



INVITATION TO TENDER NO. PS20180859 (the "ITT")

CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE

Tenders are to be addressed to the Supply Chain Management office, 4th Floor, City of Vancouver, 453 West 12th Avenue, Vancouver, British Columbia, Canada, V5Y 1V4, and must be received in the drop box at the Supply Chain Management office prior to 3:00pm, Vancouver Time (as defined in Note 2 below), on July 31, 2018 (the "Closing Time").

Tenders will be not be publicly opened. Tender results can be found within 48 hours of the Closing Time at the following website:

<http://vancouver.ca/doing-business/unverified-tender-results.aspx>

NOTES:

1. Tenders must be delivered by couriers or otherwise in person drop-box outside the Supply Chain Management Office on the 4th floor at the address specified above, prior to the Closing Time. Tenders must be in sealed envelopes or packages marked with the Tenderer's name and the ITT title and number. Tenderers should submit one copy of the Tender and one copy of each other document required by the Tender Documents, including the bid bond described in Part B of this ITT.
2. "Vancouver Time" will be conclusively deemed to be the time shown on the computer clock at the Main Floor Rotunda Information Desk at Vancouver City Hall.
3. The City of Vancouver is open on business days from 8:30 a.m. to 4:30 p.m., Vancouver Time, and is closed Saturdays, Sundays, and holidays.
4. DO NOT SUBMIT TENDERS BY FAX OR E-MAIL.
5. All queries related to this ITT should be submitted in writing to the attention of:

Jessica Li, Buyer

Fax: 604-873-7057

Email: jessica.li@vancouver.ca

(the "Contact Person")

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CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
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Definitions and General Conditions of Stipulated Price Contract
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INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART A - INTRODUCTION

1.0 OVERVIEW OF PROJECT

1.1 The City of Vancouver as represented by its Vancouver Board of Parks and Recreation (the "City") invites Tenders for the **China Creek North Park Upgrade**.

1.2 The Work generally includes, but is not limited to:

- Protect existing trees as noted on the landscape drawings, and as directed by the Consultant or Owner appointed Arborist
- Protect all existing features to remain
- Undertake all demolition work as indicated on landscape drawings except that work noted to be carried out by Owner
- Clear and grub all existing plant material to be removed as noted in landscape drawings, and dispose of in accordance with Japanese Beetle Regulations outlined in Appendix 4
- Undertake earthworks to achieve grades and slopes as indicated in landscape drawings, Excavation will be observed by Advisian to monitor for contaminated soils
- Excess soil from the top 12" of excavation to be bermed on site in accordance with treatment for Japanese Beetle. Additionally, the contractor is responsible for segregating soils identified as contaminated (containing metals greater than parkland use standards but non-hazardous waste) on site. Soils identified as contaminated to be taken to the Vancouver Landfill under a separate contract with Advisian
- Supply/ install all fill and base granular materials
- Supply/ install all subsurface drainage work
- Supply/ install a complete irrigation system
- Supply/install gravel track as indicated in landscape drawings
- Supply/ install all cast-in-place concrete elements including banding, bench and table pads, steps, walls and footings, excluding play equipment footings
- Supply/ install all asphalt paving as indicated in landscape drawings
- Supply/ install soil cement at playground embankment
- Supply/ install all metal fabrications at step handrails and all associated attachments and assemblies
- Supply/ install rubberized surfacing including underlays
- Supply/ install stone paving as indicated in landscape drawings
- Cut to length and install stepping logs as indicated in landscape drawings
- Install owner supplied picnic tables including delivery to site from proponent's works yard
- Install owner supplied boulders including delivery to site from Kent Yard
- Supply/ install all product playground equipment as noted on drawings
- Supply/ install planting medium to extent and depth indicated on landscape drawings
- Supply/ install all proposed plant material including trees, shrubs as well as bark mulch in planting beds
- Clean up and dispose of construction debris off site in accordance with local regulations; and

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CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART A - INTRODUCTION

- Provide landscape maintenance from installation for a period of one year starting from issuance of substantial performance
- 1.3 The Site is located at **China Creek North Park, 1001 East 7th Avenue, Vancouver, British Columbia**. The Site is further described in the Tender Documents, including the Site Plan attached with the drawings.
- 1.4 The purpose of this ITT is to select a Tenderer with the capability and experience to efficiently and cost-effectively perform and complete the Work.
- 1.5 IF A POTENTIAL TENDERER BELIEVES THAT THE CITY MAY BE UNABLE TO SELECT IT DUE TO A CONFLICT OF INTEREST, BUT IS UNCERTAIN ABOUT THIS, THE POTENTIAL TENDERER IS URGED TO CONTACT THE CONTACT PERSON AS SOON AS POSSIBLE WITH THE RELEVANT INFORMATION SO THAT THE CITY MAY ADVISE THE POTENTIAL TENDERER REGARDING THE MATTER. SEE SCHEDULE "L" FOR AN INDICATION OF THE TYPES OF CONFLICTS OF INTEREST THAT OFTEN ARISE.
- 2.0 SUSTAINABILITY**
- 2.1 The City's Procurement Policy, Ethical Purchasing Policy and related Supplier Code of Conduct found at <http://vancouver.ca/doing-business/selling-to-and-buying-from-the-city.aspx> align the City's approach to procurement with its corporate social, environmental and economic sustainability values and goals. They evidence the City's commitment to maximize benefits to the environment through product and service selection, and to ensure safe and healthy workplaces, where human and civil rights are respected. Each Tenderer is expected to adhere to the supplier performance standards set forth in the Supplier Code of Conduct.
- 2.2 A Contractor is to provide environmentally sensitive products or services wherever possible. Where there is a requirement that a Contractor supply materials, and where such materials may cause adverse environmental effects, each Tenderer should indicate the nature of the hazard(s) in its Tender. Furthermore, each Tenderer should advise the City of any known alternatives or substitutes for such materials that would mitigate such adverse effects.
- 3.0 TENDER DOCUMENTS**
- 3.1 The Tender Documents are:
- (a) Part A - Introduction, and its appendices:
 - (i) Appendix 1 - Mandatory Information Meeting Attendance Form;
 - (ii) Appendix 2 - Response Notification Form;
 - (iii) Appendix 3 - Specifications, Drawings and Reference Documents; and
 - (iv) Appendix 4 - Japanese Beetle and Contaminated Soils Treatment
 - (b) Part B - Terms and Conditions of ITT Process;
 - (c) Part C - Form of Tender (including all schedules),
 - (d) Part D - Form of Agreement (including all schedules);

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CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART A - INTRODUCTION

- (e) the Specifications (provided separately and to be incorporated into the Contract when finalized);
- (f) the Drawings (provided separately and to be incorporated into the Contract when finalized);
- (g) all addenda or amendments to the ITT, and all questions and answers in connection with the ITT, issued in writing by the City prior to the Closing Time, as well as any addenda, amendments or questions and answers issued in writing by the City after the Closing Time and accepted in writing by the Tenderers.

4.0 MANDATORY INFORMATION MEETING

- 4.1 Tenderers are required to attend the mandatory information meeting (the “Mandatory Information Meeting”) on **July 12, 2018** commencing at **10:00am**.
- 4.2 The location of the Mandatory Information Meeting will be: **China Creek North Park, 1007 East 7th Avenue, Vancouver, British Columbia**.
- 4.3 Tenderers are asked to pre-register for the Mandatory Information Meeting by submitting the Mandatory Information Meeting Attendance Form (Appendix 1) to the Contact Person by fax or email prior to **July 11, 2018**.

5.0 ADMINISTRATIVE REQUIREMENTS

- 5.1 Tenderers are asked to indicate their intentions to submit Tenders by submitting the Response Notification Form (Appendix 2) to the Contact Person by fax or email on or before **July 24, 2018**.
- 5.2 It is the sole responsibility of each Tenderer to check the City’s website at <http://vancouver.ca/doing-business/open-bids.aspx> regularly for addenda, amendments and questions and answers related to this ITT, which the City may issue at any time during the process, and for any reason, at its discretion.

6.0 CONDUCT OF ITT - INQUIRES AND CLARIFICATIONS

- 6.1 The City will have conduct of this ITT, and all communications are to be directed only to the Contact Person named on the cover page.
- 6.2 It is the responsibility of each Tenderer to thoroughly examine the Tender Documents and satisfy itself as to the full requirements of this ITT and their acceptability to the Tenderer.
- 6.3 The City welcomes inquiries, requests for clarification or comments from registered Tenderers. All inquiries or comments to the City must be in written form only. All inquiries, requests for clarification and comments must be faxed to **604-873-7057** or e-mailed to jessica.li@vancouver.ca prior to **3:00pm, July 24, 2018**, and must in each case be addressed to the attention of the Contact Person. In response to inquiries, requests for clarification or comments, the City, in its sole discretion, may make amendments to this ITT or may issue questions and answers to all Tenderers who have submitted a Response Notification Form and post them on the City’s website.

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CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
APPENDIX 1 - INFORMATION MEETING ATTENDANCE FORM



CITY OF VANCOUVER
Purchasing Services

Invitation to Tender No. PS20180859

To acknowledge your intent to attend the Mandatory Information Meeting and to ensure that you receive the required information, please submit this form to the person identified below in accordance with the ITT:

Jessica Li
City of Vancouver
Fax: 604-873-7057
Email: jessica.li@vancouver.ca

Your details:

Tenderer's Name:

"Tenderer"

Address:

Telephone:

Fax: _____

Key Contact Person:

E-mail:

We will attend the Mandatory Information Meeting for: ITT No. PS20180859, "Contractor for China Creek North Park Upgrade".

Signature

Name of Authorized Signatory (Please print)

E-mail Address (Please print)

Date

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
APPENDIX 2 - RESPONSE NOTIFICATION FORM



CITY OF VANCOUVER
Purchasing Services

Invitation to Tender No. PS20180859

To acknowledge your intent to submit a Tender and to ensure that you receive the required information, please submit this form to the person identified below in accordance with the ITT:

Jessica Li
City of Vancouver
Fax: 604-873-7057
Email: jessica.li@vancouver.ca

Your details:

Tenderer's Legal

Name:

"Tenderer"

Address:

Telephone:

Fax:

Key Contact Person:

E-mail:

We WILL ☐ / WILL NOT ☐ submit a Tender in response to ITT No. PS20180859, "Contractor for China Creek North Park Upgrade" on or before the Closing Time.

Signature

Name of Authorized Signatory (Please print)

E-mail Address (Please print)

Date

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
APPENDIX 3 - SPECIFICATIONS AND DRAWINGS AND REFERENCE DOCUMENTS

SPECIFICATIONS AND DRAWINGS
(See attached)

SPECIFICATIONS

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01 33 00 Submittal Procedures
01 33 23 Shop Drawings and Product Data
01 40 00 Quality Control
01 77 00 Contract Closeout
01 78 36 Warranties
01 89 13 Site Preparation-Grading

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02 41 13 Selective Site Demolition

Division 03 Concrete

03 10 00 Concrete Forming and Accessories
03 20 00 Concrete Reinforcing
03 33 00 Cast-In-Place Concrete-Non Flatwork
03 35 00 Concrete Finishing
03 35 10 Abrasive Blast Finish

Division 04 Masonry

04 43 00 Miscellaneous Stone Work
04 43 00 Boulder Placement

Division 05 Metals

05 70 00 Miscellaneous Metal

Division 11 Equipment

11 68 13 Play Equipment

Division 31 Earthwork

31 23 10 Excavation and Backfill

Division 32 Exterior Improvements

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32 01 90 Landscape Maintenance
32 12 16 Hot Mix Asphalt Paving
32 15 40 Crushed Granular Paving
31 18 16.13 Playground Surfacing
32 80 00 Irrigation System
Irrigation Plan (Existing Field Irrigation Plan)
32 91 13 Growing Medium
32 92 19 Mechanical Seeding
32 92 21 Hydraulic Seeding (Hydroseeding)
32 93 10 Plants and Planting

Division 33 Utilities

33 46 16 Subsurface Drainage Systems

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APPENDIX 3 - SPECIFICATIONS AND DRAWINGS AND REFERENCE DOCUMENTS

DRAWINGS:

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L0.1 LANDSCAPE NOTES
L0.2 STRUCTURAL NOTES
L1.0 DEMOLITION PLAN
L2.0 DETAIL KEY PLAN
L2.1 DETAIL KEY PLAN
L3.0 LAYOUT PLAN
L4.0 GRADING PLAN
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L6.3 DETAILS 3
L6.4 DETAILS 4
L6.5 DETAILS 5
I-1 IRRIGATION PLAN
I-2 IRRIGATION DETAILS

REFERENCE DOCUMENTS:

- Habitat supplied play equipment (refer to cash allowance)
- Soil Analytical Report - Maxxam Job # B830901 - 2018/04/30

VANCOUVER BOARD OF PARKS AND RECREATION

CHINA CREEK NORTH PARK UPGRADES

1001 E 7TH AVE, VANCOUVER, BC

Landscape Specifications



Issued for Tender

2018.04.27

Vancouver Board of Parks and Recreation
China Creek North Park Upgrades

00 00 00
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Vancouver Board of Parks and Recreation

China Creek North Park Upgrades

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L2.0	DETAIL KEY PLAN
L2.1	DETAIL KEY AREAS
L2.2	DETAIL KEY AREAS
L3.0	LAYOUT PLAN
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L4.1	GRADING SECTION
L5.0	PLANTING PLAN
L6.0	DETAILS 1
L6.1	DETAILS 2
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L6.3	DETAILS 4
L6.4	DETAILS 5
I1	IRRIGATION PLAN
I2	IRRIGATION DETAILS

1 – GENERAL

1.1 SCOPE OF WORK INCLUDES BUT IS NOT NECESSARILY LIMITED TO:

1. Protect existing trees as noted on the landscape drawings, and as directed by the Consultant or Owner appointed Arborist.
2. Protect all existing features to remain.
3. Undertake all demolition work as indicated on landscape drawings except that work noted to be carried out by Owner.
4. Clear and grub all existing plant material to be removed as noted in landscape drawings.
5. Undertake earthworks to achieve proposed grades and slopes.
6. Supply/ install all fill and base granular materials.
7. Supply/ install all subsurface drainage work.
8. Supply/ install a complete irrigation system.
9. Supply/ install all cast-in-place concrete elements including banding, bench and table pads, steps, walls and footings, excluding play equipment footings.
10. Supply/ install soil cement at playground embankment.
11. Supply/ install all metal fabrications at step handrails and all associated attachments and assemblies.
12. Supply/ install rubberized surfacing including underlays.
13. Supply/ install stone paving as indicated in landscape drawings.
14. Supply/ install all product playground equipment as noted on drawings.
15. Supply/ install planting medium to extent and depth indicated on landscape drawings.
16. Supply/ install all proposed plant material including trees, shrubs as well as bark mulch in planting beds.
17. Clean up and dispose of construction debris off site in accordance with local regulations.
18. Provide landscape maintenance from installation for a period of one year starting from issuance of substantial performance.

1.2 VERIFICATION OF DIMENSIONS AND QUANTITIES

1. Before proceeding with work visit site and check and verify dimensions and quantities. Report variations between drawings and site conditions to the Consultant before proceeding with work.

1.3 PRECAUTIONS

Vancouver Board of Parks and Recreation
China Creek North Park Upgrades**01 10 00**
Summary

1. Protect areas under construction from damage caused by excessive erosion, flooding, heavy rains, etc. Repair or replace unprotected damaged areas as directed by the Consultant at no cost to the Owner.

1.4 QUALITY ASSURANCE

1. British Columbian and Canadian Nursery Trades Association Guide specifications for plant nursery stock shall apply.
2. All materials shall be of the quality specified or acceptable to the Consultant. Unit samples of all materials shall be submitted to the Consultant. Substitutions shall be acceptable only when approved by Consultant.

1.5 DELIVERY AND STORAGE OF MATERIALS

1. All manufactured materials such as fertilizer, bonemeal, mulches, etc. shall be delivered to and stored on the work site in standard containers indicating contents, weights, analysis and name of manufacturer.
2. All materials that are subject to deterioration resulting from weather or any causes, shall be stored on the site in a dry, weatherproof place in such a manner that their effectiveness will not be impaired.
3. Do not store materials in areas where vegetation is to be retained, including under driplines of trees.

1.6 GUARANTEE

1. The Contractor shall guarantee the work and materials for a period of one year from the date of Substantial Completion.

END OF SECTION

1 – GENERAL**1.1 SECTION INCLUDES**

1. Information relating to:
 1. Submittal procedures
 2. Proposed products list
 3. Product data
 4. Test reports
 5. Certificates
 6. Manufacturer's instructions
 7. Manufacturer's field reports
 8. Erection drawings

1.2 RELATED DOCUMENTS

1. None

1.3 RELATED DOCUMENTS

1. None

1.4 DEFINITIONS

1. None

1.5 SUBMITTALS

1. Transmit each submittal with Consultant accepted form.
2. Sequentially number the transmittal forms.
 1. Revise submittals with original number and a sequential alphabetic suffix.
3. Identify project, Contractor, Subcontractor or supplier pertinent drawing and detail number, and specification section number, as appropriate.
4. Apply contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information are in accordance with the requirements of the work and contract documents.
5. Schedule submittals to expedite the project, and deliver to Consultant and Construction Manager at business address.

Vancouver Board of Parks and Recreation
China Creek North Park Upgrades

01 33 00
Submittals Procedures

1. Coordinate submission of related items.
6. For each submittal for review, allow (SPECIFIER COMPLETE) days excluding delivery time to and from the Contractor.
7. Identify variations from contract documents and product or system limitations, which may be detrimental to successful performance of the completed work.
8. Provide space for Contractor and Consultant review stamps.
9. When revised for resubmission, identify all changes made since previous submission.
10. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
11. Submittals not requested will not be recognized or processed.

1.6 PROPOSED PRODUCTS LIST

1. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
2. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.7 PRODUCT DATA

1. Product Data For Review:
 1. Submitted to Consultant for review and checking for conformance with information given and the design concept expressed in the contract documents.
 2. After review, provide copies and distribute per the Submittal Procedures article above and for record documents purposes.
2. Product Data For Information:
 1. Submitted for the Consultant's knowledge as contract administrator or for the Owner
3. . Product Data For Project Close-out:
 1. Submitted for the Owner's benefit during and after project completion
4. Submit the number of copies, which the Contractor requires, plus two copies for the Consultant.
5. Mark each copy to identify applicable products, models, options, and other data.
 1. Supplement manufacturers' standard data to provide information unique to this project.
6. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

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China Creek North Park Upgrades**01 33 00**
Submittals Procedures

7. After review, distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01 77 00 Contract Closeout.

1.8 SHOP DRAWINGS

1. Shop Drawings For Review:
 1. Submit to Consultant for review and checking for conformance with information given and the design concept expressed in the contract documents.
 2. Submit to Consultant /Engineer approval those items identified in Shop Drawing Requirements.
 3. After review, produce copies and distribute.
2. Shop Drawings For Information:
 1. Submitted for the Consultant's knowledge as contract administrator or for the Owner
3. Shop Drawings For Project Close-out:
 1. Submitted for the Owner's benefit during and after project completion
4. Submitted for the Owner's benefit during and after project completion
5. Submit the number of copies, which the Contractor requires, plus two copies for the Consultant.

1.9 SAMPLES

1. Samples For Review:
 1. Submitted to Consultant for review and checking for conformance with information given and the design concept expressed in the contract documents.
 2. After review, provide duplicates and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01 77 00 - Contract Closeout.
2. Samples For Information:
 1. Submitted for the Consultant's knowledge as contract administrator or for the Owner
3. Samples For Selection:
 1. Submitted to Consultant for aesthetic, color, or finish selection.
 2. Submit samples of finishes from the full range of manufactures' standard colors, textures, and patterns for Consultant selection.
 3. After review, provide duplicates and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01 77 00- Contract Closeout.
4. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices.

Vancouver Board of Parks and Recreation
China Creek North Park Upgrades

01 33 00
Submittals Procedures

1. Coordinate sample submittals for interfacing work.
5. Include identification on each sample, with full project information.
6. Submit the number of samples specified in specification, one of which the Consultant shall retain.
7. Reviewed samples, used in the project for compliance with the specifications.
8. Do not use samples for testing purposes unless specifically stated in the specification.

1.10 DESIGN DATA

1. Submit for the Consultant's knowledge as contract administrator or for the Owner.
2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.11 TEST REPORTS

1. Submit for the Consultant's knowledge as contract administrator or for the Owner.
2. Submit test reports for information for the purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.12 CERTIFICATES

1. When specified in specification, submit certification by the manufacturer, installation/application subcontractor, or the contractor to Consultant, in quantities specified for Product Data.
2. Indicate material or Product conforms to or exceeds specified requirements.
 1. Submit supporting reference data, affidavits, and certifications as appropriate.
3. Certificates may be recent or previous test results on material or Product, but must be acceptable to Consultant.

1.13 MANUFACTURER'S INSTRUCTIONS

1. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, and installation, start-up, adjusting, and finishing, to Consultant for delivery to Owner in quantities specified for Product Data.
2. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
3. Refer to Section 01 40 00 - Quality Control, Manufacturer's Field Services article.

1.14 MANUFACTURER'S FIELD REPORTS

1. Submit reports for the Consultant's benefit as contract administrator or for the Owner.
2. Submit report within 30 days of observation to Consultant for information.

Vancouver Board of Parks and Recreation
China Creek North Park Upgrades

01 33 00
Submittals Procedures

3. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.15 ERECTION DRAWINGS

1. Submit drawings for the Consultant's benefit as contract administrator or for the Owner.
2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
3. Data indicating inappropriate or unacceptable work is subject to action by the Consultant or Owner.

2 – PRODUCTS

- 1.1 NOT APPLICABLE.

3 – EXECUTION

1. The Contractor will submit all shop drawings, product information, samples, test reports, etc. as indicated above. The Consultant will generate a List of Submissions and track the submission dates and status. Refer to the List of Submittals on the following page.

END OF SECTION

CHINA CREEK NORTH PARK
UGRADES-SUBMITTALS
SUMMARY Job # 0000

SUBMITTAL INFO				TRACKING				STATUS		
SPEC SECTION	ITEM	NAME	REQUIRED SUBMITTAL TYPE	SUBMITTAL TYPE AND DATE RECEIVED	REVISION 1	REVISION 2	REVISION 3	APPROVED		CURRENT REVIEW STATUS
								YES	NO	
03.10.00, 03.10.00, 03.33.00, 05.70.00	1	Stairs & handrail	Shop drawing							
32.18.16.13	2	Rubberized surfacing	Shop drawing showing paving pattern layout							
11.68.13	3	4 seat swings	Shop drawing							
11.68.13	4	Climbing holds	Product data sheet							
11.68.13	5	Rope climber	Product data sheet							
11.68.13	6	Net climber	Product data sheet							
11.68.13	7	Play structure	Product data sheet							
11.68.13	8	Hill slide	Product data sheet							
11.68.13	9	Spring toy	Product data sheet							
33.46.16	10	Catch basin	Product data sheet							
N/A	11	Path edger	Product data sheet							
32.91.13	12	Growing medium-planting beds	Soil analysis							
32.91.13	13	Growing medium-lawn	Soil analysis							
32.92.21	14	Lawn seed mix	Seed varieties & mix percentages							
32.93.10	15	Bark mulch	Sample							

PART 1: GENERAL**1.1 General Requirements**

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read interpreted and coordinated with all other parts.

1.2 Description

- .1 This section specifies general requirements and procedures for the Contractor to make submissions of shop drawings, product samples and other submittals to Owner's Representative for review. Additional specific requirements for submissions are specified in individual sections. Submissions may include:
 - .1 Shop Drawings.
 - .2 Product Data.
 - .3 Product Samples
 - .4 Mock-Ups.

1.3 Submission Requirements

- .1 Coordinate each submission with requirements of work and Contract Documents. Individual submission will not be reviewed until all related information is available.
- .2 The Owner's Representative review of submittals made by the Contractor shall not relieve the Contractor from the responsibility for complying with contract drawings or specifications, unless the Contractor has secured the written approval of the Owner's Representative for all deviations.
- .3 Owner's Representative review for submittals shall not relieve the Contractor from responsibility for error and omissions in the submittals.
- .4 Submittals shall contain only those items specified and shall not include items which are not provided for under this contract unless they are clearly marked and/or voided as not being part of the contract.
- .5 Comply with progress schedule for a timely submission of submittals as they relate to work progress. Coordinate submittal of related items.
- .6 Allow 10 working days for Owner's Representative review of each submission.
- .7 Maintain submittal log to ensure timely and complete submittals.
- .6 Accompany submissions with transmittal letter containing:
 - .1 Date

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01 33 23
Shop Drawings and Product Data

- .2 Project title and number
- .3 Contractor's name, address, telephone and facsimile
- .4 Contact person's name and position
- .5 Identification and quantity of each shop drawing, product data, and sample (if requested or required)
- .6 Other pertinent data
- .7 Submissions shall include:
 - .1 Date and revision dates
 - .2 Project title and number.
 - .3 Name, address telephone, facsimile, and contact person of:
 - .1 Subcontractor
 - .2 Supplier
 - .3 Manufacturer
 - .4 Contractor's stamp, signed by Contractors authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents. Submittals, which do not contain this information, will be returned without being examined and shall be considered rejected.
- .8 Details of appropriate portions of Work as applicable:
 - .1 Fabrication
 - .2 Layout, showing dimensions, including identified field dimensions, and Clearances
 - .3 Setting or erection details
 - .4 Capacities
 - .5 Performance characteristics
 - .6 Standards
 - .7 Operating weight
 - .8 Wiring diagrams
 - .9 Single line and schematic diagrams
 - .10 Relationship to adjacent work
 - .11 Materials
 - .12 Finishes
- .9 After Owner's Representative review and written approval distribute copies to persons necessary to complete the work. Ensure one copy of reviewed submission is kept on site.

1.4 General Requirements

- .1 Work affected by the submittal shall not proceed until review is complete.
- .2 Present shop drawings, product data, samples, and mock-ups in the same units used in the contract documents.
- .3 Where items or information is not produced in SI Metric units converted values are accepted.

- .4 Contractor's responsibility for errors and omissions in submission is not relieved by Owner's Representative review and/or approval of submissions.
- .5 Notify Owner's Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .6 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Owner's Representative review of submission, unless Owner's Representative gives written acceptance of specific deviations.
- .7 Make any changes in submission which Owner's Representative may require consistent with Contract Documents and resubmit as directed by Owner's Representative.
- .8 Notify Owner's Representative, in writing when resubmitting, any revisions other than those requested by Owner's Representative.

1.5 Shop Drawings

- .1 Shop drawings: are defined as original drawings, or modified standard drawings, catalogue information, illustrations, schedules, performance charts, brochures and other product data provided by Contractor, to illustrate details of portions of Work, which are specific to project requirements.
- .2 Adjustments made on shop drawings by the Owner's Representative are not intended to change the Contract Price. If adjustments affect the value of work, state such in writing to the Owner's Representative prior to proceeding with work.
- .3 Submission of reproductions for each requirement requested can be made by email using the current digital PDF file format.
- .4 Faxed shop drawings are not acceptable.
- .5 Include a cross-reference of shop drawing information to applicable portions of Contract Documents.
- .6 Engineered shop drawings are to be provided if requested on the drawings.

1.6 Samples

- .1 Samples: examples of materials, equipment, quality, finishes, workmanship.
- .2 Deliver samples prepaid to the Owner's Representative's business address.
- .3 Where colour, pattern or texture is criterion submit full range of samples.
- .4 Adjustments made to samples by the Owner's Representative are not intended to change the Contract Price. If adjustments affect the value of work, state such in writing to the Owner's Representative prior to proceeding with work.
- .5 Reviewed samples will become standard of workmanship and material against which installed work will be verified.

1.7 Mock-Ups

- .1 Mock-ups: field-erected example of work complete with specified materials and workmanship.

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China Creek North Park Upgrades

01 33 23
Shop Drawings and Product Data

- .2 Erect mock-ups at locations acceptable to Owner's Representative.
- .3 Adjustments made to mock-ups by the Owner's Representative are not intended to change the Contract Price. If adjustments affect the value of work, state such in writing to the Owner's Representative prior to proceeding with work
- .4 Reviewed mock-ups will become standards of workmanship and material against which installed work will be verified.

1.8 Shop Drawing, Mock-Up and Sample Review

- .1 The review of shop drawings, mock-ups and samples by the Owner's Representative is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that the Owner's Representative approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for requirements of the construction and contract documents. Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all subtrades.

PART 2: PRODUCTS (Not Applicable)

PART 3: EXECUTION (Not Applicable)

END OF SECTION 01 33 23

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China Creek North Park Upgrades

01 40 00
Quality Control

1 – GENERAL

1.1 SECTION INCLUDES

1. Items related to:
 1. Quality assurance - control of installation
 2. Tolerances
 3. References and standards
 4. Mock-up
 5. Inspecting and testing laboratory services
 6. Manufacturers' field services

1.2 RELATED DOCUMENTS

1. None

1.3 DEFINITIONS

1. None

1.4 QUALITY ASSURANCE/CONTROL OF INSTALLATION

1. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
2. Comply fully with manufacturers' instructions, including each step in sequence.
3. If manufacturers' instructions conflict with contract documents, request clarification from Consultant before proceeding, and document instructions or directions that may invalidate a warranty.
4. Comply with specified standards as a minimum quality for the work except when tolerances are more stringent by codes or specified requirements indicate higher standards or workmanship that is more precise.
5. Perform work by persons qualified to produce workmanship of specified quality.
6. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
7. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
8. Contractor shall schedule work to prevent absorbent materials installation and/or concealment of areas until, the building is dried-in, the installation of permanent doors and windows to prevent development of mold, entrapment of mold, moisture inside concealed spaces, or moisture absorption into interior materials.

1.5 TOLERANCES

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China Creek North Park Upgrades

01 40 00
Quality Control

1. Monitor fabrication and installation tolerance control of products to produce acceptable work; do not permit tolerances to accumulate.
2. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with contract documents, request clarification from Consultant before proceeding.
3. Adjust products to appropriate dimensions; position before securing products in place.

1.6 REFERENCES AND STANDARDS

1. Workmanship shall comply with requirements of the standards specified by an association, trade, or other consensus standards of the specified products, except when the applicable code or the specifications requirements are more rigid.
2. Use current reference standard(s) based on the date of contract documents, except where a code establishes a specific date.
3. Obtain copies of standards where required by product specification sections.
4. The contractual relationships, duties, nor responsibilities of the parties in Contract nor those of the Consultant shall be altered from the contract documents by mention or inference in any referenced document.

1.7 MOCK-UP

1. Perform all tests identified in this section and in the respective product specification sections.
2. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
3. Accepted mock-ups shall be a comparison standard for the remaining work.
4. Where Consultant accepts the mock-up and product specification sections specify removal; remove mock-up and clear area when directed.

1.8 TESTING SERVICES

1. Owner will appoint and pay for specified services of an independent firm to perform testing.
2. The independent firm will perform tests and other specified services as outlined in individual specification sections and as required by the Owner.
3. Testing and source quality control may occur on or off the project site. Adjust products to appropriate dimensions; position before securing products in place.
 1. Perform off-site testing as required by the Consultant or the Owner.
4. The independent firm shall submit reports to the Owner and Consultant and Contractor, indicating observations and results of tests and compliance or non-compliance with contract documents.
5. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

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01 40 00
Quality Control

1. Notify Owner, Consultant and independent firm 2-business days minimum prior to expected time for operations requiring services.
2. Make necessary arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
6. Testing does not relieve Contractor to perform work to contract requirements.
7. The Consultant may direct the same independent firm to re-test because of non-conformance to specified requirements.
 1. Contractor shall pay for re-testing cost by deducting testing charges from the Contract Price.

1.9 INSPECTION SERVICES

1. Owner will appoint, employ, and pay for specified services of an independent firm to perform inspection.
2. The independent firm will perform inspections and other services specified in individual specification sections and as required by the Owner.
3. Inspecting may occur on or off the project site
 1. Perform off-site inspecting as required by the Consultant or the Owner.
4. The independent firm to the Owner and Consultant and Contractor, indicating inspection observations and indicating compliance or non-compliance with contract documents, will submit reports.
5. Cooperate with independent firm; furnish safe access and assistance for incidental labor as requested.
 1. Notify Owner, Consultant, and independent firm 2-business days minimum prior to expected time for operations requiring services.
6. Inspecting does not relieve Contractor to perform work to contract requirements.

1.10 MANUFACTURERS' FIELD SERVICES

1. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment and as applicable, and to initiate instructions when necessary.
2. Submit qualifications of observer to the Consultant 30 days in advance of required observations; the observer is subject to Owner's approval.
3. Report all observations, site decisions, and instructions given to the applicators or the installers that are supplemental or contrary to the manufacturers' written instructions.
4. Refer to Section 01 33 00 - SUBMITTALS, MANUFACTURERS' FIELD REPORTS.

1.11 COMMISSIONING

1. Commissioning of a system or systems is part of the construction quality process.

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China Creek North Park Upgrades**01 40 00**
Quality Control

2. Documentation and testing of these systems, as well as training of the Owner's operation and maintenance personnel, is required in cooperation with the Owner's Representative and the Commissioning Authority.
3. Project Closeout is dependent on successful completion of all commissioning procedures, documentation, and issue closure.
 1. Refer to Section 01 77 00 - Contract Closeout, for substantial completion details.
 2. Refer to Section 01 91 00 - Commissioning, for detailed commissioning requirements.

2 – PRODUCTS

1. Not applicable.

3 – EXECUTION**3.1 EXAMINATION**

1. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work, beginning new work means acceptance of existing conditions.
2. Verify that existing substrate is capable of structural support or attachment of new work.
3. Examine and verify specific conditions described in individual specification sections.
4. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.2 PREPARATION

1. Clean substrate surfaces prior to applying next material or substance.
2. Seal cracks or openings of substrate prior to applying next material or substance.
3. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

1 – GENERAL**1.1 SECTION INCLUDES**

1. Closeout procedures
2. Final cleaning
3. Adjusting
4. Project record documents
5. As-built survey
6. Operation and maintenance data
7. Spare parts and maintenance Products
8. Warranties and bonds
9. Maintenance service

1.2 CLOSEOUT PROCEDURES

1. Submit written certification that contract documents were reviewed, work inspected, and that work is complete in accordance with contract documents and ready for Owner and Architect review.
 1. The written certification shall include documentation verifying all required Commissioning Functional Performance Test Procedures were successfully completed and that all commissioning issues are resolved.
2. Provide submittals to Architect and Owner that are required by governing or other authorities.
3. Submit final application for payment identifying total adjusted contract sum, previous payments, and sum remaining due.
4. Owner will have the option to occupy all or portions of the facility.

1.3 FINAL CLEANING

1. Execute final cleaning prior to final project assessment.
2. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
3. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate for the surface and material.
4. Replace filters of operating equipment.
5. Clean debris from roofs, gutters, downspouts, and drainage systems.
6. Clean site; sweep paved areas, rake clean landscaped surfaces.

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China Creek North Park Upgrades**01 77 00**
Contract Closeout

7. Remove waste and surplus materials, rubbish, and construction facilities from the site.
8. Clean and sanitize water fountains (coolers).
9. Clean all ledges countertops and shelves with all-purpose non-abrasive cleaner leaving no residue.

1.4 ADJUSTING

1. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.5 PROJECT RECORD DOCUMENTS

1. Maintain on site one set of the following record documents; record actual revisions to the work:
 1. Drawings/specifications, RFIs and addenda
 2. Change orders and other modifications to the contract
 3. Reviewed shop drawings, product data, and samples
 4. Manufacturer's instruction for assembly, installation, and adjusting
2. Ensure entries are complete and accurate, enabling future reference by Owner.
3. Store record documents separate from documents used for construction.
4. Record information related to changes of approved construction documents concurrent with construction progress.
5. Specifications - legibly mark and record at each product section a description of the products installed.
 1. Manufacturer's name, product name and model number
 2. Product substitutions or alternates utilized
 3. Changes made by addenda and modifications
6. Record drawings and shop drawings - legibly mark each item to record actual construction.
 1. Measured depths of foundations in relation to finish first floor datum
 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the work.
 4. Field changes of dimension and detail.
 5. Provide any additional details not on original contract drawings.
7. As-built survey:
 1. Upon completion of site construction improvements, provide Architect and Owner with a complete and accurate field survey prepared, signed and sealed by a Florida registered surveyor.

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China Creek North Park Upgrades

01 77 00
Contract Closeout

1. Exact horizontal and vertical location relative to property lines and NGVD of buildings, concrete and asphalt surfaces and all drainage features including lakes, detention areas, berms, embankments and swales.
2. Show the actual grades of the spot elevations shown on the paving and drainage plans.
3. Provide sufficient information indicating a true representation of constructed grade conditions for areas where grading between two elevation points is not constructed at a uniform slope.
4. Survey shall include cross sections elevations at 15.0m stations of swales, lakes, and drainage retention areas including banks, berms, bottoms, and transitions constructed or improved.
5. Elevations shown shall be accurate to the nearest 1.0cm.

8. Submit documents, AutoCAD (2010 or later version) files, and TIFF files on a CD to Architect and Owner, prior to claim for final Application for Payment.
9. Final Commissioning Report: The Commissioning Authority will prepare a Final Commissioning Report as described in Section 01 91 00 – Commissioning.

1.6 OPERATION AND MAINTENANCE DATA

1. See section 01 78 23 for requirements.

1.7 SPARE PARTS AND MAINTENANCE PRODUCTS

1. Provide spare parts, maintenance, and extra products in quantities specified in specification.
2. Provide copies of all itemized receipts/transmittals listing the extra materials or parts with their physical location indicated prior to final payment.

1.8 WARRANTIES AND BONDS

1. Provide duplicate notarized copies.
2. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers.
3. Provide Table of Contents and assemble in D-side 3-ring binder with durable plastic cover.
4. Provide one paper copy and two CD's or DVD copies.
5. Submit prior to final application for payment.
6. For items of work delayed beyond date of substantial completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.9 MAINTENANCE SERVICE

1. Furnish service and maintenance of components indicated in specification sections for one-year from date of substantial completion.
2. Examine, clean, adjust, and lubricate system components as required for reliable operation.
3. Include systematic examination, adjustment, and lubrication of components repairing or replacing parts as required with parts produced by the manufacturer of the original component.

4. Owner shall approve in writing of any transfers or reassignments of maintenance service tasks.

2 – PRODUCTS

2.1 APPROVED PRODUCTS

1. Use only cleaning and maintenance products approved for use in Florida Educational Facilities.

3 – EXECUTION

3.1 DOCUMENTATION

1. Provide copies of all letters of maintenance transfers in the project warranty manual.

END OF SECTION

1 – GENERAL

1.1 SECTION INCLUDES:

1. Preparation and submittal of warranties
2. Time and schedule of submittals
3. Transfer of Maintenance responsibility

1.2 FORM OF SUBMITTALS

1. Provide two copies of all warranty information in an electronic format on a compact disk (CD).
2. Provide CD's labeled WARRANTIES, with project number and title, name of responsible company principal, address, and telephone number of Contractor and equipment supplier.
3. Prepare table of contents in the same sequence as the Project Manual, section 01 78 23; identify each item with the number and title of the correct specification section, and the product name.
4. Separate each warranty with index tab sheets keyed to the table of contents listing.
5. Provide full information on CD as necessary listing subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible company principal.

1.3 PREPARATION OF SUBMITTALS

1. Provide the responsible subcontractors, suppliers, and manufacturers' warranties in duplicate, within ten days after completion of the applicable item of work.
 1. Warranty shall be on the company's' original forms signed by authorized agent only.
 2. Except for items put into use with Owner's permission, leave start date of warranty period until the Date of Substantial Completion is determined.
2. Verify that documents are in proper form, contain full information, and are notarized.
3. Co-execute submittals when required.
4. Retain warranties until time specified for submittal.
5. All of the above shall be in electronic format included on the CD or DVD, provide two copies.

1.4 TIME OF SUBMITTALS

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
2. Submit other warranties within ten days after Date of Substantial Completion, but prior to final Application for Payment.
3. For warranty items delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

1.5 TRANSFER OF MAINTENANCE RESPONSIBILITY

1. Provide a separate tabbed section in the warranty documents for all letters of maintenance responsibility transference.
2. Provide separate letter for each transfer, which shall include the mutually agreed time and date of the transfer of responsibility.

2 – PRODUCTS

2.1 WARRANTY CERTIFICATES

1. The installation contractor shall complete all warranty certificates, registering the product with the manufacturer.
2. Use the date of substantial completion as the installation date.
3. List the product model and serial number on each certificate.
4. Provide copy of the original certificate in warranty manual if the original goes to manufacturer.

3 – EXECUTION

1. The installing contractor shall fill out all product warranty forms during the manufacture's required time limit.
 1. Failure to do so may result in the Owner's loss of standard product coverage in which the installing contractor shall become liable for the same coverage and time limit forfeited due to their omission.
 2. The installing contractor shall notify the owner, in a timely manner, of all optional extended warranties provided by the manufacturer and make available to the owner the opportunity to purchase the extended warranty.
 3. The installing contractor shall insure that all warranty documents, including copies of completed registration forms, are submitted to the General Contractor for inclusion into their closeout documents as required by section 01 77 00 of these specifications.
2. Warranty pre-expiration equipment review
3. The Commissioning Authority shall conduct an on-site review of equipment and systems covered by warranties.
 1. This review will be scheduled approximately two (2) months prior to expiration of the Warranty.
 2. The Construction Manager, Owner's Representative, and Owner's Operations & Maintenance representative shall accompany the Commissioning Authority during this review.
 3. The purpose of the review will be to evaluate the condition of the equipment and systems to determine if Warranty repairs of claims are necessary.
 4. The Construction Manager shall cooperate to notify the issuer of the Warranty and to schedule necessary repairs or corrective actions prior to expiration of the Warranty.

END OF SECTION

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to prepare the site suitable for subsequent work indicated in the contract documents, including but not limited to:
 - .1 Preservation and protection of existing plants, site features and intertidal habitat.
 - .2 Draining of wet areas of the site by means of temporary ditches, pumping and other means approved by the Owner's Representative.
 - .3 Tree removal and removal of tree roots only where explicitly shown on drawings and as required to obtain satisfactory base for paving.
 - .4 Stripping and disposal of all existing materials to prepare for path and base as detailed. All other deleterious materials, including unsuitable material under areas to be filled, shall be treated as over excavation.
 - .5 Stripping and removal of all deleterious materials.
 - .6 Stripping and stockpiling topsoil (if any).
 - .7 Grading of the site, including the importation of and relocation of fill to create compacted subgrades as required for subsequent work as detailed and specified.
 - .8 Work from existing conditions and grades shown on plans. The intent is to balance structural cut and fill on site. Grades shown on drawings may be revised in conjunction with the Owner's Representative to achieve this balance.
 - .9 Placing approved fill, subbase, base and associated materials as detailed.
 - .10 Finished grading of the site for landscaping including unit concrete pavers, C.I.P. concrete paving, asphalt paving, irrigation, sodding, seeding and planting.

1.3 Related Work

- | | | |
|----|-----------------------------|------------------|
| .1 | Geotechnical Report | Section 00 31 32 |
| .2 | Shrub and Tree Preservation | Section 32 01 91 |
| .3 | Playing Field | Section 32 18 23 |
| .4 | Subsurface Drainage | Section 33 46 16 |
| .5 | Growing Medium | Section 32 91 13 |
| .6 | Irrigation | Section 32 80 00 |

1.4 Quality Assurance

- .1 Codes and Standards: Perform backfilling work in compliance with applicable requirements of governing authorities having jurisdiction.

- .2 Inspection: The Owner's Representative or his representative is to inspect and approve all stages of the work. The Contractor shall give forty-eight (48) hours notice to the Owner's Representative when inspection is required.

1.5 Job Conditions

- .1 Use all means necessary to control dust, dirt and debris on and near the worksite, including Construction Access Route (C.A.R.), caused by the Contractor's operations. Thoroughly moisten all surfaces, when necessary, to prevent dust being a nuisance in adjoining areas.
- .2 Use all means to protect all materials of this Section before, during and after installation. Protect all trees designated to remain. Make good any damage. **Follow Vancouver Park Board Tree Protection Guidelines as required.** Protect existing fencing, walls, curbs, sidewalks, pavement, benchmarks, surface or underground utilities that are to remain. Notify the Owner's Representative immediately if any damage occurs. Restore to original or better condition, unless directed otherwise.
- .3 Protect adjacent construction and all surrounding properties, including municipal streets, sidewalks, above and underground services.
- .4 Obtain approval from Owner's Representative on designated Construction Access Route (C.A.R.) Ensure C.A.R. is appropriately signed and maintained during course of construction. Remediate to original condition prior to Substantial Performance.
- .5 Maintain any existing fence barriers currently on site surrounding areas of preserved existing vegetation. Do not enter areas of preserved existing vegetation without the approval of the Owner's Representative.

1.6 Site Conditions

- .1 Start of work shall signify acceptance of site as satisfactory and no claim will be recognized for extra work nor any allowance made for defective work due to site conditions.
- .2 Investigate the site to verify information shown in Contract Documents. **Verify that existing grades are as shown on Drawings and notify Owner's Representative immediately of any discrepancies.**
- .3 Review existing site conditions with regard to subsurface conditions. Data on indicated subsurface conditions is not intended as representations or warrants of continuity of such conditions. Additional test borings and other exploratory operations may be made by Contractors at no cost to the Park Board. Notify Owner's Representative prior to carrying out any such work.

1.7 Testing and Approvals

- .1 A testing agency will be retained by the Owner or its representative to perform periodic testing of the subgrade preparation if required, to ensure the requirements of the Contract and General Conditions are being met. The Contractor at no extra cost to the contract shall provide any retesting due to non-conformance.
- .2 Cooperate and assist as required the testing agency in the execution of their work.

1.8 Materials Definitions

- .1 The terms “subgrade”, “subbase”, and “base”, wherever used in the contract documents shall mean materials that meet the requirements stated herein for each class of material.

1.9 Submittals

- .1 If required, provide representative samples for subbase, base, drain rock (clear crush), quarry tailings, rip-rap or any another aggregate materials used on site, at least fourteen (14) days before scheduled time of delivery to site.

PART 2: PRODUCTS

2.1 Subgrade

- .1 Subgrade is a dense surface that has been proof rolled as specified and which has been treated to eliminate all soft or spongy areas. Compaction and uniformity of subgrade shall be subject to approval by the Owner's Representative.
- .2 Subgrade may be existing, undisturbed material resulting from cutting or may be built up using Type 1 fill or Type 2 fill, depending on the applications.

2.2 Fill

- .1 Fill material shall be natural mineral material of a consistent quality throughout, free from foreign matter such as construction debris, plant and grass seeds, organic matter (except within limits shown for Type 1) and pests, and meeting the requirements set out for Type 1 or Type 2 fill, depending on the application.
- .2 Obtain the Owner's Representative's approval of fill material before delivering to the site if imported, or before moving on site if native. **If imported material is approved for use, supply Owner's Representative with written notification a minimum of thirty (30) days prior to beginning fill operations a complete statement of origin, compensation, suitability, environmental clearance and proposed location of all deposits that is intended for imported fill.**
- .3 Fill shall be classed as Type 1 or Type 2, depending on its application and shall meet the following requirements for each type:

TYPE	APPLICATION	REQUIREMENTS
Type 1	Under planted and grass areas	Maximum aggregate size 200mm evenly

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Site Preparation and Grading

		graded, containing not more than 20% fines (clay and silt) and not more than 5% organic matter, or as approved by the Owner's Representative.
Type 2	Under subbase for pathways, paved areas, structures	Maximum aggregate size 200mm evenly graded, containing not more than 15% fines passing a No. 200 (0.075mm) sieve when tested according to ASTM designation C-136. The Owner's Representative may approve alternatives.

2.3 Subbase

- .1 Subbase shall be crushed granular aggregate composed of inert, clean, tough, durable particles capable of withstanding the effects of handling, spreading and compaction without excessive degradation or production of deleterious fines. The aggregate shall be reasonably uniform in quality and free from an excess of flat or elongated pieces.
- .2 All subbase aggregate shall have a gradation within the limits set out herein when tested according to ASTM designation C-136.

Sieve Size (mm) Total Percent Passing

75.0	100
37.5	60 - 100
20.0	40 - 80
9.5	30 - 60
4.75	20 - 45
2.36	15 - 35
1.18	10 - 25
0.300	4 - 16
0.075	2 - 9

2.4 Drain Rock, Clear Crush

- .1 5mm to 19mm uniform clear crush.

2.5 Filter Fabric

- .1 Needle-punched, non-woven filter fabric, Nilex 4551 as manufactured by Nilex, or pre-approved equivalent.

2.6 Base

- .1 20mm diameter minus domestic or imported material below all paved surfaces. Material shall be free of organic and other deleterious material with the following particle size breakdown:

Sieve Size (mm)	Total Percent Passing
20.0	100
9.5	60 - 95
4.75	40 - 70
2.36	30 - 60
1.18	20 - 45
0.300	8 - 45
0.075	2 - 9

2.7 Construction Fencing

- .1 Metal fencing is required around the entire construction site. Fencing to be a minimum of 1.8m in height. Fencing to be "Modu-Loc" or equivalent, and is to be approved by Owner's Representative before installation. The Contractor is to ensure fencing is secure at all times, so as to prevent intrusion into the construction site by any unauthorized persons. Panels to be pinned to the ground and bolted together. Contractor is responsible for maintaining the integrity of the fencing in a vertical position at all times. Fencing is to be reviewed by the Owner's Representative before the start of any construction activities and is to remain in place until Final Acceptance..1

PART 3: EXECUTION

3.1 Limits of Work

- .1 Before starting work identify the limits of work on site by accurate survey. Prior to grading, excavating or trenching the Contractor shall locate and expose all utility lines, drain pipes and all other services which are within the areas of this work, and where the existing services are located less than 300mm below the proposed depth of trenching or excavation, such existing services shall be exposed by hand and adequately marked and protected. All separation distance requirements of the local authorities having jurisdiction over the service shall be observed.
- .2 Take all measures necessary to prevent the following activities outside the limits of work except as authorized by the Owner's Representative:
 - .1 Travel of equipment and vehicles
 - .2 Storage of materials or equipment
 - .3 Stockpiling of soil or excavated materials
 - .4 Burning
 - .5 Excavating or trenching
 - .6 Cutting of roots or branches
 - .7 Disposal or spilling of toxic matter

3.2 Tree Removal

- .1 Remove trees only as shown on the plan, or as requested by the Owner's Representative. Remove all debris from site. Remove all roots and parts that would be detrimental to the construction.
- .2 Strip topsoil, surface silts and organics, down to approved subgrade. Remove topsoil, surface silts and organics from the site, except for clean topsoil approved by the Owner's Representative for stockpiling for future use.

3.3 Unsuitable Material

- .1 Remove from the site all material unsuitable for use as fill.

3.4 Drainage

- .1 Drain and/or dewater all areas to be regraded using methods acceptable to the Owner's Representative and local environmental authorities having jurisdiction.
- .2 Slope rough grades away from any building envelopes/ structures at a minimum 2%, unless specifically shown on drawings or directed by Owner's Representative.

3.5 Excavation and Filling

- .1 Cut, fill and import material as required to create subgrades as detailed and specified herein.
- .2 Remove all deleterious material and ponded water from the site.
- .3 Compact exposed ground surface beneath all fill areas with a minimum 5 ton vibrator roller, except in "soft" landscape areas, i.e. areas to receive grass or planting.
- .4 Any soft or spongy areas shall be sub-excavated, removed and replaced with granular subbase material. Such fill shall be placed in maximum 200mm lifts and compacted to the densities required for Type 1 or Type 2 fill.
- .5 Scarify existing grades to a minimum depth of 150mm prior to placing of fill. Move excavated material intended for reuse as fill directly from the cut to the fill area, spread and compact to the required densities.
- .6 Place fill in maximum 200mm lifts and compact each lift to the following Standard Proctor Densities, to ASTM D698 using approved vibratory compaction equipment, prior to placing subsequent layers as follows:
 Type 1 Fill: 95% Standard Proctor Density (S.P.D.).
 Type 2 Fill: 98% Standard Proctor Density (S.P.D.).
- .7 Compact fill materials only when the moisture content is suitable for obtaining the specified density. If moisture content is too low, apply water by means of approved distribution. If moisture content is too high, dry the fill material by blading, disking, or other approved method. **DO NOT OVER COMPACT FILL TYPE 1.**
- .8 Excavated material used as Fill Type 2, shall be overlaid with a minimum of 200mm of subbase, compacted to 98% Standard Proctor Density.

3.6 Grading

- .1 **DO NOT GRADE SOIL WHEN SOIL IS WET.** Uniformly grade areas within limits of grading under this Section. Smooth finished surface within specified tolerances, compact with levels or slopes between elevations as shown, or between such points and existing grades.
- .2 Grade areas to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes and to allow for specified depths of base courses and finished materials.
- .3 Remove particles larger than 100mm diameter from the surface leaving a smooth compacted surface to required subgrade.
- .4 Compact subgrade as required, to stated densities in the above section.

3.7 Subbase and Base

- .1 Ensure base materials and existing surface are at approximately the same moisture content to facilitate bonding.
- .2 Install subbase, base, and filter fabric as detailed. Place in maximum 200mm lifts and compact to minimum 98% Standard Proctor Density (S.P.D.).
- .3 Finish to subgrades as detailed, suitable for subsequent installation of path and base, structures and paving.

3.8 Tolerances

- .1 Maximum subgrade tolerance is $\pm 25\text{mm}$ when checked with a 3 m straight edge placed in any direction, and the subgrade shall not be consistently above or below the design grades.

3.9 Maintenance

- .1 Protect newly graded areas from traffic, erosion, and standing water and free of debris. Provide temporary drainage ditches from graded areas as required.
- .2 The site surface shall always be contoured to direct precipitation and run-off to drainage ditches or slopes leading away from the work area. Surfaces shall always be left graded smooth and rolled with a smooth drum roller to minimize infiltration of water and subsequent deterioration of material due to excessive moisture content. The surface shall never be left with undrained depressions or with a rough texture.
- .3 Repair and re-establish grades in settled, eroded and rutted areas to specified tolerances.
- .4 Repair and make good and clean up any damage and/or debris to municipal roads and streets caused by work of this Contract. Obtain and pay for all permits required for use of municipal roads and streets.

3.10 Cleaning

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Site Preparation and Grading

- .1 Remove excess excavated material, trash, debris and waste materials and dispose off site as directed by Owner's Representative at no additional cost to the Board.

END OF SECTION 01 89 13

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary for the demolition and removal of all materials as indicated in the contract documents.
- .2 Concrete shall be broken into pieces 200 minus and remain on site to be buried with fill material as shown on the drawing.
- .3 The work shall include all coordination required for the shut-off, isolation and capping of all utilities such as water, sewer, electricity, telephone and gas services.

1.3 Related Work

- .1 Shrub and Tree Preservation Section 32 01 56

1.4 Quality Assurance

- .1 Demolition to be carried out in accordance with Vancouver Building Bylaw, latest edition and all regulatory authorities as applicable.
- .2 Procedures and methods of demolition shall be to the approval of the Owner's Representative and Owner.
- .3 Codes and Regulations: Do all demolition work according to the requirements of the Vancouver Building By-law and WorkSafeBC Accident Prevention Regulations, and the Canadian Construction Safety Code.

1.5 Qualifications

- .1 Qualifications of Workers: Provide a Supervisor who shall be present at all times during the demolition work and who shall be thoroughly familiar with the work required and who shall direct and coordinate all work.
- .2 All areas of responsibility for demolition and cutting shall be thoroughly coordinated by the Contractor.
- .3 Provide one (1) person on site who is responsible for maintaining the safety barriers and protection of the workers and the public. Provide the name of this person to the Owner's Representative.
- .4 Any changes in personnel must be reported to the Owner's Representative.

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Selective Site Demolition

- .5 Each subtrade is required to coordinate its work with the work of this section as to the amount of demolition work required and as to termination conditions to be left at the junction of existing work to remain.
- .6 Each subtrade shall be responsible to ensure that all demolition and cutting does not destroy more than is required, or what is needed for future construction.
- .7 Any demolition and cutting carried beyond the necessary requirements shall be the responsibility of the Contractor, and shall be reinstated at no cost to the Owner.

1.6 Job Conditions

- .1 The Contractor shall provide for temporary connections to power and water and drainage lines as required. No outages, limitations or obstructions shall be permitted unless with the prior approval of the Owner.
- .2 The Contractor shall contact the Owner and/or Owner's Representative prior to any service interruptions and obtain permission for interruption at a specific time.
- .3 The Contractor shall take the necessary precautions to fully protect existing surfaces against damage from demolition and/or removal of existing work.

1.7 Permits

- .1 If a demolition permit is required the Contractor shall be responsible for obtaining this permit.

PART 2: PRODUCTS (Not Applicable)**PART 3: EXECUTION****3.1 Hazardous Materials**

- .1 Carefully examine work to be removed. Report the presence of hazardous materials or potentially hazardous materials to the Owner immediately.
- .2 Hazardous materials are not to be disturbed if located or suspected until their presences has been reported to the Owner. Vancouver Park Board will be responsible for the removal of any hazardous materials if they were not identified and included in the base contract.

3.2 Inspection of Existing Conditions

- .1 Carefully examine areas to be demolished. Report any discrepancies with the Contract Documents to the Owner's Representative immediately.

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Selective Site Demolition

- .2 The Contractor shall accept the site as it exists and will be responsible for all demolition work as required.
- .3 The Contractor shall visit the site at their own expense prior to the submission of tenders and take whatever time is required to ascertain existing site conditions and surrounding features related to the proposed demolition and ensure that conditions are suitable for execution of the work.
- .4 No additional sums of money will be allowed for any items resulting from lack of familiarity with the site conditions. Report any discrepancies to the Owner's Representative.
- .5 Arrange for a site visit together with Owner to examine existing site conditions adjacent to demolition. Take pictures of any existing damage and record them in writing to avoid any disputes at a later date.

3.3 Protection

- .1 The Owner shall be saved harmless by the Contractor from any loss, damage, death or injury occurring through neglect, carelessness or incompetence of the Contractor, or the handling or condition of the Contractor's equipment.
- .2 Existing trees shall be fully protected at all times during the work of this Section as required.
- .3 Immediately make all repairs and replacements to adjacent existing works caused by the Work of this Section.
- .4 Provide temporary enclosures for securing the work area and the maintenance of any services necessary to the proper and efficient operation of the project.
- .5 Protect site improvements such as sidewalks, curbs, existing landscaped and asphalt areas and all interior finishes that lie along the path of removal.
- .6 Conduct construction operations with minimum interference to existing buildings operations, adjacent buildings, adjacent public or private roadways, parking lots, sidewalks and access facilities in general. Keep such areas free of material debris and equipment at all times.
- .7 The Contractor shall provide any hoardings, barricades, warning signs and lights, as necessary, for the protection of all people and property on and adjacent to the site as specified herein or by WorkSafeBC. The Contractor shall alter, adapt, maintain, relocate and remove these additional barricades, etc. as necessary due to the work.
- .8 All barricades provided by the Contractor shall be removed from the site upon completion of the work and any damage caused repaired to the satisfaction of the Owner.
- .9 Prevent movement, settlement or damage to existing building, finishes, services, walks, paving and parts of existing building to remain. Provide shoring and bracing as required. Make good any damage and be liable for injury caused by demolition.
- .10 Provide necessary temporary weather protection with dust screens if and when required to protect existing adjacent buildings from dust penetration during demolition work.
- .11 Protect adjacent work from damage, staining, disfigurement caused by the work of this section.

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Selective Site Demolition

- .12 Promptly as the work proceeds, and on completion, keep the premises clean and free from rubbish, debris, surplus materials and equipment.
- .13 At the end of each days work, leave the work area and surrounds in a safe condition so that no parts are in danger of toppling or falling.

3.4 Demolition

- .1 Remove materials from demolition promptly as the demolition work progresses. Materials shall not be sold, buried or burned at the site. The Contractor shall be assumed to have allowed for any credit that may be obtained for such materials.
- .2 Temporary stockpiling of demolished materials that are required to be removed from the site is not permitted. All demolition materials from excavations must be removed from site daily.
- .3 The Contractor is responsible for disposing of demolition materials in a legal manner.
- .4 Carry out all necessary temporary bracing and supporting to as required during demolitions.
- .5 Prevent debris from blocking surface drainage inlets and systems that must remain in operation.
- .6 Carry out all demolitions and making good. Patch and make good to a standard at least equal to that of adjacent surfaces when related work is completed.
- .7 Any items containing PCBs should be stockpiled in a safe location. The Owner should be notified and will arrange subsequently removal and disposal of items if not included in the base contract.
- .8 No heavy equipment causing excessive vibrations to the existing structures are permitted.
- .9 Make cut clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .10 Demolish existing walls with care, do not damage adjacent surfaces noted to remain.
- .11 Remove existing millwork fixtures, services, and building components where required.
- .12 Remove existing asphalt and concrete paving, concrete curbs as required for new site development.
- .13 Remove existing site services and catch basins as noted.
- .14 Subsurface structure: remove all subsurface foundations, piles and pile caps as per the contract documents.
- .15 Refer to moving plans for equipment moving requirements.
- .16 Complete demolition work to produce clean exposed sub-grade where demolition is indicated. Remove extraneous materials.
- .17 Large boulders or rocks over two feet diameter shall remain on site unless otherwise noted by Owner's Representative.
- .18 Drilling through concrete and masonry shall be carried out using diamond drills.
- .19 Procedures and methods of drilling, coring and/or cutting shall be to the approval of the Owner.

3.5 Debris

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Selective Site Demolition

- .1 Condemned material becomes the Contractor's property and must be removed completely from the site. Keep clean all areas in use at all times.
- .2 Contractor shall be held responsible for all costs, penalties, summonses and notices arising from the failure to comply with the keeping of the adjacent site, local roads, and thoroughfares clean and free from debris and damages caused by debris and demolition work.

3.6 Cleaning

- .1 Upon the completion of all demolition work remove all equipment, materials, and debris. Leave the area clean.

END OF SECTION 02 41 13

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install erect, and strip all formwork and false work for cast-in-place concrete as indicated in the contract documents.

1.3 Related Work

- | | | |
|----|--------------------------------|------------------|
| .1 | Shop Drawings and Product Data | Section 01 33 23 |
| .2 | Concrete Reinforcement | Section 03 20 00 |
| .3 | Cast-In-Place Concrete | Section 03 33 00 |
| .4 | Concrete Finishing | Section 03 35 00 |

1.4 Reference Standards

- .1 Concrete formwork shall conform to the requirements of the following standards unless otherwise required by this specification:
 - .1 B.C. Building Code: Current Edition.
 - .2 CAN3-A23.1-M90 Concrete Materials and Methods of Concrete Construction.
 - .3 CAN/CSA-A23.3 Code for the Design of Concrete Structures for Buildings.
 - .4 CAN/CSA S269.3 Design, Fabrication, Erection and Use of Concrete Formwork.
 - .5 ACI 347 Recommended Practice for Concrete Formwork.
 - .6 WorkSafeBC - Section 34.28
- .2 Where the standard is referred to in this specification it shall mean the documents specified in this clause and their referenced documents.

1.5 Quality Assurance

- .1 Concrete formwork fabrication and erection shall be done by experienced and competent personnel having adequate training and equipment for all phases of the work specified.

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Concrete Forming and Accessories

1.6 Quality Control

- .1 Where slopes illustrating 'positive drainage' on a horizontal surface either as labels or spot elevations are indicated on construction drawings the Contractor shall construct the formwork as required to ensure that when the concrete is placed the formwork does not hinder the finishing of concrete to achieve positive drainage.

1.7 Submittals

- .1 The Contractor shall submit to the Owner's Representative three (3) copies of shop drawings illustrating the form tie layout for all concrete surfaces exposed to view.
- .2 The Contractor shall submit to the Owner's Representative three (3) copies of product data for form material to be used.

PART 2: PRODUCTS

2.1 General

- .1 Products shall satisfy the requirements of the standard unless otherwise specified or indicated on the Contract drawings.

2.2 Forms for concrete:

- .1 Non-Exposed Concrete Surfaces: Plywood, shiplap or dimensional lumber, for rough-form finish in accordance with CAN/CSA A23.1-94, Section 24, Item 24.3.2.
- .2 Architectural Concrete Surface (concrete surfaces exposed to view): as per CSA A23.1-94 24.3.3
- .3 Form work for smooth, form finish concrete shall have a form facing material which will provide smooth, hard, uniform texture on the concrete.
- .4 The form material may be medium density overlay (MDO) plywood, tempered concrete – form-grade hardboard, metal, plastic, paper or other material capable of producing smooth finish.
- .5 Material with raised grain, torn surfaces, worn edges, patches, dents, or other defects that will impair the texture of the concrete surface shall not be used.
- .6 Acceptable products include but are not limited to:
 - .1 Multipour MDO Form Panel,
 - .2 B-Matte 333 MDO Form Panel
- .7 Form material thickness shall be sufficient to ensure that finished concrete work is true to lines, shapes, angles and finishes indicated on the Contract drawings. Minimum thickness of form material shall be 19 mm (3/4"). Ensure that the same type of formwork material is used throughout the entire scope of the project.

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Concrete Forming and Accessories

- .8 Form Release Agents: Concrete form release shall be composed of an organic chemical that reacts with the alkali content of concrete to form a release film, along with providing an inert barrier to provide double separation. Acceptable materials include but are not limited to:
 - .1 Duogard Concrete Form Release Agent by W.R. Meadows
 - .2 Eco-Coat by W R Meadows
- .9 Form ties complete with precast concrete plugs shall leave no metal within 25 mm (1") of the concrete surface. Acceptable products include but are not limited to:
 - .1 Meadow Burke Snap Ties,
 - .2 Dayton Superior Plastic Snap Ties with Plastic Cone
 - .3 Void Form: Closed cell expanded polystyrene (EPS) voiding. Acceptable products include but are not limited to:
 - .1 Korolite Type 2, Mansonville Plastics, Surrey, BC,
 - .2 Korvoid, Mansonville Plastics, Surrey, BC (where compressive loads exceed 110 Kpa (16psi))
 - .3 Plastispan, Plasti-Fab EPS

PART 3: EXECUTION

3.1 Design of Formwork, Falsework and Reshoring

- .1 The Contractor shall assume full responsibility for the design of form work and ensure structural adequacy of the forms to withstand all concrete and construction loads.
- .2 As a minimum, the work shall conform to CAN/CSA-A23.1, Section 24 for regular work (concrete surfaces not exposed to view) and CAN/CSA-A23.1, Section 28 for architectural concrete (concrete surfaces exposed to view).
- .3 Forms shall be so constructed that the finished concrete will conform to the shape, dimensions and tolerances as specified in the drawings. As required they shall also incorporate the cambers specified on the structural drawings.
- .4 The strength and rigidity of forms shall be such that they will not leak mortar or result in visible irregularities in the finished concrete, but in any case the deflection of facing materials between studs as well as deflection of studs and walers shall be in accordance with the CAN/CSA S269.3.
- .5 Where concrete is exposed to view, forms are to be laid out so that joints are kept to a minimum and located in an orderly and symmetrical arrangement where possible.
- .6 Unless otherwise indicated on the construction drawings the location of form ties shall be evenly spaced and in straight horizontal and vertical lines. Prior to the start of work in this section the Contractor shall provide the Owner's Representative a shop drawing illustrating the spacing and location of form tie holes.

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Concrete Forming and Accessories

- .7 The Contractor shall take care to ensure not to exceed the live load of the structure with any construction or shoring loads.
- .8 The Contractor is responsible for monitoring the curing time and related strength of the concrete. These shall be factored into the scheduling, staging and progress of all concrete work.

3.2 Form Work Construction

- .1 Construct formwork using appropriately sized timber or steel members, braces, walers, ties, etc. to ensure that the forms will not deflect, blow out, or deform as a result of concrete load.
- .2 Contractor shall ensure that where a positive slope is indicated on the construction drawings that the form work is constructed to achieve this slope. This includes but is not limited to cast in place concrete stair form construction.
 - .1 The Contractor shall clearly indicate, using an indelible line the entire length of the stair tread the elevation of the back of the stair tread.
 - .2 Prior to the placement of concrete using the line layout noted and the finished elevation of the top of the riser formwork the Contractor shall illustrate to the Owner's Representative that the formwork has been constructed to allow for positive drainage to the lines and levels indicated on the construction drawings from the back of the tread to the nose of the tread.
- .3 Install all inserts including cant and reveal strips, anchors, ties, bolts, nailers, anchor bolts, embedded plates, indicated on the contract documents and/ or required by other trades. Ensure cant and reveal strips are true to line and grade and joints are butt tight and smooth.
- .4 Provide all voids: openings and block outs indicated on the contract documents and/ or required by other trades.
- .5 Openings that have not specifically been indicated on the structural engineer's drawings must be approved in writing by the structural engineer.
- .6 Joints and corners shall be constructed so that they will not leak as a result of pressure from freshly placed concrete. Caulk as required.
- .7 The Contractor shall ensure that all forms not treated with a form release agent are to be kept evenly moist to prevent shrinkage. Wet the surface of untreated forms just prior to placing concrete.
- .8 Form release agent shall be applied in strict accordance with the manufacturers written instructions.

3.3 Removal of Formwork

- .1 Forms shall not be removed until concrete has attained sufficient strength to ensure that no damage or continuity of concrete will occur when forms are removed.

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Concrete Forming and Accessories

- .2 The structural engineer shall advise the Contractor as to the duration of cure time required prior to the removal of suspended formwork.
- .3 The Contractor shall use wooden wedges when prying directly against face of concrete during form removal. Do not pry directly against concrete surface.
- .4 Carefully remove form ties to avoid marking concrete. Unless otherwise indicated on the construction drawings plug and grout form tie holes to prevent rust staining. Ensure grout is finished smooth and flush to finished face of concrete.
- .5 Thoroughly clean and retreat forms prior to reuse.

3.4 Architectural Concrete Formwork

- .1 With respect to these specifications Architectural Concrete refers to concrete surfaces that are exposed to view. In addition to requirements of this section and those outlined in Section 28 of CAN/CSA-A23.1, formwork for architectural concrete shall specifically address the following:
 - .1 Formwork shall be constructed so that finished concrete surface will be free from any imperfections as a result of, but not limited to, misalignment or warping of forms, misalignment or warping of plywood or steel elements, inadequate tightness of forms, mortar leakage and any texture imparted by formwork.
 - .2 Maintain true right-angled corners for all exposed edges of concrete, unless otherwise indicated.
 - .3 The pattern for form ties shall be in accordance with the approved shop drawings.
 - .4 Back all edges of forms and brace to assure that mortar leakage is eliminated.
 - .5 Thoroughly inspect all forms prior to reuse. Do not reuse forms when surfaces that will come in contact with concrete have been damaged to the extent that the finished surface will not conform to the specifications.

3.5 Cleaning

- .1 Rubbish and debris resulting from work of this section shall be collected regularly, and removed from the project site and properly disposed.

END OF SECTION 03 10 00

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install reinforcing steel as indicated in the contract documents.

1.3 Related Work

- .1 Concrete Formwork Section 03 10 00
- .2 Cast-in-Place Concrete Section 03 33 00

1.4 Reference Standards

- .1 Except as stated otherwise, all work shall conform to the following:
 - .1 B.C. Building Code 1998.
 - .2 City of Vancouver Building Bylaw No. 6134.
 - .3 CAN/CSA-A23.2 Methods of Tests for Concrete
 - .4 CAN/CSA-A23.3 Code for the Design of Concrete Structures for Buildings.
 - .5 CAN/CSA- A23.1 Concrete Materials and Methods of Concrete Construction
 - .6 CAN/CSA G30.5–M Welded Steel Wire Fabric for Concrete Reinforcement.
 - .7 CAN/CSA G30.12-M Billet-Steel Bars for Concrete Reinforcement.
 - .8 CAN/CSA W186–M Welding of Reinforcement Bars in Reinforced Concrete Construction.
 - .9 ACI manual of Standard Practice for Detailing
- .2 Where the standard is referred to in this specification is shall mean the documents specified in this clause and their referenced documents.

1.5 Inspection

- .1 All steel for the section shall be placed before pouring of concrete is begun.

1.6 Testing and Approvals

- .1 As per Section 03110 - Concrete/Reinforcement Testing.

1.7 Submittals

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China Creek North Park Upgrades**03 20 00**
Concrete Reinforcing

- .1 Submit mill certificates properly correlated to the materials in accordance with CAN/CSA G30.18.

PART 2: PRODUCTS**2.1 General**

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

2.2 Materials

- .1 Reinforcing bars will conform to CAN/CSA G30.18, Grade 400 R, unless otherwise specified herein or on the drawings.
- .2 Reinforcing not in accordance with the above standards shall not be used.
- .3 Reinforcing bars to be welded will conform to CAN/CSA G30.18, Grade 400 W.
- .4 Welded wire fabric will conform to CAN/CSA G.30.5, size and gauges as shown on the drawings.
- .5 Welded wire fabric for slabs will be delivered in flat sheets only.
- .6 Accessories: tie wire, hangers, bolsters, bar supports and spacers adequate for strength and support of reinforcing construction conditions.
 - .1 Use non-staining supports for architectural concrete.

PART 3: EXECUTION**3.1 General**

- .1 All phases of concrete reinforcement work shall be in accordance with the standard unless otherwise specified herein or on the drawings. Workers who are skilled and experienced in their trade shall do the work.
- .2 The Contractor shall notify the Owner's Representative at least 48 hours before any concrete is placed in order that an inspection may be made.
- .3 Ship bundles of bar reinforcement, clearly identified in accordance with the bar list.

3.2 Fabrication

- .1 Fabricate reinforcing to CSA-A23.1.
- .2 Reinforcing bars will be cold bent. Bars will not be straightened or rebent.
- .3 Splices in reinforcing bars at locations not shown on the Drawings must be submitted for review by the Owner's Representative. Such splices will conform to the standards.

3.3 Placing

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Concrete Reinforcing

- .1 Reinforcing of size and shapes shown on the Drawings will be accurately placed in accordance with the Drawings and the requirements of the standard.
- .2 Reinforcement shall be adequately supported by chairs, spacers, support bars, hangers, or other accessories, and secured against displacement within the tolerances permitted in the standard. Support devices contacting surfaces exposed to the exterior shall be non-corroding.
- .3 Reinforcing bars that are not part of the structural design or drawing, and whose only function is supporting other reinforcing in lieu of other support accessories, will be considered as accessories.
- .4 Clean reinforcement before concrete is placed.
- .5 Contractor to coordinate a site meeting for the Owner's Representative to review reinforcing steel and placing before concrete is placed. A minimum of 48 hours notice is required for this review meeting.

3.4 Welding

- .1 Any welding of reinforcing steel shall be in accordance with CAN/CSA W186.
- .2 Copies of the Canadian Welding Bureau approved welding procedure and certificate of current operator qualification shall be submitted to the Owner's Representative prior to commencement of welding

END OF SECTION 03 20 00

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install architectural cast in place concrete as indicated in the contract documents.
- .2 Install all anchor bolts, embedded metal, inserts, hangers, etc. supplied by other project trades to be cast into concrete. The Contractor shall be responsible for the correct positioning, depth, exposure and installation of these elements.
- .3 Install all openings, sleeves, block outs, etc. required by other trades and indicated on the construction drawings. The Contractor shall be responsible for the correct positioning, depth and installation of these elements.

1.3 Related Work

- | | | |
|----|------------------------|------------------|
| .1 | Concrete Reinforcement | Section 03 20 00 |
| .2 | Concrete Formwork | Section 03 10 00 |
| .3 | Concrete Finishing | Section 03 35 00 |

1.4 Reference Standards

- .1 Unless otherwise noted concrete work shall conform to the requirements of the following standards:
 - .1 B.C. Building Code Current Edition
 - .2 CSA CAN3-A23.1.
 - .3 CAN/CSA-A23.2 Methods of Tests for Concrete.
 - .4 CAN/CSA-A23.3 Code for the Design of Concrete Structures for Buildings.
- .2 A copy of the standard shall be kept by the Contractor on site for the duration of the work.

1.5 Submittals

- .1 A minimum of two (2) weeks prior to the start of work in this section the Contractor shall submit to the Owner's Representative the following information:

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- .1 Written confirmation of the mix design criteria from the concrete batch plant. Confirmation shall also be sent to the project Testing Agency.
- .2 Shop drawings indicating the layout of all form ties.

1.6 Quality Assurance

- .1 To ensure consistency in the mix design; colour and finished appearance the supply of concrete and aggregate to be used in the concrete mix shall be from a single source throughout the duration of work of this Contract.
- .2 Quality of Finish: The quality of finish shall be such that, when the forms are stripped, it meets the standards set out below, without further finishing work other than sandblasting as required, and clean-up.
- .3 Concrete finishes shall exhibit sharp, accurate definition at corners, arises, reglets and the like, generally free of chipped or spalled areas and within dimensional tolerances set out in CAN/CSA A23.1/A23.2-00, except in the instance of "bug holes" or "honey-combing", in which a maximum of 5 mm diameter holes will be allowed. Members shall be visually straight. Major defects will necessitate replacement. The judgement as to what constitutes major defects will be by the Owner's Representative.
- .4 Concrete finish shall be uniform in colour.
- .5 Plane surfaces without protuberances, indentations, ridges or bulges.
- .6 Abrasive blasted surfaces shall have uniform depth of cutback, distribution of aggregate and colour and texture matching the sample panel designated by the Owner's Representative
- .7 Under no circumstances shall repair to any architectural concrete be undertaken without the Owner's Representative written consent. Concrete members that are repaired without written consent may be classified as defective work at the discretion of the Owner's Representative.

1.7 Testing and Approvals

- .1 All required sampling, preparation of specimens and testing shall be performed by an independent testing agency appointed by the Owner's Representative. The testing agency shall report any procedures that are contrary to the specifications or accepted practice to the Owner's Representative.
- .2 Testing will be paid for by the Contractor. The testing agency shall submit all results directly to the Owner's Representative.
- .3 The cost of supplying the material for samples shall be borne by the Contractor. The Contractor shall provide adequate notice and coordinate the scheduling of all concrete placements with the testing agency. The Contractor shall cooperate with the testing agency during the sampling process.
- .4 The testing agency shall perform the following:

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- .1 Review mix designs to ensure conformance with the specifications. Provision of a written report to the Owner's Representative.
- .2 Test cement and aggregate for conformance with the material requirements of the specification.
- .3 Supply cylinder moulds, sample the concrete, make and cure test cylinders and perform compressive strength tests in accordance with specification standards.
- .4 Carry out slump and air content tests for each concrete test in accordance with specification standards.
- .5 Take three (3) test cylinders for each 25 cubic Metres (33 cubic yards) or fraction thereof for each class of concrete placed in any one day. In no case shall any one class of concrete be represented by less than three (3) tests.
- .5 All cylinders shall be made from concrete taken from the forms.
- .6 The Owner's Representative at their discretion may reduce or eliminate the test cylinders to be taken for minor pours or pours not of structural significance.
- .7 The testing agency shall perform the following tests on each set of cylinders:
 - .1 Compression test of one (1) of the cylinder specimens after seven (7) days.
 - .2 Compression test of the remaining two (2) cylinders of each group after twenty-eight (28) days.
 - .3 One (1) twenty-eight (28) day strength test result shall be calculated from the average of the compressive strength tests of the two (2) companion cylinders.
- .8 The testing agency shall provide certified copies of the test result to the Owner's Representative. The test results shall meet the requirements of the mix designs indicated on the Contract documents.
- .5 Should any test indicate concrete below strength, the Owner's Representative shall have the right to stop work on the suspect area until subsequent tests are made. The Contractor shall bear the cost of such required tests. Should all tests indicate below strength concrete, the Contractor shall remove this portion of the work at the Owner's Representatives request. The removal and replacement of this work by the Contractor shall be at no expense to the Owner.

1.8 Protection

- .1 Cold and hot weather requirements to CAN/CSA A23.1.

1.9 On Site Mock-Up

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- .1 Construct a 1.2m long x 1.0m high x detailed thickness of cast in place concrete wall. Mock-up shall include a representative of all wall elements noted in the construction details and plans including but not limited skate board abatement, reveals, joints, edge treatments, etc. The Owner's Representative will review and approve the mock-up prior to the start of any work of this section. The approved mock-up shall form the basis of acceptable quality required for the remainder of the concrete work.**
- .2 The approved mock-up shall be a stand-alone element and not form part of the finished project. The mock-up is to be retained on site until the project has been concluded at which point the mock-up will be disposed of by the Contractor at no additional cost to the owner.**
- .2 The mock-up can remain part of the final work at the discretion of the Owner's Representative.**

PART 2: PRODUCTS

2.1 Concrete Mixing Materials

- .1 Portland Cement: to CAN/CSA-A5.
- .2 Aggregates: fine and coarse to CAN/CSA-A23.1
- .3 Water: potable to CAN/CSA-A23.
- .4 Air entraining admixtures: To requirements of ASTM C260. Acceptable products include but are not limited to:
 - .1 N.V.R, Sternson Ltd.
 - .2 Darex AEA, Grace Construction Materials
 - .3 MB-VR, Master Builders
- .5 Chemical Admixtures: To CAN/CSA-A266.2. The Owner's Representative shall approve use in writing.
- .6 Calcium Chloride: As a raw material or as a constituent in other admixtures, shall not be used unless approved in writing by the Owner's Representative.
- .7 Curing Compound: To requirements of ASTM C309 spray applied liquid containing a fugitive dye to be applied in accordance with manufacturers written instructions.
 - .1 Curing compounds shall be compatible with other specified floor hardeners, covering adhesives and waterproofing compounds.
 - .2 The use of other curing methods including the use of burlap and sheet materials shall be at the discretion of the Owner's Representative.

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- .8 Form Release Agents: Concrete form release shall be composed of an organic chemical that reacts with the alkali content of concrete to form a release film, along with providing an inert barrier to provide double separation. Acceptable materials include but are not limited to:
- .1 Duogard Concrete Form Release Agent by W.R. Meadows
 - .2 Eco-Coat by W R Meadows
 - .3 No Hold Concentrate, Grace Construction Materials
- .9 Joint Fill Material: Fibre Board: 12mm (1/2") pre-moulded bituminous impregnated fibre board to ASTM D 1751. Acceptable materials include but are not limited to:
- .1 Flexcell, Sternson
 - .2 027 Fibre Expansion Joint, W R Meadows
- .10 Backer Rod: Closed cell, polyurethane foam to ASTM C 1330, Type C. For Joint widths up to 19mm (3/4") diameter of rod shall be 3mm (1/8") larger than the joint width.
- .11 Joint Sealant: Shall be self-levelling, non sag, two (2) part polyurethane type, conforming to CGSB 19.24-M80, Type II, Class B. Acceptable products include:
- .1 Sika; Sikaflex-2C NS Mix TG
 - .2 Iso-Flex 880 GB self leveling
 - .3 Sonneborn SL2
- .12 Colour from standard range as indicated on the Contract Drawings.
- .13 Primers and bond breakers as required to install the joint sealant system shall be in strict accordance with sealant manufacturers written recommendations.

2.2 Mix Designs

- .1 Unless otherwise noted on the Contract documents the concrete mix design shall meet the following requirements:

- .1 Ramps, stairs, and curbs:

Minimum 28 Day Strength	32 MPa
Slump	75mm, (3"), +/- 20mm (3/4")
Maximum Aggregate Size	19mm (3/4")
Water Cement Ratio	0.45
Air Content	5 – 8%
Exposure Class	C-2

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.2 Walls and Columns:

Minimum 28 Day Strength	28 MPa
Slump	75mm, (3"), +/- 20mm (3/4")
Maximum Aggregate Size	19mm (3/4")
Water Cement Ratio	0.55
Air Content	4 – 7%
Exposure Class	F-2

PART 3: EXECUTION

3.1 General

- .1 Concrete Supply: Concrete shall only be supplied by a ready-mix concrete plant indicated by the Contractor in the submittals provided as part of the approval for work of this section.
- .2 The transport of concrete in non-agitating equipment is not permitted without the prior written permission of the Owner's Representative.
- .3 Concrete shall be discharged to the specified on site locations no longer than one and one half (1.5) hours after the introduction of the mixing water to the cement and aggregates.

3.2 Openings and Inserts

- .1 The Contractor is responsible for the coordination with all trades in the setting of all slots, sleeves, openings, fasteners, block outs, bolts, dowels, hangers, inserts, conduits, clips, etc., that described or detailed in the Contract documents.

3.3 Preparation for Concrete Pour

- .1 Owner's Representative Review: A minimum of 48 hours prior to the placement of concrete the Owner's Representative shall review the following elements:
 - .1 Layout and construction of formwork.
 - .2 Layout and placement of reinforcing.
- .2 Inserts and Block Outs: The Contractor shall have all inserts, anchors, embed items, etc. positioned or close at hand to ensure a seamless, efficient concrete placement operation.
- .3 The Contractor is to review with the Owner's Representative procedures, reference lines, form construction and other practices that will be employed to ensure that concrete that is placed in areas where the Contract documents require a positive slope to ensure drainage will after final surface finishing achieve the specified slopes.

3.4 Addition of Water

- .1 To conform to CAN/CSA-A23.1.18.4.3.

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- .2 In brief – no water from the truck system or elsewhere shall be added after the initial introduction of the mixing water at the batch plant. The only exception shall be as follows:
 - .1 At the start of discharge if the measured slump of the concrete is less than that specified and no more than sixty (60) minutes have elapsed from the time the concrete was loaded at the batch plant to the start of discharge, then at the discretion of the Owner's Representative up to 12 litres per cubic metre (3 gallons per cubic yard) of water may be added to concrete in the ready mix truck. The resulting concrete must satisfy the mix design requirements of the Contract documents.

3.5 Placing of Concrete

- .1 Concrete shall be deposited in the forms as close as is practicable to its final position to avoid segregation due to re handling.
- .2 Place concrete in generally horizontal, level lifts to a maximum depth of 300 mm (12"). Ensure the free fall of concrete does not exceed 1.5 metres (5'-0").
- .3 Consolidate each lift of concrete thoroughly and uniformly by means of vibrators or finishing machines. The resultant mix should be a dense, homogeneous structure closely bonded to the reinforcing.
- .4 Vibrators shall be internal type having a minimum frequency of 7,000 revolutions per minute. A spare vibrator shall be readily accessible during all placement operations.
- .5 Ensure that the placing of concrete and the subsequent vibration process does not disturb reinforcing, location of inserts and block outs or the position of the forms.
- .6 Concrete shall not be placed during rain or snow unless Contractor has reviewed procedures for providing adequate protection to finished surfaces with the Owner's Representative. All procedures, equipment, tarps and overhead cover to be in place prior to the start of concrete placement.

3.6 Curing and Protection

- .1 Curing: Concrete shall be cured in accordance with CAN/CSA 23.1.
- .2 Unless otherwise indicated slabs shall be cured using curing compound specified. Coverage rates and method of application shall be as per manufacturers written instructions.
- .3 Freshly placed concrete shall be protected from the effects of sunshine, drying winds, cold, heat, and flowing water including rain by the use of adequate tarpaulins or other suitable materials to cover completely or enclose freshly finished surfaces, until the end of the curing period.

3.7 Finishes

- .1 Prior to final finishing, unless otherwise indicated on drawings tie holes shall be filled, formed surfaces shall be treated in accordance with CAN/CSA-A23.1. 24.

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- .2 Final concrete finishes shall be as detailed in Contract documents.

3.8 Concrete Joints

- .1 Joints are to occur at regular intervals as required by the existing conditions, no further than 9 meters (30 ft) apart unless noted otherwise.
- .2 Joint locations in beams or walls shall be approved by the Owner's Representative prior to their installation. Ensure proper key and dowels or extensions of reinforcing are provided at all joints.
- .3 The Contractor shall seek the approval of the Owner's Representative for installation of joints not indicated in the Construction documents.

3.9 Joint Fill and Sealant

- .1 Provide joint fillers and sealant to all joints unless otherwise indicated in the Contract documents.
- .2 Ensure that all joints are thoroughly prepared and cleaned of all foreign material that may impair the proper function of the joint of adhesion of the sealer. Cleaning procedures shall be in accordance with the manufacturers written instructions.
- .3 Unless otherwise indicated in the Contract documents or required by the sealant manufacturer the joint fill material shall terminate 12mm (1/2") below the top of the joint. The resultant space shall be space shall be filled with joint sealer in accordance with the manufacturers written instructions.

3.10 Patching

- .1 The Owner's Representative shall review all "bug holes" or "honey-combing", prior to any remedial work performed by the Contractor. Repair of these types of defects shall be as per CAN/CSA-A23.1.24.2. Patching and remedial work shall be performed by the Contractor at no cost to the Owner.
- .2 No other patching or repair of concrete surface shall be allowed. Defective work identified by the Owner's Representative shall be completely removed and replaced at no cost to the Owner.

3.11 Flood Test

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- .1 Immediately upon removal of the formwork of cast-in-place improvements or placement of precast concrete elements, a flood test shall be conducted by the Contractor in the presence of the Owner's Representative to ensure proper drainage of all concrete improvements. Improvements subject to a flood test shall include but are not limited to all stairs and ramps. The flood test shall consist of the application of a volume of water sufficient to allow the visual verification of all slopes and drainage patterns and ensure that ponding does not occur. The volume of water necessary to facilitate testing and the determination of the success or failure of the flood test shall be at the discretion of the Owner's Representative.
- .2 Should the concrete not meet the grade tolerances of the Contract documents or ponding is evident after a flood test the Contractor shall at the discretion of the Owner's Representative completely remove and replace all concrete. Grinding, partial removal and patching to resolve ponding or insufficient grade is not acceptable.

END OF SECTION 03 33 00

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install architectural finish, rough formed finish and the installation of anti-graffiti coatings on cast in place concrete.

1.3 Related Work

- | | | |
|----|--------------------------------|------------------|
| .1 | Shop Drawings and Product Data | Section 01 33 23 |
| .2 | Concrete Reinforcing | Section 03 20 00 |
| .3 | Cast-In-Place Concrete | Section 03 33 00 |
| .4 | Abrasive Blast Finish | Section 03 35 10 |

1.4 Reference Standards

- .1 Concrete finishes shall conform to the requirements of the following standards unless otherwise required by this specification:
 - .1 CSA/CAN3-A23.1, Concrete Materials and Methods of Concrete Construction

1.5 Submittals

- .1 Manufacturers product information sheets for all component parts of the concrete installation including but not limited to, coloured, or stained concrete.
- .2 Quality control procedures for coloured or stained concrete.

PART 2: PRODUCTS

2.1 Concrete Materials: In accordance with CSA/CAN3-A23.1.

2.2 Bonding Agent: Formulated for bonding new concrete to cured concrete. Acceptable materials include but are not limited to:

- .1 Daraweld C, Grace Construction Materials
- .2 Polymer Bonding Agent, Target
- .3 Concessive Liquid LPL, Master Builders

2.3 Non-shrink Grout for Patching: Acceptable materials include but are not limited to:

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03 35 00
Concrete Finishing

- .1 Embeco Mortar, Master Builder's,
- .2 Fast- Set Patching Concrete, Target

2.4 Integral Liquid Colour Additive: Iron oxide pigment suitable for sandblasted concrete that will produce a uniform, consistent colour. Colour pigment shall be permanent, inert, stable in atmospheric conditions, sun fast, weather resistant, alkali resistant, lime proof and non-bleeding. Particle size shall be 95 to 99% minus 325 mesh.

- .1 Acceptable products include; SGS Color-Flo Liquid Colours, by Solomon Colors, Springfield, Illinois, sgs@solomoncolor.com or pre-approved equal.
- .2 Colour as indicated on Contract drawings.

2.5 Anti-Graffiti Coating: All walls exceeding a height of 0.60M shall be protected with 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, 102-876 Cordova, Vancouver BC. (604) 254.3325.
- .2 Pre approved equal

PART 3: EXECUTION

3.1 Site Mock Up - Architectural Concrete

- .1 A minimum of ten (10) working days prior to the start of work of this section a mock up of the components listed shall be constructed on site. Do not proceed with work of this section until the mock up(s) have been reviewed and approved by the Owner's Representative. If the mock up(s) are not approved, construct additional mock up(s) until approval is obtained.
- .2 The mock up shall be stored on site as a standard of quality, colour, finish and anti-graffiti coating for each component. At the discretion of the Owner's Representative the mock up may be constructed as part of the finished component.
- .3 The mock up shall clearly illustrate all finishes, reveals, patterns, shapes and colours indicated on construction drawings and details.
- .4 **Construct a 2.5M (8'-0") length mock up of each of the following:**
 - .1 **Concrete cheek wall**
 - .2 **Concrete stairs (anti-graffiti coating to risers and treads)**
 - .3 **Concrete seat step**
 - .4 **Concrete wall**

3.2 Finishing of Concrete Surfaces

- .1 Architectural Concrete Finish (concrete surfaces that are exposed to view):

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03 35 00
Concrete Finishing

- .1 Surface finishing shall conform to CAN 3-A23.1-M94, Section 24, Finishing of Formed Surfaces, Clause 24.3.3, Smooth Form Finish.
- .2 Rough Form Finish: All concealed concrete surfaces.
 - .1 Surface finishing shall conform to CAN 3-A23.1-M94, Section 24, Finishing of Formed Surfaces, Clause 24.3.2, Rough Form Finish. Patching to be done in accordance with clause 24.2 Patching.
- .3 Sandblast Surface Finish: On concrete surfaces noted on drawings as per Section 03351.

3.3 Repairs to Defects

- .1 Architectural concrete shall have a pleasing appearance, free of defects, with minimal colour and texture variation when viewed at a distance of 6 metres (20'-0").
- .2 Should the variation in colour and texture or the appearance of defect(s) including but not limited to honeycombing, rock pockets, chips, cracks, spalls, fins and stains exceed the tolerance of the specification or CAN3 - A23.1-M94, whichever is more onerous the concrete work will be rejected. At the discretion of the Owner's Representative rejected concrete, at no cost to the owner will be demolished and replaced by the Contractor.
- .3 Grinding or repair of stair treads to facilitate positive drainage will not be accepted. Contractor at no expense to the Owner will completely remove and replace all stair systems that exhibit ponding of water on the stair treads.
- .4 At the discretion of the Owner's Representative the Contractor may be given the opportunity to provide in writing accompanied by product information and cut sheets, a detailed methodology of repair of defective concrete. The methodology should reference the manufacturers written instructions for each product and procedure and shall clearly outline the full process for repair of defective work.
- .5 Should the Owner's Representative approve the defect repair methodology a trial repair will be carried out on the mock up. In the event the mock up was incorporated into the finished work a discrete location will be chosen by the Owner's Representative for testing of the defect repair.
- .6 The acceptance of the repair shall be at the sole discretion of the Owner's Representative. Should the repair not be acceptable to the Owner's Representative the Contractor shall, at no cost to the owner demolish, and replace the defective work.

3.4 Application of Anti-Graffiti Coating

- .1 Unless otherwise indicated in the specifications or on the contract drawings anti-graffiti coating to be applied to all exposed vertical concrete surfaces.
- .2 Surface preparation and application in strict accordance with the manufacturers technical data and application instruction sheet.

3.5 Protection

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Concrete Finishing

- .1 Protect architectural concrete from any damage by the elements and defacement of any nature during construction operation.
- .2 All corners and surfaces subject to possible damage shall be suitably protected with boards or hoardings.
- .3 The Contractor shall make adequate provision to keep all exposed concrete free from laitance caused by spillage, leaking forms or other contaminants. In no event shall laitance be allowed to penetrate, stain or harden on surfaces that have been sandblasted.
- .4 Adequate protection shall be given to all exposed reinforcing steel in architectural concrete to prevent staining of surfaces of concrete due to rust and corrosion. If any rust or corrosion does occur, it shall be removed immediately to avoid permanent staining.

3.6 Cleaning

- .1 Rubbish, debris and demolition material resulting from work of this section shall be collected regularly, removed from the project site and properly disposed.
- .2 Repair, remove and clean all drips or smears resulting from the work of this section on exposed, finished surfaces or surfaces to be subsequently finished.

END OF SECTION 03 35 00

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary for abrasive blasting of surfaces as indicated in the contract documents.
- .2 The work shall include but is not limited to the following components:
 - .1 Concrete Walls and Cheek Walls
 - .2 Concrete Seat Walls and Steps
 - .3 Concrete Planters
 - .4 Concrete Banding
 - .5 Cast in Place Concrete Walks, and Miscellaneous Flat Work

1.3 Related Work

- | | | |
|----|--------------------------------|------------------|
| .1 | Shop Drawings and Product Data | Section 01 33 20 |
| .2 | Concrete Forming | Section 03 10 00 |
| .3 | Reinforcing Steel | Section 03 20 00 |
| .4 | Cast-In-Place Concrete | Section 03 33 00 |

1.4 Reference Standards

- .1 All work and material shall conform to Chapter 9 of CPCA/MPDA Specification Manual (latest edition) and as herein specified.

1.5 Qualifications

- .2 This Contractor shall have a record of satisfactory performance in the trade and shall maintain a qualified crew of abrasive blasters throughout the duration of the work.

1.6 Requirements of Regulatory Agencies

- .1 Applicable Provincial, municipal regulations and environmental requirements shall be fully maintained during abrasive blasting operations.
- .2 WorkSafe BC safety regulations shall be strictly adhered to in all respects. Specific emphasis shall be placed on monitoring and adhering to permissible noise levels and air borne particulate levels.

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03 35 10
Abrasive Blast Finish

1.7 On Site Mock-Up

- .1 A minimum of ten (10) working days prior to the start of work of this section mock up(s) of the abrasive blast finishes shall be prepared by the Contractor. Do not proceed with work of this section until the mock up(s) have been reviewed and approved by the Owner's Representative. If the mock up(s) are not approved, construct additional mock up(s) until approval is obtained.*
- .2 Construct two (2) 1.8M x 1.8M (6'-0" x 6'-0") mock up panels. Each panel shall be divided into three (3) equal zones, one for each intensity of abrasive blast finish, i.e. light, medium and heavy or as indicated on construction drawings and details. One mock up panel shall be of a vertical section of wall, the second shall a horizontal concrete surface.*
- .3 Sample panels shall be abrasive blasted after the specified curing time has elapsed. Finish abrasive blast work will follow the curing procedure and timing.*
- .4 The mock up shall be stored on site as a standard of quality, and finish for each component.*

1.8 Job Conditions

- .1 Equipment used in abrasive blasting operations shall be properly muffled. All dust shall be completely controlled during the operation.
- .2 Protect surrounding and adjoining work by adequately covering with tarpaulins or other necessary protective covering. At no cost to the Owner, make good any damage caused by failure to provide suitable protection.

PART 2: PRODUCTS

2.1 Materials

- .1 Abrasives shall conform to The International Concrete Repair Institute No. 310.2R-2013
- .2 Material and material gradation will be selected by the Abrasive blasting Subcontractor to achieve finishes described in the construction drawings and details, implemented on the mock up panels and approved by the Owner's Representative.

2.2 Product Delivery, Storage and Handling

- .1 Deliver materials to the site in unopened, weather tight packaging that is clearly marked with the manufacturers name and product information.
- .2 All materials shall be protected from the rain and excessive moisture, sit on pallets and stored in a location that will not impact other trades working on the site.

PART 3: EXECUTION

3.1 Inspection

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Abrasive Blast Finish

- .1 The Contractor shall inspect all surfaces to be abrasive blasted and report to the Owner's Representative in writing any defects or elements that will hinder the completion of abrasive blast operations. Commencement of work indicates acceptance for the above condition.
- .2 Prior to start of work of this section the Contract shall ensure that the Owner's Representative has reviewed and accepted all surfaces to be abrasive blasted.

3.2 Finish

- .1 Abrasive blasting finishes shall be light, medium and heavy abrasive blast finishes as called up on details and drawings. The exact finish of abrasive blast will be governed by matching samples reviewed by the Owner's Representative.
- .2 Refer to drawing for location, type and extent of abrasive blast finishes.

3.3 Abrasive Blast Operation

- .1 All abrasive blasting required on this project shall be carried out by the air-blasting method.
- .2 Concrete shall have cured for a minimum of twenty-one (21) days prior to abrasive blasting.
- .3 Schedule abrasive blasting operations to ensure cure times match those of the approved mock up panels.
- .4 Abrasive blasting operation shall yield uniform texture and colour to all surfaces. The texture and colour shall match the approved mock up panels.

3.4 Cleaning

- .1 During the progress of the work keep the premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris.
- .2 Upon completion of the work remove all excess materials and clean all surfaces.

END OF SECTION 03 35 10

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install miscellaneous stone work as indicated in the contract documents. Work includes but is not limited to:
 - .1 Granite stone paving
- .2 All stone to be quarried from Quarries in British Columbia
- .3 All stone to be finished in British Columbia.

1.3 Related Work

- | | | |
|----|--|------------------|
| .1 | Cast-In-Place Concrete | Section 03 33 00 |
| .2 | Excavation and Backfill | Section 31 23 10 |
| .3 | Precast Concrete Unit Paving | Section 32 14 00 |
| .4 | Precast Concrete Unit Paving – Permeable | Section 32 14 43 |

1.4 Quality Assurance

- .1 Source Supply: All material shall be obtained from quarries having adequate capacity and facilities to meet specified requirements. Cutting and finishing shall be carried out by a firm equipped to process material promptly on order and in strict accord with specifications.
- .2 All materials delivered to the site shall be clean, in good condition free of defects, stains and markings.

1.5 Protection

- .1 Site and Adjacent Property
 - .1 Protect all work from damage related to weather, other trades, and/or on site construction activities.
 - .2 Protect adjacent property and construction activities from damage arising from this contract.
- .2 Finished Stone
 - .1 Properly protect all stone against damage in transit or at project site.
 - .2 Place wood timbers under stone when stored on open ground to prevent contact with grade.

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04 43 00
Miscellaneous Stone Work

1.6 Existing Utilities and Structures

- .1 Exact location of all existing utilities and structures, whether or not indicated on the drawings will be determined by the Contractor. Conduct work so as to prevent interruption of service or damage.
- .2 Ensure that all underground utilities including drainage and irrigation systems are clearly located and protected during construction. Make good all damages.

1.7 Submittals

- .1 Material Samples; Two weeks prior to the start of construction submit to the Owner's Representative three (3) representative samples to the sizes and finishes noted. Clearly label the stone name or product name, quarry location, various finishes, project name and date.
 - .1 Granite: 300mm x 300mm x 100mm samples illustrating the following finishes on at least one face of each sample; split face finish, flame finish and or tumbled. Sample finish required for each for granite block and granite edging.
- .2 All materials delivered to site will conform to selected samples, subject to normal stone variations. One (1) submitted sample will be retained on site at Site Office as record of approved material.

1.8 Schedule

- 1 Provide the Owner's Representative three (3) copies of a schedule outlining the key milestone dates related to quantity and sequence as required to properly expedite installation.
 - .1 The completion of quarry extraction and dressing of stone
 - .2 Delivery to the site
 - .3 Installation and completion

1.9 Examination

- .1 Prior to the commencement of work of this section, inspect all surfaces on which work is to be laid and ascertain that surfaces are adequate in relationship to the preparation of work to be performed under this section. Commencement of work will signify acceptance.
- .2 Report any defects or perceived conflicts to the Owner's Representative.

PART 2: PRODUCTS

2.1 Approved Equals

- .1 It is the intent of the City to specify Locally Quarried and Finished Stone.

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- .2 Should the Contractor be seeking permission for use of an approved equal beyond the suppliers identified in this specification the following process shall be followed for the review and approval of an alternate material. See granite types for acceptable approved equal supply locations in Section 2.01.
- .3 Within the first ten (10) business days from the date of the Tender call for work of this section the Contractor shall provide in writing either by fax or email a notification to the Owner's Representative of the intention to seek an approved equal.
- .4 Following notification and within the first fourteen (14) days from the date of the Tender call supply documentation as noted to the Owner's Representative at no cost to the Owner or the Owner's Representative. Documentation to include;
 - .1 One (1) 200 mm(width) x 150 mm(depth) x 600mm(length) sample of material proposed as 'Approved Equal'. The sample shall clearly illustrate specified finishes and be labeled with the supplier name, address and phone number, stone name or product name, quarry location, and type of stone.
- .5 Owner's Representative shall review proposal for 'Approved Equal' and notify the Contractor in writing either by fax or email that the sample proposed as an 'Approved Equal' has been either accepted or rejected within five (5) business days of receipt of sample.
- .6 Rejected proposals will not be considered during the Tender evaluation.

2.2 Materials

- .1 Granite Paving at Path
 - .1 All Granite to be quarried from a **Canadian Quarry** and locally supplied.
 - .2 Supply granite edges to sizes and surface finishes as noted on the drawings.
 - .3 Saw cut all faces. Flame finish 4 faces, top, front, and sides.
 - .4 Free of cracks, seams or starts that may impair structural integrity or function. Minor variations in stone characteristic will be acceptable.
 - .5 All granite to be generally salt and pepper mix character look of grey, black and white fleck. Acceptable suppliers and proprietary products include;
 - .1 Hardy Island Granite as supplied by Bedrock Granite Sales – Coquitlam, BC 604.941.7783.
 - .2 Polycor – Quebec, QC 418.692.4695
 - .3 Granicor – Saint-Augustin, QC. 418.878.3530
 - .4 **Pre approved equal for other Canadian quarries only accepted.**
 - .6 Crushed Granular Base: The 19 mm (3/4") crushed granular base shall consist of sound, durable particle free from clay, organic material or other deleterious matter, evenly graded, to meet the following gradation requirements.

<u>Sieve Size (mm)</u>	<u>Sieve Size (inches/#)</u>	<u>Percent Passing</u>
19	(3/4")	100
12.5	(1/2")	75 – 100

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9.5	(3/8")	60 – 90
4.75	(#4)	40 – 70
2.36	(#8)	27 - 55
1.18	(#16)	16 – 42
0.60	(#30)	8 - 30
0.30	(#50)	5 – 20
0.15	(#100)	5 - 15
0.074	(#200)	2 – 8

PART 3: EXECUTION

3.1 Layout

- .1 Prior to the start of construction, stake layout of all granite elements for Owner's Representative review.
- .2 Verify all locations and dimensions and report to Owner's Representative any deviation or conflicts between drawings, specifications and site conditions.

3.2 Subgrade Preparation

- .1 Compact subgrade to 95% Modified Proctor Density.
- .2 Excavate soft and unstable areas of subgrade that cannot be compacted to standard noted, fill and compact with approved granular material.
- .3 Ensure subgrade is true to line and grade and allows for sufficient depth to ensure finish grade can be established as noted on plans.

3.3 Placement of Granite Elements

- .1 Examine material prior to installation for visible defects or damage. Do not install cracked, chipped, stained or physically damaged pieces. Report any damages to Owner's Representative immediately.
- .2 Place crushed granular base to lines and levels noted on drawings.
- .3 Set paving in pattern and layout noted on drawings.
 - .1 Ensure paving sits true, level, and do not rock or move under pedestrian load.
 - .2 Do not use shims or spacers to level stones. Stones are to sit tight edge to edge to lines and grades indicated on drawings.

3.4 Adjust and Clean

- .1 Carefully clean all stone removing all dirt and debris from all surfaces.
- .2 Remove and dispose of off site all debris as a result of work in this section.

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END OF SECTION 04 43 00

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Boulder Placement

1 GENERAL

1.1 SECTION INCLUDES

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

1.2 RELATED SECTIONS

1. Ornamental Stone Section 02380

1.3 DEFINITIONS

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

2 PRODUCTS

2.1 MATERIALS

1. On-site Boulders:

1. May be used if they meet the size specified and are pre-approved by the Consultant.

2. Imported Boulders:

1. Boulders to be supplied by City from Kent Yard (782-900 East Kent Avenue, Vancouver). Boulders to be approved by the Owner's Representative at the source prior to delivery or sample boulder approved by Owner's Representative prior to site delivery of remaining boulders.

3 EXECUTION

3.1 STOCKPILE

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

3.2 PLACEMENT

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

END OF SECTION

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install miscellaneous metalwork items as indicated in the contract documents.
 - .1 Handrails,
 - .2 Guardrails,
 - .3 Balustrades.

1.3 Related Work

- .1 Exterior Painting and Powder Coating Section 09 96 00
- .2 Site Furnishings Section 32 37 00

1.4 Reference Standards

- .1 Conform to CAN3-S16.1-M for design of steel structures, unit stresses and workmanship.
- .2 Handrails and balustrades when installed shall conform to local municipal loading requirements. Maximum deflection 1/360 of the span.

1.4 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 Painted finishes of exterior galvanized metal to conform with requirements of Section 09 96 00. Surface preparation for painting of exterior exposed steel to conform to Steel Structural Painting Council Standards - refer also to Section 09 96 00.

1.5 Submittals

- .1 Submit shop drawings of all miscellaneous metalwork for review by Owner's Representative. Completely detail items indicating all dimensions, materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcements and fixing details and accessories. **Confirm all dimensions on site prior to fabrication.**
- .2 Submit shop drawings in accordance with General Condition GC 34 as amended under Supplementary Conditions and Section 01 33 23 (as applicable).

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- .3 Do not commence fabrication of miscellaneous metal items until shop drawings are reviewed/stamped by the Owner's Representative.
- .4 Shop drawings for metal balustrades, railings and guardrails, including all connection detailing, shall be sealed by a Professional Engineer registered in the province of B.C.

1.7 Protection

- .1 Use all means necessary to protect miscellaneous metal before, during and after installation and to protect the installed work and materials of all other items until Substantial Completion.
- .2 In the event of damage immediately make all repairs and replacements necessary to the approval of the Owner's Representative at no extra cost.

1.9 Quality Assurance

- .1 Prior to commencement of any work of this Section, the contractor is required to make contact with the designated Owner's Representative properly authorized to make project decisions, and to determine schedule of inspections required and parties to be present for review/approval.
- .2 All work is to be presented at fabricator's shop for inspection of workmanship and materials prior to arrival on site and/or forwarding to paint shop for finishing work. Notify Owner's Representative a minimum of **forty-eight (48) hours** prior to all required inspections.

PART 2: PRODUCTS

2.1 Steel: shall be one of the following types as designated on the drawings or specified herein.

- .1 Structural steel, miscellaneous steel shapes, conforming to CAN3-G40.21-98, Grade 300W, 44W for flat shapes.
- .2 Seamless hollow structural sections, conforming to CAN3-G40.21, Grade 50W, Type H.
- .3 Pipe, schedule 40 standard weight, conforming to ASTM Specification A53, Grade A.
 Include galvanized sleeves for setting verticals, as required. Bends as detailed.

2.2 Bolts, Nuts and Washers: In accordance with material and size requirements of CAN3-S16.1-94M.(ASTM A307).

2.3 Galvanizing: Hot dipped galvanizing with zinc coating 610 grams per square meter area conforming to CSA G164-M92.

2.4 Galvanized Metal Primer: Shall conform to CGSB 1-GP-198-95 Cementitious Primer for Galvanized Surfaces.

2.5 Non-Galvanized Ferrous Metal Primer: Shall conform to CGSB 1-GP-40M or 1-GP-132M90 Zinc Chromate Primer for Low Moisture Sensitivity.

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- 2.6 Grout:** For fill at pipe sleeves and other locations use a, non-shrink, non-metallic, non-corrosive, flowing, 24h, MPa.15, pullout strength 7.0 MPa grout for setting metal posts.
- 2.7 Concrete Inserts:** Threaded or wedge type galvanized ferrous castings, either malleable iron to ASTM A47, or cast steel to ASTM A27 Standards. Provide bolts, washers and shims as required hot-dip galvanized as specified.
- 2.8 Fastenings:** Supply and install all hardware as required for installation. Installation hardware shall be sized to suit the material to which railings and other miscellaneous metal items are attached and shall meet the loading requirements. Hilti sleeve/chemical anchors as noted by Engineer. Submit samples for approval.
- 2.9 Angles, Clips, Channels, etc.:** Provide all angles, anchors, clips, plates, channels, etc. required to support or fix items of work installed by other sections save where specifically excepted and supply and fix any other miscellaneous ironwork required in the work.
- 2.10 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.
- 2.11 Approved Equals**
- .1 All items as specified or pre-approved equals.

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 it to the Owner's 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.
- .5 Fit and shop assemble in largest practical sections for delivery to the site.

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- .6 Fabricate and assemble miscellaneous metal items true, square and free from warpage or other defects.
- .7 Items to be fixed to concrete or masonry with expansion shields, expansion bolts or self-drilling anchors. Fixing to be of correct size to suit load being imposed.
- .8 Design, fabrication and workmanship shall conform to CAN3-S16.1-M94.
- .9 Welding shall conform to CSA W59-M89.
- .10 Use self-tapping shake-proof flat-headed screws on items requiring assembly by screws or as indicated.
- .11 Grind smooth all exposed welds, sharp edges, angles and corners.
- .12 Ensure exposed welds are continuous for length of each joint.
- .13 Bolted work shall be carefully tightened with threads of bolts nicked to prevent subsequent loosening, unless work indicated is noted as removable.
- .14 Drill or punch all holes required for the attachment of work of other trades and bolted connections.
- .15 Provide smooth exposed surfaces with all fastenings and connections hidden where possible.
- .16 Curved work shall be true to radii shown.
- .17 Galvanize all steel noted on drawings after fabrication of Sections prior to delivery to site.

3.3 Shop Preparation and Priming

- .1 All metal items shall be hot-dipped galvanized, primed and painted to requirements of Section 09900 - Aliphatic Urethane except where shown otherwise.
- .2 Apply one shop coat of primer to all miscellaneous metal items, except any items specified to be factory finished and any concrete encased items.
- .3 Prepare all miscellaneous metal for priming to Steel Structural Painting Council Standards; S.S.P.C. SP-1-82 Solvent Cleaning, followed by S.S.P.C. SP-6-85 Commercial Blast Cleaning (if applicable and recommended by Owner's Representative). Refer to SSPC Manuals, Guide to Good Painting Practices Volumes 1 and 2 for complete details.
- .4 Apply primer in accordance with manufacturer's directions.
- .5 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, and grease. Do not paint when temperature is lower than 7 degrees Celsius.
- .6 Clean surfaces to be field welded; do not paint.

3.4 Preparation for Powder Coating

- .1 Thoroughly descale all steel work after fabrication. Remove roughness and irregularities by grinding and clean wire brush. Remove oil and grease from steel surfaces.
- .2 Do not coat surfaces that are to be field welded.
- .3 Coat steel as soon as possible after cleaning.

3.5 Erection

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- .1 Erect metalwork square, plumb, straight and true, accurately fitted, with tight joints and intersections.
- .2 Provide suitable means of anchorage acceptable to Owner's Representative, 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 and workmanlike 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 Touch up rivets, field welds, bolts and burnt or scratched surfaces after completion or erection with appropriate primer.
- .7 Touch up galvanized surfaces with zinc primer where burned by field welding - refer to Section 09900. Ensure that all welds have been ground smooth and flush prior to applying zinc primer.
- .8 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.
- .9 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.

3.6 Installation

- .1 Install handrails in concrete by inserting over spigot as detailed, formed in concrete. Secure with stainless steel bolts, drilling concrete and installing wedge anchors, two per connection or as otherwise detailed. Support in accurate final location, plumb and level.

3.7 Powder Coating (if applicable):

- .1 Powder coating shall be carried out in shop by a pre- approved powder coating company. Minor marks in powder coating due to delivery and storage shall be promptly repaired by an approved method-confirm with Owner's Representative prior to repair. Damaged surfaces determined to be unacceptable for on-site repair shall be removed and re-coated at the plant.
- .2 Submit colour sample to the Owner's Representative, size of sample at least 100mm x 100mm. Final colour shall match approved samples.

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- .3 Apply powder coating to match approved sample, leaving final surfaces uniform. Hard and dry and free from foreign matter and other flaws. Repair flawed items completely; patching will not be acceptable.

3.8 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 WorkSafeBC requirements.
- .3 Any damage to paving, planting or any other structure/element due to work of this Section shall be immediately repaired at the Contractor's expense to satisfaction of Owner's Representative.
- .4 Remove and dispose of off site all surplus material, excess excavated materials, trash, debris, residue and waste material from the work of this Section.

END OF SECTION 05 70 00

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to play equipment with required safety zones as indicated in the contract documents.

1.3 Related Work

- .1 Fibar System 300 Specification
- .2 Concrete Forming and Accessories Section 03 10 00
- .3 Concrete Reinforcing Section 03 20 00

1.4 Qualifications

- .1 The Playground Equipment installer shall have a minimum of five (5) years proven record of satisfactory performance and experience on projects of similar size and scope and shall maintain a qualified crew with at least one (1) Canadian Certified Playground Inspector throughout the duration of the work who shall be qualified with the CPRA.
- .2 Qualifications of Workers:
 - .1 Only competent skilled trades people holding the designation Canadian Certified Playground Inspector who are thoroughly experienced with the material and methods specified may perform any playground installation work specified under the work of the Section.
 - .2 General labour type activities related to playground equipment installations may be performed by labourers and trades helpers who are thoroughly experienced with preparation procedures provided they work under the direct supervision of a skilled Canadian Certified Playground Inspector.
 - .3 Certification must be presented to the Owner's Representative or designated representative within 48 hours upon request, and produce written proof of such. A skilled Canadian Certified Playground Inspector shall be present at all times during the execution of the playground installation work.

1.5 Quality Assurance

- .1 All layout, materials and work must meet or exceed requirements of the latest edition of the CSA standard CAN/CSA-Z614-14 Children's Play spaces and Equipment and the IPEMA (International Play Equipment Manufacturers Association) standard.

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- .2 Hazardous materials such as asbestos, polychlorinated byphenyls (PCB's) and lead based paints are not permitted on site.
- .1 A copy of the CSA standard CAN/CSA-Z614-14 Children's Play Spaces and Equipment shall be kept on site for the duration of the construction schedule.
- .2 Should modifications to the CSA Guidelines occur, and then the modifications shall govern.

1.6 Protection

- .1 Protect all play equipment and components against damage during shipping, handling, storage and installation, and until Final Acceptance.
- .2 Provide protected storage of play equipment prior to installation off the ground and free from dampness.
- .3 Provide all necessary facilities/equipment for handling and lifting site furnishings-play equipment into final location. Take all reasonable measures to protect surrounding or adjoining work or as requested by the Owner's Representative, including all material, plant and real property related to the Work against loss or damage from any cause.
- .4 Safety: The Contractor will be responsible for all aspects of job safety at the work site as per the contract documents. All work must be carried out in a safe and responsible manner. Where applicable, Workers Compensation Board "Industrial Health and Safety Regulations" must be followed.
- .5 Contractor is responsible for ensuring adequate public safety in his work area at all times. No operating equipment is to be left unattended and the work area is to be left in a safe, secure condition at the end of each workday. Ensure that any partially installed play equipment is adequately signed with warning signs stating "CONSTRUCTION AREA - KEEP OFF" and that the overall area is properly barricaded by fences or approved guards from public access until Final Acceptance.

1.7 Submittals

- .1 Provide shop drawings of all play equipment, and obtain Owner's Representative's approval prior to manufacture. Shop drawings shall show overall dimensions, layout, height relationships, and footing and anchoring methods adapted as necessary to the requirements of this project. Shop drawings shall show clearances to the edge of play area to meet the CSA Standards. The provided installation instructions and maintenance instructions shall be "project" specific containing component information that is part of the playground design. A "generic" package of installation instruction and maintenance instructions is not acceptable. Shop Drawings will become part of the Maintenance Manual.
- .2 Submit a copy of the supplier's warranty statement stating all exclusions. The warranty certificate shall be filled out/completed by the Contractor/Supplier acknowledging the Vancouver Park Board (with site location) as the Owner.

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- .3 Submit completed Schedule A - Sample Inspection Report Form to the Owner's Representative upon completion of the project. See Schedule A below.
- Maintenance Manual/Kit: Prior to and as a condition of Substantial Performance the Contractor shall submit a project specific maintenance manual/kit for all Project Play Equipment. This manual shall:
- .1 Provide information to establish the frequency of inspections.
 - .2 Describe preventative maintenance and repair procedures.
 - .3 Provide copies of project specific inspection Report Forms for each play component shown on the Drawings.
 - .4 A reproducible copy of the as constructed Play Component System produced by the Contractor or supplier/manufacture.
 - .5 Provide 2 sets of any special tools or wrenches necessary to adjust or replace any special vandal resistant fasteners.
 - .6 Provide a PVC repair kit for repair of minor PVC damage.
 - .7 Provide an anti-graffiti chemical cleaner for removal of paint, ink or other forms of graffiti from the various surfaces/materials used on the play structure.
 - .8 A primer and matching colour touch-up kit compatible with the original manufacturer's finishing system.
 - .4 The Contractor/manufacture shall submit with their bid a list of all variances from these specifications.
 - .5 Provide all necessary templates for location of fixing devices prior to pouring of concrete bases.

1.8 Guarantee

- .1 The play equipment and complete installation shall be warranted for three (3) full years from the date of Substantial Performance. Repair or replace any faulty work or parts within 7 days after notification by the Park Board. Do not permit dangerous conditions in or around the play equipment. Refer also to inspection requirements Item 3.4.2 of this Specification.

PART 2: PRODUCTS

2.1 General

- .1 All materials shall have demonstrated record of durability in the playground or similar outdoor settings.
- .4 Site Specificity of Design - Equipment selection is based on specific program requirements, physical constraints within the site, and public input. Requests for Product Substitution will be subject to certain subjective criteria including (in no particular order):
 - .1 Similarity to specified play structure components
 - .2 Footprint
 - .3 Colour Availability

- .4 Geometry
- .5 Apparent Mass and/or Visual Density
- .6 Proven Performance Record
- .7 Variance - The Contractor/manufacturer shall submit with their bid a list of all variances from these specifications.

2.2 Play Equipment

- .1 Play equipment shall be CSA-approved manufactured units, consisting of the components shown in the drawings and itemized herein, and all incidental components required for a proper warranted installation. As manufactured by Landscape Structures or pre-approved equal.
- .2 Colour of play components: select from manufacturer's standard colour range.
- .3 Play equipment shall consist of the following elements:
 - .1 Swings
 - .2 Play structure
 - .3 Spring toy
 - .4 Slide
 - .5 Climbing holds
 - .6 Rope pull climbers
 - .7 Hill net climber
 - .8 Climbing bumps

1. Swings:

- 1. Quantity: 1
- 2. Manufacturer: Landscape Structures www.playlsi.com
- 3. Supplier: Habitat Systems www.habitat-systems.com
- 4. Contact: Dave Warner T:(604) 294-4224
- 5. Components:
 - 2 x Belt Seat, Proguard Chains for 8' ht. beam (model # 174018A)
 - 1 x Full Bucket Seat, Proguard Chains for 8' ht. beam (model # 176038A)
 - 1 x Molded Bucket Seat (2-5 yrs) w/Harness, ProGuard Chains for 8' Beam Height (model # 218671C)
 - 1 x Single Post Swing Frame, 8' Beam Height Only (model #177332A)
 - 1 x Single Post Swing Frame, Additional Bay 8' Beam Height Only (model #177333A)

2. Play structure

1. Quantity: 1
2. Manufacturer: Landscape Structures www.playlsi.com
3. Supplier: Habitat Systems www.habitat-systems.com
4. Contact: Dave Warner T:(604) 294-4224
5. Name: Smartplay Motion with play table
6. Finish: Tangerine and light blue colours

3. Spring toy

1. Quantity: 1
2. Manufacturer: Landscape Structures www.playlsi.com
3. Supplier: Habitat Systems www.habitat-systems.com
4. Contact: Dave Warner T:(604) 294-4224
5. Name: Bobble Rider, Double
6. Finish: Tangerine colour

4. Slide:

1. Quantity: 1
2. Manufacturer: Landscape Structures www.playlsi.com
3. Supplier: Habitat Systems www.habitat-systems.com
4. Contact: Dave Warner T:(604) 294-4224
5. Model: 1.50m wide
6. Finish: Stainless steel

5. Climbing holds

1. Quantity: 12 in number
2. Manufacturer: Landscape Structures www.playlsi.com
3. Supplier: Habitat Systems www.habitat-systems.com
4. Contact: Dave Warner T:(604) 294-4224

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5. Components: Complete with stainless steel attachments
6. Finish: Natural rock

6. Rope pull climbers

1. Quantity: 2
 1. Manufacturer: Landscape Structures www.playlsi.com
 2. Supplier: Habitat Systems www.habitat-systems.com
 3. Contact: Dave Warner T:(604) 294-4224
 4. Components:
 - 4 x steel posts (two per climber),
 - 2 x steel reinforced play cables (one per climber)
 - 8 x baubles (four per climber)
 - All attachments
 5. Finish:
 - Posts: Tangerine colour
 - Baubles: Light blue colour
 - Cables: Black

7. Hill net climber:

1. Quantity: 1
2. Manufacturer: Landscape Structures www.playlsi.com
3. Supplier: Habitat Systems www.habitat-systems.com
4. Contact: Dave Warner T:(604) 294-4224
5. Components:
 - 4 x steel posts
 - Steel reinforced play cables
 - Attachment clamps at cable junction points and post attachments
6. Finish:
 - Posts: Tangerine Colour
 - Cables: Black

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8. Climbing bumps

1. Quantity: 16
2. Supplier: Marathon Surfaces www.marathonsurfaces.com
3. Contact: Barbara Frewin 604.878.0625 ext. 2
4. Name: Rubberized mound, 300mm dia., blue colour

2.3 Approved Equals

- .1 All items shall be as specified or approved equals.

PART 3: EXECUTION**3.1 Preparation and Layout**

- .1 Examine the areas and conditions under which work of this Section will be performed. Verify safety zones of all equipment before setting posts in concrete footings. Do not proceed until conditions detrimental to proper and timely completion of the work have been satisfactorily corrected and thus meet the manufacturer's instructions and the requirements. Beginning work constitutes acceptance of conditions as satisfactory.
- .2 Before installing play equipment or safety surfacing, verify that the subgrades are uniform, smooth, well drained and set at correct elevations to allow for installation of specified depth of resilient safety surfacing to the correct finished grade.
- .3 Lay out the play equipment in the designated area to ensure compliance with safety zone clearances. Stake the locations of all equipment/site furnishings and obtain the approval of the Owner's Representative prior to installation. Lay out play equipment locations with flags and short lengths of string as required/requested by Owner's Representative. Obtain Owner's Representative approval before proceeding. Install with the required safety clearances between play equipment units and to retaining curb or other objects. The layout shall be in accordance with the drawings. Alternative layouts shall be approved by the Owner's Representative.

3.2 Installation of Compound Structures and Independent Activities

- .1 Install play equipment and resilient safety surfacing in strict adherence to manufacturer's instructions, level and plumb and maintaining recommended safety clearances. Adapt footing and anchoring methods as necessary to the requirements and specific site conditions of this project in accordance with approved shop drawings and in such fashion that work of other Sections is not damaged. Layout all equipment prior to construction.
- .2 Provide all concrete footings as required to properly place the equipment components. It is the Contractor's responsibility to adjust drainage pipe or other new utility locations to accommodate the equipment footings.
- .3 Place specified depths and areas of resilient safety surfacing as per detail drawings.

3.3 Protection

- .1 During construction of the play equipment structures, provide PVC web fence material in sufficient quantities and wrap the structures to prevent public access onto the equipment. Maintain the fencing wrap after completion of the play equipment and safety surfacing installation through completion of the project.

3.4 Inspections

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Play Equipment

- .1 Provide a min. 48 hours notice in order to schedule all inspections. Delay claims filed by the Contractor resulting from failure to provide adequate notice of inspection required will not be entertained. All aspects of this work shall be subject to inspection by the Owner's Representative or their designated inspector. Inspector/approval points shall be of a frequency sufficient to ensure adequate Quality Control in accordance with this specification and will occur thorough the duration of the Contract. The Contractor must supply access to the work for the Owner's Representative or their Inspector. As a minimum, inspections will occur as follows:
 - .1 Upon arrival of play equipment to the site.
 - .2 After staked layout of proposed play equipment locations.
 - .3 After play equipment anchor post installation.
 - .4 Upon Final Acceptance/Assumption by the Vancouver Park Board.
- .2 The Contractor is required to visit the site a minimum of two (2) times during the warranty period to ensure all play equipment/site furnishings are performing satisfactorily/functioning as intended and perform any maintenance services required. The first visit is to occur approximately six (6) months after the Assumption Date by the Board and the second visit is to occur approximately two (2) weeks prior to the end of the warranty period.

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 Footing excavation and backfilling shall be continuous so that the amount of open excavation at the end of each workday is minimized. Any open trench or other excavations shall be barricaded and marked with high visibility marking tape to current WorkSafeBC requirements.
- .3 Any damage to paving, planting or any other structures/elements due to settlement of improperly compacted footings shall be immediately repaired at the Contractor's expense to the satisfaction of the Owner's Representative.
- .4 Remove and disposal of offsite all surplus material, excess excavated materials, trash, debris and waste material from the work of this Section. This clean up shall include removal of all delivery packaging.

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Play Equipment

Schedule A: Inspection Report Form

Park Name: _____
 Inspection Date: _____
 Inspector's Name: _____

Location: _____
 Time: _____

**Individual Equipment
 Components**

Equipment

	Toddler Swing	Junior Swing	Tire Swing	Spiral/ Straight Slide	Spring Toys	See-Saws	Climbing Structures	Merry Go- Rounds	Composite Structure	Composite Structure	Safety Surfacing	General Site
Chains												
S-Hooks/C-Hooks												
Seats/Tire/Belts												
Hanger Bearings												
Grease Fittings												
Stability/Tilting												
Exposed Concrete												
Entanglement Points												
End/Center Fittings												
Chain Covers												
Hand Rails												
Support Bars/Legs												
Fastening Point/Areas												
Sidewalls/Bedway												
Entrapment Point/Areas												
Sharp Edges/Points												
Stair/Steps												
Plastic Component Cracking/Damage												
Spring/Bars												
Handles												
Pivot Points												

**Individual Equipment
 Components**

Equipment

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Play Equipment

	Toddler Swing	Junior Swing	Tire Swing	Spiral/ Straight Slide	Spring Toys	See-Saws	Climbing Structures	Merry Go- Rounds	Composite Structure	Composite Structure 2	Safety Surfacing	General Site
Nuts and Bolts												
Ground Clearance												
Locking Devices												
Wood Checks/Splits (max. 19mm)												
Protrusions												
Caps/Plugs												
Protective Surfaces Borders												
Equip. Spacing/ Encroachment												
Bench Seats												
Debris/Broken Glass												
Asphalt Paths												
Fencing												
Condition: Satisfactory T												
Condition: Requires Attention X												

Other Comments:

END OF SECTION 11 68 13

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to excavate and backfill for all landscape paved areas, footings, walls, etc. indicated on contract drawings.
- .2 The work shall include but is not limited to the following areas:
 - .1 Excavation of subgrade
 - .2 Grading operations to attain sub grade design grades
 - .3 Import and placement and compaction of granular fill materials
 - .4 Compaction testing
 - .5 Removal and disposal of excess material off site

1.3 Related Work

- | | | |
|----|------------------------------|------------------|
| .1 | Cast-In-Place Concrete | Section 03 33 00 |
| .2 | Hot Mix Asphalt Paving | Section 32 12 16 |
| .3 | Precast Concrete Unit Paving | Section 32 14 13 |

1.4 Reference Standards

- .1 Contractor is responsible for complying with all current Work Safe 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.
- .2 All work under this section shall conform to the requirements of the American Society for Testing and Materials, Standards as referenced herein.

1.5 On and Off Site Construction Maintenance

- .1 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 regarding of affected area to the satisfaction of the Owner's Representative.
- .2 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.
- .3 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.

1.6 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.

1.7 Protection

- .1 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.
- .2 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, inspect necessary operation for relocation.
- .3 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.
- .4 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.
- .5 The Contractor shall protect all adjacent structures and surfaces including but not limited to roadways and sidewalks from damage, direct or incidental as a result of work of this section.
- .6 The Contractor shall make good all damages to adjacent structures and surfaces including but not limited to roadways and sidewalks as a result of work of this section to the satisfaction of the Owner's Representative.

1.9 Deposits

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

1.10 Tests and Approvals

- .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.

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Excavation and Backfill

- .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.

1.11 Submittals

- .1 Prior to the start of work for this section the Contractor shall submit the following to the Owner's Representative 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.
 - .4 Confirm in writing to the Owner's Representative that he/she has verified the locations of all underground services.
 - .5 Obtained in writing and submitted to the Owner's Representative at no Cost to the Owner permission from adjacent property owners and/or municipality to carry out work beyond the property limits of this contract if required to carry out the work of this section.
 - .6 Notify the Owner's Representative for on site review of sub grade preparation work forty-eight (48) hours prior to commencement of import, placement and grading operations.

PART 2: PRODUCTS

2.1 General

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

- 2.2 Native Material Fill:** 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.

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- .3 Pit Run Gravel:** To be well graded granular material, substantially free from clay lumps, organic matter and other extraneous material, screened to remove all stones in excess of 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.

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 Sub Base:** 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

- .5 Granular Base:** The 19 mm (3/4") crushed granular base 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

- .6 River Sand:** 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: EXECUTION

3.1 Excavation

- .1 All excavation and waste discharge permits shall be undertaken in accordance with the City of Vancouver's Policy and Standard Operating Procedure- Soil and Excavation Water Contamination Management.
- .2 Grade to elevations and dimensions indicated on contract documents or required by the work of this section or related sections.
- .3 Ensure that work of this section provides sufficient space to permit erection of forms, site elements and miscellaneous elements of related sections.
- .4 Excavation shall to ensure that the placement of fill materials are minimized.
- .5 Contractor shall phase his operation so that a stable slope at the edge of excavation is maintained all times. Where sloping of the sides of excavations are not possible the Contractor shall implement appropriate safety measures in accordance with current WCB of BC requirements.
- .6 During excavation, stockpile material suitable for backfill in a neat manner and sufficient distance from the trench to avoid slides and cave-ins.
- .7 All excavated materials not required or suitable for backfill shall be removed and wasted as indicated or as directed. Grade as required to prevent surface water from flowing into trenches or other excavations. Remove any accumulated water by pumping or other approved method.
- .8 All exposed excavation faces shall be protected from weather with appropriate tarps or plastic sheeting as soon as possible after being cut.
- .9 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 material compacted to 95% Modified Proctor Density.
- .10 Bottom of excavation to be level, free from loose material and debris.
- .11 Protect excavations against freezing. Frozen areas shall be thawed and protected from further frost until subsequent work has been completed.
- .12 All necessary precautions shall be taken to preserve all materials outside the required excavations in an undisturbed condition.
- .13 Costs incurred as a result of deterioration caused by activities or neglect of the Contractor or and fill required for over excavation as a result of action by the contractor are the responsibility of the contractor.

3.2 Placement of Granular Fill Material

- .1 Prior to the backfill operation of site excavation ensure the following actions have been completed:
 - .1 Concrete foundation walls and footings shall have reached specified strength unless otherwise approved by the Owner's Representative.
 - .2 All backfill materials shall have been inspected and approved by the Geotechnical Engineer.
 - .3 Each component of the backfill operation shall have been inspected and approved to by the Geotechnical Engineer at the time of placement.
 - .4 Compaction density tests shall have been completed and tests results reviewed and approved by the Geotechnical Engineer.
- .2 Place crushed granular sub-base in maximum 300 mm (1'-0") lifts to depths indicated on drawings. Compact each lift to 95% Modified Proctor Density.
- .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.
- .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.
- .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.
- .1 Soft areas or areas that do not meet specified compacted densities shall be over excavated and filled with compacted crushed granular base as required to obtain the specified compaction density.

3.3 Grading Subgrade and Granular Fill

- .1 Site sub grade shall be shaped to lines and elevations indicated on contract drawings.
- .2 Finished surface of sub grade and granular fill material shall have no irregularities exceeding 10 mm (3/8") when checked with a 3 M straight edge placed in any direction. Correct all sub grade and granular fill surface irregularities by loosening and adding or removing sub grade or granular fill material until surface is within specified tolerance. Correcting sub grade deficiencies by manipulating granular fill material is not acceptable.

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Excavation and Backfill

- .3 Shaping of sub grade shall ensure uniform slope transitions with rounded, smooth profiles between changes in elevations
- .4 Ensure that sub grade preparation allows for depth of granular fill and finished materials as indicated on contract drawings.

3.4 Dewatering

- .1 All excavation and waste discharge permits shall be undertaken in accordance with the City of Vancouver's Policy and Standard Operating Procedure- Soil and Excavation Water Contamination Management.
- .2 Pump or otherwise continuously remove all water that has accumulated in excavation during the progress of the Work.
- .3 Do not divert water onto adjacent property.
- .4 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.

3.5 Cleaning

- .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 10

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to protect existing trees on site, adjacent properties, and on adjacent road right-of-way and sites as indicated in the contract documents, including but not limited to:
 - .1 Survey and layout for locations of protective barriers.
 - .2 Installation, maintenance, adjustment during construction, and final removal of protective barriers and signs.
 - .3 Pruning as approved by the Owner's Representative including hand excavation and root pruning.
 - .4 Watering, fertilizing, and all other measures directed by the Owner's Representative as required to maximize the health and prospects for survival of the trees.

1.3 Related Work

- .1 Clearing and Grubbing Section 31 11 00
- .2 Growing Medium Preparation and Placement Section 32 91 13

1.4 Reference Standard

- .1 City of Vancouver Tree Protection By-Law. (OR CITY OF VANCOUVER TREE PROTECTION BY-LAW 7347 OVERRIDDEN BY SPECIFICATIONS STATED HEREIN).
- .2 International Society of Arboriculture standards.
- .3 ANSI A300 Tree Pruning Guidelines

1.5 Definitions

- .1 The "Tree Protection Area" (T.P.A.) shall be established on site under the direction of the Owner's Representative. It must be demarcated on site and fenced off from all impacts of construction. The T.P.A. is defined as the "dripline", which is a line drawn vertically to the ground from the furthest horizontal extent of the canopy branches as measured around the full circumference of the tree. Minor adjustments may be required to this rule to meet site species/specific conditions. Confirm T.P.A. on site with Owner's Representative. In addition to the T.P.A. definition the following shall be minimum distances for protection

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barrier fencing from the trunk.

Diameter at height of 140cm (cm)	Minimum distance of protection barrier fencing from trunk (cm)
10	60
20	120
30	180
40	240
50	300
80	480
100	600

- .2 Excavation, soil stabilizing measures, shoring (if necessary) and related work shall be planned and executed such that no excavation or other construction activities occur within the Tree Protection Area. A variance may be obtained from the Board provided that the location, materials and methods are approved and supervised by an Owner's Representative.
- .3 No Owner approvals for root pruning beyond the limits of the T.P.A. are required. All severed or fractured roots over 2cm in diameter outside the T.P.A. are to be neatly cut back a min of 5 cm above damage with a clean, sharp tree pruning saw.

1.6 Qualifications

- .1 All pruning operations shall be carried out or under the direction of an I.S.A. Certified Arbourist using clean sharp pruning tools,

1.7 Quality Assurance

- .1 Inspection: The Contractor shall give at least forty-eight (48) hours notice to the Owner's Representative of the timing for root pruning, branch pruning, installation of protective barrier, and all other tree protection measures. The protective barrier shall be accurately located on site, prior to starting any hand excavation or root pruning. The Park Board Arbourist shall do or supervise all root pruning, branch pruning, etc. within the T.P.A. (The Park Board Arbourist shall be present when all work is being done along the line of the protective fence).
- .2 Where requested, all root pruning and branch pruning shall be done to recognized arboriculture industry standards by an I.S.A. Certified Arbourist or Tree Surgeon under direct supervision of the Owner's Representative.

PART 2: PRODUCTS**2.1 Protective Barrier**

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.1 Protection barrier shall be a 1.2m high wood fence to be securely installed, plumb, and securely fixed to the approved positions. Posts and rails, minimum 50mm x 100mm wood. Posts maximum 2.4m o.c. Refer to construction drawings.

2.2 Orange plastic web snow fencing, 1.2m high "Tenax", as supplied by Ronco Sales Ltd., or pre-approved equal. Refer to construction drawings. Tree Protection Area Signs

.1 Tree Protection Area signs shall be signs at least 900mm x 450mm, on painted plywood or other acceptable weather resistant material, stating:

TREE PROTECTION AREA, DO NOT REMOVE OR MOVE FENCE DURING CONSTRUCTION:

No Dumping No Burning

No Storage No Cutting

No Machinery No Toxic Substances (paint, solvents, fuel, oils)

TO REPORT VIOLATIONS PHONE: 604-257-8400

2.3 Water, Fertilizers, Miscellaneous

.1 Water, fertilizers and miscellaneous materials shall be as specified in other sections of the specification and as directed by the Owner's Representative.

2.4 Stakes and Fasteners

.1 Wood Stakes: 38 x 89 ACQ treated wood or No. 1 grade cedar stakes.

.2 Metal Stakes: 50mm diameter schedule 40 galvanized steel pipe or 1.8 (6'-0") long studded or drilled T Posts.

.4 Zip Straps: 140mm (5.5") long, black, nylon lock straps.

.5 Drain Tile: 150mm (6") diameter Schedule 40 PVC (polyvinyl chloride) perforated pipe conforming to ASTM D 1784.

.6 Burlap: 10 ounce, untreated, woven, natural jute based burlap.

2.5 Fill Materials

.1 Type 1 Fill: Clean, angular, crusher run natural stone, free from shale, clay, friable materials, roots and vegetable matter, and conforms to the following gradations:

Sieve Size	Percent Passing
50mm	100
20mm	95 - 100
13mm	75 - 90
10mm	57 - 83
No. 4	37 - 61
No. 16	12 - 32
No. 32	8 - 23
No. 200	5 - 10

- .2 Type 2 Fill: Clean river pump sand and gravel material, free from silt, clay, loam, friable, or soluble materials and vegetable matter.
- .3 Type 3 Fill: Approved premixed growing medium per Section 32 91 13
- .4 Clear Stone: Shall consist of clean, round, washed stone. Acceptable material includes 10 mm (3/8") rock conforming to the following gradations.

Sieve Size	Percent Passing (10mm)
14mm	100
10mm	85 - 100
5mm	10 - 30
2.5mm	0 - 10
1.25mm	0 - 5

PART 3: EXECUTION

3.1 Protective Barrier Fence Erection

- .1 Before starting site work, install a clearly visible continuous protective barrier fence at the approved lines for the "Tree Protection Area" (T.P.A.) (locations as shown on Drawings). Maintain this barrier until Substantial Performance and remove from the site at that time. Support snow fencing on posts driven vertically into the ground, at 2.4m on centre, or as otherwise approved by the Owner's Representative.

3.2 Tree Protection Area Signs

- .1 Install Tree Protection Area signs as specified on the protective barrier fence. For large areas, install a minimum of four signs, one each side of the T.P.A. Signs shall be well secured by 'Zap Strap' or similar method and shall be maintained in place until Substantial Performance.
- .2 Take all measures necessary to prevent the following activities within tree protection areas except as authorized by the Owner's Representative.
 - .1 Storage of materials or equipment.
 - .2 Stockpiling of soil or excavated materials.
 - .3 Burning of any kind.
 - .4 Excavation or trenching.
 - .5 Cutting of roots or branches.
 - .6 Travel of equipment or vehicles.
 - .7 Disposal or spillage of toxic matter.

3.3 Root Pruning

- .1 Before the start of any machine excavation, hand excavate along the established limit of excavation and prune all roots along the line. Cuts shall be clean, using approved

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arboriculture practice using clean, sharp pruning tools.

- .2 Trees to be transplanted shall be root pruned as directed by the Owner's Representative.

3.4 Branch Pruning

- .1 Do not prune any retained tree to compensate for reduction of roots unless specifically instructed by the Owner's Representative.

3.5 Watering and Fertilizing

- .1 Retained trees shall be watered thoroughly and deeply, as necessary to supplement rainfall to maintain plant turgidity without prolonged saturation of the root zone. The method, amount and frequency of watering shall be as recommended by the Owner's Representative. Suggested Summer Watering Schedule: The T.P.A. is to be watered via sprinkler, soaker hose, or by tank with a watering wand at least three times per week during June, July, August, and September or as directed by the Owner's Representative.
- .2 Fertilize Retained Trees to stimulate regeneration of lost roots and foliage. Fertilization program only as recommended by the Owner's Representative.

3.6 Excavation Around Trees and Shrubs

- .1 Excavation within drip line of trees shall be in strict accordance with those areas indicated on the contract documents or as directed by the Owner's Representative.
- .2 Excavation for New Construction within Drip Line of Tree(s):
 - .1 Hand excavate to minimize damage to root systems.
 - .2 Use narrow tine spading forks to probe and comb soil to expose roots.
 - .3 Relocate roots into backfill areas whenever possible. If large, main lateral roots are encountered, expose beyond excavation limits as required to bend and relocate without breaking.
- .3 Utility trenching Within the Drip Line of a Tree(s):
 - .1 Tunnel under and around roots by hand digging.
 - .2 Do not cut main lateral roots.
 - .3 Cutting of smaller roots that interfere with installation of new work shall be done with clean, sharp pruning tools.
- .4 Roots encountered immediately adjacent to the location of new construction that are not readily maneuverer to beyond the excavation area shall be cut 150mm (6") back from new construction.
- .5 Protection of Exposed Roots: Do not allow exposed roots to dry out prior to placement of permanent cover. Provide one of the following temporary remedial measures:
 - .1 Provide temporary earth cover using Type 3 fill.

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-
- .2 Pack with four (4) layers of wet, untreated burlap. Maintain dampness.
 - .6 Temporarily support and protect exposed roots from damage until permanently relocated and covered with backfill. Water backfill around roots to eliminate voids and airpockets.
 - .7 When directed by the Owner's Representative, pruning operations may include the removal of limbs to restore natural shape or reduce the area of the crown of the tree(s) or shrub(s). No crown pruning shall be undertaken without the consent of the Owner's Representative.
 - .8 Trees and shrubs to remain are to be thoroughly watered as required to maintain a healthy condition throughout the construction period. Contractor to document all watering operations and submit to the Owner's Representative one (1) copy of documentation at substantial performance.

3.7 Raising Grade Around Existing Trees

- .1 DO NOT RAISE GRADES within or adjacent to the tree protection zone unless authorized by Owner's Representative.
- .2 Drain Tile Installation: Install drain tile on existing grade as follows:
 - .1 Layout drain tile in a spoke like arrangement consisting of eight (8) horizontal lines radiating out from the trunk of the tree to the limit of branch spread. Horizontal line to be approximately 150 mm (6") from base of trunk.
 - .2 Slope drain tile at a minimum of 1% away from trunk of the tree to the limit of branch spread. Connect ends of each of the spokes laterally around the perimeter of the tree to form a continuous, uninterrupted circle.
 - .3 Install vertical drain tile at each end of each spoke. Vertical drain tile to extend to proposed finished grade (vertical drain tile provides a means of aeration and watering).
 - .4 Owner's Representative to review drain tile installation prior to backfill operation.
- .3 Drain Tile Backfill:
 - .1 Type 1 Fill: place a minimum of 150mm (6") cover around perimeter of drain tile.
 - .2 Type 2 Fill: place a Type 2 Fill to minimum depth of 150mm (6") over the Type 1 Fill.
 - .3 Type 3 Fill: place Type 3 Fill in 150 mm (6") lifts to raise grade specified elevations. Ensure allowance is made for depth of growing medium.
 - .4 Fill vertical drain tiles with Clear Stone. Ensure Clear Stone are flush with top of drain tile.

3.8 Lowering Grade Around Existing Trees

- .1 DO NOT LOWER GRADES within or adjacent to the tree protection zone unless authorized by Owner's Representative.
- .2 Lowering Grade:
 - .1 Carefully excavate by hand from limit of drip line of branch spread to proposed grade

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- until the specified gradient has been achieved.
- .2 Re bury or prune and remove roots as per the instructed by the Owner's Representative.
 - .3 Construct a growing medium dike at dripline to retain water. Dike to be constructed at each individual tree location unless instructed otherwise by Owner's Representative.
 - .3 Excavation Through Root Area: If excavation through root area is required, excavate around roots by hand.

3.9 Surplus Material

- .1 Remove surplus material from site and dispose of at approved disposal area.

END OF SECTION 32 01 56

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to maintain the entire landscape area indicated in the contract documents for one (1) full year, beginning on the date of Acceptance of the entire landscape area.

1.3 Related Work

- .1 Plants and Planting Section 32 93 10

1.4 Reference Standards

- .1 Work shall meet or exceed the standards and practices outlined in the BCLNA/BCSLA Landscape Standard, Section 14 Level 2, Groomed.

1.5 Qualifications

- .1 All work of this Section shall be carried out by fully experienced and licensed maintenance contractors with current membership standing in the British Columbia Landscape & Nursery Association (BCLNA). Contractor to have at least 5 years minimum experience working on projects of similar size and scope. Written proof of experience may be requested by Owner's Representative for submission.
- .2 Pesticide/Herbicide/Fungicide and other chemical handling and application shall be done only by applicators holding current certification under the B.C. Pesticide Control Act.

1.6 Work Included

- .1 Maintaining the planted areas and the entire landscape area in a weed free condition.
- .2 Fertilizing as specified in this Section.
 - .3 Disease and insect control as required to maintain plants in a disease and insect free condition.
- .4 Pruning as specified in this Section.
- .5 Replacement of dead or diseased plants.
- .6 Watering as specified in this Section.
- .7 Turf management; Lawn mowing, edging and trimming (aeration, topdressing and power raking) as specified in this Section.
- .8 Protection of the landscape area as necessary.

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- .9 Litter removal from the entire landscape and paved areas.
 - .10 Soil testing as required to determine fertilizer requirements.
 - .11 Planting of seasonal annuals and bulbs.
 - .12 Maintain all pedestrian paved surfaces in a clean condition.
 - .13 Fall winterization/Spring Start-up of the automatic irrigation system.

1.7 Work Not Included

- .1 Sweeping and cleaning of roadways and parking lots **(except for leaves and landscape debris)**.

1.8 Warranty

- .1 The work of this Section is intended to provide conditions under which the Warranty requirements of Sections 02935 (Sodding) and 02950 (Plants and Planting) can be met through the proper care of grass, plants and planted areas. The requirements of the Warranty shall be the responsibility of this Contractor.

1.9 Equipment

- .1 Equipment shall be suited to the work at hand, and shall be in good working condition. All appropriate safety devices shall be in place and functioning to current WorkSafeBC requirements.
- .2 All equipment shall be kept clean to prevent spread of diseases. Cutting equipment shall be kept sharp and well adjusted.

1.10 Documentation

- .1 The contractor shall maintain a log book of all establishment maintenance operations carried out and shall make the log book available to the Owner's Representative Inspector for inspection upon request, as may be reasonably required. **Lack of information shall infer non-compliance with the Work of this Section and payment(s) will be adjusted accordingly by the VPB project Manager.**
- .2 The contractor shall submit with each monthly invoice for Work of this Section, a report stating the dates when maintenance staff were on site, the operations carried out and documentation of any conditions requiring attention beyond the Scope of this Section. A sample report is included at the end of this Section.

1.11 Protection and Preservation

- .1 Take all precautions necessary to protect all trees, shrubs and other plant material; underground and above ground site services, curbs, paving and other services including the irrigation system on and surrounding the contract site against any damage resulting from the work of this Section. Reinstatement to original condition if damaged by the contractor, his employees, suppliers, sub-trades or equipment throughout the duration of the contract.

1.12 Codes and Regulations

- .1 All fertilizers shall comply to the Canadian Fertilizer Code.
- .2 All chemicals shall comply and be used as stated under the appropriate Government Code, Law or Regulation.

1.13 Inspection/Notification

- .1 The contractor or his authorized representative shall be present during all required inspections.
- .2 Inspections are required at least four times during the year, at times designated by the VPB Project Manager.
- .3 Make a written request ten (10) working days before the end of the one year establishment maintenance period for final inspection.
- .4 At the time of final inspection, all plants and planted areas shall be in the condition specified, all remedial work or replacements shall be complete and all plants shall be healthy and vigorous.
- .5 Notify the Board of any physical changes and or discrepancies which may affect the implementation of the contract as specified herein or which may endanger any employee of the Contractor, Board or any member of the general public.
- .6 Provide minimum three (3) days notification in writing prior to application of any chemical vegetation or pest controls. Ensure notices are posted for public safety in entire area of application three (3) days prior and for five (5) days after.

1.14 Scheduling

- .1 Schedule work on site in accordance with weather, soil and plant conditions and use of the site.
- .2 In general, execution involves weekly inspections at least during the growing period (May 1 to October 15) and at least monthly inspections during the remainder of the year, with maintenance operations scheduled on the basis of conditions observed at each inspection.
- .3 Do each operation continuously and complete within a reasonable time period.

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- .4 Maintenance personnel shall attend the site during the morning of the first normal working day of each week during the maintenance period. Work at this time shall include litter pick up and disposal, monitoring of moisture in growing medium, and reporting of any damage, deterioration or other conditions requiring attention.

1.15 Payment

- .1 Payment shall consist of equal monthly installments over the one year maintenance period.
- .2 Labour shall be designated separately from materials. All billing for materials; mulch, fertilizer, sand or other materials shall be submitted with receipts of original purchase.
- .3 An up to date log book will be submitted of work done, indicating areas of work, materials used and dates of performance in support of the monthly billing. The log book shall document the development and condition of plant material as well as preventative and/or corrective measures required which are clearly outside the Contractor's present scope/responsibility. **Failure to submit the log book in support of the billing will result in a failure to process the payment and may result in non-payment if work cannot be substantiated by the Park Board.**

PART 2: PRODUCTS

2.1 General

- .1 Product Handling
 - .1 Delivery and storage shall be as required such that materials are protected against deterioration or damage as required and such that delivery and storage do not interfere with normal use of the site.

2.2 Plant Material

- .1 Plant material shall meet the requirements of Section 32 93 10, except that new plants supplied under this Section shall be sized to match existing plants of the same variety at the time of installation of new plants.
- .2 Sod or grass seed shall match the varieties installed under Section 02935.

2.3 Water

- .1 Water will be available at no cost to the contractor. Water source will be determined at time of construction. Contact VPB Project Manager.

2.4 Fertilizers and Limes

- .1 Shall be the following fertilizers and limes with the following guarantee of analysis and used as directed under PART 3 - EXECUTION.

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- .1 Fertilizer to meet recommendations of soil analysis provided by construction contract.
- .2 Dolomite of lime (Agrico Spread Easy Dolomite).

2.5 Weed Control and Eradican Chemicals

- .1 **Do not use any chemical method of insect or disease control without prior written approval of the Park Board.** The type of herbicide and application methodology to be submitted in writing to the Owner's Representative for review and approval.
- .2 Use of herbicides, fungicides and insecticides shall conform to all current Park Board, Municipal, Provincial and Federal Government regulations and codes.

PART 3: EXECUTION

3.1 Plant Material

- .1 Watering:
 - .1 Ensure irrigation system is operating properly. Water as required to keep plants and sod in vigorous healthy condition.
 - .2 Apply at least 1 to 1-1/2" of water during each application.
 - .3 If no irrigation system has been installed, water trees by hand, by soaking the root zone once a week during dry periods. Water source will be as outlined in 2.2.1
- .2 Weed Control:
 - .1 Maintain all areas in a weed free condition.
 - .2 Inspect landscape areas for weed growth once per week during the growing season and remove all weeds within one week of observing weed growth.
 - .3 Weed control procedures shall have no detrimental effect on the growth of desired plants. Mechanical methods are the preferred methodology in the COV. Confirm with Owner's Representative if chemical or other means are to be utilized. **Do not use any chemical method of weed control without prior written approval of the Board.**
 - .4 Mechanically cut out all grass from around tree pits/saucers to a minimum 600mm dia. to protect all trunks from damage by mowers or trimming equipment.
- .3 Cultivating:
 - .1 In the spring, before beginning watering, cultivate the soil surface of all planted areas including the base of all trees as shallowly as necessary to ensure penetration of water and air into the soil. Repeat as necessary for weed control and soil permeability. In addition, this operation shall be carried out at least twice per month to prevent caking of surface soil or mulch. Where and when applicable mulch should be replaced annually or when required by erosion, decay, cultivation or vandalism.

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- .2 Avoid cultivating into the root zone of plants, particularly shallow-rooted groundcovers and rhododendrons.
- .4 Pruning:
 - .1 Deciduous Shrubs: Remove all dead, weak or diseased wood. Do not clip or shape shrubs - allow the shrub to develop a natural appearance.
 - .2 Trees: Remove dead branches only. All other tree pruning shall be carried out under the direction of the Owner's Representative. Trees improperly pruned and/or not pruned as directed by the Owner's Representative shall be considered as having died and shall be replaced with the same species by the contractor at no cost to the Board.
- .5 Pest & Disease Control:
 - .1 **Do not use any chemical method of insect or disease control without prior written approval of the Park Board.**
 - .2 Follow a program of Integrated Pest Management using a combination of physical (hosing), cultural, biological and chemical methods chosen for the most effective, safe and economical control of pests and diseases. Minimize pesticide use except where irreversible damage would result from pest and disease infestation.
 - .3 Inspect all plants for signs of pest or disease once per week during the growing season and report any such conditions in the monthly report.
 - .4 Begin treatment for pests or diseases immediately following observation. If chemical controls are required, pesticides shall be chosen on the basis of highest effectiveness and selectivity, and least hazard to the environment.
 - .5 Pest and disease control shall be carried out by skilled operators, using methods approved under current laws and regulations.
 - .6 Use the recommended type of equipment and method of application for each chemical as recommended by the chemical manufacturer.
 - .7 All chemicals shall be mixed and applied as stated on the label of the manufacturer.
 - .8 Be extremely cautious in the mixing, handling and application of all chemicals as they may be harmful (if misused) to humans, plants, animals, etc.
 - .9 The Contractor shall be liable for any damage caused through the misuse of any plant disease and/or plant insect control method.
- .6 Fertilizing:
 - .1 Two - three (2-3) months after the installation and initial fertilizing of plants (Section 02950), or when directed by Owner's Representative, apply one application of fertilizer appropriate for the time of application and specific for lawns or planting areas at the rates recommended by an approved soil testing laboratory, based on soil test results. Apply a minimum of three applications of fertilizer per annum **for all lawn areas** - April, June and August. Apply a minimum of two applications of fertilizer per annum **for all planting areas** - March and May. Follow manufacturer's recommended application rates, if soils test not taken.

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- .2 Work the fertilizer thoroughly into the top 50mm of soil.
- .3 Soil Testing - examine the site to determine any areas where the plant material or lawn is performing poorly. If required and as directed by the Owner's Representative take soil samples from the affected area(s) to an approved soils testing laboratory for soils testing. Costs for such testing shall be borne by the Contractor. Determine the problem. Correct deficiencies to the soil such as poor texture, chemical residues or nutrient level or organic matter deficiencies by appropriate means as recommended by soils testing laboratory. Correct the situation at the appropriate time of year and as coordinated with the Owner's Representative.
- .7 Liming: In January within the first year after installation, lime all exterior planting and sod areas with application of dolomite lime at the rate of 10 lbs per 1000 square feet of soil surface, or as otherwise recommended by the soil testing laboratory.
- .8 Tree Protection: All trees shall be protected against wind and snow damage by adequate staking, guying, tying or wrapping as conditions require. Guys, wire ties and stakes shall conform with Section 02950 and shall be examined at frequent intervals with adjustments or replacements made to prevent any abrasions, cuts or other damage to the plants.

3.2 Mowing and Trimming

- .1 Mow all lawns with a sharp reel or rotary mower when the grass reaches a height of 60mm (2-1/2 inches). Mow to a height of 40mm (1-1/2 inches); the height of the lawn between cuttings shall not exceed 60mm (2 inches). **Mow and trim a minimum of 32 times per annum**; weekly from April -September, three times in October, twice each in March and November. Cut as required in December, January and February. VPB will advise.
- .2 Trim all edges walks, curbs, mowing strips or planting beds at each mowing with a nylon line type power trimmer to ensure a clean straight edge.
- .3 Remove all excess grass clippings from the grass and planted areas after each mowing, sweep all paving and other surfaces clear of clippings.

3.3 Lawn Remediation

- .1 Examine the site. Correct all thin areas or bare patches caused by poor maintenance practices (or other reasons), such as improper watering, lack of fertilizer, incorrect cutting height, chemical or mechanical damage. Examination shall include review for compacted or thin areas resulting from pedestrian traffic. If required and as directed by Owner's Representative, start an immediate program to rectify the problem(s). Remediation shall include but not be limited to the following: aeration, sanding/soiling, over seeding and fertilization.

3.4 Irrigation System

- .1 **Coordinate with requirements of Section 32 80 00 Irrigation System.**

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- .2 Maintain the irrigation system in good operating condition. Check the system once per week during the operation season. Clean and adjust all sprinklers, valves, controllers, and other special components. Inspect the municipal connection details and backflow prevention devices annually as required by the City of Vancouver. Repair all damaged heads and/or other components resulting from the Contractors operations.
- .2 Test the irrigation system, flush all lateral lines and adjust heads as required for good coverage at the beginning of the growing season. Set and adjust the timing of zones several times during the season to ensure that all areas receive adequate water to supplement the natural rainfall without over watering or creating excess run-off. Adjust controller times as required to accommodate for seasonal changes in time, fertilizer application or other specifics as dictated by the Owner's Representative.
- .3 Winterize the system by blowing out all water in the irrigation system with an air compressor at the end of the growing season. Confirm exact date with Owner's Representative. Ensure all controls/power are shut-off and all pop-up type heads are in the down position.
- .4 Failure of irrigation components due to normal wear and tear, vandalism and damage by others shall be reported immediately to the Owner's Representative with an estimation of cost to repair or an instruction to contact the original irrigation subtrade to provide such a quote. Shut-off water system as required to prevent erosion damage from run-off. Water manually all landscape areas affected by loss of irrigation system until repairs have been completed Coordinate repairs to the irrigation system immediately after damage or deterioration is noticed and the quote to repair has been approved by the Board.

3.5 Cleaning Of Paved Surfaces

- .1 Maintain all pedestrian paved surfaces of the project in a clean condition. Sweep or hose off all paved surfaces after completing maintenance operations.
- .2 Maintain any sports court surfaces on a weekly basis or as required and directed by Owner's Representative to ensure that leaves or other debris are removed from the court surfaces without damaging any painted or other special surfacing.
- .3 Hose or powerwash the surfaces to remove any spills/staining which have occurred on an annual basis. **Ensure that any chemicals or stripping/stain removal agents have been reviewed and approved by Owner's Representative prior to commencing with this work.**

3.6 Clean Up/Litter Removal

- .1 Remove debris, equipment, materials, and waste due to work of this Section at the end of each day of work **from all landscape and pedestrian areas.**
- .2 Keep paved surfaces clear and swept clean of debris, materials and waste from landscaping operations as required throughout the year.
- .3 Remove leaves and landscape debris from all paved vehicular roadways and parking lots.

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- .4 SPRING CLEAN-UP - remove all debris from lawn areas, shrub and flower beds including vegetative debris or growing medium from all pedestrian paved surfaces. Place order for summer annuals as directed by Owner's Representative (If Applicable). Cultivate all planting beds and tree pits to requirements of 3.1.3.
- .5 FALL CLEAN-UP - Fall clean-up includes the same operations as specified for the Spring plus disposal of leaves from the entire site. Review the site weekly through the Fall and ensure operations are completed by end of November (or as dictated by Owner's Representative). Continue to inspect and clean the site as required at least once per month during December, January, and February.

3.7 Sample Landscape Maintenance Report

- .1 Following is a single page sample landscape maintenance report for use in meeting the requirements of 1.6.2.

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LANDSCAPE MAINTENANCE MONTHLY REPORT (sample)

Project Name/Contract No.: _____
 Owner's Representative _____
 Date: _____ Time: _____ Weather _____
 Contractor Foreman _____
 Month: _____ Size of Crew: _____

<i>Elements</i>	<i>Work completed</i>	<i>Problems requiring attention</i>
BEDDING PLANTS -cultivation/weeding -fertilization -moisture content -seasonal change		
SHRUBS & GROUNDCOVERS -cultivation/weeding -pest and disease -fertilization -replace dead/dying material -weed control -pruning/moisture content		
TREES/ MAJOR PLANTS -pruning dead/broken branches -fertilization -replace dead/dying material -check/adjust guying/stakes -weed control -moisture content		
LAWN AREAS -mowing/edge trimming -moisture content -fertilization -weed control		
PAVED/GRAVELED/ BARE AREAS -general review -special maintenance/cleaning req'd.		
GENERAL COMMENTS/OTHER OBSERVATIONS -irrigation system component check -irrigation winterization/start-up -overly dry or too wet conditions		

END OF SECTION 32 01 90

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32 12 16
Hot Mix Asphalt Paving

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install of hot-mix asphalt concrete paving on base and subbase(s) materials, on grade as indicated in the contract documents.
- .2 Restore all existing asphalt paving if damaged or deteriorated due to work of this Contract.

1.3 Related Work

- .1 Site Preparation and Grading Section 01 89 13
- .2 Aggregates and Granular Materials Section 02 41 14
- .3 Painted Pavement Markings Section 32 17 23.13

1.4 Reference Standards

- .1 Materials, mix designs, testing and application procedures shall comply with the requirements of the British Columbia Road Builders and Heavy Construction Association Specification for Hot-Mix Asphalt Concrete Pavement, revised June 1989.
- .2 Materials, mix designs, testing and application procedures shall comply with the requirements of the (MMCD) Master Municipal Specification Section 32 12 16 Hot Mix Asphalt Concrete Paving.
- .3 Sampling Mineral Aggregates ASTM D75
- .4 Sampling Bituminous Mixtures ASTM D79
- .5 Sieve Analysis of Aggregates ASTM D136
- .6 Specific Gravity of Aggregates ASTM C127 and ASTM C128
- .7 Determination of Bitumen Content ASTM D1097
- .8 Bulk Density of Compacted Asphalt Concrete Paving Mixtures ASTM D2726
- .9 Marshall Procedures for the Preparation and Testing of Bituminous Mixtures ASTM D1559
- .10 Quantity of Bitumen Absorbed by Aggregates - "Maximum specific Gravity of Bituminous Mixtures" ASTM D2041

1.5 Phasing

- .1 See Phasing Plan (if Applicable) and note that asphalt concrete paving will be completed in portions to suit the construction schedule.

1.6 Submittals

- .1 Submit sieve analysis for grading of both base and subbase materials.

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- .2 Submit hot mix asphalt design and trial mix test results to the Owner's Representative for review at least one week (7 days) **prior to** commencement of work of this Section. See Item 1.10 also.

1.7 Site Conditions

- .1 Start of work shall signify acceptance of site as satisfactory and no claim will be recognized for extra work nor any allowance made for defective work due to site conditions.
- .2 Investigate the site to verify information shown in Contract Documents. **Verify that existing grades are as shown on Drawings and notify Owner's Representative immediately of any discrepancies.**
- .3 Review existing site conditions with regard to subsurface conditions. Data on indicated subsurface conditions is not intended as representations or warrants of continuity of such conditions. Additional test borings and other exploratory operations may be made by bidders at no cost to The Board. Notify Owner's Representative prior to carrying out any such work.

1.8 Protection

- .1 Verify locations of all underground utility and drainage lines. Take all necessary precautions to protect unit precast paving, curbs, utilities and other site elements and work of other trades. Make good any damage to the satisfaction of Owner's Representative at no additional cost.
- .2 Immediately report any damage to the site or danger to persons on/near site to all concerned parties (Owner's Representative).
- .3 Prior to commencement of work of this section, erect warning signs at all locations where the public may gain entrance to the project site. Provide all necessary construction barricades as requested by Owner's Representative to protect the public from accidents occurring during construction.

1.9 Quality Assurance

- .1 Installation shall be by an installer with at least 5yrs. min. experience in placing hot-mix asphalt concrete paving on projects of similar size/scope. The contractor must be prepared to advise of previous work by submission of a written list if requested by Owner's Representative.

1.10 Environmental Conditions

- .1 Do not install hot-mix asphalt concrete pavement, base, or subbase during heavy rain or snowfall, cool temperatures or other unsuitable conditions as determined by Owner's Representative. Place paving under favourable weather conditions; with temperatures exceeding 4 degrees Celsius. Base and subbase 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)**

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- .2 Do not install asphalt concrete paving on frozen, wet, muddy or rutted base(s).
 - .3 Examine substrates and notify Owner's Representative of any deficiencies related to compaction or incorrect grades or slopes. Ensure deficiencies are corrected prior to commencement of work of this Section.
 - .4 Use Oil Soak Blotters in catch basin spillways and elsewhere as directed to avoid spilling oil into site drainage system(s) or adjacent watercourses.
 - .5 Allow asphalt concrete paving to completely cure prior to washing the surface to avoid spilling oil into site drainage system(s) or adjacent watercourses.

1.11 Testing and Approvals

- .1 The Contractor shall provide Owner's Representative with min. 48 hrs. notice to arrange for inspections and compaction tests.
- .2 An independent testing agency shall be appointed and paid for by the Owner to perform sieve analysis and density testing to confirm compliance with this Specification. Test results shall be submitted directly to the Owner's Representative. Items to be tested shall include but not necessarily be limited to the following:
 - .1 Density testing of subgrade, subbase(s), base and asphalt.
 - .2 Benkleman Beam Testing may be required prior to paving.
 - .3 Asphalt cores for density analysis.

Note: Additional density testing may be requested by Owner's Representative at any time after placement of base course(s)/asphalt concrete paving to confirm compliance with the contract documents. **Any additional tests will be at Owner's expense.**

- .3 Prior to commencing work of this Section, mix designs shall be submitted to Owner's Representative for approval. The contractor shall furnish sufficient evidence the proposed mix will produce satisfactory results to Owner's Representative (if requested). **Design of the Asphalt Mixes shall be supplied by the Owner's Representative where applicable.**

1.12 Measurement and Payment (Unit Price Contracts Only)

- .1 ***Asphalt concrete paving will be measured in tonnes of asphalt concrete actually incorporated into the Work.***

PART 2: PRODUCTS**2.1 Hot-Mix Asphalt Concrete**

- .1 Refer to Master Municipal Specification Section 02512 Hot-Mix Asphalt Concrete Paving and COV Supplemental Specifications to Master Municipal Specifications, current edition (COV Engineering Standards and Detail Dwgs.) for asphalt cement, aggregates and gradations, sand equivalents, abrasion, absorption, mineral fillers and all aspects of the mix design.
 - .1 Reclaimed Asphalt Pavement (RAP): Crush and screen so that 100 % of reclaimed asphalt pavement material passes the 37.5mm screen prior to mixing. Max.
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allowable RAP in any Mix Design will be 20% by mass. Higher percentage of RAP may be accepted by Owner's Representative if Contractor demonstrates that supplier can produce mix meeting requirements of the specification.

- .2 Do not change job-mix without prior approval of Owner's Representative (Engineer). If change in material source is required, Contractor shall submit new mix formula for review/approval.**

2.2 Base

- .1 Refer to Master Municipal Specification Section 02226 Aggregates and Granular Materials and COV Supplemental Specifications to Master Municipal Specifications, current edition (COV Engineering Standards and Detail Dwgs.).

2.3 Subbase

- .1 Refer to Master Municipal Specification Section 02226 Aggregates and Granular Materials and COV Supplemental Specifications to Master Municipal Specifications, current edition (COV Engineering Standards and Detail Dwgs.).

PART 3: EXECUTION**3.1 Plant and Mixing Requirements**

- .1 Refer to Master Municipal Specification Section 02512 Hot-Mix Asphalt Concrete Paving and COV Supplemental Specifications to Master Municipal Specifications, current edition.

3.2 Base Inspection

- .1 Prior to commencement of hot-mix asphalt concrete paving the granular base shall be inspected by Owner's Representative and the Contractor. Provide min 48 hrs. notice prior to desired paving time to allow for inspection to be scheduled. Areas of work to receive hot-mix asphalt concrete paving shall be examined and unsatisfactory conditions reported to Owner's Representative; **commencement of work shall imply acceptance of conditions**. If Owner's Representative have doubts about acceptability of the base, a Benkleman Beam Test may be ordered and work is not to proceed until such testing has been approved. The contractor shall provide a loaded single axle truck with a rear axle load of 8165 kg to be used in conducting tests.
- .2 Any areas which are found to be soft or wet shall be excavated and backfilled with the granular subbase and base as specified.
- .3 The subgrade shall be well drained. Verify that the subgrade is dry, uniform, even and ready to support subbase, base and asphalt concrete paving and the intended loads. Base course shall be examined for adequate compaction and uniform surface. The base course to be compacted to 95% Modified Proctor Density.
- .4 Verify the gradients and elevations of the subgrade and base are correct to allow installation as per the details and meet the intended finished grades. **Notify Owner's**

Representative of any discrepancies prior to proceeding with installation.

3.3 Preparation of Subgrade And Placing Base Courses

- .1 Prepare subgrade to requirements of Section 01 89 13 Site Preparation and Grading.
- .2 Place compacted aggregate base course (on compacted sub-base course) on subgrade to finished depths as detailed.
- .3 The sub-base or subgrade as detailed shall be compacted to 95% Modified Proctor Density.

3.4 Placing and Compacting Asphaltic Concrete

- .1 Place depth of asphalt concrete to thicknesses, grades and lines as shown on the contract documents or as directed by Owner's Representative. To be placed in compacted lifts of specified thicknesses. **Arrange for and complete paving in a continuous operation, avoid delays in laying parallel strips.**
- .2 Placing Conditions:
 - .1 Place asphalt mixtures only when air temperature is above 5 degrees Celsius (10 degrees and rising for tennis and sport courts)
 - .2 When temperature of surface on which material is to be placed falls below 10 degrees Celsius, provide additional rollers as necessary to obtain required compaction before cooling.
 - .3 Do not place hot-mix asphalt concrete when pools of standing water exist on surface to be paved, during rain or snow or when the surface is damp. Refer to 1.9 Environmental Conditions.
- .3 Lower Course: Machine place to specified compacted thickness (maximum lifts of 50mm after compaction) over compacted and graded aggregate base. Some areas may require thicker applications to fill in low spots and to ensure positive drainage.
- .4 Upper Course: Machine place to minimum specified compacted thickness (maximum lift of 38mm after compaction) over compacted lower course. Hand place/tamp as required around all site fixtures.
- .5 When asphalt concrete meets site fixtures, furnishings, concrete walls, walks or other (note specifically) flare the asphalt upwards around the base of fixture to ensure water drains away from the fixture and is in compliance with the overall grading and drainage plans for the Project.
- .6 Commence rolling and/or manual compaction immediately after the bearing capacity is adequate to support the required compaction equipment, without undue displacement of material or surface cracking. Rolling and/or compaction shall be carried out in compliance with the Standards noted in Item 1.3. Hand tampers may be used at all inaccessible areas. Compaction in these locations shall be to the Owner's Representative's approval.
- .7 Along building walls, curbs, gutters, headwalls, manholes and similar locations not accessible to a roller, thorough compaction shall be obtained by means of hot hand or smaller mechanical tampers before the mixture has set. At all contacts of this nature, the

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- joints between these structures and the surfacing must be effectively tack coated with an emulsified asphalt.
- .8 The finished surface is to be smooth and rolling to allow for positive drainage of all areas.
 - .9 **Notify Owner's Representative min. 48 hrs. prior to flooding to arrange for inspection.** Flood the entire asphalt concrete surface area after placement of the Lower Course Asphalt to ensure positive drainage in accordance with the grading plans. Make all necessary repairs to ensure positive drainage prior to placing the Upper Course Asphalt.
 - .10 **Cutting and removal/patching type repairs are permitted in the Lower Course asphalt only. Take care to ensure that grading and drainage problems are rectified prior to placement of Upper Course asphalt. Deflecting, ponding or other surface grading problems found in the asphalt Upper Course shall be corrected by complete removal of the top lift of asphalt concrete and replacement with a new lift of Upper Course asphalt. Final repair process subject to review/approval with Owner's Representative.**
 - .11 All asphalt concrete pavement edges shall have a uniform, beveled, tidy and straight appearance. **Border planks or sawcut edges are not acceptable.**
 - .12 Both Lower and Upper Course asphalt concrete joints shall be homogeneous with the rest of the surface and carefully matched for texture and elevation. All joints which are rejected by the Owner's Representative are to be cut out and redone to Owner approval. Asphalt joints to be done in accordance with the Standards referenced in Item 1.3 of this Specification.

3.5 Existing Asphalt

- .1 Repair all existing asphalt concrete that has been damaged/broken or eroded due to the Work of this Contract.
- .2 Where new asphalt concrete paving abuts existing asphalt concrete paving make good all cracked, damaged or eroded areas to a distance of 600mm back from the intersection to provide a uniformly graded, smooth and solid transition with the new work.
- .3 Where existing asphalt is to be overlaid, prior to installing asphalt concrete mix, the surface shall be cleaned of loose or foreign material and tack coated in accordance with Section 02547 of the MMCD.

3.6 Performance Standard(s)/Surface Tolerances (Tennis and Sport Courts Only)

- .1 All finished asphalt concrete surfaces shall be dense, compact, free from faults or cracks and true to grades, elevations and cross falls shown. The surface shall be smooth, and shall have no readily apparent roll marks, divots or heavy oil build-up. Surface grading shall be such that the entire surface of the paved area shall be free of any standing water or birdbaths after a rainfall or test flooding (allowing for sufficient time as dictated by the Owner's Representative to allow for water to run off to the perimeter or site drainage system). **Any birdbaths holding water deeper than a five-cent coin shall be patched and leveled in accordance with recommendations of the colour coating/finishing system specified. Re-flood and test. All surface irregularities are to be repaired to**

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Hot Mix Asphalt Paving

Owner's Representative approval.

- .2 All asphalt concrete paved surfaces shall have a uniform appearance. Special care shall be exercised to avoid all footprint indentations. Any areas that do not have a uniform appearance, with a tight aggregate spacing or have footprint indentations shall be repaired to Owner's Representative approval.
- .3 If asphalt concrete paving surface is a tennis or sport court the stringent surface tolerance requirements of the USTA will be strictly enforced. **Any surface irregularity with a depression greater than 3mm depth under a 3m straight edge shall be cause for rejection of the entire tennis court surface.** Repairs/resurfacing must be completed in a manner acceptable to the Owner's Representative. Repairs to tennis court surfaces shall be seamless with the adjacent surface and have a similar appearance and texture that will not result in a different shoe grip or ball bounce or compromise the application of any colour coat surface/line paint.

3.7 Finished Tolerances

- .1 Finished asphalt paving surface shall be within 6mm of design elevation but not uniformly high or low.
- .2 Finished asphalt surface shall have no surface irregularities exceeding 6mm when checked with a 3m straight edge placed in any direction (3mm in 3m for tennis and sport courts).
- .3 The final surface elevation of asphalt pavement shall be 3-7mm above adjacent drainage inlets, grates, concrete collars, concrete curbs, walks or gutters or channels after compaction/rolling to compensate for minor settling. **Confirm with the Owner's Representative.**

3.8 Thickness Tolerance

- .1 The minimum asphalt concrete pavement thickness specified herein shall mean the average compacted thickness as determined from cores taken as dictated by the Owner's Representative from random locations around the site area being paved. The Contractor is to repair the core hole locations.
- .2 The average thickness of cores shall equal or exceed the specified pavement thickness and no individual core shall be more than 5mm less than the specified thickness detailed.
- .3 Any paved surface area failing the core thickness testing criteria shall receive a minimum 12mm lift of Upper Course Asphalt.

3.9 Line Painting

- .1 Paint sports court game lines or colour coat surfaces traffic lines/symbols as detailed. Refer to Painted Pavement Markings Specification Section 09910.

3.10 Power washing

- ~~.1 If asphalt concrete paving surface is a tennis court, then power wash entire surface of each~~

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court to remove any surface oils prior to final surface coating applications.

3.11 Site Maintenance/Adjustments and Cleaning

- .1 Correct any surface irregularities that develop or have been noted prior to completion of rolling process by first loosening the surface mix and removing or adding material as required.
- .2 If irregularities or defects remain after final compaction, remove the surface course immediately and lay new material to form a true and even surface. Compact immediately to specified density.
- .3 Surplus material shall be cleared away and removed from the work site.
- .4 Excess material remaining on the Lower Course surface shall be brushed away and removed from the work site, prior to installing the Upper Course.
- .5 After removal of excess material/debris check final elevations for conformance with the drawings.

END OF SECTION 32 12 16

PART 1: GENERAL**1.1 General Requirements**

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install crushed granular paving as indicated in the contract documents.
- .2 The work shall include the supply and installation of granular paving as indicated, including:
 - .1 Granular Base
 - .2 Crushed Granular Paving
 - .3 Stabilizer
 - .4 Edge Restraint

1.3 Related Work

- .1 Excavation and Backfill Section 31 23 10

1.4 Submittals

- .1 Submit a sieve analysis and a one (1) litre sample of crushed granular paving for review.
- .2 Submit product information and sample of stabilizer.

1.5 Quality Control

- .1 Prior to the start of construction provide a stake layout of all both edges of all crushed granular paving areas for review by the Owner's Representative. Stake spacing to be such that the shapes and forms of the crushed granular paving areas can be clearly seen.

1.6 Protection

- .1 Protect all work from damage and protect all property from damage arising from this contract. Take every precaution necessary to avoid damage to drainage and irrigation systems, adjacent growing medium and planting.

1.7 Site Conditions

- .1 The Contractor shall be responsible for repair of any utilities damaged in the course of work of this section.
- .2 The Contractor shall coordinate all work that crosses crushed granular paving areas to ensure that appropriate sleeves are installed prior to the start of work of this section.

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2.1 Crushed Granular Paving: shall consist of sound, durable stone particles free from clay, organic material or other deleterious matter as per ASTM C 136.

2.2 9mm minus crushed stone

Sieve Size (mm)	Percent Passing by Weight
9.0	100%
4.75	50 -55%
2.36	25 – 28%
1.18	15- 18%

2.3 Stabilizer: organic base, water activated polymer that binds particles together forming a homogenous, semi porous surface conforming to ADA (American with Disabilities Act) requirements. Acceptable products include but are not limited to Stalok W/A Binder by Stabilizer Solutions, Phoenix Arizona or approved equal.

2.4 Edge Restraint: Shall be manufactured from 100% recycled material, UV stable and capable of retaining curved or straight precast concrete unit paver installations. Acceptable products include; B.E.A.S.T by Brickstop as distributed by Abbotsford Concrete Products, Abbotsford, BC or approved equal.

2.5 Edge Restraint Spikes: 300mm (12") long, galvanized metal spikes.

PART 3: EXECUTION**3.1 Inspection**

- .1 Areas of work to receive crushed granular paving and base course shall be examined and unsatisfactory conditions reported to Owner's Representative. Commencement of work shall imply acceptance of conditions.

3.2 Preparation of Subgrade

- .1 Excavate soft and unstable areas of subgrade that cannot be compacted to standard noted, fill and compact with approved granular material.
- .2 Compact subgrade to 95% Modified Proctor Density.
- .3 Ensure subgrade is true to line and grade and allows for sufficient depth to ensure finish grade can be established as noted on plans.

3.3 Granular Base

- .1 Place granular base over sub-grade in maximum 150 mm (6") lifts compacted to 95% MPD.

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Crushed Granular Paving

3.4 Edge Restraint

- .1 Install edge restraint to the lines and grades indicated on contract documents. Ensure straight lines are consistent and true and curved lines are continuous (faceted shapes are not acceptable).

3.5 Crushed Granular Paving

- .1 Owner's Representative shall review crushed granular base prior to the placement of the crushed granular paving.
- .2 Blending Stabilizer: Prior to the placement of material, create a homogeneous mix of stabilizer and crushed granular paving material using the mix ratio recommended by the stabilizer manufacturer.
- .3 Place the homogeneous mix of stabilizer and crushed granular paving material to lines and grades indicated on the contract drawings.
- .4 Water heavily to full depth at a rate of 95 -150 litres per 900 kg (25 – 40 gallons per ton). Randomly test for water saturation during application.
- .5 Let saturated material stand for at least six (6) hours. Compact material using a 900 – 1,800kg (2-4 ton) double drum roller or 450kg (1,000lbs) single drum roller. Do not compact with any type of vibratory equipment.
- .6 Ensure surface material remains moist by applying a light mist of water as required.

3.6 Cleaning

- .1 All paved areas or adjacent surface shall be brushed clean and excess materials shall be removed from the work site and disposed of in an approved dump location.
- .2 If cracks appear in stabilized surfaces, sweep fines into crack and tamp in place.

END OF SECTION 32 15 40

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Playground Surfacing

1 – GENERAL

1.1 SECTION INCLUDES

1. Rubberized surfacing specification.
 1. Unitary synthetic poured rubber seamless surface.

1.2 RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
2. Division 31 Section "Earth Moving" for filling and grading and for drainage course, drainage/separation geotextiles, and subbase courses.
3. CSA Z614-14: Children's playscapes and equipment
 1. Section 10 – Surfacing
 2. Section 11 – Inspection and Maintenance
 3. Section 14 – Playspace Layout

1.3 REFERENCES

1. CSA Z614-14: Children's Playscapes and Equipment

1.4 DEFINITIONS

1. Critical Height: Standard measure of shock attenuation. According to CPSC No. 325, this means "the fall height below which a life-threatening head injury would not be expected to occur."
2. SBR: Styrene-butadiene rubber.

1.5 SUBMITTALS

1. Product Data: For each type of manufactured material and product indicated.
2. Certificates of Compliance:
 1. Provide a statement, signed by an official authorized to certify on behalf of the synthetic safety surfacing and manufactured wood product manufacturer, attesting that the surfacing meets the requirements of ASTM F 1292 for a head-first fall from the highest accessible portion of installed play equipment. The impact attenuating qualities of the surfacing system shall not be diminished in the surface areas covering hardware. Testing of product shall include tests conducted over hardware. The statement shall be dated after the award of the Contract, shall state the Contractor's name and address, and shall name the project and location. The statement shall also provide the name, address, and telephone number of the testing company, the date of the test, and the test results.
 2. Provide certification by the authorized manufacturer's representative, upon completion of the installation that the safety surfacing has been installed in accordance with manufacturer's instructions and complies with all specifications.

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3. Provide a Certificate of Insurance from the manufacturers of synthetic safety surfacing, covering both product and general liability, of not less than \$1,000,000.
3. Shop drawings: Not applicable.
4. Samples for Verification: For each type of playground surface system indicated.
 1. Minimum 150mm-by-150mm Sample of synthetic rubber seamless surface, of each color specified, proposed for this project.
5. Product Schedule: For playground surface systems. Use same designations indicated on Drawings.
 1. Coordination Drawings: Refer to Landscape Drawings.
6. Qualification Data: For qualified Installer and testing agency.
7. Material Certificates: For each type of loose-fill playground surface system, from manufacturer.
8. Material Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each loose-fill playground surface system.
 1. Submit a copy of product manufacturer's test report indicating compliance with the latest CSA Children's Playspaces and Equipment guidelines with regard to thickness of product beneath various equipment height ranges.
 2. Test reports shall be by a certified laboratory, to ASTM F 1292-99 specifications using the f355-Procedure C Test Method.
 3. For sand, submit a statement signed by an official authorized to certify on behalf of the supplier of the sand, attesting that the surfacing material is free from poisonous plants, foreign objects, hazardous substances, or toxic chemicals. The statement shall be dated after the award of the contract, shall state the Contractor's name and address, and shall name the project and location.
9. Product Certificates: For each type of unitary synthetic playground surface system, from manufacturer.
10. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each unitary synthetic playground surface system.
11. Product Certificates: For each type of unitary synthetic playground surface system, from manufacturer.
12. Field quality-control reports.
13. Maintenance Data: For playground surface system to include in maintenance manuals.
14. Warranty: Sample of special warranty.

1.6 QUALITY ASSURANCE

1. Installer Qualifications: Manufacturer's installer to be retained by contractor for installation services of pour in place rubber product.
 1. Product to be installed to manufacturer's specifications, and to depths required by the critical fall height of the equipment

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2. Standards and Guidelines: Comply with CSA Z614-14 on items related to the surfacing herein.
3. Provide a letter from a CSA certified installer stating that the project has been reviewed and surfacing appears to have been installed to standards outlined in the CSA Z614-14.

1.7 JOB CONDITIONS

1. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit playground surface system installation to be performed according to manufacturers' written instructions and warranty requirements.
2. Sequencing and Scheduling: Safety surfacing shall be installed after the playground equipment is installed. The installation shall be coordinated with playground equipment and site element installation.

1.8 WARRANTY

1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of playground surface system that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 1. Reduction in impact attenuation.
 2. Deterioration of surface and other materials beyond normal weathering.
2. Warranty Period: Minimum Five years from date of Substantial Completion.

2 – PRODUCTS

2.1 MATERIALS

1. Unitary Synthetic Dual Density Seamless Surface
 1. Surface System: Poured-in-place, two-layer system with wearing course over cushion course. Provide manufacturer's standard thickness for each layer as required for overall thickness indicated, tested for impact attenuation according to ASTM F 1292 and for accessibility according to ASTM F 1951.
 1. Manufacturer: Marathon Surfaces (www.marathonsurfaces.com ,T:1.888.878.0625, Contact: Barbara) or approved equivalent.
 2. Wearing Course: Formulation of EPDM rubber particles, with minimum of 20 percent and maximum of 26 percent of ethylene propylene-diene-saturated polymethylene main chain along with other organic and inorganic components.
 2. Impact Attenuating Cushion Course: Manufacturer's standard formulation of SBR particles and polyurethane, site mixed and applied. Foam rubber shall not be permitted in substrate. Binder shall be not less than 12%, or more than 16%, of the total weight of rubber, and shall provide 100% coating of the particles. The substrate shall be compatible with the wear surface, shall be mixed and poured-in-place, and shall meet requirements herein for impact attenuation.
 3. Binder: Non-toxic, weather-resistant, UV-stabilized, aliphatic, flexible, non-hardening, 100 percent solids polyurethane complying with requirements of authorities having jurisdiction for nontoxic and low VOC

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4. Content. No more than 2% of toluene diphenyl isocyanate (TDI) shall be used. Weight of polyurethane shall be no less than 1.02 kg/l (8.5 lb/gal), or more than 1.14 kg/l (9.5 lb/gal). Coloring pigments, if used, shall be inorganic oxides. The color shall be specified by the Consultant.
5. Critical Height: All playground areas: 2.0m max fall height
6. Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location indicated.
7. Wearing Course Color(s):
 1. Black shall not be used. Colours to be full depth of surfacing required.
 2. Color Schedule (See Plans for Location of Colours).
 1. Colour 1 — 50% Blue, 50% Black blend
 2. Colour 2—50% Brown, 50% Black blend
8. Leveling and Patching Material: Portland cement-based grout or epoxy- or polyurethane-based formulation suitable for exterior use and approved by playground surface system manufacturer.

2.2 PERFORMANCE REQUIREMENTS

1. Impact Attenuation: According to ASTM F 1292.
 1. Safety surfacing within playground equipment use zones shall meet or exceed the performance requirements of CPSC and ASTM F 1292 that a surface yield both a peak deceleration of no more than 200g, and a Head Injury Criteria (HIC) value of no more than 1,000 g, for a head-first fall from the highest accessible portion of play equipment being installed. The highest accessible portion of playground equipment shall be as specified in SECTION 116800 - PLAYGROUND EQUIPMENT. The Contractor is responsible for obtaining a determination from the safety surfacing manufacturer of the product depth required to meet performance requirements for all play equipment.
 2. Accessibility of Surface Systems: According to ASTM F 1951.
 3. Minimum Characteristics for Organic Loose-Fill Surfaces: According to ASTM F 2075.

3 – EXECUTION

3.1 EXAMINATION

1. Review project plans and verify that playground equipment use zones, clearances, and reach ranges will comply with ASTM F1487 sections 8, 9, and 10, and with CAN/CSA-Z614 sections 14 and 15.
2. Examine substrates and conditions, with Installer present, for compliance with requirements for maximum moisture content, subgrade and substrate conditions, drainage, and other conditions affecting performance of the Work.
3. Ensure drainage system is laid out, installed and connected to storm system per manufacturer's instructions.
4. Finished Grade: Elevations of adjacent areas shall be as indicated on the Drawings and the safety surfacing manufacturer's directions. The appropriate subgrade elevation shall be as established for the particular

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5. safety surfacing to be installed.
6. Verify that substrates are satisfactory for unitary playground surface system installation and that substrate surfaces are dry, cured, and uniformly sloped to drain within recommended tolerances according to playground surface system manufacturer's written requirements for cross-section profile.
 1. Concrete Substrates: Verify that substrates are dry, free from surface defects, and free of laitance, glaze, efflorescence, curing compounds, form- release agents, hardeners, dust, dirt, loose particles, grease, oil, and other contaminants incompatible with playground surface system or that may interfere with adhesive bond. Determine adhesion, dryness, and acidity characteristics by performing procedures recommended in writing by playground surface system manufacturer.
7. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

1. General: Prepare substrates to receive surfacing products according to playground surface system manufacturer's written instructions. Verify that substrates are sound and without high spots, ridges, holes, and depressions.
2. Concrete Substrates: Provide sound surface free of laitance, efflorescence, curing compounds, and other contaminants incompatible with playground surface system.
 1. Repair unsatisfactory surfaces and fill holes and depressions.
 2. Mechanically scarify or otherwise prepare concrete substrates per manufacturer's instructions to achieve recommended degree of roughness.
 3. Treat control joints and other nonmoving substrate cracks to prevent telegraphing through playground surface system.

3.3 INSTALLATION, GENERAL

1. General: Comply with playground surface system manufacturer's written installation instructions. Install playground surface system over area and in thickness indicated.

3.4 GEOSYNTHETIC INSTALLATION

1. General: Install geosynthetics according to playground surface system manufacturer's and geosynthetic manufacturer's written instructions.
 1. Geotextiles: Completely cover area indicated, overlapping sides and edges a minimum of 200mm with manufacturer's standard treatment for overlapping loosely laid seams.

3.5 INSTALLATION OF SEAMLESS PLAYGROUND SURFACE SYSTEMS

1. Seamless Surface: Mix and apply components of playground surface system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface and impact-attenuating system of total thickness indicated.
 1. Substrate Primer: Apply over prepared substrate at manufacturer's standard spreading rate for type of substrate.
 2. Poured Cushion Course: Spread evenly over primed substrate to form a uniform layer applied at

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3. Manufacturer's standard spreading rate in one continuous operation, with a minimum of cold joints.
4. Intercoat Primer: Over cured cushion course, apply primer at manufacturer's standard spreading rate.
5. Wearing Course: Spread over primed base course to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation and, except where color changes, with no cold joints. Finish surface to produce manufacturer's standard wearing-surface texture.
 1. Where colored pattern is indicated, place adjacent colored material as soon as placed colored material is sufficiently cured, using primer or adhesive if required by manufacturer's written instructions.
6. Edge Treatment: As indicated. Fully adhere edges to substrate with full coverage of substrate. Maintain fully cushioned thickness required to comply with safety performance requirements.

3.6 INSTALLATION OF LOOSE-FILL PLAYGROUND SURFACE SYSTEMS ("FIBER SAFETY SURFACING")

1. Loose Fill: Wood products shall be installed at a minimum final depth of 350 mm (14 inches) throughout the play equipment use zone and over all footings and footing hardware to meet and exceed the impact attenuation requirements of ASTM F1292.
2. Wood product material shall be settled or compacted, then refilled to appropriate height and re-compacted. A final top dressing shall be installed to bring all surfaces to the designated finish elevation.

3.7 SAND SAFETY SURFACE INSTALLATION

1. Sand shall be installed over a compacted subgrade at a minimum final depth of 600mm, or as indicated on the Drawings, throughout the play equipment use zone and over all footings and footing hardware to meet the impact attenuation requirements specified herein. The finished level of sand shall be determined after sand has been settled by fully saturating with water and then completely drained.

3.8 FIELD QUALITY CONTROL

1. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
2. Testing Services: Testing and inspecting of completed applications of playground surface system shall take place according to ASTM F 1292.
3. Remove and replace applications of playground surface system where test results indicate that it does not comply with requirements.
4. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with requirements.
5. Clean-up: Do not allow adhesives on adjacent surfaces. Immediately clean up spills or excess adhesive

3.9 REPAIRS AND PROTECTIONS

1. Seamless Systems: Prevent traffic over system for not less than 48 hours after installation.

3.10 CONCRETE TOLERANCES

1. Remove waste material – including trash, and debris and legally dispose of it off the City's property.

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3.11 MANUFACTURER'S SERVICES

1. Services of a manufacturer's representative, or manufacturer's certified or authorized installer, who is experienced in installation of the specified playground safety surface, shall be provided. The representative shall supervise or inspect the installation to ensure that the safety surfacing meets the impact attenuation requirements as specified herein.
2. Regardless of the installer, the manufacturer's representative shall certify that the installation complies with the manufacturer's instructions and specifications.

END OF SECTION

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install a complete automatic irrigation system as indicated in the contract documents.
- .2 The work shall but is not limited to supply, installation, testing and commissioning;
 - .1 System piping, valves, conduit, control wiring, controls, control boxes and miscellaneous equipment
 - .2 Supply of water (potable) to the irrigation system
 - .3 Moisture sensor(s), controls and miscellaneous equipment.
 - .4 Complete winterization of Irrigation system
 - .5 Complete spring start up of Irrigation system
 - .6 Complete computer control system, hardware and software
 - .7 Complete system maintenance and operation for one year from Substantial Performance

1.3 Related Work

- | | | |
|----|--|------------------|
| .1 | Plumbing Specification | Section 22 00 00 |
| 2 | Water Utilities | Section 33 10 00 |
| .3 | Electrical Specification | Section 26 00 |
| .4 | Growing Medium Preparation and Placement | Section 32 91 13 |
| .5 | Plants and Planting | Section 32 93 10 |

1.4 Codes and Regulations

- .1 All work shall be installed in accordance with the requirements of local and applicable provincial and federal regulations. Any work shown on the drawings or described in the specifications that is at variance with current regulations shall be changed to comply with the requisite authority at no cost to the Owner.
- .2 Work Safe BC regulations shall be followed.

1.4 Quality Assurance

- .1 The Contractor is responsible for the coordination with the mechanical and electrical Owner's Representative and sub-contractors as well as for coordination of all required sleeves under paved areas and through planter walls as specified.

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- .2 The Contractor is to verify site measurements and irrigation coverage, and unless deficiencies are identified by the contractor and an amendment is made to the Contract Document prior to the quotation date, the Contractor accepts full responsibility to deliver the intended performance of the system at no additional cost to the Owner. If any conditions are subsequently observed on site that will impair proper and intended uniform irrigation coverage, notify the Owner's Representative as soon as possible, and inform what the impairment is and its resolution. Do not proceed with any work that would yield unsatisfactory coverage as it will not be accepted.

1.5 Qualifications

- .1 All irrigation work shall be done by an experienced and competent Irrigation Contractor having the capabilities and personnel necessary for all phases of the work specified.
- .2 The Irrigation Contractor shall be a member in good standing of the Irrigation Industry Association of British Columbia (IIABC) and have met the qualification standards currently applied to contractors by that organization. The Contractor must provide proof of membership, and shall provide proof of having worked in the industry for a minimum of five (5) years and provide a list of clients for whom similar sized irrigation projects have been satisfactorily completed. The acceptance of experience and work history rests solely with the Owner.

1.6 Submittals

- .1 Maintenance Data and Operation Instructions/Manual: Prior to and as a condition of Substantial Performance, submit to the Owner's Representative three (3) copies of an operating and maintenance manual containing operational information for all operating components, cleaning and lubrication schedules, overhaul/adjustment schedules and similar maintenance operations. Each manual shall be bound in a three ring binder.
- .2 As-Built Drawings: As a condition of Substantial Performance, submit with the operating and maintenance manuals, a suitably scaled reproducible copy of the "as-constructed" installation of the system. This drawing shall be accurately drawn, showing all components of the irrigation system as installed, with clear measurements provided from identifiable reference points (in metric). As-built drawings shall include invert depths and offset measurements; all such measurements must be taken during construction.
- .3 A plasticized site plan shall be installed in the controller showing the location of each and every solenoid valve, type of valve, with identified zone number, location of the controller, DCVA, control and flow meter valve, pressure regulating valve, booster pump if installed, isolating valves and water supply – with a north reference point
All solenoid valves are to have a type 316 stainless steel tag attached, 25 mm in diameter, indicating the number of the operating zone, and all zone conductors in the controller shall be correlated with the controller program and numbered in adherence thereto.
- .4 Maintenance Devices: Submit to Owner's Representative two (2) sets of all special tools, keys, and equipment that is required to commission the system or as otherwise specified in
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the Contract Documents.

- .5 Commissioning: Instruct Owner's Representative in the complete operating and maintenance procedures for this system. This instruction shall include but not be limited to showing the relative timing differences between zones of different precipitation rates and a schedule of run times suggested for various weather conditions.

1.8 Site Conditions

- .1 Existing Conditions/Underground Services: The Contractor is to verify all existing services, locate all on-site utilities and underground services by hand digging or by use of an electronic toning device or M-Scope. Mark the location of all buried cables, conduits, pipes etc., prior to any trenching. Cooperate with the Owner and utility companies to keep their respective utilities in operation. Notify Owner's Representative immediately for directions as to the procedure should any piping utilities be affected during excavation.
- .2 Site Preparation: Prior to the work of this Section, the Contractor is to carefully inspect any installed work of other trades or contractors and verify all such work is complete to the extent that this work may properly begin.
- .3 Field Measurements: Make all measurements in the field to confirm that the design meets the on site conditions to ensure the precise fit of items in accordance with the original design and performance criteria.
- .4 Discrepancies: In the event of major discrepancies, errors or conflicts between the drawings and the actual site conditions, immediately notify Owner's Representative as to procedure before proceeding with work.
- .5 Repair to Underground Services: Repair or replace all damage to underground services caused by the work of this Contract. Damage to services that are shown on the drawings or have been brought to the Contractor's attention in the field prior to commencement or during construction of the work shall be repaired in its entirety at the Contractor's expense. (Damage to services that were clearly unforeseen/unknown of existence (provided that all reasonable measures were undertaken by the Contractor to ascertain the existence of these services) shall be repaired in accordance with the Changes clause of the General Conditions). Notify Owner's Representative of damage immediately and co- ordinate replacement or repairs through her/him.

1.9 Protection

- .1 Protect existing buildings, equipment, sidewalks, landscape reference points, monuments, markers and other completed work. Make good any damage resulting from work of this Contract at no expense to the Owner.
 - .2 Do not park vehicles on the site in areas where the work will be undertaken without express written consent of the Owner's Representative. Utilize only such equipment/vehicles essential for construction of the system.
 - .3 Protect the work and material of all other trades from damage. Make good all damages from work of this Contract at no expense to the Owner.
 - .4 The Contractor shall be responsible for work and equipment until finally reviewed, tested, and accepted by Owner's Representative.
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- .5 Store materials and equipment received on site that is not immediately installed in a secure location.
 - .6 Close open ends of work with temporary covers or plugs during construction to prevent entry of obstructive material.
 - .7 Trenching and other excavations for vaults, valve boxes etc. are not to be left open during non-work hours of operation unless they are protected to current WorkSafeBC Standards. Cover, mark, and/or protect as necessary all open excavations to ensure worker and public safety.

1.10 Guarantee

- .1 Provide a written Guarantee for all workmanship and materials for one year from date of Substantial Performance. Make all corrections, adjustments and maintenance operations required as a result of failure of the irrigation system to perform due to the work of this Section.
- .2 Manufactured products, including but not limited to irrigation heads, quick couplers, controllers, valve boxes and valves, shall be warranted as per the manufacturers' standard guarantee period or a minimum of one year, whichever is greater.

1.11 Sequence

- .1 Coordinate and ensure the installation of all sleeves and irrigation piping as required under all paved surfaces and through planter walls as noted on the drawings.
- .2 The Contractor is to verify the location of the municipal water supply connection point for the automatic irrigation system. Coordinate as necessary.
- .3 The Contractor is to verify the location of the control cabinet and install a minimum 50mm PVC electrical conduit for the low voltage wires from the control cabinet to a point a minimum of 600mm below grade to the top of the PVC conduit and 1.5 meters horizontal from the control cabinet. There shall not be an in-grade junction box below the control cabinet.

1.12 Review

- .1 Prior to commencement of any work related to this irrigation project, the contractor is required to make contact with the designated Owner's Representative authorized to make project decisions.
- .2 All work is to remain uncovered for inspection of workmanship and materials. Notify Owner's Representative a minimum of forty-eight (48) hours prior to required inspections. Failure to provide such notice and closing in of un-inspected work is sufficient grounds for withholding any payments due to the Contractor. All buried work that has not been inspected and approved will have to be totally uncovered.

PART 2: PRODUCTS

Vancouver Board of Parks and Recreation**China Creek North Park Upgrades****32 80 00****Irrigation System****2.1 General****.1 Product Handling**

- .1 Deliver and store materials in new condition, in unopened containers and protect until installed. Deliver, handle and store pipe and fittings so as to avoid gouging, bending or cracking.

2.2 Pipe and Fittings

- .1 Plastic Pipe: Pipe shall be Schedule 40 polyvinyl chloride (PVC) conforming to ASTM D1784-97, D1785-96B and/or CSA B137.3-93 standards.(ASTM F441/441M-97 or CSA B137.6-96 for CPVC). It shall be extruded, virgin, high impact pipe conforming to Cell Class 12454-B, solvent weldable with belled ends, and continually and permanently marked showing manufacturer's name or trademark, type of material, pipe size and pressure rating.

Size and Classes as follows:

<u>Size</u>	<u>Class</u>
19 - 25 mm. diameter	Schedule 40 PVC
31 -100 mm. diameter	Schedule 40 PVC
Mainlines, any size	Schedule 40 PVC

.2 Plastic Pipe Fittings:

- .1 GSR Schedule 40 PVC conforming to ASTM D-2466-97 (and F438-97 for CPVC) standards and be of the same material as the pipe. Fittings shall be designed for solvent welding to PVC pipe except where valves, risers, etc. require threaded joints.
- .2 Fittings for PVC pipe shall be 2/3 to full interference fit to ensure a fully sealed joint. Provide a minimum two (2) times depth of insert of fitting clearance between fittings to allow for repair. No exception.
- .3 All threaded connections shall be joined with minimum three (3) wraps Teflon Tape: no substitutions accepted.
- .4 Threaded nipples shall be Schedule 80 PVC and be manufactured from the same material specified for the pipe.
- .5 Threaded connections of PVC to metal shall have female threads on the PVC and male threads on the metal (Schedule 80 FMI adapter)
- .3 Primers and Pipe Solvents: CSA approved type as recommended by pipe manufacturer for the temperature and conditions under which the work is being performed. Deliver in sealed containers clearly marked with name of manufacturer and lot number. Use of non- CSA approved specialty primers or solvents such as "Wet R Dry" are not acceptable.
- .4 Sleeves: In locations noted on the drawings and sized a minimum of two (2) nominal pipe sizes larger than any irrigation lateral line to be carried and a minimum of three (3) minimal pipe sizes larger if carrying a mainline:
 - .1 Shall be cast iron piping under all designated vehicular access routes.

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- .2 Shall be Schedule 40 PVC under all other paved surfaces, through walls, and through or underneath footing walls.

2.3 Valves and Valve Boxes

- .1 Solenoid Valves: New, pristine quality valves manufactured by Toro or pre-approved equivalent of the types indicated on the drawings, and sized the same diameter as the pipe they control. Integrally Regulated solenoid valves are not acceptable unless site topography deems their use necessary and specific approval by Owner's Representative has been given. Integrally regulated solenoid valves will not be considered as pre-approved equals.
- .2 Quick Coupler Valves: Brass, 19 mm. installed with schedule 80 nipples, couplings (if used) and triple threaded swing joints. Install Q.C. at location shown on drawings. Accommodate Q.C. in valve box or separate enclosure, as required, and install in active, non-solenoid valved line d solenoid valved line. Ensure top of Q.C. valve is installed a maximum of 50 mm. below lid of valve box to allow easy key operation.
- .3 Isolation Valves: Cast Bronze gate valves with non-rising stems: R&W Model 280 or pre-approved alternative for 13 mm up to and including 63 mm diameter and R&W non-rising, cast iron flanges, Model 415 for 75 mm and larger diameter.
- .4 Bronze Ball Valves: Threaded hubs, Cambridge, 50mm, Model #202 NL-H7F7 or appropriate model number to suit specified diameter of Shut-Off curb stop type or pre-approved alternative.
- .5 Valve Boxes: Shall be green plastic irrigation boxes complete with captive lock bolt cover complete with S.S. bolts, sized to suit valves and other components with adequate room for operating and maintenance access:
 NDS - 113 BC (14" x 19") 1-2 valves or Carson 1419 (14" x 19") 1-2 valves
 NDS - 117 BC (17" 20") 3 valves or Carson 1320 (13" x 20") 3 valves

2.4 Sprinkler Heads

- .1 New pristine quality heads manufactured by Toro or pre-approved equivalent of the types and sizes indicated on drawings.
- .1 Sports field/Playfield Heads:
- .1 The full or part-circle sprinklers shall be gear driven rotary types. The sprinkler shall be of a pop-up design with an overall height of 225 mm (or 263 mm for Valve in Head). Body diameter of 88 mm, a cap diameter of 63 mm a pop-up stroke of 60 mm. The top sprinkler shall be mounted at 13 mm below the final finished grade and shall have a 25 mm NPT or BSP female threaded inlet.
- .2 The sprinkler shall be capable of covering designed radius at designed kilo Pascal pressure with a discharge rate of designed litres per minute. Water distribution shall be via two (2) nozzles mounted in a 38 mm diameter stainless steel nozzle turret. The dual nozzles shall elevate 60 mm when in operation. Radius reduction shall be adjustable up to 25%, by means of a stainless steel radius adjustment screw accessible from the top of the nozzle

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when the sprinkler is properly installed. The body and cap of the sprinkler shall be injection moulded from ABS, a non-corrosive, impact-resistant, UV-resistant, heavy-duty plastic material. The sprinkler shall have a plastic filter screen sized to prevent entry of foreign material into the nozzle. All components shall be removable from the top of the sprinkler case. Retraction shall be achieved by a heavy-duty stainless steel spring. The sprinkler shall have a riser seal and a wiper. A sealed, oil-packed gear-drive assembly isolated from the water supply shall accomplish rotation. The drive assembly gear mechanism shall be constructed of brass and stainless steel gears. The sprinkler shall have a standard rubber cover available in black or lavender for effluent water use applications. Various arc patterns shall be achieved with any one of twelve fixed arc gear drive assemblies.

.2 Large Open Area/Passive Lawn Heads:

- .1 The full or part-circle sprinklers shall be gear driven rotary types. Part-circle models shall be adjustable from 40 degrees to 330 degrees. The sprinkler shall be capable of covering designed radius at x pounds per square inch pressure with a discharge rate of designed litres per second. Water distribution shall be via one modular nozzle mounted and locked onto a 35 mm diameter nozzle turret.
- .2 The dual nozzles shall elevate 60 mm when in operation. Radius reduction shall be adjustable up to 25%, by means of a stainless steel radius adjustment screw accessible from the top of the nozzle when the sprinkler is properly installed. The body and cap of the sprinkler shall be injection moulded from ABS, a non-corrosive, impact-resistant, UV-resistant, heavy-duty plastic material. The sprinkler shall have a plastic filter screen sized to prevent entry of foreign material to the nozzle. All components shall be removable from the top of the sprinkler case
- .3 The sprinkler shall have a single piece riser/body seal that regulates flushing during pop-up and retraction to clear any debris from around the riser, and a heavy-duty stainless steel spring to ensure positive retraction. The seal shall be a single piece injection moulded from Santoprene, a synthetic rubber.
- .4 The sprinkler shall be capable of accepting any one of 24 nozzles. The nozzles shall be colour-coded and available in three trajectories. Rotation shall be accomplished by a sealed, oil-packed gear-drive assembly isolated from the water supply and driven by a variable stator that maintains a constant speed of rotation with all nozzles. The variable stator shall require no adjustments when changing nozzles. The sprinkler shall employ a modular, interchangeable nozzle technology. Any individual nozzle shall be easily removed, installed and locked if field adjustment is required. A standard pop-up model shall be available with a check valve that shall maintain 3000 mm of elevation change.
- .5 A lavender effluent water use indicator must be available and able to be fitted into the nozzle. A 19 mm NPT plug shall be provided with all side inlet models

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to plug the unused inlet.

Hi-Pop Version:

The sprinkler shall be of a pop-up design with an overall height of 413 mm, a body diameter of 60 mm and a pop-up stroke of 263 mm. The sprinkler shall be capable of installation at grade level and shall have a 19 mm NPT female inlet.

Lawn Version:

The sprinkler shall be of a pop-up design with an overall height of 175 mm, a body diameter of 75 mm and a pop-up stroke of 75 mm. The sprinkler shall be capable of installation at grade level and shall have a 19 mm NPT female inlet.

Commercial Version:

The sprinkler shall be of a pop-up design with an overall height of 175 mm, a body diameter of 75mm and a pop-up stroke of 75mm. The sprinkler shall have a standard locking cap to provide vandal resistance. It shall be supplied with a standard check valve that shall hold 3000 mm of elevation change. The riser assembly shall be encased in stainless steel for increased vandal resistance and durability. The sprinkler shall be capable of installation at grade level and shall have a 19 mm NPT female inlet.

Shrub Version:

The sprinkler shall be of shrub design with an overall height of 128 mm and a base diameter of 44 mm. The sprinkler shall be capable of mounting above grade and shall have a 13 mm or 19 mm NPT female threaded inlet.

.3 Small Lawn Areas/Shrub Bed Areas:

- .1 The nozzles shall be the fixed spray type designed to provide matched precipitation rates from 1500 mm to 4500 mm radius. The nozzles shall have a colour-coded base that provides easy identification of the radius and/or type of nozzle in use. The nozzle top shall provide an alphanumeric indication of the radius and arc of the nozzle as well as a graphical indication of the arc. The nozzle shall be available with a pressure-compensating device capable of maintaining 207 KPa with operating pressures from 207 KPa to 470 KPa. Non-pressure compensating nozzles shall be capable of accepting a compensating device to provide this feature at any time. The nozzle shall be capable of 25% radius reduction and complete shut-off via a stainless steel screw accessible from the top of the nozzle. The nozzle shall have male threads. A colour-coded screen appropriately sized to prevent entry of foreign materials into the nozzle shall accompany the nozzles. A secondary 200-mesh stainless steel screen shall accompany all nozzles with a 207 KPa flow rate less than 1.89 litres per minute. The nozzle shall be injection moulded from ABS, a non-corrosive, impact resistant, UV-resistant heavy-duty plastic material. The accompanying primary screen shall be injection moulded from polyethylene, a non-corrosive plastic material. The accompanying secondary screen shall be stainless steel.

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2.5 Control and Common Ground Wiring

- .1 Obtain Electrical Permit for the work from Permits and Licenses, City of Vancouver.
- .2 Use insulated solid copper wire, minimum #14 AWG, TWU insulation of a type approved by the governing electrical authority and by CSA for direct underground burial, sized to suit loads, and distances. Maximum voltage loss shall be three percent (3%). Insulation colour for control/signal conductors shall be consistently applied throughout the system, and white conductor shall always be the common wire.
- .3 Confirm control wire size with the manufacturer of zone control valves to ensure wire is sized to the length of its run and in compliance with the current Canadian Electrical Code, as amended by the Province of British Columbia and the City of Vancouver.
- .4 Wire, breakers, conduits and related materials that comprise the electrical supply to the controller shall be CSA approved, and installation shall be pursuant to the Canadian Electrical Code, as amended by the province of British Columbia and the City of Vancouver. Underground installation of electrical wiring must comply with Table 53 of the CEC, Part 1.

2.6 Miscellaneous Materials

- .1 Electrical Tape: All weather, black plastic 19 mm wide, a minimum 0.1778 mm thick, or use approved equal.
- .2 Electrical Wire Splices shall be made watertight with CSA approved watertight connectors. No splicing of wires shall occur unless located in an accessible box and shown on the As-Built Drawings.
- .3 Thread Lubricant: Type manufactured for plastic to metal connections such as Teflon tape or Permatex 2.
- .4 Conductors in the Control Cabinet must all be terminated on terminal strips suitable for wire size.

2.7 Automatic Controller

- .1 Scorpio Controller with UHF radio, or Motorola compatible controller.
 - .1 Capable of manual and automatic operation.
 - .2 Independent stand-alone operation with 16 programs
 - .3 Ready for central control via radio communication.
 - .4 Must be capable of supporting 1 flow meter input to monitor real time flow rates, alarming for:
 - .1 High flow, shutdown station(s)
 - .2 Low flow, shutdown station(s)
 - .3 Unopened, shutdown station(s)
 - .4 Burst main, shutdown station(s)
 - .5 Main leak, shutdown station(s)
 - .5 Must be capable of supporting a connection of any digital sensor to force a "wait

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response”.

- .6 Electrical surge protection.
- .7 Independent and remote station programming.
- .8 Water adjustment factor by using percentage scale, 0-99% in 1% steps.
- .9 Selective station operation, sequential station operation, single station operation.
- .10 Stop time prevents irrigation past a specific deadline entered.
- .11 Program by time, volume or time and flow
- .12 Cycles per program 1-98.
- .13 Electrical characteristics:
 - .1 CSA approved, 120/240 VAC, 50-60 Hz @ 30 VA.
 - .2 Capable of not less than STATED independent stations; allowing for variation due to size of system, spares and future expansion of the system/or requirements of proposed system as requested by Owner.
- .14 Options to include: Rain Sensor Capability.
- .15 Operational key pad(s) shall be supplied with each controller.
- .16 Controller to be radio controlled.
- .17 Controller must provide a minimum allowance for one (1) extra output for activation of the hydrometer (when specifying number of stations on controller one station must be designated for activation of the hydrometer.

2.8 Cabinet for Controller

- .1 Two (2) electrical circuits rated at 15 amps 120 volts shall be installed to the Control Cabinet, one circuit shall supply the duplex receptacles for the Scorpio Controllers- one duplex receptacle for each controller; the other circuit shall supply a duplex receptacle for general purposes. All conductors shall be a minimum of 12 AWG, RW90 insulation, solid copper, and run in an electrical PVC conduit.
- .2 The Control Cabinet shall be CSA approved and of the type specified on the drawings, complete with approved weather proof lockable metal door and grounded by means of ground rods or plates. It must be large enough and capable of providing all necessary features for programming equipment for the irrigation system as designed.

2.9 Back Flow Preventer

- .1 Wilkins Zurn or Watts Series 007M1QT double check Backflow Prevention Assembly, complete with gate valves, or pre-approved equal.
- .2 All back flow preventers larger than 50 mm shall be the approved type or pre-approved equal.
- .3 All back flow prevention devices to be CSA and BCWWA approved and conform to all current Municipal cross connection control standards as applicable.

2.10 Service Vault

- .1 All back flow prevention devices to be located in precast concrete vaults complete with concrete bottom that shall be sized as shown on the drawings,

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- .2 The vault shall be supplied by AE Precast Concrete Products or shall be a pre-approved alternative.
 - .3 Vaults shall be supplied complete with double hinged, galvanize steel checker plate locking covers, with lock and hasp assembly which shall be recessed below top of lid. Lids are to extend the full length of the service vault to allow for unimpeded access into the vault. Each lid is to be a maximum weight of 27 kg each. Install service vault flush with finished grade.
 - .4 The piping and valve assembly within the vault must be adequately supported and braced (minimum two (2) riser type supports and two (2) side wall supports), with adjustable supports, complete with riser, pipe clamps, galvanized metal and stainless steel bolts. Install as per provided schematic drawing.
 - .5 All piping inside the vault is to be brass or type, and is to extend a minimum of 300 mm outside the vault on the downstream side and a minimum of 150 mm on the upstream side.
 - .6 The top of the piping shall be 600 mm from the top of the lid. The service vault shall be filled with 25 mm drain rock to within 300 mm of the bottom of the pipe. Contractor shall install a 100 mm PVC drainpipe, complete with a backwater valve. The vertical section of the drainpipe is to be perforated and terminating with a grate that is flush with the surface of the drain rock. The drainpipe is to run (minimum of .5% slope) into a catch basin or an approved drainage system.
 - .7 PVC connections to brass outside the vault on the downstream side are to be made with schedule 80 PVC female adapters.
 - .8 Inside vault piping shall be brass including the triple threaded swing joints for blow down quick coupler, or pre-approved alternative.
 - .9 All piping to vault from the city service is to be type K copper or pre-approved alternative.

2.11 Pressure Reducing Valve

- .1 If required, Watts Series 223 sized to system: Range 173 KPa to 470 KPa or pre-approved alternative.

2.12 Blow Out Tee

- .1 Brass, 19 mm in size on triple brass threaded swing joint.

2.13 Flow Meter

- .1 Hydrometer: Bermad Model No. 910-P or pre-approved equal.
 - .2 Shall combine a turbine type water meter and a diaphragm actuated, solenoid controlled valve mounted in a single globe style valve body.
 - .3 The meter shall power a gear mechanism which activates a reed switch that transmits a pulse at a pre-determined amount of flow.
 - .4 The unit shall include integral flow guides to eliminate the need for straight pipe allowances before and after the valve.
 - The hydrometer shall be capable of sending electronic flow data to a compatible
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irrigation controller to enable it to be integrated within an overall computer controlled system.

- .5 Three different coloured wires shall be installed to the controller from the Bermad, two of which must be a white common.
- .6 Flow meter must have a manual override to bypass meter.
- .7 Three way actuator must be of brass construction and must have a solenoid. Plastic materials are not acceptable.

2.14 Approved Equals

- .1 All items as specified or pre-approved equivalents.
- .2 Proposed equivalents shall meet or exceed the specifications in performance, flow, pressure loss and all other important characteristics of the original equipment specified.
- .3 The alternative equipment shall be of good quality construction, with a proven record of trouble free performance and low maintenance, on projects of similar size and scope.
- .4 The proposed equivalent must be available from a local distributor with a well-stocked inventory of all readily available spare parts.
- .5 The alternative equipment must have an equivalent warranty to the original equipment specified.
- .6 Alternative equipment must be compatible with all other remaining system components and must be agreed upon by both parties to the contract.
- .7 Submission guidelines for approval of equal products must be strictly adhered to or no consideration for approval as equals will be considered.

PART 3: EXECUTION

3.1 Irrigation System Layout

- .1 Establish and coordinate exact locations of lines, valves and heads, with planting locations to avoid conflicts and damage to plants during installation. Stake locations for approval by Owner's Representative. The Contractor is to verify grades for all components.
- .2 Layout the piping and sprinkler locations with flags or short lengths of pipe, in accordance with the drawings, and obtain the approval of the Owner's Representative before proceeding. The layout shall be in accordance with the drawing. The Owner's Representative must approve alternative layouts.

3.2 Installation of Piping

- .1 The Contractor is to verify that all pipe, fittings, primers and cements are compatible for proper installation.
- .2 Obtain field assistance from pipe manufacturer/supplier as necessary to ensure correct installation and adhesive techniques are used on joints.
- .3 Do not cement pipe and fittings under wet or muddy conditions, and follow the manufacturer's recommendations.

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- .4 Layout the piping system in accordance with drawings. Route piping to take into account site elevation changes and to minimize low head weeping subsequent to shutdown.
- .5 No irrigation line shall be directly over and parallel to another irrigation line or any other service line. Ensure minimum horizontal and vertical clearance requirements as dictated by Canadian Electrical Code for all piping installations near any electrical conduit/service.
- .6 Where possible, main supply lines may occupy the same trench as lateral sprinkler lines, provided that a minimum horizontal clearance of 150mm is maintained. Multiple lateral lines may occupy the same trench provided that a minimum of 50mm horizontal clearance is maintained and the pipes are all on the same plane.
- .7 Install pipes in long 'S' curves to allow for expansion and contraction.
- .8 Comply with all the manufacturer's printed data and recommendations regarding pipe cutting, cleaning, bevelling, deburring, fitting preparation, primer and cement application and correct joining techniques. Ensure that all joints are properly fused and bonded and that all curing times given site climatic conditions are fully observed prior to testing or charging of piping system.
- .9 Install yellow warning tape approximately 250mm above all mainline runs with low voltage wiring located below piping. Warning tape on lateral lines is not required.
- .10 Trenching:
 - .1 All excavation shall be undertaken in accordance with the City of Vancouver's Policy and Standard Operating Procedure- Soil and Excavation Water Contamination Management.
 - .2 Open excavation shall be carried out in a safe and orderly manner and in accordance with the requirements of the Workers' Compensation Act of B.C. Approved shoring shall be used where required for safe working conditions.
 - .3 All trenches are to be hand or machine excavated. Pulling pipes is not acceptable. All trenches shall be dug on the alignment and to the depth required as shown on the drawings and as stated herein. In any event, the water main service pipe shall be buried to a depth of at least 750 mm below ground. The irrigation main and zone lines shall be buried to a depth of at least 406 mm below the surface measured to top of pipe. Trenches are to be straight with uniform slopes to the bottom of all trenches.
 - .4 Where the pipes are to be laid in sub-surface material the trench shall be excavated to a depth at least 100 mm below the bottom of the pipe elevation. The trench shall be backfilled with at least 100 mm of sand passing a 5 mm sieve and be carefully compacted by hand.
 - .5 Prior to backfilling, all lines, valves and fittings shall be inspected by Owner's Representative, where required.
 - .6 Trenches shall be at least 300 mm away from paving stones or other hard surfaces to avoid undermining such surface or its edge retention.

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- .7 Backfilling shall take place in an orderly fashion. Where the line is within an enclosed planting bed or sod lawn area and does not penetrate below the growing medium, the growing medium shall be carefully placed over the pipe and be carefully tamped by hand to achieve compaction equivalent to the surrounding area. Where the lines penetrate the native soil or sub-surface fill, backfilling to a depth of 100mm over the top of the pipe shall be carried out with sand passing a 5 mm sieve and be carefully compacted by hand.
 The remainder of the backfill to finish grade shall be with suitable material, free of any rocks over 25mm in diameter and other similar materials that could damage the pipe or create unusual settling conditions.
- .8 Compact the growing medium to the same density as the native material in the trench sidewalls to prevent differential settlement.
- .9 Fill piping with water at approx. 0.172 MPa during backfill operations.
- .10 Contractor is responsible to repair all trenches which have settled below the adjacent grade for a period of one (1) year from date of Substantial Performance.
- .11 Material refuse such as pipe pieces, excess wire, rags, fittings or PVC cement canisters shall not be left as a part of backfill in any of the trenches.

3.3 Installation of Equipment

- .1 General: Install all equipment as shown in plans and details, using specified and appropriate pipes, connectors, cements, lubricants, solvents for each type of joint.
- .2 Valve Boxes: Install valves in valve boxes, allowing adequate space within boxes for proper operation/servicing of each component. Keep the valve box clean and clear of all debris that may fall into it during construction/installation. Ensure a minimum 150 mm of 19 mm drain gravel is placed in the bottom of each valve box. Additionally, ensure the following:
 - .1 The top of the valve box is to be level and flush with grade, and located in shrub areas where possible.
 - .2 Valves are to be installed vertical and centred.
 - .3 Valve boxes are to be blocked (with brick or concrete pavers) so that neither blocking nor valve box rest on lateral or mainlines when supporting the weight of expected forces on the top of the box.
 - .4 Quick coupler valves to be installed within valve boxes in active, non-solenoid valved line or in specified designated solenoid valved line.
- .3 Automatic Controllers: Ensure controller(s) are located to allow for maximum viewing of the system operation. Install in location shown on drawing. If not shown coordinate location with Project Manager prior to starting work. Install at 1500 mm height to the centre of the Cabinet or as otherwise detailed at location shown. Make all connections to optimize the operation and sequencing station valves in a logical manner to expedite proper testing of all system operations.

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- .4 Control Wiring: Protect control and common wiring by installing beneath irrigation mainline. Obtain approval from Owner's Representative for all wiring to be installed in separate trenching and protect with Yellow Buried Wire Warning Tape that shall be 200 mm above the wires. Leave additional 600 mm of each wire at each valve and neatly coil and wrap excess. Wrap conductors with electrical tape at 900 mm intervals. Make wire splices only in accessible valve boxes. Minimize the number of splices. As much as possible ensure that wire runs are continuous without interruption. Run control wiring from valves and connect to automatic controller. Install control wiring in a conduit that extend 1500 mm horizontally from the vertical connection point of the controller, with the horizontal portion 600 mm below grade to the top of the pipe. Electrical conduit to be a 50 mm diameter PVC with a sweep elbow from below grade to bottom of controller cabinet location. Ensure that conduit is clamped to mounting surfaces with conduit pipe clamps at 250 mm on centre spacing or as detailed.
- .5 Quick Coupler Valves: Install in valve box to allow for easy insertion and rotation of quick coupler keys, with the top of the Quick Coupler installed a maximum of 50 mm below the lid of the valve box, on Schedule 80, triple threaded swing joints and nipples to provide sufficient "give" should a hose or line be pulled.
- .6 Irrigation Heads: Install all heads on triple swing joint assemblies of the same size as the sprinkler inlet. Adjust all heads to 12 mm below finished grade for sodded lawn areas once sodded lawn has been approved by Owner's Representative.
 - .1 All sprinkler heads to be installed a minimum 50 mm away from any hard surface.

3.4 Testing

- .1 Closing in Work:
 - .1 Obtain approval from the Electrical Inspector before backfilling any section of the underground electrical installation.
 - .2 Obtain approval of Owner's Representative before backfilling any sections of the irrigation system.
 - .3 Any work closed in before inspection will be required to be re-exposed for inspection at no extra cost to the Owner. Provide 48 hours minimum notice to Owner's Representative to arrange inspections and review of pressure testing.
- .2 Testing: Upon completion of the irrigation system, arrange with the Owner's Representative to be present to observe pressure testing. Test all plastic pipe and sprinklers as follows:
 - .1 After the pipe is in place in the bottom of the trench with risers in place, cap the risers where the sprinklers will be attached and insure that all pipe, couplings and fittings are exposed.
 - .2 Apply a pressure of 0.551 MPa (80 psi) to each section, using a test pump and calibrated container. Inspect visually for leaks at couplings and fittings, cut out and replace any that leak. Maintain test pressure for two (2) hours. After replacing any defective sections, pressure test for two (2) hours and note any pressure loss.

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- .3 After approval by the Owner's Representative, backfill the pipe maintaining pressure in the line, noting any sudden drop in pressure. If there is any indication of a leak, locate the defective section and replace. Leaks shall not be repaired by patching.
 - .4 Provide written documentation that pressure testing has been completed satisfactorily, including re-testing (for 2 hours) of all defective sections. Written notice shall state the date, parties present, pressures applied and duration of pressure tests.
 - .3 Flushing: after testing and prior to attaching sprinklers, flush out each section to remove any dirt accumulated.
 - .4 Adjustment: Adjust the irrigation heads for optimum coverage and rate of flow, including minor adjustment in actual head locations. Set the controller operation times as dictated by Owner's Representative. The Contractor is required to balance and adjust the various components of the system to ensure the efficient operation of the system. This includes the adjustment of any pressure regulators, full and part circle radius heads, valves and adjustments to controllers.
 - .5 Systems that are Substantially Complete on or after September 15th, shall be left in a winterized state as per Item 3.5. This contractor is responsible to return the following Spring at a time dictated by the Project Manager and start-up the system and perform all maintenance functions necessary to provide a fully operating system.
 - .6 Coverage Test: When the irrigation system has been completed, a coverage test shall be completed in the presence of the Owner's Representative to determine if coverage of water on planted areas is complete and determine if any adjustments are required.
 - .7 Controller Test: As part of the above, and prior to Final Acceptance by the Owner's Representative, the automatic controller(s) shall be set in sequence and thoroughly tested through each zone to determine if any adjustments are required.
 - .8 Submit Certificate of Double Check Valve Assembly Test and Pass at the time of Substantial Completion.

3.5 Winterizing

- .1 Winterize the system for the first time with the Owner's Representative and Owner's Representative observing. Winterizing shall include all operations necessary to protect the system from freezing temperatures, including manual and solenoid valve operations to isolate vulnerable parts of the system and draining components and pipes and/or blowing water out of all pipes with compressed air.

3.6 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 Trenching, laying pipe and backfilling shall be continuous so that the amount of open trenching at the end of each workday is minimized. Any open trench or other excavations shall be barricaded and marked with high visibility marking tape to current WorkSafeBC requirements.

Vancouver Board of Parks and Recreation

32 80 00

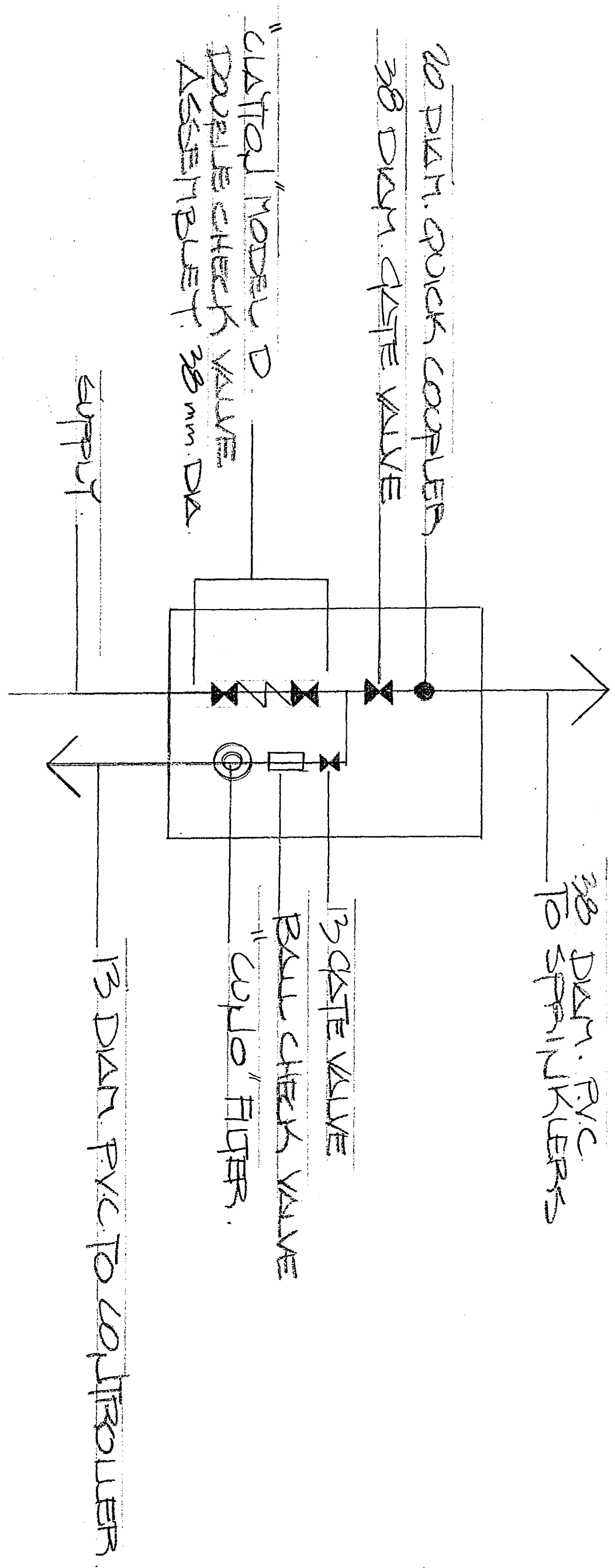
China Creek North Park Upgrades

Irrigation System

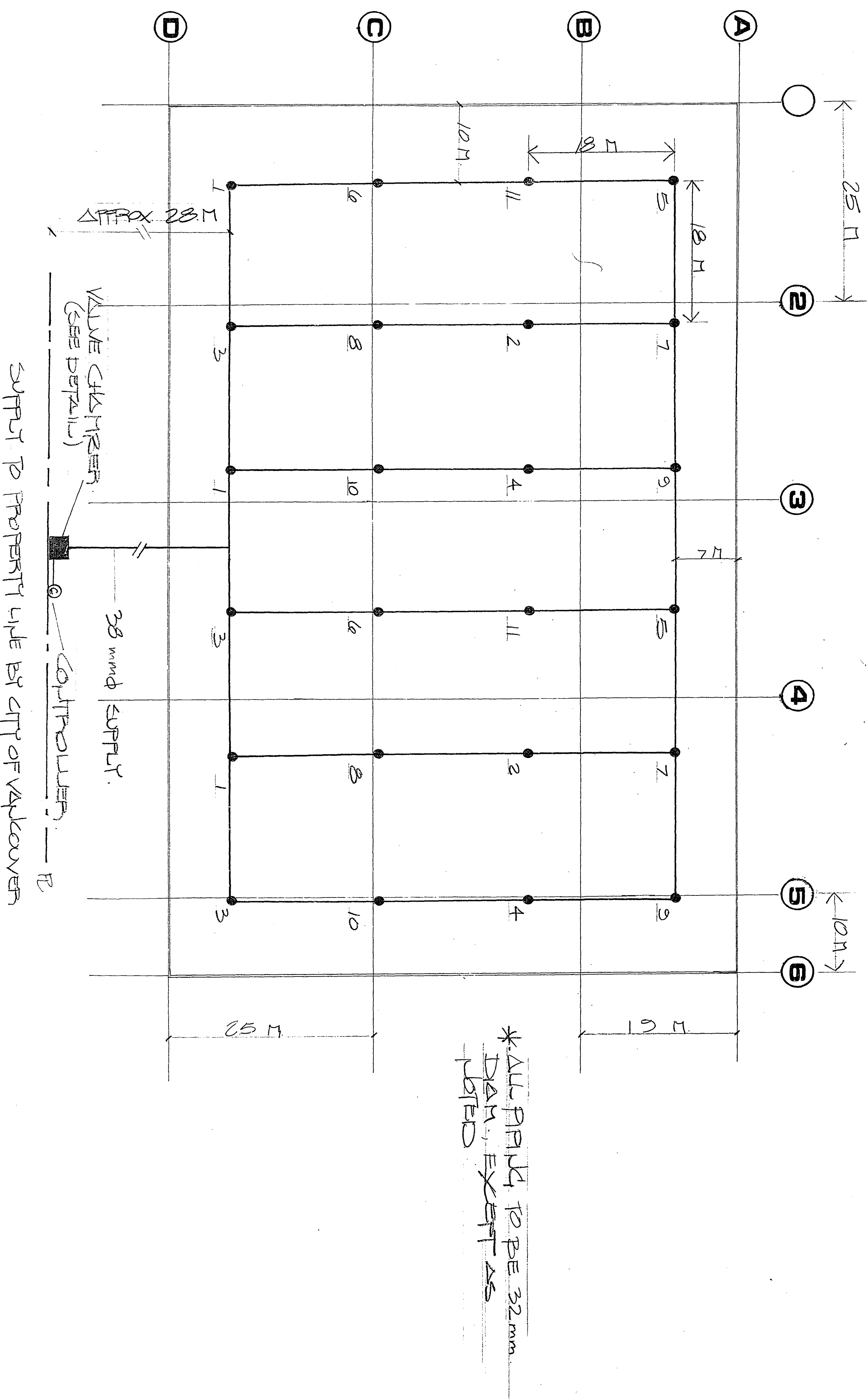
-
- .3 Any damage to paving, planting or any other structures/elements due to settlement of improperly compacted trenches shall be immediately repaired at the Contractor's expense to satisfaction of the Owner's Representative.
 - .4 Remove and dispose from the site any and all surplus material, excess excavated materials, trash, debris and waste material arising from the work of this Section.

END OF SECTION 32 80 00

A vertical ruler scale with markings from 0 to 5 centimeters. The scale is oriented vertically, with 0 at the top and 5 at the bottom. Each centimeter is marked with a horizontal line and a number. There are also smaller, unlabeled markings between the centimeter marks, representing millimeters. The unit 'CM' is written at the top of the scale.



VALVE CHAMBER
SCHEMATIC PFS.



	REV.	DATE	BY	DESCRIPTION	CHECKED BY
PLANNING					
OPERATIONS					
RECREATION					
FINANCE					
SUPERINTENDENT					
BOARD OF PARKS AND RECREATION					
CITY OF VANCOUVER 2099 BEACH AVENUE V8G-1Z4 TEL. 681-1141					
PROJECT TITLE CHILD CREEK PARK PLAYING FIELD					
SHEET TITLE					
DRAWN KAVOLJAS	SHEET NO.				
CHECKED	SHEET SIZE A2				
DATE MAY 3/82	DRAWING NO. OGI.OO2				
SCALE 1=5'					

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install growing medium and mulch as indicated in the contract documents. Growing medium for landscape areas including urban agriculture beds and planters.

1.3 Related Work

- | | | |
|-----|---------------------------------|------------------|
| .1 | Excavation Backfill and Grading | Section 32 23 10 |
| .2 | Sod Lawns | Section 32 92 23 |
| .2a | Seeded Lawns | Section 32 92 19 |
| .3 | Plants and Planting | Section 32 93 10 |
| .4 | Subsurface Drainage Systems | Section 33 46 16 |

1.4 Reference Standards

- .1 Conform to the requirements of the latest editions of the following standards and legislation:
 - .1 BCSLA/BCLNA British Columbia Landscape Standard
 - .2 Canadian System of Soil Classification
 - .3 Canadian National Master Construction Specification, 32 91 19.13 Topsoil and Grading.

1.5 Materials Definitions

- .1 For the purpose of this specification the term "growing medium" shall mean a mixture of mineral particulates, microorganisms and organic matter which provides a suitable medium capable of supporting the intended plant growth.

1.6 Types and Locations of Growing Medium

- .1 Provide and install the following types of growing medium at the locations shown for each type:
- .2 Growing medium types:
 - .1 TYPE A On Site/Imported Soil
 - .2 TYPE B Growing Medium

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China Creek North Park Upgrades

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Growing Medium

1.7 Review

- .1 Verify the size, location and depth of all existing site services and sub-surface utilities prior to commencement of the work. Repair all damage as result of failure to perform adequate review at no cost to the Vancouver Park Board.
- .2 Notify Owner's Representative when the site is prepared for growing medium placement. Do not place growing medium until subgrades have been reviewed and approved.
- .3 Provide at least two days (48 hours) notice in advance of each required reviewed.

1.8 Testing

- .1 Submit to the Owner's Representative a copy of growing medium analysis from a laboratory approved by the Owner's Representative. The analysis shall be of tests done on the proposed growing medium from samples taken at the supply source within three weeks immediately prior to soil placement. Cost of initial analysis and subsequent tests to ensure compliance with specification shall be borne by the contractor. **Results of these tests shall be presented to the Owner's Representative for review BEFORE any growing medium delivery to site.** Pond/In-stream growing medium placed prior to the review of test results by the Owner's Representative will result in rejection of pond/In-stream growing medium and subsequent removal of material by the contractor at no cost to the owner.
- .2 The analysis will include measurement of percent sand, fines, (silt and clay), and organic matter to total 100%, pH, lime required to achieve pH 6.5, water soluble salts, total carbon to total nitrogen ratio, total nitrogen and available levels of phosphorus, potassium, calcium and magnesium
- .3 The analysis shall outline the testing laboratory's recommendations for amendments, fertilizer and other required modifications to make the proposed growing medium meet the requirements of this specification.
- .4 At the discretion of the Owner's Representative submit up to two additional samples at intervals outlined by the Owner's Representative of pond/in-stream growing medium taken from material delivered to site. Samples shall be taken from a minimum of three random locations and mixed to create a single uniform sample for testing. Results of these tests shall be presented to the Owner's Representative for review.
5. Test reports for landscaping soils containing biosolids shall be submitted to demonstrate the finished product meets the BC Organic Matter Recycling Regulation's (OMRR) "Biosolids Growing Medium" standards; and, be supported by a documented review by a Qualified Professional as defined by OMRR

Organic Matter Recycling Regulation

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/18_2002

- .6 Failure to satisfy these contractual requirements could result in the contractor being required to remove unacceptable growing medium at their expense.

1.9 Submittals

Vancouver Board of Parks and Recreation**China Creek North Park Upgrades****32 91 13****Growing Medium**

-
- .1 Submit to the Owner's Representative a copy of an analysis by an approved independent soil-testing laboratory. Acceptable laboratories include; Benchmark Laboratories Nanaimo, Ltd. Nanaimo, BC (250-585-2555), Pacific Soil Analysis Inc., Richmond, BC. (604.273.8226) or pre-approved equal. The analysis shall be of tests done on the proposed growing medium and additives proposed for the work from samples taken at the supply source, within three weeks immediately prior to growing medium placement. Costs of the initial analysis, and subsequent tests to ensure compliance with the specification shall be borne by the Contractor. Failure to submit soils analysis is cause for immediate rejection and possible removal of any placed growing medium.
 - .2 The analysis shall include a breakdown of the following components: total nitrogen by weight, available levels of phosphorous, potassium, calcium, magnesium, soluble salt content, organic matter by weight, % sand, % fines (silt and clay) and pH value. In addition, the analysis shall clearly indicate the Project Name, Date Tested and Contractor's Name.
 - .3 Submit with the above analysis, the testing laboratory's recommendations for amendments, fertilizers and other modifications to make the proposed growing medium meet the requirements of this specification.

1.10 Samples

- .1 Submit to the Owner's Representative one composite sample of each type of proposed growing medium for each different application within the project (e.g. lawns, shrubs, urban agriculture planter). Each sample shall be a composite of at least three samples from the proposed source and shall be at least one (1) litre in volume.
- .2 Urban Agriculture Growing Medium: Submit to the Owner's Representative confirmation that that the organic material component of the Urban Agriculture Growing medium is derived from an organic source free of heavy metals, contaminants, animal or plant chemical additives or supplements. The confirmation shall be in the form of a letter on company letterhead or written confirmation from provincial or regulatory agency.
- .3 At the discretion of the Owner's Representative, submit up to two additional samples, including samples of proposed additives to the growing medium from material delivered to the site as required to ascertain compliance with this specification. Results of these tests shall be submitted to the Owner's Representative for approval.
- .4 After the completion of the soils analysis, a one litre sample of the completed/mixed growing medium, including all amendments shall be submitted at least twenty-one (21) days before placement of growing medium to allow for evaluation of samples and testing for noxious weed content by Owner. Owner's Representative will advise of test results.
- .5 Samples of each growing medium type shall be submitted to the Owner's Representative in zip lock plastic bags clearly marked with the date, project name, sample name and supplier name and telephone number.
- .6 Organic Material: One composite sample or each organic material type. Sample shall be a composite of at least three samplings from the proposed source, and shall be at least one (1) litre in volume.

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China Creek North Park Upgrades

32 91 13
Growing Medium

1.11 Quality Assurance

- .1 Advise Owner's Representative of sources of growing medium to be utilized on this Project a minimum of thirty days (30) prior to starting work of this Section.
- .2 Carry out growing medium preparation and placement such that the final product matches the standard set by the samples submitted, within a range of variation that may reasonably be expected with good quality control while incorporating the recommendations for amendment by the testing laboratory.
- .3 The Vancouver Park Board may appoint an independent testing laboratory to ascertain compliance with this specification and to recommend modifications to make the growing medium meet the requirements of this specification.

PART 2: PRODUCTS

2.1 General

- .1 Product Handling
 - .1 Do not move or work growing medium or additives when they are excessively wet, extremely dry, frozen, mixed with ice and/or snow, or in any manner which will adversely affect growing medium structure. Growing medium whose structure has been destroyed by handling under these conditions will be rejected and shall be replaced by the contractor at no cost to the owner.
 - .2 Protect growing medium and additives against extreme wetting by rain or other agents, and against contamination by weeds and insects.
 - .3 Deliver fertilizer and other chemicals in manufacturer's original containers. Protect against damage and moisture until incorporated into the work.
 - .4 Stockpile materials in bulk form in paved areas and provide protection by storing under roof or tarpaulins. Take all necessary precautions to prevent contamination of component materials from wind blown soils, weed seeds and insects. Contamination of individual components may result in rejection, if used.
 - .5 All growing medium will be delivered to site **premixed** from a recognized growing medium source ensuring consistency throughout the mix.
- 2 Approved Equals
 - .1 All items as specified or pre-approved equals.

2.2 On Site /Imported Soil (Type A)

- .1 On site-imported soil shall be friable "A Horizon" topsoil to the requirements of the B.C. Landscape Standard, stripped and stockpiled on site in an approved location. Stripping and stockpiling work shall be such that the soil is not damaged or contaminated. (Refer to Product Handling).
- .2 Mineral particle sizes shall be within the following ranges by weight:

100% shall pass a 10 mm (3/8") sieve.

Maximum of 10% shall pass a #200 sieve. (Silt and clay)

Vancouver Board of Parks and Recreation**China Creek North Park Upgrades****32 91 13****Growing Medium**

Soil shall be of a sandy loam or loamy sand texture containing between 3% and 15% organic matter (dry weight basis). Soil shall be virtually free from subsoil, wood including woody plant parts, weeds, stones over 30mm, pests, undesirable grasses or weeds, and seeds or parts thereof and foreign objects. Soil shall be free from crabgrass, couch grass, *Equisetum*, convolvulus or other weeds or seeds or parts thereof.

- .3 Soil shall be suitable for modification by screening and additives to meet the requirements for Screened Growing Medium (Type B as specified) except where specified and approved for use as unscreened On Site Soil (Type A).

2.3 Additives

- .1 Manure: Well-rotted farm animal manure or compost, to the requirements of the BCSLA/BCLNA B.C. Landscape Standard. Animal manures and compost often have excessive levels of water-soluble salts. The growing medium shall be leached via fresh water from the irrigation system or through natural rainfall until an electrical conductivity of 3.0mmho/cm or less is achieved.
- .2 Compost: A uniform blend of natural source-separated organic materials, composted such that it is brown-black in colour and has carbon to nitrogen ratio of 25 to 1 or lower. pH 6 to 7. Substantially free from subsoil, pests, roots, wood, construction debris, undesirable grasses or weeds, and seeds or parts thereof. Free from toxic materials, crabgrass, couch grass, *Equisetum*, weeds, and seeds or parts thereof. The Owner does not allow use of any paper fibre amended compost products. Approved Suppliers include Fraser Richmond Biocycle and Stream Organics.
- .3 Sand: Approved medium river pump sand, well washed and free of contaminants, chemical and organic matter. Gradation of particle sizes shall fall within the following range ("Percent" to be reported as the mass of the particles whose size is less than the designated sieve opening but greater than the next designated sieve opening):

USBS Sieve Sieve Size

<u>Number</u>	<u>(mm)</u>	<u>Percent Class</u>
4	4.76	0 - 3 Fine gravel
10	2.00	0 - 20 Very coarse sand
18	1.00	0 - 20 Coarse sand
35	0.50	60 - 80 Medium sand
60	0.25	0 - 40 Fine sand
140	0.105	0 - 4 Very fine sand
270	0.063	0 - 2 Silt & clay

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-
- .5 Sand shall have a saturated hydraulic conductivity between 100 mm. and 300 mm. per hour. Test conditions shall be for saturated sand, 15 blows compaction.
 - .6 Sand shall have:
 - Organic content < 0.5% by weight.
 - Water Soluble Salt content < 0.5mmhos/cm
 - Ph of between 5.0 and 7.0
 - .7 Available copper, zinc and manganese following acid digest test in 0.1N HC1 and shaken for ½ hour shall be less than 25 PPM when analyzed by atomic absorption spectroscopy.
 - .8 Peat moss: Is not to be used.
 - .9 Wood Residuals: Content of wood residuals such as fir or hemlock sawdust shall not cause a Carbon to Nitrogen ratio higher than 25:1. Cedar or redwood sawdust shall not be present in the growing medium mix.
 - .10 Dolomite Lime: Approved commercial brands for horticultural purposes, coarsely ground; containing not less than 20% calcium by weight.

2.4 Fertilizers

- .1 Standard commercial brands, meeting the requirements of the Canada Fertilizer Act, packed in waterproof containers, clearly marked with the name of the manufacturer, weight and analysis.
- .2 Generally Fertilizers must be those fertilizers specified in the soils analysis report/ recommendations. Contractor shall not make any substitutions without prior written approval from Owner's Representative.

2.5 Growing Medium (Type B)

- .1 Growing Medium shall be predominantly sand based and screened with additives and fertilizers as required to make it meet the following specifications:
 - .1 Substantially free from roots, sticks, building materials, wood chips, chemical pollutants and other extraneous materials.
 - .2 Population of plant pathogenic nematodes: maximum 1000 per litre for any single species.
 - .3 Maximum requirement of dolomite lime to required pH: 50kg/100M2.
 - .4 Salinity: maximum saturation extract conductivity of 3.0 mmho/cm @25 deg. C
 - .5 Fertility:
 - Total Nitrogen 0.4-0.8% by weight
 - Available Phosphorous 70-80 ppm
 - Available Potassium 150-250ppm
 - .6 Cation Exchange Capacity: 30-50 meq.
 - .7 Carbon to Nitrogen Ratio: max. 40:1
 - .8 pH:
 - Lawns 6.0 to 7.0
 - Planting Areas 5.5 to 6.0
 - .9 Boron: the concentration in the saturation extract shall not exceed 1.0 ppm
-

Vancouver Board of Parks and Recreation**China Creek North Park Upgrades****32 91 13****Growing Medium**

-
- .10 Sodium: the sodium absorption ratio (SAR) as calculated from analysis of the saturation extract shall not exceed 8.0
 - .11 Total Nitrogen shall be 0.2% to 0.6% by weight.
 - .12 Available phosphorous shall be 20-100 ppm
 - .13 Available potassium shall be 50-250 ppm.
 - .14 Tolerances: Samples of growing medium taken just before planting shall have the specified properties to within the tolerances of plus or minus 20% of the stated values, except for salinity, which shall be less than the stated limit.
 - .15 The textural properties and organic content shall be have the following composition AFTER MIXING (BY DRY WEIGHT):
- .2 For PLANTING BEDS growing medium shall consist of the following AFTER MIXING (% BY DRY WEIGHT):
 - 80- 88% round sand (>0.05mm-<2mm)
 - 3 % max silt (>0.0002mm - <0.05mm)
 - 2 % max clay (<0.002mm)
 - Total fines max 5%
 - 12-15% organic matter
 - pH 5 .0 to 6.0

Nutrient Content:

 - Nitrogen 0.2 - 0.6%
 - Phosphorus: 50 -150ppm
 - Potassium 50 - 300 ppm
 - C/N ratio max 25: 1
 - .3 For LAWN AREAS growing medium shall consist of the following AFTER MIXING (% BY DRY WEIGHT):
 - 85- 92% round sand (>0.05mm-<2mm)
 - 3 % max silt (>0.0002mm - <0.05mm)
 - 2 % max clay (<0.002mm)
 - Total fines max 5%
 - 8- 10% organic matter
 - pH 6 .0 to 6.5

Nutrient Content:

 - Nitrogen 0.2 - 0.6%
 - Phosphorus: 50 -150ppm
 - Potassium 50 - 300 ppm
 - C/N ratio max 25: 1

2.6 Organic Material

- .1 Organic Material (non-urban agriculture):
 - .1 Shall be, fully composted material that does not contain cedar or redwood bark or wood, black/brown in colour.

Vancouver Board of Parks and Recreation**China Creek North Park Upgrades****32 91 13****Growing Medium**

-
- .2 Organic component shall not contain mushroom manure compost or mushroom starter.
 - .3 Acceptable suppliers include
 - Veratec Group, Chilliwack, BC (Formerly Yardworks)
 - Harvest Power Canada Ltd., Richmond, BC (Soil Amender), (Formerly Fraser Richmond Soil and Fibre Ltd.)
 - Eco-Soil Recycling, Surrey, BC
- .2 Organic Material (urban agriculture):
- .1 Shall be derived from an organic source free of sewage biowaste, heavy metals, contaminants, animal or plant chemical additives or supplements.
 - .2 The material shall be fully composted material that does not contain cedar or redwood bark or wood, black/brown in colour.
 - .3 Organic component shall not contain mushroom manure compost or mushroom starter.
 - .4 Acceptable suppliers include
 - Veratec Group, Chilliwack, BC (Formerly Yardworks)
 - Harvest Power Canada Ltd., Richmond, BC (Soil Amender), (Formerly Fraser Richmond Soil and Fibre Ltd.)
 - Eco-Soil Recycling, Surrey, BC
- .3 Organic Material (biosolids):
- .1 Landscaping soils containing biosolids shall meet the BC Organic Matter Recycling Regulation's (OMRR) "Biosolids Growing Medium" standards; and, be supported by a documented review by a Qualified Professional as defined by OMRR
 - .2 Acceptable suppliers include Veratec, Chilliwack, BC (Formerly Yardworks Supply, Ltd), Harvest Power Canada Ltd. – British Columbia (Formerly Fraser Richmond Soil and Fibre Ltd.) (Soil Amender), Richmond, B.C., Eco-Soil, Langley BC, or pre- approved equal.

2.7 Construction Adhesive

- .1 PL 200 Construction Adhesive by OSI Sealants Inc. or approved equal.

2.8 Drainage Medium

- .1 Drain Rock or Torpedo Gravel: Shall consist of clean round stone or crushed rock. Acceptable material includes 19 mm (3/4") drain rock or torpedo gravel conforming to the following gradations.

SIEVE SIZE	PERCENT PASSING (19MM)	PERCENT PASSING (TORPEDO)
25mm	100	

Vancouver Board of Parks and Recreation**China Creek North Park Upgrades****32 91 13****Growing Medium**

19mm	0-100	
9.5mm	0-5	100
4.75mm	0	50-100
2.36mm		10-35
1.18mm		5-15
0.60mm		0-8
0.30mm		0-5
0.15mm		0-2

- .2 Drain Mat: Light duty, UV stable, impermeable cusped core bonded to a layer of non-woven filter fabric with the following minimum properties

- .1 Compressive Strength -718 kN/m² as per ASTM D-1621
- .2 Flow Rate – 188 l/min/Metre as per ASTM D-4716
- .3 Approximate profile thickness of 10mm (3/8").
Acceptable products include J-DRain 200 manufactured by JDR Enterprises (1.800.843.7569), Nudrain WD/15 manufactured by Nilex Geotechnical Products Inc., Burnaby B.C., or approved equal.

2.9 Filter Fabric

- .1 Needled, non-woven polypropylene mat. Nilex 4545 by Nilex Geotechnical Projects, Burnaby, B.C.

PART 3: EXECUTION**3.1 Subgrade Preparation**

- .1 All excavation shall be undertaken in accordance with the City of Vancouver's Policy and Standard Operating Procedure- Soil and Excavation Water Contamination Management.
- .2 Request a review of the subgrade conditions and obtain approval of the Owner's Representative to placing any growing medium.
- .3 On Grade Planting Area:
 - .1 Scarify compacted subgrade to a minimum depth of 200mm (8") immediately before placing growing medium.
 - .2 Verify that subgrades are at the proper elevations before placing growing medium.
 - .4 Placement of growing medium implies acceptance of subgrade conditions.
 - .5 Remove debris, roots, branches stones in excess of 50mm dia. and other deleterious materials as directed by Owner's Representative.
 - .6 Remove any soil contaminated with calcium chloride, toxic materials or petroleum products.
 - .7 Remove any materials that protrude 25mm above the surface.
 - .8 Dispose of removed material off site.
 - .9 Review sub grade conditions to ensure that there is proper drainage in all planting areas and tree pits. Perform a percolation test as needed to confirm proper drainage.

Vancouver Board of Parks and Recreation**China Creek North Park Upgrades****32 91 13****Growing Medium****.4 Structural Slab Planting Area:**

- .1 Verify planter drains and or slab drains have been installed.

3.2 Placement of Drainage Medium – Drain Rock

- .1 Verify that architectural slab membrane, protection board, insulation, etc. has been approved by the Owner's Representative prior to the placement of drainage medium.
- .2 Place drainage medium over entire planter bottom ensuring consistent depth as per construction details.
- .3 Place filter fabric over the entire finished surface of drainage medium. Ensure seams are overlapped as per manufacturer's recommendations.
- .4 Ensure filter fabric fits tight to face of planter wall. Take care during loading of growing medium to ensure filter fabric is not dislodged.

3.3 Placement of Drainage Medium – Drain Mat

- .1 Verify that architectural slab membrane, protection board, insulation, etc. has been approved by the Owner's Representative prior to the placement of drainage medium.
- .2 Place drainage medium – drain mat over entire planter bottom cut outs for slab drains. Ensure that overlap of filter cloth portion of drain mat is provided as per manufacturer's recommendations. Ensure there are no gaps between drainage medium panels.

3.4 Importing Procedures for Prepared Growing Medium

- .1 **Imported Growing Medium:** Growing medium shall be imported and stockpiled on site in a location approved by the Owner's Representative.
 - .1 Carry out stock piling operation such that the growing medium structure is not compromised through compaction, vibration or other actions.
 - .2 Stock piled growing medium shall be protected from rain, drying and contaminants.
 - .3 Growing medium shall be free of subsoil, pests, roots, wood, construction debris, undesirable grasses including crabgrass or couch grass, noxious or weeds and weed seeds or parts thereof foreign objects and toxic materials. Presence of these contaminants shall be grounds for rejection of growing medium and replacement at no cost to the Owner.

3.5 Preparation for Placement of Growing Medium On Slab

- .1 Ensure protection board is in place and verify that previous work (waterproofing, etc.) is approved prior to starting work of this Section.
- .2 Place slab drainage layer and filter fabric separator as detailed to depths shown on drawings. Lap filter fabric 150mm (6") at all seams/joints. Ensure fabric extends 150mm (6") upward inside all planter sidewalls. Ensure that filter fabric, slab drainage protection board, etc. are not damaged or displaced during installation of growing medium.

3.6 Preparation of Growing Medium

- .1 Mixing/screening of growing medium on site is not allowed. All growing medium is to arrive pre-mixed with the exception of addition of the following components that are to be applied at rates indicated in the growing medium analysis recommendations:
- .2 Thoroughly mix using mechanical mixing/screening equipment the constituent growing medium components and recommended additives. Resulting mixture will have a particle size class and properties that match the requirements of this specification.
- .3 No hand mixing will be accepted unless specifically approved by the Owner's Representative.

3.7 Placing Growing Medium

- .1 Do not place growing medium until Owner's Representative has reviewed drainage medium installation.
- .2 Ensure that irrigation lines to be installed have been reviewed by the Owner's Representative prior to the placing of growing medium.
- .3 Growing medium shall be moist but not wet when placed (25% of field capacity). It shall not be handled in anyway if it is wet or frozen.
- .4 Place all growing medium to the required finished grades with adequate moisture in uniform lifts of 100mm to 150mm compacted to 80MPD during dry weather, over drainage medium where planting is indicated.
- .5 Except where drawings or details show otherwise, place to the following minimum and/or maximum depths and levels (measured after initial settling of growing medium):
 - .1 Tree Planting Areas on grade maximum 900mm (36") and shall conform to the following additional parameters:
 - .1 Planting hole shall be minimum 300mm (12") wider than rootball on all sides.
 - .2 Planting hole shall be minimum depth of root ball. Undisturbed soil below rootball to be compacted to 100MPD.
 - .3 Each tree shall have access to minimum 30m³ growing medium volume and minimum 15m³ growing medium volume per tree within connected volumes.
 - .4 The required growing medium volume may be accommodated with varying soil depths between 900mm (36") and 250mm (10") outside the area defined by the planting hole. The growing medium volume must have a direct relationship to the mature drip line with outward adjustment for columnar species.
 - .2 Shrub and Groundcover Areas on grade 450mm (18") minimum depth.
 - .3 Low or High Traffic Lawn Areas on grade 250mm (10") minimum depth.
 - .4 Urban Agriculture 450mm (18") or to within 25mm or 1" of the top of the planter.
- .6 If subgrade/subsoil drains rapidly increase soil depths as directed by Owner's Representative to ensure adequate moisture retention.
- .7 On slab depth of growing medium to achieve finished grades in all cases. Growing

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medium depths are not to exceed maximum allowed for by the structural engineer.

Voiding, sand fill or additional growing medium may be used where required build-up over the drainage layer exceeds the required minimum depths stated above.

- .1 For Lawn Areas Flush with adjacent surfaces after initial settlement.
- .2 For Planting Areas as detailed on drawings. Crown all planting beds.
- .3 Refer to drawings for top of slab and finished elevations, as applicable.
- .5 Crown or slope for positive surface drainage as shown on the drawings.

3.8 On Site Application of Amendments

- .1 Ensure minimum 7 days separation time between the application of any lime treatment or fertilizers and plant material installation.
- .2 Addition of amendment components shall be at the rates indicated in the growing medium analysis recommendations via the following methods:
- .3 Fertilizers
 - .1 This material shall be applied with mechanical spreaders over the entire planting area
 - .2 Rake fertilizers into top 50mm minimum of the placed growing medium.
- .4 Lime
 - .1 This material shall be applied with mechanical spreaders over the entire planting area and mixed thoroughly into the top 100mm (4") of the growing medium prior to fine grading.
 - .2 Do not apply by hand.
 - .2 Ensure line does not come in contact with the nitrogen - phosphate - potash fertilizers during amending process.
- .5 Organic Matter
 - .1 Organic matter shall be top-dressed and cultivated into the top 150 -200mm (6"-8") of the growing medium prior to fine grading.

3.9 Finish Grading

- .1 Manually fine grade growing medium installation to contours and elevations shown on drawings or as directed by Owner's Representative. Tolerance for finish grading to be 5mm.
- .2 Eliminate rough spots and low areas to ensure positive drainage.
- .3 Finish Grade of growing medium shall be 25 mm (1") from finished elevation of adjacent curb or planter wall unless otherwise noted on drawings
- .4 Leave surface smooth, uniform, firm against deep foot printing, with a fine loose texture.

3.10 Weed Control

- .1 Ensure all weeds and weed roots that have germinated during the course of work of this section have been eliminated from growing medium.

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- .2 Provide the Owner's Representative with a written methodology outlining of weed removal seven (7) days prior to starting weed removal operations.

3.11 Mulching

- .1 Place mulch over all growing medium except grass areas. Moisten uniformly and spread to a consistent settled depth of 50mm in tree and shrub planting areas, 25mm in ground cover areas.

3.12 Acceptance

- .1 Owner's Representative will inspect and test growing medium and determine acceptance of material as placed, depth and finish grading prior to any planting or sodding operations commencing.
- .2 Approval of placed growing medium subject to additional soil test analysis if requested. Costs for additional testing of placed growing medium shall be at the Contractor's expense.

3.13 Cleaning

- .1 All excess materials and other debris resulting from growing medium preparation and placement operations shall be disposed of off site.
- .2 Ensure all discolouration of adjacent surfaces caused by growing medium placement have been removed. Ensure all paved areas, tops of planters, and adjacent surfaces have been thoroughly cleaned to the satisfaction of the Owner's Representative.

END OF SECTION 32 91 13

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install seeded lawn as indicated in the contract documents.
- .2 The work of this section shall include, but shall not necessarily be limited to the supply, installation and maintenance of the following:
 - .1 Fine grade growing medium
 - .2 Seeded lawn
 - .3 Maintenance of seeded areas until Final Acceptance

1.3 Related Work

- .1 Irrigation Section 32 80 00
- .2 Growing Medium Section 32 91 13

1.4 Reference Standards

- .1 BC Landscape Standard, latest edition.

1.5 Quality Assurance

- .1 Contractor to provide seed analysis that will include but is not limited to;
 - .1 Analysis of seed mixture
 - .2 Percentage of pure seed
 - .3 Year of production
 - .4 Date when tagged and location
 - .5 Percentage germination
 - .6 Name and address of distributor.

The sample accepted by the review will form the standard by which the project will be supplied.
- .2 Should the Contractor require the source of seed supply to change during the construction a written request must be provided to the Owner's Representative 48 hours in advance. The request is to be followed up by submission of proposed seed supplier and substitution seed analyses for Owner's Representatives review prior to the start of supply to the site.
- .3 All seed shall be delivered and stored in original containers in enclosed storage facility protected from the damage, weather, insects and rodents.

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32 92 19
Mechanical Seeding

1.6 Drainage Control

- .1 Provide for proper water management and drainage of site during work of this section. Water management shall include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance to ensure that storm water which may become laden with soil or growing medium is detained and cleaned prior to discharge from site.

1.7 Site Conditions

- .2 Examine site prior to the commencement of work to verify surface preparation is complete and has been accepted by the Owner's Representative.

1.8 Guarantee

- .3 The Contractor hereby guarantees that the sod will remain free of defects in accordance the General Conditions for a period of one (1) year from the date of Substantial Performance. The contractor shall make all corrections, adjustments and replacements required as a result of failure of all products in this section.
- .4 The Owner reserves the right to extend Contractor's guarantee period and responsibilities for one (1) additional year if, at end of the initial guarantee period the leaf development and growth of the seeded areas is not sufficient to ensure future survival.

PART 2: PRODUCTS

- 2.1 Grass seed:** Certified Canada No. 1 Grade to Government of Canada, Seeds Regulations and having minimum germination of 75% and minimum purity of 95%. See drawings for seed mix specification.
- 2.2 Water:** potable, free of impurities that would inhibit sod growth. Contractor to ensure adequate water is available to maintain seeded areas during germination and in a vigorously growing, healthy state until Final Acceptance of work of this section.
- 2.3 Fertilizer:** complete synthetic, slow release fertilizer. Type and application shall be as required by the growing medium analysis report.
- 2.4 Wood Posts:** 38mm (1/12") x 38mm (1/12") x 1.5m (5'-0") No. 1 Grade or better Hem/Fir, untreated wood.
- 2.5 Binder Twine:** Hemp based multiple strand string.
- 2.6 Flagging Tape:** 30mm wide (1.875"), biodegradable ribbon tape made of non-woven cellulosic material, colour; red, as distributed by Freedom Supply Company www.dag-ny.com, 1.800.263.0635 or approved equal.

PART 3: EXECUTION

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3.1 Preparation of Surfaces

- .1 Scarify existing sub grade to 100mm (4") depth over entire area to receive growing medium and seed.
- .2 Fine grade scarified sub grade. Fine grading process shall ensure area to receive growing medium and seed provides slopes (2% minimum - 33% maximum) for positive drainage, is free of humps and hollows, deleterious material, sticks and stones over 50 mm (2") in size (dimensions relates to length, width and height).
- .3 Place growing medium to a depth of 300mm (12") when compacted to 80%MPD. Compaction of growing medium to 80% MPD will not leave deep foot impressions when walked.
- .4 Fine grade growing medium to lines and levels indicated on construction documents. Ensure that all low spots, humps and irregularities are eliminated prior to review by Owner's Representative.
- .5 Prior to the broadcast of seed Owner's Representative to review fine grading of growing medium. Review includes grades, growing medium depth and condition of finished surface. Subsequent to the Owner's Representative review and at no cost to the Owner the Contractor shall re grade/ add growing medium and make adjustments as directed by Owner's Representative.

3.2 Seeding

- .1 Seeding operations shall be carried out in the following calendar seasons;
 - .1 Spring (April 1st to June 15th)
 - .2 Fall (August 15th to September 30th).
 - .3 Seeding shall not take place during periods of rain, freezing and/or abnormally hot and dry weather.
- .2 Seed Application: Seed rates as per seed manufacturer's recommendations.
 - .1 Sow seed during calm weather with wind speeds less than 8 kph (5 mph), using wheeled or hand held rotary broadcaster.
 - .2 Sow half of required amount of seed in one direction and remainder at right angles.
 - .3 Carefully incorporate seed into top of growing medium with light chain harrow or wire rakes to a minimum depth of 6mm (1/4") as seeding operation progresses or within one (1) hour after seeding
 - .4 Immediately after seed application roll seeded area with 90kg (200 lb.) water ballast type lawn or agricultural roller. If seeded area becomes wet due to rain suspend rolling operations until area has dried to the point where growing medium will not adhere to the surface of the roller.
- .3 Watering Operation: Apply water with fine spray to avoid seed wash out. Watering procedure shall ensure penetration of minimum 50mm (2") into growing medium and be at sufficient duration and intervals to keep growing medium evenly moist during germination and grow in period.
- .4 The Contractor is to carry out at no cost to the Owner, reseed operations at two (2) week

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intervals where germination has failed or wash outs have occurred.

- .5 Perimeter Protection: All seeded areas shall be surrounded by a 900 mm high barrier made up of the following components:
 - .1 Wood posts placed at 1.8Metres (6'-0") on centre.
 - .2 Wood Posts to be driven to a depth of 300mm (12").
 - .3 String two (2) strands of hemp based binder twine (or equal product) between posts. Insure one full wrap of twine around each post.
 - .4 Tie 300 mm (12") strands of 'red' flagging tape at 450 mm (18") intervals along the entire length of both strands of twine.
 - .5 Maintain perimeter protection until Final Acceptance of seeded area by Owner's Representative. Upon acceptance remove perimeter fence and dispose of off-site.
- .6 Seeded areas that have been damaged by construction operation, construction/ site personnel or construction traffic shall be replaced at no cost to the Owners. Replacement shall include removal of growing medium, regarding of sub grade, replacing growing medium and reseeding as required.

3.3 Maintenance

- .1 Maintenance of seeded areas shall begin immediately after seeding operation and shall continue until all deficiencies noted in the Substantial Performance review have been rectified to the satisfaction of the Owner's Representative and conditions for Final Acceptance been achieved. The Contractor is to notify the Owner's Representative in writing forty-eight hours (48) prior to stopping maintenance operations.
- .2 Maintenance shall follow the BC Landscape Standard, current edition, Level 2 'Groomed'. Over and above this maintenance protocol the Contractor shall monitor the application of water to the seeded areas and ensure that watering procedures are continuous.
 - .1 Apply water with fine spray to avoid seed wash out. Watering procedure shall ensure penetration of minimum 50mm (2") into growing medium and be at sufficient duration and intervals to keep growing medium evenly moist during germination and grow in period.
 - .2 Monitor watering on a regular interval to ensure that watering operations are not causing wash out of seeded area. Should wash outs occur as a result of watering or rain fall re and re wash out, reseed and continue maintenance and watering procedures.
- .3 Grass Cutting: After the 'first' cut of seeded areas grass cutting operations shall be carried out on a weekly (seven day) basis until Final Acceptance by Owner's Representative.
 - .1 First cut of seeded areas shall occur when a uniform grass height of 75mm (3") has been attained. First cut shall be to a height of 64 mm (2.5").
 - .2 Continue regular weekly cutting at a height of 50mm (2") until Final Acceptance.
 - .3 Cutting operations shall be such that each cut is at right angles to the previous cut.
 - .4 Contractor to remove grass clippings after each cut and dispose of off-site.
- .4 Fertilizer analysis shall conform to recommendations provided with growing medium

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analysis. Application of fertilizer shall follow manufacturer's recommendations noting that after October 1 lawn areas shall not be fertilized until April 15th of the following spring.

- .5 Seeded lawn areas to be kept free of invasive and/or noxious broadleaf weeds, grasses including but not limited to poa annua, disease, fungi, detrimental nematodes and detrimental insects.

3.4 Acceptance

- .1 Conditions for Final Acceptance of Seeded areas:
 - .1 Seeded areas are vigorously growing, well established with a thick, dense and healthy green appearance.
 - .2 Seeded areas are to not have any eroded or wash out areas, bare or dead spots and are free of invasive and/or noxious broadleaf weeds and grasses.
 - .3 No surface growing medium is visible when established seeded areas have been cut to height of 50mm (2")
 - .4 Seeded areas have been cut at least two (2) times a minimum of (7) days apart.
- .2 Areas seeded after September 30 will be not be reviewed for Final Acceptance until April 30th the next year.

END OF SECTION 32 92 19

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install plants by hydroseeding to all areas identified or disturbed by the work of this contract.

1.3 Related Work

- | | | |
|----|-----------------------|------------------|
| .1 | Landscape Maintenance | Section 32 01 90 |
| .2 | Irrigation | Section 32 80 00 |
| .3 | Growing Medium | Section 32 91 13 |
| .4 | Plants and Planting | Section 32 93 10 |

1.4 Reference Standards and Requirements of Regulatory Agencies

- .1 Conform to the requirements of the latest editions of the following standards and legislation:
 - .1 BCSLA/BCLNA British Columbia Landscape Standard
 - .2 British Columbia Standard for Turfgrass Sod
 - .3 British Columbia Weed Control Act
 - .4 Canada Seed and Fertilizer Act
 - .5 Canada Pest Control Products Act

1.5 Submittals

- .1 Submit dealer guarantee statements of composition of the mixture and the percentages of purity and germination of each variety of grass seed.
- .2 Submit the original seed containers which clearly identify the manufacturer's guarantee of seed analysis.
- .3 Submit completed Schedule A - Application Record to the Owner's Representative.
- .4 Provide all product data for seed, mulch, tackifier and fertilizer as required and as requested by the Owner's Representative.

Submission in writing if requested by Owner's Representative fourteen (14) days prior to commencing Work of this Section:

- .1 Size of truck slurry in litres.
- .2 Amount of material to be used per tank based on size of slurry tank.
- .3 Number of tank loads required per hectare to achieve specified slurry mixture per hectare.

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Hydraulic Seeding (Hydroseeding)

1.6 Protection

- .1 Protect all seeded areas against trespassing and from damage at all times until Acceptance. If any seeded areas are damaged, they shall be repaired as required to satisfaction of Owner's Representative.
- .2 Comply with COV pesticide/herbicide control regulations regarding application of herbicides to control noxious weeds. Ensure all manufacturer's recommendations regarding application are strictly adhered to.

1.7 Testing and Approvals

- .1 Notify Owner's Representative at least forty-eight (48) hours before installing seed for inspection of finished grades. Do not hydroseed until grades are approved by Owner's Representative.
- .2 Obtain approval in writing from the Owner's Representative for application of any chemical vegetation controls. Comply with applicable federal, provincial and municipal legislation and regulations.

1.8 Conditions for Acceptance

- .1 The conditions for acceptance of hydroseeded lawn areas and for turning over the hydroseeded areas to the Vancouver Park Board for subsequent maintenance are:
 - .1 Substantial Performance for the entire project shall have been declared.
 - .2 Hydroseeded lawn areas shall have been maintained as specified for a min. of 55 days. Hydroseeded lawn shall be mown as specified (to a height of 38mm) no more than two days before inspection for Acceptance.
 - .3 The hydroseeded lawn shall be uniformly healthy, in a vigorous growing condition, representative of a dense stand of grass, with all deficiencies corrected to the approval of the Owner's Representative. Lawn shall have no evidence of noxious weeds.
- .2 Inspection and Acceptance by the Board: Notify the Owner's Representative at least 48 hours in advance to schedule inspection of the entire landscape ready for Acceptance. Acceptance by the Board will only be given provided Maintenance as per Item 3.4 has been carried out and other Conditions of Item 1.8 have been met.

1.10 Time of Seeding

- .1 The seeding shall be done during periods which are most favourable for the establishment of a healthy stand (of grass) and at times designated by the Board in accordance with the construction schedule and activities and coordinated with the local weather conditions.
- .2 No seeding shall be done when the soil is frozen, covered by frost or when there is standing or flowing water on the site, nor if the wind speed is greater than 5 km/h.
- .1 The seeding operations shall not be completed between June 15th and September 30th unless the project area is irrigated.

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Hydraulic Seeding (Hydroseeding)

1.11 Guarantee

- .1 All workmanship and materials covered under Work of this Section shall be guaranteed for a period of ONE (1) full year from the date of Substantial Performance.

PART 2: PRODUCTS

2.1 General

.1 Product Handling

- .1 All grass seed, hydraulic mulch fertilizers and related materials shall be stored in a dry, weatherproof storage place and shall be protected from damage by heat, moisture, rodents or other causes until time of use. Care shall be taken that labels and other identification(s) are not removed or defaced in any fashion.

2.2 Fertilizer

- .1 Granular Fertilizer: Standard approved brands delivered in original containers, bearing manufacturer guaranteed analysis, dry and free-flowing, organic base, conforming to the applicable Provincial Fertilizer Laws, not less than 19% Nitrogen, 19% Phosphoric Acid and 19% Potash (19-19-19), or as otherwise required based on growing medium test results and time of application.
- .2 Slow-Release Fertilizer: Prills designed to release nutrients over a period of months. Agriform 16-7-12 plus iron or equivalent.

2.3 Grass Seed

- .1 Shall be fresh, clean, new crop certified Canada #1 or better seed, in accordance with Government of Canada "Seeds Act", with a minimum germination of 75% and a minimum purity of 97%. Supplied in standard containers with the following information provided: suppliers name and address, lot number/year of production, net weight (mass), names and percentages of individual seed species and percentage of pure seed. Composed of the following varieties in the proportions and testing the minimum percentages of purity and germination indicated:
 10% Common Kentucky Bluegrass
 25% Common Creeping Red Fescue
 25% Common Chewings Fescue
 40% Turf Type Perennial Ryegrass
 As supplied and mixed by: a recognized, pre-approved seed distributor acceptable to the Owner.
- .2 Areas into which any other varieties of seed have been introduced will not be accepted. The Owner reserves right to test seed for purity and germination rate.

2.4 Mulch

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- .1 Hydroseeding Mulch: Hydroseeding solution shall contain a mulch of dry virgin wood cellulose fibre specifically designed for hydraulic seeding, containing no growth or germination inhibiting factors, and dyed green with a water activated non-toxic dye for visual metering during application; "Ecofibre" as manufactured by Canfor or pre-approved equivalent. In addition:
 - .1 The Owner does not accept any mulches made from recycled materials such as paper, saw dust, cardboard or pulp residue.
 - .2 Mulch shall be capable of dispersing in water to form a homogeneous slurry and remaining in such a state when agitated or mixed with other specified materials. In addition, it shall be capable of forming an absorptive mat ground cover allowing water percolation into underlying growing medium.
 - .3 It shall be free of weeds and other foreign material and shall be supplied in packages bearing the manufacturer's label clearly indicating weight and product name.

2.5 Tackifier

- .1 M-Binder (Mesh Organic Soil & Mulch Binder)

2.6 Water

- .1 Clean potable water (as supplied by Municipality) free of any impurities which would inhibit germination or otherwise adversely affect growth or be harmful to the environment.

2.7 Weed Control

- .1 Manual weed control is the preferred method in COV and may be the only permitted methodology. Confirm with Owner's Representative. If chemical vegetation control is permitted, use herbicides of type and at an application rate as required to achieve the desired control. Use only standard commercial herbicide products registered for sale and use in Canada under the Pest Control Products Act. Do not use herbicides containing sodium chlorate unless specifically authorized by the Owner's Representative. Do not use herbicides containing 2, 4, 5-T in public areas or where there is a possibility of contaminating ditches draining to irrigation or potable water and only as permitted by the COV.

2.8 Approved Equals

- .1 All items as specified or pre-approved equals.

PART 3: EXECUTION**3.1 Soil Preparation**

- .1 Grades:
 - .1 Areas to be seeded shall be at grades shown at the time of seeding, free of "humps and hollows". Crown or slope for surface drainage and eliminate all low spots or

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- depressions. Ensure that growing medium is placed to required depths and tolerances as specified and detailed in the Contract Documents and spread evenly over the approved subgrade. Ensure the growing medium is firm against footprints, loose in texture and free of all stones, roots branches etc. as required under Section 02920 Growing Medium Preparation and Placement.
- .2 Restore all areas to be seeded that are misshapen or eroded to specified condition, grade, slope as directed just prior to seeding. Minor adjustment and refinement of finish grade to be made as directed by Owner's Representative.
 - .3 Obtain Owner's Representative's approval of finish grading prior to proceeding.
 - .4 Ensure smooth finish on all surfaces and finished grades as shown on the drawings and as specified herein.
- .2 Clearing: Remove all weeds, briars, debris and other refuse and deleterious materials which may be detrimental to the growth of the grass.
 - .3 Cultivation: as required to minimum depth of 100mm.
 - .4 Moisture: ensure areas to be seeded are moist to minimum depth of 150mm before seeding.

3.2 Application

- .1 Apply with equipment designed for hydraulic seeding, a uniform solution in water of:

Seed as specified 24.4kg/1000 square meters

Fertilizer	Type and Rate as required by soil testing analysis.
Fibre Mulch	250kg/1000 square meters
Tackifier	Not required on flat areas or slopes up to 25%
	6 kg/1000 sq. meters on slopes from 26%-35%.
	(increase to 8 kg/1000 sq. meters on slopes greater than 35%)
- .2 Ensure uniform distribution of the solution over the entire area, with adequate discharge pumps, hoses and gun nozzles.
- .3 Take precautions to protect planting beds, walks, roads, buildings and other site features such as signs, guardrails, fences, and utilities against spraying with the solution. Thoroughly clean any surface which is sprayed with the solution where not intended to the satisfaction of the Owner's Representative.
- .4 Do not perform work under adverse field conditions such as wind speeds over 5 km/h, frozen ground or ground covered with snow, ice or standing water
- .5 Apply seed in a uniform workmanlike and continuous fashion until completed. Seed which has been in the hydraulic seeder more than 2 hours shall be considered dead and must be replaced.
- .6 Submit completed Schedule A - Application Record to the Owner's Representative on a daily basis.
- .7 No vehicular traffic will be permitted on areas to be seeded. All unreachable work or work

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- .8 under difficult control conditions shall be completed with use of hoses.
- .9 Ensure a minimum overlap of 450mm between applications to form uniform surfaces.

3.3 Supplementary Fertilizer Application

- .1 Prior to Acceptance, at a time approved by the Owner's Representative, apply fertilizer formulation as recommended for the season at manufacturer's recommended rates evenly to all sodded areas. Water thoroughly.

3.4 Maintenance

- .1 Perform maintenance of the hydroseeded areas from time of seeding (date of installation) to date of Acceptance by the Board. Work to include: watering, cultivation, fertilizing, cutting, weeding, and all other measures necessary to ensure germination and development of a uniform, dense, healthy stand of grass.
- .2 Begin maintenance immediately after installation and continue until Acceptance by the Board of all hydroseeded lawn areas. Maintenance shall consist of all measures necessary to keep lawn healthy, in a vigorous growing condition and all other measures necessary to ensure germination and development of a uniform, dense, healthy stand of grass. Maintenance shall include, but shall not be limited to the following:
 - .1 Mowing shall be carried out at regular intervals as required to maintain grass at a maximum height of 60mm. (2-1/2"). Not more than 1/3 of the blade shall be cut at any one mowing. Edges of lawn areas shall be neatly trimmed. Heavy clippings shall be removed immediately after mowing and trimming.
 - .2 Watering shall be carried out when required and with sufficient quantities to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.
 - .3 Rolling shall be carried out when required to remove any minor depressions or irregularities.
 - .4 Weed control shall be carried out when the density of weeds reaches 10 broadleaf weeds or 50 annual weedy grasses per 37 sq. M. (400 square feet).
 - .5 Weed control, whether manual or chemical, shall reduce the density of weeds to zero. If chemical, apply in strict accordance with the manufacturer's recommendations and to the standards specified herein.
 - .6 Any seeded areas showing deterioration or bare spots shall be repaired immediately. All areas shall be top dressed and over seeded with a seed mix matching the original seed mix.
 - .7 All seeded areas shall be adequately protected with warning signs, temporary wire, twine or mesh fences as dictated by Owner's Representative. Fencing shall be maintained in good condition to provide a continuous barrier until Acceptance. Except as otherwise required by the work of this Contract, the fencing shall be removed from the site upon Acceptance/Assumption by the Owner.

3.5 Cleaning

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- .1 Remove from the site all surplus materials and other debris resulting from seeding operations.
- .2 Flush all walks, pavement and any area surface sprayed with solution clean to the satisfaction of the Owner's Representative

SCHEDULE A - HYDROSEED APPLICATION RECORD (SAMPLE)

Project Name/Owner's
Contract No.:

Owner's Representative _____

Weather
Conditions _____

Date: _____

Contractor Foreman: _____

Size of Crew: _____

Month: _____

<i>Time</i>	<i>Load No.</i>	<i>Seed Mix/ Flower Mix</i>	<i>Fertilizer</i>	<i>Mulch</i>	<i>Tackifier</i>

END OF SECTION 32 92 21

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install plant material as indicated in the contract documents.

1.3 Related Work

- | | | |
|----|-----------------------|------------------|
| .1 | Landscape Maintenance | Section 32 01 90 |
| .2 | Irrigation | Section 32 80 00 |
| .3 | Growing Medium | Section 32 91 13 |
| .4 | Sod Lawn | Section 32 92 23 |

1.4 Quality Assurance

- .1 All materials and work shall conform to the latest edition of the following standards or as otherwise specified:
 - .1 CNTA (Landscape Canada) Canadian Standards for Nursery Stock – Current Edition
 - .2 BCLNA Standard for Container Grown plants – Current Edition
 - .3 BCSLA/BCLNA British Columbia Landscape Standard – Current Edition
 - .4 Perennial Plant Association Standards for herbaceous perennial plants
 - .5 ANSI A-300 Tree Pruning Guidelines
 - .6 Urban Tree Foundation/ISA Guideline Specifications For Nursery Tree Quality, current version

1.5 Source Quality Control

- .1 Seven (7) days prior to the Owner's Representative review of plant material at source the Contractor shall confirm in writing availability of plant material noted on Plant List.
- .2 Plant material will be supplied from nurseries who are certified by the Clean Plants program, Canadian Nursery Certification Institute (CNCI), current certification standard <http://cleanplants.ca/>. The certification shall include but is not limited to the requirements of the current active module(s), e.g. P. Ramorum module. The certification must extend to all fields and allied nursery operations where plant material is sourced. Only nurseries, fields and allied nursery operations that are certified will be permitted to supply plant material for this project.
- .3 Plant Material Review at the source nursery

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- .1 Contractor request for review of the plant material at source nursery to be a minimum of seven (7) days prior to scheduled review.
 - .2 Owner's Representative shall make one (1) visit to source nursery for review of plant material for entire project.
 - .3 If review in more than one location becomes necessary, the Contractor shall reimburse the Owner's Representative for the additional time required at the current hourly rates of the Staff personnel.
 - .4 Shipping of plant material to project site shall not proceed until Owner's Representative has reviewed the plant material at the source nursery.
 - .5 All plants are subject to review and may be rejected for failure to comply with this specification at any time until Acceptance. Immediately replace rejected material and remove from the site at no cost to the Owner.
 - .6 Trees required for the work **must be reviewed and tagged by the Owner's Representative at (the place of growth) before being dug.** Inspection and tagging at the place of growth shall not affect the right to reject such trees on or after delivery thereof to the site.
 - .7 Plants required for the work **must be reviewed by the Contractor before being prepared for delivery.** Inspection shall not affect the right to reject such plants on or after delivery thereof to the site.
 - .8 **Plants arriving on site must be reviewed by the Owner's Representative prior to off-loading.** Provide minimum 48 hours notice to schedule review.
 - .9 The Contractor or his authorized representatives shall be present during all required reviews as specified or as may be required.
 - .4 Plant Material Review at Project Site
 - .1 All plant material shall be reviewed at the project site by the Owner's Representative prior to planting.
 - .2 Plant material that is rejected by the Owner's Representative shall be immediately removed from the site and replaced at the Contractors expense.
 - .5 Imported Plant Material
 - .1 Plant material imported from out of province and out of country shall be accompanied with necessary federal and provincial permits and import licenses.
 - .2 The Contractor shall conform to all federal and provincial laws and regulations with regard to horticultural inspection of domestic and imported plant material.
 - .6 Condition of Plant Material
 - .1 Plant rootballs and containers shall be completely free of noxious weeds and volunteer plants including, but not limited to, Horsetail and Morning Glory.
 - .7 Plant material grown or supplied in Fabric Containers are not acceptable.

1.6 Submittals

- .1 Confirmation Plant List
 - .1 Contractor shall provide in writing to the Owner's Representative a minimum of seven (7) days prior to review of plant material at the source nursery a plant list
-

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- confirming the quantity, botanical name, common name and size of plants specified.
- .2 Prior to the review of plant material by the Owner's Representative the Contractor shall submit written documentation with CNCI certification stamp stating that the nursery has undergone all components of a certification program and has been audited to verify that all components are properly implemented. The documentation submitted shall include but is not limited to the nurseries CNCI Clean Plants certification number.
 - .3 Substitutions
 - .1 Contractor shall provide in writing to the Owner's Representative a minimum of seven (7) days prior to review of plant material at the source nursery a list of proposed substitutions for review.
 - .1 Substitutions in plant material will not be considered unless written proof is submitted thirty (30) days prior to scheduled installation stating a specified plant cannot be obtained within the specified area of search.
 - .2 Plant substitutions shall be of similar genus and species and of equal or greater size as those originally specified. The list shall contain the following information:
 - .1 Botanical name, common name of the specified plant
 - .2 Botanical name, common name of the proposed substitute plant
 - .3 Pot size, plant size and calliper of trees to be substituted
 - .3 Upon submission of such proof, a proposal will be considered for using the nearest equivalent size or variety with an equitable adjustment of the Contract price.
 - .4 Planting Schedule
 - .1 Contractor shall provide in writing to the Owner's Representative upon award of the Contract a detailed planting schedule outlining dates and duration of planting operations.
 - .2 Revisions to the Planting Schedule as a result of delays of any kind shall be submitted to the Owner's Representative in a timely manner prior to the start of planting operations.
 - .5 Composted Mulch: Contractor to submit a one (1) litre sample of Composted Mulch to the Owner's Representative for review prior to shipment to the site.
 - .6 Prepared Growing Medium: Contractor to submit a one (1) litre sample of the Prepared Growing Medium to the Owner's Representative for review prior to shipment to the site.
 - .7 Antidesicant: Contractor to submit three (3) copies of manufacturer product data and specification for Owner's Representative review.

1.7 Acceptance

- .1 The conditions for Acceptance of landscape areas and for turning over the landscape areas to the Owner for subsequent maintenance are:
 - .1 Growing medium quality, fertility levels, depths and surface grading have been completed to the requirements of Section 32.91.13.
 - .2 Plant quantities, sizes, quality and locations are as shown in the Contract Documents or as otherwise approved by the Owner's Representative.

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- .3 Substantial Performance for the complete project shall have been declared.
 - .4 All plants shall be installed at the correct elevation relative to finished grade, healthy, in a vigorous growing condition and established to the satisfaction of the Owner's Representative.
 - .5 Trees will be assessed for acceptance only when in leaf, and not when in a dormant state.
 - .6 All deficiencies with regard to landscape work shall have been rectified.
 - .7 All trees are staked where required.
 - .8 **Landscape areas shall have been maintained for at least 55 days.** All planted areas are free of all visible weeds and substantially free from underground weed seeds or parts thereof, to the requirements of Section 32 01 90 Landscape Maintenance (as Applicable).
 - .9 Mulch has been placed as required. All areas not to receive mulch are in a cultivated, loose, friable condition where water can freely permeate the surface.
 - .2 The date of Acceptance shall be as determined by the Owner's Representative base upon the Inspection for Acceptance. Contractor shall request inspection for Acceptance, giving at least 48 hours notice.

1.8 Warranty

- .1 Replace for a period of one (1) year after Substantial Performance of the project, all unsatisfactory plant material **and continue to replace such plant material until the replacement is acceptable to the OWNER'S REPRESENTATIVE**, at no cost to the Owner. This warranty will apply to all plant material, whether supplied by Contractor or Owner.
- .2 This guarantee is based on adequate maintenance by the Owner after Acceptance. The Contractor will not be responsible for plant loss due to extreme climatic conditions such as abnormal freezing temperatures or hail which occur after Acceptance. The Contractor shall be responsible for plant loss due to inadequate acclimatization of plants for their planted location.
- .3 Adequacy of acclimatization and existence of extreme climatic conditions shall be as determined by an **independent Owner's Representative** on the basis of plant variety, location, recorded temperatures for the locale, time of planting and other factors pertinent to the situation.

1.9 Plant Material Replacements

- .1 The Contractor shall remove from the site and immediately replace any plant material that has been determined by the Owner's Representative to have died or failed to grow in a satisfactory manner during the warranty or maintenance period.
 - .2 The Contractor shall extend the warranty on this replacement plant material for one (1) year from the date of replanting.
 - .3 The Contractor shall continue such replacement and warranty of plant material until the Owner's Representative has determined that the 'Conditions for Final Acceptance' have
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been met.

1.10 Permits

- .1 Obtain and pay for all permits required for the work, including such permits as may be required for planting and related work on municipal property (e.g. street trees).

PART 2: PRODUCTS**2.1 General**

- .1 Area of Search: Area of search for specified plant material shall include the Lower Mainland of British Columbia, Vancouver Island, Washington and Oregon States, except as noted on the plant list.
- .2 Provenance: All plant material used on this project shall be hardy in this climate. Plant types have been selected with this as a criterion. This Contractor shall guarantee that plant material supplied has equal provenance, i.e.: it is developed from cuttings or seeds collected in an area of similar climatic characteristics. Submit proof of equal provenance to Owner's Representative upon request.
- .3 Plants or seeds purchased for Park Board projects are to be free of neonicotinoid ("neonics") or other nicotinic Acetylcholine receptor agonists. Pesticides covered by this specification include but are not limited to clothianidin, dinotefuran, flupyradifurone, imidacloprid, thiamethoxam, sulfoxaflor, thiacloprid, and acetamiprid."

2.2 Plant Material

- .1 Plant material shall be of the sizes and quantities as shown in plant lists on Landscape Drawings and shall be nursery grown unless specifically described as "collected". **All "non-specimen" plantings specified in the Plant List(s) are specified according to the Canadian Nursery Trades Association Canadian Standards for Nursery Stock and the BCLNA Standard for Container Grown Plants.**
- .2 In particular, plant material shall conform to the following CNTA Standards:
 - .1 "Nursery stock shall be true to name, type and form and representative of their species or variety. In addition, they shall be of the size and grade and quality stated".
 - .2 "Quality shall be normal for the species when grown under proper cultural conditions viable, substantially free from pests and disease, and undamaged".
 - .3 "Roots shall not be subject to long exposure to drying winds, sun or frost, between digging and delivery".
 - .4 Root balls and soil in containers shall be free from pernicious perennial weeds."
 - .5 Roots shall be transplanted or root pruned at least once within the year prior to planting.
 - .6 Take precautions during digging, handling and shipping of plant material to avoid injury to plants and root systems.
 - .7 Plants for use when symmetry is required shall be matched as nearly as possible.
 - .8 Plants shall not be pruned prior to delivery.

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- .9 All plants shall be measured when the branches are in the normal position. Measurements shall be as set out in the BCLNA Standard for Container Grown Plants. Caliper of trees shall be measured 12 inches above the ground.
 - .10 Trees shall have straight trunks with a single leader intact. There shall be no abrasion of the bark and no fresh cuts of limbs over 1-1/4" that have not completely calloused over.
 - .11 Where trees are to be in a formal arrangement or occur in consecutive order, they shall be carefully measured as to height and spread and tagged with a number before delivery to the site. These trees shall be correspondingly identified on plan to assure symmetry and expeditious handling.
 - .12 Plants larger in size than specified in the itemized plant list may be used if approved; but the use of larger plants shall not increase the Contract price. If the use of larger plants is approved, the ball of earth or spread of roots shall be increased in proportion to the size of the plant.
 - .13 The size specified is the size of plant required at the time of delivery to the construction site. Sizes shown are minimum sizes.
 - .3 Container dimensions shall be as defined in the B.C. Landscape Standard 1997 Edition.

2.3 Tree Ties

- .1 Flat woven polypropylene material. 20 mm (3/4") wide, 544 Kg. (1200lb), break strength. Arbor Tie by Deep Root, or approved equal. Submit sample for approval to protect bark or other types approved by the Owner. Generally, they shall be of a material that will not damage the bark. Tree tie material shall be at least 25mm (1") in width and shall remain pliable in all weather conditions. They shall permit a reasonable degree of movement by the tree under normal loading conditions/forces such as wind without detrimental effects. Rubber tree buckles, or galvanized wire with rubber hose will not be accepted.

2.4 Burlap

- .1 Shall be untreated, free from toxic contaminants and of sufficient strength to hold the rootball in a compact, stable mass that does not move relative to the main stem(s) of the tree or shrub.

2.5 Wire Baskets

- .1 Non-galvanized metal basket designed and manufactured for the purpose of tree moving. Basket shall be shaped to ensure that the root ball will allow a stable planting condition in accordance with standards noted.

2.6 Water

- .1 Potable and free of minerals that are detrimental to plant growth.

2.7 Composted Mulch

- .1 9mm (3/8") Composted Mulch, black/brown in colour with no cedar or redwood bark or
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wood material manufactured by Yard Works, Richmond, BC, Eco-Soil, Langley BC Fraser
Richmond Bio-Cycle, Richmond, B.C. or pre-approved equal.

2.8 Anti-desiccant

- .1 Wax-like emulsion that will provide a transpiration reducing film over the plant surface. Moisturin by GSI Horticultural, Bend, Oregon, (541) 383-0222 or approved equal.

2.9 Tree Trunk Protection

- .1 Extrusion mold process, polyethylene with UV protectors: "Arborgard" manufactured by DeepRoot products Canada, Inc., Vancouver, B.C., or pre-approved equal.

2.10 Tree Guy Anchors/ Tree Guy System

- .1 Direct burial or screw type disc guy anchor and guy system. The Arrow Anchor by Tree-Guy/ Tree Guy System, Santa Anna, California (800) 624-1116, or approved equal.

2.10 Stakes and Stake Fasteners

- .1 **Fir, standard or better, 75mm x 75mm x 3000mm long.** Stake fasteners shall be hot dipped galvanized or stainless steel.

2.11 Flagging Tape

- .1 30mm (13/16") wide 'Red' PVC flagging tape by Identi-Tape, Boulder, CO or approved

PART 3: EXECUTION**3.1 Planting Season**

- .1 Plant only during the season or seasons that are normal for such work, as determined by weather conditions and as approved by the Owner's Representative. Plants planted before or after any stipulated dates will be rejected. **Tree planting is not permitted between June 30th and September 30th regardless of irrigation. Shrub, ground cover planting or sodded or seeded lawn installation between June 15th and September 30th is not accepted unless the project area is irrigated.**
- .2 Do not plant during freezing, abnormally hot, dry or wet weather or when damaging climatic conditions can be anticipated.
- .3 The Contractor will be responsible for death or deterioration of plants caused by exposure to damaging climatic conditions, planting under conditions itemized above or inadequate acclimatization of plant material.

3.2 Planting Schedule

- .1 All planting operations shall be done in a timely manner in accordance to the 'Planting Schedule'.

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- .2 'Planting Schedule' shall be updated as required by the Contractor to coincide with status of site and coordination with other trades. Provide the Owner's Representative with up dates to the schedule as required throughout the planting process.

3.3 Delivery

- .1 Dig and handle all plant material in a manner suitable for each species to prevent injury to or removal of fibrous roots. All plant material delivered with broken or loose root balls or containers will be rejected by the Owner's Representative and replaced by the Landscape Contractor at no additional cost to the Owner.
- .2 Take precautions to avoid burning of plants by sun or wind during handling and transporting.
- .3 Keep root balls and container soil moist prior to delivery by covering with bark mulch, wet straw or soil and water as required to ensure moist root balls.
- .4 Coordinate the delivery of plant materials with work of other trades and other site activities.
- .5 Off load the plant materials at the site as designated by the Owner's Representative.
- .6 All plant material shall be acclimatized to the final location before delivery and planting. The Contractor will be held responsible for plant losses caused by inadequate acclimatization.

3.4 Plant Layout

- .1 Locate plants according to the Planting Plan for approval of plant location and orientation. Notify the Owner's Representative, giving 48 hours notice, when plant layout will be ready for review. At this time the Owner's Representative may make adjustments in plant locations and orientation prior to planting.
- .2 Stake location of all major trees for approval to positioning. Notify the Owner's Representative at least 48 hours before planting of major trees. **The Owner's Representative must be present** during planting of major trees to ensure proper orientation and location.
- .3 Anti-desiccant shall be applied only as directed by the Owner's Representative. Application of anti-desiccant shall be in accordance with manufacturer's instructions.
- .4 Coordinate planting operations with other trades and project schedule.

3.5 Excavation

- .1 Existing Utilities; The Contractor is responsible for confirming the location and extent of existing utilities prior to the start of all planting operations. All attempts should be made to ensure that utility services are maintained to all on and off site parties throughout the entire planting operation.
 - .2 For all trees, excavate tree pits with vertical sides, depth to be of sufficient size to contain root ball, min 600mm x 10m² surface area of growing medium or as detailed, directed by Owner's Representative.
 - .3 Scarify the sides of tree pits.
 - .4 **Test all tree pits for poor drainage as directed by Owner's Representative.** Fill each tree pit with a minimum of 20 litres (5 gallon) of water. Water should freely drain through
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subsoil within ten (10) minutes. If poor drainage or percolation is encountered report this condition immediately to the Owner's Representative for acceptable remedial measures. Measures such as auguring holes through the impervious layers and backfilling with approved clean rounded drain rock or sand, raising the planting grade, or adding dedicated drain lines connected to the subsurface drainage system will be considered.

- .1 Notify Owner's Representative if tree pits in any soil condition do not drain freely or if tree pit fills with ground water.
- .2 There shall be no standing water in the bottom of tree pit at time of planting.
- .5 Protect bottom of tree pit(s) against freezing.
- .6 Ensure tree pits and plant beds are kept well drained and free of contaminants and construction debris.
- .7 Excavate hole in growing medium sufficient to receive root ball. Excavation of the subgrade below the root balls of trees shall be only as necessary to permit the bottom of the root ball to sit on undisturbed material or compacted fill such that the top of the root ball remains at the proper finished grade. Disturbed subgrade or fill below the root ball shall be compacted to prevent settlement of the tree after planting. Remove excess material from the site.
- .8 Remove excavated subsoil material from site, or use on site in an approved manner. Obtain prior approval from Owner's Representative.

3.6 Planting Procedure

- .1 Planting operations shall be carried out under conditions that are conducive to healthy, vigorous growth of plant material.
- .2 Planting operations shall not be carried out when the growing medium is frozen, mixed with ice and/or snow, saturated or compacted to levels that exceed this specification.
- .3 Plant material shall be planted vertical, straight and plumb at locations staked in field and or noted on landscape plans.
- .4 Ensure orientation of plant material will give best appearance in relation to views from adjacent buildings, roads, walks or use areas.
- .2 Install all plants at height grown in Nursery. Allow for settling of the growing medium after planting. The grade that the plant was grown in the nursery shall be used as the indicator for proper growing medium and plant elevation relationship. Top of root ball elevation shall match the elevation of adjacent growing medium elevation.
- .3 Plants shall be set plumb in the planting beds or in the center of the pits, except where the plant's character requires variation. Obtain approval from Owner's Representative.
- .4 Backfill around root ball with prepared growing medium, tamping and watering to ensure firm support for the plant and eliminating all air pockets around the root ball. Ensure water penetration into the root balls during planting procedures.
- .5 Remove all string, rope, burlap and other restricting elements out to the perimeter of the root ball. Cut all wire basket handles flush with the top ring or fold back down into the planting hole. Do not remove wire baskets. Ensure no wires from the basket protrude into the top 100mm of the growing medium.

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- .7 Ensure a 150mm (6") deep saucer around all trees for the full width of the planting pit.

3.7 Fertilizer Application

- .1 Place fertilizer as per recommendations of soil analysis and to requirements of Section 32 91 13.

3.8 Tree Stabilization

- .1 Stake and Tie trees immediately after planting if specified and only as directed by the Owner's Representative. Trees damaged as a result of delayed staking shall be replaced.
- .2 Trees shall stand plumb on completion of this operation.
- .3 Stakes and ties shall be installed such that injury to bark will not occur.
- .4 Ensure guy pins and stakes are placed out beyond the root ball. Trees that have had root balls penetrated by guy pins and stakes will be rejected.
- .5 Tie one (1) to two (2) flagging tape flags to all guy wires at a height that is clearly visible.

3.9 Tree Trunk Protection

- .1 Trees in lawn areas shall have trunk protection.
- .2 Place tree trunk protection around base of tree trunk as per manufacturer instructions.
- .3 Trees 100mm (4") caliper or less shall have one protector. Do not interlock ends of tree protector.
- .4 Trees greater than 100 mm (4") caliper shall have a minimum of two interlocked protectors. Do not interlock outside ends.

3.10 Tree Rings

- .1 Trees in lawn areas shall have 750mm (30") tree rings cut around the base of each tree. The tree rings shall be true circles centered on the trunk of the tree.
- .2 Have sod removed and area mulched as per specifications.
- .3 Trees in seeded areas shall have 750mm (30") tree rings cut around the base of each tree once seeded areas have been accepted by the Owner's Representative. The tree rings shall:
- .1 Be true circles centered on the trunk of the tree.
- .2 Have grass removed and area mulched as per specifications.

3.11 Pruning

- .1 Prune trees and shrubs after planting operation only as directed by Owner's Representative.
- .2 Prune only as directed by Owner's Representative.
- .3 Tree pruning is to be performed in accordance with the best practices published on the International Society of Arboriculture's (ISA) website (www.treesaregood.org).

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- .4 Branch removal should be limited to necessary clearance pruning for public and electrical safety and the removal of dead, diseased, and/or defective wood to improve tree health and/or structure.
 - .5 Street trees are to be pruned and maintained in accordance with Illuminating Engineering Society of North America (IES) standards for Roadway Lighting.
 - .6 Each shrub planted shall be pruned to preserve the natural character of the plant and in a manner appropriate to its particular requirements in the landscape design.
 - .7 All soft wood sucker growth and all broken or badly bruised branches shall be removed with a clean cut.
 - .8 All pruning shall be done with proper, sharp pruning tools. All pruning cuts to be made protecting the branch collar.
 - .9 All pruning cuts shall be made with pruning saws or hook and blade pruning tools designed and manufactured for pruning operations. Anvil-type pruning tools shall not be used in any pruning operations.
 - .10 Do not damage the branch collar.
 - .11 Do not damage the leader or lead branches. Plants which have had the main leader or lead branches damaged or removed will be rejected and replaced by the Contractor at no cost to the Owner.
 - .12 Do not remove minor twig branches along the main structural branches.

3.12 Applying Mulch

- .1 Prior to the application of composted mulch;
 - .1 Reset all plants that have settled so that relationship of nursery grade of root ball to finish grade of growing medium is as per specification
 - .2 Manually remove all weeds and weed roots from root balls and adjacent growing medium.
 - .3 Remove all deleterious material and debris from planting areas.
 - .4 All fine grading is complete, the growing medium is loose and friable
 - .5 The Owner's Representative has reviewed of all planting areas.
- .2 Spread composted mulch to minimum depth of 50 mm (2").
 - .1 Ensure finish composted mulch layer is a minimum of 12mm (1/2") below adjacent hard landscape surfaces and edges.
 - .2 Ensure mulch is kept 125 mm (5") away from tree trunks and 75 mm (3") away from stems of shrubs.

3.13 Maintenance

- .1 Begin maintenance at time of planting and continue for a minimum of fifty-five (55) days or until Acceptance whichever is greater, at which time the Owner will take over maintenance.
- .2 If for any reason the Contractor elects, on his own without the written consent of

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the Owner's Representative to suspend maintenance operations he is to provide the Owner's Representative written notice of such action. Any damages or requirement for the replacement of plant material that as a result of the suspension of maintenance operations shall be the borne by the Contractor at no cost to the Owner.

- .3 Maintenance of plant material includes but is not limited to watering at intervals sufficient to maintain healthy, vigorous growth, weeding of plant beds and tree pits, cultivating of growing medium, pruning, only if requested, treatment of insects, moulds, fungi or disease to the Level 2 "Groomed" as per the BCNLA Landscape Standard, Current Edition or as directed by Owner's Representative.
- .4 Plant material shall be deep watered at least once per day when temperatures exceed 25 degrees Celsius (77 degrees F).
- .5 Contractor to ensure adequate moisture in plant root zone prior to winter freeze-up.
- .6 Ensure tree guards, stakes, flagging tape on tree guy wire and tree ties are kept secure, taught and in proper repair.

3.14 Finish Grading

- .1 All planted areas and all growing medium shall be fine graded after placing to the finished elevations and contours as detailed and specified herein. Surfaces shall be true to intended grades, smooth, uniform, and firm against deep foot printing, with a fine loose surface texture. Ensure all rough spots and low areas are eliminated to ensure positive surface drainage. Adjust grades to accommodate for mulch as specified/detailed.

3.15 Cleaning

- .1 All excess materials and other debris resulting from planting operations shall be removed from the job site.
- .2 Flush all walks and paved areas and rake all lawn areas clean to the satisfaction of the Owner's Representative.

END OF SECTION 32 93 10

PART 1: GENERAL

1.1 General Requirements

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts.

1.2 Description

- .1 Supply all products, labour, equipment, and services necessary to install a completely operating drainage system as indicated in the contract documents.

1.3 Related Work

- | | | |
|----|------------------------------|------------------|
| .1 | Plumbing | Section 22 00 00 |
| .2 | Site Preparation and Grading | Section 01 89 13 |
| .3 | Excavation and Backfill | Section 31 23 10 |
| .4 | Growing Medium | Section 32 91 13 |
| .5 | Plants and Planting | Section 32 93 10 |

1.4 Submittals

- .1 Record Drawings: Submit a suitably scaled reproducible copy of the "as-constructed" condition of the system. This drawing should be professionally drawn or produced with the use of computer-aided drafting/design (CADD) where possible. All components of the subsurface drainage system shall be shown as installed with clear measurements provided from an identifiable reference point.
- .2 Submit one graphic sieve analysis of the proposed bedding material and a one litre sample of the proposed drain rock.
- .3 If an alternative is proposed to any specified drainage components, submit samples and or manufacturer's data sheets for approval by Owner's Representative.

1.5 Protection

- .1 Protect existing buildings, equipment, sidewalks, landscape reference points, monuments, markers and other completed work. Make good any damage resulting from work of this Contract at no expense to the Board.
- .2 Do not park vehicles on the site in areas where the work will be undertaken without express written consent of the Board. Utilize only such equipment/vehicles essential for construction of the system.
- .3 Trenching and other excavations for vaults, valve boxes etc. are not to be left open during non-work hours of operation unless they are protected to current WorkSafeBC Standards. Cover/mark/protect, as necessary, all open excavations to ensure public safety.

1.6 Site Conditions

- .1 Existing Conditions/Underground Services: Verify the existence and location of all on site utilities/underground services by hand digging or use of an electronic toning device or M-Scope. Mark the location of all buried cables, conduits, pipes etc. **prior to any trenching**. Cooperate with the Board and utility companies to keep their respective utilities in operation. Notify Owner's Representative immediately for directions as to the procedure should any piping utilities be encountered during excavation.
- .2 Site Preparation: Prior to the work of this Section, carefully inspect any installed work of other trades or contractors and verify all such work is complete to the extent that this work may commence properly.
- 3 Field Measurements: Make all measurements in the field and adjust the design to meet the on site conditions to ensure precise fit of items in accordance with the original design.
- .4 Discrepancies: In the event of a major discrepancy, errors or conflicts between the drawings and the actual site conditions, immediately notify Owner's Representative as to procedure before proceeding with work.
- .5 Repair to Underground Services: Repair all damage to underground services caused by the work of this Contract. Damage to services that are shown on the drawings or have been brought to the Contractor's attention in the field prior to commencement or during construction of the work shall be repaired in entirety at the Contractor's expense. Damage to services that were clearly unforeseen/unknown of existence (provided that all reasonable measures were undertaken by the Contractor to ascertain the existence of these services) shall be repaired in accordance with the Changes clause of the General Conditions. Notify Owner's Representative of damage immediately.

PART 2: PRODUCTS

2.1 Drain Pipe

- .1 Perforated Pipe: 100mm dia . **CSA SDR-35 Rigid Perforated Drain Pipe**.
- .2 Solid Pipe: 250 mm dia. SDR 35 Rigid Non Perforated Drain Pipe.
- .3 All pipes and fittings that are polyvinyl chloride (PVC) must conform to CSA B182.1-96M.

2.2 Drainage Structures

- .1 Area Drains: **The Park Board does not accept any plastic (PVC) drains or drainage structures**. Area drains should be designed for outdoor use, complete with square bolt-down cast iron or bronze grate and sediment bucket. Product to be heavy-duty grade and by Zurn, or pre-approved equivalent. All area drains shall be sized for area and to be a minimum of 8 inches square.
- .2 Lawn Basins/Catch Basins: Precast concrete barrels, lids and riser rings to ASTM C478 complete with galvanized steel rungs (where specified), sized to suit application and a minimum diameter of 600 mm. As supplied by Ocean Construction Supplies **or pre-approved equivalent**. Cast Iron grate and frame by Dobney Foundry (typical, No. B26 B grate and frame for 600 dia. precast concrete barrels, or equivalent).

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- .3 Drain Rock: 19 to 25 mm (3/4"-1") diameter clear gravel drain rock (uniform clear crush or round free) and free of silt, sand and clay with the following gradations:

Sieve size	% Passing (by weight)
25 mm (1 in)	100
19 mm (3/4 in)	0 - 100
12.5 mm (No. 8)	0 - 30
9.5 mm (No. 16)	0 - 3

- .4 Filter Gravel: Shall be bird's-eye clean gravel with 98% passing the 7.5mm (5/16") sieve, 95% retained by the 4.76 sieve and less than 1% passing the 2.36mm sieve. The material will be clean free of organic, oil, grease or toxic materials.

2.3 Filter Fabric

- .1 The Owner does not incorporate filter fabric in its subsurface drainage systems.

2.4 Clean-Outs

- .1 Clean-outs are required all drain lines.

2.5 Approved Equals

- .1 All items as specified or pre-approved equivalents.

PART 3: EXECUTION**3.1 Inspection and Layout**

- .1 Provide Owner's Representative 48 hours advance notice for inspection and approval of all subgrade prior to placing drain lines. Report any unsatisfactory conditions to Owner's Representative.
- .2 Layout the piping and drainage structure locations with flags or stakes and obtain the Owner's Representative's approval before proceeding. The layout shall be in accordance with the drawing(s). Route piping to take into account site elevation changes and locate drainage structures to maximize run-off collection. Alternative layouts shall be approved by Owner's Representative and indicated on the Record Drawings.
- .3 Coordinate exact locations of lines, clean-outs and structures, with planting locations to avoid conflicts and damage to plants during installation. Stake locations for approval by Owner's Representative. Verify grades for all drainage components.
- .4 Closing in Uninspected Work:
- .1 Obtain approval of Owner's Representative before backfilling any sections of the subsurface drainage system.
- .2 Any work closed in before inspection will be required to be exposed for inspection at

no extra cost to the Owner.

3.2 Installation Specification

- .1 All excavation shall be undertaken in accordance with the City of Vancouver's Policy and Standard Operating Procedure- Soil and Excavation Water Contamination Management.
- .2 Area Drains: Excavate as required and perform all inlet and outlet connections as per drawings and or manufacturer's recommended installation methods. Backfill with drain rock and install as per details.
- .3 Lawn Basins: Excavate as required and perform all inlet and outlet connections as per drawings and or manufacturer's recommended installation methods. Backfill with drain rock and install as per details.
- .4 Clean-Outs: Excavate as required and perform all inlet and outlet connections as per drawings and or manufacturer's recommended installation methods. Backfill with drain rock and install as per details.
- .5 Trenching and Drain Pipe Installation:
 - .1 Open excavation shall be carried out in a safe and orderly manner and in accordance with the requirements of the Workers' Compensation Act of B.C. Approved shoring shall be used where required for safe working conditions.
 - .2 All trenches are to be hand or machine excavated. All trenches shall be dug on the alignment and to the depth required as shown on the drawings and as stated herein. Trenches are to be straight with uniform slopes to the bottom of all trenches.
 - .3 Where the pipes are to be laid in sub-surface material the trench shall be excavated to a depth at least 100 mm below the bottom of the pipe elevation or as detailed.
The tops of pipes are to be a minimum of 500 mm (20 in) below the final grades.
 - .4 Prior to backfilling, all lines, connections and fittings shall be inspected by Owner's Representative where required.
 - .6 Trenches shall be at least 600mm away from paving stones or other hard surfaces to avoid undermining such surface or its edge retention.
 - .7 Backfilling shall take place in an orderly fashion. Place drain rock material to the full width of the trench bottom, with minimum bedding depth to be 100 mm. Shape bed true to grade to provide continuous, uniform bearing surface for pipe. After pipe is in place, backfill to allow for a minimum of 200 mm of drain rock over the surface of the pipe. Place a uniform 75 mm of bird's eye gravel on top of drain rock. The remainder of the backfill to finish grade shall be with growing medium free of rocks and other unsuitable materials that could damage the pipe or create unusual settling conditions.
 - .8 Compact the growing medium to the same density as the native material in the trench sidewalls to prevent differential settlement.
 - .9 Contractor is responsible to repair all trenches which have settled below the adjacent grade for a period of one (1) year from date of Substantial Performance.
 - .10 **The Owner does not accept any material refuse such as pipe pieces, rags,**

Vancouver Board of Parks and Recreation**33 46 16****China Creek North Park Upgrades****Subsurface Drainage Systems****fittings or other waste left as backfill in any trenches.**

- .11 No drainage line shall be directly over and parallel to another drainage line or service line of any other trade. Ensure minimum horizontal and vertical clearance requirements as dictated by Canadian Electrical Code for all piping installations near any electrical conduit/service.
- .12 **Perforated and Solid SDR Pipe**: Place bedding and/or drain rock material and install pipe in locations shown as per details and plans. Comply with all the manufacturer's printed data and recommendations regarding pipe installation, cleaning, fitting preparation and correct joining techniques.
- .13 All pipe inverts shall be installed within 15mm of design grades and bedded to provide uniform falls to drain structures.

3.3 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 Trenching, laying pipe and backfilling shall be continuous so that the amount of open trenching at the end of each workday is minimized. Any open trench or other excavations shall be barricaded and marked with high visibility marking tape to current WorkSafeBC requirements.
- .3 Any damage to paving, planting or any other structures/elements due to settlement of improperly compacted trenches shall be immediately repaired at the Contractor's expense to satisfaction of Owner's Representative.
- .4 Remove and dispose of off site all surplus material, excess excavated materials, trash, debris and waste material from the work of this Section.

END OF SECTION 33 46 16

CHINA CREEK NORTH PARK UPGRADES

1001 E 7th AVE, VANCOUVER, BC

ISSUED FOR TENDER

OWNER

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COUNSULTANTS

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IRRIGATION:
WATER PLAN-IT
#202, 1405 St. Paul Street
Kelowna, BC V1Y 8H2
Contact: Regan Hyde
Email: regan@waterplanit.ca
Tel: 250-878-6178

GEOTECHNICAL
BRAUN GEOTECHNICAL LTD.
#106A - 9785 192 Street
Surrey, B.C. V4N 4C7
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PROJECT SITE



CONTEXT PLAN

BENCH MARK :	6	---	---			DESIGNED BY: AR		 #503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698	 CITY OF VANCOUVER PARKS DEPARTMENT					COVER SHEET	DRAWING No. Scale:
	5	---	---			DRAWN BY: GC									
	4	APR 27, 2018	ISSUED FOR TENDER			CHECKED BY: AR									
	3	JAN 12, 2018	95% DETAIL DESIGN			DATE: January 11, 2018									
	2	OCT 18, 2017	75% DETAIL DESIGN			APPROVED BY: AR									
	1	AUG 8, 2017	50% DETAIL DESIGN												
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SEAL PEER REVIEW															
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NOTES TO BIDDERS (CONTRACTORS)

LANDSCAPE NOTES

1.0 GENERAL

- 1
- CONTRACTOR TO ENSURE DRAWINGS AND SPECIFICATIONS HAVE BEEN REVIEWED (COMPLETE) AND THAT SUB-CONTRACTORS ARE PROVIDED WITH COMPLETE INFORMATION AT TIME OF BIDDING, AND SUBSEQUENT MOBILIZATION UPON AWARD.
- 2
- CONTRACTOR TO VERIFY ALL UNITS AND QUANTITIES SHOWN.
- 3
- CONTRACTOR TO IMMEDIATELY NOTIFY CONTRACT ADMINISTRATOR OF ANY DISCREPANCIES BETWEEN DRAWINGS AND SPECIFICATIONS PRIOR TO COMMENCING WORK. DO NOT COMMENCE WORK UNTIL DISCREPANCY IS CLARIFIED OR RESOLVED.
- 4
- CONTRACTOR TO IMMEDIATELY NOTIFY CONTRACT ADMINISTRATOR OF ANY SCHEDULE DELAYS IMPOSED BY UNFORESEEN ISSUES. SUBMIT NOTICE THROUGH EMAIL.
- 5
- CONTRACTOR TO PROVIDE A WEEKLY EMAIL SUMMARIZING WORKS COMPLETED IN THE WEEK, INCLUDING PHOTOS OF WORK BEING UNDERTAKEN, AND WORKS SCHEDULED FOR THE FOLLOWING WEEK.
- 6
- CONTRACTOR TO SUBMIT RFIS THROUGH EMAIL FOR FORMAL RECORD.
- 7
- CONTRACTOR TO SUBMIT REQUESTS FOR REVIEW BY CONSULTANTS MINIMUM 72HRS IN ADVANCE OF REBAR AND FORM WORKS, ELECTRICAL AND CIVIL ENGINEERING RELATED UTILITY TRENCHING, AND GENERAL PREPARATIONS PRIOR TO LARGE CONCRETE POURS.
- 8
- CONTRACTOR WILL RECEIVE FOUR COPIES OF THE ISSUE FOR CONSTRUCTION DRAWING SET AT THE TIME OF AWARD. MAINTAIN ONE COPY ON SITE IN CLEAN CONDITION, AND MAINTAIN REGULAR SITE NOTES AND REDLINES REGARDING SITE CHANGES ON THE COPY. PROVIDE THE REDLINE DRAWING SET, AND A MARKED UP PDF SET FOR PROJECT RECORDS AT THE TIME OF SUBSTANTIAL COMPLETION. PROVIDE A SUPPORTING DIGITAL SURVEY OF WORK AS CONSTRUCTED. INCLUDE INVERTS AND RIM ELEVATIONS OF ALL STORM INFRASTRUCTURE.THE VALUE OF THE REDLINE SET AND SURVEY WILL BE A \$10,000 DEFICIENCY ITEM IF NOT PROVIDED AT THE TIME OF SUBSTANTIAL REVIEW.
- 9
- ADDITIONAL DRAWING SETS OF THE ISSUE FOR CONSTRUCTION DRAWING SET MAY BE PROVIDED IF REQUESTED.
- 10
- INCLUDE A STATUTORY DECLARATION OF PROGRESS PAYMENT AND WCB SUBMITTAL WITH EACH PROGRESS CLAIM. FAILURE TO PROVIDE THESE SUBMITTALS WILL INHIBIT THE CONTRACT ADMINISTRATOR FROM REVIEWING A CLAIM OR PREPARING A PAYMENT CERTIFICATE.

2.0 WARRANTY & MAINTENANCE

- 1
- THE PROJECT REQUIRES A ONE YEAR WARRANTY ON ALL HARD AND SOFTSCAPE WORK.
- 2
- THE WARRANTY PHASE WILL COMMENCE AT THE TIME OF SUBSTANTIAL COMPLETION OF THE TOTAL CONTRACT.
- 3
- ESTABLISHMENT MAINTENANCE OF SOFT LANDSCAPES IS TO BE PROVIDED FOR ONE CALENDAR YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OF THE PROJECT.
- 4
- THE ONE YEAR PLANT MATERIAL WARRANTY PERIOD RESTARTS AT THE TIME OF PLANT REPLACEMENT.

3.0 PERMITS

- 1
- CONTRACTOR TO PROVIDE THE FOLLOWING PERMITS:
- 1
- WATER PERMIT: REQUEST CITY CONTACT FROM CONTRACT ADMINISTRATOR AT TIME OF AWARD
- 2
- ELECTRICAL PERMIT: REQUEST CITY CONTACT FROM CONTRACT ADMINISTRATOR AT TIME OF AWARD
- 3
- SIDEWALK PERMIT: REQUEST CITY CONTACT FROM CONTRACT ADMINISTRATOR AT TIME OF AWARD
- 4
- ANY OTHER PERMITS REQUESTED IN THE DRAWINGS OR SPECIFICATIONS HEREIN.

4.0 FIELD LAYOUT AND SURVEY COORDINATION

- 1
- SITE LAYOUT TO BE BASED ON TSS (TOTAL STATIONING SURVEY) OR APPROVED EQUAL GPS METHOD TO ENSURE ACCURACY IN LAYOUT.
- 2
- SITE LAYOUT AND SURVEY FILES CAN BE PROVIDED IN AUTOCAD FORMAT AT THE TIME OF CONSTRUCTION START-UP.

5.0 SITE MOBILIZATION, STAGING, AND SAFETY

- 1
- PROVIDE MOD-U-LOCK FENCE OR APPROVED EQUAL AROUND THE LIMIT OF CONSTRUCTION AND PROTECT THE SITE AT ALL TIMES FROM PUBLIC ACCESS.
- 2
- PROVIDE INFORMATION ON INTENDED SITE STORAGE AND STAGING AREA(S) AT CONSTRUCTION START-UP. IF STORAGE OR STAGING AREA(S) ARE TO BE MOVED BETWEEN DIFFERENT PHASES OF WORK, INFORM OWNER AND CONTRACT ADMINISTRATOR AT CONSTRUCTION START-UP WITH MARKED UP PLANS.
- 3
- PROVIDE PROOF OF A BC-ONE (BC-1) CALL AT THE TIME OF CONSTRUCTION START-UP MEETING.
- 4
- ENSURE ESC (EROSION AND SEDIMENT CONTROL) MEASURES HAVE BEEN REVIEWED PRIOR TO COMMENCING DEMOLITION OR EXCAVATION WORKS OF THE SITE. AMEND ANY ESC RELATED REQUESTS FROM THE ENVIRONMENTAL ENGINEER IMMEDIATELY. PROVIDE PHOTO PROOF AND EMAIL CONFIRMATION TO THE CONTRACT ADMINISTRATOR AND ENVIRONMENTAL ENGINEER FOR APPROVAL PRIOR COMMENCING WORK.
- 5
- ENSURE TREE PROTECTION FENCING HAS BEEN REVIEWED PRIOR TO COMMENCING WORK.

6.0 SITE CLEANLINESS

- 1
- MAINTAIN THE SITE IN A CLEAN AND ORDERLY FASHION AND FOLLOWING BEST PRACTICES WITH CURRENT WCB SAFETY REQUIREMENTS.
- 2
- RECYCLE CARDBOARD AND WASTE MATERIALS AS PER WASTE MANAGEMENT AND DISPOSAL PROCEDURES DEFINED UNDER DIVISION 1 OF THE SPECIFICATIONS.
- 3
- ENSURE A POWER WASH AND CLEAN-UP HAS BEEN PROVIDED PRIOR TO THE SUBSTANTIAL COMPLETION REVIEW.
- 4
- ENSURE CLEAN ROADS AND SITE ENTRY/EXIT THROUGH THE ENTIRE COURSE OF CONSTRUCTION. PROVIDE ADDITIONAL CLEANING AS REQUESTED BY THE CONTRACT ADMINISTRATOR.

7.0 HARDSCAPES

- 1
- GENERAL REQUIREMENTS
- 1
- ENSURE THAT HARDSCAPES MEET FLUSH WITH ADJOINING SURFACES UNLESS NOTED OTHERWISE.
- 2
- PROVIDE A MOCK-UP AS PER PROJECT SPECIFICATIONS.
- 3
- MOCK-UPS TO INCLUDE A SAMPLE OF JOINT QUALITY, INCLUDING ANY FILLERS OR SEALANTS SPECIFIED (I.E. SIKAFLEX). REFER TO SPECIFICATIONS.
- 4
- ENSURE JOINT SEALANTS SPECIFIED ARE INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS.
- 5
- INSTALL FILLERS (I.E. MORTAR, GROUT) OR SEALANTS A MINIMUM 48 HOURS PRIOR TO REVIEW OF SITE MOCK-UPS TO ENSURE COLOUR IN PRODUCTS HAS SET TO TRUE FINISH.

- 6
- ENSURE THAT TRENCHING HAS BEEN REVIEWED AND ACCEPTED PRIOR TO BACKFILLING OF MATERIALS.
- 7
- PROVIDE COPIES OF ELECTRICAL TRENCHING REPORTS AND PLUMBING REPORTS PROVIDED BY BUILDING INSPECTION DEPARTMENT TO THE CONTRACT ADMINISTRATOR AND OWNER.
- 8
- ENSURE BACKFILL MATERIALS ARE AS PER SPECIFICATIONS.
- 9
- PROVIDE SIEVE TESTS AND AFFILIATED SUBMITTALS OF ALL SANDS AND BACKFILL MATERIALS FOR APPROVAL PRIOR TO ORDER AND INSTALLATION. REFER TO SPECIFICATIONS.
- 10
- WHEN MEETING A NEW HARDSURFACE TO AN EXISTING HARD SURFACE, PROVIDE NOTICE TO THE CONTRACT ADMINISTRATOR OF ANY CONDITIONS WHERE THE JOINT WILL RESULT IN MORE THAN A 6MM DIFFERENTIAL (I.E. A NEW CONCRETE SIDEWALK IS MEETING AGAINST AN EXISTING ASPHALT SIDEWALK THAT HAS A SMALL DEPRESSION). DO NOT COMMENCE WORK UNTIL THE CONTRACT ADMINISTRATOR HAS CLARIFIED IF RECTIFICATION OF THE EXISTING SURFACE IS NEEDED TO AVOID TRIPPING HAZARD.
- 11
- CONFIRM DESIGN GRADES HAVE BEEN CHECKED PRIOR TO POURING, LAYING OR INSTALLING ANY HARD SURFACE MATERIALS OVER PREPARED BACKFILL.
- 12
- REPORT ANY GRADES THAT CONTRADICT BEST CONSTRUCTION PRACTICES IMMEDIATELY TO THE CONTRACT ADMINISTRATOR (I.E. WATER FLOWS TOWARDS A BUILDING OR IS GOING TO PUDDLE IN AN AREA, OR AN AREA OF SURFACE APPEARS FLAT). DO NOT PROCEED UNTIL SLOPES AND DESIGN HAVE BEEN CLARIFIED.
- 13
- PROVIDE ANY SURVEY SHOTS OR SPOT GRADE CHECKS AS REQUESTED BY CONTRACT ADMINISTRATOR.
- 14
- REFER TO CIVIL ENGINEERING DRAWINGS FOR ADDITIONAL HARDSCAPE REQUIREMENTS.

2. CONCRETE PAVING

- 1
- PROVIDE A MOCK-UP AS NOTED ABOVE.
- 2
- ENSURE ADJOINING CURBS OR BANDS MAINTAIN THE SAME SAW-CUT OR EXPANSION JOINT PATTERNS AS SHOWN IN DESIGN DRAWINGS.
- 3
- CHALK-LINE ALL SAW-CUTS FOR REVIEW PRIOR TO CUTTING.
- 4
- IN AREAS WITHOUT CUSTOM SAW-CUT OR EXPANSION JOINT PATTERNING, PROVIDE:

1

EXPANSION JOINTS MAXIMUM EVERY 9M ON CENTRE.

2

SAW-CUT JOINTS MAXIMUM EVERY 3M ON CENTRE.

3

CONFIRM LOCATIONS WITH CONSULTANT PRIOR TO COMMENCING FORMWORK.
- 5
- ALL HORIZONTAL FLAT CONCRETE TO HAVE A MEDIUM SANDBLAST FINISH UNLESS NOTED OTHERWISE. REFER TO SPECIFICATION.
- 6
- CONCRETE TO COMPLY WITH STANDARD DIVISION 3 SPECIFICATIONS FOR MMCD PLATINUM SPECIFICATIONS, AND CCDC MASTER SPECIFICATIONS RESPECTIVELY.
- 7
- CONCRETE THAT IS REINFORCED MUST BE REVIEWED PRIOR TO POURING. ENSURE REBAR IS 'CHAIR'D' AND SUSTAINED IN AN UPRIGHT POSITION.
- 8
- REFER TO CIVIL ENGINEERING DRAWINGS FOR ADDITIONAL CONCRETE PAVING REQUIREMENTS.
- 9
- REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

8.0 WALLS

1. GENERAL REQUIREMENTS

- 1
- PROVIDE MOCK-UP FOR REVIEW OF FORM, QUALITY AND FINISH PRIOR TO INSTALLING ADDITIONAL WORK. REFER TO SPECIFICATIONS.
- 2
- MOCK-UPS TO INCLUDE A SAMPLE OF JOINT QUALITY, INCLUDING ANY FILLERS, EPOXIES OR SEALANTS (I.E. SIKAFLEX) SPECIFIED.
- 3
- ENSURE JOINT EPOXIES AND SEALANTS SPECIFIED ARE INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS.
- 4
- MOCK-UPS TO INCLUDE ANY GEO-GRID OR SUPPORTING ANCHOR SYSTEM REQUIREMENTS. SUBMIT MATERIAL PRODUCT INFORMATION FOR APPROVAL PRIOR TO COMMENCING MOCK-UP.
- 5
- INSTALL FILLERS (I.E. MORTAR, GROUT) OR SEALANTS A MINIMUM 48 HOURS PRIOR TO REVIEW OF SITE MOCK-UPS TO ENSURE COLOUR IN PRODUCTS HAS SET TO TRUE FINISH.
- 6
- ENSURE REINFORCING HAS BEEN REVIEWED BY CONSULTANT AND STRUCTURAL ENGINEER. REVIEWER CONTACT WILL BE PROVIDED AT CONSTRUCTION KICK-OFF MEETING.
- 7
- ENSURE THAT TRENCHING HAS BEEN REVIEWED AND ACCEPTED PRIOR TO BACKFILLING OF MATERIALS.
- 8
- ENSURE BACKFILL MATERIALS ARE AS PER SPECIFICATIONS.
- 9
- PROVIDE SIEVE TESTS AND AFFILIATED SUBMITTALS OF ALL SANDS AND BACKFILL MATERIALS FOR APPROVAL PRIOR TO ORDER AND INSTALLATION. REFER TO SPECIFICATIONS.
- 10
- REPORT ANY ISSUES THAT CONTRADICT BEST CONSTRUCTION PRACTICES IMMEDIATELY TO THE CONTRACT ADMINISTRATOR (I.E A RETAINING WALL DOES NOT HAVE A DRAIN BEHIND IT). DO NOT PROCEED UNTIL DESIGN HAS BEEN CLARIFIED.
- 11
- PROVIDE ANY SURVEY SHOTS OR SPOT GRADE CHECKS AS REQUESTED BY CONTRACT ADMINISTRATOR.
- 12
- REFER TO CIVIL ENGINEER, STRUCTURAL ENGINEER AND ELECTRICAL ENGINEER'S DRAWINGS FOR ADDITIONAL REQUIREMENTS. REPORT DISCREPANCIES IMMEDIATELY TO CONTRACT ADMINISTRATOR.
- 13
- REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

2. CONCRETE WALLS

- 1
- PROVIDE A MOCK-UP. REFER TO SPECIFICATIONS.
- 2
- WALLS TO RECEIVE A 13MM ROUNDED BEVEL ('FILLET') UNLESS NOTED OTHERWISE.
- 3
- CHALK-LINE ALL SAW-CUTS FOR REVIEW PRIOR TO CUTTING.
- 4
- IN AREAS WITHOUT CUSTOM SAW-CUT OR EXPANSION JOINT PATTERNING, PROVIDE:

1

EXPANSION JOINTS MAXIMUM EVERY 9M ON CENTRE.

2

SAW-CUT JOINTS MAXIMUM EVERY 3M ON CENTRE.

3

CONFIRMATION OF LOCATIONS WITH CONSULTANT PRIOR TO COMMENCING FORMWORK.

4

ENSURE A MINIMUM 40MM CONCRETE BETWEEN SAW-CUT AND REBAR INSIDE THE CONCRETE FORM.
- 5
- PROVIDE A MINIMUM 75MM (3") COVER OF CONCRETE OVER ALL CONCRETE REINFORCING, WITH THE EXCEPTION OF CONTROL JOINTS AS NOTED ABOVE.
- 6
- ALL VERTICAL CONCRETE TO RECEIVE A LIGHT SANDBLAST FINISH UNLESS NOTED OTHERWISE. REFER TO SPECIFICATION.
- 7
- CONCRETE TO COMPLY WITH STANDARD DIVISION 3 SPECIFICATIONS FOR MMCD PLATINUM SPECIFICATIONS, AND CCDC MASTER SPECIFICATIONS RESPECTIVELY.
- 8
- CONCRETE THAT IS REINFORCED MUST BE REVIEWED PRIOR TO POURING.
- 9
- REFER TO CIVIL ENGINEER, STRUCTURAL ENGINEER AND ELECTRICAL ENGINEER'S DRAWINGS FOR ADDITIONAL REQUIREMENTS. REPORT DISCREPANCIES IMMEDIATELY TO CONTRACT ADMINISTRATOR.
- 10
- REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

9.0 METALS

- 1
- SUBMIT SHOP DRAWINGS FOR METAL WORKS (I.E. FENCES, FASTENERS AND RAILINGS). REFER TO SPECIFICATIONS.
- 2
- TREAT METAL WORK FOR PROTECTION FROM CORROSION AND ABRASION. ALL STEEL TO BE GALVANIZED OR STAINLESS.
- 3
- ENSURE ANCHOR PLATES, HANGERS, AND AFFILIATED FASTENER JOINING MATERIALS MEET FLUSH BETWEEN JOINING SURFACES WITHOUT GAPS, UNLESS SPECIFIED OTHERWISE.
- 4
- COMPLETE METAL BONDING (I.E. WELDING, SOLDERING) SUCH THAT WORK IS TREATED FOR PROTECTION AND WILL NOT CORRODE.
- 5
- CONCEAL BONDING WORK IN THE FINISHING OF THE METAL WORK.
- 6
- ENSURE SMOOTH FINISH WITH SANDING OR OTHER APPLICABLE HANDWORK NEEDED TO PROVIDE SMOOTH AND CONSISTENT APPEARANCE.
- 7
- INSTALL A GROUNDING ROD FOR ALL VERTICAL METAL ELEMENTS TALLER THAN 1800MM IN HEIGHT.
- 8
- ENSURE SHOP DRAWINGS WITH PICKETS OR RAILINGS COMPLY WITH BC BUILDING CODE REQUIREMENTS (I.E. RAILING HEIGHT, PICKET SPACING).
- 9
- POWDERCOAT APPLICATIONS: ENSURE METAL IS PRETREATED (I.E. GALVANIZED) OR ALTERNATE PROTECTION PROCESS PRIOR TO POWDER COATING. CONFIRM VIA SHOP DRAWING.
- 10
- REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

10.0 WOOD

- 1
- SUBMIT SHOP DRAWINGS FOR WOOD WORKS (I.E. DECKING, BENCHES, CUSTOM ELEMENTS). REFER TO SPECIFICATIONS.
- 2
- ENSURE WOOD DOES NOT CRACK OR SPLINTER WITH FASTENER CONNECTIONS. PRE-DRILL AND COUNTERSINK AS NEEDED TO PROVIDE SMOOTH CONNECTIONS, UNLESS SPECIFIED OTHERWISE.
- 3
- ENSURE WOOD IS FREE OF SPLINTERS, SLIVERS, AND INCONSISTENCIES.
- 4
- ENSURE WOOD IS FREE OF DEFECTS THAT COULD IMPACT STRUCTURAL INTEGRITY.
- 5
- ENSURE WOOD HAS NO EXPOSED SHARP EDGES. SAND SMOOTH UNLESS SPECIFIED OTHERWISE.
- 6
- TREAT CUTS WITH SPECIFIED WOOD PRESERVATIVE SOLUTION OR ALTERNATE.
- 7
- REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

11.0 DRAINAGE

- 1
- SUBMIT SHOP DRAWINGS FOR REVIEW OF ALL SPECIFIED DRAINAGE FEATURES. THIS APPLIES TO PRE-MANUFACTURED PRODUCTS AND CUSTOM DETAILS. INCLUDE INSTALLATION GUIDES WHEN AVAILABLE BY MANUFACTURER.

12.0 SITE FURNISHINGS

- 1
- SUBMIT SHOP DRAWINGS FOR REVIEW OF ALL SPECIFIED SITE FURNISHINGS. THIS APPLIES TO PRE-MANUFACTURED PRODUCTS AND CUSTOM DETAILS. INCLUDE COLOUR AND FINISH INFORMATION WITH DRAWINGS, INCLUDING INFORMATION ON ALL FASTENERS. INCLUDE INSTALLATION GUIDES WHEN AVAILABLE BY MANUFACTURER.

13.0 SOFT LANDSCAPES

- 1
- SOFT LANDSCAPE SUPPLY, SUBMITTALS, PREPARATION AND EXECUTION TO COMPLY WITH BC LANDSCAPE STANDARDS. FULL DOCUMENT APPLIES.
- 2
- ENSURE CONTRACTOR INSTALLING SOFT LANDSCAPES HAS A CURRENT COPY OF THE BC LANDSCAPE STANDARDS PRESENT ON SITE.
- 3
- SUBMIT REQUEST FOR REVIEW BY CONSULTANT OF SITE SOFT LANDSCAPE FINE GRADING PRIOR TO INSTALLATION OF SOD OR SEED.
- 4
- PLANTS AND TREES:

1

PROVIDE CONSULTANT WITH OPPORTUNITY TO REVIEW PLANT STOCK AT NURSERY PRIOR TO SHIPMENT TO SITE. CONSULTANT RESERVES RIGHT TO REJECT STOCK ON SITE WHEN INCONSISTENT FROM NURSERY SAMPLE STOCK. PROVIDE CONSULTANT OPPORTUNITY TO REVIEW TREES AT NURSERY AND TAG PREFERRED TREE STOCK FOR THE PROJECT THAT COMPLIES WITH DRAWING SIZE, SPECIES, AND FORM. ONE (1) WEEK NOTICE IS REQUIRED FOR NURSERY REVIEW.

2

GROWING MEDIUM TO BE "LEVEL 2 GROOMED, 2P" AS PER CHART 6.3.5.1 IN CHAPTER 6 OF THE BC LANDSCAPE STANDARD. MINIMUM 450MM DEPTH REQUIRED FOR PLANTINGS UNLESS NOTED OTHERWISE. TREES REQUIRE ADDITIONAL DEPTH, AS PER TREE INSTALLATION REQUIREMENTS SHOWN IN THE BC LANDSCAPE STANDARD.

3

SUBMIT GROWING MEDIUM REPORT FOR REVIEW PRIOR TO ORDER OR INSTALLATION. REPORT TO MATCH TABLE 6.3.5.3 "PROPERTIES OF GROWING MEDIA FOR LEVEL 2 "GROOMED" AREAS". ADDITIONAL GROWING MEDIUM REPORT REQUIREMENTS ARE PROVIDED IN PROJECT SPECIFICATIONS.

4

MULCH:

1



TO BE DARK BROWN (NOT RED) IN COLOUR. 1L SAMPLE REQUIRED FOR REVIEW PRIOR TO PURCHASE.

2

TO COMPLY WITH BC LANDSCAPE STANDARDS.

3

REQUIRED FOR ALL NEW TREE AND SHRUB PLANTINGS UNLESS NOTED OTHERWISE.
- 5
- THE CONSULTANT MAY REQUEST, AT THE CONTRACTOR'S EXPENSE, UP TO TWO TESTS OF GROWING MEDIUM IF SUSPECTED INCONSISTENCIES APPEAR. TESTS SAMPLES WILL BE SUBMITTED TO PACIFIC SOIL ANALYSIS INC. IN RICHMOND BC. SUITE 5 11720 VOYAGUER WAY, RICHMOND, BC, V6X 3G9.
- 6
- ESTABLISHMENT MAINTENANCE AND WATERING: REFER TO SECTION 3.0 OF THESE LANDSCAPE NOTES. REFER TO EXTERIOR MAINTENANCE SPECIFICATION.
- 7
- WARRANTY: REFER TO SECTION 3.0 OF THESE LANDSCAPE NOTES.
- 8
- REFER TO SPECIFICATIONS AND DRAWINGS FOR ADDITIONAL INFORMATION.

BENCH MARK :	6	###	###			DESIGNED BY: AR	 <div>#503, 4190 Loughheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698</div>	 <div>CITY OF VANCOUVER PARKS DEPARTMENT</div>					LANDSCAPE NOTES	CHINA CREEK NORTH PARK	DRAWING No. <div>L0.1</div>	Scale: -
	5	###	###			DRAWN BY: LN										
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	1	AUG 8, 2017	50% DETAIL DESIGN													
	REV.	DATE	REVISION						SEAL	PEER REVIEW				SHEET 2 OF 14		

STRUCTURAL NOTES

1) GENERAL

- ALL ELEVATIONS ARE GIVEN IN METRES (m) UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS ARE GIVEN IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE.
- SCALE INDICATED ON DRAWING IS APPROPRIATE SCALE AT FULL SIZE.
- DO NOT CONSTRUCT FROM THESE DRAWINGS UNLESS MARKED "ISSUED FOR CONSTRUCTION".
- THE CONTRACTOR IS RESPONSIBLE FOR ACQUIRING ALL PERMITS FOR WORKING WITHIN THE WORK AREA.
- THE NOTES AND SPECIFICATIONS GIVEN ON THE PROJECT DRAWINGS ARE FROM THE RELATED SECTIONS OF THE PROJECT SPECIFICATIONS. THEY DO NOT REPLACE THE PROJECT SPECIFICATIONS.
- THE CONTRACTOR SHALL EXAMINE ALL CONTRACT DOCUMENTS, CHECK DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER FOR CLARIFICATION PRIOR TO COMMENCING CONSTRUCTION. DISCREPANCIES NOT REPORTED ARE THE RESPONSIBILITY OF THE CONTRACTOR. CHECK AND VERIFY ALL DIMENSIONS BEFORE COMMENCING WITH ANY WORK. NOTIFY THE ENGINEER OF ANY ERRORS OR OMISSIONS.
- TEMPORARY SUPPORT AND TEMPORARY AND PERMANENT BRACING OF LOAD BEARING AND NON-LOAD BEARING ELEMENTS DURING CONSTRUCTION TO RESIST DEAD, LIVE AND CONSTRUCTION LOADS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- THE GENERAL CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR REVIEW BY THE ENGINEER OF RECORD. ALLOW ADEQUATE TIME FOR REVIEW BY THE ENGINEER OF RECORD PRIOR TO FABRICATION OR ERECTION.
- IMMEDIATELY PRIOR TO PLACING CONCRETE, THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR INSPECTION OF FORMWORK, REINFORCEMENT AND PREPARATION OF EXISTING CONCRETE.

2) MATERIAL

2.1) CAST-IN-PLACE CONCRETE

- THE CONTRACTOR SHALL SUBMIT A REPORT OUTLINING THE PROPOSED MIX DESIGN FOR EACH CLASSIFICATION OF CONCRETE TO THE ENGINEER FOR REVIEW AND ACCEPTANCE AT LEAST 2 WEEKS IN ADVANCE OF WHEN CONCRETE PRODUCTION IS SCHEDULED TO COMMENCE. REVIEW AND ACCEPTANCE OF THE MIX DESIGN BY THE DESIGN ENGINEER DOES NOT CONSTITUTE ACCEPTANCE OF THE CONCRETE. ACCEPTANCE OF THE CONCRETE WILL BE BASED SOLELY ON THE TEST RESULTS OF THE CONCRETE PLACED ON THE PROJECT. NO CONCRETE SHALL BE PLACED PRIOR TO RECEIVING ENGINEER ACCEPTANCE OF THE MIX DESIGN. EACH MIX DESIGN SUBMITTAL SHALL INCLUDE THE FOLLOWING:
 - NAME OF THE PROPOSED SUPPLIER.
 - PROJECT SPECIFICS.
 - DISTANCE AND EXPECTED TRAVEL TIME FROM BATCH PLANT TO PROJECT SITE.
 - EXPECTED METHOD OF BATCHING, TRANSPORTING AND PLACING CONCRETE.
 - SPECIFIED MIX PARAMETER REQUIREMENTS.
 - NAME AND CONTACT INFORMATION OF INDEPENDENT, CERTIFIED QUALITY CONTROL TESTING FIRM AND/OR CERTIFIED TESTING PERSONNEL.
- ADDENDUM TO A23.1-04 "CONCRETE MIX PROPORTIONS" SHALL MEET THE REQUIREMENTS GIVEN IN THE FOLLOWING TABLE:

MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (MPa)	NOMINAL SIZE OF COARSE AGGREGATE (mm)	AIR CONTENT (%)	SLUMP (mm)	MAXIMUM W/C RATIO BY MASS	EXPOSURE CLASS
35	20	6 ± 1	50 ± 20	0.40	C-1
- THE MAXIMUM PROPORTION OF AGGREGATE PASSING 5mm SCREEN SHALL BE 35% OF THE TOTAL MASS OF AGGREGATE.
- ALL CEMENT SHALL BE TYPE 10 NORMAL PORTLAND CEMENT, UNLESS SHOWN OTHERWISE ON THE DRAWINGS.
- FLY ASH OR OTHER POZZOLANS USED AS ADMXTURES SHALL CONFORM TO ASTM C618-12 "STANDARD SPECIFICATION FOR FLY ASH AND RAW OR CALCINED NATURAL POZZOLAN FOR USE IN CONCRETE".
- UNLESS OTHERWISE NOTED ON THE DRAWINGS, CONCRETE COVERS SHALL BE AS FOLLOWS:
 - WHEN CAST AGAINST AND PERMANENTLY EXPOSED TO THE EARTH = 75mm
 - EVERYWHERE ELSE = 60mm
- EXPOSED CORNERS OF CONCRETE SHALL BE CHAMFERED 13mm, UNLESS NOTED OTHERWISE.
- DIMENSIONAL TOLERANCES FOR CONCRETE WORK SHALL BE GIVEN IN CAN/CSA A 23.1-09 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION".
- ALL CONCRETE SHALL BE CURED IN ACCORDANCE WITH CAN/CSA A23.1-09 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION".

2.2) REINFORCEMENT

- REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CAN/CSA - G30.18 GRADE 400R, UNLESS OTHERWISE NOTED.
- SPACING OF BARS SHOWN ON THE DRAWING IS FROM THE CENTER TO CENTER OF BARS.

DEVELOPMENT LENGTHS ARE AS FOLLOWS:

UNCOATED VERTICAL BARS	UNCOATED HORIZONTAL BARS	UNCOATED TOP HORIZONTAL BARS *
400mm	500mm	650mm

LAP SPLICES OF REINFORCING STEEL ARE AS FOLLOWS:

UNCOATED BARS	UNCOATED TOP HORIZONTAL BARS *
500mm	650mm

- TOP BARS DEFINED AS BARS WITH MORE THAN 300mm OF FRESH CONCRETE BELOW DEVELOPMENT LENGTH OR SPLICE.
- NO MORE THAN 50% OF THE BARS TO BE SPLICED AT ONE LOCATION.
 - WELDING OF REINFORCEMENT IS NOT PERMITTED WITHOUT WRITTEN APPROVAL BY THE DESIGN ENGINEER. REINFORCEMENT BARS TO BE WELDED SHALL BE BILLET STEEL BARS CONFORMING TO CSA-G30.18-M DESIGNATION "W".
 - MECHANICAL COUPLERS FOR REINFORCEMENT BARS MAY BE USED SUBJECT TO ENGINEER'S APPROVAL AND SHALL DEVELOP NOT LESS THAN 120% OF THE YIELD STRENGTH OF THE BAR.

2.1) STEEL

- FABRICATORS RESPONSIBLE FOR WELDED CONSTRUCTION MUST BE CERTIFIED FOR DIVISION 1 OR DIVISION 2.1 TO CURRENT VERSION OF CAN/CSA W47.1-09 "CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL".
- SHOP AND FIELD WELDING TO CURRENT VERSION OF CAN/CSA W59-13 "WELDED STEEL CONSTRUCTION (METAL ARC WELDING)". ELECTRODES TO BE COMPATIBLE WITH BASE METAL. MINIMUM 6mm FILLET WELDS UNLESS NOTED OTHERWISE.
- STRUCTURAL STEEL PLATE TO CURRENT VERSION OF CAN/CSA G40.20/G40.21, GRADE 350W.
- MISCELLANEOUS STEELWORK TO CURRENT VERSION OF CSA G40.20/G40.21 GRADE 350W.
- SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION. SHOW ALL DETAILS, INCLUDING FIELD WELDS, AND MATERIAL SPECIFICATIONS. SHOP DRAWINGS TO BE SEALED BY A PROFESSIONAL ENGINEER FOR DESIGN CONNECTIONS.

3) EXCAVATION, SUPPORT AND PROTECTION

- THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IN THE EVENT OF ANY NON-ELASTIC GROUND MOVEMENT SUCH AS, BUT NOT LIMITED TO, SLOUGHING BEYOND THE SPECIFIED EXCAVATION FACE, BREAKAGE OF SERVICES AND/OR SLOPE FAILURE. IF DEEMED NECESSARY BY THE ENGINEER, THE SLOPE SHALL BE BACKFILLED AND WORK STOPPED IN THE AREA.
- THE CONTRACTOR SHALL VERIFY THE ACTUAL LOCATIONS OF ALL EXISTING, LIVE, UNDERGROUND UTILITIES THAT MAY BE AFFECTED. THE EXISTENCE OF ANY EXISTING UTILITIES THAT MAY BE IMPACTED BY THE EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR IN COORDINATION WITH THE OWNER AND SHALL BE BROUGHT TO THE ATTENTION OF ISL ENGINEERING LTD.
- SIGNIFICANT LOCAL VARIATION FROM ASSESSED SOIL CONDITIONS, SUCH AS BACKFILLED EXCAVATIONS OR UNDERGROUND SERVICE LOCATIONS, MAY REQUIRE A REVISION OF THE DESIGN. THE CONTRACTOR SHALL COOPERATE IN CASE OF ANY DESIGN CHANGES AND CONTRACT CHANGES TO BE DONE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 48 HOURS BEFORE COMMENCING EXCAVATION. EACH STAGE OF EXCAVATION MUST BE APPROVED BY THE ENGINEER BEFORE PROCEEDING WITH THE NEXT STAGE OF EXCAVATION.
- UNDERPINNING AND PROTECTION OF ADJACENT STRUCTURES IS ENTIRELY THE RESPONSIBILITY OF THE CONTRACTOR.

4) FOUNDATION, BACKFILLING AND COMPACTION



- A MAXIMUM FACTORED BEARING CAPACITY OF 100kPa WAS USED IN THE DESIGN.
- GROUND CONDITIONS MAY VARY, THE FOUNDATION REQUIREMENTS WILL BE COORDINATED AND VERIFIED WITH THE GEOTECHNICAL ENGINEER ON SITE.

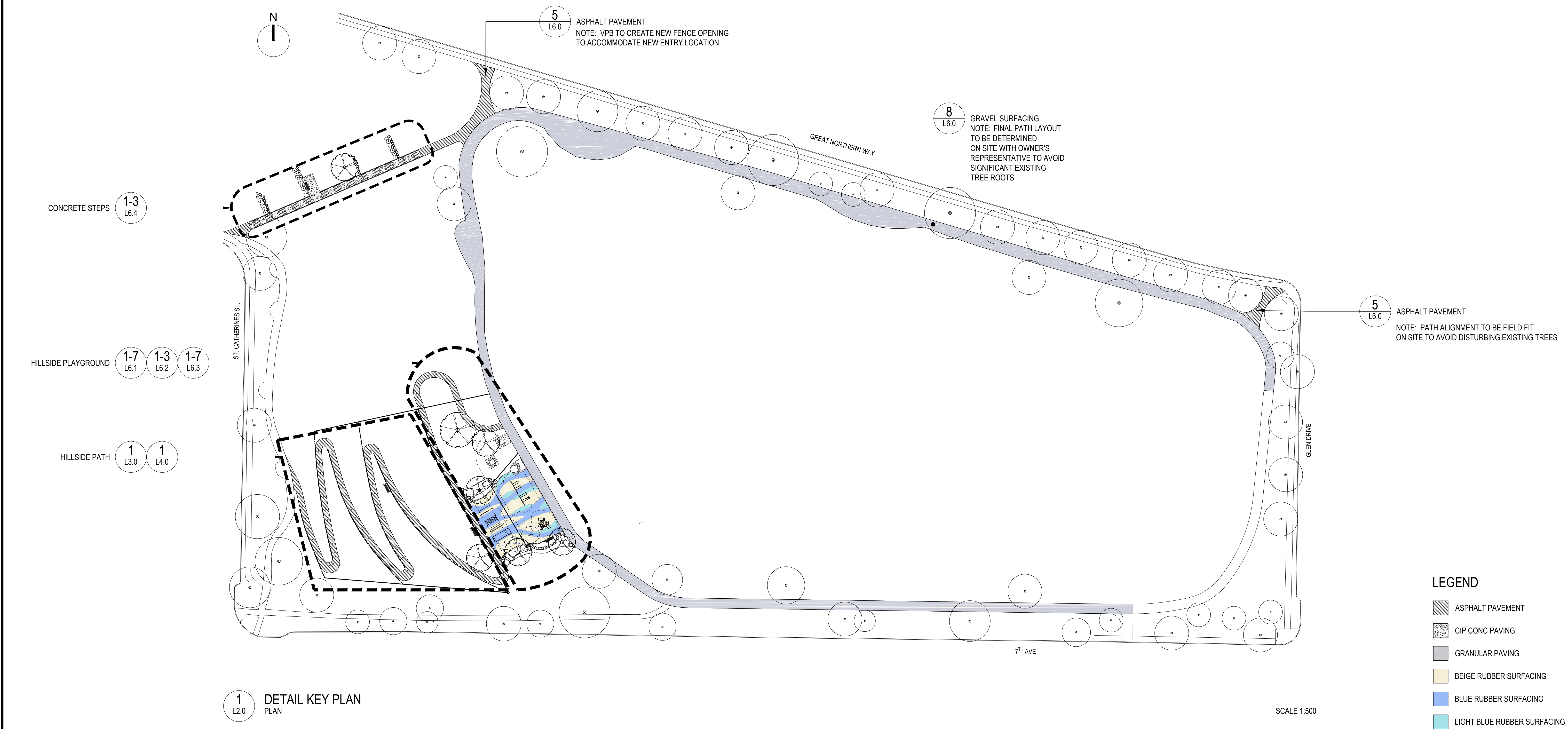
- THE ZONE OF COMPACTION FOR THE ENGINEERED BACKFILL SHALL BE AS SHOWN ON THE DRAWING AND COMPACTED TO A MINIMUM 95% OF MODIFIED PROCTOR DENSITY, AT OPTIMUM MOISTURE CONTENT. MATERIAL COMPACTION TESTING MAY BE REQUIRED BY THE ENGINEER'S REPRESENTATIVE.
- ALL BASE MATERIAL UNDER CAST-IN-PLACE CONCRETE SHALL BE 19mm MINUS CRUSHED GRANULAR BASE MATERIAL COMPACTED TO A MINIMUM 95% OF MODIFIED PROCTOR DENSITY.
- ALL FOOTING EXCAVATIONS AND COMPLETED STRUCTURAL BACKFILL SHALL BE INSPECTED AND APPROVED PRIOR TO PROCEEDING WITH ANY FURTHER FOUNDATION FORMWORK.
- BACKFILLING MATERIAL IS TO BE FREE DRAINING GRANULAR MATERIAL THAT IS APPROVED BY THE ENGINEER'S REPRESENTATIVE PRIOR TO ALL BACKFILLING OPERATIONS.
- THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A QUALIFIED TESTING AGENCY TO PERFORM COMPACTION TESTS AS REQUESTED BY THE ENGINEER.
- KEEP EXCAVATION FREE OF WATER WHILE FILL AND CONCRETE FOUNDATION IS PLACED.
- PROTECT BOTTOM OF EXCAVATION FROM FROST. DO NOT PLACE CONCRETE ON FROZEN SOIL.



5) QUALITY CONTROL

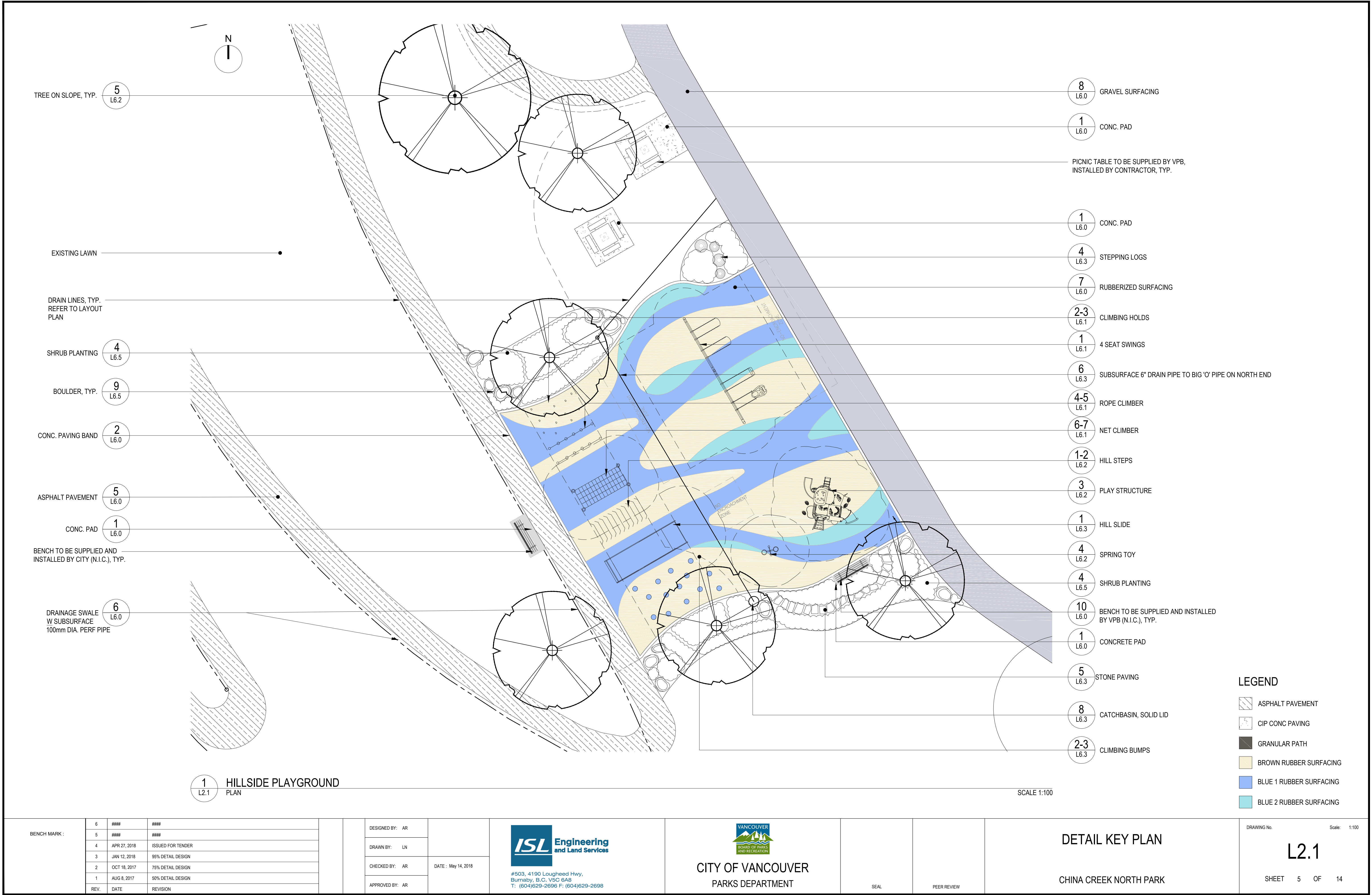
- QUALITY CONTROL DOCUMENTS FOR ALL FABRICATED COMPONENTS SHALL BE PROVIDED TO THE ENGINEER'S REPRESENTATIVE PRIOR TO INSTALLATION. THESE DOCUMENTS SHALL, AT MINIMUM, INCLUDE:
 - PROOF OF PLANT CSA CERTIFICATION (WELDING OR PRECAST)
 - STEEL MILL TEST CERTIFICATES (OR EQUIVALENT) FOR EACH COMPONENT
 - PLANT REBAR INSPECTION PRIOR TO POUR FOR EACH COMPONENT
 - CONCRETE TEST RESULTS FOR EACH COMPONENT
- SHOP DRAWINGS SHALL BE PROVIDED TO THE ENGINEER'S REPRESENTATIVE FOR REVIEW AT LEAST 10 DAYS PRIOR TO FABRICATION/POURING. FABRICATION/POURING SHALL NOT PROCEED WITHOUT REVIEWED SHOP DRAWINGS.
- DESIGN PARAMETERS

3.1.	SNOW LOAD	Ss = 1.9kPa
3.2.	RAIN LOAD	Sr = 0.3kPa
3.3.	WIND LOAD	1/50 = 0.45kPa
		1/10 = 0.35kPa
SEISMIC LOAD		Sa(0.2) = 0.863
		Sa(0.5) = 0.765
		Sa(1.0) = 0.432
		Sa(2.0) = 0.261
		PGA = 0.375
- STANDARDS
THE STANDARDS USED INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
 - BRITISH COLUMBIA BUILDING CODE 2012
 - CAN/CSA-A23.1-09, CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION.
 - CAN/CSA-A23.2-09 (R014), TEST METHODS AND STANDARD PRACTICES FOR CONCRETE.
 - CAN/CSA-A23.3-04 (R2010), DESIGN OF CONCRETE STRUCTURES.
 - CAN/CSA-S269.3-M92-(R2013), CONCRETE FORMWORK
 - CAN/CSA-S16.01, DESIGN OF STEEL STRUCTURE

BENCH MARK :	6	###	###			DESIGNED BY: AR	 #503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698	 CITY OF VANCOUVER PARKS DEPARTMENT		SEAL	PEER REVIEW	STRUCTURAL NOTES CHINA CREEK NORTH PARK	DRAWING No. L0.2 SHEET 2 OF 14
	5	###	###										
	4	APR 27, 2018	ISSUED FOR TENDER			DRAWN BY: LN							
	3	JAN 12, 2018	95% DETAIL DESIGN			CHECKED BY: AR							
	2	OCT 18, 2017	75% DETAIL DESIGN			DATE: October 18, 2017							
	1	AUG 8, 2017	50% DETAIL DESIGN			APPROVED BY: AR							
REV.	DATE	REVISION											



BENCH MARK :	6	###	###	DESIGNED BY: AR	DRAWN BY: LN	<div> #503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698</div>	<div> CITY OF VANCOUVER PARKS DEPARTMENT</div>	SEAL	PEER REVIEW	DETAIL KEY PLAN CHINA CREEK NORTH PARK	DRAWING No. 1:500
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	4	APR 27, 2018	ISSUED FOR TENDER								
	3	JAN 12, 2018	95% DETAIL DESIGN								
	2	OCT 18, 2017	75% DETAIL DESIGN								
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REV.	DATE	REVISION		APPROVED BY: AR	DATE: October 18, 2017						
DETAIL KEY PLAN CHINA CREEK NORTH PARK SHEET 4 OF 14											



TREE ON SLOPE, TYP. 5 L6.2

EXISTING LAWN

DRAIN LINES, TYP. REFER TO LAYOUT PLAN

SHRUB PLANTING 4 L6.5

BOULDER, TYP. 9 L6.5

CONC. PAVING BAND 2 L6.0

ASPHALT PAVEMENT 5 L6.0

CONC. PAD 1 L6.0

BENCH TO BE SUPPLIED AND INSTALLED BY CITY (N.I.C.), TYP.

DRAINAGE SWALE W SUBSURFACE 100mm DIA. PERF PIPE 6 L6.0

8 L6.0 GRAVEL SURFACING

1 L6.0 CONC. PAD

PICNIC TABLE TO BE SUPPLIED BY VPB, INSTALLED BY CONTRACTOR, TYP.

1 L6.0 CONC. PAD

4 L6.3 STEPPING LOGS

7 L6.0 RUBBERIZED SURFACING

2-3 L6.1 CLIMBING HOLDS

1 L6.1 4 SEAT SWINGS

6 L6.3 SUBSURFACE 6" DRAIN PIPE TO BIG 'O' PIPE ON NORTH END

4-5 L6.1 ROPE CLIMBER

6-7 L6.1 NET CLIMBER

1-2 L6.2 HILL STEPS

3 L6.2 PLAY STRUCTURE

1 L6.3 HILL SLIDE

4 L6.2 SPRING TOY

4 L6.5 SHRUB PLANTING

10 L6.0 BENCH TO BE SUPPLIED AND INSTALLED BY VPB (N.I.C.), TYP.

1 L6.0 CONCRETE PAD

5 L6.3 STONE PAVING

8 L6.3 CATCHBASIN, SOLID LID



2-3 L6.3 CLIMBING BUMPS

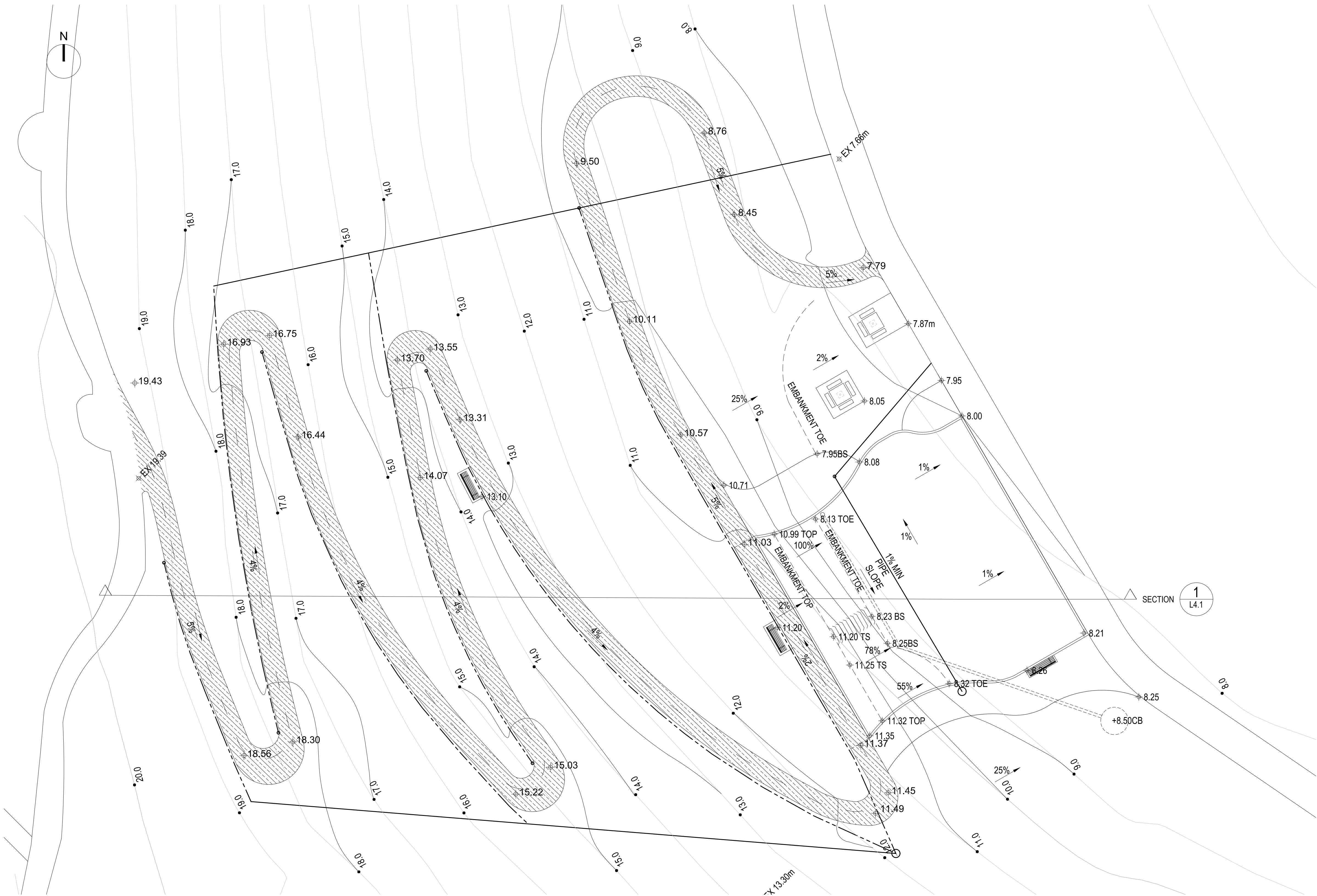
1 L2.1 HILLSIDE PLAYGROUND PLAN

SCALE 1:100

LEGEND

- ASPHALT PAVEMENT
- CIP CONC PAVING
- GRANULAR PATH
- BROWN RUBBER SURFACING
- BLUE 1 RUBBER SURFACING
- BLUE 2 RUBBER SURFACING

BENCH MARK :	6	###	###		DESIGNED BY: AR	 #503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698	 CITY OF VANCOUVER PARKS DEPARTMENT				DETAIL KEY PLAN	CHINA CREEK NORTH PARK	DRAWING No. L2.1 Scale: 1:100	
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	3	JAN 12, 2018	95% DETAIL DESIGN											
	2	OCT 18, 2017	75% DETAIL DESIGN		CHECKED BY: AR									DATE : May 14, 2018
	1	AUG 8, 2017	50% DETAIL DESIGN											
	REV.	DATE	REVISION		APPROVED BY: AR									



LEGEND

	EXISTING ELEVATION
	PROPOSED ELEVATION
	PERCENTAGE SLOPE GRADIENT
	BREAKLINE
	TOP OF SLOPE
	BOTTOM OF SLOPE
	TOP OF CURB
	BOTTOM OF CURB
	TOP OF STEP
	BOTTOM OF STEP
	TOP OF WALL
	BOTTOM OF WALL
	BOTTOM OF TREE
	HIGH POINT
	LOW POINT
	RIM ELEVATION
	AREA DRAIN
	CATCH BASIN
	TRENCH DRAIN

NOTES:

1. ALL DIMENSIONS IN METERS METRIC MEASURE UNLESS OTHERWISE NOTED.
2. CONSULTANT TO PROVIDE DIGITAL DRAWING FILES FOR CONSTRUCTION LAYOUT.
3. ALL SPOT ELEVATIONS IN METRIC METER MEASUREMENT UNITS UNLESS OTHERWISE INDICATED.
4. TREES NOT SHOWN FOR GRAPHIC CLARITY.

1 HILLSIDE PLAYGROUND
L4.0 PLAN

SCALE 1:150

BENCH MARK:

6	###	###
5	###	###
4	APR 27, 2018	ISSUED FOR TENDER
3	JAN 12, 2018	95% DETAIL DESIGN
2	OCT 18, 2017	75% DETAIL DESIGN
1	AUG 8, 2017	50% DETAIL DESIGN
REV.	DATE	REVISION

DESIGNED BY: AR

DRAWN BY: LN

CHECKED BY: AR

APPROVED BY: AR

DATE: May 14, 2018



#503, 4190 Lougheed Hwy,
Burnaby, B.C. V5C 6A8
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CITY OF VANCOUVER
PARKS DEPARTMENT

SEAL

PEER REVIEW

GRADING PLAN

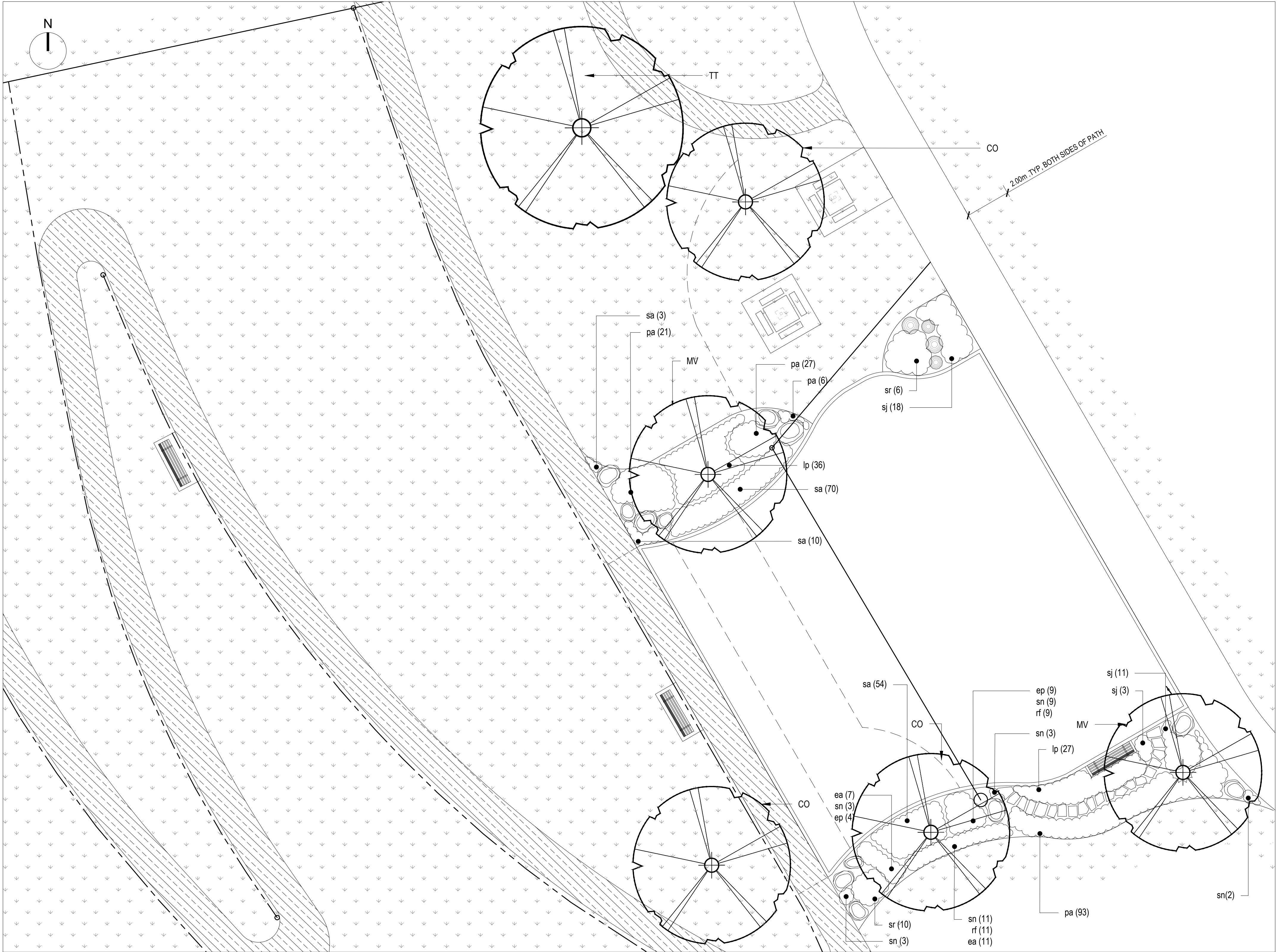
CHINA CREEK NORTH PARK

DRAWING No.

Scale: 1:100

L4.0

SHEET 8 OF 14



LEGEND

EXISTING TREE TO BE RETAINED

PROPOSED TREE

PROPOSED SHRUB MASS

HYDROSEEDED LAWN

PLANT SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE/COND	SPACING (O.C)
TREES					
CO	3	COTINUS OBOVATUS	CHITTAMWOOD	B+B; MULTI-STEM; 2.5M HT	AS NOTED
MV	2	MAGNOLIA VIRGINIANA	NORTHERN SWEETBAY	B+B; 8cm cal.; 1.8M STD.	AS NOTED
TT	1	TILIA TOMENTOSA	SILVER LINDEN	B+B; 8cm cal.; 1.8M STD.	AS NOTED
SHRUBS					
lp	63	LONICERA PILEATA	BOX-LEAVED HONEYSUCKLE	#2POT/ FULL	0.45m
pa	147	PENNISETUM ALOPECUROIDES	FOUNTAIN GRASS	#2POT/ FULL	0.45m
sa	137	SESLERIA AUTUMNALIS	AUTUMN MOOR GRASS	#2POT/ FULL	0.3m
sr	16	CALAMAGROSTIS X ACUTIFLORA	'KARL FOERSTER' FEATHER REED GRASS	#2POT/ FULL	0.75m
sj	32	SPIRAEA JAPONICA 'CRISPA'	JAPANESE SPIREA	#2POT/ FULL	0.45m
cs	23	CORNUS STOLONIFERA*	YELLOW TWIG DOGWOOD	#3POT/ FULL	1.0m
PERENNIALS					
ea	18	ASTILBE ARENDSII 'ERIKA'	ERIKA ASTILBE	#2POT/ FULL	0.3m
ep	13	ECHINACEA 'POWWOW BERRY'	CONEFLOWER 'POWWOW BERRY'	#2POT/ FULL	0.3m
rf	20	RUDBECKIA FULGIDA 'GOLDSTURM'	BLACK-EYED SUSAN 'GOLDSTURM'	#2POT/ FULL	0.3m
sn	31	SALVIA NEMOROSA 'AMETHYST'	SAGE 'AMETHYST'	#2POT/ FULL	0.3m

PLANTING NOTES

1. STAKE OUT LOCATION OF TREES AND PLANTING BEDS, AND OBTAIN APPROVAL FROM CITY REPRESENTATIVE PRIOR TO EXCAVATION. MAKE ADJUSTMENTS AS NECESSARY.

2. THE CONTRACTOR SHALL ENSURE COORDINATION WITH BC ONE CALL AT 1-800-474-6886 AND OTHER UTILITIES AS REQUIRED TO STAKE ALL BELOW GRADE UTILITIES. CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES TO UTILITIES.

3. HAND DIG ONLY WHEN CLOSER THAN 1.0m FROM U.G. POWER, TELEPHONE AND GAS ALIGNMENTS.

4. HAND DIG ONLY WITHIN DRIP LINE OF EXISTING TREES.

5. ALL PLANT MATERIAL HAVE BEEN SPECIFIED ACCORDING TO CANADIAN NURSERY AND LANDSCAPE ASSOCIATION STANDARDS FOR NURSERY STOCK AND BC LANDSCAPE STANDARD (7TH EDITION).

6. ALL TREE STAKES TO BE 1.0m MIN CLEARANCE FROM U/G POWER, TELEPHONE AND GAS ALIGNMENTS

7. IF MINIMUM UTILITY SETBACKS PERMIT, POSITION TREE STAKES IN DIRECTION OF PREVAILING WINDS.

8. IN MIXED PLANTING BEDS, PLANT SAME SPECIES PLANTS IN SINGLE MASSES.

9. HYDROSEED ALL DISTURBED LAWN AREAS.

* PLANT LOCATED AT CONCRETE STEPS (SEE L6.4)

1

L5.0

HILLSIDE PLAYGROUND PLANTING PLAN

1:100

BENCH MARK :

6

###

###

5

###

###

4

APR 27, 2018

ISSUED FOR TENDER

3

JAN 12, 2018

95% DETAIL DESIGN

2

OCT 18, 2017

75% DETAIL DESIGN

1

AUG 8, 2017

50% DETAIL DESIGN

REV.

DATE

REVISION

DESIGNED BY: AR

DRAWN BY: LN

CHECKED BY: AR

APPROVED BY: AR

DATE: October 18, 2017

ISL

Engineering and Land Services

#503, 4190 Lougheed Hwy,
Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

VANCOUVER

BOARD OF PARKS AND RECREATION

CITY OF VANCOUVER
PARKS DEPARTMENT

SEAL

PEER REVIEW

PLANTING AREAS

CHINA CREEK NORTH PARK

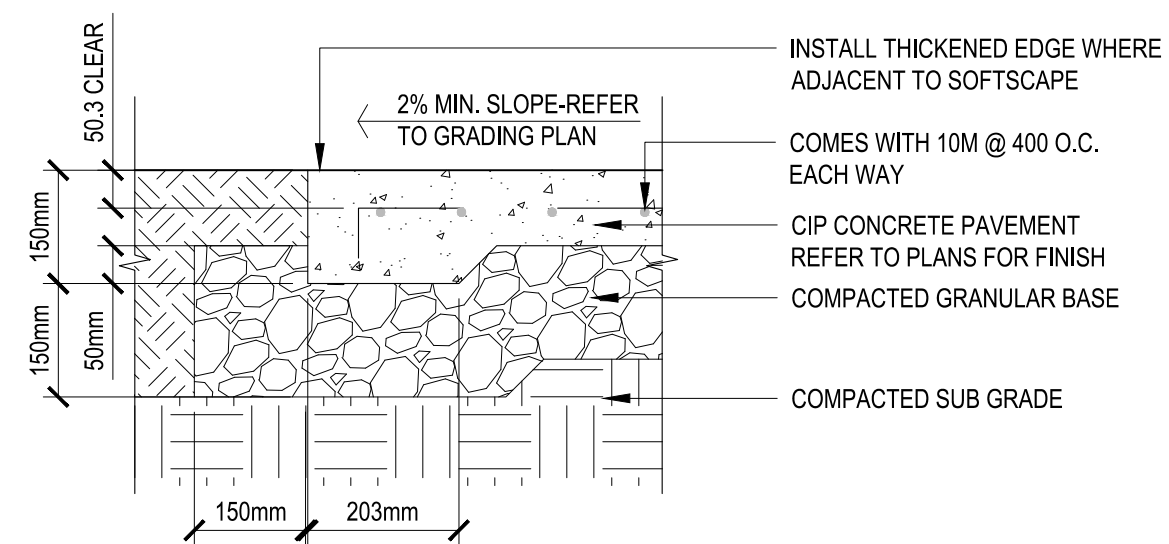
DRAWING No.

Scale: 1:100

L5.0

SHEET 9 OF 14

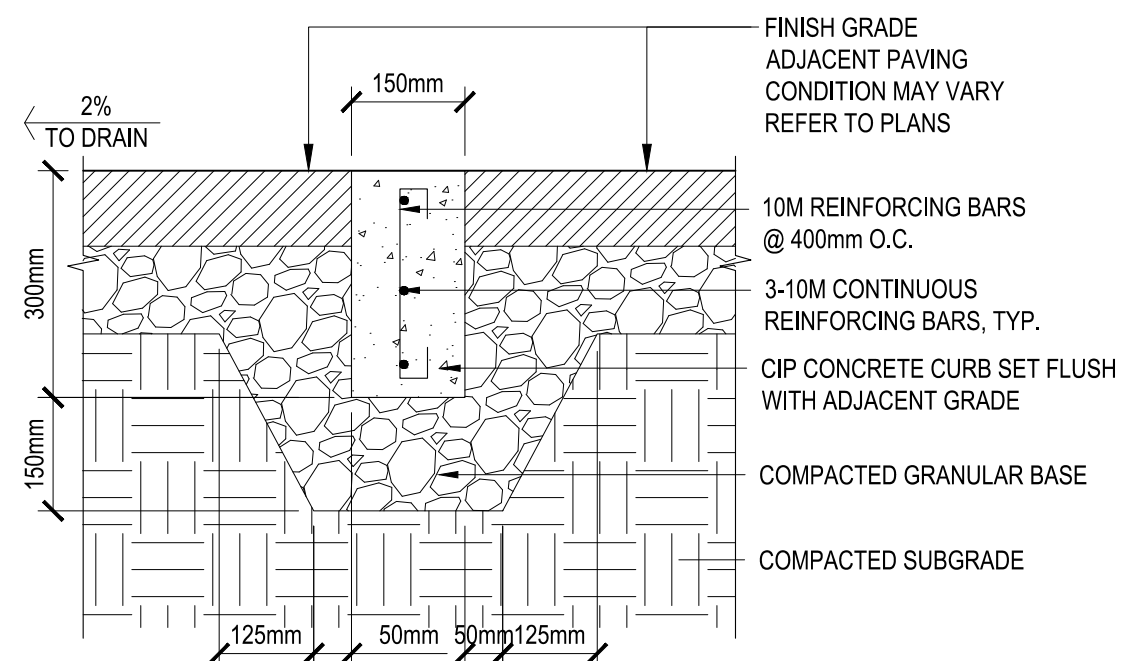
File : N:\Projects\31664 cov china creek playground\02_CADD\20_drafting\204_Landscape Design\L5.0 Planting Plan.dwg



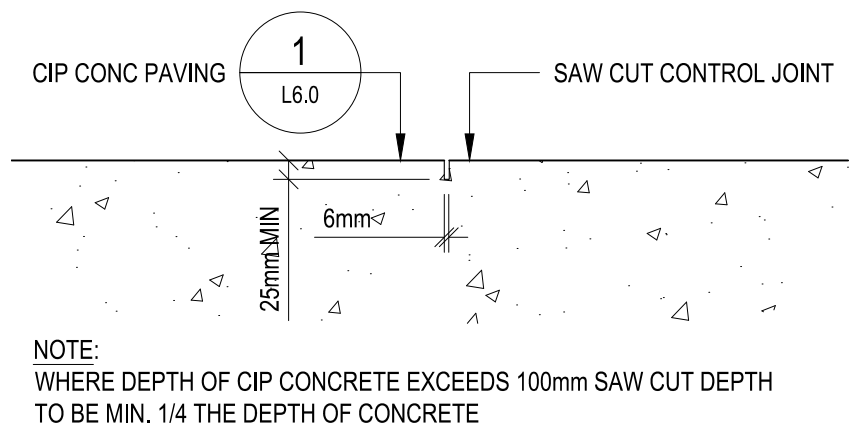
NOTE:

1. CONTROL JOINTS TO BE PROVIDED 1.5m MIN. O.C. UNLESS SHOWN OTHERWISE ON PLAN, NO TROWEL MARKS.
2. EXPANSION JOINTS WITH FIBREBOARD TO BE PROVIDED 6m MAX. O.C. AND AT INTERFACE WITH STRUCTURES SUCH AS WALLS, STEPS, AND CURBS
3. REFER TO DETAIL 3 AND 4 FOR CONTROL AND EXPANSION JOINT DETAILS

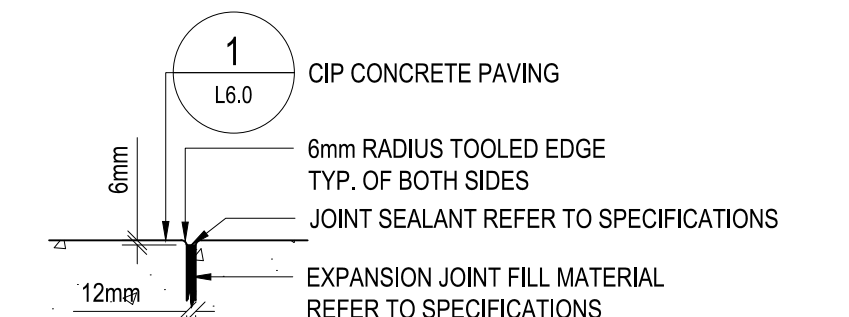
1 CIP CONCRETE PAVEMENT
SECTION 1:10



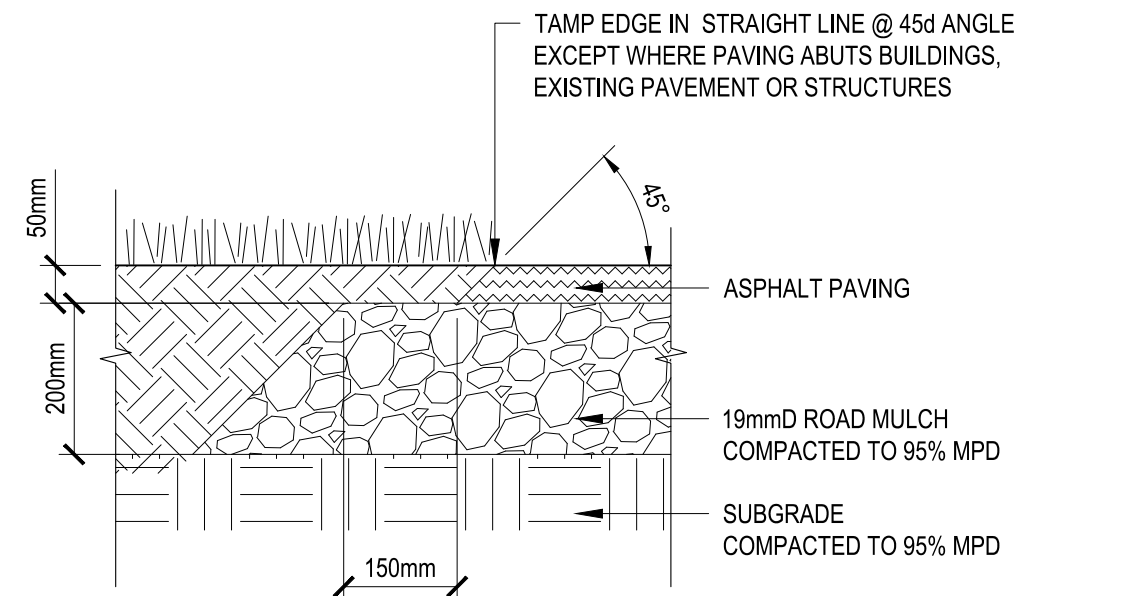
2 CONCRETE BAND
SECTION 1:10



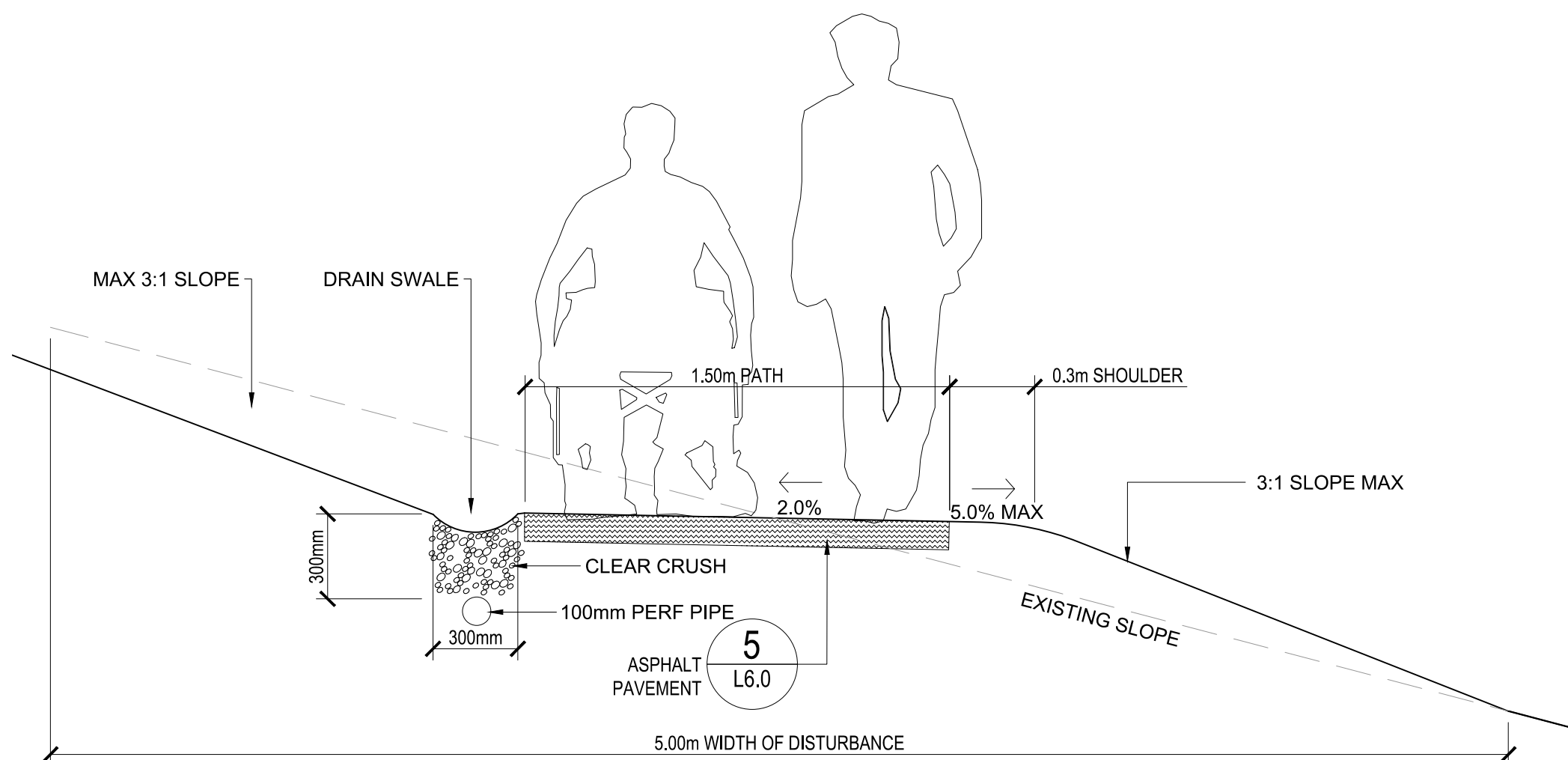
3 CONTROL JOINT
SECTION 1:10



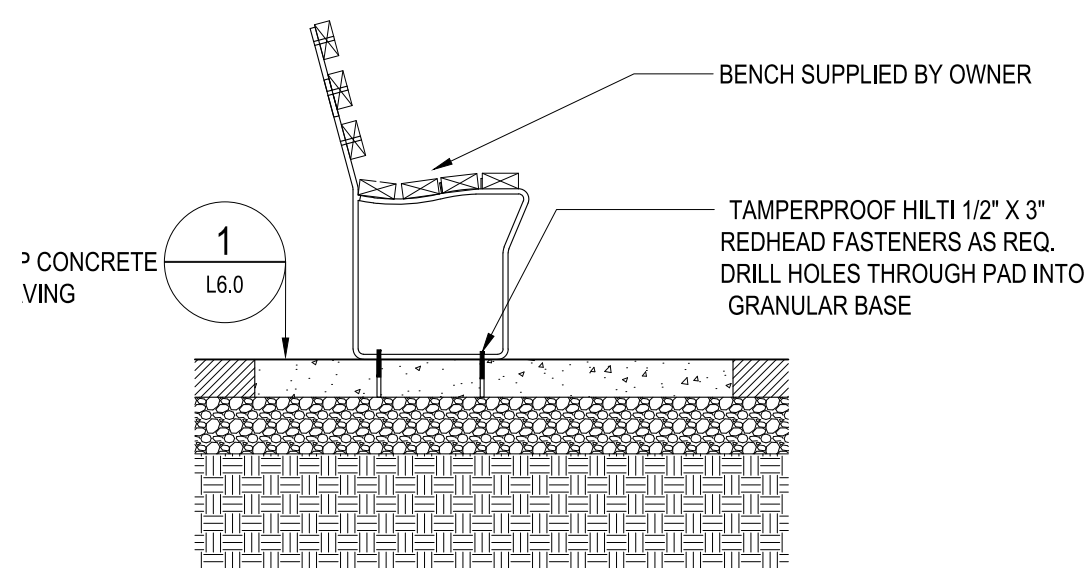
4 EXPANSION JOINT
SECTION 1:10



5 ASPHALT PAVEMENT
SECTION 1:10



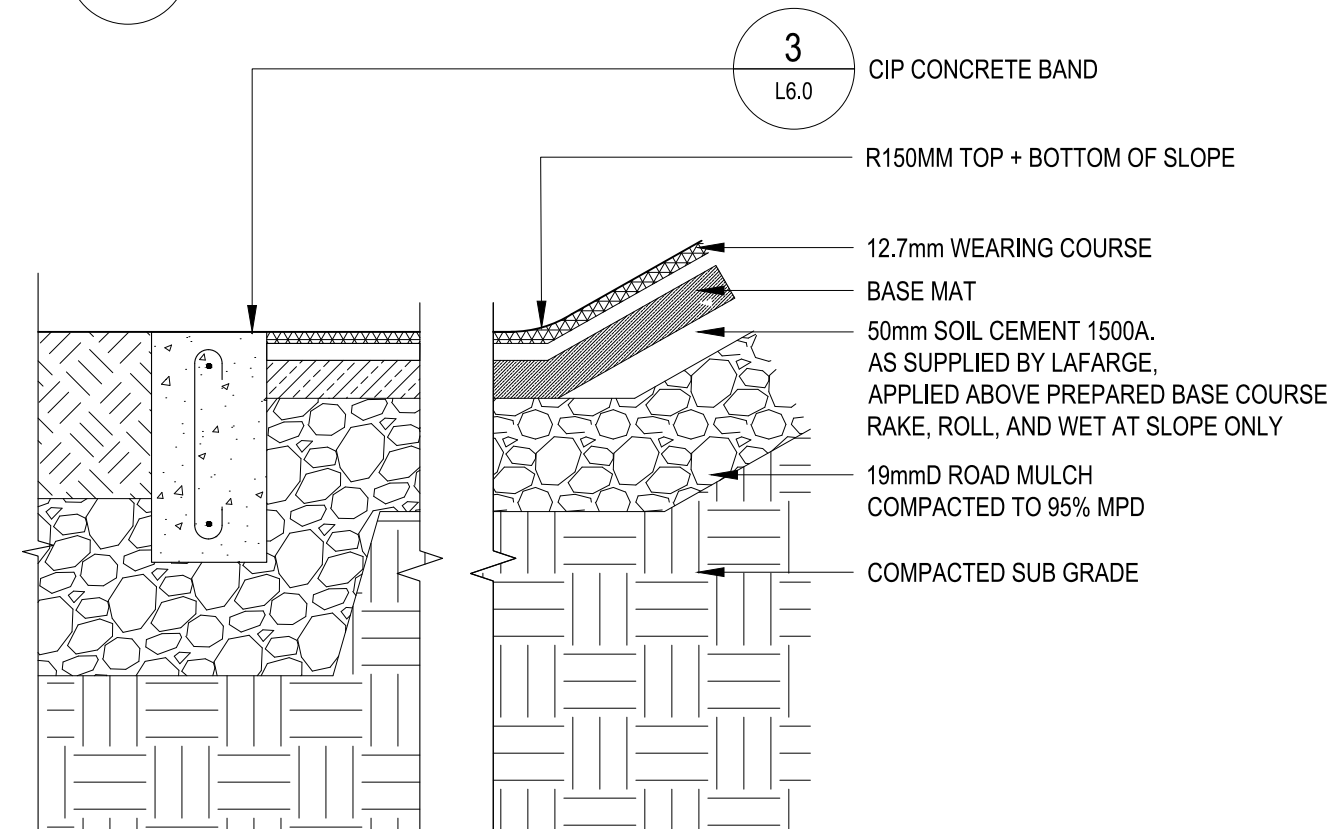
6 ACCESSIBLE PATH
SECTION 1:20



NOTE:

1. BENCH TO BE PROVIDED BY OWNER
2. BENCH CONNECTION TO CIP CONCRETE BASE WITH TAMPERPROOF HILTI 1/2" X 3" REDHEAD FASTENERS AS REQ

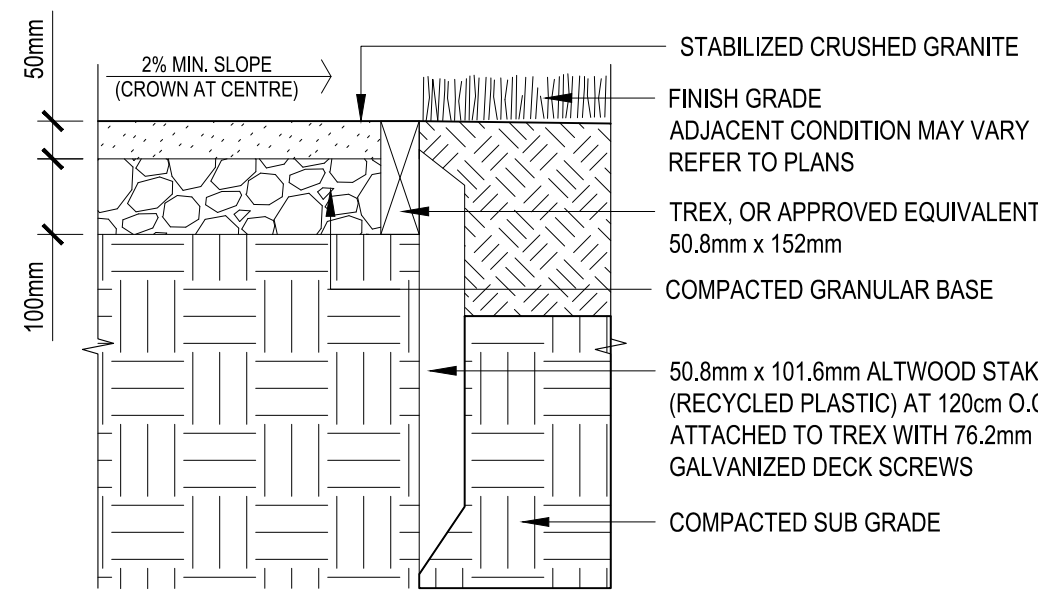
10 BENCH
SECTION 1:20



NOTES:

1. POURED-IN-PLACE RUBBER PROVIDED BY LANDSAFE SUPPLIER MARATHON ATHLETIC SURFACES, OR APPROVED EQUAL. REFER TO SUPPLIER SPECIFICATIONS AND RECOMMENDATIONS.
2. ALL DEPTHS TO BE AS PER MANUFACTURER'S RECOMMENDATIONS.



7 RUBBERIZED SURFACING
SECTION 1:10



8 GRAVEL SURFACING
SECTION 1:10



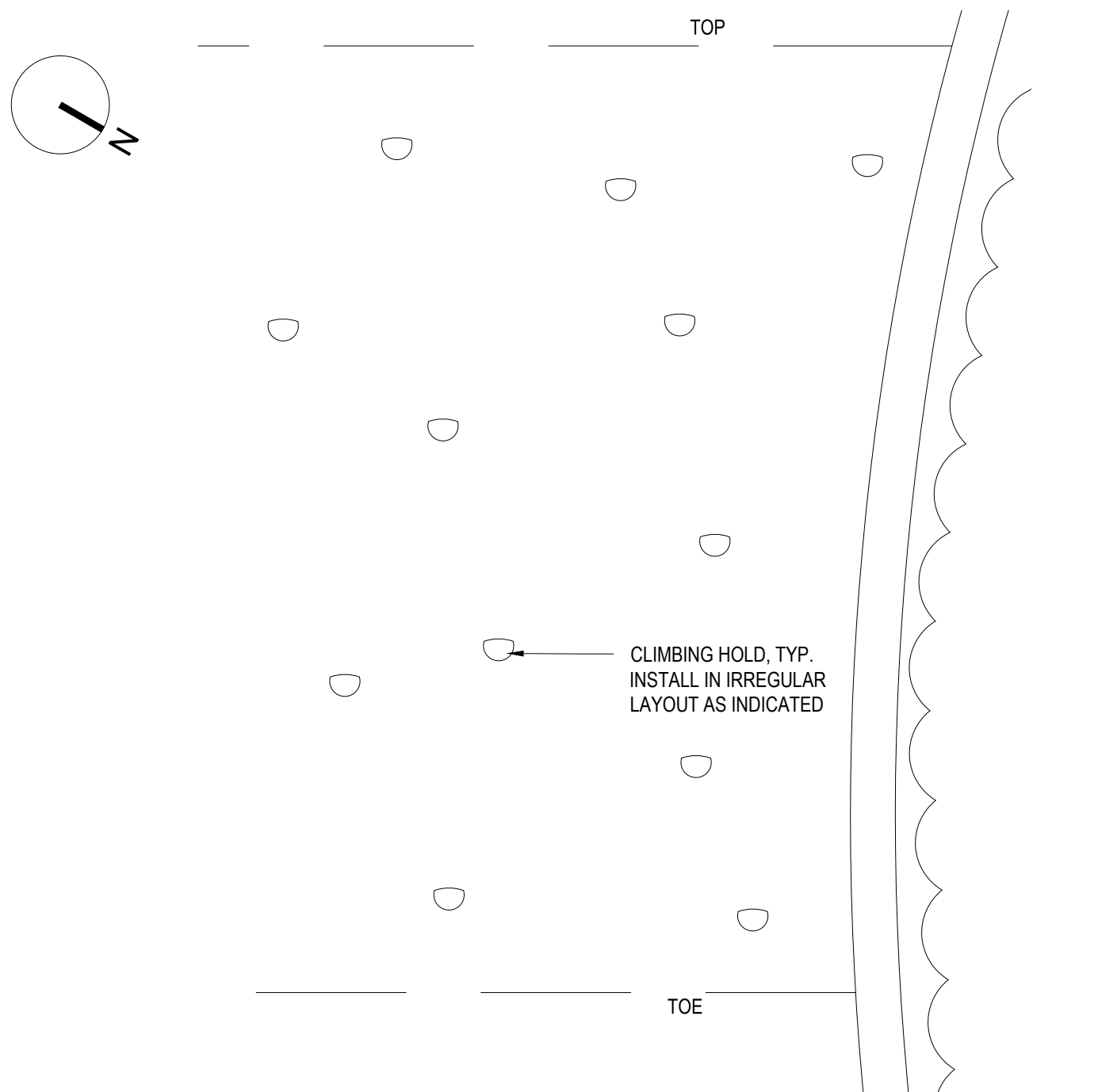
9 RUBBERIZED SURFACING PATTERN
PLAN 1:100

BENCH MARK :	6	###	###	DESIGNED BY: AR	DRAWN BY: LN	<div> #503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698</div> <div> CITY OF VANCOUVER PARKS DEPARTMENT</div>	SEAL	PEER REVIEW	DETAILS 1	CHINA CREEK NORTH PARK	DRAWING No. _____ Scale: _____
	5	###	###								
	4	APR 27, 2018	ISSUED FOR TENDER								
	3	JAN 12, 2018	95% DETAIL DESIGN								
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	REV.	DATE	REVISION								
CHECKED BY: AR						DATE : May 14, 2018					
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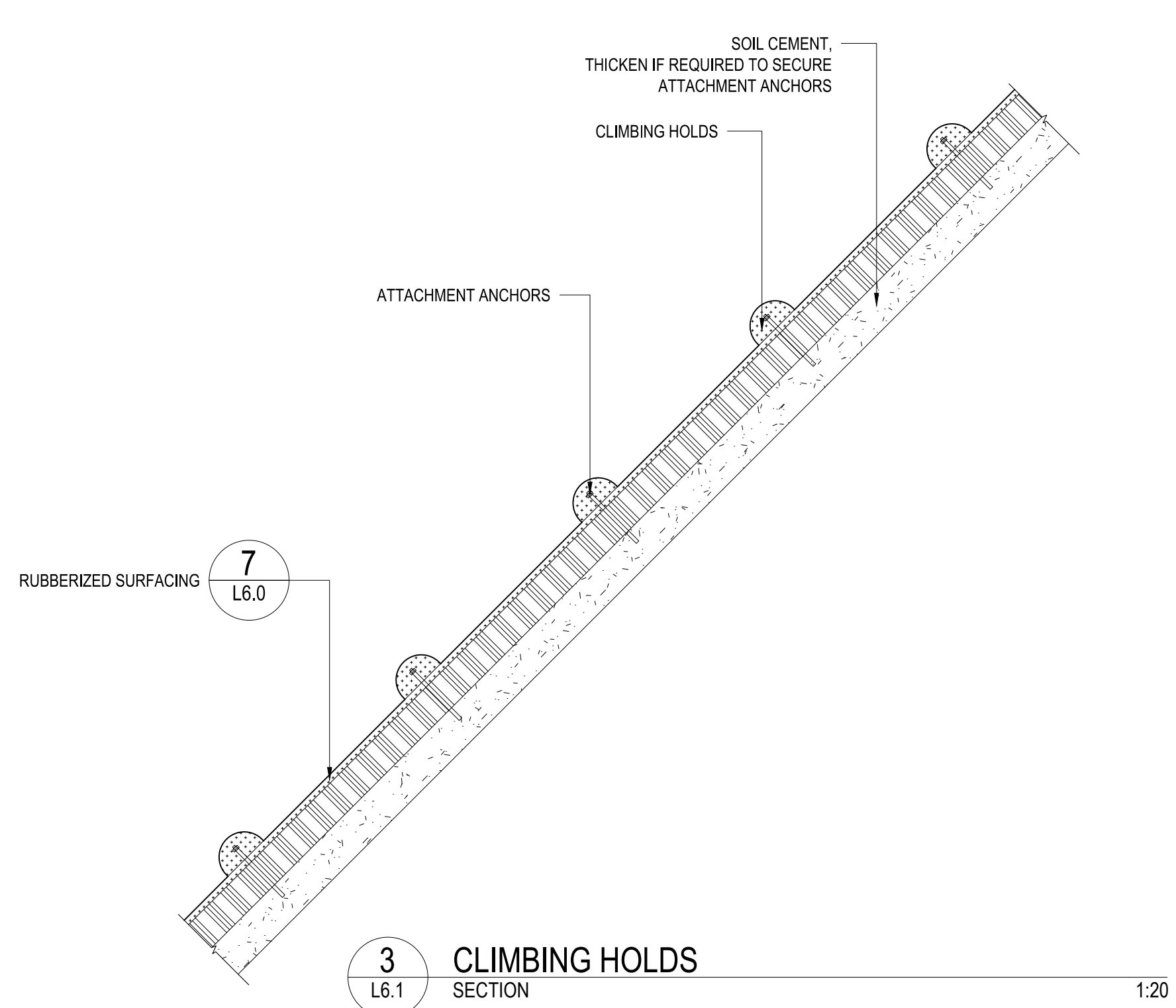


*Above is the 5-12 Molded Bucket Seat w/ Harness. The 2-5 Molded Bucket Seat w/ Harness is the product included in Design 1125533-1-1.

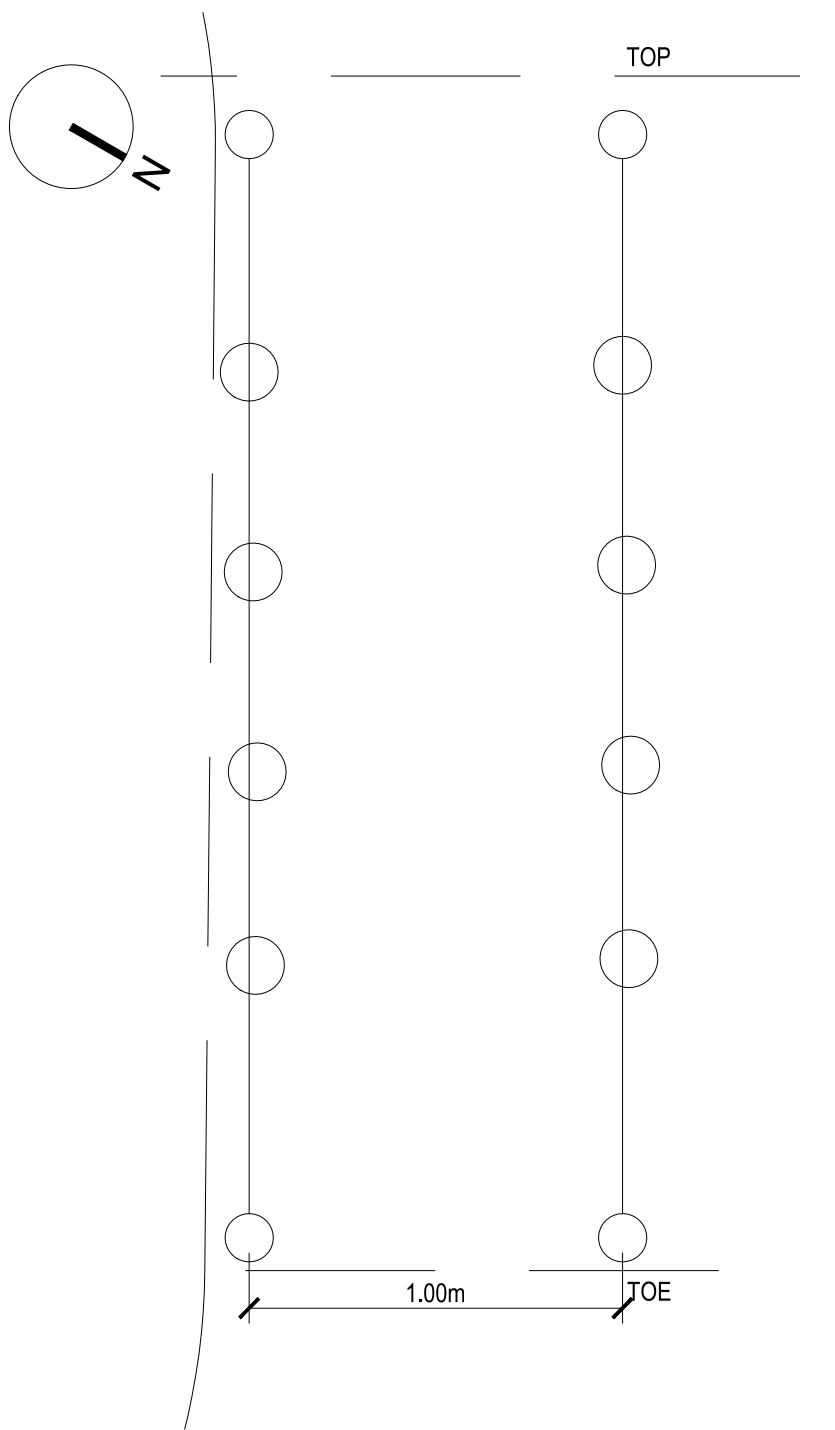
1 SWING (TWO BAY, TWO BELT SWINGS, ONE BUCKET SWING, ONE MOLDED BUCKET SWING)
L6.1 AXONOMETRIC NTS



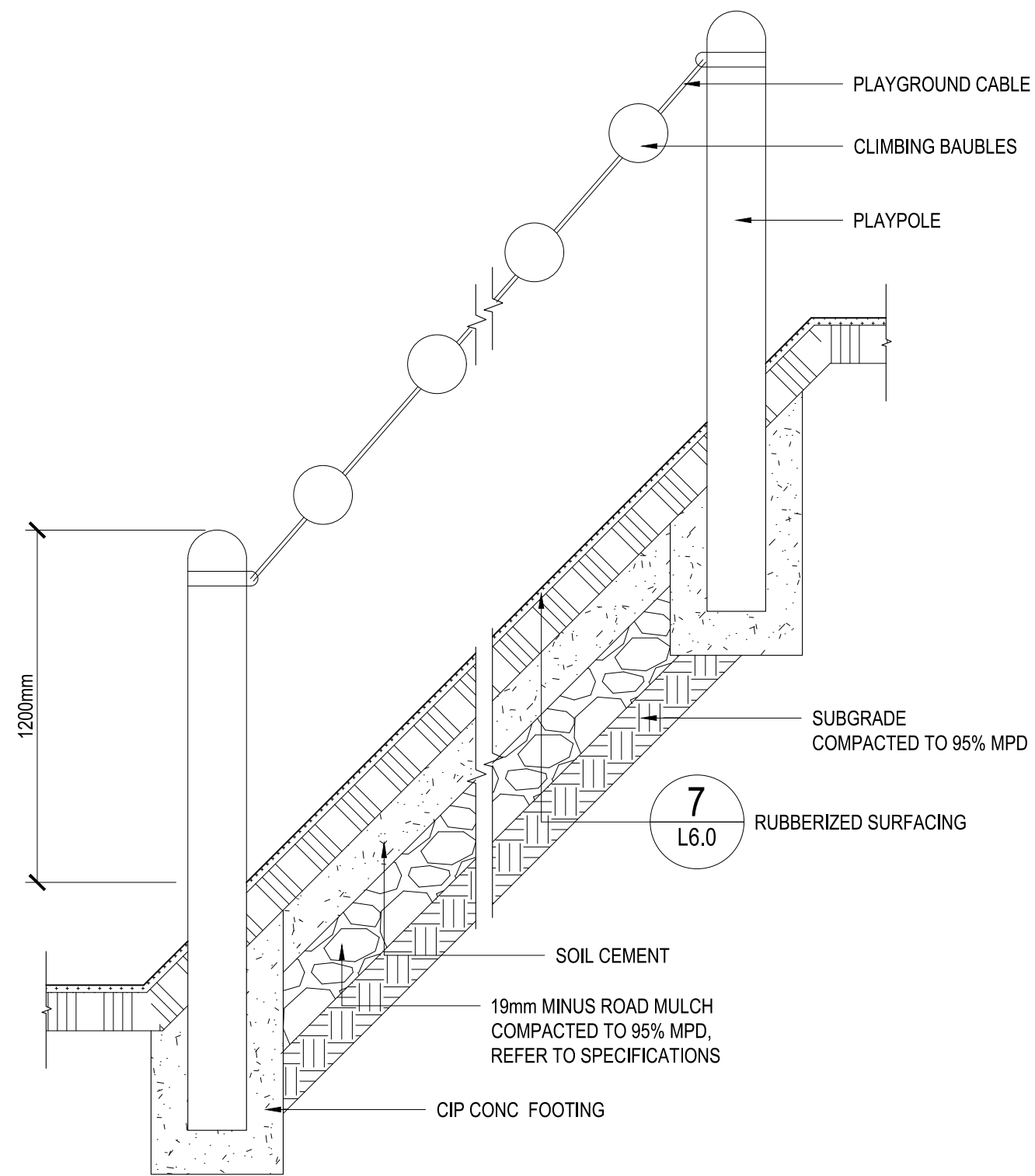
2 CLIMBING HOLDS
L6.1 PLAN 1:20



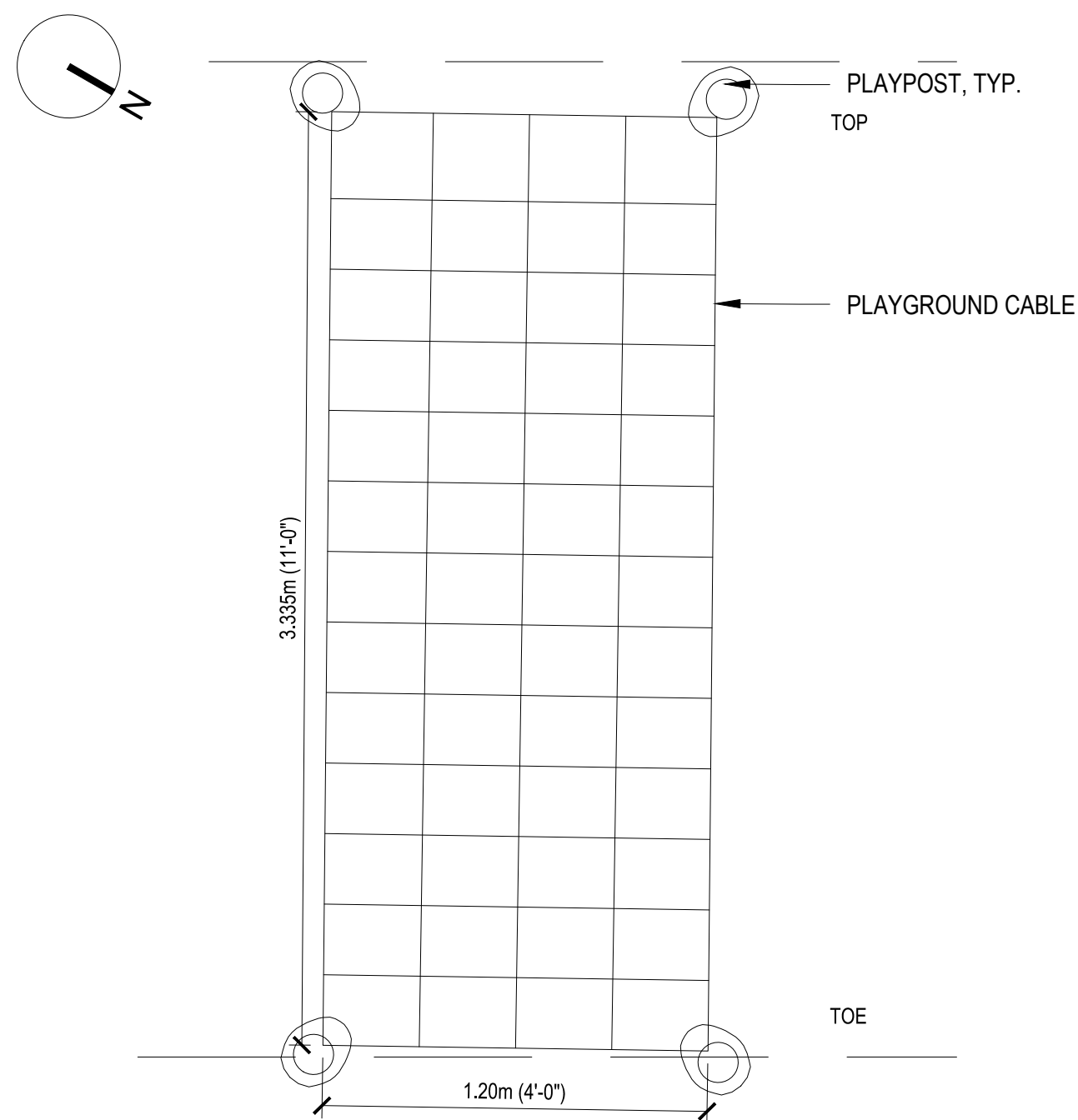
3 CLIMBING HOLDS
L6.1 SECTION 1:20



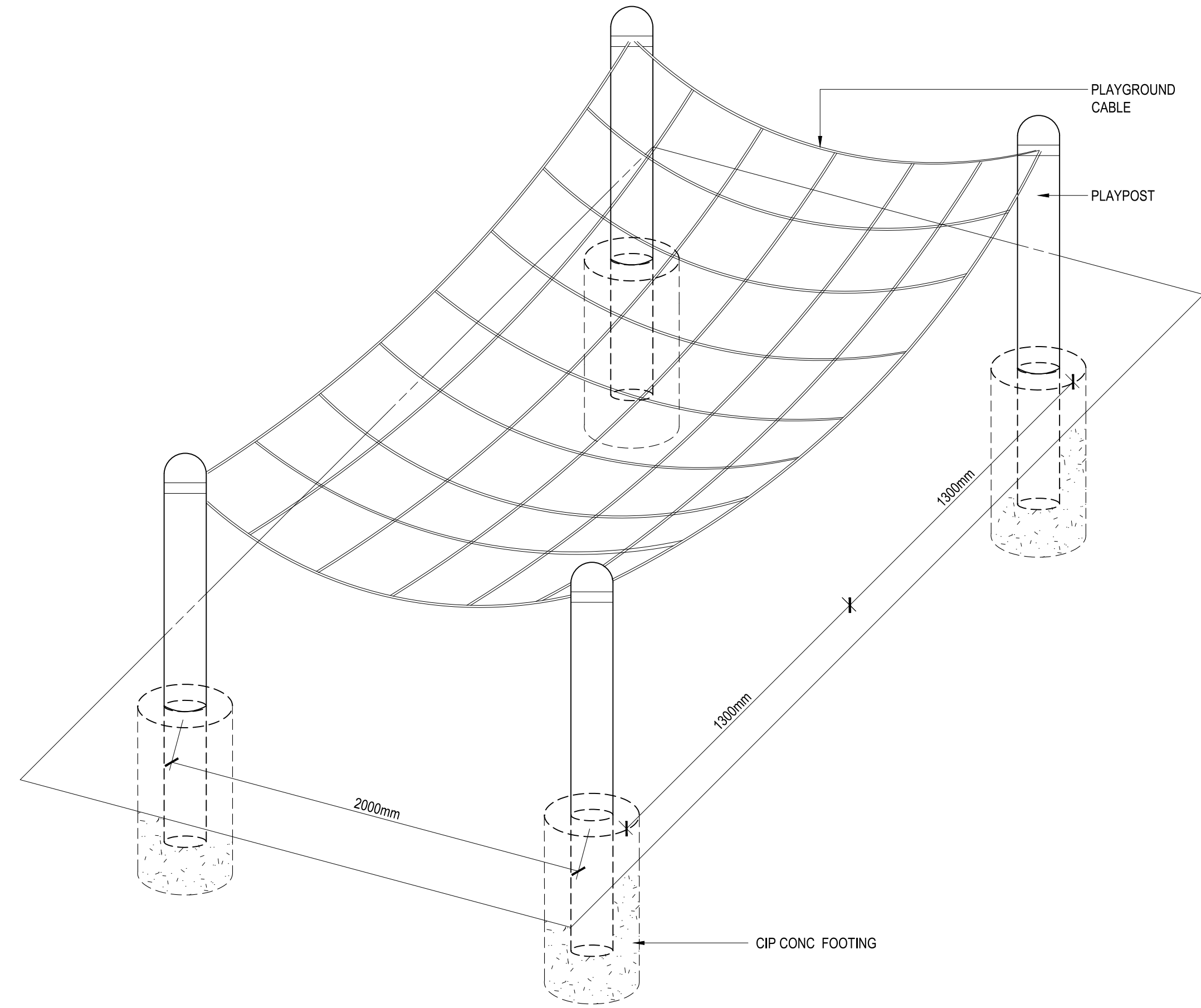
4 ROPE CLIMBER
L6.1 PLAN 1:20





5 ROPE CLIMBER
L6.1 SECTION 1:20

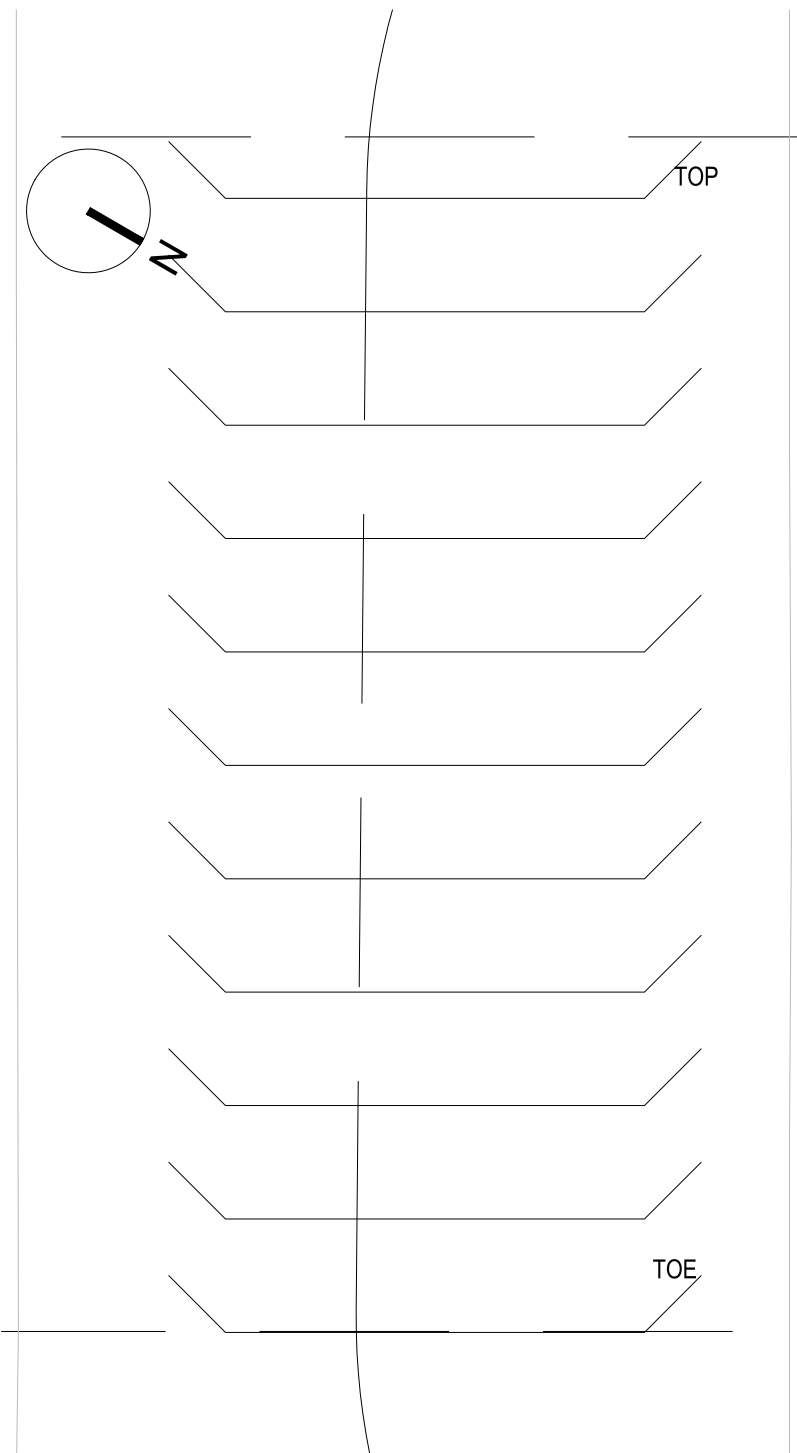


6 NET CLIMBER
L6.1 PLAN 1:20



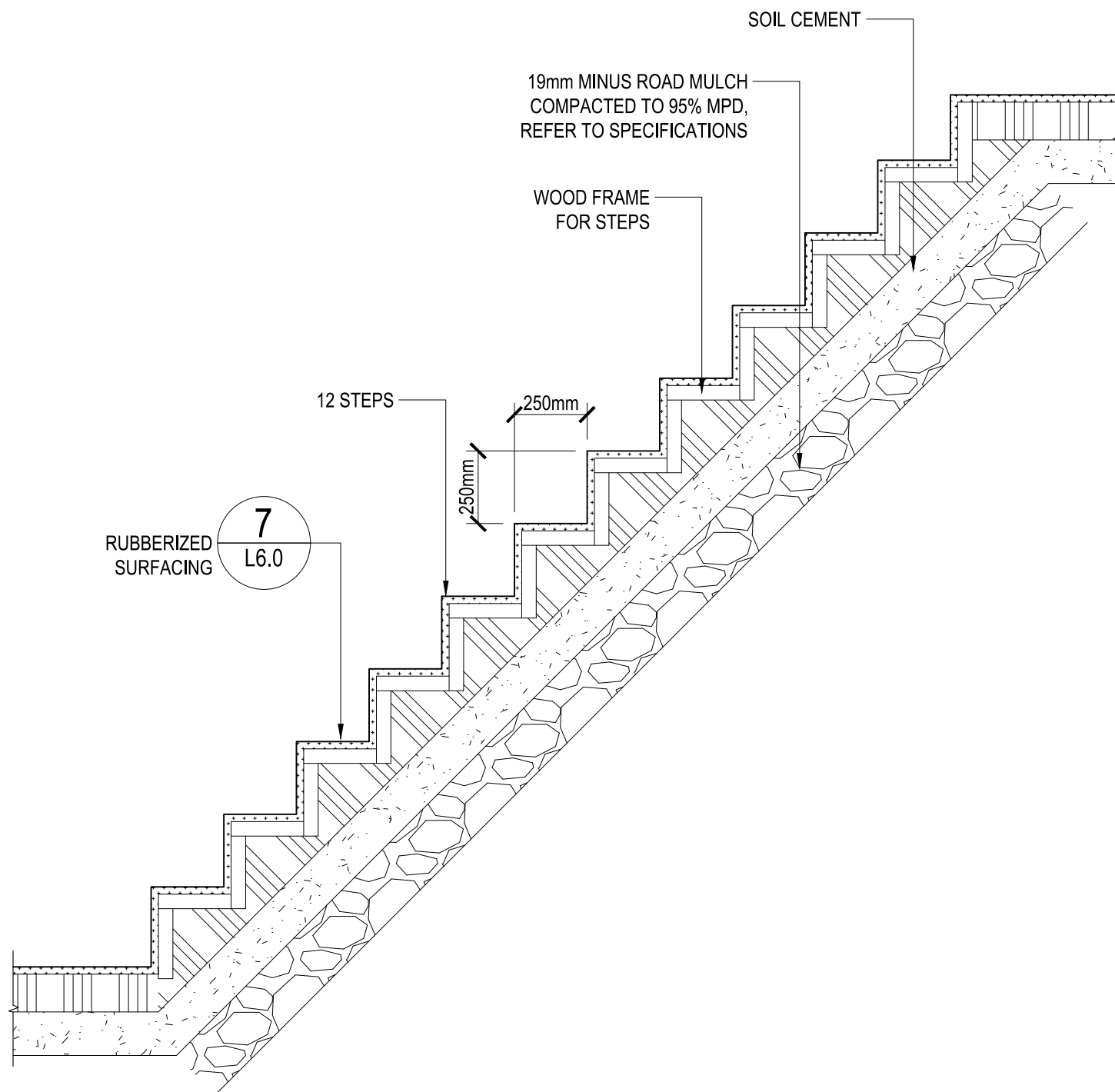
7 NET CLIMBER
L6.1 AXONOMETRIC NTS

BENCH MARK :	6	###	###	DESIGNED BY: AR	DATE : October 18, 2017	 #503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698	 CITY OF VANCOUVER PARKS DEPARTMENT	SEAL	PEER REVIEW	DETAILS 2 CHINA CREEK NORTH PARK	DRAWING No. L6.1 SHEET 11 OF 14
	5	###	###								
	4	APR 27, 2018	ISSUED FOR TENDER								
	3	JAN 12, 2018	95% DETAIL DESIGN								
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	1	AUG 8, 2017	50% DETAIL DESIGN								
REV.	DATE	REVISION		APPROVED BY: AR							



1 HILL STEPS
L6.2 PLAN

1:20



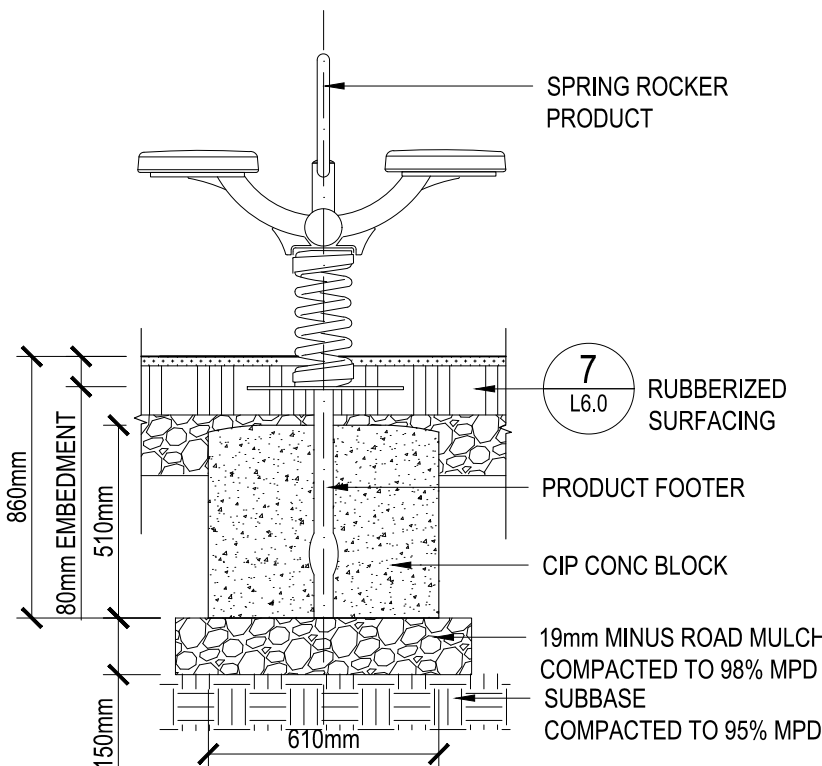
2 HILL STEPS
L6.2 SECTION

1:20



3 PLAY STRUCTURE
L6.2 AXONOMETRIC

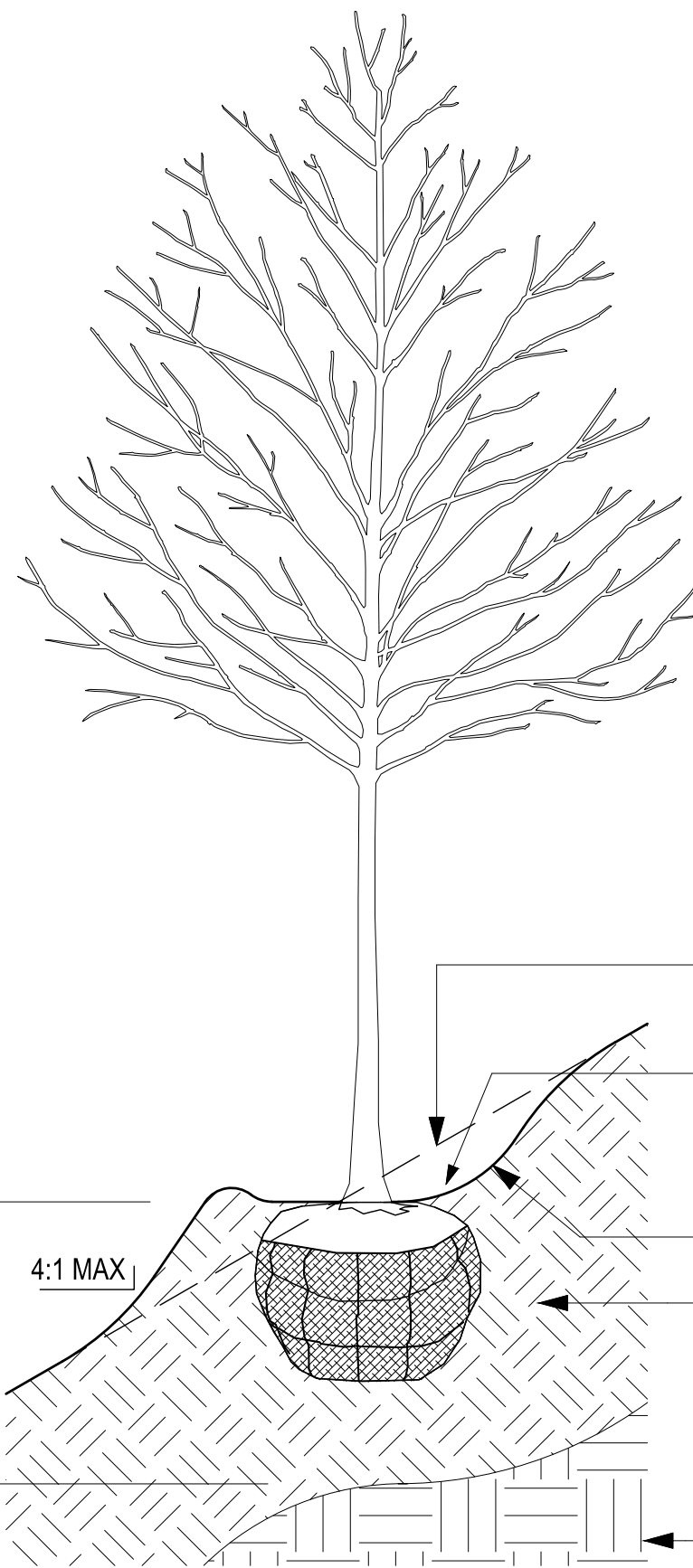
NTS



NOTE: PRODUCT TO BE ASSEMBLED & INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS.

4 SPRING TOY
L6.2 SECTION

1:20





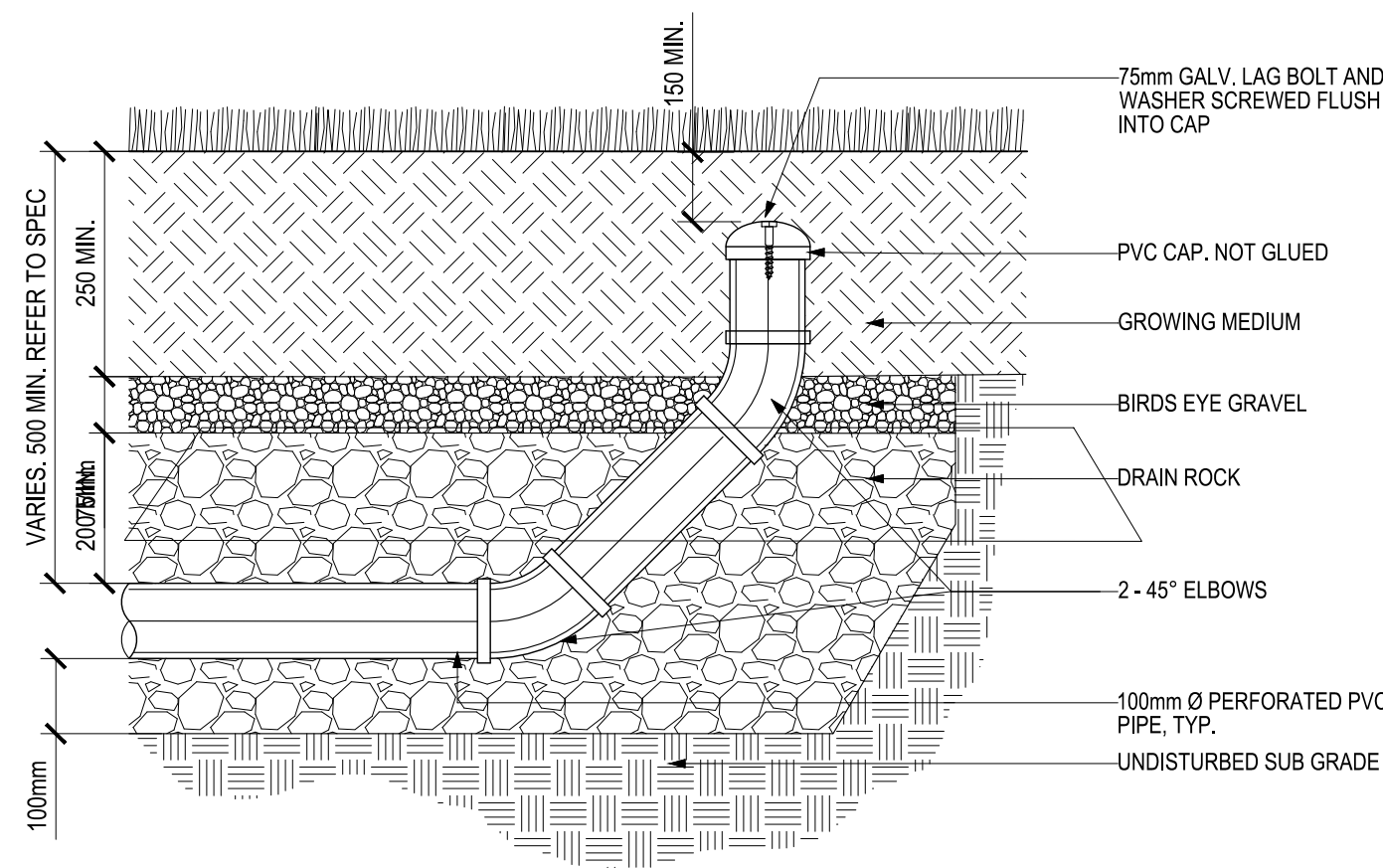
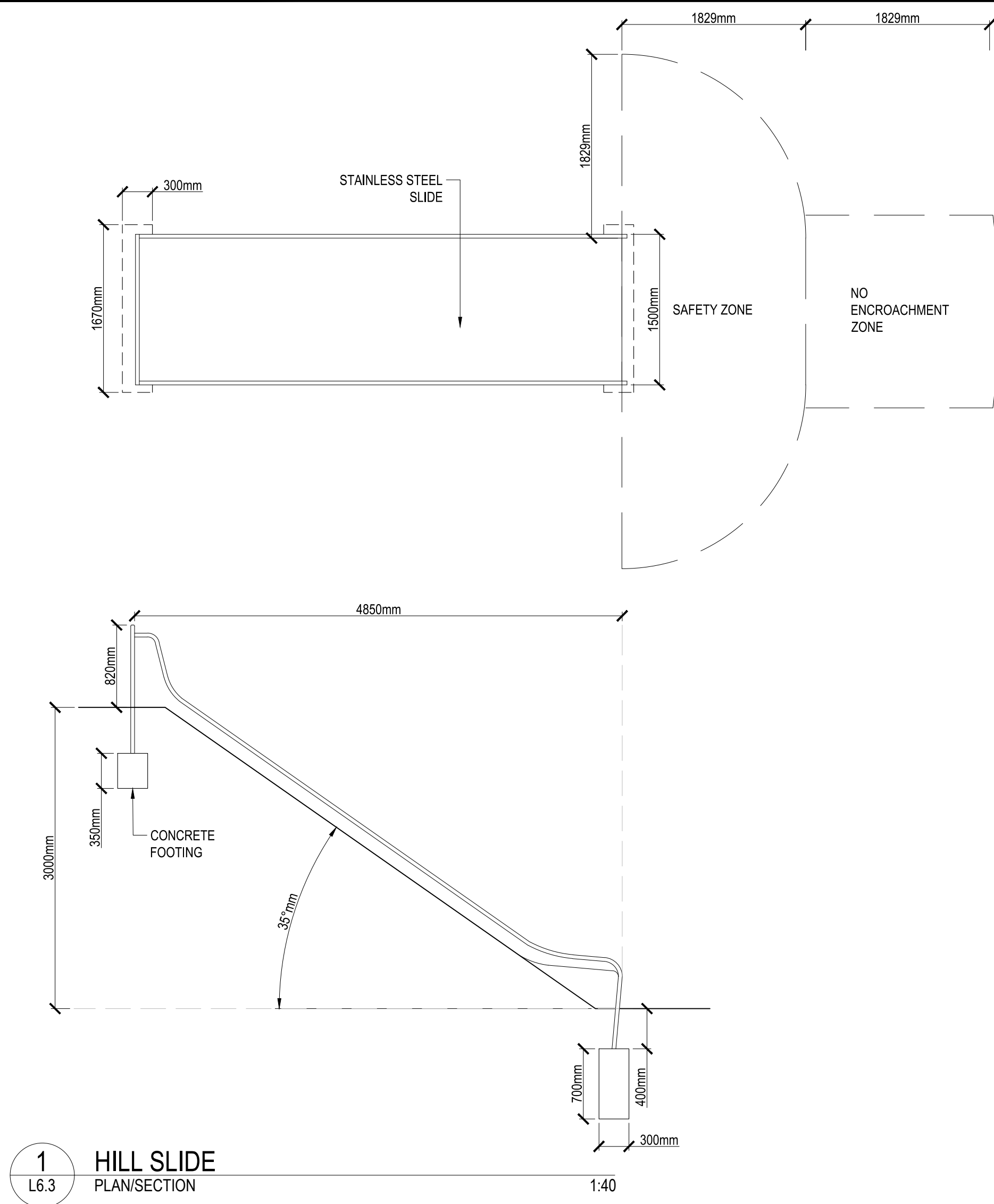
NOTES:

1. TREE TO BE PLANTED WITH ELEVATION OF TOP OF ROOTBALL. LEVEL WITH FINISH GRADE ELEVATION.
2. COMPOSTED BARK MULCH TO BE KEPT AT LEAST 100mm AWAY FROM BASE OF TREE TRUNK.
3. ONLY PRUNE BROKEN OR DAMAGED BRANCHES USING APPROVED PRUNING TOOLS AND STANDARD I.S.A. PRUNING PRACTICES AS DIRECTED BY CONSULTANT OR PROJECT ARBORIST. SEE SPECIFICATIONS.
4. PLANTING PIT MUST BE FREE DRAINING.

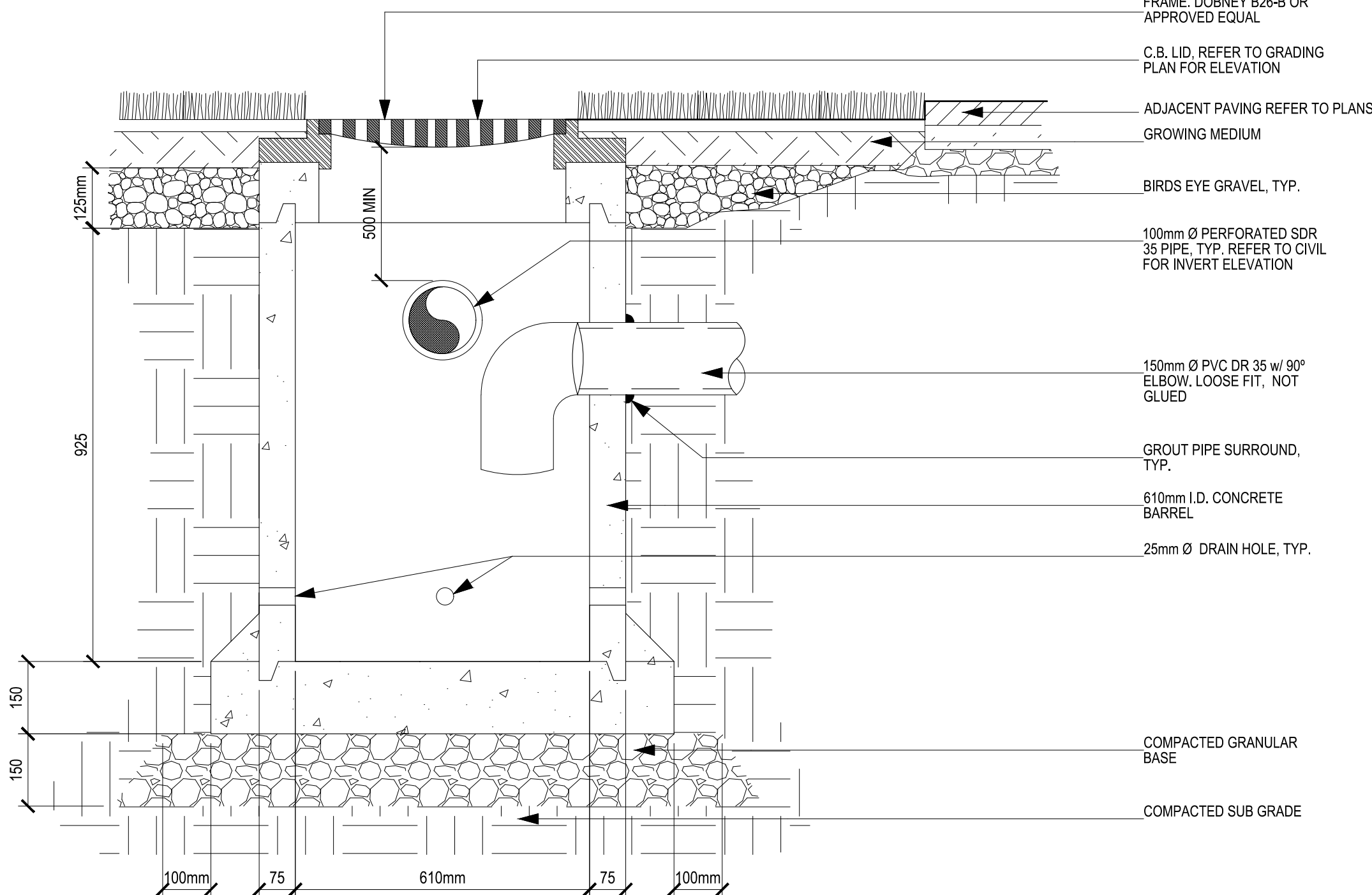
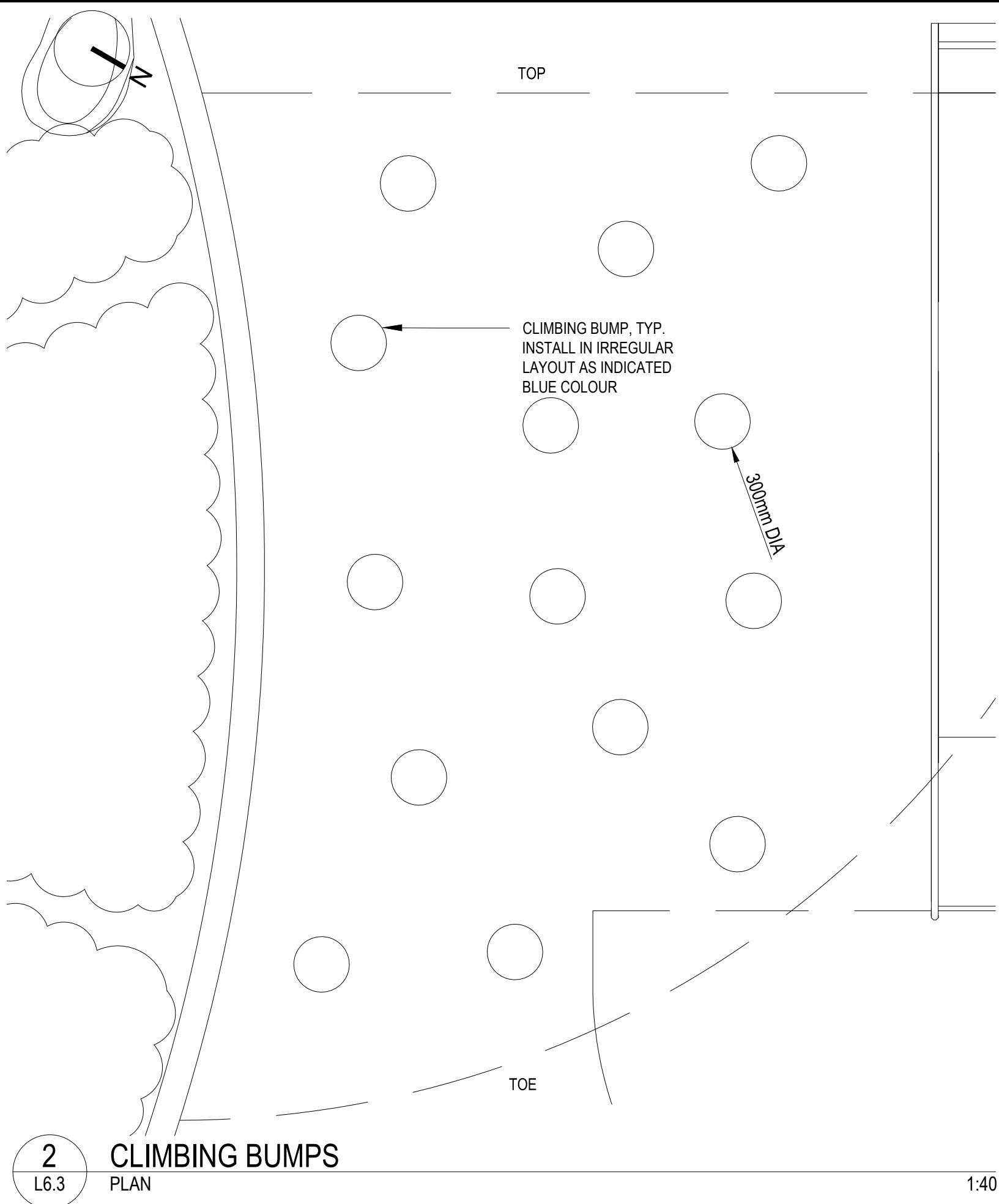
5 TREE ON SLOPE
L6.2 SECTION

1:20

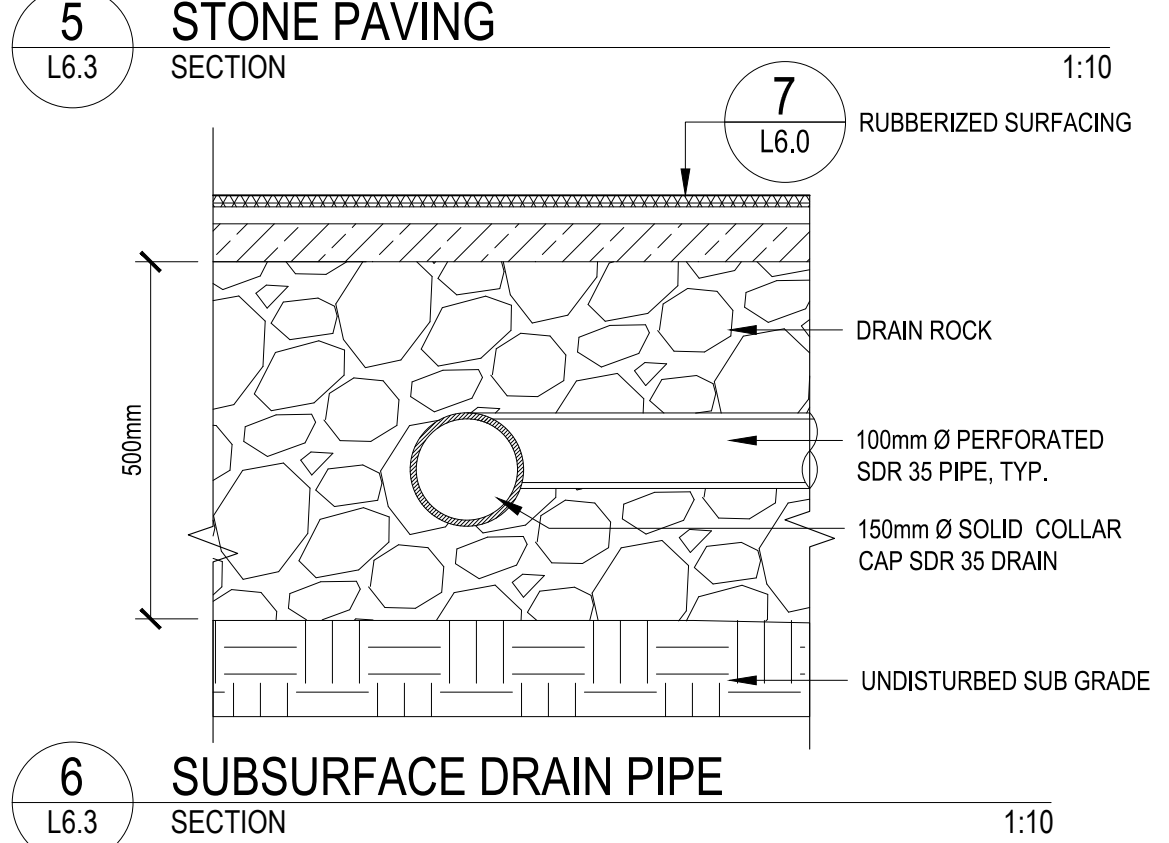
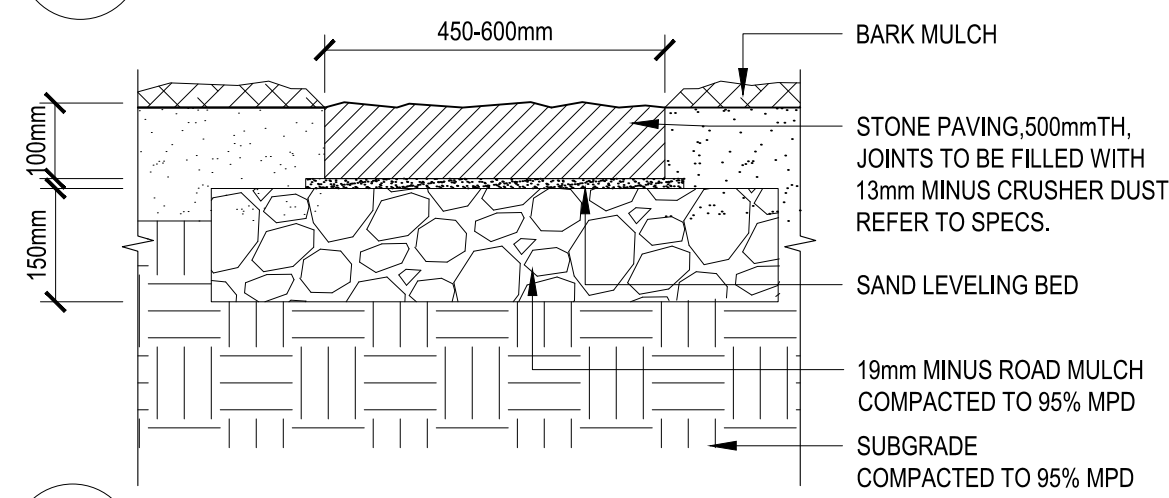
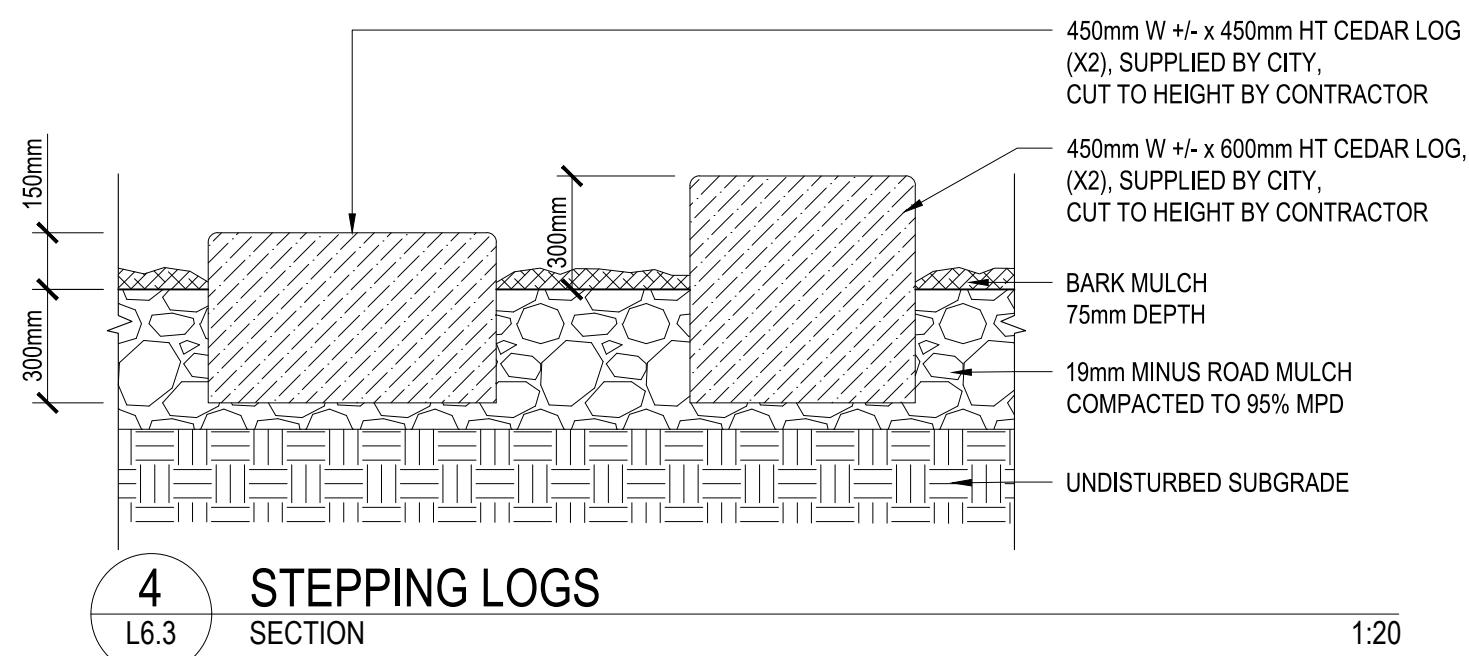
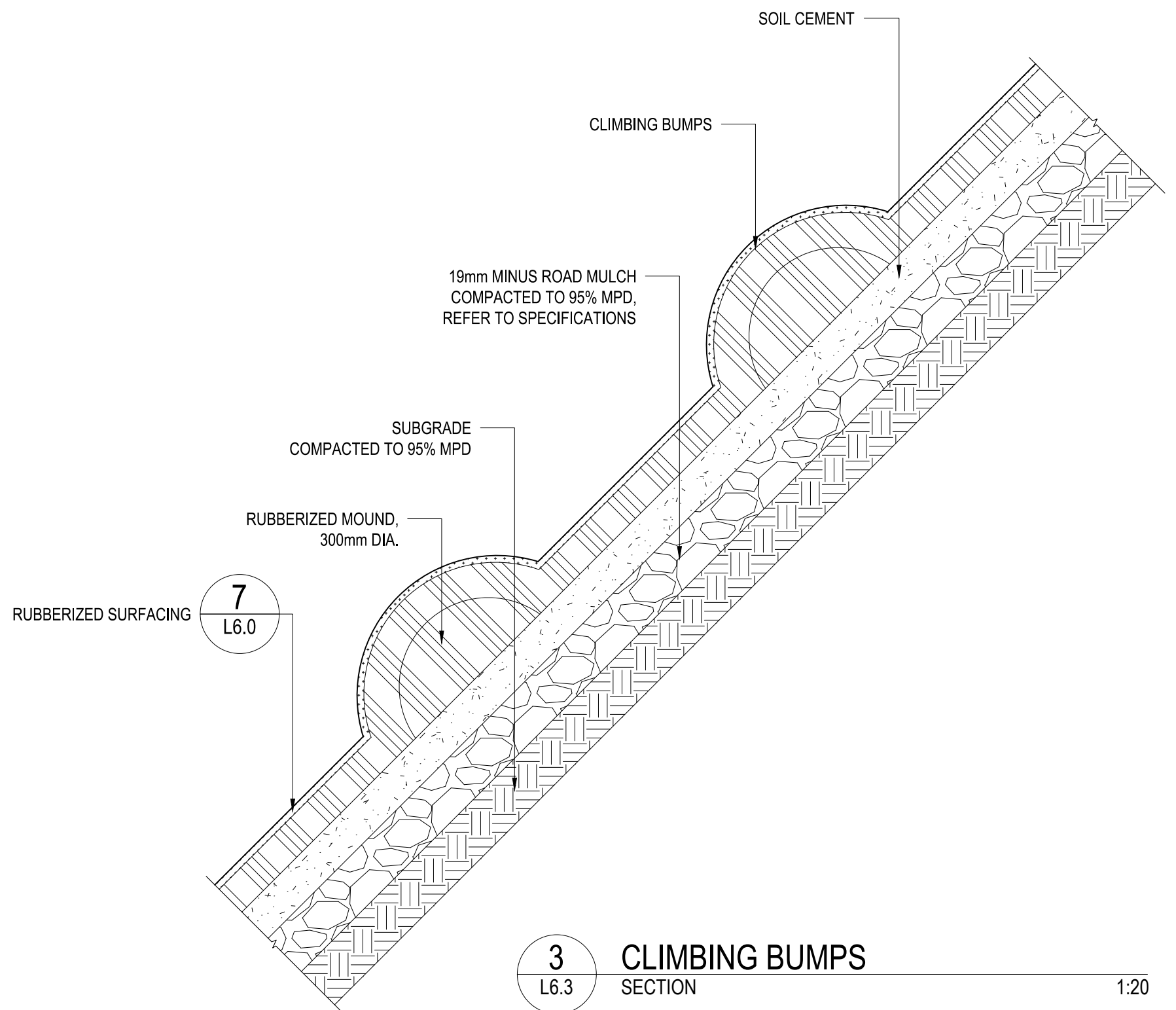
BENCH MARK :	6	###	###	DESIGNED BY: AR	DRAWN BY: LN	 #503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698	 CITY OF VANCOUVER PARKS DEPARTMENT	SEAL	PEER REVIEW	DETAILS 2	CHINA CREEK NORTH PARK	DRAWING No. L6.2	SHEET 11 OF 14
	5	###	###										
	4	APR 27, 2018	ISSUED FOR TENDER										
	3	JAN 12, 2018	95% DETAIL DESIGN										
	2	OCT 18, 2017	75% DETAIL DESIGN										
	1	AUG 8, 2017	50% DETAIL DESIGN										
	REV.	DATE	REVISION										



NOTE:
1. ALL TRENCHES TO BE MINIMUM OF 600mm AWAY FROM FROM HARDSCAPE



NOTE:
1. GRADE ALL AREAS 1.5% - 2% SLOPE TOWARDS THE CATCHBASIN
2. SURFACE OF EXCAVATED AREA TO BE RESOURED NOT SEEDED
3. REQUIRED SIZING OF CATCH BASIN TO BE VERIFIED BY PROJECT REQUIREMENTS.



7 CLEAN OUT SECTION L6.3

8 CATCHBASIN SECTION L6.3

6 SUBSURFACE DRAIN PIPE SECTION L6.3

3 CLIMBING BUMPS SECTION L6.3

4 STEPPING LOGS SECTION L6.3

5 STONE PAVING SECTION L6.3

BENCH MARK :	6	###	###
	5	###	###
	4	APR 27, 2018	ISSUED FOR TENDER
	3	JAN 12, 2018	95% DETAIL DESIGN
	2	OCT 18, 2017	75% DETAIL DESIGN
	1	AUG 8, 2017	50% DETAIL DESIGN
	REV.	DATE	REVISION

DESIGNED BY: AR
DRAWN BY: LN
CHECKED BY: AR
APPROVED BY: AR

DATE : May 14, 2018



#503, 4190 Lougheed Hwy,
Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698



CITY OF VANCOUVER
PARKS DEPARTMENT

SEAL

PEER REVIEW

DETAILS 3

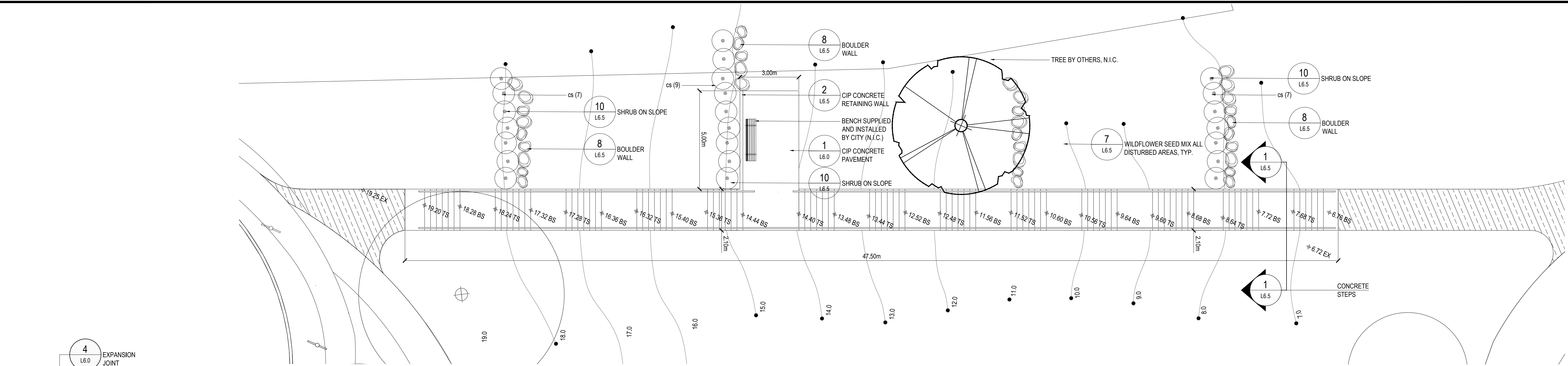
CHINA CREEK NORTH PARK

DRAWING No.

Scale:

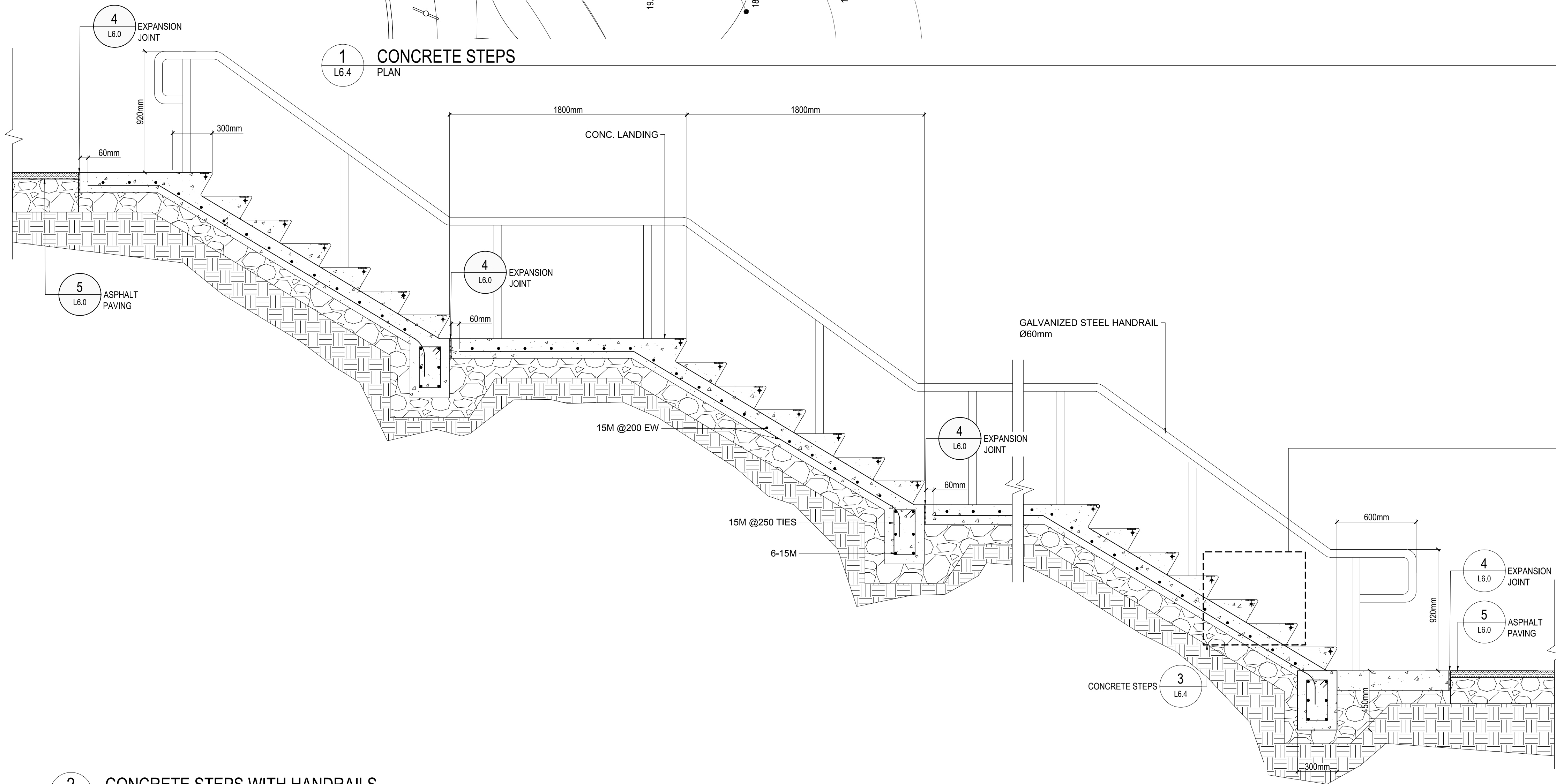
L6.3

SHEET 12 OF 14



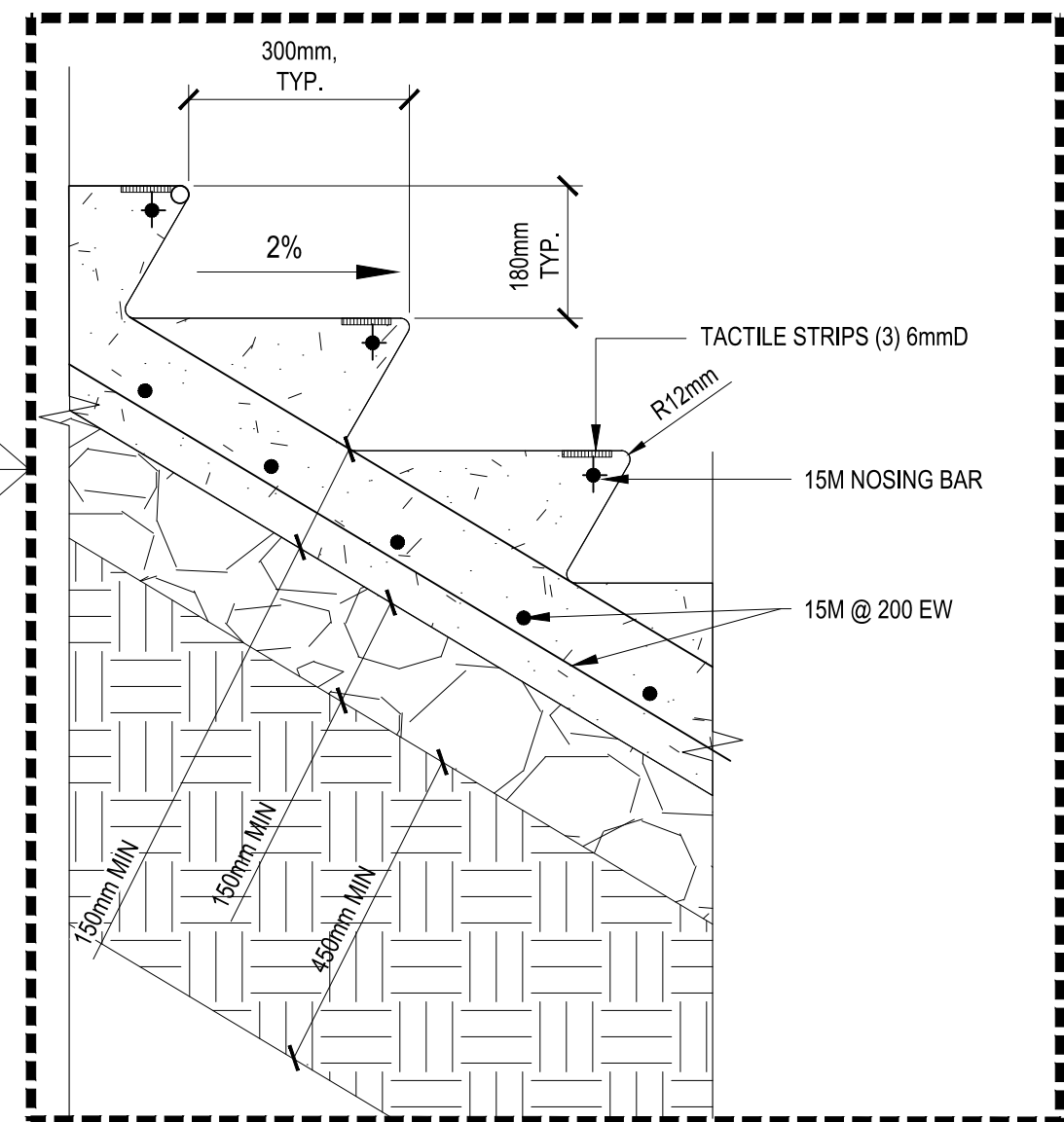
1 CONCRETE STEPS
L6.4 PLAN

1:100





2 CONCRETE STEPS WITH HANDRAILS
L6.4 SECTION

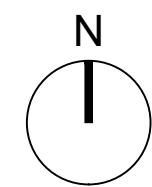
1:20



3 CONCRETE STEPS
L6.4 SECTION

1:10

BENCH MARK :	6	###	###	DESIGNED BY: AR	DRAWN BY: LN	CHECKED BY: AR	DATE : October 18, 2017	 #503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698	 CITY OF VANCOUVER PARKS DEPARTMENT	SEAL	PEER REVIEW	DETAILS 4 CHINA CREEK NORTH PARK	DRAWING No. Scale: SHEET 13 OF 14
	5	###	###										
	4	APR 27, 2018	ISSUED FOR TENDER										
	3	JAN 12, 2018	95% DETAIL DESIGN										
	2	OCT 18, 2017	75% DETAIL DESIGN										
	1	AUG 8, 2017	50% DETAIL DESIGN										
	REV.	DATE	REVISION										



IRRIGATION LEGEND

- 25mm SCHEDULE 40 PVC LATERAL
- 75mm SCHEDULE 40 PVC SLEEVE
- 40mm SCHEDULE 40 PVC MAINLINE
- 1 SPRAYHEAD SPRINKLER
1-2 TORO 5702-4P
- 2 ELECTRIC CONTROL VALVE
1-2 TORO P220 SERIES VALVE

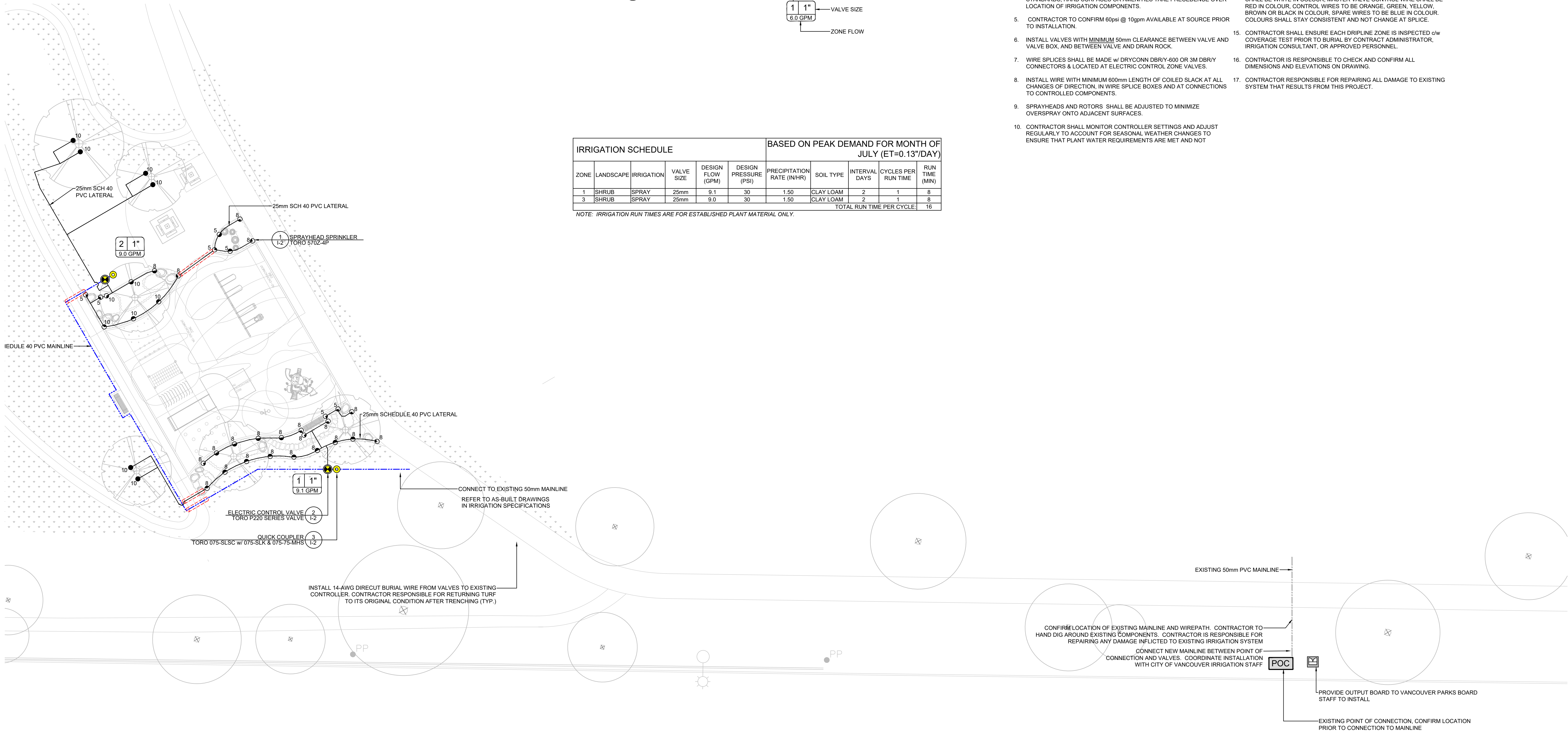
- 3 QUICK COUPLER
1-2 TORO 075-SLSC w/ 075-SLK & 075-75-MHS
- POC EXISTING POINT OF CONNECTION
- EXISTING CONTROLLER. CONTRACTOR TO SUPPLY TORO WIRELESS OUTPUT BOARD TO PARKS BOARD
- ZONE NUMBER
- 1 1" VALVE SIZE
- 6.0 GPM ZONE FLOW

INSTALLATION NOTES

- ALL IRRIGATION PRODUCTS, MATERIALS AND CONSTRUCTION SHALL CONFORM TO VANCOUVER BOARD PARKS AND RECREATION SECTION 32 80 00, UNLESS OTHERWISE NOTED ON PLANS.
- CONTRACTOR SHALL SLEEVE ALL IRRIGATION AND WIRES UNDER ALL WALKWAYS, DRIVEWAYS, ROCK WALLS AND RETAINING WALLS. WATER LINES AND WIRE SHALL NOT SHARE SAME SLEEVE. SLEEVE SIZING SHALL BE TWICE THE THE DIAMETER OF IRRIGATION PIPE.
- THE CONTRACTOR SHALL VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES AND SERVICES PRIOR TO CONSTRUCTION.
- IRRIGATION PLANS ARE SCHEMATIC ONLY. ALL PLANT MATERIAL, LIGHT STANDARDS, HARD SURFACES OR AMENITIES TAKE PRECEDENCE OVER LOCATION OF IRRIGATION COMPONENTS.
- CONTRACTOR TO CONFIRM 60psi @ 10gpm AVAILABLE AT SOURCE PRIOR TO INSTALLATION.
- INSTALL VALVES WITH MINIMUM 50mm CLEARANCE BETWEEN VALVE AND VALVE BOX, AND BETWEEN VALVE AND DRAIN ROCK.
- WIRE SPLICES SHALL BE MADE w/ DRYCONN DBRY-600 OR 3M DBRY/ CONNECTORS & LOCATED AT ELECTRIC CONTROL ZONE VALVES.
- INSTALL WIRE WITH MINIMUM 600mm LENGTH OF COILED SLACK AT ALL CHANGES OF DIRECTION, IN WIRE SPLICE BOXES AND AT CONNECTIONS TO CONTROLLED COMPONENTS.
- SPRAYHEADS AND ROTORS SHALL BE ADJUSTED TO MINIMIZE OVERSPRAY ONTO ADJACENT SURFACES.
- CONTRACTOR SHALL MONITOR CONTROLLER SETTINGS AND ADJUST REGULARLY TO ACCOUNT FOR SEASONAL WEATHER CHANGES TO ENSURE THAT PLANT WATER REQUIREMENTS ARE MET AND NOT
- IDENTIFY ELECTRIC CONTROL VALVE WITH PERMANENT LABEL OR TAG INDICATING ZONE NUMBER OF VALVE.
- SUBSTITUTION REQUESTS SHALL BE MADE IN WRITING TO THE CONSULTANT MINIMUM 7 BUSINESS DAYS PRIOR TO CLOSE OF TENDER AND SHALL BE ACCOMPANIED BY PRODUCT LITERATURE, SHOP DRAWINGS, PERFORMANCE CHARTS, AND PROFILE & COVERAGE EVALUATION BY S.P.A.C.E.
- CONTRACTOR SHALL CONFIRM LOCATION OF POINT OF CONNECTION AND CONTROLLER PRIOR TO INSTALLATION.
- ALL WIRES SHALL BE 14 AWG DIRECT BURIAL WIRE. COMMON WIRE SHALL BE WHITE IN COLOUR. MASTER VALVE CONTROL WIRE SHALL BE RED IN COLOUR. CONTROL WIRES TO BE ORANGE, GREEN, YELLOW, BROWN OR BLACK IN COLOUR. SPARE WIRES TO BE BLUE IN COLOUR. COLOURS SHALL STAY CONSISTENT AND NOT CHANGE AT SPLICE.
- CONTRACTOR SHALL ENSURE EACH DRIPLINE ZONE IS INSPECTED w/ COVERAGE TEST PRIOR TO BURIAL BY CONTRACT ADMINISTRATOR, IRRIGATION CONSULTANT, OR APPROVED PERSONNEL.
- CONTRACTOR IS RESPONSIBLE TO CHECK AND CONFIRM ALL DIMENSIONS AND ELEVATIONS ON DRAWING.
- CONTRACTOR RESPONSIBLE FOR REPAIRING ALL DAMAGE TO EXISTING SYSTEM THAT RESULTS FROM THIS PROJECT.

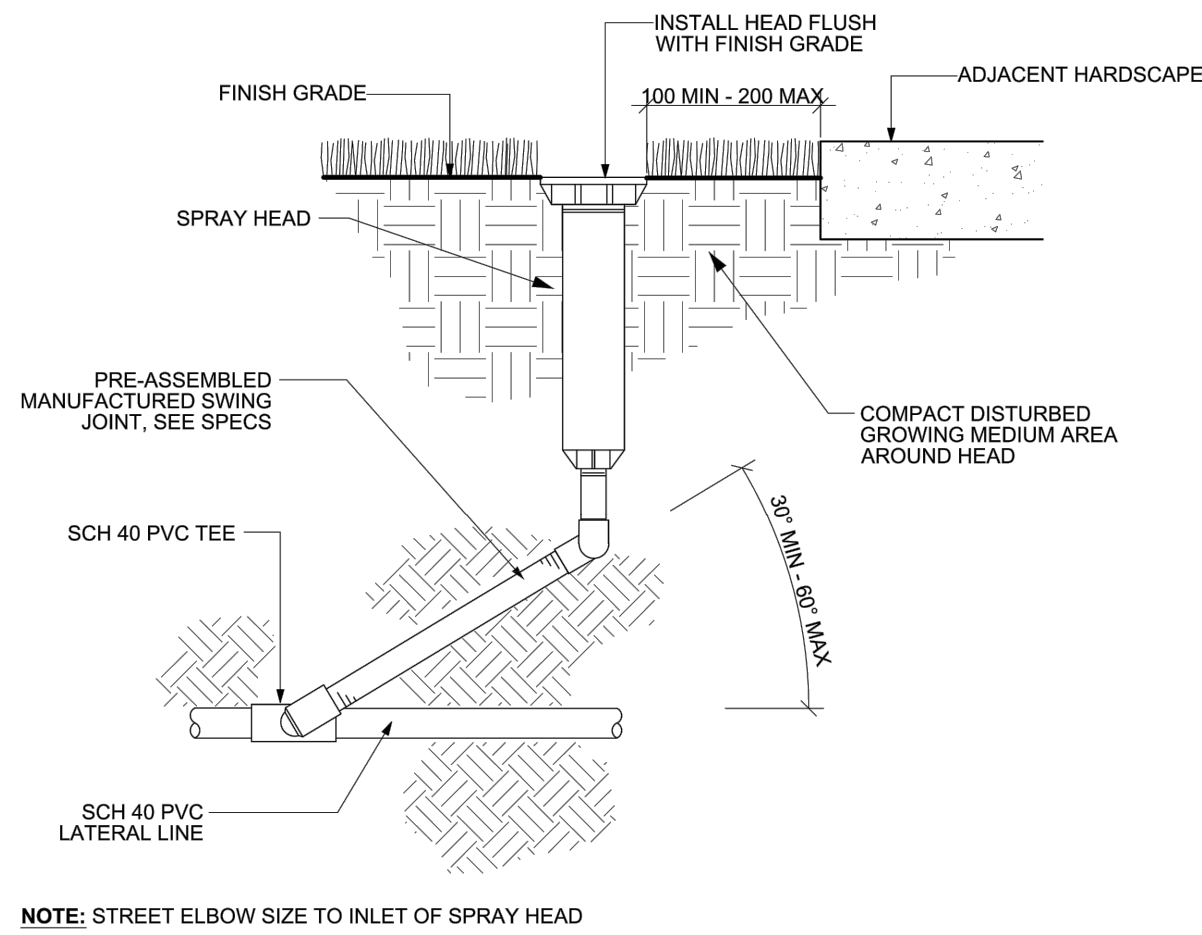
IRRIGATION SCHEDULE						BASED ON PEAK DEMAND FOR MONTH OF JULY (ET=0.13"/DAY)				
ZONE	LANDSCAPE	IRRIGATION	VALVE SIZE	DESIGN FLOW (GPM)	DESIGN PRESSURE (PSI)	PRECIPITATION RATE (IN/HR)	SOIL TYPE	INTERVAL DAYS	CYCLES PER RUN TIME	RUN TIME (MIN)
1	SHRUB	SPRAY	25mm	9.1	30	1.50	CLAY LOAM	2	1	8
3	SHRUB	SPRAY	25mm	9.0	30	1.50	CLAY LOAM	2	1	8
TOTAL RUN TIME PER CYCLE:										16

NOTE: IRRIGATION RUN TIMES ARE FOR ESTABLISHED PLANT MATERIAL ONLY.

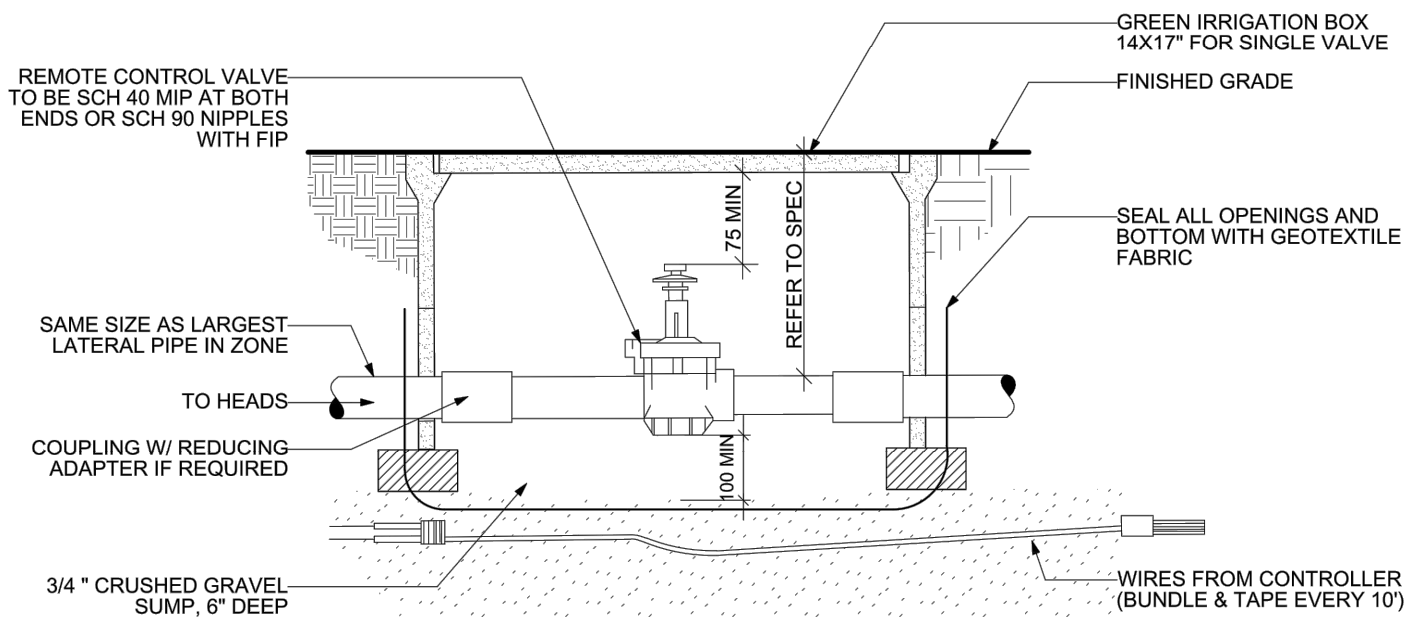


1 IRRIGATION PLAN
I-1 SCALE: 1:200

BENCH MARK :				DESIGNED BY: RH		 #503, 4190 Loughheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698	 CITY OF VANCOUVER PARKS DEPARTMENT	SEAL	PEER REVIEW	IRRIGATION PLAN CHINA CREEK NORTH	DRAWING No. 1-1 SHEET 1 OF 2 Scale: 1:200
				DRAWN BY: RH							
	3	APR 27 2018	ISSUED FOR TENDER	CHECKED BY: RH	DATE: March 19, 2018						
	2	MAR 19, 2018	ISSUED FOR 100% REVIEW	APPROVED BY: RH							
	1	MAR 19, 2018	ISSUED FOR 95% REVIEW								
REV.	DATE	REVISION									

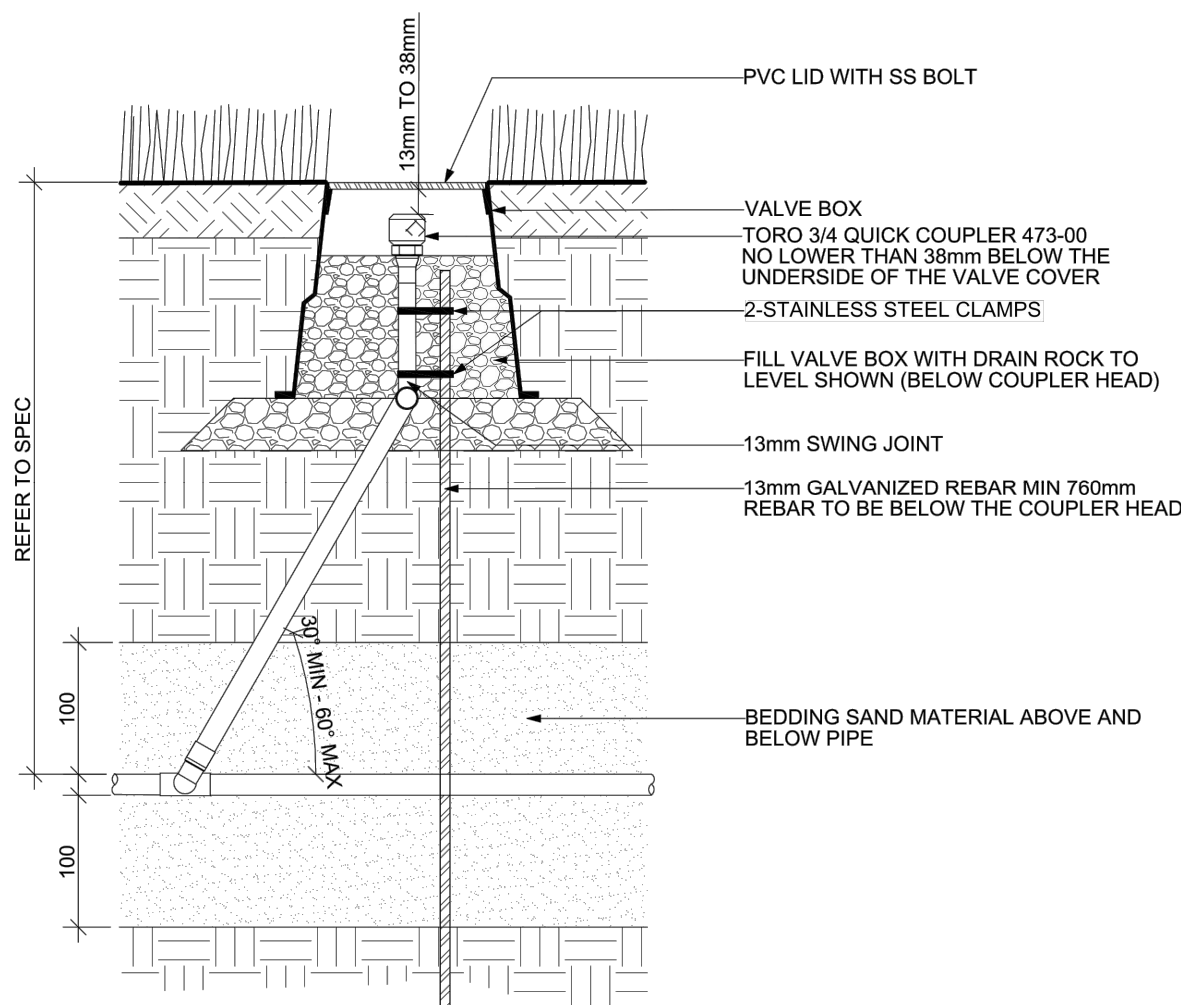


1 SPRAYHEAD SPRINKLER
I-2 N.T.S.




- NOTES:
1. ALL WIRE TO BE INSTALLED & SUPPLIED PER LOCAL CODE.
 2. PROVIDE EXPANSION COIL AT EACH CONNECTION IN VALVE BOX (COIL WIRE AROUND 1/2" PIPE 10 TIMES).
 3. DIAMETER OF FITTINGS LEADING TO AND FROM VALVE SHALL EQUAL CONTROL VALVE DIAMETER.

2 ELECTRIC CONTROL VALVE
I-2 N.T.S.



3 QUICK COUPLER
I-2 N.T.S.

BENCH MARK :						DESIGNED BY: RH		 #503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8 T: (604)629-2696 F: (604)629-2698	 CITY OF VANCOUVER PARKS DEPARTMENT	SEAL	PEER REVIEW	IRRIGATION DETAILS CHINA CREEK NORTH	DRAWING No.	Scale: 1:200	
						DRAWN BY: RH								I-2	SHEET 2 OF 2
	3	APR 27, 2018	ISSUED FOR TENDER			CHECKED BY: RH	DATE: March 19, 2018								
	2	MAR 19, 2018	ISSUED FOR 100% REVIEW												
	1	MAR 19, 2018	ISSUED FOR 95% REVIEW												
	REV.	DATE	REVISION			APPROVED BY: RH									



Pricing – Double Bobble Rider

Supply playground equipment (Landscape Structures Inc.)	\$2,455.00
Install playground equipment (Habitat Systems Inc.)	\$531.00
Subtotal	\$2,986.00
GST @ 5%	\$149.30
PST @ 7%	\$171.85
Total	\$3,307.15

Pricing – Hill Net Climber

Supply playground equipment (Landscape Structures Inc.)	\$8,715.00
Install playground equipment (Habitat Systems Inc.)	\$1,787.00
Subtotal	\$10,502.00
GST @ 5%	\$525.10
PST @ 7%	\$610.05
Total	\$11,637.15

Pricing – (2) Rope Pull Climbers

Supply playground equipment (Landscape Structures Inc.)	\$5,537.00
Install playground equipment (Habitat Systems Inc.)	\$1,128.00
Subtotal	\$6,665.00
GST @ 5%	\$333.25
PST @ 7%	\$387.59
Total	\$7,385.84

Pricing – Smart Play Motion w/ Play Table

Supply playground equipment (Landscape Structures Inc.)	\$21,692.00
Install playground equipment (Habitat Systems Inc.)	\$4,518.00
Subtotal	\$26,210.00
GST @ 5%	\$1,310.50
PST @ 7%	\$1,518.44
Total	\$29,038.94



Pricing

2 Bay Single-Post w/ (2) Belt Seats, (1) Full Bucket Seat & (1) Molded Bucket Seat w/ Harness

Supply playground equipment (Landscape Structures Inc.)	\$4,872.00
Install playground equipment (Habitat Systems Inc.)	\$942.00
Subtotal	\$5,814.00
GST @ 5%	\$290.70
PST @ 7%	\$341.04
Total	\$6,445.74

Pricing – Custom Stainless Steel Hillside

Supply (1) 3m 304 Stainless Steel Hillside Slide – Hill Height: 3.00m, Slide Width: 1.50m, Slide Length: 4.85m, Use Zone Length: 2.40m (Habitat Systems Inc.)	\$24,500.00
Install playground equipment (Habitat Systems Inc.)	\$3,750.00
Subtotal	\$28,250.00
GST @ 5%	\$1,412.50
PST @ 7%	\$1,715.00
Total	\$31,377.50

Pricing – Climbing Wall; 12 handholds

Supply playground equipment (Habitat Systems Inc.)	\$306.00
Install playground equipment (Habitat Systems Inc.)	\$1,659.00



Subtotal	\$1,965.00
GST @ 5%	\$98.25
PST @ 7%	\$21.42
Total	\$2,084.67

***Above pricing includes 2 types of handholds (6) of the type featured in the left photo and (6) of the type featured in the right photo.**



Single Post Swing Frame



Single Post Swing Frame Additional Bay



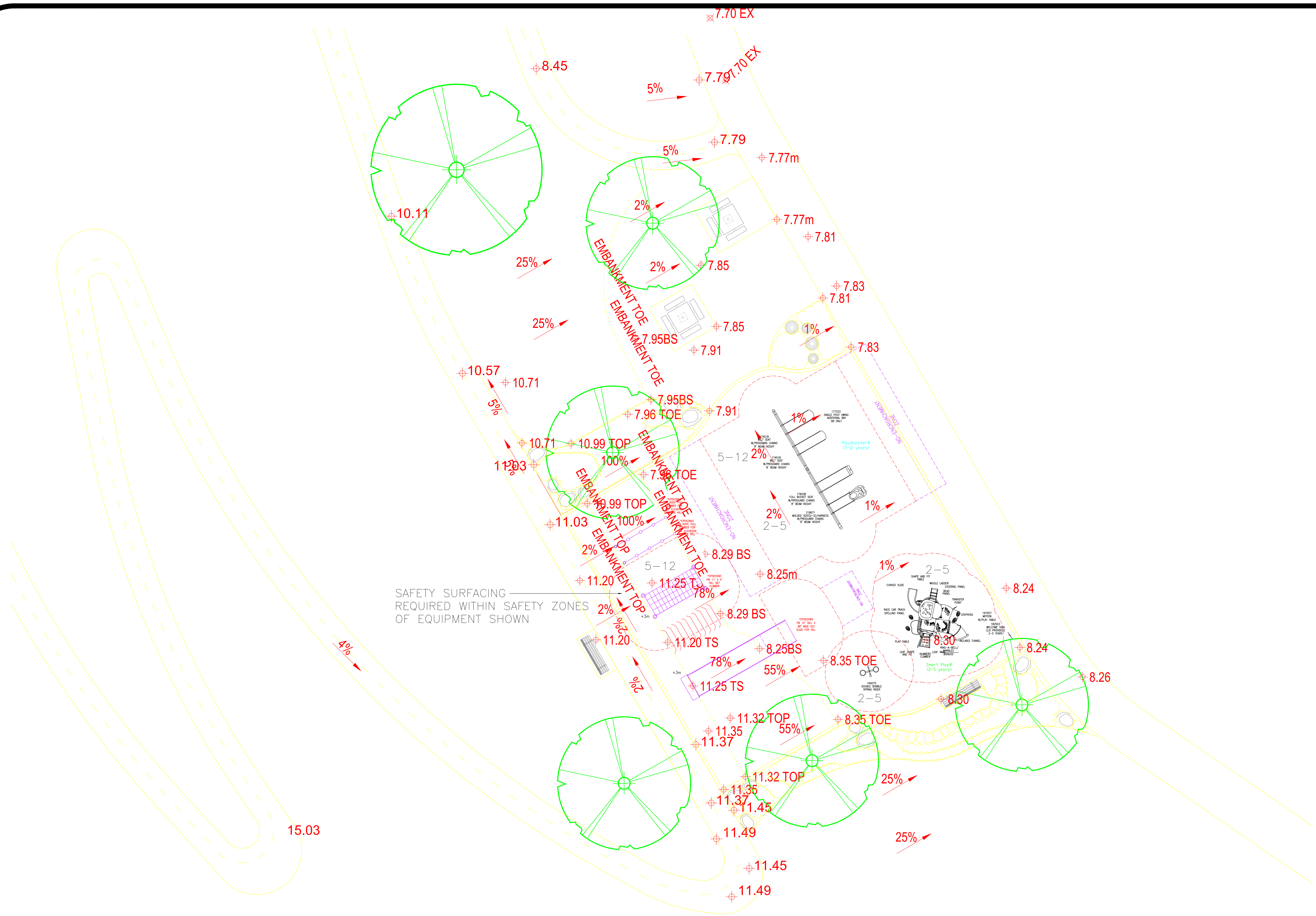
Bobble Rider™, Double



Motion

PRODUCT FEATURES:

- 5" round aluminum posts – 100 year warranty with factory installed post caps that eliminate rusting
- 360 degree compression clamping system – 100 year warranty on-site adjustable with maximum holding power allowing overhead height adjustment
- Tenderdecks 4' square 12 gauge steel, allowing for more users at one time
- Tendertuff Coating warm to little hands in cold weather and anti-slip
- Polyethylene Slide double wall thickness, molded-in inserts with slide hoods and handbars
- Adjustable Slide footer accounts for the natural shifting that occurs in hot and cold weather, prevents string entanglements
- Stainless Steel Hardware & Fasteners – 100 year warranty vandal-resistant, can't be removed with standard tools
- Swing Parts Slashproof belt swing seats, galvanized chain, oil-impregnated bearings in the hangers, stainless steel double clevis and bolt link chain connectors with tamperproof hardware
- Polyester-Wrapped, Steel-Reinforced Cable six-stranded, galvanized steel cables wrapped in abrasion resistant, color stable polyester yarn are extremely durable and vandal resistant
- Connections Cloverleaf and "T" connectors allow for replacement of portions of cable rather than the whole net, and with no doubling of cable at the perimeter, the Aeronet Climber boasts a crisp geometric shape
- Tensioning Anchors Anchored below ground for strength and stability, but accessible above ground for easy tensioning



The play components identified on this plan are IPEMA certified. (Unless otherwise noted) The use and layout of these components conform to the Canadian Standards Association (CSA) Standard CAN/CSA-Z614. To verify product certification, visit www.ipema.org.

THIS PLAY AREA & PLAY EQUIPMENT IS DESIGNED FOR AGES 2-12 YEARS UNLESS OTHERWISE NOTED ON PLAN.

THIS CONCEPTUAL PLAN WAS BASED ON INFORMATION AVAILABLE TO US, PRIOR TO CONSTRUCTION, DETAILED SITE INFORMATION INCLUDING SITE DIMENSIONS, TOPOGRAPHY, EXISTING UTILITIES, SOIL CONDITIONS, AND DRAINAGE SOLUTIONS SHOULD BE OBTAINED, EVALUATED, & UTILIZED IN THE FINAL DESIGN. PLEASE VERIFY ALL DIMENSIONS OF PLAY AREA, SIZE, ORIENTATION, AND LOCATION OF ALL EXISTING UTILITIES, EQUIPMENT, AND SITE FURNISHINGS PRIOR TO ORDERING. SLIDES SHOULD NOT FACE THE HOT AFTERNOON SUN.

CHOOSE A PROTECTIVE SURFACING MATERIAL THAT HAS A CRITICAL HEIGHT VALUE TO MEET THE MAXIMUM FALL HEIGHT FOR THE EQUIPMENT (REF. ASTM F1487 STANDARD CONSUMER SAFETY PERFORMANCE SPECIFICATION FOR PLAYGROUND EQUIPMENT FOR PUBLIC USE, SECTION 8 CURRENT REVISION). THE SUBSURFACE MUST BE WELL DRAINED. IF THE SOIL DOES NOT DRAIN NATURALLY IT MUST BE TILED OR SLOPED 1/8" TO 1/4" PER FOOT TO A STORM SEWER OR A "FRENCH DRAIN".

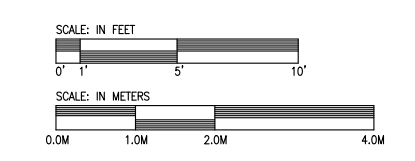
AREA OF ACCESSIBLE/PROTECTIVE SURFACING (POURED-IN-PLACE SUGGESTED)

DESIGNED BY:

CB

COPYRIGHT: 3/15/2018
LANDSCAPE STRUCTURES, INC.
601 7th STREET SOUTH - P.O. BOX 198
DELANO, MINNESOTA 55328
PH: 1-800-328-0035 FAX: 1-763-972-6091

Date	Previous Drawing #	Initials



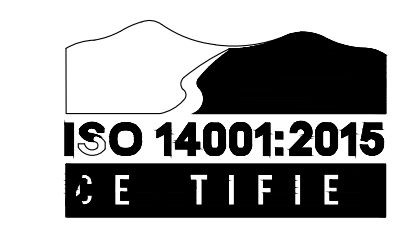
Estimated manufacturing time:
22 weeks from the
time of LSI order acceptance.

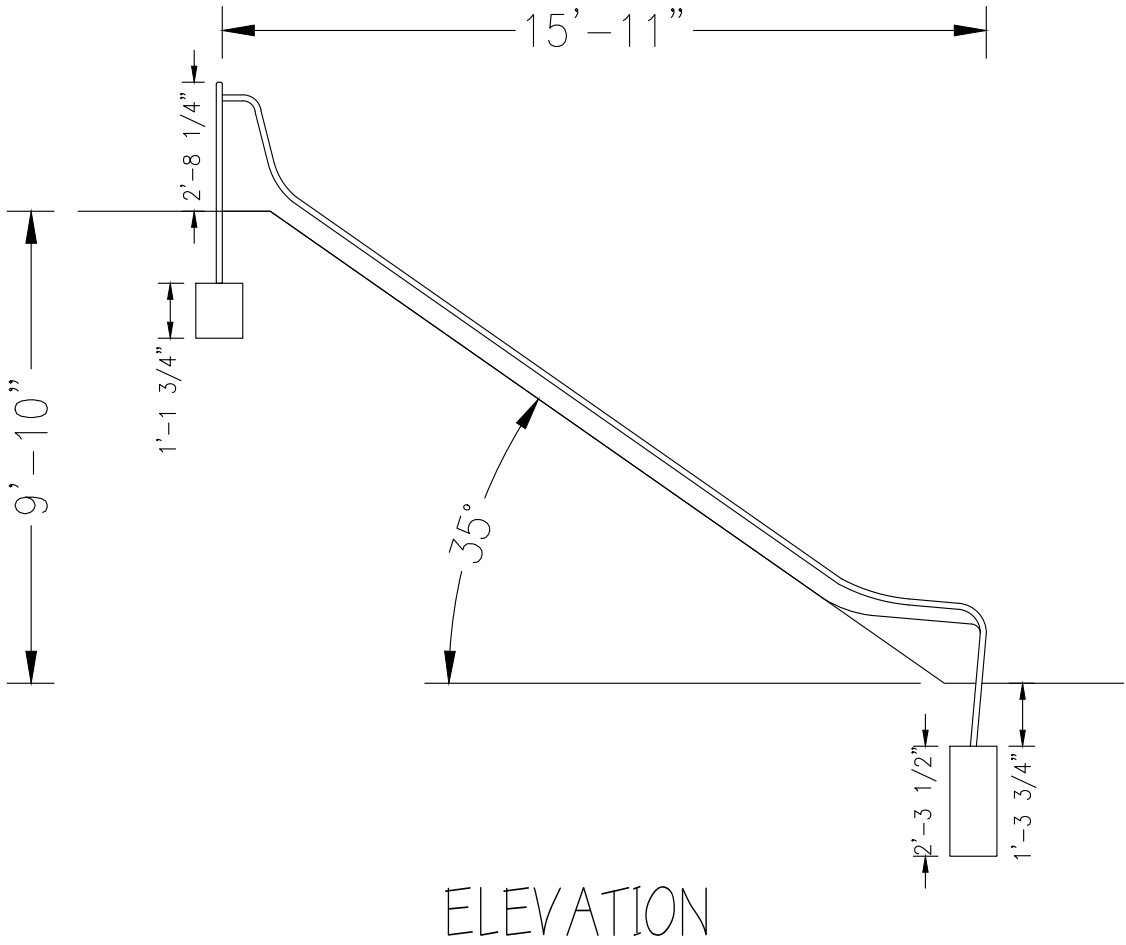
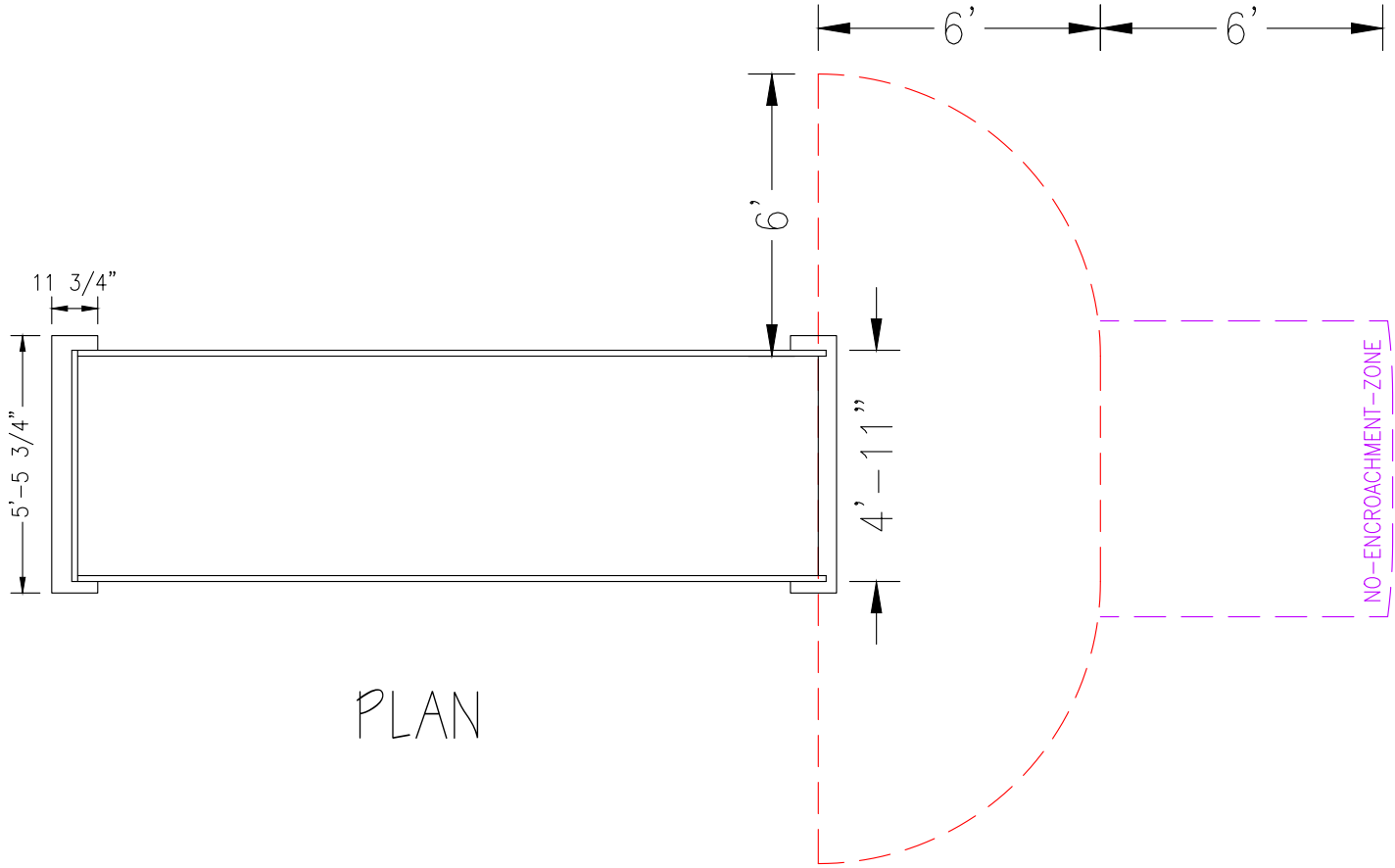
China Creek North

Habitat
Systems Inc.
Arron Jackson

SYSTEM TYPE:
PlayBooster/Smart Play

DRAWING #:
1125533-02-01





NOTE: THIS DRAWING, INCLUDING THE PRINCIPALS OF DESIGN AND CONCEPT, IS THE PROPERTY OF HABITAT SYSTEMS INC. WITH THE AGREEMENT THAT IT IS NOT TO BE REPRODUCED, COPIED OR LOANED IN WHOLE OR IN PART



9'10" HILL SLIDE

REVISION NOTES	

PROJECT NO.	162-1-1
SCALE	1/4" = 1'-0"
DESIGNER	A. JACKSON
DATE	3/19/18
DATE OF PRINT	3/19/18

Your Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Your C.O.C. #: 552132-02-01

Attention: Neil Simpson

WORLEYPARSONS CANADA SERVICES LTD
Suite 500-4321 Still Creek Dr
BURNABY, BC
CANADA V5C 6S7

Report Date: 2018/04/30

Report #: R2547688

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B830901

Received: 2018/04/25, 12:55

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/MTBE LH VH F1 in Soil - Field Pres. (1)	2	N/A	2018/04/27	BBY8SOP-00010/11/12	BCMOE BCLM Jul 2017
Elements by ICPMS (total)	5	2018/04/27	2018/04/27	BBY7SOP-00004 / BBY7SOP-00001	EPA 6020b R2 m
Moisture	2	2018/04/26	2018/04/26	BBY8SOP-00017	BCMOE BCLM Dec2000 m
PAH in Soil by GC/MS (SIM)	1	2018/04/26	2018/04/27	BBY8SOP-00022	BCMOE BCLM Jul2017m
Total PAH and B(a)P Calculation (2)	1	N/A	2018/04/30	BBY WI-00033	Auto Calc
pH (2:1 DI Water Extract)	5	2018/04/27	2018/04/27	BBY6SOP-00028	BCMOE BCLM Mar2005 m
EPH less PAH in Soil By GC/FID	1	N/A	2018/04/30	BBY WI-00033	Auto Calc
EPH in Soil by GC/FID	2	2018/04/26	2018/04/27	BBY8SOP-00029	BCMOE BCLM Jul 2016
Volatile HC-BTEX for Soil	2	N/A	2018/04/27	BBY WI-00033	Auto Calc

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Your C.O.C. #: 552132-02-01

Attention: Neil Simpson

WORLEYPARSONS CANADA SERVICES LTD
Suite 500-4321 Still Creek Dr
BURNABY, BC
CANADA V5C 6S7

Report Date: 2018/04/30
Report #: R2547688
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B830901

Received: 2018/04/25, 12:55

- (1) The extraction date for VOC, BTEX, VH, or F1 samples that are field preserved with methanol equals the date sampled, unless otherwise stated.
- (2) Total PAHs in Soil include: Quinoline, Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Acridine, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b&j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene.

Total PAHs in Sediment include: Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(a)pyrene, and Dibenz(a,h)anthracene.

Encryption Key



Nahed Amer
Project Manager
30 Apr 2018 14:00:25

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Nahed Amer, Project Manager

Email: NAmer@maxxam.ca

Phone# (604) 734 7276

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B830901
Report Date: 2018/04/30

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

PHYSICAL TESTING (SOIL)

Maxxam ID		TI0971	TI0972		
Sampling Date		2018/04/18	2018/04/18		
COC Number		552132-02-01	552132-02-01		
	UNITS	SS18-02	SS18-03	RDL	QC Batch
Physical Properties					
Moisture	%	21	22	0.30	8970489
RDL = Reportable Detection Limit					

Maxxam Job #: B830901
Report Date: 2018/04/30

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

TOTAL PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		TI0971		
Sampling Date		2018/04/18		
COC Number		552132-02-01		
	UNITS	SS18-02	RDL	QC Batch
Hydrocarbons				
EPH (C10-C19)	mg/kg	<100	100	8971773
EPH (C19-C32)	mg/kg	<100	100	8971773
Surrogate Recovery (%)				
O-TERPHENYL (sur.)	%	97		8971773
RDL = Reportable Detection Limit				

Maxxam Job #: B830901
Report Date: 2018/04/30

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

CSR BTEX/VPH IN SOIL - FIELD PRESERVED (SOIL)

Maxxam ID		TI0971	TI0972		
Sampling Date		2018/04/18	2018/04/18		
COC Number		552132-02-01	552132-02-01		
	UNITS	SS18-02	SS18-03	RDL	QC Batch
Calculated Parameters					
VPH (VH6 to 10 - BTEX)	mg/kg	<10	<10	10	8970158
Volatiles					
Methyl-tert-butylether (MTBE)	mg/kg	<0.10	<0.10	0.10	8971072
Benzene	mg/kg	<0.0050	<0.0050	0.0050	8971072
Toluene	mg/kg	<0.020	<0.020	0.020	8971072
Ethylbenzene	mg/kg	<0.010	<0.010	0.010	8971072
m & p-Xylene	mg/kg	<0.040	<0.040	0.040	8971072
o-Xylene	mg/kg	<0.040	<0.040	0.040	8971072
Styrene	mg/kg	<0.030	<0.030	0.030	8971072
Xylenes (Total)	mg/kg	<0.040	<0.040	0.040	8971072
VH C6-C10	mg/kg	<10	<10	10	8971072
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	106	107		8971072
4-Bromofluorobenzene (sur.)	%	102	101		8971072
D10-ETHYLBENZENE (sur.)	%	97	99		8971072
D4-1,2-Dichloroethane (sur.)	%	101	100		8971072
RDL = Reportable Detection Limit					

Maxxam Job #: B830901
Report Date: 2018/04/30

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

LEPH & HEPH WITH PAH FOR CSR IN SOIL (SOIL)

Maxxam ID		TI0972		
Sampling Date		2018/04/18		
COC Number		552132-02-01		
	UNITS	SS18-03	RDL	QC Batch
Calculated Parameters				
Low Molecular Weight PAH`s	mg/kg	<0.050	0.050	8970155
High Molecular Weight PAH`s	mg/kg	<0.050	0.050	8970155
Total PAH	mg/kg	<0.050	0.050	8970155
Polycyclic Aromatics				
Quinoline	mg/kg	<0.050	0.050	8971762
Naphthalene	mg/kg	<0.010	0.010	8971762
1-Methylnaphthalene	mg/kg	<0.050	0.050	8971762
2-Methylnaphthalene	mg/kg	<0.020	0.020	8971762
Acenaphthylene	mg/kg	<0.0050	0.0050	8971762
Acenaphthene	mg/kg	<0.0050	0.0050	8971762
Fluorene	mg/kg	<0.020	0.020	8971762
Phenanthrene	mg/kg	<0.010	0.010	8971762
Anthracene	mg/kg	<0.0040	0.0040	8971762
Fluoranthene	mg/kg	<0.020	0.020	8971762
Pyrene	mg/kg	<0.020	0.020	8971762
Benzo(a)anthracene	mg/kg	<0.020	0.020	8971762
Chrysene	mg/kg	<0.020	0.020	8971762
Benzo(b&j)fluoranthene	mg/kg	<0.020	0.020	8971762
Benzo(b)fluoranthene	mg/kg	<0.020	0.020	8971762
Benzo(k)fluoranthene	mg/kg	<0.020	0.020	8971762
Benzo(a)pyrene	mg/kg	<0.020	0.020	8971762
Indeno(1,2,3-cd)pyrene	mg/kg	<0.020	0.020	8971762
Dibenz(a,h)anthracene	mg/kg	<0.020	0.020	8971762
Benzo(g,h,i)perylene	mg/kg	<0.050	0.050	8971762
Calculated Parameters				
LEPH (C10-C19 less PAH)	mg/kg	<100	100	8970156
HEPH (C19-C32 less PAH)	mg/kg	<100	100	8970156
Hydrocarbons				
EPH (C10-C19)	mg/kg	<100	100	8971773
EPH (C19-C32)	mg/kg	<100	100	8971773
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	94		8971762
RDL = Reportable Detection Limit				

Maxxam Job #: B830901
Report Date: 2018/04/30

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

LEPH & HEPH WITH PAH FOR CSR IN SOIL (SOIL)

Maxxam ID		TI0972		
Sampling Date		2018/04/18		
COC Number		552132-02-01		
	UNITS	SS18-03	RDL	QC Batch
D8-ACENAPHTHYLENE (sur.)	%	91		8971762
D8-NAPHTHALENE (sur.)	%	90		8971762
TERPHENYL-D14 (sur.)	%	99		8971762
O-TERPHENYL (sur.)	%	90		8971773
RDL = Reportable Detection Limit				

Maxxam Job #: B830901
Report Date: 2018/04/30

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Maxxam ID		TI0970	TI0971	TI0972	TI0973	TI0974		
Sampling Date		2018/04/18	2018/04/18	2018/04/18	2018/04/18	2018/04/18		
COC Number		552132-02-01	552132-02-01	552132-02-01	552132-02-01	552132-02-01		
	UNITS	SS18-01	SS18-02	SS18-03	SS18-04	SS18-05	RDL	QC Batch
Physical Properties								
Soluble (2:1) pH	pH	7.32	6.70	8.07	7.56	6.51	N/A	8971638
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	18400	14500	18900	19400	19400	100	8971632
Total Antimony (Sb)	mg/kg	0.88	<0.10	0.25	5.43	0.32	0.10	8971632
Total Arsenic (As)	mg/kg	6.34	4.09	2.53	8.58	2.02	0.50	8971632
Total Barium (Ba)	mg/kg	116	41.4	117	387	84.4	0.10	8971632
Total Beryllium (Be)	mg/kg	0.34	<0.20	0.30	0.38	0.23	0.20	8971632
Total Bismuth (Bi)	mg/kg	<0.10	<0.10	<0.10	0.34	<0.10	0.10	8971632
Total Boron (B)	mg/kg	4.1	1.9	3.2	16.6	<1.0	1.0	8971632
Total Cadmium (Cd)	mg/kg	0.182	0.069	0.105	1.10	0.100	0.050	8971632
Total Calcium (Ca)	mg/kg	4050	2690	6840	6520	2600	100	8971632
Total Chromium (Cr)	mg/kg	17.9	16.9	37.9	30.2	17.5	1.0	8971632
Total Cobalt (Co)	mg/kg	6.60	5.01	13.0	9.11	8.38	0.30	8971632
Total Copper (Cu)	mg/kg	32.3	5.94	32.1	193	18.4	0.50	8971632
Total Iron (Fe)	mg/kg	20400	14700	29300	37700	19500	100	8971632
Total Lead (Pb)	mg/kg	72.2	2.27	4.98	361	19.8	0.10	8971632
Total Magnesium (Mg)	mg/kg	4180	4380	8470	4160	6930	100	8971632
Total Manganese (Mn)	mg/kg	443	194	483	438	289	0.20	8971632
Total Mercury (Hg)	mg/kg	0.140	<0.050	<0.050	0.525	<0.050	0.050	8971632
Total Molybdenum (Mo)	mg/kg	0.94	0.68	0.35	2.68	0.44	0.10	8971632
Total Nickel (Ni)	mg/kg	11.9	11.3	27.8	26.9	13.1	0.80	8971632
Total Phosphorus (P)	mg/kg	538	531	570	919	309	10	8971632
Total Potassium (K)	mg/kg	594	614	1780	686	676	100	8971632
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	8971632
Total Silver (Ag)	mg/kg	0.140	0.073	<0.050	0.758	<0.050	0.050	8971632
Total Sodium (Na)	mg/kg	158	156	397	315	150	100	8971632
Total Strontium (Sr)	mg/kg	43.0	21.0	60.8	98.8	32.6	0.10	8971632
Total Thallium (Tl)	mg/kg	0.075	0.055	0.115	0.084	0.060	0.050	8971632
Total Tin (Sn)	mg/kg	10.3	0.21	0.40	139	2.18	0.10	8971632
Total Titanium (Ti)	mg/kg	567	653	1100	696	737	1.0	8971632
Total Tungsten (W)	mg/kg	<0.50	<0.50	<0.50	0.60	<0.50	0.50	8971632
RDL = Reportable Detection Limit								
N/A = Not Applicable								

Maxxam Job #: B830901
Report Date: 2018/04/30

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Maxxam ID		TI0970	TI0971	TI0972	TI0973	TI0974		
Sampling Date		2018/04/18	2018/04/18	2018/04/18	2018/04/18	2018/04/18		
COC Number		552132-02-01	552132-02-01	552132-02-01	552132-02-01	552132-02-01		
	UNITS	SS18-01	SS18-02	SS18-03	SS18-04	SS18-05	RDL	QC Batch
Total Vanadium (V)	mg/kg	49.9	38.9	67.5	44.4	46.0	2.0	8971632
Total Zinc (Zn)	mg/kg	90.9	29.9	63.6	604	66.3	1.0	8971632
Total Zirconium (Zr)	mg/kg	0.86	2.45	7.03	2.22	2.36	0.50	8971632
RDL = Reportable Detection Limit								

Maxxam Job #: B830901
Report Date: 2018/04/30

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	14.0°C
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Results relate only to the items tested.



Success Through Science®

Maxxam Job #: B830901
Report Date: 2018/04/30

QUALITY ASSURANCE REPORT

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8971072	1,4-Difluorobenzene (sur.)	2018/04/26	104	70 - 130	102	70 - 130	106	%				
8971072	4-Bromofluorobenzene (sur.)	2018/04/26	102	70 - 130	101	70 - 130	101	%				
8971072	D10-ETHYLBENZENE (sur.)	2018/04/26	98	60 - 130	80	60 - 130	87	%				
8971072	D4-1,2-Dichloroethane (sur.)	2018/04/26	89	70 - 130	89	70 - 130	96	%				
8971762	D10-ANTHRACENE (sur.)	2018/04/27	102	50 - 140	97	50 - 140	101	%				
8971762	D8-ACENAPHTHYLENE (sur.)	2018/04/27	94	50 - 140	91	50 - 140	93	%				
8971762	D8-NAPHTHALENE (sur.)	2018/04/27	93	50 - 140	91	50 - 140	92	%				
8971762	TERPHENYL-D14 (sur.)	2018/04/27	102	50 - 140	98	50 - 140	101	%				
8971773	O-TERPHENYL (sur.)	2018/04/27	77	60 - 140	72	60 - 140	93	%				
8970489	Moisture	2018/04/26					<0.30	%	2.9	20		
8971072	Benzene	2018/04/26	89	60 - 140	86	70 - 130	<0.0050	mg/kg	NC	40		
8971072	Ethylbenzene	2018/04/26	95	60 - 140	92	70 - 130	<0.010	mg/kg	NC	40		
8971072	m & p-Xylene	2018/04/26	92	60 - 140	89	70 - 130	<0.040	mg/kg	NC	40		
8971072	Methyl-tert-butylether (MTBE)	2018/04/26					<0.10	mg/kg	NC	40		
8971072	o-Xylene	2018/04/26	91	60 - 140	89	70 - 130	<0.040	mg/kg	NC	40		
8971072	Styrene	2018/04/26					<0.030	mg/kg	NC	40		
8971072	Toluene	2018/04/26	87	60 - 140	85	70 - 130	<0.020	mg/kg	NC	40		
8971072	VH C6-C10	2018/04/26			100	70 - 130	<10	mg/kg	NC	40		
8971072	Xylenes (Total)	2018/04/26					<0.040	mg/kg	NC	40		
8971632	Total Aluminum (Al)	2018/04/27					<100	mg/kg	1.6	40	103	70 - 130
8971632	Total Antimony (Sb)	2018/04/27	89	75 - 125	95	75 - 125	<0.10	mg/kg	NC	30	107	70 - 130
8971632	Total Arsenic (As)	2018/04/27	105	75 - 125	97	75 - 125	<0.50	mg/kg	0.043	30	96	70 - 130
8971632	Total Barium (Ba)	2018/04/27	NC	75 - 125	98	75 - 125	<0.10	mg/kg	0.32	40	108	70 - 130
8971632	Total Beryllium (Be)	2018/04/27	96	75 - 125	93	75 - 125	<0.20	mg/kg	5.1	30	92	70 - 130
8971632	Total Bismuth (Bi)	2018/04/27					<0.10	mg/kg	NC	30		
8971632	Total Boron (B)	2018/04/27					<1.0	mg/kg	NC	30		
8971632	Total Cadmium (Cd)	2018/04/27	105	75 - 125	97	75 - 125	<0.050	mg/kg	5.8	30	97	70 - 130
8971632	Total Calcium (Ca)	2018/04/27					<100	mg/kg	4.9	30	103	70 - 130
8971632	Total Chromium (Cr)	2018/04/27	100	75 - 125	99	75 - 125	<1.0	mg/kg	0.24	30	99	70 - 130
8971632	Total Cobalt (Co)	2018/04/27	102	75 - 125	100	75 - 125	<0.30	mg/kg	1.5	30	99	70 - 130
8971632	Total Copper (Cu)	2018/04/27	96	75 - 125	97	75 - 125	<0.50	mg/kg	2.6	30	104	70 - 130



Success Through Science®

Maxxam Job #: B830901
Report Date: 2018/04/30

QUALITY ASSURANCE REPORT(CONT'D)

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277

Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8971632	Total Iron (Fe)	2018/04/27					<100	mg/kg	0.72	30	102	70 - 130
8971632	Total Lead (Pb)	2018/04/27	112	75 - 125	99	75 - 125	<0.10	mg/kg	0.17	40	113	70 - 130
8971632	Total Magnesium (Mg)	2018/04/27					<100	mg/kg	0.88	30	104	70 - 130
8971632	Total Manganese (Mn)	2018/04/27	NC	75 - 125	96	75 - 125	<0.20	mg/kg	0.36	30	100	70 - 130
8971632	Total Mercury (Hg)	2018/04/27	103	75 - 125	99	75 - 125	<0.050	mg/kg	NC	40	95	70 - 130
8971632	Total Molybdenum (Mo)	2018/04/27	102	75 - 125	95	75 - 125	<0.10	mg/kg	10	40	103	70 - 130
8971632	Total Nickel (Ni)	2018/04/27	100	75 - 125	100	75 - 125	<0.80	mg/kg	0.20	30	105	70 - 130
8971632	Total Phosphorus (P)	2018/04/27					<10	mg/kg	3.4	30	103	70 - 130
8971632	Total Potassium (K)	2018/04/27					<100	mg/kg	4.5	40	91	70 - 130
8971632	Total Selenium (Se)	2018/04/27	100	75 - 125	96	75 - 125	<0.50	mg/kg	NC	30		
8971632	Total Silver (Ag)	2018/04/27	95	75 - 125	89	75 - 125	<0.050	mg/kg	NC	40	102	70 - 130
8971632	Total Sodium (Na)	2018/04/27					<100	mg/kg	4.6	40	97	70 - 130
8971632	Total Strontium (Sr)	2018/04/27	107	75 - 125	98	75 - 125	<0.10	mg/kg	2.6	40	108	70 - 130
8971632	Total Thallium (Tl)	2018/04/27	105	75 - 125	98	75 - 125	<0.050	mg/kg	9.4	30	94	70 - 130
8971632	Total Tin (Sn)	2018/04/27	97	75 - 125	99	75 - 125	<0.10	mg/kg	23	40	98	70 - 130
8971632	Total Titanium (Ti)	2018/04/27	NC	75 - 125	94	75 - 125	<1.0	mg/kg	5.2	40		
8971632	Total Tungsten (W)	2018/04/27					<0.50	mg/kg	NC	30		
8971632	Total Vanadium (V)	2018/04/27	100	75 - 125	99	75 - 125	<2.0	mg/kg	0.46	30	105	70 - 130
8971632	Total Zinc (Zn)	2018/04/27	NC	75 - 125	100	75 - 125	<1.0	mg/kg	0.90	30	106	70 - 130
8971632	Total Zirconium (Zr)	2018/04/27					<0.50	mg/kg	7.0	30		
8971638	Soluble (2:1) pH	2018/04/27			99	97 - 103			0.62	20		
8971762	1-Methylnaphthalene	2018/04/27	93	50 - 140	91	50 - 140	<0.050	mg/kg	NC	50		
8971762	2-Methylnaphthalene	2018/04/27	91	50 - 140	90	50 - 140	<0.020	mg/kg	NC	50		
8971762	Acenaphthene	2018/04/27	89	50 - 140	89	50 - 140	<0.0050	mg/kg	NC	50		
8971762	Acenaphthylene	2018/04/27	87	50 - 140	87	50 - 140	<0.0050	mg/kg	NC	50		
8971762	Anthracene	2018/04/27	91	50 - 140	89	50 - 140	<0.0040	mg/kg	NC	50		
8971762	Benzo(a)anthracene	2018/04/27	89	50 - 140	89	50 - 140	<0.020	mg/kg	NC	50		
8971762	Benzo(a)pyrene	2018/04/27	84	50 - 140	84	50 - 140	<0.020	mg/kg	NC	50		
8971762	Benzo(b&j)fluoranthene	2018/04/27	90	50 - 140	94	50 - 140	<0.020	mg/kg	NC	50		
8971762	Benzo(b)fluoranthene	2018/04/27	84	50 - 140	91	50 - 140	<0.020	mg/kg	NC	50		
8971762	Benzo(g,h,i)perylene	2018/04/27	86	50 - 140	85	50 - 140	<0.050	mg/kg	NC	50		



Success Through Science®

Maxxam Job #: B830901
Report Date: 2018/04/30

QUALITY ASSURANCE REPORT(CONT'D)

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Location: CHINA CREEK NORTH PARK
Sampler Initials: NS

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8971762	Benzo(k)fluoranthene	2018/04/27	93	50 - 140	84	50 - 140	<0.020	mg/kg	NC	50		
8971762	Chrysene	2018/04/27	93	50 - 140	93	50 - 140	<0.020	mg/kg	NC	50		
8971762	Dibenz(a,h)anthracene	2018/04/27	86	50 - 140	84	50 - 140	<0.020	mg/kg	NC	50		
8971762	Fluoranthene	2018/04/27	91	50 - 140	89	50 - 140	<0.020	mg/kg	NC	50		
8971762	Fluorene	2018/04/27	86	50 - 140	87	50 - 140	<0.020	mg/kg	NC	50		
8971762	Indeno(1,2,3-cd)pyrene	2018/04/27	86	50 - 140	85	50 - 140	<0.020	mg/kg	NC	50		
8971762	Naphthalene	2018/04/27	86	50 - 140	86	50 - 140	<0.010	mg/kg	NC	50		
8971762	Phenanthrene	2018/04/27	91	50 - 140	89	50 - 140	<0.010	mg/kg	NC	50		
8971762	Pyrene	2018/04/27	94	50 - 140	92	50 - 140	<0.020	mg/kg	NC	50		
8971762	Quinoline	2018/04/27	104	50 - 140	104	50 - 140	<0.050	mg/kg	NC	50		
8971773	EPH (C10-C19)	2018/04/27	90	60 - 140	90	70 - 130	<100	mg/kg	NC	40		
8971773	EPH (C19-C32)	2018/04/27	86	60 - 140	85	70 - 130	<100	mg/kg	NC	40		

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

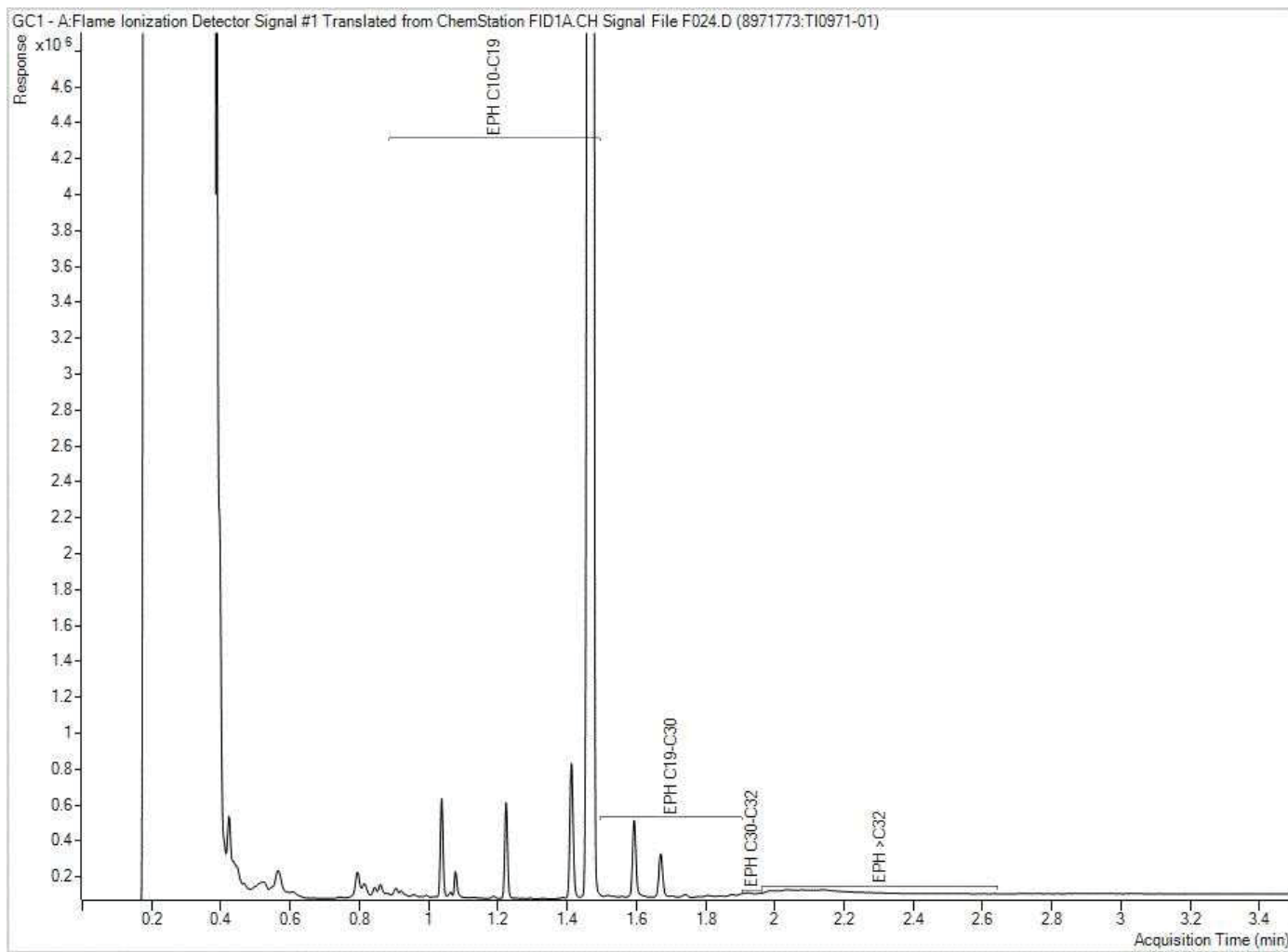
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Maxxam <small>1:1 Traceability Group Company</small>		Maxxam Analytics International Corporation o/a Maxxam Analytics 4606 Canada Way, Burnaby, British Columbia Canada V5G 1K3 Tel:(604) 734 7276 Toll-free:800-563-6266 Fax:(604) 731 2386 www.maxxam.ca		Page 1 of 1																																					
INVOICE TO: Company Name: #11343 WORLEYPARSONS CANADA SERVICES LT Contact Name: ACCOUNTS PAYABLE Address: 502 502-4321 Still Creek Dr. BURNABY BC V5C 6S7 Phone: (604) 298-1616 x Email: CAN.TradeAP@WorleyParsons.com		Report Information Company Name: <u>as invoice</u> Contact Name: <u>Neil Simpson</u> Address: <u></u> Phone: <u></u> Email: <u>neil.simpson@advision.com, BC.Lab@worleyparsons.c</u>		Project Information Quotation #: B70093 P.O. #: <u></u> Project #: <u>307004-00004 307071-01277</u> Project Name: <u>Chinook Creek North Park</u> Site #: <u></u> Sampled By: <u>NEIL S. PEREZ S.</u>																																					
Regulatory Criteria: <input type="checkbox"/> CSR <input type="checkbox"/> CCME <input type="checkbox"/> BC Water Quality <input type="checkbox"/> Other: <u></u>		Special Instructions <u>also email alison.cube@advision.com</u>		ANALYSIS REQUESTED (PLEASE BE SPECIFIC) <table border="1"> <tr> <th>Matrix</th> <th>Field Filtered ? (Y/N)</th> <th>BTEX / UPH</th> <th>EPH</th> <th>LEPH / HEPH / PAH</th> <th>METALS</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>2</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> </tr> <tr> <td>3</td> <td></td> <td>X</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td>X</td> <td></td> </tr> </table>		Matrix	Field Filtered ? (Y/N)	BTEX / UPH	EPH	LEPH / HEPH / PAH	METALS	1				X		2		X	X	X		3		X		X		4				X		5				X	
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SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM		Turnaround Time (TAT) Required: Please provide advance notice for rush projects		Regular (Standard) TAT: (will be applied if Rush TAT is not specified): <input checked="" type="checkbox"/> Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are + 5 days - contact your Project Manager for details.																																					
Job Specific Rush TAT (if applies to entire submission) 1 DAY <input type="checkbox"/> 2 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> Date Required: <input type="checkbox"/>		Rush Confirmation Number: <u></u> (call lab for #)		# of Bottles: <u>3</u> Comments: <u>How AFTER TESTS FOR POSSIBLE FURTHER ANALYSIS</u>																																					
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix																																					
1	SS18-01	25/04/18	—	Soil																																					
2	SS18-02	25/04/18	—	Soil																																					
3	SS18-03	25/04/18	—	Soil																																					
4	SS18-04	25/04/18	—	Soil																																					
5	SS18-05	25/04/18	—	Soil																																					
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Date: (YY/MM/DD) <u>18/03/25</u> Time: <u>12:55</u>		Date: (YY/MM/DD) <u>18/03/25</u> Time: <u>12:55</u>		# Jars used and not submitted: <u>N/A</u>																																					
Lab Use Only Temperature (°C) on Receipt: <u>19.14</u>		Custody Seal Intact on Closure? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		White: Maxxam Yellow: Client																																					

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B830901
Report Date: 2018/04/30
Maxxam Sample: TI0971

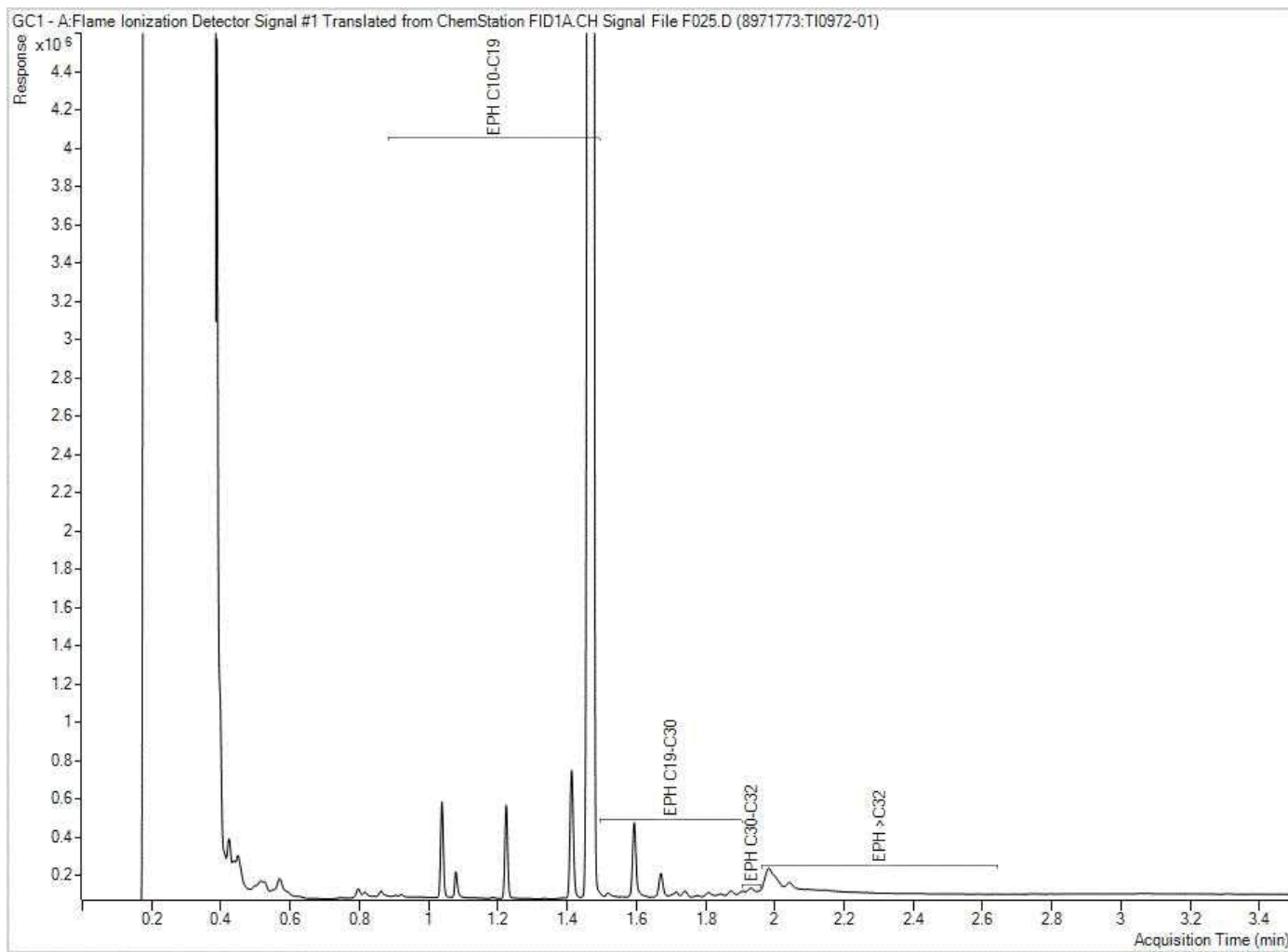
WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Reference: CHINA CREEK NORTH PARK
Client ID: SS18-02

EPH in Soil by GC/FID Chromatogram

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B830901
Report Date: 2018/04/30
Maxxam Sample: TI0972

WORLEYPARSONS CANADA SERVICES LTD
Client Project #: 307071-01277
Site Reference: CHINA CREEK NORTH PARK
Client ID: SS18-03

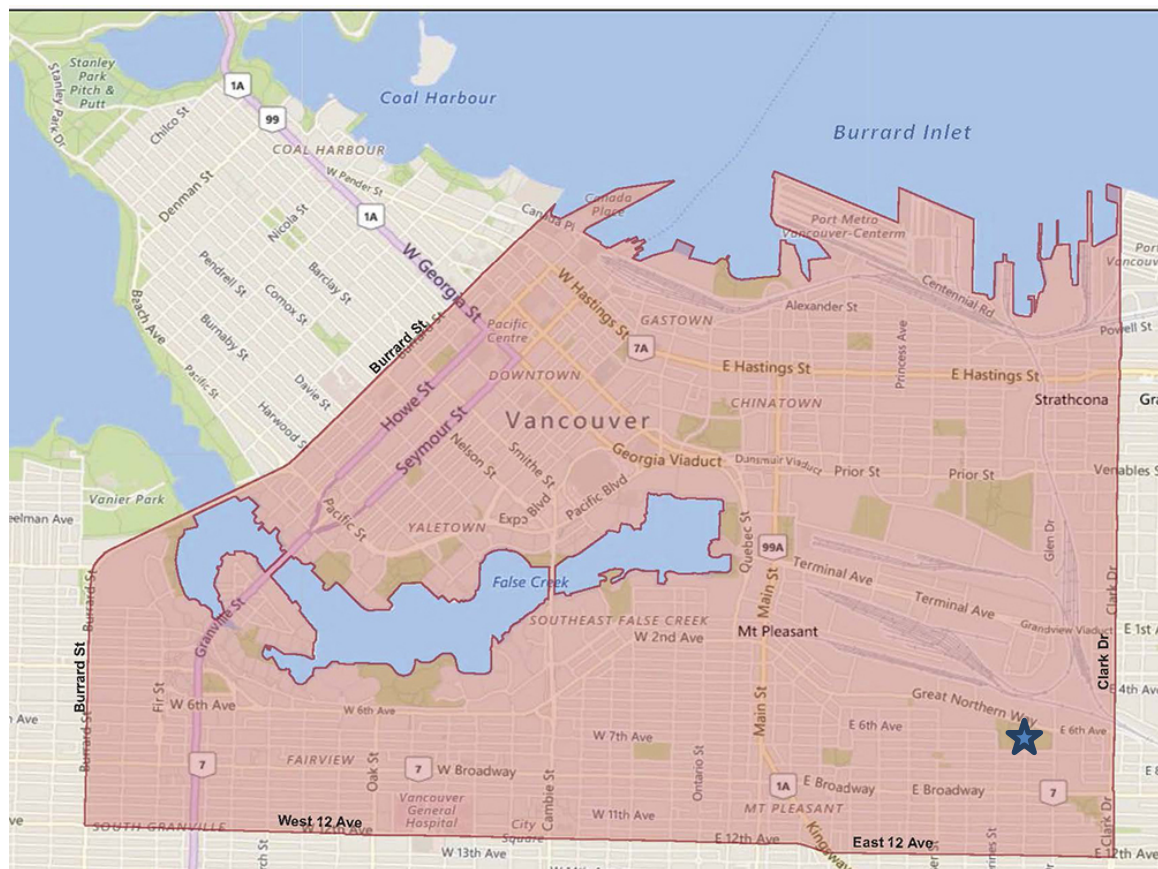
EPH in Soil by GC/FID Chromatogram

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
APPENDIX 4 - JAPANESE BEETLE AND CONTAMINATED SOILS TREATMENT

Japanese Beetle and Contaminated Soils Treatment

Japanese beetle is a regulated plant pest that attacks many economically important plants. The Canadian Food Inspection Agency (CFIA) has established a regulated area to control the spread of Japanese beetle in the Vancouver area.



(Regulated area in red, China Creek North Park indicated by star)

Anyone growing or working with soil, plants or plant waste in the regulated area should be aware of the full requirements described in:

- ["D-96-15: Phytosanitary requirements to prevent the spread of Japanese beetle, *Popillia japonica*, in Canada and the United States"](http://www.inspection.gc.ca/plants/plant-pests-invasive-species/directives/horticulture/d-96-15/eng/1323854808025/1323854908041) <http://www.inspection.gc.ca/plants/plant-pests-invasive-species/directives/horticulture/d-96-15/eng/1323854808025/1323854908041>
- ["Japanese Beetle Infested Place Order for the City of Vancouver"](http://www.inspection.gc.ca/plants/plant-pests-invasive-species/insects/japanese-beetle/japanese-beetle-infested-place-order/eng/1525272391906/1525272448971) <http://www.inspection.gc.ca/plants/plant-pests-invasive-species/insects/japanese-beetle/japanese-beetle-infested-place-order/eng/1525272391906/1525272448971>
- "Guidance for construction companies doing business in the Japanese Beetle Regulated Area in Vancouver": www.inspection.gc.ca/plants/plant-pests-invasive-species/insects/japanese-beetle/jb-vancouver/construction-companies/eng/1526354423602/1526354423867

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
APPENDIX 4 - JAPANESE BEETLE AND CONTAMINATED SOILS TREATMENT

The CFIA is working with the City of Vancouver, Province of BC, Invasive Species council of BC, BC Landscape and Nursery Association, and industry associations to establish additional storage and/or drop-off sites for commercial operations working within the regulated area. Whenever possible, regulated materials should remain within the regulated area.

Regulated year round

Soil, turfgrass, sod, ornamental grasses and other outdoor plants with soil

These articles can move freely within the regulated area.

Soil moving out of the regulated area requires a CFIA issued movement certificate

Top 30 cm of undisturbed soil must undergo CFIA approved treatment (e.g. deep burial).

Soil that is 30 cm or deeper does not require any additional risk mitigation measures.

Plants with soil can be moved out of the regulated area for treatment or disposal; a CFIA issued movement certificate is required.

Regulated from June 15 to October 15

Branches and plant debris with no soil

Movement out of the regulated area requires a CFIA issued movement certificate and/or must have undergone CFIA approved treatment to preclude the spread of Japanese beetle.

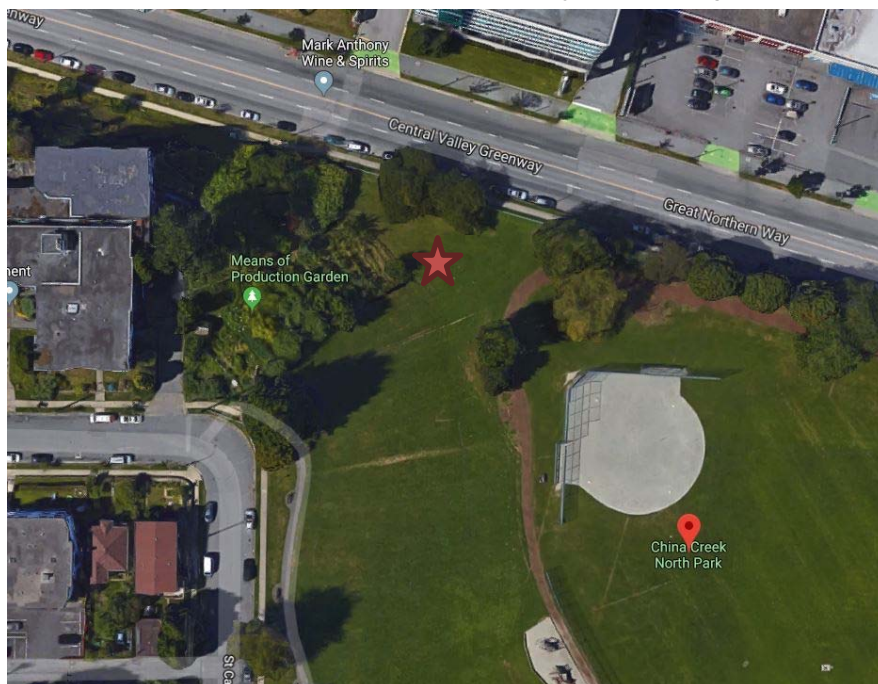
Non-compliance

When issues of non-compliance are observed, the CFIA will follow the Agency's Compliance and Enforcement Operational Policy. One of the enforcement options is to issue an Administrative Monetary Penalty which is a Notice of Violation with a warning or it can include a penalty. Penalties for individuals can range from \$500 to \$1300 and \$1300 to \$10,000 for violations committed during the course of business.

Materials Treatment at China Creek North Park

The contractor will be required to take all stripped turf and any other plant materials requiring disposal to a CFIA drop-off site within the regulated area.

Excess of soil from the top 12" of excavation will be used to create a berm (max slopes of 3:1) in the northwest corner of the park site (indicated by star in image below).



INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
APPENDIX 4 - JAPANESE BEETLE AND CONTAMINATED SOILS TREATMENT

Contaminated Materials

China Creek North Park has undergone historical infilling, therefore an environmental soils analysis was completed in areas with planned excavation. The results indicated concentrations of certain metals in soil exceeding the *Contaminated Sites Regulation* (CSR) parkland use (PL) standards in the sloped path and foot of slide areas. All other concentrations of metals, hydrocarbons and PAHs were less than the CSR PL standards.

Area	Soil Sample ID	Metals parameters that exceed CSR PL
Foot of slide	SS18-03	Sodium
Sloped path	SS18-04	Barium, copper, iron, lead, sodium, tin, zinc

Refer to Soil Analytical Report for further details.

Contaminated Materials Treatment at China Creek North Park

There is no contamination in the top 12" of fill on site, therefore there is no cross-contamination of soil that exceeds CSR PL standards and is regulated by CFIA for the Japanese Beetle.

Under a separate contract managed by the owner, Advisian Engineering will monitor excavation works and be responsible for disposal of contaminated materials at the Vancouver Landfill. Prime contractor is responsible for segregating materials on site as indicated by Advisian.

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART B - TERMS AND CONDITIONS OF ITT PROCESS

1.0 DEFINITIONS AND INTERPRETATION

1.1 Definitions

The following capitalized terms have the meanings set out below when used in the Tender Documents, unless the context requires otherwise:

- (a) “**City**” means the City of Vancouver as represented by its Vancouver Board of Parks and Recreation;
- (b) “**Closing Time**” has the meaning set out on the cover page of this ITT;
- (c) “**Contract**” means a contract substantially in the form of Part D - Form Agreement, to be entered into between the City and a successful Tenderer;
- (d) “**Contractor**” means a Tenderer, the Tender of which (or at least one offer contained within which) the City has accepted, and which Tenderer has consequently entered into a Contract;
- (e) “**Consultant**” means the architect, engineer or other professional consultant who will act as the City’s agent for the purpose of managing and administering a Contract, who may be an employee of the City or an independent consultant engaged by the City on its behalf;
- (f) “**Drawings**” means the portion of the Tender Documents consisting of the graphic and pictorial representations of the Work or Work requirements;
- (g) “**Form of Tender**” means the form of tender in Part C - Form of Tender to this ITT on which Tenderers are to complete their Tenders;
- (h) “**GST**” means the tax payable and imposed pursuant to Part IX of the *Excise Tax Act* (Canada), as amended or replaced from time to time;
- (i) “**Information and Privacy Legislation**” includes the *Freedom of Information and Protection of Privacy Act* (British Columbia) and the regulations thereunder;
- (j) “**Losses**” means, in respect of any matter, all:
 - (i) direct and indirect; and
 - (ii) consequential,

claims, demands, proceedings, losses, damages, liabilities, deficiencies, costs and expenses (including without limitation, all legal and other professional fees and disbursements, interest, penalties and amounts paid in settlement, whether from a third person or otherwise);
- (k) “**Notice of Award**” has the meaning set out in Part C - Form of Tender;
- (l) “**Notice to Proceed**” has the meaning set out in Part C - Form of Tender;

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART B - TERMS AND CONDITIONS OF ITT PROCESS

- (m) "PST" means the provincial sales tax payable and imposed pursuant to the *Provincial Sales Tax Act* (British Columbia), as amended or replaced from time to time;
- (n) "Site" has the same meaning as "Place of the Work," as defined in the Form of Agreement;
- (o) "Specifications" means the portion of the Tender Documents consisting of the written requirements and standards for products, systems, workmanship, quality, and the services necessary for the performance of the Work;
- (p) "Tender" means a tender submitted to the City in response to this ITT;
- (q) "Tender Contract" means the contract between the City and each Tenderer governing the ITT process;
- (r) "Tender Documents" means the documents identified as such in Part A - Introduction;
- (s) "Tenderer" means an entity eligible to participate in this ITT process, or as used in Part C - Form of Tender, a particular such entity;
- (t) "Tender Price" means the amount stipulated by the Tenderer in the space provided therefor in the Form of Tender, including all applicable taxes, which price, for greater certainty, is the Tenderer's proposed Contract Price to complete all of the Work; and
- (u) "Work" means the total construction and related services required by the Tender Documents;

All other capitalized terms used in this ITT have the meanings given to them elsewhere in the ITT.

1.2 Interpretation

- (a) In the Tender Documents, any reference to the masculine, the feminine or the neuter includes the others unless the context requires otherwise. Also, any reference to the singular includes the plural where appropriate.
- (b) If there is a conflict between or among (i) the Specifications and Drawings and (ii) the other Tender Documents, the other Tender Documents shall prevail over the Specifications and Drawings.
- (c) In these Tender Documents, the word "should" and the terms "is asked to" and "are asked to" are used to denote actions or Tender inclusions that, while not mandatory, are strongly recommended. In contrast, the terms "will", "shall", "must", "is to", "are to", "is required to" and "are required to" are used to denote mandatory requirements of the ITT. If a Tenderer is uncertain as to whether or not a particular action or Tender inclusion is mandatory, the Tenderer should submit an inquiry to the Contact Person.

2.0 SUBMISSION INSTRUCTIONS

- 2.1 Each Tenderer must complete its Tender on the Form of Tender and submit its Tender in accordance with the instructions set forth on the cover page of the ITT and elsewhere herein.

**INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART B - TERMS AND CONDITIONS OF ITT PROCESS**

- 2.2 Any Tender received after the Closing Time may be returned unopened to the Tenderer.
- 2.3 Faxed or emailed Tenders and/or other documents will not be accepted.
- 2.4 Each Tender must be signed by an authorized signatory or authorized signatories of the Tenderer (as necessary for due execution on behalf of the Tenderer). Each Tender by a company or partnership should specify the full legal name of the legal entity submitting the Tender.
- 2.5 All blank spaces in the Form of Tender should be filled in and all schedules completed. Any failure by a Tenderer to complete the Form of Tender may result in preference being given to competing Tenderers. All prices and notations should be legibly written in a non-erasable medium. Erasures, interlineations or other corrections should be initialled by an authorized signatory of the Tenderer.
- 2.6 Subject to any alternatives or options in respect of which the City requests pricing or other information in a Schedule to the Form of Tender, Tenders are to be all inclusive and without qualification or condition.
- 2.7 The City may, at any time and for any reason, extend the Closing Time by means of a written amendment published on the City's website, as set out in Part A - Introduction.
- 2.8 A Tenderer that has already submitted a Tender may amend its Tender prior to the Closing Time: a) by submitting an amendment identifying a plus or minus variance to the Tenderer's Tender Price or the Tenderer's price for a subset of the Work (if, in the latter case, Section 1.0 of the Form of Tender requests that, in addition to offering a Tender Price for all of the Work, the Tenderer offer prices for subsets of the Work); or b) by sending in a completely new Tender, clearly indicating it replaces the previously submitted Tender. Any such revision must clearly identify the ITT number and the Closing Time. A Tender revision submitted as aforesaid shall effectively amend the Tender and the City shall only review and evaluate the Tender as amended.
- 2.9 The City will not be responsible for any cost incurred by any Tenderer in preparing a Tender.

3.0 BONDS

- 3.1 Tenders will be irrevocable and each offer made therein shall remain open for acceptance by the City for a period of ninety (90) calendar days after the Closing Time. Each Tender must be accompanied by a bid bond valid for a period of ninety (90) calendar days commencing on the Closing Time, payable to the "City of Vancouver", in the amount of ten percent (10%) of the Tender Price, and not a dollar amount, as a guarantee of the due execution of a Contract and the delivery of the performance bond and labour and material payment bond required by the Form of Tender. The forms of these bonds are to be those issued by the Canadian Construction Documents Committee as follows:

Bid Bond:	CCDC 220 (latest)
Performance Bond:	CCDC 221 (latest)
Labour and Material Payment Bond:	CCDC 222 (latest)

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART B - TERMS AND CONDITIONS OF ITT PROCESS

- 3.2 Each Tender must be accompanied by a "Consent of Surety", substantially in the form provided as a schedule to the Form of Tender, duly completed by a surety company authorized and licensed to carry on business in British Columbia.
- 3.3 The bid bonds of unsuccessful Tenderers will be returned to them upon request at any time after the Contract is awarded. The bid bond of the Tenderer to whom the award is made will be returned upon request of the Tenderer following: execution of the Contract; delivery of a performance bond for 50% of the Tender Price (or the aggregate tendered price for the subset(s) of the Work in respect of which a Notice of Award has been given) and a labour and material payment bond for 50% of such price; commencement of the Work; and compliance with any other conditions set out in the Form of Tender. The cost of all bond premiums must be included in the Tender Price.
- 3.4 All bonds must be issued by a surety company authorized and licensed to carry on business in British Columbia.

4.0 TENDER PRICE

- 4.1 Subject to any adjustment for changes to the Work, which is approved by the City in accordance with the Tender Documents or Contract Documents, the Tender Price shall be the maximum compensation owing to the Contractor for the Work (and each tendered price for any subset of the Work referred to in Section 1.0 of the Form of Tender (if applicable) shall be the maximum compensation owing to the Contractor for such subset of the Work) and the Contractor's compensation shall cover and include all profit and all costs of supervision, labour, material, equipment, overhead, financing and all other costs and expenses whatsoever incurred in performing the Work (or the relevant subset of the Work).
- 4.2 If unit prices or other price breakdowns are requested in a schedule to the Form of Tender, such information must be included in the Tender. Furthermore, if such unit prices or other price breakdowns are requested in a schedule to the Form of Tender, such amounts may be used to compute interim progress payments and will be reviewed by the City in its evaluation of Tenders; therefore Tenderers should ensure that such amounts accurately reflect their costs for each item. A Tenderer may be required to justify any submitted unit price or other price breakdown.
- 4.3 If an itemized breakdown of the Tender Price (or of the tendered price for any subset of the Work) is requested in a schedule to the Form of Tender, the City may delete any items in order to meet any budget limitation and award a Contract for only the remaining items to a Tenderer who is agreeable thereto.
- 4.4 If Section 1.0 of the Form of Tender requests that, in addition to offering a Tender Price for all of the Work, each Tenderer offer prices for subsets of the Work, then, each such offer made in respect of a subset of the Work by a Tenderer shall be irrevocable to the same extent as, and otherwise subject to all of the same terms and conditions as, the Tenderer's offer to complete all of the Work for the Tender Price. If Tenders are made in respect of subsets of the Work, the City may award a Contract for all of the Work to one Tenderer or it may award multiple Contracts to different Tenderers in respect of particular subsets of the Work. The City may also determine, in order to meet any budget limitation, to award Contract(s) only in respect of one or more, but not all, of the subsets of Work described in Section 1.0 of the Form of Tender. Tenderers are advised that the City is not bound to award any Contract to the Tenderer offering to complete the Work, or offering to complete any subset of the Work, for

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART B - TERMS AND CONDITIONS OF ITT PROCESS

the lowest price. Without limiting the foregoing, the City may split the award of Contracts even though the aggregate Contract price is higher than any particular Tenderer's Tender Price.

5.0 ACCEPTANCE OF TENDERS

5.1 Despite anything to the contrary contained in the Tender Documents:

- (a) Tenderers are notified that the lowest or any Tender (or the lowest price offered for any particular subset of the Work, if applicable) need not necessarily be accepted and the City reserves the right to reject any and all Tenders at any time, or cancel the ITT process, without further explanation or to accept any Tender (or any offer made within a Tender) that is considered advantageous to the City.
- (b) Acceptance of any offer made within a Tender is contingent on funds being approved and a contract award being made by, or pursuant to authority delegated by, Vancouver City Council and the compliance of the Tenderer with the conditions required to be satisfied upon receipt of a Notice of Award.
- (c) Tenders which fail to conform to the Tender Documents may or may not be disqualified or rejected. The City may or may not waive any non-compliance with the Tender Documents, including any material non-compliance, irregularity or anomaly, and including any non-compliance as to the timing of delivery of anything required by the Tender Documents, and may at its sole discretion elect to retain for consideration Tenders which are non-conforming because they do not contain the content or form required by the Tender Documents or because they have not complied with the process for submission set out in this ITT.
- (d) Where the City is of the view, in its sole discretion, that there is an ambiguity or other discrepancy which cannot be discerned or resolved from examining the contents of a Tender, then whether or not such an ambiguity or discrepancy actually exists on the face of the Tender, the City may, prior to any Contract award, solicit clarification from the Tenderer or accept clarification from the Tenderer on any aspect of the Tender. Such clarification may include the acceptance of any further documents or information which will then form part of the Tender. The soliciting or accepting of such clarification (whether or not solicited) by the City will be without any duty or obligation of the City to advise any other Tenderers or to allow them to vary their tendered price(s) as a result of the acceptance of clarification from any one or more Tenderers and the City will have no liability to any Tenderer as a result of such acceptance of clarification.
- (e) The award of any Contract will be based on an evaluation of the Tenders by the City to determine which, in the City's opinion, offer the best overall value to the City. The City expects to place the greatest emphasis on price; however, the City may take into account other factors affecting value, including those concerning quality, service or sustainability, or Tenderers' past work, reputations or experience. The City may also focus, where relevant, on the overall net impact of a Tender (or an offer therein) on the finances of the City (including both capital and operating costs). Therefore, the City may accept a Tender other than the lowest Tender.
- (f) If the City determines that all Tender Prices are too high, all Tenders may be rejected.

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CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART B - TERMS AND CONDITIONS OF ITT PROCESS

- (g) The City may, prior to any Contract award, agree, with the Tenderer considered to provide best value or any one or more Tenderers, to certain changes to the scope of the Work or certain changes to Contract conditions, in each case without having any duty or obligation to advise any other Tenderers or to allow them to vary any tendered prices as a result of such changes, and the City will have no liability to any other Tenderer as a result of such changes. However, each Tender must be a tender in respect of the Work set forth herein, to complete that Work (or to complete subsets of that Work, if so specified in Section 1.0 of the Form of Tender) under an agreement in the form of the Form of Agreement included as Part D of the ITT, and not propose variations thereto.
- (h) Each Tenderer acknowledges and agrees that the City will not be responsible for Losses incurred by the Tenderer as a result of or arising out of submitting a Tender, or due to the City's acceptance or non-acceptance of its Tender, or any part thereof, or any breach by the City of the Tender Contract between the City and the Tenderer, or arising out of any Contract award not being made in accordance with the express or implied terms of the Tender Documents.
- (i) The City may award a Contract on the basis of policies and preferences not stated in the Tender Documents or otherwise than as stated in the Tender Documents.
- (j) Prior to any Contract award, a Tenderer may be required to demonstrate financial stability. Should the City so request, a Tenderer may be required to provide annual financial reports or a set of financial statements prepared by an accountant.
- (k) City guidelines or policies that may be applicable to the ITT will not give rise to legal rights on the part of any Tenderer, Contractor, subcontractor, supplier, or other person as against the City and will in no case create any liability on the part of the City. For certainty, the City's Procurement Policy, as amended or replaced from time to time, is now agreed to be an internal guideline document and creates no legal rights or obligations with respect to this ITT.
- (l) The City may reject any Tender by a Tenderer that has engaged in collusion with another Tenderer or otherwise attempted to influence the outcome of the ITT other than through the submission of its Tender.
- (m) The City may elect, in its sole discretion, to accept for consideration Tenders that contain conditions or qualifications that are in the nature of corrections of typos or resolutions of internal inconsistencies in this ITT or the Form of Agreement in Part D, or that represent immaterial changes to the Form of Agreement in Part D and do not consist of changes of substance or changes to allocations of risk, or with respect to the scope of any Work, that are for the avoidance of doubt only and do not suggest any deviation from the requirements of the ITT. This Section 5.1(m) is a reservation of rights for the benefit of the City and no Tenderer may rely on this paragraph to qualify its Tender.

6.0 AWARD OF CONTRACT

- 6.1 Award of a Contract will be subject to approval by, or pursuant to authority delegated by, Vancouver City Council and the Tenderer's compliance with the conditions required to be met upon receipt of the Notice of Award.

**INVITATION TO TENDER NO. PS20180859
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PART B - TERMS AND CONDITIONS OF ITT PROCESS**

- 6.2 Any successful Tenderer will become a Contractor and will be required to sign a Contract with the City, subject to any amendments approved by the City in writing.

7.0 EXAMINATION OF TENDER DOCUMENTS

- 7.1 Each Tenderer should examine the Tender Documents and must also satisfy itself of the extent of the Work. Each Tenderer must make its own estimate of the facilities and difficulties attending the performance and the completion of Work.
- 7.2 No allowance will be made on behalf of a Contractor for any error, omission or negligence on the Contractor's part or for non-compliance with the requirements of the foregoing clause 7.1.

8.0 SITE EXAMINATION/PRE-SUBMISSION DUE DILIGENCE BY TENDERER

- 8.1 Tenderers should make a careful examination of the Site and investigate and satisfy themselves at their own risk and expense as to all matters relating to the nature and extent of Work, the means of access to the Site, the extent of required coordination with public use of adjacent areas, and any and all matters which are referred to in the Specifications and Drawings and other Tender Documents, or which are necessary for the full and proper completion of any Work or are required by the conditions under which it must be performed. No allowance will be made subsequently for any error, negligence, interpretation, or misinterpretation on a Contractor's part.
- 8.2 The City and the Consultant do not make any representations or warranties concerning the completeness or accuracy of Site and geotechnical information (if any) provided in or with the Tender Documents, and each Tenderer must evaluate such information as part of its overall assessment of actual Site conditions.
- 8.3 If any Tenderer wishes to evaluate any Site conditions, and, for that purpose, requires access or documents from the City beyond the access and documents already provided for in this ITT, the City encourages the Tenderer to submit a written request to the City as far in advance of the Closing Time as is possible. The City will then consider whether or not to facilitate the request. In response to such a request, the City may elect to, itself, undertake a particular study and distribute the results to all Tenderers.

9.0 INTERPRETATION AND CLARIFICATIONS

- 9.1 If any Tenderer is in doubt as to the correct interpretation of any part of the Specifications, Drawings, or other Tender Documents, the Tenderer should request an interpretation of the same from the City by the time stated in Part A - Introduction, Section 6.3. In the absence of such a request, the Tenderer's Tender will be presumed to be based upon the interpretation that may be subsequently given in accordance with the Contract Documents, after award of a Contract.
- 9.2 Prior to the Closing Time, requests for clarification of the Specifications, Drawings, or other Tender Documents may be answered in writing by the City and sent to all prospective Tenderers who have submitted a Response Notification Form on or before the indicated deadline. The City is not responsible for any other explanations or interpretations of the Specifications, Drawings or other Tender Documents.

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10.0 PRODUCT APPROVAL

- 10.1 Wherever any material, machinery, equipment or fixture (any “Product”) is specified or shown in the Tender Documents by reference to a proprietary item, product or model number, catalogue number, manufacturer or trade name or similar reference, each Tenderer obligates itself to submit its Tender and, if applicable, accept award of a Contract based upon the use of such Product. Use of any such reference in the Tender Documents is intended to establish the measure of quality which the City (or its Consultant) has determined to be requisite and necessary for the Work. Where two or more Products are shown or specified, the Contractor has the option of which to use.
- 10.2 For approval of Products other than those specified, a Tenderer should submit a request in writing to the City at least five business days prior to the Closing Time. Requests must clearly define and describe the Product for which approval is requested. Requests should be accompanied by manufacturer’s literature, specifications, drawings, cuts, performance data or other information necessary to completely describe the items. Approval by the City will only be in the form of an addendum to the Specifications issued by the City.
- 10.3 Approvals of Products, as noted in clause 10.2 above, shall only be deemed effective insofar as the Products conform to the Specifications.

11.0 INSURANCE

- 11.1 Each Tenderer should ensure that it can maintain the insurance described in the Form of Agreement (Part D).
- 11.2 The Tenderer should complete and submit the “Certificate of Existing Insurance” attached as a Schedule to the Form of Tender, together with the “Undertaking of Insurance” attached as a Schedule to the Form of Tender.
- 11.3 Following Contract award, a successful Tenderer will be required to complete a certificate of insurance for the Work (or the particular subset of the Work in respect of which the Contract is made), in the form attached as a schedule to the Form of Tender.

12.0 WORKSAFEBC

- 12.1 The Tenderer should ensure that it can comply with all WorkSafeBC requirements, as described in the Form of Agreement (Part D).

13.0 LABOUR RATES AND EQUIPMENT

- 13.1 Tenderers must provide, if requested in a schedule to the Form of Tender, the force account labour and equipment rates setting out the all-inclusive hourly rates for all applicable types of equipment as well as the all-inclusive hourly rates for all applicable categories of labour, which rates will then apply pursuant to any Contract.

14.0 LISTS OF SUBCONTRACTORS AND SUPPLIERS

- 14.1 Tenderers should provide, if requested in a schedule to the Form of Tender, lists of proposed subcontractors and suppliers, specifying the name and address of, and the portion of the Work to be completed by, or the equipment or materials to be supplied by, each proposed subcontractor or supplier.

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- 14.2 The City reserves the right to object to any of the proposed subcontractors or suppliers listed in a Tender. If the City objects to a listed subcontractor or supplier, then the City will permit a Tenderer to propose a substitute subcontractor or supplier acceptable to the City. A Tenderer will not be required to make such a substitution and, if the City objects to a listed subcontractor or supplier, the Tenderer may, rather than propose a substitute subcontractor or supplier, consider its Tender rejected by the City and, by written notice, withdraw its tender. The City shall, in that event, return the Tenderer's bid security.

15.0 TAXES AND FEES

- 15.1 The successful Tenderer will be required to obtain and pay for any applicable municipal, provincial and federal permits and licences necessary for the proper completion of the Work. The City will not be liable in any manner for the same, and the successful Tenderer agrees to indemnify and save the City harmless from and against all claims and Losses in relation to obtaining and paying for any applicable municipal, provincial and federal permits and licences necessary for the proper completion of the Work.
- 15.2 Each Tenderer's Tender Price (and each other price offered by the Tenderer in its Tender, if applicable) must, unless otherwise expressly stated, be inclusive of all applicable municipal, provincial, federal and other taxes, and all customs and excise duties and other assessments and charges, including sales taxes assessed upon the sale of goods and services to the City under the Contract, and the successful Tenderer agrees to indemnify and save the City harmless from and against all claims which shall be made with respect thereto.

16.0 NON-RESIDENT WITHHOLDING TAX

- 16.1 Tenderers are advised that, if the Contractor is not a resident of Canada, federal tax legislation may require that a certain percentage of any Contract Price otherwise payable to the Contractor be withheld by the City and remitted to the Receiver-General for Canada. The percentage required to be withheld and remitted varies depending on, among other things, the country of residence, the provisions of any applicable tax treaties and the nature of the payment. Non-resident Tenderers may contact the Vancouver office of the Canada Revenue Agency for further details. Under any Contract, any and all money so withheld and remitted shall be treated as a payment to the Contractor against the Contract Price.

17.0 NO CLAIM AGAINST THE CITY

- 17.1 The Tenderer acknowledges and agrees that the City will not be responsible for any Losses incurred by the Tenderer, including, without limiting the generality of the foregoing, any Losses incurred by the Tenderer directly or indirectly caused by any act or omission of the City or breach of any agreement or duty by the City, express or implied, and by submitting a Tender each Tenderer shall be deemed to have agreed that it has no claim whatsoever.
- 17.2 The Tenderer now indemnifies and will protect and save the City and any of its employees, advisors or representatives (including the Consultant) harmless from and against all Losses, in respect of any claim or threatened claim by any of its subcontractors, or materials or equipment suppliers alleging or pleading:
- (a) a breach of the Tender Contract by the City or any of its employees, advisors or representatives (including the Consultant);

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PART B - TERMS AND CONDITIONS OF ITT PROCESS

- (b) an unintentional tort, of the City or any of its employees, advisors or representatives (including the Consultant), occurring in the course of conducting this ITT; or
- (c) liability on any other basis related to the ITT or the Tender Contract.

18.0 DISPUTE RESOLUTION

18.1 Any dispute relating in any manner to this ITT, except only disputes arising between the City and any Tenderer to whom the City has made an award of a Contract, which arise under such Contract, will be resolved by arbitration in accordance with the *Commercial Arbitration Act* (British Columbia), amended as follows:

- (a) The arbitrator will be selected by the City's Director - Supply Chain Management;
- (b) Sections 17.1 and 17.2 above will:
 - (i) bind the arbitrator, the Tenderer and the City; and
 - (ii) survive any and all awards made by the arbitrator; and
- (c) The Tenderer will bear all costs of the arbitration.

19.0 CONFIDENTIALITY AND PRIVACY

19.1 Each Tender, once submitted to the City, will be held in accordance with the City's role as a public body required under Information and Privacy Legislation to protect or disclose certain types of records according to certain statutory rules. Each Tender, upon submission to the City, will be received and held in confidence by the City, unless and to the extent that it is or must be disclosed pursuant to Information and Privacy Legislation or other applicable legal requirements, and except that the City may publicly disclose information about or from Tenders, including without limitation names and prices, in the course of publicly reporting to the Vancouver City Council about the ITT.

19.2 If unsuccessful, a Tenderer, at the City's request, shall destroy or return all copies and originals (in any format or medium) of the Tender Documents.

20.0 RELEASE OF INFORMATION RESTRICTED

20.1 The release of information about Tenders is restricted. Tenderers can obtain information concerning the names of the other Tenderers who have submitted a Tender and the Tender Price shown on each Form of Tender at the following website within 48 hours of the Closing Time. However, no other information is anticipated to be disclosed by the City.

<http://vancouver.ca/doing-business/unverified-tender-results.aspx>

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CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART C - FORM OF TENDER

Tender of:			
	Legal Name of Person, Partnership or Corporation (the "Tenderer")		
Business Address:			
Postal or Zip Code:			
Cheques Payable to/Remit to Address:			
Postal or Zip Code:			
Key Contact Person:			
Telephone No.:		Fax No.:	
E-mail:			
Tax registration numbers (as applicable):			
Dun & Bradstreet Number (if available):		WorkSafeBC Account Number:	
City of Vancouver Business License Number (or, if available, Metro West Inter- municipal Business License Number):		Date, Jurisdiction and Form of Organization (as applicable):	

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART C - FORM OF TENDER

1.0 TENDER PRICE AND SCHEDULE

Having carefully read and examined the Tender Documents, and having agreed to the terms and conditions set out in Parts A and B of the ITT, the undersigned Tenderer (for purposes of this Tender, the "Tenderer") offers to complete the Work and to furnish all plant, tools, equipment, labour, products, material and supervision necessary therefor, and to enter into an agreement in the form of the Form of Agreement set forth as Part D of the ITT to execute the Work, for the Tender Price specified below.

ITT NO. PS20180859

The Tender Price (including all costs, taxes and fees)(as per Schedule A), is
_____ dollars
and _____ cents (\$_____)

The Tender Price includes all PST and GST.

The Tenderer's offer to complete all of the Work is an offer made according to the following schedule:

- (a) Work will begin by October 1, 2018, subject to the City issuing a Notice to Proceed.
- (b) Substantial performance of the Work will occur by June 15, 2019.
- (c) Total performance of the Work will occur by June 30, 2019.

2.0 ELECTRONIC PAYMENTS ACKNOWLEDGEMENT

If awarded a contract, the Tenderer agrees that all payments to be made by the City will be by electronic funds transfer, and the Tenderer will provide the City with the necessary banking information to facilitate this process.

3.0 IRREVOCABILITY; NOTICE OF AWARD

The Tenderer agrees that each offer made by the Tenderer herein will be irrevocable and open for acceptance by the City for a period of ninety (90) calendar days commencing on the Closing Time, even if an offer of another Tenderer is accepted by the City. If within this period the City delivers a written notice by which the City accepts an offer of the Tenderer (a "Notice of Award"), the Tenderer will, within ten (10) Working Days (as defined in CCDC 2) of the receipt of the Notice of Award, deliver to the City:

- (a) a performance bond and a labour and material payment bond, each in the amount of fifty percent (50%) of the Tender Price, issued by a surety licensed to carry on the business of suretyship in the province of British Columbia, and in a form acceptable to the City;

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CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART C - FORM OF TENDER**

- (b) a detailed construction schedule consistent with the preliminary construction schedule included in this Tender, which indicates the timing of the major activities of the relevant Work and provides sufficient detail of the critical events and their inter-relationship to demonstrate such Work will be performed by the relevant completion date stated in this Tender;
- (c) a detailed traffic management plan addressing vehicular and pedestrian movement, safety and access with specific details of the methods, signage and materials used to maintain Site operations and access to staff and public users of the Site;
- (d) a detailed Site-specific safety and health plan addressing as a high-level overview the health and safety issues including, but not limited to hazards, mitigation measures, site orientations, safety meetings, first aid attendant requirements, and training requirements and record keeping;
- (e) a WorkSafeBC number and a "clearance letter" confirming that the Tenderer is in WorkSafeBC compliance;
- (f) a valid City of Vancouver business licence;
- (g) a completed Contractor's Pre-Contract Hazard Assessment Form (in the form of Schedule 9 to the Form of Agreement);
- (h) banking details to support payments by Electronic Funds Transfer (EFT); and
- (i) a completed and signed certificates of insurance (in the forms attached as a schedule to this Form of Tender) indicating that all of the insurance coverage required by the Contract is in place.

4.0 NOTICE TO PROCEED

The Tenderer agrees that upon the City's receipt and acceptance (in the City's discretion) of the required submissions listed above, the Tenderer will, within two (2) Working Days, execute and return to the City the Contract and the other Contract Documents requiring execution (in each case, as prepared by the City for execution) and, upon the City's receipt and acceptance thereof, the City may deliver to the Tenderer a "Notice to Proceed", and the Tenderer will:

- (a) commence the relevant Work within two (2) Working Days of the receipt of the Notice to Proceed or such longer time as may be otherwise specified in the Notice to Proceed; and
- (b) issue, post, and copy the City on the "Notice of Project" as and when required under section 20.2 of the *Occupational Health & Safety Regulation* (BC Regulation 296/97).

5.0 CONDITIONS

- (a) The Tenderer agrees that if the Tenderer receives a Notice of Award or a Notice to Proceed and fails or refuses to comply with the requirements stated in the foregoing clause 3.0 or clause 4.0, as the case may be, then such failure or refusal will be deemed to be a repudiation of the Tender Contract and refusal to enter into the

**INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART C - FORM OF TENDER**

relevant Contract and the City may, on written notice to the Tenderer, award the Contract to another party. It is further agreed that, as full compensation on account of damages suffered by the City because of such failure or refusal, the bid security shall be forfeited to the City in the amount equal to the lesser of:

- (i) the face value of the bid security; and
 - (ii) the amount by which the Tender Price is less than the amount for which the City contracts with another party to perform the Work.
- (b) The lowest or any submitted tender will not necessarily be accepted in relation to all or any of the Work. The City reserves the right to reject this Tender at any time without further explanation or to accept any Tender considered advantageous to the City.
- (c) The schedules attached to this Form of Tender form an integral part of the same.

6.0 ADDENDA, AMENDMENTS AND QUESTIONS AND ANSWERS

The Tenderer acknowledges receipt of the following addenda, amendments and questions and answers to the Tender Documents:

Addendum No.
Amendment No.
Questions and Answers No.

The Tenderer agrees that it thoroughly understands and accepts the terms and conditions contained therein.

7.0 CITY PRE-CONTRACT HAZARD ASSESSMENT

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PART C - FORM OF TENDER

The Tenderer acknowledges receipt of the completed City Pre-Contract Hazard Assessment (Schedule 8 of Part D - Form of Agreement), subject to GC 9.4.12, Schedule 1 of Part D - Form of Agreement.

8.0 CERTIFICATION

The Tenderer represents and warrants that this Tender complies in all respects with the Tender Documents.

9.0 LABOUR

The above stated price is based on the Work under the Contract being performed by union/non-union labour. (Delete "union" or "non-union" as applicable).

10.0 CONTRACT TERMS IN THE ITT

Without limitation, the Tenderer expressly agrees with the City to all of the terms and conditions set forth in Part A and Part B of the ITT and is bound thereby.

SIGNED on behalf of the Tenderer this _____ day of _____ 20____ by _____ the _____ duly authorized signatory or signatories of the Tenderer:

Per: _____

Name and Title: _____

Per: _____

Name and Title: _____

If the Tenderer has a corporate seal, the corporate seal should be applied in the space below:

If the Tenderer is an individual, a proprietorship or a partnership, the above signature(s) should be witnessed:

Witness signature

Witness name

Witness address

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "A" (PART C - FORM OF TENDER)

SCHEDULE "A"

SCHEDULE OF QUANTITIES AND PRICES

EACH TENDER MUST COMPLETE THIS SCHEDULE A, AS AMENDED, IN FULL. EACH PAGE OF THIS SCHEDULE A MUST BE INITIALLED BY THE SIGNATORIES OF THE FORM OF TENDER. TENDERS MUST NOT BE SUBMITTED WITHOUT A COMPLETED, DULY EXECUTED SCHEDULE A.

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "A" (PART C - FORM OF TENDER)

The Tender Price to complete all of the Work is apportioned in accordance with the following table. The prices shown in each of the numbered rows of the table shall include (i) all labour, material and other costs, (ii) overhead and profit, (iii) PST, and (iv) all other taxes, duties, assessments, charges and fees, *except for GST*. GST shall be shown separately on the row provided therefor.

NOTE: Prices must be PST-inclusive. Only GST is to be shown as a separate line item.

The sum of the amounts shown in the table below **MUST** equal the Tender Price stipulated in the space provided in the Form of Tender which, for greater certainty, is the Tenderer's proposed Contract Price for a Contract to complete all of the Work.

EVERY ROW OF THE BELOW TABLE MUST BE COMPLETED WITH A DOLLAR AMOUNT, EVEN IF THAT DOLLAR AMOUNT IS \$0.

Item	Description	Amount (including PST)
1.0	General Works	
1.1	Mobilization/Demobilization	\$
1.2	Temporary Granular Path	\$
2.0	Demolition	
2.1	Demolition	\$
3.0	Earthwork and Drainage	
3.1	Excavation, Backfilling and Subgrade Preparation Including bulk excavation works and filling, berming of excess top 12" of soil on site, subgrade reshaping, supply and placement of imported subgrade fill and related works (see Soil Analytical Report for areas with excavation that must be disposed offsite, disposal by others).	\$
3.2	Boulder Retaining Wall Boulders supplied by VPB from Kent Yard, delivered to site and installed by contractor	\$
3.3	Drainage Including 100mm perf. 150mm solid, catch basins and cleanouts as per details	\$
4.0	Concrete, Pathway and Track	
4.1	CIP Concrete	\$

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "A" (PART C - FORM OF TENDER)

	Including retaining wall, stair and landings (including galvanized steel railing), bench and picnic table pads, playground paving band	
4.2	Cement soil wall	\$
4.3	Asphalt Paving Including accessible path, connections to stair and connections to track	\$
4.4	Crushed Granite Track Restoration Including path edger	\$
5.0	Play Equipment and Surfacing	
5.1	Allowance for Supply and Install of Play Equipment by Habitat Systems Inc. (or Approved Equal): Climbing holds, four seat swing, Rope climber (including 4 posts, collars, cables & climbing toggles), Net climber (including 4 posts, collars & cables), Play structure (Habitat Smart Play motion w play table), Hill slide (1.5m w, steel), and Spring rider * including concrete footings for play equipment *	Cash Allowance: \$87,250.00
5.2.	Poured in Place Rubberized Surfacing Including playground hill steps, and climbing bumps	\$
5.3	Stepping Logs (VPB supply/ contractor install)	\$
5.4	Stone Paving (VPB supply/ contractor install)	\$
5.5	Landscape Boulders Boulders supplied by VPB from Kent Yard, delivered to site and installed by contractor	\$
5.6	Picnic tables (VPB supply/ contractor install)	\$
6.0	Plants and Growing Medium	
6.1	Growing Medium	\$
6.2	Hydroseed	\$
6.3	Trees (6)	\$

June 21, 2018

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Name of Tenderer

Initials of Signing Officer(s)

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "A" (PART C - FORM OF TENDER)

6.4	Shrubs	\$
6.5	Perennials	\$
6.6	One year landscape establishment/maintenance	\$
7.0	Irrigation	
7.1	Irrigation	\$
8.0	Other	
8.1	Other (contingency allowances and any other work or costs not reflected in the items above but required to complete the Work covered by the Tender Documents) List Work if applicable.	\$
19.	SUBTOTAL (including all PST)	\$
20.	GST (5%)	\$
21.	TENDER PRICE (including all costs, taxes and fees)	\$ (including PST and GST)

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "A" (PART C - FORM OF TENDER)

List of Unit Prices for Any Additional Work

These unit prices will be used for changing quantities from those indicated in the Tender Documents or Contract Documents upon written instruction from the City. The unit prices will be applied in accordance with PART 6 CHANGES IN THE WORK of the General Conditions of the Stipulated Price Contract (CCDC 2 - 2008), as modified by the Supplementary General Conditions (Schedule 1 to Part D - Form of Agreement). The prices should include (i) all labour, material and other costs, (ii) overhead and profit, (iii) PST, and (iv) all other taxes, duties, assessments, charges and fees, *except for GST*.

Item	Description	Unit	Unit Price (including PST)
1.	Gravel surfacing (50 mm thick complete with base, subbase, and edging, per detail, supply, installed, complete)	Sq.m	\$
2.	Excavation with Offsite Disposal to Vancouver Landfill	Cu.m.	\$
3.	Asphalt Pavement (50 mm thick complete with base, subbase, per detail, supply, installed, complete)	Sq.m.	\$
4.	Concrete Surface (100 mm thick, reinforced, complete with base, subbase per detail, supply, installed, complete)	Sq.m	\$
5.	Concrete band at play areas (300 mm thick, reinforced, complete with base, subbase per detail, supply, installed, complete)	I.m.	\$
6.	Perforated Pipe - 100mm (including preparation, granulars, connections, supply, installed, complete)	I.m.	\$
7.	Sodded Lawn - (per Specifications, including 100mm growing medium, preparation, supplied, installed, complete)	Sq.m.	\$

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "B" (PART C - FORM OF TENDER)

SCHEDULE "B"

PRELIMINARY CONSTRUCTION SCHEDULE

The Work is expected to begin by **October 1, 2018** and substantial performance is targeted for **June 15, 2019**. Please clearly define time requirements for project milestones identified in the table below. If necessary, please add an attachment to this Schedule.

TABLE 1 - PROJECT MILESTONES	
Milestone	Date of Completion
Project Start/Mobilization	October 1, 2018
Substantial completion	June 15, 2019
Total Completion	June 30, 2019

Additional pages may be attached to this page. Each such additional page is to be clearly marked "ITT No. PS20180859, FORM OF TENDER - SCHEDULE B", and is to be signed by the Tenderer.

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "C" (PART C - FORM OF TENDER)

SCHEDULE "C"

SUBCONTRACTORS AND SUPPLIERS

1.0 SUBCONTRACTORS

The Tenderer intends to use the following subcontractors for the portions of the Work identified below. (All subcontractors who are proposed to perform any portion of the Work should be listed.)

Subcontractor	Address	Type of Work
		Asphalt
		Concrete
		Poured in place rubberized surfacing
		Landscape maintenance
		Play equipment

Additional pages may be attached to this page. Each such additional page is to be clearly marked "ITT No. PS20180859, FORM OF TENDER - SCHEDULE C", and is to be signed by the Tenderer.

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "C" (PART C - FORM OF TENDER)

2.0 A hazardous materials survey has been performed at the Site and is attached. No hazardous materials have been identified. If, at any point during construction, the successful Tenderer encounters, or has reason to believe it will encounter, any hazardous materials, the successful Tender will be expected to immediately stop work and advise the City who will either decide to abate or will request the Tenderer do so by way of change order and the Tenderer will be required to use one of the City's pre-qualified hazardous material abatement contractors as set out below. Any hazardous materials abatement conducted by the Tenderer, through one of the City's pre-qualified hazardous material abatement contractors, must be completed in accordance with the Occupational Health and Safety Regulation and hazardous waste disposed of in accordance with the Environmental Management Act. If the City's Hazardous Materials Team determines consulting services are required to oversee the project, the City will retain a pre-qualified hazardous materials consultant. A completion report including all disposal documentation will be completed by the consultant and provided to the City's Hazardous Materials Team upon project completion.

PRE-QUALIFIED ABATEMENT CONTRACTORS LIST (in alphabetical order):

Company	Key contact/Email/Phone
Actes Environmental Limited	Michael Fleming, Michael@actesenvironmental.com 604-990-4258
Enviro-Vac	Chris Mitsche, chris@envirovac.com 888-296-2499
Nucor Environmental Solution Limited	Jim Dumelie, jimd@nucorenv.ca 604 521 2214
Phoenix Enterprise	Richard Purdy, rpurdy@phoenixenterprisesltd.com 604-594-0224
Pro Active Hazmat and Environmental	Sheldon White, Sheldonw@proactivehazmat.com 778-298-2268
Quantum Murray	Gustavo Perez, gperez@qmlp.ca 604 270 7388

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "D" (PART C - FORM OF TENDER)

SCHEDULE "D"

TENDERER'S EXPERIENCE WITH RELATED WORK

Tenderers should confirm that they and their proposed subcontractors have the required experience to perform the Work. Each Tenderer should:

1. Complete and submit a CCDC 11 (latest) issued by the Canadian Construction Documents Committee;
2. Provide information concerning completed projects in the previous five (5) years in the City Vancouver and for other civic clients, in particular where such projects were of similar scope and size to the Work, for each of itself and its proposed subcontractors, including the following information:

Reference #1

Description of Project:

Location of Project:

Contract Value:

\$

(Cdn. Dollars)

Start and Completion Dates:

Completed on Schedule?

Yes

No

(Circle Correct Response)

Name of Contract City:

Name of Project Reference:

Current Telephone Number and E-mail of Project Reference:

Names of Key Personnel and Subcontractors:

June 21, 2018

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Name of Tenderer

Initials of Signing Officer

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "D" (PART C - FORM OF TENDER)

Reference #2

Description of Project:

Location of Project:

Contract Value:

\$

(Cdn. Dollars)

Start and Completion Dates:

Completed on Schedule?

Yes

No

(Circle Correct Response)

Name of Contract City:

Name of Project Reference:

Current Telephone Number and E-mail of Project Reference:

Names of Key Personnel and Subcontractors:

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "D" (PART C - FORM OF TENDER)

Reference #3

Description of Project:

Location of Project:

Contract Value:

\$

(Cdn. Dollars)

Start and Completion Dates:

Completed on Schedule?

Yes

No

(Circle Correct Response)

Name of Contract City:

Name of Project Reference:

Current Telephone Number and E-mail of Project Reference:

Names of Key Personnel and Subcontractors:

Additional pages may be attached to this page. Each such additional page is to be clearly marked "ITT No. PS20180859, FORM OF TENDER - SCHEDULE D", and is to be signed by the Tenderer.

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "E" (PART C - FORM OF TENDER)

SCHEDULE "E"

FORCE ACCOUNT LABOUR & EQUIPMENT RATES

Tenderers should complete the following tables setting out the all-inclusive hourly rates for all applicable types of equipment as well as the all-inclusive hourly rates for all applicable categories of labour, which rates will then apply pursuant to any Contract.

TABLE 1 - SCHEDULE OF LABOUR RATES

Job Classification	Regular Rate	Overtime Rate
	\$	\$
	\$	\$
	\$	\$
	\$	\$
	\$	\$
	\$	\$

TABLE 2 - SCHEDULE OF EQUIPMENT RATES

No.	Equipment Description	Hourly Rate	No. of Hours	Overhead And Profit	Total Price
		\$		\$	\$
		\$		\$	\$
		\$		\$	\$
		\$		\$	\$
		\$		\$	\$

Labour and equipment rates must be inclusive of all taxes except for GST, and all assessments, benefits, small tools, overhead and profits.

Additional pages may be attached to this page. Each such additional page is to be clearly marked "ITT No. PS20180859, FORM OF TENDER - SCHEDULE E", and is to be signed by the Tenderer.

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "F" (PART C - FORM OF TENDER)

SCHEDULE "F"

FORM OF CONSENT OF SURETY

PROJECT: _____

Should it be required, we the undersigned Surety Company do hereby undertake to become bound as a surety in an approved Contract Performance Bond and Labour and Material Payment Bond, each in the amount of fifty percent (50%) of the awarded Contract Price for the fulfillment of a Contract, which may be awarded to _____ at the Tender Price (or another offered price) set forth in the attached Tender, which Performance Bond and Labour and Material Payment Bond we understand are to conform to the applicable CCDC forms and be filed with the City within 10 Working Days of receipt of Notice of Award of a Contract, unless otherwise directed by the City.

We hereby further declare that the undersigned Surety Company is legally entitled to do business in the Province of British Columbia and that it has a net worth over and above its present liabilities and the amounts herein set forth.

The Common Seal of _____
was hereto affixed in the presence of:

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "G" (PART C - FORM OF TENDER)

SCHEDULE "G"

SUSTAINABILITY

1. Please list any products or services contemplated in the Tender that are toxic or hazardous to the environment or humans and complete the following table in relation thereto.

Item	Description of Toxin/Hazard	Substantiation for Use	Mitigation strategy to reduce the effect of the Toxin/Hazard

2. Please identify the Tenderer's standard practices for disposal of obsolete or expired products or equipment.

Item	Type of Product/Equipment	Disposal Method

3. Please identify the Tenderer's current or proposed solutions to address and reduce carbon emissions.

Item	Carbon Emission Risk	Solution to Reduce Carbon Emissions

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "H" (PART C - FORM OF TENDER)

SCHEDULE "H"

CERTIFICATE OF INSURANCE

(TO BE COMPLETED IF AWARDED THE CONTRACT)



GENERAL CERTIFICATE OF INSURANCE



Section 8 b) – Staff to select the required # of days Written Notice before sending the certificate out for completion.
 Section 2 through 8 – to be completed and executed by the Insurer or its Authorized Representative

1. **THIS CERTIFICATE IS ISSUED TO:** City of Vancouver, as represented by its Board of Parks & Recreation
2099 Beach Avenue, Vancouver, BC, V6G 1Z4

and certifies that the insurance policies as listed herein have been issued to the Named Insured(s) and are in full force and effect as of the effective date of the agreement described below.

2. **NAMED INSURED:** *[must be the same name as the Permittee/Licensee or Party(ies) to the Contract and is/are either an individual(s) or a legally incorporated company(ies)]*

MAILING ADDRESS:

LOCATION ADDRESS:

DESCRIPTION OF OPERATION, CONTRACT, AGREEMENT, LEASE, PERMIT OR LICENSE:

3. **PROPERTY INSURANCE** naming the City of Vancouver and its Board of Parks & Recreation as Named Insureds and/or Loss Payees with respect to their interests and shall contain a waiver clause in favour of the City of Vancouver and its Board of Parks & Recreation (All Risks Coverage including Earthquake and Flood)

INSURED VALUES: (Replacement Cost)
 INSURER: _____ Building and Tenants' Improvements \$ _____
 TYPE OF COVERAGE: _____ Contents and Equipment: \$ _____
 POLICY NUMBER: _____ Deductible Per Loss: \$ _____
 POLICY PERIOD: From _____ to _____

4. **COMMERCIAL GENERAL LIABILITY INSURANCE (Occurrence Form)**

Including the following extensions: **LIMITS OF LIABILITY: (Bodily Injury and Property Damage Inclusive)**
☒ Personal Injury Per Occurrence: \$ _____
☒ Products and Completed Operations Aggregate: \$ _____
☒ Cross Liability or Severability of Interest All Risk Tenants' Legal Liability: \$ _____
☒ Employees as Additional Insureds Deductible Per Occurrence: \$ _____
☒ Blanket Contractual Liability
☒ Non-Owned Auto Liability
 INSURER: _____
 POLICY NUMBER: _____
 POLICY PERIOD: From _____ to _____

5. **AUTOMOBILE LIABILITY INSURANCE** for operation of owned and/or leased vehicles

INSURER: _____ **LIMITS OF LIABILITY:**
 POLICY NUMBER: _____ Combined Single Limit: \$ _____
 POLICY PERIOD: From _____ to _____ *If vehicles are insured by ICBC, complete and provide Form APV-47.*

6. ☐ **UMBRELLA OR EXCESS LIABILITY INSURANCE**

LIMITS OF LIABILITY: (Bodily Injury and Property Damage Inclusive)
 INSURER: _____ Per Occurrence: \$ _____
 POLICY NUMBER: _____ Aggregate: \$ _____
 POLICY PERIOD: From _____ to _____ Self-Insured Retention: \$ _____

7. **OTHER INSURANCE** (e.g. Boiler & Machinery, Business Interruption, Crime, etc.) – Please specify Name of Insurer(s), Policy Number, Policy Period, and Limit.

8. **POLICY PROVISIONS:**

Where required by the governing contract, agreement, lease, permit or license, it is understood and agreed that:

- The City of Vancouver and its Board of Parks & Recreation, their officials, officers, employees, servants and agents have been added as Additional Insureds with respect to liability arising out of the operation of the Named Insured pursuant to the governing contract, agreement, lease, permit or license;*
- THIRTY (30) days written notice of cancellation or material change resulting in reduction of coverage with respect to any of the policies listed herein, either in part or in whole, will be given by the Insurer(s) to the Holder of this Certificate; the exception is cancellation for non-payment of premiums in which case the applicable statutory conditions will apply;*
- The insurance policy (policies) listed herein shall be primary with respect to all claims arising out of the operation of the Named Insured. Any insurance or self-insurance maintained by the City of Vancouver and its Board of Parks & Recreation shall be in excess of this insurance and shall not contribute to it.*

SIGNED BY THE INSURER OR ITS AUTHORIZED REPRESENTATIVE

PRINT NAME OF INSURER OR ITS AUTHORIZED REPRESENTATIVE, ADDRESS AND PHONE NUMBER

Dated: _____

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "I" (PART C - FORM OF TENDER)

SCHEDULE "I"

CERTIFICATE OF EXISTING INSURANCE

(TO BE COMPLETED AND SUBMITTED WITH TENDER)



**CERTIFICATE OF EXISTING INSURANCE
TO BE COMPLETED AND APPENDED TO THE PROPOSAL/TENDER**



Section 2 through 8 – to be completed and executed by the Insurer or its Authorized Representative

1. **THIS CERTIFICATE IS ISSUED TO:** City of Vancouver as represented by its Board of Parks & Recreation
2099 Beach Avenue, Vancouver, B.C. V6G 1Z4
and certifies that the insurance policy (policies) as listed herein has/have been issued to the Named Insured and is/are in full force and effect.
2. **NAMED INSURED** *(must be the same name as the proponent/bidder and is either an individual or a legally incorporated company)*

BUSINESS TRADE NAME or DOING BUSINESS AS

BUSINESS ADDRESS

DESCRIPTION OF OPERATION

3. PROPERTY INSURANCE (All Risks Coverage including Earthquake and Flood)

INSURER _____	Insured Values (Replacement Cost) -
TYPE OF COVERAGE _____	Building and Tenants' Improvements \$ _____
POLICY NUMBER _____	Contents and Equipment \$ _____
POLICY PERIOD From _____ to _____	Deductible Per Loss \$ _____

4. COMMERCIAL GENERAL LIABILITY INSURANCE (Occurrence Form)

Including the following extensions:	INSURER _____
✓ Personal Injury	POLICY NUMBER _____
✓ Property Damage including Loss of Use	POLICY PERIOD From _____ to _____
✓ Products and Completed Operations	Limits of Liability (Bodily Injury and Property Damage Inclusive) -
✓ Cross Liability or Severability of Interest	Per Occurrence \$ _____
✓ Employees as Additional Insureds	Aggregate \$ _____
✓ Blanket Contractual Liability	All Risk Tenants' Legal Liability \$ _____
✓ Non-Owned Auto Liability	Deductible Per Occurrence \$ _____

5. AUTOMOBILE LIABILITY INSURANCE for operation of owned and/or leased vehicles

INSURER _____	Limits of Liability -
POLICY NUMBER _____	Combined Single Limit \$ _____
POLICY PERIOD From _____ to _____	<i>If vehicles are insured by ICBC, complete and provide Form APV-47.</i>

6. ☐ UMBRELLA OR ☐ EXCESS LIABILITY INSURANCE **Limits of Liability (Bodily Injury and Property Damage Inclusive) -**

INSURER _____	Per Occurrence \$ _____
POLICY NUMBER _____	Aggregate \$ _____
POLICY PERIOD From _____ to _____	Self-Insured Retention \$ _____

7. PROFESSIONAL LIABILITY INSURANCE

INSURER _____	Limits of Liability
POLICY NUMBER _____	Per Occurrence/Claim \$ _____
POLICY PERIOD From _____ to _____	Aggregate \$ _____
	Deductible Per Occurrence/Claim \$ _____

If the policy is in a "CLAIMS MADE" form, please specify the applicable Retroactive Date: _____

8. OTHER INSURANCE

TYPE OF INSURANCE _____	Limits of Liability
INSURER _____	Per Occurrence \$ _____
POLICY NUMBER _____	Aggregate \$ _____
POLICY PERIOD From _____ to _____	Deductible Per Loss \$ _____
TYPE OF INSURANCE _____	Limits of Liability
INSURER _____	Per Occurrence \$ _____
POLICY NUMBER _____	Aggregate \$ _____
POLICY PERIOD From _____ to _____	Deductible Per Loss \$ _____

SIGNED BY THE INSURER OR ITS AUTHORIZED REPRESENTATIVE

PRINT NAME OF INSURER OR ITS AUTHORIZED REPRESENTATIVE, ADDRESS AND PHONE NUMBER

Dated _____

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "J" (PART C - FORM OF TENDER)

SCHEDULE "J"

UNDERTAKING OF INSURANCE

To: City of Vancouver

Re: PS20180859 - CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE

Dear Sirs:

We, the undersigned have completed, signed and attached the "Certificate of Existing Insurance" enclosed with this undertaking and now also do hereby undertake and agree that if _____ (the "Tenderer") is awarded a Contract, we will insure the Contractor in accordance with the requirements of the Contract, the form of which is included in the Tender Documents and will form part of the Contract Documents.

Dated at _____, British Columbia, this _____ day of _____ 20____.

By: _____

Title: _____

Full Corporate Name of Insurer:

The "Certificate of Existing Insurance" provided with the ITT should be completed and signed and enclosed with this schedule, both of which are to be signed by the Insurance Company or an authorized broker on behalf of the Insurance Company. A SEPARATE FORM (AND CERTIFICATE OF EXISTING INSURANCE) SHOULD BE SIGNED FOR EACH POLICY IF THE TENDERER HAS MORE THAN ONE INSURER OR BROKER FOR ITS POLICIES.

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "K" (PART C - FORM OF TENDER)

Schedule "K"
DECLARATION OF SUPPLIER CODE OF CONDUCT COMPLIANCE

Purpose: All proposed suppliers are to complete and submit this form to certify compliance with the supplier performance standards set out in the Supplier Code of Conduct.

The City of Vancouver expects each supplier of goods and services to the City to comply with the supplier performance standards set out in the City's Supplier Code of Conduct (SCC) <http://vancouver.ca/policy_pdf/AF01401P1.pdf>. The SCC defines minimum labour and environmental standards for City suppliers and their subcontractors.

Suppliers are expected to comply with the aforementioned standards upon submitting a tender, proposal, application, expression of interest or quotation to the City, or have a plan in place to comply within a specific period of time. The City reserves the right to determine an appropriate timeframe in which suppliers must come into compliance with these standards. To give effect to these requirements, an authorised signatory of each proposed vendor must complete the following declaration and include this declaration with its submission:

As an authorised signatory of _____ (vendor name), I declare that I have reviewed the SCC and to the best of my knowledge, _____ (vendor name) and its proposed subcontractors have not been and are not currently in violation of the SCC or convicted of an offence under national and other applicable laws referred to in the SCC, other than as noted in the table below (include all violations/convictions that have occurred in the past three years as well as plans for corrective action).

Section of SCC / title of law	Date of violation /conviction	Description of violation / conviction	Regulatory / adjudication body and document file number	Corrective action plan

I understand that a false declaration and/or lack of a corrective action plan may result in no further consideration being given to the submission of _____ (vendor name).

Signature: _____

Name and Title: _____

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "L" (PART C - FORM OF TENDER)

SCHEDULE "L"

CONFLICT OF INTEREST DECLARATION

NO CONFLICT OF INTEREST / NO COLLUSION / NO LOBBYING

Declaration as to no Conflict of Interest in ITT

- (a) The Tenderer confirms and warrants that there is no officer, director, shareholder, partner, employee or contractor of the Tenderer or of any of its proposed subcontractors, or any other person related to the Tenderer's or any proposed subcontractor's organization (a "person having an interest") or any spouse, business associate, friend or relative of a person having an interest who is:
- a. an official or employee of the City; or
 - b. related to or has any business or family relationship with an elected official or employee of the City,
- in each case, such that there could be any conflict of interest or any appearance of conflict of interest in the evaluation or consideration of the Tender by the City, and, in each case, except as set out, in all material detail in the section titled "Disclosure" in this Schedule "L".
- (b) The Tenderer confirms and warrants that there is no person having an interest (as defined above) who is a former official, former employee or former contractor of the City and who has non-public information relevant to the ITT obtained during his or her employment or engagement by the City, except as set out, in all material detail, in the section titled "Disclosure" in this Schedule "L".

Declaration as to No Conflict of Interest Respecting Proposed Supply

The Tenderer confirms and warrants that neither the Tenderer nor any of its proposed subcontractors is currently engaged in supplying (or is proposing to supply) goods or services to a third party such that entering into an agreement with the City in relation to the subject matter of the ITT would create a conflict of interest or the appearance of a conflict of interest between the Tenderer's duties to the City and the Tenderer's or its subcontractors' duties to such third party, except as set out, in all material detail, in the section titled "Disclosure" in this Schedule "L".

Declaration as to No Collusion

The Tenderer confirms and warrants that:

- (a) the Tenderer is not competing within the ITT with any entity with which it is legally or financially associated or affiliated; and
- (b) the Tenderer is not cooperating in any manner in relation to the ITT with any other tenderer responding to the ITT,

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "L" (PART C - FORM OF TENDER)

in each case, except as set out, in all material detail, in the section titled "Disclosure" in this Schedule "L".

Declaration as to Lobbying

The Tenderer confirms and warrants that:

- (a) neither it nor any officer, director, shareholder, partner, employee or agent of the Tenderer or any of its proposed subcontractors is registered as a lobbyist under any lobbyist legislation in any jurisdiction in Canada or in the United States of America; and
- (b) neither it nor any officer, director, shareholder, partner, employee or agent of the Tenderer or any of its proposed subcontractors has engaged in any form of political or other lobbying whatsoever with respect to the Tender or sought, other than through the submission of the Tender, to influence the outcome of the ITT,

in each case, except as set out, in all material detail, in the section titled "Disclosure" in this Schedule "L".

Disclosure [Add disclosure here.]

(NOTE: The City will evaluate each matter disclosed to determine whether and to what extent the Tenderer can be given consideration in the ITT in light of the particular matter.)

THE TENDERER HAS EXECUTED AND DELIVERED THIS DECLARATION AS AN INTEGRAL PART OF ITS TENDER IN THE MANNER AND SPACE SET OUT BELOW:

Signature of Authorized Signatory for the Tenderer

Date

Name and Title

Signature of Authorized Signatory for the Tenderer

Date

Name and Title

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE "M" (PART C - FORM OF TENDER)

SCHEDULE "M"
PRIME CONTRACTOR AGREEMENT FORM
(TO BE COMPLETED AND SUBMITTED WITH TENDER)

PRIME CONTRACTOR AGREEMENT FORM

1.0 DEFINITIONS

- a) **"OH&S Regulation"** means the Occupational Health & Safety Regulation (British Columbia Regulation 296/97) enacted pursuant to the WCA, and any successor legislation, all as such Regulation is amended or re-enacted from time to time;
- b) **"Owner"** means City of Vancouver;
- c) **"Place of the Work"** means the work site at **China Creek North Park, 1007 East 7th Avenue, Vancouver, Vancouver, British Columbia**;
- d) **"Prime Contractor"** means the Contractor, who is designated pursuant to Article 3 below by the Owner to be the Prime Contractor for the Project with respect to occupational health and safety for the purposes of WCB Legislation;
- e) **"Project"** means **PS20180859 at China Creek North Park, 1007 East 7th Avenue, Vancouver, British Columbia**, as contemplated by the Contract Documents, and includes all the Work;
- f) **"WCA"** means the *Workers Compensation Act*, R.S.B.C. 1996, Chapter 492, and any successor legislation, as such Act is amended or re-enacted from time to time;
- g) **"WCB"** means the Worker's Compensation Board of British Columbia; and
- h) **"WCB Legislation"** means the WCA and all regulations thereto including the OH&S Regulation, and all rules, regulations and requirements of WorkSafeBC, and any successor legislation, rules, regulations and requirements, all as amended or re-enacted from time to time; and
- i) **"WorkSafeBC"** means the British Columbia Provincial governmental organization by that name which is responsible, inter alia, for promoting workplace health and safety for the workers and employers of British Columbia, and for working with the affected parties to provide return-to-work rehabilitation, compensation, health care benefits and a range of other services, in the event of work-related injuries or diseases suffered by workers in British Columbia.

All other capitalized terms used in this Prime Contractor Agreement have the meanings given to them in the Contract Documents of which this Prime Contractor Agreement is a part, as applicable.

2.0 PRIME CONTRACTOR'S RESPONSIBILITIES

Proof of Qualification to act as Prime Contractor

- The Prime Contractor is to provide a current copy of its WorkSafeBC "Clearance Letter", a signed copy of this Prime Contractor Agreement and all other documents requested by the Owner prior to commencement of the Work.
- The Prime Contractor is to notify the Owner of any changes of status with WorkSafeBC or the WCB during the course of the Project.

After the Prime Contractor has been designated and before Work has commenced, the Prime Contractor shall:

- Conduct all necessary and appropriate inquiries of all relevant Owner staff and records in order to verify in writing to the Owner that the Owner has given to the Contractor all information known to the Owner that is necessary to identify and eliminate or control hazards to the health and safety of persons at the Place of the Work.
- Conduct a pre-contract hazard assessment and carefully review, and plan to address, all hazards identified in that assessment.
- Inform all other employers whose employees are providing services for the Project at the Place of the Work, that it is the Prime Contractor.
- Establish and maintain a system or process to ensure all employers, employees and visitors at/to the Place of the Work comply with the WCA, the OH&S Regulation and the requirements of WorkSafeBC. The Prime Contractor will thus be responsible for site orientation and hazard communication.
- Review and complete a "Pre-Job Meeting Form" if the Owner requests.
- For construction projects, post the Notice of Project on the Place of the Work and deliver a copy to WorkSafeBC at least twenty-four (24) hours before construction commences.
- Comply with Section 20.2 of the OH&S Regulation in respect of the Notice of Project.
- Identify and set expectations for each subcontractor's safety contact.
- Coordinate all safety-related activities, from site orientations to safety committee meetings and toolbox talks, to inspections and incident reviews.
- Inform employers and workers of the workplace hazards associated with the Place of the Work.
- At the Place of the Work, provide the information listed in Section 20.3(4) of the OH&S Regulation.
- In all other respects strictly comply with, and strictly enforce compliance by others, as applicable, with, the WCA, the OH&S Regulation, the requirements of WorkSafeBC, the safety policies and procedures of the Owner and the terms and conditions of the Contract Documents applicable.

Throughout the term of the Project, the Prime Contractor shall:

- Ensure that all hazards are promptly and appropriately identified and addressed.
- Ensure the health and safety of the workers on the Project.

- Maintain a current list of persons that each sub-trade (employer) has designated to be responsible for that employer's health and safety activities.
- Ensure provision of first aid equipment and services as required by the OH&S Regulation.
- Coordinate all occupational health and safety activities for the Project.
- Prepare, and communicate to all workers on the Place of the Work, an emergency response plan, taking into account the number of people onsite, the people who work outside regular hours and the types of emergencies that may arise. This plan should also describe subcontractor and individual worker responsibilities (e.g. responding to a fire) and provide for any necessary training and equipment, including first aid supplies as work processes change over the course of the Project, this emergency response plan must be updated as appropriate.
- Make and maintain detailed notes and reports in respect of the initial site safety meeting, safety committee meetings, reviews of contractors' safety systems, inspection and incident investigations, first aid records and orientation and training.
- On any site where workers of two (2) or more employers are working at the same time and the combined workforce is greater than five (5), identify and designate a "Qualified Coordinator" to coordinate health and safety activities.
- In all other respects strictly comply with, and strictly enforce compliance by others, as applicable, with, the WCA, the OH&S Regulation, the requirements of WorkSafeBC, the safety policies and procedures of the Owner and the terms and conditions of the Contract Documents applicable.

Prime Contractor's Qualified Coordinator, if applicable, (Construction Only) responsibilities:

- Comply with all requirements listed in Section 20.3(3) of the OH&S Regulation and on page 13 of the Owner's Multiple Employer Workplace/Contractor Coordination Program (2003).
- Coordinate all health and safety activities for the Project.
- Post workplace drawings showing where first aid is located, the emergency transportation system for injured workers and evacuation marshalling points.
- Ensure that regular workplace safety meetings are held and documented.
- Know who all other contractors' "Qualified Persons" are.
- Ensure that all workers at the Place of the Work are informed of workplace hazards, from both the pre-contract hazard assessment and from ongoing work activities of all employers at the Place of the Work, and ensure that hazards are properly and punctually addressed throughout the duration of the Project.

3.0 DESIGNATION AS PRIME CONTRACTOR

By signing this Prime Contractor Agreement, the undersigned Contractor accepts all responsibilities of a **Prime Contractor** as outlined above and in the Owner's Contractor Coordination Program (2003), Part III of the WCA and the OH&S Regulation, as well as any other responsibilities required by WorkSafeBC.

As a Contractor signing this Prime Contractor Agreement with the Owner, the undersigned company agrees that the company and its management staff, supervisory staff and workers will comply with the all WorkSafeBC requirements, the OH&S Regulation and Part III of the WCA.

Any violation of a requirement of WCB Legislation by the Prime Contractor may be considered a breach of the Contractor's Contract with the Owner resulting in possible termination or suspension of the Contract and/or any other actions deemed appropriate at the discretion of the Owner.

Any penalties, sanctions or additional costs levied against the Owner, as a result of an action or inaction of the Prime Contractor in its capacity as such, are the sole responsibility of the Prime Contractor, as set out in the Contract.

I, the undersigned, acknowledge that I have read and understand the information above. By signing this Prime Contract Agreement, I agree as an authorized representative of the Contractor to accept all responsibilities of the **Prime Contractor** for this Project.

Date

Contract #

Name of Contractor

Qualified Coordinator's Name

(Construction Only)

Signature of Authorized
Representative

Print Name and Title

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
TITLE PAGE (PART D --FORM OF AGREEMENT)



INVITATION TO TENDER ("ITT") NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE

CONSTRUCTION AGREEMENT

between

[CONTRACTOR NAME]

and

CITY OF VANCOUVER AS REPRESENTED BY ITS VANCOUVER BOARD OF PARKS AND RECREATION

[DATE]

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
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INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART D - FORM OF AGREEMENT

CONSTRUCTION AGREEMENT

THIS CONSTRUCTION AGREEMENT (the “Agreement”) dated for reference [\[insert date\]](#) is entered into

BETWEEN:

CITY OF VANCOUVER AS REPRESENTED BY ITS VANCOUVER BOARD OF PARKS AND RECREATION

453 West 12th Avenue
Vancouver, British Columbia V5Y 1V4

(the “City”)

OF THE FIRST PART

AND:

[\[INSERT NAME OF CONTRACTOR\]](#)

[\[insert address\]](#)

(the “Contractor”)

OF THE SECOND PART

BACKGROUND

- A. By way of an Invitation to Tender for Contractor for China Creek North Park Upgrade, the City requested tenders from general contractors to perform the Work.
- B. In response to the Invitation to Tender, the Contractor submitted a tender dated [\[insert date\]](#).
- C. After evaluating the tenders and obtaining necessary approvals, the City issued a Notice of Award to the Contractor, thereby creating this Contract with the Contractor for the Work based on the Contractor’s tender.

THE CITY AND THE CONTRACTOR NOW AGREE AS FOLLOWS:

ARTICLE A-1 THE WORK

The Contractor shall:

- 1.1 perform the Work required by the Contract Documents for Contractor for China Creek North Park Upgrade at China Creek North Park, 1001 East 7th Avenue in Vancouver, British Columbia (which is the Place of the Work), in respect of which Work [\[insert name of Consultant\]](#) is acting as, and is, the Consultant;
- 1.2 do and fulfill everything indicated by the Contract Documents; and

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
PART D - FORM OF AGREEMENT

- 1.3 commence the Work by the [day] day of [month], [year] and, subject to adjustment to the Contract Time as provided for in the Contract Documents, attain Substantial Completion of the Project, as certified by the Consultant, by the [day] day of [month], [year], in accordance with the Project Schedule, included as a schedule to this Agreement.

ARTICLE A-2 AGREEMENTS AND AMENDMENTS

- 2.1 The Contract supersedes all prior negotiations, representations, or agreements, either written or oral, relating in any manner to the Work, including the tender documents that are not expressly listed in Article A-3 of this Agreement.
- 2.2 The Contract may be amended only as provided in the Contract Documents.

ARTICLE A-3 CONTRACT DOCUMENTS

- 3.1 The following are the Contract Documents referred to in Article A-1 of this Agreement, whether or not attached to this Agreement:
- (a) this Agreement;
 - (b) the "Definitions" and "General Conditions of Stipulated Price Contract" contained within standard construction document CCDC 2 - Stipulated Price Contract, 2008 edition, not attached but incorporated by reference;
 - (c) the following schedules to this Agreement:
 - (i) Schedule 1 - Supplementary General Conditions (the "Supplementary General Conditions")
 - (ii) Schedule 2 - List of Specifications and Drawings (the listed Specifications and Drawings are incorporated by reference);
 - (iii) Schedule 3 - Schedule of Prices (the "Schedule of Prices");
 - (iv) Schedule 4 - Subcontractors and Suppliers;
 - (v) Schedule 5 - Project Schedule (the "Project Schedule");
 - (vi) Schedule 6 - Performance and Labour and Material Payments Bonds;
 - (vii) Schedule 7 - Insurance Certificate;
 - (viii) Schedule 8 - City Pre-Contract Hazard Assessment Form
 - (ix) Schedule 9 - Contractor Pre-Contract Hazard Assessment Form
 - (x) Schedule 10 - Force Account Labour and Construction Equipment Rates (the "Schedule of Force Account Labour and Construction Equipment Rates");
 - (xi) Schedule 11 - Prime Contractor Agreement Form;
 - (d) the Form of Tender submitted by the Contractor, dated [insert], titled [insert] (incorporated by reference) (the "Form of Tender");

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- (e) the traffic management plan provided by the Contractor to the City (incorporated by reference);
- (f) the Place of the Work-specific safety and health plan provided by the Contractor to the City (incorporated by reference)
- (g) [\[insert any other relevant documents to be incorporated by reference\]](#).

3.2 Capitalized terms used in the Contract Documents will have the meanings ascribed to such terms in the Contract Documents.

ARTICLE A-4 CONTRACT PRICE

- 4.1 The Contract Price to do, perform and supply all the Work in accordance with, and perform all the obligations specified by, the Contract Documents is [\[insert price without GST\]](#), plus GST of [\[insert amount\]](#), for a total Contract Price of [\[insert total amount, including GST\]](#).
- 4.2 The Contract Price is inclusive of GST, PST and all other taxes, and all duties assessments, charges and fees, permit and inspection costs, and WorkSafeBC assessments relating to the Work. For the avoidance of doubt, the Contract Price includes, without limitation, all PST on materials, other Products and Construction Equipment.
- 4.3 The PST, GST and other taxes, duties, assessments, charges and fees included in the Contract Price will be remitted by the Contractor to the applicable authorities as and when the City pays the Contract Price to the Contractor or as earlier required by applicable law.
- 4.4 All amounts are in Canadian dollars.
- 4.5 The Contract Price shall be subject to adjustments as provided for in the Contract Documents.
- 4.6 For purposes of the Contract Documents, "GST" means the tax payable and imposed pursuant to Part IX of the *Excise Tax Act* (Canada), as amended or replaced from time to time, and "PST" means the provincial sales tax payable and imposed pursuant to the *Provincial Sales Tax Act* (British Columbia), as amended or replaced from time to time.

ARTICLE A-5 PAYMENT

- 5.1 Subject to the terms and conditions of the Contract Documents, the City will pay the Contract Price to the Contractor in consideration of the performance of the Work.
- 5.2 The payment for any Work under this Contract made to the Contractor by the City will not be construed as an acceptance of any Work being in accordance with the Contract Documents.
- 5.3 Should either party fail to make payments as they become due under the terms of the Contract Documents, interest at the Bank Rate plus two percent (2%) per annum on such unpaid amounts will also become due and payable until payment. Such interest will be compounded on a monthly basis. The "Bank Rate" for these purposes is the rate established by the Bank of Canada from time to time as the minimum rate at which the Bank of Canada makes short term advances to Canadian chartered banks.

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ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES

6.1 Except as otherwise expressly provided in the Contract Documents, communications between the parties hereto or between them and the Consultant will be in writing and may be delivered by hand or sent by electronic transmission or by courier or registered mail:

(i) to the City at:

City of Vancouver as represented by its Vancouver Board of Parks and Recreation
453 West 12th Avenue
Vancouver, British Columbia V5Y 1V4

Attention: [insert name]
[insert title]

Fax No.: [insert]
Email: [insert];

(ii) to the Contractor at:

[insert name and address]; or

(iii) to the Consultant at:

[insert name and address]

or to such other person or address of which one party may advise the others in writing from time to time or at any time, and each such communication will be deemed to be received by the recipient:

- (A) on the date of delivery, if delivered by hand: to the individual, if the recipient is an individual; to a partner, if the recipient is a partnership; or to an officer of the corporation, if the recipient is a corporation; or
- (B) on the day following transmission, if sent by electronic transmission and confirmed by documentation of successful transmission or receipt of an email reply effectively acknowledging delivery; or
- (C) one Working Day after the date of confirmed delivery, if sent by courier or registered mail.

ARTICLE A-7 LAW OF CONTRACT

The laws of British Columbia will apply to and govern the Contract Documents and the courts of British Columbia will have jurisdiction over all disputes not resolved by mediation or arbitration.

ARTICLE A-8 SUCCESSORS AND ASSIGNS

The Contract shall enure to the benefit of and be binding upon the City and Contractor and their respective successors and permitted assigns.

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ARTICLE A-9 TIME OF THE ESSENCE

All time limits stated in this Contract are of the essence of the Contract.

IN WITNESS WHEREOF the parties hereto have executed this Agreement on the date first herein above written.

CITY OF VANCOUVER AS REPRESENTED BY ITS VANCOUVER BOARD OF PARKS AND RECREATION
by its authorized signatories:

Signature: _____

Name: _____

Title: _____

Signature: _____

Name: _____

Title: _____

[INSERT NAME OF CONTRACTOR]

by its authorized signatories:

Signature: _____

Name: _____

Title: _____

Signature: _____

Name: _____

Title: _____

Proof of authority in the form of a certified copy of a resolution naming the person or persons in question as authorized to sign the Agreement for and on behalf of the corporation or partnership, who are parties to this Agreement, shall be attached.

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SCHEDULE 1
SUPPLEMENTARY GENERAL CONDITIONS

(SUPPLEMENTARY GENERAL CONDITIONS ARE MODIFICATIONS TO CCDC 2 -2008)

INTRODUCTION

- 1.1.1 These Supplementary General Conditions amend the "Definitions" and the "General Conditions of the Stipulated Price Contract" contained within standard construction document CCDC 2 - Stipulated Price Contract, 2008 edition ("CCDC 2"), available for download at <http://www.ccdc.org/downloads/index.html>. Any reference in the Contract Documents to "General Conditions" or "GC" means the General Conditions contained in CCDC 2 as amended by these Supplementary General Conditions. Whenever there is a conflict between these Supplementary General Conditions and the other Contract Documents or wherever the Contract Documents are silent and these Supplementary General Conditions speak to a particular issue or matter, the provisions of these Supplementary General Conditions shall take precedence.
- 1.1.2 Unless the context dictates otherwise and to the extent not otherwise defined in the Contract Documents, capitalized terms used in these Supplementary General Conditions have the meanings given thereto in CCDC 2.
- 1.1.3 To the extent that the *Lien Act* (as defined below) expressly forbids parties from contracting out of all or some of the provisions of the *Lien Act* then, to the extent that those provisions of the *Lien Act* apply, such provisions of the *Lien Act* shall take precedence over any provision of the Contract Documents that is determined to contradict or contravene such provisions of the *Lien Act*, but only to the extent of such contradiction or contravention.

AMENDMENTS TO THE DEFINITIONS

The following amendments are made to the "Definitions" in CCDC 2:

Add the following at the end of paragraph 5 (the definition of "Contract"):

The Contract supersedes all prior negotiations, representations or agreements, either written or oral, except to the extent included in the Contract Documents or expressly incorporated by reference into the Contract by an actual reference to the same in Article A-3 of the Agreement - CONTRACT DOCUMENTS.

Delete paragraph 6 and replace with the following:

6. Contract Documents

The Contract Documents consist of those documents listed in Article A-3 of the Agreement - CONTRACT DOCUMENTS, those documents expressly incorporated by reference into the Contract by an actual reference to the same in Article A-3 of the Agreement - CONTRACT DOCUMENTS, and amendments agreed upon in writing between the parties together with all other documents, schedules and additions mutually agreed to or settled by the parties from time to time in respect of the Contract.

Delete the definition of Owner at paragraph 12 and replace with the following:

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"Owner" or "City"

"Owner" and "City" each mean the entity identified as the "City" in the Agreement (represented as stated therein or otherwise) or the City's authorized agent or representative, as designated to the Contractor in writing. However, "Owner" and "City" each expressly do not include the Consultant and expressly do not include the City of Vancouver acting in its capacity as a municipal regulatory authority.

Delete the definition of Substantial Performance of the Work at paragraph 20 and replace with the following:

20. Substantial Performance of the Work

Substantial Performance of the Work shall have the same meaning as "substantial performance" of the Agreement, as determined under Section 1(2) of the *Lien Act*.

Delete the definition of Work at paragraph 25 and replace it with the following:

25. Work

Work means the total construction and related services required by the Contract Documents or properly inferable therefrom.

Add the following definitions:

27. Applicable Laws

Applicable Laws means all applicable federal, provincial and municipal laws, bylaws, codes, rules, regulations, policies and requirements applicable to the Work and the Project.

28. Certificate of Completion

Certificate of Completion means the certificate under section 7 of the *Lien Act* stating that work under a contract or subcontract has been completed and includes an order made under section 7(5) of the *Lien Act*.

29. Cost Plus Work

Cost Plus Work means Work that is described or designated as cost-plus work in the Contract Documents.

30. Environmental Law

Environmental Law means any applicable law relating to the protection of the environment or occupational health and safety including those pertaining to (a) reporting, licensing, permitting, investigating, remediating and cleaning up in connection with any presence or release, or the threat of the same, of Hazardous Substances, and (b) the generation, manufacture, processing, distribution, use, re-use, treatment, storage, disposal, transport, labelling, handling and the like of Hazardous Substances.

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31. Final Certificate for Payment

Final Certificate for Payment means the certificate issued on Total Performance of the Work.

32. Hazardous Substance

Hazardous Substance means any contaminant, waste, hazardous substance, hazardous waste, or dangerous goods in such quantities and concentrations as contravene applicable limitations under Environmental Law and that may impair the environment, injure or damage property or plant or animal life or harm or impair the health of any individual.

33. Holdback

Holdback means a holdback required by the *Lien Act*.

34. Lien or Liens

Lien or Liens means a lien under the *Lien Act*.

35. Lien Act

Lien Act means the *Builders Lien Act* (British Columbia) and any additional successor or replacement legislation which may be passed that is applicable to the Place of the Work.

36. Lump Sum Work

Lump Sum Work means Work that is described or designated as lump sum work in the Contract Documents or Work that is not so described or designated but is also not Unit Price Work or Cost Plus Work.

37. Site Labour Disturbance

Site Labour Disturbance means any strike, lock-out or labour disturbance, including those resulting from any jurisdictional or non-affiliation issues, involving employees, whether or not members of a trade union, of the Contractor, any Subcontractor, any Supplier, or any of their respective subcontractors of any tier, which delays or in any way adversely affects the performance and completion of Work at the Place of the Work.

38. Total Performance of the Work

Total Performance of the Work means the entire Work has been satisfactorily performed and is so certified by the Consultant.

39. Trade Union Council

Trade Union Council means a council or association of trade unions of which employees of the Contractor or a Subcontractor are members

40. Unit Price Work

Unit Price Work means Work that is described or designated as unit price work in the Contract Documents.

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41. WorkSafeBC Rules

WorkSafeBC Rules means the *Workers Compensation Act* (British Columbia) and the regulations thereunder, including without limitation the *WorkSafeBC Occupational Health and Safety Regulation* (British Columbia), and all amendments made to such act and regulations and in force from time to time, and any statute or regulation that may be passed which supplements or supersedes such regulations.

ALTERATION OF GENERAL CONDITIONS AND ADDITIONAL CONDITIONS

The following amendments are made to the "General Conditions of the Stipulated Price Contract" in CCDC 2:

GC1.1 CONTRACT DOCUMENTS

GC1.1.7.1 is deleted in its entirety and replaced as follows:

- .1 The order of priority of documents, from highest to lowest, shall be:
- the Agreement between the City and the Contractor (excluding its schedules);
 - these Supplementary General Conditions;
 - the Definitions from CCDC 2;
 - the General Conditions from CCDC 2;
 - the Specifications;
 - the Drawings;
 - the other schedules to the Agreement between the City and the Contractor;
 - the other Contract Documents (except for the below document); and
 - the Form of Tender.

GC1.5 ADVERTISING

GC1.5 is added as follows:

GC1.5 ADVERTISING

- 1.5.1 The Contractor will obtain the City's prior written approval for any public advertising, press release or other general publicity matter, in which the name, logo, official marks or trademarks of the City or any related person are mentioned or used or in which words are used from which any connection with the City may be inferred. The Contractor will not allow or permit any public ceremony in connection with the Work without the permission of the City provided in writing. The Contractor will not erect or permit the erection of any sign or advertising without the prior written approval of the City.

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GC2.2 ROLE OF THE CONSULTANT

GC2.2.5 is deleted in its entirety and replaced with the following:

- 2.2.5 The Consultant will be the “payment certifier” pursuant to the *Lien Act*. Based on the Consultant’s observations and evaluation of the Contractor’s applications for payment for Work and the Consultant’s review of the status of the Work, including as against the Project Schedule, the Consultant will issue certificates of payment and will issue each Certificate of Completion and the Final Certificate for Payment.

GC2.2.19 is added as follows:

- 2.2.19 Notwithstanding GC2.2.13, the Contractor shall be responsible for requesting any required instructions or clarifications from the Consultant which are needed for the performance of the Work and shall request such instructions or clarifications in time to avoid any delay of the Work.

GC2.2.20 is added as follows:

- 2.2.20 Nothing in GC2.2 shall derogate from or affect the terms and provisions of any contractual or other legal relations between the City and the Consultant, and such contractual and other legal relations shall in all cases take precedence over GC2.2 in the event of a conflict.

GC2.3 REVIEW AND INSPECTION OF THE WORK

GC2.3.1 is amended by deleting the first sentence of the paragraph and replacing it with the following:

The City and the Consultant and their authorized representatives shall have access to the Work at all times.

GC2.3.2 is amended by deleting the first sentence of the paragraph and replacing it with the following:

If work is designated for review, tests, inspections or approvals in the Contract Documents, or by the Consultant's instructions, or by the laws or ordinances of the Place of the Work, the Contractor shall give the Consultant reasonable notification of when the work will be ready for review and inspection.

GC2.3.4 is deleted in its entirety and replaced with the following:

- 2.3.4 If the Contractor covers, or permits to be covered, work that has been designated for review, tests, inspections or approvals before such review, tests, inspections or approvals are made, given or completed, the Contractor shall, if so directed, uncover such work, have the reviews, tests, inspections or approvals satisfactorily completed, and make good covering work at the Contractor's expense.

GC2.3.8 is added as follows:

- 2.3.8 The Consultant may:

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- .1 review and monitor the Contractor's performance of any aspects of the Work for conformance with the requirements of the Contract, including review and monitor the following:
 - (a) the Contractor's submittals; and
 - (b) any and all construction activities; and
- .2 perform or arrange for the performance of any tests, checks, and inspections of the Work as the City may reasonably request whether or not specifically required by the Contract Documents.

Should the Consultant be required to make more than one review of rejected work or should the Consultant perform additional reviews due to failure of the Work to comply with the status of completion asserted by the Contractor in an application, the Contractor is required to compensate the City for such additional Consultant services including expenses incurred. Adjustment for such compensation should be made as outlined under PART 6 - CHANGES IN THE WORK.

GC2.3.9 is added as follows:

- 2.3.9 Review, monitoring and/or approval by the Consultant or City of the Contractor's performance of the Contract shall not relieve the Contractor of its sole responsibility and liability for the proper performance of the Contract strictly in accordance with its terms.

GC2.3.10 is added as follows:

- 2.3.10 Acceptance of the Work by the City does not free the Contractor from its obligation to correct deficiencies as provided in GC2.4 - DEFECTIVE WORK, which are not identified at the time of drawing up the deficiency list or are hidden deficiencies.

GC2.4 DEFECTIVE WORK

GC2.4.1 is amended by adding the following to the end of the paragraph:

In the event that work or materials are found to be condemned, then if the Contractor does not remove such condemned materials or work within the time fixed by written notice, the City may remove them and may store such materials at the expense of the Contractor. If the Contractor does not pay the expense of such removal within five (5) calendar days thereafter, the City may, upon ten (10) days written notice sell such materials with the proceeds thereof, if any, after deducting all the costs and expenses that should have been borne by the Contractor, being returned to the Contractor.

GC2.4.3 is deleted in its entirety and replaced with the following:

- 2.4.3. If in the opinion of the Consultant it is not expedient to correct defective work or work not performed as provided in the Contract Documents, the City may deduct from the amount otherwise due to the Contractor the difference in value between the work as performed and that called for by the Contract Documents or, at the option of the City, the cost or value of such work as would have been necessary to correct such non-compliance with the Contract Documents. If the City and the Contractor do not agree

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on the difference in value, they shall refer the matter to the Consultant for a determination.

GC3.1 CONTROL OF THE WORK

GC3.1.3 is added as follows:

3.1.3 The Contractor shall, and shall ensure that each Subcontractor shall, employ competent and skilled workmen and apprentices and employ proper equipment in good condition. The Contractor shall have complete control over its employees and Subcontractors and shall enforce discipline and order among its employees and assure discipline and order by its Subcontractors including, in all cases, without limiting the foregoing, compliance with and enforcement of WorkSafeBC Rules.

GC3.1.4 is added as follows:

3.1.4 The Contractor shall be familiar with, and its performance of this Contract shall be governed by and comply with, all Applicable Laws and applicable permits which exist at present or which may be respectively enacted or obtained after the date hereof by or from bodies or tribunals having jurisdiction or authority over the Work.

GC3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

GC3.2.2 is amended by deleting the first sentence and replacing it with the following:

When separate contracts are awarded for other parts of the Project, or when work is performed by the City's own forces, the Contractor shall:

GC3.2.2.3 is deleted in its entirety.

GC3.2.2.4 is deleted in its entirety.

GC3.2.3.3 is amended by adding the following to the end of the paragraph:

Failure by the Contractor to so report shall invalidate any claims against the City by reason of the deficiencies of the other contractors' or the City's own forces' work, except those of which the Contractor was not reasonably aware.

GC3.2.7 is added as follows:

3.2.7 The Contractor acknowledges that the Place of the Work generally and portions of the Project will continue to be used by the City and others as described in the Contract Documents. The Contractor will work simultaneously and harmoniously with others using the Place of the Work and use all efforts not to interfere with or delay others.

GC3.5 CONSTRUCTION SCHEDULE

GC3.5.1.1 is deleted in its entirety and replaced with the following:

.1 if the City states in writing that the Contractor has not yet done so to the City's satisfaction, prepare and submit to the City and the Consultant a construction schedule that indicates the timing of the major activities of the Work and provides sufficient

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detail of the critical events and their inter-relationship to demonstrate the Work will be performed in conformity with the Contract Time, which such construction schedule will, if agreed to by the City, thereafter be deemed to supersede the schedule included in Schedule 5 of the Agreement as the "Project Schedule";

GC3.5.1.3 is amended by adding the following to the end:

... indicating the results expected from the resulting change in schedule.

GC3.5.2 is added as follows:

3.5.2 The Contractor will regularly monitor the progress of the Work and advise the City and the Consultant of any revisions to, or any slippage in, the construction schedule.

GC3.5.3 is added as follows:

3.5.3 The Contractor will submit to the Consultant and the City monthly updates and provide comments on adherence to the construction schedule and details of any remedial actions being undertaken to improve schedule slippages.

GC3.5.4 is added as follows:

3.5.4 If the construction schedule is not adhered to, the Contractor will use all reasonable means to accelerate the Work, without additional compensation, to comply with the construction schedule. For the avoidance of doubt, references in the Contract Documents to the "construction schedule" will be deemed to be references to the "Project Schedule" unless the context requires otherwise.

GC3.6 SUPERVISION

GC3.6.3 is added as follows:

3.6.3 Any superintendent or foreman whose work is unsatisfactory to the Consultant, or to whom the Consultant may have any reasonable objection, shall be dismissed from the Work upon written notice of the Consultant. No superintendents or foremen will be substituted or replaced, except at the request or with the written consent of the City, or as a result of any such employee's voluntary termination of employment or incapacity and any replacement will have comparable or superior qualifications and experience.

GC3.7 SUBCONTRACTORS AND SUPPLIERS

GC3.7.2 is deleted in its entirety and replaced as follows:

3.7.2 No Subcontractor or Supplier listed in Schedule 4 (if any) shall be replaced without the written consent of the City, which consent shall not be unreasonably withheld.

GC3.7.7 is added as follows:

3.7.7 In every subcontract the Contractor shall specify that the Consultant shall be the person responsible for payment certification under that subcontract for the purposes of the *Lien Act*. With every request to the Consultant for a determination whether a

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subcontract has been completed, the Contractor shall furnish a detailed description of the scope of work covered by the subcontract and a complete reconciliation of the subcontract account. In this GC3.7.7, the word "subcontract" shall have the meaning it has when used in the *Lien Act*.

GC3.8 LABOUR AND PRODUCTS

GC3.8 is deleted in its entirety and replaced with the following:

GC 3.8 LABOUR AND PRODUCTS

3.8.1 *Unions and Wages*

(a) *Open Site*

The Place of the Work and adjacent work areas associated with the Project are, or are part of, an "open site" and the Work will be performed on a "no strike/no lockout" basis. Accordingly, the Contractor and its Subcontractors, as well as the City and other contractors, may employ labourers at the Place of the Work who are members of a trade union, including a trade union affiliated with a Trade Union Council or who are members of another trade union, or who are not members of a trade union.

(b) *Labour Disruptions*

The Contractor will use its best commercial efforts to ensure that no Site Labour Disturbance shall occur and the Contractor:

- (i) will only retain Subcontractors for the Work whose employees are either:
 - (1) certified in British Columbia to be represented by a trade union and subject to a collective agreement which does not expire until after the expected date of Total Performance of the Work; or
 - (2) not certified to be represented by a trade union; and

will require such Subcontractors to only retain subcontractors and suppliers whose employees are either certified in British Columbia to be represented by a trade union and subject to a collective agreement which does not expire until after the expected date of Total Performance of the Work or not certified to be represented by a trade union; and
- (ii) represents and warrants that, with respect to any employees of the Contractor who may work at or near the Place of the Work and who are certified in British Columbia to be represented by a trade union and subject to a collective agreement, such collective agreement to which such employees are subject does not expire until after the expected date of Total Performance of the Work;

but if any Site Labour Disturbance occurs and does or may adversely impact the City, the Work or the Contract Time, the Contractor will use its best commercial efforts to ensure that the length and extent of such impact is minimized (including without

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limitation by cooperating with the City in any measures it may take to ameliorate such impact) and the Contractor will be liable to the City for any such impact.

(c) *Required for Union Contractors*

Without limiting the generality of Section (b) above, if the Contractor, or any Subcontractor, proposes to employ labourers at the Place of the Work who are members of a trade union, including a trade union that is affiliated with a Trade Union Council authorized to bind its member trade unions, then the Contractor must first submit to the Consultant:

- (i) a waiver of all non-affiliation or reservations rights under applicable collective agreements, including renewals or replacements thereof, effective for the duration of the Contract and executed by the Trade Union Council on behalf of all trades, or executed by the particular trade unions whose members will be so employed; and
- (ii) an agreement that there will be no Site Labour Disturbance at or affecting the Place of the Work and/or the progress of the Work, effective for the duration of the Contract, and executed by the Trade Union Council on behalf of all trades, or executed by the particular trade unions whose members will be so employed.

(d) *Fair Wages*

The Contractor shall pay or cause to be paid to every person employed on the Work not less than the wages or remuneration generally accepted as current at that time.

- 3.8.2 The Contractor shall provide and pay for labour, Products, tools, Construction Equipment, water, heat, light, power, transportation, and other facilities and services necessary for the performance of the Work in accordance with the Contract.
- 3.8.3 Unless otherwise specified in the Contract Documents, Products provided shall be new. Products which are not specified shall be of a quality consistent with those specified and their use acceptable to the Consultant. All Products supplied by the Contractor must at all times contain 0.00% asbestos. Should any Product be found to contain more than 0.00% asbestos, the Contractor will promptly abate and remove all Products containing asbestos at its sole cost.
- 3.8.4 The Contractor shall maintain good order and discipline among the Contractor's employees engaged on the Work and shall not employ on the Work anyone not skilled in the tasks assigned. The City shall have the right, by written notification to the Contractor, to require the removal from the Project of any employee of the Contractor or a Subcontractor or employee of a Subcontractor of the Contractor who is incompetent, untrained, acts in an unsafe manner, is disorderly or is otherwise unsatisfactory, or who causes a breach of the terms of this Contract. Any such employee or Subcontractor shall be immediately removed from the Place of the Work by the Contractor and shall not be employed again on the Project without the prior written approval of the City.

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- 3.8.5 All materials shall be delivered, stored, handled and applied in strict accordance with the manufacturer's instructions, and shall be delivered with type, grade and brand name clearly identifiable and with seals intact.

GC3.9 DOCUMENTS AT THE SITE/DAILY RECORD

GC3.9.1 is deleted in its entirety and replaced with the following:

- 3.9.1 The Contractor shall keep one copy (as opposed to the originally executed set) of all Contract Documents, Shop Drawings, Change Orders, Change Directives, the diary record required by GC3.9.2 below, submittals, reports, and records of meetings at the Place of the Work, in good order, properly indexed, and available at all regular working hours on Working Days to the City and the Consultant.

GC3.9.2 is added as follows:

- 3.9.2 The Contractor shall, from the date of commencement of the Work, maintain a careful diary record of the progress of the Work. This record shall be open to the Consultant's inspection at all reasonable times and delivered to the Consultant on completion of the Work. The diary shall detail:
- .1 daily weather conditions;
 - .2 the commencement, progress and completion of various portions of the work;
 - .3 the dates of all meetings and their purposes; and
 - .4 the dates of visits or inspections by government authorities, inspectors, utility companies, etc.

GC3.10 SHOP DRAWINGS

GC3.10.2 is amended by adding the following to the end:

... or as the Consultant may reasonably request.

GC3.10.13 is added as follows:

- 3.10.13 The Contractor represents and warrants that it has reviewed all Contract Documents and inspected and examined the Place of the Work and the Project to the extent it considers necessary and in accordance with prudent practice and satisfied itself as to the nature and extent of the conditions, including the physical and climatic conditions which may be encountered in the performance of the Work and to the extent possible to establish the state and quality of the existing construction. The Contractor further acknowledges that it will be required to share the Place of the Work with the City and others, all as described in the Contract Documents.

GC3.12 CUTTING AND REMEDIAL WORK

GC3.12.3 is amended by adding the following to the end:

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... unless the City elects to do the work or retain other contractors, after having given the Contractor written notice of the work to be performed. Such work shall be performed in accordance with GC3.2.

GC4.1 CASH ALLOWANCES

GC4.1.1 is deleted in its entirety and replaced as follows:

4.1.1 The Contract Price includes the cash allowances, if any, stated in the Contract Documents. Except to the extent specifically described in the Contract Documents, such cash allowances:

- (a) will cover the net out-of-pocket cost of the Contractor for services, products, construction machinery and equipment, freight, unloading, handling, storage, installation and other authorized expenses incurred in performing the work stipulated under the cash allowances, but
- (b) will not cover labour or installation, unless (and then only to the extent):
 - (i) specifically stated in the Contract Documents as being included in the cash allowance, or
 - (ii) specifically designated as an itemized or separate price for purposes of the cash allowance,

and otherwise will be deemed to be included in the Contract Price (ex-cash allowances).

GC4.1.2 is deleted in its entirety and replaced as follows:

4.1.2 The Contract Price (ex-cash allowances), and not the cash allowances, includes the Contractor's and Subcontractors' overhead and profit in respect of such cash allowances. Unless noted otherwise in the Contract Documents, none of the work included in the Drawings and Specifications is intended to be paid for by the cash allowances. The cash allowances are for the City's use, at the City's sole discretion.

GC4.1.3 is amended by adding the following to the end of the paragraph:

The Consultant may require that cash allowance Work proceed only after competitive tenders or proposals are sought and received by the Contractor for all or any part of such Work. The Contractor shall provide full disclosure to the Consultant of all such tenders or proposals. The Contractor shall not accept any such tenders or proposals without the prior consent of the Consultant. The Contractor shall maintain at the Place of the Work, or such other location as the Consultant may approve, accurate and complete records and accounts documenting all costs incurred under cash allowances. These records and accounts shall be available for inspection by the Consultant and the City at all reasonable times, and the Consultant and the City may take copies thereof.

GC5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

GC5.1 is deleted in its entirety and replaced with the following:

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GC5.1 GENERAL FINANCIAL/PAYMENT PROVISIONS

- 5.1.1 The City shall, at the request of the Contractor, before signing the Contract, and promptly from time to time thereafter, furnish to the Contractor reasonable evidence that financial arrangements have been made to fulfill the City's obligations under the Contract. The Contractor now acknowledges that the City's financial statements as published pursuant to the *Financial Information Act* (British Columbia) constitute full satisfaction of this requirement and satisfactory evidence of the City's ability to fulfill its obligations under this Contract.
- 5.1.2 The City shall give the Contractor Notice in Writing of any material change in the City's financial arrangements to fulfill the City's obligations under the Contract during the performance of the Contract.
- 5.1.3 The City shall pay to the Contractor for the proper and timely performance and completion of the Work the Contract Price, consisting of:
- (i) if all or part of the Work is described or designated as Unit Price Work in the Schedule of Prices, the product of each unit price stated in the Schedule of Prices, multiplied by the quantity of each corresponding item of Work necessary for the proper performance and completion of the Work (and if such quantity differs from the quantity expressed in the Contract Documents and such difference is approved in writing by the City, the Contract Price expressed in ARTICLE A-4 of the Agreement shall be deemed to be adjusted to coincide with the approved quantity);
 - (ii) if all or part of the Work is Lump Sum Work, the aggregate of lump sum prices stated in the Schedule of Prices;
 - (iii) the aggregate of all cash allowances, if any, specified in Schedule 3 of the Agreement; and
 - (iv) if all or part of the Work is described or designated as Cost Plus Work, the cost reasonably and necessarily incurred by the Contractor in performing and completing such Work, such cost to be determined in accordance with GC5.1A.3, plus a percentage or fixed fee, as stated in GC5.1A.3.
- 5.1.4 The Contract Price is subject to adjustment only in accordance with the Contract Documents.
- 5.1.5 The Contract Price is expressed and payable in Canadian dollars.
- 5.1.6 Subject to the provisions of the Contract Documents and in accordance with the *Lien Act* in respect of Holdbacks, the City shall:
- .1 make progress payments to the Contractor on account of the Contract Price monthly when due, based on:
 - (i) the value of the Work completed and Products and materials incorporated into the Work as certified by the Consultant, and

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- (ii) Products and materials delivered to the Place of the Work but not yet incorporated into the Work, as agreed to by the City;
 - .2 upon issuance of a Certificate of Completion in respect of a subcontract to which the Contractor is a party, and where fifty-five (55) calendar days have elapsed since the issuance of the Certificate of Completion without any Liens having been filed which arose under the subcontract, pay the Holdback to the Contractor in respect of the subcontract;
 - .3 upon issuance of the Certificate of Completion (in respect of Substantial Performance of the Work), and where fifty-five (55) calendar days have elapsed since the issuance of the Certificate of Completion without any Liens or other liens having arisen with respect to this Contract, pay the balance of the Holdback to the Contractor in respect of this Contract;
 - .4 upon issuance of the Final Certificate for Payment (in respect of Total Performance of the Work), and provided no Liens or other liens have arisen in respect of this Contract, pay the balance of the Contract Price to the Contractor.
- 5.1.7 If either party fails to pay when due an amount owing to the other under this Contract, that amount will bear interest at the Bank Rate plus two percent (2%), calculated daily from the due date to the date of payment. For this purpose, the "Bank Rate" means the rate of interest established from time to time by the Bank of Canada as the minimum rate at which the Bank of Canada advances short term loans to Canadian chartered banks.
- 5.1.8 If the Work suffers any loss or damage, as a result of which an amount is paid under any policy of insurance provided by the City under the Contract, then such amount shall be paid to the City and advanced to the Contractor in monthly progress payments as the Contractor performs and completes repair or restoration Work in respect of such loss or damage.

GC5.1A BASIS OF PAYMENT:

5.1A.1 *Basis of Payment for Unit Price Work*

- .1 *Unit Price Work:* Payment for Unit Price Work, if any, shall be based on the unit prices set out in the Schedule of Prices.
- .2 *Measurement:* The Contractor shall measure the Work and the Consultant will verify such measurements to determine payment to the Contractor in accordance with the measurement provisions of the Contract Documents.

5.1A.2 *Basis of Payment for Lump Sum Work*

- .1 *Lump Sum Work:* Payment for Lump Sum Work, if any, shall be based on the lump sum prices set out in the Schedule of Prices.

5.1A.3 *Basis of Payment for Cost Plus Work*

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- .1 *Cost Plus Work:* Payment for Cost Plus Work, if any, shall be based on the cost of such Work, as provided in GC5.1A.3.2, plus a fixed fee or percentage fee calculated as a percentage of the cost of such Work, for the Contractor's overhead and profit, except as stated in GC5.1A.4 or GC6.3.6. The fixed fee or percentage fee shall be as provided in the Schedule of Prices (or, if not so specified, as agreed between the City and the Contractor in writing), except as stated in GC5.1A.4.
- .2 *Cost of the Work:* The cost of Cost Plus Work, except as otherwise specified in the Contract Documents or agreed in writing between the City and the Contractor, shall be at rates prevailing in the locality of the Place of the Work and shall include the following cost elements as applicable to such Work:
- (i) wages and benefits paid for labour in the direct employ of the Contractor under applicable collective bargaining agreements, or under a salary or wage schedule agreed upon by the Consultant and the Contractor;
 - (ii) salaries, wages, and benefits of the Contractor's personnel, when stationed at the field office, in whatever capacity employed; or personnel at shops or on the road, engaged in expediting the production or transportation of materials or equipment;
 - (iii) contributions, assessments, or taxes incurred for such items as employment insurance, provincial or territorial health insurance, workers' compensation, and Canada Pension Plan, insofar as such cost is based on wages, salaries, or other remuneration paid to employees of the Contractor and included in the cost of the Work as provided in paragraphs (i) and (ii);
 - (iv) travel and subsistence expenses of the Contractor's personnel described in paragraphs (i) and (ii), to be included only with the prior approval of the City;
 - (v) the cost of all Products, including the cost of transportation thereof;
 - (vi) the cost of Construction Equipment, Temporary Work, and hand tools not owned by the workers, including transportation, and maintenance thereof, which are consumed in the performance of the Work, at cost less salvage value on such items used but not consumed, which remain the property of the Contractor;
 - (vii) the cost of all tools and Construction Equipment, exclusive of hand tools used in the performance of the Work, whether rented from or provided by the Contractor or others, including installation, minor repairs and replacements, dismantling, removal, transportation and delivery cost thereof;
 - (viii) deposits lost;
 - (ix) the amounts of all subcontracts;

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- (x) the cost of quality assurance such as independent inspection and testing services;
 - (xi) charges levied by authorities having jurisdiction at the Place of the Work;
 - (xii) any adjustment in premiums for all bonds and insurance which the Contractor is required by the Contract Documents to purchase and maintain;
 - (xiii) any adjustment in value-added taxes (not including taxes on income or capital), for which the Contractor is liable;
 - (xiv) charges for long distance telephone and facsimile communications, courier services, expressage, and petty items incurred in relation to the performance of the Work;
 - (xv) the cost of removal and disposal of waste products and debris; and
 - (xvi) cost incurred due to emergencies affecting the safety of persons or property.
- .3 *Approval Required:* The Contractor shall obtain the Consultant's approval prior to subcontracting or entering into other agreements for Cost Plus Work.
- .4 *Rejection of Costs:* The Consultant may refuse to certify payment for all or part of the cost of any item under any cost element, where the item in question was unsuitable or unnecessary, or the cost was otherwise improperly incurred in the performance of the Work.
- .5 *Records:* The Contractor shall keep full and detailed accounts and records necessary for the documentation of the cost of Cost Plus Work and shall provide the Consultant with copies thereof when requested.
- .6 *Access to Records:* the City and the Consultant shall be afforded reasonable access to all of the Contractor's books, records, correspondence, instructions, drawings, receipts, vouchers, and memoranda related to the cost of Cost Plus Work and for this purpose the Contractor shall preserve such records for a period of one (1) year after the date of Substantial Performance of the Work.

5.1A.4 *Cost Plus Contract Rates and Mark Ups*

Notwithstanding any other provision hereof, when Cost Plus Work is performed then:

- (i) the costs of labour will be determined by the labour rates specified in the schedules to the Agreement, including the Schedule of Force Account Labour and Construction Equipment Rates, if any, in each case without any mark-up unless otherwise specified therein; and
- (ii) the costs of Construction Equipment will be determined by the construction equipment rates specified in the schedules to the Agreement, including the

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Schedule of Force Account Labour and Construction Equipment Rates, if any, in each case without mark-up unless otherwise specified therein.

GC5.2 APPLICATIONS FOR PROGRESS PAYMENT

GC5.2 is deleted in its entirety and replaced with the following:

GC5.2 APPLICATIONS FOR PROGRESS PAYMENT

- 5.2.1 Applications for payment shall be submitted to the Consultant on or before the last day of each calendar month, dated as of the last day of the month, and be in respect of the Work completed prior to the application being signed (the “**payment period**”).
- 5.2.2 The amount claimed shall be the value, proportionate to the amount of the Contract, of Work performed and Products delivered to the Place of the Work as of the last day of the payment period.
- 5.2.3 The Contractor shall submit to the Consultant at least fifteen (15) calendar days before the first application for payment, a schedule of values for the parts of the Work, aggregating the total amount of the Contract Price, so as to facilitate evaluation of applications for payment. A second schedule, stating the anticipated monthly progress payments, is to be submitted upon request.
- 5.2.4 The schedule of values shall be made out in such form and supported by such evidence as the Consultant may reasonably direct and when accepted by the Consultant, shall be used as the basis for applications for payment, unless it is found to be in error.
- 5.2.5 When making an application for payment, the Contractor shall submit a statement based upon the schedule of values. Claims for Products delivered to the Place of the Work but not yet incorporated into the Work shall be supported by such evidence as the Consultant may reasonably require to establish the ownership, value and delivery of the Products. The City has the right to refuse payment for Products delivered to the Place of the Work but not incorporated in the Work. The Contractor shall obtain the City's permission prior to invoicing for such Products.
- 5.2.6 Each application for payment shall:
 - .1 be in such form and detail as the Consultant shall require and submitted consistently in such form and detail unless otherwise advised by the Consultant and clearly show:
 - (D) the Contractor's full name, address and telephone number;
 - (E) the City's purchase order number;
 - (F) the name of the City's project manager;
 - (G) the application for payment number and date; and
 - (H) the Contractor's PST and GST registration number(s);

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- .2 be attached to a statement or statutory declaration sworn by an officer of the Contractor, which attests to the accuracy and completeness of the information contained therein, and for each application following the first application also include in addition to the foregoing and not in lieu of the same, a current CCDC 9A Statutory Declaration of Progress Payment Distribution by Contractor, which shall be completed and sworn before a Notary Public or Commissioner for Oaths for the Province of British Columbia;
 - .3 relate the Work for which payment is claimed to the Project Schedule and the schedule of values provided and provide such back-up invoices and other materials as may be reasonably necessary for the Consultant to review such application;
 - .4 be accompanied by a sworn declaration that there are no Liens or other liens relating to the Contractor, the Work or the Products registered against the City, the Project or the Place of the Work or the City's interest therein or against the Holdback;
 - .5 attach the documents required under GC9.4 demonstrating compliance by the Contractor and each Subcontractor with WorkSafeBC Rules;
 - .6 attach the monthly update contemplated by GC3.5.3; and
 - .7 provide a comprehensive list of items which remain to be completed and any defective items which remain to be corrected and the Contractor's estimate of the costs and time to complete or correct such items.
- 5.2.7 The Contractor shall deliver a complete application as provided in GC5.2.6 and if such application is not complete, the Consultant may reject all or the applicable portions of the same by promptly (and in any event within five (5) calendar days of its receipt) notifying the Contractor of the deficiencies in the application. The Contractor will promptly supply to the Consultant such further certification or information as may be necessary to remedy the deficiencies in the application.
- 5.2.8 An application for payment shall be deemed to be received by the Consultant only if and when submitted in full conformity with GC5.2.6.

GC5.3 PROGRESS PAYMENT

GC5.3.1.2 is amended by adding the following before the last sentence of the paragraph:

If, after a certificate for payment has been issued to the City (and prior to payment by the City), the Consultant determines on the basis of new information that the amount certified for payment is incorrectly high or low relative to the Work being certified, then the Consultant shall issue a revised certificate.

GC5.3.1.3 is amended by deleting the words "Article A-5 of the Agreement - PAYMENT" and replacing with "this GC5 and the *Lien Act*".

GC5.3.2 is added as follows:

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- 5.3.2 Subject to the provisions of the *Lien Act*, the City may retain a deficiency holdback from progress payments prior to Substantial Performance of the Work to ensure that sufficient money is withheld to fund any agreed deficiency holdback at Substantial Performance of the Work

GC5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

GC5.4 is deleted in its entirety and replaced with the following:

GC5.4 SUBSTANTIAL PERFORMANCE OF THE WORK/CERTIFICATE OF COMPLETION

- 5.4.1 When the Contractor considers that Substantial Performance of the Work has been achieved, or if permitted by the *Lien Act* the Contractor wishes to apply for a Certificate of Completion with respect to a subcontract with a Subcontractor, the Contractor shall, within one Working Day, deliver to the Consultant and to the City an application for a Certificate of Completion (a "**Completion Certificate Application**") in conformity with GC5.4.4.
- 5.4.2 The Consultant will review the Work to verify the validity of the application and shall promptly, and in any event, no later than ten (10) calendar days after receipt of the Contractor's application:
- .1 advise the Contractor in writing that the Work or the designated portion of the Work is not "completed" (as that term is used in the *Lien Act*) and give reasons why, or
 - .2 prepare a Certificate of Completion in respect of the Work or subcontract stating on the certificate the date of issuance in accordance with the *Lien Act* and issue a copy of that certificate to each of the City and the Contractor.
- 5.4.3 Immediately following the issuance of the Certificate of Completion for all of the Work, the Contractor, in consultation with the Consultant, shall establish a reasonable date for Total Performance of the Work (which date will be deemed to be the date for the same set out in the Project Schedule if such date is specified).
- 5.4.4 Each Completion Certificate Application referred to in GC5.4.1 shall also contain an application for payment and shall consist of the following:
- .1 a cover letter stating that the submittal is an application for a Certificate of Completion as well as an application for payment, and clearly identifying the Work or subcontract for which the Certificate of Completion is being sought;
 - .2 all of the certifications and information required on an application for payment, as set out in GC5.2.6;
 - .3 with respect to the Work or subcontract, as applicable, all deliverables, including copies of all manufacturer's warranties, called for in the Contract Documents which are or should be available at the time of the Completion Certificate Application, including, without limitation and by way of example only, all operation manuals, service manuals, warranty certificates, maintenance contracts, service contracts, software licences, inspection

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reports, and other applicable manuals, contracts, certificates, guarantees and warranties.

- 5.4.5 Failure to specify an incomplete or defective item on a Completion Certificate Application or the Consultant's issuance of a Certificate of Completion or certificate of payment in respect of the same does not alter the responsibility of the Contractor to complete the Contract.
- 5.4.6 Subject to the requirements of the *Lien Act* relative to the date of issuance by the Consultant of the Certificate of Completion of the Work pursuant to GC5.4.2.2:
- .1 the Consultant shall issue to the City and copy to the Contractor a certificate of payment for an amount equal to the Contract Price less:
 - (i) three times the value of any deficiencies shown on the comprehensive list of items to be completed or corrected, as determined by the Consultant,
 - (ii) the value of incomplete work as determined by the Consultant, and
 - (iii) the amounts of all previous certificates of payment;
 - .2 the City shall then make payment to the Contractor in accordance with the provisions of GC5.3.1.3 provided always that a Completion Certificate Application shall be deemed received only if and when submitted in accordance with GC5.2.6 as well as GC5.4.4; and
 - .3 for the avoidance of doubt, this GC5.4.6 does not create an obligation to avoid retaining, or to release, any Holdback.

GC5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

GC5.5 is deleted in its entirety and replaced with the following:

GC5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

- 5.5.1 After the issuance of the Certificate of Completion evidencing Substantial Performance of the Work, the Contractor shall:
- .1 submit an application for payment of the Holdback,
 - .2 submit a current CCDC 9A Statutory Declaration of Progress Distribution by Contractor, as well as a current CCDC 9B Statutory Declaration of Progress Distribution by Subcontractor from each of the Subcontractors, which in every case shall be fully and properly completed and sworn before a Notary Public or Commissioner for Oaths for the Province of British Columbia;
 - .3 verify that there are no Liens or other liens relating to the Contractor, the Work or the Products registered against the City, the Project or the Place of the Work or the City's interest therein or against the Holdback, and swear and submit to the Consultant a written declaration that there are no such Liens or other liens;

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- .4 attach the documents required under GC9.4 demonstrating compliance by the Contractor and each Subcontractor with WorkSafeBC Rules; and
 - .5 attach copies of a current title search of the Place of the Work confirming that no Liens have been registered prior to the time the release of the Holdback is due.
- 5.5.2 After the receipt of and approval of the application documents described in GC5.5.1, the Consultant will issue a certificate for payment of the Holdback (less any previous releases of the Holdback on account of subcontract Certificates of Completion).
- 5.5.3 The Contractor now acknowledges that the City is exempt under the regulations of the *Lien Act* from the requirement to keep the Holdback in a separate holdback account.
- 5.5.4 The Holdback is due and payable as set out in GC5.1.6.3. The City may retain out of the Holdback any sums required by law to satisfy any Liens arising under the Contract or any subcontract or, if permitted by the *Lien Act*, claims against the Contractor.

GC5.6 PROGRESSIVE RELEASE OF HOLDBACK

GC5.6.1 is deleted in its entirety and replaced with the following:

- 5.6.1 Any portion of the Holdback in respect of a Subcontractor or Supplier subcontract is due and payable as set out in GC5.1.6.3. The City may retain out of the subcontract portion of the Holdback any sums required by law to satisfy any Liens arising in connection therewith or, if permitted by the *Lien Act*, other claims.

GC5.6.2 is deleted in its entirety.

GC5.6.3 is amended by deleting the words "final certificate for payment" and replacing with "Final Certificate for Payment".

GC5.7 FINAL PAYMENT

GC5.7.1 is deleted in its entirety and replaced as follows:

- 5.7.1 When the Contractor considers that Total Performance of the Work has been achieved, the Contractor shall submit its final application for payment. The application for payment on attaining Total Performance of the Work shall consist of the following:
- .1 all of the certifications and information required on an application for payment as set out in GC5.2.6, all appropriately amended to clearly confirm that the Work is fully completed, all Products have been delivered, and all Lien periods have expired with no Liens or other liens having been filed;
 - .2 a current CCDC 9A Statutory Declaration of Progress Distribution by Contractor, as well as a current CCDC 9B Statutory Declaration of Progress Distribution by Subcontractor from each of the Subcontractors, which in every case shall be fully and properly completed and sworn before a Notary Public or Commissioner for Oaths for the Province of British Columbia;

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- .3 copies of a current title search of the Place of the Work confirming that no Liens have been registered as at the date of application for Final Certificate for Payment; and
- .4 all deliverables called for in the Contract Documents which were not delivered at the time of Substantial Performance of the Work.

GC5.7.3 is amended by deleting the words “final certificate for payment” and replacing with “Final Certificate for Payment”.

GC5.7.4 is deleted in its entirety and replaced as follows:

- 5.7.4 Subject to paragraph 9.4.1 of GC9.4 - CONSTRUCTION SAFETY & WORKPLACEBC RULES, and the *Lien Act*, the City shall, no later than twenty-one (21) calendar days after the issuance of a Final Certificate for Payment, pay the Contractor as provided in GC5.1.6.4

GC6.1 OWNER'S RIGHT TO MAKE CHANGES

GC6.1.3 is added as follows:

- 6.1.3 Change Orders, contemplated Change Orders, and Change Directives shall be on printed forms supplied by the City or Consultant and may include:
 - .1 job site instructions or site memo forms, for immediate authorization at the Place of the Work in order not to delay the performance of the Work and for changes of a minor nature with no price variation, which shall be issued on site on the signature of the Consultant only;
 - .2 contemplated Change Orders issued by the Consultant for purposes of the Contractor's response to a proposed method of adjustment and extent of adjustment to the Contract Price or Contract Time, which shall be signed by the Consultant only;
 - .3 Change Orders authorizing the Contractor to proceed with the Work as set out by the Consultant and Contractor in a contemplated Change Order, which shall be signed by the City and the Contractor.

GC6.1.4 is added as follows:

6.1.4 *Basis of Payment for Changes on Cost Plus Basis*

- .1 *Work Done on Cost Plus Basis:* The cost of Work done under a Change Directive or Change Order on a cost-plus basis, except as otherwise specified in the Contract Documents or agreed in writing between the City and the Contractor, shall be at rates prevailing in the locality of the Place of the Work and, subject to GC6.1.6, shall include the cost elements set out in GC5.1A.3(i) through (xvi) as applicable to such Work.
- .2 *Approval Required:* The Contractor shall obtain the Consultant's approval prior to subcontracting or entering into other agreements for Work done under a Change Directive or Change Order on a cost-plus basis.

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- .3 *Rejection of Costs:* The Consultant may refuse to certify payment for all or part of the cost of any item under any cost element, where the item in question was unsuitable or unnecessary, or the cost was otherwise improperly incurred in the performance of the Work.
- .4 *Records:* The Contractor shall keep full and detailed accounts and records necessary for the documentation of the cost of Work done under a Change Directive or Change Order on a cost-plus basis, and shall provide the Consultant with copies thereof when requested.
- .5 *Access to Records:* the City and the Consultant shall be afforded reasonable access to all of the Contractor's books, records, correspondence, instructions, drawings, receipts, vouchers, and memoranda related to the cost of Work done under a Change Directive or Change Order on a cost-plus basis, and for this purpose the Contractor shall preserve such records for a period of one (1) year after the date of Substantial Performance of the Work.
- .6 Notwithstanding any other provision hereof, when a change in the Work is valued on a cost-plus basis, then:
 - (i) the costs of labour will be determined by the labour rates specified in the schedules to the Agreement, including the Schedule of Force Account Labour and Construction Equipment Rates, if any, in each case without any mark up unless otherwise specified therein;
 - (ii) the costs of Construction Equipment will be determined by the construction equipment rates specified in the schedules to the Agreement, including the Schedule of Force Account Labour and Construction Equipment Rates, if any, in each case without mark up unless otherwise specified therein; and
 - (iii) for further certainty, to the extent that any changes involve changes in the quantities of Unit Price Work such changes will be determined solely by the unit prices, without mark-up, unless otherwise specified in the schedules to the Agreement.

GC6.1.5 is added as follows:

6.1.5 Valuation and Marks ups for all Change Orders and Change Directives

The following terms and conditions will apply to any quotation for a Change Order prepared by the Contractor pursuant to GC 6.2 - *CHANGE ORDER*, and will also apply to any Change Directive issued pursuant to GC 6.3 - *CHANGE DIRECTIVE*:

- .1 The valuation for all (except previously agreed separate prices and unit prices) Work done under a Change Directive or Change Order which result in an increase in the Contract Price, whether valued as a lump sum or on a cost-plus basis, will be based on the actual direct unavoidable costs incurred by the Contractor and will be deemed to include all amounts on account of overhead, profit, administrative, and any other indirect expenses or allowances except as follows:

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- .1 The Contractor will receive combined overhead and profit equal to ten percent (10%) of the direct unavoidable costs incurred by the Contractor's use of his own forces;
- .2 The Contractor will receive five percent (5%) combined overhead and profit on the amounts paid by the Contractor to any Subcontractor or Suppliers as a direct result of the Change Order or Change Directive (provided always that the Subcontract contains the same limitations on Change Orders and Change Directives as this Contract).
- .3 The Subcontractor will receive combined overhead and profit of ten percent (10%) on account of the direct unavoidable costs incurred by the Subcontractor as direct result of the Change Order or Change Directive, and
- .4 The Supplier will receive no overhead, profit or other markup on account of the Change Order or Change Directive.
- .2 The valuation for all (except previously agreed separate price and unit rates) changes in the Work which result in a decrease in the Contract Price will be based on the actual savings in all costs to the Contractor, Subcontractor and Suppliers, exclusive of markups or deductions for overhead, profit, administrative or any other indirect costs not causally related to the Change Order or Change Directive.
- .3 If a change in the Work results in both expenditures and savings, any overhead or profit that is otherwise payable by the City shall be payable only on the net increase in expenditures, if any, with respect to that change in the Work.
- .4 The Contractor will only enter into Subcontracts with Subcontractors and Suppliers which obligate each Subcontractor and Supplier to comply with the provisions of this Part 6 - CHANGES IN THE WORK.
- .5 Upon the request of the Consultant, the Contractor will promptly deliver all supporting documentation including labour, Products, services, Subcontract breakdowns and all other documentation in order to substantiate any Change Order quotation or change in the Contract Price pursuant to a Change Directive.
- .6 The Contractor will be responsible for having time sheets covering all personnel respecting any Change Order or Change Directive checked and approved daily by the Consultant, and claims for reimbursement of any extra wages, salaries or other expenses relating to such personnel will only be accepted when properly supported by such signed time sheets.
- .7 All costs and expenses incurred by the Contractor and any Subcontractor or Suppliers in preparing any requested Change Order quotation or submitting, substantiating or otherwise administering a claim pursuant to a Change Order or Change Directive will be the responsibility of the Contractor and may not be included in any adjustment to the Contract Price.

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GC6.1.6 is added as follows:

6.1.6 Cost Plus Maximum under Change Order

When a change in Work is valued on a cost-plus basis, the City may require that the aggregate amount incurred under the corresponding Change Directive shall not exceed a maximum amount acceptable to the City, acting reasonably, and specified in the Change Directive, as such amount may be revised from time to time by subsequent written authorization of the City. The Contractor shall not be entitled to payment in excess of such applicable maximum amount in respect of any such Change Directive.

GC6.3 CHANGE DIRECTIVE

GC6.3.3 is deleted in its entirety.

GC6.3.5 is deleted in its entirety.

GC6.3.6 is deleted in its entirety.

GC6.3.7 is deleted in its entirety.

GC6.3.8 is deleted in its entirety.

GC6.3.9 is deleted in its entirety.

GC6.3.10 is deleted in its entirety.

GC6.4 CONCEALED OR UNKNOWN CONDITIONS

GC6.4.1 is deleted in its entirety and replaced as follows:

6.4.1 If the Contractor discovers conditions at the Place of the Work which: (i) are subsurface or otherwise concealed physical conditions which existed before the commencement of the Work; (ii) could not reasonably have been discovered by proper investigation by the Contractor under GC3.10.13; and (iii) differ materially from those disclosed in the Contract Documents, including any geotechnical report, environmental assessment, or other report included or referenced in the Contract Documents or provided or made known to the Contractor before the commencement of the Work, then the Contractor shall give Notice in Writing to the Consultant of such conditions before they are disturbed and in no event later than five (5) Working Days after first observance of the conditions.

GC6.4.1A is added as follows:

6.4.1A The Contractor must give notice under GC6.4.1 within five (5) Working Days after discovery of the conditions or the time when the Contractor by reasonable diligence could have discovered the conditions, failing which the Contractor may not make or enforce any claim against the City, whether for a change in the Contract Price or other compensation or for an extension of the Contract Time arising from those conditions.

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GC6.4.2 is amended by deleting the words "If the finding is that the conditions differ materially and this would cause" and replacing with "If the requirements of GC6.4.1 and GC6.4.1A are satisfied and the relevant conditions would cause".

GC6.4.3 is amended by deleting the words "the conditions at the Place of Work are not materially different" and replacing with "the requirements of GC6.4.1 and GC6.4.1A are not satisfied".

GC6.4.4 is deleted in its entirety and replaced as follows:

- 6.4.4 If such concealed or unknown conditions relate to Hazardous Substances, artefacts and fossils, or mould, the parties will be governed by the provisions of GC9.2 - TOXIC AND HAZARDOUS SUBSTANCES, GC9.3 - ARTIFACTS AND FOSSILS and GC9.5 - MOULD.

GC7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT

GC7.1.5.2 is amended by deleting the words "final certificate for payment" and replacing with "Final Certificate for Payment".

GC7.1.7 is added as follows:

- 7.1.7 The City may terminate the Contract at any time for the convenience of the City by notice given to the Contractor. If the Contract is terminated under this GC7.1.7, then:
- (a) the Contractor shall suspend performance of the Work and shall not incur further cost or expense in relation to the Work, except (i) as necessary to protect the Work and the safety of persons, or (ii) as authorized or directed in writing by the City;
 - (b) the Contractor shall remove from the Place of the Work its personnel and all Construction Equipment and other material that is owned or leased by the Contractor, except as otherwise required to comply with GC7.1.7(a)(i) and (ii); and
 - (c) the City shall pay the Contractor for all Work performed, including the cost of complying with GC7.1.7(a)(i) and (ii), in accordance with the terms and conditions of payment set out in the Contract, together with the documented and reasonable cost of terminating subcontracts with Subcontractors and Suppliers and demobilizing the Contractor's personnel and Construction Equipment, all as certified by the Consultant, and upon such payment being made, the Contractor shall have no further or other claim against the City for, or in connection with, termination of the Contract.

GC7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE CONTRACT

GC7.2.2 is amended by replacing the number "20" where it appears in the first sentence with the number "30".

GC7.2.3 is amended by adding the following to the beginning of the first sentence:

If the default cannot be corrected in five (5) Working Days or in such other time as may be subsequently agreed in writing by the parties,

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GC7.2.3.1 is deleted in its entirety.

GC7.2.3.4 is deleted in its entirety and replaced with the following:

- .4 the City violates the requirements of the Contract to a substantial degree and the Consultant, except for GC5.1- GENERAL FINANCIAL/PAYMENT PROVISIONS, confirms by written statement to the Contractor that sufficient cause exists.

GC7.2.4 is amended by revising the second line to read:

...corrected within fourteen (14) Working Days following the receipt of the Notice in Writing, the Contractor may, without prejudice to any ...

GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION

GC8.2.1.1 is deleted in its entirety and replaced as follows:

- .1 within thirty (30) Working Days after the Contract was awarded, or

GC8.2.1.2 is deleted in its entirety and replaced as follows:

- .2 if the parties neglected to make an appointment within the thirty (30) Working Days, within twenty (20) Working Days after either party by Notice in Writing requests that the Project Mediator be appointed.

GC8.2.3 is amended by adding the following to the end:

However, the City and the Contractor nonetheless irrevocably and unconditionally attorn to the jurisdiction of the courts of British Columbia, and courts to which appeals therefrom may be taken, in respect of any dispute or claim arising under or relating to the Contract. The City and the Contractor acknowledge and agree that such courts have jurisdiction, but not necessarily exclusive jurisdiction in respect of any such dispute or claim. If a dispute arises under or in relation to this Contract, and the dispute cannot be resolved by the City's project manager and the Contractor's principal representative at the Place of the Work within three (3) Working Days after the dispute arises, or the City's project manager is not authorized to resolve the dispute, then:

- (a) the dispute will be referred to the City's Director of Facilities and the Contractor's project manager for resolution, and if they cannot resolve the dispute within three (3) Working Days after referral to them, then
- (b) the dispute will be referred to a senior executive of the City designated by it and a senior executive of the Contractor designated by it, for resolution, and if they cannot resolve the dispute within three (3) Working Days after referral to them, then
- (c) either party may take such further legal proceedings as they consider necessary for the resolution of the dispute either concurrently with or in lieu of the process outlined in GC8.2.4 to GC8.2.9.

GC8.2.4 is amended by revising the second line to read:

...the parties may request the Project Mediator...

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GC8.2.6 is amended by revising the second line to read:

...either party may request referral of the dispute...

GC8.2.7 is deleted in its entirety and replaced as follows:

8.2.7 If a Notice in Writing is not given under paragraph 8.2.6 within the required time or the other party does not reply and agree to binding arbitration, the parties may refer the unresolved dispute to the courts or to any other form of dispute resolution, including arbitration, which they have agreed to use.

GC8.2.9 is added as follows:

8.2.9 Where references are made in the Contract Documents to “the time of bid closing”, it is intended by the parties that this shall mean the effective date of the contract.

GC9.1 PROTECTION OF WORK AND PROPERTY

GC9.1.1 is deleted in its entirety and replaced with the following:

9.1.1 The Contractor shall protect the Work, Products delivered to the Place of the Work, the City’s property and property on or adjacent to the Place of the Work from theft and damage which may arise as the result of the Contractor’s operations under the Contract, and shall be responsible for such theft and damage, except theft and damage which occurs as the result of:

- .1 errors in the Contract Documents;
- .2 acts or omissions by the City, other contractors, or their agents and employees.

GC9.1.4 is amended by revising the first line to read:

Should damage occur to the Work, Products delivered to the Place of the Work, the City’s property or property on or adjacent to the Place of the Work, for which the Contractor is not responsible, as provided in paragraph...

GC9.1.5 is added as follows:

9.1.5 The Contractor is responsible for protection of the Work during shutdown, including shutdowns caused by strikes.

GC9.2 TOXIC AND HAZARDOUS SUBSTANCES

GC9.2.1 is deleted in its entirety and replaced with the following:

9.2.1 For the purposes of the Contract, the City shall be deemed to have control and management of the Place of the Work with respect to the condition of the Place of the Work prior to the commencement of the Work in relation to applicable Environmental Law and the presence of any Hazardous Substances.

GC9.2.2 is deleted in its entirety and replaced with the following:

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9.2.2 Prior to the Contractor commencing the Work, the City shall:

- .1 take reasonable steps to determine whether the Place of the Work contains any Hazardous Substances and, if so, whether the condition of the Place of the Work is in compliance with applicable Environmental Law; and
- .2 provide the Consultant and the Contractor with a written list of any such Hazardous Substances that the City knows to exist on, and their locations within, the Place of the Work.

GC9.2.3 is deleted in its entirety and replaced with the following:

- 9.2.3 Unless the Contract expressly provides otherwise, the City shall be responsible for taking such steps as may be necessary, in accordance with applicable Environmental Law to dispose of, store or otherwise deal with Hazardous Substances so as to cause the Place of the Work to comply with the requirements of applicable Environmental Law before the Contractor commences the Work.

GC9.2.4 is deleted in its entirety and replaced with the following:

- 9.2.4 Except as previously disclosed in writing by the City or as otherwise known by the Contractor, if the Contractor:

- .1 encounters Hazardous Substances at the Place of the Work; or
- .2 has reasonable grounds to believe that Hazardous Substances are present at the Place of the Work which were not brought to the Place of the Work by the Contractor or anyone for whom the Contractor is responsible or which were disclosed but have not been dealt with as required under paragraph 9.2.3,

the Contractor shall:

- (a) take reasonable steps, including stopping the Work, to ensure that no person's exposure to any Hazardous Substance at the Place of the Work exceeds any levels contrary to the requirements of applicable Environmental Law, and
- (b) immediately report the circumstances to the Consultant and the City by Notice in Writing.

GC9.2.5 is deleted in its entirety and replaced with the following:

- 9.2.5 If the City and the Contractor, acting reasonably, fail to agree on whether the condition of the Place of the Work is in compliance with applicable Environmental Law prior to the commencement of the Work or whether Hazardous Substances were brought onto the Place of the Work by the Contractor or anyone for whom the Contractor is responsible, or whether the Contractor or anyone for whom the Contractor is responsible caused the release of Hazardous Substances at the Place of the Work, the City shall retain an independent qualified expert to investigate and report on the subject of the dispute. Subject to paragraph 9.2.6, the City shall pay for the cost of the expert's investigation and report. The City will provide a copy of the expert's report to the Contractor.

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GC9.2.6 is deleted in its entirety and replaced with the following:

- 9.2.6 If the expert's report under paragraph 9.2.5 determines that the Place of the Work was in compliance with applicable Environmental Law prior to the commencement of the Work or that Hazardous Substances were brought onto the Place of the Work by the Contractor or any for whom the Contractor is responsible, or that the Contractor or anyone for whom the Contractor is responsible caused the release of a Hazardous Substance at the Place of the Work, the Contractor shall pay for the cost of the expert's investigation and report.

GC9.2.7 is deleted in its entirety and replaced with the following:

- 9.2.7 If the City and the Contractor agree, or if the expert's report under paragraph 9.2.5 concludes, that the Contractor or anyone for whom the Contractor is responsible brought a Hazardous Substance onto, or caused the release of a Hazardous Substance on, the Place of the Work, the Contractor shall promptly at the Contractor's expense:
- .1 take such steps as are necessary to safely and in compliance with Environmental Law remove, transport and dispose of such Hazardous Substance and to remediate the Place of the Work to such extent as is required to cause the Place of the Work to comply with all applicable Environmental Law;
 - .2 make good any damage to the Work, the City's property and any property affected by any migration of the Hazardous Substance as provided in paragraph 9.1.3 of GC9.1 - PROTECTION OF WORK AND PROPERTY;
 - .3 reimburse the City for all resultant costs and expenses reasonably incurred by the City; and
 - .4 indemnify the City as required by GC12.1 - INDEMNIFICATION

GC9.2.8 is deleted in its entirety and replaced with the following:

- 9.2.8 If the City and the Contractor agree, or if the expert's report under paragraph 9.2.5 concludes, that neither the Contractor nor anyone for whom the Contractor is responsible is responsible for bringing a Hazardous Substance onto, or for causing the release of a Hazardous Substance on, the Place of the Work, the City shall promptly at the City's expense:
- .1 take such steps as are necessary to safely and in compliance with Environmental Law remove, transport and dispose of such Hazardous Substance and to remediate the Place of the Work to such extent as is required to cause the Place of the Work to comply with all applicable Environmental Law;
 - .2 reimburse the Contractor for all resultant costs and expenses reasonably incurred by the Contractor;
 - .3 extend the Contract time for such reasonable time as the Consultant may recommend in consultation with the Contractor and the expert referred to in paragraph 9.2.5 and reimburse the Contractor for costs reasonably incurred as a result of the delay, and

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.4 indemnify the Contractor as required by GC12.1 - INDEMNIFICATION.

GC9.2.9 is amended by deleting the words "Part 8 of the General Conditions - Dispute Resolution" from the second line and replacing with "Part 8 - DISPUTE RESOLUTION".

GC9.2.10 is added as follows:

9.2.10 The Contractor shall, and shall ensure that anyone for whom the Contractor is responsible shall, at all times comply with all applicable Environmental Law and ensure that all Work is conducted in compliance with all applicable Environmental Law.

GC 9.3 ARTIFACTS AND FOSSILS

GC9.3.1 is deleted in its entirety and replaced with the following:

9.3.1 If the Contractor or anyone for whom the Contractor is responsible discovers fossils coins, articles of value or antiquity, structures and other remains or things of scientific, cultural or historical interest at the Place of the Work (in GC9.3 called, "Historical Items"), the Contractor shall immediately give Notice in Writing thereof to the City and the Consultant. As between the City and the Contractor, all Historical Items shall be, and shall be deemed to be, the absolute property of the City, and the Contractor hereby irrevocably waives and disclaims any right, title or interest therein.

GC9.3.2 is deleted in its entirety and replaced with the following:

9.3.2 The Contractor shall take all reasonable precautions, and shall comply with all reasonable directions from the Consultant, to prevent removal or damage to Historical Items as identified in paragraph 9.3.1 or as otherwise known to be present at the Place of the Work.

GC9.3.3 is deleted in its entirety and replaced with the following:

9.3.3 The Consultant will investigate the impact on the Work of the discovery of any Historical Item identified in paragraph 9.3.1. If conditions are found that would cause an increase or decrease in the Contractor's cost or time to perform the Work, the Consultant, with the City's approval, will issue appropriate instructions for a change in the Work as provided in GC6.2 -CHANGE ORDER or GC6.3 - CHANGE DIRECTIVE.

GC9.4 CONSTRUCTION SAFETY

The above heading for GC9.4 is amended by adding "&WORKSAFEBC RULES" to the end.

GC9.4.2 is added as follows:

9.4.2 Unless otherwise specified in the Contract Documents or notified to the contrary by the Consultant, the Contractor is the "prime contractor" for the purpose of the WorkSafeBC Rules, notwithstanding that the City, the Consultant or another contractor may provide from time to time some of the services normally provided by such a "prime contractor".

GC9.4.3 is added as follows

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9.4.3 If the Contractor is the "prime contractor", the Contractor shall:

- .1 *Compliance with Law:* comply with all Applicable Laws, and all reasonable rules established by the City of which the Contractor is given timely notice through the Consultant, relative to occupational health and safety;
- .2 *Safety Programs:* initiate, maintain and supervise all safety programs and measures in connection with the performance of the Work, which program shall respond fully to the requirements of all Applicable Laws relative to occupational health and safety, all to the satisfaction of the Consultant;
- .3 *Site Meetings:* conduct regular safety meetings at the Place of the Work, no less frequently than weekly, record minutes of such meetings and give copies of such minutes to the Consultant on a weekly basis;
- .4 *Safety Equipment:* supply and maintain at the Place of the Work all safety equipment necessary to protect workers and others from accident or injury; and
- .5 *First Aid:* supply and maintain at the Place of the Work all personnel, equipment and supplies necessary for the provision of appropriate first-aid to any worker or person suffering an accident or injury at or about the Place of the Work, and establish an emergency procedure for prompt removal of any such person from the Place of the Work to a hospital, clinic or medical office for further treatment.
- .6 *Notice of Project:* prior to commencement of construction:
 - (a) complete and file a "Notice of Project" with the WorkSafeBC in compliance with Section 20.2 of the *Occupational Health and Safety Regulation*;
 - (b) post the Notice of Project at the Place of the Work, and
 - (c) provide a copy of the Notice of Project to the City and confirm in writing that the Notice of Project has been posted at the Place of the Work.

GC9.4.4 is added as follows

9.4.4 If, or for so long as the Contractor is not the "prime contractor", the Contractor shall:

- .1 *Compliance with Law:* comply with all Applicable Laws, and all reasonable rules established by the City of which the Contractor is given timely notice through the Consultant, relative to occupational health and safety;
- .2 *Compliance with Directions:* comply with all reasonable directions issued by the "prime contractor" regarding compliance with Applicable Laws, and rules established by the City, relative to occupational health and safety; and
- .3 *Site Safety Meetings:* attend all Place of the Work safety meetings convened by the "prime contractor".

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GC9.4.5 is added as follows

9.4.5 Whether or not the Contractor is the "prime contractor", it shall:

- .1 *Reporting:* report immediately to the "prime contractor" (if not the Contractor) and the Consultant all accidents and injuries of any kind or severity occurring on or about the Place of the Work and involving employees of the Contractor or any Subcontractor, or any other person of which the Contractor is aware, and arising out of or in connection with the Work;
- .2 *Written Confirmation:* confirm in writing each report made under subparagraph (a); and
- .3 *City Policy:* respect and adhere to City's safety and training policies relative to the Place of the Work and the Work.

GC9.4.6 is added as follows

9.4.6 If the Consultant determines that the Contractor is not in compliance with its obligations as "prime contractor", if applicable, the City may, but is not obliged to, provide some or all of the services required to discharge those obligations. All costs incurred by the City in providing such services shall be paid by the Contractor to the City, and may be deducted from any amount then or thereafter becoming due to the Contractor under the Contract.

GC9.4.7 is added as follows:

9.4.7 The Contractor shall indemnify and save harmless the City from any and all damages, liabilities, cost, fines, penalties, fees and expenses whatsoever including, without limitation, legal fees, charges and disbursements as between a solicitor and his own client, related to or arising out of the assignment to the Contractor, and the Contractor's assumption, of the responsibilities, obligations and liabilities of the "prime contractor" under the WorkSafeBC Rules with respect to the Place of the Work.

GC9.4.8 is added as follows:

9.4.8 The Contractor agrees that it shall at its own expense procure and carry or cause to be procured and carried and paid for, full WorkSafeBC coverage for itself and all workers, employees, servants and others engaged in or upon any work or service which is the subject of this Contract.

GC9.4.9 is added as follows:

9.4.9 The Contractor agrees that the City has the unfettered right to set off the amount of the unpaid premiums and assessments for such WorkSafeBC coverage against any monies owing by the City to the Contractor. The City shall have the right to withhold payment under this Contract until the WorkSafeBC premiums, assessments or penalties in respect of work done or service performed in fulfilling this Contract had been paid in full.

GC9.4.10 is added as follows:

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9.4.10 Promptly upon execution of this Agreement, the Contractor will provide the City with the Contractor's and all Subcontractors' WorkSafeBC registration numbers.

GC9.4.11 is added as follows:

9.4.11 Promptly upon execution of this Agreement, and concurrently with making any application for payment under this Contract, the Contractor will provide the City with written confirmation that the Contractor and all Subcontractors are registered in good standing with WorkSafeBC and that all assessments have been paid to the then current date.

GC9.4.12 is added as follows:

9.4.12 The Contractor may or may not have received, as part of the Contract Documents, a "Pre-Contract Hazard Assessment" prepared by or for the City pursuant to the City's statutory obligations under the WorkSafeBC Rules (Section 119 of the *Workers' Compensation Act*) as an "owner of a workplace". Despite the City's statutory obligations, the Contractor now acknowledges and agrees that the Contractor may not rely on the "Pre-Contract Hazard Assessment" and now agrees to assume by the terms of this Contract full responsibility for carrying out the City's obligations under Section 119 of the *Workers' Compensation Act*, including without limitation and by way of example only, conducting all due diligence inquiries of all applicable City staff and departments in order to ascertain what, if any, information is known or has been recorded by City staff about the Place of the Work that is necessary to identify and eliminate or control hazards to the health or safety of persons at the Place of the Work. The City now agrees to make all reasonable efforts to assist the Contractor in obtaining timely access to City staff and City records for this purpose.

GC9.4.13 is added as follows:

9.4.13 The Contractor will indemnify the City and hold harmless the City from all manner of claims, demands, costs, losses, penalties and proceedings arising out of or in any way related to:

- .1 unpaid WorkSafeBC assessments of the Contractor or any other employer for whom the Contractor is responsible under this Contract;
- .2 the acts or omissions of any person engaged directly or indirectly by the Contractor in the performance of this Contract, or for whom the Contractor is liable pursuant to the Contractor's obligations as the "prime contractor", and which acts or omissions are or are alleged by WorkSafeBC to constitute a breach of the WorkSafeBC Rules or other failure to observe safety rules, regulations and practices of WorkSafeBC, including any and all fines and penalties levied by WorkSafeBC; or
- .3 any breach of the Contractor's obligations under Clause GC9.1.

GC9.4.14 is added as follows:

9.4.14 The Contractor agrees to retain a full-time construction safety officer whenever required by the then-current Vancouver Building By-law. The construction safety

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officer shall bear written proof of qualification satisfactory to the City of Vancouver's Director of Permits and Licenses.

GC9.5 MOULD

GC9.5.1 is deleted in its entirety and replaced with the following:

- 9.5.1 If the Contractor or the City observes or reasonably suspects the presence of mould at the Place of the Work of the nature and quantity such that special handling and precautions are required under Environmental Law or that otherwise may reasonably present a hazard to the health and safety of persons, the remediation of which has not been separately arranged by the City or is not expressly part of the Work,
- .1 the observing party shall promptly report the circumstances to the other party by Notice in Writing;
 - .2 the Contractor shall promptly take all reasonable steps, including stopping all or such portions of the Work as may be necessary to ensure that no person suffers injury, sickness or death and that no property is damaged as a result of exposure to or the presence of the mould; and
 - .3 if the City and the Contractor do not agree on whether any mould discovered is of the nature and quantity such that special handling and precautions are required under Environmental Law, or whether such mould may otherwise reasonably present a hazard to the health and safety of persons, or with respect to what steps are appropriate to be taken to deal with the mould, or as to the cause of the presence of the mould, the City shall retain an independent qualified expert to investigate and report on the subject of the dispute. Subject to paragraph 9.5.2, the City shall pay for the cost of the expert's investigation and report. The City will provide a copy of the expert's report to the Contractor.

GC9.5.2 is deleted in its entirety and replaced with the following:

- 9.5.2 If the expert's report under paragraph 9.5.1.3 determines that the mould does not require special handling and precautions in compliance with Environmental Law or does not otherwise reasonably present a hazard to the health and safety of persons, the Contractor will pay for the cost of the expert's investigation and report. If the expert's report under paragraph 9.5.1.3 determines that the mould was caused as the result of the acts or omissions of the Contractor or anyone for whom the Contractor is responsible, the Contractor shall promptly, at the Contractor's expense:
- .1 take such steps as are necessary to safely and in compliance with Environmental Law remove, transport and dispose of such mould and to remediate the Place of the Work to such extent as is required to cause the Place of the Work to comply with all applicable Environmental Law;
 - .2 make good any damage to the Work, the City's property and any property affected by the mould as provided in paragraph 9.1.3 of GC9.1 - PROTECTION OF WORK AND PROPERTY;

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- .3 reimburse the City for all resultant costs and expenses reasonably incurred by the City; and
- .4 indemnify the City as required by GC12.1 - INDEMNIFICATION.

GC9.5.3 is deleted in its entirety and replaced with the following:

- 9.5.3 If the City and the Contractor agree, or if the expert's report under paragraph 9.5.1.3 concludes, that the presence of mould at the Place of the Work requires special handling or precautions under Environmental Law or otherwise presents a hazard to the health or safety of persons, and that the Contractor or anyone for whom the Contractor is responsible is not responsible for the presence of such mould, the City shall promptly at the City's expense:
- .1 take such steps as are necessary to safely and in compliance with Environmental Law remove, transport and dispose of such mould and to remediate the Place of the Work to such extent as is required to cause the Place of the Work to comply with all applicable Environmental Law;
 - .2 reimburse the Contractor for the cost of taking the steps under paragraph 9.5.1.2 and making good any damage to the Work as provided in paragraph 9.1.4 of GC9.1 - PROTECTION OF WORK AND PROPERTY; and
 - .3 extend the Contract Time for such reasonable time as the Consultant may recommend in consultation with the Contractor and the expert referred to in paragraph 9.5.1.3 and reimburse the Contractor for reasonable costs incurred as a result of the delay.

GC10.1 TAXES AND DUTIES

GC10.1.1 is deleted in its entirety and replaced as follows:

- 10.1.1 The Contractor shall allow for the payment by the Contractor out of the Contract Price of all PST, GST and other federal, provincial and municipal taxes, rates, levies, assessments and duties, both refundable and non-refundable, and all deposits, (temporary crossings, excavations, etc.). The Contractor agrees to indemnify and save harmless at all times the City from and against all claims which may be made with respect thereto.

GC10.1.2 is amended by revising the first line to read:

...due to changes in such included taxes, duties and rebates after the time...

GC10.1.3 is added as follows:

- 10.1.3 Where an exemption or recovery of government sales taxes, customs duties or excise taxes is applicable to the Contract, the Contractor shall submit for the City's review the exemption or recovery application and the supporting invoices of the actual quantities of materials incorporated in the Work prior to applying for the rebate. The City will then issue a certificate verifying the application.

GC10.1.4 is added as follows:

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10.1.4 Notwithstanding any other provision to the contrary, if the City determines that it is necessary to satisfy its obligations under any Applicable Law relating to taxes, the City may:

- .1 withhold an amount from a payment made to the Contractor hereunder; and
- .2 pay the withheld amount directly to the competent government authority,

in which case the amount so withheld and paid by the City to the relevant competent government authority shall be deemed to have been paid to the Contractor on the date on which the remainder of the payment to which it relates was paid to the Contractor, and the Contractor agrees and acknowledges that it shall have no claim against the City for such amount withheld and paid to the competent government authority.

GC10.2 LAWS, NOTICES, PERMITS AND FEES

GC10.2.2 is deleted in its entirety and replaced as follows:

10.2.2 The Contractor shall, except as set out below in this GC10.2.2 and unless otherwise specified in the Contract Documents, obtain and maintain all permits, licences, and certificates and pay all fees required for the performance of the Work, and obtain all necessary access and storage rights for areas outside of the Place of the Work (including without limitation and by way of example only, parking for its workers, the swing arc of any construction crane required for the Work, or storage space for materials) but this shall not include the obligation to obtain easements or other access rights over the actual Place of the Work.

GC10.2.3 deleted in its entirety and replaced as follows:

10.2.3 The Contractor shall be responsible for the procurement of permits, licences, inspections, and certificates, which are necessary for the performance of the Work and customarily obtained by contractors in the jurisdiction of the Place of the Work after the issuance of the building permit. The Contract Price includes the cost of all permits, licences, inspections and certificates and their procurement. The Contractor will arrange for all inspections and testing required by such permits. The Contractor shall provide to the Consultant copies of all permits and inspection reports from the various authorities as soon as they are received.

GC10.2.5 is amended by revising the first sentence to read:

10.2.5 The Contractor shall be responsible to provide reasonable verification that the Contract Documents are in compliance...

GC10.4 WORKERS' COMPENSATION

GC10.4 is deleted in its entirety.

GC10.5 LIVING WAGE

GC10.5 is added as follows:

GC10.5 LIVING WAGE

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10.5.1 For the purposes of this GC10.5, the following terms shall have the following meanings:

- (a) **"Living Wage"** means the hourly wage established by the Living Wage Certifier from time to time during the Term, which includes: (i) direct wages; and (ii) the value of any non-mandatory benefits such as paid sick leave, employer-paid Medical Services Plan premiums and extended health benefits;
- (b) **"Living Wage Certifier"** means the Living Wage for Families Campaign, any successor entity, or, in the event the Living Wage for Families Campaign ceases to carry on operations, such other living wage certification entity designated by the City to the Contractor in writing;
- (c) **"Living Wage Employee"** means any and all employees of the Contractor and all Subcontractors of the Contractor that perform any part of the Work on a property owned by or leased to the City, including all streets, sidewalks and other public rights of way, for at least one consecutive hour, but excluding Students, volunteers and employees of Social Enterprises;
- (d) **"Social Enterprise"** means a business that: (i) is owned by a non-profit organization or community services co-operative; (ii) is directly involved in the production and/or selling of goods and services for the combined purpose of generating income and achieving social, cultural, and/or environmental aims; and (iii) has a defined social and/or environmental mandate.
- (e) **"Student"** means an individual who is enrolled in a school, college, university or other educational institution and is employed by the Contractor or a Subcontractor, as the case may be, to obtain practical workplace experience as a requirement of or credit for their education;

10.5.2 Notwithstanding any other provision of any Contract Document but subject to GC 10.5.3, the Contractor shall pay all Living Wage Employees not less than the Living Wage.

10.5.3 Notwithstanding GC 10.5.2, the Contractor has up to 6 months from the date on which any increase in the Living Wage is published by the Living Wage Certifier to increase wages for all Living Wage Employees such that all Living Wage Employees continue to be paid not less than the Living Wage.

10.5.4 The Contractor shall ensure that the requirements of GC 10.5.2 apply to all Subcontractors.

10.5.5 A breach by the Contractor of its obligations pursuant to GC 10.5.2 and 10.5.4 shall be deemed to constitute a failure by the Contractor to comply with the requirements of the Contract to a substantial degree and shall entitle the City to terminate the Contract in accordance with GC 7.1.2.

10.5.6 The Contractor shall maintain up-to-date records and accounts which clearly document its satisfaction of the requirements of this GC 10.5 and shall make the same available to the City upon request. The City may request copies of all such records and accounts which shall be provided to the City by the Contractor (subject to reimbursement of the Contractor's reasonable copying costs and any other direct costs and expenses, if any)

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at any time prior to the expiry of 365 days after Total Completion of the Work or earlier termination of this Agreement. Any records and accounts provided by the Contractor in accordance with this Section 10.5.5 shall be treated by the City as confidential information.

- 10.5.7 The Contractor shall, at the direction of the City, post signs at Places of Work that are owned by or leased to the City, including all streets, sidewalks and other public rights of way, informing Living Wage Employees of the obligations of the Contractor and Subcontractor pursuant to this GC 10.5 and providing contact information to report any breaches thereof. The City shall supply the Contractor with all such signs and the Contractor shall return all such signs upon completion of the Work or otherwise at the request of the City.
- 10.5.8 The Contractor shall prepare and submit to the City in a format reasonably acceptable to the City before January 31 of each calendar year of the term or, for each partial calendar year of the term, within 30 days of the expiry of the term a living wage report setting out:
- (a) the number of Living Wage Employees of the Contractor and each Subcontractor who were paid a Living Wage pursuant to this Section 3.12 during the previous calendar year or portion thereof that would not have received a Living Wage for substantially similar work but for the obligations of the Contractor pursuant to this GC10.5; and
 - (b) the total incremental costs incurred by the Contractor, including any amounts paid to Subcontractors, in order to fulfill its obligations pursuant to this GC10.5 to pay a Living Wage to the Living Wage Employees described in GC10.5.8(a).

GC11.1 INSURANCE

GC11.1 is deleted in its entirety and replaced as follows:

GC11.1 GENERAL INSURANCE REQUIREMENTS

- 11.1.1 The Contractor and Subcontractors shall be required to file with the City on or prior to the date of this Agreement (or at such later time as they become Subcontractors), "Certificates of Insurance" in the form required by the City, and where required by the City's Director of Risk Management, certified copies of all insurance policies and endorsements evidencing the placement and endorsement of insurance in accordance with this GC11.1 and GC11.2.
- 11.1.2 The Contractor and Subcontractors shall be required to file evidence of renewal of the insurance policies required under this GC11.1 and GC11.2 with the City at least fifteen (15) calendar days prior to their expiry.
- 11.1.3 In addition to the specific requirements set out below, all policies of insurance shall:
- .1 be endorsed so as to provide for thirty (30) calendar days' prior notice to the City of cancellation, lapse or material change;

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- .2 if they are for property insurance (as opposed to liability) insurance, contain a waiver of subrogation in favour of the City Insurance Group (as defined below) and all employees and agents of the City Insurance Group;
- .3 specifically name the City of Vancouver, the Consultant and their officials, officers, employees, agents and consultants engaged on the Project as additional insureds (collectively referred to as the "City Insurance Group");
- .4 be issued by a company or companies authorized to issue insurance policies in British Columbia; and
- .5 be issued on a policy form acceptable to the City's Director of Risk Management.

11.1.4 Unless otherwise specified, insurance shall be continuously maintained from a date not later than the date hereof, through to the date on which both the Certificate of Completion has been issued for the Work and an occupancy permit, if required, has been issued for the Place of the Work.

GC11.2 CONTRACT SECURITY

GC11.2 is deleted in its entirety and replaced with the following:

GC 11.2 SPECIFIC INSURANCE COVERAGE

11.2.1 Without restricting the generality of GC12.1 - INDEMNIFICATION, and despite the limits of liability set out in GC12.1 - INDEMNIFICATION, the Contractor and Subcontractors, at their expense, shall retain the following types of insurance:

(a) *Wrap-Up Liability Insurance:*

Wrap-up liability insurance protecting the City Insurance Group, the Contractor, and their respective subcontractors, agents and employees against damages arising from personal injury (including death) and claims for property damage which may arise out of the operations of the Contractor, its Subcontractors, or their respective agents or employees in connection with the Work.

The policy shall be placed prior to commencement of the Work and shall specifically cover liability arising out of the performance of this Contract and shall cover all liability assumed by the Contractor under any contract or agreement, including the indemnity provisions of this Contract. The policy shall be maintained continuously throughout the entire term of the contract through to the date on which both the Certificate of Completion has been issued for the Work and an occupancy permit, if required, has been issued for the Place of the Work, and thereafter, in the case of completed operations coverage for a further period of twenty-four (24) months, and the policy shall provide:

1. broad-form property damage and completed operations coverage;
2. personal injury coverage;

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3. blanket contractual liability coverage;
5. contingent employer's liability coverage;
6. cross liability & severability of interest clause,
7. non-owned automobile liability coverage,

and where such further risk exists, the following extensions of coverage shall be included:

1. coverage for shoring, blasting, excavating, underpinning, demolition, removal, pile-driving and grading, as applicable;
2. coverage for hoist liability;
3. coverage for operation of attached machinery; and
4. contractor's pollution liability coverage, including coverage for asbestos, mould or other hazardous substances.

This insurance shall be for an amount of not less than five million dollars (\$5,000,000) per occurrence, and shall include a standard form of severability of interests and cross-liability clause. The deductible per occurrence shall not exceed ten thousand dollars (\$10,000) and the Contractor shall be liable for all deductible amounts.

(b) *Property Insurance:*

- (1) All-risks course-of-construction property insurance in the form of an installation floater in the joint names of the Contractor and the City Insurance Group, covering the Work and all property of every description to be used in the performance of the Work. This insurance shall be primary, and be of an amount of not less than the value to replace the Play Equipment and Surfacing. The deductible per occurrence shall not exceed ten thousand dollars (\$10,000); and

(c) *All-Risk Contractor's Equipment Insurance* covering all equipment owned or rented by the Contractor and its agents or employees against all risks of loss or damage with coverage sufficient to allow for immediate replacement.

- (d) *Automobile Liability Insurance* to be carried at all times on all licensed vehicles owned by or leased to the Contractor, protecting against damages arising from bodily injury (including death), and from claims for property damage arising from the operations of the Contractor, its agents or employees. This insurance shall be for a minimum amount of five million dollars (\$5,000,000) inclusive per accident.

Where, in the City's opinion, pertinent risk exists, the Contractor is also required to carry the following coverage:

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- (e) *Hull & Machinery Insurance* in the amount not less than the full value of the vessel, barge or equipment with a deductible of no more than ten thousand dollars (\$10,000) protecting the Contractor and its Subcontractors from all claims for loss or damage to any vessel, barge or equipment arising out of ownership or operation of the Contractor or its Subcontractors.
- (f) *Protection & Indemnity Insurance* including City's legal liability insurance to cover all claims for bodily injury including death, property damage or loss arising out of the activities conducted by the Contractor, any Subcontractor, or their respective employees or agents in an amount no less than five million dollars (\$5,000,000) per occurrence and a deductible of not more than ten thousand dollars (\$10,000).

11.2.2 If the Contractor or a Subcontractor fails to provide evidence of the required insurance under this GC11 as and when required by the Contract Documents, then the City shall have the right to obtain the insurance and then give evidence of the same to the Contractor and Consultant, and the cost of doing so will then be payable by the Contractor to the City or at the City's option may be deducted from the Contract Price by Change Directive.

GC11.3 CONTRACT SECURITY

GC11.3 is added as follows:

GC11.3 CONTRACT SECURITY

11.3.1 The Contractor shall pay for and deliver to the City, on or prior to the date of this Agreement, a performance bond and a labour and material payment bond, which shall each be for fifty percent (50%) of the Contract Price and shall include provision for, without limitation:

1. payment of any Consultant's and legal expenses incurred by the City in determining the extent of the Work executed and Work still to be executed, and any additional Work required as a result of the interruption of the Work,
2. payment of additional expenses caused to the City for watchmen's services, light, heat, power, etc. incurred by the City during the period between the Contractor's default under the Contract and the commencement of a new contract,
3. extended guarantee periods, corrections after final payment, and warranty obligations, and
4. coverage of the faithful performance of all terms and conditions of the Contract Documents including all additions and revisions thereto permitted under the Contract.

11.3.2 Such bonds shall be issued by a duly licensed surety company authorized to transact the business of a surety in British Columbia and the bonds shall be maintained in good standing until the issuance of the Final Certificate for Payment and the expiry of the warranty. Subject to the requirements of this GC11.3, the bonds shall be in accordance with the latest edition of the CCDC approved bond forms.

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11.3.3 The Contractor will give the City Notice in Writing of any material change in the surety within five (5) calendar days of the occurrence.

GC12.1 INDEMNIFICATION

GC12.1.1 is deleted in its entirety and replaced as follows:

12.1.1 The Contractor now indemnifies and shall defend, indemnify and hold harmless the City, the Consultant, the project manager and their respective directors, officers, employees, agents, consultants or advisors (collectively, the "Indemnitees") from and against all claims, demands, losses, costs, damages, actions, suits or proceedings ("Liability"), whether founded in equity or at law including contract, tort or statute and howsoever caused, arising from or in any way connected with (A) any wrongful or negligent act, error or omission of, or defective goods supplied by, the Contractor, Subcontractors, Suppliers or their respective employees or agents when attending the Place of the Work or in the performance of the Work, in each case whether or not any one or more of the Indemnitees are contributorily negligent, and (B) any claim made under the Lien Act by a Subcontractor, or a "subcontractor" as defined in the Lien Act. Expressly excluded from this indemnity is any Liability caused solely and directly by the wrongful act or negligence of an Indemnatee.

GC12.1.2 is deleted in its entirety and replaced as follows:

12.1.2 The obligation of the Contractor to indemnify the Indemnitees shall be limited to the greater of the Contract Price or five million dollars (\$5,000,000) but in no event shall the sum be greater than twenty million dollars (\$20,000,000). However, despite any other term of this Contract, in no event will this limitation apply in any way to reduce or limit the indemnity or recovery by either party under any insurance policy or bond required by the Contract Documents and in no event will this limit apply to the Contractor's or the City's obligations to indemnify under GC9.2 - TOXIC AND HAZARDOUS SUBSTANCES, GC9.4 CONSTRUCTION SAFETY & WORKSAFE BC RULES, GC9.5 -MOULD and GC10.3 - PATENT FEES.

GC12.1.3 is deleted in its entirety and replaced as follows:

12.1.3 The obligation of the Contractor to indemnify the Indemnitees hereunder shall be inclusive of interest and all legal costs.

GC12.1.4 is deleted in its entirety and replaced as follows:

12.1.4 The City and the Contractor shall indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of their obligations described in GC9.2 - TOXIC AND HAZARDOUS SUBSTANCES, GC9.4 CONSTRUCTION SAFETY & WORKSAFE BC RULES, GC9.5 -MOULD and GC10.3 - PATENT FEES

GC12.1.5 is deleted in its entirety.

GC12.1.6 is deleted in its entirety and replaced as follows:

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12.1.6 In respect of any claim for indemnity or to be held harmless by the City or the Contractor, Notice in Writing of such claim shall be given within a reasonable time after the facts upon which such claim is based became known;

GC12.1.7 is added as follows:

12.1.7 In the event of any Liability being alleged against or claimed from an Indemnatee in respect of which an indemnity is required to be provided by the Contractor pursuant to GC12.1.1, the following provisions shall apply:

- (a) subject to GC12.1.7(b), GC12.1.7(c) and GC12.1.7(d), where it appears that the Indemnatee is or may be entitled to indemnification from the Contractor in respect of all (but not part only) of the liability arising out of a claim, such person entitled to indemnification may at its sole election and subject to:
 - (i) approval by any relevant insurers (without prejudice to GC12.1.7(e); and
 - (ii) the Contractor providing the Indemnatee with a secured indemnity to its reasonable satisfaction against all costs and expenses (including legal expenses) that it may incur by reason of such action,permit or require the Contractor to dispute the claim on behalf of the Indemnatee at the Contractor's own expense and take conduct of any defence, dispute, compromise, or appeal of the claim and of any incidental negotiations; provided that the Indemnatee shall give the Contractor (provided at the Contractor's cost) all reasonable cooperation, access and assistance for the purposes of considering and resisting such claim;
- (b) with respect to any claim conducted by the Contractor pursuant to GC12.1.7(a)
 - (i) the Contractor shall keep the Indemnatee fully informed and consult with it about material elements of the conduct of the claim;
 - (ii) the Contractor shall not bring the name of the Indemnatee into disrepute; and
 - (iii) the Contractor shall not pay or settle such claims without the prior consent of the Indemnatee, such consent not to be unreasonably withheld or delayed;
- (c) a Indemnatee shall be free to pay or settle any claim on such terms as it thinks fit (and without prejudice to its rights and remedies under the Contract Documents) if:
 - (i) the Contractor is not entitled to, or is not permitted or instructed, take conduct of the claim in accordance with GC12.1.7(a); or
 - (ii) the Contractor fails to comply in any material respect with the provisions of GC12.1.7(e) or GC12.1.7(b);

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- (d) the Indemnatee entitled to indemnification pursuant to GC12.1.1 shall be free at any time to give notice to the Contractor that it is retaining or taking over (as the case may be) the conduct of any defence, dispute, compromise or appeal of any claim (or of any incidental negotiations) to which GC12.1.7(a) applies. On receipt of such notice the Contractor shall promptly take all steps necessary to transfer the conduct of such claim to the Indemnatee, and shall provide to the Indemnatee all reasonable co-operation, access and assistance for the purposes of considering and resisting such claim; and
- (e) the Contractor shall inform the Indemnatee of the requirements of any insurer who may have an obligation to provide an indemnity in respect of any liability arising under this Agreement and in relation to such the Indemnatee shall issue instructions accordingly.

GC12.2 WAIVER OF CLAIMS

GC12.2.1 is deleted in its entirety and replaced as follows:

12.2.1. *Waiver of Claims by City:* As of the date of the Final Certificate for Payment, the City expressly waives and releases the Contractor from all claims against the Contractor including without limitation those that might arise from the negligence or breach of Contract by the Contractor except one or more of the following:

- .1 those made in writing prior to the date of the Final Certificate for Payment and still unsettled;
- .2 those arising from the provisions of GC12.1 - INDEMNIFICATION or GC12.3 - WARRANTY;
- .3 those arising from the provisions of GC9.2 - TOXIC AND HAZARDOUS SUBSTANCES, GC9.4 CONSTRUCTION SAFETY & WORKSAFE BC RULES, GC9.5 - MOULD and GC10.3 - PATENT FEES and those arising from the Contractor bringing or introducing any toxic or hazardous substances and materials to the Place of the Work after the Contractor commences the Work; and
- .4 those arising from the Contractor's actions, errors, omissions or negligence which result in delays or substantial defects or deficiencies in the Work. "Substantial defects or deficiencies" means those defects or deficiencies in the Work which affect the Work to such an extent or in such a manner that all or any part of the Work is unfit for the purpose intended by the Contract Documents.

GC12.2.2 is deleted in its entirety and replaced as follows:

12.2.2 *Waiver of Claims by Contractor:* As of the date of the Final Certificate for Payment, the Contractor expressly waives and releases the City from all claims against the City including without limitation those that might arise from the negligence or breach of Contract by the City except:

- .1 those made in writing prior to the Contractor's application for Final Payment and still unsettled; and

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- .2 those arising from the provisions of GC9.2 - TOXIC AND HAZARDOUS SUBSTANCES or GC10.3 - PATENT FEES.

GC12.2.3 is deleted in its entirety and replaced as follows:

- 12.2.3 GC12.2 - WAIVER OF CLAIMS shall take precedence over the provisions of paragraph 1.3.1 of GC1.3 - RIGHTS AND REMEDIES.

GC 12.2.4 is deleted in its entirety and replaced as follows:

- 12.2.4 The City waives and releases the Contractor from all claims referred to in paragraph 12.2.1.4 except claims for which Notice in Writing of claim has been received by the Contractor from the City within a period of six (6) years from the date of Substantial Performance of the Work.

GC12.2.5 is deleted in its entirety.

GC12.2.6 is deleted in its entirety.

GC12.2.7 is deleted in its entirety.

GC12.2.8 is deleted in its entirety.

GC12.2.9 is deleted in its entirety.

GC12.2.10 is deleted in its entirety.

GC12.3 WARRANTY

GC12.3.1 is deleted in its entirety and replaced as follows:

- 12.3.1 The Contractor shall perform the Work in a good and workmanlike manner.

GC12.3.2 is deleted in its entirety and replaced as follows:

- 12.3.2 The Contractor now warrants that the Work (and all Products) will be free from all defects arising from faulty construction, manufacturing, installation, materials, equipment or workmanship in any part of the Work (or Products) for a period of one (1) year commencing on the issuance of the Certificate of Completion for the Work, and with respect to any Work or Products warranted by a Subcontractor or Supplier for a period of longer than one (1) year after the issuance of the Certificate of Completion, the Contractor now warrants that it has fully and effectively assigned such warranty to the City and that the City may enforce the same to the same extent and in the same manner as if the warranty had been issued directly to the City by that Subcontractor or Supplier.

GC12.3.3 is deleted in its entirety and replaced as follows:

- 12.3.3 For the purposes of this GC12.3, the phrase, "defects arising from faulty construction, manufacturing, installation, materials, equipment or workmanship in any part of the Work (or Products)"

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- (a) expressly excludes any and all defects arising from or contributed to by the acts or omissions of the Consultant in the design and specification of the Work as set out in the Drawings, Specifications, or other written instructions or directives issued by the Consultant under this Contract, but only to the extent of the Consultant's defective design or specification, and
- (b) expressly includes all defects or deficiencies that arise even if the Work is carried out in a good and workmanlike manner.

GC12.3.4 is deleted in its entirety and replaced as follows:

12.3.4 During the warranty period, the Contractor will promptly repair and correct all defects at no cost to the City. If the Contractor fails to repair or correct any defect during the warranty period within ten (10) calendar days of written notice of its existence, the City may but is not obligated to make the repairs or corrections itself and the actual out-of-pocket costs of such repairs or corrections made by the City will be payable by the Contractor to the City within seven (7) calendar days of receiving an invoice from the City for same. In the event of an emergency where, in the opinion of the City, delay could cause serious loss or damage, or inconvenience to the public, the repairs or corrections may be made without prior notice being sent to the Contractor.

GC12.3.5 is deleted in its entirety and replaced as follows:

12.3.5 Where, pursuant to GC13.1 - Occupancy, the City commences the use of the Work and Products for their intended purposes prior to the issuance of the Certificate of Completion for the Work, the warranty period will be deemed to commence from the issuance date despite such prior use.

GC12.3.6 is deleted in its entirety and replaced as follows:

12.3.6 Issuance of the Certificate of Total Performance of the Work will not extinguish any of the Contractor's obligations under this Contract and the Contractor will remain liable to perform and complete all Work and carry out all obligations required under this Contract

GC13.1 OCCUPANCY

GC13.1 is added as follows:

GC13.1 OCCUPANCY

- 13.1.1 The City reserves the right to take possession of and use any completed or partially completed portion of the Work, regardless of the time of completion of the Work, providing it does not interfere with the Contractor's Work, as determined by the Consultant.
- 13.1.2 Such taking possession or use of such Work or part thereof as described in GC13.1.1 shall not be construed as final acceptance of the Work or any part thereof, or an acknowledgement of fulfillment of the Contract.

END OF SUPPLEMENTARY GENERAL CONDITIONS

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SCHEDULE 1 (PART D - FORM OF AGREEMENT)

INVITATION TO TENDER NO. PS20180859
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SCHEDULE 2 (PART D - FORM OF AGREEMENT)

SCHEDULE 2
LIST OF SPECIFICATIONS AND DRAWINGS

The following is the list of Specifications and Drawings referred to in Article A-3:

[To be added.]

All are incorporated by reference in the form made available by the City during the ITT.

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SCHEDULE 3 (PART D - FORM OF AGREEMENT)

SCHEDULE 3
SCHEDULE OF PRICES

[When the Contract is finalized, this Schedule will be based on the breakdown of the tendered price in relation to the particular Work for which the Contract is awarded, as provided in the successful Tenderer's Form of Tender.]

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SCHEDULE 4 (PART D - FORM OF AGREEMENT)

**SCHEDULE 4
SUBCONTRACTORS AND SUPPLIERS**

The following are Subcontractors that the Contractor will use for the Work:

Subcontractor	Address	Division/Section Of Work
[To be completed, based on Tender]		

The following are Suppliers that the Contractor will use for the Work:

Supplier	Manufacturer	Address	Item
[To be completed, based on Tender]			

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SCHEDULE 5 (PART D - FORM OF AGREEMENT)

SCHEDULE 5
PROJECT SCHEDULE

[Insert the construction schedule provided in response to the Notice of Award, as accepted by the City.]

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SCHEDULE 6 (PART D - FORM OF AGREEMENT)

SCHEDULE 6
PERFORMANCE AND LABOUR AND MATERIAL PAYMENT BONDS

[Attach copies of performance bond and labour and material payment bond
provided after contract award.]

(see attached)

INVITATION TO TENDER NO. PS20180859
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SCHEDULE 7 (PART D - FORM OF AGREEMENT)

SCHEDULE 7
INSURANCE CERTIFICATES

[Attach copies of insurance certificates for the project provided after Contract award.]

(see attached)

CITY PRE-CONTRACT HAZARD ASSESSMENT FORM

Contract Title _____ CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE _____

Project Manager (City employee) _____ Lehran Hache _____

Contract Name and No. (if known) _____ INVITATION TO TENDER NO. PS20180859 _____

PURPOSE

This document shall be completed by the City's designated project manager, who shall list all the known worksite hazards and all the existing work process hazards associated with the upcoming contract. The completed document shall then be provided to all potential contractors, as part of the tender package, so the project can be bid appropriately based on the known worksite hazards.

DEFINITIONS

"Project Manager" means the City employee designated to be the liaison with the contractor for the purpose of managing, overseeing, coordinating or in any other way administering the contract.

INSTRUCTIONS FOR COMPLETION

The document must be completed in full. Choices for each entry are:

Yes (Y) the known worksite hazard or existing work process hazard does exist

No (N) the known worksite hazard or existing work process hazard does not exist*, or, a third party (environmental consultant) will address the issue (usually for a hazardous materials assessment)

* based on reasonable estimation from all input by persons with expertise or relevant knowledge and understanding

Not Applicable (NA) the worksite hazard or existing work process is not applicable for this contract type

INFORMATION FROM HAZARDOUS MATERIALS ASSESSMENTS PROVIDED BY A THIRD PARTY

A hazardous materials assessment may be completed prior to the Project Manager completing the City's List of Known Workplace Hazards. Any such assessment should be referenced by the Project Manager in this document and provided with the tender package. Hazardous materials may include asbestos, lead, crystalline silica, ammonia, PCBs, CFCs, moulds, mercury, ozone depleting substances (ODSs), radioactive substances.

ASSISTANCE IN COMPLETING THIS DOCUMENT

If you have questions while completing this document, or are unsure if the listed hazards apply, please seek assistance from Health and Safety (604.871.6078 or healthandsafety@vancouver.ca).

Hazard or Issue		Project Manager
		<i>Yes (Y), No (N) or Not Applicable (NA)</i>
1. Asbestos-containing Materials. Disturbance or penetrations of flooring, walls, ceiling tiles, pipe lagging, ac pipe, transite siding, particularly in older facilities; e.g., furniture/fixture installation, carpeting/flooring services and boiler repair/tune-up services		
(a)	Asbestos containing materials (ACM) will be encountered	NA
(b)	A hazardous materials assessment for asbestos is provided in the tender package	NA
(c)	A hazardous materials assessment for asbestos is the responsibility of the contractor	NA
2. Lead-containing Materials. Disturbance of lead-based paint, particularly in older facilities. Also present in certain electrical circuitry and metal alloys; e.g., overhead bridge crane maintenance/repair, high-voltage cable splicing services, boiler repair/tune-up services, fixture installation services, and chiller maintenance/repair services		
(a)	Inorganic lead-containing materials may be encountered	NA
(b)	A hazardous materials assessment for lead is provided in the tender package	NA
(c)	A hazardous materials assessment for lead is the responsibility of the contractor	NA
3. Other hazardous materials. May include ammonia, pcb's, cfc's, moulds, mercury, ozone depleting substances (ods), radioactive substances, sewage, unknown contaminated materials, other (list other here)		
China Creek North Park has undergone historical infilling, therefore an environmental soils analysis was completed in areas with planned excavation. The results indicated concentrations of certain metals in soil exceeding the <i>Contaminated Sites Regulation</i> (CSR) parkland use (PL) standards in the sloped path and foot of slide areas. All other concentrations of metals, hydrocarbons and PAHs were less than the CSR PL standards.		
Area	Soil Sample ID	Metals parameters that exceed CSR PL
Foot of slide	SS18-03	Sodium
Sloped path	SS18-04	Barium, copper, iron, lead, sodium, tin, zinc
(a)	A hazardous materials assessment for ammonia is provided in the tender package	NA
(b)	a hazardous materials assessment for (list the specific hazardous material) will be provided in the tender package;	NA

Hazard or Issue	Project Manager
	<i>Yes (Y), No (N) or Not Applicable (NA)</i>
(c) a hazardous materials assessment for (list the specific hazardous materials) will be the contractors responsibility	NA
4. Confined Spaces. Working in vaults, chambers, pits, tanks, etc.; e.g., construction, inspection and testing services, water/fuel storage tank clean-out services, and utility corrosion inspection services:	
(a) a hazard assessment (for entry and inspection only) from the City of Vancouver is provided in the tender package;	NA
(b) the City of Vancouver shall provide procedures to isolate adjacent piping, or to lock out equipment (complicated systems only);	NA
(c) the contractor shall be responsible for isolation and lockout procedures.	NA
5. Lock Out. Industrial equipment maintenance, power machinery repair services, pump maintenance/repair services, mechanical refrigeration systems, elevator repair, overhead bridge crane maintenance/repair services, cathodic protection services, hydraulic test systems repair/service, and air compressor rebuilding services:	
(a) lockout will be required to isolate or prevent the unexpected release of energy (electrical, mechanical, hydraulic, chemical, thermal, kinetic, gravitational, pneumatic);	NA
(b) work will be performed on or near energized equipment, lines, or circuits	Y
If yes to (a) or (b) describe: <u>Overhead power lines on East 7th Ave by vehicle access point</u>	
6. Fall Protection. Tree pruning, window and ledge cleaning, window replacement, overhead bridge crane maintenance/repair services, roll-up door replacement, tent installation, awning/canopy installation, overhead air exchange installation, construction inspection and testing services	
(a) Workers will be exposed to a potential fall in excess of 3 m (10 feet), or to a fall of less than 3 m which would likely result in a serious injury (ex. impalement on rebar)	NA
(b) Scaffolding or ladders will be required to be secured to a building or structure	NA
7. Overhead and Underground Utilities. Tree pruning services, tree removal, utility relocation or replacement, underground utility identification (digging with powered equipment), concrete sawing services, pole painting	
(a) There will be electrical hazards associated with overhead power lines such as limits of approach and contact	NA
(b) Necessary assurances (in writing) have (or will be) obtained by the City, through the utility company, for any work where minimum limits of approach cannot be maintained (provide documentation and review at pre job meeting with the successful contractor candidate)	NA

Hazard or Issue	Project Manager
	<i>Yes (Y), No (N) or Not Applicable (NA)</i>
(c) Necessary assurances must be obtained (in writing) by the successful contractor, through the utility company, for any work where minimum limits of approach will not be able to be maintained	Y
(d) Underground or hidden utilities are located on the job site and any excavation or drilling work in proximity to an underground utility service must be undertaken in conformity with the requirements of the owner of that utility service	Y
If yes to (c), and the specific physical locations where minimum limits of approach will not be able to be maintained are known, how will this information be provided to the contractor? <u>Any work on Park Board property requires a utility locating assessment in addition to a BC ONE call,</u>	
8. Construction, Excavation, Shoring and Demolition	
(a) As "prime contractor", the City of Vancouver project manager will submit the Notice of Project	NA
(b) Workers will be required to enter an excavation over 1.2m (4 ft) in depth	NA
9. Chemicals, Solvents, Fumes, Vapours, And/Or Dusts (existing work processes or known worksite hazard only) - ice rinks, swimming pools, cleaning solvents, adhesives, paints, coatings, binders; e.g., storage tank clean-out services, countertop installation (epoxies), and flooring	
(a) The worksite has chemicals solvents, fumes, vapours or dusts that may affect the contractor	NA
(b) Material Safety Data Sheets for chemicals currently in use at the worksite will be available, on request, to the contractor	NA
If yes to (a), list the work processes and/or chemicals in use: _____	
10. Noise (existing work processes only)	
Employees will be exposed to noise levels above 85dbA	NA

OTHER HAZARDS (NOT IDENTIFIED ABOVE)	
(a)	<u>Used hypodermic needles are a real risk in all Vancouver parks. Workers should be trained in safe disposal and exercise caution when reaching into areas with limited visibility.</u> _____ _____
(b)	_____ _____
(c)	_____

KNOWN WORKPLACE HAZARDS LIST COMPLETED BY	
Project Manager Name (print): Lehran Hache	
Project Manager Signature: <i>Lehran Hache</i>	Date: May 16, 2018
Title: Landscape Architect	Phone: 604-257-8472

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

SCHEDULE 9
CONTRACTOR PRE-CONTRACT HAZARD ASSESSMENT FORM

[Completed form to be attached to the finalized agreement.]

CONTRACT TITLE _____

PROJECT MANAGER (CITY EMPLOYEE) _____

CONTRACTOR REPRESENTATIVE _____

CONTRACT NAME & # _____

Purpose

This document shall be completed by the contractor awarded the contract, who shall identify all the known and potential work process hazards associated with the contract. The contractor, who is responsible for all identified actions, shall provide a completed Contractors Pre-Work Hazard Identification (CHI) document to the Project Manager (City employee) for review and consultation before the contract work begins.

Reference Material

In order to complete this document, the contractor should reference a completed copy of the **List of Known Workplace Hazards**, initially provided with the tender package. The contractor is also responsible to reference any **Hazardous Materials Assessments**, provided by the City with the tender package, and possibly referenced in the List of Known Workplace Hazards document.

Instructions for Completion

The document must be completed in full. Choices for each entry are:

Y - Yes - this work process or worksite hazard will exist for this contract and are the responsibility of the contractor

N - No - Even though the work process or worksite hazard will exist, it will not be the responsibility of the contractor

NA - Not Applicable - the work process or worksite hazard is not applicable for this contract

TBD - a third party (environmental consultant) will address the issue (primarily for a hazardous materials assessment)

Each grouping of safety hazards or issues in this document (bold text, capitalized) may list some examples of work tasks where this hazard may be encountered. These examples are not conclusive; there may be other examples of work tasks that create this hazard or issue.

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

Documentation and Training Requirements

During the contract term, the contractor may be requested by the City of Vancouver, and shall provide documented evidence for items identified with a **(D)** in this document.

The summary table at the end of the document provides all potentially required documentation, and if applicable, the WCB OHS Regulation reference.

For any identified hazard marked with a **(T)**, the contractor is responsible to train their employees.

HAZARDOUS MATERIALS

The contractor is responsible for providing additional information on hazardous materials which may be encountered as part of the work process, yet not identified in the List of Known Workplace Hazards.

HAZARD OR ISSUE	Contractor Confirmation
1. ASBESTOS-CONTAINING MATERIALS - disturbance or penetrations of flooring, walls, ceiling tiles, pipe lagging, ac pipe, transite siding, particularly in older facilities; e.g., furniture/fixture installation, carpeting/flooring services, and boiler repair/tune-up services.	Yes (Y) No (N) Not Applicable (NA) or To Be Determined (TBD)
a) We have reviewed the hazardous materials assessment for asbestos provided by the City of Vancouver (or third party) in the tender package	Y N NA TBD
b) We will provide a written hazardous materials assessment for asbestos	Y N NA TBD
c) We have a written Asbestos Program (D)	Y N NA
d) As Prime Contractor, we will submit a Notice of Project Asbestos(NOP-A) to WorksafeBC at least 24 hours in advance of the project startup	Y N NA

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

2. LEAD-CONTAINING MATERIALS - disturbance of lead-based paint, particularly in older facilities. Also present in certain electrical circuitry and metal alloys; .e.g., overhead bridge crane maintenance/repair, high-voltage cable splicing services, boiler repair/tune-up services, fixture installation services, and chiller maintenance/repair services.	Yes (Y) No (N) or Not Applicable (NA)
a) We have reviewed the hazardous materials assessment for lead provided by the City of Vancouver (or third party) in the tender package	Y N NA TBD
b) We will provide a written hazardous materials assessment for lead	Y N NA TBD
c) We have a written exposure control program for Lead (D)	Y N NA

3. OTHER HAZARDOUS MATERIALS - may include PCBs, CFCs, molds, mercury, ozone depleting substances (ODS), radioactive substances, sewage and unidentified contaminated hazardous materials, other: (list other here) _____	Yes (Y) No (N) or Not Applicable (NA)
a) We have reviewed the hazardous materials assessment for (insert hazardous material type here) provided by the City of Vancouver, or a third party, in the tender package	Y N NA TBD
b) We have reviewed the hazardous materials assessment for (insert hazardous material type here) provided by the City of Vancouver, or a third party, in the tender package	Y N NA TBD
c) We will provide a hazardous materials assessment for (insert hazardous material type here)	Y N NA TBD
d) We will provide a hazardous materials assessment for (insert hazardous material type here)	Y N NA TBD

4. CONFINED SPACES - working in vaults, chambers, pits, tanks, etc.; e.g., construction, inspection and testing services, water/fuel storage tank clean-out services, and utility corrosion inspection services.	Yes (Y) No (N) or Not Applicable (NA)
a) We have reviewed the confined space hazard assessment provided by the City of Vancouver in the tender package	Y N NA TBD
b) We have a written confined space entry program (D)	Y N NA
c) Our employees have received confined space training (T)	Y N NA
d) We shall complete a confined space hazard assessment specific to the work to be performed (D)	Y N NA
e) We shall develop site specific written safe operating procedures (including evacuation and rescue components) prior to starting work (D)	Y N NA

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

f) We shall identify and record isolation points (D)	Y N NA
g) We will develop alternate procedures (as per WCB OHS Regulation # 9.22) to be used to isolate adjacent piping containing harmful substances (D)	Y N NA
h) We will provide for the services of rescue persons	Y N NA

If yes to g), provide brief description:

5. LOCK OUT - industrial equipment maintenance, power machinery repair services, pump maintenance/repair services, mechanical refrigeration systems, elevator repair, overhead bridge crane maintenance/repair services, cathodic protection services, hydraulic test systems repair/service, and air compressor rebuilding services.	Yes (Y) No (N) or Not Applicable (NA)
a) We will be required to lock out in order to isolate or prevent the unexpected release of energy (electrical, mechanical, hydraulic, chemical, thermal, kinetic, gravitational, pneumatic)	Y N NA
b) We will perform work on, or near, energized equipment, lines or circuits	Y N NA

Note: If yes to a) or b) above, no work may be performed until reviewed by City of Vancouver project manager or project manager designate.

If yes to a) or b) describe:

6A. FALL PROTECTION - tree pruning, window and ledge cleaning, window replacement, overhead bridge crane maintenance/repair services, roll-up door replacement, tent installation, awning/canopy installation, overhead air exchange installation, construction inspection and testing services.	Yes (Y) No (N) or Not Applicable (NA)
a) Our employees will be exposed to a potential fall in excess of 3 m (10 feet), or to a fall of less than 3 m which would likely result in a serious injury (ex. impalement on rebar)	Y N NA
b) We will produce a written Fall Protection Plan for work that will occur more than 25 feet above grade, or, if written procedures (control zone) are to be used as the means of fall protection (D)	Y N NA
c) Our employees who will be required to use fall protection have received training (T)	Y N NA

If yes to a), describe:

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SCHEDULE 9 (PART D - FORM OF AGREEMENT)

6B. SCAFFOLDING AND LADDERS - window replacement or cleaning, tree pruning, roll-up door replacement, tent installation, and awning/canopy installation.	Yes (Y) No (N) or Not Applicable (NA)
a) Our employees will use scaffolding or ladders for access to the work	Y N NA
b) The scaffolding or ladders will be exposed to wet and/or slippery conditions	Y N NA
c) We will ensure scaffolding or ladders are secured before accessing the worksite	Y N NA
d) Scaffolding will be erected and dismantled only by qualified workers	Y N NA

7. OVERHEAD POWER LINES AND UNDERGROUND UTILITIES - tree pruning services, tree removal, utility relocation or replacement, underground utility identification services, concrete sawing services, pole painting	Yes (Y) No (N) or Not Applicable (NA)
a) There are electrical hazards associated with overhead power lines such as limits of approach and contact	Y N NA
b) We will obtain necessary assurances, in writing, through the utility company, for any work where minimum limits of approach cannot be maintained	Y N NA
c) Underground or hidden utilities may be on the job site and we shall contact the Project Manager and BC OneCall at least four business days prior to the start of any excavation work	Y N NA
d) In the event of an inadvertent utility strike, we will have a written procedure for immediate notification of both the utility company and WorkSafeBC (D)	Y N NA

8. CONSTRUCTION, EXCAVATION, SHORING AND DEMOLITION	Yes (Y) No (N) or Not Applicable (NA)
a) As Prime Contractor, we will submit a Notice of Project (NOP) to WorkSafeBC at least 24 hours in advance of the project startup date	Y N NA
b) Workers may be required to enter an excavation over 1.2m (4 ft) in depth	Y N NA
c) We will develop site specific written safe operating procedures, including evacuation and rescue components, prior to starting any excavation work (D)	Y N NA
d) Shoring will be installed in accordance with Part 20 of the WorkSafeBC OH&S Regulation	Y N NA
e) We will provide safe means of entry and exit for excavations	Y N NA
f) We will provide for the services of rescue persons and equipment (excavation rescue)	Y N NA

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CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

g) We will develop a demolition/salvage plan (D)	Y N NA
h) We will evaluate the demolition materials for reuse or recycling	Y N NA
i) We will protect passers-by from potential hazards	Y N NA

9. CHEMICALS, SOLVENTS, FUMES, VAPORS, AND DUSTS - cleaning solvents, adhesives, paints, coatings, binders; e.g., storage tank clean-out services, countertop installation (epoxies), and flooring	Yes (Y) No (N) or Not Applicable (NA)
a) We will complete a hazard assessment for chemicals we will use in our work, and if chemicals already exist at the workplace, our assessment will identify possible results of any reactions between our chemicals and those of the City's operations	Y N NA

10. NOISE AND VIBRATION - includes installations and heavy equipment operation. Noise examples for 85 - 90 dbA (at noise source) include forklift, smoke alarm, table saw. Whole body vibration examples include truck or equipment operator and jackhammer operation	Yes (Y) No (N) or Not Applicable (NA)
a) Our employees will be exposed to noise levels above 85dbA	Y N NA
b) We have a written hearing conservation program (D)	Y N NA
c) Our employees will be exposed to excessive levels of whole body vibration (WBV)	Y N NA

11. OCCUPATIONAL HEALTH AND SAFETY PROGRAM	Yes (Y) No (N) or Not Applicable (NA)
a) We have a written Safety Program (D)	Y N NA
b) We will make regular inspections of all workplaces	Y N NA
c) We will immediately investigate any reported unsafe conditions and correct as required	Y N NA
d) We will investigate all incidents and provide written incident reports to the Project Manager	Y N NA
e) We will develop a written plan (D) identifying how risk to the public and workers will be minimized (may include the use of barriers and safe entry/exit points from the worksite)	Y N NA

INVITATION TO TENDER NO. PS20180859
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SCHEDULE 9 (PART D - FORM OF AGREEMENT)

12. FIRST AID	Yes (Y) No (N) or Not Applicable (NA)
a) First aid equipment, supplies, facilities and services will be readily accessible during working hours	Y N NA
b) We will complete a first aid assessment (D)	Y N NA
c) We will post site drawings and signs indicating the location of, and how to summon, first aid	Y N NA
d) We will develop an effective means of communication between the first aid attendant and the work areas	Y N NA

13. FIRE PROTECTION - solvents, fuels, soldering, torch cutting, or heating devices; e.g., gasoline and diesel fuel delivery services, flooring services, fire suppression service, and water pipe repair services	Yes (Y) No (N) or Not Applicable (NA)
a) We will weld, solder, or cut with a torch	Y N NA
b) We will use or store flammable/combustible liquids	Y N NA
c) We will use temporary heating devices	Y N NA
d) We will provide water and/or fire extinguishers on the job site	Y N NA

14. PERSONAL PROTECTIVE EQUIPMENT (PPE)	Yes (Y) No (N) or Not Applicable (NA)
a) We will ensure our workers have appropriate personal protective clothing and equipment (e.g., safety footwear, hi-vis vests, hardhats, eye protection, face protection, hearing protection, chemical gloves/clothing)	Y N NA
b) We have a written PPE program (D)	Y N NA

15. RESPIRATORY PROTECTION	Yes (Y) No (N) or Not Applicable (NA)
a) The work will involve materials or processes requiring respiratory protection	Y N NA

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

b) We have a written respiratory protection program (D)	Y N NA
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16. TOOLS MACHINERY AND EQUIPMENT	Yes (Y) No (N) or Not Applicable (NA)
a) We will use powder-actuated tools.	Y N NA
b) Our employees who operate equipment have been trained and are qualified in use of that equipment. (T)	Y N NA

If yes to a), describe:

17. CRANES, FORKLIFTS, AND MANLIFTS - heavy or oversized goods delivery, tree pruning, overhead bridge crane maintenance/repair, and roll-up door replacement.	Yes (Y) No (N) or Not Applicable (NA)
a) We will use a crane, forklift, manlift or other lifting equipment	Y N NA
b) Our lifting and rigging equipment is certified where applicable, and inspected on a regular basis	Y N NA
c) Our operators shall have a valid operators certificate (mobile crane or tower crane) or have received training (boom lift, scissor lift or forklift) (T)	Y N NA
d) Only lifting attachments approved for use by the forklift manufacturer will be used	Y N NA

18. RIGGING	Yes (Y) No (N) or Not Applicable (NA)
a) We will lift or sling loads overhead	Y N NA
b) We will inspect ropes, hooks and slings before use on each shift	Y N NA

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

19. MOTOR VEHICLES AND HEAVY EQUIPMENT - goods delivery, personnel transportation services, trailer relocation services, oil/water pumpout and recycling services, asphalt grinding and asphalt sealing services, weed/brush abatement and mowing services, landscape hydroseed services, tree stump grinding, and concrete sawing and removal	Yes (Y) No (N) or Not Applicable (NA)
a) We will use motor vehicles or heavy equipment at the work location	Y N NA
b) All operators have a valid provincial driver's license	Y N NA
c) We will inspect vehicles, including safety features (e.g., ROPS)	Y N NA

20. TRAFFIC CONTROL	Yes (Y) No (N) or Not Applicable (NA)
a) There will be uncontrolled movement of vehicular traffic at the worksite	Y N NA
b) We will develop a written traffic control plan (D)	Y N NA
c) We will put in place any required traffic control devices	Y N NA
d) The traffic control devices conform to the Ministry of Transportation and Infrastructure (MoTI) <i>"Traffic Control Manual for Work on Roadways"</i>	Y N NA
e) We will provide Traffic Control Persons (TCP's) as required by law	Y N NA

21. CRYSTALLINE SILICA DUST	Yes (Y) No (N) or Not Applicable (NA)
a) Our work will involve jackhammering, rotohammering, drilling, grinding or other disturbance of concrete or stone, creating potential exposure to silica dust	Y N NA

22. Additional Concerns	Yes (Y) No (N) or Not Applicable (NA)
We foresee additional health and safety concerns associated with the work	Y N NA

If yes, describe:

a) _____

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CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

- b) _____
- c) _____
- d) _____
- e) _____
- f) _____

Describe the control measures each of the concerns listed above:

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____
- f) _____

PRE CONTRACT HAZARD ASSESSMENT COMPLETED BY	
Contractor's Representative Name (print):	
Contractor's Representative Signature:	Date:
Title:	Phone:

CONTRACTOR'S DESIGNATE RESPONSIBLE FOR ONSITE SAFETY	
Name (print):	
Title:	Phone:

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

SUMMARY OF DOCUMENTATION (D) TO BE PROVIDED BY THE CONTRACTOR upon request by the City of Vancouver (documentation required as per Workers Compensation Board Occupational Health and Safety (WCB OHS) Regulation, the Workers' Compensation Act (WCA) or the City of Vancouver)	Yes (Y) or Not Applicable (NA)
a) Safety Program (WCB OHS Regulation Parts 3.1-3.3)	
b) Asbestos Exposure Control Plan (WCB OHS Regulation Part 6.3)	
c) Lead (Pb) Exposure Control Plan (WCB OHS Regulation Part 6.60)	
d) Respiratory Protection Program (WCB OHS Regulation Part 8.5)	
e) Confined Space Entry Program (WCB OHS Regulation Parts 9.5 and 9.6)	
f) Plan for minimizing risk to public and to workers (City of Vancouver)	
g) Personal Protective Equipment (PPE) Program (WCB OHS Regulation Part 8.5)	
h) Hearing Conservation Program (WCB OHS Regulation Part 7.5)	
i) Confined Space Hazard Assessment (WCB OHS Regulation Part 9.9)	
j) Work Procedure, including evacuation and rescue, for confined space (WCB OHS Regulation Part 9.10 and 9.11)	
k) Identification of Isolation Points (confined space) (WCB OHS Regulation Part 9.19)	
l) Alternate procedures to isolate adjacent piping (confined space) (WCB OHS Regulation Part 9.22)	
m) Fall Protection Plan (WCB OHS Regulation Part 11.3)	
n) Traffic Control Plan (Ministry of Transportation and Infrastructure (MOTI) manual, as referenced in WCB OHS Regulation Part 18.3)	
o) In the event of a utility strike, a written procedure for notification of Utility Provider (WCB OHS Regulation Part 4.18) and WorksafeBC (Workers' Compensation Act Part 3, Division 10, Sec. 172 (1)(c))	
p) Work Procedure (including evacuation and rescue) for excavations (City of Vancouver)	
q) Demolition/Salvage Plan (City of Vancouver in reference to WCB OHS Regulation Part 20.112)	
r) First Aid Assessment (WCB OHS Regulation Part 3.16 (2))	

SUMMARY OF TRAINING REQUIREMENTS (T) OF CONTRACTOR EMPLOYEES (for any persons completing this type of work throughout the duration of the contract)	Yes (Y) or Not Applicable
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INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 9 (PART D - FORM OF AGREEMENT)

	(NA)
a) Confined Space Entry (WCB OHS Regulation Part 9.8)	
b) Fall Protection (WCB OHS Regulation Part 11.2 (6))	
c) Equipment Operation (WCB OHS Regulation Part 4.3 (1) (b)(i) (ii))	
d) Mobile Equipment (ex. boom lift, scissor lift, forklift) (WCB OHS Regulation Part 16.4)	

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 10 (PART D - FORM OF AGREEMENT)

SCHEDULE 10
FORCE ACCOUNT LABOUR AND CONSTRUCTION EQUIPMENT RATES

[When Contract is finalized, insert table of labour and equipment rates provided with successful Tenderer's Form of Tender]

INVITATION TO TENDER NO. PS20180859
CONTRACTOR FOR CHINA CREEK NORTH PARK UPGRADE
SCHEDULE 11 (PART D - FORM OF AGREEMENT)

SCHEDULE 11
PRIME CONTRACTOR AGREEMENT FORM

[When Contract is finalized, insert Prime Contractor Agreement Form provided with successful Tenderer's Form of Tender]