPLY LINE IN THIS LOCATION. IRRIGATION SYSTEM IS TO BE SIZED FOR THE 50mm PE SUPPLY LINE WITH A STATIC PRESSURE OF 70 PSI. IRRIGATION BACKFLOW PREVENTER AND POINT OF CONNECTION IS TO CONFORM TO THE *CITY OF NANAIMO, ENGINEERING STANDARDS AND SPECIFICATIONS, SECTION 14.0 - LANDSCAPE, 2020.*

LOCATION OF IRRIGATION CONTROLLER TO BE CONFIRMED BY RDN. ELECTRICAL POWER SOURCE IS NOT AVAILABLE AT THIS LOCATION, THEREFORE THE IRRIGATION CONTROLLER SHALL BE BATTERY OPERATED.

50mm PE WATER SERVICE (BY OTHERS)

SPORTS FIELDS AND SURROUNDING AREA ARE TO BE IRRIGATED USING RAIN BIRD SPRINKLERS

IRRIGATED AREA BOUNDARY

CONTRACTOR TO PROVIDE 50mm MAINLINE STUB, 3 SPARE CONTROL WIRES AND 1 SPARE COMMON WIRE FROM IRRIGATION CONTROLLER TO THIS LOCATION FOR POSSIBLE FUTURE TIE IN. NEATLY LOOP 600mm OF SPARE WIRE INSIDE VALVE BOX

IRRIGATION LEGEND:

AREA TO BE IRRIGATED WITH RAIN BIRD SPRINKLERS

50mm PE WATER SERVICE (BY OTHERS)

NOTES:

1. THE DESIGN/BUILD IRRIGATION CONTRACTOR SHALL BE A CERTIFIED IRRIGATION CONTRACTOR (CIC) - TURF / COMMERCIAL CERTIFIED BY THE IRRIGATION INDUSTRY ASSOCIATION OF BRITISH COLUMBIA (IIABC).
2. CONTRACTOR IS TO PROVIDE THE IRRIGATION DESIGN FOR APPROVAL TO THE CITY OF NANAIMO, PRIOR TO CONSTRUCTION.
3. THE SPRINKLER LAYOUT SHALL HAVE A MINIMUM OF HEAD-TO-HEAD AND ROW-TO-ROW SPACING.
4. THE IRRIGATION SYSTEM SHALL BE DESIGNED AND SIZED FOR THE 50mm PE WATER SERVICE SUPPLY LINE WITH A STATIC PRESSURE OF 70 PSI.
5. ALL PRODUCTS, MATERIALS, AND CONSTRUCTION METHODS USED IN THIS LANDSCAPE RENOVATION PROJECT SHALL CONFORM TO AS PER *CITY OF NANAIMO, ENGINEERING STANDARDS AND SPECIFICATIONS, SECTION 14.0 - LANDSCAPE, 2020.*
6. RAIN BIRD PRODUCTS INC. CONTROL VALVES, ROTORS, SPRAYS, AND CONTROLLERS ARE TO BE INSTALLED AS PER *CITY OF NANAIMO, ENGINEERING STANDARDS AND SPECIFICATIONS, SECTION 14.0 - LANDSCAPE, 2020.*
7. THE INFORMATION SHOWN ON THESE DRAWINGS IS SCHEMATIC IN NATURE. PLANT MATERIAL, STRUCTURES, AND LANDSCAPE FEATURES TAKE PRECEDENCE OVER IRRIGATION.
8. CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION, AND TYPE OF ALL UNDERGROUND UTILITIES AND SERVICES PRIOR TO COMMENCING ANY CONSTRUCTION OR DEMOLITION ACTIVITIES.
9. *IRRIGATION POINT OF CONNECTION TO BE INSTALLED AS PER CITY OF NANAIMO, ENGINEERING STANDARDS AND SPECIFICATIONS, SECTION 14.0 - LANDSCAPE, 2020.*
10. *CONTRACTOR TO PROVIDE AND INSTALL BATTERY POWERED IRRIGATION CONTROLLER TO OPERATE IRRIGATION SYSTEM AS PER CITY OF NANAIMO, ENGINEERING STANDARDS AND SPECIFICATIONS, SECTION 14.0 - LANDSCAPE, 2020.*

1 / IR-01 FIELD IRRIGATION PLAN AND NOTES
1:300

PLOT DATE: March 3, 2022

REV	REVISIONS	DATE	DRAWN	APPR'D
E	ISSUE FOR TENDER	03-04-22	DB	CM

OWNER

JACK BAGLEY PARK : SITE WORK AND SPORTS COURTS
FIELD IRRIGATION PLAN AND NOTES

STAMP

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2656 F: (604)629-2698
ion Irrigation Management Inc.

SCALE	AS SHOWN	DATE	03-04-2022
DRAWN BY	DB	DESIGN BY	DB
CHECKED BY	CWM	APPROVED BY	CWM

DWG. NO. IR-02 OF 18
REV. E

DESIGN NO. ISSUED FOR TENDER

DESTROY ALL PRINTS BEARING PREVIOUS NO.

File: \\proj\9022 ISL\39 Jack Bagley Park\Drawings\dwg\Jack Bagley Park. Sports Fields irrigation Plan. Mar 1, 22.dwg

May 24, 2019

ISSUED FOR REVIEW
FILE: 704-ENG.VGEO03594-01
Via Email: arobertson@islengineering.com

ISL Engineering and Land Services Ltd.
Suite 5013 - 4190 Lougheed Highway
Burnaby, BC V5C 6A8

Attention: Andrew Robertson, MBCSLA, LEED AP

Subject: Jack Bagley Community Park – Geotechnical Desktop Study

This 'Issued for Review' document is provided solely for the purpose of client review and presents our interim findings and recommendations to date. Our usable findings and recommendations are provided only through an 'Issued for Use' document, which will be issued subsequent to this review. Final design should not be undertaken based on the interim recommendations made herein. Once our report is issued for use, the 'Issued for Review' document should be either returned to Tetra Tech Canada Inc. (Tetra Tech) or destroyed.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by the Regional District of Nanaimo (RDN), care of ISL Engineering and Land Services Ltd. (ISL), to conduct a geotechnical desktop study of the Jack Bagley Community Park in Nanoose Bay, BC (the Park). Tetra Tech understands the RDN is planning to construct a racquetball court at the park and is seeking preliminary input to determine the feasibility of the project.

2.0 PROJECT DESCRIPTION

The Park is located adjacent to Powder Point Road and behind Nanoose Bay Elementary School, as shown in Figure 1. Land at the Park is currently constructed entirely as a turf playing field. Three sides of the Park are cut into the slope, with the fourth side sloped down to the adjacent Powder Point Road. At the base of the downslope to the road, a lock-block wall of approximately 0.75 m (one block) in height exists.

Tetra Tech understands the RDN is undertaking preliminary site planning to determine the feasibility of constructing racquetball courts at the Park.

3.0 SITE RECONNAISSANCE

A site visit was conducted by Eli Riedl, EIT, of Tetra Tech, on May 17, 2019. During the site visit the following observations were made:

- Cut slopes surrounding the park were generally composed of till-like SAND, with varying amounts of gravel and silt components. Occasional boulders were observed in the exposed soils;
- The turf sports field appeared to have adequate drainage, with no swampy areas evident. The site visit followed a period of drier weather, but there was evidence of regular irrigation;
- Probes of the sports field soils indicated compact soils likely underly loose surficial organics at a depth of approximately 0.15 m;

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#1 - 4376 Boban Drive
Nanaimo, BC V9T 6A7 CANADA
Tel 250.756.2256 Fax 250.756.2686

- Several shallow depressions were noted in the sports field, indicating that some differential settlement has occurred; and,
- Probes of the downslope from the edge of the fields to Powder Point Road indicated looser soils.

Selected photos from the site reconnaissance are included in Appendix B.

4.0 BACKGROUND INFORMATION REVIEW

4.1 Air Photos

Air photos from 1978 and 1992 were reviewed for this desktop review. The air photo from 1978 shows the site of the Park in use as a borrow pit (Figure 2). In the 1992 air photo, the site has been developed into a sports field with baseball diamonds similar to the current configuration (Figure 3).

4.2 Surficial and Bedrock Geology

Review of the map "Soils of South Vancouver Island, British Columbia, Soil Survey Report No. 44, Sheet 3", indicates soils in the area of the Park are composed of approximately 80% Kye deposits and 20% Dashwood deposits. "Soils of Southern Vancouver Island, MOE Technical Report 17" describes Kye deposits as loamy sand, generally developed from "fluvial, fluvioglacial and/or marine" parent material. Kye deposits are described as rapidly drained and strongly acidic. The Soils of Southern Vancouver Island Report describes Dashwood soils as very gravelly, loamy sand, to gravelly, sandy loam, normally less than 1 m thick and underlain by morainal deposits. Dashwood soils are further described as well drained and moderately to strongly acidic.

The British Columbia Ministry of Environment Map "Vancouver Island Bedrock Geology" indicates the bedrock geology in the area of the Park consists of undivided sedimentary rocks belonging to the Nanaimo Group.

4.3 Geotechnical Reports

No technical reports relevant to the proposed development at the park were readily available for Tetra Tech to review. It should be noted that the review of air photos indicates the Nanoose Bay Elementary School, located north of the project site, was constructed after 1992. There is most likely a geotechnical report associated with the construction of the school, however, it could not be located for this report.

5.0 DISCUSSION

Based on the results of Tetra Tech's review, no conditions were found which would preclude the proposed development at the Park. In general, regarding the proposed racquetball courts at the park, Tetra Tech can make the following comments.

- Granular soils probably underly the site. Granular soils are generally considered advantageous in foundation design;
- There appears to be adequate drainage at the site. The site is positioned mid-slope and the underlying soils appear to be well drained; and,

- Depressions in the field were noted during site reconnaissance, indicating some differential settlement has occurred in the subsurface. Over-excavation of soils may be necessary during construction to achieve desired foundation performance.

While conditions were generally inferred to be agreeable to the proposed development, the ability of this desktop study to assess geotechnical conditions is limited. If the proposed development at the Park is to go to construction, an intrusive geotechnical exploration and assessment should be undertaken.

6.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the Regional District of Nanaimo and their agents. Tetra Tech Canada Inc. (operating as Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than the Regional District of Nanaimo, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

7.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully Submitted,
Tetra Tech Canada Inc.

ISSUED FOR REVIEW

ISSUED FOR REVIEW

Prepared by:
Eli Riedl, EIT.
Junior Engineer
Direct Line: 250.756.3966 x300
Eli.Riedl@tetratech.com

Reviewed by:
Andrew Walker
Senior Geotechnical Engineer
Direct Line: 250.756.3966 x241
Andrew.Walker@tetratech.com

/dr

Attachments: Figures 1 – 3
Appendix A - Tetra Tech's Limitations of the Use of this Document
Appendix B – Site Photos

FIGURES

LEGEND

Subject Site Outline

NOTES
Imagery from Google Earth

STATUS
ISSUED FOR REVIEW

CLIENT
Regional District of Nanaimo

TETRA TECH

Jack Bagley Community Park Geotechnical Desktop Study

Site Location

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.VGEO03594-01	ER	AW		0

OFFICE	DATE
NANAIMO	May 24, 2019

Figure 1

LEGEND

NOTES

STATUS
FISSUED FOR REVIEW

CLIENT

Regional District of Nanaimo

TETRA TECH

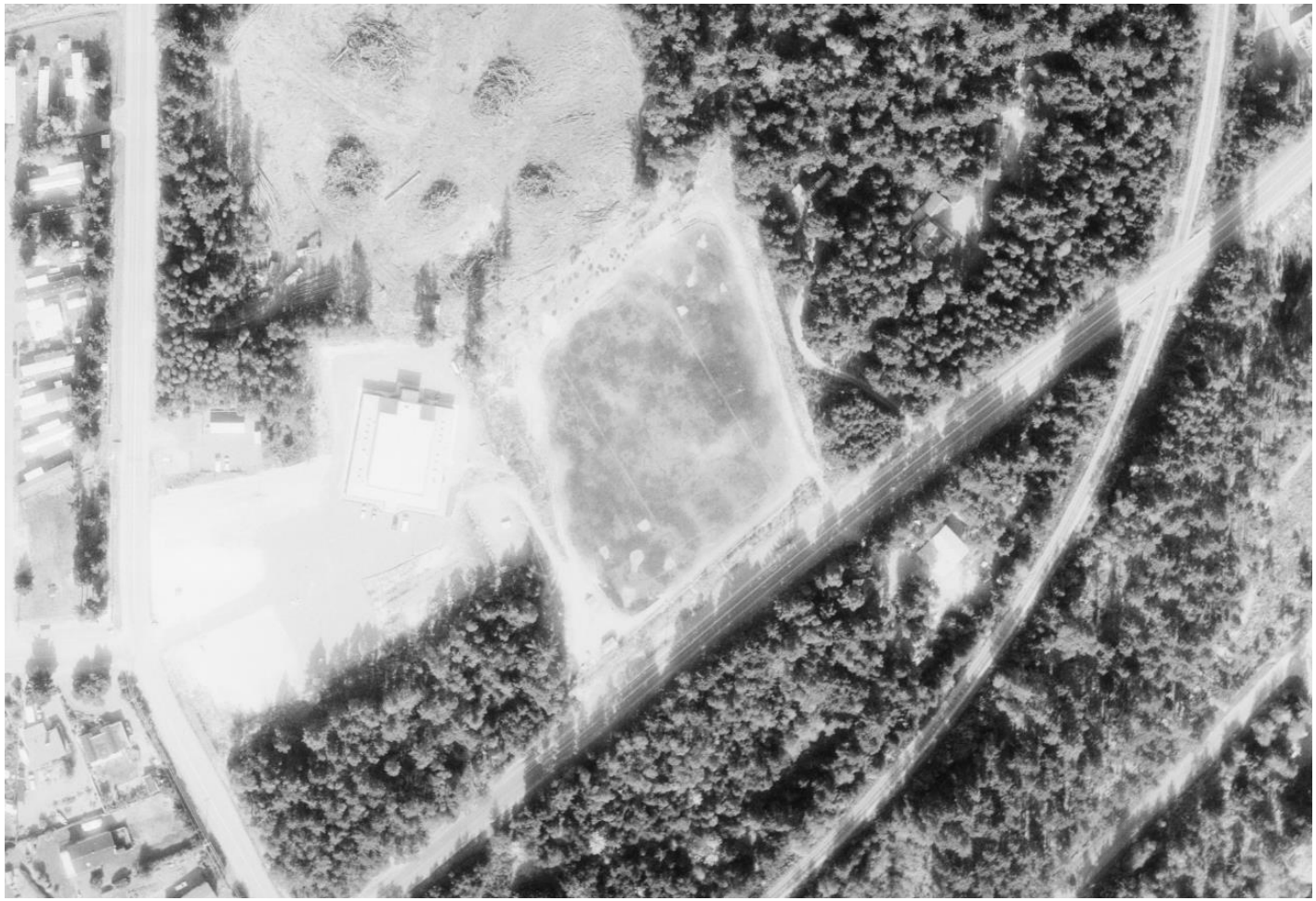
Jack Bagley Community Park Geotechnical Desktop Study

Site Detail from 1978 Air Photo

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.VGEO03594-01	ER	AW		0

OFFICE	DATE
NANAIMO	May 24, 2019

Figure 2



LEGEND

NOTES

STATUS
ISSUED FOR REVIEW

CLIENT
Regional District of Nanaimo

TETRA TECH

Jack Bagley Community Park Geotechnical Desktop Study

Site Detail from 1992 Air Photo

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.VGEO03594-01	ER	AW		0

OFFICE	DATE
NANAIMO	May 24, 2019

Figure 3

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

APPENDIX B

SITE PHOTOS

Photo 1: Soil Outcrop On Site Slope

Photo 2: Lock Block Wall at Base of Site

Photo 3: Soil Outcrop On Site Slope

Photo 4: Site Viewed from Southeast Corner

Photo 5: Site Viewed from Southwest Corner

Photo 6: Depression in Field

BRITISH COLUMBIA | Ministry of Transportation

Permit/File Number: 2021-05124
Office: Vancouver Island District

PERMIT TO CONSTRUCT, USE, AND MAINTAIN WORKS WITHIN THE RIGHT-OF-WAY OF A PROVINCIAL PUBLIC HIGHWAY

PURSUANT TO TRANSPORTATION ACT AND/OR THE INDUSTRIAL ROADS ACT AND/OR THE MOTOR VEHICLE ACT AND/OR AS DEFINED IN THE NISGA'A FINAL AGREEMENT AND THE NISGA'A FINAL AGREEMENT ACT.

BETWEEN:

The Minister of Transportation and Infrastructure

Vancouver Island District
Third Floor
2100 Labieux Road
Nanaimo, BC V9T 6E9

("The Minister")

AND:

Regional District of Nanaimo
6300 Hammond Bay Road
Nanaimo, British Columbia V9T 6N2

("The Permittee")

WHEREAS:

A. The Minister has the authority to grant permits for the auxiliary use of highway right of way, which authority is pursuant to both the Transportation Act and the Industrial Roads Act, the Motor Vehicle Act, as defined in the Nisga'a Final Agreement and the Nisga'a Final Agreement Act;

B. The Permittee has requested the Minister to issue a permit pursuant to this authority for the following purpose:

The installation, operation, and maintenance of new 2" water service line within Northwest Bay Road, located at Apollo Drive, to serve Rem LOT A, DISTRICT LOT 6, NANOOSE DISTRICT, PLAN VIP13317 in accordance with ISL drawing 32345 C-01 Rev C.

C. The Minister is prepared to issue a permit on certain terms and conditions;

ACCORDINGLY, the Minister hereby grants to the Permittee a permit for the Use (as hereinafter defined) of highway right of way on the following terms and conditions:

1. That the construction and maintenance of the said works is carried out to the satisfaction of the Regional Executive Director.
2. That, before opening up any highway or interfering with any public work, intimation in writing of the intention to do so must be given to the District Official at least seven days before the work is begun.
3. That any person appointed by the Regional Executive Director for the purpose shall have free access to all parts of the works for the purpose of inspecting the same.
4. That the construction of the said works shall be commenced on or before the 1st February 2022 and shall be prosecuted with due diligence and to the satisfaction of the Regional Executive Director and shall be completed on or before the 1st May 2022
5. (a) The highway must at all times be kept open to traffic. The roadway must be completely restored for traffic as soon as possible. At all times the permittee must safeguard the traveling public.

   (b) That, unless with the consent of the Regional Executive Director no more than forty-five (45) metres of pipe-track or other excavation in any public highway is to be kept open at one time.

   (c) All excavation work must be carried out in accordance with the BC Occupational Health and Safety Regulation. Care shall be

taken to protect adjacent property.

(d) That all excavations shall be carefully back-filled with suitable material, which is to be tamped into place, and that the permittee shall restore the surface of the road and shoulders and ditches at their own expense. All surplus material is to be removed from the Provincial Crown lands, or deposited where and as required by the District Official of the Ministry of Transportation and Infrastructure. The permittee is financially responsible for any maintenance works required on said ditch for a period of one year. The Ministry will carry out the necessary remedial work and invoice the permittee monthly.

(e) The pipeline crossing installation is to be placed by drilling and (or) jacking in such a manner as to afford minimum grade settlement. No water jetting will be permitted. That where, in the opinion of the District Official, an excavation or opening for a pipeline crossing installation could be made which would not be detrimental to the highway or its users, permission will be granted for said works. On throughways, freeways, and main highways no open cuts will be allowed.

(f) That all pipelines in excess of a nominal diameter of 5 cm., whether gas, oil, water, pressure sewers, conduits, etc., shall be installed where indicated by the District Official, encased in a steel casing-pipe or conduit-pipe of sufficient strength to withstand all stresses and strains resulting from the location, such casing to extend the full width of the highway right-of-way if deemed necessary to the District Official. The ends of the casing-pipe shall be suitably sealed and, if required, properly vented above the ground with vent-pipes not less than 5 cm. in diameter, and extending not less than 1.2 metres above ground surface. Vent-pipes shall be connected 30 cm. from the ends of the casing-pipe, and the top of each vent shall be fitted with a turn-down elbow, properly screened and equipped with identification markers.

All pipelines of non-rigid material, i.e., plastic or copper, of any diameter, shall be cased, or embedded in sand.

The inside diameter of the casing-pipe shall be at least 25 percent larger than the outside diameter of the pipeline. The casing-pipe shall be installed with an even bearing throughout its length, and in such a manner so as to prevent leakage, except through the vents.

The top of the casing-pipe, or the pipeline where casing is not required, shall be located as directed by the District Official, and shall in no case be less than 1.2 metres below the surface of the highway and not less than 1.0 metres below the highway ditches. Pipelines must not obstruct drainage structures or ditches or interfere with traffic on the highway or with highway maintenance.

6. That where the work for which permission is hereby granted comes in contact with any bridge, culvert, ditch, or other existing work, such existing work must be properly maintained and supported in such manner as not to interfere with its proper function during the construction of the new work, and on the completion of the new work the bridge, culvert, ditch, or other existing work interfered with shall be completely restored to its original good condition.

7. That when necessary all excavations, materials, or other obstructions are to be efficiently fenced, lit, and watched, and at all times every possible precaution is to be taken to ensure the safety of the public.

8. The Permittee shall indemnify and save harmless the Ministry, its agents and employees, from and against all claims, liabilities, demands, losses, damages, costs and expenses, fines, penalties, assessments and levies made against or incurred, suffered or sustained by the Ministry, its agents and employees, or any of them at any time or times, whether before or after the expiration or termination of this permit, where the same or any of them are based upon or arise out of or from anything done or omitted to be done by the Permittee, its employees, agents or Subcontractors, in connection with the permit.

9. That the permission herein granted to use and maintain the works is only granted for such times as the land or public work in, upon, or over which the said works are constructed is under the jurisdiction of the Minister of Transportation and Infrastructure. This permission is not to be construed as being granted for all time, and shall not be deemed to vest in the permittee any right, title or interest whatsoever in or to the lands upon which the works are constructed. Should the lands affected at any time be included within that of an incorporated municipality or city, this permission shall become void, unless the works are on a highway duly classified as an arterial highway pursuant to Section 45 of the Transportation Act.

10. That after receiving notice in writing of the intention on the part of the Provincial Government to construct, extend, alter, or improve any public work, the person or persons responsible for the maintenance of the works for which permission is hereby granted shall within six weeks move or alter such work at their own expense to such new positions or in such manner as may be necessitated by the construction, extension, alteration, or improvement proposed to be carried out by the Provincial Government.

11. That while reasonable care will be taken on the part of the Provincial Government to do as little damage as possible to any private work in the carrying-out of the construction, extension, alterations, improvement, repair, or maintenance of any public work adjacent thereto, the Provincial Government can accept no responsibility for any kind of such damage.

12. That the permission hereby granted to construct, use, and maintain work is granted without prejudice to the provisions of the Transportation Act, or other Acts governing Crown lands and public works or their use by the public.

13. That this permission shall be in force only during such time as the said works are operated and maintained by the applicants, to the entire satisfaction of the Regional Executive Director.

14. That the Ministry will not be responsible for grade changes on accesses caused by reconstruction of any Provincial highway.

15. This permit is valid only for the specific works stated herein. Any alterations or additions must be covered by a separate permit.

16. This permit may be canceled, at the discretion of the Minister, without recourse, should the permittee fail to comply with all the terms of the permit. Thirty days' notice will be given before cancellation.

17. When the requirements of the Ministry necessitate use of the said lands for Provincial purposes, at the discretion of the Minister, this permit may be canceled.

18. That these works shall be identified with this permit number in a manner satisfactory to the District Official of the Ministry of Transportation and Infrastructure.

19. As a condition of this permit, the permittee unconditionally agrees with the Ministry of Transportation and Infrastructure that the permittee is the prime contractor or will appoint a qualified prime contractor, as described in Section 118 of the Workers Compensation Act, for the purposes of the work described by this permit, at the work location described in this permit, and that the permittee or designated prime contractor will observe and perform all of the duties and obligations which fall to be discharged by the prime contractor pursuant to the Workers Compensation Act and the Occupational Health and Safety Regulation.

20. The permittee is advised and acknowledges that the following hazards may be present at the work location and need to be considered in co-ordinating site safety: overhead hazards, particularly electrical or telecommunications lines; buried utilities, particularly electrical, telecommunication, and gas lines; traffic, danger trees, falling rocks, and sharp or infectious litter.

21. Any works within the Ministry right-of-way that fall within the scope of "engineering" under the Engineers and Geoscientists Act will be performed by a Professional Engineer, and shall comply with this Ministry's "Engineer of Record and Field Review Guidelines". The Guidelines can be viewed on the Ministry's website at http://www2.gov.bc.ca/assets/gov/driving-and-transportation/transportation-infrastructure/engineering-standards-and-guidelines/technical-circulars/2009/t06-09.pdf

22. The permittee is responsible for preventing the introduction and spread of noxious weeds on the highway right-of-way as defined by the British Columbia Weed Control Act and Weed Control Regulation.

23. In accordance with Sections 000.03 Non-Ministry Developments on Ministry Land or That are Intended to Become Ministry Assets and 165.20 Archaeological and Paleontological Discoveries of the Design Build Standard Specification for Highway Construction - In the event that any item of archaeological, heritage, historical, cultural or scientific interest is found on the project site, the following Chance Find Procedure shall apply:

    Such item(s) shall remain the property of the Province and the Permittee shall, on making or being advised of such a find, immediately cease operations in the affected area, minimize activities which create ground disturbance in and adjacent to the affected area, and notify the District Official and the Archaeology Branch of the British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development. Work shall not resume within 30 m of the discovery site until an appropriate directive has been received from that agency.

    To protect archaeological and paleontological sites that are situated within or adjacent to a project site, the Permittee may be required to use a variety of mitigative measures, including but not limited to drainage or erosion control, slope stabilization measures, or erecting fences or other suitable barriers to protect archaeological or paleontological sites that are situated within or adjacent to a project site. These measures, with any negotiated extensions of time for completion of the Works they require, will be determined and adopted at the discretion of the District Official. The costs associated with such mitigative measures will be borne by the Permittee.

    A buffer zone, in which no land alteration or other activity is permitted, may be required to ensure adequate site protection. The width of this buffer zone shall be determined by the District Official in consultation with a representative of the Archaeology Branch of the British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development. The Permittee shall be responsible for the actions of employees and subcontractors with respect to site vandalism and the unlicensed collection of artifacts from Designated archaeological sites in and around the work location.

    The Permittee shall ensure that all workers and Subcontractors are fully aware of these requirements and processes.

24. The Permittee shall be responsible for the preservation during construction of all geodetic benchmarks, survey monuments and property markers on the right-of-way. The Permittee shall use, at no expense to the Ministry, a British Columbia Land Surveyor to replace any survey monuments destroyed or damaged as a result of the Permittee's negligence. At locations where construction work will cover or destroy such markers, the Permittee shall not move or remove them until written direction is received from the Ministry Representative.

25. The Permittee shall ensure all equipment working on or hauling material on to and from the Site does not damage or deposit material onto any part of an existing roadway. Materials spilled onto the public roadways or driveways opened to public traffic shall be cleaned up immediately. The Permittee has the full responsibility to repair any damage to existing highways, local roads and driveways caused by its construction equipment and/or operations.

26. The Permittee shall take all reasonable precautions to attempt to ensure the safety of the public in connection with the Use. In particular, but not so as to limit this obligation, the Permittee shall, if so required by the Designated Ministry Official on reasonable grounds, prepare and implement a traffic control plan. The contents of the plan and the manner in which it is

implemented must meet the reasonable satisfaction of the Designated Ministry Official.

27. The Permittee shall, at his cost, supply, erect, and maintain standard traffic control devices in accordance with the Ministry of Transportation and Infrastructure Traffic Control Manual for Works on Roadways and Occupational Health and Safety Regulation.

28. Pavement must be cut by hand or approved mechanical means in straight lines parallel to the trench centreline.

Distance from a pavement cut to the edge of the trench must be at least 150 mm or sufficient to ensure the pavement will not be undermined by sloughing.

Except where trenching is well clear of the road shoulder, all excavated material must be removed from the site immediately.

Stockpiling of native material adjacent to the trench is not permitted.

Trenches must be backfilled or adequately covered at the end of the work day

Trench shoring must conform to WorkSafe BC standards and is to be used where soil conditions warrant. Extreme care must be taken to avoid sloughing of the trench sides to minimize damage to the subgrade beyond the limits of excavation.

29. Pipe bedding must conform to industry standards.

Where sloughing of trench sides has undermined the pavement, the pavement must be marked with a painted line showing the extent of the damaged area. Pavement must be removed from this area and the voids filled and compacted in accordance with backfill requirements.

Trenches must be backfilled with granular material that meets Ministry standards as set out in Section 202.02 (Table 202-C), 2016 Standard Specifications for Highway Construction and all subsequent interim revisions and updates, in accordance with the following minimum requirements:

(a) Sub-base material must meet or exceed specified requirements for Select Granular Sub Base aggregates.

(b) Crushed Base Course depth is to match existing depth, but must not be less than 300 mm compacted thickness and consist of "25 mm minus" WGB (or IGB) crushed aggregate.

Backfill must be placed in layers not exceeding 150 mm compacted thickness and shall be compacted with approved tamping equipment to a minimum of 95 percent Proctor density to within 300 mm of the surface and 100 percent for the final 300 mm.

30. As soon as any portion of the highway can be re-opened to traffic, a temporary asphalt patch must be applied.

31. Pavement edges must be cut, made true and straight, cleaned, and primed before installing a final patch.

Asphalt concrete must be restored to the same thickness as the existing surface or to a minimum of 75 mm thickness, whichever is greater. Asphaltic concrete must meet Ministry standards as set out in Section 502, Standard Specifications for Highway Construction.

Asphalt concrete is to be laid in two or more lifts or layers. Each lift is to be thoroughly compacted before successive lifts are applied.

The Permittee will ensure that the permanent pavement patch is to Ministry standards for one year from the date that the patch is installed.

32. Where the Ministry and a regulator both set a standard or requirement in a particular area, the highest or most stringent of the two will apply to any installation on highway right-of- way.

33. All unsuitable material and inorganic debris shall be removed from the project area. All surplus or unsuitable organic waste and debris shall be removed from the site unless its complete burning is approved by the Designated Ministry Official in compliance with the B.C. Open Burning Smoke Control regulation.

34. Sites are to be reseeded to standards set out in Section 757, Standard Specifications for Highway Construction.

35. Excavations across entrances, whether private or commercial, must be backfilled and thoroughly compacted by the end of the current working day. The surface must be restored, whether paved or gravel, to its original condition within 48 hours.

Affected property owners must be notified at least 48 hours in advance before excavating a driveway.

36. The Minister may order the removal or alteration of utility installations, if necessary, for the protection of the highway or highway users.

If the utility owner does not respond to an order to remove or alter a utility installation, the Minister may carry out that work and recover costs from the utility.

37. Permittee is responsible for ensuring that all works are contained to the highway right of way. Any works located within private property must have the owner's permission.

38. A copy of the permit is to be kept by the field supervisor, in order that he is aware of all permit conditions.

39. Three reasonable attempts to bore or jack the pipeline, under paved road crossings, shall be expected prior to consideration of open cut crossings. Should open cutting be subsequently permitted, compaction, material, concrete capping and patching specifications shall be provided. If open cutting is permitted the crossing shall be perpendicular to centre line in order to minimize disturbance to the road structure, unless otherwise approved. Any open cut trench is to be saw cut to a width of one metre additional width beyond the edge of the trench excavation unless such width reaches the curb or edge of pavement. After three (3) months or when the hot patch has settled, the trench plus an additional three (3) meters on either side is to be scarified to a 50mm depth and re-paved to create a smooth seam and surface. The permittee shall be responsible for the repair of any failure and/or settlement of the excavation area for a period of three (3) years.

40. The permittee is responsible for obtaining the necessary approval from all other agencies affected.

41. Traffic Control Plan

The Permittee shall take all reasonable precautions to attempt to ensure the safety of the public in connection with the Use. In particular, but not so as to limit this obligation, the Permittee shall prepare and implement a traffic control plan. The contents of the plan and the manner in which it is implemented must meet the reasonable satisfaction of the Designated Ministry Official and be submitted to this office a minimum of 14 days prior to the commencement of any works at the location.

The rights granted to the Permittee in this permit are to be exercised only for the purpose as defined in Recital B on page 1.

Dated at Nanaimo, British Columbia, this 29th day of September, 2021

On Behalf of the Minister

CCDC 4

CCDC 4

Unit Price Contract

2011

[Name of Project]

Apply a CCDC 4 copyright seal here. The application of the seal demonstrates the intention of the party proposing the use of this document that it be an accurate and unamended form of CCDC 4 – 2011 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

CANADIAN CONSTRUCTION DOCUMENTS COMMITTEE
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AGREEMENT BETWEEN OWNER AND CONTRACTOR
For use when unit prices are the primary basis of payment.

This Agreement made on the day of in the year .

by and between the parties

hereinafter called the *Owner*

and

hereinafter called the *Contractor*

The *Owner* and the *Contractor* agree as follows:

ARTICLE A-1 THE WORK

The *Contractor* shall:

1.1 perform the *Work* required by the *Contract Documents* for

insert above the name of the Work

located at

insert above the Place of the Work

for which the Agreement has been signed by the parties, and for which

insert above the name of the Consultant

is acting as and is hereinafter called the "*Consultant*" and

1.2 do and fulfill everything indicated by the *Contract Documents*, and

1.3 commence the *Work* by the day of in the year and, subject to adjustment in *Contract Time* as provided for in the *Contract Documents*, attain *Substantial Performance of the Work*, by the day of in the year .

ARTICLE A-2 AGREEMENTS AND AMENDMENTS

2.1 The *Contract* supersedes all prior negotiations, representations or agreements, either written or oral, relating in any manner to the *Work*, including the bidding documents that are not expressly listed in Article A-3 of the Agreement - CONTRACT DOCUMENTS.

2.2 The *Contract* may be amended only as provided in the *Contract Documents*.

ARTICLE A-3 CONTRACT DOCUMENTS

3.1 The following are the *Contract Documents* referred to in Article A-1 of the Agreement - THE WORK:

- Agreement between *Owner* and *Contractor*
- Definitions
- The General Conditions of the Unit Price Contract
- *

* *(Insert here, attaching additional pages if required, a list identifying all other Contract Documents e.g. supplementary conditions; information documents; specifications, giving a list of contents with section numbers and titles, number of pages and date; material finishing schedules; drawings, giving drawing number, title, date, revision date or mark; addenda, giving title, number, date)*

ARTICLE A-4 CONTRACT PRICE

4.1 The *Schedule of Prices* forms the basis for determining the *Contract Price*. Quantities for *Unit Price* items in the *Schedule of Prices* are estimated.

Schedule of Prices

Item No.	Description of Work	* Unit of Measure	* Estimated Quantity (EQ)	Unit Price (UP)	Amount (EQ x UP)
Page Subtotal Carried Forward from Page					$
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				Page Sub-total	$

** Lump sum items are denoted as lump sum (LS) as the unit of measure and have a quantity of one (1).*

Schedule of Prices

Item No.	Description of Work	* Unit of Measure	* Estimated Quantity (EQ)	Unit Price (UP)	Amount (EQ x UP)
		Page Subtotal Carried Forward from Page			$
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				$	$ 0.00
				Total Amount	$

** Lump sum items are denoted as lump sum (LS) as the unit of measure and have a quantity of one (1).*

4.2 The estimated *Contract Price*, which is the total amount indicated in the *Schedule of Prices*, and which excludes *Value Added Taxes*, is:

/100 dollars $

4.3 *Value Added Taxes* (of %) payable by the *Owner* to the Contractor, based on the estimated *Contract Price*, are:

/100 dollars $

4.4 Total estimated amount payable by the *Owner* to the *Contractor* for the construction of the *Work* is:

/100 dollars $

4.5 These amounts shall be subject to adjustments as provided in the *Contract Documents*.

4.6 All amounts are in Canadian funds.

ARTICLE A-5 PAYMENT

5.1 Subject to the provisions of the *Contract Documents*, and in accordance with legislation and statutory regulations respecting holdback percentages and, where such legislation or regulations do not exist or apply, subject to a holdback of percent (%), the *Owner* shall:

.1 make progress payments to the *Contractor* on account of the *Contract Price* when due in the amount certified by the *Consultant* together with such *Value Added Taxes* as may be applicable to such payments, and

.2 upon *Substantial Performance of the Work*, pay to the *Contractor* the unpaid balance of the holdback amount when due together with such *Value Added Taxes* as may be applicable to such payment, and

.3 upon the issuance of the final certificate for payment, pay to the *Contractor* the unpaid balance of the *Contract Price* when due together with such *Value Added Taxes* as may be applicable to such payment.

5.2 In the event of loss or damage occurring where payment becomes due under the property and boiler insurance policies, payments shall be made to the *Contractor* in accordance with the provisions of GC 11.1 – INSURANCE.

5.3 Interest

.1 Should either party fail to make payments as they become due under the terms of the *Contract* or in an award by arbitration or court, interest at the following rates on such unpaid amounts shall also become due and payable until payment:

(1) 2% per annum above the prime rate for the first 60 days.

(2) 4% per annum above the prime rate after the first 60 days.

Such interest shall be compounded on a monthly basis. The prime rate shall be the rate of interest quoted by

(Insert name of chartered lending institution whose prime rate is to be used)

for prime business loans as it may change from time to time.

.2 Interest shall apply at the rate and in the manner prescribed by paragraph 5.3.1 of this Article on the settlement amount of any claim in dispute that is resolved either pursuant to Part 8 of the General Conditions – DISPUTE RESOLUTION or otherwise, from the date the amount would have been due and payable under the *Contract*, had it not been in dispute, until the date it is paid.

ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING

6.1 *Notices in Writing* will be addressed to the recipient at the address set out below. The delivery of a *Notice in Writing* will be by hand, by courier, by prepaid first class mail, or by facsimile or other form of electronic communication during the transmission of which no indication of failure of receipt is communicated to the sender. A *Notice in Writing* delivered by one party in accordance with this *Contract* will be deemed to have been received by the other party on the date of delivery if delivered by hand or courier, or if sent by mail it shall be deemed to have been received five calendar days after the date on which it was mailed, provided that if either such day is not a *Working Day*, then the *Notice in Writing* shall be deemed to have been received on the *Working Day* next following such day. A *Notice in Writing* sent by facsimile or other form of electronic communication shall be deemed to have been received on the date of its transmission provided that if such day is not a *Working Day* or if it is received after the end of normal business hours on the date of its transmission at the place of receipt, then it shall be deemed to have been received at the opening of business at the place of receipt on the first *Working Day* next following the transmission thereof. An address for a party may be changed by *Notice in Writing* to the other party setting out the new address in accordance with this Article.

Owner

*name of Owner**

address

Facsimile number *e-mail address*

Contractor

*name of Contractor**

address

Facsimile number *e-mail address*

Consultant

*name of Consultant**

address

Facsimile number *e-mail address*

** If it is intended that the notice must be received by a specific individual, that individual's name shall be indicated.*

ARTICLE A-7 LANGUAGE OF THE CONTRACT

7.1 When the *Contract Documents* are prepared in both the English and French languages, it is agreed that in the event of any apparent discrepancy between the English and French versions, the English/French* language shall prevail.
* *Complete this statement by striking out inapplicable term.*

7.2 This Agreement is drawn in English at the request of the parties hereto. La présente convention est rédigée en anglais à la demande des parties.

ARTICLE A-8 SUCCESSION

8.1 The *Contract* shall enure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successors, and assigns.

In witness whereof the parties hereto have executed this Agreement by the hands of their duly authorized representatives.

SIGNED AND DELIVERED
in the presence of:

WITNESS	**OWNER**
	name of owner
signature	*signature*
name of person signing	*name and title of person signing*
signature	*signature*
name of person signing	*name and title of person signing*
WITNESS	**CONTRACTOR**
	name of Contractor
signature	*signature*
name of person signing	*name and title of person signing*
signature	*signature*
name of person signing	*name and title of person signing*

N.B. Where legal jurisdiction, local practice or Owner or Contractor requirement calls for:
(a) proof of authority to execute this document, attach such proof of authority in the form of a certified copy of a resolution naming the representative(s) authorized to sign the Agreement for and on behalf of the corporation or partnership; or
(b) the affixing of a corporate seal, this Agreement should be properly sealed.

DEFINITIONS

The following Definitions shall apply to all *Contract Documents*.

Change Directive
A *Change Directive* is a written instruction prepared by the *Consultant* and signed by the *Owner* directing the *Contractor* to proceed with a change in the *Work* within the general scope of the *Contract Documents* prior to the *Owner* and the *Contractor* agreeing upon an adjustment in *Contract Price* and *Contract Time*.

Change Order
A *Change Order* is a written amendment to the *Contract* prepared by the *Consultant* and signed by the *Owner* and the *Contractor* stating their agreement upon:
- a change in the *Work*;
- the method of adjustment or the amount of the adjustment in the *Contract Price*, if any; and
- the extent of the adjustment in the *Contract Time*, if any.

Construction Equipment
Construction Equipment means all machinery and equipment, either operated or not operated, that is required for preparing, fabricating, conveying, erecting, or otherwise performing the *Work* but is not incorporated into the *Work*.

Consultant
The *Consultant* is the person or entity engaged by the *Owner* and identified as such in the Agreement. The *Consultant* is the Architect, the Engineer or entity licensed to practise in the province or territory of the *Place of the Work*. The term *Consultant* means the *Consultant* or the *Consultant*'s authorized representative.

Contract
The *Contract* is the undertaking by the parties to perform their respective duties, responsibilities and obligations as prescribed in the *Contract Documents* and represents the entire agreement between the parties.

Contract Documents
The *Contract Documents* consist of those documents listed in Article A-3 of the Agreement - CONTRACT DOCUMENTS and amendments agreed upon between the parties.

Contract Price
The *Contract Price* is the sum of the products of each *Unit Price* stated in the *Schedule of Prices* multiplied by the appropriate actual quantity of each *Unit Price* item that is incorporated in or made necessary by the *Work*, plus lump sums, if any, and allowances, if any, stated in the *Schedule of Prices.* .

Contract Time
The *Contract Time* is the time stipulated in paragraph 1.3 of Article A-1 of the Agreement - THE WORK from commencement of the *Work* to *Substantial Performance of the Work.*

Contractor
The *Contractor* is the person or entity identified as such in the Agreement. The term *Contractor* means the *Contractor* or the *Contractor*'s authorized representative as designated to the *Owner* in writing.

Drawings
The *Drawings* are the graphic and pictorial portions of the *Contract Documents*, wherever located and whenever issued, showing the design, location and dimensions of the *Work*, generally including plans, elevations, sections, details, and diagrams.

Notice in Writing
A *Notice in Writing*, where identified in the *Contract Documents*, is a written communication between the parties or between them and the *Consultant* that is transmitted in accordance with the provisions of Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

Owner
The *Owner* is the person or entity identified as such in the Agreement. The term *Owner* means the *Owner* or the *Owner*'s authorized agent or representative as designated to the *Contractor* in writing, but does not include the *Consultant*.

Place of the Work
The *Place of the Work* is the designated site or location of the *Work* identified in the *Contract Documents*.

Product
Product or Products means material, machinery, equipment, and fixtures forming the *Work*, but does not include *Construction Equipment.*

Project
The *Project* means the total construction contemplated of which the *Work* may be the whole or a part.

Provide
Provide means to supply and install.

Schedule of Prices
The *Schedule of Prices* is the schedule included in Article A-4 - CONTRACT PRICE and, subject to adjustments as provided in the *Contract Documents*, identifies:
- the items of work;
- the units of measure, estimated quantity, and *Unit Price* for each *Unit Price* item;
- the price for each lump sum item, if any; and
- allowances, if any.

Shop Drawings
Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, *Product* data, and other data which the *Contractor* provides to illustrate details of portions of the Work.

Specifications
The *Specifications* are that portion of the *Contract Documents*, wherever located and whenever issued, consisting of the written requirements and standards for *Products*, systems, workmanship, quality, and the services necessary for the performance of the *Work*.

Subcontractor
A *Subcontractor* is a person or entity having a direct contract with the *Contractor* to perform a part or parts of the *Work* at the *Place of the Work*.

Substantial Performance of the Work
Substantial Performance of the Work is as defined in the lien legislation applicable to the *Place of the Work*. If such legislation is not in force or does not contain such definition, or if the *Work* is governed by the Civil Code of Quebec, *Substantial Performance of the Work* shall have been reached when the *Work* is ready for use or is being used for the purpose intended and is so certified by the *Consultant*.

Supplemental Instruction
A *Supplemental Instruction* is an instruction, not involving adjustment in the *Contract Price* or *Contract Time*, in the form of *Specifications*, *Drawings*, schedules, samples, models or written instructions, consistent with the intent of the *Contract Documents*. It is to be issued by the *Consultant* to supplement the *Contract Documents* as required for the performance of the *Work*.

Supplier
A *Supplier* is a person or entity having a direct contract with the *Contractor* to supply *Products*.

Temporary Work
Temporary Work means temporary supports, structures, facilities, services, and other temporary items, excluding *Construction Equipment*, required for the execution of the *Work* but not incorporated into the *Work*.

Unit Price
A *Unit Price* is the amount payable for a single *Unit Price* item as stated in the *Schedule of Prices*.

Value Added Taxes
Value Added Taxes means such sum as shall be levied upon the *Contract Price* by the Federal or any Provincial or Territorial Government and is computed as a percentage of the *Contract Price* and includes the Goods and Services Tax, the Quebec Sales Tax, the Harmonized Sales Tax, and any similar tax, the collection and payment of which, have been imposed on the *Contractor* by the tax legislation.

Work
The *Work* means the total construction and related services required by the *Contract Documents*.

Working Day
Working Day means a day other than a Saturday, Sunday, statutory holiday or statutory vacation day that is observed by the construction industry in the area of the *Place of the Work*.

GENERAL CONDITIONS OF THE UNIT PRICE CONTRACT

PART 1 GENERAL PROVISIONS

GC 1.1 CONTRACT DOCUMENTS

1.1.1 The intent of the *Contract Documents* is to include the labour, *Products* and services necessary for the performance of the *Work* by the *Contractor* in accordance with these documents. It is not intended, however, that the *Contractor* shall supply products or perform work not consistent with, not covered by, or not properly inferable from the *Contract Documents*.

1.1.2 Nothing contained in the *Contract Documents* shall create any contractual relationship between:
- .1 the *Owner* and a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.
- .2 the *Consultant* and the *Contractor*, a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.

1.1.3 The *Contract Documents* are complementary, and what is required by any one shall be as binding as if required by all.

1.1.4 Words and abbreviations which have well known technical or trade meanings are used in the *Contract Documents* in accordance with such recognized meanings.

1.1.5 References in the *Contract Documents* to the singular shall be considered to include the plural as the context requires.

1.1.6 Neither the organization of the *Specifications* nor the arrangement of *Drawings* shall control the *Contractor* in dividing the work among *Subcontractors* and *Suppliers*.

1.1.7 If there is a conflict within the *Contract Documents*:
- .1 the order of priority of documents, from highest to lowest, shall be
  - the Agreement between the *Owner* and the *Contractor*,
  - the Definitions,
  - Supplementary Conditions,
  - the General Conditions,
  - Division 1 of the *Specifications*,
  - technical *Specifications*,
  - material and finishing schedules,
  - the *Drawings*.
- .2 *Drawings* of larger scale shall govern over those of smaller scale of the same date.
- .3 dimensions shown on *Drawings* shall govern over dimensions scaled from *Drawings*.
- .4 later dated documents shall govern over earlier documents of the same type.

1.1.8 The *Owner* shall provide the *Contractor*, without charge, sufficient copies of the *Contract Documents* to perform the *Work*.

1.1.9 *Specifications*, *Drawings*, models, and copies thereof furnished by the *Consultant* are and shall remain the *Consultant*'s property, with the exception of the signed *Contract* sets, which shall belong to each party to the *Contract*. All *Specifications*, *Drawings* and models furnished by the *Consultant* are to be used only with respect to the *Work* and are not to be used on other work. These *Specifications*, *Drawings* and models are not to be copied or altered in any manner without the written authorization of the *Consultant*.

1.1.10 Models furnished by the *Contractor* at the *Owner*'s expense are the property of the *Owner*.

GC 1.2 LAW OF THE CONTRACT

1.2.1 The law of the *Place of the Work* shall govern the interpretation of the *Contract*.

GC 1.3 RIGHTS AND REMEDIES

1.3.1 Except as expressly provided in the *Contract Documents*, the duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

1.3.2 No action or failure to act by the *Owner*, *Consultant* or *Contractor* shall constitute a waiver of any right or duty afforded any of them under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

GC 1.4 ASSIGNMENT

1.4.1 Neither party to the *Contract* shall assign the *Contract* or a portion thereof without the written consent of the other, which consent shall not be unreasonably withheld.

PART 2 ADMINISTRATION OF THE CONTRACT

GC 2.1 AUTHORITY OF THE CONSULTANT

2.1.1 The *Consultant* will have authority to act on behalf of the *Owner* only to the extent provided in the *Contract Documents*, unless otherwise modified by written agreement as provided in paragraph 2.1.2.

2.1.2 The duties, responsibilities and limitations of authority of the *Consultant* as set forth in the *Contract Documents* shall be modified or extended only with the written consent of the *Owner*, the *Contractor* and the *Consultant*.

2.1.3 If the *Consultant*'s employment is terminated, the *Owner* shall immediately appoint or reappoint a *Consultant* against whom the *Contractor* makes no reasonable objection and whose status under the *Contract Documents* shall be that of the former *Consultant*.

GC 2.2 ROLE OF THE CONSULTANT

2.2.1 The *Consultant* will provide administration of the *Contract* as described in the *Contract Documents*.

2.2.2 The *Consultant* will visit the *Place of the Work* at intervals appropriate to the progress of construction to become familiar with the progress and quality of the work and to determine if the *Work* is proceeding in general conformity with the *Contract Documents*.

2.2.3 If the *Owner* and the *Consultant* agree, the *Consultant* will provide at the *Place of the Work*, one or more project representatives to assist in carrying out the *Consultant*'s responsibilities. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in writing to the *Contractor*.

2.2.4 The *Consultant* will promptly inform the *Owner* of the date of receipt of the *Contractor*'s applications for payment as provided in paragraph 5.3.1.1 of GC 5.3 – PROGRESS PAYMENT.

2.2.5 Based on the *Consultant*'s observations and review of the *Contractor*'s applications for payment, the *Consultant* will determine the amounts owing to the *Contractor* under the *Contract* and will issue certificates for payment as provided in Article A-5 of the Agreement - PAYMENT, GC 5.3 - PROGRESS PAYMENT and GC 5.7 - FINAL PAYMENT.

2.2.6 The *Consultant* will not be responsible for and will not have control, charge or supervision of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs required in connection with the *Work* in accordance with the applicable construction safety legislation, other regulations or general construction practice. The *Consultant* will not be responsible for the *Contractor*'s failure to carry out the *Work* in accordance with the *Contract Documents*. The *Consultant* will not have control over, charge of or be responsible for the acts or omissions of the *Contractor*, *Subcontractors*, *Suppliers*, or their agents, employees or any other persons performing portions of the *Work*.

2.2.7 Except with respect to GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER, the *Consultant* will be, in the first instance, the interpreter of the requirements of the *Contract Documents*.

2.2.8 Matters in question relating to the performance of the *Work* or the interpretation of the *Contract Documents* shall be initially referred in writing to the *Consultant* by the party raising the question for interpretations and findings and copied to the other party.

2.2.9 Interpretations and findings of the *Consultant* shall be consistent with the intent of the *Contract Documents*. In making such interpretations and findings the *Consultant* will not show partiality to either the *Owner* or the *Contractor*.

2.2.10 The *Consultant*'s interpretations and findings will be given in writing to the parties within a reasonable time.

2.2.11 With respect to claims for a change in *Contract Price*, the *Consultant* will make findings as set out in GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.

2.2.12 The *Consultant* will have authority to reject work which in the *Consultant*'s opinion does not conform to the requirements of the *Contract Documents*. Whenever the *Consultant* considers it necessary or advisable, the *Consultant* will have authority to require inspection or testing of work, whether or not such work is fabricated, installed or completed. However, neither the authority of the *Consultant* to act nor any decision either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the *Consultant* to the *Contractor*, *Subcontractors*, *Suppliers,* or their agents, employees or other persons performing any of the *Work*.

2.2.13 During the progress of the *Work* the *Consultant* will furnish *Supplemental Instructions* to the *Contractor* with reasonable promptness or in accordance with a schedule for such instructions agreed to by the *Consultant* and the *Contractor.*

2.2.14 The *Consultant* will review and take appropriate action upon *Shop Drawings*, samples and other *Contractor*'s submittals, in accordance with the *Contract Documents*.

2.2.15 The *Consultant* will prepare *Change Orders* and *Change Directives* as provided in GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.

2.2.16 The *Consultant* will conduct reviews of the *Work* to determine the date of *Substantial Performance of the Work* as provided in GC 5.4 - SUBSTANTIAL PERFORMANCE OF THE WORK.

2.2.17 All certificates issued by the *Consultant* will be to the best of the *Consultant*'s knowledge, information and belief. By issuing any certificate, the *Consultant* does not guarantee the *Work* is correct or complete.

2.2.18 The *Consultant* will receive and review written warranties and related documents required by the *Contract* and provided by the *Contractor* and will forward such warranties and documents to the *Owner* for the *Owner*'s acceptance.

GC 2.3 REVIEW AND INSPECTION OF THE WORK

2.3.1 The *Owner* and the *Consultant* shall have access to the *Work* at all times. The *Contractor* shall provide sufficient, safe and proper facilities at all times for the review of the *Work* by the *Consultant* and the inspection of the *Work* by authorized agencies. If parts of the *Work* are in preparation at locations other than the *Place of the Work*, the *Owner* and the *Consultant* shall be given access to such work whenever it is in progress.

2.3.2 If work is designated for measurement for payment, tests, inspections or approvals in the *Contract Documents*, or by the *Consultant*'s instructions, or by the laws or ordinances of the *Place of the Work*, the *Contractor* shall give the *Consultant* reasonable notification of when the work will be ready for measurements, tests, inspections and approvals. The *Contractor* shall arrange for and shall give the *Consultant* reasonable notification of the date and time of inspections by other authorities.

2.3.3 The *Contractor* shall furnish promptly to the *Consultant* two copies of certificates and inspection reports relating to the *Work*.

2.3.4 If the *Contractor* covers, or permits to be covered, work that has been designated for measurement for payment, tests, inspections or approvals before such measurements, tests, inspections or approvals are made, given or completed, the *Contractor* shall, if so directed, uncover such work, have the measurements, tests, inspections, or approvals satisfactorily completed, and make good covering work at the *Contractor*'s expense.

2.3.5 The *Consultant* may order any portion or portions of the *Work* to be examined to confirm that such work is in accordance with the requirements of the *Contract Documents*. If the work is not in accordance with the requirements of the *Contract Documents*, the *Contractor* shall correct the work and pay the cost of examination and correction. If the work is in accordance with the requirements of the *Contract Documents*, the *Owner* shall pay the cost of examination and restoration.

2.3.6 The *Contractor* shall pay the cost of making any test or inspection, including the cost of samples required for such test or inspection, if such test or inspection is designated in the *Contract Documents* to be performed by the *Contractor* or is designated by the laws or ordinances applicable to the *Place of the Work*.

2.3.7 The *Contractor* shall pay the cost of samples required for any test or inspection to be performed by the *Consultant* or the *Owner* if such test or inspection is designated in the *Contract Documents*.

GC 2.4 DEFECTIVE WORK

2.4.1 The *Contractor* shall promptly correct defective work that has been rejected by the *Consultant* as failing to conform to the *Contract Documents* whether or not the defective work has been incorporated in the *Work* and whether or not the defect is the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the *Contractor*.

2.4.2 The *Contractor* shall make good promptly other contractors' work destroyed or damaged by such removals or replacements at the *Contractor*'s expense.

2.4.3 If, in the opinion of the *Consultant,* it is not expedient to correct defective work or work not performed as provided in the *Contract Documents*, the *Owner* may deduct from the amount otherwise due to the *Contractor* the difference in value between the work as performed and that called for by the *Contract Documents*. If the *Owner* and the *Contractor* do not agree on the difference in value, they shall refer the matter to the *Consultant* for a determination.

PART 3 EXECUTION OF THE WORK

GC 3.1 CONTROL OF THE WORK

3.1.1 The *Contractor* shall have total control of the *Work* and shall effectively direct and supervise the *Work* so as to ensure conformity with the *Contract Documents*.

3.1.2 The *Contractor* shall be solely responsible for construction means, methods, techniques, sequences, and procedures and for co-ordinating the various parts of the *Work* under the *Contract*.

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

3.2.1 The *Owner* reserves the right to award separate contracts in connection with other parts of the *Project* to other contractors and to perform work with own forces.

3.2.2 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner*'s own forces, the *Owner* shall:

.1 provide for the co-ordination of the activities and work of other contractors and *Owner*'s own forces with the *Work* of the *Contract*;

.2 assume overall responsibility for compliance with the applicable health and construction safety legislation at the *Place of the Work*;

.3 enter into separate contracts with other contractors under conditions of contract which are compatible with the conditions of the *Contract*;

.4 ensure that insurance coverage is provided to the same requirements as are called for in GC 11.1 - INSURANCE and co-ordinate such insurance with the insurance coverage of the *Contractor* as it affects the *Work*; and

.5 take all reasonable precautions to avoid labour disputes or other disputes on the *Project* arising from the work of other contractors or the *Owner*'s own forces.

3.2.3 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner*'s own forces, the *Contractor* shall:

.1 afford the *Owner* and other contractors reasonable opportunity to store their products and execute their work;

.2 cooperate with other contractors and the *Owner* in reviewing their construction schedules; and

.3 promptly report to the *Consultant* in writing any apparent deficiencies in the work of other contractors or of the *Owner*'s own forces, where such work affects the proper execution of any portion of the *Work*, prior to proceeding with that portion of the *Work*.

3.2.4 Where the *Contract Documents* identify work to be performed by other contractors or the *Owner*'s own forces, the *Contractor* shall co-ordinate and schedule the *Work* with the work of other contractors and the *Owner*'s own forces as specified in the *Contract Documents*.

3.2.5 Where a change in the *Work* is required as a result of the co-ordination and integration of the work of other contractors or *Owner*'s own forces with the *Work*, the changes shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.

3.2.6 Disputes and other matters in question between the *Contractor* and other contractors shall be dealt with as provided in Part 8 of the General Conditions - DISPUTE RESOLUTION provided the other contractors have reciprocal obligations. The *Contractor* shall be deemed to have consented to arbitration of any dispute with any other contractor whose contract with the *Owner* contains a similar agreement to arbitrate.

GC 3.3 TEMPORARY WORK

3.3.1 The *Contractor* shall have the sole responsibility for the design, erection, operation, maintenance, and removal of *Temporary Work*.

3.3.2 The *Contractor* shall engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform those functions referred to in paragraph 3.3.1 where required by law or by the *Contract Documents* and in all cases where such *Temporary Work* is of such a nature that professional engineering skill is required to produce safe and satisfactory results.

3.3.3 Notwithstanding the provisions of GC 3.1 - CONTROL OF THE WORK, paragraph 3.3.1 and paragraph 3.3.2 or provisions to the contrary elsewhere in the *Contract Documents* where such *Contract Documents* include designs for *Temporary Work* or specify a method of construction in whole or in part, such designs or methods of construction shall be considered to be part of the design of the *Work* and the *Contractor* shall not be held responsible for that part of the design or the specified method of construction. The *Contractor* shall, however, be responsible for the execution of such design or specified method of construction in the same manner as for the execution of the *Work*.

GC 3.4 DOCUMENT REVIEW

3.4.1 The *Contractor* shall review the *Contract Documents* and shall report promptly to the *Consultant* any error, inconsistency or omission the *Contractor* may discover. Such review by the *Contractor* shall be to the best of the *Contractor*'s knowledge, information and belief and in making such review the *Contractor* does not assume any responsibility to the *Owner* or the *Consultant* for the accuracy of the review. The *Contractor* shall not be liable for damage or costs resulting from such errors, inconsistencies or omissions in the *Contract Documents,* which the *Contractor* did not discover. If the *Contractor* does discover any error, inconsistency or omission in the *Contract Documents*, the *Contractor* shall not proceed with the work affected until the *Contractor* has received corrected or missing information from the *Consultant*.

GC 3.5 CONSTRUCTION SCHEDULE

3.5.1 The *Contractor* shall:

.1 prepare and submit to the *Owner* and the *Consultant* prior to the first application for payment, a construction schedule that indicates the timing of the major activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time*;

.2 monitor the progress of the *Work* relative to the construction schedule and update the schedule on a monthly basis or as stipulated by the *Contract Documents*; and

.3 advise the *Consultant* of any revisions required to the schedule as the result of extensions of the *Contract Time* as provided in Part 6 of the General Conditions - CHANGES IN THE WORK.

GC 3.6 SUPERVISION

3.6.1 The *Contractor* shall provide all necessary supervision and appoint a competent representative who shall be in attendance at the *Place of the Work* while work is being performed. The appointed representative shall not be changed except for valid reason.

3.6.2 The appointed representative shall represent the *Contractor* at the *Place of the Work*. Information and instructions provided by the *Consultant* to the *Contractor*'s appointed representative shall be deemed to have been received by the *Contractor*, except with respect to Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

GC 3.7 SUBCONTRACTORS AND SUPPLIERS

3.7.1 The *Contractor* shall preserve and protect the rights of the parties under the *Contract* with respect to work to be performed under subcontract, and shall:

.1 enter into contracts or written agreements with *Subcontractors* and *Suppliers* to require them to perform their work as provided in the *Contract Documents*;

.2 incorporate the terms and conditions of the *Contract Documents* into all contracts or written agreements with *Subcontractors* and *Suppliers*; and

.3 be as fully responsible to the *Owner* for acts and omissions of *Subcontractors*, *Suppliers* and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the *Contractor*.

3.7.2 The *Contractor* shall indicate in writing, if requested by the *Owner*, those *Subcontractors* or *Suppliers* whose bids have been received by the *Contractor* which the *Contractor* would be prepared to accept for the performance of a portion of the *Work*. Should the *Owner* not object before signing the *Contract*, the *Contractor* shall employ those *Subcontractors* or *Suppliers* so identified by the *Contractor* in writing for the performance of that portion of the *Work* to which their bid applies.

3.7.3 The *Owner* may, for reasonable cause, at any time before the *Owner* has signed the *Contract*, object to the use of a proposed *Subcontractor* or *Supplier* and require the *Contractor* to employ one of the other subcontract bidders.

3.7.4 If the *Owner* requires the *Contractor* to change a proposed *Subcontractor* or *Supplier*, the *Contract Price* and *Contract Time* shall be adjusted by the differences occasioned by such required change.

3.7.5 The *Contractor* shall not be required to employ as a *Subcontractor* or *Supplier*, a person or firm to which the *Contractor* may reasonably object.

3.7.6 The *Owner*, through the *Consultant*, may provide to a *Subcontractor* or *Supplier* information as to the percentage of the *Subcontractor*'s or *Supplier*'s work which has been certified for payment.

GC 3.8 LABOUR AND PRODUCTS

3.8.1 The *Contractor* shall provide and pay for labour, *Products*, tools, *Construction Equipment*, water, heat, light, power, transportation, and other facilities and services necessary for the performance of the *Work* in accordance with the *Contract*.

3.8.2 Unless otherwise specified in the *Contract Documents*, *Products* provided shall be new. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*.

3.8.3 The *Contractor* shall maintain good order and discipline among the *Contractor*'s employees engaged on the *Work* and shall not employ on the *Work* anyone not skilled in the tasks assigned.

GC 3.9 DOCUMENTS AT THE SITE

3.9.1 The *Contractor* shall keep one copy of current *Contract Documents*, submittals, reports, and records of meetings at the *Place of the Work*, in good order and available to the *Owner* and the *Consultant*.

GC 3.10 SHOP DRAWINGS

3.10.1 The *Contractor* shall provide *Shop Drawings* as required in the *Contract Documents*.

3.10.2 The *Contractor* shall provide *Shop Drawings* to the *Consultant* to review in orderly sequence and sufficiently in advance so as to cause no delay in the *Work* or in the work of other contractors.

3.10.3 Upon request of the *Contractor* or the Consultant, they shall jointly prepare a schedule of the dates for provision, review and return of *Shop Drawings*.

3.10.4 The *Contractor* shall provide *Shop Drawings* in the form specified, or if not specified, as directed by the *Consultant*.

3.10.5 *Shop Drawings* provided by the *Contractor* to the *Consultant* shall indicate by stamp, date and signature of the person responsible for the review that the *Contractor* has reviewed each one of them.

3.10.6 The *Consultant*'s review is for conformity to the design concept and for general arrangement only.

3.10.7 *Shop Drawings* which require approval of any legally constituted authority having jurisdiction shall be provided to such authority by the *Contractor* for approval.

3.10.8 The *Contractor* shall review all *Shop Drawings* before providing them to the *Consultant*. The *Contractor* represents by this review that:

.1 the *Contractor* has determined and verified all applicable field measurements, field construction conditions, *Product* requirements, catalogue numbers and similar data, or will do so, and

.2 the *Contractor* has checked and co-ordinated each *Shop Drawing* with the requirements of the *Work* and of the *Contract Documents*.

3.10.9 At the time of providing *Shop Drawings*, the *Contractor* shall expressly advise the *Consultant* in writing of any deviations in a *Shop Drawing* from the requirements of the *Contract Documents*. The *Consultant* shall indicate the acceptance or rejection of such deviation expressly in writing.

3.10.10 The *Consultant*'s review shall not relieve the *Contractor* of responsibility for errors or omissions in the *Shop Drawings* or for meeting all requirements of the *Contract Documents*.

3.10.11 The *Contractor* shall provide revised *Shop Drawings* to correct those which the *Consultant* rejects as inconsistent with the *Contract Documents,* unless otherwise directed by the *Consultant*. The *Contractor* shall notify the *Consultant* in writing of any revisions to the *Shop Drawings* other than those requested by the *Consultant*.

3.10.12 The *Consultant* will review and return *Shop Drawings* in accordance with the schedule agreed upon, or, in the absence of such schedule, with reasonable promptness so as to cause no delay in the performance of the *Work*.

GC 3.11 USE OF THE WORK

3.11.1 The *Contractor* shall confine *Construction Equipment*, *Temporary Work*, storage of *Products*, waste products and debris, and operations of employees and *Subcontractors* to limits indicated by laws, ordinances, permits, or the *Contract Documents* and shall not unreasonably encumber the *Place of the Work*.

3.11.2 The *Contractor* shall not load or permit to be loaded any part of the *Work* with a weight or force that will endanger the safety of the *Work*.

GC 3.12 CUTTING AND REMEDIAL WORK

3.12.1 The *Contractor* shall perform the cutting and remedial work required to make the affected parts of the *Work* come together properly.

3.12.2 The *Contractor* shall co-ordinate the *Work* to ensure that the cutting and remedial work is kept to a minimum.

3.12.3 Should the *Owner*, the *Consultant*, other contractors or anyone employed by them be responsible for ill-timed work necessitating cutting or remedial work to be performed, the cost of such cutting or remedial work shall be valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.

3.12.4 Cutting and remedial work shall be performed by specialists familiar with the *Products* affected and shall be performed in a manner to neither damage nor endanger the *Work*.

GC 3.13 CLEANUP

3.13.1 The *Contractor* shall maintain the *Work* in a safe and tidy condition and free from the accumulation of waste products and debris, other than that caused by the *Owner*, other contractors or their employees.

3.13.2 Before applying for *Substantial Performance of the Work* as provided in GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK, the *Contractor* shall remove waste products and debris, other than that resulting from the work of the *Owner*, other contractors or their employees, and shall leave the *Place of the Work* clean and suitable for use or occupancy by the *Owner*. The *Contractor* shall remove products, tools, *Construction Equipment*, and *Temporary Work* not required for the performance of the remaining work.

3.13.3 Prior to application for the final payment, the *Contractor* shall remove any remaining products, tools, *Construction Equipment*, *Temporary Work*, and waste products and debris, other than those resulting from the work of the *Owner*, other contractors or their employees.

PART 4 ALLOWANCES

GC 4.1 CASH ALLOWANCES

4.1.1 The *Contract Price* includes the cash allowances, if any, stated in the *Contract Documents*. The scope of work or costs included in such cash allowances shall be as described in the *Contract Documents*.

4.1.2 The *Contract Price*, and not the cash allowances, includes the *Contractor*'s overhead and profit in connection with such cash allowances.

4.1.3 Expenditures under cash allowances shall be authorized by the *Owner* through the *Consultant*.

4.1.4 Where the actual cost of the Work under any cash allowance exceeds the amount of the allowance, the *Contractor* shall be compensated for the excess incurred and substantiated plus an amount for overhead and profit on the excess as set out in the *Contract Documents*. Where the actual cost of the Work under any cash allowance is less than the amount of the allowance, the *Owner* shall be credited for the unexpended portion of the cash allowance, but not for the *Contractor*'s overhead and profit on such amount. Multiple cash allowances shall not be combined for the purpose of calculating the foregoing.

4.1.5 The *Contract Price* shall be adjusted by *Change Order* to provide for any difference between the amount of each cash allowance and the actual cost of the work under that cash allowance.

4.1.6 The value of the work performed under a cash allowance is eligible to be included in progress payments.

4.1.7 The *Contractor* and the *Consultant* shall jointly prepare a schedule that shows when the *Consultant* and *Owner* must authorize ordering of items called for under cash allowances to avoid delaying the progress of the *Work*.

GC 4.2 CONTINGENCY ALLOWANCE

4.2.1 The *Contract Price* includes the contingency allowance, if any, stated in the *Contract Documents*.

4.2.2 The contingency allowance includes the *Contractor*'s overhead and profit in connection with such contingency allowance.

4.2.3 Expenditures under the contingency allowance shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.

4.2.4 The *Contract Price* shall be adjusted by *Change Order* to provide for any difference between the expenditures authorized under paragraph 4.2.3 and the contingency allowance.

PART 5 PAYMENT

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

5.1.1 The *Owner* shall, at the request of the *Contractor*, before signing the *Contract*, and promptly from time to time thereafter, furnish to the *Contractor* reasonable evidence that financial arrangements have been made to fulfill the *Owner*'s obligations under the *Contract*.

5.1.2 The *Owner* shall give the *Contractor Notice in Writing* of any material change in the *Owner*'s financial arrangements to fulfill the *Owner*'s obligations under the *Contract* during the performance of the *Contract*.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

5.2.1 Applications for payment on account as provided in Article A-5 of the Agreement - PAYMENT may be made monthly as the *Work* progresses.

5.2.2 Applications for payment shall be dated the last day of each payment period, which is the last day of the month or an alternative day of the month agreed in writing by the parties.

5.2.3 As of the last day of the payment period, the amount claimed shall be:

1. the value of *Unit Price* work performed, being the sum of the products of each *Unit Price* stated in the *Schedule of Prices* multiplied by the appropriate actual quantity of each *Unit Price* item that is incorporated in or made necessary by the *Work*; plus
2. the value of lump sum work performed, proportionate to the amount of the lump sum item, plus
3. the value of *Products* delivered to the *Place of the Work* .

5.2.4 The *Contractor* shall submit to the *Consultant*, at least 15 calendar days before the first application for payment, a schedule of values for the lump sum items of work, aggregating the total amount of each lump sum item, so as to facilitate evaluation of applications for payment.

5.2.5 The schedule of values for lump sum items of work shall be made out in such form and supported by such evidence as the *Consultant* may reasonably direct and when accepted by the *Consultant*, shall be used as the basis for applications for payment for lump sum items, unless it is found to be in error.

5.2.6 The *Contractor* shall include with each application for payment:

1. a statement based on the schedule of values for the lump sum items of work; and
2. quantity measurements and other evidence as requested by the *Consultant* for each *Unit Price* item.

5.2.7 Applications for payment for *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall be supported by such evidence as the *Consultant* may reasonably require to establish the value and delivery of the *Products*.

GC 5.3 PROGRESS PAYMENT

5.3.1 After receipt by the *Consultant* of an application for payment submitted by the *Contractor* in accordance with GC 5.2 - APPLICATIONS FOR PROGRESS PAYMENT:

.1 the *Consultant* will promptly inform the *Owner* of the date of receipt of the *Contractor*'s application for payment,

.2 the *Consultant* will issue to the *Owner* and copy to the *Contractor*, no later than 10 calendar days after the receipt of the application for payment, a certificate for payment in the amount applied for, or in such other amount as the *Consultant* determines to be properly due. If the *Consultant* amends the application, the *Consultant* will promptly advise the *Contractor* in writing giving reasons for the amendment,

.3 the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement - PAYMENT on or before 20 calendar days after the later of:

- receipt by the *Consultant* of the application for payment, or
- the last day of the monthly payment period for which the application for payment is made.

5.3.2 Where the basis of payment for an item is by *Unit Price*, quantities in progress payments shall be considered approximate until all work required by that *Unit Price* item is complete.

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

5.4.1 When the *Contractor* considers that the *Work* is substantially performed, or if permitted by the lien legislation applicable to the *Place of the Work* a designated portion thereof which the *Owner* agrees to accept separately is substantially performed, the *Contractor* shall, within one Working Day, deliver to the *Consultant* and to the Owner a comprehensive list of items to be completed or corrected, together with a written application for a review by the *Consultant* to establish *Substantial Performance of the Work* or substantial performance of the designated portion of the *Work*. Failure to include an item on the list does not alter the responsibility of the *Contractor* to complete the *Contract*.

5.4.2 The *Consultant* will review the *Work* to verify the validity of the application and shall promptly, and in any event, no later than 20 calendar days after receipt of the *Contractor*'s list and application:

.1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or

.2 state the date of *Substantial Performance of the Work* or a designated portion of the *Work* in a certificate and issue a copy of that certificate to each of the *Owner* and the *Contractor*.

5.4.3 Immediately following the issuance of the certificate of *Substantial Performance of the Work*, the *Contractor*, in consultation with the *Consultant*, shall establish a reasonable date for finishing the *Work*.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

5.5.1 After the issuance of the certificate of *Substantial Performance of the Work*, the *Contractor* shall:

.1 submit an application for payment of the holdback amount,

.2 submit CCDC 9A 'Statutory Declaration' to state that all accounts for labour, subcontracts, *Products*, *Construction Equipment*, and other indebtedness which may have been incurred by the *Contractor* in the *Substantial Performance of the Work* and for which the *Owner* might in any way be held responsible have been paid in full, except for amounts properly retained as a holdback or as an identified amount in dispute.

5.5.2 After the receipt of an application for payment from the *Contractor* and the statement as provided in paragraph 5.5.1, the *Consultant* will issue a certificate for payment of the holdback amount.

5.5.3 Where the holdback amount required by the applicable lien legislation has not been placed in a separate holdback account, the *Owner* shall, 10 calendar days prior to the expiry of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*, place the holdback amount in a bank account in the joint names of the *Owner* and the *Contractor*.

5.5.4 In the common law jurisdictions, the holdback amount authorized by the certificate for payment of the holdback amount is due and payable on the calendar day following the expiration of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*. Where lien legislation does not exist or apply, the holdback amount shall be due and payable in accordance with other legislation, industry practice or provisions which may be agreed to between the parties. The *Owner* may retain out of the holdback amount any sums required by law to satisfy any liens against the *Work* or, if permitted by the lien legislation applicable to the *Place of the Work*, other third party monetary claims against the *Contractor* which are enforceable against the *Owner*.

5.5.5 In the Province of Quebec, the holdback amount authorized by the certificate for payment of the holdback amount is due and payable 30 calendar days after the issuance of the certificate. The *Owner* may retain out of the holdback amount any sums required to satisfy any legal hypothecs that have been taken, or could be taken, against the *Work* or other third party monetary claims against the *Contractor* which are enforceable against the *Owner*.

GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK

5.6.1 In the common law jurisdictions, where legislation permits and where, upon application by the *Contractor*, the *Consultant* has certified that the work of a *Subcontractor* or *Supplier* has been performed prior to *Substantial Performance of the Work*, the *Owner* shall pay the *Contractor* the holdback amount retained for such subcontract work, or the *Products* supplied by such *Supplier*, on the first calendar day following the expiration of the holdback period for such work stipulated in the lien legislation applicable to the *Place of the Work*. The *Owner* may retain out of the holdback amount any sums required by law to satisfy any liens against the *Work* or, if permitted by the lien legislation applicable to the *Place of the Work*, other third party monetary claims against the *Contractor* which are enforceable against the *Owner*.

5.6.2 In the Province of Quebec, where, upon application by the *Contractor*, the *Consultant* has certified that the work of a *Subcontractor* or *Supplier* has been performed prior to *Substantial Performance of the Work*, the *Owner* shall pay the *Contractor* the holdback amount retained for such subcontract work, or the *Products* supplied by such *Supplier*, no later than 30 calendar days after such certification by the *Consultant*. The *Owner* may retain out of the holdback amount any sums required to satisfy any legal hypothecs that have been taken, or could be taken, against the *Work* or other third party monetary claims against the *Contractor* which are enforceable against the *Owner*.

5.6.3 Notwithstanding the provisions of the preceding paragraphs, and notwithstanding the wording of such certificates, the *Contractor* shall ensure that such subcontract work or *Products* are protected pending the issuance of a final certificate for payment and be responsible for the correction of defects or work not performed regardless of whether or not such was apparent when such certificates were issued.

GC 5.7 FINAL PAYMENT

5.7.1 When the *Contractor* considers that the *Work* is completed, the *Contractor* shall submit an application for final payment.

5.7.2 The *Consultant* will, no later than 10 calendar days after the receipt of an application from the *Contractor* for final payment, review the *Work* to verify the validity of the application and advise the *Contractor* in writing that the application is valid or give reasons why it is not valid.

5.7.3 When the *Consultant* finds the *Contractor*'s application for final payment valid, the *Consultant* will promptly issue a final certificate for payment.

5.7.4 Subject to the provision of paragraph 10.4.1 of GC 10.4 - WORKERS' COMPENSATION, and any lien legislation applicable to the *Place of the Work*, the *Owner* shall, no later than 5 calendar days after the issuance of a final certificate for payment, pay the *Contractor* as provided in Article A-5 of the Agreement - PAYMENT.

GC 5.8 WITHHOLDING OF PAYMENT

5.8.1 If because of climatic or other conditions reasonably beyond the control of the *Contractor*, there are items of work that cannot be performed, payment in full for that portion of the *Work* which has been performed as certified by the *Consultant* shall not be withheld or delayed by the *Owner* on account thereof, but the *Owner* may withhold, until the remaining portion of the *Work* is finished, only such an amount that the *Consultant* determines is sufficient and reasonable to cover the cost of performing such remaining work.

GC 5.9 NON-CONFORMING WORK

5.9.1 No payment by the *Owner* under the *Contract* nor partial or entire use or occupancy of the *Work* by the *Owner* shall constitute an acceptance of any portion of the *Work* or *Products* which are not in accordance with the requirements of the *Contract Documents*.

PART 6 CHANGES IN THE WORK

GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

6.1.1 The *Owner*, through the *Consultant*, without invalidating the *Contract*, may make:
- .1 changes in the *Work* consisting of additions, deletions or other revisions to the *Work* by *Change Order* or *Change Directive*, and
- .2 changes to the *Contract Time* for the *Work*, or any part thereof, by *Change Order*.

6.1.2 The *Contractor* shall not perform a change in the *Work* without a *Change Order* or a *Change Directive*.

GC 6.2 CHANGE ORDER

6.2.1 When a change in the *Work* is proposed or required, the *Consultant* will provide the *Contractor* with a written description of the proposed change in the *Work*. The *Contractor* shall promptly present, in a form acceptable to the *Consultant*, a method of adjustment or an amount of adjustment for the *Contract Price*, if any, and the adjustment in the *Contract Time*, if any, for the proposed change in the *Work*.

6.2.2 The method of adjustment or the amount of adjustment to the *Contract Price* presented by the *Contractor* may be one of or a combination of the following:

.1 Change to the estimated quantities for *Unit Price* items listed in the *Schedule of Prices* that are applicable to the change in the *Work*;

.2 Lump sum quotation for the change in the *Work*;

.3 *Unit Price* quotation for the change in the *Work*;

.4 Cost of the *Contractor's* actual expenditures attributable to the change plus a fee for the Contractor's overhead and profit as agreed by the parties;

.5 Cost of the *Contractor's* actual savings attributable to the change.

6.2.3 When the *Owner* and *Contractor* agree to the adjustments in the *Contract Price* and *Contract Time* or to the method to be used to determine the adjustments, such agreement shall be effective immediately and shall be recorded in a *Change Order*. The value of the work performed as the result of a *Change Order* shall be included in the application for progress payment.

GC 6.3 CHANGE DIRECTIVE

6.3.1 If the *Owner* requires the *Contractor* to proceed with a change in the *Work* prior to the *Owner* and the *Contractor* agreeing upon the corresponding adjustment in *Contract Price* and *Contract Time*, the *Owner*, through the *Consultant*, shall issue a *Change Directive*.

6.3.2 A *Change Directive* shall only be used to direct a change in the *Work* which is within the general scope of the *Contract Documents*.

6.3.3 A *Change Directive* shall not be used to direct a change in the *Contract Time* only.

6.3.4 Upon receipt of a *Change Directive*, the *Contractor* shall proceed promptly with the change in the *Work*.

6.3.5 For the purpose of valuing *Change Directives*, changes in the *Work* that are not substitutions or otherwise related to each other shall not be grouped together in the same *Change Directive*.

6.3.6 The adjustment in the *Contract Price* for a change carried out by way of a *Change Directive* shall be determined on the basis of the cost of the *Contractor*'s actual expenditures and savings attributable to the *Change Directive*, valued in accordance with paragraph 6.3.7 and as follows:

.1 If the change results in a net increase in the *Contractor*'s cost, the *Contract Price* shall be increased by the amount of the net increase in the *Contractor*'s cost, plus the *Contractor*'s percentage fee on such net increase.

.2 If the change results in a net decrease in the *Contractor*'s cost, the *Contract Price* shall be decreased by the amount of the net decrease in the *Contractor*'s cost, without adjustment for the *Contractor*'s percentage fee.

.3 The *Contractor*'s fee shall be as specified in the *Contract Documents* or as otherwise agreed by the parties.

6.3.7 The cost of performing the work attributable to the *Change Directive* shall be limited to the actual cost of the following:

.1 salaries, wages and benefits paid to personnel in the direct employ of the *Contractor* under a salary or wage schedule agreed upon by the *Owner* and the *Contractor*, or in the absence of such a schedule, actual salaries, wages and benefits paid under applicable bargaining agreement, and in the absence of a salary or wage schedule and bargaining agreement, actual salaries, wages and benefits paid by the *Contractor*, for personnel

(1) stationed at the *Contractor*'s field office, in whatever capacity employed;

(2) engaged in expediting the production or transportation of material or equipment, at shops or on the road;

(3) engaged in the preparation or review of *Shop Drawings*, fabrication drawings, and coordination drawings; or

(4) engaged in the processing of changes in the *Work*.

.2 contributions, assessments or taxes incurred for such items as employment insurance, provincial or territorial health insurance, workers' compensation, and Canada or Quebec Pension Plan, insofar as such cost is based on wages, salaries or other remuneration paid to employees of the *Contractor* and included in the cost of the work as provided in paragraphs 6.3.7.1;

.3 travel and subsistence expenses of the *Contractor*'s personnel described in paragraphs 6.3.7.1;

.4 all *Products* including cost of transportation thereof;

.5 materials, supplies, *Construction Equipment*, *Temporary Work*, and hand tools not owned by the workers, including transportation and maintenance thereof, which are consumed in the performance of the *Work*; and cost less salvage value on such items used but not consumed, which remain the property of the *Contractor*;

.6 all tools and *Construction Equipment*, exclusive of hand tools used in the performance of the *Work*, whether rented from or provided by the *Contractor* or others, including installation, minor repairs and replacements, dismantling, removal, transportation, and delivery cost thereof;

.7 all equipment and services required for the *Contractor*'s field office;

.8 deposits lost;

.9 the amounts of all subcontracts;
.10 quality assurance such as independent inspection and testing services;
.11 charges levied by authorities having jurisdiction at the *Place of the Work*;
.12 royalties, patent licence fees and damages for infringement of patents and cost of defending suits therefor subject always to the *Contractor*'s obligations to indemnify the *Owner* as provided in paragraph 10.3.1 of GC 10.3 - PATENT FEES;
.13 any adjustment in premiums for all bonds and insurance which the *Contractor* is required, by the *Contract Documents*, to purchase and maintain;
.14 any adjustment in taxes, other than *Value Added Taxes*, and duties for which the *Contractor* is liable;
.15 charges for long distance telephone and facsimile communications, courier services, expressage, and petty cash items incurred in relation to the performance of the *Work*;
.16 removal and disposal of waste products and debris; and
.17 safety measures and requirements.

6.3.8 Notwithstanding any other provisions contained in the General Conditions of the *Contract*, it is the intention of the parties that the cost of any item under any cost element referred to in paragraph 6.3.7 shall cover and include any and all costs or liabilities attributable to the *Change Directive* other than those which are the result of or occasioned by any failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor*'s attention to the *Work*. Any cost due to failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor*'s attention to the *Work* shall be borne by the *Contractor*.

6.3.9 The *Contractor* shall keep full and detailed accounts and records necessary for the documentation of the cost of performing the work attributable to the *Change Directive* and shall provide the *Consultant* with copies thereof when requested.

6.3.10 For the purpose of valuing *Change Directives*, the *Owner* shall be afforded reasonable access to all of the *Contractor*'s pertinent documents related to the cost of performing the work attributable to the *Change Directive*.

6.3.11 Pending determination of the final amount of a *Change Directive*, the undisputed value of the work performed as the result of a *Change Directive* is eligible to be included in progress payments.

6.3.12 If the *Owner* and *Contractor* do not agree on the proposed adjustment in the *Contract Time* attributable to the change in the *Work*, or the method of determining it, the adjustment shall be referred to the *Consultant* for determination.

6.3.13 When the *Owner* and the *Contractor* reach agreement on the adjustment to the *Contract Price* and to the *Contract Time*, this agreement shall be recorded in a *Change Order*.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

6.4.1 If the *Owner* or the *Contractor* discover conditions at the *Place of the Work* which are:
.1 subsurface or otherwise concealed physical conditions which existed before the commencement of the *Work* which differ materially from those indicated in the *Contract Documents*; or
.2 physical conditions, other than conditions due to weather, that are of a nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the *Contract Documents*,
then the observing party shall give *Notice in Writing* to the other party of such conditions before they are disturbed and in no event later than 5 *Working Days* after first observance of the conditions.

6.4.2 The *Consultant* will promptly investigate such conditions and make a finding. If the finding is that the conditions differ materially and this would cause an increase or decrease in the *Contractor*'s cost or time to perform the *Work*, the *Consultant*, with the *Owner*'s approval, will issue appropriate instructions for a change in the *Work* as provided in GC 6.2 - CHANGE ORDER or GC 6.3 - CHANGE DIRECTIVE.

6.4.3 If the *Consultant* finds that the conditions at the *Place of the Work* are not materially different or that no change in the *Contract Price* or the *Contract Time* is justified, the *Consultant* will report the reasons for this finding to the *Owner* and the *Contractor* in writing.

6.4.4 If such concealed or unknown conditions relate to toxic and hazardous substances and materials, artifacts and fossils, or mould, the parties will be governed by the provisions of GC 9.2 - TOXIC AND HAZARDOUS SUBSTANCES AND MATERIALS, GC 9.3 - ARTIFACTS AND FOSSILS and GC 9.5 – MOULD.

GC 6.5 DELAYS

6.5.1 If the *Contractor* is delayed in the performance of the *Work* by an action or omission of the *Owner*, *Consultant* or anyone employed or engaged by them directly or indirectly, contrary to the provisions of the *Contract Documents*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.

6.5.2 If the *Contractor* is delayed in the performance of the *Work* by a stop work order issued by a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or any person employed or engaged by the *Contractor* directly or indirectly, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.

6.5.3 If the *Contractor* is delayed in the performance of the *Work* by:

.1 labour disputes, strikes, lock-outs (including lock-outs decreed or recommended for its members by a recognized contractors' association, of which the *Contractor* is a member or to which the *Contractor* is otherwise bound),

.2 fire, unusual delay by common carriers or unavoidable casualties,

.3 abnormally adverse weather conditions, or

.4 any cause beyond the *Contractor*'s control other than one resulting from a default or breach of *Contract* by the *Contractor*,

then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The extension of time shall not be less than the time lost as the result of the event causing the delay, unless the *Contractor* agrees to a shorter extension. The *Contractor* shall not be entitled to payment for costs incurred by such delays unless such delays result from actions by the *Owner*, *Consultant* or anyone employed or engaged by them directly or indirectly.

6.5.4 No extension shall be made for delay unless *Notice in Writing* of the cause of delay is given to the *Consultant* not later than 10 *Working Days* after the commencement of the delay. In the case of a continuing cause of delay only one *Notice in Writing* shall be necessary.

6.5.5 If no schedule is made under paragraph 2.2.13 of GC 2.2 - ROLE OF THE CONSULTANT, then no request for extension shall be made because of failure of the *Consultant* to furnish instructions until 10 *Working Days* after demand for such instructions has been made.

GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

6.6.1 If the *Contractor* intends to make a claim for an increase to the *Contract Price*, or if the *Owner* intends to make a claim against the *Contractor* for a credit to the *Contract Price*, the party that intends to make the claim shall give timely *Notice in Writing* of intent to claim to the other party and to the *Consultant*.

6.6.2 Upon commencement of the event or series of events giving rise to a claim, the party intending to make the claim shall:

.1 take all reasonable measures to mitigate any loss or expense which may be incurred as a result of such event or series of events, and

.2 keep such records as may be necessary to support the claim.

6.6.3 The party making the claim shall submit within a reasonable time to the *Consultant* a detailed account of the amount claimed and the grounds upon which the claim is based.

6.6.4 Where the event or series of events giving rise to the claim has a continuing effect, the detailed account submitted under paragraph 6.6.3 shall be considered to be an interim account and the party making the claim shall, at such intervals as the *Consultant* may reasonably require, submit further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.

6.6.5 The *Consultant's* findings, with respect to a claim made by either party, will be given by *Notice in Writing* to both parties within 30 *Working Days* after receipt of the claim by the *Consultant*, or within such other time period as may be agreed by the parties.

6.6.6 If such finding is not acceptable to either party, the claim shall be settled in accordance with Part 8 of the General Conditions - DISPUTE RESOLUTION.

GC 6.7 QUANTITY VARIATIONS

6.7.1 The provisions of GC 6.7 - QUANTITY VARIATIONS apply to the estimated quantities identified in the *Schedule of Prices*, or where the estimated quantities have been amended by *Change Order*, the provisions apply to the amended estimated quantities.

6.7.2 The *Owner* or the *Contractor* may request an adjustment to a *Unit Price* contained in the *Schedule of Prices* provided the actual quantity of the *Unit Price* item in the *Schedule of Prices* exceeds or falls short of the estimated quantity by more that 15%.

6.7.3 Where the actual quantity exceeds the estimated quantity by more than 15%, a *Unit Price* adjusted pursuant to paragraph 6.7.2 shall apply only to the quantity that exceeds 115% of the estimated quantity.

6.7.4 Where the actual quantity falls short of the estimated quantity by more than 15%, a *Unit Price* adjusted pursuant to paragraph 6.7.2 shall apply to the actual quantity of the *Unit Price* item. The adjusted *Unit Price* shall not exceed a *Unit Price* that would cause the payment amount to exceed that derived from the original *Unit Price* and estimated quantity.

6.7.5 The party that intends to request for an adjustment to a *Unit Price* shall give timely *Notice in Writing* to the other party and to the *Consultant*.

6.7.6 The *Consultant's* findings, with respect to a claim made by either party, will be given by *Notice in Writing* to both parties within 30 *Working Days* after receipt of the claim by the *Consultant*, or within such other time period as may be agreed by the parties.

6.7.7 If such finding is not acceptable to either party, the claim shall be settled in accordance with Part 8 of the General Conditions - DISPUTE RESOLUTION.

PART 7 DEFAULT NOTICE

GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT

7.1.1 If the *Contractor* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Contractor*'s insolvency, or if a receiver is appointed because of the *Contractor*'s insolvency, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, terminate the *Contractor*'s right to continue with the *Work*, by giving the *Contractor* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.

7.1.2 If the *Contractor* neglects to prosecute the *Work* properly or otherwise fails to comply with the requirements of the *Contract* to a substantial degree and if the *Consultant* has given a written statement to the *Owner* and *Contractor* that sufficient cause exists to justify such action, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, give the *Contractor Notice in Writing* that the *Contractor* is in default of the *Contractor*'s contractual obligations and instruct the *Contractor* to correct the default in the 5 *Working Days* immediately following the receipt of such *Notice in Writing*.

7.1.3 If the default cannot be corrected in the 5 *Working Days* specified or in such other time period as may be subsequently agreed in writing by the parties, the *Contractor* shall be in compliance with the *Owner*'s instructions if the *Contractor*:

.1 commences the correction of the default within the specified time, and
.2 provides the *Owner* with an acceptable schedule for such correction, and
.3 corrects the default in accordance with the *Contract* terms and with such schedule.

7.1.4 If the *Contractor* fails to correct the default in the time specified or in such other time period as may be subsequently agreed in writing by the parties, without prejudice to any other right or remedy the *Owner* may have, the *Owner* may:

.1 correct such default and deduct the cost thereof from any payment then or thereafter due the *Contractor* provided the *Consultant* has certified such cost to the *Owner* and the *Contractor*, or
.2 terminate the *Contractor*'s right to continue with the *Work* in whole or in part or terminate the *Contract*.

7.1.5 If the *Owner* terminates the *Contractor*'s right to continue with the *Work* as provided in paragraphs 7.1.1 and 7.1.4, the *Owner* shall be entitled to:

.1 take possession of the *Work* and *Products* at the *Place of the Work*; subject to the rights of third parties, utilize the *Construction Equipment* at the *Place of the Work*; finish the *Work* by whatever method the *Owner* may consider expedient, but without undue delay or expense, and

.2 withhold further payment to the *Contractor* until a final certificate for payment is issued, and

.3 charge the *Contractor* the amount by which the full cost of finishing the *Work* as certified by the *Consultant*, including compensation to the *Consultant* for the *Consultant*'s additional services and a reasonable allowance as determined by the *Consultant* to cover the cost of corrections to work performed by the *Contractor* that may be required under GC 12.3 - WARRANTY, exceeds the unpaid balance of the *Contract Price*; however, if such cost of finishing the *Work* is less than the unpaid balance of the *Contract Price*, the *Owner* shall pay the *Contractor* the difference, and

.4 on expiry of the warranty period, charge the *Contractor* the amount by which the cost of corrections to the *Contractor*'s work under GC 12.3 - WARRANTY exceeds the allowance provided for such corrections, or if the cost of such corrections is less than the allowance, pay the *Contractor* the difference.

7.1.6 The *Contractor*'s obligation under the *Contract* as to quality, correction and warranty of the work performed by the *Contractor* up to the time of termination shall continue after such termination of the *Contract*.

GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

7.2.1 If the *Owner* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Owner*'s insolvency, or if a receiver is appointed because of the *Owner*'s insolvency, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.

7.2.2 If the *Work* should be suspended or otherwise delayed for a period of 20 *Working Days* or more under an order of a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or of anyone directly or indirectly employed or engaged by the *Contractor*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner Notice in Writing* to that effect.

7.2.3 The *Contractor* may give *Notice in Writing* to the *Owner*, with a copy to the *Consultant*, that the *Owner* is in default of the *Owner*'s contractual obligations if:

.1 the *Owner* fails to furnish, when so requested by the *Contractor*, reasonable evidence that financial arrangements have been made to fulfill the *Owner*'s obligations under the *Contract*, or

.2 the *Consultant* fails to issue a certificate as provided in GC 5.3 - PROGRESS PAYMENT, or

.3 the *Owner* fails to pay the *Contractor* when due the amounts certified by the *Consultant* or awarded by arbitration or court, or

.4 the *Owner* violates the requirements of the *Contract* to a substantial degree and the *Consultant*, except for GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER, confirms by written statement to the *Contractor* that sufficient cause exists.

7.2.4 The *Contractor*'s *Notice in Writing* to the *Owner* provided under paragraph 7.2.3 shall advise that if the default is not corrected within 5 *Working Days* following the receipt of the *Notice in Writing*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, suspend the *Work* or terminate the *Contract*.

7.2.5 If the *Contractor* terminates the *Contract* under the conditions set out above, the *Contractor* shall be entitled to be paid for all work performed including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the termination of the *Contract*.

PART 8 DISPUTE RESOLUTION

GC 8.1 AUTHORITY OF THE CONSULTANT

8.1.1 Differences between the parties to the *Contract* as to the interpretation, application or administration of the *Contract* or any failure to agree where agreement between the parties is called for, herein collectively called disputes, which are not resolved in the first instance by findings of the *Consultant* as provided in GC 2.2 - ROLE OF THE CONSULTANT, shall be settled in accordance with the requirements of Part 8 of the General Conditions - DISPUTE RESOLUTION.

8.1.2 If a dispute arises under the *Contract* in respect of a matter in which the *Consultant* has no authority under the *Contract* to make a finding, the procedures set out in paragraph 8.1.3 and paragraphs 8.2.3 to 8.2.8 of GC 8.2 - NEGOTIATION, MEDIATION AND ARBITRATION, and in GC 8.3 - RETENTION OF RIGHTS apply to that dispute with the necessary changes to detail as may be required.

8.1.3 If a dispute is not resolved promptly, the *Consultant* will give such instructions as in the *Consultant*'s opinion are necessary for the proper performance of the *Work* and to prevent delays pending settlement of the dispute. The parties shall act immediately according to such instructions, it being understood that by so doing neither party will jeopardize any claim the party may have. If it is subsequently determined that such instructions were in error or at variance with the *Contract Documents*, the *Owner* shall pay the *Contractor* costs incurred by the *Contractor* in carrying out such instructions which the *Contractor* was required to do beyond what the *Contract Documents* correctly understood and interpreted would have required, including costs resulting from interruption of the *Work*.

GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION

8.2.1 In accordance with the Rules for Mediation of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing, the parties shall appoint a Project Mediator

.1 within 20 *Working Days* after the *Contract* was awarded, or

.2 if the parties neglected to make an appointment within the 20 *Working Days*, within 10 *Working Days* after either party by *Notice in Writing* requests that the Project Mediator be appointed.

8.2.2 A party shall be conclusively deemed to have accepted a finding of the *Consultant* under GC 2.2 - ROLE OF THE CONSULTANT and to have expressly waived and released the other party from any claims in respect of the particular matter dealt with in that finding unless, within 15 *Working Days* after receipt of that finding, the party sends a *Notice in Writing* of dispute to the other party and to the *Consultant*, which contains the particulars of the matter in dispute and the relevant provisions of the *Contract Documents*. The responding party shall send a *Notice in Writing* of reply to the dispute within 10 *Working Days* after receipt of such *Notice in Writing* setting out particulars of this response and any relevant provisions of the *Contract Documents*.

8.2.3 The parties shall make all reasonable efforts to resolve their dispute by amicable negotiations and agree to provide, without prejudice, frank, candid and timely disclosure of relevant facts, information and documents to facilitate these negotiations.

8.2.4 After a period of 10 *Working Days* following receipt of a responding party's *Notice in Writing* of reply under paragraph 8.2.2, the parties shall request the Project Mediator to assist the parties to reach agreement on any unresolved dispute. The mediated negotiations shall be conducted in accordance with the Rules for Mediation of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing.

8.2.5 If the dispute has not been resolved within 10 *Working Days* after the Project Mediator was requested under paragraph 8.2.4 or within such further period agreed by the parties, the Project Mediator shall terminate the mediated negotiations by giving *Notice in Writing* to the *Owner*, the *Contractor* and the *Consultant*.

8.2.6 By giving a *Notice in Writing* to the other party and the *Consultant*, not later than 10 *Working Days* after the date of termination of the mediated negotiations under paragraph 8.2.5, either party may refer the dispute to be finally resolved by arbitration under the Rules for Arbitration of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing. The arbitration shall be conducted in the jurisdiction of the *Place of the Work*.

8.2.7 On expiration of the 10 *Working Days*, the arbitration agreement under paragraph 8.2.6 is not binding on the parties and, if a *Notice in Writing* is not given under paragraph 8.2.6 within the required time, the parties may refer the unresolved dispute to the courts or to any other form of dispute resolution, including arbitration, which they have agreed to use.

8.2.8 If neither party, by *Notice in Writing*, given within 10 *Working Days* of the date of *Notice in Writing* requesting arbitration in paragraph 8.2.6, requires that a dispute be arbitrated immediately, all disputes referred to arbitration as provided in paragraph 8.2.6 shall be

.1 held in abeyance until

(1) *Substantial Performance of the Work*,

(2) the *Contract* has been terminated, or

(3) the *Contractor* has abandoned the *Work*,

whichever is earlier; and

.2 consolidated into a single arbitration under the rules governing the arbitration under paragraph 8.2.6.

GC 8.3 RETENTION OF RIGHTS

8.3.1 It is agreed that no act by either party shall be construed as a renunciation or waiver of any rights or recourses, provided the party has given the *Notice in Writing* required under Part 8 of the General Conditions - DISPUTE RESOLUTION and has carried out the instructions as provided in paragraph 8.1.3 of GC 8.1 – AUTHORITY OF THE CONSULTANT.

8.3.2 Nothing in Part 8 of the General Conditions - DISPUTE RESOLUTION shall be construed in any way to limit a party from asserting any statutory right to a lien under applicable lien legislation of the jurisdiction of the *Place of the Work* and the assertion of such right by initiating judicial proceedings is not to be construed as a waiver of any right that party may have under paragraph 8.2.6 of GC 8.2 – NEGOTIATION, MEDIATION AND ARBITRATION to proceed by way of arbitration to adjudicate the merits of the claim upon which such a lien is based.

PART 9 PROTECTION OF PERSONS AND PROPERTY

GC 9.1 PROTECTION OF WORK AND PROPERTY

9.1.1 The *Contractor* shall protect the *Work* and the *Owner*'s property and property adjacent to the *Place of the Work* from damage which may arise as the result of the *Contractor*'s operations under the *Contract*, and shall be responsible for such damage, except damage which occurs as the result of:
.1 errors in the *Contract Documents*;
.2 acts or omissions by the *Owner*, the *Consultant*, other contractors, their agents and employees.

9.1.2 Before commencing any work, the *Contractor* shall determine the location of all underground utilities and structures indicated in the *Contract Documents* or that are reasonably apparent in an inspection of the *Place of the Work*.

9.1.3 Should the *Contractor* in the performance of the *Contract* damage the *Work*, the *Owner*'s property, or property adjacent to the *Place of the Work*, the *Contractor* shall be responsible for making good such damage at the *Contractor*'s expense.

9.1.4 Should damage occur to the *Work* or *Owner*'s property for which the *Contractor* is not responsible, as provided in paragraph 9.1.1, the *Contractor* shall make good such damage to the *Work* and, if the *Owner* so directs, to the *Owner*'s property. The *Contract Price* and *Contract Time* shall be adjusted as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

9.2.1 For the purposes of applicable legislation related to toxic and hazardous substances, the *Owner* shall be deemed to have control and management of the *Place of the Work* with respect to existing conditions.

9.2.2 Prior to the *Contractor* commencing the *Work*, the *Owner* shall,
.1 take all reasonable steps to determine whether any toxic or hazardous substances are present at the *Place of the Work*, and
.2 provide the *Consultant* and the *Contractor* with a written list of any such substances that are known to exist and their locations.

9.2.3 The *Owner* shall take all reasonable steps to ensure that no person's exposure to any toxic or hazardous substances exceeds the time weighted levels prescribed by applicable legislation at the *Place of the Work* and that no property is damaged or destroyed as a result of exposure to, or the presence of, toxic or hazardous substances which were at the *Place of the Work* prior to the *Contractor* commencing the *Work*.

9.2.4 Unless the *Contract* expressly provides otherwise, the *Owner* shall be responsible for taking all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to dispose of, store or otherwise render harmless toxic or hazardous substances which were present at the *Place of the Work* prior to the *Contractor* commencing the *Work*.

9.2.5 If the *Contractor*
.1 encounters toxic or hazardous substances at the *Place of the Work*, or
.2 has reasonable grounds to believe that toxic or hazardous substances are present at the *Place of the Work*,
which were not brought to the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible and which were not disclosed by the *Owner* or which were disclosed but have not been dealt with as required under paragraph 9.2.4, the *Contractor* shall
.3 take all reasonable steps, including stopping the *Work*, to ensure that no person's exposure to any toxic or hazardous substances exceeds any applicable time weighted levels prescribed by applicable legislation at the *Place of the Work*, and
.4 immediately report the circumstances to the *Consultant* and the *Owner* in writing.

9.2.6 If the *Owner* and *Contractor* do not agree on the existence, significance of, or whether the toxic or hazardous substances were brought onto the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and the *Contractor*.

9.2.7 If the *Owner* and *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were not brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall promptly at the *Owner's* own expense:

.1 take all steps as required under paragraph 9.2.4;

.2 reimburse the *Contractor* for the costs of all steps taken pursuant to paragraph 9.2.5;

.3 extend the *Contract* time for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in 9.2.6 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay; and

.4 indemnify the *Contractor* as required by GC 12.1 - INDEMNIFICATION.

9.2.8 If the *Owner* and *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Contractor* shall promptly at the *Contractor's* own expense:

.1 take all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to safely remove and dispose the toxic or hazardous substances;

.2 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 reimburse the *Owner* for reasonable costs incurred under paragraph 9.2.6; and

.4 indemnify the Owner as required by GC 12.1 - INDEMNIFICATION.

9.2.9 If either party does not accept the expert's findings under paragraph 9.2.6, the disagreement shall be settled in accordance with Part 8 of the General Conditions - Dispute Resolution. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraph 9.2.7 or 9.2.8 it being understood that by so doing, neither party will jeopardize any claim that party may have to be reimbursed as provided by GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.

GC 9.3 ARTIFACTS AND FOSSILS

9.3.1 Fossils, coins, articles of value or antiquity, structures and other remains or things of scientific or historic interest discovered at the *Place or Work* shall, as between the *Owner* and the *Contractor*, be deemed to be the absolute property of the *Owner*.

9.3.2 The *Contractor* shall take all reasonable precautions to prevent removal or damage to discoveries as identified in paragraph 9.3.1, and shall advise the *Consultant* upon discovery of such items.

9.3.3 The *Consultant* will investigate the impact on the *Work* of the discoveries identified in paragraph 9.3.1. If conditions are found that would cause an increase or decrease in the *Contractor's* cost or time to perform the *Work*, the *Consultant*, with the *Owner's* approval, will issue appropriate instructions for a change in the *Work* as provided in GC 6.2 - CHANGE ORDER or GC 6.3 CHANGE DIRECTIVE.

GC 9.4 CONSTRUCTION SAFETY

9.4.1 Subject to paragraph 3.2.2.2 of GC 3.2 - CONSTRUCTION BY OWNER OR OTHER CONTRACTORS, the *Contractor* shall be solely responsible for construction safety at the *Place of the Work* and for compliance with the rules, regulations and practices required by the applicable construction health and safety legislation and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the *Work*.

GC 9.5 MOULD

9.5.1 If the *Contractor* or *Owner* observes or reasonably suspects the presence of mould at the *Place of the Work*, the remediation of which is not expressly part of the *Work*,

.1 the observing party shall promptly report the circumstances to the other party in writing, and

.2 the *Contractor* shall promptly take all reasonable steps, including stopping the *Work* if necessary, to ensure that no person suffers injury, sickness or death and that no property is damaged as a result of exposure to or the presence of the mould, and

.3 if the *Owner* and *Contractor* do not agree on the existence, significance or cause of the mould or as to what steps need be taken to deal with it, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and *Contractor*.

9.5.2 If the *Owner* and *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was caused by the *Contractor*'s operations under the *Contract*, the *Contractor* shall promptly, at the *Contractor*'s own expense:

.1 take all reasonable and necessary steps to safely remediate or dispose of the mould, and

.2 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

.3 reimburse the *Owner* for reasonable costs incurred under paragraph 9.5.1.3, and

.4 indemnify the *Owner* as required by paragraph 12.1 of GC 21.1 - INDEMNIFICATION.

9.5.3 If the *Owner* and *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was not caused by the *Contractor*'s operations under the *Contract*, the *Owner* shall promptly, at the *Owner*'s own expense:

.1 take all reasonable and necessary steps to safely remediate or dispose of the mould, and

.2 reimburse the *Contractor* for the cost of taking the steps under paragraph 9.5.1.2 and making good any damage to the *Work* as provided in paragraph 9.1.4 of GC 9.1 - PROTECTION OF WORK AND PROPERTY, and

.3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in paragraph 9.5.1.3 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay, and

.4 indemnify the *Contractor* as required by paragraph 12.1.

9.5.4 If either party does not accept the expert's finding under paragraph 9.5.1.3, the disagreement shall be settled in accordance with Part 8 of the General Conditions - DISPUTE RESOLUTION. If such desagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraphs 9.5.2 or 9.5.3, it being understood that by so doing neither party will jeopardize any claim the party may have.

PART 10 GOVERNING REGULATIONS

GC 10.1 TAXES AND DUTIES

10.1.1 The *Contract Price* shall include all taxes and customs duties in effect at the time of the bid closing except for *Value Added Taxes* payable by the *Owner* to the *Contractor* as stipulated in Article A-4 of the Agreement - CONTRACT PRICE.

10.1.2 Any increase or decrease in costs to the *Contractor* due to changes in such included taxes and duties after the time of the bid closing shall increase or decrease the *Contract Price* accordingly.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

10.2.1 The laws of the *Place of the Work* shall govern the *Work*.

10.2.2 The *Owner* shall obtain and pay for development approvals, building permit, permanent easements, rights of servitude, and all other necessary approvals and permits, except for the permits and fees referred to in paragraph 10.2.3 or for which the *Contract Documents* specify as the responsibility of the *Contractor*.

10.2.3 The *Contractor* shall be responsible for the procurement of permits, licences, inspections, and certificates, which are necessary for the performance of the *Work* and customarily obtained by contractors in the jurisdiction of the *Place of the Work* after the issuance of the building permit. The *Contract Price* includes the cost of these permits, licences, inspections, and certificates, and their procurement.

10.2.4 The *Contractor* shall give the required notices and comply with the laws, ordinances, rules, regulations, or codes which are or become in force during the performance of the *Work* and which relate to the *Work*, to the preservation of the public health, and to construction safety.

10.2.5 The *Contractor* shall not be responsible for verifying that the *Contract Documents* are in compliance with the applicable laws, ordinances, rules, regulations, or codes relating to the *Work*. If the *Contract Documents* are at variance therewith, or if, subsequent to the time of bid closing, changes are made to the applicable laws, ordinances, rules, regulations, or codes which require modification to the *Contract Documents*, the *Contractor* shall advise the *Consultant* in writing requesting direction immediately upon such variance or change becoming known. The *Consultant* will make the changes required to the *Contract Documents* as provided in GC 6.1 - OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.

10.2.6 If the *Contractor* fails to advise the *Consultant* in writing; and fails to obtain direction as required in paragraph 10.2.5; and performs work knowing it to be contrary to any laws, ordinances, rules, regulations, or codes; the *Contractor* shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations, or codes.

10.2.7 If, subsequent to the time of bid closing, changes are made to applicable laws, ordinances, rules, regulations, or codes of authorities having jurisdiction which affect the cost of the *Work*, either party may submit a claim in accordance with the requirements of GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.

GC 10.3 PATENT FEES

10.3.1 The *Contractor* shall pay the royalties and patent licence fees required for the performance of the *Contract*. The *Contractor* shall hold the *Owner* harmless from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor*'s performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention by the *Contractor* or anyone for whose acts the *Contractor* may be liable.

10.3.2 The *Owner* shall hold the *Contractor* harmless against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor*'s performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention in executing anything for the purpose of the *Contract*, the model, plan or design of which was supplied to the *Contractor* as part of the *Contract Documents*.

GC 10.4 WORKERS' COMPENSATION

10.4.1 Prior to commencing the *Work*, *Substantial Performance of the Work* and the issuance of the final certificate for payment, the *Contractor* shall provide evidence of compliance with workers' compensation legislation at the *Place of the Work*, including payments due thereunder.

10.4.2 At any time during the term of the *Contract*, when requested by the *Owner*, the *Contractor* shall provide such evidence of compliance by the *Contractor* and *Subcontractors*.

PART 11 INSURANCE AND CONTRACT SECURITY

GC 11.1 INSURANCE

11.1.1 Without restricting the generality of GC 12.1 - INDEMNIFICATION, the *Contractor* shall provide, maintain and pay for the following insurance coverages, the minimum requirements of which are specified in CCDC 41 – CCDC Insurance Requirements in effect at the time of bid closing except as hereinafter provided:

.1 General liability insurance in the name of the *Contractor* and include, or in the case of a single, blanket policy, be endorsed to name, the *Owner* and the *Consultant* as insureds but only with respect to liability, other than legal liability arising out of their sole negligence, arising out of the operations of the *Contractor* with regard to the *Work*. General liability insurance shall be maintained from the date of commencement of the *Work* until one year from the date of *Substantial Performance of the Work*. Liability coverage shall be provided for completed operations hazards from the date of *Substantial Performance of the Work*, as set out in the certificate of *Substantial Performance of the Work*, on an ongoing basis for a period of 6 years following *Substantial Performance of the Work*.

.2 Automobile Liability Insurance from the date of commencement of the *Work* until one year after the date of *Substantial Performance of the Work*.

.3 Aircraft or Watercraft Liability Insurance when owned or non-owned aircraft or watercraft are used directly or indirectly in the performance of the *Work*

.4 "Broad form" property insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as Insureds all *Subcontractors*. The "Broad form" property insurance shall be provided from the date of commencement of the *Work* until the earliest of:

(1) 10 calendar days after the date of *Substantial Performance of the Work*;

(2) on the commencement of use or occupancy of any part or section of *Work* unless such use or occupancy is for construction purposes, habitational, office, banking, convenience store under 465 square metres in area, or parking purposes, or for the installation, testing and commissioning of equipment forming part of the *Work*;

(3) when left unattended for more than 30 consecutive calendar days or when construction activity has ceased for more than 30 consecutive calendar days.

.5 Boiler and machinery insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as Insureds all *Subcontractors*. The coverage shall be maintained continuously from commencement of use or operation of the boiler and machinery objects insured by the policy and until 10 calendar days after the date of *Substantial Performance of the Work*.

.6 The "Broad form" property and boiler and machinery policies shall provide that, in the case of a loss or damage, payment shall be made to the *Owner* and the *Contractor* as their respective interests may appear. In the event of loss or damage:

(1) the *Contractor* shall act on behalf of the *Owner* for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the *Contractor* shall proceed to restore the *Work*. Loss or damage shall not affect the rights and obligations of either party under the *Contract* except that the *Contractor* shall be entitled to such reasonable extension of *Contract Time* relative to the extent of the loss or damage as the *Consultant* may recommend in consultation with the *Contractor*;

(2) the *Contractor* shall be entitled to receive from the *Owner*, in addition to the amount due under the *Contract*, the amount which the *Owner*'s interest in restoration of the *Work* has been appraised, such amount to be paid as the restoration of the *Work* proceeds in accordance with the progress payment provisions. In addition the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor*'s interest in the restoration of the *Work*; and

(3) to the *Work* arising from the work of the *Owner*, the *Owner*'s own forces, or another contractor, in accordance with the *Owner*'s obligations under the provisions relating to construction by *Owner* or other contractors, shall pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as in accordance with the progress payment provisions.

.7 Contractors' Equipment Insurance from the date of commencement of the *Work* until one year after the date of *Substantial Performance of the Work*.

11.1.2 Prior to commencement of the *Work* and upon the placement, renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any amending endorsements applicable to the *Work*.

11.1.3 The parties shall pay their share of the deductible amounts in direct proportion to their responsibility in regards to any loss for which the above policies are required to pay, except where such amounts may be excluded by the terms of the *Contract*.

11.1.4 If the *Contractor* fails to provide or maintain insurance as required by the *Contract* Documents, then the *Owner* shall have the right to provide and maintain such insurance and give evidence to the *Contractor* and the *Consultant*. The *Contractor* shall pay the cost thereof to the *Owner* on demand or the *Owner* may deduct the cost from the amount which is due or may become due to the *Contractor*.

11.1.5 All required insurance policies shall be with insurers licensed to underwrite insurance in the jurisdiction of the *Place of the Work*.

11.1.6 If a revised version of CCDC 41 – INSURANCE REQUIREMENTS is published, which specifies reduced insurance requirements, the parties shall address such reduction, prior to the *Contractor*'s insurance policy becoming due for renewal, and record any agreement in a *Change Order*.

11.1.7 If a revised version of CCDC 41 – INSURANCE REQUIREMENTS is published, which specifies increased insurance requirements, the *Owner* may request the increased coverage from the Contractor by way of a *Change Order*.

11.1.8 A *Change Directive* shall not be used to direct a change in the insurance requirements in response to the revision of CCDC 41 – INSURANCE REQUIREMENTS.

GC 11.2 CONTRACT SECURITY

11.2.1 The *Contractor* shall, prior to commencement of the *Work* or within the specified time, provide to the *Owner* any *Contract* security specified in the *Contract Documents.*

11.2.2 If the *Contract Documents* require surety bonds to be provided, such bonds shall be issued by a duly licensed surety company authorized to transact the business of suretyship in the province or territory of the *Place of the Work* and shall be maintained in good standing until the fulfillment of the *Contract*. The form of such bonds shall be in accordance with the latest edition of the CCDC approved bond forms.

PART 12 INDEMNIFICATION, WAIVER OF CLAIMS AND WARRANTY

GC 12.1 INDEMNIFICATION

12.1.1 Without restricting the *Owner*'s obligation to indemnify as described in paragraphs 12.1.4 and 12.1.5, the *Owner* and the *Contractor* shall each indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by them or in respect to claims by third parties that arise out of, or are attributable in any respect to their involvement as parties to this *Contract*, provided such claims are:

.1 caused by:

(1) the negligent acts or omissions of the party from whom indemnification is sought or anyone for whose acts or omissions that party is liable, or

(2) a failure of the party to the *Contract* from whom indemnification is sought to fulfill its terms or conditions; and

.2 made by *Notice in Writing* within a period of 6 years from the date of *Substantial Performance of the Work* as set out in the certificate of *Substantial Performance of the Work* issued pursuant to paragraph 5.4.2.2 of GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK or within such shorter period as may be prescribed by any limitation statute of the province or territory of the *Place of the Work*.

The parties expressly waive the right to indemnity for claims other than those provided for in this *Contract*.

12.1.2 The obligation of either party to indemnify as set forth in paragraph 12.1.1 shall be limited as follows:

.1 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is to be provided by either party pursuant to GC 11.1 – INSURANCE, the general liability insurance limit for one occurrence as referred to in CCDC 41 in effect at the time of bid closing.

.2 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is not required to be provided by either party in accordance with GC 11.1 – INSURANCE, the greater of the *Contract Price* as recorded in Article A-4 – CONTRACT PRICE or $2,000,000, but in no event shall the sum be greater than $20,000,000.

.3 In respect to claims by third parties for direct loss resulting from bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, the obligation to indemnify is without limit. In respect to all other claims for indemnity as a result of claims advanced by third parties, the limits of indemnity set forth in paragraphs 12.1.2.1 and 12.1.2.2 shall apply.

12.1.3 The obligation of either party to indemnify the other as set forth in paragraphs 12.1.1 and 12.1.2 shall be inclusive of interest and all legal costs.

12.1.4 The *Owner* and the *Contractor* shall indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of their obligations described in GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.

12.1.5 The *Owner* shall indemnify and hold harmless the *Contractor* from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings:

.1 as described in paragraph 10.3.2 of GC 10.3 – PATENT FEES, and

.2 arising out of the *Contractor*'s performance of the *Contract* which are attributable to a lack of or defect in title or an alleged lack of or defect in title to the *Place of the Work*.

12.1.6 In respect to any claim for indemnity or to be held harmless by the *Owner* or the *Contractor*:

.1 *Notice in Writing* of such claim shall be given within a reasonable time after the facts upon which such claim is based became known;

.2 should any party be required as a result of its obligation to indemnify another to pay or satisfy a final order, judgment or award made against the party entitled by this contract to be indemnified, then the indemnifying party upon assuming all liability for any costs that might result shall have the right to appeal in the name of the party against whom such final order or judgment has been made until such rights of appeal have been exhausted.

GC 12.2 WAIVER OF CLAIMS

12.2.1 Subject to any lien legislation applicable to the *Place of the Work*, as of the fifth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the *Contractor* waives and releases the *Owner* from all claims which the *Contractor* has or reasonably ought to have knowledge of that could be advanced by the *Contractor* against the *Owner* arising from the *Contractor*'s involvement in the *Work*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the date of *Substantial Performance of the Work*, except as follows:

.1 claims arising prior to or on the date of *Substantial Performance of the Work* for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* no later than the sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*;

.2 indemnification for claims advanced against the *Contractor* by third parties for which a right of indemnification may be asserted by the *Contractor* against the *Owner* pursuant to the provisions of this *Contract*;

.3 claims for which a right of indemnity could be asserted by the *Contractor* pursuant to the provisions of paragraphs 12.1.4 or 12.1.5 of GC 12.1 – INDEMNIFICATION; and

.4 claims resulting from acts or omissions which occur after the date of *Substantial Performance of the Work*.

12.2.2 The *Contractor* waives and releases the *Owner* from all claims referenced in paragraph 12.2.1.4 except for those referred in paragraphs 12.2.1.2 and 12.2.1.3 of GC 12.1 – INDEMNIFICATION and claims for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* within 395 calendar days following the date of *Substantial Performance of the Work*.

12.2.3 Subject to any lien legislation applicable to the *Place of the Work*, as of the fifth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the *Owner* waives and releases the *Contractor* from all claims which the *Owner* has or reasonably ought to have knowledge of that could be advanced by the *Owner* against the *Contractor* arising from the *Owner*'s involvement in the *Work*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the date of *Substantial Performance of the Work*, except as follows:

.1 claims arising prior to or on the date of *Substantial Performance of the Work* for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* no later than the sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*;

.2 indemnification for claims advanced against the *Owner* by third parties for which a right of indemnification may be asserted by the *Owner* against the *Contractor* pursuant to the provisions of this *Contract*;

.3 claims for which a right of indemnity could be asserted by the *Owner* against the *Contractor* pursuant to the provisions of paragraph 12.1.4 of GC 12.1 - INDEMNIFICATION;

.4 damages arising from the *Contractor*'s actions which result in substantial defects or deficiencies in the *Work*. "Substantial defects or deficiencies" mean those defects or deficiencies in the *Work* which affect the *Work* to such an extent or in such a manner that a significant part or the whole of the *Work* is unfit for the purpose intended by the *Contract Documents*;

.5 claims arising pursuant to GC 12.3 - WARRANTY; and

.6 claims arising from acts or omissions which occur after the date of *Substantial Performance of the Work*.

12.2.4 The *Owner* waives and releases the *Contractor* from all claims referred to in paragraph 12.2.3.4 except claims for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* within a period of six years from the date of *Substantial Performance of the Work* should any limitation statute of the Province or Territory of the *Place of the Work* permit such agreement. If the applicable limitation statute does not permit such agreement, within such shorter period as may be prescribed by:

.1 any limitation statute of the Province or Territory of the *Place of the Work*; or

.2 if the *Place of the Work* is the Province of Quebec, then Article 2118 of the Civil Code of Quebec.

12.2.5 The *Owner* waives and releases the *Contractor* from all claims referenced in paragraph 12.2.3.6 except for those referred in paragraph 12.2.3.2, 12.2.3.3 and those arising under GC 12.3 – WARRANTY and claims for which *Notice in Writing* has been received by the *Contractor* from the *Owner* within 395 calendar days following the date of *Substantial Performance of the Work*.

12.2.6 "*Notice in Writing* of claim" as provided for in GC 12.2 – WAIVER OF CLAIMS to preserve a claim or right of action which would otherwise, by the provisions of GC 12.2 – WAIVER OF CLAIMS, be deemed to be waived, must include the following:

.1 a clear and unequivocal statement of the intention to claim;

.2 a statement as to the nature of the claim and the grounds upon which the claim is based; and

.3 a statement of the estimated quantum of the claim.

12.2.7 The party giving "*Notice in Writing* of claim" as provided for in GC 12.2 – WAIVER OF CLAIMS shall submit within a reasonable time a detailed account of the amount claimed.

12.2.8 Where the event or series of events giving rise to a claim made under paragraphs 12.2.1 or 12.2.3 has a continuing effect, the detailed account submitted under paragraph 12.2.7 shall be considered to be an interim account and the party making the claim shall submit further interim accounts, at reasonable intervals, giving the accumulated amount of the claim and any further grounds upon which it is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.

12.2.9 If a *Notice in Writing* of claim pursuant to paragraph 12.2.1.1 is received on the seventh or sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the period within which *Notice in Writing* of claim shall be received pursuant to paragraph 12.2.3.1 shall be extended to two calendar days before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*. If a *Notice in Writing* of claim pursuant to paragraph 12.2.3.1 is received on the seventh or sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the period within which *Notice in Writing* of claim shall be received pursuant to paragraph12.2.1.1 shall be extended to two calendar days before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*.

GC 12.3 WARRANTY

12.3.1 Except for extended warranties as described in paragraph 12.3.6, the warranty period under the *Contract* is one year from the date of *Substantial Performance of the Work*.

12.3.2 The *Contractor* shall be responsible for the proper performance of the *Work* to the extent that the design and *Contract Documents* permit such performance.

12.3.3 The *Owner*, through the *Consultant*, shall promptly give the *Contractor Notice in Writing* of observed defects and deficiencies which occur during the one year warranty period.

12.3.4 Subject to paragraph 12.3.2, the *Contractor* shall correct promptly, at the *Contractor*'s expense, defects or deficiencies in the *Work* which appear prior to and during the one year warranty period.

12.3.5 The *Contractor* shall correct or pay for damage resulting from corrections made under the requirements of paragraph 12.3.4.

12.3.6 Any extended warranties required beyond the one year warranty period as described in paragraph 12.3.1, shall be as specified in the *Contract Documents*. Extended warranties shall be issued by the warrantor to the benefit of the *Owner*. The *Contractor*'s responsibility with respect to extended warranties shall be limited to obtaining any such extended warranties from the warrantor. The obligations under such extended warranties are solely the responsibilities of the warrantor.

The following are the Supplementary General Conditions referred to in Part 17 of the Instructions to Tenderers.

These amendments shall be read in conjunction with the Agreement, Definitions and General Conditions of the Unit Price Contract (CCDC4-2011) of the Contract Documents. Where reference is made in the Contract Documents to the General Conditions of Contract (GC), such reference includes these amendments.

AGREEMENT BETWEEN OWNER AND CONTRACTOR

Article A-2 Agreements and Amendments

SGC 1 Add paragraph 2.3:

Counterpart. The Agreement may be executed in any number of counterparts, each of which will be deemed to be an original and all of which taken together will be deemed to constitute one and the same instrument. Delivery by electronic transmission in portable document format (PDF) of an executed counterpart of this Agreement is as effective as delivery of an originally executed counterpart of this Agreement.

DEFINITIONS

SGC 2 Delete the definition for Value Added Taxes, and replace it with the following:

Value Added Taxes
Value Added Taxes means the Good & Services Taxes under the Excise Tax Act (Canada).

Add the definitions:

Milestone Dates
Milestone Dates means any date specified in the Contract Documents for completion of the Work, or portion of the Work, including the date for Substantial Performance of the Work.

Abnormally Adverse Weather
Abnormally Adverse Weather means temperature, precipitation, wind or other weather condition which, in a two-week period, differs from the statistical average for that condition in that period by more than one standard deviation, calculated based on relevant data available from Environment Canada.

Construction Schedule
Construction Schedule means a schedule of the Work prepared by the Contractor setting out the start and completion dates of the major elements of the Work including, but not limited to, mobilization, shop drawings, construction, installation, testing, commissioning, Substantial Performance of the Work, Owner occupancy and any other Milestone Dates, and may be amended from time to time in accordance with the Contract Documents.

GENERAL CONDITIONS OF CONTRACT

GC 1.1 CONTRACT DOCUMENTS

SGC 3 Replace GC1.1.7.1 with the following:

.1 the order of priority of documents, from highest to lowest, shall be:

- Duly executed Agreement
- Supplementary General Conditions
- Duly executed Tender Form
- The most recent Addendum followed by other Addenda, the more recent taking precedence over earlier Addenda.
- The Specifications, Drawings, Appendices and General Conditions
- The Tender Documents
- Other relevant documents such as but not limited to executed bonds, insurance certificate and any reports, standards or the like included by reference.

GC 1.5 FORCE MAJEURE

SGC 4 Add new paragraph 1.5 as follows:

GC 1.5 A party is not liable for failure to perform the party's obligations if such failure is as a result of Acts of God (including fire, flood, earthquake, storm, hurricane or other natural disaster), war, invasion, act of foreign enemies, hostilities (regardless of whether war is declared), civil war, rebellion, revolution, insurrection, military or usurped power or confiscation, terrorist activities, nationalization, government sanction, blockage, embargo, labour dispute, strike, lockout, pandemic, epidemic or interruption or failure of electricity.

In the event force majeure occurs, the party who is delayed or fails to perform shall give prompt notice to the other party and shall take all reasonable steps to eliminate the cause. Should the force majeure event last for longer than 30 calendar days, the Regional District, at its sole discretion, may terminate this Agreement by written notice to the Vendor without further liability, expense, or cost of any kind.

GC 2.1 AUTHORITY OF THE CONSULTANT

SGC 5 In paragraph 2.1.3 delete the phrase “against whom the Contractor makes no reasonable objection”.

GC 2.2 ROLE OF THE CONSULTANT

SGC 6 Add new paragraph 2.2.19 as follows**:**

2.2.19 All decisions, determinations, findings, interpretations instructions, consents and approvals of the Consultant must be in writing. Neither the Owner nor the Consultant will be bound by any oral decisions, determinations, findings, interpretations, instructions, consents, or approvals of the Consultant.

GC 2.3 REVIEW AND INSPECTION OF THE WORK

SGC 7 Add new paragraph 2.3.8 as follows:

2.3.8. If the Contractor is not prepared for a review or inspection after the Contractor has notified the Consultant of readiness for a proposed review or inspection, and as a result the Consultant is required to make second or subsequent visits, the contractor shall reimburse the Owner for any additional charges rendered by the Consultant to the Owner for the second visit or subsequent visits, and the Owner may deduct the amount of any such charges from any monies otherwise owing to the Contractor on account of the Contract Amount.

GC 3.1 CONTROL OF THE WORK

SGC 8 Add the following paragraph to 3.1.1 after "Contract Documents":

"including the Construction Schedule."

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

SGC 9 Delete GC 3.2.2.2 and replace with following:

3.2.2.2. Use reasonable efforts to ensure that the Owner's other contractors or own forces are made aware of, and comply with, the safety precautions and programs of the Contractor provided pursuant to GC 9.4 – CONSTRUCTION SAFETY.

GC 3.5 CONSTRUCTION SCHEDULE

SGC 10 In paragraph 3.5.1 sub-paragraph .1, delete ". . . prior to the first application for payment. . ." and replace with the following:

"within ten (10) working days after Notice of Intent to Award";

SGC 11 Add paragraph:

3.5.1.4 If the Contractor submits a Construction Schedule or a revision to the Construction Schedule indicating that any Milestone Dates will not be met then receipt of such schedule by the Consultant will not relieve the Contractor of the obligation to meet the Milestone Dates as set out in the Contract Documents.

SGC 12 Add paragraph:

3.5.1.5 The Contractor shall immediately notify the Consultant in writing of any occurrence which, in the opinion of the Contractor has caused or which the Contractor anticipates may cause a delay to, or which will affect, the performance of the Work in accordance with the Construction Schedule. Such notice shall include complete details of the reason for the delay, the anticipated length of the delay and a revision to the Construction Schedule in accordance with the anticipated delay.

SGC 13 Add the following paragraphs 3.5.2, 3.5.3, 3.5.4, 3.5.5, 3.5.6, 3.5.7, and 3.5.8:

3.5.2 The Contractor shall perform the Work in compliance with the Milestone Dates and the Construction Schedule. Any such failure to comply shall be deemed to be a default to which the provisions of GC 7.1.2 to GC 7.1.6 (inclusive) apply.

3.5.3 If the Consultant determines that, because of the Contractor's own acts or omissions, the progress of the Work is behind the Construction Schedule, or the Contractor will not meet any particular Milestone Date then the Contractor shall, upon written notice from the Consultant

and at the Contractor's own cost, take all reasonable measures to accelerate the Work so as to conform to the Construction Schedule or meet the Milestone Date.

3.5.4 If the Consultant determines that, because of reasons other than the Contractor's own acts or omissions, the progress of the Work is behind the Construction Schedule, or will not meet any particular Milestone Date, or if the Owner desires to accelerate the Work to achieve early completion of the Work, then on written notice from the Consultant the Contractor shall accelerate the Work as directed by the Consultant at the Owner's cost, such acceleration to be a change to the Work to which the provisions of Part 6 shall apply.

3.5.5 If the Consultant has not directed the Contractor to accelerate the Work at the Owner's cost, the Contractor shall not be entitled to claim any payment on account of acceleration costs unless the Contractor has given prior written notice within 5 working days to the Consultant setting out that the Contractor intends to claim such costs and the reasons for such claim, provided however that the giving of such notice shall not entitle the Contractor to payment of such costs

3.5.6 If the Contractor accelerates the performance of the Work because of a notice given pursuant to GC 3.5.3, or for the Contractor's own benefit, then the Owner may claim all reasonable additional costs incurred as a result of such acceleration.

3.5.7 If, for any reason, the Contractor deems it necessary to accelerate the Work then the Contractor shall provide written notice of its intention to accelerate the Work 5 Working Days prior to doing so and shall accelerate the Work at its own expense.

3.5.8 The Tenderer, should he fail to complete the work in the time specified above, shall compensate the Owner for the actual cost to the Owner of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the contract past the completion date.

GC 3.6 SUPERVISION

SGC14 Delete paragraphs 3.6.1 and 3.6.2 and replace with the following:

3.6.1 The Contractor shall employ a competent senior representative at the Place of the Work (the "Supervisor") who shall have the responsibility to ensure that the Work is performed in compliance with the Contract Documents.

3.6.2 The Supervisor shall represent the Contractor at the Place of the Work and instructions given to the Supervisor by the Consultant shall be deemed to have been given to the Contractor.

3.6.3 The Contractor shall not change the Supervisor without consent of the Consultant, such consent not to be unreasonably withheld.

GC 3.7 SUBCONTRACTORS AND SUPPLIERS

SGC 15 Delete paragraphs 3.7.3 and 3.7.4

SGC 16 Add the following paragraph:

3.7.7 The Contractor shall, in respect of his Subcontractors, be held responsible for and shall ensure that said Subcontractors obtain and pay for all necessary permits, fees, licenses and certificates of inspection and insurance in connection with the Work as may be required by applicable statutes, regulations, by-laws and ordinances.

GC 3.10 SHOP DRAWINGS

SGC 17 Add the following new subsection

3.10.13 The Contractor shall submit all Shop Drawings, record drawing drawings and any other drawings concerning the Work in triplicate and in reproducible, suitable, and usable electronic form.

GC 3.11 USE OF THE WORK

SGC 18 Add the following paragraphs 3.11.3 and 3.11.4 as follows:

3.11.3 The Owner will obtain any Road Usage Permits required for Work within Ministry of Transportation and Infrastructure Roadways.

3.11.4 The Contractor will submit a traffic management plan in accordance with Ministry of Transportation and Infrastructure requirements for Traffic Management for Work on Roadways:

https://www2.gov.bc.ca/gov/content/transportation/transportation-infrastructure/engineering-standards-guidelines/traffic-engineering-safety/trafficmanagementmanual

for approval by Ministry of Transportation and Infrastructure showing how the Contractor will provide for safe and efficient access and exit of construction vehicles from Place of Work and the Contractor will ensure all work is conducted in accordance with the plan.

GC 3.13 CLEANUP

SGC 19. Add the following paragraphs 3.13.4 as follows:

3.13.4 The Contractor is responsible for dust control within the Place of the Work and roadways beyond the limits of the Place of the Work that have been affected during construction. While performing the Work the Contractor shall control dust originating from the Work and shall take immediate corrective action if directed by the Consultant. The Contractor will clean the Place of the Work and employ a street sweeper to clean affected roadways as directed by the Consultant. Dusty or loose materials shall be transported in covered haulage vehicles. Wet materials shall be transported in suitable watertight haulage vehicles.

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

SGC 20 Delete GC 5.1 - “Financing Information Required of the Owner” in its entirety.

GC 5.2 APPLICATION FOR PROGRESS PAYMENT

SGC 21 Delete entirely paragraph 5.2.4

SGC 22 Add the following paragraphs 5.2.8 and 5.2.9 as follows:

5.2.8 As a condition to all payments, the Contractor shall submit to the Consultant a Statutory Declaration on the standard Canadian Construction Association (CCA) 9A 2001 declared before a notary public or commissioner for oaths for the Province of British Columbia stating that:

.1 all wages for the various classes of labour, and all accounts for purchase of materials, equipment, or for the rental of equipment employed in or about the Work, and amounts due to Subcontractors have been paid;

.2 there are no outstanding claims or liens relating to labour or services provided in connection with the Work; and

.3 all levies, assessments and sums due under any applicable Workers' Compensation laws or similar laws in force at the place of the Work have been fully paid.

As a further condition of payment, there shall be no liens registered against the Place of the Work, arising from or connected with the Work. In the event that a claim of builders lien relating to the Work has been registered against title to the Place of the Work, the Contractor shall be obligated, at its expense, to take all steps necessary, including making court application, to have the claim of lien immediately discharged from title to the Place of the Work and to indemnify the Owner for all costs, including court costs on a solicitor and own client basis, incurred as a result.

5.2.9 As a condition to all payments after the first progress payment, the Contractor shall also submit to the Consultant a Statutory Declaration for "Statement of Claims" on a form approved by the Owner, also declared before a notary public or a Commissioner for Taking Oaths for the Province of British Columbia stating:

.1 there are no outstanding claims for payment for Work, or changes to the Construction Schedule in respect of Work, performed beyond the scope of the Contract, or

.2 there are outstanding claims for payment for Work, or changes to the Construction Schedule in respect of Work, performed beyond the scope of the Contract which have been communicated to the Consultant in writing, but for which a Change Order or Change Directive has not yet been received; or

.3 there are outstanding claims for payment for Work, or changes to the Construction Schedule in respect of Work, performed beyond the scope of the Contract, including adjustments to the Construction Schedule, for which Change Orders or Change Directives have not been issued and which have not yet been communicated to the Consultant in writing.

GC 5.3 PROGRESS PAYMENT

SGC 23 In paragraph 5.3.1 sub-paragraph .3, delete ". . . 20 calendar days. . ." and replace with ". .. 30 calendar days. . ."; and

Add the following new subsection

5.3.3 The payment by the Owner of any monthly or other payment shall not bind the Owner with respect to any subsequent payment or the final progress payment, but shall be taken as approximate only, and shall not mean, or be construed to mean, that the Owner has accepted Work that is not in accordance with the requirements of the Contract, or that the Contractor is in any manner released from its obligation to comply with the Contract.

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

SGC 24 Add new paragraphs 5.4.4; 5.4.5 and 5.4.6 as follows:

5.4.4 Prior to or at the time of applying for a review under paragraph 5.4.1 to establish Substantial Performance of Work, the Contractor shall submit to the Consultant the following items:

.1 Letters of Assurance for professional design and review from those professionals engaged by the Contractor under the provisions of the Contract, including all applicable sealed shop drawings.

.2 All required manufacturer's inspections, certifications, guarantees, warranties as specified in the Contract Documents.

.3 All maintenance manuals, operating instructions, maintenance and operating tools, replacement parts or materials as specified in the Contract Documents.

.4 Certificates issued by all permit issuing authorities indicating approval of all installations requiring permits.

.5 Certificates issued by all testing, commissioning, cleaning, inspection authorities and associations as specified in the Contract Documents.

.6 All Drawings and as-installed documents in the form specified in the Contract Documents.

.7 A certificate issued by Workers Compensation Board confirming that the Contractor has paid all assessments.

5.4.5 Prior to Substantial Performance of the Work and in addition to the lien holdback, a deficiency holdback shall be established for Work determined by the Consultant to be defective or incomplete (the "Deficiency Holdback"). The Consultant shall establish the amount of the Deficiency Holdback as twice the estimated cost to rectify defective work and finish incomplete Work using the services of another contractor or the Owner's own forces. No part of the Deficiency Holdback shall become payable until all of the defective Work is corrected and all of the Work is complete. If the defective or incomplete Work is not corrected or completed within a reasonable time as determined by the Consultant, then all or a portion of the Deficiency Holdback as determined by the Consultant may be retained by the Owner to be applied against the loss and damage suffered by the Owner to correct or complete the Work.

5.4.6 The Contractor's application for the Certificate of Substantial Performance shall constitute a waiver and release by the Contractor of any and all claims arising out of or relating to the Contract up to the date of Substantial Performance of the Work. This waiver and release shall apply without limitation to claims that arise due to the negligence or breach of contract by the Owner, the Consultant, and their respective employees, agents, officers and consultants, but does not include claims made by the Contractor in writing prior to application for a certificate of Substantial Performance of the Work and delivered to the Consultant prior to the date of Substantial Performance of the Work and still unsettled.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

SGC 25 Delete entirely paragraph 5.5.3

GC 5.7 FINAL PAYMENT

SGC 26 In paragraph 5.7.4, revise "5 calendar days" to read "15 working days"

GC 5.9 NON-CONFORMING WORK

SGC 27 In paragraph 5.9.1 replace "No payment by the Owner" with the words "No payment by the Owner or certification by the Consultant"

GC 6.1 CHANGES IN THE WORK

SGC 28 Add the following paragraphs 6.1.3 and 6.1.4 as follows:

6.1.3 The Contractor shall not be entitled to rely on any oral representation (except in an emergency in which GC 6.1.4 will apply), site meeting discussion, site meeting minutes or other communication as approval that any Work is a Change. The Contractor must receive a Change

Order or Change Directive before proceeding with a Change and the Contractor shall strictly comply with the requirements of this GC

6.1.4 In an emergency, when it is impractical to delay a Change Directive, the Consultant may issue an oral direction which the Contractor shall follow. In such event the Consultant shall issue a written Change Directive at the first opportunity.

GC 6.2 CHANGE ORDER

SGC. 29 Change the first part of paragraph 6.2.3 to read "When the Owner and the Contractor agree in writing…"

Add:

6.2.4. When the valuation of a change in the Work is to be determined either by estimate and acceptance in a lump sum, or by cost and fixed or percentage fee, the valuation shall be in accordance with the following:

.1 Work performed by the Contractor – Contractors direct field costs plus 10% mark-up for overhead and profit.

.2 Work performed by the Sub-Contractor – Sub-contractors will receive direct field costs plus 10% mark-up for overhead and profit. The General Contractor will receive an additional 5% markup on the actual cost evidenced by invoice to cover all overhead and profit.

GC 6.3 CHANGE DIRECTIVE

SGC 30 Delete and replace GC 6.3.6.3 with:

"The Contractor's fee will cover all overhead and profit and will be calculated as follows:

.1 Work performed by the Contractor – Contractor's direct field costs plus 10% mark-up for overhead and profit.

.2 Work performed by the Sub-Contractor – Sub-contractors will receive direct field costs plus 10% mark-up for overhead and profit. The Contractor will receive a 5% markup on the Sub-contractor's actual cost evidenced by invoice to cover all of the Contractor's overhead and profit.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

SGC 31 Add the following paragraphs 6.4.5 and 6.4.6:

6.4.5 Despite the rest of this GC, Contract Time will not be extended and the Contractor will not be entitled to any increase in the Contract Price due to conditions of the Place of the Work which the Consultant determines would have been reasonably foreseeable by the Contractor had the Contractor conducted a reasonable inspection of the Place of the Work, including the subsurface soil conditions of the Place of the Work."

6.4.6 Before commencing any Work at the Place of the Work, the Contractor shall be responsible to locate in three dimensions all underground utilities and structures indicated on the Contract Documents as being at the Place of Work. The Contractor shall also be responsible to consult with all utility providers that provide electricity, communication, gas or other utility services in the area of the Place of Work, to locate in three dimensions all underground utilities for which they have records. The Contractor shall also locate in three dimensions any other utilities or

underground structures that are reasonably apparent in an inspection of the Place of the Work.

GC 6.5 DELAYS

SGC 32 GC 6.5.4 Change "10" to "5" in the second line of paragraph 6.5.4. At the end of paragraph 6.5.4 add the following sentences**:**

"A Notice in Writing shall be delivered to the Consultant for each and every delay and shall indicate the reasons for such delay and the best estimate of the Contractor as to its estimated duration and likely effect upon the Contract Time. No oral communication, site meeting discussion or meeting minutes shall be sufficient notification of delay"

SGC 33 Add paragraphs 6.5.6, 6.5.7 and 6.5.8 as follows:

6.5.6 If the Consultant determines that the Contractor is delayed in the performance of the Work, for reasons other than those under GC6.5.1, GC6.5.2 or GC6.5.3, such that in the Consultant's opinion the Work is more than 20 percent behind the Construction Schedule, then upon notice from the Owner, the Contractor will increase the hours of work, the days of work, and the number of workers as required to bring the Work back into line with the Construction Schedule and any costs associated with such measures shall be borne by the Contractor.

6.5.7 In the event of any delay the Contractor shall take all reasonable measures to minimize the effects and costs of the delay and (except where the delay is caused by the Owner or the Consultant or other cause reasonably outside of the control of the Contractor) the Contractor will be responsible for all costs relating to the delay.

6.5.8 The Contractor shall maintain and protect the Work during the period of delay in the performance of the Work.

GC 7.2 CONTRACTOR'S RIGHT TO STOP THE WORK OR TERMINATE THE CONTRACT

SGC 34 Delete entirely paragraph 7.2.3.1

SGC 35 Replace paragraph 7.2.5 with the following:

7.2.5 If the Contractor terminates the Contract under the conditions set out above, the Contractor shall be entitled to be paid for all work performed under the Contract including reasonable profit and will be entitled to no further compensation from the Owner."

GC 8.2 NEGOTIATION, MEDIATION, AND ARBITRATION

SGC 36 Delete paragraph 8.2.1 and substitute the following:

8.2.1 In accordance with the latest edition of the Rules for Mediation of CCDC 40 – **2018 Rules for Mediation and Arbitration of Construction Disputes**, the parties shall appoint a Project Mediator within 15 working days after both parties agree in writing that a Project Mediator be appointed.

SGC 37 Delete the paragraphs 8.2.6, 8.2.7 and 8.2.8 and replace with the following:

8.2.6 Upon termination of mediated negotiations, either party may refer the unresolved dispute to the courts or to any other form of dispute resolution, including arbitration, which the parties have agreed to use.

GC 9.1 PROTECTION OF WORK AND PROPERTY

SGC 38 Add the following paragraph 9.1.5 as follows:

9.1.5 When carrying out excavation work, the Contractor may encounter underground utilities such as sewers, gas mains, telephone cables, power cables, and water mains. The Contractor shall be fully responsible for any breakage or damage to such utilities, and the Contractor shall pay the full cost of repairing such damage and making good any losses or damage suffered by the Owner or others.

GC 9.4 CONSTRUCTION SAFETY

SGC 39 Delete paragraph 9.4.1 and replace with the following:

9.4.1 The Contractor shall be solely responsible for construction safety at the Place of the Work as and to the extent required by applicable legislation, regulations and codes, including the Workers Compensation Act, applicable regulations and good construction practice, and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work.

GC 10.1 TAXES AND DUTIES

SGC 40 Add paragraph 10.1.3 as follows:

10.1.3 Any tax including, without limiting the generality of the foregoing, the Value-Added Tax or any government sales tax, customs, duty or excise tax, whether paid or not, which is found to be inapplicable or for which exemption may be obtained is, the sole and exclusive property of the Owner. The Contractor agrees to cooperate with the Owner or his agent in the application for any refund of any such taxes, which cooperation shall include without limitation making or concurring in the making of application for any such refund or exemption and providing to the Owner or his agent copies, or where required, originals, or records, invoices, purchase orders and other documentation necessary to support such application for exemption or refund.

SGC 41 Add paragraph 10.1.4 as follows:

10.1.4 Where any invoices or other documents are required for tax and duty refund purposes, the Contractor shall provide the Owner with such invoices and other documents as may be necessary to substantiate the amount of taxes or duties paid during the performance of the Contract for which the Owner may rightfully claim redemption.

SGC 42 Add paragraph 10.1.5 as follows:

10.1.5 The Contractor agrees to provide the Owner with a signed statement, if requested by the Owner, in which is the Contractor confirms that the Contractor and all Subcontractors relinquish all claims to any refunds or reimbursements of any Federal or Provincial taxes paid by the Contractor relating to performance of the Contract for which the Owner may rightfully claim redemption and the Contractor hereby relinquishes all such claims.

GC 10.2 LAWS, NOTICES, PERMITS AND FEES

SGC 43 GC 10.2.6 Delete the words “knowing it to be” in the second line of paragraph 10.2.5 and replace them with “that is”.

SGC 44 Add the following paragraph:

10.2.8 The Contractor will notify and deal with organizations involved with or affected by the Work, such as telephone, electricity, gas and other utility providers, railway companies and government agencies.

GC 10.4 WORKERS' COMPENSATION

SGC 45 Add the following sentence to paragraph 10.4.1:

"The Contractor agrees that the Owner has the unfettered right to set off the amount of any unpaid premiums and assessments for WorkSafe BC coverage against any monies owing by the Owner to the Contractor."

SGC 46 Add paragraph 10.4.3 as follows:

10.4.3 The Contractor shall indemnify and hold harmless the Owner from all manner of claims, demands, damages, costs, losses, penalties, actions, causes of action and proceedings arising out of or in any way related to unpaid WorkSafe BC assessments owed by any person working on the Project or relating to the Work or arising out of or in any way related to the failure to observe safety rules, regulations and practices of WorkSafe BC.

SGC 47 Add paragraph 10.4.4 as follows:

10.4.4 The Contractor will be the "Prime Contractor" within the meaning of Part3, Division 3, Section 118(1) for the Project under the *Workers Compensation Act* (British Columbia) and will fulfill all obligations of the "Prime Contractor" under that Act, including by ensuring that the activities of any employees, workers and other persons at the Place of the Work relating to occupational health and safety are coordinated and by doing everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with the *Workers Compensation Act* and the regulations under that Act applicable to the Place of the Work".

GC 12.1 INDEMNIFICATION

SGC 48 Delete GC 12.1.1 and 12.1.2 and replace with the following:

12.1.1 Without restricting the parties' obligation to indemnify as described in paragraphs 12.1.4 and 12.1.5, the Owner and the Contractor shall each indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by them or in respect to claims by third parties that arise out of, or are attributable in any respect to their involvement as parties to this Contract, provided such claims are:

.1 caused by:
the negligent acts or omissions of the party from whom indemnification is sought or anyone for whose acts or omissions that party is liable, or a failure of the party to the Contract from whom indemnification is sought to fulfill its terms or conditions; and

.2 made by Notice in Writing within a period of 10 years from the date of Substantial Performance of the Work as set out in the certificate of Substantial Performance of the Work issued pursuant to paragraph 5.4.2.2 of GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK or within such territory of the Place of the Work.

12.1.2 The obligation of either party to indemnify as set forth in paragraph 12.1.1 shall be limited as follows:

.1 In respect to losses suffered by the Owner and the Contractor for which insurance is, or for which insurance is not, required to be provided by either party shall in no event be greater than $5,000,000.

.2 In respect to claims by third partied for direct loss resulting from bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, the obligation to indemnify is without limit. In respect to all other claims for indemnity as a destruction of tangible property, the obligation to indemnify is without limit. In respect to all other claims for indemnity as a destruction of tangible property, the obligation to indemnify is without limit. In respect to all other claims for indemnity as a result of claims advanced by third parties, the limits of indemnity set forth in paragraphs 12.1.2.1 shall apply.

GC 12.3 WARRANTY

SGC 49 Add the following sentence to paragraph 12.3.4:

In effecting a correction of defects or deficiencies, the Contractor shall also bear all costs involved in removing, replacing, repairing or restoring aspects of the Work that may be affected in the process of making the correction.

SGC 50 Add paragraph 12.3.7 as follows:

12.3.7 Where a material, product or installation covered by warranty fails, the stipulated warranty and warranty period shall be renewed for the specific work being replaced or repaired, with the exception of warranties referred to in GC 12.3.6

END OF SECTION 00500