Fraser Valley Regional District | PLANNING & DEVELOPMENT

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SCHEDULE A-4 — Permit Application

I / We hereby apply under Part 14 of the *Local Government Act* for a;

☑ Development Variance Permit

☐ Temporary Use Permit

☐ Development Permit

An Application Fee in the amount of $ 350 as stipulated in FVRD Application Fees Bylaw No. 1231, 2013 must be paid upon submission of this application.

Civic Address: 1777 COLUMBIA VALLEY RD PID: _____

Legal Description: Lot _____ Block _____ Section 15 Township 22 Range _____ Plan BCS 3022

The property described above is the subject of this application and is referred to herein as the 'subject property.' This application is made with my full knowledge and consent. I declare that the information submitted in support of the application is true and correct in all respects.

Owner's Declaration

Name of Owner (print)	Signature of Owner	Date
AQUADEL CROSSING		
Name of Owner (print)	Signature of Owner	Date

Owner's Contact Information

Address	City	
PO BOX 2267	CHILLIWACK	
Email		Postal Code V2R 1A6
Phone	Cell	Fax 604 858 2864

Office Use Only	Date	File No.
	10 MAY 2018	3090-20 2018-22
	Received By: J.H.	Folio No. 775.02269.051
	Receipt No. 5976/4	Fees Paid: $ 350.00

45950 Cheam Avenue | Chilliwack, BC | V2P 1N6 Phone: 604-702-5000 | Toll Free: 1-800-528-0061 | Fax: 604-792-9684

Agent

I hereby give permission to _____ to act as my/our agent in all matters relating to this application.

Only complete this section if the applicant is NOT the owner.

Signature of Owner	Date
Signature of Owner	Date

Agent's contact information and declaration

Name of Agent		Company
Address		City
Email		Postal Code
Phone	Cell	Fax

I declare that the information submitted in support of this application is true and correct in all respects.

Signature of Agent	Date

Development Details

Property Size _____ Present Zoning _____

Existing Use _____

Proposed Development WATER RESERVOIR EXPANSION

Proposed Variation / Supplement ALLOW FOR NEW STRUCTURE TO ENCROACH ON SIDEYARD SETBACK.

(use separate sheet if necessary)

Reasons in Support of Application THIS IS THE ONLY FEASIBLE PLACE TO ADD THE EXPANSION

45950 Cheam Avenue | Chilliwack, BC | V2P 1N6 Phone: 604-702-5000 | Toll Free: 1-800-528-0061 | Fax: 604-792-9684

Provincial Requirements **(This is not an exhaustive list; other provincial regulations will apply)**

Riparian Areas Regulation

Please indicate whether the development proposal involves residential, commercial, or including vegetation removal or alteration; soil disturbance; construction of buildings and structures; creation of impervious or semi-pervious surfaces; trails, roads, docks, wharves, bridges and, infrastructure and works of any kind – within:

yes ☐ no ☑ 30 metres of the high water mark of any water body

yes ☐ no ☑ a ravine or within 30 metres of the top of a ravine bank

"Water body" includes; 1) a watercourse, whether it usually contains water or not; 2) a pond, lake, river, creek, or brook; 3) a ditch, spring, or wetland that is connected by surface flow to 1 or 2 above.

Under the *Riparian Areas Regulation* and the *Fish Protection Act*, a riparian area assessment report may be required before this application can be approved.

Contaminated Sites Profile

Pursuant to the *Environmental Management Act*, an applicant is required to submit a completed "Site Profile" for properties that are or were used for purposes indicated in Schedule 2 of the *Contaminated Sites Regulations*. Please indicate if:

yes ☐ no ☑ the property has been used for commercial or industrial purposes.

If you responded 'yes,' you may be required to submit a Site Profile. Please contact FVRD Planning or the Ministry of Environment for further information.

Archaeological Resources

Are there archaeological sites or resources on the subject property?

yes ☐ no ☑ I don't know ☐

If you responded 'yes' or 'I don't know' you may be advised to contact the Archaeology Branch of the Ministry of Tourism, Sport and the Arts for further information.

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Required Information

When providing Application Forms to the applicant, Regional District staff shall indicate which of the following attachments are required for this application. **Additional information may also be required at a later date.**

	Required	Received	Details
Location Map			Showing the parcel (s) to which this application pertains and uses on adjacent parcels
Site Plan At a scale of: 1:_____			Reduced sets of metric plans
			North arrow and scale
			Dimensions of property lines, rights-of-ways, easements
			Location and dimensions of existing buildings & setbacks to lot lines, rights-of-ways, easements
			Location and dimensions of proposed buildings & setbacks to lot lines, rights-of-ways, easements
			Location of all water features, including streams, wetlands, ponds, ditches, lakes on or adjacent to the property
			Location of all existing & proposed water lines, wells, septic fields, sanitary sewer & storm drain, including sizes
			Location, numbering & dimensions of all vehicle and bicycle parking, disabled persons' parking, vehicle stops & loading
			Natural & finished grades of site, at buildings & retaining walls
			Location of existing & proposed access, pathways
			Above ground services, equipment and exterior lighting details
			Location & dimensions of free-standing signs
			Storm water management infrastructure and impermeable surfaces
			Other:
Floor Plans			Uses of spaces & building dimensions
			Other:
Landscape Plan Same scale as site plan			Location, quantity, size & species of existing & proposed plants, trees & turf
			Contour information (_____ metre contour intervals)
			Major topographical features (water course, rocks, etc.)
			All screening, paving, retaining walls & other details
			Traffic circulation (pedestrian, automobile, etc.)
			Other:
Reports			Geotechnical Report
			Environmental Assessment
			Archaeological Assessment
			Other:

The personal information on this form is being collected in accordance with Section 26 of the *Freedom of Information and Protection of Privacy Act, RSBC 1996 Ch. 165* and the *Local Government Act, RSBC 2015 Ch. 1.* It will only be collected, used and disclosed for the purpose of administering matters with respect to planning, land use management and related services delivered, or proposed to be delivered, by the FVRD. Questions about the use of personal information and the protection of privacy may be directed to the FVRD Privacy Officer at 45950 Cheam Avenue, Chilliwack, BC V2P 1N6, Tel: 1-800-528-0061 FOI@fvrd.ca.

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LETTER OF AUTHORIZATION

Registered Authority

Please be advised that I/we, BCS3022 THE COTTAGES AT CULTUS LAKE
(Print names of ALL Registered Owners or Corporate Director)

Representing, _____
(Corporate name - if applicable)

am/are the registered owner(s);

Site Civic Address: 1777 COLUMBIA VALLEY RD

Lot# _____ Block_____ Plan _____ PID# _____

SEC 15, TOWNSHIP 22 NEW WEST DIST
STRATA PLAN BCS 3022

Appointed Authorized Agent

Name of Authorized Agent AQUADEL CROSSING LTD.
Company Name
Mailing Address PO BOX 2267, CHILLIWACK, BC, V2R 1A6.

City: CHILLIWACK Postal Code: V2R 1A6.
Email: _____
Phone: _____

Signature of Authorized Agent X _____

Permission to act:

As my/our Authorized Agent in the matter of the following:

- [ ] to view and obtain copies of all plans and permits
- [x] to apply for and obtain building permits for proposed construction to the above reference Civic Address
- [x] to apply for Planning File: Development Permit [ ] Development Variance Permit [ ] Subdivision [ ]
- [x] other: CORIX WATER TANK EXPANSION BLDG PERMIT ON CORIX R/W ONLY

THIS LETTER OF AUTHORIZATION EXPIRES SEPT. 1, 2018.

Authorized Signature (Registered Owner or Corporate Director)

This document shall serve to notify the Fraser Valley Regional District that I am/we are the legal owner(s) of the property described above and do authorize the person indicated above ("Authorized Agent") to act on my/our behalf on all matters indicated above ("Permission to act") for the above referenced property. In addition, I/we have read and understand the above application and authorize the Authorized Agent to sign the above on my/our behalf.

X _____
Sign
KAREN WEAVER
Print
Date: 04-13-18

X _____
Sign
_____
Print
Date: _____

The personal information on this form is being collected in accordance with Section 27 of the *Freedom of Information and Protection of Privacy Act, RSBC 1996 Ch. 165* and the *Local Government Act, RSBC 2015 Ch. 1*. It will only be collected, used and disclosed for the purpose of administering matters with respect to planning, land use management and related services delivered, or proposed to be delivered, by the FVRD. Questions about the use of personal information and the protection of privacy may be directed to the FVRD Privacy Officer at 45950 Cheam Avenue, Chilliwack, BC V2P 1N6, Tel: 1-800-528-0061 FOI@fvrd.ca.

van den Brink
ENGINEERING LTD.
STRUCTURAL CONSULTING

101-45991 Airport Road
Chilliwack, BC V2P 1A3

Tel: 604-792-2268
Fax: 604-793-2226

Building Department
Fraser Valley Regional District
1-45950 Cheam Avenue
Chilliwack, BC V2P 1N6

April 13, 2018
Project: 17-241

Re: Aquadel Crossing Water Reservoir Expansion
31859 Gabriola Court, Abbotsford, BC

This letter is to confirm that in our structural design of the reservoir expansion, the effects of the following noted items were taken into account, including any impacts on the existing tank structure:

- Additional weights of the new structure and design loadings
- The new openings in the existing walls to allow water passage between the new and existing.

The specified sizes and locations of the new openings do not require additional reinforcing of the existing tank structure. The structural integrity of the existing tank is not compromised by the proposed reservoir expansion as detailed on our drawings.

We trust the above meets your requirements and understanding. If you have any questions, please contact the undersigned.

Sincerely,
van den Brink Engineering Ltd.

Ivan van den Brink, P.Eng., Struct. Eng.

Fraser Valley Regional District | PLANNING & DEVELOPMENT

www.fvrd.bc.ca | building@fvrd.bc.ca

Owner(s) Acknowledgement of Responsibility

Re: Property Address: 1777 COLUMBIA VALLEY RD

Legal Description: SECTION 15, TOWNSHIP 22, NEW WESTMINSTER DISTRICT, STRATA PLAN BCS3022,

Permit #: BP014215 - (Water Reservoir Expansion)

This undertaking is given by the undersigned, as the ***owner(s)*** of the property described above, with the intention that it be binding on the ***owner(s)*** and that the ***Regional District*** will rely on same.

I/We confirm that I/we have applied for a permit pursuant to Fraser Valley Regional District Building Bylaw No. 1188, 2013 and that I/we have carefully reviewed and fully understand all of the provisions of the Bylaw and in particular understand, acknowledge and accept the provisions describing the purpose of the Bylaw, the conditions under which permits are issued, the disclaimer of warranty or representation and the limited extent of the scope of the Bylaw and inspections there under.

Without in any way limiting the foregoing, I/we acknowledge fully that it is my/our responsibility, whether or not any work to be performed pursuant to the permit applied for is done by me/us, my/our ***agent***, a contractor or a ***registered professional*** to ensure compliance with the ***Building Code*** and the Bylaw.

I/we am/are not in any way relying on the ***Regional District*** or the ***Building Official*** to protect the ***owner(s)*** or any other persons as set out in the Bylaw and I/we will not make any claim alleging any such responsibility or liability on the part of the ***Regional District*** or its ***Building Official.***

Owner(s) Information:

Name: CORIX MULTI-UTILITY SERVICES (CMUS)

Address: 19900 84TH AVE LANGLEY BC V2Y3C2

Signature: [signature] - BOB SHIELDS ON BEHALF OF CMUS

Date: MAY 2, 2018.

The personal information on this form is being collected in accordance with Section 27 of the *Freedom of Information and Protection of Privacy Act, RSBC 1996 Ch. 165* and Part 9, Division 1 of the *Local Government Act, RSBC 2015 Ch. 1 and regulations thereto.* The personal information collected on this form will only be collected, used and disclosed for the purposes of administering matters with respect to Building Regulation. Questions with respect to the collection, use and disclosure of the personal information being collected on this form may be directed to the Fraser Valley Regional District Privacy Officer and Head of Freedom of Information and Privacy at 45950 Cheam Avenue, Chilliwack, BC V2P 1N6; by telephone at 604-702-5000 or toll free at 1-800-528-0061; or by email to FOI@fvrd.ca.

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Owner(s) Acknowledgement of Responsibility

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Without in any way limiting the foregoing, I/we acknowledge fully that it is my/our responsibility, whether or not any work to be performed pursuant to the permit applied for is done by me/us, my/our ***agent***, a contractor or a ***registered professional*** to ensure compliance with the ***Building Code*** and the Bylaw.

I/we am/are not in any way relying on the ***Regional District*** or the ***Building Official*** to protect the ***owner(s)*** or any other persons as set out in the Bylaw and I/we will not make any claim alleging any such responsibility or liability on the part of the ***Regional District*** or its ***Building Official***.

Owner(s) Information:

Name: CORIX MULTI-UTILITY SERVICES (CMUS)

Address: 19900 84TH AVE LANGLEY BC V2Y3C2

Signature: - BOB SHIELDS ON BEHALF OF CMUS

Date: MAY 2, 2018.

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www.fvrd.bc.ca | building@fvrd.bc.ca

File Number: 3800-30-BP014215H

4 April 2018

AQUADEL CROSSING LTD
PO BOX 2267
CHILLIWACK, BC V2R 1A6

Dear sir:

Re: Building Permit Application No. BP014215 for the purposes of constructing a Water Reservoir Expansion on property legally described as SECTION 15, TOWNSHIP 22, NEW WESTMINSTER DISTRICT, STRATA PLAN BCS3022, 1777 COLUMBIA VALLEY RD

In connection with the above referenced application, an inspection of the proposed site carried out on **4 April 2018** indicated that the proposed construction would be on land which may be subject to certain geotechnical hazards. Therefore, pursuant to Section 56 of the Community Charter (2003, SBC Chap 326), in order to have your building permit application processed further, you are required to submit a report from a qualified professional which certifies that the land may be used safely for the use intended. This report may then have to be registered on the title of the subject property before the building permit is issued.

I enclose some guidance notes to assist you in this matter. Please note that it is important that your qualified professional contacts <PLANNER> in the Regional District Planning Department before commencing any work on the report.

If you require any clarification or further information regarding this matter, please contact me at your convenience.

Yours sincerely,

Mike Foster

Digitally signed by Mike Foster
DN: cn=Mike Foster, o=Fraser Valley Regional District, ou=Building and Bylaw, email=mfoster@fvrd.ca, c=CA
Date: 2018.04.04 10:52:02 -07'00'

Mike Foster
Building Inspector.

Fraser Valley Regional District | PLANNING & DEVELOPMENT

www.fvrd.bc.ca | building@fvrd.bc.ca

4 April 2018

File Number: 3800-30-BP014215H

AQUADEL CROSSING LTD
PO BOX 2267
CHILLIWACK, BC V2R 1A6

SENT VIA EMAIL TO: wendyb@genicadev.com

Dear Sir or Madam:

Re: Building Permit Application on property at 1777 COLUMBIA VALLEY RD

Building Permit Application Number:	BP014215
Proposed works:	Water Reservoir Expansion
Legally described as:	SECTION 15, TOWNSHIP 22, NEW WESTMINSTER DISTRICT, STRATA PLAN BCS3022, DUMMY FOLIO FOR COMMON PROPERTY PROPERTY MANUALLY ADDED BY FVRD, NOT ON BCA ROLL.
Parcel Identifier (PID):	

Thank you for submitting a building permit application on Feb 14, 2018 for the project referenced above. Building permits benefit you and your neighbours in many ways. They ensure buildings are safe for you, your family and visitors. They support higher market value for your property by increasing buyer confidence. They reduce your insurance costs because insurers know the building meets the BC Building Code, and building permits reduce lifecycle repair and maintenance costs by ensuring the building is efficient and well-built. Not only do building permits provide value to you, they also benefit your neighbours by enhancing the overall safety and quality of your neighbourhood.

Professional builders know the process inside and out. However, most people only experience building permitting a few times in their lives so it can be challenging. We carefully reviewed your application and have prepared the checklist below to guide you. Whether you are a pro or a first-timer, this checklist will help you get your building permit quickly and efficiently.

PLANNING REQUIREMENTS

Check When Complete

1. Development Variance Permit - The proposed Water Reservoir Expansion does not comply with Area H Zoning Bylaw No. 66 due to the encroachment on the side setback. Please revise your plans to meet FVRD bylaw requirements. If you cannot meet the requirements because of unique conditions on your property, please contact FVRD Planning to discuss the possibility of a Development Variance Permit. Call 604-702-5000 or email planning@fvrd.ca. ☑

2. GeoHazard Report - The proposed structure may be subject to a geotechnical hazard due to Land slip. To protect your safety, a report and a Hazard Assurance Statement from a geotechnical engineer is required that states that the Water Reservoir Expansion will be safe for its intended use. The report will be registered on your property title as a Covenant. A Covenant can take time but there are a couple of things you can do to speed it up: ☐

   - **Lawyer / notary contact.** Provide us with contact information for the notary or lawyer who will handle the covenant for you.
   - **Priority Agreement.** If your property title includes a mortgage or other financial charge, your financial institution will need to sign a Priority agreement. Contact your financial institution about this early on to avoid delays.

   Questions & Contacts. Detailed info on property development can be found on our web site at www.fvrd.ca. Contact FVRD Planning staff at 604-702-5000 or planning@fvrd.ca.

BUILDING REQUIREMENTS

3. Engineering Design – *BC Building Code* - Please submit the following information prepared by a *Registered Professional of Record*: ☑

   a) Structural Engineers (Van Den Brink) sealed letter stating that the new holes into the existing tank will not lower the current level of structural integrity of the tank and further detail on how the tank will be reinforced, if necessary to maintain its integrity. This is needed to meet the requirements of the BC Building Code.

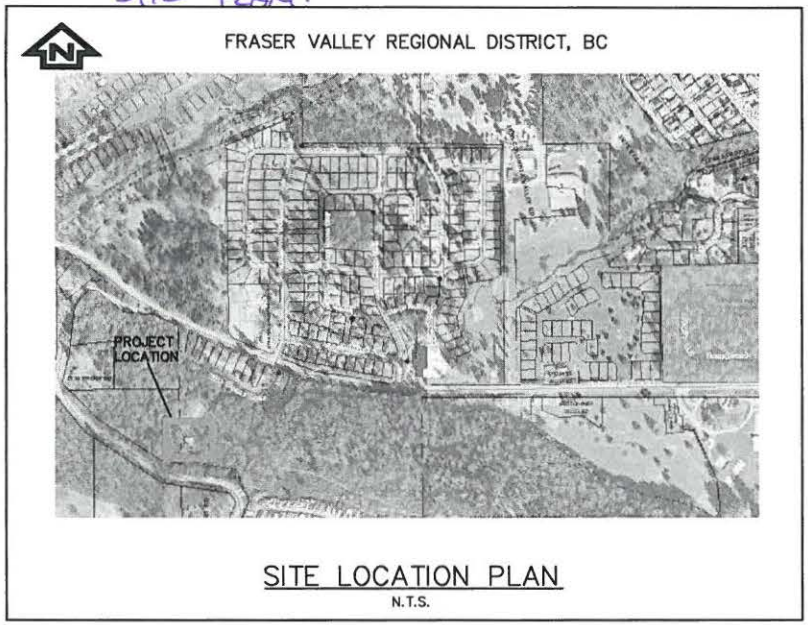
   A *Registered Professional of Record* is a person who is may practise as an Architect under the *Architects Act*, or a person who is may practise as a Professional Engineer under the *Engineers and Geoscientists Act*.

4. Letter of Authorization from the Registered Property Owner(s) - Written confirmation from all property owners registered on the title of the property is required to authorize the application. Please have Strata Corporation BCS3022 or Corix Utilities complete and submit the attached form for Aquadel Crossing Ltd. ☑ copy

5. Owners Acknowledgement of Responsibility - Please provide written confirmation from all property owners registered on the title of the property to acknowledge responsibility for the proposed construction. Please have Strata Corporation or Corix Utilities complete and submit the attached "Owners Acknowledgement of Responsibility" form. ☐ copy

Once you have submitted all of the items identified in the checklist above, we will review your building plans and move on to the next steps of the permitting process. This may require additional information or clarification. Our goal is to issue your permit within four weeks of receiving a complete application. If you provide complete and timely information we can often do it more quickly.

Site Plan.



SITE LOCATION PLAN
N.T.S.

Client:

AQUADEL CROSSING JOINT VENTURE

Project:

AQUADEL CROSSING
WATER RESERVOIR EXPANSION
1777 COLUMBIA VALLEY ROAD

Engineering Services Provided by:

WEDLER ENGINEERING

www.wedler.com

THE WEDLER GROUP
- Abbotsford 1.604.746.0300
- Chilliwack 1.604.792.0651
- Courtenay 1.250.334.3263
- Surrey 1.604.588.1919

Drawing Index: Rev #3

Drawing No.	Revision	Title of Drawing
		COVER SHEET
C16-5365/D-01	C	STANDARD NOTES
C16-5365/D-02	C	WATER SYSTEM CONTEXT PLAN
C16-5365/D-03	C	RESERVOIR SITE PLAN
C16-5365/D-04	C	RESERVOIR GRADING & WATER DETAILS

DRAWING INDEX REVISION #3

Project No: C16-5365/D
Date: APRIL 2018
ISSUED FOR BUILDING PERMIT

WEDLER ENGINEERING

LOCAL GOVERNMENT FILE: SUB

NOTES

GENERAL

1. THE GOVERNING JURISDICTION FOR THIS PROJECT IS THE FRASER VALLEY REGIONAL DISTRICT (FVRD) AND COREX UTILITIES.
2. ALL WORKS, MATERIALS AND TESTING SHALL BE IN ACCORDANCE WITH THE CURRENT BYLAWS OF THE GOVERNING JURISDICTIONS, THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (PRINTED 2009 "PLATINUM" EDITION) (MMCD) AND THE B.C. PLUMBING CODE AS APPLICABLE.
3. FOR SITE DIMENSIONS, REFER TO LEGAL SURVEY PLANS. FOR BUILDING LAYOUT DIMENSIONS, REFER TO ARCHITECTURAL PLANS. ALL ELEVATIONS ARE SHOWN IN METERS RELATED TO GEODETIC SURVEY OF CANADA. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE SHOWN IN METERS AND ALL PIPE DIAMETERS ARE SHOWN IN MILLIMETERS.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TO WEDLER ENGINEERING A DIGITAL VIDEO AND PHOTOGRAPHIC RECORD IDENTIFYING ANY AND ALL EXISTING FEATURES TO BE DISTURBED. THE CONTRACTOR SHALL RESTORE ALL DISTURBED PAVEMENT, CURBS, SIDEWALKS, BOULEVARDS, LANDSCAPING, FENCES OR ANY OTHER FEATURES AFFECTED BY THE WORK IN COMPLIANCE WITH THE SPECIFICATIONS OF THE GOVERNING JURISDICTION, MMCD AND ANY RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER AND TO THE SATISFACTION OF THE GOVERNING JURISDICTION AND WEDLER ENGINEERING.
5. THE CONTRACTOR MUST CONTACT THE GOVERNING JURISDICTION AND WEDLER ENGINEERING PRIOR TO CONSTRUCTION TO SCHEDULE A PRE-CONSTRUCTION MEETING.
6. THE CONTRACTOR SHALL NOTIFY WEDLER ENGINEERING A MINIMUM OF 2 WORKING DAYS PRIOR TO REQUIRED INSPECTIONS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:
   A) MOBILIZATION
   B) DURING PIPE LAYING
   C) DURING CONSTRUCTION OF DETENTION FACILITIES
   D) DURING PREPARATION OF PAVEMENT STRUCTURE
   E) TESTING OF ALL UTILITIES
   F) AFTER COMPLETION OF ALL WORK
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT. CONFIRM BENCH MARK OR TEMPORARY BENCH MARK PRIOR TO CONSTRUCTION. ADVISE WEDLER ENGINEERING OF ANY DISCREPANCIES.
8. ANY VARIATIONS FROM THE PROPOSED WORK MUST BE APPROVED IN WRITING BY WEDLER ENGINEERING. FAILURE TO NOTIFY WEDLER ENGINEERING IN ADVANCE MAY RESULT IN REJECTION OF THE WORK. SUBSTITUTION OF ANY SPECIFIED MATERIALS, PRODUCTS OR EQUIPMENT WITH AN APPROVED EQUAL OR APPROVED EQUIVALENT WILL BE PERMITTED ONLY WITH THE EXPRESS WRITTEN APPROVAL OF WEDLER ENGINEERING, AT ITS DISCRETION.
9. THE CONTRACTOR SHALL ADJUST THE TOPS OF ALL ACTIVE MANHOLES, CATCH BASINS, VALVE BOXES, ETC. AS REQUIRED TO MATCH NEW GRADING.
10. ALL TRENCH BACKFILL WITHIN PUBLIC RIGHTS-OF-WAY TO BE IMPORTED GRANULAR BACKFILL UNLESS OTHERWISE APPROVED BY THE GEOTECHNICAL ENGINEER.
11. CONNECTIONS TO EXISTING STORM AND SANITARY SEWERS TO BE MADE WITH METHODS AND MATERIALS APPROVED BY THE GOVERNING JURISDICTION. APPROVAL TO BE OBTAINED BEFORE INSTALLATION.
12. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY AT THE PLACE OF WORK AS AND TO THE EXTENT REQUIRED BY APPLICABLE CONSTRUCTION SAFETY LEGISLATION, REGULATIONS AND CODES, AND BY GOOD CONSTRUCTION PRACTICE. THE CONTRACTOR SHALL PERFORM ITS WORKS IN STRICT COMPLIANCE WITH THE REQUIREMENTS, RULES, REGULATIONS AND BY-LAWS OF ANY FEDERAL, PROVINCIAL OR MUNICIPAL AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL APPLY FOR AND OBTAIN ALL REQUIRED PERMITS.
13. THE CONTRACTOR SHALL MAINTAIN AND REPAIR ALL PUBLIC AND PRIVATE ROADS AFFECTED BY THE WORK AND ARRANGE FOR ADEQUATE STREET CLEANING DURING WORKING DAYS.
14. THE CONTRACTOR SHALL PREPARE A TRAFFIC MANAGEMENT PLAN FOR APPROVAL BEFORE START OF CONSTRUCTION. TRAFFIC MANAGEMENT PLAN TO BE IN ACCORDANCE WITH THE GOVERNING JURISDICTION'S REGULATIONS. AS A MINIMUM, ONE LANE TRAFFIC MUST BE MAINTAINED AND KEPT OPEN AT ALL TIMES.
15. THE CONTRACTOR SHALL CARRY OUT THE WORK SO AS TO MINIMIZE THE INCONVENIENCE TO THE PUBLIC. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SERVICES AND ACCESS TO RESIDENCES AND BUSINESSES AT ALL TIMES FOR VEHICLES AND PEDESTRIANS. ANY DISRUPTIONS THAT ARE UNAVOIDABLE WILL REQUIRE A MINIMUM NOTICE OF 2 WORKING DAYS BE GIVEN TO PROPERTY OWNERS, THE GOVERNING JURISDICTION AND WEDLER ENGINEERING.
16. THE CONTRACTOR SHALL RECORD ON A CURRENT SET OF PLANS IN A NEAT MANNER, ALL CHANGES, ADDITIONS AND DELETIONS TO REFLECT THE "AS CONSTRUCTED" INSTALLATION. THIS SET OF PLANS SHALL BE RETURNED TO WEDLER ENGINEERING AT THE COMPLETION OF THE WORKS AND PRIOR TO THE ISSUANCE OF SUBSTANTIAL PERFORMANCE. ANY ADDITIONAL SURVEY REQUIRED TO COMPLETE THE RECORD DRAWINGS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

EXISTING STRUCTURES, UTILITIES AND PROPERTIES

1. INFORMATION ON THE DRAWINGS REGARDING EXISTING UTILITIES WAS COMPILED FROM RECORD DRAWINGS, CONSTRUCTION DRAWINGS AND FIELD SURVEYS. THIS INFORMATION IS NOT NECESSARILY ACCURATE OR COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DATA BY EXPOSURE BEFORE ANY CONSTRUCTION AND TO IMMEDIATELY REPORT ANY DISCREPANCIES TO WEDLER ENGINEERING. BEFORE CONSTRUCTION, ALL TIE-IN INVERTS SHALL BE CONFIRMED, AND EXPOSURES PERFORMED WHERE THERE IS POTENTIAL FOR CONFLICTS BETWEEN EXISTING AND PROPOSED SERVICES. ANY COSTS RESULTING FROM THE CONTRACTOR'S FAILURE TO DO SO SHALL BE AT THE CONTRACTOR'S EXPENSE.
2. BEFORE CONSTRUCTION THE CONTRACTOR SHALL ASCERTAIN FOR HIMSELF THE EXACT LOCATION OF BOUNDARIES OF PROPERTIES, RIGHTS-OF-WAY OR EASEMENTS. ANY COST RESULTING FROM SPECIAL CONSTRUCTION METHODS, EQUIPMENT OR MATERIALS REQUIRED TO PERFORM THE WORK WITHOUT ENCROACHING ON OR CAUSING DAMAGE TO OTHER PROPERTY, SHALL BE INCLUDED IN THE CONTRACT PRICE, AND NO ADDITIONAL PAYMENT WILL BE MADE FOR SUCH COSTS.

COORDINATION WITH OTHER WORK

1. CONTRACTOR TO IMMEDIATELY REPORT (TO WEDLER ENGINEERING AND OTHERS AS REQUIRED) ANY CONFLICTS, DISCREPANCIES, ETC. BETWEEN WORKS SHOWN ON WEDLER ENGINEERING PLANS AND WORKS SHOWN ON ANY OTHER PLANS.

WATERWORKS

1. THE COMPLETED WORK SHALL BE FLUSHED, DISINFECTED, AND BACTERIOLOGICALLY TESTED ACCORDING TO MMCD PRINTED 2009 "PLATINUM" (SECTION 33 11 01 WATERWORKS) AND HEALTH AUTHORITY STANDARDS.
2. WATER MAINS TO BE PRESSURE TESTED TO 200 PSI (1380 KPA).
3. CURRENT PROCEDURES OF THE GOVERNING JURISDICTION FOR ACCEPTANCE AND TIE-IN OF NEW WATERMAINS SHALL BE FOLLOWED
4. PIPE MATERIALS AND FITTINGS TO BE AS SPECIFIED ON DRAWINGS AND TO MEET MMCD PRINTED 2009 "PLATINUM" (SECTION 33 11 01 WATERWORKS). WATER MAIN PIPE TO BE PVC C900 DR18 AND FITTINGS TO BE CAST IRON.
5. ALL MECHANICAL JOINTS, FITTINGS, VALVES, APPURTENANCES, AND MECHANICAL RESTRAINTS TO BE c/w DENSO PASTE, DENSO MASTIC AND DENSO TAPE OR APPROVED EQUAL, APPLIED TO MANUFACTURER'S RECOMMENDATIONS TO PREVENT CORROSION.
6. MINIMUM HORIZONTAL SEPARATION BETWEEN ANY WATER MAIN AND STORM OR SANITARY SEWER OR FORCEMAIN IS 3.0m. WHERE A WATER MAIN MUST CROSS A STORM OR SANITARY SEWER OR FORCEMAIN, THE WATER MAIN MUST PASS ABOVE THE OTHER PIPE WITH A MINIMUM 0.5m CLEARANCE BETWEEN THE PIPES. WHERE THESE SEPARATIONS ARE NOT ATTAINABLE, ALL WATER MAIN JOINTS ARE TO BE PROTECTED PER CORROSION PROTECTION MEASURES ABOVE TO A MINIMUM DISTANCE OF 3.0m FROM THE VIOLATION AND BEST PRACTICE TO BE USED TO KEEP WATER MAIN JOINTS AS FAR FROM THE SEPARATION VIOLATION AS POSSIBLE.

STORM SEWERS & SANITARY SEWERS

1. THE PIPE DISTANCES SHOWN ON STORM AND SANITARY SEWER DRAWINGS ARE MEASURED HORIZONTALLY FROM MANHOLE CENTERLINE TO MANHOLE CENTERLINE.

QUALITY CONTROL

1. ALL TESTING SHALL BE PERFORMED BY INDEPENDENT AND CERTIFIED TESTING AGENCIES AT THE CONTRACTOR'S COST.
2. ALL REQUIRED TESTING OF THE SUBGRADE, EMBANKMENT, BACKFILL, GRANULAR MATERIALS, COMPACTION, CONCRETE, ASPHALT, GROWING MEDIUM, ETC. IS THE RESPONSIBILITY OF THE CONTRACTOR AND AT THE CONTRACTOR'S COST.
3. ALL CLEANING, FLUSHING, PRESSURE AND LEAKAGE TESTING, VIDEO INSPECTION, DISINFECTION AND BACTERIOLOGICAL TESTING AS REQUIRED FOR WATER, SANITARY AND DRAINAGE SYSTEMS ARE AT THE CONTRACTOR'S COST.
4. MATERIAL TESTS SHALL BE PERFORMED AT THE MINIMUM FREQUENCIES / INTERVALS AS PER THE GOVERNING JURISDICTION'S REGULATIONS, OR AS PER "WEDLER MINIMUM MATERIAL TEST FREQUENCIES", WHICHEVER IS GREATER.
5. IN ADDITION TO THE REQUIREMENTS OF THE GENERAL CONDITIONS, THE CERTIFICATE OF SUBSTANTIAL PERFORMANCE WILL NOT BE ISSUED PRIOR TO RECEIPT BY WEDLER ENGINEERING OF COPIES OF ALL REQUIRED CERTIFICATES, INSPECTION AND TESTING REPORTS.

GEOTECHNICAL AND GEOSYNTHETICS

1. DESIGN AND CONSTRUCTION OF ALL SLOPES AND RETAINING WALLS TO BE CERTIFIED BY THE GEOTECHNICAL ENGINEER.
2. ALL GEOSYNTHETICS TO BE REVIEWED AND APPROVED BY THE GEOTECHNICAL ENGINEER.

EROSION & SEDIMENT MANAGEMENT

1. ALL WORK IS TO BE UNDERTAKEN AND COMPLETED BY THE CONTRACTOR IN SUCH MANNER AS TO PREVENT THE RELEASE OF SILT, SEDIMENT OR SEDIMENT LADEN WATER, CONCRETE OR CONCRETE LEACHATE, OR ANY OTHER DELETERIOUS SUBSTANCES INTO ANY STORM SEWER, LAWN DRAIN, SOAK-AWAY, DRY WELL OR WATERCOURSE. (SEDIMENT LADEN WATER MAY BE DISCHARGED TO STORM SYSTEMS THAT ARE USED TO CONVEY FLOWS TO A SEDIMENT MANAGEMENT FACILITY).
2. INSTALL TEMPORARY PIPES, SWALES, CULVERTS, ETC. AS REQUIRED TO DIRECT SEDIMENT LADEN FLOWS TO SEDIMENT MANAGEMENT FACILITIES. REMOVE TEMPORARY WORKS WHEN NO LONGER NEEDED. BACKFILL WITH MATERIALS AND LEVELS OF COMPACTION AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
3. TO PREVENT EROSION:
   a. PREVENT CONCENTRATED OVERLAND FLOWS FROM OCCURRING,
   b. COVER STOCKPILES, EXPOSED EARTH AND DISTURBED AREAS WITH STRAW OR BY OTHER COVERINGS,
   c. LIMIT CLEARING AS MUCH AS POSSIBLE TO AREAS TO BE IMMEDIATELY WORKED.
4. PREVENT WIND BLOWN EROSION BY WATERING, COVERING EXPOSED EARTH OR BY OTHER APPROVED MEASURES.
5. CONTRACTOR TO INSTALL SILT FENCE SOUTH OF SPRING CREEK ALONG ENTIRE ENVIRONMENTAL SETBACK LINE, AS WELL AS OTHER EROSION & SEDIMENT MANAGEMENT WORKS BEFORE ANY OTHER WORK, INCLUDING CLEARING AND EARTHWORKS, AS REQUIRED.
6. ALL EROSION & SEDIMENT MANAGEMENT WORKS TO BE MAINTAINED BY THE CONTRACTOR AT ALL TIMES TO ASSURE PROPER OPERATION. REPLACEMENT OF FENCES AND/OR BERMS, THE FLUSHING OF SEWERS AND THE CLEANING OF SUMPS MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.
7. REMOVE AND DISPOSE OF ACCUMULATED SEDIMENT FROM SEDIMENT MANAGEMENT FACILITIES ON OR BEFORE SEDIMENT REACHING ONE THIRD THE HEIGHT OF THE FACILITY.
8. MONITOR EROSION AND SEDIMENT MANAGEMENT WORKS AT LEAST ONCE PER WEEK AND AFTER HEAVY RAIN OR SNOW MELT EVENTS.
9. BEFORE CONSTRUCTION ACTIVITIES, CONTRACTOR TO CLEAN EXISTING SUMPS AND FIT EXISTING CATCH BASINS & LAWN DRAINS WITH A FILTREXX INLET SOXX OR APPROVED EQUIVALENT TO PREVENT SEDIMENT FROM ENTERING ANY STORM SYSTEMS. DO NOT USE FILTER FABRIC.
10. IMMEDIATELY UPON INSTALLATION, THE CONTRACTOR SHALL FIT ALL NEW CATCH BASINS AND LAWN DRAINS WITH A FILTREXX INLET SOXX OR APPROVED EQUIVALENT TO PREVENT SEDIMENT FROM ENTERING ANY STORM SYSTEMS (UNLESS THE STORM SYSTEM IS USED TO CONVEY FLOWS TO A SEDIMENT MANAGEMENT FACILITY). DO NOT USE FILTER FABRIC.
11. DURING CONSTRUCTION THE CONTRACTOR MAY NEED TO EMPLOY ADAPTIVE MEASURES, AND/OR ADDITIONAL MEASURES, AND/OR ADJUST THE INSTALLED EROSION AND SEDIMENT MANAGEMENT WORKS TO PREVENT THE RELEASE OF SEDIMENT LADEN WATER AS SITE CONDITIONS CHANGE.
12. ALL EROSION & SEDIMENT MANAGEMENT WORKS ARE TO REMAIN IN PLACE UNTIL BUILDING ACTIVITIES ARE 90% COMPLETE AND UNTIL VEGETATION HAS DEVELOPED ON EXPOSED AND DISTURBED AREAS WHICH CONTRIBUTE FLOWS TO THE EROSION & SEDIMENT MANAGEMENT WORKS.

POST-CONSTRUCTION DRAINAGE MAINTENANCE

PROVIDE REGULAR MONITORING OF:

- ALL DRAINAGE COLLECTION AND CONVEYANCE SYSTEMS (SUCH AS LAWN DRAINS, CATCH BASINS, MANHOLES, SWALES, ETC.
- ALL DRAINAGE STORAGE AND TREATMENT SYSTEMS (SUCH AS DETENTION TANKS, OIL INTERCEPTORS, SETTLING CHAMBERS, FILTER CHAMBERS, ETC.)
- ALL MANUFACTURED DRAINAGE PRODUCTS (SUCH AS STORMCEPTOR, STORMTEC, ETC.). MONITOR AS PER MANUFACTURER'S RECOMMENDATIONS.
- ALL DRAINAGE INFILTRATION SYSTEMS (SUCH AS ROCK PITS, INFILTRATION GALLERIES, PERFORATED DRAINS, ETC.)

CLEAN ALL SYSTEMS AS REQUIRED ON A REGULAR BASIS (MINIMUM ONCE PER YEAR), OR WHEN MONITORING INDICATES CLEANING IS REQUIRED, OR AS PER MANUFACTURER'S RECOMMENDATIONS.

CLEAN ALL SUMPS ON A REGULAR BASIS (MINIMUM ONCE PER YEAR), OR WHEN MONITORING INDICATES SUMPS ARE FILLING.

REPLACE PEA GRAVEL WHEN CLEANING FILTER CHAMBER(S). ENSURE SCREENS REMAIN INTACT.

GRADING & RETAINING WALL NOTES

1. ALL EARTHWORKS, CUT SLOPES, FILL SLOPES, RETAINING WALLS AND OVERALL SITE GRADE DESIGNS ARE TO BE REVIEWED AND APPROVED BEFORE CONSTRUCTION BY THE GEOTECHNICAL ENGINEER OF RECORD FOR THE PROJECT. FURTHER, THE CONSTRUCTION OF THESE WORKS MUST BE FIELD REVIEWED AND SIGNED OFF BY THE GEOTECHNICAL ENGINEER BEFORE SUBSTANTIAL COMPLETION IS GRANTED FOR THE PROJECT.
2. RETAINING WALLS SUPPORTING SOILS, STRUCTURES, ETC. WITHIN LOTS, TO BE LOCATED ENTIRELY ON THE LOTS.
3. SEE GEOTECHNICAL DRAWINGS FOR SPECIFIC DETAILS FOR TYPE OF WALLS, TIE-BACKS, BATTER, BLOCK CONFIGURATION, DRAINAGE, ETC.
4. RETURN RETAINING WALLS TO SUIT.
5. INSTALL HANDRAIL AS PER MMCD STD DWG C14, OR GUARD AS PER BUILDING CODE ON RETAINING WALLS EXCEEDING 600mm IN HEIGHT.
6. CONNECT RETAINING WALL DRAINAGE SYSTEMS TO PROPOSED STORM SEWER SYSTEMS.
7. ALL SLOPES TO BE VEGETATED UPON COMPLETION.
8. BACK YARDS TO BE SLOPED AT 2.0% AWAY FROM THE BUILDING.
9. THE LOT GRADING SHOWN HAS BEEN DETERMINED BASED ON THE BUILDINGS AND DRIVEWAYS BEING SIZED, LOCATED AND ELEVATED AS SHOWN, ASSUMING TYPICAL BUILDING PRACTICE.
10. DO NOT REVISE BUILDING AND/OR DRIVEWAY SIZES, LOCATIONS AND ELEVATIONS WITHOUT CONSULTING CITY BUILDING DEPARTMENT, ARCHITECT, CIVIL ENGINEER AND GEOTECHNICAL ENGINEER TO DETERMINE IMPACTS ON CIVIL WORKS, EARTH WORKS, GRADING AND RETAINING WALLS.
11. INDIVIDUAL LOTS SHALL BE GRADED IN ACCORDANCE WITH A LOT GRADING PLAN ACCEPTED BY THE CITY. NO RETAINING WALLS SHALL BE ALTERED OR RECONSTRUCTED ON INDIVIDUAL LOTS.
12. LAWN DRAINS AND AREAS SURROUNDING LAWN DRAINS TO BE GRADED TO PREVENT PONDING OF SURFACE WATER.

FOUNDATIONS

1. TOP OF CONCRETE SLAB / FOUNDATION STRUCTURE TO BE MINIMUM 0.2m HIGHER THAN EXTERNAL FINISHED ELEVATIONS.

STORM SERVICES

1. ALL RAIN WATER LEADERS, PERIMETER DRAINS, TRENCH DRAINS AND LAWN DRAINS FROM ALL LOTS TO BE CONNECTED TO THE STORM SEWERS UNLESS OTHERWISE INDICATED.
2. TRENCH DRAINS REQUIRED AS PART OF HOUSE CONSTRUCTION FOR DRIVEWAYS GRADED TOWARDS HOUSES.

BEFORE YOU DIG

INFORMATION ON THE DRAWINGS REGARDING EXISTING UTILITIES WAS COMPILED FROM MUNICIPAL RECORD DRAWINGS AND FIELD SURVEYS. THIS INFORMATION IS NOT NECESSARILY ACCURATE OR COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DATA BY EXPOSURE PRIOR TO ANY CONSTRUCTION AND TO IMMEDIATELY REPORT ANY DISCREPANCIES TO WEDLER ENGINEERING. PRIOR TO CONSTRUCTION, ALL TIE-IN INVERTS SHALL BE CONFIRMED, AND EXPOSURES PERFORMED WHERE THERE IS POTENTIAL FOR CONFLICTS BETWEEN EXISTING AND PROPOSED SERVICES. ANY COSTS RESULTING FROM THE CONTRACTOR'S FAILURE TO DO SO SHALL BE AT THE CONTRACTOR'S EXPENSE.

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REV	DESCRIPTION	YYYY-MM-DD	BY	REV	DESCRIPTION	YYYY-MM-DD	BY
A	ISSUED FOR PERMITTING	2018-01-10	AMJ				
B	ISSUED FOR TENDER	2018-02-21	AMJ				
C	ISSUED FOR BUILDING PERMIT	2018-04-30	AMJ				

LEGAL: BCS3022, SRW PLAN BCP36706

PROJ. MGR. JEF
DESIGN/DRAWN AMJ
PEER REVIEWED
HORIZ. SCALE
VERT. SCALE

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Surrey 1.604.588.1919

AQUADEL CROSSING JOINT VENTURE
WATER RESERVOIR EXPANSION
1777 COLUMBIA VALLEY ROAD, LINDELL BEACH, BC

STANDARD NOTES

DRAWING NO. C16-5365/D-01 OF -4-
LOCAL GOVERNMENT FILE -FILE-
PHASE
REVISION C

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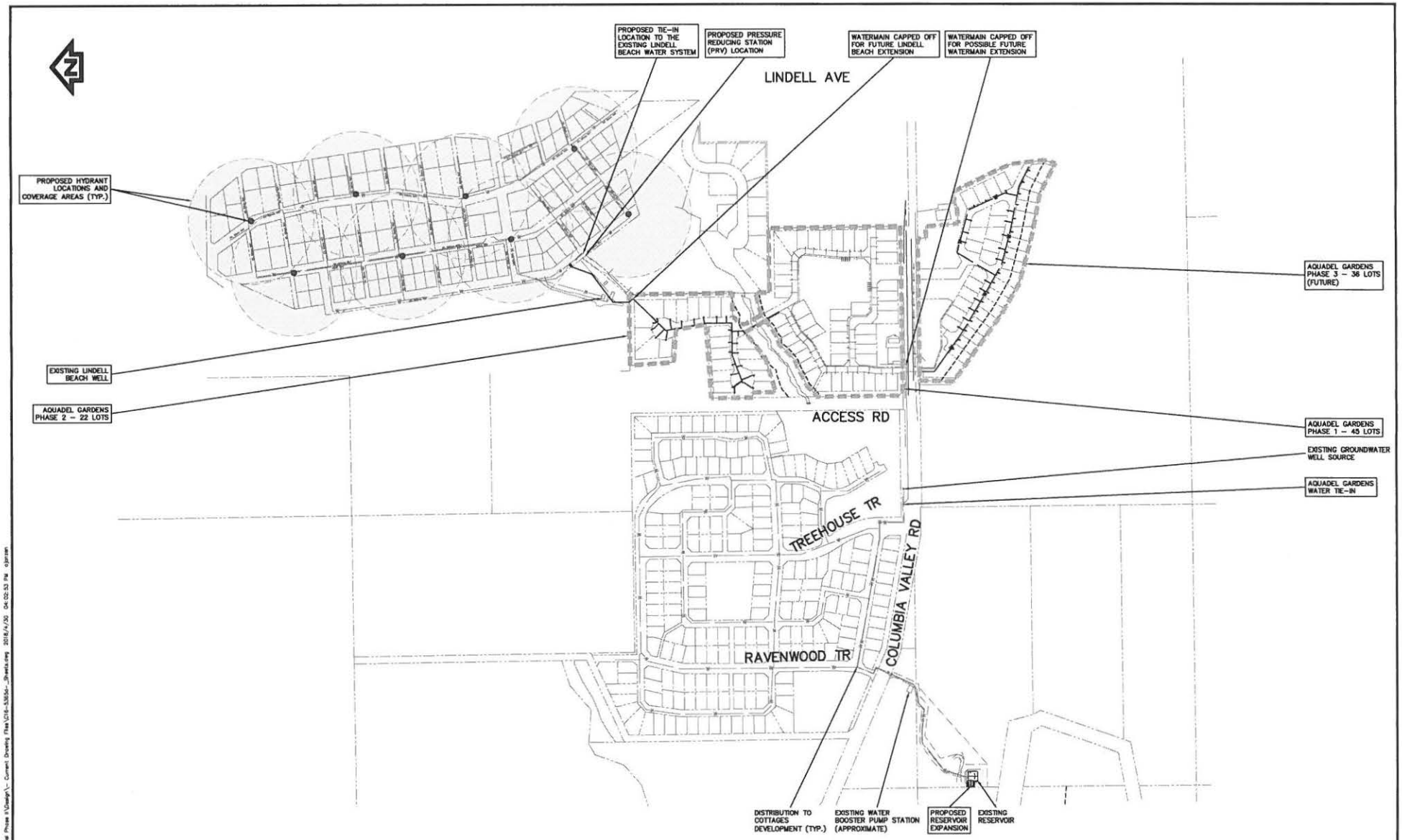

LEGAL:
BCS3022
SRW PLAN BCP38706

REV	DESCRIPTION	YYYY-MM-DD	BY
A	ISSUED FOR PERMITTING	2018-01-10	ASU
B	ISSUED FOR TENDER	2018-02-21	ASU
C	ISSUED FOR BUILDING PERMIT	2018-04-30	ASU

FIELD MGR. JDT
DESIGN/DRAWN ASU
PEER REVIEWED
HORIZ. SCALE 1:2500
VERT. SCALE

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AQUADEL CROSSING JOINT VENTURE
WATER RESERVOIR EXPANSION
1777 COLUMBIA VALLEY ROAD, LINDELL BEACH, BC
WATER SYSTEM CONTEXT PLAN

DRAWING NO. C16-5365/D-02
LOCAL GOVERNMENT FILE --FILE--
PHASE
REVISION C

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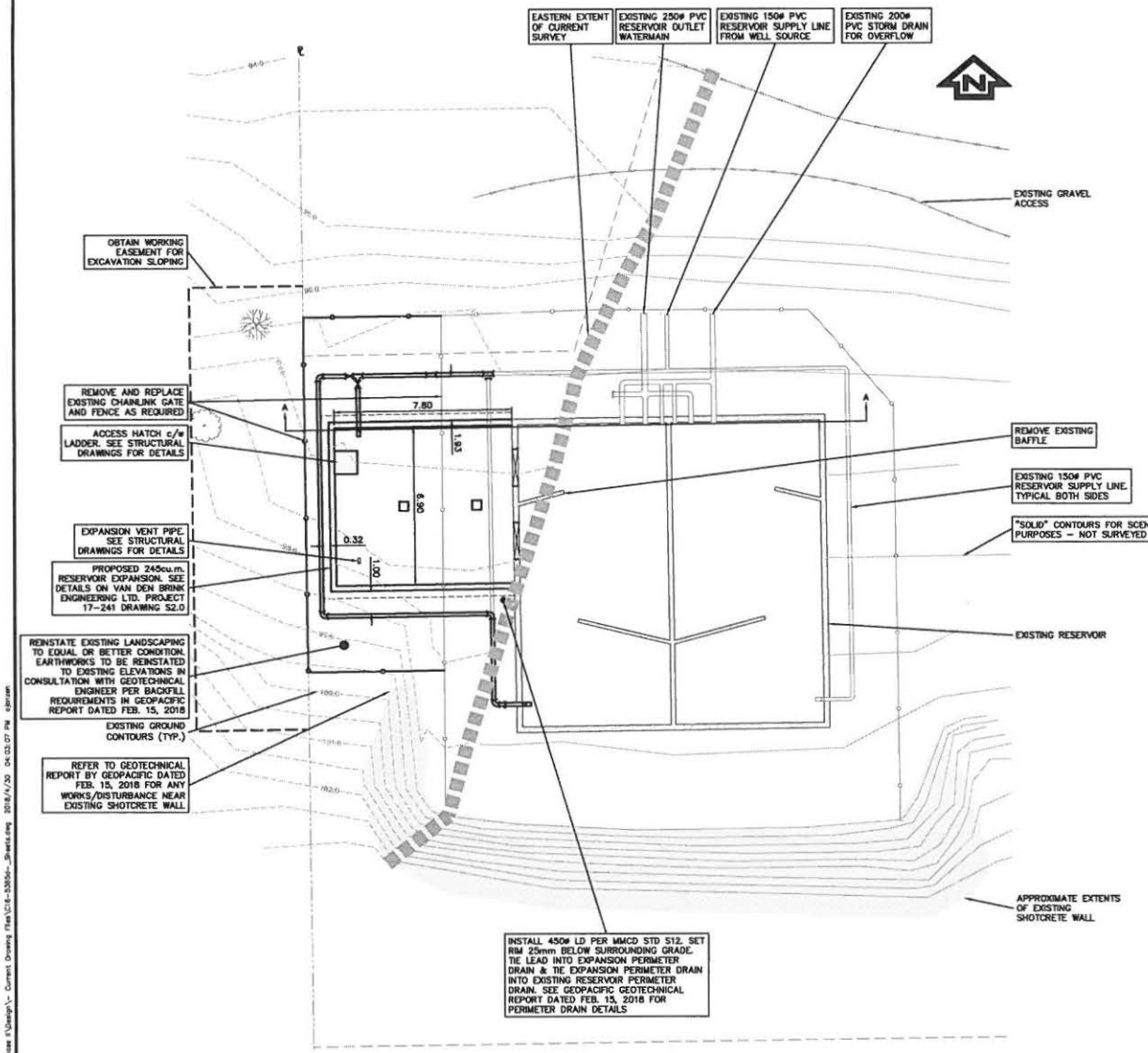

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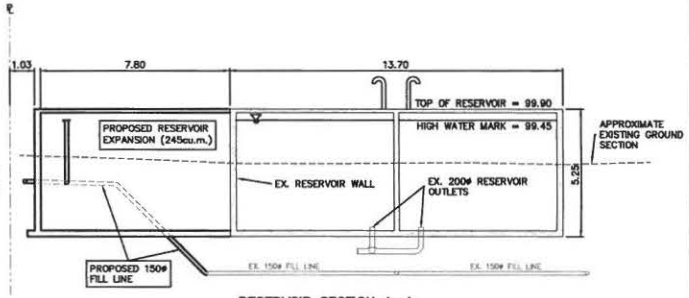

RESERVOIR SECTION A–A
N.T.S.

REV	DESCRIPTION	YYYY-MM-DD	BY
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B	ISSUED FOR TENDER	2018-02-01	ANJ
C	ISSUED FOR BUILDING PERMIT	2018-04-30	ANJ

LEGAL: BCS3022 SRW PLAN BCP36706

PROJ. MGR. JEF
DESIGN/DRAWN ANJ
PEER REVIEWED
HORIZ. SCALE AS SHOWN
VERT. SCALE

WEDLER ENGINEERING
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AQUADEL CROSSING JOINT VENTURE
WATER RESERVOIR EXPANSION
1777 COLUMBIA VALLEY ROAD, LINDELL BEACH, BC

RESERVOIR SITE PLAN

DRAWING NO. C16-5365/D-03 OF -6-
LOCAL GOVERNMENT FILE -FILE-
PHASE
REVISION C

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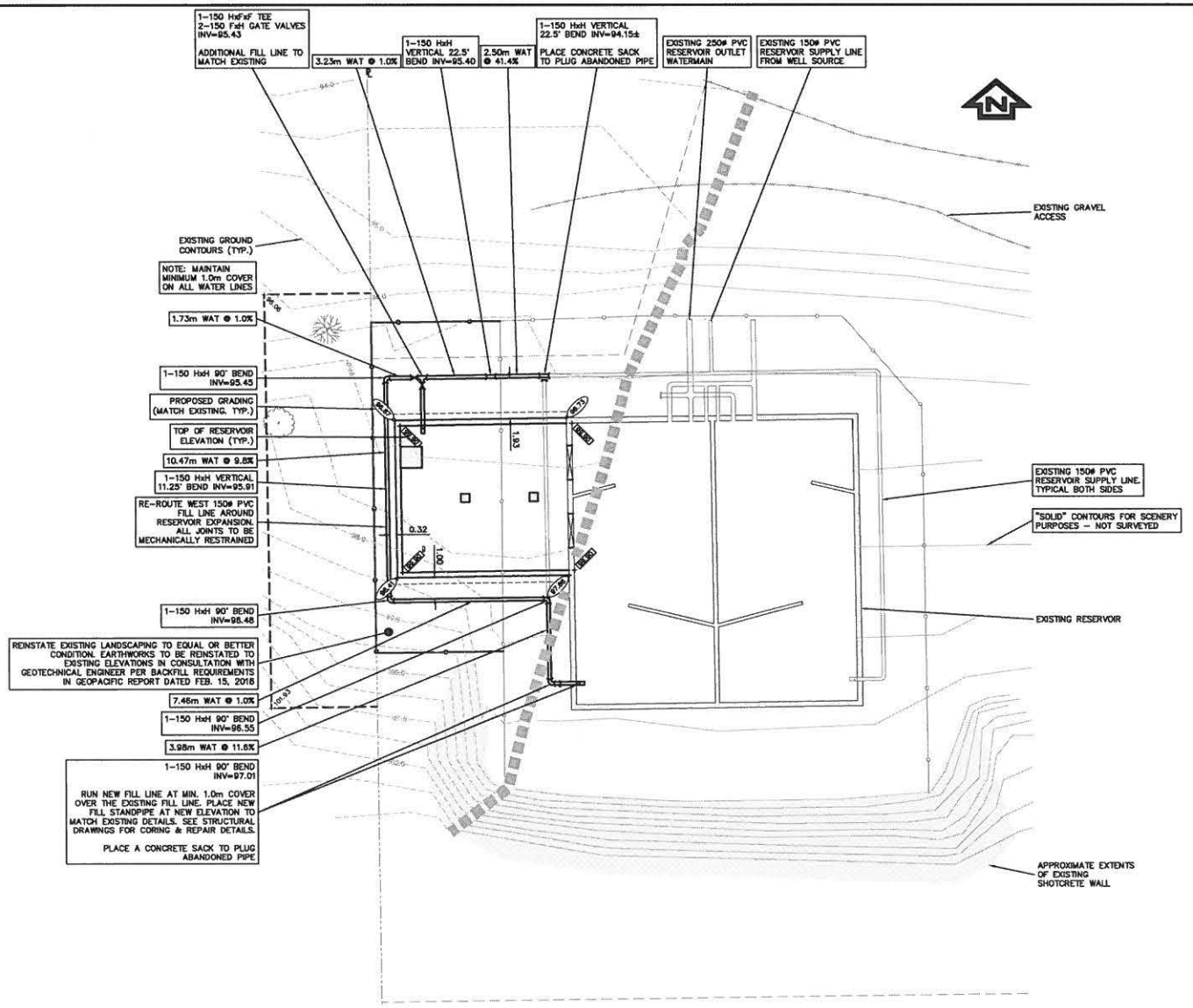

LEGAL:
BCS3022
SRW PLAN BCP36706

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A	ISSUED FOR PERMITTING	2018-01-10	ANJ
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PROJ. MGR. JEF
DESIGN/DRAWN ANJ
PEER REVIEWED
HORIZ. SCALE 1:100
VERT. SCALE

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AQUADEL CROSSING JOINT VENTURE
WATER RESERVOIR EXPANSION
1777 COLUMBIA VALLEY ROAD, LINDELL BEACH, BC

RESERVOIR GRADING & WATER DETAILS

DRAWING NO. C16-5365/D-04 OF -4-
LOCAL GOVERNMENT FILE -FILE-
PHASE
REVISION C

PROGRESS PRINT - NOT FOR CONSTRUCTION

STRUCTURAL IFC.

GENERAL:

CODING CODE: B.C. BUILDING CODE 2012 (PART 4), INCLUDING ALL AMENDMENTS.

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH MUNICIPAL BY-LAWS, B.C.B.C. 2012, AND W.C.B. REGULATIONS.

CONTRACTORS, SUPPLIERS, SUBTRADES, ETC. ARE TO ENSURE THEY ARE WORKING ON CURRENT DRAWINGS AND SHOULD VERIFY THAT THEY ARE IN POSSESSION OF LATEST ISSUE. DISCARD OBSOLETE DRAWINGS. DO NOT BUILD FROM DRAWINGS UNLESS THEY INDICATE "ISSUED FOR CONSTRUCTION".

ALL FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALE SHOWN ON PLANS, SECTIONS, AND DETAILS.

WHERE NOTES AND DETAILS ON DRAWINGS EXCEED MINIMUMS OF GENERAL NOTES AND TYPICAL DETAILS, THEY SHALL TAKE PRECEDENCE.

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS, ELEVATIONS, AND CONDITIONS PRIOR TO STARTING CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES OR INCONSISTENCY BETWEEN STRUCTURAL DRAWINGS AND ARCHITECTURAL DRAWINGS. ANY DISCREPANCIES NOT REPORTED BECOME THE RESPONSIBILITY OF THE CONTRACTOR.

THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING, DURING THE BIDDING PERIOD, OF ANY DISCREPANCIES OR OMISSIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS. UPON RECEIPT OF SUCH INFORMATION, THE ENGINEER WILL PROVIDE WRITTEN CLARIFICATION. ANY SUCH DISCREPANCY, OMISSION, OR VARIATION NOT REPORTED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND CORRECTIVE WORK SHALL BE PERFORMED AS DIRECTED BY THE ENGINEER.

IF SITE CONDITIONS DIFFER FROM THOSE ANTICIPATED OR AS SHOWN ON THE DRAWINGS (BUILDINGS, BUILDING COMPONENTS, PROPERTY LINES, SOIL CONDITIONS, ETC.), THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER FOR CORRECTIVE OR REMEDIAL WORK. FAILURE TO NOTIFY ENGINEER WILL MAKE THE CONTRACTOR RESPONSIBLE FOR ALL CONDITIONS AND COSTS ASSOCIATED.

THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE CORRECTION OF DEFICIENCIES, AS DIRECTED BY THE ENGINEER.

REVIEW OF THE WORK, OR ANY PORTION THEREOF, BY THE ENGINEER SHALL NOT, IN ANY WAY, RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY AND OBLIGATION TO COMPLY WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS.

STRUCTURAL ELEMENTS PRESENTED ON THESE DRAWINGS ARE FOR PERMANENT STRUCTURE/FOUNDATION ONLY. TEMPORARY GEOTECHNICAL REQUIREMENTS ARE NOT INCLUDED.

THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY BRACING REQUIRED FOR CONSTRUCTION LOADINGS AND STABILITY UNTIL THE PROJECT IS COMPLETED.

THE DESIGN AND INSPECTION OF FALSEWORK, SHORING, AND RESHORING ARE THE RESPONSIBILITY OF THE CONTRACTOR AS REQUIRED BY WORKERS' COMPENSATION BOARD AND AS REQUIRED TO KEEP THE STRUCTURE PLUMB AND LEVEL DURING CONSTRUCTION.

THE CONTRACTOR IS RESPONSIBLE FOR SAFETY ON THE JOB SITE AND CONFORMANCE TO W.C.B. REGULATIONS DURING CONSTRUCTION.

STRUCTURAL INFORMATION PRESENTED ON THESE DRAWINGS DOES NOT INCLUDE THE DESIGN AND DETAILING OF ANY WATERPROOFING SYSTEMS. REFER TO ARCHITECTURAL DRAWINGS FOR THIS INFORMATION.

MECHANICAL, ELECTRICAL, CIVIL AND GEOTECHNICAL ENGINEERING REQUIREMENTS ARE NOT INCLUDED ON THESE DRAWINGS AND ARE THE RESPONSIBILITY OF OTHERS.

SEE MECHANICAL, ELECTRICAL, AND/OR MANUFACTURER'S DRAWINGS FOR EQUIPMENT PAD SIZES AND LOCATIONS AND FOR SIZES AND LOCATION OF OPENINGS IN FLOORS AND WALLS.

OPENINGS, POCKETS, ETC. SHALL NOT BE PLACED IN SLABS, DECKS, BEAMS, JOISTS, COLUMNS, WALLS, ETC. UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS. NOTIFY THE STRUCTURAL ENGINEER WHEN MECHANICAL/ELECTRICAL DRAWINGS SHOW OPENINGS, POCKETS, ETC. BUT ARE NOT LIKEWISE SHOWN ON THE STRUCTURAL DRAWINGS.

SEE MECHANICAL, ELECTRICAL, AND/OR MANUFACTURER'S DRAWINGS FOR SIZE, LOCATION, AND ANCHOR BOLT REQUIREMENTS OF ALL MACHINE BASES. ALL DESIGN OF MACHINE AND EQUIPMENT BASES IS THE RESPONSIBILITY OF OTHERS, UNLESS SPECIFICALLY DETAILED ON STRUCTURAL DRAWINGS. ALL CONTRACTORS TO FURNISH TEMPLATES TO GENERAL CONTRACTOR SHOWING ANCHOR BOLT LOCATION FOR EQUIPMENT FURNISHED BY THEM.

REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR GRADES, FLOOR AND ROOF ELEVATIONS AND SLOPES, AND FOR DIMENSIONS AND LOCATIONS OF DOORS, WINDOWS, RECESSES, SLEEVES, EQUIPMENT, SHAFTS, INSERTS, NAILERS, CHAMFERS, ETC. GRADES, ELEVATIONS AND SLOPES SHOWN ON STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY AND MUST BE CONFIRMED. MAINTAIN STRUCTURAL THICKNESSES INDICATED.

CHARGES FOR EXTRAS TO THE CONTRACT AMOUNT MUST BE BROUGHT TO THE CONSULTANT'S ATTENTION BEFORE THE WORK PROCEEDS. ADEQUATE TIME MUST BE ALLOWED FOR REVIEW AND APPROVAL OF EXTRAS BY THE CONSULTANT. WORK WHICH PROCEEDS PRIOR TO APPROVAL BY THE CONSULTANT MAY NOT BE APPROVED FOR EXTRA PAYMENT.

DESIGN LOADS:

LOADS INDICATED ARE SPECIFIED LOADS:

	DEAD	SNOW	LIVE
SUSPENDED SLAB	125 PSF	–	100 PSF

$S_s(a = 80.8$ PSF, $S_r = 8.4$ PSF, $I_s(ULS) = 1.25$ (POST DISASTER), $C_b = 0.6$, $C_s = 1.0$, $C_a = 1.0$)

HOURLY WIND PRESSURES ($q_{(hr)}$) = 9.8 PSF, $I_w = 1.25$ ULS (POST DISASTER)

SEISMIC DATA:
- $S_a(0.2) = 0.685$
- $S_a(0.5) = 0.563$
- $S_a(1.0) = 0.290$
- $S_a(2.0) = 0.150$
- PGA = 0.328
- Rd = 2.0
- Ro = 1.4
- $I_E = 1.5$ (POST DISASTER)

THE CONTRACTOR MUST ENSURE THAT CONSTRUCTION LOADS IMPOSED ON THE STRUCTURE DO NOT EXCEED THE SPECIFIED DESIGN LIVE LOADS NOTED ABOVE.

SHOP DRAWING REVIEW:

SHOP DRAWINGS TO BE SUBMITTED MINIMUM 10 WORKING DAYS PRIOR TO REQUIRED DATE OF REVIEW AND APPROVAL BY THE ENGINEER.

SHOP DRAWINGS SHALL BE COMPLETE AT THE TIME OF SUBMISSION. REFER TO MATERIAL SECTIONS FOR REQUIREMENTS WITH RESPECT TO ENGINEER'S SEAL ON SHOP DRAWINGS. DRAWINGS REQUIRING SEAL AND WHICH ARE NOT SEALED MAY BE RETURNED WITHOUT REVIEW.

SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER BY THE GENERAL CONTRACTOR OR ARCHITECT ONLY, UNLESS DIRECTED OTHERWISE.

SHOP DRAWINGS WILL BE RETURNED TO THE GENERAL CONTRACTOR OR ARCHITECT ONLY, UNLESS DIRECTED OTHERWISE.

FOR SPECIFIC SHOP DRAWING SUBMITTAL REQUIREMENTS, SEE APPROPRIATE MATERIAL SECTIONS.

THE SHOP DRAWING REVIEW PERFORMED BY THE DESIGNER WILL BE FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN CONCEPTS ONLY.

THIS REVIEW SHALL NOT MEAN THAT THE ENGINEER APPROVES THE DETAIL DESIGN INHERENT IN THE SHOP DRAWINGS, RESPONSIBILITY FOR WHICH SHALL REMAIN WITH THE CONTRACTOR AND/OR FABRICATOR SUBMITTING SAME. THIS REVIEW SHALL NOT RELIEVE THE CONTRACTOR AND/OR FABRICATOR OF HIS RESPONSIBILITY FOR OMISSIONS IN THE SHOP DRAWINGS OR OF HIS RESPONSIBILITY FOR MEETING ALL REQUIREMENTS OF THE CONSTRUCTION AND CONTRACT DOCUMENTS.

THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE JOB SITE FOR INFORMATION THAT PERTAINS SOLELY TO FABRICATION PROCESSES OR TECHNIQUES OF CONSTRUCTION AND INSTALLATION AND FOR COORDINATION OF THE WORK OF ALL SUB-TRADES.

FIELD REVIEW:

VAN DEN BRINK ENGINEERING PROVIDES FIELD REVIEWS ONLY FOR THE WORK SHOWN ON STRUCTURAL DRAWINGS PREPARED BY VAN DEN BRINK ENGINEERING. THIS REVIEW IS A PERIODIC REVIEW AT THE JUDGMENT OF VAN DEN BRINK ENGINEERING. THE PURPOSE IS TO ASCERTAIN THAT THE WORK IS IN GENERAL CONFORMANCE WITH THE PLANS AND SUPPORTING DOCUMENTS PREPARED BY VAN DEN BRINK ENGINEERING, AND FACILITATE COMPLETION OF THE LETTERS OF ASSURANCE REQUIRED BY BUILDING CODE AUTHORITIES. FIELD REVIEWS BY VAN DEN BRINK ENGINEERING ARE NOT CARRIED OUT FOR THE BENEFIT OF THE CONTRACTOR(S), NOR DOES THE FIELD REVIEW MAKE VAN DEN BRINK ENGINEERING GUARANTORS OF THE CONTRACTOR(S) WORK. IT REMAINS THE CONTRACTOR(S) SOLE RESPONSIBILITY TO PROVIDE IT'S OWN QUALITY CONTROL AND TO PERFORM THE WORK WITH GOOD WORKMANSHIP AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS.

THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CHECKING OF ITS SUB-CONTRACTOR'S WORK PRIOR TO FIELD REVIEW BY THE ENGINEER.

IN ORDER TO CARRY OUT FIELD REVIEWS IN ACCORDANCE WITH B.C.B.C. 2012, THE ENGINEER SHALL BE NOTIFIED A MINIMUM OF 24 HOURS PRIOR TO ALL CONCRETE POURS, ALL MASONRY GROUT POURS AND PRIOR TO COVERING ANY STRUCTURAL FRAMING OR COMPONENTS.

THE CONTRACTOR SHALL NOTIFY THE TRUSS MANUFACTURER TO INSPECT ALL TRUSSES AND PROVIDE A SEALED CERTIFICATE FOR INSTALLATION AND MANUFACTURE PRIOR TO INSTALLATION OF ANY ROOF MEMBRANE.

THE CONTRACTOR SHALL ENSURE, THAT PRIOR TO NOTIFYING THE ENGINEER, ALL WORK MUST BE COMPLETE, INCLUDING BACKFRAMING, AND IN PLACE.

ADDITIONAL FIELD REVIEW REQUIRED BY THE ENGINEER DUE TO INCOMPLETE WORK OR DEFICIENCIES SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

REFER TO MATERIALS SECTIONS FOR INSPECTION REQUIREMENTS RELATED TO SPECIFIC MATERIALS.

FOUNDATIONS:

FOUNDATIONS HAVE BEEN DESIGNED BASED ON THE GEOTECHNICAL REPORT DATED FEBRUARY 15, 2018 PROVIDED BY GEOPACIFIC CONSULTANTS LTD:

SOIL BEARING PRESSURE: SLS = 3,000 PSF (150 KPa)
ULS = 4,700 PSF (225 KPa)

BOTTOM OF ALL FOOTINGS TO BE MINIMUM 460mm BELOW FINAL FINISHED GRADE FOR FROST COVER.

ALL STRIP FOOTINGS TO BE MINIMUM 450mm WIDE. ALL PAD FOOTINGS TO BE MINIMUM 600mm WIDE.

SOIL SITE CLASS D

PREPARE SITE FOR FOUNDATIONS IN ACCORDANCE WITH GEOTECHNICAL REPORT RECOMMENDATIONS.

MAINTAIN MAXIMUM SLOPE OF 2.0 HORIZ. TO 1.0 VERT. BETWEEN UNDERSIDE OF ADJACENT FOOTINGS (NEW AND/OR EXISTING) OR AS INDICATED BY THE GEOTECHNICAL ENGINEER.

APPROVAL TO PLACE CONCRETE IN THE FOOTINGS BY THE STRUCTURAL ENGINEER DOES NOT IMPLY ACCEPTANCE OF BEARING CAPACITY ON SUBGRADE CONDITIONS. IN ANY EVENT, FOOTINGS ARE TO BEAR ON FIRM, UNDISTURBED MATERIAL. GRASS, ROOTS, ROOT NETWORKS, TOP SOIL, ETC., ARE TO BE REMOVED FROM FOUNDATION AREA. ANY FOOTINGS BEARING ON COMPACTED, GRANULAR FILL SHALL BE AS SPECIFIED BY THE GEOTECHNICAL ENGINEER AND SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER.

FOUNDATION BEARING SURFACES MUST BE PROTECTED FROM FREEZING AT ALL TIMES.

FOOTING TO BE CENTERED UNDER COLUMNS AND WALLS UNLESS SPECIFICALLY NOTED OTHERWISE.

DESIGN AND INSPECTION OF FOUNDATION AND SITE DRAINAGE IS THE RESPONSIBILITY OF OTHERS.

PROVIDE DRAINAGE BEHIND ALL STRUCTURAL WALLS WITH DRAIN TILE TIED INTO MECHANICAL DRAINAGE SYSTEM.

BASEMENT AND RETAINING WALLS HAVE BEEN DESIGNED TO RESIST LATERAL PRESSURES FOR LEVEL, FREE DRAINING, MODERATELY COMPACTED, GRANULAR BACKFILL OR AS SPECIFIED BY GEOTECHNICAL ENGINEER.

DO NOT PROCEED WITH BACKFILL OF BASEMENT WALLS AND RETAINING WALLS UNTIL MINIMUM 7 DAYS AFTER THE COMPLETION OF INTERIOR FLOOR SYSTEMS AND/OR SUSPENDED SLAB, INCLUDING SLAB-ON-GRADE, UNLESS WALLS ARE ADEQUATELY BRACED. BRACING DESIGN IS THE RESPONSIBILITY OF THE CONTRACTOR'S ENGINEER.

PROVIDE MINIMUM 6 INCH LAYER OF FREE DRAINING COMPACTED BACKFILL UNDER SLAB-ON-GRADE.

PROVIDE 6-MIL POLY VAPOR BARRIER UNDER ALL SLABS ON GRADE WHERE INDICATED ON DRAWINGS. APPROVAL TO REMOVE THE POLY VAPOUR BARRIER MUST BE CONFIRMED, IN WRITING, BY BOTH THE GEOTECHNICAL ENGINEER AND THE ARCHITECT.

CONCRETE:

CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF CSA A23.1-09 AND CSA A23.3-09.

BEFORE ANY CONCRETE IS PLACED, THE CONTRACTOR SHALL GIVE THE ENGINEER 24 HOURS NOTICE IN ORDER TO CARRY OUT FIELD REVIEW OF PLACED REINFORCEMENT.

PROPORTION READY MIXED CONCRETE IN ACCORDANCE WITH CSA A23.1-09 ALTERNATE 1, TABLE 5 TO MEET THE FOLLOWING REQUIREMENTS:

LOCATION	COMP. MIN 28 DAY STRENGTH (MPa)	SLUMP MAX. AGG. (mm)	AIR SIZE (mm)	EXP. CONTENT(%)	CLASS
WATER RESERVOIR TANK FOUNDATION SLAB, WALLS & SUSPENDED SLAB	35*	70	20	4-7	F-2

* CONCRETE WATER RESERVOIR TANK MIXES ARE TO BE REVIEWED AND APPROVED BY THE CONCRETE TESTING CONSULTANT PRIOR TO PLACEMENT. CONCRETE MIX TYPE AND INTERNAL MEMBRANE IS TO BE CONFIRMED BY THE TESTING CONSULTANT TO ENSURE THE MIX, PLACEMENT PROCEDURES, AND CURING WILL ENABLE THE TANKS TO PASS THE REQUIRED LEAK TEST, WITH MINIMAL CONCRETE SHRINKAGE. REFER TO ADDITIONAL CONCRETE SPECIFICATIONS ON DRAWING S2.0.

ALL CONCRETE SHALL BE NORMAL DENSITY TYPE GU CEMENT UNLESS OTHERWISE NOTED.

SUBMIT PROPOSED MIX DESIGNS TO MATERIALS CONSULTANT/ TESTING AGENCY FOR REVIEW. MATERIALS CONSULTANT AGENCY TO PROVIDE LETTER TO STRUCTURAL ENGINEER CONFIRMING PROPOSED MIX DESIGNS MEET PROJECT SPECIFICATIONS.

SLUMPS NOTED ARE BEFORE THE ADDITION OF SUPERPLASTICIZER.

DO NOT ADD WATER TO THE CONCRETE ON SITE WITHOUT PRIOR APPROVAL BY THE MATERIALS CONSULTANT/TESTING AGENCY.

NO MORE THAN 120 MINUTES SHALL ELAPSE BETWEEN CONCRETE BATCHING AND CONCRETE PLACEMENT UNLESS APPROVED BY THE MATERIALS CONSULTANT/TESTING AGENCY AND THE STRUCTURAL ENGINEER. MATERIAL CONSULTANT/TESTING AGENCY HAS THE AUTHORITY TO REJECT CONCRETE IF NOT IN ACCORDANCE WITH SPECIFICATIONS.

DO NOT USE ADMIXTURES EXCEPT AS FOLLOWS OR AS APPROVED BY ENGINEER:
- DO NOT USE CHLORIDE-TYPE ADMIXTURES.
- WATER-REDUCING AGENT, TYPE WR, IN ACCORDANCE WITH CSA A266.4-M78.
- AIR-ENTRAINING AGENT AS REQUIRED FOR SPECIFIED EXPOSURE CLASSIFICATION.
- SUPERPLASTICIZING AGENT IN ACCORDANCE WITH CSA A266.5-M1981.

CONCRETE TEMPERATURES AS DELIVERED SHALL COMPLY WITH TABLE 14 OF CSA A23.1-09.

FOR CONCRETE IN CONTACT WITH SULPHATE TYPE SOILS INCLUDE REQUIREMENTS OF TABLES 2&3 AND SECTION 4.1.1.8 OF CSA A23.1-09.

PROVIDE STORAGE FACILITY ON SITE FOR THE INITIAL CURING OF TEST CYLINDERS.

THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE STRUCTURAL DESIGN AND CONSTRUCTION OF FALSEWORK IN ACCORDANCE WITH CSA S269.1-1975 AND FORMWORK IN ACCORDANCE WITH CAN/CSA-S86.1-M93.

LEAVE FORMWORK IN PLACE FOR THE FOLLOWING MINIMUM PERIODS OF TIME AFTER PLACING CONCRETE:
- 10 DAYS FOR BEAM SOFFITS, SLABS, DECKS AND OTHER STRUCTURAL MEMBERS, OR 7 DAYS WHEN REPLACED IMMEDIATELY WITH ADEQUATE SHORING TO STANDARD SPECIFIED FOR FALSEWORK. ALSO, VAN DEN BRINK ENGINEERING IS TO REVIEW THE 7 DAY CONCRETE TEST CYLINDER RESULTS TO ENSURE TESTS MEET OR EXCEED 70% OF SPECIFIED 28 DAY COMPRESSIVE STRENGTHS AND TO INFORM CONTRACTOR IF ADDITIONAL SHORING WILL BE REQUIRED TO BE INSTALLED UNTIL CONCRETE REACHES FULL STRENGTH.

WHERE NOTED ON DRAWINGS VERTICAL AND HORIZONTAL CONSTRUCTION JOINTS BELOW GRADE SHALL HAVE CONTINUOUS BENTONITE (VOLCLAY RX-102 OR APPROVED EQUAL) WATER STOPS.

ALL CONSTRUCTION JOINTS IN STRUCTURAL MEMBERS TO BE APPROVED BY THE ENGINEER FOR LOCATION AND DETAIL PRIOR TO CONSTRUCTION. FLEXURAL REINFORCEMENT TO CONTINUE UNINTERRUPTED THROUGH ALL CONSTRUCTION JOINTS. KEYWAYS TO BE PROVIDED IN ALL JOINTS.

REMOVE ALL CONSTRUCTION DEBRIS FROM FORMS OR SLAB ON GRADE PRIOR TO PLACING CONCRETE.

CONCRETE SHALL BE CURED IN ACCORDANCE WITH CSA A23.1-09.

CONCRETE SHALL BE PROTECTED FROM ALL HARMFUL EFFECTS DURING CONSTRUCTION.

PROVIDE HOT AND COLD WEATHER PROTECTION IN ACCORDANCE WITH REQUIREMENTS OF CSA A23.1-09. ANY PROPOSED CHANGES FROM THESE REQUIREMENTS MUST BE APPROVED IN WRITING BY THE MATERIAL CONSULTANT/TESTING AGENCY.

SPECIAL CONSTRUCTION PROCEDURES FOR CONCRETE WORK IN ADVERSE WEATHER CONDITIONS SHALL BE APPROVED BY THE MATERIALS CONSULTANT/TESTING AGENCY AND BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO COMMENCING WITH THE WORK. THIS INCLUDES CONCRETE CAST DURING WEATHER BELOW 5° CELSIUS OR ABOVE 25° CELSIUS. WORK UNDERTAKEN WITHOUT SUCH REVIEW SHALL BE THE RISK OF THE CONTRACTOR ALONE. A CONCRETE SEALER (COMPATIBLE WITH THE BOND BREAKER USED FOR CASTING TILT-UP PANELS) SHALL BE APPLIED TO SLABS CAST IN DRY WEATHER ABOVE 25° CELSIUS.

IF SITE CONDITIONS DIFFER FROM THOSE SHOWN ON DRAWINGS, THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO PLACING ANY REINFORCEMENT FOR ADDITIONAL INSTRUCTION ON REMEDIAL DETAILS.

CHAIRS FOR REINFORCEMENT IN EXPOSED SOFFITS OR OTHER AREAS EXPOSED TO WEATHER, PARKING, SWIMMING POOLS, ETC., AND VIEW SHALL BE PLASTIC OR EPOXY COATED.

CONCRETE TESTING SHALL BE DONE IN ACCORDANCE WITH CSA-A23.2, AT THE EXPENSE OF THE CONTRACTOR, BY AN INDEPENDENT TESTING AGENCY.

A MINIMUM OF 3 TEST CYLINDERS SHALL BE CAST FOR EACH 100 CU. METERS. MINIMUM 3 TEST CYLINDERS FOR EACH POUR AND EACH CLASS OF CONCRETE. TEST 1 CYLINDER AT 7 DAYS AND 2 CYLINDERS AT 28 DAYS. ONE ADDITIONAL CYLINDER IN EACH SET SHALL BE FIELD CURED AND TESTED AT 7 DAYS FOR ALL SUSPENDED SLABS, TILT-UP PANELS AND CONCRETE POURED IN TEMPERATURE BELOW 5 DEGREES CELSIUS. FOR TILT-UP PANELS PROVIDE ONE ADDITIONAL TEST OF 3 ACCUMULO CYLINDERS.

SUBMIT COPIES OF ALL TEST RESULTS TO ENGINEER, MAXIMUM 48 HOURS AFTER TEST.

CONCRETE REINFORCING:

ALL CONCRETE REINFORCING SHALL CONFORM TO CSA G.30.18-M92 UNLESS NOTED OTHERWISE. 10M AND LARGER SHALL BE GRADE 400 (Fy = 400 MPa) BARS. ALL REINFORCING TO BE WELDED SHALL BE GRADE 400W, WITH WELDING TO CONFORM TO CSA W186-M1990.

WELDED WIRE FABRIC TO CONFORM TO CSA G30.5-1983 (R1991) AND TO BE GRADE 400.

WELDED DEFORMED WIRE FABRIC TO CONFORM TO CSA G30.15-M1983 (R1991) AND TO BE GRADE 400.

REINFORCING STEEL TO BE CLEAN AND UNSEAMED.

REINFORCING STEEL TO BE DETAILED AND ALL PLACING, SPLICING, AND SETTING OR SUPPORTS MUST BE IN ACCORDANCE WITH LATEST EDITION OF REINFORCING STEEL MANUAL OF STANDARD PRACTICE BY REINFORCING STEEL INSTITUTE OF CANADA.

MINIMUM LAPS OF REINFORCEMENT UNLESS INDICATED OTHERWISE TO BE:

BAR SIZE	COLUMNS LAPS	TYP. CONCRETE LAP LESS THAN 12" CONCRETE BELOW LAP	TYP. CONCRETE LAP MORE THAN 12" CONCRETE BELOW LAP
10M	N/A	17"	20"
15M	18"	33"	40"
20M	23"	39"	47"
25M	30"	46"	60"
30M	35"	55"	72"
35M	41"	64"	84"

(LAP LENGTHS FOR EPOXY COATED REBAR WILL BE GREATER THAN THOSE SHOWN ABOVE. REFER TO DRAWINGS.)

WHERE LAP DIMENSIONS ARE SHOWN ON DRAWINGS, SUCH DIMENSIONS SHALL GOVERN.

NO SPLICES PERMITTED WITHOUT THE ENGINEER'S APPROVAL, WHERE THE LENGTH OF BARS HAS BEEN GIVEN ON THE DRAWINGS.

UNLESS NOTED OTHERWISE ON DRAWINGS, HORIZONTAL STEEL TO BE CONTINUOUS AROUND CORNERS AND LAPPED.

MINIMUM LAP OF MESH SHALL BE ONE FULL MESH.

REINFORCEMENT SHALL BE PLACED TO THE TOLERANCES SPECIFIED IN CSA A23.1-04.

REINFORCING TO HAVE CLEAR CONCRETE COVER AS FOLLOWS OR AS NOTED ON DRAWINGS:

CONCRETE CAST AGAINST EARTH (BOTTOM OF FOOTINGS) AND SLAB ON GRADE.	3"
FORMED CONCRETE EXPOSED TO EARTH (SIDES & TOPS OF FTGS)	2"
BEAMS, COLUMNS AND PILASTERS EXPOSED TO EARTH OR WEATHER (COVER TO TIES OR STIRRUPS)	1 1/2"

	FIRE RATING (1 1/2 hr.)	(2hr)	(3hr)	(4hr)
BEAMS, COLUMNS AND PILASTERS NOT EXPOSED TO EARTH OR WEATHER (COVER TO TIES OR STIRRUPS)	1 1/4"	1 1/2"	1 1/2"	2"
SLABS AND WALLS EXPOSED TO EARTH OR WEATHER:				
20M AND SMALLER	1 1/4"	1 1/4"	1 1/4"	1 1/2"
25M	1 1/2"	1 1/2"	1 1/2"	1 1/2"
30M	1 3/4"	1 3/4"	1 3/4"	1 1/2"
35M	2"	2"	2"	2"
SLABS AND WALLS NOT EXPOSED TO EARTH OR WEATHER:				
20M AND SMALLER	3/4"	1"	1 1/4"	1 1/2"
25M	1"	1"	1 1/4"	1 1/2"
30M	1 1/4"	1 1/4"	1 1/4"	1 1/2"
35M	1 1/2"	1 1/2"	1 1/2"	1 1/2"

REINFORCEMENT MUST BE CLEAN AND FREE FROM ANY SUBSTANCE WHICH MAY HASTEN RUSTING OR REDUCE CONCRETE BOND. ANY QUESTIONABLE MATERIALS TO BE CLEANED OR REPLACED AT THE CONTRACTOR'S EXPENSE TO THE ENGINEER'S SATISFACTION.

WHERE CONCRETE SURFACES ARE TO BE EXPOSED, ONLY NON-CORROSIVE TYPE REINFORCING CHAIRS SHALL BE USED TO SUPPORT REINFORCING.

ALL REINFORCEMENT TO BE CHAIRED AND TIED IN ITS FINAL POSITION IN ACCORDANCE WITH THE DRAWINGS AT NOT MORE THAN 3 FT. CENTERS TO PREVENT ANY MOVEMENT DURING THE PLACEMENT OF CONCRETE. STAPLE ALL CHAIRS TO FORMWORK PRIOR TO PLACING CONCRETE.

TEMPERATURE REINFORCEMENT IS REQUIRED IN EACH DIRECTION IN ALL NON-POST-TENSIONED SLABS. PROVIDE THE FOLLOWING MINIMUM AMOUNTS UNLESS OTHERWISE INDICATED:

SLAB THICKNESS	TEMPERATURE REINFORCEMENT
5" OR LESS	10M @ 12"
6" TO 7"	15M @ 18"
7" TO 8"	15M @ 18"
8" TO 9"	15M @ 17"
9" TO 10"	15M @ 15"
10" TO 11"	15M @ 14"
11" TO 12"	15M @ 13"
12" TO 13"	15M @ 11"
13" TO 14"	15M @ 11"
14" TO 15"	15M @ 10"
15" TO 16"	15M @ 9"
16" TO 17"	15M @ 8"
17" TO 18"	15M @ 8"
18" TO 20"	20M @ 12"

(LAP ALL TEMPERATURE REINFORCING AS PER LAP LENGTHS SHOWN IN THIS SECTION.)

REINFORCING STEEL ON DRAWINGS SHOW THUS:
TOP BARS – SOLID LINE ———
BOTTOM BARS – BROKEN LINE - - - -

ALL ENDS OF WALLS SHALL HAVE TWO EXTRA 15M VERTICAL BARS OR AS NOTED ON DRAWINGS.

ALL EDGES OF CANTILEVERED SLABS TO HAVE 3-15M CONTINUOUS, PARALLEL TO EDGE.

PROVIDE ADDITIONAL 4-20M CONTINUOUS TOP BARS ON ALL SLAB BANDS. LAP 3'-0" AT MIDSPAN BETWEEN COLUMNS AND HOOK 1'-0" WHERE SLAB BAND TERMINATES AT END WALL.

OPENINGS IN SLABS AND WALLS TO HAVE TWO 15M EXTRA BARS EACH SIDE, EXTENDING 24" PAST CORNERS, PLUS ONE 15M X 48" DIAGONAL EACH CORNER, UNLESS NOTED OTHERWISE.

NO OPENINGS OR CANS FOR PIPES IN A SUSPENDED SLAB TO BE CLOSER THAN 400 MM TO FACE OF COLUMNS WITHOUT PRIOR APPROVAL BY THE ENGINEER.

REINFORCING AT OPENINGS SHALL NOT BE CUT OR BENT, BUT SHALL BE DISPLACED TO OTHER SIDE TO CLEAR OPENINGS.

COORDINATE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS FOR EXACT LOCATION OF OPENINGS, CURBS, SLEEVES, WATERPROOFING, ETC.

DOWELS IN FOOTINGS TO MATCH SIZE AND SPACING OF VERTICAL BARS ABOVE.

PROVIDE DOWELS INTO COLUMNS TO CORRESPOND WITH SIZE AND NUMBER AS SPECIFIED ON THE DRAWING.

ALL SUMPS, PITS, TRENCHES, ETC. TO HAVE 6" WALLS AND BASE SLAB. REINFORCE WITH 10M @ 18" EACH WAY UNLESS NOTED OTHERWISE.

OBTAIN APPROVAL FROM ENGINEER FOR ANY SLAB OR BEAM POUR JOINTS NOT SPECIFICALLY INDICATED ON DRAWINGS.

DRAWING INDEX:

No.	DATE	DESCRIPTION
3	MAR. 01, 2018	ISSUED FOR CONSTRUCTION
2	FEB. 22, 2018	ISSUED FOR PRICING
1	DEC. 22, 2017	ISSUED FOR PERMIT

ISSUE

SEAL

van den Brink ENGINEERING LTD.
STRUCTURAL CONSULTING
101 – 45591 AIRPORT ROAD
CHILLIWACK, B.C. V2P 1A3
TEL: 604-792-2268
FAX: 604-793-2226

PROJECT:

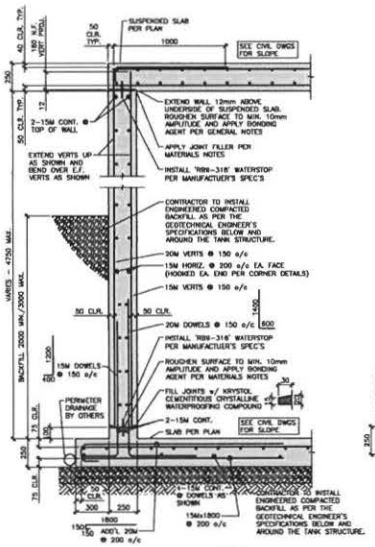
AQUADEL CROSSING WATER RESERVOIR EXPANSION

17285 COLUMBIA VALLEY ROAD
LINDELL BEACH, B.C.

DRAWING TITLE:

GENERAL NOTES

PROJECT No.:	17-241
SCALE:	AS NOTED
DRAWN:	DYLAN WOELDERS
CHECKED:	IVAN VAN DEN BRINK
DATE:	MARCH 01, 2018
DRAWING No.	S1.0
ISSUE	3



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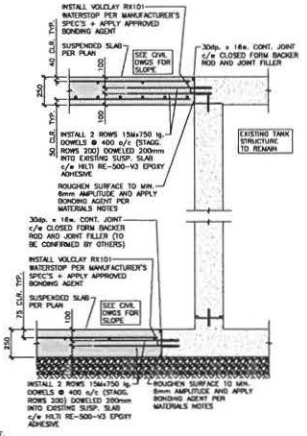

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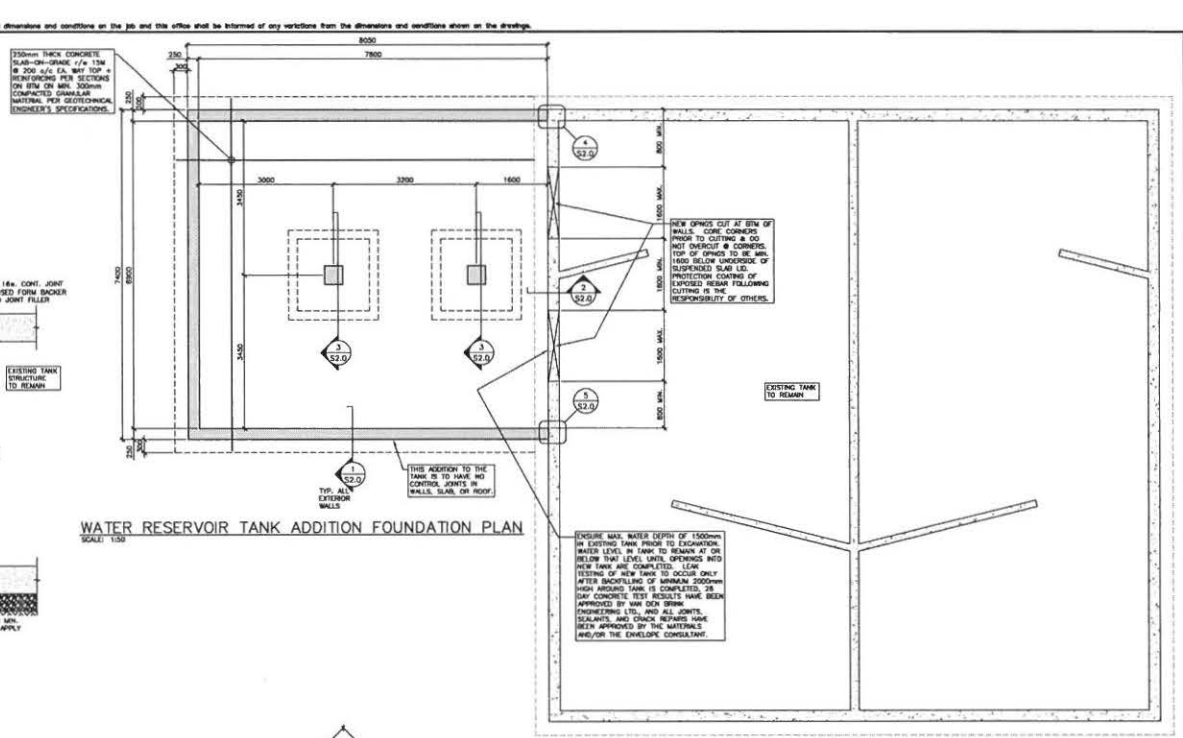

WATER RESERVOIR TANK ADDITION FOUNDATION PLAN
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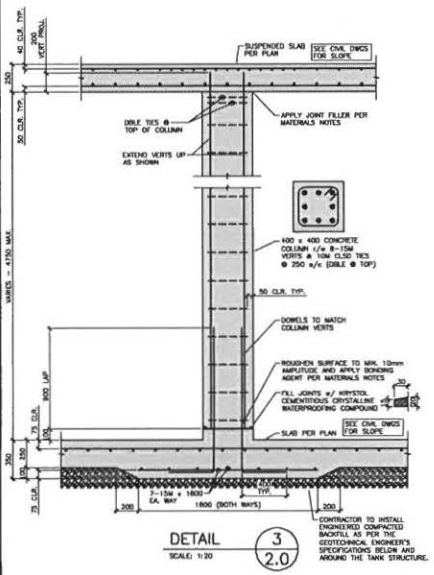

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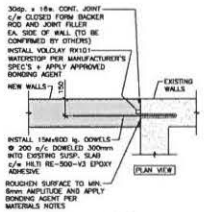

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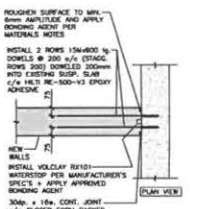

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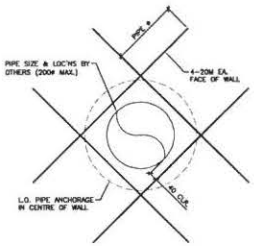


TYP. WALL & SUSP. SLAB PIPE PENETRATION

MATERIALS SPECIFICATIONS:

ALL MATERIALS & WATERPROOFING NOTED IN THIS SECTION & IN DETAILS TO BE REVIEWED AND APPROVED BY THE MATERIALS CONSULTANT AND ENVELOPE CONSULTANT. VAN DEN BRINK ENGINEERING LTD. IS NOT RESPONSIBLE FOR ANY DESIGN OR SPECIFICATIONS RELATED TO WATERPROOFING OR MATERIALS.

BONDING AGENT – APPLY "SIKA TOP ARMATEC" 110 EPOCEM TO THE FOLLOWING JOINTS:
- –STARTER WALL TO WALL (AT BASE OF EXTERIOR WALLS)
- –WALLS TO SUSPENDED SLAB

FORM TIE HOLES, APPLY "THOROC" PLUG TO ALL FORM TIE HOLES AFTER PLASTIC CONES HAVE BEEN REMOVED. PLUGS TO BE APPLIED PRIOR TO SURFACE SEALANT APPLICATION.

JOINT SEALANTS – APPLY "SIKA FLEX 1a" FILLER TO THE FOLLOWING:
- –SLAB-ON-GRADE AND WALL CONTROL JOINTS
- –STARTER WALL TO WALL
- –AT ALL WALL CORNERS
- –WALL TO SUSPENDED SLAB

APPLY 1 COAT OF "XYPEX" CONCENTRATE AND ONE COAT OF "XYPEX" AS PER MANUFACTURER'S SPECIFICATIONS TO ALL INSIDE SURFACES OR APPROVAL EQUAL. ALTERNATIVELY, ADD "XYPEX ADMIX C-500" TO CONCRETE AS PER MANUFACTURER'S SPECIFICATIONS.

FORM TIES TO BE "DAYTON RICHMOND" PRODUCTS AND USED AS FOLLOWS:
- –A–4 HEX SNAP TIE IN 250mm THICK WALLS; 25mm BREAKBACK
- –A–2 25x25 PLASTIC CONES
- –A–8 WATERSEAL WASHER

ALL PRODUCTS TO BE INSTALLED IN ACCORDANCE WITH SUPPLIER/MANUFACTURER SPECIFICATIONS.

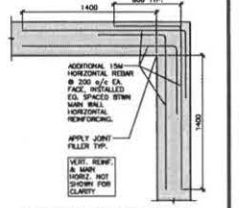
GENERIC NOTES:

1. DO NOT PLACE BACKFILL AROUND CONCRETE TANK UNTIL MINIMUM 28 DAYS AFTER CONCRETE WALLS & SUSPENDED SLAB HAS BEEN POURED AND CONCRETE TEST RESULTS HAVE BEEN REVIEWED AND APPROVED BY VAN DEN BRINK ENGINEERING LTD.
2. ONCE APPROVAL HAS BEEN GIVEN BY VAN DEN BRINK ENGINEERING TO BACKFILL AROUND THE TANK, BACKFILL IS TO PLACED IN MAXIMUM 600mm DEEP LIFTS. GEOTECHNICAL ENGINEER MAY REQUIRE SMALLER LIFTS. BACKFILLING EQUALLY ON ALL SIDES OF THE TANK.
3. MAXIMUM 600mm DEEP OF WATER IS PERMITTED IN THE TANK IF HEIGHT OF BACKFILL AROUND THE TANK IS NOT AT LEAST AS HIGH AS THE LEVEL OF THE WATER ON THE INSIDE OF THE TANK.
4. SEE S1.0 & THIS DRAWING FOR GENERAL NOTES, INCLUDING MATERIAL SPECIFICATIONS AND REQUIREMENTS.
5. NO PLUMBING OR MECHANICAL PIPES ARE TO PASS UNDER ANY STRIP OR PAD FOOTING WITHOUT PRIOR APPROVAL FROM VAN DEN BRINK ENGINEERING LTD.
6. ALL HOOKED AND U-SHAPE DOWELS TO BE TIED IN PLACE PRIOR TO PLACING CONCRETE.
7. PAD FOOTINGS TO BE CENTRED BELOW PEDESTALS U.N.O.
8. FOR WOOD FRAME WALL ANCHORAGE REQUIREMENTS, REFER TO DETAILS AND FRAMING SCHEDULES. IT IS STRUCTURALLY ACCEPTABLE TO WET-SET ANCHOR BOLTS. ALL HOLD-DOWNS TO BE TIED IN PLACE PRIOR TO PLACING CONCRETE.
9. ALL METAL CONNECTORS ON EXTERIOR OF BUILDING OR IN CONTACT WITH PRESSURE TREATED LUMBER TO BE HOT DIPPED GALVANIZED OR STAINLESS STEEL.

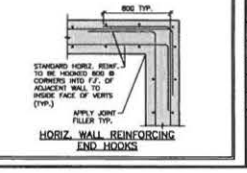
LEGEND:

A.F. – ALTERNATE FACE	H1E – HOOKED 1 END
E.F. – EACH FACE	H2E – HOOKED 2 ENDS
F.F. – FAR FACE	CONT. – CONTINUOUS
BUL – BTM UPPER LAYER	BLL – BTM LOWER LAYER
TUL – TOP UPPER LAYER	TLL – TOP LOWER LAYER
S.F. – STRIP FOOTING	P. – PEDESTAL
F. – PAD FOOTING	U.N.O. – UNLESS NOTED OTHERWISE
TYP. – TYPICAL	

TYP. TANK WALL CORNER DETAILS



ADD'L HORIZ. WALL REINFORCING



HORIZ. WALL REINFORCING END HOOKS

DRAWING INDEX:

No.	DATE	DESCRIPTION
3	MAR. 19, 2018	ISSUED FOR CONSTRUCTION
2	FEB. 22, 2018	ISSUED FOR PRICING
1	DEC. 22, 2017	ISSUED FOR PERMIT

ISSUE

SEAL

van den Brink ENGINEERING LTD.
STRUCTURAL CONSULTING
101 – 45991 AIRPORT ROAD
CHILLIWACK, B.C. V2P 1A3
TEL: 604-792-2268
FAX: 604-793-2226

PROJECT:

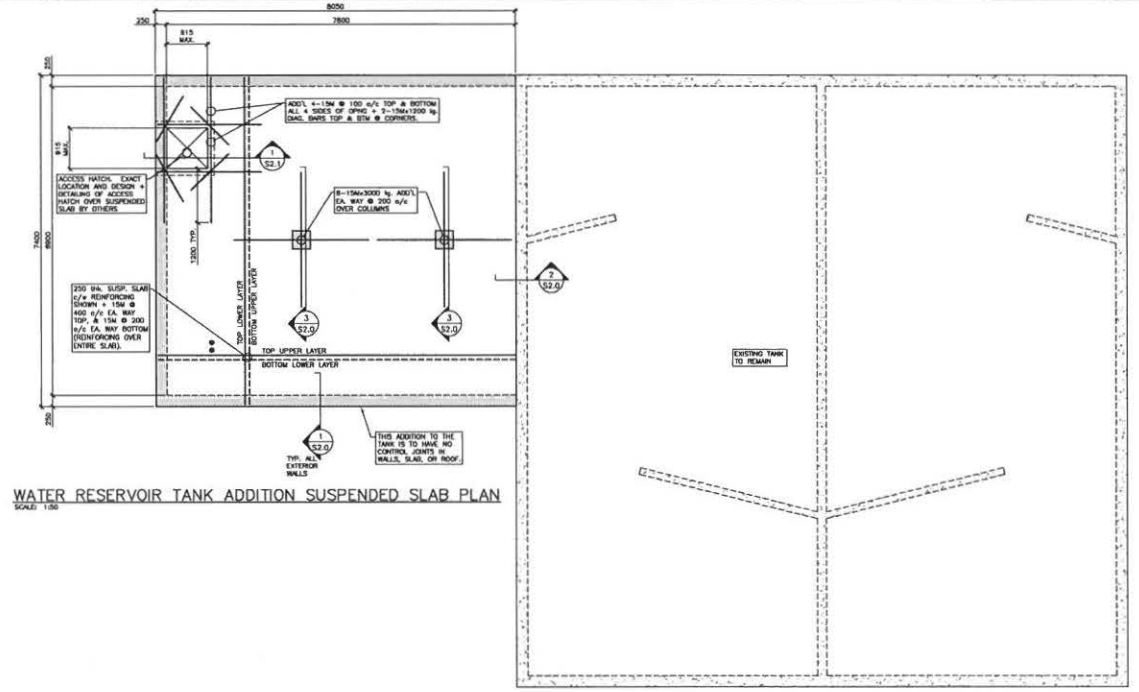
AQUADEL CROSSING WATER RESERVOIR EXPANSION

1785 COLUMBIA VALLEY ROAD
LINDELL BEACH, B.C.

DRAWING TITLE:

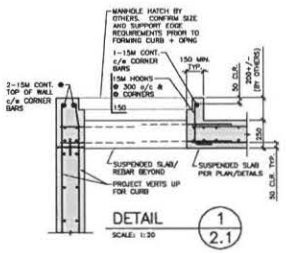
WATER RESERVOIR TANK ADDITION FOUNDATION PLAN, NOTES, & DETAILS

PROJECT No.:	17-241
SCALE:	AS NOTED
DRAWN:	DYLAN WOELDERS
CHECKED:	IVAN VAN DEN BRINK
DATE:	MARCH 01, 2018
DRAWING No.	ISSUE
S2.0	3



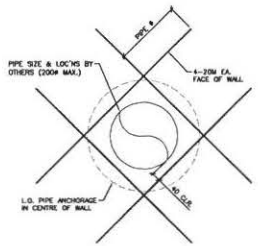
WATER RESERVOIR TANK ADDITION SUSPENDED SLAB PLAN

SCALE: 1:50



DETAIL 1 / 2.1

SCALE: 1:20



TYP. WALL & SUSP. SLAB PIPE PENETRATION

MATERIALS SPECIFICATIONS:

ALL MATERIALS & WATERPROOFING NOTED IN THIS SECTION & IN DETAILS TO BE REVIEWED AND APPROVED BY THE MATERIALS CONSULTANT AND ENVELOPE CONSULTANT. VAN DEN BRINK ENGINEERING LTD. IS NOT RESPONSIBLE FOR ANY DESIGN OR SPECIFICATIONS RELATED TO WATERPROOFING OR MATERIALS.

BONDING AGENT – APPLY "SIKA TOP ARMATEC" 110 EPOCEM TO THE FOLLOWING JOINTS:
- –STARTER WALL TO WALL (AT BASE OF EXTERIOR WALLS)
- –WALLS TO SUSPENDED SLAB

FORM TIE HOLES, APPLY "THOROC" PLUG TO ALL FORM TIE HOLES AFTER PLASTIC CONES HAVE BEEN REMOVED. PLUGS TO BE APPLIED PRIOR TO SURFACE SEALANT APPLICATION.

JOINT SEALANTS – APPLY "SIKA FLEX 1a" FILLER TO THE FOLLOWING:
- –SLAB-ON-GRADE AND WALL CONTROL JOINTS
- –STARTER WALL TO WALL
- –AT ALL WALL CORNERS
- –WALL TO SUSPENDED SLAB

APPLY 1 COAT OF "XYPEX" CONCENTRATE AND ONE COAT OF "XYPEX" AS PER MANUFACTURER'S SPECIFICATIONS TO ALL INSIDE SURFACES OR APPROVAL EQUAL. ALTERNATIVELY, ADD "XYPEX ADMIX C-500" TO CONCRETE AS PER MANUFACTURER'S SPECIFICATIONS.

FORM TIES TO BE "DAYTON RICHMOND" PRODUCTS AND USED AS FOLLOWS:
- –A-4 HEX SNAP TIE IN 250mm THICK WALLS; 25mm BREAKBACK
- –A-2 25x35 PLASTIC CONES
- –A-8 WATERSEAL WASHER

ALL PRODUCTS TO BE INSTALLED IN ACCORDANCE WITH SUPPLIER/MANUFACTURER SPECIFICATIONS.

GENERIC NOTES:

1. DO NOT PLACE BACKFILL AROUND CONCRETE TANK UNTIL MINIMUM 28 DAYS AFTER CONCRETE WALLS & SUSPENDED SLAB HAS BEEN POURED AND CONCRETE TEST RESULTS HAVE BEEN REVIEWED AND APPROVED BY VAN DEN BRINK ENGINEERING LTD.
2. ONCE APPROVAL HAS BEEN GIVEN BY VAN DEN BRINK ENGINEERING TO BACKFILL AROUND THE TANK, BACKFILL IS TO PLACED IN MAXIMUM 800mm DEEP LIFTS. GEOTECHNICAL ENGINEER MAY REQUIRE SMALLER LIFTS. BACKFILLING EQUALLY ON ALL SIDES OF THE TANK.
3. MAXIMUN 800mm DEEP OF WATER IS PERMITTED IN THE TANK IF HEIGHT OF BACKFILL AROUND THE TANK IS NOT AT LEAST AS HIGH AS THE LEVEL OF THE WATER ON THE INSIDE OF THE TANK.
4. SEE S1.0 & THIS DRAWING FOR GENERAL NOTES, INCLUDING MATERIAL SPECIFICATIONS AND REQUIREMENTS.
5. NO PLUMBING OR MECHANICAL PIPES ARE TO PASS UNDER ANY STRIP OR PAD FOOTING WITHOUT PRIOR APPROVAL FROM VAN DEN BRINK ENGINEERING LTD.
6. ALL HOOKED AND U-SHAPE DOWELS TO BE TIED IN PLACE PRIOR TO PLACING CONCRETE.
7. PAD FOOTINGS TO BE CENTRED BELOW PEDESTALS U.N.O.
8. FOR WOOD FRAME WALL ANCHORAGE REQUIREMENTS, REFER TO DETAILS AND FRAMING SCHEDULES. IT IS STRUCTURALLY ACCEPTABLE TO WET-SET ANCHOR BOLTS. ALL HOLD-DOWNS TO BE TIED IN PLACE PRIOR TO PLACING CONCRETE.
9. ALL METAL CONNECTORS ON EXTERIOR OF BUILDING OR IN CONTACT WITH PRESSURE TREATED LUMBER TO BE HOT DIPPED GALVANIZED OR STAINLESS STEEL.

LEGEND:

A.F. – ALTERNATE FACE	H1E – HOOKED 1 END
E.F. – EACH FACE	H2E – HOOKED 2 ENDS
F.F. – FAR FACE	CONT. – CONTINUOUS
BUL – BTM UPPER LAYER	BLL – BTM LOWER LAYER
TUL – TOP UPPER LAYER	TLL – TOP LOWER LAYER
SF_ – STRIP FOOTING	P_ – PEDESTAL
F_ – PAD FOOTING	U.N.O. – UNLESS NOTED OTHERWISE
TYP. – TYPICAL	

DRAWING INDEX:

No.	DATE	DESCRIPTION
3	MAR. 01, 2018	ISSUED FOR CONSTRUCTION
2	FEB. 23, 2018	ISSUED FOR PRICING
1	DEC. 22, 2017	ISSUED FOR PERMIT

ISSUE

SEAL

van den Brink ENGINEERING LTD.
STRUCTURAL CONSULTING
101 – 45991 AIRPORT ROAD
CHILLIWACK, B.C. V2P 1A3
TEL: 604-792-2265
FAX: 604-793-2225

PROJECT:

AQUADEL CROSSING WATER RESERVOIR EXPANSION

1785 COLUMBIA VALLEY ROAD
LINDELL BEACH, B.C.

DRAWING TITLE:

WATER RESERVOIR TANK ADDITION SUSPENDED SLAB PLAN & NOTES

PROJECT No.:	17-341
SCALE:	AS NOTED
DRAWN:	DYLAN WOELDERS
CHECKED:	IVAN VAN DEN BRINK
DATE:	MARCH 01, 2018
DRAWING No.	S2.1
ISSUE	3

VALLEY GEOTECHNICAL
Engineering Services Ltd

Telephone: 604 882-8475
Fax: 604 882-8476
general@valleygeo.ca
www.valleygeo.ca

#15 – 20279 – 97th Avenue
Langley, British Columbia
Canada, V1M 4B9

Aquadel Crossing JV
PO Box 2267
Chilliwack, BC V2R 1A6

May 8, 2018

Attention: Mr. Cody Les

Regarding: Reservoir Addition Risk Analysis Hazard Report
1777 Columbia Valley Highway, Cultus Lake, FVRD
Project: 44588-01

1. INTRODUCTION

Valley Geotechnical Engineering Services Ltd. (Valley Geo) has been retained by Aquadel Crossing to complete a Hazard Assessment Report for the proposed water reservoir expansion. This report, with the site plans, summarizes our work to date and presents recommendations pertinent to the proposed reservoir addition (extension) at the subject site.

This report has been prepared in accordance with the Fraser Valley Regional District (FVRD) guidelines for geotechnical reports and hazard assessments, pursuant to Section 56 of the Community Charter and the APEGBC "Guidelines for Legislated Landslide Assessments for Proposed Residential Developments in BC (Revised May 2010)." This report may be used by FVRD Approving Officer for the reservoir addition (extension) building permit approval for a period of two years from the above date.

Based on our review we confirm that the land can be used safely for the use intended provided the recommendations presented in this report are completed. We note that this report only addresses the hazards for the subject site.

2. INFORMATION REVIEWED

Valley Geo previously completed the geotechnical works associated with the original reservoir located on the subject site. This project and several Valley Geo projects in the vicinity were reviewed and referenced in preparation of this report.

- Geotechnical Investigation & Report, Lots 2, 3 Columbia Valley Highway, Lot 4 Frost Road dated October 31, 2018.
- Report Addendum for the Booster Station at 1760 &1766 Columbia Valley Highway dated August 31, 2011.

- Geotechnical Investigation & Report, 1800 Block Columbia Valley Highway dated December 20, 2007
- Addendum: Geotechnical Recommendations for Proposed Water Reservoir at the 1800 Block of Columbia Valley Highway (Lot 2) dated March 31, 2017
- Excavation, Shoring Installation, and Wall Construction for the Existing Reservoir

In addition to the above, the following external documents were also reviewed:

- Online Aerial Photos (Google Maps & Earth)
- FVRD online Mapping System
- Hazard Acceptability Thresholds for Development Approvals by Local Government by Dr. Peter W. Cave dated 1993
- UBC Surficial Geology Maps

3. SITE DESCRIPTION

Valley Geo completed a site reconnaissance on April 26, 2018 and desktop study for the subject site and surrounding area.

The site consists of a rural property located at 1777 Columbia Valley Highway in the Fraser Valley Regional District with a legal description as follows:

- Plan BCS3022 Section 10 and 15 Township 22 NWD

The site is irregularly shaped with approximate dimensions of 115.73m (N-S) and 95.56m (E-W). A reservoir exists on the site and services the local subdivisions below. As part of the original construction a combined temporary and permanent shotcrete wall was constructed to retain the upper slopes to the south. The shotcrete wall extends approximately 4m below the finished grade surrounding the existing reservoir. A gravel road with flat turn-around provides access for the existing reservoir.

The site is surrounded by rural properties to the west and east and a recent cabin development to the north and Frost Road the south. The site slopes range from 60% above the reservoir to 25% below the reservoir towards the north and north-east. The majority of the site is vegetated with mature coniferous and deciduous growth. Several trees are slightly pistol butt indicating minor surficial creep.

The slopes south of the subject site generally plateau outside of the Frost Road right-of-way. The slopes to the north of the subject site range from 25% to relatively flat in the valley bottom. Immediately south of Frost Road, localized steeper slopes were observed during our site review. This suggests fill may have been placed in this area. The site is located approximately 1km from the nearest mountain that may be subject to an avalanche hazard.

A road side ditch is located on the south side of Frost Road. A 500mm culvert under the road discharges the collected water on the road right-away which flows onto the subject site. Minor erosion channels were observed in the north-east direction away from the existing reservoir.

Frost Creek is located well below the reservoir location at the toe of the slopes. No other notable water courses were observed during our site reconnaissance.

See Appendix A attached for a site location and survey plans.

4. PROPOSED DEVELOPENT

It is proposed to construct an 8.05m by 7.40m addition at the north-west corner of the existing reservoir. The addition is generally confined to the existing flatter area at the end of the access road.

See Appendix B for the addition civil drawings completed by Wedler Engineering.

5. SOIL CONDITIONS

The Surficial Geological Map Survey of Canada (Map 1485A) indicates the soil at the site is classified as stream deposits (SAj) mountain stream channel gravel and minor sand, up to 10m thick.

Valley Geo previously completed a test pit investigation on June 17, 2006 as part of the existing reservoir geotechnical report. In addition, the soil conditions encountered during the existing reservoir excavation and shotcrete placement encountered were referenced in preparation of this report. The soil conditions generally consist of the following:

- 0.3m of topsoil with roots over
- 0.6m of brown medium dense fine silty sand over
- Loose to medium dense (possibly colluvium) sub-rounded to angular sandy silt to silty sand matrix was encountered to depths explored.

Weak shale like rock was encountered in the vicinity at depth underlying the above profile. No free water was encountered during any work completed on or in the vicinity of the site.

6. SLOPE STABILTY

As part of the hazard review a slope stability analysis was completed. The slope stability analysis was carried out using Slope/W program with limit equilibrium analysis using Morgenstern-Price's Method. The analysis is based on 2012 BC Building Code (BCBC) and the APEGBC's "Guidelines for Legislated Landslide Assessments for Proposed Residential Developments in BC (revised in May 2010)". Requirements for a "safe" slope consist of the following:

- Static factor of safety greater than 1.5, and
- Under seismic conditions;
  a. Factor of safety greater than 1.0, or
  b. Horizontal displacements along the slip surface of 15cm or less.

The results of stability analysis indicate that from a global perspective the slopes have the required factors of safety and fall with the required design criteria under both static and seismic conditions. However, minor localized surficial sloughs may occur if the topsoil becomes saturated or with loss of root structure.

See the slope analysis plots attached as Appendix C.

7. HAZARDS AND MITIGATION

Valley Geo has reviewed the site for potential hazards as summarized in the Community Charter. The hazard levels were compared to the acceptable hazard levels as summarized in the Hazard Acceptability Thresholds paper by Dr. Peter W. Cave for an extension.

During our site reconnaissance and desktop review, no rock bluffs or evidence of debris floods was observed. The site is located 1km from the nearest mountain that may be subject to avalanche hazard. The site is well above any creeks that may be subject to flooding or avulsion.

We have therefore concluded that the following hazards to not exist:

- Inundation by Flood Waters
- Mountain stream erosion and avulsion
- Snow Avalanche
- Rock Fall
- Debris Flood

Due to the hillside slopes in the vicinity and uncontrolled water discharge from the culvert under Frost Road, the hazards that may affect the proposed development include:

- Landslides, Small Scale, Localized
- Major Catastrophic Landslide
- Debris Floods, Debris Flows, and Debris Torrents

The following summarizes our review, probability or occurrence, remedial recommendations, and covenant requirements. A Geo-Hazard Assurance Statement is attached as Appendix D.

7.1 Landslides, Small-Scale, Localized (Static)

Slopes up to 1.5 horizontal to 1 vertical exist above the reservoir and 4 horizontal to 1 vertical below the reservoir and generally heavily vegetated. Several pistol-butt trees were observed indicating localized creepage. There is a potential for surficial failures during saturated conditions from extended rainfall, from the culvert under Frost Road, or loss of root structure. We estimate an unmitigated annual probability of damage of 1:500 – 1:10,000.

The proposed addition is located outside the runout of any small surficial sloughs and the grades below the culvert are to the north-east and any failures would be directed away from the addition. The root structure of the trees is essential for maintaining the strength of the upper soils and must not be disturbed to minimize the risk of surficial sloughing.

Based on the above, we estimate a probability of damage to the reservoir addition due to small scale localized landslides to be <1:10,000.

7.2 Major Catastrophic Landslide

Valley Geo has reviewed the surrounding topography, soil conditions, and available online aerial photos. To the best of our knowledge there have not been any large-scale slippages or slides in the area and no evidence of historical slides was observed that may affect the reservoir addition location. However, due to the lack of past studies and monetary restraints for a full analysis, we are unable to entirely rule out the risk of a major landslide.

On this basis, we estimate the annual probability of hazard from a Massive and Catastrophic Landslide to be 1:1,000 to 1:10,000.

7.3 Debris Flows, and Debris Torrents

No creeks subject to debris flooding and torrents are located in the vicinity of the subject site. However, a culvert draining the Frost Road road-side ditch discharges onto the subject site. Several minor erosion channels were observed during our site reconnaissance. Currently, the flow is generally directed away from the proposed reservoir location.

It is our experience that erosion from uncontrolled discharge onto slope of this magnitude is unpredictable and may change. In addition, the current building permit application has no ability to control any increase of flows from future development or drainage re-alignments.

For this reason, we are unable to rule out this hazard entirely. On this basis we estimate the annual probability of hazard from debris flows and torrents to be 1:500 – 1:10,000.

8.0 CONCLUSIONS AND CLOSURE

Valley Geo has concluded that the subject site is safe for the use intended provided the annual probabilities of hazards are understood by all parties involved. We should be given an opportunity to review any changes to the building layout and provide additional recommendations, if required.

We trust that this hazard assessment report provides you with information required for the permit process. If you have any questions, please do not hesitate to call.

Yours very truly;

Brad VanDelft, A.Sc.T., Eng. L.
Senior Geotechnical Engineer – Principal

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
R. J. VALVERDE VASQUEZ
14259
9 - MAY - 2018

Raul Valverde, P.Eng.
Principal Engineer

Joel Blanco, P.Eng.
Senior Geotechnical Engineer

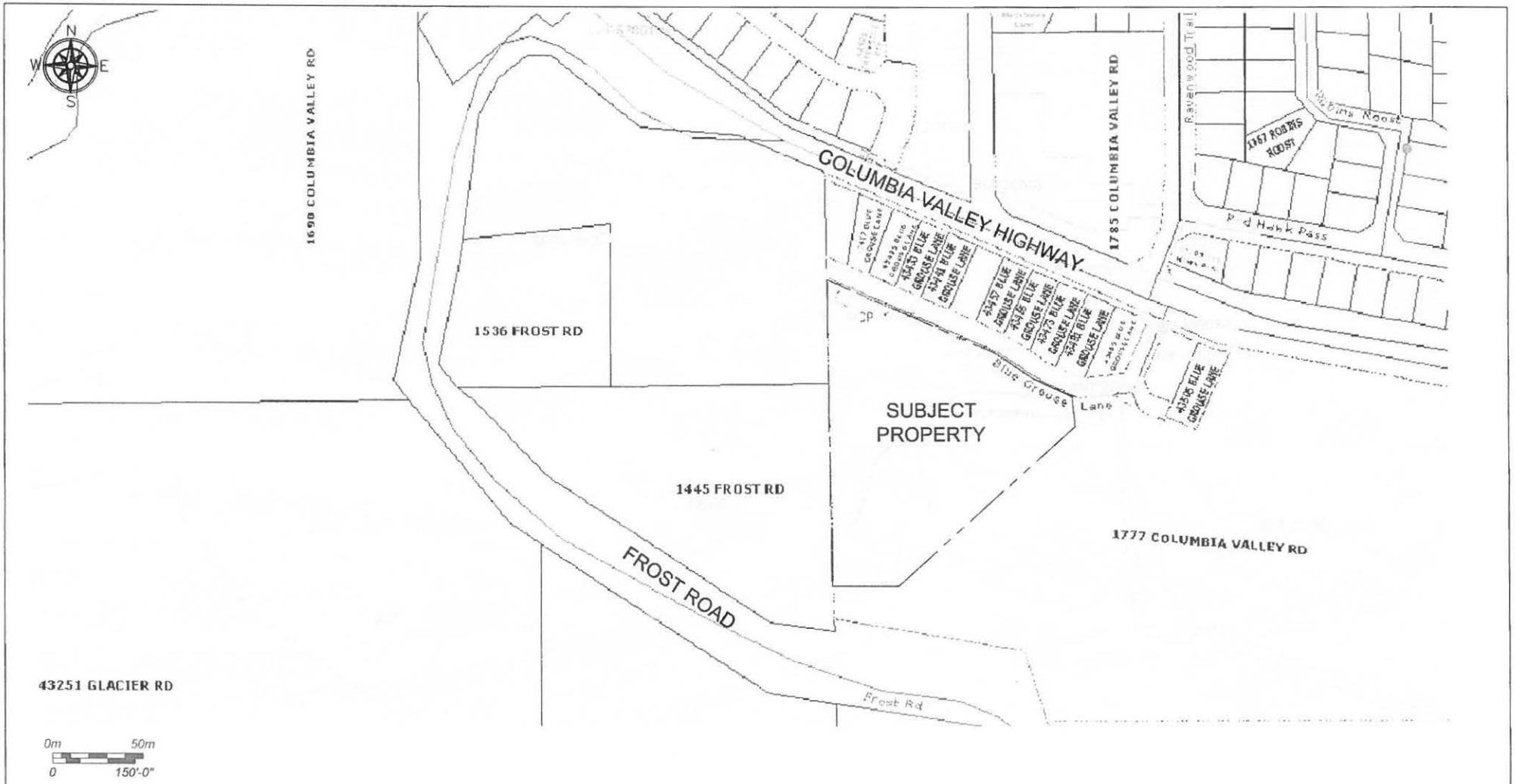
LIST OF ATTACHMENTS:

Appendix A: Site Location and Survey Plans
Appendix B: Addition Civil Drawings
Appendix C: Slope Analysis
Appendix D: Geo-Hazard Assurance Statement

\\Vges-srv-dc1\vges\VGES-PROJECTS\44500\44588-01\(44588-01) 2018-05-08 Hazard Report.doc

Appendix A

Site Location and Survey Plans



VALLEY GEOTECHNICAL
Engineering Services Ltd

Unit 15 20279 97th Avenue
Langley BC, V1M 4B9
Phone: (604) 882-8475
Fax: (604) 882-8476

Client: Aquadel Crossing JV

Location: 1777 Columbia Valley Highway
Cultus Lake, FVRD, BC

FILE No.	DATE
44588-01	May 8, 2018

SEAL

REV.	DATE	DESCRIPTION

Site Location and Survey Plans

Site Location Plan

DRAWN:	ML	DWG No.
CHECKED:	RV	1 of 2
SCALE:	1:500	

\\Vges-srv-dc1\vges\VGES-PROJECTS\42900\42906-03\(42906-03) 2018 05 07 Section for Water Reservior.dwg

VALLEY GEOTECHNICAL Engineering Services Ltd.	Client: Aquadel Crossing JV			Site Location and Survey Plans	
Unit 15 20279 97th Avenue Langley BC, V1M 4B9 Phone: (604) 882-8475 Fax: (604) 882-8476	Location: 1777 Columbia Valley Highway Cultus Lake, FVRD, BC			Survey Plan	
	FILE No. 44588-01	DATE May 8, 2018	SEAL	DRAWN: ML	DWG No. 2 of 2
				CHECKED: RV	
				SCALE: 1:750	

REV	DATE	DESCRIPTION

SITE PLAN OF SELECTED TOPOGRAPHIC FEATURES

ON: PART OF COMMON PROPERTY STRATA PLAN BCS3022 SECTION 10 AND 15 TOWNSHIP 22 NEW WESTMINSTER DISTRICT

SCALE 1 : 300

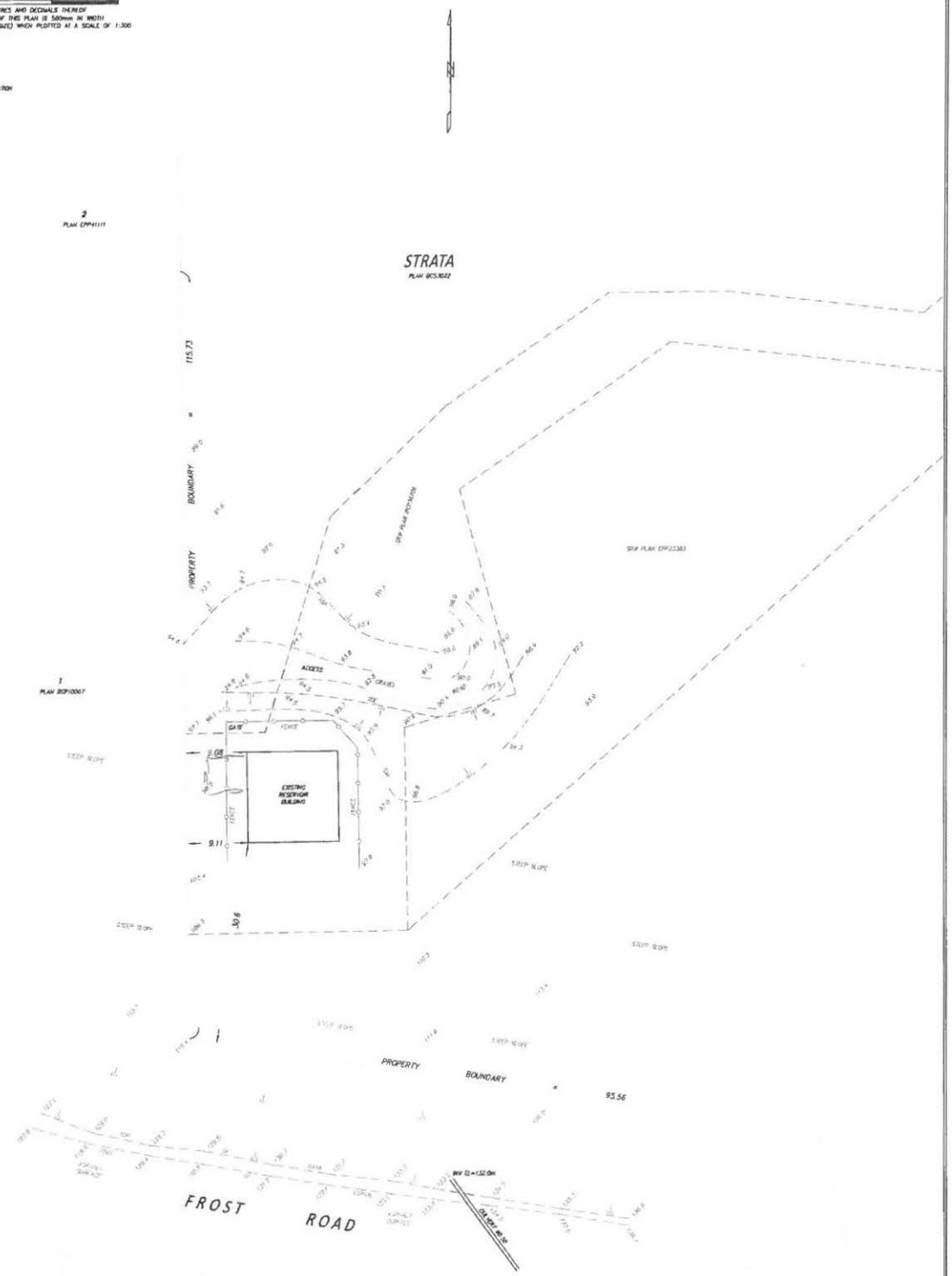
0 10 20 30 m

ALL DISTANCES ARE IN METRES AND DECIMALS THEREOF
THE INTENDED PLOT SIZE OF THIS PLAN IS 560mm IN WIDTH
BY 432mm IN HEIGHT (C SIZE) WHEN PLOTTED AT A SCALE OF 1:300

ADDRESS: 1777 COLUMBIA VALLEY ROAD

LEGEND:

SPOT ELEVATION



NOTES:

1. THIS PLAN IS PREPARED FOR DESIGN PURPOSES ONLY. IT IS NOT BE USED FOR PROPERTY LINE RE-ESTABLISHMENT.
2. ELEVATIONS ARE GEODETIC, SHOWN IN METRES, AND ARE DERIVED FROM GPS OBSERVATIONS. DATUM CGVD28.

DATED THIS 25TH DAY OF APRIL, 2018

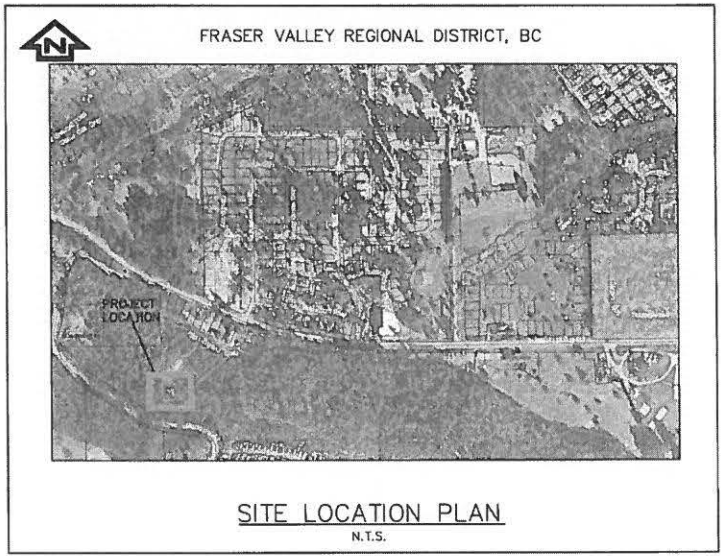
RANDY ARNOLD, BCLS
THIS DOCUMENT IS NOT VALID UNLESS ORIGINALLY SIGNED AND SEALED.

ARNOLD & ASSOCIATES
B.C. LAND SURVEYORS
29448 SUMAS VALLEY DR. ABBOTSFORD BC V4X 1J2
PHONES: 604-856-0511
604-316-8449
EMAIL: arnsurvey@yahoo.ca

FILE: 18302_5

Appendix B

Addition Civil Drawings



SITE LOCATION PLAN
N.T.S.

Client:

AQUADEL CROSSING JOINT VENTURE

Project:

AQUADEL CROSSING
WATER RESERVOIR EXPANSION
1777 COLUMBIA VALLEY ROAD

Engineering Services Provided by:

WEDLER ENGINEERING

www.wedler.com

THE WEDLER GROUP
- Abbotsford 1.604.746.0300
- Chilliwack 1.604.792.0651
- Courtenay 1.250.334.3263
- Surrey 1.604.588.1919

Drawing Index: Rev #1

Drawing No.	Revision	Title of Drawing
		COVER SHEET
C16-5365/D-01	A	STANDARD NOTES
C16-5365/D-02	A	WATER CONTEXT PLAN
C16-5365/D-03	A	RESERVOIR SITE PLAN

DRAWING INDEX REVISION #1

Project No: C16-5365/D
Date: JANUARY 2018
ISSUED FOR PERMITTING

WEDLER ENGINEERING

LOCAL GOVERNMENT FILE: SUB

NOTES

GENERAL

1. THE GOVERNING JURISDICTION FOR THIS PROJECT IS THE FRASER VALLEY REGIONAL DISTRICT (FVRD) AND CORIX UTILITIES.
2. ALL WORKS, MATERIALS AND TESTING SHALL BE IN ACCORDANCE WITH THE CURRENT BYLAWS OF THE GOVERNING JURISDICTIONS, THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (PRINTED 2009 "PLATINUM" EDITION) (MMCD) AND THE B.C. PLUMBING CODE AS APPLICABLE.
3. FOR SITE DIMENSIONS, REFER TO LEGAL SURVEY PLANS. FOR BUILDING LAYOUT DIMENSIONS, REFER TO ARCHITECTURAL PLANS. ALL ELEVATIONS ARE SHOWN IN METERS RELATED TO GEODETIC SURVEY OF CANADA. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE SHOWN IN METERS AND ALL PIPE DIAMETERS ARE SHOWN IN MILLIMETERS.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TO WEDLER ENGINEERING A DIGITAL VIDEO AND PHOTOGRAPHIC RECORD IDENTIFYING ANY AND ALL EXISTING FEATURES TO BE DISTURBED. THE CONTRACTOR SHALL RESTORE ALL DISTURBED PAVEMENT, CURBS, SIDEWALKS, BOULEVARDS, LANDSCAPING, FENCES OR ANY OTHER FEATURES AFFECTED BY THE WORK IN COMPLIANCE WITH THE SPECIFICATIONS OF THE GOVERNING JURISDICTION, MMCD AND ANY RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER AND TO THE SATISFACTION OF THE GOVERNING JURISDICTION AND WEDLER ENGINEERING.
5. THE CONTRACTOR MUST CONTACT THE GOVERNING JURISDICTION AND WEDLER ENGINEERING PRIOR TO CONSTRUCTION TO SCHEDULE A PRE-CONSTRUCTION MEETING.
6. THE CONTRACTOR SHALL NOTIFY WEDLER ENGINEERING A MINIMUM OF 2 WORKING DAYS PRIOR TO REQUIRED INSPECTIONS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:
   A) MOBILIZATION
   B) DURING PIPE LAYING
   C) DURING CONSTRUCTION OF DETENTION FACILITIES
   D) DURING PREPARATION OF PAVEMENT STRUCTURE
   E) TESTING OF ALL UTILITIES
   F) AFTER COMPLETION OF ALL WORK
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT. CONFIRM BENCH MARK OR TEMPORARY BENCH MARK PRIOR TO CONSTRUCTION. ADVISE WEDLER ENGINEERING OF ANY DISCREPANCIES.
6. ANY VARIATIONS FROM THE PROPOSED WORK MUST BE APPROVED IN WRITING BY WEDLER ENGINEERING. FAILURE TO NOTIFY WEDLER ENGINEERING IN ADVANCE MAY RESULT IN REJECTION OF THE WORK. SUBSTITUTION OF ANY SPECIFIED MATERIALS, PRODUCTS OR EQUIPMENT WITH AN APPROVED EQUAL OR APPROVED EQUIVALENT WILL BE PERMITTED ONLY WITH THE EXPRESS WRITTEN APPROVAL OF WEDLER ENGINEERING, AT ITS DISCRETION.
7. THE CONTRACTOR SHALL ADJUST THE TOPS OF ALL ACTIVE MANHOLES, CATCH BASINS, VALVE BOXES, ETC. AS REQUIRED TO MATCH NEW GRADING.
8. ALL TRENCH BACKFILL WITHIN PUBLIC RIGHTS-OF-WAY TO BE IMPORTED GRANULAR BACKFILL UNLESS OTHERWISE APPROVED BY THE GEOTECHNICAL ENGINEER.
9. CONNECTIONS TO EXISTING STORM AND SANITARY SEWERS TO BE MADE WITH METHODS AND MATERIALS APPROVED BY THE GOVERNING JURISDICTION. APPROVAL TO BE OBTAINED BEFORE INSTALLATION.
10. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY AT THE PLACE OF WORK AS AND TO THE EXTENT REQUIRED BY APPLICABLE CONSTRUCTION SAFETY LEGISLATION, REGULATIONS AND CODES, AND BY GOOD CONSTRUCTION PRACTICE. THE CONTRACTOR SHALL PERFORM ITS WORKS IN STRICT COMPLIANCE WITH THE REQUIREMENTS, RULES, REGULATIONS AND BY-LAWS OF ANY FEDERAL, PROVINCIAL OR MUNICIPAL AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL APPLY FOR AND OBTAIN ALL REQUIRED PERMITS.
11. THE CONTRACTOR SHALL MAINTAIN AND REPAIR ALL PUBLIC AND PRIVATE ROADS AFFECTED BY THE WORK AND ARRANGE FOR ADEQUATE STREET CLEANING DURING WORKING DAYS.
12. THE CONTRACTOR SHALL PREPARE A TRAFFIC MANAGEMENT PLAN FOR APPROVAL BEFORE START OF CONSTRUCTION. TRAFFIC MANAGEMENT PLAN TO BE IN ACCORDANCE WITH THE GOVERNING JURISDICTION'S REGULATIONS. AS A MINIMUM, ONE LANE TRAFFIC MUST BE MAINTAINED AND KEPT OPEN AT ALL TIMES.
13. THE CONTRACTOR SHALL CARRY OUT THE WORK SO AS TO MINIMIZE THE INCONVENIENCE TO THE PUBLIC. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SERVICES AND ACCESS TO RESIDENCES AND BUSINESSES AT ALL TIMES FOR VEHICLES AND PEDESTRIANS. ANY DISRUPTIONS THAT ARE UNAVOIDABLE WILL REQUIRE A MINIMUM NOTICE OF 2 WORKING DAYS BE GIVEN TO PROPERTY OWNERS, THE GOVERNING JURISDICTION AND WEDLER ENGINEERING.
14. THE CONTRACTOR SHALL RECORD ON A CURRENT SET OF PLANS IN A NEAT MANNER, ALL CHANGES, ADDITIONS AND DELETIONS TO REFLECT THE "AS CONSTRUCTED" INSTALLATION. THIS SET OF PLANS SHALL BE RETURNED TO WEDLER ENGINEERING AT THE COMPLETION OF THE WORKS AND PRIOR TO THE ISSUANCE OF SUBSTANTIAL PERFORMANCE. ANY ADDITIONAL SURVEY REQUIRED TO COMPLETE THE RECORD DRAWINGS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

EXISTING STRUCTURES, UTILITIES AND PROPERTIES

1. INFORMATION ON THE DRAWINGS REGARDING EXISTING UTILITIES WAS COMPILED FROM RECORD DRAWINGS, CONSTRUCTION DRAWINGS AND FIELD SURVEYS. THIS INFORMATION IS NOT NECESSARILY ACCURATE OR COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DATA BY EXPOSURE BEFORE ANY CONSTRUCTION AND TO IMMEDIATELY REPORT ANY DISCREPANCIES TO WEDLER ENGINEERING. BEFORE CONSTRUCTION, ALL TIE-IN INVERTS SHALL BE CONFIRMED, AND EXPOSURES PERFORMED WHERE THERE IS POTENTIAL FOR CONFLICTS BETWEEN EXISTING AND PROPOSED SERVICES. ANY COSTS RESULTING FROM THE CONTRACTOR'S FAILURE TO DO SO SHALL BE AT THE CONTRACTOR'S EXPENSE.
2. BEFORE CONSTRUCTION THE CONTRACTOR SHALL ASCERTAIN FOR HIMSELF THE EXACT LOCATION OF BOUNDARIES OF PROPERTIES, RIGHTS-OF-WAY OR EASEMENTS. ANY COST RESULTING FROM SPECIAL CONSTRUCTION METHODS, EQUIPMENT OR MATERIALS REQUIRED TO PERFORM THE WORK WITHOUT ENCROACHING ON OR CAUSING DAMAGE TO OTHER PROPERTY, SHALL BE INCLUDED IN THE CONTRACT PRICE, AND NO ADDITIONAL PAYMENT WILL BE MADE FOR SUCH COSTS.

COORDINATION WITH OTHER WORK

1. CONTRACTOR TO IMMEDIATELY REPORT (TO WEDLER ENGINEERING AND OTHERS AS REQUIRED) ANY CONFLICTS, DISCREPANCIES, ETC. BETWEEN WORKS SHOWN ON WEDLER ENGINEERING PLANS AND WORKS SHOWN ON ANY OTHER PLANS.

WATERWORKS

1. THE COMPLETED WORK SHALL BE FLUSHED, DISINFECTED, AND BACTERIOLOGICALLY TESTED ACCORDING TO MMCD PRINTED 2009 "PLATINUM" (SECTION 33 11 01 WATERWORKS) AND HEALTH AUTHORITY STANDARDS.
2. WATER MAINS TO BE PRESSURE TESTED TO 200 PSI (1380 KPA).
3. CURRENT PROCEDURES OF THE GOVERNING JURISDICTION FOR ACCEPTANCE AND TIE-IN OF NEW WATERMAINS SHALL BE FOLLOWED
4. PIPE MATERIALS AND FITTINGS TO BE AS SPECIFIED ON DRAWINGS AND TO MEET MMCD PRINTED 2008 "PLATINUM" (SECTION 33 11 01 WATERWORKS). WATER MAIN PIPE TO BE PVC C900 DR18 AND FITTINGS TO BE CAST IRON.
5. ALL MECHANICAL JOINTS, FITTINGS, VALVES, APPURTENANCES, AND MECHANICAL RESTRAINTS TO BE c/w DENSO PASTE, DENSO MASTIC AND DENSO TAPE OR APPROVED EQUAL, APPLIED TO MANUFACTURER'S RECOMMENDATIONS TO PREVENT CORROSION.
6. MINIMUM HORIZONTAL SEPARATION BETWEEN ANY WATER MAIN AND STORM OR SANTIARY SEWER OR FORCEMAIN IS 3.0m. WHERE A WATER MAIN MUST CROSS A STORM OR SANITARY SEWER OR FORCEMAIN, THE WATER MAIN MUST PASS ABOVE THE OTHER PIPE WITH A MINIMUM 0.5m CLEARANCE BETWEEN THE PIPES. WHERE THESE SEPARATIONS ARE NOT ATTAINABLE, ALL WATER MAIN JOINTS ARE TO BE PROTECTED PER CORROSION PROTECTION MEASURES ABOVE TO A MINIMUM DISTANCE OF 3.0m FROM THE VIOLATION AND BEST PRACTICE TO BE USED TO KEEP WATER MAIN JOINTS AS FAR FROM THE SEPARATION VIOLATION AS POSSIBLE.

STORM SEWERS & SANITARY SEWERS

1. THE PIPE DISTANCES SHOWN ON STORM AND SANITARY SEWER DRAWINGS ARE MEASURED HORIZONTALLY FROM MANHOLE CENTERLINE TO MANHOLE CENTERLINE.

QUALITY CONTROL

1. ALL TESTING SHALL BE PERFORMED BY INDEPENDENT AND CERTIFIED TESTING AGENCIES AT THE CONTRACTOR'S COST.
2. ALL REQUIRED TESTING OF THE SUBGRADE, EMBANKMENT, BACKFILL, GRANULAR MATERIALS, COMPACTION, CONCRETE, ASPHALT, GROWING MEDIUM, ETC. IS THE RESPONSIBILITY OF THE CONTRACTOR AND AT THE CONTRACTOR'S COST.
3. ALL CLEANING, FLUSHING, PRESSURE AND LEAKAGE TESTING, VIDEO INSPECTION, DISINFECTION AND BACTERIOLOGICAL TESTING AS REQUIRED FOR WATER, SANITARY AND DRAINAGE SYSTEMS ARE AT THE CONTRACTOR'S COST.
4. MATERIAL TESTS SHALL BE PERFORMED AT THE MINIMUM FREQUENCIES / INTERVALS AS PER THE GOVERNING JURISDICTION'S REGULATIONS, OR AS PER "WEDLER MINIMUM MATERIAL TEST FREQUENCIES", WHICHEVER IS GREATER.
5. IN ADDITION TO THE REQUIREMENTS OF THE GENERAL CONDITIONS, THE CERTIFICATE OF SUBSTANTIAL PERFORMANCE WILL NOT BE ISSUED PRIOR TO RECEIPT BY WEDLER ENGINEERING OF COPIES OF ALL REQUIRED CERTIFICATES, INSPECTION AND TESTING REPORTS.

GEOTECHNICAL AND GEOSYNTHETICS

1. DESIGN AND CONSTRUCTION OF ALL SLOPES AND RETAINING WALLS TO BE CERTIFIED BY THE GEOTECHNICAL ENGINEER.
2. ALL GEOSYNTHETICS TO BE REVIEWED AND APPROVED BY THE GEOTECHNICAL ENGINEER.

EROSION & SEDIMENT MANAGEMENT

1. ALL WORK IS TO BE UNDERTAKEN AND COMPLETED BY THE CONTRACTOR IN SUCH MANNER AS TO PREVENT THE RELEASE OF SILT, SEDIMENT OR SEDIMENT LADEN WATER, CONCRETE OR CONCRETE LEACHATE, OR ANY OTHER DELETERIOUS SUBSTANCES INTO ANY STORM SEWER, LAWN DRAIN, SOAK-AWAY, DRY WELL OR WATERCOURSE. (SEDIMENT LADEN WATER MAY BE DISCHARGED TO STORM SYSTEMS THAT ARE USED TO CONVEY FLOWS TO A SEDIMENT MANAGEMENT FACILITY).
2. INSTALL TEMPORARY PIPES, SWALES, CULVERTS, ETC. AS REQUIRED TO DIRECT SEDIMENT LADEN FLOWS TO SEDIMENT MANAGEMENT FACILITIES. REMOVE TEMPORARY WORKS WHEN NO LONGER NEEDED. BACKFILL WITH MATERIALS AND LEVELS OF COMPACTION AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
3. TO PREVENT EROSION:
   a. PREVENT CONCENTRATED OVERLAND FLOWS FROM OCCURRING.
   b. COVER STOCKPILES, EXPOSED EARTH AND DISTURBED AREAS WITH STRAW OR BY OTHER COVERINGS.
   c. LIMIT CLEARING AS MUCH AS POSSIBLE TO AREAS TO BE IMMEDIATELY WORKED.
4. PREVENT WIND BLOWN EROSION BY WATERING, COVERING EXPOSED EARTH OR BY OTHER APPROVED MEASURES.
5. CONTRACTOR TO INSTALL SILT FENCE SOUTH OF SPRING CREEK ALONG ENTIRE ENVIRONMENTAL SETBACK LINE, AS WELL AS OTHER EROSION & SEDIMENT MANAGEMENT WORKS BEFORE ANY OTHER WORK, INCLUDING CLEARING AND EARTHWORKS, AS REQUIRED.
6. ALL EROSION & SEDIMENT MANAGEMENT WORKS TO BE MAINTAINED BY THE CONTRACTOR AT ALL TIMES TO ASSURE PROPER OPERATION. REPLACEMENT OF FENCES AND/OR BERMS, THE FLUSHING OF SEWERS AND THE CLEANING OF SUMPS MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.
7. REMOVE AND DISPOSE OF ACCUMULATED SEDIMENT FROM SEDIMENT MANAGEMENT FACILITIES ON OR BEFORE SEDIMENT REACHING ONE THIRD THE HEIGHT OF THE FACILITY.
8. MONITOR EROSION AND SEDIMENT MANAGEMENT WORKS AT LEAST ONCE PER WEEK AND AFTER HEAVY RAIN OR SNOW MELT EVENTS.
9. BEFORE CONSTRUCTION ACTIVITIES, CONTRACTOR TO CLEAN EXISTING SUMPS AND FIT EXISTING CATCH BASINS & LAWN DRAINS WITH A FILTREXX INLET SOXX OR APPROVED EQUIVALENT TO PREVENT SEDIMENT FROM ENTERING ANY STORM SYSTEMS. DO NOT USE FILTER FABRIC.
10. IMMEDIATELY UPON INSTALLATION, THE CONTRACTOR SHALL FIT ALL NEW CATCH BASINS AND LAWN DRAINS WITH A FILTREXX INLET SOXX OR APPROVED EQUIVALENT TO PREVENT SEDIMENT FROM ENTERING ANY STORM SYSTEMS (UNLESS THE STORM SYSTEM IS USED TO CONVEY FLOWS TO A SEDIMENT MANAGEMENT FACILITY). DO NOT USE FILTER FABRIC.
11. DURING CONSTRUCTION THE CONTRACTOR MAY NEED TO EMPLOY ADAPTIVE MEASURES, AND/OR ADDITIONAL MEASURES, AND/OR ADJUST THE INSTALLED EROSION AND SEDIMENT MANAGEMENT WORKS TO PREVENT THE RELEASE OF SEDIMENT LADEN WATER AS SITE CONDITIONS CHANGE.
12. ALL EROSION & SEDIMENT MANAGEMENT WORKS ARE TO REMAIN IN PLACE UNTIL BUILDING ACTIVITIES ARE 90% COMPLETE AND UNTIL VEGETATION HAS DEVELOPED ON EXPOSED AND DISTURBED AREAS WHICH CONTRIBUTE FLOWS TO THE EROSION & SEDIMENT MANAGEMENT WORKS.

POST-CONSTRUCTION DRAINAGE MAINTENANCE

PROVIDE REGULAR MONITORING OF:

- ALL DRAINAGE COLLECTION AND CONVEYANCE SYSTEMS (SUCH AS LAWN DRAINS, CATCH BASINS, MANHOLES, SWALES, ETC.
- ALL DRAINAGE STORAGE AND TREATMENT SYSTEMS (SUCH AS DETENTION TANKS, OIL INTERCEPTORS, SETTLING CHAMBERS, FILTER CHAMBERS, ETC.)
- ALL MANUFACTURED DRAINAGE PRODUCTS (SUCH AS STORMCEPTOR, STORMTEC, ETC.). MONITOR AS PER MANUFACTURER'S RECOMMENDATIONS.
- ALL DRAINAGE INFILTRATION SYSTEMS (SUCH AS ROCK PITS, INFILTRATION GALLERIES, PERFORATED DRAINS, ETC.)

CLEAN ALL SYSTEMS AS REQUIRED ON A REGULAR BASIS (MINIMUM ONCE PER YEAR), OR WHEN MONITORING INDICATES CLEANING IS REQUIRED, OR AS PER MANUFACTURER'S RECOMMENDATIONS.

CLEAN ALL SUMPS ON A REGULAR BASIS (MINIMUM ONCE PER YEAR), OR WHEN MONITORING INDICATES SUMPS ARE FILLING.

REPLACE PEA GRAVEL WHEN CLEANING FILTER CHAMBER(S). ENSURE SCREENS REMAIN INTACT.

GRADING & RETAINING WALL NOTES

1. ALL EARTHWORKS, CUT SLOPES, FILL SLOPES, RETAINING WALLS AND OVERALL SITE GRADE DESIGNS ARE TO BE REVIEWED AND APPROVED BEFORE CONSTRUCTION BY THE GEOTECHNICAL ENGINEER OF RECORD FOR THE PROJECT. FURTHER, THE CONSTRUCTION OF THESE WORKS MUST BE FIELD REVIEWED AND SIGNED OFF BY THE GEOTECHNICAL ENGINEER BEFORE SUBSTANTIAL COMPLETION IS GRANTED FOR THE PROJECT.
2. RETAINING WALLS SUPPORTING SOILS, STRUCTURES, ETC. WITHIN LOTS, TO BE LOCATED ENTIRELY ON THE LOTS.
3. SEE GEOTECHNICAL DRAWINGS FOR SPECIFIC DETAILS FOR TYPE OF WALLS, TIE-BACKS, BATTER, BLOCK CONFIGURATION, DRAINAGE, ETC.
4. RETURN RETAINING WALLS TO SUIT.
5. INSTALL HANDRAIL AS PER MMCD STD DWG C14, OR GUARD AS PER BUILDING CODE ON RETAINING WALLS EXCEEDING 600mm IN HEIGHT.
6. CONNECT RETAINING WALL DRAINAGE SYSTEMS TO PROPOSED STORM SEWER SYSTEMS.
7. ALL SLOPES TO BE VEGETATED UPON COMPLETION.
8. BACK YARDS TO BE SLOPED AT 2.0% AWAY FROM THE BUILDING.
9. THE LOT GRADING SHOWN HAS BEEN DETERMINED BASED ON THE BUILDINGS AND DRIVEWAYS BEING SIZED, LOCATED AND ELEVATED AS SHOWN, ASSUMING TYPICAL BUILDING PRACTICE.
10. DO NOT REVISE BUILDING AND/OR DRIVEWAY SIZES, LOCATIONS AND ELEVATIONS WITHOUT CONSULTING CITY BUILDING DEPARTMENT, ARCHITECT, CIVIL ENGINEER AND GEOTECHNICAL ENGINEER TO DETERMINE IMPACTS ON CIVIL WORKS, EARTH WORKS, GRADING AND RETAINING WALLS.
11. INDIVIDUAL LOTS SHALL BE GRADED IN ACCORDANCE WITH A LOT GRADING PLAN ACCEPTED BY THE CITY. NO RETAINING WALLS SHALL BE ALTERED OR RECONSTRUCTED ON INDIVIDUAL LOTS.
12. LAWN DRAINS AND AREAS SURROUNDING LAWN DRAINS TO BE GRADED TO PREVENT PONDING OF SURFACE WATER.

FOUNDATIONS

1. TOP OF CONCRETE SLAB / FOUNDATION STRUCTURE TO BE MINIMUM 0.2m HIGHER THAN EXTERNAL FINISHED ELEVATIONS.

STORM SERVICES

1. ALL RAIN WATER LEADERS, PERIMETER DRAINS, TRENCH DRAINS AND LAWN DRAINS FROM ALL LOTS TO BE CONNECTED TO THE STORM SEWERS UNLESS OTHERWISE INDICATED.
2. TRENCH DRAINS REQUIRED AS PART OF HOUSE CONSTRUCTION FOR DRIVEWAYS GRADED TOWARDS HOUSES.

BEFORE YOU DIG

INFORMATION ON THE DRAWINGS REGARDING EXISTING UTILITIES WAS COMPILED FROM MUNICIPAL RECORD DRAWINGS AND FIELD SURVEYS. THIS INFORMATION IS NOT NECESSARILY ACCURATE OR COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DATA BY EXPOSURE PRIOR TO ANY CONSTRUCTION AND TO IMMEDIATELY REPORT ANY DISCREPANCIES TO WEDLER ENGINEERING. PRIOR TO CONSTRUCTION, ALL TIE-IN INVERTS SHALL BE CONFIRMED, AND EXPOSURES PERFORMED WHERE THERE IS POTENTIAL FOR CONFLICTS BETWEEN EXISTING AND PROPOSED SERVICES. ANY COSTS RESULTING FROM THE CONTRACTOR'S FAILURE TO DO SO SHALL BE AT THE CONTRACTOR'S EXPENSE.

REV	DESCRIPTION	YYYY-MM-DD	BY	REV	DESCRIPTION	YYYY-MM-DD	BY
A	ISSUED FOR PERMITTING	2018-01-10	AMJ				

LEGAL:

BM/TBM:

PROJ. MGR.: JET
DESIGN/DRAWN: AMJ
PEER REVIEWED:
HORIZ. SCALE:
VERT. SCALE:

WEDLER ENGINEERING
www.wedler.com

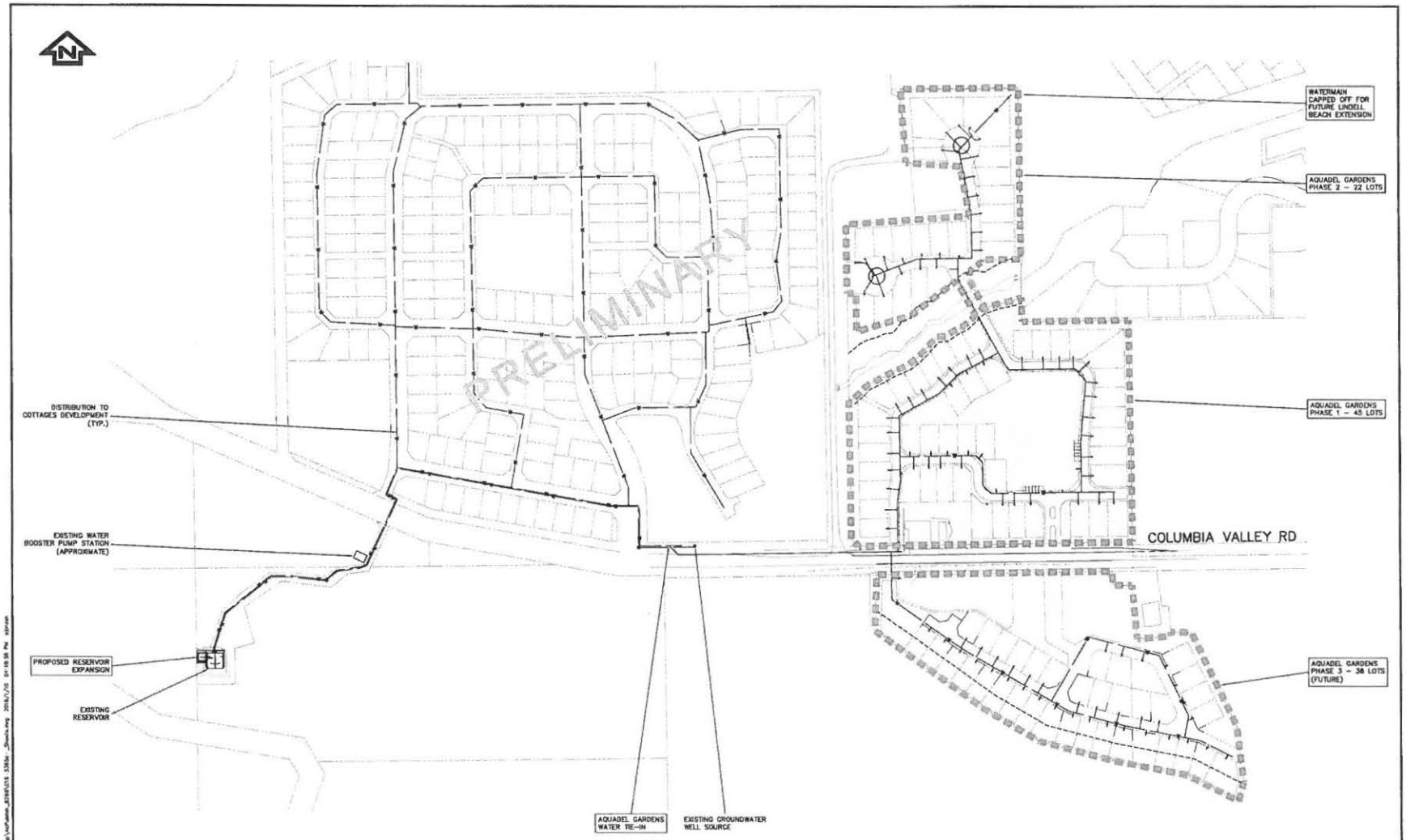
THE WEDLER GROUP: Abbotsford, Chilliwack, Courtenay, Surrey

AQUADEL CROSSING JOINT VENTURE
WATER RESERVOIR EXPANSION
LINDELL BEACH, BC

STANDARD NOTES

DRAWING NO.: C16-5365/D-02 OF -3-
LOCAL GOVERNMENT FILE: -FILE-
PHASE:
REVISION: .A.

PROGRESS PRINT - NOT FOR CONSTRUCTION



REV	DESCRIPTION	YYYY-MM-DD	BY
A	ISSUED FOR PERMITTING	2016-01-10	AMJ

PROJ. MGR. AT
DESIGN/DRAWN AMJ
PLAN REVISED
HORZ. SCALE 1:1500
VERT. SCALE

WEDLER ENGINEERING
www.wedler.com

THE WEDLER GROUP
- Abbotsford 1.866.746.4388
- Chilliwack 1.604.792.9521
- Courtenay 1.250.334.3063
- Surrey 1.604.588.1918

AQUADEL CROSSING JOINT VENTURE
WATER RESERVOIR EXPANSION
LINDELL BEACH, BC

WATER CONTEXT PLAN

DRAWING NO. C16-5365/D-02 | OF -3-
LOCAL ENHANCEMENT FILE -FILE-
PHASE | REVISION A

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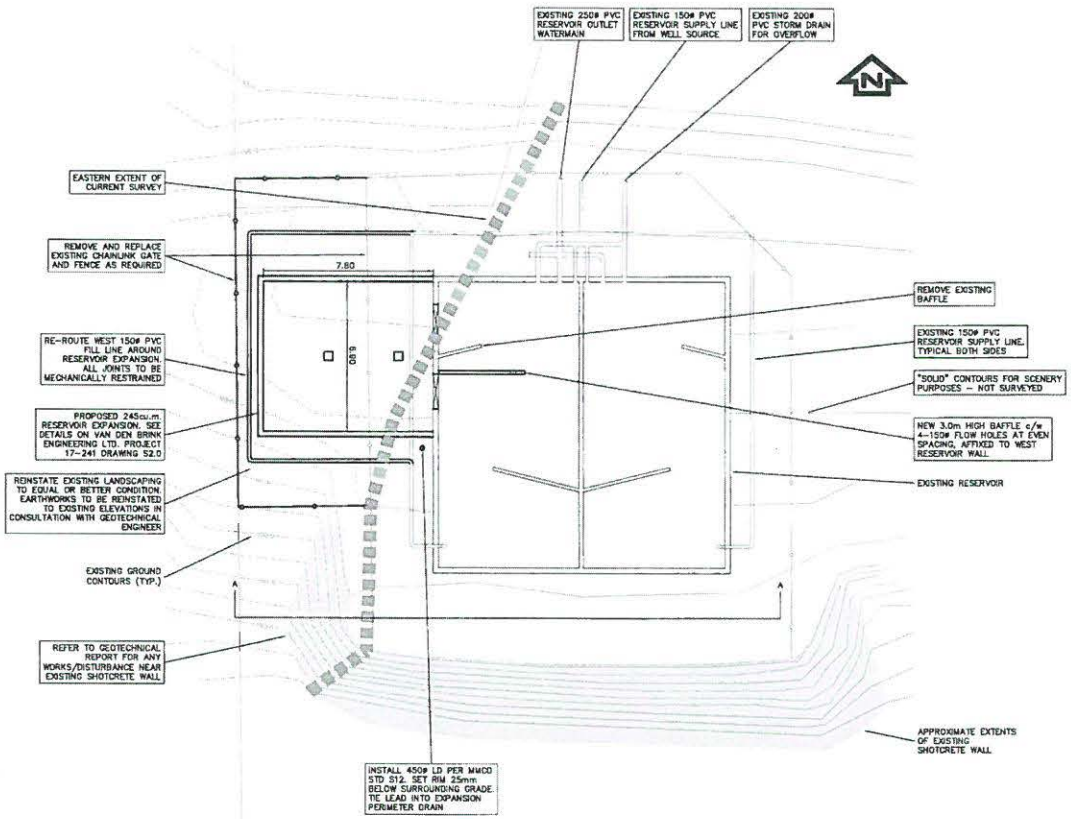
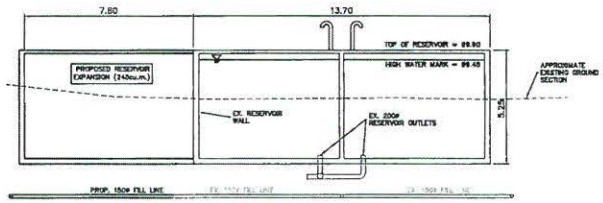


RESERVOIR PLAN DETAILS
1:100



RESERVOIR SECTION A–A
N.T.S.

REV	DESCRIPTION	YYYY-MM-DD	BY	REV	DESCRIPTION	YYYY-MM-DE	BY
A	ISSUED FOR PERMITTING	2018-01-12	ANU				

PROJ. MGR. JST
DESIGN/DRAWN ANU
PEER REVIEWED
HORIZ. SCALE AS SHOWN
VERT. SCALE

WEDLER ENGINEERING
www.wedler.com

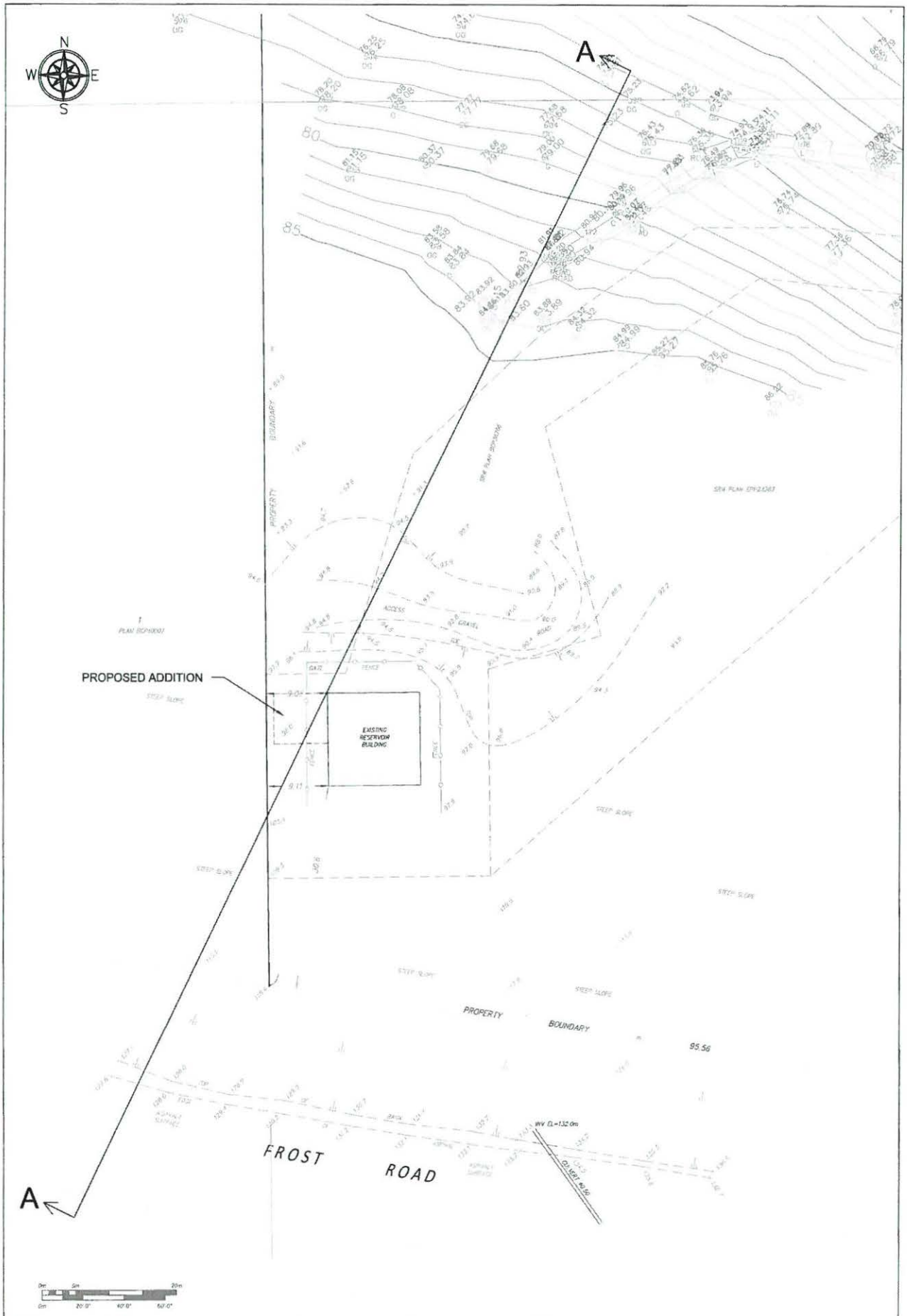
THE WEDLER GROUP
- Abbotsford 1.604.746.0300
- Chilliwack 1.604.792.0851
- Courtenay 1.250.334.3080
- Surrey 1.604.588.1918

AQUADEL CROSSING JOINT VENTURE
WATER RESERVOIR EXPANSION
LINDELL BEACH, BC
RESERVOIR SITE PLAN

DRAWING NO. C16-5365/D-03
OF -3-
LOCAL GOVERNMENT FILE -FILE-
PHASE
REVISION A

PROGRESS PRINT - NOT FOR CONSTRUCTION

Appendix C
Slope Analysis



VALLEY GEOTECHNICAL
Engineering Services Ltd

Unit 15 20279 97th Avenue
Langley BC, V1M 4B9
Phone: (604) 882-9475
Fax: (604) 882-9476

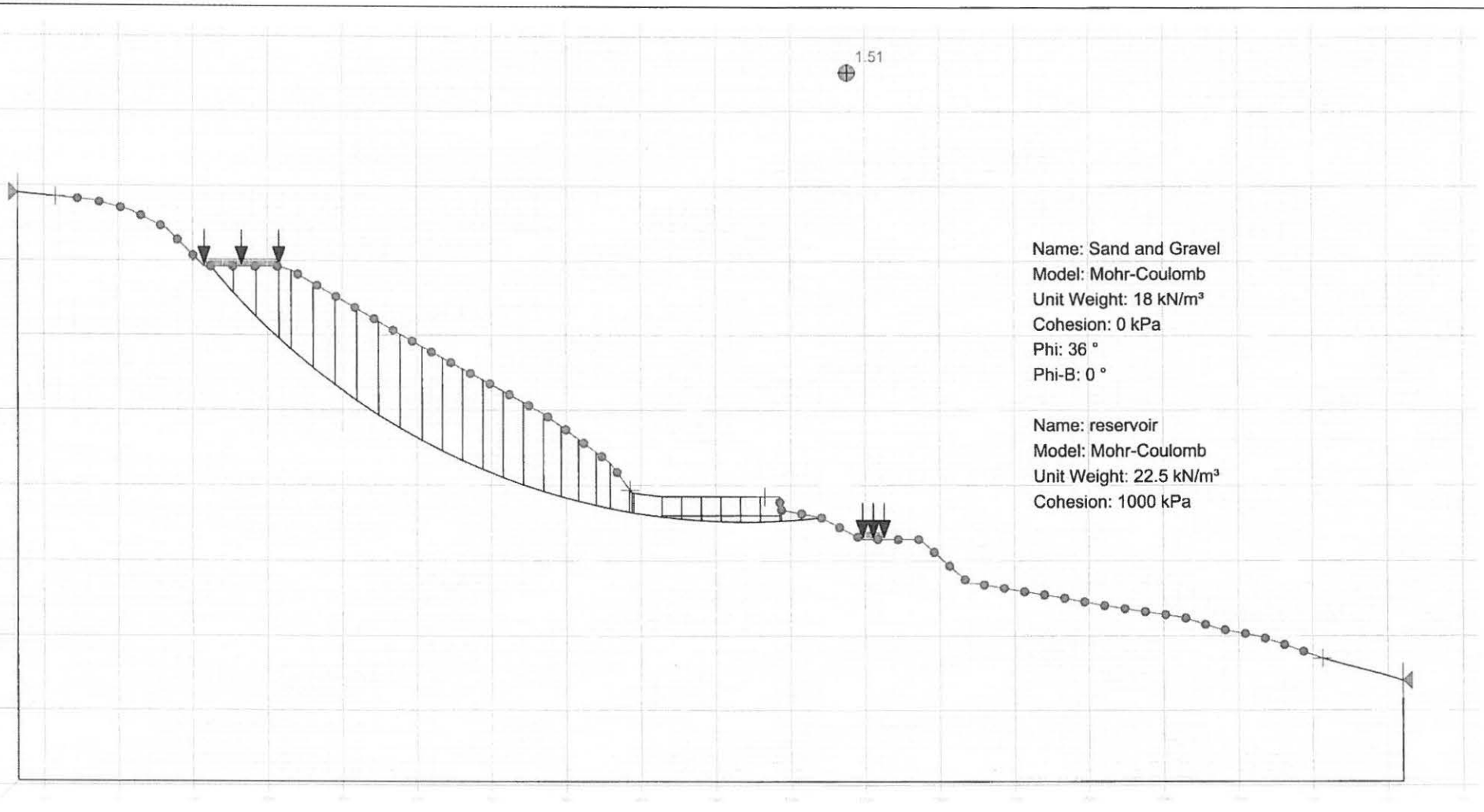
Client:	Aquadel Crossing JV
Location:	1777 Columbia Valley Highway Cultus Lake, FVRD, BC
FILE No.	44588-01
DATE	May 8, 2018

SEAL

REV	DATE	DESCRIPTION

Slope Analysis
Site Plan

DRAWN:	ML	DWG No.
CHECKED:	RV	1 of 3
SCALE:	1:500	



VALLEY GEOTECHNICAL
Engineering Services Ltd

Unit 15 20279 97th Avenue
Langley BC, V1M 4B9
Phone: (604) 882-8475
Fax: (604) 882-8476

Client: Aquadel Crossing JV

Location: 1777 Columbia Valley Highway
Cultus Lake, FVRD, BC

FILE No.	DATE
44588-01	May 8, 2018

SEAL

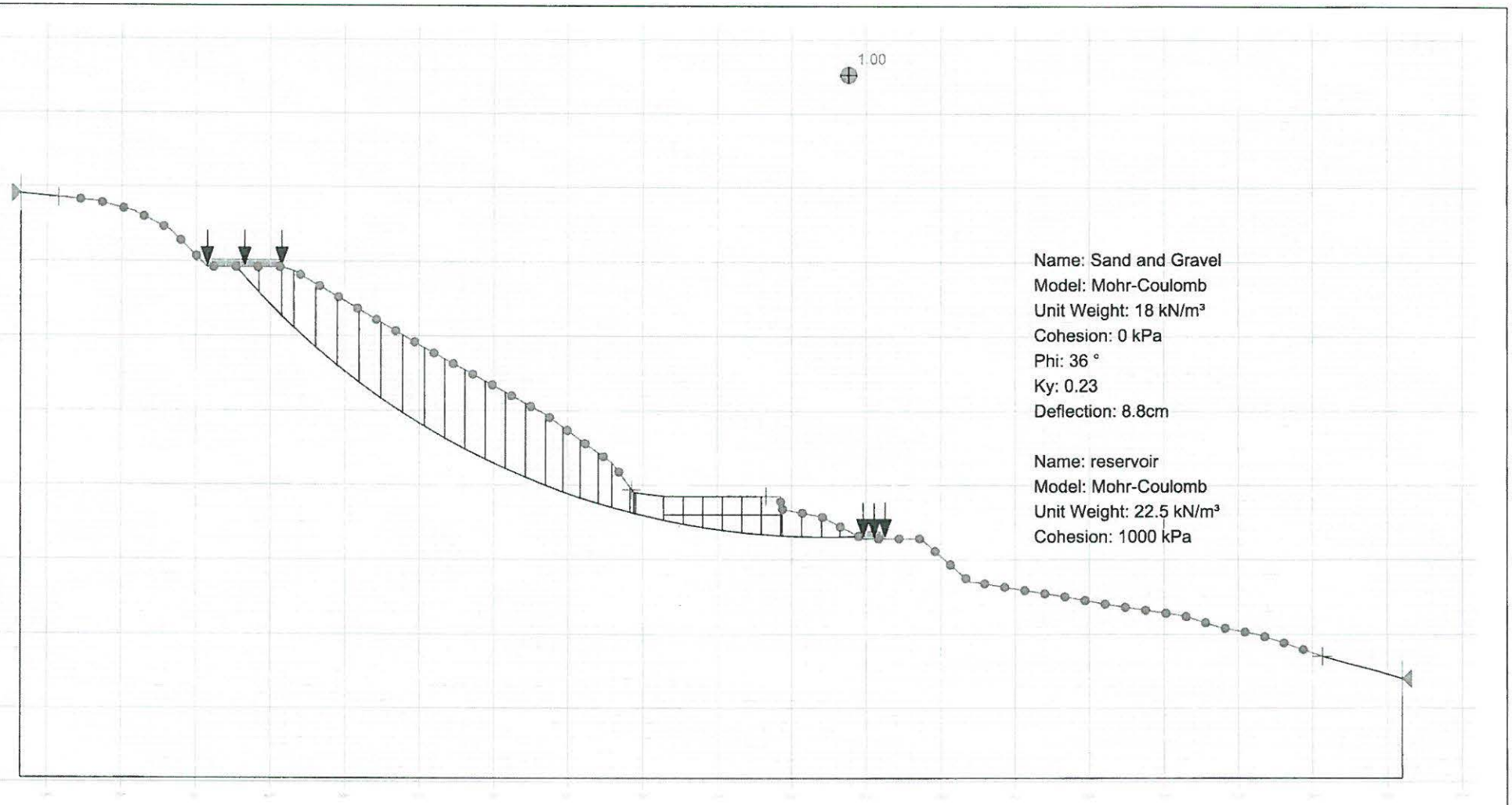
REV.	DATE	DESCRIPTION

Slope Analysis

Section A-A
Static Condition

DRAWN:	ML	DWG No.
CHECKED:	RV	2 of 3
SCALE:	1:500	

\\Vges-srv-dc1\vges\VGES-PROJECTS\44500\44588-01\(44588-01) 2018 05 08 Section for Water Reservior.dwg



VALLEY GEOTECHNICAL
Engineering Services Ltd

Unit 15 20279 97th Avenue
Langley BC, V1M 4B9
Phone: (604) 882-8475
Fax: (604) 882-8476

Client: Aquadel Crossing JV

Location: 1777 Columbia Valley Highway
Cultus Lake, FVRD, BC

FILE No.	DATE
44588-01	May 8, 2018

SEAL

REV.	DATE	DESCRIPTION

Slope Analysis

Section A-A
Seismic Condition

DRAWN:	ML	DWG No.
CHECKED:	RV	3 of 3
SCALE:	1:500	

\\Vges-srv-dc1\vges\VGES-PROJECTS\44500\44588-01\(44588-01) 2018 05 08 Section for Water Resevior.dwg

Appendix D

Geohazard Assurance Statement

Geo-Hazard Assurance Statement
for Development Approvals

A. Project Information

Date May 8, 2018 FVRD File No. _____

Property Information

Project Name & Description Reservoir Addition (Extension)

Legal Description Plan BCS3022 Section 10 and 15 Township 22 NWD

Site Address 1777 Columbia Valley Highway PID _____

Client Information

Name Aquadel Crossing Ltd

Role ☐ Property Owner ☑ Developer ☐ Other

Client Address PO Box 2267, V2R 1A6

Qualified Professional Information

Name Raul Valverde

APEGBC Designation ☑ P.Eng. ☐ P. Geo. ☐ Eng.L ☐ Geo.L

Company Name Valley Geotechnical Engineering Services Ltd.

Mailing Address #15, 20279 - 97 Avenue, Langley

Email Address _____ Phone # _____

Geo-Hazard Report Reference

Title Reservoir Addition Risk Analysis Report Date May 8, 2018

Personal information on this form is being collected in accordance with Section 27 of the Freedom of Information and Protection of Privacy Act, RSBC 1996 Ch. 165; Part 9, Division 1 [Building Regulation] and Part 14 [Planning and Land Use Management] of the Local Government Act, RSBC 2015 Ch. 1; and Section 56 of the Community Charter, SBC 2003 Ch. 26 and will only be collected, used and disclosed for the purpose of administering geo-technical hazard reviews and assurance statements related to development approvals. Questions? Contact FVRD Privacy Officer at 45950 Cheam Avenue, Chilliwack, BC V2P 1N6; 604-702-5000 or 1-800-528-0061; or FOI@fvrd.ca.

B. Assurance

Based on the contents of this Assurance Statement and the Report, I hereby give assurance that:
(check as applicable)

☐	Development Permit	The Report will "assist the local government in determining what conditions or requirements under it will impose in the permit", as required by the *Local Government Act* (Division 7)
☑	Building Permit ☑ Community Charter	"The land may be used safely for the use intended", as required by the *Community Charter* (Section 56)
	☑ Seismic Slope	The Report addresses the requirements of the BC Building Code 2006, 4.1.8.1.6 (8) and 9.4.4.4 (2), as detailed in the BC Building & Safety Policy Branch Information Bulletin B10-01, Jan 18, 2010
☐	Floodplain Management Bylaw Exemption	"The land may be used safely for the use intended", as required by the *Local Government Act*. (Section 524)
☐	Subdivision	"The land may be used safely for the use intended", as required by the *Land Title Act* (Section 86).
☐	Other *(e.g. Zoning Bylaw Amendment, Official Community Plan Amendment, Temporary Use Permit, etc.)*	<Insert statement as appropriate>

C. APEGBC Professional Practice Guidelines

The Report and this Assurance Statement should be completed in accordance with the current version of one or both of the following Professional Engineers and Geoscientists of BC (APEGBC).

- *Legislated Flood Assessments in a Changing Climate in BC*
- *Legislated Landslide Assessments for Proposed Residential Development in British Columbia, ("APEGBC Landslide Guidelines").*

These two documents are collectively referred to as the "APEGBC Guidelines". The italicized words in this Assurance Statement are defined in the APEGBC Guidelines.

The Report has been prepared pursuant to the following APEGBC Guidelines *(check one or both as applicable)*.

☐ APEGBC Flood Guidelines

☑ APEGBC Landslide Guidelines

If the Report is **not** prepared pursuant to either of the APEGBC Guidelines, please explain.

D. Background Information

Qualified Professionals **must** confirm and check that each item is included in the Report.

- [x] 1. Property location map — 8.5 x 11 size
- [x] 2. Development proposal site plan — 8.5 x 11 size. *If a subdivision, show the parent parcel and all lots to be created, including any remainder.*
- [x] 3. Description of the proposed development project (including building use) to the extent this is known at the time of Report preparation.
  - [ ] residential
  - [ ] industrial
  - [ ] commercial
  - [ ] institutional
  - [x] other water reservoir

E. Technical Requirements

Qualified Professionals **must** review, confirm and check completed items (as applicable).

Report Content

- [x] 4. Relevant information pertaining to the Property and pertinent potential hazards from appropriate background sources, including the FVRD online library.
- [x] 5. Time limitation or condition statement to describe extent the FVRD may rely on the Assurance Statement and Report for development approvals, and when resubmittal is recommended.
- [x] 6. Maps, illustrations and diagrams to illustrate areas referred to in the Report.
- [x] 7. Description of field work conducted on and, if required, beyond the Property.
- [x] 8. Contact and consultation with the Fraser Valley Regional District. Provide name and title of contact.

  FVRD Planner - Mike Foster

- [x] 9. Review of relevant FVRD bylaws and other statutory requirements.
- [x] 10. Restrictive covenants registered against the Property title that pertain to geo-hazards (if registered, the Report provides relevant information about the covenants).
- [x] 11. Notation of any visibly apparent natural hazards or other hazards identified in background reports, which are not identified and addressed in this Report. If yes, provide details in Section H: Geo-Hazard Summary Table.

  ○ Yes
  ● No

- [x] 12. Does the report rely on one or more supporting reports, each of which is independently reviewed, signed and sealed. If yes, provide details in Section H: Geo-Hazard Summary Table.

  ○ Yes
  ● No

- [ ] 13. For subdivision approval, the Report addresses natural hazards for:

  - [ ] the parent parcel prior to subdivision
  - [ ] any lots to be created (including any remainder)

Geo-hazard Assessment, Risk Acceptability and Risk Transfer

☑ 14. In considering the above-noted potential hazards that may affect the property, I have:

- ☑ reviewed and characterized the potential hazard(s)
- ☑ estimated the potential frequency and magnitude of the potential hazard(s)
- ☑ relied on supporting reports as noted above
- ☑ relied on a pre-existing assessment of hazard frequency and magnitude
- ☑ considered the potential effects of climate change in the context identified in the Report
- ☑ considered the potential effects of changed future conditions (upstream watershed changes, forestry activity, land use changes, sea level rise, etc.) in the context identified in the Report

☑ 15. This Assurance Statement pertains to all geo-hazards that are assessed in the Report and any supporting reports, and accurately reflects the contents of those documents.

☑ 16. The FVRD has adopted "Hazard Acceptability Thresholds for Development Approvals by Local Government", which provides a specific level of hazard or risk tolerance. I have included a Hazard Summary Table which:

- ☑ lists all the potential hazards addressed by the Report and any supporting reports
- ☑ provides an annual return frequency and acceptability threshold classification for the unmitigated condition
- ☑ proposes mitigative measures to appropriately reduce the geo-hazard risk
- ☑ provides an annual return frequency and acceptability threshold classification for the mitigated condition

☑ 17. The Report describes the potential transfer of natural hazard risk to other properties or infrastructure as a result of the proposed project (including any proposed *mitigation works*) and

- ☑ considered the potential for transfer of natural hazard risk
- ☑ concludes that there is no significant transfer of natural hazard risk
- ☑ identifies the potential transfer of natural hazard risk and proposes measures to offset such transfer of risk

Mitigation and Design Recommendations (if recommended)

The Report contains the following items:

☐ 18. Implementation steps for the identified structural mitigation works (in terms of design, construction and approval).

☑ 19. Clearly identified safe locations for building(s), ancillary structures, and onsite utility services (as applicable, such as a septic field) out of the natural hazard area as a preferred development alternative.

☑ 20. Commentary on the effectiveness of proposed structural mitigation works in terms of ability to reduce the potential hazard impact, and identification of any residual risk that would remain.

☐ 21. Proposed Flood Construction Level (FCL) for future development and including specification of an appropriate method of achieving the FCL.

☐ 22. Proposed watercourse setback, which is clearly referenced from the natural boundary, top of bank or another suitable basis.

☐ 23. Proposed operation and maintenance actions that will be necessary in order for the level of safety to be maintained in the future, with indications of who should be responsible for those actions and when.

Riparian Area Regulation (if applicable)

☐ 24. QP must review RAR assessment report to avoid conflict with Geo-Hazard Report recommendations.

F. FVRD Supplemental Requirements

The following points are understood by the Qualified Professional when submitting a Report:

☑ 25. Permission is granted to the FVRD to use the Report in considering approval of the proposed development on the property, provided that such permission is limited only to the proposed development project for which the Report was prepared.

☑ 26. Methodology used in the Report is described in sufficient detail to facilitate a professional review of the study by the FVRD when necessary.

☑ 27. Professional liability insurance coverage of at least $1 million per claim is carried by the QP.

☑ 28. Third party review or supplemental information may be required by the FVRD where complex development proposals warrant.

☑ 29. Permission is granted to the FVRD to include the Report in the online FVRD geo-hazard report library (as background information, not for other parties to rely).

G. Qualified Professional (QP)

Prepared by: (QP of Record)

Name Raul Valverde

Designation ☑ P.Eng. ☐ P. Geo. ☐ Eng.L ☐ Geo.L

Reviewed by:

Name Joel Blanco

Designation ☑ P.Eng. ☐ P. Geo.

The Report has received appropriate technical review which is consistent with both the APEGBC Professional Practice Guidelines, and APGBC Quality Management Guidelines. The name of the reviewer is noted in the Report and below.

Professional Seal, Signature and Date:

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
J. F. BLANCO
44388

May 9, 2018

☑ I am a Qualified Professional as defined in the APEGBC Guidelines, and I fulfill the education, training and experience requirements as outlined in the APEGBC Guidelines

☑ I have signed, sealed, dated and thereby certify, this Assurance Statement and the attached report.

H. Geo-Hazard Summary Table

The geo-hazard report and/or any supporting reports addresses the following hazard types.

Geo-Hazard Type #1 Small Scale Localized Landslip		Geo-Hazard Type #2 Major Catastrophic Landslide	
Annual Return Frequency (Unmitigated) 1:500 - 1:10000		Annual Return Frequency (Unmitigated) 1:1000 - 1:10000	
Acceptability Threshold Classification	3	Acceptability Threshold Classification	2
MITIGATION (if necessary)			
Proposed Mitigation Measures	Yes ● No ○	Proposed Mitigation Measures	Yes ○ No ●
Annual Return Frequency (Mitigated) <10000		Annual Return Frequency (Mitigated)	
Acceptability Threshold Classification	1	Acceptability Threshold Classification	
Comments		Comments	
SUPPORTING REPORT			
Was this report prepared by others?	Yes ○ No ●	Was this report prepared by others?	Yes ○ No ●
If yes, list report name, date and author.		If yes, list report name, date and author.	

Geo-Hazard Type #3 Debris Flow and Debris Torrent		Geo-Hazard Type #4	
Annual Return Frequency (Unmitigated) 1:500 - 1:10000		Annual Return Frequency (Unmitigated)	
Acceptability Threshold Classification	2	Acceptability Threshold Classification	
MITIGATION (if necessary)			
Proposed Mitigation Measures	Yes ○ No ●	Proposed Mitigation Measures	Yes ○ No ○
Annual Return Frequency (Mitigated)		Annual Return Frequency (Mitigated)	
Acceptability Threshold Classification		Acceptability Threshold Classification	
Comments		Comments	
SUPPORTING REPORT			
Was this report prepared by others?	Yes ○ No ●	Was this report prepared by others?	Yes ○ No ○
If yes, list report name, date and author.		If yes, list report name, date and author.	

Indicate which hazards were **NOT** reviewed:

- ☐ Chilliwack River Valley Erosion or Avulsion
- ☐ Debris Flow and Debris Torrent
- ☐ Debris Flood
- ☐ Fraser River & tributaries flooding
- ☐ Mountain Stream Erosion or Avulsion
- ☐ Major Catastrophic Landslide
- ☐ Seismic Effects/Liquefaction
- ☐ Rockfall - Small Scale Detachment
- ☐ Slope Stability
- ☐ Small Scale Localized Landslide
- ☐ Snow Avalanche
- ☑ Tsunami

Hazard Acceptability Thresholds Classification, as per Hazard Acceptability Thresholds for Development Approvals by Local Government dated November 1993 by Dr. Peter Cave.

1 Approval with conditions relating to hazards.
2 Approval, without siting conditions or protective works conditions, but with a covenant including "save harmless" conditions.
3 Approval, but with siting requirements to avoid the hazard, or with requirements for protective works to mitigate the hazard.
4 Approval as (3) above, but with a covenant including "save harmless" conditions as well as siting conditions, protective works or both.
5 Not approvable.

Additional Comments