

City of Coquitlam

Request for Proposals

RFP No. 22-012

Mackin Park Backstop Replacement

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Appendix B - The City's Supplemental Specification to MMCD 2009, Platinum Edition, Vol. II

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[PROPOSAL SUBMISSION FORM](#)

SUMMARY OF KEY INFORMATION

RFP Reference	RFP No. 22-012 Mackin Park Backstop Replacement
Overview of the Opportunity	The City requests Proposals from experienced qualified firms for the provision of the Mackin Park Backstop Replacement .
Closing Date and Time	2:00 pm local time Friday, January 28, 2022
Instructions for Proposal Submission	Proposals are to be consolidated into one PDF file and uploaded electronically through QFile, the City's file transfer service accessed at qfile.coquitlam.ca/bid In the "Subject Field" enter: RFP Number and Name Add files in .pdf format and Send (Ensure your web browser remains open until you receive 2 emails from QFile to confirm receipt.) Phone 604-927-3037 should assistance be required. The City reserves the right to accept Proposals received after the Closing Date and Time.
Obtaining RFP Documents	RFP Documents are available for download from the City of Coquitlam's website: https://www.coquitlam.ca/Bid-Opportunities Printing of RFP documents is the sole responsibility of the Proponents.
Instructions to Proponents	The guidelines for participation that will apply to this RFP are posted on the City's website: Instructions to Proponents
Questions	Questions are to be submitted in writing quoting the RFP number and name up to 3 business days before the Closing Date sent to email: bid@coquitlam.ca
Addenda	Proponents are required to check the City's website for any updated information and addenda issued, before the Closing Date at the following website: https://www.coquitlam.ca/Bid-Opportunities
Withdrawal of Submission	Proposals may be withdrawn by written notice only, made by an authorized representative of the Proponent sent to email: bid@coquitlam.ca prior to the Closing Date and Time.
Terms and Conditions of Contract	City of Coquitlam Standard Terms and Conditions - Purchase of Goods and Services are posted on the City's website and will apply to the Contract awarded as a result of this RFP.

DEFINITIONS

“City” “Owner” means City of Coquitlam;

“Contract” means the City Purchase Order that will be issued to formalize the Contract with the successful Proponent through negotiation process with the City based on the Proposal submitted and will incorporate by reference the Request for Proposals, the Terms and Conditions of Contract included in this RFP, any additional subsequent information, any addenda issued, the Proponent’s response and acceptance by the City.

“Contractor” means the person(s) firm(s) or corporation(s) appointed by the City to carry out all duties, obligations, work and services described in the Request for Proposal and all associated documentation, which may also include mutually agreed revisions subsequent to submission of a Proposal. Both “Contractor” and “Proponent” are complementary in terms of duties, obligations and responsibilities contemplated at the Request for Proposals stage, through evaluation process, execution and performance of the services and works.

“Price” means the amount that will be paid by the City to the Contractor for delivery and acceptance of goods and Services;

“Project Manager” means the City staff member appointed to coordinate the work;

“Proponent” means responder to this Request for Proposals;

“Proposal” means the submission by the Proponent;

“Request for Proposals” “RFP” shall mean and include the complete set of documents, specifications and addenda incorporated herein, and included in this Request for Proposals;

“Services” “Work” “Works” means and includes the provision by the successful Proponent of all services, duties, and expectations as further described in this RFP. This will also mean the whole of the work, tools, materials, labour, equipment, travel, and all that is required to be done, furnished and performed by the Contractor;

“Shall” “Must” “Will” “Mandatory” means a requirement that must be met;

“Site” means the place or places where the Services are to be performed

“Supply” “Provide” shall mean supply and pay for and provide and pay for.

1 INSTRUCTIONS TO PROPONENTS

1.1 Purpose

The City requests Proposals from experienced qualified firms for the provision of the Mackin Park Backstop Replacement.

1.2 Proposal Submission

Proponents should complete and submit the information requested in this RFP document on the Proposal Submission Form or in a format that has been approved and is acceptable to the City.

1.3 Site Visit

Proponents are encouraged to visit the site on their own.

Location: Mackin Park South West Backstop

Address: 1046 Brunette Ave, Coquitlam, BC

1.4 Instructions to Proponents

Proponents are advised that the rules for participation that will apply to this RFP are located: [Instructions to Proponents](#).

By submission of a Proposal, the Proponent agrees and accepts the rules by which the RFP and selection process will be conducted.

- a) Proponents are responsible to inspect the existing site(s) and shall fully understand the difficulties and restrictions for execution of the Work under this Contract.
Interpretations by the Proponent of the meaning of any section of the Contract drawings and specifications herein prior to submitting a price for the Work shall not remove the responsibility of completing the Work as per the directions of the City, including all costs associated with that Work, should the Proponent's interpretation be incorrect.
- b) Prior to submitting a price for the Work, the Proponent must seek clarification from the City for any items within the drawings and specifications that may appear to be unclear or conflicting.
- c) Prior to bidding, Proponents should visit, inspect, and familiarize themselves with the site(s) and of everything and of every condition potentially affecting the Works to be executed, so that the execution of the Contract by the successful Proponent is founded and based upon the Proponent's own examination, information, and judgment. Failure to visit the site(s) prior to the Proposal Closing Date will in no way relieve the successful Proponent from the necessity of furnishing any material or performing any Work that may be required to complete the Work in accordance with the conditions and specifications without additional cost to the City.
- d) It shall be the responsibility of the Proponent, by personal inspection of the site(s) of the Works, examination of the Contract documents, calculations, tests, and by requesting any required clarifications from the City, to become satisfied with respect to the quantities, quality, and practicability of the Work. The Proponent must be aware

that any information from the City was and is approximate and speculative only and cannot in any manner be warranted or guaranteed. If the Proponent fails to make a proper investigation and examination of the site(s) and the Work, they shall signify by entering into the Contract that they are willing to assume all risk of the Work proving more onerous than was contemplated and/or assumed when the Contract was signed.

A complete set of RFP and Contract documents will include:

- i. **Request for Proposals Documents**
 - ii. **Proposal Submission Form**
 - iii. **Appendix A – Project Drawings**
 - iv. **Appendix B – The City’s Supplementary Terms and Conditions to MMCD**
 - v. **Appendix C – Sediment and Erosion Control**
 - vi. **Addenda as issued**
- e) Figure dimensions of a drawing shall take precedence over measurements scaled from the drawing and large-scale drawings take precedence over those of a smaller scale. Supplementary drawings and specifications supersede their antecedents. Addenda drawings take precedent over all drawings. Addenda specifications take precedent over all specifications. In case of conflict between figured dimensions on a drawing and the dimensions of a specified product, the dimensions of the specified product will govern. The drawings and specifications complement each other and anything called for by one will be as binding as if called for by both.
- f) All information requested for the Proposal is to be completed by the Proponent on the supplied forms only and shall be based upon the whole of the specifications and Contract documents, without reservation. A Proposal that does not include all of the above sections, completed as specified herein, may be rejected.
- g) The selected Proposal shall supply all materials, equipment, installation, commissioning, and construction necessary for the successful starting and completion of the project in accordance with the drawings and specifications herein. It shall be the responsibility of the Proponent to include in the submitted Proposal amount sufficient amounts to cover the cost of the Work and materials required to complete the Work but not specifically noted in the drawings and/or specifications. It is assumed that all taxes, duties and levies have been included in the Proposal amount.
- h) Complete sub-contracting of Works will not be approved; however, segments of Work involving special skills may be sub-contracted.
- i) The Proponent must indicate the names of the Proponent’s senior staff for the project, specifically identifying the project superintendent, and the names of the major sub-contractors and the Work they will be performing.
- j) The Proponent must carefully examine the Proposal Documents and worksite(s). The Proponent may not claim, after the submission of a Proposal, that there was any misunderstanding with respect to the requirements and conditions imposed by the City.

- k) There will be no opportunity to make any additional claim for compensation or invoice for additional charges that were not considered and included in the Proposal price submitted, unless the City, at its sole discretion, deems that it would be unreasonable to do so, or there are additional Work requirements due to unforeseen circumstances.
- l) All information in this RFP Document, Drawings, Specifications, Site Visit and Investigation, and any resulting Addenda will be incorporated into any Contract between the City and the successful Proponent, and therefore must be considered by the Proponent in preparing their Proposal.

1.5 Prices

All Prices shall be all inclusive in Lump Sum Form (Canadian Funds) exclude GST and shall remain **FIRM** for the completion of the Services.

1.6 COVID-19 Safety Requirements

Contractor is responsible for following all COVID - 19 site safety requirements which are posted by WorkSafeBC and subject to change as the situation evolves:

- <https://www.worksafebc.com/en/about-us/covid-19-updates/covid-19-industry-information/construction>
- <http://www.bccassn.com/media/Guidance%20to%20Construction%20Sites%20Operating%20During%20COVID19.pdf>
- [Contractor COVID-19 Info Sheet](#)

Contractors must post their Site Safety Covid-19 Specific requirements in plain view and visible to the public.

1.7 Requested Departures

The Proponent acknowledges that the departures requested in the Proposal Submission Form will not form part of the Contract unless and until the City specifically consents in writing to any of them.

1.8 Evaluation Criteria

Evaluation Criteria of each proposal will be determined in accordance with the following:

Proposal Evaluation Summary	Maximum Points to be Awarded
Corporate	25
Technical	25
Financial and Value Added	50
Total	100

The criteria for evaluation of the Proposals may include, but is not limited to:

Corporate Experience, Reputation, Capacity and Resources

- Established business and demonstrated performance providing services of similar size, scope and complexity
- References
- Key Personnel on project team, qualifications and experience
- Sub-contractors
- Suppliers

Technical

- Methodology, set-up and execution of the Work
- Site Safety
- Risk factors
- Disposal and reuse
- Compliance to Specifications
- Equipment and Resources
- Completion Date

Financial and Value Added

- Financial offer
- Value Added / Sustainable benefits

These criteria will be used to determine best overall value to the City. Proposals will be compared to select one or more that are most advantageous.

And, upon selection of one or more lead Proponent(s):

- References may be contacted
- Interviews may be conducted

The City reserves the right to check references on other projects even if they are not specifically listed. Information obtained from references will be confidential and will not be disclosed to any Proponents.

These criteria will be used to determine best overall value to the City as well as any other criteria that may become evident during the evaluation process.

The City may, at its discretion, request clarification or additional information from a Proponent with respect to any Proposal and the City may make such requests to only selected Proponents. The City may consider such clarifications or additional information in evaluating a Proposal.

Incomplete Proposals or Proposals submitted on forms other than the Proposal Form may be rejected.

Proponents agree the City may disclose names of Proponents and total award amount, however, unevaluated results, unit prices, rates or scores will not be provided to any Proponents.

The City reserves the right to reject without further consideration any Proposal which in its opinion does not meet the criteria it considers essential for the work outlined in this RFP.

Where only one Proposal is received, the City may reject such and re-issue the RFP on a selected basis.

Prices shall include the provision of all tools, materials, equipment, labour, transportation, fuel, supervision, management, overhead, materials, traffic control, services, all necessary packing and crating (where applicable), Canadian Customs import and export duties, freight, handling, transportation, insurance, all other associated or related charges, foreign, federal, provincial and municipal taxes, bonding costs, all licences, permits, inspections and all other requirements necessary for the commencement, performance and completion of Services as described.

1.9 Eligibility

For eligibility, and as a condition of award, the successful Proponent would be required to meet or provide the equivalent:

- a) Commercial General Liability (CGL) insurance \$5M coverage provided on the [City's Standard Insurance Form](#)
- b) [Prime Contractor Designation Form](#) and be responsible for all the work at the site in accordance with WCB regulations
- c) Be registered and provide WorkSafeBC clearance
- d) Accept the City's standard Terms and Conditions posted on the City's website: [Standard Terms and Conditions - Purchase of Goods and Services](#)
- e) A City of Coquitlam or Tri Cities Intermunicipal [Business License](#)

1.10 Completion Dates

Completion Date - The Work shall be completed not later than **March 25, 2022**

The City of Coquitlam will review schedules and allow for exceptions to completion dates and to be flexible due to Covid-19 and the reasonable steps that Contractors will be faced with to allow for social distancing practices to be implemented with their crews.

1.11 Examination of Proposal Documents and Worksite

The Proponent must carefully examine the Proposal Documents and worksite. The Proponent may not claim, after the submission of a Proposal, that there was any misunderstanding with respect to the requirements and conditions imposed by the City.

There will be no opportunity to make any additional claim for compensation or invoice for additional charges that were not considered and included in the Proposal price submitted, unless the City, at its sole discretion, deems that it would be unreasonable to do so, or there are additional Work requirements due to unforeseen circumstances.

All information in this RFP Document, Site Visit and any resulting Addenda will be incorporated into any Contract between the City and the successful Proponent, and therefore must be considered by the Proponent in preparing their Proposal.

1.12 Sub-Consultants

The use of sub-Consultants is acceptable providing they are fully identified in the Proposal and realize the conditions of this document will apply to all sub-Consultants named. Joint

submissions must identify a prime Proponent who assumes responsibility for the Proposal as well as for the professional standards, actions and performance for all Proponents, if awarded the Work.

1.13 Requirements

- a) The selected Proposal shall supply all materials and construction necessary for the successful starting and completion of the project in accordance with the drawings and specifications herein. It shall be the responsibility of the Proponent to include in the submitted Proposal amount sufficient amounts to cover the cost of the Work and materials required to complete the Work but not specifically noted in the drawings and/or specifications. It is assumed that all taxes, duties and levies have been included in the Proposal amount.
- b) The Proponent must indicate the names of the Proponent's senior staff for the project, specifically identifying the project superintendent, and the names of the major sub-Contractors and the Work they will be performing.

1.14 Bidders List

The City does not retain a list of interested contractors ("Bidders List"). Interested contractors are encouraged to register as plan takers and may view the RFP Documents and Drawings by contacting the Vancouver Regional Construction Association ("VRCA"), website : www.vrca.ca , ph: 604- 294-3766 or email: info@vrca.ca quoting the Coquitlam RFP Reference Number.

2 GENERAL CONDITIONS OF CONTRACT

2.1 Terms and Conditions of Contract

The City's [Standard Terms and Conditions - Purchase of Goods and Services](#), as published on the City's website, the Conditions listed below, along with the accepted Proposal, Appendix B – The City's Supplementary Terms and Conditions to MMCD, addenda and any subsequent clarifications, correspondence, the totality of which will constitute the Contract.

PROJECT SPECIFIC TERMS AND CONDITIONS

2.2 Permits and Regulations

The Contractor is to obtain permits, pay all fees therefore and comply with all Provincial, Municipal and other legal regulations and by-laws applicable to the Work. If no local regulations, comply with the National Building Codes of Canada, latest revision. Workers Compensation Act and Workplace Hazardous Material Information System ("W.H.M.I.S.") requirements and regulations are to be strictly adhered to.

2.3 Qualified Personnel

All Work shall be performed by skilled persons in strict accordance with the applicable Municipal, Provincial, Federal and other laws, regulations, standards, codes, etc. All workmanship and materials will be subject at any time to the inspection and approval of the City.

The Contractor and persons hired by it to perform the Work shall at all times be properly attired and shall be courteous to the public and all other trades / work crews, and perform the Work in a manner that minimizes any inconvenience or nuisance to the public.

2.4 Damage and Defects

The Contractor shall use due care so that no persons are injured, or no property damaged or lost in providing the services. The Contractor shall be solely responsible for all loss, damages, costs and expenses in respect of any injury to persons, damage of property, or infringement of the rights of others incurred in the performance of the services or caused in any other manner whatsoever by the Contractor or its employees.

The Contractor shall rectify any loss or damage for which, in the opinion of the City, the Contractor is responsible, at no charge to the City and to the satisfaction of the City.

Alternatively, the City may repair the loss or damage and the Contractor shall pay to the City the costs of repairing the loss or damage upon demand from the City. Where, in the opinion of the City, it is not practical or desirable to repair the loss or damage, the City may estimate the cost of the loss or damage and deduct such estimated amount from the amount owing to the Contractor.

2.5 One Year Guarantee

The Contractor shall guarantee to maintain the Work and materials against any defects arising from faulty installation, faulty materials supplied under the Contract, or faulty workmanship, which may appear within one (1) year from the date of acceptance of the Work by the City. Faulty or damaged materials shall be replaced, and any defects discovered or failures which

occur during the guarantee period, shall be rectified to the satisfaction of the City on-site within 2 weeks of notification. This shall be at no cost to the City.

2.6 Protection of Public

The Contractor shall take adequate measures to protect the public, City staff, and all others on site from injury, damage, or other loss resulting from maintenance operations and related activities.

The Contractor shall promptly report to the City any safety incidents as they occur.

3 SCOPE OF SERVICES

3.1 Scope of Work

The Work includes, but is not limited to, supply, delivery, installation, provision of all labour, supervision, equipment, tools, materials, transportation, and incidentals necessary for **Mackin Park Backstop Replacement** as stated in this RFP and appendices

- **Appendix A – Project Drawings.**
- **Appendix B – The City’s Supplementary Terms and Conditions to MMCD**
- **Appendix C – Sediment and Erosion Control**

The Work will generally include, but not limited to:

- a) Supply and Installation of New Backstop as per Architectural Drawings:
 - I. Demolition, removal and disposal, of existing backstop at a legal dumping site.
 - II. Install of new concrete foundations and concrete pads.
 - III. Installation of new posts and chain-link.
 - IV. Construction of new dug outs and benches.
 - V. Remediation with sod to all disturbed areas including areas previously effected by soil sampling.
 - VI. Pedestrian and traffic control.
 - VII. Maintain a safe and secured construction site.
 - VIII. Complete site clean-up so backstop and field are ready for immediate use.
- b) Survey, layout, site management and safety, as well as quality control testing and measures needed to demonstrate the backstop is constructed to meet the standards and layout of the design drawings and project documents and specifications.
- c) Erosion and sediment control Works, refer to **Appendix C – Sediment and Erosion Control**
- d) The Contractor to provide a project construction schedule prior to the start of construction. The schedule must identify all the necessary start and completion dates of construction

3.2 Products

Products and materials are to be delivered and stored in the original manufacturer’s packaging with labels intact and store the products where they will be protected from damage, theft and vandalism.

3.3 Clean Up

At the end of each day and at the conclusion of Work, the Contractor shall promptly remove any of his/her equipment or materials and leave the site(s) in a clean and cleared condition.

3.4 Hours of Work

Unless otherwise specified the Contractor shall carry out the Work during regular business hours, and in compliance with the City’s Noise Bylaw. Permits will be required for Work outside of normal working hours. The Contractor shall be responsible for obtaining any such permits.

3.5 Equipment

Equipment must be in good mechanical repair and not require excessive maintenance or create excessive down time that jeopardizes the Contractors ability to provide the Services.

3.6 On-Site Hazards

The Contractor is to make themselves aware of any and all on-site hazards including but not limited to underground and overhead utilities in or near to the Work area and to take every precaution necessary to eliminate any risk that may exist. If an on-site hazard exists that is causing or may cause injury to any person(s), the Respondent is to take immediate action to mitigate risk and damage, and then to notify the City's contact person.

The locations of all such hazards are to be investigated and verified in the field by the Contractor.

3.7 Inspection of Services

- a) All Services provided shall be subject to inspection and shall meet the approval of the City. If they are not approved, the City shall have the right to reject them or to require correction.
- b) Acceptance or rejection of the Work shall be made as promptly as practical, but failure to accept or reject the Work shall not relieve the Contractor from responsibility for Services provided not in accordance with the Contract.
- c) The City will not be deemed to have accepted the Services by virtue of a partial or full payment for it.
- d) The City shall be the final judge of all Services and its decisions of all questions in dispute will be final.

3.8 Frequency of Invoicing

Contractor to Invoice on a monthly basis for Work that has been completed up to date of invoice and not previously invoiced and paid.

3.9 Delivery, Storage, and Handling

All materials and equipment to be new. Deliver and store materials in original, unopened packaging. Assume all packing, transportation, and insurance costs.

All packaging material must be removed from site at the Contractor's expense.

Store materials in a safe and secure location, and protect against damage. City is not responsible for loss, damage or theft of material or equipment.

3.10 Public Relations

Good public relations must be maintained at all times by the Contractor, the Contractor's employees, and representatives. All enquiries and complaints must be satisfactorily resolved in a courteous and businesslike manner and be acted upon within a 24-hour period.

Appendix A – Project Drawings

Mackin Park

Issued for RFP

Contact Information	Other Key Contacts:
VDZ+A Project Landscape Architecture Fort Langley Studio 101 - 9181 Church Street Fort Langley, British Columbia, V1M 1A0 Mount Pleasant Studio 102-3535 Kingsway Vancouver, British Columbia, V5T 3J7 Primary project contact: David Jerke Principal Landscape Architect davidj@vdz.ca o. 604 546 0920 Alternate contacts (incase away): Mark van der Zalm Principal Landscape Architect mark@vdz.ca o. 604 546 0920	City of Coquitlam Project Owner Brian Morley 3000 Guildford Way Coquitlam, BC V3B 7N2 o. 604 927 6321 bmorley@coquitlam.ca
	Legal Address and Description:
	Mackin Park, 1046 Brunette Ave., Coquitlam, British Columbia, V3K, CAN Plan 63676, Lot 17, Plan Area 19, Folio / Roll # 07574020, Parcel ID I2170037, PID 003-365-913

Sheet List Table

Sheet Number	Sheet Title
L-01	COVER PAGE
L-02	SITE PLAN
CV-01	GRADING PLAN
L-03	DETAILS
L-04	DETAILS



1 LOCATION MAP
NTS

3	DJ	Issued for RFP	2021-Dec-23
2	TS	Structural Review - DRAFT	2021-Dec-10
1	TS	Initial Review - DRAFT	2021-Dec-03
No.	By:	Description	Date
REVISIONS TABLE FOR DRAWINGS			
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No.	By:	Description	Date
REVISIONS TABLE FOR SHEET			
Project: Mackin Park Backstop			
Location: 1046 Brunette Avenue Coquitlam, B.C.			
Drawn: FS		Stamp:	
Checked: TS			
Approved: DJ			
Scale: AS SHOWN			
Original Sheet Size: 24"x36"			
		CONTRACTOR SHALL CHECK ALL DIMENSIONS ON THE WORK AND REPORT ANY DISCREPANCY TO THE CONSULTANT BEFORE PROCEEDING. ALL DRAWINGS AND SPECIFICATIONS ARE THE EXCLUSIVE PROPERTY OF THE OWNER AND MUST BE RETURNED AT THE COMPLETION OF THE WORK. ALL REZONING/CDP/PA/FA/FP DRAWINGS MUST NOT BE PRICED FOR CONSTRUCTION UNLESS LABELED ISSUED FOR TENDER/CONSTRUCTION.	

[illegible]

3	DJ	Issued for RFP	2021-Dec-23
2	TS	Structural Review - DRAFT	2021-Dec-10
1	TS	Initial Review - DRAFT	2021-Dec-03
No.	By:	Description	Date

REVISIONS TABLE FOR DRAWINGS

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By:	Description	Date
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REVISIONS TABLE FOR SHEET

Project:
Mackin Park Backstop

Location:
1046 Brunette Avenue
Coquitlam, B.C.

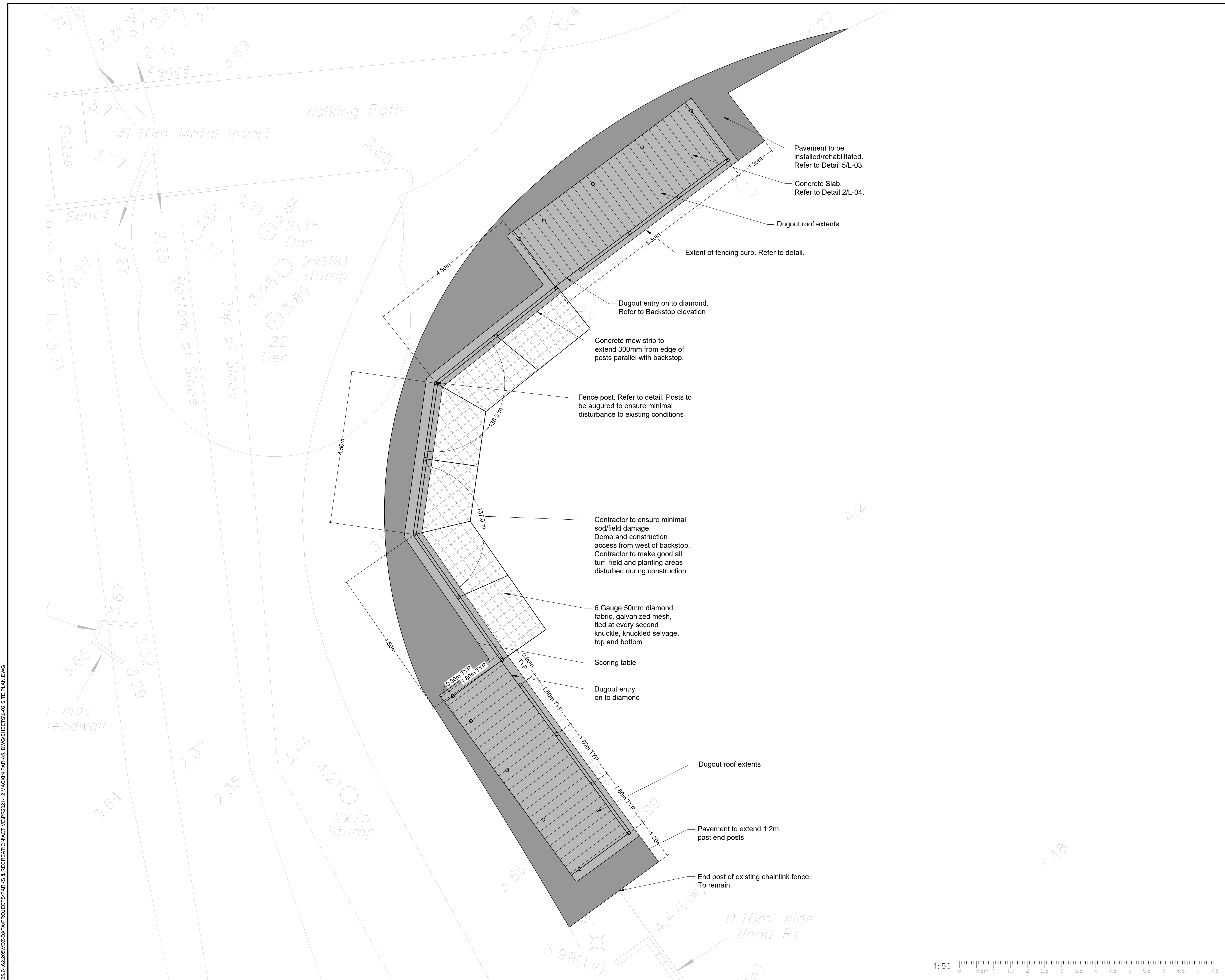
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FS	
Checked:	
TS	
Approved:	Original Sheet Size:
DJ	24"x36"
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1:50	

Drawing Title:
SITE PLAN



VDZ Project #:
PR2021-12

Drawing #: L-02





NOT FOR CONSTRUCTION

3	DJ	Issued for RFP	2021-Dec-23
2	TS	Structural Review - DRAFT	2021-Dec-10
1	TS	Initial Review - DRAFT	2021-Dec-03
No.	By:	Description	Date

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No.	By:	Description	Date

REVISIONS TABLE FOR SHEET

Project:
Mackin Park Backstop

Location:
1046 Brunette Avenue
Coquitlam, B.C.

Drawn:
FS

Stamp:

Checked: DJ

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Approved:
DJ

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24"x36"

Scale:
1:500

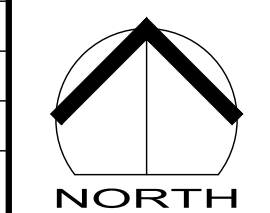
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CONTRACTOR TO TEST PIT IN ORDER TO
CONFIRM ALL LOCATIONS, DEPTHS,
AND TYPE OF SERVICE PRIOR TO ORDERING
MATERIALS.

CONTRACTOR TO CONTACT TELUS, BC
HYDRO, FORTISBC, AND BC ONE CALL
PRIOR TO CONSTRUCTION TO CONFIRM
LOCATIONS OF UTILITIES
AND APPURTENANCES REQUIRING
ADJUSTMENT

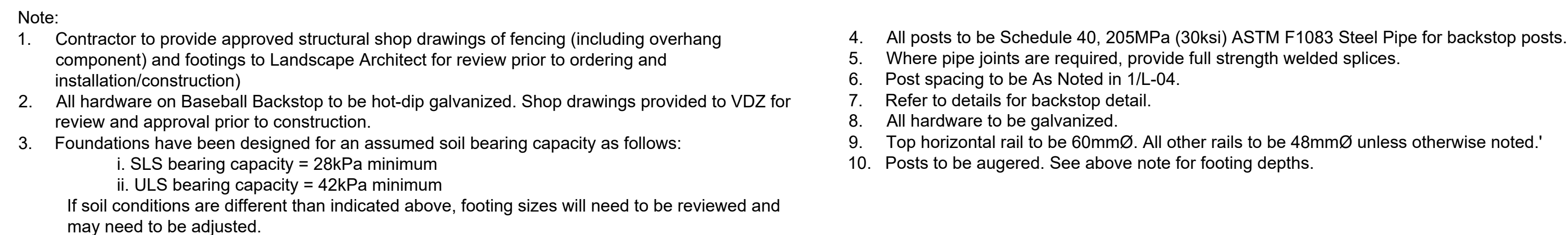
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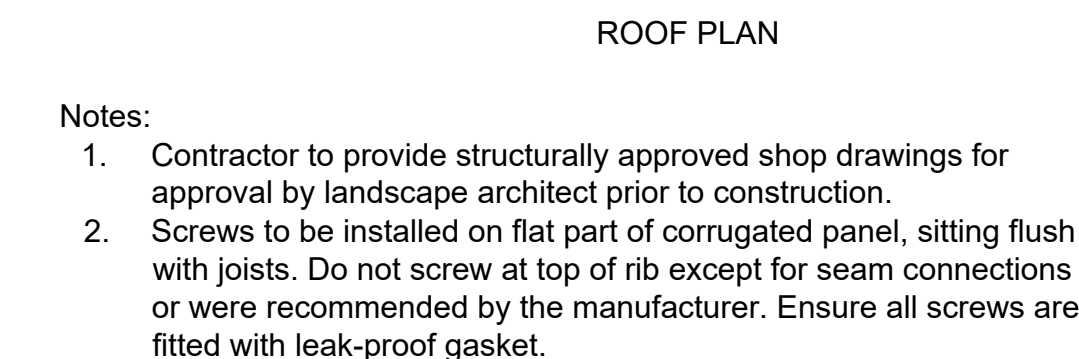


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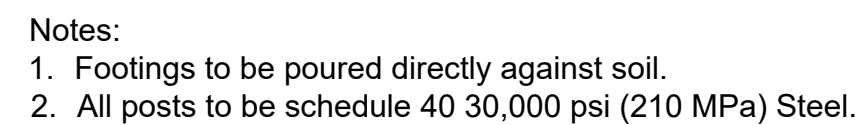
Drawing #: CV-01



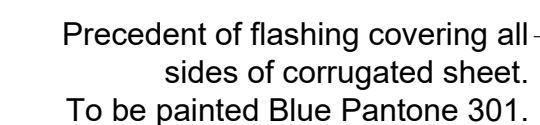
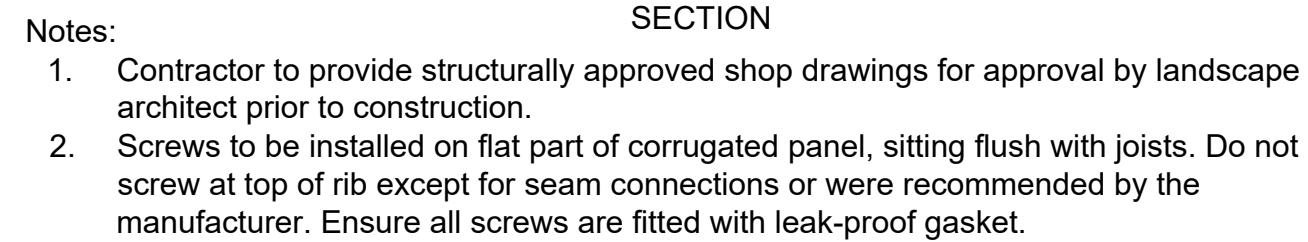
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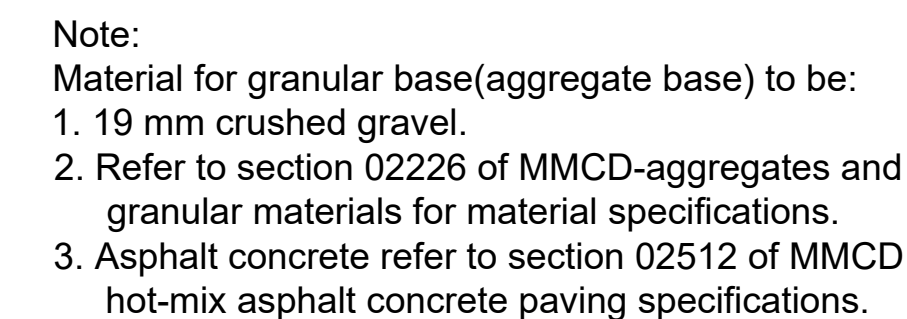
4 Scale 1:50



Scale 1:10



3 Scale 1:50



5 Scale 1:50

[illegible]

REVISIONS TABLE FOR DRAWINGS

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No.	By:	Description	Date
REVISIONS TABLE FOR SHEET			

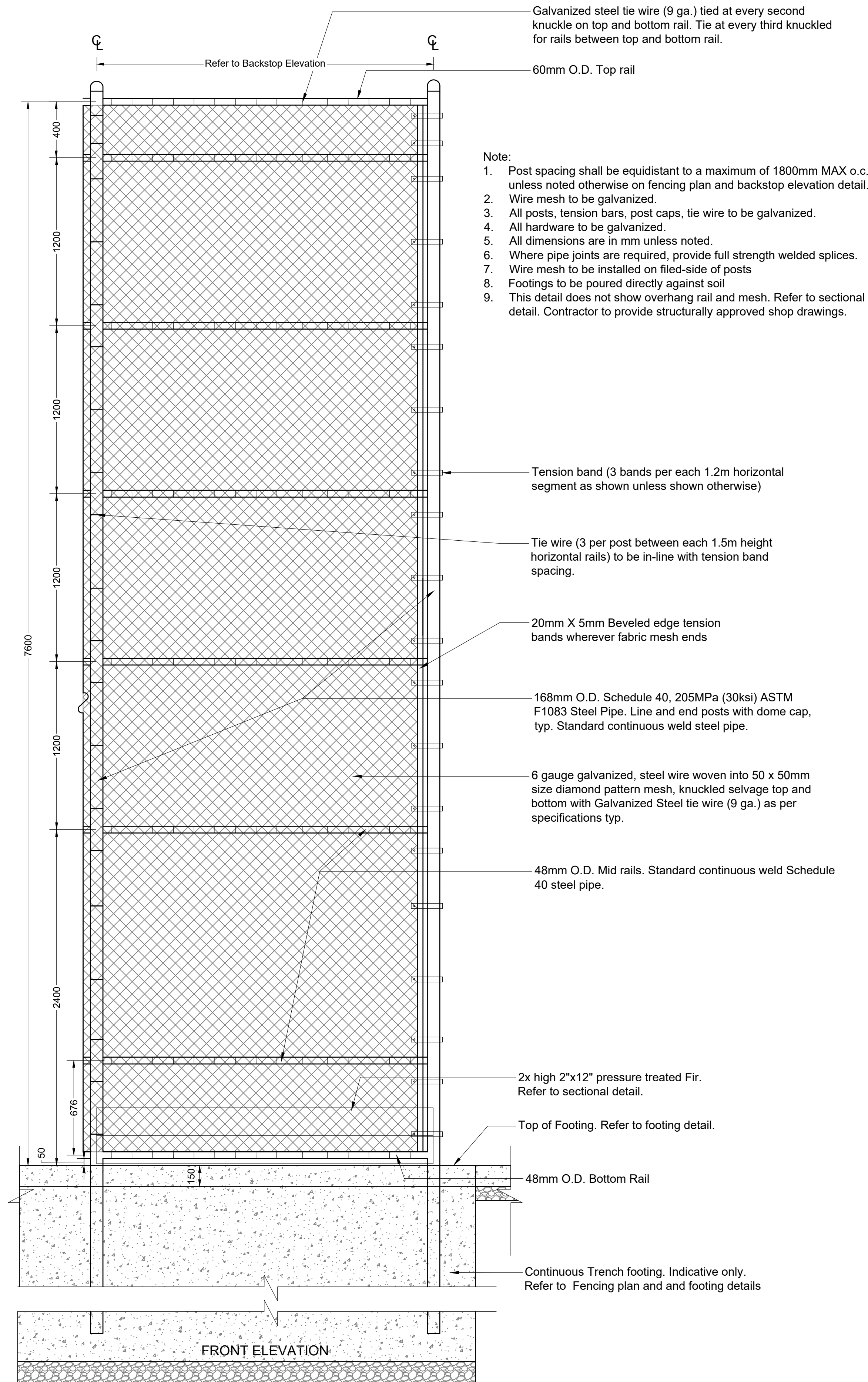
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Coquitlam, B.C.

Drawn:	Stamp:
ES	

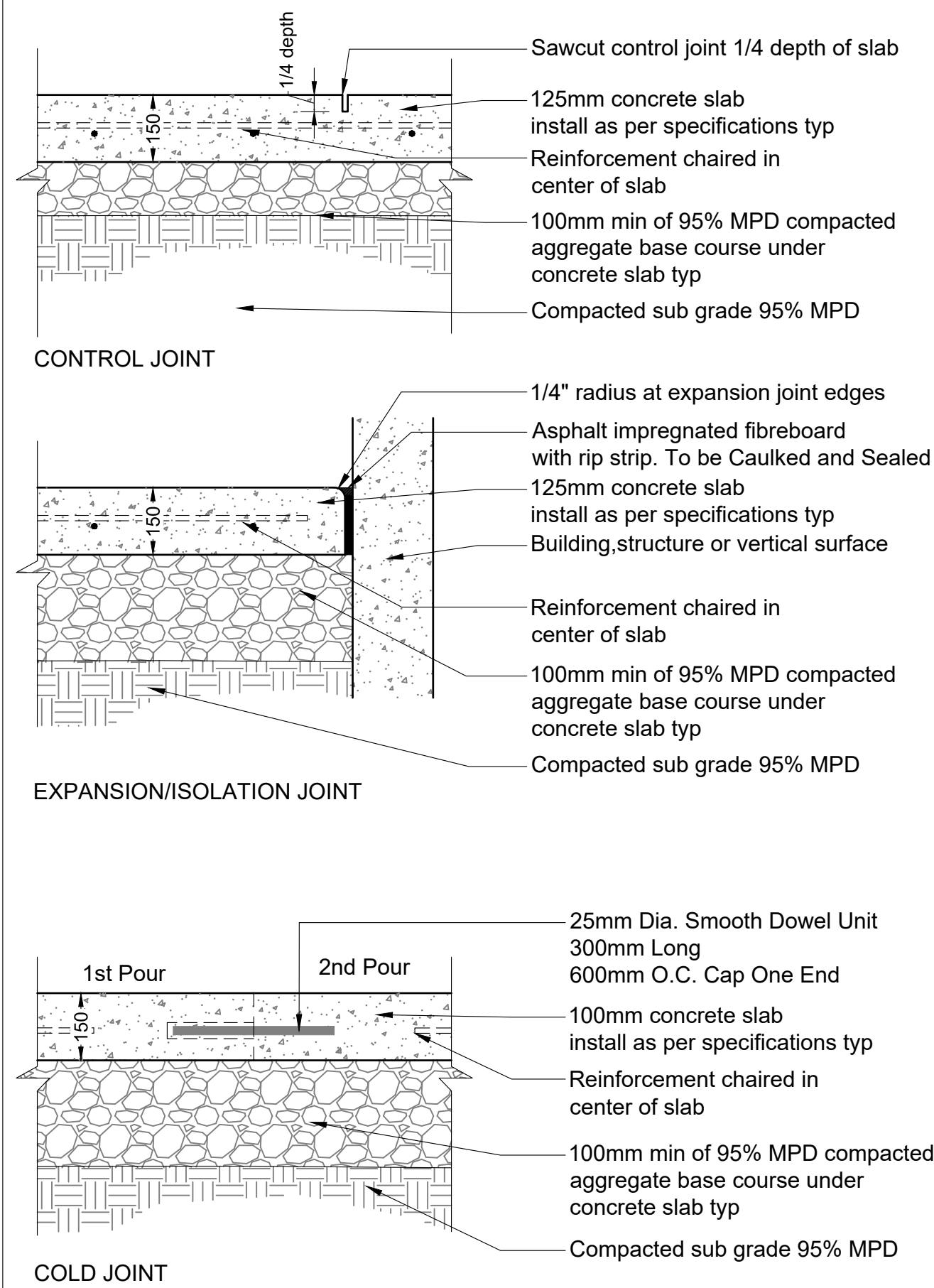
Checked:
TS

DJ	24"x36"
Scale:	CONTRACTOR SHALL CHECK ALL TOLERANCES FOR EACH MATERIAL AND

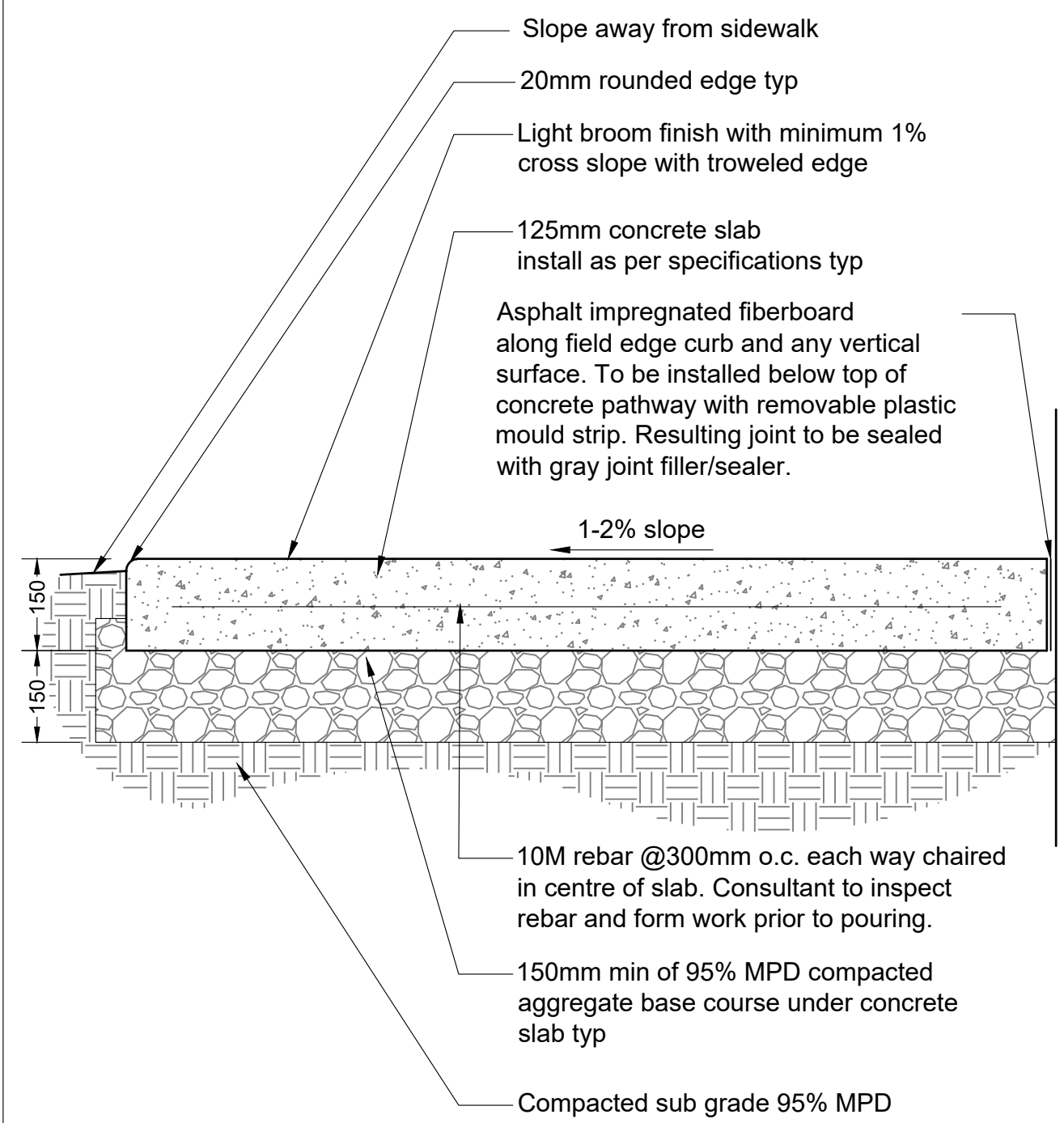
AS SHOWN



1 4.9m CHAINLINK BACKSTOP
Scale 1:20



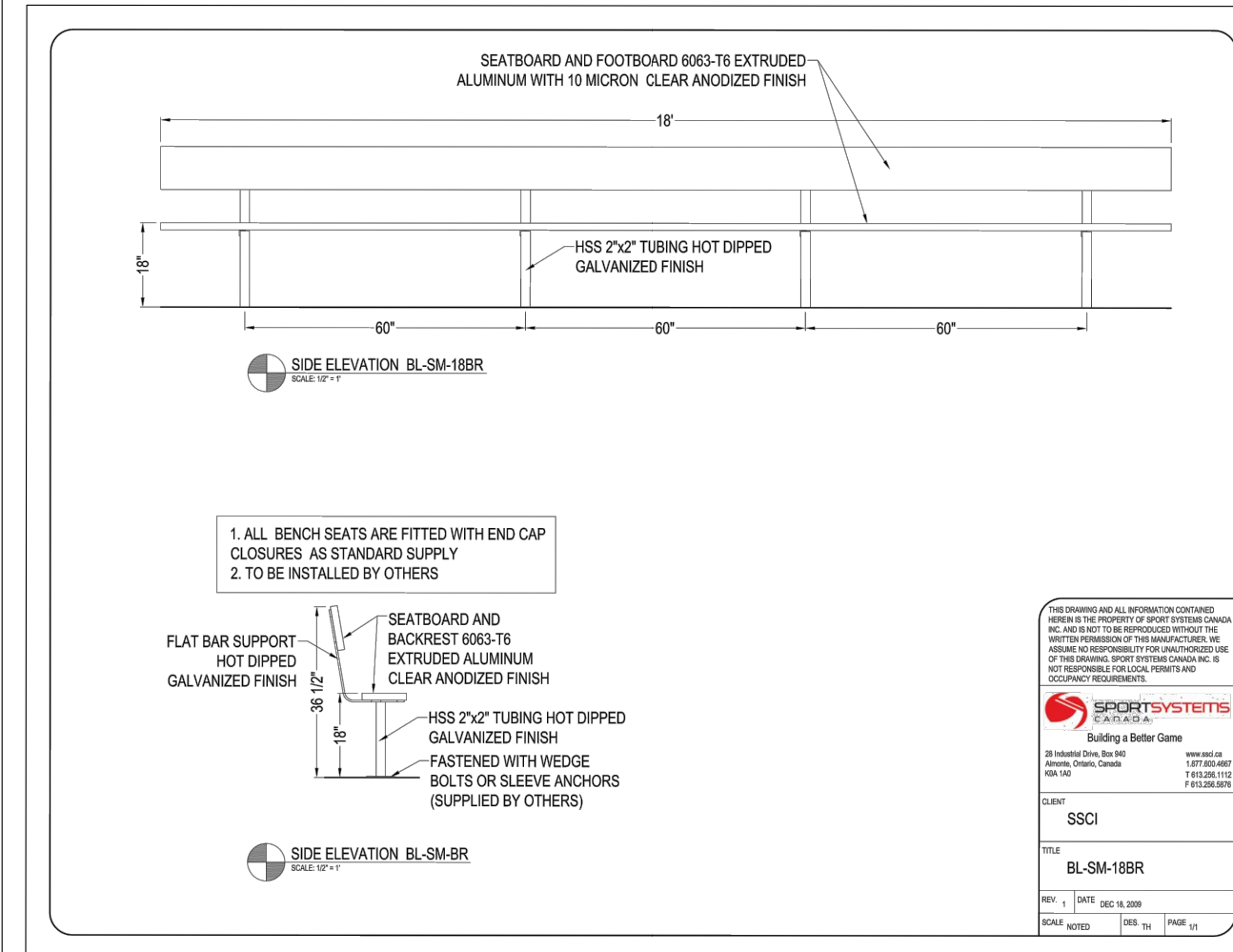
2 CONCRETE SLAB ON GRADE
Scale 1:10



2 CONCRETE SLAB ON GRADE
Scale 1:10

Model: **BL-SM-18BR**
Size: 18 ft (5.49m)
Material: Anodized aluminum
Manufacturer: Sports Systems Canada
Quantity: 2 (1 per dugout).
Mount: Surface. Refer to manufacturer's specifications and instructions

- Notes:
1. Install to manufacturer's specifications and instructions.
 2. Layout to be approved by landscape architect prior to installation.



3 DUGOUT PLAYERS BENCHES



Scoring Table
Model: BL-TIMERTABLE-6
Material: Aluminum
Manufacturer: SportSystems
p. 1-877-600-4667

1. Install to manufacturer's specifications.

4 SCORING TABLE

3	DJ	Issued for RFP	2021-Dec-23
2	TS	Structural Review - DRAFT	2021-Dec-10
1	TS	Initial Review - DRAFT	2021-Dec-03
No.	By:	Description	Date
REVISIONS TABLE FOR DRAWINGS			
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No.	By:	Description	Date
REVISIONS TABLE FOR SHEET			
Project: Mackin Park Backstop			
Location: 1046 Brunette Avenue Coquitlam, B.C.			
Drawn: FS		Stamp:	
Checked: TS			
Approved: DJ			
Scale: AS SHOWN		Original Sheet Size: 24"x36"	
CONTRACTOR SHALL CHECK ALL DIMENSIONS ON THE WORK AND REPORT ANY DISCREPANCY TO THE CONSULTANT BEFORE PROCEEDING. ALL DRAWINGS AND SPECIFICATIONS ARE THE EXCLUSIVE PROPERTY OF THE OWNER AND MUST BE RETURNED AT THE COMPLETION OF THE WORK. ALL REZONING/CDPP/APPA/AB DRAWINGS MUST NOT BE PRICED FOR CONSTRUCTION UNLESS LABELED ISSUED FOR TENDER/CONSTRUCTION.			

Appendix B – The City’s Supplementary Terms and Conditions to MMCD

Supplementary Specifications

To be read in conjunction with Master Municipal Construction Document
Volume II (2009, Platinum Edition, Vol. II) for Standard Specifications & Standard
Detail Drawings referenced but not listed below.

TABLE OF CONTENTS

Section 01 33 01	– Record of Drawings
Section 03 30 00	– Cast-In-Place Concrete
Section 05 50 00	– Metal Fabrication
Section 31 23 01	– Excavation
Section 32 11 23	– Aggregate Base Courses
Section 32 12 16	– Asphalt Paving
Section 32 13 13	– Concrete Paving
Section 32 13 73	– Concrete Paving Joint Sealants
Section 32 31 13	– Chain Fencing

**1.7 Recording Actual Site
Conditions**

(add to clause 1.7 as follows)

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

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:
 - 1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.
 - 2. Section 03 30 20 Concrete Walks, Curbs and Gutters.
 - 3. Section 32 13 13 Concrete Paving.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement.

1.3 INFORMATIONAL SUBMITTALS

- A. Material certificates.
- B. Material test reports.
- C. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.
- D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

- B. Testing Agency Qualifications: An independent agency, **acceptable to authorities having jurisdiction**, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1.5 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.6 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1.
 - 1. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M).

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301 (ACI 301M).
 - 2. ACI 117 (ACI 117M).

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
 - 1. Board Form: Rough Cut Hemlock, 150mm (6") Dimension. Sample to be provided to Consultant/City Representative for approval prior to construction of form work.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- D. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

2.4 CONCRETE MATERIALS

- A. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, [**Type I**].
 - 2. Fly Ash: ASTM C 618, [**Class F**]
 - 3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
 - 4. Blended Hydraulic Cement: ASTM C 595/C 595M.
- B. Normal-Weight Aggregates: ASTM C 33/C 33M, graded.
 - 1. Maximum Coarse-Aggregate Size **3/4-inch (19 mm)** nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Lightweight Aggregate: ASTM C 330/C 330M, **1-inch (25-mm), 3/4-inch (19-mm), 1/2-inch (13-mm), 3/8-inch (10-mm)** nominal maximum aggregate size.
- D. Air-Entraining Admixture: ASTM C 260/C 260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

- F. Water: ASTM C 94/C 94M.

2.5 FIBER REINFORCEMENT

- A. Synthetic Micro-Fiber: Monofilament polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, **1 to 2-1/4 inches (25 to 57 mm)** long.
- B. Synthetic Micro-Fiber: Fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, **1 to 2-1/4 inches (25 to 57 mm)** long.

2.6 WATERSTOPS

- A. Flexible Rubber Waterstops: CE CRD-C 513, **with factory-installed metal eyelets**, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
- B. Chemically Resistant Flexible Waterstops: Thermoplastic elastomer rubber Waterstops **with factory-installed metal eyelets**, for embedding in concrete to prevent passage of fluids through joints; resistant to oils, solvents, and chemicals. Factory fabricate corners, intersections, and directional changes.
- C. Flexible PVC Waterstops: CE CRD-C 572, **with factory-installed metal eyelets**, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
- D. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).
- E. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer-modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch (10 by 19 mm).

2.7 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

- D. Water: Potable.

2.8 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: [**ASTM D 1751, asphalt-saturated cellulosic fiber**].

2.9 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned based on laboratory trial mixture or field test data, or both, according to ACI 301 (ACI 301M).
- B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Normal-Weight Concrete:
1. Minimum Compressive Strength: **4500 psi (31 MPa)** at 28 days.
 2. Maximum W/C Ratio: **0.50**
 3. Slump Limit: **4 inches (100 mm)** plus or minus 1 inch (25 mm).
 4. Air Content: **5.5** percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
 5. Air Content: **6** percent, plus or minus 1.5 percent at point of delivery for **1-inch (25-mm), 3/4-inch (19-mm)** nominal maximum aggregate size.
 6. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
 7. Synthetic Micro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than a rate of **1.0 lb/cu. yd. (0.60 kg/cu. m), 1.5 lb/cu. yd. (0.90 kg/cu. m)**.

2.11 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and **ASTM C 1116/C 1116M** and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

2.13 ANTI-GRAFFITI COATING

- A. All walls exceeding a height of 0.6 metres shall be protected by an Anti-Graffiti coating. Acceptable suppliers and proprietary products include:
 - 1. CBR 501-AG Anti-Graffiti Coating by Broda Stains and Coatings, as supplied by CBR Products, Cordova, Vancouver BC. (604-254-3325).

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).
- C. **Chamfer** exterior corners and edges of permanently exposed concrete as shown in drawings.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 VAPOR-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.4 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least **one-fourth** of concrete thickness as follows:
 - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

3.6 WATERSTOP INSTALLATION

- A. Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions.

3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed. Arrange site review for formwork and reinforcement with Consultant 24 hours prior to concrete pour. All density testing results to be provided to Consultant prior to concrete pour.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).

3.8 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces **not exposed to public view**.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
- C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:
 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
 3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix 1 part portland cement and 1 part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
 2. No trowel edges.

3.10 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 (ACI 301M) for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer **unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.**

3.11 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by City Representative/Consultant. Remove and replace concrete that cannot be repaired and patched to City Representative/Consultants approval.

END OF SECTION 033000

Part 1 GENERAL

1.1 Summary

1. This section covers the fabrication and installation of Monkey Bars and other Parkour bar and post elements, post anchors and handrails submitted from suppliers.

1.2 Related Requirements:

1. Section 10 14 00 – Signage.
2. City of Coquitlam Specifications:
 - .1 Section 03300 – Cast-in-place Concrete.

1.3 Administrative Requirements

1. Pre-Installation Meetings: convene pre-installation meeting a min. of 5 business days prior to beginning on-site installation, with contractor's representative, and Consultant in accordance with Section 01 32 16.07 – Construction Progress Schedule – Bar (GANTT) Chart to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Coordination with other subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.

1.4 Action and Informational Submittals

1. Submit in accordance with Section 01 33 00 – Submittal Procedures.
2. Architectural Signage Manufacturer:
 - .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal lettering and include product characteristics, performance criteria, physical size, finish, and limitations.
3. Metal Shop / Fabricator:
 - .1 Shop Drawings:
 - .1 Indicate details of construction, profiles, jointing, fastening and other related details.
 - .2 Indicate materials, thicknesses, finishes and hardware.
4. Samples:
 - .1 Sample of fabricated work and finishes is to be submitted for approval as per Section 01 33 00 – Submittal Procedures.
 - .2 Allow 5 business days for inspection of samples by Consultant before proceeding with Work.
 - .3 When accepted, samples will demonstrate minimum standard for Work.
 - .4 Do not proceed with work prior to receipt of written acceptance of sample by Consultant.
 - .5 Accepted samples shall be retained by Owner for reuse, as needed.

1.5 Informational Submittals

1. Product Data:
 - .1 Submit manufacturer's printed product literature panel signage or components, specifications and datasheet and include product characteristics, performance criteria, physical size, finish, and limitations.
2. Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

1.6 Quality Assurance

1. Welding work to conform to CSA Standard W59 and shall only be performed by organizations and operators qualified under CSA Welding Qualification Code, CSA W47.
2. Electrodes to conform to CSA Standard W48.

3. Finishes: Material finish as specified on drawings or approved equal.

1.7 Delivery

1. All miscellaneous metal items delivered to the site shall be tagged and supplied with sufficient information for identification and fixing in correct location.
2. Arrange delivery in such sequence and manner to permit the most efficient and economical performance of this section of work as per Section 01 32 16.07 – Construction Progress Schedule – Bar (GANTT) Chart.

1.8 Protection

1. Protect miscellaneous metal before, during, and after installation until Final Acceptance.
2. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and City Representative at the Contractor's cost.

1.9 Cooperation

1. Cooperate with all other trades and subconsultants in the installation of the work of this section.

Part 2 **PRODUCTS**

2.1 Materials

1. Horizontal Bars:

.1 Metal:

- .1 Schedule 40 30,000 psi (210MPa) Steel
- .2 1 ½" Diameter, 1.9" O.D.
- .3 Iron Pipe Size XS, Schedule 80S

2. Vertical Posts

.1 Metal:

- .1 Schedule 40 30,000 psi (210MPa) Steel
- .2 4.5" Diameter
- .3 Iron Pipe Size STD
- .4 Schedule 40S
- .5 Wall Thickness 0.237"

3. Diagonal Stabilizing Bar

.1 Metal:

- .1 Schedule 40 30,000 psi (210MPa) Steel
- .2 1 ¼" Diameter, 1.66" O.D.
- .3 Iron Pipe Size XS
- .4 Schedule 40S

Part 3 **EXECUTION**

3.1 Examination

1. Examine all details of the work as related to this section and other sections. Ensure that all conditions are suitable to provide a complete and satisfactory installation or be responsible for any additional costs involved.
2. Carefully inspect all surfaces and the work of other trades as it relates to the work of this Section for defects and discrepancies and report same to the Consultant and City representative.

3.2 Fabrication

1. Verify all dimensions on site prior to proceeding with shop fabrication.
2. Fabricate all work in accordance with details shown on drawings and reviewed/stamped shop

drawings.

3. Fabricate items from steel unless otherwise noted.
4. Where possible, fit and shop assemble work, ready for erection. This includes the majority of the monkey bar set. Due to overall dimensions some on-site welding may be required.
5. Fabricate and assemble miscellaneous metal items true, square, and free from warpage or other defects.
6. Items to be fixed to or set in concrete as per plans unless approved otherwise.
7. Design, fabrication, and workmanship shall conform to CAN3-S16.1-M94.
8. Welding shall conform to CSA W59-M89.
9. Grind smooth all exposed welds, sharp edges, angles, and corners.
10. Ensure exposed welds are continuous for length of each joint.
11. Provide smooth exposed surfaces with all fastenings and connections hidden where possible.
12. Curved work shall be true to radii shown.
13. All welding to occur in a controlled environment.

3.3 Erection

1. Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
2. Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor chips, bar anchors, expansion bolts and shields, and toggles. Ensure that items cast into concrete or built into masonry are given to the appropriate trades together with setting templates.
3. Execute all metal work in a thorough manner according to best shop practices. Material cut from stock to be sheared or parted straight and all debarred. Where cuts are burned, grind off clean and true to line. Exposed welding or welding in fitted surfaces to be ground smooth or fileted as required. Fabricate all items accurately, true to line and dimension.
4. Make field connections with bolts to CAN3-S16.1-M84, or weld.
5. Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
6. Fastenings shall be concealed where possible, sizes and spacing as indicated on the drawings, and shall conform to local municipal requirements, CSA Specifications, and best trade practices to give permanent stability and good appearance. Avoid staining, scratches, damage, and distortion of materials.
7. Fix in place with epoxy grout where applicable. Remove excess epoxy grout by approved means, leaving the surface around each handrail base smooth and clean.

3.4 Installation

1. Horizontal and Vertical Bars: Set in concrete as per plans and details.
- 2.

3.5 Site Maintenance/Clean-Up

1. The job site shall be kept in a neat, clean, and orderly condition at all times during the installation process.
2. Erection/installation of all miscellaneous metal shall be continuous so that the amount of exposed/unprotected/incomplete work at the end of each workday is minimized. Any unsafe conditions created by work of this Section shall be barricaded and marked with high visibility marking tape to current Worker's Compensation Board requirements.
3. Any damage to paving, planting or any other site element due to work of this Section shall be immediately repaired at the Contractor's expense to satisfaction of Consultant.
4. Remove and dispose of all surplus material, excess excavated materials, trash, debris, residue, and waste material from the work of this Section as per Section 01 35 43 – Environmental Procedures and local code.

END OF SECTION 05 55 00

PART 1.0 - 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 City 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 complete satisfaction of the City 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 City 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 City 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 City Representative /Consultant.
- .4 Native Material:
 - .1 Refer to Section 32 91 21 - Topsoil and Finish Grading

1.5 Protection

- .1 Examine site with City 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 City 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, benchmarks, 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 City 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 City 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 City Representative/Consultant is to inspect and approve all stages of the work.
 - .1 Provide forty-eight (48) hours notice to the City Representative/Consultant when inspection is required.
- .5 At the City 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 City 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 **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 City 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 City 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 City 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 City 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 City Representative/Consultant
 - .4 Perform over excavation only by written authorization of the City Representative/Consultant. If additional over excavation is required, City 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 City 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 City Representative/Consultant.
- .2 Measurement and payment for removal and off-site disposal of surplus, soft or unsuitable material revealed during proof-rolling include, 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 City Representative/Consultant.
- .3 Loads removed offsite that are **not witnessed** by the City 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 City Representative/Consultant as loads are delivered. Loads delivered that are **not witnessed** by the City 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 City Representative/Consultant.

PART 2.0 – PRODUCTS

2.1 Materials (if backfill required)

.1 Backfill

- .1 Use suitable existing inorganic material approved by the City 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 City 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 - Excavating and Backfilling
 - .2 Section 31 05 17 - Aggregate and Granular Materials
- .2 Excavated or graded material conforming to the backfill specification may be used as site fill or for grading work after approval by the City Representative/Consultant.
- .3 The City 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 City Representative/Consultant prior to use of this material.
- .5 Protect approved material from contamination.
- .6 **Recycled Concrete**

- .1 Recycled concrete free from 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 from 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 Subbase

- .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

PART 3.0 – EXECUTION

3.1 Excavation

- .1 Prior to commencing excavation the Contractor shall:
 - .1 Confirm in writing to the City Representative/Consultant that he has verified the locations of all underground services.
 - .2 Obtained in writing and submitted to the City 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 City 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 ensure that the placement of fill materials is minimized.
- .6 Contractor shall phase his operation so that a stable slope at the edge of excavation is always maintained. 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 City 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 City Representative/Geotechnical Engineer when excavations are complete.
- .16 Excavation taken below depths shown on the Contract Drawings without the written authorization of the City 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 City Representative/ Engineer 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 City 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 City Representative/Geotechnical Engineer when bottom of excavations appears unsuitable and proceed as directed by the City Representative/Geotechnical Engineer.
- .24 Obtain City Representative/Geotechnical Consultant approval of completed excavation.
- .25 Remove unsuitable material from bottom of excavation to extended depth as directed by City Representative/Geotechnical Engineer. Backfill and compact as directed by City Representative/Geotechnical Engineer.
- .26 Hand trim roots, make firm, and remove loose materials and debris from excavations.
- .27 Costs incurred because 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 City Representative/Geotechnical Engineer.
 - .2 All backfill materials shall have been inspected and approved by the City Representative/Geotechnical Engineer
 - .3 Each component of the backfill operation shall have been inspected and approved by the City Representative/Geotechnical Engineer at the time of placement.
 - .4 Compaction density tests shall have been completed and tests results reviewed and approved by the City Representative/Geotechnical Engineer.
- .2 Place crushed granular subbase 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 inside hill or sloping sections to ensure proper bond between new materials and existing surfaces. Method used to be subject to prior approval of the City 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 City 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 City 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 City 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 Sub grade 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

- .1 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. 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 City 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. Equipment that does not achieve specified densities must be replaced or supplemented.

3.9 Finish Grading

- .1 See Section 2921 - Growing Medium Placement 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 31 23 01SS

Part 1 General

1.1 PRODUCTS INSTALLED BUT NOT SUPPLIED UNDER THIS SECTION

- .1 N/A

1.2 RELATED REQUIREMENTS

- 1.2.1 Section [01 74 21 - Construction/Demolition Waste Management and Disposal].
- 1.2.2 Section [31 24 13 - Roadway Embankments].
- 1.2.3 Section [31 05 16 - Aggregate Materials].
- 1.2.4 Section [32 11 16.01 - Granular Sub-base].

1.3 REFERENCES

- .1 ASTM International
 - .1 ASTM C117 - [04], Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131 - [06], Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136 - [06], Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D698-[07e1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
 - .5 ASTM D1557 - [09], Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³) (2,700kN-m/m³).
 - .6 ASTM D1883 - [07e2], Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .7 ASTM D4318 - [10], Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1 - [88], Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2 - [M88], Sieves, Testing, Woven Wire, Metric.

1.4 ACTION AND INFORMATIONAL 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.

Part 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] [ASTM C117]. Sieve sizes to [CAN/CGSB-8.1] [CAN/CGSB-8.2].

- .1 Gradation Method #1 to:

Sieve Designation	% 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]	

- .2 Native Fill Material
 - .1 Will be considered but must be reviewed and approved by either the project Geotechnical Engineer or should a Geotechnical Engineer not be part of the project team a Geotechnical Engineer engaged by the Contractor at no cost to the Owner.
- .3 Pit Run Gravel
 - .1 To be well graded granular material, substantially free from clay lumps, organic matter, and other extraneous material, screened to remove all stones more than **the** maximum diameter specified in material

description, e.g. (300mm Pit Run Gravel, 200mm Pit Run Gravel and 100mm Pit Run Gravel). Recycled concrete free from contaminated and other extraneous materials conforming to the specified gradations may be used as pit run gravel.

Shall conform to the following gradation limits:

Sieve Size (mm)	Percent Passing
(300)	100
(200)	100
(100)	100
75	100
50	70-100
25	50-100
4.75	22-100
2.36	10-85
0.075	2-8

.4 Granular Subbase

.1 Shall be 75 mm minus, clean, granular material free of organic material.

.2 The granular subbase shall conform to the following gradation limits:

Sieve Size (mm)	Percent Passing
75	100
37.5	60-100
19	35-80
9.5	26-60
4.75	20-40
2.36	15-30
1.18	10-20
0.6	5-15
0.3	3-10
0.075	0-5

.5 River Sand

.1 River sand to be free of organic material, salt, and foreign objects.

.2 River sand shall conform to the following gradation standards:

Sieve Size (mm)	Percent Passing
19	100
4.75	80-100
0.6	20-100
0.425	10-100
0.15	0-50
0.075	0-4

.6 Filter Fabric

- .1 Needle-punched, non-woven filter fabric, Nilex 4551 as manufactured by Nilex, or pre-approved equivalent.
- .2 Fabric to be 100% Polypropylene, non-woven, needle-punched engineering fabric. Material to be AMOCO 4546 or approved equal.
- .3 Fabric to have the following hydraulic properties:
 - .1 Apparent size opening US SIEVE (ASTM-D4751) 70.
 - .2 Permittivity Sec-1 (ASTM-D4491) 2.0.
 - .3 Flow rate gal/min/sq.ft. (ASTM-D4491) 145.Fabric to have the following physical properties:
 - .1 Grab Tensile Strength lbs. (ASTM-D4632) 100.
 - .2 Grab Tensile Elongation % (ASTM-D4632) 50.
 - .3 Mullen Burst PSI (ASTM-D3786) 225.
 - .4 Puncture lb. (ASTM-D4833) 65.
 - .5 Trapezoid Tear lb. (ASTM-D4533) 45.
 - .6 UV Resistance % (ASTM-D4355 – 500 hours)70.
- .4 Fabric to be placed with a minimum width of 4.0 metres and a minimum continuous length of 50 metres. When a length of fabric is not continuous, the lateral seam shall have a minimum overlap of 0.6 metres. The fabric shall not be folded or turned up along the edges.
- .7 Permeable Aggregates
 - .1 Permeable aggregates shall be a product manufactured by using clean crushed rock (less than 2% fines) and washed concrete sand (less than 2% fines). Bank sand is not an acceptable component for use in the mixture.
 - .2 Field Surface Drain Rock
 - .1 To be clean, washed, uniformly graded torpedo gravel conforming to the following gradations:

Sieve Size (mm)	Percent Passing
19	100
15.8	85-100
12.5	15-85
9.5	0-15
4.75	0-5
2.36	0-4
1.18	0-2
 - .3 Field Course Permeable Aggregate
 - .1 To be open-graded, fractured, and conforming to the following gradations:

Sieve Size (mm)	Percent Passing
19	100
12.5	60-100
9.5	40-90
4.75	30-80
2.36	10-60
0.60	10-20
0.15	2-5
0.075	0-2

- .4 Aggregate to be a minimum of 75% fractured with at least one fractured face by mechanical means on each individual particle larger than 6.4mm.
- .5 Aggregate to be clean and shall have a minimum infiltration rate of 250mm per hour in accordance with the test procedure set out in Section 1.12.4 of this document.
- .6 Compact to 95% of maximum dry density as per ASTM D698.

Part 3 Execution

3.1 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to [sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent].
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PLACEMENT AND INSTALLATION

- .1 Place granular base after sub-base and/or subgrade surface is inspected and approved in writing by City 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 City 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 can obtain 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 City 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 95% MPD.
 - .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 Consultant.
 - .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.
- .5 Proof rolling:
 - .1 For proof rolling use standard roller of [45400] kg gross mass with four pneumatic tires each carrying [11350] kg and inflated to [620] kPa. Four tires arranged abreast with centre to centre spacing of [730] mm.
 - .2 Obtain written approval from [Consultant] to use nonstandard proof rolling equipment.
 - .3 Proof roll at level in granular base as indicated.
 - .1 If use of nonstandard proof rolling equipment is approved, [Consultant] to determine level of proof rolling.
 - .4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.
 - .5 Where proof rolling reveals areas of defective subgrade:
 - .1 Remove base, sub-base and subgrade material to depth and extent as directed by [Consultant].

- .2 Backfill excavated subgrade with [common material and compact in accordance with Section [31 22 14 - Airfield Grading]] [sub-base material and compact in accordance with Section [32 11 16.01 - Granular Sub-Base]].
- .3 Replace sub-base material and compact in accordance with Section [32 11 16.01 - Granular Sub-base].
- .4 Replace base material and compact in accordance with this Section.
- .6 Where proof rolling reveals defective base or sub-base, remove defective materials to depth and extent as directed by [Consultant] and replace with new materials in accordance with Section [32 11 16.01 - Granular Sub-base] and this section at no extra cost.
- .6 Handling of Base Course Permeable Aggregates
 - .1 Subgrade and drain trenches must be accepted by the consultant prior to placement of any permeable aggregates. Remove any contamination from the drain rock trenches before placing base aggregates.
 - .2 Place geosynthetic fabric and cover immediately with base course aggregate. Do not allow equipment on fabric.
 - .3 No trucks or equipment to drive over drain rock trenches until after a minimum of 200 millimetres of compacted base aggregate is covering the drain rock.
 - .4 Keep moisture content of permeable aggregates at 3% to 5% in the stockpile and add water at site as required to achieve same moisture content.
 - .5 When material is dumped on-site minimize distance material is pushed. After material is dumped from the truck, mix material with excavator bucket to eliminate segregation as directed by the Consultant.
 - .6 Place base aggregate in one lift of specified thickness.
 - .7 Do not place base aggregate if water is ponded on subgrade.
 - .8 Remove and dispose of material which becomes segregated because of construction process. This applies both during placement of material and surface segregation after final grading.
- .7 Dewatering
 - .1 Pump or otherwise continuously remove all water that has accumulated in excavation during the progress of the Work.
 - .2 Do not divert water onto adjacent property.
 - .3 Ensure that sediment control devices are in place as per municipal or provincial regulations prior to the start of dewatering operations. Do not divert dewatering effluent to natural water bodies.

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.

- .2 Finished tolerances for permeable aggregate.
 - .1 Field course plus or minus 3 millimetres from specified grade but not uniformly high or low. No irregularities exceeding 6 millimetres when checked with a 3-metre straight edge placed in any direction.
 - .2 All grading of subgrade and field aggregates to be controlled using laser survey equipment.

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

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hot-mix asphalt patching.
2. Hot-mix asphalt paving.
3. Hot-mix asphalt overlay.

B. 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

- A. Preinstallation Conference: Conduct conference at **Mackin Park, City of Coquitlam.**

1.3 ACTION SUBMITTALS

- A. Product Data: **Contractor is to submit a Design Mix of each mix-type for City Representative/Consultant to review and approve prior to ordering and/or placing on site.**

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each paving material. **Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.**

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: **A paving-mix manufacturer registered with and approved by authorities having jurisdiction.**

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Coarse Aggregate: ASTM D 692/D 692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

- B. Fine Aggregate: **ASTM D 1073 or AASHTO M 29**, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
- C. Mineral Filler: **ASTM D 242/D 242M or AASHTO M 17**, rock or slag dust, hydraulic cement, or other inert material.
- D. 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

- A. Asphalt Binder: AASHTO M 320, **PG 64-22**.

2.3 MIXES

- A. Surface Course Limit: Recycled content no more than **10** percent by weight.
- B. 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.)

PART 3 - EXECUTION

3.1 PATCHING

- A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending **12 inches (300 mm)** 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.
- B. 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

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. 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

- A. 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 **250 deg F (121 deg C)**.
 - 2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than **10 feet (3 m)** wide unless infill edge strips of a lesser width are required.

- C. 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

- A. 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 **6 inches (150 mm)**.
 - 3. Offset transverse joints, in successive courses, a minimum of **24 inches (600 mm)**.
 - 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

- A. 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 **185 deg F (85 deg C)**.
- B. 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.
- C. 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.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. 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.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus **1/2 inch (13 mm)**.
 - 2. Surface Course: Plus **1/4 inch (6 mm)**, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a **10-foot (3-m)** straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: **1/4 inch (6 mm)**.
 - 2. Surface Course: **1/8 inch (3 mm)**.

3.7 FIELD QUALITY CONTROL

- A. Replace and compact hot-mix asphalt where core tests were taken.
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

- A. 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)**
- B. Do not install asphalt concrete paving on frozen, wet, muddy or rutted base(s).

- C. 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.
- D. Use Oil Soak Blotters in catch basin spillways and elsewhere as directed to avoid spilling oil into site drainage system(s) or adjacent watercourses.
- E. 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

- B. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes Concrete Paving. **Including the Following:**

1. Walks and dugout areas.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each type of product, ingredient, or admixture requiring color selection.
- C. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.3 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1.4 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures. Testing agency to be approved by City Representative and Consultant.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with **ACI 301** (**ACI 301M**) unless otherwise indicated.

2.2 STEEL REINFORCEMENT

- A. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, fabricated from as-drawn steel wire into flat sheets.
- B. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

- C. Reinforcing Bars: ASTM A 615/A 615M, **Grade 60 (Grade 420)**; deformed.
- D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified.

2.3 CONCRETE MATERIALS

- A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C 150/C 150M, portland cement **Type I**.
- B. Normal-Weight Aggregates: ASTM C 33/C 33M, **Class 4M**.
- C. Air-Entraining Admixture: ASTM C 260/C 260M.
- D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
- E. Water: Potable and complying with ASTM C 94/C 94M.

2.4 FIBER REINFORCEMENT

2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, **Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry or cotton mats**.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.

2.6 RELATED MATERIALS

- A. Joint Fillers: **ASTM D 1751, asphalt-saturated cellulosic fiber** in preformed strips.
- B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to **ACI 301 (ACI 301M)**, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
- B. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
 - 1. Air Content: **5-1/2** percent plus or minus 1-1/2 percent.
- C. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
- D. Concrete Mixtures: Normal-weight concrete.
 - 1. Compressive Strength (28 Days): **4640 psi (32 MPa)**.
 - 2. Maximum W/C Ratio at Point of Placement: **[0.45]**
 - 3. Slump Limit: **5 inches (125 mm)**, plus or minus **1 inch (25 mm)**.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M **and ASTM C 1116/C 1116M**. Furnish batch certificates for each batch discharged and used in the Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Proof-roll prepared subbase surface below **concrete paving** to identify soft pockets and areas of excess yielding.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT INSTALLATION

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness.
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a **1/4-inch (6-mm)** radius. Repeat tooling of edges after applying surface finishes. **Eliminate edging-tool marks on concrete surfaces.**

3.6 CONCRETE PLACEMENT

- A. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- B. Comply with **ACI 301 (ACI 301M)** requirements for measuring, mixing, transporting, and placing concrete.
- C. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- D. Screed paving surface with a straightedge and strike off.
- E. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.

- B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by **moisture curing, moisture-retaining-cover curing, or a combination of these.**

3.9 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 (ACI 117M) and as follows:
 - 1. Elevation: 3/4 inch (19 mm).
 - 2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
 - 3. Surface: Gap below 10-feet- (3-m-) long; unlevelled straightedge not to exceed 1/2 inch (13 mm).
 - 4. Joint Spacing: 3 inches (75 mm).
 - 5. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
 - 6. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.10 REPAIR AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Consultant / City Representative.
- B. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

- C. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold-applied joint sealants.
2. Hot-applied joint sealants.
3. Joint-sealant backer materials.
4. Primers.

1.2 PREINSTALLATION MEETINGS

- #### A. Preinstallation Conference:
- Conduct conference at **Centennial Secondary School** or via phone/online if appropriate. To be decided by City of Coquitlam and according to their health and safety measures.

1.3 ACTION SUBMITTALS

- #### A. Product Data:
- For each type of product.
- #### B. Samples:
- For each kind and color of joint sealant required.
- #### C. Paving-Joint-Sealant Schedule:
- Include the following information:
1. Joint-sealant application, joint location, and designation.
 2. Joint-sealant manufacturer and product name.
 3. Joint-sealant formulation.
 4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- #### A. Product certificates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- #### A. Compatibility:
- Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

2.2 COLD-APPLIED JOINT SEALANTS

- A. Single-Component, Nonsag, Silicone Joint Sealant: ASTM D 5893/D 5893M, Type NS.
- B. Single-Component, Self-Leveling, Silicone Joint Sealant: ASTM D 5893/D 5893M, Type SL.
- C. Multicomponent, Nonsag, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use T.
- D. Single Component, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Use T.
- E. Multicomponent, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade P, Class 25, for Use T.

2.3 HOT-APPLIED JOINT SEALANTS

Classifications of sealants in this article are based on ASTM D 6690. Type I is for moderate climates and tested down to zero deg F (minus 18 deg C) with 50 percent extension. Type II and Type III are for most climates and tested down to minus 20 deg F (minus 29 deg C) with 50 percent extension. Type IV is for very cold climates and tested down to minus 20 deg F (minus 29 deg C) with 200 percent extension.

- A. Hot-Applied, Single-Component Joint Sealant: ASTM D 6690, Type I.

2.4 JOINT-SEALANT BACKER MATERIALS

- A. Round Backer Rods for Cold- and Hot-Applied Joint Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
- B. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.
- C. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.5 PRIMERS

- A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

PART 3 - EXECUTION

3.1 INSTALLATION OF JOINT SEALANTS

- A. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Cleaning of Joints: Clean out joints immediately to comply with joint-sealant manufacturer's written instructions.
- C. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer.
- D. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions.
- E. Install joint-sealant backings to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of joint-sealant backings.
 - 2. Do not stretch, twist, puncture, or tear joint-sealant backings.
 - 3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.
- F. Install joint sealants immediately following backing installation, using proven techniques that comply with the following:
 - 1. Place joint sealants so they fully contact joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- G. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:
 - 1. Remove excess joint sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- H. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.
- I. Clean off excess joint sealant as the Work progresses, by methods and with cleaning materials approved in writing by joint-sealant manufacturers.

END OF SECTION 321373

PART 1.0 – 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 City 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 City 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 City 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 before removal and all necessary new materials to complete reinstatement.

PART 2.0 – 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, City 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 unless otherwise specified on drawings. 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 unless otherwise specified on drawings:
 - .1 For passive and low activity City and Park areas the chain link fence is to be:
 - .1 1200mm high with the post spacing 2400mm o.c. and,
 - .2 Chain link fabric to be 9 gauge (3.55mm diameter) galvanized, vinyl coated, black, commercial grade with 50mm openings.
 - .2 For high activity City and Park areas the chain link fence is to be:
 - .1 1200mm high with the post spacing 2400mm o.c. and,
 - .2 Chain link fabric to be 6 gauge(4.50mm) galvanized, vinyl coated, black, commercial, and heavy grade with 50mm openings.
 - .3 For the soccer playing field backstop fences the chain link fence is to be:
 - .1 6000mm and higher with the post spacing 2400mm o.c. (unless otherwise specified on drawings) and,
 - .2 Chain link fabric to be 6 gauge(4.50mm) 6 gauge galvanized, vinyl coated, black, commercial, and heavy grade with 38mm openings.
 - .3 Posts and rails for all fencing locations are to CAN/CGSB-138.2, schedule 40 galvanized steel pipe and are to be powder-coated black steel pipe. No short lengths, tubing, conduit or open seam material will be permitted.
 - .1 Post and rail sizes are to be as follows unless otherwise specified on drawings:
 - .1 For passive/active public/non-public areas which are 1200mm or 2400mm and higher:
 - .1 Corner and gate posts are to be 76mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .2 Line posts are to be 60mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .3 Top and bottom rails and horizontal braces are to be 48mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .4 Bottom tension wire to be single stand, 6 gauge (4.50mm diameter) black vinyl coated, galvanized steel wire.
 - .2 Soccer playing field backstop which are 8400mm high:
 - .1 Corner and line posts to be 168.3mm (6 5/8") nominal outside diameter, standard continuous weld Schedule 40, 50ksi (345MPa) ASTM F1083 steel pipe, powder-coated black.
 - .2 Bottom and horizontal bracing rails to be 48mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .3 Top bracing rails to be 60mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .4 Tie wire fasteners are to be single strand, black vinyl coated galvanized aluminium 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 black powder coated steel.
- .7 Tension bar bands: 3 x 20 mm galvanized black powder coated steel or 5x20mm minimum black powder coated aluminium.
- .8 All fastenings and fittings to be hot dip galvanized.
- .9 All caps to be powder coated black and welded in place.
- .10 Install the chain link fence person gates and vehicle gates as indicated on the Contract Drawings.
 - .1 Chain Link Vehicle Gates.
 - .1 The vehicle gates are not to use a centre post. The closure device is to operate by securing the gates together when in the closed position. The closure device is to operate independent of the locking pins. Closure device must accept a standard padlock.
 - .2 The vehicle gate is to have locking pins with locking pin aluminum sleeves recessed 25mm into the concrete walkway to secure the gates in the open and closed positions. The top of the sleeve is to be flush with the surrounding concrete surface. The locking pin rod is to be spring-loaded so that the pin is always in the raised position unless pushed and turn locked into place, as per the drawings herein.
 - .3 The vehicle gate is to be 3.65 metres high to be bridged with a top rail over it, as per detail.
 - .4 The vehicle gate is to operate on wheels which fully support the weight of the gate. The wheels must be suitable for use on concrete surfaces and must not mark the concrete surface.
 - .5 Vehicle gates are not to have signage inserts.
 - .6 All hinges are to be heavy duty and welded into place.
 - .2 Chain Link Person Gates.
 - .1 The person gates are to have clear openings of as shown on plans to accommodate handicapped accessible for sports wheelchairs.
 - .2 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.

- .3 The Dog Park gates are to be able to swing 90 degrees if they will hit the adjacent fence and 135 degrees if they open into the dog park area.
- .4 For soccer playing field entry gates, the gates are not to have locking pins for the open positions. Field entry gates are to be able to swing 180 degrees wide and lock open by attaching to main fence line.
- .5 The person gates are to be to the full height of the fence and are not to be bridged with a top rail over them as to eliminate any restrictions on the height of objects passing through the gate.
- .6 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.
 - .4 For vinyl coating: 0.045mm minimum dry film thickness
- .2 Powdercoating:
 - .1 Powdercoat all exposed surfaces. Powder coating to use powdercoat paint on acid washed surfaces. Wash and coating to be completed on a conveyor system. Dipping is not acceptable. Finish must be baked dry. Colour to be black except for backstop signage and signage inserts which are to have Owner selected custom colours.
 - .2 The powder-coat finish must not crack or chip when scratched tested.
- .3 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 high gloss finish. Use black or a custom colour as necessary to match the surrounding powder-coating.

PART 3.0 - 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 Removal and re-use of useable existing chain link fabric

- .1 Cut tie wires and remove existing fabric. Take care not to stretch or otherwise damage the fabric. Do not re-use damage portions of existing fabric.
- .2 Cut fabric to length and height as required. Ensure cut edges are properly and securely tied. Attach fabric as per the specifications herein.
- .3 All surplus fabric is to be rolled up into roll sizes that are manageable by one person and handed over to the City Representative if, requested to do so. Damaged fabric to be disposed of off-site.

3.6 Removal and re-use of useable existing chain link posts and rails

- .1 Cut existing posts and rails taking care to maximize the usable length of the existing post or rail. Do not re-use damage posts or rails.
- .2 Cut posts and rails as required. Prepare surfaces and powder-coat as per the specifications herein. Install posts and rails as per the specifications herein. 2400mm post spacing can be adjusted to accommodate re-used rails. Ensure that where spacing is adjusted it is consistent and in one section of fence.

- .3 Dispose of damaged or surplus posts, rails, and mesh off-site

3.7 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.

3.8 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 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 black high gloss organic zinc-rich paint.
 - .2 One (1) 500 ml can of high gloss organic zinc-rich paint of each custom colour.
 - .3 Four (4) packages of 50 tie wires.

END OF SECTION 32 31 13SS

Appendix C – Sediment and Erosion Control

Sediment and Erosion Control

The following mitigation measures will be implemented to prevent the introduction of sediment into the surrounding environment and avoid/reduce potential environmental effects.

- a) Construction activities must be conducted in a manner that prevents sediment and/or sediment-laden waters from entering aquatic environments.
- b) Works will occur during dry weather conditions where feasible.
- c) Existing site access routes, roads and trails will be utilized where possible.
- d) All exposed soil surfaces that could contribute sediment-laden water into the aquatic environment during precipitation events must be protected from erosion. Sufficient quantities of curlex sediment logs, erosion control blankets, polyethylene sheeting, filter cloth, sandbags and other appropriate measures that are necessary to stabilize exposed soils must be onsite prior to commencement of works. The PM will work with the contractor to field fit ESC measures in select locations where necessary based on proximity to watercourses, slope of the land, level of disturbance and weather conditions.
- e) Where implemented, the Contractor will inspect and maintain ESC measures regularly.
- f) Temporary stockpiles will be located within predetermined laydown areas. Predetermined areas should be located as far as possible from the top of bank of adjacent watercourses. Stockpiles are to be laid on top of and covered by tarps or polyethylene sheeting (min. 6 mil) and anchored with sandbags or stakes to prevent erosion and soil mobilization when not in use and during wet conditions.
- g) Any exposed soils will be stabilized through application of a suitable seed mix and covered with straw mulch to a depth of 2.5 cm.



City of Coquitlam

REQUEST FOR PROPOSALS

RFP No. 22-012

Mackin Park Backstop Replacement

Proposals will be received on or before 2:00 pm local time on

Friday, January 28, 2022

(Closing Date and Time)

INSTRUCTIONS FOR PROPOSAL SUBMISSION

Proposal submissions are to be consolidated into one PDF file and uploaded through QFile, the City's file transfer service accessed at website: qfile.coquitlam.ca/bid

1. In the "Subject Field" enter: RFP Number and Name

2. Add files in .pdf format and "Send"

(Ensure your web browser remains open until you receive 2 emails from QFile to confirm upload is complete.)

Proponents are responsible to allow ample time to complete the Proposal Submission process. If assistance is required phone 604-927-3037.

Legal Name of Proponent	
Contact Person and Title	
Business Address	
Telephone	
Email Address	

1.

DEPARTURES AND AWARD

a) CONTRACT - I/We have reviewed the City's Standard Terms and Conditions - Purchase of Goods and Services and would be prepared to enter into an agreement that incorporates the City's Stand Terms and Conditions, amended by the following departures (list, if any):	
Section	Requested Departure(s) / Alternative(s)
b) SERVICES - I/We have reviewed the Scope of Services as described in this RFP and are prepared to meet those requirements, amended by the following departures and additions (list, if any):	
Requirements – Requested Departure(s) / Alternate(s) / Addition(s)	
c) AWARD - For eligibility of award, the City requires the successful Proponent to complete and have the following in place before providing the Goods and Services.	
i. WCB - WorkSafe BC coverage in goodstanding and further, if an "Owner Operator" is involved, personal operator protection (P.O.P.) will be provided:	WCB Registration Number:
ii. Prime Contractor - Acceptance of Prime Contractor Designation for the Services: Prime Contractor Designation Form	Qualified Coordinator: Contact Number:
iii. Insurance – Provide Insurance coverage as per the City's Standard Insurance Form	
iv. Vendor Info - Complete and return the City's Vendor Profile and Electronic Funds Transfer Application (PDF)	
v. Business License - A City of Coquitlam or Tri Cities Intermunicipal Business License	
As of the date of this Proposal, we advise that we have the ability to meet all of the above requirements except as follows (list, if any):	

2. CORPORATE

a) CAPABILITIES, CAPACITY AND RESOURCES - Proponents to provide information on the following (use the spaces provided and/or attach additional pages, if necessary):	
i.	Structure of the Proponent, background, how many years they have been in business and organizational history (e.g. mission, vision, corporate directions, years in business, etc.):
ii.	Proponent is to state relevant experience and qualifications as to the Services requested in the RFP:
iii.	Proponent is to provide a narrative as to their demonstrated ability to provide the Services requested in the RFP :
iv.	Proponent is describe their capabilities, resources and capacities, as relevant to the Services requested in the RFP: This includes their capacity to take on this project in regards to other work the Proponent may have ongoing:

b) REFERENCES – Proponent shall be competent and capable of performing the Services requested and successfully delivered service contracts of similar size, scope and complexity. The City reserves the right to contact any person(s), agency(ies) or firm(s) not listed as part of an independent review (use the spaces provided and/or attach additional pages, if necessary):	
Reference No. 1	
Description of Contract	
Size and Scope	
Work Performed	
Start Date	
End Date	
Contract Value	
Project completed on budget	

Project completed on schedule	
Reference Information	Company
	Name:
	Phone Number:
	Email Address:

Reference No. 2	
Description of Contract	
Size and Scope	
Work Performed	
Start Date	
End Date	
Contract Value	
Project completed on budget	
Project completed on schedule	
Reference Information	Company
	Name:
	Phone Number:
	Email Address:

Reference No. 3	
Description of Contract	
Size and Scope	
Work Performed	
Start Date	
End Date	
Contract Value	
Project completed on budget	
Project completed on schedule	
Reference Information	Company
	Name:
	Phone Number:
	Email Address:

c) KEY PERSONNEL – Proponent proposes the following key personnel for the Services stated in the RFP. No changes, additions or deletions are to be made to these Key Personnel without the City’s written approval. (use the spaces provided and/or attach additional pages, if necessary)

LINE ITEM	NAME	TITLE/POSITION	EXPERIENCE AND QUALIFICATIONS	YEARS WITH YOUR ORGANIZATION
i.				
ii.				
iii.				

d) SUB-CONTRACTORS - The following Sub-contractors will be utilized in provision of the Services and will comply with all the terms and conditions of this RFP. No changes, additions or deletions are to be made to these subcontractors without the City’s written approval:

Sub-Contractor No. 1	
Legal Name	
Trade/Services Performed	
Background and Experience	
Contact Information	Name:
	Phone Number:
	Email Address:

Sub-Contractor No. 2	
Legal Name	
Trade/Services Performed	
Background and Experience	
Contact Information	Name:
	Phone Number:
	Email Address:

Sub-Contractor No. 3	
Legal Name	
Trade/Services Performed	
Background and Experience	
Contact Information	Name:
	Phone Number:
	Email Address:

e) SUPPLIERS

The Proponent proposes to supply the various products for the Work from the following suppliers:

LINE ITEM	PRODUCT	MANUFACTURER	SUPPLIER
i.			
ii.			
iii.			
iv.			
v.			
(use the spaces provided and/or attach additional pages, if necessary)			

f) HEALTH AND SAFETY

I. Confirm the Proponent has a written safety program in place that meets the requirements of WorkSafeBC?	
☐ Yes	☐ No
II. Is your company COR (Certificate of Recognition) certified with respect to WorkSafeBC?	
☐ Yes	☐ No
III. Proponent is to state how they would address site safety requirements on this project with respect to COVID-19:	

3.

TECHNICAL

a) APPROACH and METHODOLOGY

Summarize the key features of your Proposal and the Technical Approach to be used. Provide a brief description the various components required for successful completion of the Work.

- i. **Delivery, Set-Up and Execution** - Proposals should address the plan for the delivery, set up and execution of the Work; as well as the disposal, recycle or reuse for the surplus materials. Include any safety and pedestrian control measures.

- ii. **Quality Assurance** - Provide the measures the Proponent will use to maintain quality control for the Services being performed.

- iii. **Risk Factors** - Describe the risk factors anticipated and how the Proponent intends to mitigate these.

- iv. **Safety** - Proponent is to state how they will address safety on the Work site.

- v. **Disposal and Recycling** - Provide details on all disposal location and recycling location.

b) EQUIPMENT AND VEHICLES - Equipment, vehicles and power tools used at the work site must be clearly identified. Please list Proponent's vehicles and equipment which is owned or leased and would be used in providing the services. Demonstration of the equipment, vehicles and tools offered may be required and must comply in all respects with all applicable standards, requirements and governing regulations of CSA and the BC Motor Vehicle Act. For the purposes of above, small tools are considered to be any tool worth \$2,000 or less in new value. All other tools should be listed as equipment in the table below.

Equipment (including power tools to be used)	Make / Model	Year

c) Completion Date

I. The Proponent states that they are available and ready to start this Work and confirms the Work shall be completed on or before **March 25, 2022**. This date will be an important consideration in the evaluation.

☐ Yes

☐ No

II. If Proponent has stated NO, please state date and explanation as to proposed completion date:

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4. FINANCIAL

a) PRICE - Prices proposed are to be all inclusive; therefore, include all labour, material, tools, equipment, transportation, fuel, supervision, disposal fees, permit fees and any other items required for provision of the services (exclude GST):

ITEM	SCOPE OF WORK	Unit of Measure	PRICE (exclude GST)
i.	Site Mobilization, Erosion and Sediment Control: Provide price for site mobilization, demolition and removal of existing backstop, and establishment of Erosion and Sediment Control.		\$
ii.	New Backstop Price for completing all Work pertaining to the cost to supply & installation of posts, chain-link, and dug outs		\$
iii.	Benches Price for supply and installation of dug out benches as per specifications		\$
iv.	Demobilization, Clean-up and Misc. Costs Provide price for demobilization, clean-up, sod remediation, preparation of as-built markups, , commissioning review meeting and closeout work affiliated with the project. Incidentally price any miscellaneous project costs identified with completion Work within price.		\$
v.	Other not Listed:		\$
vi.	Other not Listed:		\$
vii.	TOTAL		\$

b) VALUE ADD
Provide information on what makes your firm innovative, what is your competitive advantage, and what other services your firm provides that would assist or be of benefit to the City

c) SUSTAINABLE BENEFITS AND SOCIAL RESPONSIBILITY
a) Describe all initiatives, policies, programs and product choices that illustrate your firm's efforts towards sustainable practices and environment responsibility in providing the services that would benefit the City

b) What policies does your organization have for hiring apprentices, indigenous peoples, recent immigrants, veterans, young people, women, and people with disabilities:
c) What policies does your organization have for the procurement of goods and services from local small and medium sized business or social enterprises:

Attention Purchasing Manager:

5. **I/We, the undersigned duly authorized representative of the Proponent**, having received and carefully reviewed all of the Proposal documents, including the RFP and any issued addenda posted on the City's website www.coquitlam.ca/Bid-Opportunities, and having full knowledge of the Site, and having fully informed ourselves as to the intent, difficulties, facilities and local conditions connected to performing the Services, submit this Proposal in response to the RFP.
6. **I/We** agree to the rules of participation outlined in the [Instructions to Proponents](#) and should our Proposal be selected, agree to the City's [Standard Terms and Conditions - Purchase of Goods and Services](#) and will accept the City's Contract as defined within this RFP document.
7. **I/We confirm** that, if I/we am/are awarded the Agreement, I/we will at all times be the "Prime Contractor" as provided by the Worker's Compensation Act (British Columbia) with respect to the Services. I/we further confirm that if I/we become aware that another contractor at the place(s) of the Services has been designated as the "Prime Contractor", I/we will notify the City immediately, and I/we will indemnify and hold the City harmless against any claims, demands, losses, damages, costs, liabilities or expenses suffered by the City in connection with any failure to so notify the City.
8. **I/We acknowledge** receipt of the following Addenda related to this Request for Proposals and have incorporated the information received in preparing this Proposal.

Addendum No.	Date Issued

This Proposal is submitted this ____ day of _____, 20____.

I/We have the authority to sign on behalf of the Proponent and have duly read all documents.

Name of Proponent	
Signature(s) of Authorized Signatory(ies)	1.
	2.
Print Name(s) and Position(s) of Authorized Signatory(ies)	1.
	2.