ATTACHMENT 7

MUNICIPALITY OF NORTH Cowichan
7030 Trans-Canada Highway
Duncan, BC V9L 6A1 Canada
www.northcowichan.ca
T 250.746.3100
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Mobile Home Park Permit

Permit No.	MHP00001
Registered Owner	1251719 BC Ltd.
Applicant	Sean Carroll, Core Group Civil Consultants Ltd.
Subject Property	9090 Trans-Canada Highway
Description of Land	
• Parcel Identifier	009-885-200
• Folio No.	15038.000
• Legal Description	The East 60 Acres of Section 10, Range 5, Chemainus District, Except 16.5 Foot Strip Along and Adjoining the North and East Boundaries thereof, Reserved for Road Purposes, Except Parts in Plans 11489, 26194 and VIP68870
Number of Park Units	101
Source of Water	Municipal
Sewage Disposal Method	Septic

Conditions of Permit

1. This permit is issued subject to compliance with all relevant Municipality of North Cowichan bylaws, including Mobile Home Parks Bylaw No. 1775 and Zoning Bylaw 1997, No. 2950.

2. This permit applies to the land described above and hereinafter called "the Land."

3. The Land shall be developed in accordance with **Development Permit No. DP000256** issued by the Municipality of North Cowichan on **November 2, 2022,** and filed under **Registration No. CB318246** with the Land Title and Survey Authority of British Columbia and the following schedules"

   - **Schedule 1 - MHP00001 - Sewage Disposal Island Health - TRAX Developments Ltd. June 9, 2021 (22 pages)**
   - **Schedule 2 - MHP00001 - Sewage Disposal Island Health - TRAX Developments Ltd. May 1, 2023 (4 pages)**
   - **Schedule 3 - MHP00001 - Landscaping Plan and Security - PMG Landscape Architects May 16, 2022 (8 pages)**
   - **Schedule 4 - MHP00001 - Servicing Plan - Modular Home Development Core Group August 17, 2023 (23 pages)**

- **Schedule 5 - MHP00001 - Civil Schedule B - Core Group February 21, 2023 (4 pages)**
- **Schedule 6 - MHP00001 - Stormwater Management Memo, Schedule B - Geopacific June 1, 2021 (6 pages)**
- **Schedule 7 - MHP00001 - Retaining Wall Drawing, Schedule B and EGBC Assurances November 20, 2023 (10 pages)**

4. A portion of the Land is in the Agricultural Land Reserve. The use and development of this portion of Land for the Mobile Home Park must comply with the Agricultural Land Commission's **Reasons for Decision, Resolution No. 366/2022** issued on **October 11, 2022**, and all relevant policies and regulations of the Agricultural Land Commission.

5. This permit is not a building permit. A valid building permit must be obtained prior to construction and / or placement of any modular dwelling unit or accessory structure on the property.

6. Further to page 1 of Schedule 7, retaining wall(s) proposed along lots 39 to 48 must be constructed as per the "Single Tier Walls" typical design, or as otherwise determined by the "Engineer of Record".

7. The agreed landscaping security in the amount of $143,332.48 has been receipted. As per the provided November 8, 2023, Core Group Consultants letter of agreement, no partial drawdown of security (monies held for duration of project) will be permitted until completion of the entire project's landscaping installation.

8. The Municipality reserves the right to observe installations and testing of any aspect of the servicing for this project; and review certifications including confirmation from Island Health for sewage collection, treatment, and disposal.

9. Pursuant to Section 2.02 (h) of the Mobile Home Parks Bylaw No. 1775, if after issuance of this permit the authorized construction has not commenced within six months from the date of the Mobile Home Park approval, or if, after the commencement of a period of six months through any cause other than weather conditions, strikes or lockouts, or if the work be not carried on continuously and in a bonafide manner this permit shall be void, and the work shall not again commence until a new permit has been issued and fee paid.

Date of Mobile Home Park Permit Approval/Issuance by Council or its

Delegate: This permit was approved and issued on **January 31, 2024.**

This permit will expire on **July 31, 2024.**

The Corporation of the District of North Cowichan

Tim Byron,
Chief Building Inspector

TRAX DEVELOPMENTS LTD.

Box 9-6, Thetis Island, BC, V0R2Y0. T 250-246-4774 Fx 866-424-8569
onsite@traxdev.com

4/28/2021

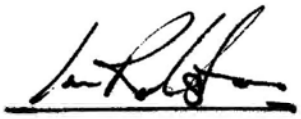
RE: 9090 Trans Canada Highway sewerage system servicing

This is to confirm that intend designing, and the developer intends constructing, onsite sewerage systems compliant with the BC *Health Act* Sewerage System Regulation to provide sewerage servicing for the proposed phased development of this site.

The proposed development is to be phased. Each phase is to be served with a separate sewerage system, collecting wastewater from the individual dwelling units within that phase, treating this wastewater and discharging it to ground. Each phase is expected to be of such a size that the design daily domestic sewage flow for each separate system will be below 22,700 Litres.

Please do not hesitate to contact the undersigned for clarification.

Sincerely



Ian Ralston P.L.Eng
TRAX

island health

RECORD OF SEWERAGE SYSTEM

Filing # (OFFICE USE ONLY) DC 21/144

1. Property Information

■ New Construction ☐ Alteration ☐ Repair ☐ Amendment – Original Filing #

Tax Assessment Roll #: PID provided.

PID #: 009-885-200

Legal Description (Plan, Lot, District Lot, Block Numbers):
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ADJOINING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES; EXCEPT PARTS IN PLAN

Street (Civic) Address or General Location: 9090 Trans Canada Highway

City: Chemainus

2. Owner Information

Name of Legal Owner: 1230226 B.C. LTD

Mailing Address: C/O TRAX Developments Ltd. Box 9-6

Phone: 250-246-4774 City: Thetis Island Prov: BC Postal Code: V0R2Y0

3. Authorized Person Information

Name of Authorized Person: Ian Ralston

Mailing Address: Box 9-6

Phone: 250-246-4774 City: Thetis Island Prov: BC Postal Code: V0R2Y0

Registration #: 158292

Email: onsite@traxdev.com

4. Structure Information

Sewerage System Will Serve:

☐ Single Family Dwelling ☐ Other Structure *(specify)* _____ ■ Other Dwelling *(specify)* 20 Modular homes

The sewerage system is designed for an estimated minimum daily domestic sewage flow of *(check one)*

☐ Less than or equal to 9,100 litres ■ More than 9,100 litres but less than 22,700 litres

5. Site Information

Depth of native soil to seasonal high water table or restrictive layer *(cm)* 140 cm, see specs

Information respecting the type, depth and porosity of the soil (sand media) is attached ■ Yes ☐ No

GPS Location of System *(decimal degrees)* Latitude N 48.89984996643548 Longitude W -123.71886581048344

Horizontal Accuracy *(m)* 10 ■ Recreational GPS ☐ Differential GPS

6. Drinking Water Protection

Will the sewerage system be located less than 30 m from a water well? ☐ Yes ■ No

If yes, attach a professional's report and specify the intended distance _____ *(m)*

Distance of proposed sewerage system to the closest body of surface water >30 m to permanent fresh water *(m)*

7. System Information

Sewerage treatment method ■ Type 1 ☐ Type 2 ☐ Type 3

8. Legal or Regulatory Considerations

■ Construction of the proposed sewerage system will not conflict with legal instruments registered on the property. See specifications

Is this filing submitted as the result of an order from the Health Authority? ☐ Yes *(attach a copy of the order)* ■ No

9. Plot Plan and Specifications

Plot Plan (to scale) and specifications are attached ■ Yes ☐ No

■ The plans and specifications are consistent with Standard Practice

Source of Standard Practice: ■ Ministry of Health Standard Practice Manual ■ Other See design notes

10. Authorized Person's Signature

Signature

Date: 7 June 2021

OFFICE USE ONLY

Filing Accepted Date June 9/21

Receipt Number $ 200.00 # 255743

Revised August 2015

North Cow.

TRAX DEVELOPMENTS LTD.
SEWERAGE SYSTEM DESIGN NOTES AND SUMMARY SPECIFICATIONS

Design	9090 TCH Phase 1	Friday, June 4, 2021
Revision	Rev. 0	Client: Core Group Civil Consultants
Notes	System selection and design based primarily on SPM V3 (September 2014) and supporting rationale and calculations (on file). See references for other sources of standard practice utilized.	

Introduction and objectives	The owner intends construction of a sewerage system with STEP collection and central dispersal to serve a first 20 home phase of a proposed mobile home park on this site. TRAX has been retained by the client on behalf of the owner to provide a design of the sewerage system. This sewerage system will be owned and managed by the owner. Later phases are to be served by separate systems, which will be designed and filed separately at the time of development of those phases. **Objective** of this report is to provide a suitable design for a Sewerage System including dispersal area on this site to serve the use defined below. Preliminary site and soil evaluation was carried out by Ian Ralston P.L.Eng and Henry VanHell ROWP (site and soil evaluation summary report attached) and serves as the basis for this design. See also plans (R0) which are based on survey and development plans provided by the client. Prior to and during installation, the design engineer may approve design changes. The design engineer and installer will prepare as-built drawings and specifications to confirm these changes. Construction must be supervised (field review of installation) by TRAX, this will be by the design engineer (Ian Ralston) or a subordinate under direct supervision. Prior to installation the design engineer will specify the minimum requirements for field review, shop drawing review and for notification of TRAX. Unspecified or contradictory installation details should be confirmed with TRAX (the design engineer). Certain items must be confirmed with TRAX prior to or at installation or may be redesigned during installation by TRAX; these are noted in these specifications or in the plans. For general installation, maintenance, monitoring and operation practice the installation is to follow the SPM V3 **Limitations** This design and site evaluation report is subject to the attached Statement of General Conditions. By accepting and using this report the owner and client acknowledge that the capacity of the system is limited to the stated design flows of wastewater with characteristics representative of normal residential sewage.
Domestic water supply well setback	Client reports, and site evaluation did not identify any domestic water supply wells within 30 m of proposed sewerage system components. The area is served by municipal water supply. Prior to installation, the installer is to confirm that no domestic water supply wells are located within 30 m of any proposed sewerage system component. If a well is found closer than this specified distance, the design engineer is to be informed and construction is to cease until instructions are provided.
Preliminary design	This is a preliminary design, and may be revised prior to or during system installation. Certain items must be confirmed prior to or during construction, as identified in the drawings and specifications.
STEP collection system mains and pumps, water main setback	As site grading plans may change prior to construction the specification of STEP collection pumps and forcemains is preliminary and must be confirmed and detailed prior to construction. The client will take responsibility for detailed installation specification and construction of the STEP mains and STEP connection valves, in coordination with TRAX. All sewerage system components, including the STEP mains, are to be set back a minimum of 3 m to the propsed municipal water main that will run down new roadways. The civil drawings are to specify risk management requirements for situations where the STEP piping must cross water lines, and this must be acceptable to the Public Health Engineer.
Summary of regulatory context	Other sewerage systems will be installed on the site, to serve other sources of wastewater or other phases. This system is to be completely separate from those systems, and is to serve only the sources identified in this design. It is not to be physically connected at any point to other sources of wastewater or other sewerage systems existing or planned on the site. The Ministry of Health and Ministry of Environment have provided a policy document clarifying the application of regulations for onsite sewerage systems, the *Onsite Sewage Jurisdictional Flow Divide Interpretation Guideline*.Based on that policy document, each separate sewerage system (whether on the same lot or not) must be filed under the Sewerage System Regulation if the system has a daily design flow of less than 22,700 L/day and discharges to ground—which is the case for this system. Following this policy, we have designed this system following the Sewerage System Regulation and standard practice as defined by that regulation. Following this regulatory policy, standard practice and the above noted observations we have developed a design with the characteristics described below.
Attached	Drawings. Float setting sheet for pump chambers. Site and soil evaluation summary.

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JUN 09 2021
This filing Does Not Constitute
Approval for Further Subdivision

Lot legal	Note that lot legal may change. THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ADJOINING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11489, 26194 AND VIP68870		
PID	009-885-200 (current)	Easements or Covenants?	Title on file. An existing development permit is in place, we understand that a new permit will replace this. If any requirements of the new permit affect the sewerage system construction, contact the design engineer for revisions to this design. An easement is in place for a water main (see plan), the water main is proposed to be relocated, and this design includes requirements for water line setbacks. Other easements are in place, relating to use of parts of the southern part of the property by the adjacent property. These are not relevant to the proposed system placement.
Development permit or environmentally sensitive areas	**Any and all development permissions necessary for construction of the sewerage system and for connected facilities are the responsibility of the owner.** We understand that development approval by the Municipality of North Cowichan may be required, if these include requirements related to the system contact the design engineer for revisions to this design to address such requirements. The proposed dispersal area falls partly within a reportedly required buffer strip to the development external property lines, we understand from the client that this is acceptable and have relied upon the client's opinion for siting the dispersal beds in this area. Note that tree cover is to be maintained in the bed area.		
Owners	1230226 B.C. LTD		
		Address	9090 Trans Canada Highway, Chemainus (civic address may change)

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System Selection

Item	Value	Constraint, opportunity, result	Solution and rationale
Site, soils and site use			
Use (existing and planned)	*Type of use*	*Mobile home*	Per each of 20 mobile homes
	Number of bedrooms	*3*	Typical, with water conserving fixtures and appliances.
	Floor area (sq m)	*140*	Typical maximum.
Occupants		*3.75*	per Table II-9
DDF Table II-9 (L/day)	*Occupancy*	*1125*	Per each mobile home
DDF other (L/day)			SPM design flows utilized to allow use of SPM standard loading rates.
Effluent strength		*Normal residential*	No garburators, large tubs or water filter/softener backwash water to flow to the system
Chosen DDF (L/day)		*22500*	For the 20 mobile homes in Phase 1. ADF = 11250 L/day on a weekly average basis.
Soil texture (<2 mm fraction)	*Sandy Loam*	*Fine Sands, Loamy Fine Sands, Sandy Loams*	
Structure	*Subangular Blocky*	*F*	Table II-4
Structure grade	*Strong*		
Consistence	*Very Friable*		
Coarse fragment %	*3%*	*No HLR adjustment*	s. III-4.1.2.2
Coarse fragment type	*Gravel*		
Different soil for LLR?	*No*		
Other soil notes			Underlying Till shows high measured permeability.
Kfs or Perc to be used?	*Kfs*	*Kfs*	
Kfs (mm/day)	*1320*	*1320*	
Kfs for LLR selection (mm/day)		*1320*	
Soil depth (cm)	*140*		Based on TP4 and 5 plus geotechnical pits.
Slope %	*20%*		
Slope shape, location		*Ridge, Convex Linear*	
Temperature	*Low frost risk*		
Net positive evapotranspiration, mm/yr?	*0*	*No ET, ETA, Lagoons*	Tree cover to be retained and or enhanced. ET based on Farmwest data
Rainfall, mm/year	*1039*	*No HLR adjustment*	Duncan Forestry Environmnet Canada climate normals.
System selection and loading rates			
Soil constraints?	*Table II-5*	*Type 1 VS 90cm Type 2 VS 120cm Dosed to sequential trenches or pressure manifold only (unless ET, ETA, lagoon)*	Pressure distribution to be used to sand media bed system to address limited available area.
	Table II-5 notes	*No further constraints*	Manual check for VS, AIS
	Table II-6	*Seepage Beds, sand lined beds and bottomless sand filtersNot allowed*	Sand mounds OK
	Table II-6 notes	*No further constraints*	See above for ET, ETA and Lagoon net positive ET constraints.
	Table II-7 notes	*No further constraints*	Opportunity due to higher permeability in underlying Till.
Soil depth and VS options, distribution and dosing options	*Type 1, gravity dist.*	*90*	Pressure distribution to be used to sand media bed system to address limited available area.
	Type 1, micro dosing to sand media bed system. Table II-17	Native soil 25 cm Sand 30 cm Total 60 cm	
	Selected option, minimum as constructed	Native soil 120 cm Sand 30 cm Total 150 cm	Custom VS, performance based rationale on file considering custom contour loading rate and performance in VS for custom HS as well as a check on system performance and to support the use of VS monitoring as a surrogate for soil treatment performance.

Horizontal separation constraints?	*Breakout (to beds)*	3 m	Expected minimum 7.5 m to surface breakout to meet SPM standards, risk of breakout at as close as 3 m considered in case of flow of part of percolate toward east and breakout on road cut. Custom, performance based, rationale on file following EGBC guidelines.
	Property lines (external, to beds)	1 m	From bed. Lines to be surveyed. Note that greater spacing may be necessary to keep toe area fill within property line.
	Tanks to property lines (internal to development)	0 m	STEP tanks may be placed on internal property lines.
	Water mains to tanks and piping	3 m	Meets SPM standards. For any crossing pipes, refer to civil drawings and specifications.
	Other setbacks	To meet SPM standards	
HLR for Type 2 or sand media system basal area (mm/day)	*Table II-22:*	50	
	Table II-23:	60	
	Adjusted:	50	Adjustment for coarse fragment content and or rainfall not needed
	Selected HLR:	50	
HLR for Type 1 to sand media system (mm/day)	*Table II-24 sand type:*	Sand filter coarse sand	
	Table II-24 HLR:	50	
	Selected HLR:	50	
Minimum system contour length	*VS for LLR (cm)*	120	
	Table II-26	Use LLR tables	
	Table II-27 (L/day/m)	130	
	Table II-28 (L/day/m)	200	
	Tabular LLR (L/daym)	130	
	Selected LLR (L/daym)	634	Custom HLLR based on Darcy Law calculation, on file. For Phase 1 system conservatively based on receiving area to west of system only and not considering flow in underlying Till soils. Note that natural discharge capacity for incident rainfall assumed to be provided by native soils and Till with water table mounding per existing observed conditions.
	Min. length, m	35.5	
Length constraint?	*Max. contour length available (m)*	38	
	Bed length for AIS (m)	38	
Dispersal area size options	*Native soil, Type 2 AIS (square metres)*	450	
	Sand mound, Type 1 AIS to sand (sq.m)	450	
	Type 1 sand mound option, width of sand bed (m)	11.84	For single bed.

Dispersal area sizing and system summary (further system selection rationale on file)

	Sand Media system, Type 1		
	Type of system	*Sand mound*	
	Type of sand	*Sand filter coarse sand*	
	Bed width (m)	3.6	
	Bed length (m)	38	Nominal. Actual bed lengths vary, bed layout designed to allow similar dose volume for each of 10 zones across 4 beds. Upper two beds (1 and 2) with 2 zones per bed, lower 2 beds with three zones per bed.
	Number of beds	4	
	Bed spacing (m)	2	Minimum spacing 1.5 m bed to bed to allow for sand media slope.
	Resultant HLR (mm/day)	46	Specified bed area total minimum 480 sqm, resultant HLR at DDF 46 mm/day
	Number of laterals	6	
	Lateral spacing (m)	0.6	
	Grade rise at bed width (m)	0.72	
	Minimum bed spacing (m)	1.44	Based on minimum 1:2 slope from bed to bed for sand media.
	Basal area needed beyond bed area (sqm)	0	Basal minium AIS < bed AIS proposed.
	Vertical separation & dose		See typical section
	Native soil (cm)	120	
	Sand media (cm)	30	
	Total constructed (cm)	150	For monitoring minium VS during normal wet season operation 70 cm at upslope edge of bed for all bed areas, and minimum 40 cm at all times. Datalogger monitoring to be utilized.
	Type of distribution	Uniform	
	Type of dosing	Micro dosing	
	Soil or sand media type for dosing specification	Sand filter coarse sand	
	Sand media system?	Yes	
	Effluent type for dose spec.	1	
	Soil or sand depth for micro dosing selection (cm)	30	Sand media minimum depth.
	Dosing frequency (SPM)	28	
	Dosing frequency (specified)	28	
Dispersal area sizing			
	Pressure distribution		
	Dose volume (L)	804	
	Number of zones	10	
	Dose volume per zone (L)	80.4	
	(usgal)	21	
	Design HLR (mm/day)	46	
	Center or end fed?	End	
	Lateral length (m)	13.5	From manifold, typical (ranges 13 to 15 m)
	Number of laterals (total for all zones)	60	
	Number of laterals per zone	6	
	Lateral diam. (inches)	1.25	
	Lateral type	Sch 40 PVC	
	Manifold diam. (inches)	2	
	Manifold type	Sch 40 PVC	
	At Grade Bed?	No	
	Min. orifice number for all zones	874	
	Chosen orifice number	900	For hydraulic design, preliminary. At final layout bed lengths are to be provided to design engineer and final orifice number and pump sizing specified.
	Orifices per zone	90.0	Will vary by zone, each zone to be subject to final hydraulic design during construction.
	Orifices per lateral	15.0	
	Nominal spacing (cm)	96	
	Orifice size (inches)	5/32	
	Design method	Orenco Pump Select	On file, preliminary.
	Pump operating point, usgpm	88	
	Pump TDHR, ft.	58	Based on nominal 6 m static lift, to be confirmed.
	Distal pressure (ft.)	7 ft target	5 ft minimum.
	Laterals drain?	No	
	Pump run time per dose (s)	15	Per zone
	Doses per day total for all zones	150	
	STD to peak factor	2	Based on ADF to DDF factor.
	Timer interval, STD (mins)	10	At ADF

	Timer interval, PEAK (mins)	5	At DDF, before alarm
	Run time per day (mins) at DDF	70	For all zones
Other considerations			
	Chosen receivinng and filter tank size	5000 IG	With final filtration to 1/16".
	Chosen STEP septic tank size (L)	80000	Chosen tank size: 2500 IG, shared by two modular homes. Pump out tank with demand dose pumping from second chamber of tank. First chamber volume 8077 L Total STEP tank volume 80,000 L
	Minimum septic tank size (L)	67500	For Type 1 system
System summary	*Treatment*	*Type 1 with effluent filter*	Final filtration in addition to filtration at each STEP tank
	Flow equalization	*Micro timed dosing*	No dosing above DDF, large flow equalization capacity.
	Dispersal	Pressure distribution to sand media bed	*Custom sand media bed design*
	Summary of site use and capability constraints addressed by specified system	*Simplest system to meet site constraints, avoiding use of treatment plant system to improve overall reliability.*	

SPECIFICATIONS

Piping and installation of pipelines	Install all piping to meet Plastic Pipe and Fittings Association and SPM standards and guidelines, with pipe bedding and backfill to meet appropriate MMCD standards for the location. Pipeline minimum cover 45 cm, 60 cm in travelled areas. Bed pipes with pre-approved bedding sand and compact, min. 15 cm bedding around pipes. Where piping is below traffic areas, sleeve piping and consult project civil engineers for backfill and compaction requirements. Ensure groundwater flow concentration will not occur in pipeline trenches, using trench dams as necessary (confirm dam and any associated drainage details with project civil engineer). All pipeline trenches to be marked for detection. Install tape at 4" below grade above drip forcemain or flush main lines. For lines not installed in same trench as cables install with tracer wire. Provide a 12 AWG PE jacketed copper clad steel tracer wire (example PRO-TRACE HF-CCS PE30). Install tracer wire at 15cm above pipelines. Bring tracer wire into terminal valve boxes and connection boxes with a 1.5 m slack loop (without breaking cable) to provide access for tracing, ground both ends of tracer cable in accessible location with disconnect at distal end, provide minimum 1.5 m long leads for connection. If splices are necessary, use manufacturer recommended water resistant splices, insulated with electrical tape (minimize splices). Tank interconnection piping PVC Sch40 solvent weld. Fully support interconnection piping. Ensure all components are separated by min. 3 m from water supply piping, or relocate or sleeve water supply piping as necessary. All valve boxes with "sewer" lids and pea gravel bases. Mark each box location with 5 ft upright length of 1/2" EMT conduit or pre approved equal. Where pipelines must cross bare rock or areas with very shallow soil, pipelines may be bedded and filled over with pre approved fill. Cover to be minimum 30 cm settled depth. In all cases vegetation is to be established over trenched areas or filled areas as rapidly as practical, and biodegradeable erosion control matting is to be used in the interim.
Valve boxes	Install all valve boxes in landscaped areas, or contact design engineer for revised specifications. Plastic valve boxes, sized as needed for adequate access or as per the drawings. All valve boxes to be bedded on and around with 10 mm washed pea gravel, with the base of the box supported on a minimum of 10 cm depth of pea gravel. All valve boxes with tamper resistant lids marked "sewer" or with purple lids. Boxes over electrical splice boxes marked "electrical". Mark boxes for detection with 60 cm section of 16 mm rebar installed vertically in the valve box. Where necessary utilize concrete blocks to support valve box bases per MMCD standards to ensure piping or dripline is not impacted by valve box settling, even where direct foot pressure is applied to the valve box.
STEP collection tanks, one shared be two modular homes	Septic tank Dans Precast 2500 IG, with first compartment as septic tank and second as pump chamber. With standard 4" PVC solvent weld inlet tee, effluent filter at outlet of first compartment. Second compartment with no outlet (pump discharge via riser). Compartment divider sealed to lid to prevent scum carry over. Access risers all 24" diameter, with separate riser for pump compartment, do not place risers over compartment divider. Effluent filter Polylok A100 12 x 20 with alarm (Polylok filter alarm switch, SJE Rhombust Tank Alert Duo XT alarm panel) and base support. Provide design engineer with shop drawings of tanks for review prior to tanks being poured. The STEP tanks are shown schematically in the drawings, final location of the tanks is to be pre approved by the design engineer in coordination with the project civil and structural engineers, taking into account sewer locations from the modular homes and with the structural engineer's review of tank excavation near the modular home pads and necessary separation to avoid the tank location affecting either tanks or pads structurally.
STEP collection tanks, pump discharge system	Second compartment of 2500 IG tank as STEP pump chamber, nominal capacity 720 IG. Pump discharge via riser. Venting via effluent filter to septic tank. Second compartment of STEP tank with pump system, Myers 10MD05121 (120V) pump with discharge assembly per drawings. Note discharge orifice,orifice sizing to be confirmed with design engineer based on final elevations during construction. Pump controlled by demand dosing using SJE Rhombus Dual Float Assembly (120V) set to dose with pump on at 7" above inside base of tank and off at 6". Alarm float SJE Rhombus NO sensor float, set at 18" above inside base of tank to float on (allowing >1 day DDF alarm reserve in pump compartment). Floats supported on site built float tree constructed of 1.25" Sch40 PVC pipe supported on base of tank and clipped to riser with Simtech orifice shield (shield screwed to riser with two of #10x1.5" stainless steel screws), floats attached using SJE Rhombus clips and all stainless steel hosse clamps. Provide adequate wire to allow removal of float tree and pump from tank without disconnection. Alarm from high level float and effluent filter float to SJE Rhombus Tank Alert Duo panel mounted on pressure treated 4x4" post at tank with small roof over to protect from direct rainfall. Panel set at 36" above final grade. Effluent filter alarm to amber lamp, pump tank high level alarm to red lamp. All electrical work to BC Electrical Code. Pump discharge and electrical connection via riser, seal pipe penetration with grommet with Sikkaflex 1a sealant backup. Electrical connections through SJE Rhombus 2" cord seal assembly and hub, with 2" conduit to above grade splice box. Use waterproof plastic box, mount on same post as alarm panel and protect with same roof. Discharge to connection to STEP forcemain through 1.25" IPS SIDR9 HDPE (pump drop) pipe, no joints. Transitions at ends of pipe constructed using 1.25" MIP x barb, stainless steel Boshart transitions installed with two of all stainless steel hose clamps per fitting. At pump tank transition to be installed into stainless steel ball valve at outlet of pump discharge assembly. At connection check valve transition to be installed with stainless steel 1.25" union and stainless steel threaded nipple to check valve. Provide and hold on site spare STEP pump and one set of all discharge assembly and control components.
STEP collection system mains	STEP collection main sizing to be confirmed by design engineer in coordination with project civil engineers. Preliminary sizing 2" IPS SDR11 HDPE for both mains. Install pipe with all fusion or socket fusion welded fittings, all transitions to PVC with flange fittings with stainless steel bolts. Project civil engineers to detail specification of STEP mains and connections, ensuring provision of cleanouts and, at connections, 1.25" connection plumbing with all stainless ball valve and serviceable stainless steel flap type check valve (FIP) per connection in suitable valve boxes located as shown on the plan drawing. STEP mains to discharge individually to inlet of first final receiving septic tank (ST-1) via minium 3 m length of 4" PVC Sch40 solvent weld pipe, transitioning with flange fitting and with true union PVC ball valve per main. Design engineer to be retained to review shop drawings and or proposed drawings and specifications prior to construction of STEP mains and connections.

Central receiving septic tanks ST-1 and ST-2	Dans Precast 2500 IG, single compartment. Two tanks in series. First tank with normal inlet and outlet tees, second with inlet tee and effluent filter at outlet. Effluent filter Polylok A300 12 x 28 with alarm (Polylok filter alarm switch, SJE Rhombust Tank Alert XT alarm panel) and base support. Secondary effluent filter, Polylok A100 8x18 with base support. Install with invert of outlet at normal tank inlet elevation. Wye outlet pipes together outside tank. Note outlet riser and dual outlet boots must be placed to allow installation of both filters through riser. Provide design engineer with shop drawings of tanks for review prior to tanks being poured.
Central equalization tanks EQ-1 and EQ-2	Dans Precast 5100 IG, two tanks. Manifold at base (with rubber boots at base of tank end wall) and at inlet elevation, tanks with inlet and outlet boots at standard inlet elevation. Manifold pipes enter tanks through rubber boots. Encase in non shrinking grout at entry prior to embedding in anti flotation flange concrete pour for vault. Ensure invert of base manifold pipe is level to internal base of tanks. lower tank section with anti-flotation flange. The tank lower section is to be provided with anti-flotation base by the manufacturer, with rebar extending from these bases. Note that the anti-flotation base adds approximately 5 cm (2") to the tank height. At installation the rebar is to be bent down parallel to the ground surface and concrete is to be poured to provide minimum 7.5 cm below and 7.5 cm above the rebar and to form a flange minimum 60 cm around the tank base. Concrete is to be minimum 20 MPa. Provide total of 6 of 24" risers in tanks to allow placement of two pumps per riser plus one riser for transducer and float controls. Provide design engineer with shop drawings of tanks for review prior to tanks being poured.
Tank installation	Ensure equalization tanks are placed to maintain all discharge forcemains below dispersal bed elevations. All tanks to be installed to good engineering practice and per manufacturer standards. See note below for bedding. Ensure all pipe connections are fully supported. See below for information on tank bedding and pipe protection. All tanks to be installed with minimum 15 cm drainrock or pea gravel base below tank. Tank connections to be made with 4" Sch40 PVC pipe. Sanitary tees in tanks may use PVC DWV fittings, ensure fittings allow for proper tank venting. If Fernco couplings are used ensure installed with stainless steel shear rings. To reduce risk of floating for the tanks tank area is to be effectively drained to the site stormwater system, with a drainage system that will lower water table during wet season conditions to at least below 30 cm above the base of the lowest tank or if not practical for the equalization tanks, at least below the mid tank joint for the equalization tanks. Provide the design engineer with shop drawings showing proposed drainage system details and elevations for pre approval. Note that stormwater system design is the responsibility of the site civil engineers. At the tank area provide an 8" diameter PVC pipe installed from the base of the lowest tank in the area (or near the outlet end of each STEP tank) to just below final grade, with pea gravel around the base slotting. The base of the pipe is to be capped and side slotted for 15 cm from the bottom of the pipe, and the top provided with a cleanout cover with drilled vent hole per SPM standards. This pipe may be used to inspect water table level in the tank area prior to tank pump out. Tank areas are to be protected from traffic.
Tank installation, lid joint sealing	After tank lid or upper part is installed and mastic fully settled, seal inside and out of lid joint using Sikaflex 1a sealant following manufacturer guidelines. Back up seal on inside by grouting lid with non shrinking grout.
Tank bedding	Free draining material is to be used as bedding around pipelines, sewers, tanks, tank connections and tank risers and, where tank cover is 50 cm or greater, for a minimum 15 cm depth over the tank lid top. This free draining material is to be hydraulically connected to the tank area drainage system allowing any incoming water to drain away from tanks to the site stormwater system. This free draining material may be birds eye gravel, 6 or 10 mm washed pea gravel, 19 mm washed round drain rock (pea gravel or drain rock to meet SPM standards) or compacted pre-approved washed bedding sand (compacted to minimum 95% standard proctor density) or other pre-approved material which will maintain adequate permeability after compaction. In all cases piping is to be bedded in bedding sand or other pre-approved granular pipe bedding material. Where pipes enter or leave risers, place pipes on top of the concrete tank lid and in traffic areas embed in minimum 10 cm concrete if cover over tank is less than 50 cm (see separate note with respect to electrical conduit). Where the tank excavation is based on broken rock or other coarse materials the design engineer may specify graded aggregate to blind the rock, or non-woven geotextile as a separation layer. The contractor is to allow for a Nilex 4553 geotextile layer covering up to 25% of the sides and base of the excavation, and the same material between drain rock and any bedding sand as a separation layer if a graded filter with pea gravel is not used as a separation layer. Note that pea gravel and drain rock must be compacted with a vibratory compactor or vibration using a rod system to ensure that the material is fully settled. All upslope run on and stormwater is to be diverted away from the tank area.
Tank access	All tanks with with Orenco riser bases cast into the lid with no internal concrete lip. Install UltraRib 24" riser pipe, secure to bases with PL Premium adhesive and min. 4 of #10 stainless steel screws installed from inside the adapter. Risers with TuffTite lids with stainless steel screws. Riser lids to be min. 5 cm above final grade, slope grade away from risers. Except where below manhole covers, in which case lid top to be at maximum elevation practical without interfering with the manhole cover. Each riser is to be provided with a TuffTite lid with seal, secured with stainless steel screws to the UltraRib pipe. All riser penetrations must be sealed with grommets backed up with Sikkaflex 1a sealant or pre-approved equal. Note that equipment access is to be provided within 15 cm of the top of risers.
Tank watertight testing.	Tanks to be tested for water tightness of tank and of tank/riser connections and the connection from the equalization tank to pump vault, after installation but before tank interconnection and backfill. Follow the procedure described in the SPM V2 Appendix O. Inlet and outlet of tanks should be capped or caps inserted in the rubber boots. Do not fill more than 2.5 cm above top of tank lid. Maximum leakage in 24 hours after 24 hour presoak 0.1% of volume. Measure fall in riser adapter by marking adapter at water level. Do not attempt to measure fall in tank itself. Report results to design engineer and do not backfill tanks until design engineer has confirmed that leakage rate meets standard.

Venting, for central receiving and pump tanks.	4" Sch40 PVC, install with no single fitting over 45 degrees to allow for cleaning. Provide stainless steel insect screen at tank riser exit to reduce risk of insects or sludge entering vent pipes. From first receiving tank outlet riser and one pump tank riser for each pump tank on top of tank lid, slope pipe up to vent exit to odor biofilter to allow condensate to drain to tank. Minimum 0.1% slope. Use DWV sanitary tees or wyes for connection of tanks. See drawings for vent biofilter. Provide shop drawings for pre approval.
Float and level settings	To be confirmed prior to commissioning based on final layout. Preliminary settings attached.
Discharge pumps	Confirm pump selection with designer at layout prior to installation. Preliminary specification: One pump per zone, total of 10 pumps. Installed with two pumps per riser in equalization tanks. Pumps Monarch (Little Giant) WS100HM-12-20 with 2" discharge (240 VAC 13.6 FLA, pump height 13.75"), install with PVC Sch 80 2" Y-ball check valve vertically at pump outlet, 2" Sch 40 PVC pipe riser, 2" Sch 80 PVC slip 90 and 2" PVC double block true union ball valve (ball valve installed horizontally, with max. 15 cm from valve to top of riser). 2" PVC Sch 40 forcemain exits pump chamber through side of riser on top of tank lid. Pump run time approx. 15 seconds per dose. Provide and hold on site one spare discharge pump and one set of pump discharge assy. components.
Discharge pump control system	Confirm with designer at layout prior to installation. Preliminary specification: Custom 10 zone panel (with level controls) with individual pump timer settings per zone, with standards and override settings for timed dosing. With pump datalogging. With external alarm strobe. In waterproof housing. If custom panel to be utilized, provide design engineer with shop drawings for review prior to order. Alternate option, utilize SJE Rhombus EZI duplex panel with C-sensor level control and redundant high and low level floats. EZI S1W104C3A3E4A4D6A10E17D29830A22G With pump relay output taken to custom 10 zone switching relay with separately adjustable time down relays to allow individual on times per zone. Resulting in a total of 10 zones with one pump per zone. Floats (redundant high and low) SJE Rhombus NO sensor floats, externally weighted, 20' cord. Supported on SJE Rhombus stainless steel float brackets or pre approved site built brackets.
Electrical installation	The sewerage system design does not include electrical engineering services and any specifications or notes related to electrical components or installation are for information on preferred approach, and for guidance, only. Where there is a difference between the specifications or notes and the Code, the Code is to be followed. All floats and pump cables to be led to external splice boxes through 2" rigid PVC conduit, utilize 2" or 2.5" (depending on number of cables) SJE Rhombus cord seal assemblies to seal and provide strain relief at riser penetration. Any splices in tanks to be heat shrink sealed, with cable sheath sealed with secondary heat shrink. Ensure c-sensor transducer cable is led in separate conduit to control panel, and fully shielded. Any splices to be soldered and shielded. Do not run in close proximity to line voltage conduits. Where practical, place waterproof splice boxes above grade, where not practical ensure valve boxes over splice boxes are adequately drained and bring conduit vertically up into base of valve box to the water proof splice box. Confirm splice box location and detail is acceptable to the client and to the electrical inspector prior to installation. All panels are to be protected by surge suppression either in the panel or at the electrical supply.
Forcemain and manifold system	Confirm with designer at layout prior to installation. Preliminary specification: Forcemain, 2" Sch 40 PVC with Sch80 PVC fittings, taken from pump to end of each dispersal system zone, forcemain continues as manifold Note that design engineer may specify 3" PVC mains for upper dispersal area bed zones, where 3" PVC used transition to and from 2" with reducing couplings. Forcemain to be installed below manifold elevation, does not drain to field after dose. Place bentonite or other low permeability plugs in forcemain trench to prevent flow concentration in trench. Forcemain to feed up to manifold with 90 deg. elbow at end of manifold. Install forcemain on undisturbed mineral soil. Manifold (2" Sch 40 PVC) feeds bed system single zone from end of zone Cleanout to grade (using Simtech STF-111L-2.00 long radius sweep, extension pipe as required and male adapter with threaded PVC cap) in 10" round valve box at end of manifold. Valve box with min. 2 cuft pea gravel base. At each lateral 2" x 1.25" Sch 40 PVC slip tee, and 1.25" slip PVC sch 40 ball valve to lateral. Ensure forcemain and manifold fully supported to reduce risk of differential settling. All valves in valve boxes marked "sewer" and with pea gravel base.
Dispersal area and distribution system	Confirm with designer at layout prior to installation. Preliminary specification: 10 zone pressure distribution system. Upper beds (1 and 2) with two zones, lower beds (4 and 5) with three zones. Beds (360 cm wide) with distribution system laid out 6 laterals wide. lateral spacing 60 cm (30 cm to edge of pea gravel bed). Laterals at nominal 13 to 15 m length per lateral. Lateral lines 1.25" Sch 40 PVC, install lateral pipes level to ± .5 cm over length of bed. Level from lateral to lateral as well as along length of each lateral. Orifices 5/32" at approx. 96 cm on center, confirm number with design engineer at final layout, min. 30 cm from all orifices to edge of bed,all orifices face up. For average zone 15 orifices per each lateral, confirm for each zone at final layout. Target distal pressure 7 ft. min. Cover orifices with Simtech STF-106TDS-1.25-1.50 orifice shields. Each lateral with cleanout at distal end, cover cleanouts with 10" diameter valve boxes based in the pea gravel bed and embedded around with pea gravel. Form cleanouts using Simtech STF-111L-1.25 long radius sweeps, PVC Sch40 MIP x slp and PVC threaded cap (all 1.25"). Each lateral with ball valve (for isolation during flushing) at proximal end, cover ball valves with 10" round valve boxes per cleanout boxes. Two bed observation ports installed to base of pea gravel bed to SPM standards for each bed Cover with 10" diameter valve boxes. Flush laterals at commissioning, minimum 12 gallons flush per.

Sand media	Base of sand media to be placed on prepared native soil following SPM sand mound standards and guidelines. Design engineer to be retained to inspect and pre-approve soil moisture content prior to bed preparation, and the prepared bed prior to sand placement. Sand media is to meet SPM Coarse Sand Filter Sand specifications and is to be pre-approved by TRAX. The sand must be kept clean during installation. Install sand media following SPM sand mound standards and guidelines after scarification, establish minimum settled sand depth of 30 cm above scarified basal area and level top of sand media by raising sand depth at downslope side of bed. Material testing: Sand delivered to the site is to be checked by the installer using a jar test for each load delivered to confirm sand is clean, with <4% silt and clay. In addition the installer may retain sand samples from each truckload delivered.
Dispersal system distribution bed	Distribution bed to be installed level. Bed to be centered on sand media bed, and sand media is to be placed around bed. Wood forms may be used for bed construction. Aggregate 10 mm washed pea gravel meeting SPM standards, minimum depth below laterals 10 cm. Minimum 5 cm above laterals. Cover pea gravel with min. 5 cm SPM specification Mound sand prior to placing cover soil, create cross slope from centerline of bed using sand to raise center of bed cover per section drawing. **Do not cover bed with filter fabric.** Cover soil to meet SPM standards, may be pre approved soil from the site. Cover soil to be vegetated with lawn grass. At final layout the design engineer may approve stepping the bed between two zones, if this is done a pre approved membrane must be installed vertically between the ends of the two zone's pea gravel beds, extending from the top of the pea gravel bed to the base of the underlying sand media.
Dispersal system toe membranes and toe areas to property lines	At north end of bed area install vertical membrane to restrict flow to north, directing flow to the west downslope of the beds. Membrane to be pre approved, insert membrane minimum 60 cm into native soil below base of sand media and extend membrane up to top of pea gravel bed. Laterally, extend membrane minimum 2 m beyond edges of pea gravel bed. On side away from bed the membrane is to be supported by pre approved clean fill of lower permeability, which is capable of maintaining a 1v:2h slope, where necessary a low rock enclosure may be pre approved at the toe of this fill to ensure toe areas are maintained inside the property line. If the fill material contains rock or sharp gravel the membrane must be capable of maintaining integrity with this material place, or must be protected by pre approved non woven geotextile.
Distribution bed air laterals	Air laterals are to be pre installed in case aeration of the bed is necessary at a later date, this is to manage risk associated with the bed width being over 3 m. This is to be 4" Big O piping (perforated), installed in the base of the pea gravel bed, with the base of the pipe resting on the sand media. Install with 5 runs for the length of each zone, spaced mid way between effluent laterals. Each end of the pipes manifolded to 4" PVC CSA solid solvent weld sewer manifold with 4" PVC sewer solid pipe riser at each end from center of manifold, riser at one end of zone to 120 cm above final grade, painted black, and to 75 cm at other end, left white, both completed with candy cane formed with two 90 deg. elbows and a grate insert. To allow for future active aeration of the bed, install electrical supply to control panel adequate to power a 0.5 HP 120V blower (dedicated 15 A circuit) to each zone from the tank area.
Forest cover and protection of soils	**Fence dispersal area and 7.5 m around prior to commencement of site development. Do not cut soils or remove or disturb vegetation in this area, and do not allow machine access or travel in the area. Do not store construction materials in the area.** During construction, follow instructions of design engineer to reduce impact on soils and vegetation and retain trees where practical Plant new trees after completion. Where necessary, install pea gravel tree wells around tree trunks which will be buried in sand media or other fill, with pea gravel at 60 cm around trunks. Maintenance of forest canopy cover is critical to system performance. Deactivate and remediate soils in old access roads under the direction of the design engineer where these fall within the dispersal or receiving areas. After completion of beds and cover soil, establish grass cover vegetation as rapidly as practical, biodegradeable erosion control matting is to be used in the interim to protect soils.
Basal/VS observation standpipes and level logger	4" PVC Sewer pipe installed as shown on the plan section. One per bed at upper edge of bed near bed centerline. Side slot pipe from near base to approx. 10 cm above base of sand media using a hand saw. Backfill around the pipe with pea gravel to 10 cm above the uppermost side slot. Ensure sand media is packed around pipe during backfill and media placement. Extend pipe to 10 cm below final grade, terminate with threaded cleanout and plug. Drill 1/8" diameter hole in base of cleanout fitting to vent pipe. Cover with 10" diameter valve box, with pea gravel base in valve box. Note that the Bed 4 VS observation standpipe is to be installed to greater depth than for the other beds and is to have installed a datalogging level sensor, to be pre approved or INW PT2X with 8ft. vent and cable.
Primary monitoring provisions	Monitor water table observation standpipes to measure wet season seasonal water table level below dispersal bed lower edge, to provide assurance of maintenance of VS in excess of 70 cm below the infiltrative surface during normal winter conditions and minimum 40 cm at all times. This will include the specification of continuous monitoring through the use of the datalogging level sensor in the Bed 4 VS observation standpipe.

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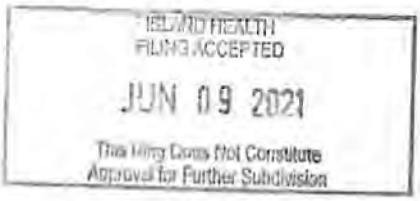


REFERENCES

The following documents were the principal sources of reference for standard practice in this design.

The BC SEWERAGE SYSTEM STANDARD PRACTICE MANUAL Version 3, September 2014, Ian Ralston, Michael Payne for Ministy of Health. And supporting rationale documentation and calculations (on file).
The BC SEWERAGE SYSTEM STANDARD PRACTICE MANUAL Version 2, 21st September 2007, Issued By: Ministry of Health, Population Health and Wellness Health Protection.
APEGBC Professional Practice Guidelines - Onsite Sewerage Systems. V1.2 January 2013
Lask, R.H. 1986. Wastewater engineering design for unsewered areas, Technomic
Design Guidance for Large Subsurface Wastewater Treatment Systems (LSTS), Minnesota Pollution Control Agency, Version: 03-08-2005
Further references for performance design of custom VS, HLR/system contour length and HS on file.

STATEMENT OF GENERAL CONDITIONS

Scope of this Report

This review report satisfies only those objectives stated in the Introduction. TRAX Developments Ltd. (TRAX) has not conducted a Hydrogeology Study or Environmental Impact Assessment.

Use of this Report

This TRAX Developments Ltd. (TRAX) report pertains only to a specific project. If the project is modified, then our client will allow us to confirm that the report is still valid. We prepared this report only for the benefit of our Client and those agencies authorized by law to regulate our Client's activities. No others may use any part of this report without our written consent. To understand the content of this report, the reader must refer to the entire, signed report. We cannot be responsible for the consequences of anyone using only a part of the report, or referring only to a draft report. This report reflects our best judgement based on information available at the time. Any use of this report, or reliance on this report, by a third party is the responsibility of that third party. We accept no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions taken based on this report.

Reliance on Provided Information

TRAX has relied on the accuracy and completeness of information provided by its client and by other professionals. We are not responsible for any deficiency in this document that results from deficiency in this information.

Logs of Test Holes and Subsurface Interpretations

Ground and ground water conditions always vary across a site and vary with time. Test hole and well logs show subsurface conditions only at the locations of the test hole or well.

Descriptions of Geological Materials and Water Wells

This report includes descriptions of natural geological materials, including soil, rock, and ground water. TRAX based these descriptions on observations at the time of the study (site evaluation). Unless otherwise noted, we based the report's conclusions and recommendations on these observed conditions. Construction activities on the site or adjacent sites may change or alter these geological materials.

Changed Conditions

Conditions encountered by others at this site may differ significantly from what we encountered, either due to natural variability of subsurface conditions or construction activities. Our client will inform us about any such changes, and will give us an opportunity to review our recommendations. Recognizing changed soil and rock conditions, or changed well conditions, requires experience. Therefore, during construction or remediation, a qualified professional should be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

Recommendations

We recommend that our client engage TRAX to review all design drawings and constructed works that are based on our conclusions and recommendations.

Declaration of Interest

Ian Ralston, in a personal capacity, is a manufacturer's representative for Geoflow Inc. in BC. TRAX undertakes to ensure that no bias toward this equipment manufacturer will be shown during design and specification.

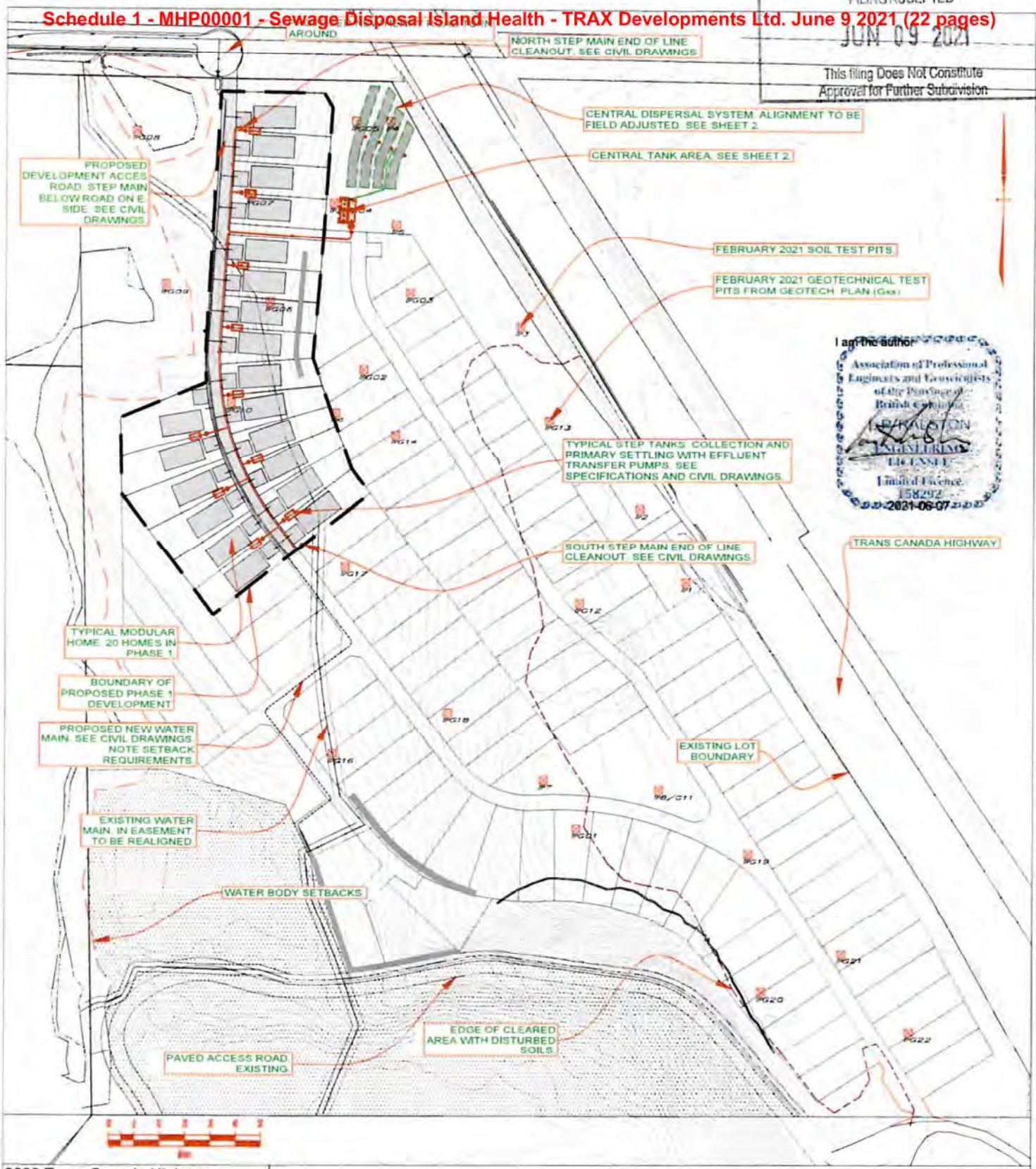
Risks and Liability

TRAX and Ian Ralston carry insurance for errors and omissions in the amount of $1M. In all cases the liability of TRAX and/or Ian Ralston is limited to the fees charged. By accepting and using this report the client acknowledges that they understand the insurance carried by TRAX and Ian Ralston and accepts that TRAX and Ian Ralston's liability are limited in this way.

Engineering Limited License scope

Ian Ralston holds a License from EGBC to practice engineering within the following scope of practice:

Civil Engineering. Limited to: Design, construction and maintenance of sewage systems, including site and soil evaluations for these systems. Systems of 22.7 cubic meters per day or less.



9090 Trans Canada Highway, Chemainus. Phase 1 sewerage system (PID 009-885-200)
Keyplan showing site layout with proposed Phase 1 modular homes.

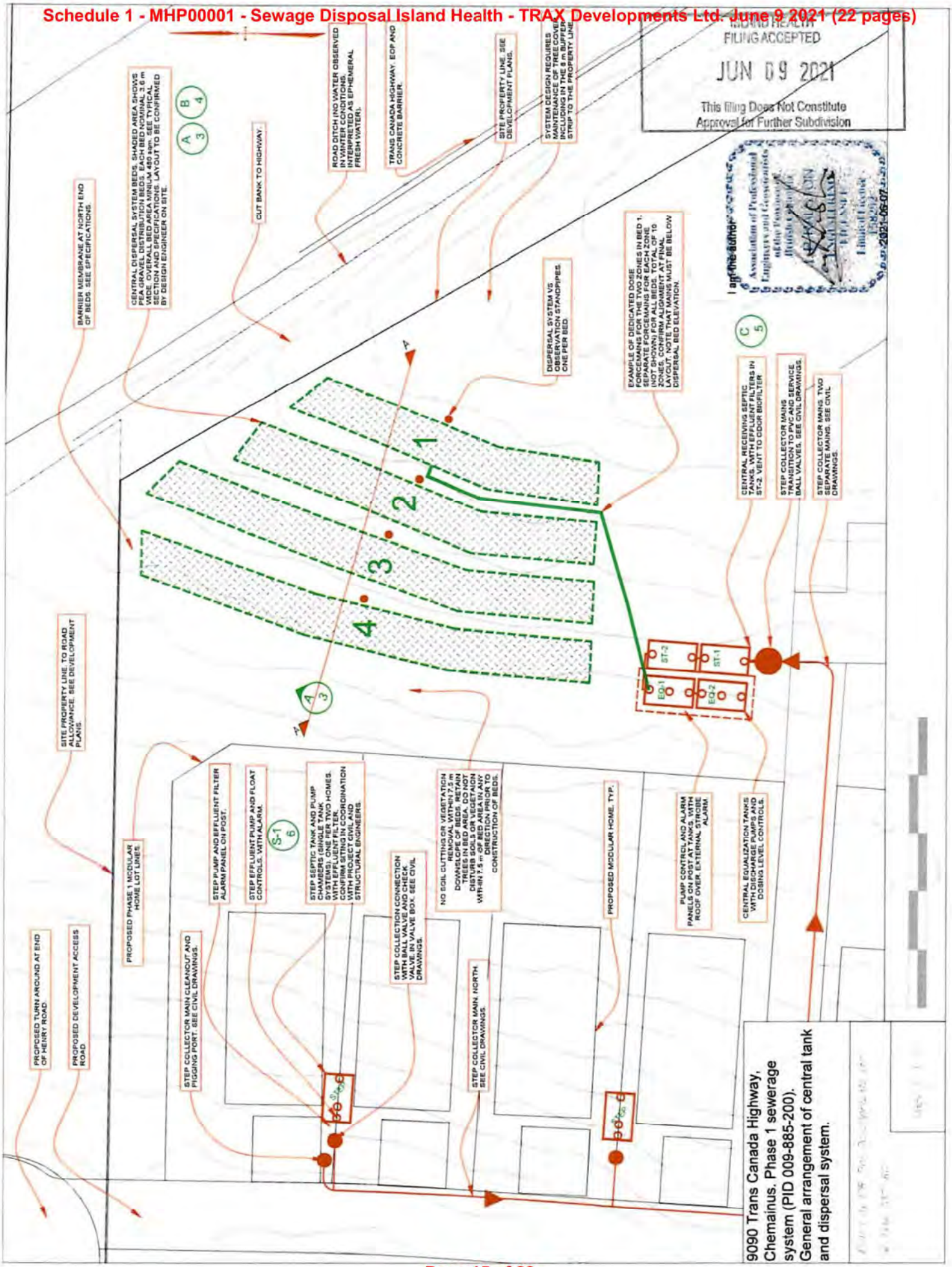
Drawn by IPR Trax Developments Ltd. Based survey plan and approximate field measurements. Contours (1m) from LIDAR.

4 June 2021 R0

NOTES.
Layout shown is schematic and does not show all details of proposed site use. Layout of dispersal areas and tanks is to be confirmed on site at time of construction. See specifications for vegetation and soil protection requirements for dispersal area and area surrounding.

This design is for a sewerage system serving 20 modular homes in Phase 1 of a proposed phased development of the site **only.** This key plan shows preliminary layout of lot lines in other phases, which may be altered over time prior to construction of those phases. Future phases will be served by other, completely separate, sewerage systems which will be designed and filed at the time of development of those phases and constructed under those separate filings.

Refer to design notes and specifications (R0). STEP main and STEP connection valves to be completed as part of the civil engineering of the project, with coordination with this design. STEP tanks are shown schematically, location to be confirmed in coordination with civil engineers (including with consideration of separation to modular home pads for structural requirements). Refer to civil drawings. For details of site development plans, including proposed site grading and general location of site and legal plans, refer to civil, geotechnical and other plans and reports.



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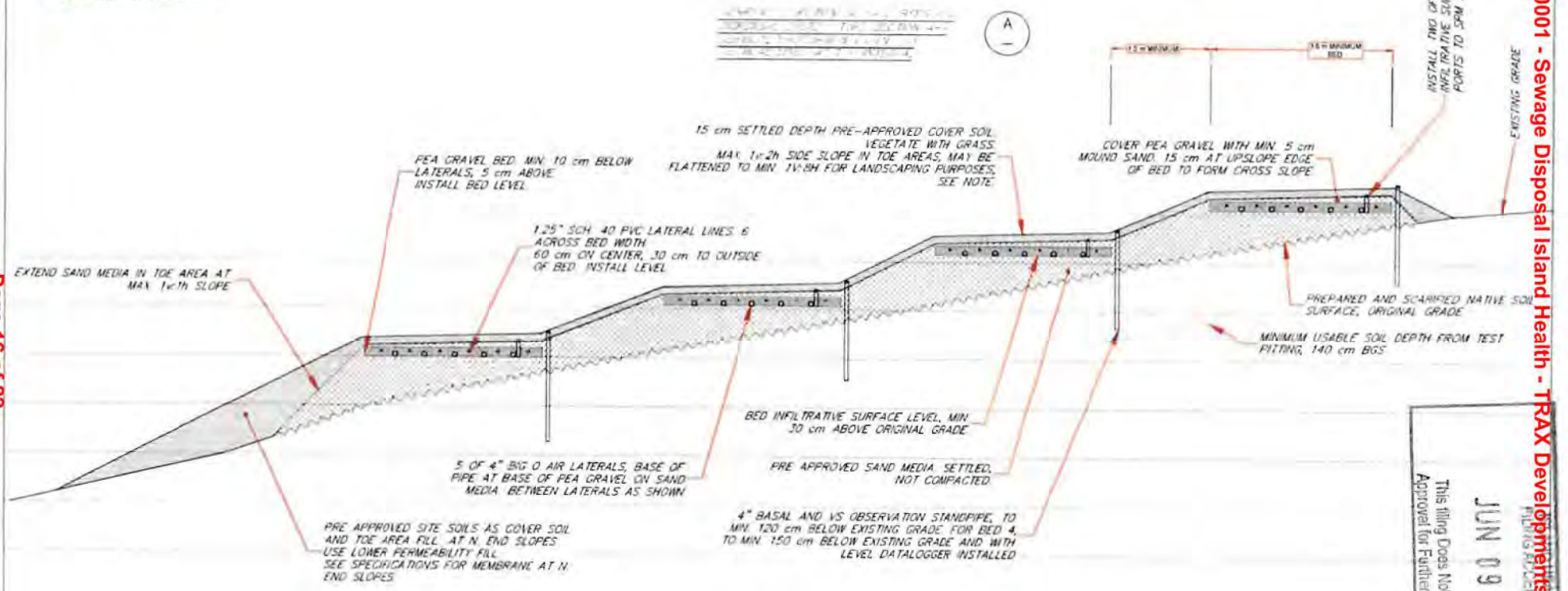


JUN 09 2021
This filing Does Not Constitute Approval for Further Subdivision

9090 Trans Canada Highway, Chemainus. Phase 1 sewerage system (PID 009-885-200)
Sewerage system typical section showing sand media beds.

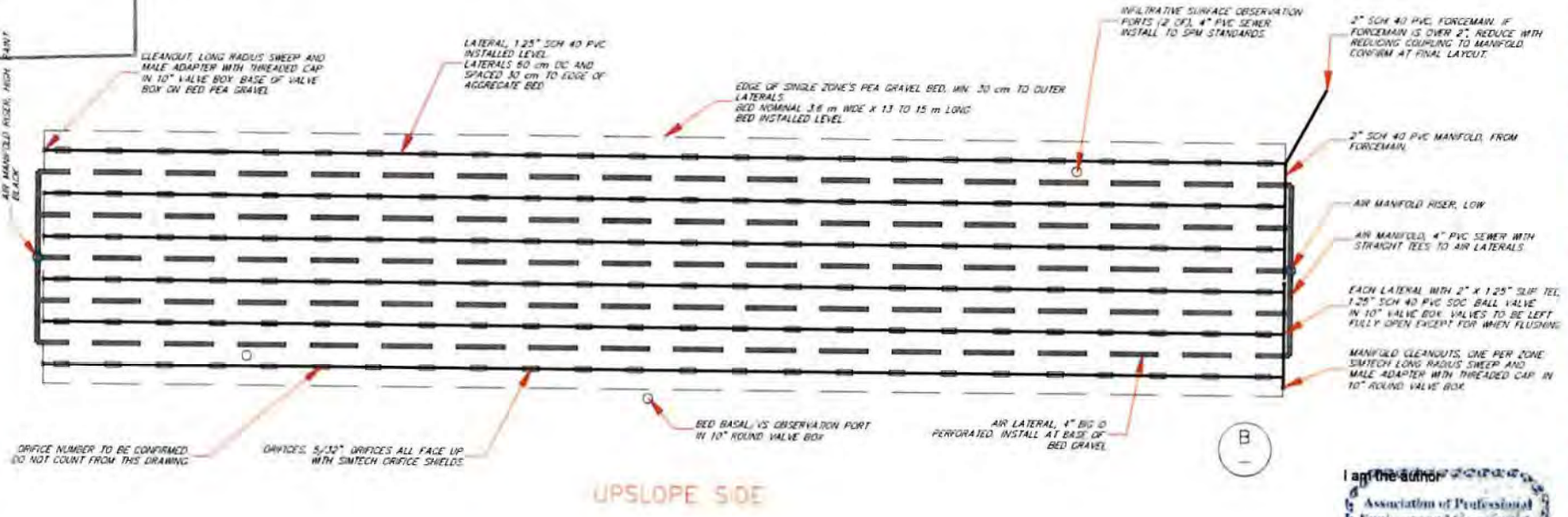
NOTES

See specifications, R0.

Section schematic and preliminary, confirm section and layout at installation with the design engineer. Design engineer to be retained to confirm layout and inspect bed layout and scarified soils prior to sand installation. All aggregate, sand and cover soil materials to be pre-approved by the design engineer.

Where machinery must travel on bed and receiving area use only pre-approved tracked machines and restrict travel to pre-approved locations, during periods where soil moisture is suitable to reduce risk of soil damage.

The grass on the beds and toe areas is to be kept mowed or cut during system operation. To facilitate this it is recommended that the toe areas be flattened, where practical, to 1:3 or 1:4 to allow mowing. The toe areas where beds are placed close to property lines will need to be maintained at the maximum allowable slope, requiring vegetation management with a trimmer.



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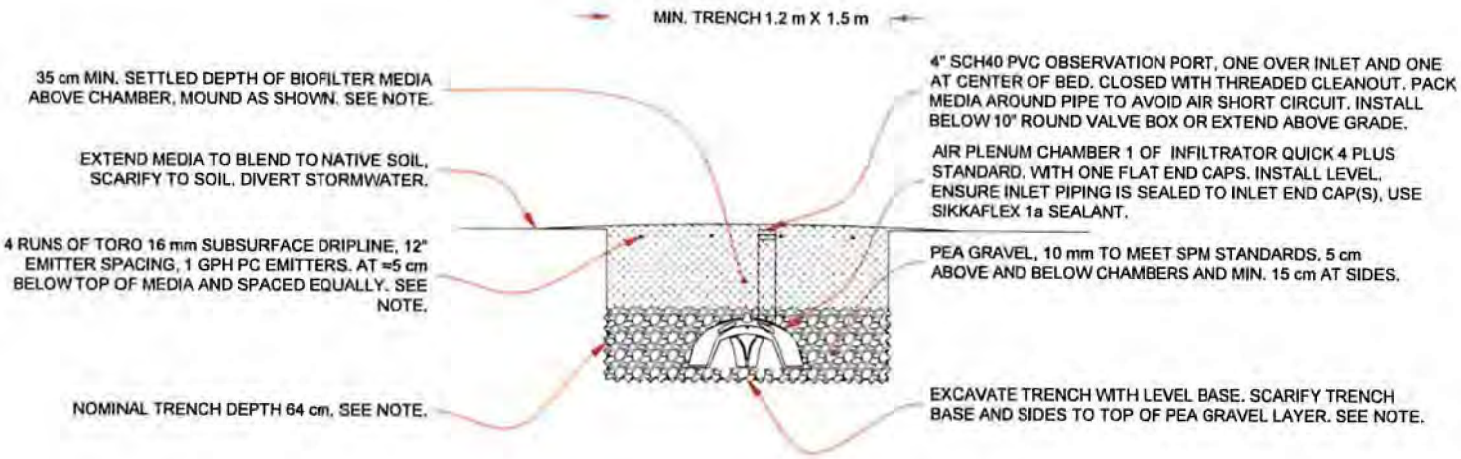
9090 Trans Canada Highway, Chemainus. Phase 1 sewerage system (PID 009-885-200) Sewerage system typical schematic of distribution piping in one bed zone	NOTES TYPICAL, NOT TO SCALE. See specifications. R0. Schematic only. Shows typical single zone within a bed. Confirm forcemain size, zone lengths, orifice number with design engineer at final layout. Do not scale or count from this schematic, refer to specifications.



SCHEMATIC SECTION OF BIOFILTER MEDIA BED (TYP).
VERTICAL PROPORTION 1:1 (N.T.S.)

C

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NOTES AND SPECIFICATIONS:

Section schematic, confirm section and layout at installation with the design engineer.

Place biofilter above top of lid elevation of highest tank, and feed with air with passive vents (2 of, see specifications).

Biofilter media is to consist of a pr-approved mix of 19 mm plus clean wood chips or shreds with mature, stable, low odor compost at 30 to 50% compost to 70 to 50% wood chips mix (by dry weight). Ground oyster shell or dolomite prills are to be added to this mix at 5% by weight. The contractor is to provide test results showing final void ratio as settled,, with a target of 50% and minimum 40%.
All aggregate and media as well as any proposed substitutions to be pre-approved by the design engineer based on submissions from the contractor.
System may be installed partially above grade, with media placed above the ground surface and the chamber installed below grade, in that case ensure that media depth above the pea gravel is minimum 35 cm in all directions and scarify media to any native soil below to reduce risk of short circuiting. Ensure bed is placed in a location with permeable soil below the bed to avoid risk of saturation during rainfall, with minimum vertical separation of 60 cm to SHWT or flow restrictive layer in pre approved native soil or sand media fill. Install with base of bed level. Divert stormwater flows away from bed area.

Dripline is intended to maintain moist conditions in biofilter media. The dripline may be installed as a single line, looped at bed ends. Follow manufacturer guidelines for installation, and particularly, provide an air valve to protect the dripline from aspiration of particles during depressurization. Dosing may be controlled by any standard single zone irrigation controller, or as part of an existing irrigation zone, and the operator is to adjust dosing to maintain biofilter media at a suitable moisture content as directed by the design engineer.

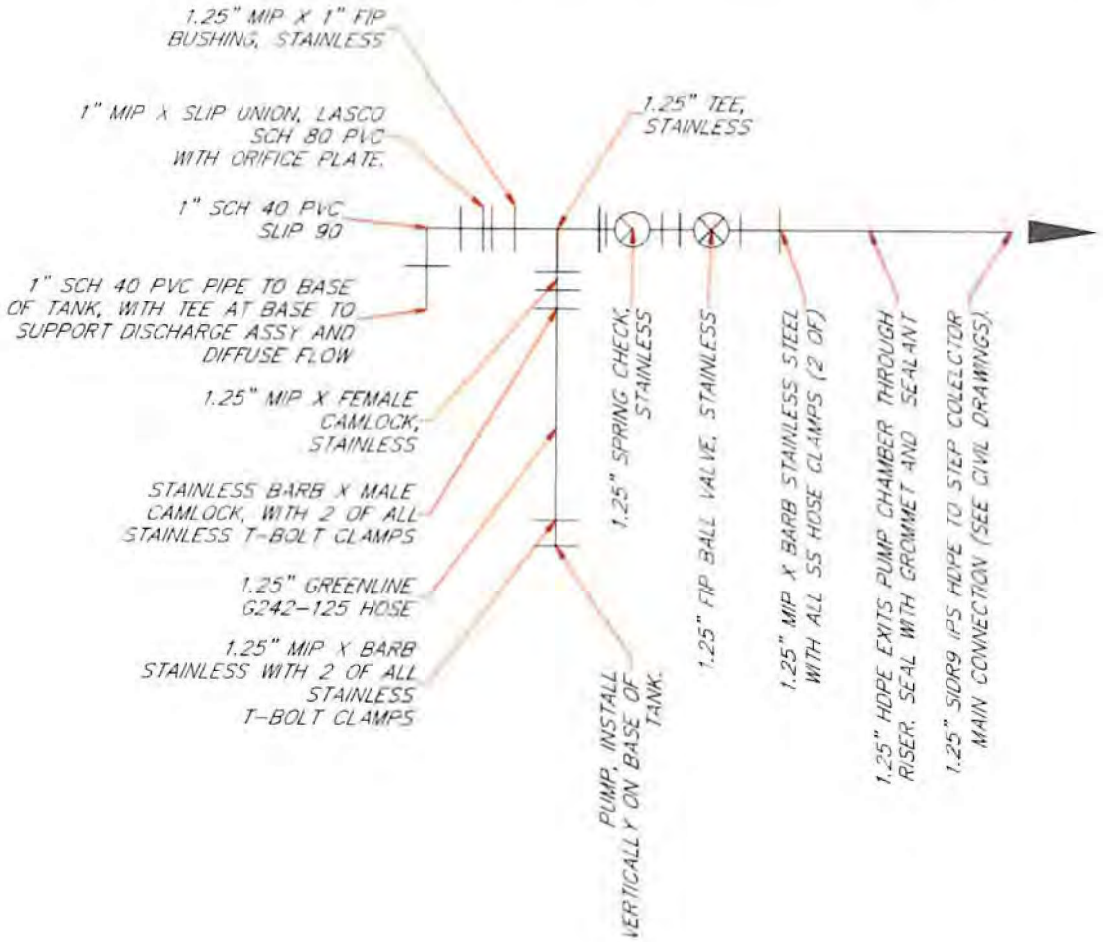
The operator is to control weed growth on the biofilter and rodent control may be necessary to prevent burrowing animals forming channels in the filter or entering the chambers. If burrowing animals are thought to be a potential issue, place chambers on ½" stainless steel mesh attached to base of chambers with plastic strips and stainless steel screws.

The locations of the biofilter trench edges are to be marked with permanent labeled steel posts. Prevent traffic on bed with suitable barrier.

The contractor is to provide shop drawings for pre approval showing details of ducting, ports etc. and including media test results for pre approval.

9090 Trans Canada Highway, Chemainus. Phase 1 sewerage system (PID 009-885-200)
Sewerage system vent biofilter

Schematic of STEP pump installation (TYP) (NTS)



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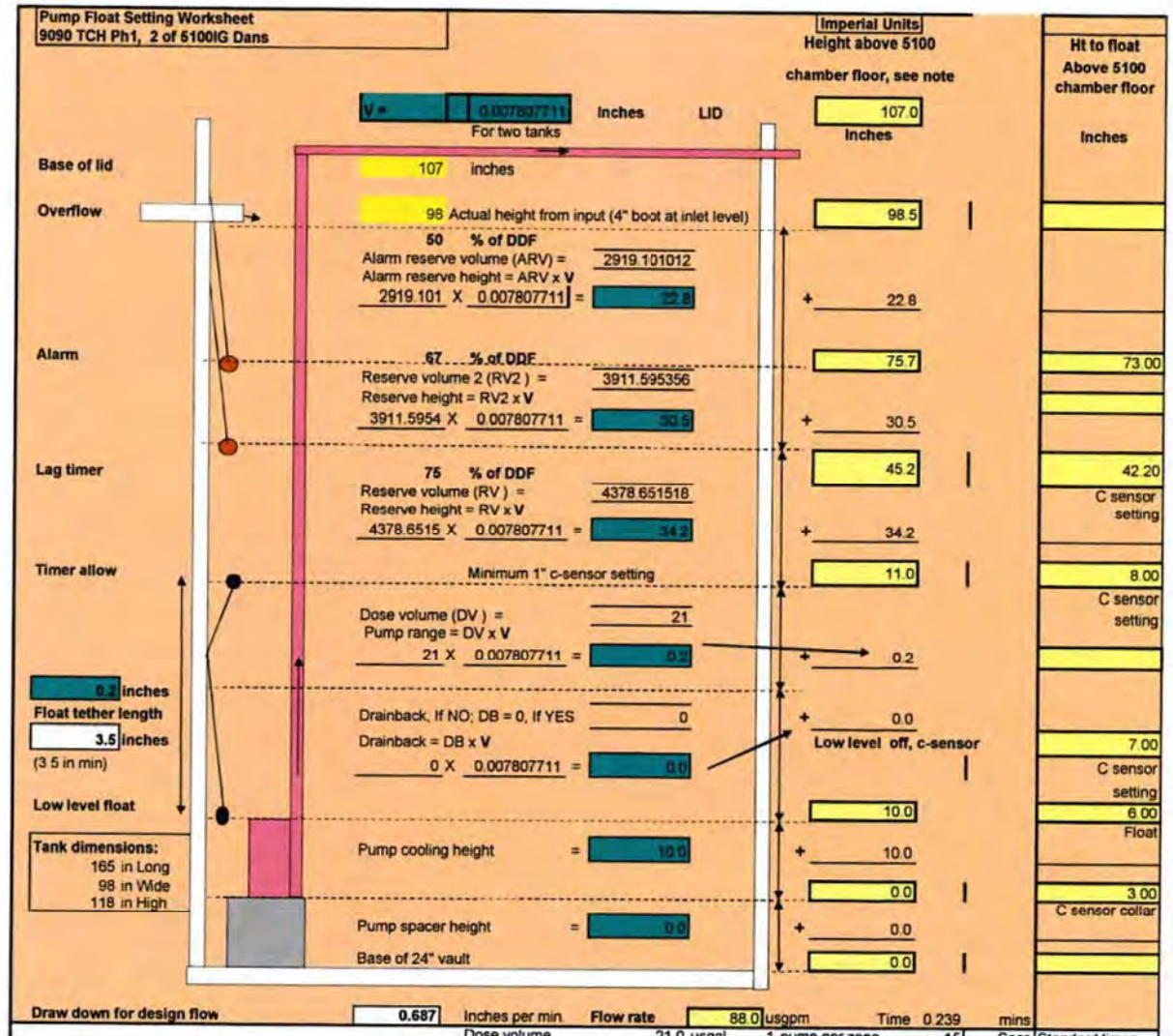
ISLAND HEALTH
ACCEPTED
JUN 09 2021
This filing Does Not Constitute Approval for Further Subdivision

I am the author

Association of Professional Engineers and Geoscientists of the Province of British Columbia
APPROVED
ENGINEERING
LD LANEY
Limited Licence
158202
2021-06-07

9090 Trans Canada Highway, Chemainus. Phase 1 sewerage system (PID 009-885-200) Sewerage system STEP effluent pump discharge assembly.	NOTES: Pump installed vertically. Myers 10MD05121 (120V) pump. Barb fittings must be sized correctly for SIDR9 (pump drop) pipe, warm pipe prior to clamping over barb. Use barb 90s if necessary to align HDPE outside riser. Insulate over HDPE pipe on tank with SM sheet if cover is less than 30 cm. Drill discharge orifice in pre approved HDPE disc to fit union. Confirm sischarge orifice size with design engineer, default 3/16". Lightly coat side of disc on nut side of union with silicone sealant to retain disc during disassembly. Externally weighted floats. See specifications for settings.

TRAX Developments Ltd



TRAX DEVELOPMENTS LTD.
SEWERAGE SYSTEM SITE AND SOIL NOTES, RATIONALE NOTES

Design	9090 TCH Phase 1	Friday, June 4, 2021
Revision	Rev. 0	Client: Core Group Civil Consultants
Notes	Test pits were excavated by 20 T class excavator in February 2021, and logged by Ian Ralston and Henry VanHell and permeability tests were made by Henry VanHell ROWP, with site visits, earlier hand auger testing and review by Ian Ralston. Original logs and photographs on file. Evaluation also considered geotechnical report by Geopacific with test pit information and permeability testing (on file). Further evaluation of SHWT was based on observation of the cutbank along the Trans Canada Higway for the NE part of the site, and of existing groundwater monitoring standpipes.	

Permeability	6 tests have been made using a constant head borehole permeameter at 40 cm BGS, by Henry VanHell, February 2021. Calculations on file..Kfs Median 1320 mm/day and range of 1000 to 1700 mm/day. The geotechnical report included the results of two infiltration tests in soils at 1.6 and 1.8 m BGS. The test in the till layer characteristic of till below soils in areas identified as suitable for dispersal at a depth of 1.8 m BGS showed a long term infiltration rate of 166 mm/hr, and the test at 1.6 m BGS in lower permeability Silty Clay Loam or Clay Loam soil showed a rate of 8.4 mm/hour. For dispersal area design this supports the interpretation that the till layers found below the usable soil depth in TP3, 4, 5, and geotechnical pits 3, 4, 5 and 13 are likely to show significant permeability, despite being classified as a limiting layer due to their cemented consistency, reducing risk of water table mounding in soils below dispersal areas.
Summary of soils for pits representing the planned Phase 1 sewerage system dispersal area	TP3: (outside of area selected for Phase 1 dispersal system) L1- 0 to 15 cm Black, Sandy Loam SABK/3, VFR, Roots Fine to Medium, Many. Coarse Fragments 3% gravel L2- 15 to 80 cm Brown, Sandy Loam ABK/3, VFR, Roots Fine to Medium, Few. Coarse Fragments 3% gravel and cobbles L3- 80 to 110 cm Tan, Sandy Loam (Till) Pseudo Platy/3, M Cemented, Roots Fine, Few. Coarse Fragments 10% gravel and cobbles Base of pit on weathered Till. No SHWT observed. No mottling observed. Some stones in all layers. No moisture or seepage observed. Interpreted SHWT >110 cm. L3 considered a limiting layer by the SPM, but expected to show significant permeability (see above) and shows root penetration. TP4: L1- 0 to 15 cm Black, Sandy Loam and Loam SABK/3, VFR, Roots Fine, Many. Coarse Fragments 3% gravel L2- 15 to 60 cm Brown, Sandy Loam ABK/3, VFR, Roots Fine to Medium, Many. Coarse Fragments 3% gravel and cobbles L3- 60 to 145 cm Tan, Sandy Loam (Till) Pseudo Platy/3, EW Cemented, Roots Fine, Few. Coarse Fragments 10% gravel and cobbles Base of pit on weathered Till. No SHWT observed. Some small patches of mottling observed in L3, but no evidence of perched water tables despite wet weather antecedent. No moisture or seepage observed. Interpreted SHWT >145 cm. L3 not a restrictive layer (EWC consistence). TP5: L1- 0 to 15 cm Black, Sandy Loam and Loam SABK/3, VFR, Roots Fine, Common. Coarse Fragments 3% gravel L2- 15 to 50 cm Brown, Sandy Loam ABK/3, VFR, Roots Fine to Medium, Common. Coarse Fragments 3% gravel and cobbles L3- 50 to 90 cm Tan, Sandy Loam ABK/3, VFR, Roots Fine to Medium, Common. Coarse Fragments 3% gravel and cobbles L4- 90 to 140 cm Grey, Sandy Loam (Till) Pseudo Platy/3, M Cemented, Roots Fine, Few. Coarse Fragments 10% gravel and cobbles Base of pit on weathered Till. No SHWT observed. No mottling observed. No moisture or seepage observed. Interpreted SHWT >140 cm. L4 not a restrictive layer (EWC consistence). Interpretation of SHWT depth confirmed by old monitoring well in potential western receiving area, showing ~150 cm to water table in winter conditions, and no evidence of water table on cut bank to TCH east of potential dispersal area (despite Till exposure) and no water in road ditch along the NE part of the site. Geotechnical pit #05 in the relevant area showed "very dense" sand with some silt at 1.2 m and no seepage to depth of pit at 1.6 m, similar conditions. Soil type for HLR selection for sand media basal area Sandy Loam, Favorable structure and consistence category, For HLLR selection same soil but with consideration of deep percolation to Till layer. For conservative contour loading and VS design utilize 120 cm nominal soil depth.
Summary of site information	Refer to geotechnical report for general details of site. The proposed dispersal area slopes at approximately 20% from a ridgeline crest at the east property line toward the west and NWW. The area is treed in young second growth Douglas fir forest.

Horizontal setback triggers and risk	No wells are reported within 30 m of the proposed dispersal area, and the location is serviced with municipal water. Key critical setback trigger is risk of breakout toward the road allowance (to the east of the proposed system). While evaluation did not show any rainfall generated water flow from the cutbank to the highway there is a risk that percolate may surface in this area. The closest expected point of breakout to the system would be 3m to the east from dispersal bed, based on consideration of depth to Till layers in the soil. Breakout to the east is seen to be lower risk in terms of human contact than to the west (where residences will be sited), so breakout to the west is to be maintained at SPM standard separation. There may be some risk of breakout to the Henry Road unused road allowance to the north of the site, which is side slope to the proposed dispersal beds. Risk is considered the same or lower for contact compared to the highway road cut, which is controlling. Custom, performance based, horizontal separation to potential surface breakout has been developed based on custom HLR and VS rationale, on file, following EGBC guidelines, to manage risk to health and avoid causing a health hazard. Further risk management will include the use of key trenches to improve deep infiltration of percolate, and placement of dispersal beds to ensure flows to the west of the system for over 50% of the percolate. Note that layout of the system is to be made to maximize HS to potential breakout. Given that the road ditch to the east of the system does not show evidence of surface flow during wet season conditions this ditch is considered ephemeral and not a setback boundary for design. In order to improve system performance (through reducing contour loading rate and to place system in most favorable topographic location and in most favorable soils) non critical setback to property lines (existing or proposed) may be reduced. To manage risk any lines are to be laid out by survey and setback maintained at 1 m minimum.
Site and project specific horizontal separation summary	To property lines, 1 m. To potential surface breakout, 3 m (reduced from 7.5 m) minimum, for breakout toward east or north road allowances only. 7.5 m to be maintained on west side of system.
Selected location	Location along east property line is chosen to: - Use area of favorable, undisturbed native soils - Take advantage of favorable topography, including alignment with possibility of flows to both sides of a ridge, and ridge alignment with reduced risk of run on from other areas. - Allow installation approximately on contour and maximize length on contour. - Allow for current and potential future site development plans by using an area not designated for other uses. - Address landscaping objectives by backing against existing roadway and providing a vegetated buffer
Rationale notes, custom, performance based design	Given the size of the system and the restricted area available for dispersal system construction (based on site characteristics and proposed development–both current and future), and the need to use the most favorable available area resulting in reduced setback to breakout (custom HS), the design has been based on custom, performance based rationale per EGBC guidelines and following the approach used for development of BC SPM standards, together with the performance objectives of the BC SPM and BC Water Quality Objectives. This approach consists of setting performance objectives for water (percolate) flowing from the dispersal system to the receiving area. In this case, objectives have been set for water flowing to potential breakout to surface. Dispersal system design has been based on the need to achieve these objectives. The median objectives established for this project for percolate surfacing within 7.5 m of the dispersal beds are based on SPM performance objectives, EGBC guidelines for surface breakout and with safety factor intended to support the use of VS monitoring as a surrogate for pathogen attenuation performance, and are as follows: •Acute pathogen indicator objective, fecal coliforms median <200 CFU/100 mL •Chronic pathogen indicator objective, fecal coliforms median 0.02 CFU/100 mL or less To support improved pathogen attenuation a custom VS has been developed, based on the use of micro timed dosing and reduced HLR coupled with the use of sand media and a greater VS than that required by SPM standards. During operation, monitoring of the dispersal system will utilize VS as a surrogate for system performance. Rationale retained on file, including custom, performance based, contour loading, water table mounding calculations, custom analysis of Vertical Separation, supported by modeling of performance in the design VS, and custom HS.

island health

RECORD OF SEWERAGE SYSTEM

Filing # (OFFICE USE ONLY) **DC23/072**

1. Property Information

■ New Construction ☐ Alteration ☐ Repair ☐ Amendment – Original Filing #

Tax Assessment Roll # PID provided.

PID # 009-885-200

Legal Description (Plan, Lot, District Lot, Block Numbers) THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND AJOINING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11489, 26194 AND VIP68870

Street (Civic) Address or General Location 9090 Trans Canada Highway **Phase 2**

City Chemainus

2. Owner Information

Name of Legal Owner 1230226 B.C. LTD

Mailing Address C/O TRAX Developments Ltd. Box 9-6

Phone 250-246-4774 | City Thetis Island | Prov BC | Postal Code V0R2Y0

3. Authorized Person Information

Name of Authorized Person Ian Ralston

Mailing Address Box 9-6

Phone 250-246-4774 | City Thetis Island | Prov BC | Postal Code V0R2Y0

Registration # 158292

Email onsite@traxdev.com

4. Structure Information

Sewerage System Will Serve:

☐ Single Family Dwelling ☐ Other Structure *(specify)* _____ ■ Other Dwelling *(specify)* 20 Mobile homes

The sewerage system is designed for an estimated minimum daily domestic sewage flow of *(check one)*

☐ Less than or equal to 9,100 litres ■ More than 9,100 litres but less than 22,700 litres

5. Site Information

Depth of native soil to seasonal high water table or restrictive layer *(cm)* 70 cm, see specs

Information respecting the type, depth and porosity of the soil (sand media) is attached ■ Yes ☐ No

GPS Location of System *(decimal degrees)* Latitude N 48.89932814999155 Longitude W 123.71830026256758

Horizontal Accuracy *(m)* 10 ■ Recreational GPS ☐ Differential GPS

6. Drinking Water Protection

Will the sewerage system be located less than 30 m from a water well? ☐ Yes ■ No

If yes, attach a professional's report and specify the intended distance _____ *(m)*

Distance of proposed sewerage system to the closest body of surface water >30 m to permanent fresh water *(m)*

7. System Information

Sewerage treatment method ■ Type 1 ☐ Type 2 ☐ Type 3

8. Legal or Regulatory Considerations

■ Construction of the proposed sewerage system will not conflict with legal instruments registered on the property. See specifications

Is this filing submitted as the result of an order from the Health Authority? ☐ Yes *(attach a copy of the order)* ■ No

9. Plot Plan and Specifications

Plot Plan (to scale) and specifications are attached ■ Yes ☐ No

■ The plans and specifications are consistent with Standard Practice

Source of Standard Practice: ■ Ministry of Health Standard Practice Manual ■ Other See design notes

10. Authorized Person's Signature

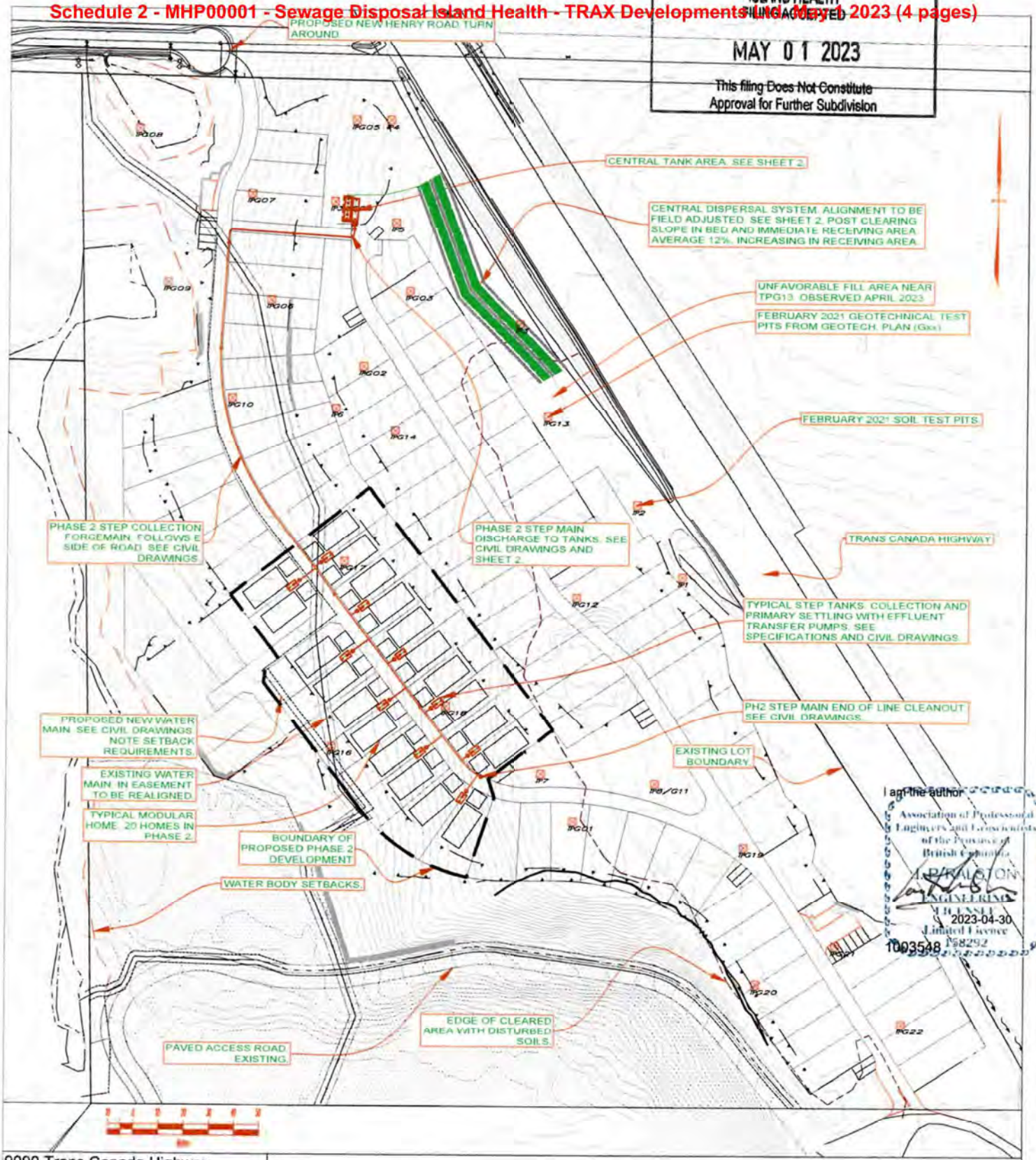
Signature

Date 30 April 2023

OFFICE USE ONLY

Filing Accepted Date May 1/23

Receipt Number #099381 $200.00



9090 Trans Canada Highway, Chemainus. Phase 2 sewerage system (PID 009-885-200)
Keyplan showing site layout with proposed Phase 2 modular homes.

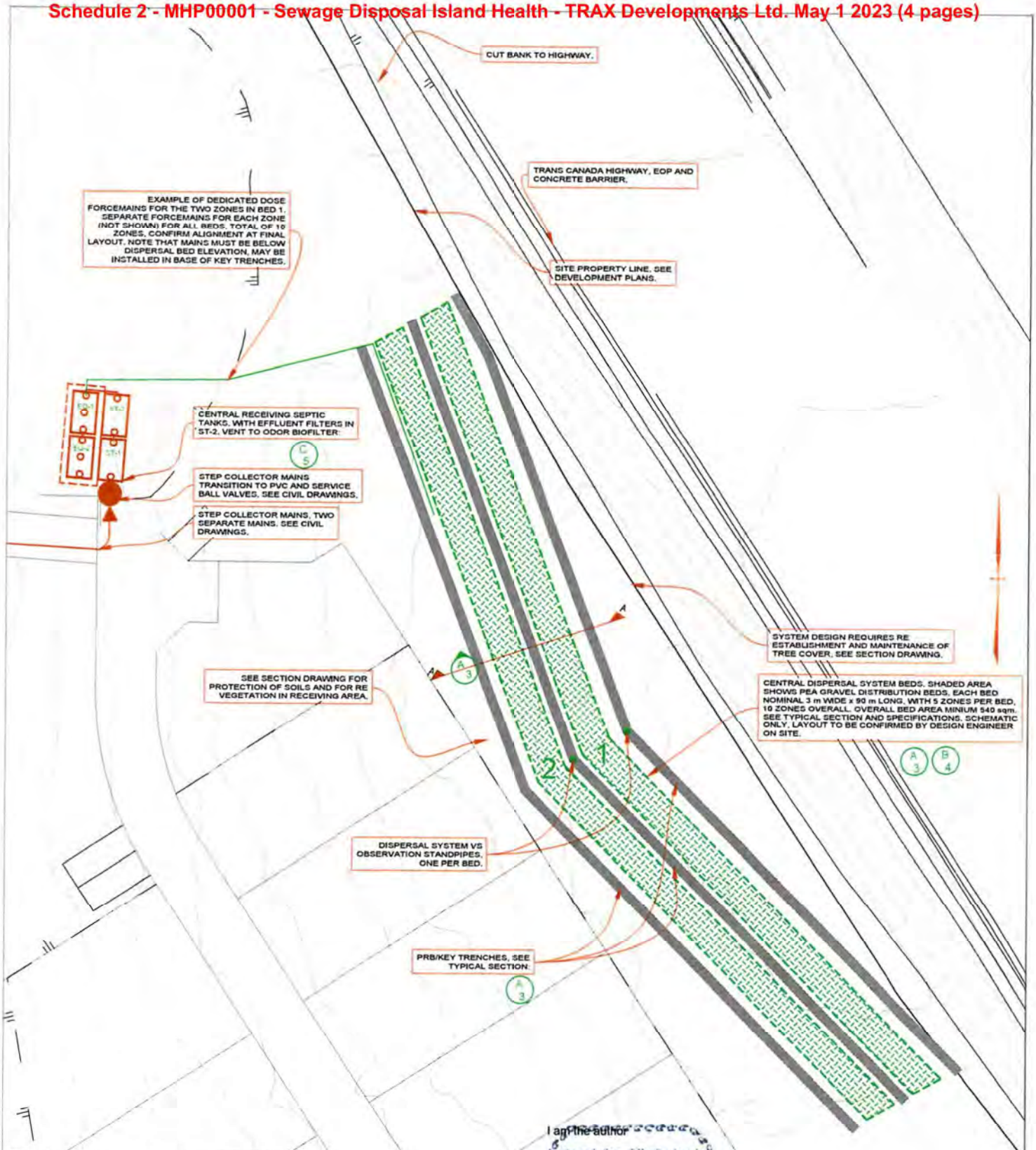
Drawn by IPR Trax Developments Ltd. Based survey plan, client plans, MNC mapping and approximate field measurements. Contours (1m) from LIDAR.

29 April 2023 R0

NOTES:
Layout shown is schematic and does not show all details of proposed site use. Layout of dispersal areas and tanks is to be confirmed on site at time of construction. See specifications for vegetation and soil protection requirements for dispersal area and area surrounding.

This design is for a sewerage system serving up to 20 modular homes in Phase 2 of a proposed phased development of the site **only.** This key plan shows preliminary layout of lot lines in other phases, which may be altered over time prior to construction of those phases. Phase 1 and future phases will be served by other, completely separate, sewerage systems which will be designed and filed at the time of development of those phases and constructed under those separate filings.

Refer to design notes and specifications (R0). STEP main and STEP connection valves to be completed as part of the civil engineering of the project, with coordination with this design through shop drawing review. STEP tanks are shown schematically, location to be confirmed in coordination with civil engineers (including with consideration of separation to modular home pads for structural requirements). Refer to civil drawings. For details of site development plans, including proposed site grading and general location of site and legal plans, refer to civil, geotechnical and other plans and reports. TRAX's scope does not include structural or geotechnical engineering.



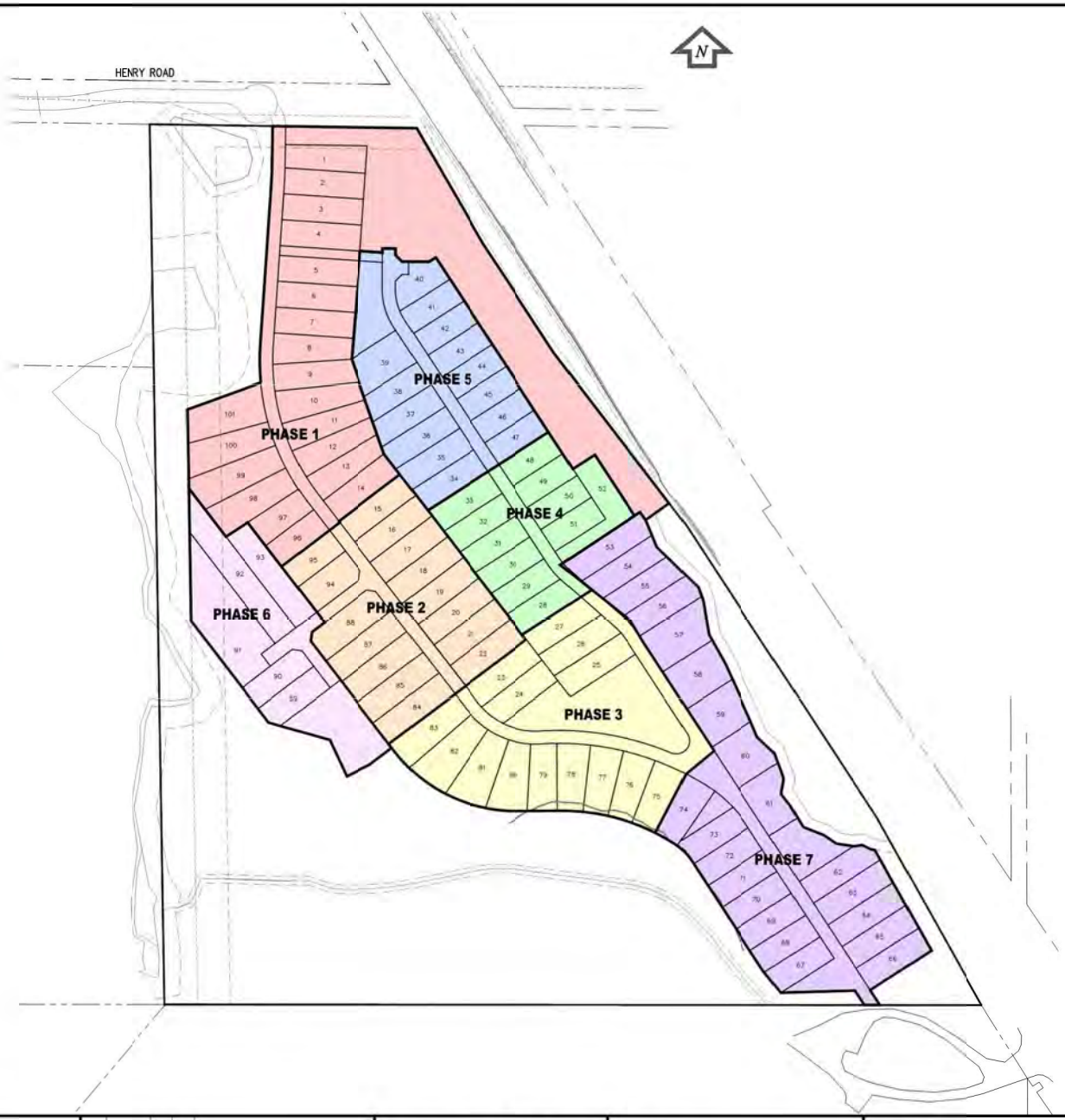
9090 Trans Canada Highway, Chemainus. Phase 2 sewerage system (PID 009-885-200). General arrangement of central tank and dispersal system.

29 April 2023 R0

I am the author

Association of Professional Engineers and Geoscientists of the Province of British Columbia
T. PARALOTON
ENGINEERING
LICENSEE
2023-04-30
Limited Licence
1003548 158292

ISLAND HEALTH
FILING ACCEPTED
MAY 01 2023
This filing Does Not Constitute Approval for Further Subdivision



LEGAL DESCRIPTION :

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND AJOINING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11489, 26194 AND VIP68870
PID No: 009-683-200

CIVIC ADDRESS :

9090 ISLAND HIGHWAY, CHEMAINUS, BC

LEGEND

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- PHASE 5
- PHASE 6
- PHASE 7

BENCHMARK DATA:

ELEVATIONS ARE DERIVED FROM TABLET MARKING J062 (GCM No: 885996) LOCATED IN N. COWICHAN PEN POWERLINE R/W NEAR SW CORNER OF FIRST PYLON E. OF HWY @ ABOUT 1/4 OF A MILE S. OF FULLER'S LAKE RD.

ELEVATION = 67.772m

REV'D	DATE(Y/M/D)	DR'N	CH'D	
1	2021/11/10	DB	CN	DEVELOPMENT PERMIT SUBMISSION
0	2021/03/30	DB	CN	DEVELOPMENT PERMIT SUBMISSION

CHECK BEFORE YOU DIG

INFORMATION ON EXISTING UTILITIES MAY NOT BE COMPLETE OR ACCURATE. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS FOR UTILITIES, SERVICE LOCATIONS, AND DETAILS. THE EXACT LOCATION OF THESE UTILITIES SHALL BE DETERMINED ON SITE.

GRAPHIC SCALE:

GRAPHIC SCALE

-20 0 20 40

SCALE: 1:1000

CoreGroup CONSULTANTS
LAND DEVELOPMENT SERVICES
320-8988 FRASERTON COURT
BURNABY, BC V5J 5H8
tel. (604)299 0505 fax. (604)299 0629
Permit To Practice No. 1001017 (BC)

SEAL:

DISTRICT OF NORTH COWICHAN

DESIGNED –	DB
DRAWN –	DB
METRIC SCALE –	1:1000
APPROVED–	CN
DATE–	DEC. 10, 2021

MORGAN MAPLES

LOT BUILD OUT PHASING PLAN

9090 ISLAND HIGHWAY, CHEMAINUS, BC

FILE	-
CONSULTANTS DWG No–	2
CITY DOC. No–	DP000839
SHEET	16 OF 16

Schedule 3 - MHP00001 - Landscaping Plan and Security - PMG Landscape Architects May 16, 2022 (8 pages)

SITE FURNISHINGS LEGEND

PLANT SCHEDULE

PMG PROJECT NUMBER: 22-079

KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANTED SIZE / REMARKS
	7	ABIES GRANDIS	GRAND FIR	2.5M HT; CB&B
	5	ACER CIRCINATUM	VINE MAPLE	60M CAL; 1.5M STD; B&B
	21	ACER GRISEUM	PAPERBARK MAPLE	60M CAL; 3M STD; B&B
	4	ACER X FREEMANII 'AUTUMN BLAZE'	AUTUMN BLAZE MAPLE	60M CAL; 1.5M STD; B&B
	2	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	10CM CAL; 2M STD; B&B
	4	CHAMAECYPARIS NOOTKATENSIS 'PENDULA'	WEEPING NOOTKA CYPRESS	2M HT; B&B
	6	CORNUS MAS	CORNELIAN CHERRY	3M HT; B&B
	30	LIQUIDAMBAR STYRACIFLUA 'WORPLESDON'	WORPLESDON SWEET GUM	60M CAL; 3M STD; B&B
	5	MALUS 'SPRING SNOW'	FLOWERING CRABAPPLE (FRUITLESS)	50M CAL; 1.5M STD; B&B
	9	NYSSA SYLVATICA	BLACK TUPELO	50M CAL; 1.5M STD; B&B
	6	PINUS SYLVESTRIS	SCOTS PINE	1.5M HT; B&B
	9	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	3M HT; B&B
	23	TILIA AMERICANA 'REDMOND'	REDMOND LINDEN	60M CAL; 1.5M STD; B&B
	31	ZELKOVA SERRATA	SAWLEAF ZELKOVA	60M CAL; 1.5M STD; B&B

NOTES: * PLANT SIZES IN THIS LIST ARE SPECIFIED ACCORDING TO THE BC LANDSCAPE STANDARD AND CANADIAN LANDSCAPE STANDARD, LATEST EDITION. CONTAINER SIZES SPECIFIED AS PER ABOVE STANDARD. BOTH PLANT SIZE AND CONTAINER SIZE ARE THE MINIMUM ACCEPTABLE SIZES. * REFER TO SPECIFICATIONS FOR DEFINED CONTAINER SIZES AND PLANT MATERIAL AND WARRANTY REQUIREMENTS. * PLANT MATERIAL SHALL BE NURSERY GROWN UNLESS OTHERWISE APPROVED BY LANDSCAPE ARCHITECT AT SOURCE OF SUPPLY. AREA OF SEARCH TO INCLUDE LOWER MAINLAND AND FRASER VALLEY. * SUBSTITUTIONS: OBTAIN WRITTEN APPROVAL FROM THE LANDSCAPE ARCHITECT PRIOR TO MAKING ANY SUBSTITUTIONS TO THE SPECIFIED MATERIAL. UNAPPROVED SUBSTITUTIONS WILL BE REJECTED. ALLOW A MINIMUM OF FIVE DAYS PRIOR TO DELIVERY FOR REQUEST TO SUBSTITUTE. SUBSTITUTIONS ARE SUBJECT TO BC LANDSCAPE STANDARD AND CANADIAN LANDSCAPE STANDARD—DEFINITION OF CONDITIONS OF AVAILABILITY. * ALL LANDSCAPE MATERIAL AND WORKMANSHIP MUST MEET OR EXCEED BC LANDSCAPE STANDARD AND CANADIAN LANDSCAPE STANDARD LATEST EDITION. * ALL PLANT MATERIAL MUST BE PROVIDED FROM CERTIFIED DISEASE FREE NURSERY. * BIO-SOLIDS NOT PERMITTED IN GROWING MEDIUM UNLESS AUTHORIZED BY LANDSCAPE ARCHITECT.

22076-4.ZIP

pmg LANDSCAPE ARCHITECTS
Suite C100, – 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604 294-0011 _ f: 604 294-0022

COREGROUP CONSULTANTS

NO.	DATE	REVISION DESCRIPTION	DR.
1	22.03.04	ISSUED FOR COMMENTS	JM
2	22.04.14	REVISED PER MUNICIPALITY COMMENTS	JM
3	22.04.27	ISSUED FOR MUNICIPALITY COMMENTS	TA

PROJECT:

MORGAN MAPLES

9090 TRANS-CANADA HIGHWAY
CHEMAINUS, BC

SEAL:

DRAWING TITLE:

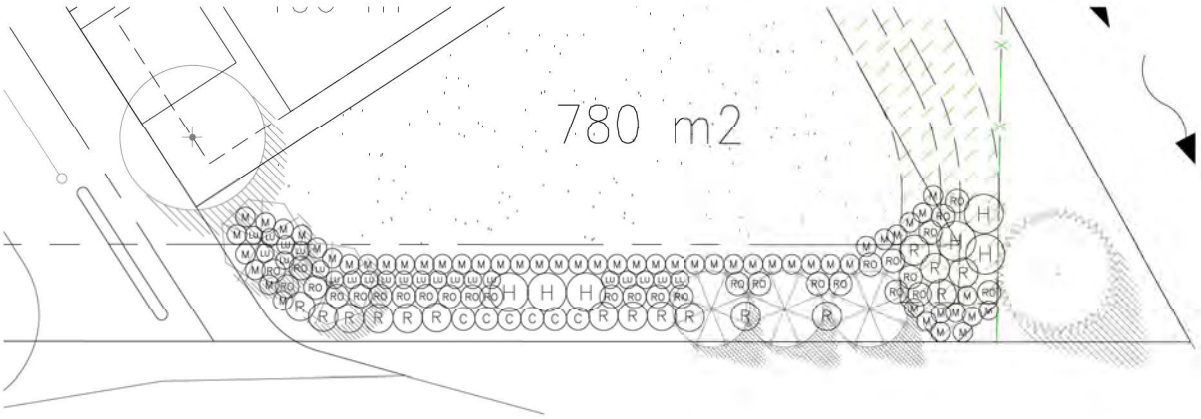
LANDSCAPE PLAN

DATE:	22.APR.11
SCALE:	1:1000
DRAWN:	DO
DESIGN:	DO
CHKD:	MCY

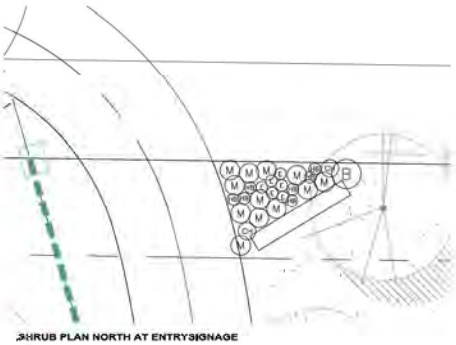
DRAWING NUMBER:

L1 OF 4

PMG PROJECT NUMBER: 22-079



SHRUB PLAN SOUTH



SHRUB PLAN NORTH AT ENTRY SIGNAGE

PLANT SCHEDULE — PMG PROJECT NUMBER: 22-076

KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANTED SIZE / REMARKS
SHRUBS				
B	1	BERBERIS DARWINII	DARWINS BARBERRY; YELLOW ORANGE	#3 POT; 40CM
C	5	CEANOTHUS 'VICTORIA'	CALIFORNIA LILAC	#2 POT; 40CM
CH	2	CHAMAECYPARIS OBTUSA 'NANA'	COMPACT HINOKI CYPRESS	#1 POT
H	5	HOLODISCUS DISCOLOR	OCEANSPRAY	#2 POT; 50CM
M	6b	MAHONIA NERVOSA	LONGLEAF MAHONIA	#1 POT; 20CM
R	19	RIBES SANGUINEUM	RED FLOWERING CURRANT	#2 POT; 60CM
RO	49	ROSA NUTKANA	NOOTKA ROSE	#2 POT
PERENNIALS				
E	4	EPIMEDIUM X RUBRUM	RED BARRENWORT	15CM POT
H	7	HELLEBORUS 'HONEY HILL JOY'	LENTEN ROSE	15CM POT
LU	22	LUPINUS POLYPHYLLUS	LARGE-LEAVED LUPINE	#1 POT

NOTES: * PLANT SIZES IN THIS LIST ARE SPECIFIED ACCORDING TO THE BC LANDSCAPE STANDARD AND CANADIAN LANDSCAPE STANDARD, LATEST EDITION. CONTAINER SIZES SPECIFIED AS 'ER CNLA STANDARD, BOTH PLANT SIZE AND CONTAINER SIZE ARE THE MINIMUM ACCEPTABLE SIZES. * REFER TO SPECIFICATIONS FOR DEFINED CONTAINER MEASUREMENTS AND OTHER PLANT MATERIAL REQUIREMENTS. * SEARCH AND REVIEW: MAKE PLANT MATERIAL AVAILABLE FOR OPTIONAL REVIEW BY LANDSCAPE ARCHITECT AT SOURCE OF SUPPLY, AREA OF SEARCH TO INCLUDE LOWER MAINLAND AND FRASER VALLEY. * SUBSTITUTIONS: OBTAIN WRITTEN APPROVAL FROM THE LANDSCAPE ARCHITECT PRIOR TO MAKING ANY SUBSTITUTIONS. TO THE SPECIFIED MATERIAL. UNAPPROVED SUBSTITUTIONS WILL BE REJECTED. ALLOW A MINIMUM OF FIVE DAYS PRIOR TO DELIVERY FOR REQUEST TO SUBSTITUTE. SUBSTITUTIONS ARE SUBJECT TO BC LANDSCAPE STANDARD AND CANADIAN LANDSCAPE STANDARD - DEFINITION OF CONDITIONS OF AVAILABILITY. ALL LANDSCAPE MATERIAL AND WORKMANSHIP MUST MEET OR EXCEED BC LANDSCAPE STANDARD AND CANADIAN LANDSCAPE STANDARD LATEST EDITION. * ALL PLANT MATERIAL MUST BE PROVIDED FROM CERTIFIED DISEASE FREE NURSERY. * SEWAGE IS NOT PERMITTED IN GROWING MEDIUM UNLESS AUTHORIZED BY LANDSCAPE ARCHITECT.

22076-4.ZIP

pmg LANDSCAPE ARCHITECTS
Suite C100 – 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604.294-0011 ; f: 604.294-0322

COREGROUP CONSULTANTS

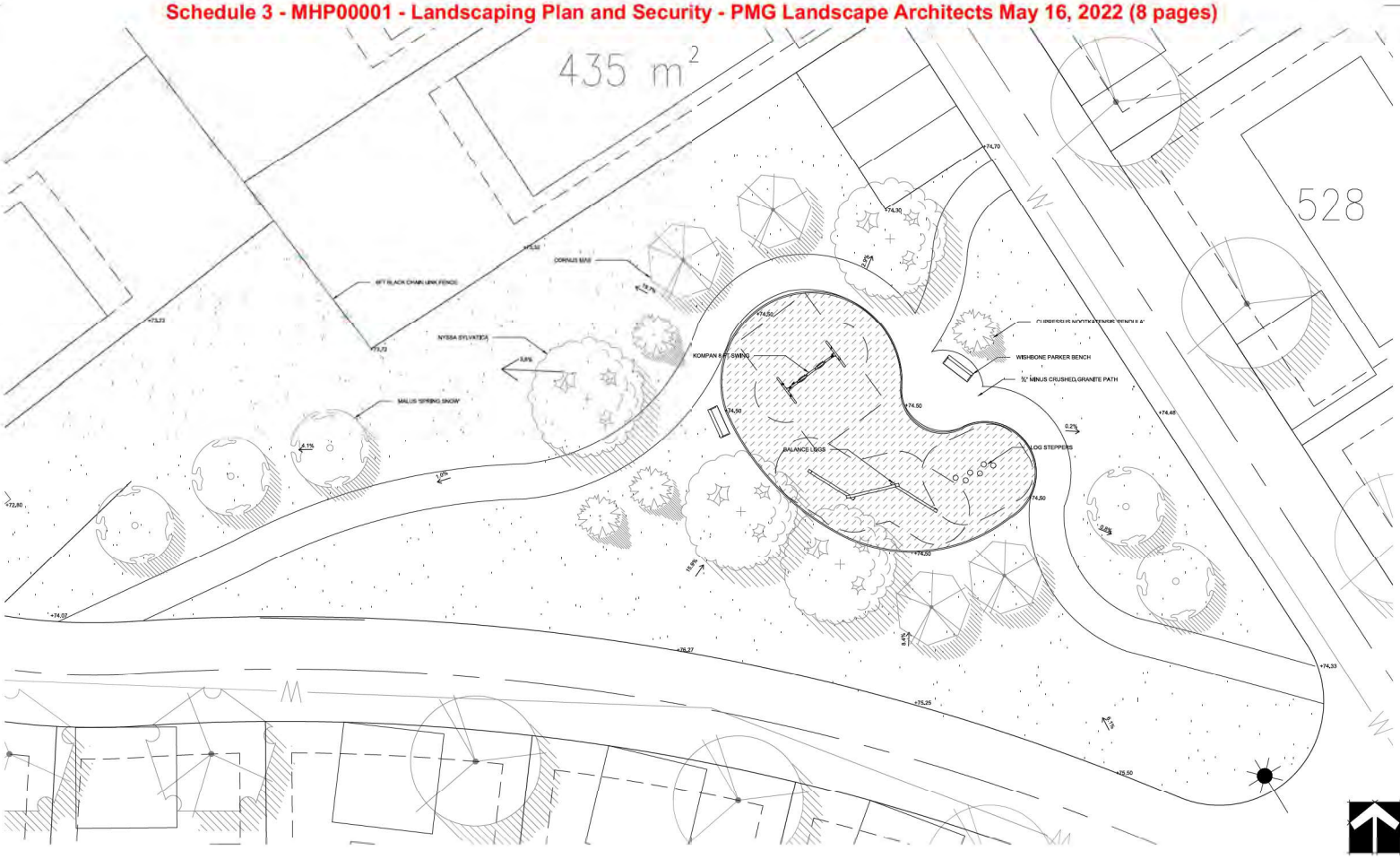
NO.	DATE	REVISION DESCRIPTION	DR.
1	22.APR.11	ISSUED FOR ECONOMICS	JM
2	22.MAY.12	ISSUED FOR MUNICIPALITY COMMENTS	JM
3	22.MAY.16	ISSUED FOR MUNICIPALITY COMMENTS	MC

PROJECT:
MORGAN MAPLES
9090 TRANS-CANADA HIGHWAY
CHEMAINUS, BC

SEAL:

DRAWING TITLE:
SHRUB PLAN

DATE: 22.APR.11
SCALE: 1:100
DRAWN: DO
DESIGN: DO
CHKD: MCY
DRAWING NUMBER: L2 OF 4
PMG PROJECT NUMBER: 22-076



22076-4.ZIP

pmg LANDSCAPE ARCHITECTS
Suite C100 – 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604.294-0011 ; f: 604.294-0322

COREGROUP CONSULTANTS

NO.	DATE	REVISION DESCRIPTION	DR.
1	22.MAR.24	ISSUED FOR ECONOMICS	JM
2	22.APR.12	REVISED PER MUNICIPALITY COMMENTS	JM
3	22.MAY.06	ISSUED PER MUNICIPALITY COMMENTS	TA

PROJECT:

MORGAN MAPLES

9090 TRANS-CANADA HIGHWAY
CHEMAINUS, BC

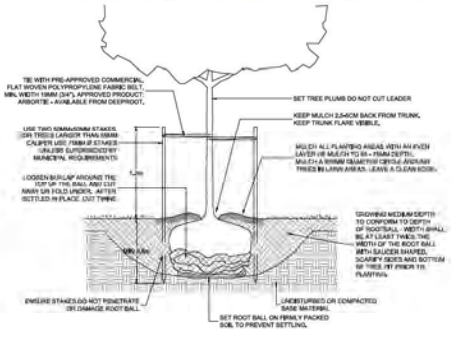
SEAL:

DRAWING TITLE:

PLAY ENLARGEMENT PLAN

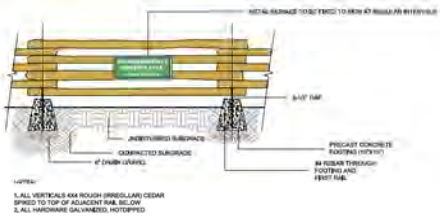
DATE:	22.APR.11
SCALE:	1:100
DRAWN:	DO
DESIGN:	DO
CHKD:	MCY
DRAWING NUMBER:	L3
PMG PROJECT NUMBER:	22-076

OF 4



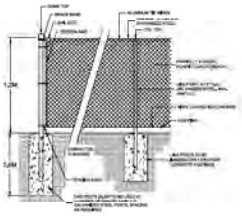
- ALL MATERIALS AND LABOUR TO MEET LATEST CSLA STANDARDS.

1 / L1 **TREE PLANTING DETAIL** 1:25



NOTES:
1. ALL VERTICALS 4X4 ROUGH (IRREGULAR) CEDAR SPACED TO TOP OF ADJACENT RAIL BELOW
2. ALL HARDWARE GALVANIZED, HOTDIPPED

2 / L1 **SPEA SPLIT RAIL FENCE WITH METAL SIGN** 1:25



3 / L1 **1.2M HEIGHT CHAIN LINK FENCE** 1:25

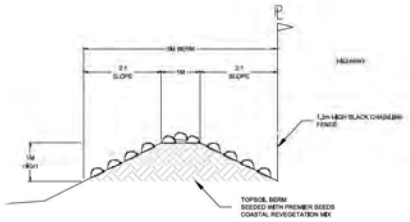
KOMPAN BFT ANTI-WRAP SWING

WISHBONE PARKER BENCH
GREY RECYCLED PLASTIC LUMBER
TEXTURED BLACK POWDER COAT

WISHBONE PARKER PICNIC TABLE
GREY RECYCLED PLASTIC LUMBER
TEXTURED BLACK POWDER COAT

KOMPAN ROBINIA TWIN 6' SWINGER BRIGHT

NATURAL LOG STEPPERS



4 / L1 **HIGHWAY BUFFER SECTION (TYP)** 1:50

22076-4.ZIP

pmg LANDSCAPE ARCHITECTS
Suite C100, – 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604 294-0011 , f: 604 294-0322

COREGROUP CONSULTANTS

NO.	DATE	REVISION DESCRIPTION	DR.
1	21.04.14	ISSUED FOR COMMENTS	JH
2	21.07.12	ISSUED FOR MUNICIPALITY COMMENTS	JH
3	22.MAY.06	ISSUED FOR MUNICIPALITY COMMENTS	TA

PROJECT:

MORGAN MAPLES

9090 TRANS-CANADA HIGHWAY
CHEMAINUS, BC

SEAL:

DRAWING TITLE:

LANDSCAPE DETAILS

DATE:	22.APR.11
SCALE:	1:100
DRAWN:	DO
DESIGN:	DO
CHKD:	MCY

DRAWING NUMBER:

L4 OF 4

PMG PROJECT NUMBER: **22-076**

pmg LANDSCAPE ARCHITECTS

May 16, 2022

Core Group Consultants
320-8988 Fraserton Court
Burnaby BC

scarroll@coregroupconsultants.com

Attention: Sean Carroll

Re: PMG File No.: 22-076
Morgan Maples, 9090 Trans-Canada Highway

The following cost estimate for bonding purposes was based on our Landscape Plans dated May 16, 2022

		Size	Approximate Quantity	Unit Price	Total Price
1	Earthwork:				
	b) Topsoil (cost per m^3)		100	$ 35.00	3,500.00
2	Lawn (cost per m^2)				
	a) Seeded		3000	$ 7.00	21,000.00
3	Hard Surfacing				
	a) 3/4" Crushed Granite (per cubic m)		50	$ 65.00	3,250.00
	b) Engineered wood fibre (per sq. m)		160	$ 4.20	672.00
4	Fences & Walls (cost per lin. m)				
	g) 6' ht chainlink fence		1300	$ 100.00	130,000.00
5	Furnishings (itemize) installed				
	a) Bench		4	$ 1,600.00	6,400.00
	b) Picnic table		3	$ 3,750.00	11,250.00
	c) Balance logs		3	$ 600.00	1,800.00
	d) Log steppers		6	$ 400.00	2,400.00
	e) Swing set		1	$ 4,500.00	4,500.00
6	Plant Material:				
	a) Trees				
	1) Malus 'Spring Snow'	5 cm cal.	5	$ 250.00	1,250.00
	2) Nyssa sylvatica	5 cm cal.	9	$ 250.00	2,250.00
	3) Acer griseum	6 cm cal.	8	$ 300.00	2,400.00
	4) Acer rubrum 'Red Sunset'	6 cm cal	21	$ 300.00	6,300.00
	5) Acer x freemanii 'Autumn Blaze'	6 cm cal	4	$ 300.00	1,200.00
	6) Betula nigra 'Dura Heat'	6 cm cal.	8	$ 300.00	2,400.00
	7) Liquidambar styraciflua 'Worplesdon'	6 cm cal.	30	$ 300.00	9,000.00
	8) Tilia americana 'Redmond'	6 cm cal.	23	$ 300.00	6,900.00
	9) Zelkova serrata	6 cm cal.	31	$ 300.00	9,300.00
	10) Cornus mas	2 m ht.	6	$ 180.00	1,080.00
	11) Chamaecyparis nootkatensis 'Pendula'	2 m ht.	4	$ 200.00	800.00
	12) Abies grandis	2.5 m ht.	7	$ 220.00	1,540.00
	13) Pseudotsuga menziesii	3 m ht.	9	$ 330.00	2,970.00
	14) Pinus sylvestris	3.5 m ht.	6	$ 260.00	1,560.00
	b) Shrubs / Groundcovers				
	1) Lupinus polyphyllus	#1 pot	26	$ 5.00	130.00
	2) Mahonia nervosa	#1 pot	49	$ 5.00	245.00
	3) Ceanothus 'Victoria'	#2 pot	18	$ 10.00	180.00
	4) Holodiscus discolor	#2 pot	7	$ 10.00	70.00
	5) Ribes sanguineum	#2 pot	16	$ 10.00	160.00
	6) Rosa nutkana	#2 pot	30	$ 10.00	300.00
	c) Installation			50%	25,017.50
7	Mulch (cost per m^3)				
	a) Bark mulch		20	$ 39.00	780.00

8	Totals	Total for 1	3,500.00
		Total for 2	21,000.00
		Total for 3	3,922.00
		Total for 4	130,000.00
		Total for 5	26,350.00
		Total for 6	75,052.50
		Total for 7	780.00
		TOTAL	**$ 260,604.50**

Please note that this is only an estimate, and is subject to change due to economic conditions, availability of materials, and actual site conditions at the time of construction.

Yours truly,

Scott Archer
PMG Landscape Architects Ltd.

Reviewed By: Mary Chan Yip

LEGAL DESCRIPTION :

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ADJOINING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11489, 28194 AND VIP66870
PID No. 009-585-200

CIVIC ADDRESS :

LEGEND

PHASE 1
PHASE 2
PHASE 3
PHASE 4
PHASE 5
PHASE 6
PHASE 7

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM TARGET MONUMENT 99057 FROM Mr. BRIDGE LOCATED IN S. CHEMAINUS ON HIGHWAY 1 N.W. NEAR THE CORNER OF BRICE AVENUE C. OF HWY 1. ABOUT 1/4 OF A MILE S. OF HIGHWAY 1 GRAY RD.
ELEVATION = 17.772m

NO.	DATE (YYYY/MM/DD)	BY	CK	REVISION / ISSUANCE
1	2022/02/09	GB	AR	DEVELOPMENT PERMIT SUBMISSION
10	2022/05/09	GB	MS	DEVELOPMENT PERMIT SUBMISSION

REVISION / ISSUANCE LOG

CHECK BEFORE YOU DIG

INFORMATION ON EXISTING UTILITIES MAY NOT BE COMPLETE OR ACCURATE. PRIOR TO CONSTRUCTION CONTRACTOR SHALL CONTACT ENGINEER OF ALL EXISTING UTILITIES AND REVIEW THE ENGINEER OF POTENTIAL CONFLICTS. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS FOR UTILITIES, SERVICE LOCATIONS, AND DETAILS. THE EXACT LOCATION OF THESE SITE MUST SHALL BE DETERMINED ON SITE.

GRAPHIC SCALE

GRAPHIC SCALE
0 10 20 40
SCALE 1:800

CoreGroup
CONSULTANTS
LAND DEVELOPMENT SERVICES
[illegible]

DISTRICT OF NORTH COWICHAN

MORGAN MAPLES

LOT BUILD OUT
PHASING PLAN

MODULAR HOME DEVELOPMENT

9090 ISLAND HIGHWAY
CHEMAINUS, BC

BUILDING PERMIT PLANS - SITE SERVICING

PROJECT LOCATION MAP
NOT TO SCALE

LEGAL DESCRIPTION:

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT,
EXCEPT 16.5 FOOT STRIP ALONG AND ADJOINING THE NORTH AND EAST BOUNDARIES THEREOF,
RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11489, 26194 AND VIP68870
PID No: 009-885-200

DEVELOPER:

1251719 B.C. LTD.
320-8988 FRASERTON COURT
BURNABY, BC V5J 5H8
TEL: 604-299-0605

CONSULTANT:

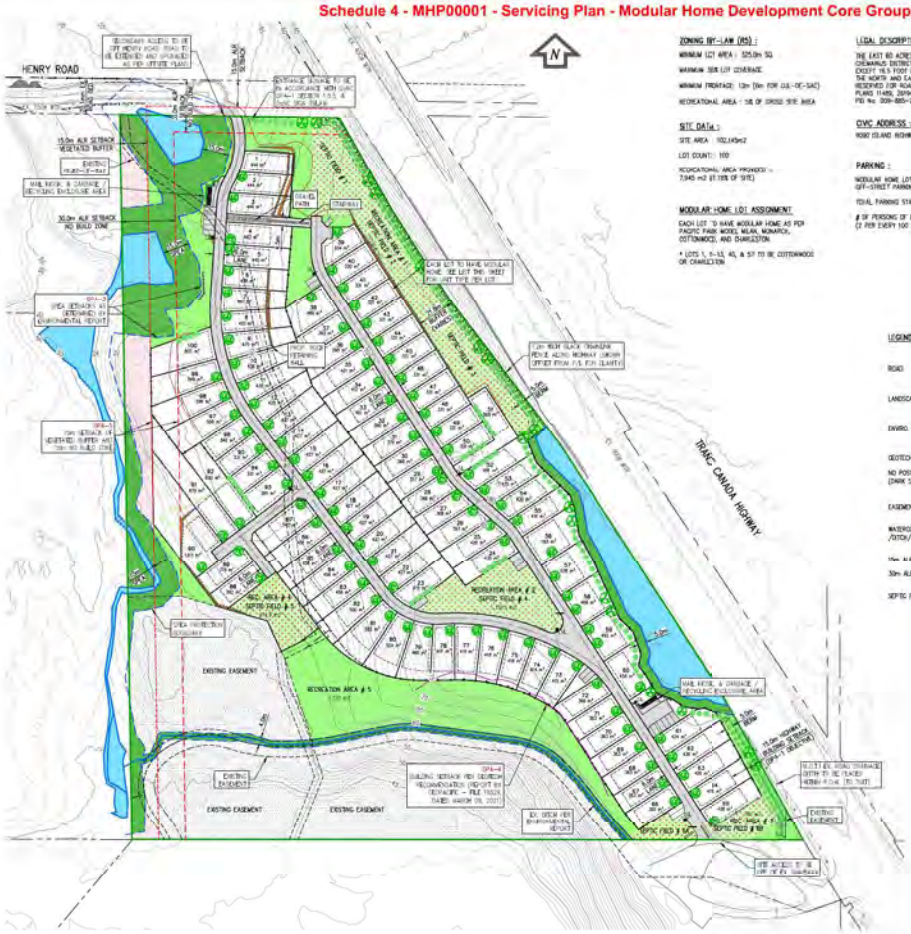
CoreGroup CONSULTANTS
LAND DEVELOPMENT SERVICES
320-8988 FRASERTON COURT
BURNABY, BC V5J 5H8
tel. (604)299 0605 fax. (604)299 0629
Permit To Practice No. 100157 (BC)

DRAWING LIST:

1. SITE PLAN
2. SITE SERVICING PLAN
3. SITE GRADING PLAN
4. FIRE SUPRESSION PLAN
5. ROADWORKS, GRADING, WATERWORKS
6. ROADWORKS, GRADING, WATERWORKS
7. ROADWORKS, GRADING, WATERWORKS
8. ROADWORKS, GRADING, WATERWORKS
9. STORM AND SANITARY WORKS
10. STORM AND SANITARY WORKS
11. STORM AND SANITARY WORKS
12. STORM AND SANITARY WORKS
13. STORMWATER MANAGEMENT PLAN
14. STORMWATER MANAGEMENT PLAN
15. STREETLIGHT AND SIGNAGE PLAN
16. EROSION AND SEDIMENT CONTROL PLAN – STAGE 1
17. EROSION AND SEDIMENT CONTROL PLAN – STAGE 2
18. EROSION AND SEDIMENT CONTROL PLAN – STAGE 3
19. EROSION AND SEDIMENT CONTROL PLAN – STAGE 4
20. GARBAGE ENCLOSURE AND MAIL KIOSK DETAILS
21. NOTES AND DETAILS
21A. LOT BUILDOUT PHASING PLAN

AUGUST 14, 2023
MUNICIPAL PROJECT No. CIP00839

Schedule 4 - MHP00001 - Servicing Plan - Modular Home Development Core Group August 17 2023 (23 pages)



ZONING BY-LAW (RS) :

MINIMUM LOT AREA : 525.0m SQ

MAXIMUM SITE LOT COVERAGE

MINIMUM FRONTAGE: 12m (9m FOR CUL-DE-SAC)

RECREATIONAL AREA : 10% OF GROSS SITE AREA

SITE DATA :

SITE AREA : 102,145m2

LOT COUNT: 100

RECREATIONAL AREA PROVIDED =
7345 m2 (7.19% OF SITE)

MODULAR HOME LOT ASSIGNMENT

EACH LOT TO HAVE MODULAR HOME AS PER PACIFIC PARK MODEL MILAN, MONARCH, COTTONWOOD, AND CHARLESTON

* LOTS 1, 9-13, 45, & 57 TO BE COTTONWOOD OR CHARLESTON

LEGAL DESCRIPTION :

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALSONG THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11495, 20764 AND VIP88853

PID No. 009-885-200

CIVIC ADDRESS :

9087 ISLAND HIGHWAY, CHEMAINUS, BC

PARKING :

MODULAR HOME LOT PARKING : 200
OFF-STREET PARKING : 17

TOTAL PARKING STALLS : 219

OF PERSONS OF DISABILITY STALLS : 9
(2 PER EVERY 100 STALLS)

LEGEND

ROAD

LANDSCAPE

ENVIRO. SETBACK

GEOTECH SETBACK

NO POST STREETLIGHT (DARK SKY)

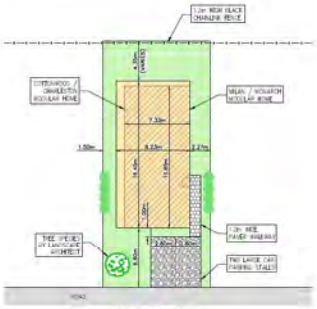
EASEMENT AREA

WATERCOURSE /DITCH/WETLAND

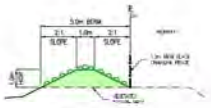
30m ALR SETBACK

SEPTIC FIELD

ENTRANCE SIGN (EXAMPLE)
IN ACCORDANCE WITH DoNC DPA-1 SECTION 1.5.5. & DoNC SIGN BYLAW
SCALE: N.T.S.



TYPICAL LOT LAYOUT
SCALE: 1:250



HIGHWAY BUFFER SECTION
(TYPICAL)
SCALE: 1:100

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET. OPPOSITE PARCEL 'A' REFERENCE ICON 5273530.01

REV'D	DATE(YMMJD)	DRN	CHK	ISSUED FOR / REVISIONS
1	2023/08/14	GD	DN	ISSUED FOR BUILDING PERMIT
0	2023/05/31	GD	DN	ISSUED FOR REVIEW

LEGAL DESCRIPTION

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALSONG THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11495, 20764 AND VIP88853 EX PID No. 009-885-200

GRAPHIC SCALE:

GRAPHIC SCALE
0 5 10 20 40
SCALE: 1:1000

DEVELOPER

1251719 B.C. LTD.
[illegible]
Burnaby, BC V5J 3H9
Tel: (604)299-2626

CoreGroup
ENGINEERING
LAND DEVELOPMENT SERVICES
320-4946 TRADITION COURT
BURNABY, BC V5J 5H9
tel: (604)299-2626 fax: (604)299-2629

SCALE:

DESIGNED — DN
DRAWN — GD
MATERIAL SCALE — 1:1000
APPROVED — DN
DATE — AUG. 14, 2023

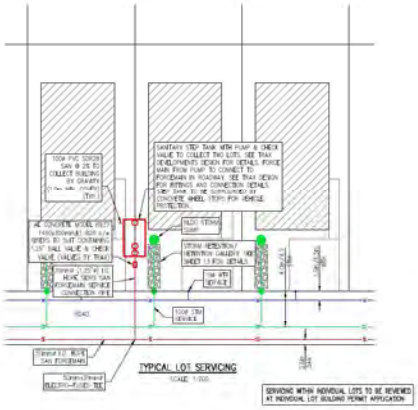
DISTRICT OF NORTH COWICHAN

MORGAN MAPLES

SITE PLAN

9087 ISLAND HIGHWAY, CHEMAINUS, BC

FILE
DRAWING/SHEET No. — 2087
DTT No. — DP00005
SHEET 1 OF 21



LEGAL DESCRIPTION :

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALSWING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARCEL A (PLAN 11488), 29194 AND VIP59870

PID No. 009-685-200

CIVIC ADDRESS :

8060 ISLAND HIGHWAY, CHEMAINUS, BC

LEGEND

EX. WATER
PROP. WATER
PROP. SAN FORCE MAIN
PROP. STORM SEWER
PROP. HYDRANT
NO POST STREETLIGHT (DARK SKY)

BENCHMARK DATA:

ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET OPPOSITE PARCEL 'A' REFERENCE ICGM 57273(B)

NO.	DATE/BY/M	BY	CK	ISSUED FOR BUILDING PERMIT
0	2023/05/31	DP	CK	ISSUED FOR GRADING
REVS	DATE/BY/AUD	DRN	CHK	

LEGAL DESCRIPTION

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALSWING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARCEL A (PLAN 11488), 29194 AND VIP59870 PID No. 009-685-200

GRAPHIC SCALE:

GRAPHIC SCALE
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SCALE: 1:1000

DEVELOPER

1251719 B.C. LTD.
[illegible]
Burnaby, BC V5J 3H9
Tel: 604-299-0629

CoreGroup
CONSULTANTS
LAND DEVELOPMENT SERVICES
325-4988 TRANSTON COURT
BURNABY, BC V5J 5H9
tel. (604)299 0629 fax. (604)299 0629

SEAL:

DISTRICT OF NORTH COWICHAN

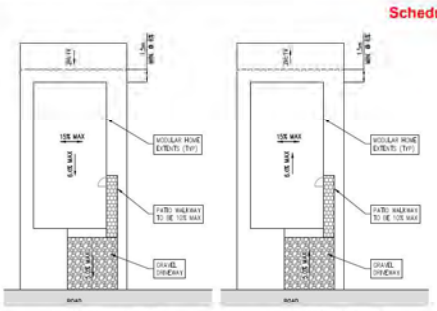
DESIGNED — DP
DRAWN — MM
CHECKED — MM
SCALE — 1:1000
APPROVED — DP
DATE — AUG. 14, 2023

MORGAN MAPLES

SITE SERVICING PLAN

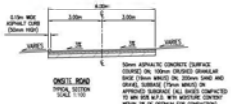
8060 ISLAND HIGHWAY, CHEMAINUS, BC

FILE
DWG No. — 2087
SITE
DOC. No. — OPD0426
Sheet 2 OF 21



TYPICAL LOT GRADING PLAN
GRADING TOWARDS ROAD
(NORTHEAST SIDE OF ROAD)
SCALE 1:200

TYPICAL LOT GRADING PLAN
GRADING AWAY FROM ROAD
(SOUTHWEST SIDE OF ROAD)
SCALE 1:200



ONSITE ROAD
TYPICAL SECTION
SCALE 1:100

50mm ASPHALTIC CONCRETE SURFACE, COURSE (IN, 100mm CRUSHED GRANULAR BASE (19mm MINUS) ON, 200mm SAND AND GRAVEL SUBBASE (75mm MINUS) ON APPROVED SUBGRADE (ALL BASES COMPACTED TO MIN 95% M.P.D. WITH MOISTURE CONTENT WITHIN 2% OF OPTIMUM FOR COMPACTION)

FINAL GRADING OF LOTS TO BE REVIEWED AT INDIVIDUAL LOT BUILDING PERMIT APPLICATION

SEE SHEETS 5-8 FOR ROADWAY AND WALL GRADING INFORMATION AND DETAILS

LEGEND

- MODULAR GRAVEL PAD ELEVATION (TYP)
- ROAD SPOT ELEVATION LP/HP (LOW/HIGH POINT)
- ROAD GRADE
- RETAINING WALL
- GEOTECH SETBACK
- TOP OF BANK / BOTTOM OF BANK

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPOIN CENTER OF SECTION 10, TOWNSHIP 17 (IN HOUSE) DISTRICT. ONPOINTE PARCEL 'E' REFERENCE PLAN 51735(B)

NO.	DATE (M/D/Y)	BY	CK	ISSUE / REVISION / AMENDMENT
1	05/01/2023	JW	DN	ISSUED FOR BUILDING PERMIT
0	2023/02/21	SW	DN	ISSUED FOR GRADING
REV'D	DATE (YY/MM/DD)	DRN	CK'D	

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONG THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, 29158 AND APPROVED TO key DLN-065-000

GRAPHIC SCALE:
GRAPHIC SCALE
0 15 30 60
SCALE: 1:750

DEVELOPER
1251710 B.C. LTD.
[illegible]
[illegible]
Tel: (604)209-0609

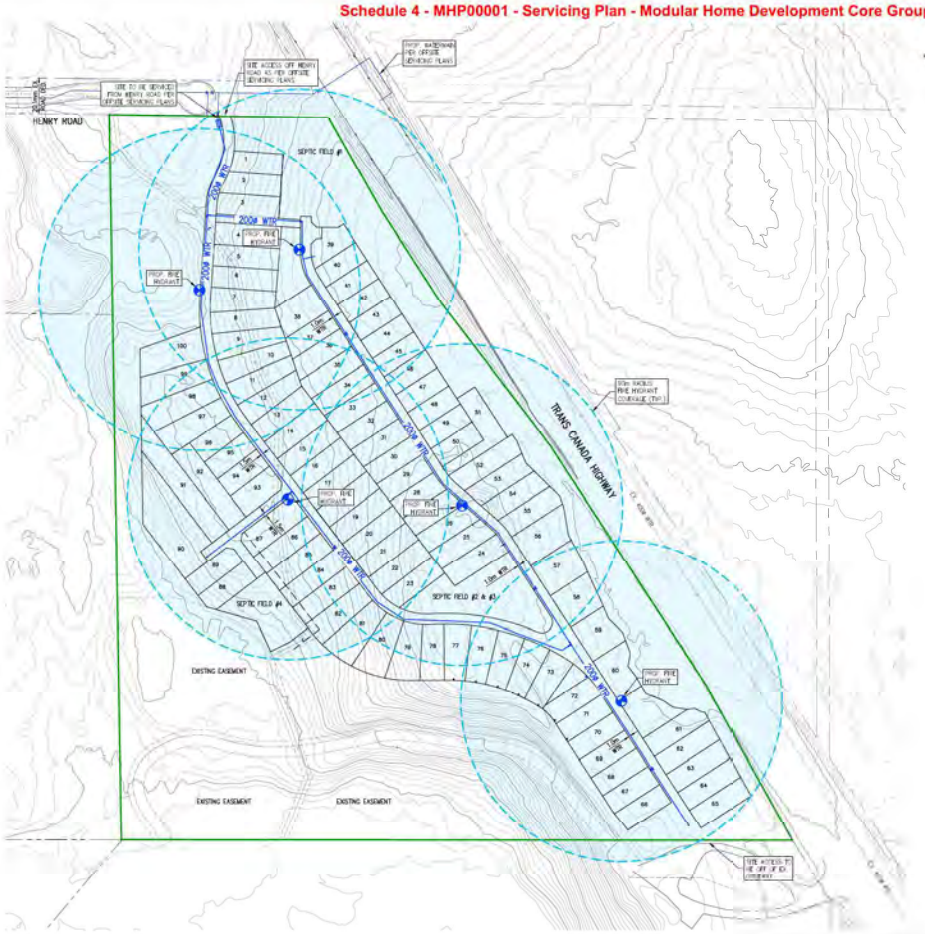
CoreGroup CONSULTANTS
LAND DEVELOPMENT SERVICES
325-5668 TRADEPOST COURT
DUNCAN, BC V9L 3J8
tel: (604)209-0609 fax: (604)709-0629

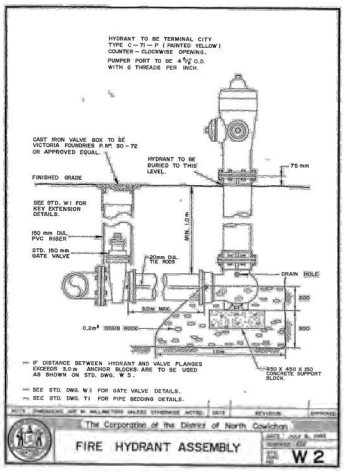
SEAL:

DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
SITE GRADING PLAN
5992 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED – SW
DRAWN – MA
METRIC SCALE – 1:750
APPROVED – DN
DATE – AUG. 14, 2023

FILE –
CONSULTANTS DWG No – 2087
CITY DOC. No – DP000455
SHEET 3 OF 21





LEGAL DESCRIPTION :

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALOMING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11488, 26194 AND VIP58870
PID No: 008-883-200

CIVIC ADDRESS :

6090 ISLAND HIGHWAY, CHEMAINUS, BC

LEGEND

PROP. WATER
PROP. HYDRANT
HYDRANT COVERAGE

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET / OPPOSITE PARCEL 'E' (REFERENCE ICOM 5173518)

1	2023/08/14	JW	DN	ISSUED FOR BUILDING PERMIT
0	2023/05/31	DP	DN	ISSUED FOR GRADING
REV'D	DATE(YR/MO/DA)	DRN	CHKD	

LEGAL DESCRIPTION

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALOMING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11488, 26194 AND VIP58870
PID No: 008-883-200

GRAPHIC SCALE:
GRAPHIC SCALE
0 20 40 60
SCALE: 1:1000

DEVELOPER
1251719 B.C. LTD.
[illegible]
BURNABY, BC V5J 3H9
TEL: 604-294-0629

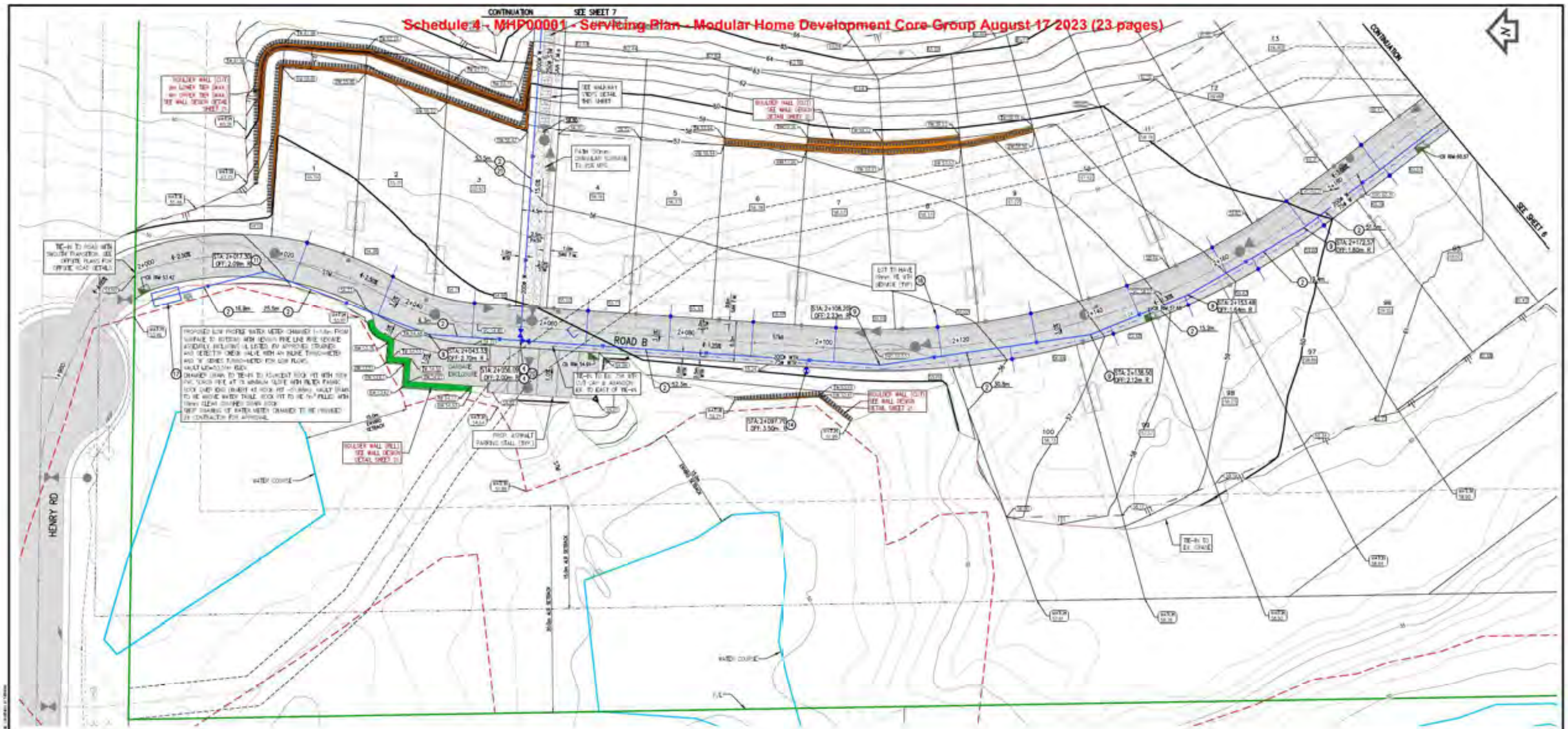
CoreGroup
ENGINEERING
LAND DEVELOPMENT SERVICES
320-4946 TRADEWIND COURT
BURNABY, BC V5J 3H9
tel: (604)299 0629 fax: (604)299 0629

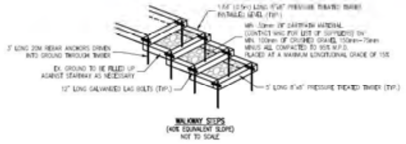
SEAL:

DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
FIRE SUPPRESSION PLAN
6090 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED	DN
DRAWN	MA
SCALE	1:1000
APPROVED	DN
DATE	AUG. 14, 2023

PLF
DWG No. 2087
DFT
DOC. No. DWG#28
Sheet 4 OF 21





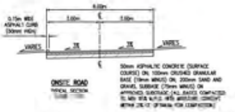
WALKWAY STEPS
(40% EQUIVALENT SLOPE)
NOT TO SCALE

NOTES

1. SEE SHEET 21 FOR NOTES.

WATER CONSTRUCTION NOTES:

① REMOVE EX. FLUSHOUT AND TIE-IN TO EX. WATER BY MUNICIPAL CREWS AT DEVELOPER'S COST
② 200mm PVC C900 CLASS 200 WATER
③ 100mm PVC C900 CLASS 200 WATER
④ 200mm GATE VALVE
⑤ 100mm GATE VALVE
⑥ 200mm 90° BEND
⑦ 200mm 45° BEND
⑧ 200mm 22.5° BEND
⑨ 200mm 11.25° BEND
⑩ 100mm 45° BEND
⑪ 100mm 22.5° BEND
⑫ 100mm 11.25° BEND
⑬ 200mmx150mm REDUCER
⑭ FIRE HYDRANT ASSEMBLY PER MMCD DETAIL W2 (WITH PLYWOOD RING WHEN NOT IN SERVICE) c/w 150mm PVC C900 CLASS 200 WATER LEAD TO FIRE MAIN. INSTALL 150mm GATE VALVE ON HYDRANT LEAD AT TEE ON MAIN.
⑮ BLOW-OFF PER MMCD W8
⑯ 19mm PE WATER SERVICE. DETAILS WITHIN LOT TO BE REVIEWED AS PART OF INDIVIDUAL BUILDING PERMIT REVIEWS OF MODULAR HOMES
⑰ WATER METER CHAMBER WITH PIPING ORIENTATION PER PLAN VIEW
⑱ 200mmx200mmx100mm TEE
⑲ 150mm 90° BEND
⑳ 200mmx200mmx200mm TEE
㉑ PVC ANCHOR BLOCKS PER MMCD [illegible] INSTALLED AT 10m MAXIMUM SPACING



ONSITE ROAD
TYPICAL SECTION
[illegible]

50mm ASPHALTIC CONCRETE (SURFACE COURSE) ON 100mm CRUSHED GRANULAR BASE (19mm MINUS) ON 200mm SAND AND GRAVEL SUBBASE (75mm MINUS) ON APPROVED SUBGRADE (ALL BASES COMPACTED TO MIN 95% M.P.D. WITH MOISTURE CONTENT WITHIN 2% OF OPTIMUM FOR COMPACTION)

LEGEND

BEGINNING OF CURVE	PC
END OF CURVE	PT
POINT OF REVERSE HORIZONTAL CURVE	PRC
POINT OF COMPOUND HORIZONTAL CURVE	PCC
START OF VERTICAL CURVE	SVC
COMPOUND VERTICAL CURVE	CVC
END OF VERTICAL CURVE	EVC
HIGH POINT	HP
LOW POINT	LP
GRADE BREAK	GB
CATCH BASIN	CB
PROP. LOT CORNER ELEV.	[illegible]
PROP. SLAB ELEV.	[illegible]
PROP. SWALE ELEVATION	[illegible]
PROP. CATCH BASIN (CB)	[illegible]
PROP. DOMESTIC (POTABLE) WATER	[illegible]

BENCHMARK DATA:

ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ON POON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET OPPOSITE PARCEL "A" REFERENCE PLAN [illegible]

1	2023/08/14	DB	CN	ISSUED FOR BUILDING PERMIT
0	2023/03/21	DB	CN	ISSUED FOR GRADING
REV'D	DATE(Y/M/D)	DWN	CHKD	

LEGAL DESCRIPTION

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ADJOINING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, 26158 AND VIP[illegible] PID: 009-885-[illegible]

GRAPHIC SCALE:

GRAPHIC SCALE
SCALE 1:250

DEVELOPER

1251719 B.C. LTD.
320-8988 FRASERTON COURT
BURNABY, BC V5J 5H8
TEL: 604-[illegible]

CoreGroup
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SEAL

DISTRICT OF NORTH COWICHAN

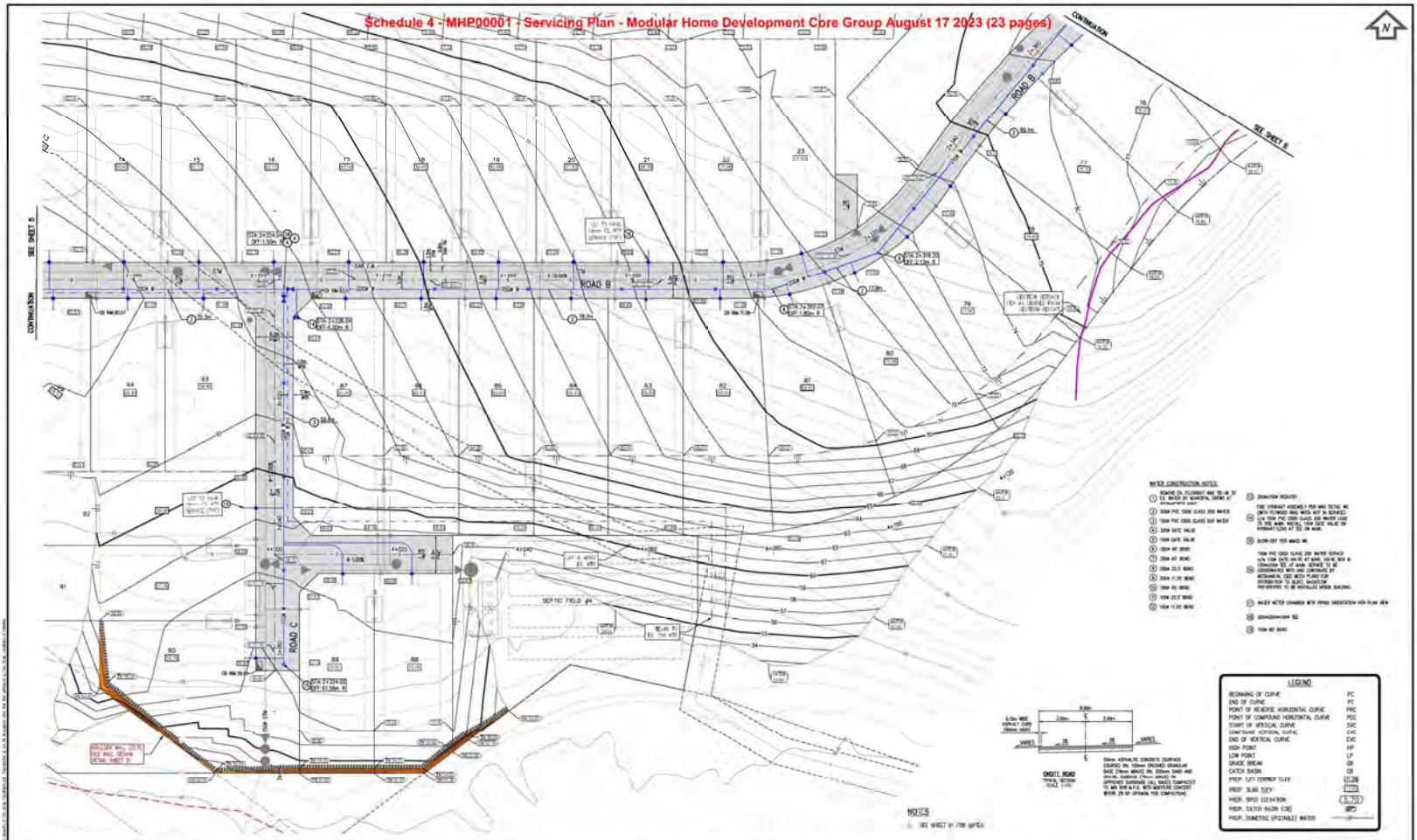
DESIGNED –	DB
DRAWN –	DB
METRIC SCALE	1:250
APPROVED –	CN
DATE –	AUG 14, 2023

MORGAN MAPLES

ROADWORKS, GRADING, WATER AND FIRE SUPRESSION PLAN

[illegible] ISLAND HIGHWAY, CHEMAINUS BC

FILE –	
CONSULTANT'S DWG No –	2087
CITY DOC. No –	[illegible]
SHEET	5 OF 21



BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ON/PON CENTER OF SECTION 10, TOWNSHIP 11 DN NELSON DISTRICT (MYCHOSE PARCEL 'B' REFERENCE PLAN 57251M)

NO.	DATE (D/M/Y)	DR	CK	DESCRIPTION
1	2023/08/14	DR	CK	CHANGE TO BUILDING ENVELOPE
0	2023/03/21	DR	CK	ISSUED FOR GRADING
REVISIONS		DRN	CK'D	

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONG THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, 26153 AND 57251M(10.1 ha) DDs 185K, 220

GRAPHIC SCALE
GRAPHIC SCALE
SCALE: 1:250

DEVELOPER
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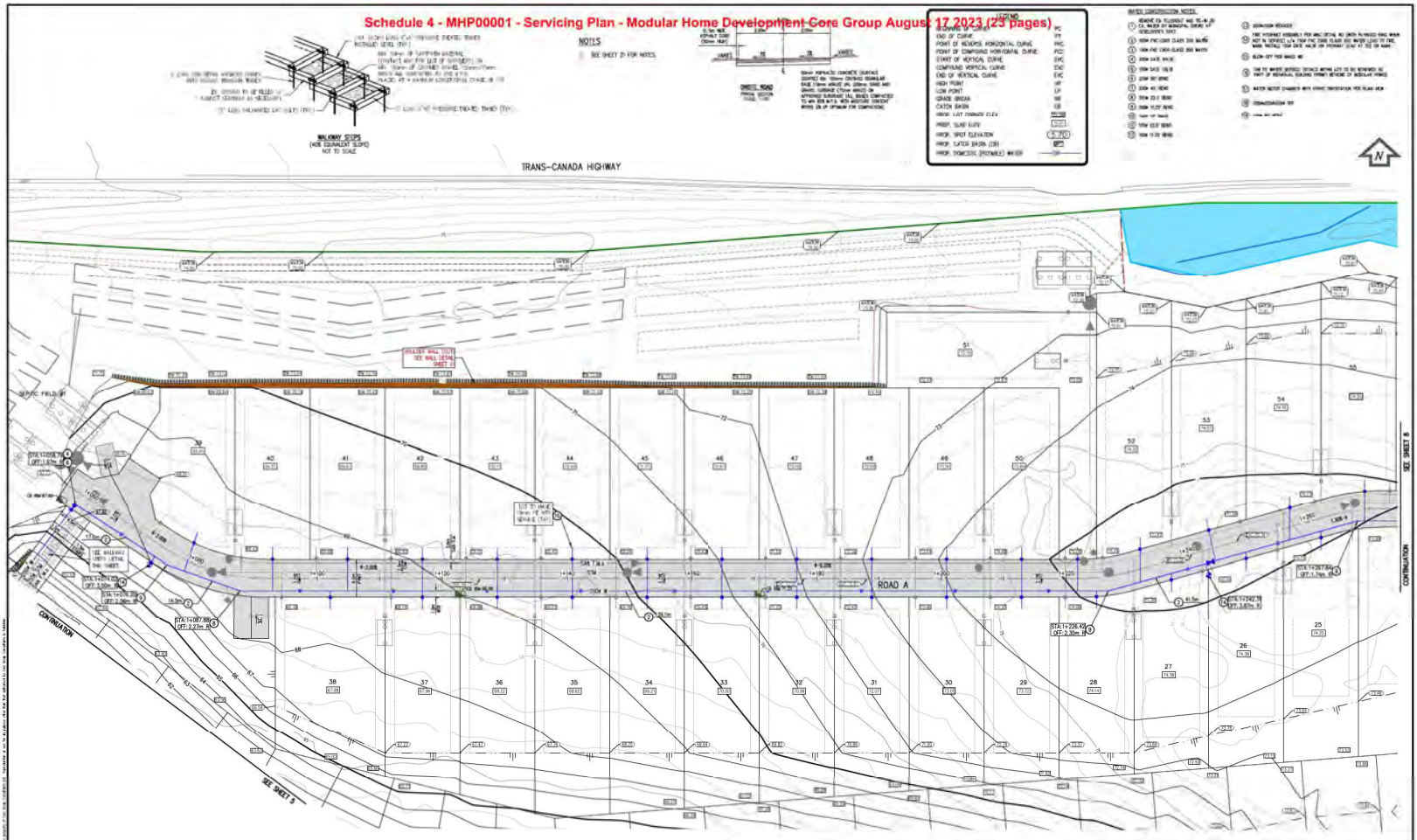
SEAL:

DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
ROADWORKS, GRADING, WATER AND FIRE SUPRESSION PLAN
9980 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED: DR
DRAWN: —
CHECKED: —
MODEL SCALE: 1:250
APPROVED: CK
DATE: AUG. 14, 2023

FILE: —
CORE CONSULTANTS JOB NO.: 2087
CITY DOC. NO.: DP000435
SHEET 8 OF 21



BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPOIN CENTER OF SECTION 10, TOWNSHIP 11 ON NELSON STREET (ONPOINT# PARCEL 'B' REFERENCE PLAN 57251M)

NO.	DATE	BY	CK	ISSUED FOR BUILDING PERMIT
1	2023/08/14	DR	DN	
0	2023/05/31	DR	DN	ISSUED FOR GRADING
REVISIONS		DRN	CK'D	

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONG THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARCEL A (DD 36815I) AND 26158 AND REVISED BY DD# 36815-2RW

GRAPHIC SCALE
SCALE: 1:250

DEVELOPER
1251719 B.C. LTD.
Page 8 of 23

CoreGroup
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SEAL:

DISTRICT OF NORTH COWICHAN

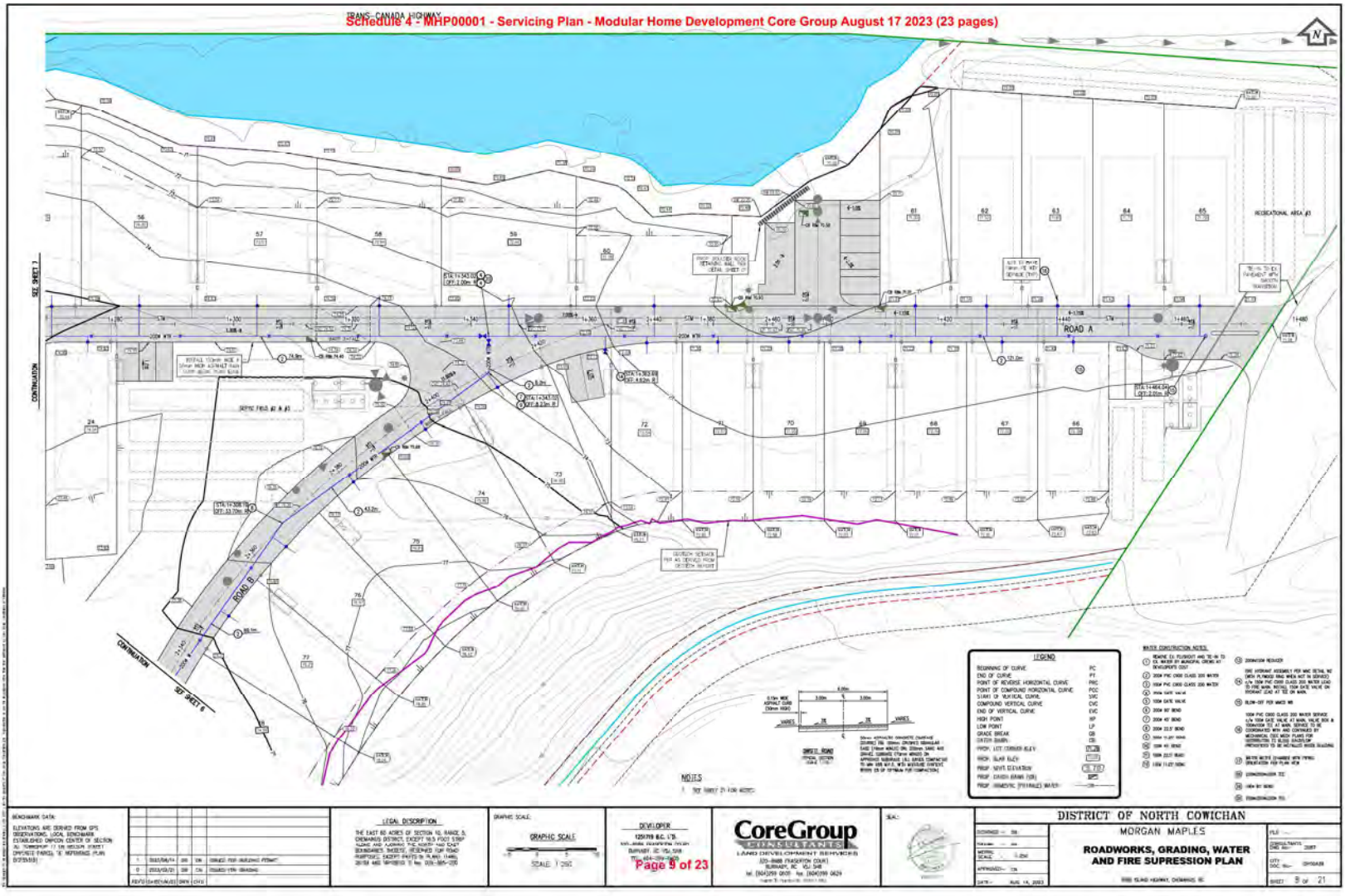
MORGAN MAPLES

ROADWORKS, GRADING, WATER AND FIRE SUPRESSION PLAN

7980 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED: DR
DRAWN: DR
CHECKED: DN
APPROVED: DN
DATE: AUG. 14, 2023

FILE:
CONSULTANTS DWG NO.: 2087
CITY DOC. No.: CW004438
SHEET 7 OF 21



BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPOSN CENTER OF SECTION 10, TOWNSHIP 17, DL 95, SECOND DISTRICT, ONPOSITE PARCEL 'B' REFERENCE PLAN 57251(B).

NO.	DATE	BY	CK	DESCRIPTION
1	2023/08/14	DB	DN	ISSUED FOR BUILDING PERMIT
0	2023/03/31	DB	DN	ISSUED FOR GRADING
REVISIONS				

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 POLE STRIP ALONG AND ALONGWAY THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, 26153 AND 57251(B) (I) AND 2015-1845-2015

GRAPHIC SCALE
SCALE: 1:250

DEVELOPER
1251719 B.C. LTD.
Page 9 of 23

CoreGroup
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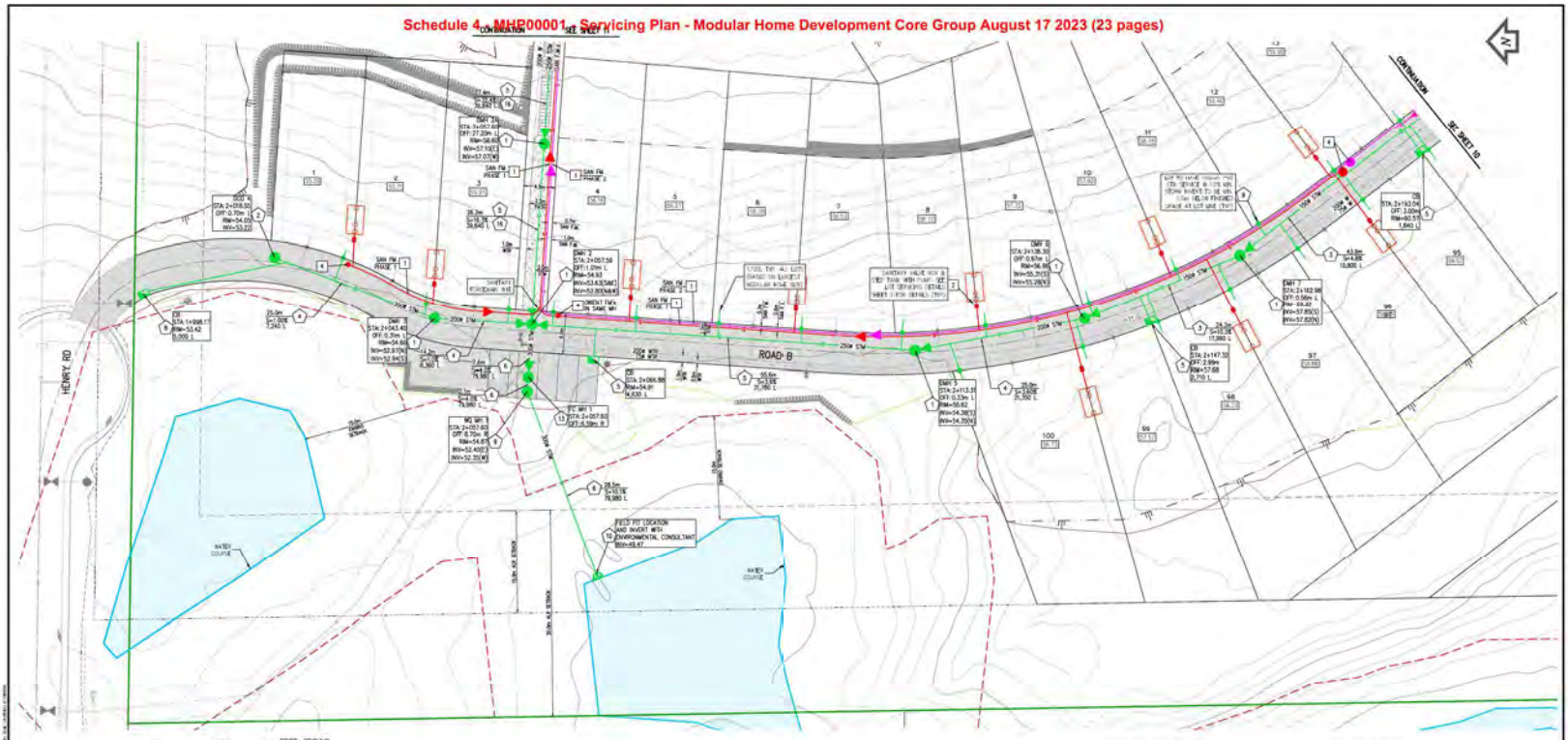
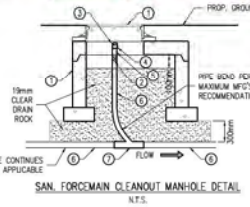
SEAL:

DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
ROADWORKS, GRADING, WATER AND FIRE SUPRESSION PLAN
9980 ISLAND HIGHWAY, CHEMAINUS, BC
DESIGNED — DN
DRAWN — MM
CHECKED — DN
APPROVED — DN
DATE — AUG. 14, 2023
FILE —
CONSULTANT'S ENG. NO.— 2087
CITY DOC. NO.— DP000438
SHEET 9 OF 21





SAN. FORCEMAIN CLEANOUT MANHOLE DETAIL
N.T.S.

NOTES:
1. 1050M (BARREL c/w MANHOLE FRAME AND COVER (MIN. ONE PRECAST CONCRETE SPACER)
2. 50mm DIA. SHUT OFF BALL VALVE
3. PVC SCH. 80 THREADED CAP WITH EXTERNAL RIBS
4. MALE ADAPTOR TO THREADED PVC SCH. 80 PIPE
5. 500mm DIA. PVC SCH. 80 PIPE, LENGTH CUT TO SUIT GROUND LEVEL
6. 50 DIA. HDPE DR11
7. 50 DIA. HDPE DR11 MANUFACTURED WYE

NOTES
1. SEE SHEET 11 FOR NOTES

SANITARY SEWER CONSTRUCTION NOTES:
1. 50mm I.D. HDPE SDR11 FORCE MAIN COLLECTOR. MINIMUM 1.0m COVER.
2. LOT SERVICE TO COLLECT GRAVITY CONNECTIONS FROM MODULAR HOMES. DETAILS TO BE REVIEWED AS PART OF INDIVIDUAL BUILDING PERMIT REVIEWS OF MODULAR HOMES. SEE TYPICAL DETAIL SHEET 5.
3. 4M FOR SEPTIC FIELD SERVICES, PER APPROVED VANCOUVER ISLAND HEALTH AUTHORITY PERMIT. SEE MAX DESIGN FOR DETAILS.
4. SANITARY FORCEMAIN CONNECT/GRINDLER & 150MM/42 PER DETAIL SHEET 6

CORE GROUP DEVELOPMENTS LTD. DRAWINGS FOR SEPTIC FIELD AND INDIVIDUAL LOT COLLECTION SHALL BE PUMP DESIGNS.

CORE GROUP DRAWINGS ARE TAKING DESIGN FOR FORCEMAIN COLLECTION PIPES ALONG BOUNDARIES ONLY.

STORM SEWER CONSTRUCTION NOTES:
1. 1050M STORM MANHOLE c/w 600mm VCCP SUMP PER MMCD 3I
2. STORM SEWER CLEANOUT PER MMCD 3I
3. 150M PVC SDR 28 STORM
4. 200M PVC SDR 28 STORM
5. 250M PVC SDR 28 STORM
6. 200M PVC SDR 35 STORM
7. 375M PVC SDR 35 STORM
8. 150 DEEP CATCHBASIN PER MMCD 3I/ 3J c/w 150M LEAD @ 2% MIN.
9. 150M PVC SDR 35 STORM (STUBBED @ PIE MH) (MOTE: 50mm MMCD CROSSED (SHARE) HOUSING & SURROUND) c/w 50M BLIND SUMP AND PIPE MMCD 7G WITH 100mm DEEP SUMP (EACH SUMP LOCATION TO BE DETERMINED AS PART OF INDIVIDUAL BUILDING PERMIT REVIEWS OF MODULAR HOMES)
10. TYPE 3 HEADWALL OUTLET PER LANGLEY CONCRETE c/w ENERGY DISSIPATION BLOCKS
11. RUNOFF WATER QUALITY MANHOLE (OIL WATER SEPARATOR) PER CONTECH CDS-1515 OR APPROVED EQUAL
12. 1200M PERFORATED STORM SUMP MANHOLE
13. 150M FLOW CONTROL MANHOLE (SA.357m SHEET 13)
14. 250M PVC (YR) STORM
15. 300M PVC (YR) STORM
16. PVC WATER BLOCKS FOR MMCD 5E A.2, 1" INSTALLED AT 10M MAXIMUM SPACING
17. CONCRETE ENCASE PIPES PER MMCD 5E A.2.1

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET / ONPCNTE PARCEL 'B' REFERENCE PLAN 57351(B)

NO.	DATE	BY	CK	ISSUED FOR / REVISION
1	2023/08/14	DR	CK	ISSUED FOR BUILDING PERMIT
0	2023/05/31	DR	CK	ISSUED FOR REVIEW

REVISED (1=FIRST ISSUE) DRWN CHKD

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONGING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11446, 28153 AND 50128(B) 5 Rev. 2019-11-05

GRAPHIC SCALE:
GRAPHIC SCALE
0 2 5 10
SCALE: 1:250

DEVELOPER
1251719 B.C. LTD.
[illegible]
BURNABY, BC V5J 3H8
TEL: (604)299-0600 FAX: (604)299-0629
Page 10 of 23

CoreGroup
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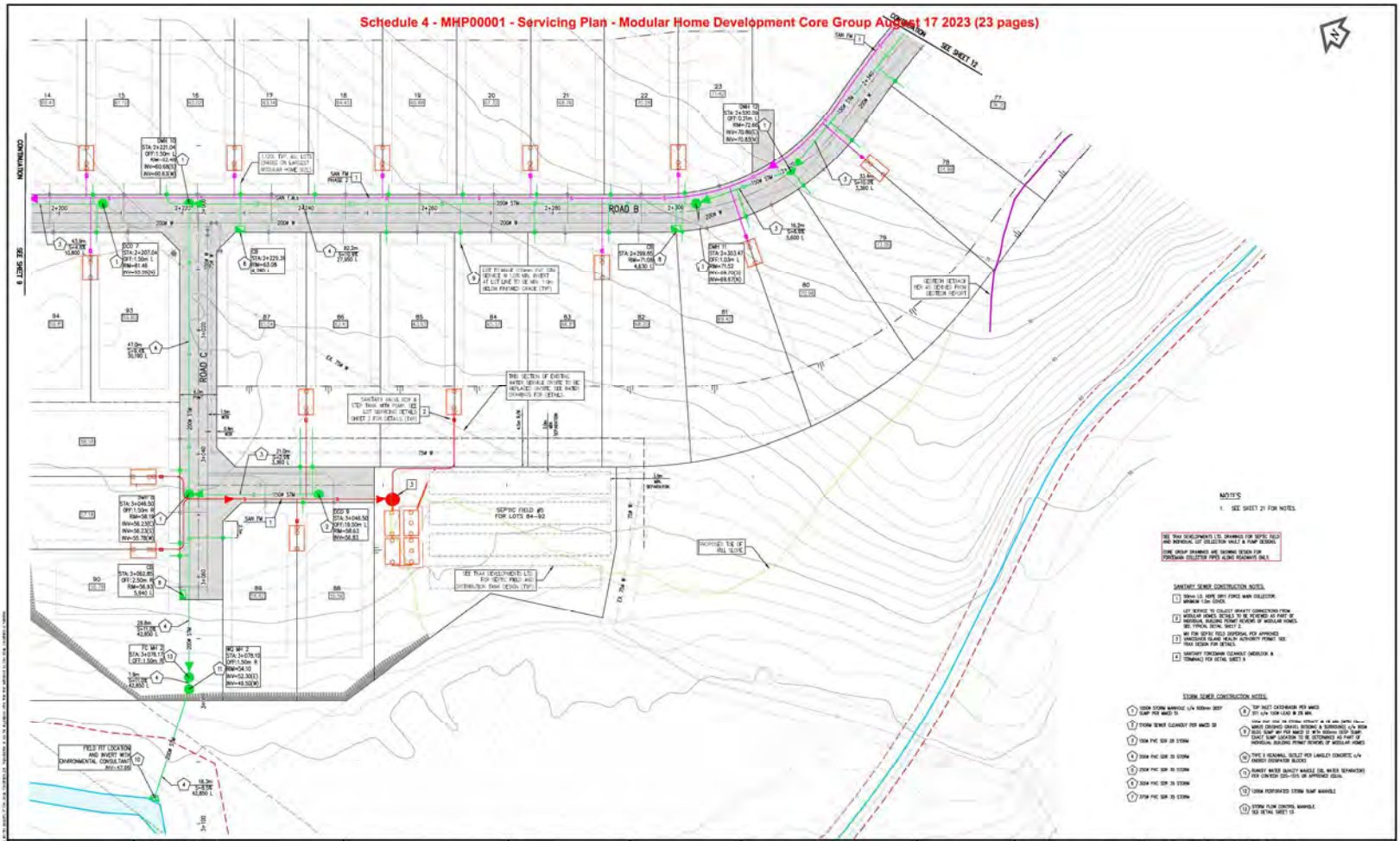
SEAL:

DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
STORM AND SANITARY WORKS
9900 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED — DR
DRAWN — MM
CHECKED — CK
SCALE — 1:250
APPROVED — CK
DATE — AUG. 14, 2023

FILE —
CONSULTANT'S ENG. NO. — 2087
CITY DOC. NO. — CH10438
SHEET 9 OF 21



BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPOIN CENTER OF SECTION 10, TOWNSHIP 11 ON WILSON CREEK / ONPOINT PARCEL 'B' REFERENCE PLAN 57259(B).

NO.	DATE/DD/MM/YY	DR	CK	CHANGE PER BUILDING PERMIT
0	2023/03/31	DR	CK	ISSUED FOR REVIEW
REVISIONS		DRN	CHK	

LEGAL DESCRIPTION
THE EAST 80 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONGWAY THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, 26158 AND 57259(B) [illegible]

GRAPHIC SCALE
GRAPHIC SCALE
SCALE: 1:250

DEVELOPER
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CoreGroup CONSULTANTS
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BURNABY, BC V5J 5H8
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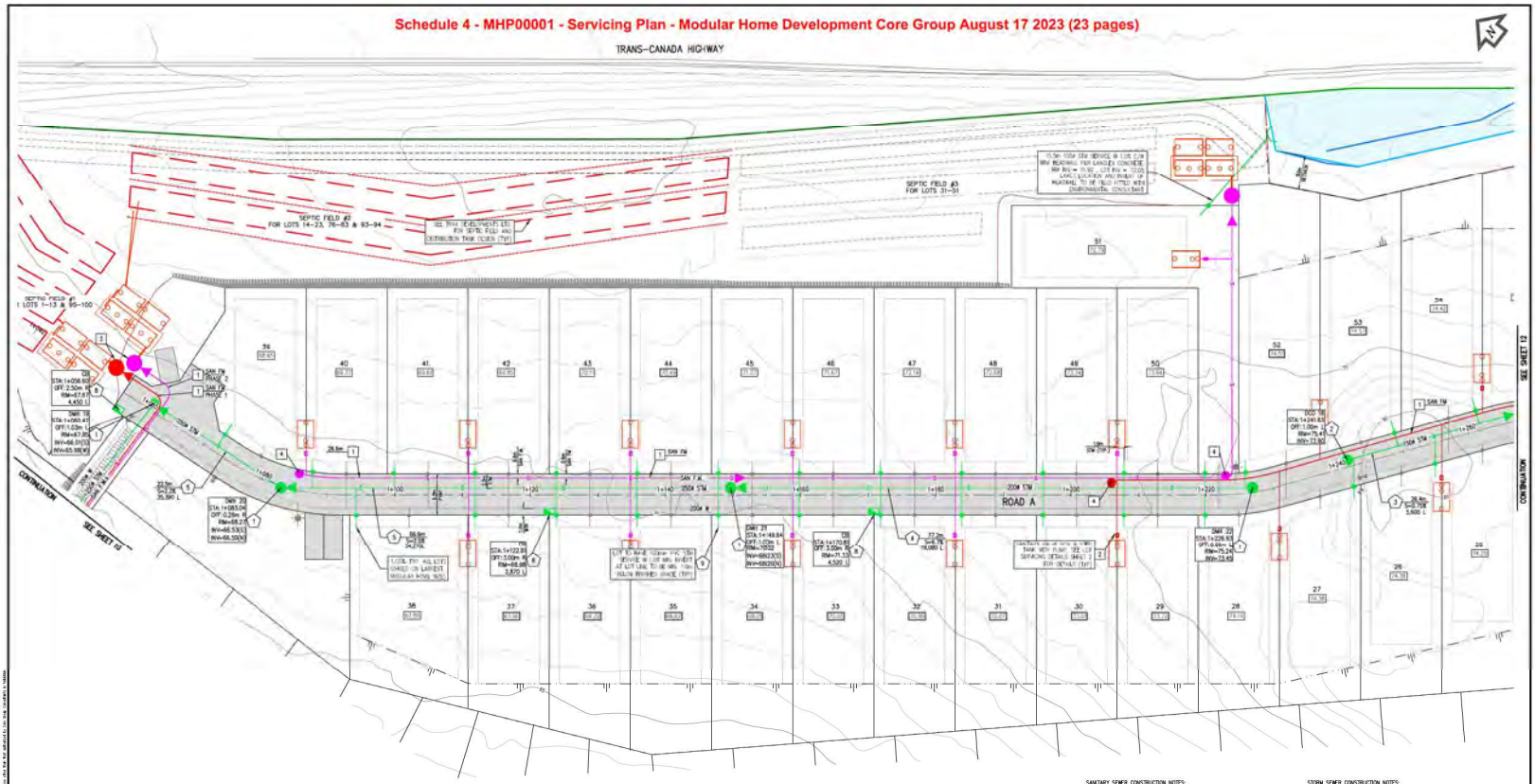
SEAL:

DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
STORM AND SANITARY WORKS
9382 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED:	DR
DRAWN:	[illegible]
CHECKED:	[illegible]
SCALE:	1:250
APPROVED:	CK
DATE:	AUG. 14, 2023
FILE:	[illegible]
CONSULTANTS DWG. NO.:	2087
CITY DWG. NO.:	CW0438
SHEET	10 OF 21



NOTES

1. SEE SHEET 21 FOR NOTES.

SANITARY SEWER CONSTRUCTION NOTES:

STORM SEWER CONSTRUCTION NOTES:

BENCHMARK DATA:

ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPOIN CENTER OF SECTION 10, TOWNSHIP 11 ON WESLEY STREET (ONPOINT PARCEL 'S' REFERENCE PLAN 57251(S))

1	2023/08/14	DB	DN	CHANGE FOR BUILDING PERMIT
0	2023/03/21	DB	DN	ISSUED FOR REVIEW
REV'D	(Y-M-D)	INIT'D	CHK'D	

LEGAL DESCRIPTION

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ADJOINING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, 26158 AND 57251(S) (See DDs 185-205)

GRAPHIC SCALE:

GRAPHIC SCALE

SCALE: 1:250

DEVELOPER

1251719 B.C. LTD.
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BURNABY, BC V5J 3W8
TEL: 604-299-0629

CoreGroup
CONSULTANTS
LAND DEVELOPMENT SERVICES
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DISTRICT OF NORTH COWICHAN

MORGAN MAPLES

STORM AND SANITARY WORKS

6980 ISLAND HIGHWAY, CHEMAINUS, BC

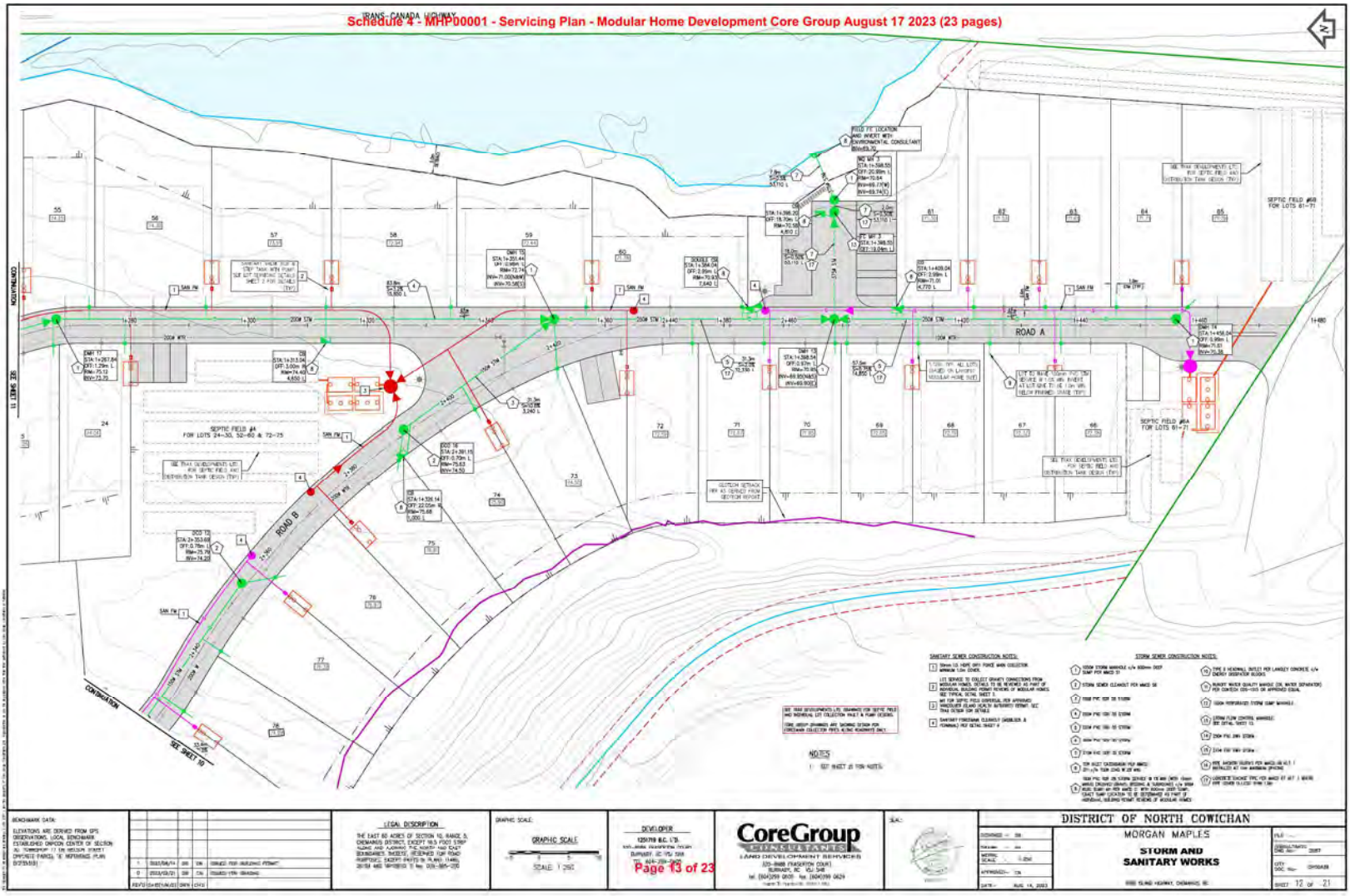
DESIGNED	DB
DRAWN	MM
MODEL SCALE	1:250
APPROVED	DN
DATE	AUG. 14, 2023

FILE:

CONSULTANT'S ENG. NO. 2087

CITY DOC. NO. DWG#28

SHEET 11 OF 21



BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ON PIPE CENTER OF SECTION 10, TOWNSHIP 11 ON WESTERLY CHYCHOSE PARCEL 'B' REFERENCE PLAN 57351(B)

NO.	DATE (D-M-Y)	BY	CK	ISSUED FOR / REVISION
1	2023/08/14	DB	DN	ISSUED FOR BUILDING PERMIT
0	2023/03/31	DB	DN	ISSUED FOR REVIEW

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONGING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, 26153 AND 57351(B) (See Doc. 305-205)

GRAPHIC SCALE
GRAPHIC SCALE
0 5 10 15
SCALE: 1:250

DEVELOPER
1251710 B.C. LTD.
Page 13 of 23

CoreGroup
CONSULTANTS
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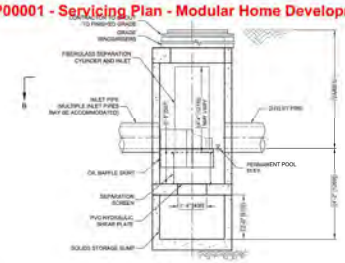
DUNCAN, BC V9L 5H8
tel: (604)709 0600 fax: (604)709 0629

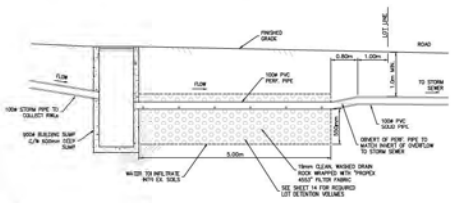
SEAL:

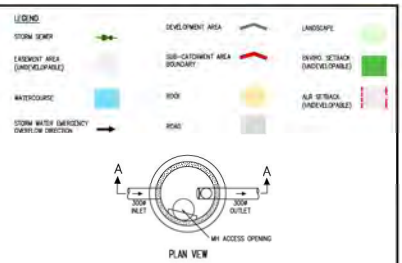
DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
STORM AND SANITARY WORKS
6960 ISLAND HIGHWAY, CHEMAINUS, BC

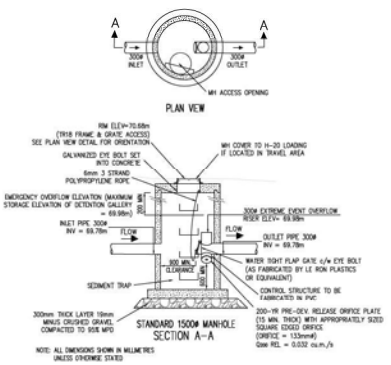
DESIGNED — DN
DRAWN — MM
CHECKED — DN
APPROVED — DN
DATE — AUG. 14, 2023

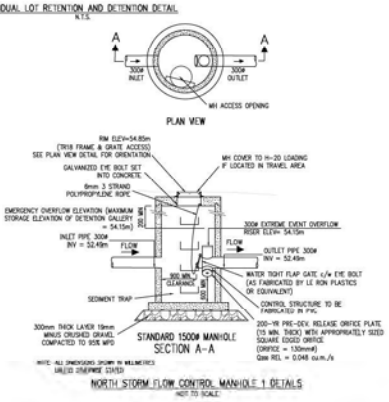
FILE —
CONSULTANT'S DWG. NO. — 2087
CITY DWG. NO. — CW30438
SHEET 12 OF 21

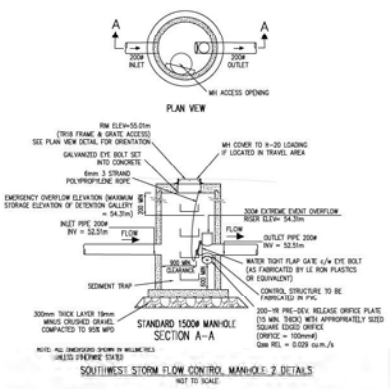












NOTE:
SEE SUB-CATCHMENT AREA CALCULATIONS ON SHEET 14

* INDIVIDUAL LOT DETENTION TO BE SHOWN ON BUILDING PERMIT APPLICATION UPON MODULAR HOME SELECTION *

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET. ONPOINT PARCEL 'B' REFERENCE ICGVA 5173510.81

NO.	DATE/BY/#	DR	CK	DESCRIPTION
1	2023/JUL/14	DR	CK	ISSUED FOR BUILDING PERMIT
0	2023/JUL/31	DR	CK	ISSUED FOR GRADING
REV'D	DATE/BY/AUD	DR/K	CK/E	

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONGING THE NORTH AND EAST BOUNDARIES, THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11446, 23458 AND IMPROVED TO key PLN-1885-2000

GRAPHIC SCALE:
GRAPHIC SCALE
0 20 40
SCALE: 1:1000

DEVELOPER
1251719 B.C. LTD.
[illegible]
BURNABY, BC V5J 3H9
TEL: 604-299-[illegible]

CoreGroup
ENGINEERING SERVICES
LAND DEVELOPMENT SERVICES
325-4946 TRADITION COURT
BURNABY, BC V5J 3H9
tel: (604)299-0600 fax: (604)299-0629

SEAL:

DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
STORMWATER MANAGEMENT PLAN
6960 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED — DR
DRAWN — AM
SCALE — 1:1000
APPROVED — CK
DATE — AUG. 14, 2023

FILE:
CORE GROUP PROJECT NO: 2087
DFT/DSC. No: DWG#26
Sheet 13 OF 21

SUB-CATCHMENT AREA A
1:1000

AREA A CALCULATIONS:

A. SITE AREA: 2.29 ha (48 CONTRIBUTING LOTS)

BUILDING ROOF AREA	0.65 ha (AVG. 135m2 PER LOT)
GRAVEL PARKING	0.16 ha (AVG. 33m2 PER LOT)
ROADS	0.26 ha
LANDSCAPE	1.22 ha

TOTAL IMPERVIOUS AREA = 0.65 ha + 0.26 ha = 0.91 ha

DETENTION REQUIREMENT – RAINFALL EVENTS UP TO 25% MAR

TARGET RAINFALL CAPTURE = 0.91ha x 12mm (25% M.A.R.) = 109.4m3

RETENTION REQUIREMENT – RAINFALL EVENTS UP TO 50% MAR

TARGET RAINFALL CAPTURE = 0.91ha x 24mm (25% M.A.R.) = 218.7m³

LANDSCAPE AREAS TO HAVE MIN. 100mm TOPSOIL

TOTAL RAINFALL CAPTURE FOR SITE WITH 100mm TOPSOIL DEPTH
=100mm TOPSOIL X 1.22 ha X 0.30 VOIDS RATIO
=366m³ (167% OF TARGET)

SITE RELEASE RATE

STORAGE VOLUME TO BE RELEASED OVER 24hr PERIOD AFTER RAINFALL EVENT

RELEASE RATE = 0.5mm/hr X IMPERVIOUS AREA = 1.4 L/s/ha

RELEASE RATE = 1.4 L/s/ha X 0.91 ha = 1.27 L/s

DETENTION

Q200 = 242m³

DETENTION VOLUME PER LOT = 242m³ / 48 LOTS = 5.04m³/LOT

TO PROVIDE THE REQUIRED RETENTION & DETENTION EACH LOT WILL NEED APPROXIMATELY 10m² INFILTRATION AREA (5m x 2m) AND 5.10m³ OF DETENTION. DETENTION WILL BE DETAILED ON EACH BUILDING PER PERMIT APPLICATION.

SUB-CATCHMENT AREA C
1:1000

AREA C CALCULATIONS:

A. SITE AREA: 1.53 ha (27 CONTRIBUTING LOTS)

BUILDING ROOF AREA	0.37 ha (AVG. 135m2 PER LOT)
GRAVEL PARKING	0.09 ha (AVG. 33m2 PER LOT)
ROADS	0.24 ha
LANDSCAPE	0.84 ha

TOTAL IMPERVIOUS AREA = 0.37 ha + 0.24 ha = 0.61 ha

DETENTION REQUIREMENT – RAINFALL EVENTS UP TO 25% MAR

TARGET RAINFALL CAPTURE = 0.61ha x 12mm (25% M.A.R.) = 72.1m3

RETENTION REQUIREMENT – RAINFALL EVENTS UP TO 50% MAR

TARGET RAINFALL CAPTURE = 0.61ha x 24mm (25% M.A.R.) = 144.3m³

LANDSCAPE AREAS TO HAVE MIN. 100mm TOPSOIL

TOTAL RAINFALL CAPTURE FOR SITE WITH 100mm TOPSOIL DEPTH
=100mm TOPSOIL X 0.84 ha X 0.30 VOIDS RATIO
=252m³ (175% OF TARGET)

SITE RELEASE RATE

STORAGE VOLUME TO BE RELEASED OVER 24hr PERIOD AFTER RAINFALL EVENT

RELEASE RATE = 0.5mm/hr X IMPERVIOUS AREA = 1.4 L/s/ha

RELEASE RATE = 1.4 L/s/ha X 0.61 ha = 0.85 L/s

DETENTION

Q200 = 161m³

DETENTION VOLUME PER LOT = 161m³ / 27 LOTS = 6.0m³/LOT

TO PROVIDE THE REQUIRED RETENTION & DETENTION EACH LOT WILL NEED APPROXIMATELY 12m² INFILTRATION AREA (6.0m x 2.0m) AND 6.0m³ OF DETENTION. DETENTION WILL BE DETAILED ON EACH BUILDING PER PERMIT APPLICATION.

SUB-CATCHMENT AREA B
1:1000

AREA B CALCULATIONS:

A. SITE AREA: 1.36 ha (26 CONTRIBUTING LOTS)

BUILDING ROOF AREA	0.35 ha (AVG. 135m2 PER LOT)
GRAVEL PARKING	0.09 ha (AVG. 33m2 PER LOT)
ROADS	0.15 ha
LANDSCAPE	0.78 ha

TOTAL IMPERVIOUS AREA = 0.35 ha + 0.15 ha = 0.50 ha

DETENTION REQUIREMENT – RAINFALL EVENTS UP TO 25% MAR

TARGET RAINFALL CAPTURE = 0.50ha x 12mm (25% M.A.R.) = 60.1m3

RETENTION REQUIREMENT – RAINFALL EVENTS UP TO 50% MAR

TARGET RAINFALL CAPTURE = 0.50ha x 24mm (25% M.A.R.) = 120.2m³

LANDSCAPE AREAS TO HAVE MIN. 100mm TOPSOIL

TOTAL RAINFALL CAPTURE FOR SITE WITH 100mm TOPSOIL DEPTH
=100mm TOPSOIL X 0.78 ha X 0.30 VOIDS RATIO
=234m³ (195% OF TARGET)

SITE RELEASE RATE

STORAGE VOLUME TO BE RELEASED OVER 24hr PERIOD AFTER RAINFALL EVENT

RELEASE RATE = 0.5mm/hr X IMPERVIOUS AREA = 1.4 L/s/ha

RELEASE RATE = 1.4 L/s/ha X 0.50 ha = 0.70 L/s

DETENTION

Q200 = 143m³

DETENTION VOLUME PER LOT = 143m³ / 26 LOTS = 5.5m³/LOT

TO PROVIDE THE REQUIRED RETENTION & DETENTION EACH LOT WILL NEED APPROXIMATELY 10m² INFILTRATION AREA (5m x 2m) AND 5.5m³ OF DETENTION. DETENTION WILL BE DETAILED ON EACH BUILDING FOR PERMIT APPLICATION.

OVERALL AREA CALCULATIONS:

(BASED ON NORTH COWICHAN RAIN WATER MANAGEMENT GUIDELINES)

A. SITE AREA: 10.21 ha
CONTRIBUTING AREA: 5.18 ha (101 CONTRIBUTING LOTS)

BUILDING ROOF AREA	1.37 ha (AVG. 135m2 PER LOT)
GRAVEL PARKING	0.34 ha (AVG. 33m2 PER LOT)
ROADS	0.65 ha
LANDSCAPE	2.84 ha

TOTAL IMPERVIOUS AREA = 1.37 ha + 0.65 ha = 2.02 ha

LEGEND

STORM SEWER	⟶	DECK	🟨
EASEMENT AREA (UNDEVELOPABLE)	▨	ROAD	▨
WATERCOURSE	🟦	LANDSCAPE	🟩
STORM WATER EMERGENCY OVERFLOW DIRECTION	➡	ENVIRO. SETBACK (UNDEVELOPABLE)	🟩
DEVELOPMENT AREA	^	ALR SETBACK (UNDEVELOPABLE)	¦ ¦
SUB-CATCHMENT AREA BOUNDARY	^		

*** INDIVIDUAL LOT DETENTION TO BE SHOWN ON BUILDING PERMIT APPLICATION UPON MODULAR HOME SELECTION ***

BENCHMARK DATA:

ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ON POST CENTER OF SECTION 30, TOWNSHIP 17 ON NELSON STREET OPPOSITE PARCEL "E" INTEGRATED (CAN 0172/5518)

1	2023/08/14	DR	CN	ISSUED FOR BUILDING PERMIT
0	2023/02/21	DR	CN	ISSUED FOR GRADING
REV'D	DATE(Y/M/D)	DWN	CHK'D	

LEGAL DESCRIPTION

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ADJOINING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 1748RW, 29158 AND VIP80810 PID No. 009-385-250

GRAPHIC SCALE:

GRAPHIC SCALE
-20 0 20 40
SCALE 1:1000

DEVELOPER

1251719 B.C. LTD.
320–8988 FRASERTON COURT
BURNABY, BC V5J 5H8
TEL. 604-[illegible]

CoreGroup
CONSULTANTS
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BURNABY, BC V5J 5H8
tel. (604)299 0605 fax (604)299 0629

SEAL:

DISTRICT OF NORTH COWICHAN

DESIGNED – DR
DRAWN – DR
METRIC SCALE – 1:1000
APPROVED – CN
DATE – AUG. 14, 2023

MORGAN MAPLES

STORMWATER MANAGEMENT PLAN

[illegible] ISLAND HIGHWAY, CHEMAINUS, BC

FILE –
CONSULTANTS DWG No – 2087
CITY DOC. No – [illegible]
SHEET 14 OF 21

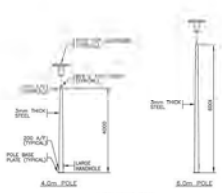
LUMCA POST-TOP LUMINAIRE

STREETLIGHT NOTES:

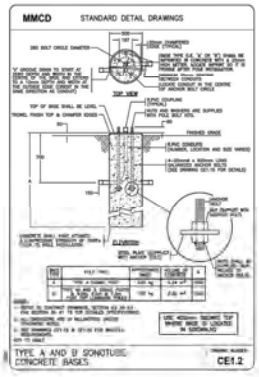
1. SEE B.C. HYDRO REGULATIONS FOR SERVICE CONNECTION DETAILS.
2. CONTRACTOR TO ARRANGE FOR EXACT SERVICE LOCATION(S) WITH B.C. HYDRO PRIOR TO COMMENCING CONSTRUCTION.
3. ALL LUMINAIRES TO HAVE SHATTERPROOF POLYCARBONATE REFRACTORS.
4. ALL LAMPS ARE TO BE CLEAR.
5. ALL POLES ARE TO BE HOT DIPPED GALVANIZED AND POWDER COATED DARK GREY COLOUR (BALTORO).
6. DEVELOPER SHALL OBTAIN ALL PERMITS AND LICENCES PRIOR TO CONSTRUCTION.
7. DEVELOPER TO ENSURE THAT ALL STREET LIGHT POLES ARE A MINIMUM 3.0m CLEAR OF ALL HYDRO POLES AND OVERHEAD PRIMARY WIRES AND 0.3m CLEAR OF ALL OVERHEAD SECONDARY WIRES PRIOR TO INSTALLING BASES.
8. ALL STREET LIGHTS ARE TO BE 1.0m CLEAR OF ALL DRIVEWAYS.
9. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF STREETLIGHTS AND POLES FOR APPROVAL PRIOR TO ORDERING MATERIALS.
10. CONTRACTOR TO CONTACT BC ONECALL 3 WORKING DAYS PRIOR TO START OF CONSTRUCTION FOR UTILITY LOCATES.

LEGEND

PROPOSED 6.0m HIGH POST-TOP STREETLIGHT 30W LED LUMINAIRE PER LUMCA CONCEPT SERIES CA1HLCSUE & CPHHD-1B.E0S-30W-30K-L2 (MAY VARY COMPLIANT) ON TYPE B CONCRETE BASE.
FEEDER CONDUIT TO BE 50mm RPVC CONTAINING 3 No. 6 RWU ALUMINUM LTC ALUMINUM BOND LIGHTS TO BE ON ALTERNATING PHASE CONNECTION. 120V/240V SERVICE BASE WITH PHOTOCELL & FUSES TO BE FIELD-LOCATED ONSITE NEAR BC HYDRO FEEDPOINT. (OR APPROVED EQUAL)



SITE LIGHTING
6.0m POST TOP



BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET. OPPOSITE PARCEL 'B' REFERENCE ICON 1073553.01

REV'D	DATE(YR/MO/DD)	DRN	CHK	
1	2023/08/14	GD	DN	ISSUED FOR BUILDING PERMIT
0	2023/05/31	GD	DN	ISSUED FOR GRADING

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONG THE NORTH AND EAST BOUNDARIES, SHOWN, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11496, 29158 AND 49222 TO THE DISTRICT OF NORTH COWICHAN

GRAPHIC SCALE
GRAPHIC SCALE
0 30 60
SCALE: 1:1500

DEVELOPER
1251719 B.C. LTD.
[illegible]
DUNCAN, BC V9L 5H8
TEL: 604-709-4700

CoreGroup
CONCRETE SERVICES
LAND DEVELOPMENT SERVICES
320-4988 TRANSTON COURT
BURNABY, BC V5J 5H8
tel: (604)299 0800 fax: (604)299 0829

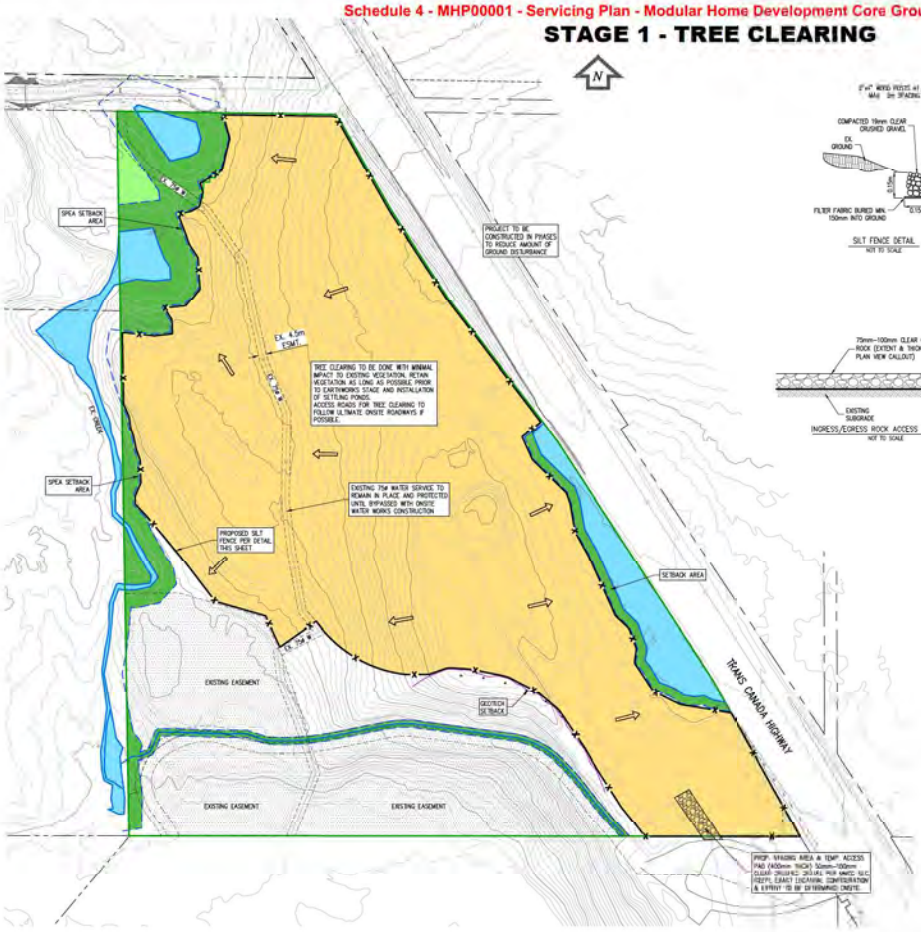
SEAL:

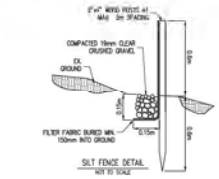
DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
STREETLIGHTING AND SIGNAGE PLAN
9882 TRANS CANADA HIGHWAY, CHEMAINUS, BC

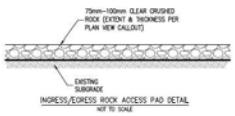
DESIGNED — DN
DRAWN — GD
CHECKED — MA
SCALE — 1:1500
APPROVED — DN
DATE — AUG. 14, 2023

FILE:
DRAWING NUMBER: 2087
SITE: DWG. No.: DWG0025
SHEET 15 OF 21

STAGE 1 - TREE CLEARING







SEDIMENT CONTROL NOTES :

1. UNDER THIS PLAN, ALL PERSONS INCLUDING BUT NOT LIMITED TO THE DEVELOPER, OWNER OF THE LAND, THE ENGINEER OF RECORD, ESC SUPERVISOR, CIVIL CONTRACTOR, CIVIL SUB-CONTRACTOR & BUILDING SUB-TRADES HEREIN AFTER REFERRED TO AS THE OWNER/DEVELOPER/PERSON RESPONSIBLE/ ENGAGED ON SITE SHALL COMPLY WITH ALL REGULATORY REQUIREMENTS SPECIFIED BY FEDERAL, PROVINCIAL, AND MUNICIPAL AUTHORITIES PERTAINING TO ON SITE MANAGEMENT AND DISCHARGE ASSOCIATED WITH EROSION AND SEDIMENT CONTROL REGULATIONS.
2. THE DEVELOPER/PERSONS RESPONSIBLE SHALL ENSURE THAT ALL CONSTRUCTION ACTIVITIES ARE UNDERTAKEN IN ALL MANNER THAT ENSURE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED TO PREVENT AND CONTAIN ON-SITE SEDIMENT THAT EXISTING [illegible] THE FROM ENTERING DOWNSTREAM DRAINAGE INFRASTRUCTURE AND AQUATIC SYSTEMS.
3. ALL SITE AND/OR LOT ACCESS FROM DISTURBED AREAS TO PAVED SURFACES IS TO BE RESTRICTED TO SPECIFIED ACCESS FACILITIES TO LIMIT THE TRANSPORT OF SEDIMENT ONTO ROADWAYS. DURING THE CONSTRUCTION PHASE, VEHICLE ACCESS TO THE DISTURBED AREAS IS TO BE LIMITED TO GRAVEL PADS ONLY.
4. WHEREVER POSSIBLE, EXISTING VEGETATION WILL BE LEFT UNDISTURBED UNTIL IMMEDIATELY BEFORE CONSTRUCTION (<10 DAYS).
5. ALL SILT GENERATING AREAS (DISTURBED SOILS) WHICH ARE TO BE LEFT EXPOSED FOR MORE THAN 30 DAYS MUST BE HYDROSEEDED AND MACHINE SPRAYED WITH STRAW TO A MINIMUM RATE OF 5,000kg/ha. ALL SILT GENERATING AREAS WHICH ARE TO BE LEFT EXPOSED FOR LESS THAN 30 DAYS MUST BE COVERED WITH POLY OR HYDROSEEDED AND MACHINE SPRAYED WITH STRAW TO A MINIMUM RATE OF 5,000kg/ha.

MAINTENANCE: ALL STAGES (AS APPLICABLE)

1. GRAVEL ACCESS PADS TO BE INSPECTED DAILY TO ENSURE FUNCTIONALITY, ADD ADDITIONAL ROCK AS REQUIRED.
2. THE CONTRACTOR MUST REGULARLY CLEAN PAVED ROAD SURFACES OF ACCUMULATED SEDIMENTS AT THE END OF EACH DAY OF AS REQUIRED. NO SOIL, SAND OR OTHER MATERIAL WITH A HIGH SEDIMENT CONTENT SHALL BE DEPOSITED ON ROADS OUTSIDE OF THE PROPERTY BOUNDARIES, PARTICULARLY ON PAVED ROAD SURFACES.
3. SEDIMENT FENCES/BARRIERS TO BE INSPECTED AND REPAIRED PRIOR TO EXPECTED RAIN EVENTS AND FOLLOWING ALL SIGNIFICANT STORM EVENTS OR PERIODS OF EXTENDED RAIN. ACCUMULATED SEDIMENTS GREATER THAN 30% OF THE FENCE CAPACITY OR DEFICIENCIES SHOULD BE DEALT WITH ACCORDINGLY
4. ALL SEDIMENT REMOVED FROM ESC CONTROL FACILITIES TO BE DISPOSED OF IN A MANNER AS TO NOT COMPOUND OR COMPROMISE THE SEDIMENT LOADING OF OTHER CONTROL MEASURES.

CLEARING, ROAD STRIPPING, GRAVELLING, AND ROUGH GRADING STAGE

1. INSTALL SPECIFIED ESC ACCESS FACILITIES/MEASURES AT ENTRY/EXIT POINTS. ALL VEHICLE MOVEMENTS TO AND FROM THE SITE IS TO BE RESTRICTED TO CONTROLLED ENTRY/EXIT POINTS.
2. ANY STOCKPILED MATERIAL TO BE COVERED WITH POLY PLASTIC AND ENCIRCLED BY SEDIMENT FENCE AS SPECIFIED.
3. EXPOSED SLOPES TO BE COVERED IN POLY PLASTIC IMMEDIATELY TO PREVENT CREATION OF SILT-LADEN RUNOFF. PERMANENT (AND TEMPORARY SLOPES TO BE LEFT FOR MORE THAN 30 DAYS) TO BE SEEDED WITH FALL RYE (OR APPROVED ALTERNATE) AND COVERED WITH STRAW AT A MINIMUM RATE OF 5,000kg/ha.
4. EXPOSED VEHICLE-TRAVELED WORK AREAS TO BE ARMOURED WITH MIN. 150mm THICK LAYER OF 10-50mm OPEN-GRADED CRUSHED GRAVEL TO PREVENT EROSION AND TRACKING OF SILTATEOUS MATERIAL.

WET WEATHER SHUT DOWN

WET WEATHER SHUT DOWN PROCEDURES ARE TO BE IMPLEMENTED IF A RAIN EVENT IN EXCESS OF 25mm IN A 24-HOUR PERIOD FORECAST. ADDITIONALLY, REACTIVE WET WEATHER SHUT DOWNS ARE TO BE IMPLEMENTED WHERE THE INTENSITY AND/OR DURATION OF THE PRECIPITATION RESULTS IN THE SATURATION OF THE OVERLAYING SURFACE MATERIAL AND SIGNIFICANT PONDING OR SURFACE RUN OFF OCCURS.

UNDERLYING SOIL IS SAND AND SILTY SAND

LEGEND

PROPOSED TREE CLEARING AREA

PROPOSED SILT FENCE —X—

EXISTING CONTOURS

EXISTING OVERLAND FLOW DIRECTION

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET. ONPOINT# PARCEL 'A' REFERENCE ICON 1073338.01

NO.	DESCRIPTION	BY
1	ISSUED FOR BUILDING PERMIT	DM
0	ISSUED FOR GRADING	DM
REVS	DATE(YR/MO/DD)	DRN

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONG THE NORTH AND EAST BOUNDARIES, SHOWN, REFERRED TO AS ROAD [illegible] EXCEPT PARTS IN PLANS 11486, 29158 AND [illegible]

GRAPHIC SCALE:
GRAPHIC SCALE
-20 0 20 40
SCALE: 1:1(20)

DEVELOPER
1251719 B.C. LTD.
[illegible]
BURNABY, BC V5J 3H9
TEL: 604-[illegible]

CoreGroup
ENGINEERING
LAND DEVELOPMENT SERVICES
325-4946 TRADITION COURT
BURNABY, BC V5J 3H9
tel: (604)299 0605 fax: (604)299 0629

SCALE:

DISTRICT OF NORTH COWICHAN

MORGAN MAPLES

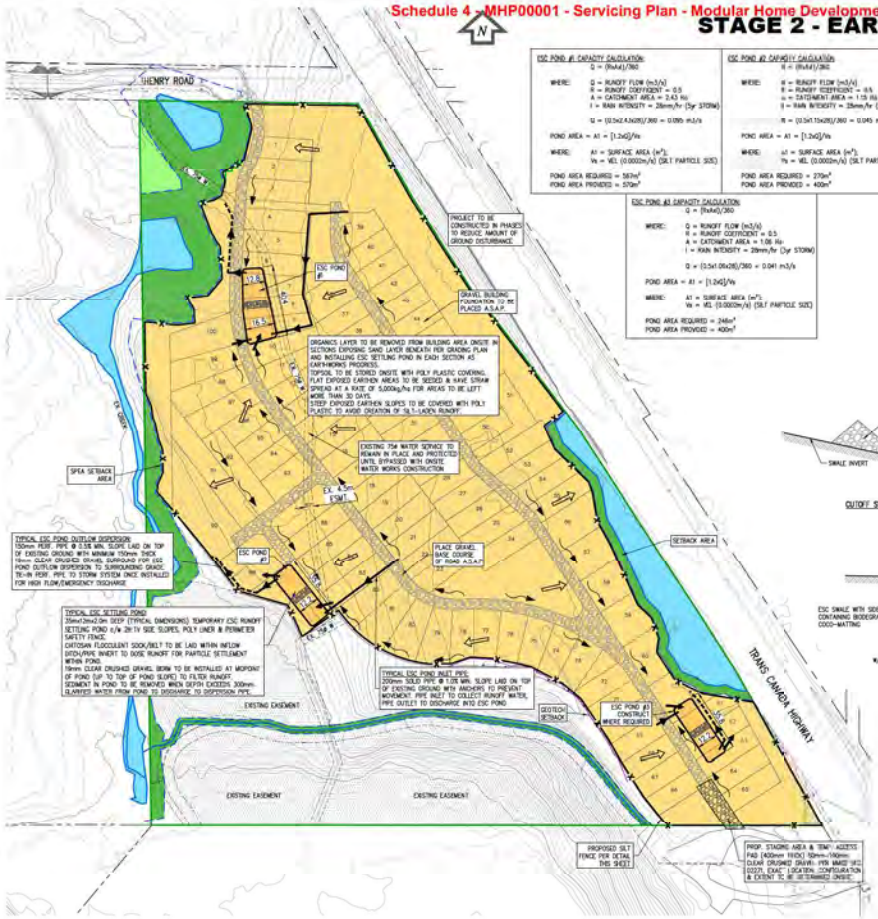
EROSION AND SEDIMENT CONTROL PLAN STAGE 1

6882 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED — DM
DRAWN — MH
SCALE: 1:1000
APPROVED — DM
DATE — AUG. 14, 2023

FILE:
CORE GROUP PROJECT No.: 2087
DFT/ SEC. No.: DM/DRAS
Sheet 18 OF 21

STAGE 2 - EARTHWORKS



ESC POND #1 CAPACITY CALCULATION:

Q = (RxAxI)/360

WHERE: Q = RUNOFF FLOW (m3/s); R = RUNOFF COEFFICIENT = 0.5; A = CATCHMENT AREA = 2.43 Ha; I = RAIN INTENSITY = 28mm/hr (3yr STORM)

Q = (0.5x2.43x28)/360 = 0.095 m3/s

POND AREA = A1 + [1.2xQ]/Vs

WHERE: A1 = SURFACE AREA (m²); Vs = WL (0.00032m/s) (SILT PARTICLE SIZE)

POND AREA REQUIRED = 583m²
POND AREA PROVIDED = 570m²

ESC POND #2 CAPACITY CALCULATION

R = (RxAxI)/360

WHERE: R = RUNOFF FLOW (m3/s); R = RUNOFF COEFFICIENT = 0.5; a = CATCHMENT AREA = 1.15 Ha; I = RAIN INTENSITY = 28mm/hr (3yr STORM)

R = (0.5x1.15x28)/360 = 0.045 m3/s

POND AREA = A1 + [1.2xQ]/Vs

WHERE: a1 = SURFACE AREA (m²); Vs = WL (0.00032m/s) (SILT PARTICLE SIZE)

POND AREA REQUIRED = 270m²
POND AREA PROVIDED = 400m²

ESC POND #3 CAPACITY CALCULATION:

Q = (RxAxI)/360

WHERE: Q = RUNOFF FLOW (m3/s); R = RUNOFF COEFFICIENT = 0.5; A = CATCHMENT AREA = 1.06 Ha; I = RAIN INTENSITY = 28mm/hr (3yr STORM)

Q = (0.5x1.06x28)/360 = 0.041 m3/s

POND AREA = A1 + [1.2xQ]/Vs

WHERE: A1 = SURFACE AREA (m²); Vs = WL (0.00032m/s) (SILT PARTICLE SIZE)

POND AREA REQUIRED = 246m²
POND AREA PROVIDED = 400m²

LEGEND

- PROPOSED PHASED TREE CLEARING AREA
- PROPOSED SILT FENCE
- EXISTING CONTOURS
- ESC POND INLET / OUTLET
- INTERCEPTOR CUT-OFF SWALE
- EXISTING OVERLAND FLOW DIRECTION
- ESC POND OUTLET DISPERSION PIPE
- ESC POND INLET PIPE

SEDIMENT CONTROL NOTES:

1. UNDER THIS PLAN, ALL PERSONS INCLUDING BUT NOT LIMITED TO THE DEVELOPER, OWNER OF SITE LANDS, THE ENGINEER OF RECORD, ESC SUPERVISOR, CIVIL CONTRACTOR, CIVIL SUB-CONTRACTOR & BUILDING SUB-TRADES HEREIN AFTER REFERRED TO AS THE OWNER/DEVELOPER/PERSON RESPONSIBLE ENGAGED ON SITE SHALL COMPLY WITH ALL REGULATORY REQUIREMENTS SPECIFIED BY FEDERAL, PROVINCIAL AND MUNICIPAL AUTHORITIES PERTAINING TO ON SITE MANAGEMENT AND DISCHARGE ASSOCIATED WITH EROSION AND SEDIMENT CONTROL REGULATIONS.
2. THE DEVELOPER/PERSONS RESPONSIBLE SHALL ENSURE THAT ALL CONSTRUCTION ACTIVITIES ARE UNDERTAKEN IN ALL MANNER THAT ENSURE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED TO PREVENT AND DOWNTAIN ON-SITE SILT LADEN RUNOFF THAT EXCEEDS 75mg/L TSS FROM ENTERING DOWNSTREAM DRAINAGE INFRASTRUCTURE AND AQUATIC SYSTEMS.
3. ALL SITE AND/OR LOT ACCESS FROM DISTURBED AREAS TO PAVED SURFACES IS TO BE RESTRICTED TO SPECIFIED ACCESS FACILITIES TO LIMIT THE TRANSPORT OF SEDIMENT ONTO ROADWAYS, DURING THE CONSTRUCTION PHASE, VEHICLE ACCESS TO THE DISTURBED AREAS IS TO BE LIMITED TO GRAVEL PADS ONLY.
4. MAXIMIZE POSSIBLE, EXISTING VEGETATION WILL BE LEFT UNDISTURBED UNTIL IMMEDIATELY BEFORE CONSTRUCTION (<30 DAYS).
5. ALL SILT GENERATING AREAS (DISTURBED SOILS) WHICH ARE TO BE LEFT EXPOSED FOR MORE THAN 30 DAYS MUST BE HYDROSEEDED AND MACHINE SPRAYED WITH STRAW TO A MINIMUM RATE OF 5,000kg/ha. ALL SILT GENERATING AREAS WHICH ARE TO BE LEFT EXPOSED FOR LESS THAN 30 DAYS MUST BE COVERED WITH POLY OR HYDROSEEDED AND MACHINE SPRAYED WITH STRAW TO A MINIMUM RATE OF 5,000kg/ha.

MAINTENANCE ALL STAGES (AS APPLICABLE)

1. GRAVEL ACCESS PADS TO BE INSPECTED DAILY TO ENSURE FUNCTIONALITY, ADD ADDITIONAL ROCK AS REQUIRED.
2. THE CONTRACTOR MUST REGULARLY CLEAN PAVED ROAD SURFACES OF ACCUMULATED SEDIMENTS AT THE END OF EACH DAY OR AS REQUIRED. NO SOIL, SAND OR OTHER MATERIAL WITH A HIGH SEDIMENT CONTENT SHALL BE DEPOSITED OR PILED OUTSIDE OF THE PROPERTY BOUNDARIES, PARTICULARLY ON PAVED ROAD SURFACES.
3. SEDIMENT FENCES/BARRIERS TO BE INSPECTED AND REPAIRED PRIOR TO EXPECTED RAIN EVENTS AND FOLLOWING ALL SIGNIFICANT STORM EVENTS OR PERIODS OF EXTENDED RAIN. ACCUMULATED SEDIMENTS GREATER THAN 30% OF THE FENCE CAPACITY OR DEFICIENCIES SHOULD BE DEALT WITH ACCORDINGLY
4. ALL SEDIMENT REMOVED FROM ESC CONTROL FACILITIES TO BE DISPOSED OF IN A MANNER AS TO NOT COMPOUND OR COMPROMISE THE SEDIMENT LOADING OF OTHER CONTROL MEASURES.

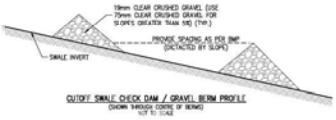
CLEARING, ROAD STRIPPING, GRAVELLING, AND ROUGH GRADING STAGE

1. INSTALL SPECIFIED ESC ACCESS FACILITIES/MEASURES AT ENTRY/EXIT POINTS. ALL VEHICLE MOVEMENTS TO AND FROM THE SITE IS TO BE RESTRICTED TO CONTROLLED ENTRY/EXIT POINTS.
2. ANY STOCKPILED MATERIAL TO BE COVERED WITH POLY PLASTIC AND ENCIRCLED BY SEDIMENT FENCE AS SPECIFIED.
3. EXPOSED SLOPES TO BE COVERED IN POLY PLASTIC IMMEDIATELY TO PREVENT CREATION OF SILT-LADEN RUNOFF. PERMANENT (AND TEMPORARY SLOPES TO BE LEFT FOR MORE THAN 30 DAYS) TO BE SEEDED WITH FALL RYE (OR APPROVED ALTERNATE) AND COVERED WITH STRAW AT A MINIMUM RATE OF 5,000kg/ha.
4. EXPOSED VEHICLE-TRAVELED WORK AREAS TO BE ARMOURED WITH MIN. 150mm THICK LAYER OF 10-50mm CRUSHED GRAVEL TO PREVENT EROSION AND TRACKING OF SILT/ARGUS MATERIAL.

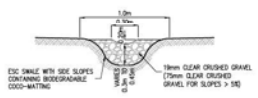
WET WEATHER SHUT DOWN

WET WEATHER SHUT DOWN PROCEDURES ARE TO BE IMPLEMENTED IF A RAIN EVENT IN EXCESS OF 25mm IN A 24-HOUR PERIOD FORECAST. ADDITIONALLY, REACTIVE WET WEATHER SHUT DOWNS ARE TO BE IMPLEMENTED WHERE THE INTENSITY AND/OR DURATION OF THE PRECIPITATION RESULTS IN THE SATURATION OF THE OVERLAYING SURFACE MATERIAL AND SIGNIFICANT PONDING OR SURFACE RUN OFF OCCURS.

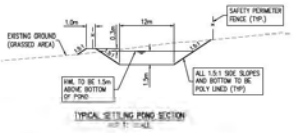
UNDERLYING SOIL IS SAND AND SILTY SAND



CUTOFF SWALE CHECK DAM / GRAVEL BERM PROFILE
(SHOWN THROUGH CENTRE OF BERM)
NOT TO SCALE

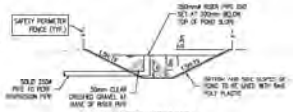


ESC CUTOFF SWALE SECTION
W/ SMALL NOTCH FOR GREATER RAINFALL EVENTS
NOT TO SCALE



TYPICAL SETTLING POND SECTION
NOT TO SCALE

ESC POND OUTFALL DISPERSION PIPE SECTION
NOT TO SCALE



SETTLING POND OUTLET DETAIL
NOT TO SCALE

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 (IN WELLER STREET) OWNSITE PARCEL 'A' REFERENCE PLAN 57751(S1)

1	2023/08/14	DS	VN	ISSUED FOR BUILDING PERMIT
0	2023/05/31	DS	CN	ISSUED FOR GRADING
REVISION HISTORY		DATE	CHK	

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONGING THE NORTH AND EAST BOUNDARIES, THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS OF PLANS 11480, 20158 AND 57751(S1) & No. DL19-1865-2016

GRAPHIC SCALE:
GRAPHIC SCALE
SCALE: 1:1000

DEVELOPER
1251719 B.C. LTD.
[illegible]
BURNABY, BC V5J 5Y9
TEL: 604-709-7070

CoreGroup CONSULTANTS
LAND DEVELOPMENT SERVICES
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SCALE:

DISTRICT OF NORTH COWICHAN

DESIGNED — DS
DRAWN — MA
REVIEWED — CN
APPROVED — CN
SCALE — 1:1000
DATE — AUG. 14, 2023

MORGAN MAPLES
EROSION AND SEDIMENT CONTROL PLAN
STAGE 2
6990 ISLAND HIGHWAY, CHEMAINUS, BC

FILE: —
DRAWING NUMBER: DWG No. — 2087
DIV: DSC No. — CHEMAINUS
SHEET 17 OF 21

STAGE 3 - UTILITY SERVICING

SEDIMENT CONTROL NOTES:

1. UNLESS THIS PLAN ALL PERSONS INCLUDING BUT NOT LIMITED TO THE DEVELOPER, OWNER OF THE LAND, THE ENGINEER OF RECORD, ESC SUPERVISOR, CIVIL CONTRACTOR, CIVIL SUB-CONTRACTOR & BUILDING SUB-TRADES HEREIN AFTER REFERRED TO AS THE OWNER/DEVELOPER/PERSON RESPONSIBLE, ENGAGED ON SITE SHALL COMPLY WITH ALL REGULATORY REQUIREMENTS SPECIFIED BY FEDERAL, PROVINCIAL, AND MUNICIPAL AUTHORITIES, PERTAINING TO ON SITE MANAGEMENT AND DISCHARGE ASSOCIATED WITH EROSION AND SEDIMENT CONTROL REGULATIONS.
2. THE DEVELOPER/PERSON RESPONSIBLE SHALL ENSURE THAT ALL CONSTRUCTION ACTIVITIES ARE UNDERTAKEN IN ALL MANNER THAT ENSURE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED TO PREVENT AND CONTAIN ON SITE, SILT LADEN RUNOFF THAT EXCEEDS 25mg/L TSS FROM ENTERING DOWNSTREAM DRAINAGE INFRASTRUCTURE AND AQUATIC SYSTEMS.
3. ALL SITE AND FOR LOT ACCESS FROM DISTURBED AREAS TO PAVED SURFACES IS TO BE RESTRICTED TO SPECIFIED ACCESS FACILITIES TO LIMIT THE TRANSPORT OF SEDIMENT ONTO ROADWAYS. DURING THE CONSTRUCTION PHASE, VEHICLE ACCESS TO THE DISTURBED AREAS IS TO BE LIMITED TO GRAVEL PADS ONLY.
4. WHEREVER POSSIBLE, EXISTING VEGETATION WILL BE LEFT UNDISTURBED UNTIL IMMEDIATELY BEFORE CONSTRUCTION (<10 DAYS).
5. ALL SILT GENERATING AREAS (DISTURBED SOILS) WHICH ARE TO BE LEFT EXPOSED FOR MORE THAN 30 DAYS MUST BE HYDROSEEDED AND MACHINE SPRAYED WITH STRAW TO A MINIMUM RATE OF 5,000kg/ha. ALL SILT GENERATING AREAS WHICH ARE TO BE LEFT EXPOSED FOR LESS THAN 30 DAYS MUST BE COVERED WITH POLY OR HYDROSEEDED AND MACHINE SPRAYED WITH STRAW TO A MINIMUM RATE OF 5,000kg/ha.

MAINTENANCE: ALL STAGES (AS APPLICABLE)

1. GRAVEL ACCESS PADS TO BE INSPECTED DAILY TO ENSURE FUNCTIONALITY, ADD ADDITIONAL ROCK AS REQUIRED.
2. THE CONTRACTOR MUST REGULARLY CLEAN PAVED ROAD SURFACES OF ACCUMULATED SEDIMENTS AT THE END OF EACH DAY OR AS REQUIRED. NO SOIL, SAND OR OTHER MATERIAL WITH A HIGH SEDIMENT CONTENT SHALL BE DEPOSITED OR PILED OUTSIDE OF THE PROPERTY BOUNDARIES, PARTICULARLY ON PAVED ROAD SURFACES.
3. SEDIMENT FENCES/BARRIERS TO BE INSPECTED AND REPAIRED PRIOR TO EXPECTED RAIN EVENTS AND FOLLOWING ALL SIGNIFICANT STORM EVENTS OR PERIODS OF EXTENDED RAIN. ACCUMULATED SEDIMENTS GREATER THAN 30% OF THE FENCE CAPACITY OR DEFICIENCIES SHOULD BE DEALT WITH ACCORDINGLY.
4. ALL SEDIMENT REMOVED FROM ESC CONTROL FACILITIES TO BE DISPOSED OF IN A MANNER AS TO NOT COMPOUND OR COMPROMISE THE SEDIMENT LOADING OF OTHER CONTROL MEASURES.

LEGEND

- PROPOSED SILT FENCE
- ESC POND INLET / OUTLET
- CATCHBASIN SEDIMENT TRAP INSERT
- ESC POND INLET/OUTLET PIPE

UTILITY AND ROAD WORKS INSTALLATION STAGE

1. ALL ACCESS TO AND FROM SITE TO BE FROM THE RESTRICTED ENTRY-EXIT POINTS.
2. ESC SUPERVISOR TO CONDUCT MONITORING AS PER THE CITY OF SURREY MONITORING AND REPORTING REQUIREMENTS.
3. CONTRACTOR TO ENSURE THAT ESC MEASURES ARE WELL MAINTAINED, CLEARED, REPAIRED, OR REPLACED AS REQUIRED.
4. CONTRACTOR TO CO-ORDINATE THE ELIMINATION OF TEMPORARY ESC FACILITIES IF THEY ARE NO LONGER REQUIRED OR TO FACILITATE SITE OPERATIONS WITH THE ESC SUPERVISOR. ADDITIONAL ESC FACILITIES MAY NEED TO BE INSTALLED AS PER THE DIRECTION OF THE ESC SUPERVISOR.
5. EXPOSED VEHICLE-TRAVELED WORK AREAS TO BE ARMOURED WITH MIN. 150mm THICK LAYER OF 10-50mm CRUSHED GRAVEL TO PREVENT EROSION AND TRACKING OF SILTATEOUS MATERIAL.

WET WEATHER SHUT DOWN

WET WEATHER SHUT DOWN PROCEDURES ARE TO BE IMPLEMENTED IF A RAIN EVENT IN EXCESS OF 25mm IN A 24-HOUR PERIOD FORECAST. ADDITIONALLY, REACTIVE WET WEATHER SHUT DOWNS ARE TO BE IMPLEMENTED WHERE THE INTENSITY AND/OR DURATION OF THE PRECIPITATION RESULTS IN THE SATURATION OF THE OVERLAYING SURFACE MATERIAL AND SIGNIFICANT PONDING OR SURFACE RUN OFF OCCURS.

UNDERLYING SOIL IS SAND AND SILTY SAND

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET. ONPOINT# PARCEL 'B' REFERENCE ICON 1073338181

NO.	DATE/BY/A+	JOB	CK	ISSUED FOR BUILDING PERMIT
0	2023/05/31	DP	CK	ISSUED FOR GRADING
REVS	DATE/NAME	DRN	CK'D	

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONG THE NORTH AND EAST BOUNDARIES, THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, 20658 AND 1999RW01 [1 ha. 0.06-.20]

GRAPHIC SCALE:
GRAPHIC SCALE
10 0 20 40
SCALE: 1:1000

DEVELOPER
1251719 B.C. LTD.
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BURNABY, BC V5J 5H9
TEL: 604-299-2020

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325-4960 TRADITION COURT
BURNABY, BC V5J 5H9
tel: (604)299 2020 fax: (604)299 0629

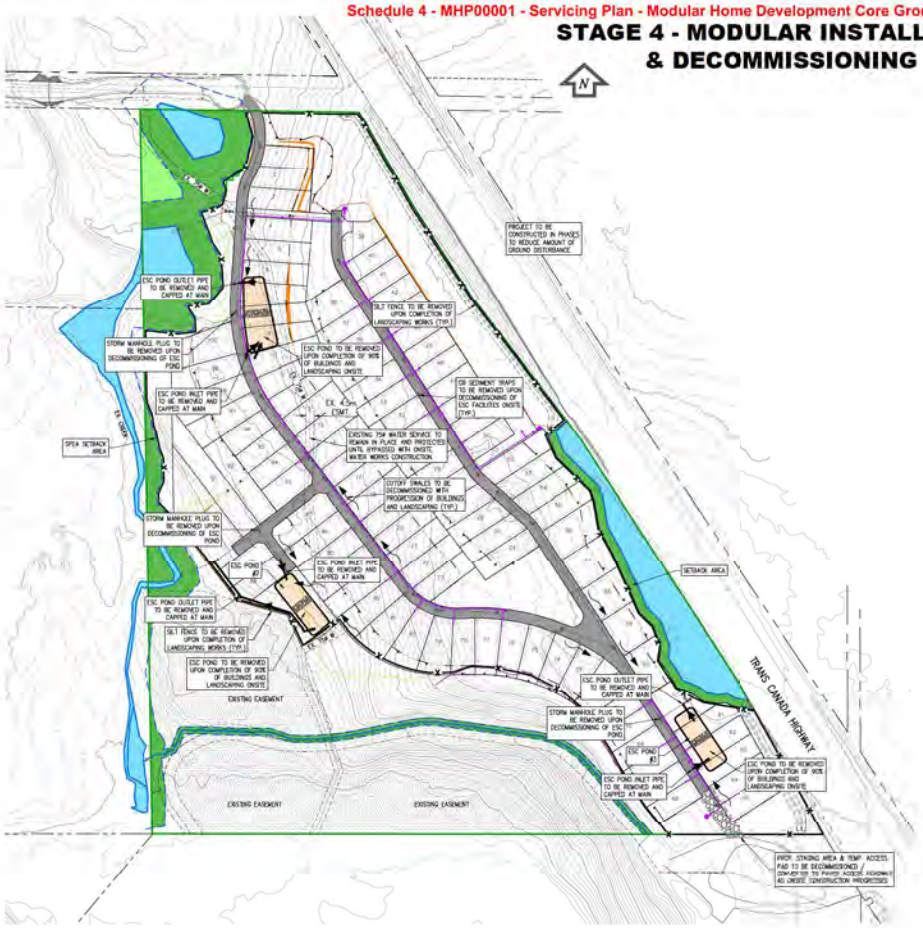
SCALE:

DISTRICT OF NORTH COWICHAN
MORGAN MAPLES
EROSION AND SEDIMENT CONTROL PLAN
STAGE 3
6960 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED	DS
DRAWN	MM
MATRIX SCALE	1:1000
APPROVED	DS
DATE	AUG. 14, 2023

FILE:
DRAWING No. 2087
DFT/SEC. No. DWG0626
Sheet 18 OF 21

STAGE 4 - MODULAR INSTALLATION & DECOMMISSIONING



SEDIMENT CONTROL NOTES :

1. UNDER THIS PLAN, ALL PERSONS INCLUDING BUT NOT LIMITED TO THE DEVELOPER, OWNER OF THE LAND, THE ENGINEER OF RECORD, ESC SUPERVISOR, QUAL CONTRACTOR, QNAL SUB-CONTRACTOR & BUILDING SUB-TRADES HEREIN AFTER REFERRED TO AS THE OWNER/DEVELOPER/PERSON RESPONSIBLE ENGAGED ON SITE SHALL COMPLY WITH ALL REGULATORY REQUIREMENTS SPECIFIED BY FEDERAL, PROVINCIAL, AND MUNICIPAL AUTHORITIES PERTAINING TO ON SITE MANAGEMENT AND DISCHARGE ASSOCIATED WITH EROSION AND SEDIMENT CONTROL REGULATIONS.
2. THE DEVELOPER/PERSONS RESPONSIBLE SHALL ENSURE THAT ALL CONSTRUCTION ACTIVITIES ARE UNDERTAKEN IN ALL MANNER THAT ENSURE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED TO PREVENT AND CONTAIN ON-SITE, SILT LADEN RUNOFF THAT EXCEEDS 75mg/L TSS FROM ENTERING DOWNSTREAM DRAINAGE INFRASTRUCTURE AND AQUATIC SYSTEMS.
3. ALL SITE AND/OR LOT ACCESS FROM DISTURBED AREAS TO PAVED SURFACES IS TO BE RESTRICTED TO SPECIFIED ACCESS FACILITIES TO LIMIT THE TRANSPORT OF SEDIMENT ONTO ROADWAYS. DURING THE CONSTRUCTION PHASE, VEHICLE ACCESS TO THE DISTURBED AREAS IS TO BE LIMITED TO GRAVEL PADS ONLY.
4. WHEREVER POSSIBLE, EXISTING VEGETATION WILL BE LEFT UNDISTURBED UNTIL IMMEDIATELY BEFORE CONSTRUCTION (<10 DAYS).
5. ALL SILT GENERATING AREAS (DISTURBED SOILS) WHICH ARE TO BE LEFT EXPOSED FOR MORE THAN 30 DAYS MUST BE HYDROSEEDED AND MACHINE SPRAYED WITH STRAW TO A MINIMUM RATE OF 5,000kg/ha. ALL SILT GENERATING AREAS WHICH ARE TO BE LEFT EXPOSED FOR LESS THAN 30 DAYS MUST BE COVERED WITH POLY OR HYDROSEEDED AND MACHINE SPRAYED WITH STRAW TO A MINIMUM RATE OF 5,000kg/ha.

MAINTENANCE: ALL STAGES (AS APPLICABLE)

1. GRAVEL ACCESS PADS TO BE INSPECTED DAILY TO ENSURE FUNCTIONALITY, ADD ADDITIONAL ROCK AS REQUIRED.
2. THE CONTRACTOR MUST REGULARLY CLEAN PAVED ROAD SURFACES OF ACCUMULATED SEDIMENTS AT THE END OF EACH DAY OR AS REQUIRED. NO SOIL, SAND OR OTHER MATERIAL WITH A HIGH SEDIMENT CONTENT SHALL BE DEPOSITED OR PILED OUTSIDE OF THE PROPERTY BOUNDARIES, PARTICULARLY ON PAVED ROAD SURFACES.
3. SEDIMENT FENCES/BARRIERS TO BE INSPECTED AND REPAIRED PRIOR TO EXPECTED RAIN EVENTS AND FOLLOWING ALL SIGNIFICANT STORM EVENTS OR PERIODS OF EXTENDED RAIN. ACCUMULATED SEDIMENTS GREATER THAN 30% OF THE FENCE CAPACITY OR DEFICIENCIES SHOULD BE DEALT WITH ACCORDINGLY.
4. ALL SEDIMENT REMOVED FROM ESC CONTROL FACILITIES TO BE DISPOSED OF IN A MANNER AS TO NOT COMPOUND OR COMPROMISE THE SEDIMENT LOADING OF OTHER CONTROL MEASURES.

BUILDING CONSTRUCTION & LANDSCAPING

1. GENERAL CONTRACTOR TO ENSURE THAT STORMWATER CONVEYANCE CHANNELS AND DISCHARGE POINTS TO ADJACENT STREAMS, DITCHES, OR ENTRY POINTS TO PIPED NETWORKS, ARE ADEQUATELY PROTECTED.
2. CONTRACTOR TO ENSURE THAT ESC FACILITIES SPECIFIED IN THE ESC PLAN OR ANY ADDENDUMS ARE IMPLEMENTED ACCORDINGLY.
3. AFTER FINAL LOT GRADING IS COMPLETED ALL DISTURBED AREAS ARE TO BE PROTECTED AS PER THE ESC PLAN.
4. EXPOSED VEHICLE-TRAVELED WORK AREAS TO BE ARMOURED WITH MIN. 150mm THICK LAYER OF 10-50mm CRUSHED GRAVEL TO PREVENT EROSION AND TRACKING OF SILT/SOIDS MATERIAL

LEGEND

PROPOSED SILT FENCE —x—

CATCHBASIN/ SEDIMENT TRAP INSERT

ESC POND INLET PIPE

BENCHMARK DATA:
ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPCON CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET. OPPOSITE PARCEL 'A' REFERENCE ICON 5173519

NO.	DATE/BY/#	DESCRIPTION
1	2023/08/14 JW	ISSUED FOR BUILDING PERMIT
0	2023/05/31 DP	ISSUED FOR REVIEW

LEGAL DESCRIPTION
THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALONG THE NORTH AND EAST BOUNDARIES, THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, 29158 AND 49888

GRAPHIC SCALE:
GRAPHIC SCALE
0 10 20 40
SCALE 1:1000

DEVELOPER
1251719 B.C. LTD.
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CoreGroup
ENGINEERING SERVICES
LAND DEVELOPMENT SERVICES
325-4960 TRANSTON COURT
BURNABY, BC V5J 5H9
tel: (604)299-0620 fax: (604)299-0629

SEAL:

DISTRICT OF NORTH COWICHAN

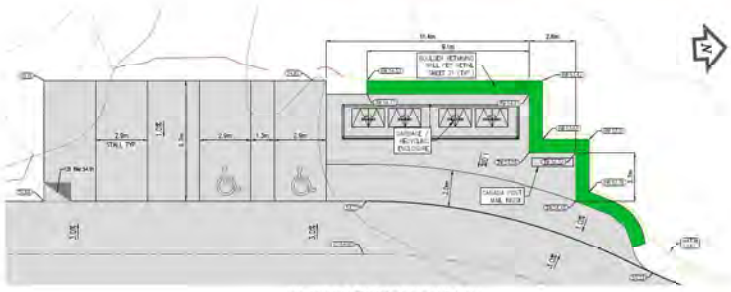
DESIGNED — DA
DRAWN — MA
MATERIAL — 1:1000
APPROVED — DA
DATE — AUG. 14, 2023

MORGAN MAPLES

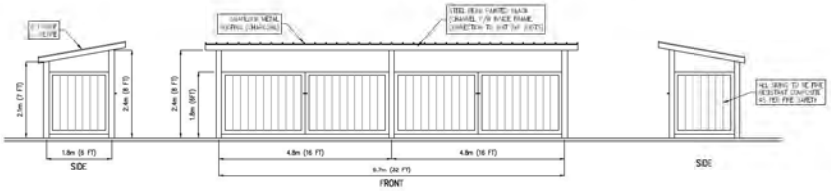
EROSION AND SEDIMENT CONTROL PLAN STAGE 4

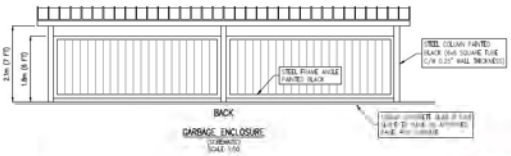
6960 ISLAND HIGHWAY, CHEMAINUS, BC

PLE
DRAWING NO. 2087
DFT DWG. No. DP05A08
Sheet 19 OF 21

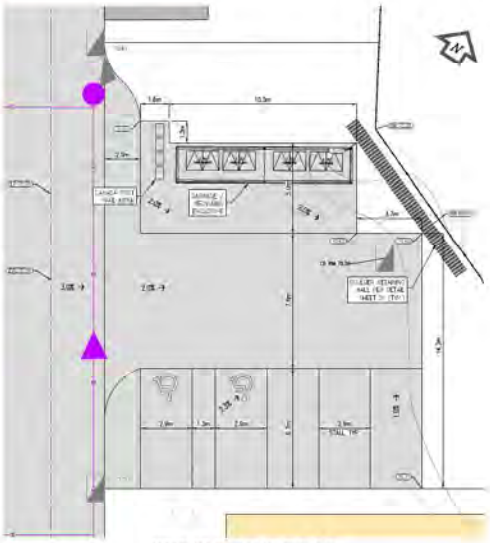


GARBAGE AND RECYCLING ENCLOSURE PLAN





GARBAGE ENCLOSURE



GARBAGE AND RECYCLING ENCLOSURE PLAN

LEGAL DESCRIPTION :

THE EAST 66 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT,
EXCEPT 10.5 PERCH STRIP ALONG AND ALSO ALONG THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11490, 26134 AND 49788 AND
PID No. 009-885-200

CIVIC ADDRESS :

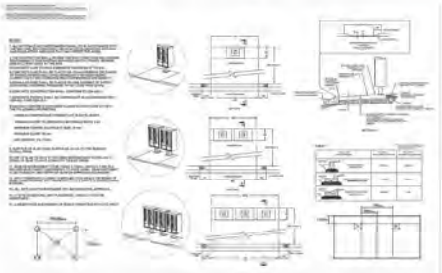
PARKING :

MODULAR HOME LOT PARKING : 200
OFF-STREET PARKING : 17

TOTAL PARKING STALLS : 219

OF PERSONS OF DISABILITY STALLS : 4
(2 PER EVERY 100 STALLS)

MAIL KIOSK



BENCHMARK DATA :

ELEVATIONS ARE DERIVED FROM SPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ON/NEAR CENTRE OF SECTION 10, TOWNSHIP 17 ON WILSON STREET, OPPOSITE PARCEL 'E' REFERENCE ICSM 57733181

REV'D	DATE(YMD)	DES	CHK	
1	2023/08/14	DR	DN	ISSUED FOR BUILDING PERMIT
0	2023/05/31	DR	DN	ISSUED FOR REVIEW

LEGAL DESCRIPTION

THE EAST 66 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 10.5 PERCH STRIP ALONG AND ALONG THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11490, 26134 AND 49788 AND PID No. 009-885-200

GRAPHIC SCALE

SCALE: 1:100

DEVELOPER

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SEAL:

DISTRICT OF NORTH COWICHAN

MORGAN MAPLES

GARBAGE ENCLOSURE & MAIL KIOSK DETAILS

8983 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED: DN
DRAWN: [illegible]
MATERIAL SCALE: 1:100
APPROVED: DN
DATE: AUG. 14, 2023

FILE:
DEVELOPMENT/DWG No.: 2087
SITE/DWG No.: OPINION
Sheet 20 of 21

GENERAL CONSTRUCTION NOTES

1. ELEVATIONS ARE REFERRED TO GEODETIC DATUM.
2. ALL ONSITE SERVICES TO BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST NATIONAL BUILDING CODE, THE LATEST B.C. BUILDING CODE, THE LATEST MASTER MUNICIPAL SPECIFICATIONS (MMCD) AND PASS THE INSPECTION OF THE DISTRICT OF NORTH COWICHAN BUILDING DEPARTMENT. ALL WORKS CONSTRUCTED WITHIN THE EXISTING MUNICIPAL RIGHTS-OF-WAY TO CONFORM TO THE DISTRICT OF NORTH COWICHAN ENGINEERING DEPARTMENT STANDARDS AND SPECIFICATIONS AND BE CARRIED OUT UNDER THEIR INSPECTION. TIE INTO EXISTING SERVICES MUST BE CONFIRMED THROUGH THE DISTRICT AND MUST PROVIDE 48 HOURS NOTICE OF START OF WORK.
3. THE CONTRACTOR SHALL ENSURE ALL APPROVALS REQUIRED FOR THE PROPOSED WORK HAVE BEEN OBTAINED PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION. THE CONTRACTOR IS TO CHECK WITH BC HYDRO, TELUS, SHAW, FORTIS AND ANY OTHER UNDERGROUND UTILITY COMPANIES PRIOR TO COMMENCING WORK FOR VERIFICATIONS OF LOCATIONS AND DEPTHS OF ALL GAS MAINS AND UNDERGROUND UTILITIES TO ENSURE NO CONFLICTS.
4. ALL LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND SERVICES DETERMINED FROM THE DISTRICT OF NORTH COWICHAN 'AS CONSTRUCTED' DRAWINGS AND THE ENGINEER CANNOT BE RESPONSIBLE FOR THEIR ACCURACY. CONTRACTOR TO VERIFY THE LOCATION OF ALL EXISTING SERVICES AND TIE-IN POINTS PRIOR TO CONSTRUCTION AND TO NOTIFY THE ENGINEER OF ANY DISCREPANCIES, CONFLICTS OR ONORTH COWICHANS. CONTRACTOR TO CONFIRM ALL OFFSITE TIE-IN ELEVATIONS PRIOR TO COMMENCING CONSTRUCTION.
5. OPEN TRENCH OPERATIONS IN EXISTING PAVEMENT SHALL BE VERTICAL AND REPLACED WITH HOT MIX ASPHALT AFTER BACKFILL AND COMPACTION. ALL PAVEMENTS, BOULEVARDS, ETC. ARE TO BE RESTORED TO ORIGINAL CONDITIONS WHERE NO IMPROVEMENT IS PROPOSED UNDER THE CONTRACT.
6. THE CONTRACTOR SHALL USE EXTREME CARE WHEN WORKING NEAR EXISTING SERVICES AND ANY SERVICES DISTURBED ARE TO BE REPLACED TO THE SATISFACTION OF THE DISTRICT OF NORTH COWICHAN OR OTHER APPROVING AGENCIES.
7. ANY MATERIAL SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER.
8. ALL SURVEY MONUMENTS MUST BE PROTECTED AND ANY DAMAGE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
9. ALL EXISTING IMPROVEMENTS SHALL BE RESTORED TO THE SATISFACTION OF THE DISTRICT OF NORTH COWICHAN. IN SPECIAL CASES THE DISTRICT INSPECTOR MAY REQUIRE WRITTEN ACCEPTANCE BY THE AFFECTED PROPERTY OWNERS FOR RESTORATION WORKS PERFORMED BY THE CONTRACTOR.
10. SEE ARCHITECT'S DRAWINGS FOR BUILDING DETAILS, DIMENSIONS AND FINISHED FLOOR ELEVATIONS.
11. STORM, SANITARY AND WATER SERVICE CONNECTIONS TO BE TERMINATED AS SHOWN ON PLANS BY "ON-SITE" SERVICING CONTRACTOR. CONTINUATION BY BUILDING PLUMBING CONTRACTORS INCLUDING SEWER CLEANOUTS REQUIRED IMMEDIATELY OUTSIDE BUILDING.
12. FORTY-EIGHT HOURS NOTICE TO MUNICIPALITY PRIOR TO CONSTRUCTION WITHIN ROAD ALLOWANCES.
13. CONTRACTOR TO CONFIRM WITH THE MECHANICAL ENGINEER PRIOR TO CONSTRUCTION TO CONFIRM SIZES AND LOCATIONS OF CONNECTIONS TO BUILDINGS.
14. ALL SERVICES TO BE LAID OUT RELATIVE TO BUILDING PERIMETERS.
15. SEE LANDSCAPE ARCHITECT'S DRAWINGS FOR THE LANDSCAPE AND GRADING DETAILS.
16. ALL BUILDINGS CORNERS AND SITE FURNISHINGS TO BE SURVEYED (STAKED) PRIOR TO SITE SERVICING.
17. OFFSITE WORKS TO BE APPROVED BY THE DISTRICT OF NORTH COWICHAN ENGINEERING DEPARTMENT PRIOR TO ORDERING MATERIALS FOR ONSITE WORKS.
18. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THIS PROJECT.

STORM AND SANITARY SEWER NOTES

1. STORM SEWER TO BE PVC PIPE PER CSA c/w GASKETS (UNLESS OTHERWISE NOTED) AND SHALL HAVE A MINIMUM SDR 35 SPECIFICATION FOR MAIN LINES AND MINIMUM SDR 28 FOR SERVICE CONNECTIONS.
2. ALL SANITARY SEWER PIPES SHALL BE PVC MINIMUM SDR 35 SPECIFICATION FOR PIPES 200ø OR GREATER FOR MAIN LINES AND MINIMUM SDR 28 FOR 100ø AND 150ø FOR SERVICE CONNECTIONS.
3. CATCH BASIN LEADS TO BE 200mm AT 1.00% MIN. DOUBLE CATCH BASIN LEADS TO BE 250mm AT 1.00% MIN. TOP INLET CATCH BASINS SHALL BE PER MMCD STD. DET. S11.
4. ALL MANHOLE BARRELS SHALL BE 1050 mm DIAMETER UNLESS NOTED OTHERWISE.
5. ALL MANHOLES TO BE INSTALLED PER MMCD STD. DET. S1, MANHOLE CONNECTIONS TO BE INSTALLED AS PER MMCD STD. DET. S2, AND MANHOLE INSIDE RAMP CONNECTIONS TO BE INSTALLED PER MMCD STD. DET. S3.
6. ALL LAWN BASINS SHALL BE IN ACCORDANCE WITH MMCD STD. DET. S12 TYPE 1.
7. ALL WYES TO BE MANUFACTURED.
8. ALL STORM & SANITARY SEWERS IN ASPHALT AND PARKING AREAS TO BE DWV PIPE WHERE COVER IS LESS THAN 0.9m.
9. EXISTING INVERTS TO BE VERIFIED IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION.
10. THE CONTRACTOR SHALL BE RESPONSIBLE IN ENSURING THAT THE FINISHED RIM ELEVATION OF THE STORM AND SANITARY SEWER MANHOLE MATCHES THE FINISHED ROAD GRADES AND ELEVATIONS.
11. ALL C.B.'S IN ASPHALT AND PARKING AREAS TO BE 600ø AND SHALL BE CONSTRUCTED WITH DONUT FRAME AND GRATE TO SUPPORT H20 LOADING.
12. ALL STORM AND SANITARY SYSTEMS TO BE IN ACCORDANCE WITH B.C. BUILDING CODE (2006).
13. CLEANOUTS TO BE INSTALLED TO SECTION 4.7, B.C. BUILDING CODE (2006).
14. STORM AND SANITARY CONNECTIONS ARE TO TERMINATE 1m FROM BUILDINGS AND HAVE MINIMUM 1m OF COVER. SEE MECHANICAL ENGINEER'S DRAWINGS FOR CONFIRMATION OF LOCATIONS. DESIGN AND REQUIREMENT OF INSPECTION CHAMBERS OR STORM SUMPS ARE THE RESPONSIBILITY OF THE MECHANICAL ENGINEER.
15. ALL BUILDING CORNERS AND LANDSCAPING FEATURES (INCL. FENCING) TO BE STAKED PRIOR TO SITE SERVICING.
16. ALL ROOF DRAIN OUTLETS ARE TO BE ON THE ROAD/LANE SIDE OF BUILDINGS AND GARAGES. NO OUTLETS INTO BACKYARDS.
17. MANHOLE LIDS TO BE ORIENTED TO AVOID CURBS AND UNIT PAVER PLACEMENTS (SEE PAVING PLAN).
18. ALL STORM AND SANITARY SEWER SYSTEMS TO BE TESTED PER SECTION 3.6 OF THE B.C. PLUMBING CODE. THE ENGINEER IS TO BE NOTIFIED 48 HOURS PRIOR TO TESTING.
19. STORM SEWERS SHALL BE VIDEO INSPECTED PER MMCD SPECIFICATIONS.
20. SANITARY SEWERS SHALL BE PRESSURE TESTED AND VIDEO INSPECTED PER MMCD SPECIFICATIONS.

ROADWORKS NOTES

1. ALL ELEVATIONS AND DIMENSIONS ARE METRIC.
2. ALL MANHOLE LIDS, VALVE COVERS, CATCHBASINS AND LIDS OF ANY OTHER STRUCTURE TO BE ADJUSTED TO SUIT FINAL OR PROPOSED ROAD, DRIVEWAY, SIDEWALK AND BOULEVARD / LANDSCAPED AREAS.
3. GEOTECHNICAL ENGINEER TO APPROVE ALL SUBGRADES PRIOR TO PLACING BASE MATERIALS.
4. ALL SUBGRADES AND BASE MATERIALS COMPACTED TO 95% MPD. ALL MATERIALS IN ACCORDANCE WITH MMCD STANDARDS.
5. COMPACTION TESTING, ASPHALT TESTING AND CONCRETE TESTING BY CONTRACTOR.
6. FOR FENCE LOCATIONS, SEE ARCHITECT AND LANDSCAPE ARCHITECT'S PLANS.
7. ALL PAVEMENT MARKINGS TO BE INCLUDED IN CONTRACT.
8. CURBS ONSITE TO BE TYPE 'R' CURB (ROLLOVER) IN ACCORDANCE WITH MMCD STD. DWG. C4 UNLESS NOTED OTHERWISE.
9. GARAGE ELEVATIONS SHOWN ARE FOR CENTRE OF GARAGE DOOR.
10. LOCATIONS OF DRIVEWAYS, WHEELCHAIR RAMPS, ETC. SHALL BE CONFIRMED IN THE FIELD PRIOR TO CONSTRUCTION OF THE PROPOSED CONCRETE CURB AND GUTTER AND SIDEWALK.
11. BENKELMAN BEAM TESTING WILL BE REQUIRED TO CONFIRM THE SUITABILITY OF THE ROAD STRUCTURE PRIOR TO PAVING.
12. ALL LOOSE, ORGANIC, OTHERWISE DELETERIOUS MATERIALS OR SOFT SPOT(S) ARE TO BE EXCAVATED AND REMOVED FROM THE ROADWAY AND UTILITY TRENCHES IN THE ROADWAY AS PER THE GEOTECHNICAL CONSULTANT'S REPORT OR AS DIRECTED BY THE DISTRICT.

GRADING NOTES

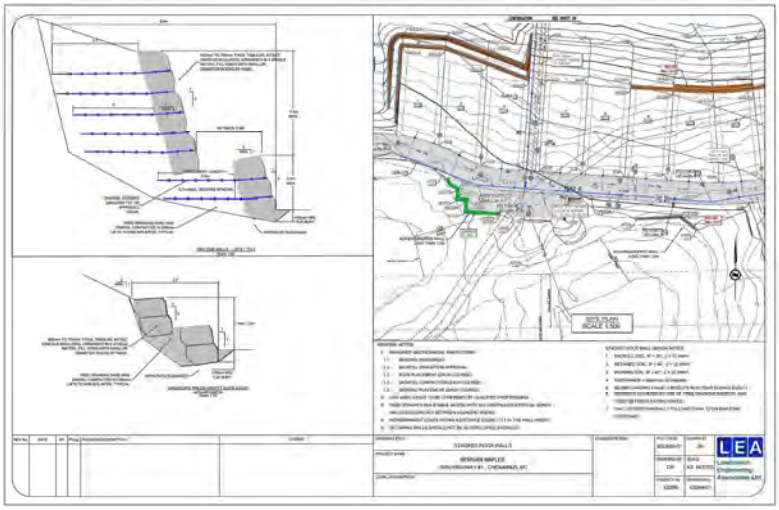
1. ALL ELEVATIONS AND DIMENSIONS ARE METRIC.
2. SITE PREPARATION, STRIPPING, EXCAVATION AND FILLING OPERATIONS TO BE REVIEWED BY A GEOTECHNICAL ENGINEER AND ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH GEOTECHNICAL RECOMMENDATIONS.
3. CUT AND FILL SLOPES TO BE REVIEWED AND APPROVED BY GEOTECHNICAL ENGINEER.
4. ALL SITE GRADES SHOWN ARE FINISHED GRADING ELEVATIONS AND ARE TO BE REVIEWED BY GEOTECHNICAL ENGINEER.
5. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS AND BYLAWS OF ALL REGULATORY AUTHORITIES, FEDERAL AND PROVINCIAL GOVERNMENT DEPARTMENTS INCLUDING THE 'LAND DEVELOPMENT GUIDELINES FOR THE PROTECTION OF AQUATIC HABITAT' AS PRODUCED BY THE DEPARTMENT OF FISHERIES AND OCEANS CANADA.
6. ALL ROOF DRAINS TO DRAIN TOWARD THE ROADS AND LANES, NO ROOFS ARE TO DRAIN ONTO THE BACK YARDS.

WATERWORKS NOTES

1. ASSUME TEST PRESSURE OF 1380 kPa (200psi).
2. ALL WATER VALVES ARE TO BE KEPT FLUSH WITH THE FIRST LIFT OF ASPHALT. BOXES TO BE ADJUSTED TO FINAL GRADE PRIOR TO TO PLACING FINAL LIFT.
3. 100ø WATER CONNECTIONS SHALL BE PVC CLASS 200 PIPE CONFORMING TO AWWA C900 AND CERTIFIED TO CSA B137.3 WITH TRACER WIRE AND APPROPRIATE VALVES, STOPS, FITTINGS, AND SADDLES.
4. FIRE HYDRANT ASSEMBLY (CANADA VALVE CENTURION OR APPROVED EQUIVALENT) IN ACCORDANCE WITH DISTRICT OF NORTH COWICHAN SPECIFICATIONS, MMCD SPECIFICATIONS, AND APPROVED BY THE FIRE DEPARTMENT.
   - FIRE HYDRANTS TO BE PAINTED RED.
5. WATERMAIN PIPE TO BE PVC C900 DR18 PER AWWA.
6. WATER MAIN OR SERVICE PIPE WALLS TO HAVE WRAPPED JOINTS PER LOCAL & MUNICIPAL HEALTH STANDARDS IF CLOSER THAN 0.5m VERTICAL OR 3.0m HORIZONTAL TO SANITARY OR STORM MAIN PIPE WALLS.
7. ALL WATERMAINS SERVICING SPRINKLER SYSTEM SHALL CONFORM TO NFPA 24.
8. MINIMUM GRADE ON WATERMAINS IS TO BE 0.10%.
9. MINIMUM PIPE COVER IS TO BE 1.0m TO FINISHED GRADE OR ALTERNATIVE TO MEET H-20 LIVE ROAD REQUIREMENTS AS APPROVED BY THE ENGINEER.
10. ALL FITTINGS, BENDS AND PIPE JOINTS TO HAVE JOINT RESTRAINTS THROUGHOUT.
11. ALL FITTINGS & BENDS TO HAVE CONCRETE THRUST BLOCKS INSTALLED PER MMCD.
12. ALL BUILDING CORNERS AND LANDSCAPING FEATURES (INCL. FENCING) TO BE STAKED PRIOR TO SITE SERVICING.
13. VALVES & BOXES TO BE INSTALLED PER MMCD W3.
14. VALVE BODIES, COMPONENTS & HYDRANTS TO BE DUCTILE IRON.
15. TIE-INS AND CONNECTIONS TO THE EXISTING WATERMAIN SHALL BE PERFORMED BY THE DISTRICT CREWS. THE CONTRACTOR MUST CONTACT THE DISTRICT OF NORTH COWICHAN 48 HOURS PRIOR TO THE COMMENCEMENT OF TIE-IN OR CONNECTION PROCEDURES.
16. DURING CONSTRUCTION AND AT ANY TIME PRIOR TO ACCEPTANCE AND PRESSURIZATION OF WATERMAINS, THE DEVELOPER SHALL INSTALL A 300 mm x 300 mm SQUARE 18 mm SHEET OF PLYWOOD OVER THE PUMPER NOZZLE OF EACH HYDRANT TO INDICATE THAT THE HYDRANT IS NOT IN USE.
17. ALL TESTING AND CHLORINATION OF WATERMAINS TO BE DONE BY THE CONTRACTOR UNDER THE INSPECTION OF THE DISTRICT OF NORTH COWICHAN INSPECTOR AND ENGINEER. THE ENGINEER IS TO BE NOTIFIED 48 HOURS PRIOR TO TESTING. PRESSURE TEST TO BC BUILDING CODE (2006) AND SHALL CHLORINATE AND FLUSH TO MINISTRY OF HEALTH AND AWWA STANDARDS. TESTING TO BE APPROVED BY THE DISTRICT PRIOR TO TIE-IN TO MUNICIPAL WATER.
18. CHANGES IN GRADE TO BE MADE BY DEFLECTION OF PIPE JOINTS TO A MAXIMUM OF HALF OF THE MANUFACTURER'S RECOMMENDED MAXIMUM DEFLECTION OR BY USING A TYT x TYT FITTING.

TESTING NOTES:

1. ALL TESTING TO BE PERFORMED BY A CSA OR CCIL (CANADIAN CERTIFIED TESTING LABORATORIES) CERTIFIED LABORATORY.
2. FREQUENCY OF DENSITY TESTS FOR BACKFILLING SHALL BE ONE TEST PER 50 LINEAL METRES OR TRENCH PER METRE OF DEPTH. MATERIAL TO BE COMPACTED IN 300mm LIFTS.
3. FREQUENCY OF DENSITY TESTS FOR ROADWAY EXCAVATION, EMBANKMENT (SUB-GRADE FILL) AND COMPACTION SHALL BE ONE TEST PER 250m³ PER 300mm LIFT.
4. FREQUENCY OF DENSITY TESTS FOR GRANULAR BASE AND SUB-BASE SHALL BE ONE TEST PER 30 LINEAL METRES OF LANE WIDTH STAGGERED EACH SIDE OF CENTRELINE PER 150mm LIFT OR OF SPECIFIED THICKNESS.
5. FREQUENCY OF DENSITY TESTS FOR SIDEWALK BASE SHALL BE ONE TEST PER 30 LINEAL METRES WITHIN SIDEWALK AND DRIVEWAY AREA.
6. FREQUENCY OF DENSITY TESTS FOR CURB BASE SHALL BE ONE TEST PER 100 LINEAL METRES.
7. FREQUENCY OF MARSHALL TESTS FOR HOT-MIX ASPHALT CONCRETE PAVING SHALL BE ONE TEST PER 500 TONNES OF MIX PLACED OR ONE TEST FOR EACH TYPE OF ASPHALT MIX, MINIMUM ONE PER DAY.
8. FOR STREET PAVING, CORE LOCATIONS WILL BE SELECTED FOR EACH PASS OF THE PAVING MACHINE AS FOLLOWS:
   - 8.1. ACROSS THE WIDTH, CORE LOCATIONS WILL BE SELECTED RANDOMLY FROM ONE-SIXTH INCREMENTS.
   - 8.2. ALONG THE LENGTH, CORE LOCATIONS WILL HAVE A RANDOMLY SELECTED START WITH CORES AT A SPACING OF APPROXIMATELY, BUT NOT TO EXCEED 30 METRES.
   - 8.3. FOR OTHER PAVING OPERATIONS, A MINIMUM OF ONE CORE FOR EVERY 250 SQUARE METRES OF ASPHALT MIX PLACED.
9. FREQUENCY OF PLASTIC CONCRETE TESTS FOR SIDEWALK SHALL BE ONE TEST PER 150 LINEAL METRES OR A MINIMUM OF ONE PER DAY.
10. FREQUENCY OF PLASTIC CONCRETE TESTS FOR CURB AND GUTTER SHALL BE ONE TEST PER 300 LINEAR METRES OF A MINIMUM OF ONE PER DAY.
11. SANITARY SEWER MAINS TO BE VIDEO INSPECTED & PRESSURE TESTED PER MMCD.
12. STORM SEWERS TO BE VIDEO INSPECTED PER MMCD.
13. WATER SERVICE / MAIN PRESSURE AND BACTERIOLOGICAL TESTING TO BE DONE BY CONTRACTOR PRIOR TO TIE-IN AND ACCEPTANCE BY ENGINEER. ASSUMED TEST PRESSURE OF 1380 kPa (200 psi).
14. ALL TESTING OF WATER MAINS / SERVICES TO BE DONE AND APPROVED BEFORE BACKFILLING PIPE AND TYING IN TO OFFSITE WATER SERVICE/MAIN.
15. BACKFLOW PREVENTERS IN METER CHAMBERS TO BE TESTED AND CERTIFIED TO SHOW UNITS ARE IN PROPER WORKING ORDER.



BENCHMARK DATA:

ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ON PCON CENTER OF SECTION 30, TOWNSHIP 17 ON NELSON STREET OPPOSITE PARCEL 'A' REFERENCE PLAN [illegible]

1	2023/08/14	DR	CN	ISSUED FOR BUILDING PERMIT
0	2023/03/21	DR	CN	ISSUED FOR GRADING
REV'D	DATE(YY/MM/DD)	DWN	CHK'D	

LEGAL DESCRIPTION

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ADJOINING THE NORTH AND EAST BOUNDARIES, THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARTS IN PLANS 11486, [illegible]

GRAPHIC SCALE:

DEVELOPER
1251719 B.C. LTD.
320-8988 FRASERTON COURT
BURNABY, BC V5J 5H8
TEL. 604-704-[illegible]

CoreGroup
CONSULTANTS
LAND DEVELOPMENT SERVICES
320-8988 FRASERTON COURT
BURNABY, BC V5J 5H8
tel. (604)299 0605 fax. (604)299 0629

SEAL:

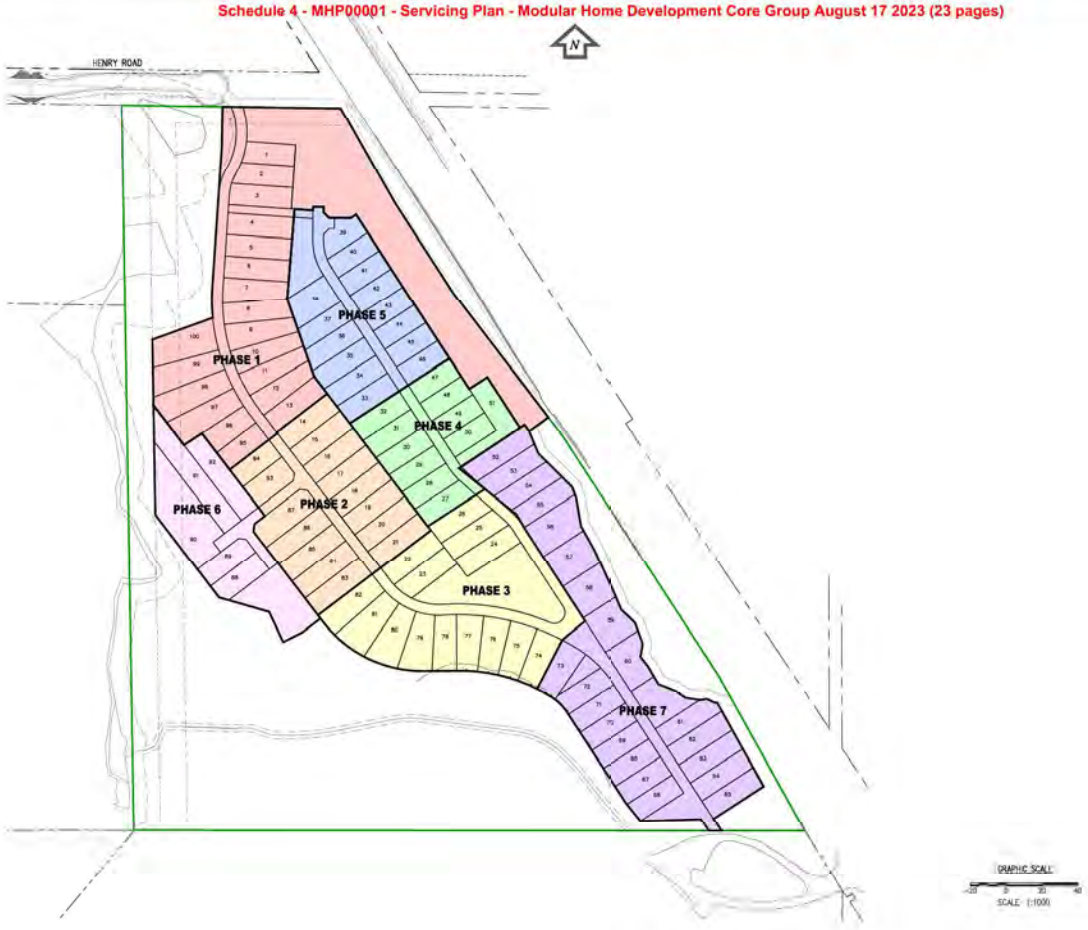
DESIGNED — DR
DRAWN — DR
METRIC SCALE
APPROVED — CN
DATE — AUG 14, 2023

DISTRICT OF NORTH COWICHAN

MORGAN MAPLES

NOTES & ROCK WALL DETAIL

FILE —
CONSULTANTS DWG. No. — 2087
CITY DOC. No. —
SHEET 21 OF 21



LEGAL DESCRIPTION :

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALIGNING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARCEL H-PLANS 11480, 20194 AND VIP58909.
PID No. 009-885-220

CIVIC ADDRESS :

9580 ISLAND HIGHWAY, CHEMAINUS, BC

LEGEND

PHASE 1
PHASE 2
PHASE 3
PHASE 4
PHASE 5
PHASE 6
PHASE 7

GRAPHIC SCALE

-20 0 20 40

SCALE: (1:600)

BENCHMARK DATA:

ELEVATIONS ARE DERIVED FROM GPS OBSERVATIONS. LOCAL BENCHMARK ESTABLISHED ONPOIN CENTER OF SECTION 10, TOWNSHIP 17 ON NELSON STREET. ONPOINT PARCEL 'A' REFERENCE ICON 5723530.

NO.	DATE/BY/#	JD	CK	ISSUED FOR BUILDING PERMIT
0	2021/05/31	DP	CK	ISSUED FOR REVIEW
REVS	DATE/NAME	DRN	CHKD	

LEGAL DESCRIPTION

THE EAST 60 ACRES OF SECTION 10, RANGE 5, CHEMAINUS DISTRICT, EXCEPT 16.5 FOOT STRIP ALONG AND ALIGNING THE NORTH AND EAST BOUNDARIES THEREOF, RESERVED FOR ROAD PURPOSES, EXCEPT PARCEL H (PLANS 11480, 20194 AND VIP58909) 9580 ISLAND HIGHWAY, CHEMAINUS, BC

GRAPHIC SCALE:

DEVELOPER

125719 B.C. LTD.
[illegible]
DUNCAN, BC V9L 5H9
TEL: 604-709-2429

CoreGroup
ENGINEERING & SURVEYS
LAND DEVELOPMENT SERVICES
325-5865 TRANSTON COURT
BURNABY, BC V5J 5H9
tel: (604)299 0600 fax: (604)299 0629

SEAL:

DISTRICT OF NORTH COWICHAN

MORGAN MAPLES

LOT BUILD OUT PHASING PLAN

9580 ISLAND HIGHWAY, CHEMAINUS, BC

DESIGNED	DR
DRAWN	MA
SCALE	1:1000
APPROVED	CM
DATE	AUG. 14, 2023

FILE:
DWG No.: 2087
SITE DOC. No.: DP00026
Sheet 21A of 21

BRITISH COLUMBIA BUILDING CODE 2018

SCHEDULE B

Forming Part of Subsection 2.2.7., Division C of the British Columbia Building Code

Building Permit Number
(for authority having jurisdiction's use)

ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW

Notes: (i) This letter must be submitted prior to the commencement of construction activities of the components identified below. A separate letter must be submitted by each *registered professional of record*.
(ii) This letter is endorsed by: Architectural Institute of BC, Association of Professional Engineers and Geoscientists of the Province of BC, Building Officials' Association of BC, and Union of BC Municipalities.
(iii) In this letter the words in italics have the same meaning as in the British Columbia Building Code.

To: The *authority having jurisdiction*

District of North Cowichan
Name of Jurisdiction (Print)

Re: Morgan Maples
Name of Project (Print)

9090 Island Highway, Chemainus,BC
Address of Project (Print)

The undersigned hereby gives assurance that the design of the

(Initial those of the items listed below that apply to this *registered professional of record*. All the disciplines will not necessarily be employed on every project.)

_____ **ARCHITECTURAL**
_____ **STRUCTURAL**
_____ **MECHANICAL**
AW **PLUMBING** — SITE SERVICES
_____ **FIRE SUPPRESSION SYSTEMS**
_____ **ELECTRICAL**
_____ **GEOTECHNICAL — temporary**
_____ **GEOTECHNICAL — permanent**

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA
C. G. NOLAN
18863
Feb 21 2023

(Professional's Seal and Signature)

February 21, 2023
Date

components of the plans and supporting documents prepared by this *registered professional of record* in support of the application for the *building* permit as outlined below substantially comply with the British Columbia Building Code and other applicable enactments respecting safety except for construction safety aspects.

The undersigned hereby undertakes to be responsible for *field reviews* of the above referenced components during construction, as indicated on the "SUMMARY OF DESIGN AND FIELD REVIEW REQUIREMENTS" below.

CRP's Initials

BRITISH COLUMBIA BUILDING CODE 2018

Schedule B - *Continued*

Building Permit Number
(for *authority having jurisdiction* s use)

9090 Island Highway, Chemainus,BC
Project Address

Plumbing - Site Services
Discipline

The undersigned also undertakes to notify the *authority having jurisdiction* in writing as soon as possible if the undersigned's contract for *field review* is terminated at any time during construction.

I certify that I am a *registered professional* as defined in the British Columbia Building Code.

Cormac Nolan P.Eng
Registered Professional of Record's Name (Print)

320 -8988 Fraserton Court
Address (Print)

Burnaby, BC
Address (Print) (continued)

604 299-0605
Phone Number

(Professional's Seal and Signature)

February 21, 2023
Date

(If the *Registered Professional of Record* is a member of a firm, complete the following)

I am a member of the firm Core Group Civil Consultants Ltd Permit To Practice # 1001017(BC)
and I sign this letter on behalf of the firm. (Print name of firm)

Note: The above letter must be signed by a *registered professional of record,* who is a *registered professional*. The British Columbia Building Code defines a *registered professional* to mean

(a) a person who is registered or licensed to practise as an architect under the Architects Act, or
(b) a person who is registered or licensed to practise as a professional engineer under the Engineers and Geoscientists Act.

CRP's Initials

Schedule B - *Continued*

Building Permit Number
(for *authority having jurisdiction s* use)

9090 Island Highway, Chemainus,BC
Project Address

Plumbing - Site Services
Discipline

SUMMARY OF DESIGN AND FIELD REVIEW REQUIREMENTS

(Initial applicable discipline below and cross out and initial only those items not applicable to the project.)

ARCHITECTURAL

1.1 Fire resisting assemblies
1.2 *Fire separations* and their continuity
1.3 *Closures*, including tightness and operation
1.4 Egress systems, including *access to exit* within *suites* and *floor areas*
1.5 Performance and physical safety features (guardrails, handrails, etc.)
1.6 Structural capacity of architectural components, including anchorage and seismic restraint
1.7 Sound control
1.8 Landscaping, screening and site grading
1.9 Provisions for firefighting access
1.10 *Access* requirements for *persons with disabilities*
1.11 Elevating devices
1.12 Functional testing of architecturally related fire emergency systems and devices
1.13 Development Permit and conditions therein
1.14 Interior signage, including acceptable materials, dimensions and locations
1.15 Review of all applicable shop drawings
1.16 Interior and exterior finishes
1.17 Dampproofing and/or waterproofing of walls and slabs below *grade*
1.18 Roofing and flashings
1.19 Wall cladding systems
1.20 Condensation control and cavity ventilation
1.21 Exterior glazing
1.22 Integration of building envelope components
1.23 Environmental separation requirements (Part 5)
1.24 Building envelope, Part 10 – ASHRAE, NECB or Energy Step Code requirements
~~1.25 Building envelope, testing, confirmation or both as per Part 10 requirements~~

(Professional's Seal and Signature)

February 21, 2023
Date

STRUCTURAL

2.1 Structural capacity of structural components of the *building*, including anchorage and seismic restraint
2.2 Structural aspects of *deep foundations*
2.3 Review of all applicable shop drawings
~~2.4 Structural aspects of unbonded post-tensioned concrete design and construction~~

MECHANICAL

3.1 HVAC systems and devices, including high *building* requirements where applicable
3.2 *Fire dampers* at required *fire separations*
3.3 Continuity of *fire separations* at HVAC penetrations
3.4 Functional testing of mechanically related fire emergency systems and devices
3.5 Maintenance manuals for mechanical systems
3.6 Structural capacity of mechanical components, including anchorage and seismic restraint
3.7 Review of all applicable shop drawings
3.8 Mechanical systems, Part 10 – ASHRAE, NECB or Energy Step Code requirements
~~3.9 Mechanical systems, testing, confirmation or both as per Part 10 requirements~~

CRP's Initials

BRITISH COLUMBIA BUILDING CODE 2018

Schedule B - *Continued*

Building Permit Number
(for *authority having jurisdiction's* use)

9090 Island Highway, Chemainus,BC
Project Address

Plumbing - Site Services
Discipline

PLUMBING

4.1 ~~Roof *drainage systems*~~
4.2 Site ~~and foundation drainage systems~~ SERVICES
4.3 ~~*Plumbing systems* and devices~~
4.4 Continuity of *fire separations* at plumbing penetrations
4.5 Functional testing of plumbing related fire emergency systems and devices
4.6 Maintenance manuals for *plumbing systems*
4.7 Structural capacity of plumbing components, including anchorage and seismic restraint
4.8 Review of all applicable shop drawings
4.9 Plumbing systems, Part 10 – ASHRAE, NECB or Energy Step Code requirements
~~4.10 Plumbing systems, testing, confirmation or both as per Part 10 requirements~~

~~FIRE SUPPRESSION SYSTEMS~~

5.1 Suppression system classification for type of *occupancy*
5.2 Design coverage, including concealed or special areas
5.3 Compatibility and location of electrical supervision, ancillary alarm and control devices
5.4 Evaluation of the capacity of city (municipal) water supply versus system demands and domestic demand, including pumping devices where necessary
5.5 Qualification of welder, quality of welds and material
5.6 Review of all applicable shop drawings
5.7 Acceptance testing for "Contractor's Material and Test Certificate" as per NFPA Standards
5.8 Maintenance program and manual for suppression systems
5.9 Structural capacity of sprinkler components, including anchorage and seismic restraint
5.10 For partial systems — confirm sprinklers are installed in all areas where required
5.11 Fire Department connections and hydrant locations
5.12 Fire hose standpipes
5.13 Freeze protection measures for fire suppression systems
~~5.14 Functional testing of fire suppression systems and devices~~

~~ELECTRICAL~~

6.1 Electrical systems and devices, including high building requirements where applicable
6.2 Continuity of *fire separations* at electrical penetrations
6.3 Functional testing of electrical related fire emergency systems and devices
6.4 Electrical systems and devices maintenance manuals
6.5 Structural capacity of electrical components, including anchorage and seismic restraint
6.6 Clearances from *buildings* of all electrical utility equipment
6.7 Fire protection of wiring for emergency systems
6.8 Review of all applicable shop drawings
6.9 Electrical systems, Part 10 – ASHRAE, NECB or Energy Step Code requirements
~~6.10 Electrical systems, testing, confirmation or both as per Part 10 requirements~~

~~GEOTECHNICAL — Temporary~~

7.1 *Excavation*
7.2 Shoring
7.3 Underpinning
~~7.4 Temporary construction dewatering~~

~~GEOTECHNICAL — Permanent~~

8.1 Bearing capacity of the *soil*
8.2 Geotechnical aspects of deep *foundations*
8.3 Compaction of engineered fill
8.4 Structural considerations of *soil*, including slope stability and seismic loading
8.5 Backfill
8.6 Permanent dewatering
~~8.7 Permanent underpinning~~

(Professional's Seal and Signature)

February 21, 2023
Date

CRP's Initials

GEOPACIFIC
604.439.0922
1779 W 75th Avenue
Vancouver, B.C V6P 6P2

Core Group Civil Consultants Ltd.
#320 – 8988 Fraserton Court
Burnaby, BC
V5J 5H8

February 11, 2022
File: 18529

Attention: Dylan Bryson

Re: Geotechnical Comments on Proposed Stormwater Management Systems
Proposed Modular Home Park - 9090 Island Highway, Chemanius, BC

We understand our comments are required regarding the stormwater management systems proposed onsite and their impact on the groundwater regime and slope stability. We understand each modular home lot will have a raingarden and infiltration gallery to direct water into the ground across the development. We further understand grade changes are proposed across the site with grade increases of up to 9 m towards the south, and grade decreases of up to 8 m to the north.

GeoPacific previously completed a test pit investigation of the subsurface and groundwater conditions on February 23 and 24, 2021. At that time, a total of 22 test pits were excavated across the site between 0.8 m and 3.5 m below current site grades, including two infiltration tests near the centre of site. The results of our investigation are outlined in our Geotechnical Investigation Report, dated March 9, 2021. The subsurface soil conditions across the site generally consist of a layer of topsoil, overlying compact to dense sand to very stiff sandy silt. Some rock outcrops were observed along the west side of site. The static groundwater table was not encountered during the investigation. Some perched groundwater is expected to occur on the boundary of the till-like soils. We expect the stormwater management systems will be located in the native sand to sandy silt, or engineered fill.

We have reviewed the Rainwater Management Plan Report (dated January 24, 2022), provided by Core Group Civil Consultants Ltd. The report indicates stormwater will be managed through the use of stormwater infiltration and detention systems.

Based on the grading plan provided, we expect some permanent slopes will be present. From a geotechnical perspective, we recommend any infiltration galleries have a minimum setback of 5 m away from the top of any permanent slope and be located a minimum of 2 m above the static groundwater table or bedrock contact. If these conditions cannot be met, then stormwater detention systems should be employed in these areas. GeoPacific intends to review the conditions during construction, as outlined in our Geotechnical Investigation Report, to confirm the subsurface conditions on the lots and provide additional recommendations as necessary. Given the above, both stormwater management by infiltration and/or detention is feasible from a geotechnical perspective and an acceptable level of slope stability will be maintained.

We are pleased to be of assistance to you on this project and we trust that our comments and recommendations are both helpful and sufficient for your current purposes. If you would like further details or would like clarification of any of the above, please do not hesitate to call.

For:
GeoPacific Consultants Ltd.

Austin Lockstidt, B.A.Sc., EIT
Engineer In Training

Kevin Bodnar, M.Eng., P.Eng.
Principal

BRITISH COLUMBIA BUILDING CODE 2018

SCHEDULE B

Forming Part of Subsection 2.2.7., Division C of the British Columbia Building Code

Building Permit Number
(for *authority having jurisdiction's* use)

ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW

Notes: (i) This letter must be submitted prior to the commencement of construction activities of the components identified below. A separate letter must be submitted by each *registered professional of record*.
(ii) This letter is endorsed by: Architectural Institute of BC, Association of Professional Engineers and Geoscientists of the Province of BC, Building Officials' Association of BC, and Union of BC Municipalities.
(iii) In this letter the words in italics have the same meaning as in the British Columbia Building Code.

To: The *authority having jurisdiction*

District of North Cowichan
Name of Jurisdiction (Print)

Re: Morgan Maples
Name of Project (Print)

9090 Island Highway, Chemainus, BC
Address of Project (Print)

The undersigned hereby gives assurance that the design of the

(Initial those of the items listed below that apply to this *registered professional of record*. All the disciplines will not necessarily be employed on every project.)

	ARCHITECTURAL
	STRUCTURAL
	MECHANICAL
	PLUMBING
	FIRE SUPPRESSION SYSTEMS
	ELECTRICAL
D	**GEOTECHNICAL — temporary**
D	**GEOTECHNICAL — permanent**

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
K. J. L. BOGNAR
37915

(Professional's Seal and Signature)

June 1, 2021
Date

components of the plans and supporting documents prepared by this *registered professional of record* in support of the application for the *building* permit as outlined below substantially comply with the British Columbia Building Code and other applicable enactments respecting safety except for construction safety aspects.

The undersigned hereby undertakes to be responsible for *field reviews* of the above referenced components during construction, as indicated on the "SUMMARY OF DESIGN AND FIELD REVIEW REQUIREMENTS" below.

CRP's Initials

BRITISH COLUMBIA BUILDING CODE 2018

Schedule B - *Continued*

Building Permit Number
(for *authority having jurisdiction's* use)

9090 Island Highway, Chemainus, BC
Project Address

Geotechnical
Discipline

The undersigned also undertakes to notify the *authority having jurisdiction* in writing as soon as possible if the undersigned's contract for *field review* is terminated at any time during construction.

I certify that I am a *registered professional* as defined in the British Columbia Building Code.

Kevin Bodnar, P. Eng.
Registered Professional of Record's Name (Print)

1779 West 75th Avenue
Address (Print)

Vancouver B.C. V6P 6P2
Address (Print) (continued)

(604) 439-0922
Phone Number

(Professional's Seal and Signature)

June 1, 2021
Date

(If the *Registered Professional of Record* is a member of a firm, complete the following.)

I am a member of the firm GeoPacific Consultants Ltd.
and I sign this letter on behalf of the firm. (Print name of firm)

Note: The above letter must be signed by a *registered professional of record*, who is a *registered professional*. The British Columbia Building Code defines a *registered professional* to mean

(a) a person who is registered or licensed to practise as an architect under the Architects Act, or
(b) a person who is registered or licensed to practise as a professional engineer under the Engineers and Geoscientists Act.

CRP's Initials

Schedule B - *Continued*

Building Permit Number
(for *authority having jurisdiction's* use)

9090 Island Highway, Chemainus, BC
Project Address

Geotechnical
Discipline

SUMMARY OF DESIGN AND FIELD REVIEW REQUIREMENTS

(Initial applicable discipline below and cross out and initial only those items not applicable to the project.)

_____ ARCHITECTURAL

1.1 Fire resisting assemblies
1.2 *Fire separations* and their continuity
1.3 *Closures*, including tightness and operation
1.4 Egress systems, including *access to exit* within *suites* and *floor areas*
1.5 Performance and physical safety features (guardrails, handrails, etc.)
1.6 Structural capacity of architectural components, including anchorage and seismic restraint
1.7 Sound control
1.8 Landscaping, screening and site grading
1.9 Provisions for firefighting access
1.10 *Access* requirements for *persons with disabilities*
1.11 Elevating devices
1.12 Functional testing of architecturally related fire emergency systems and devices
1.13 Development Permit and conditions therein
1.14 Interior signage, including acceptable materials, dimensions and locations
1.15 Review of all applicable shop drawings
1.16 Interior and exterior finishes
1.17 Dampproofing and/or waterproofing of walls and slabs below *grade*
1.18 Roofing and flashings
1.19 Wall cladding systems
1.20 Condensation control and cavity ventilation
1.21 Exterior glazing
1.22 Integration of building envelope components
1.23 Environmental separation requirements (Part 5)
1.24 Building envelope, Part 10 – ASHRAE, NECB or Energy Step Code requirements
1.25 Building envelope, testing, confirmation or both as per Part 10 requirements

(Professional's Seal and Signature)

June 1, 2021
Date

_____ STRUCTURAL

2.1 Structural capacity of structural components of the *building*, including anchorage and seismic restraint
2.2 Structural aspects of *deep foundations*
2.3 Review of all applicable shop drawings
2.4 Structural aspects of unbonded post-tensioned concrete design and construction

_____ MECHANICAL

3.1 HVAC systems and devices, including high *building* requirements where applicable
3.2 *Fire dampers* at required *fire separations*
3.3 Continuity of *fire separations* at HVAC penetrations
3.4 Functional testing of mechanically related fire emergency systems and devices
3.5 Maintenance manuals for mechanical systems
3.6 Structural capacity of mechanical components, including anchorage and seismic restraint
3.7 Review of all applicable shop drawings
3.8 Mechanical systems, Part 10 – ASHRAE, NECB or Energy Step Code requirements
3.9 Mechanical systems, testing, confirmation or both as per Part 10 requirements

CRP's Initials

BRITISH COLUMBIA BUILDING CODE 2018

Schedule B - *Continued*

Building Permit Number
(for *authority having jurisdiction's* use)

9090 Island Highway, Chemainus, BC
Project Address

Geotechnical
Discipline

PLUMBING

4.1 Roof *drainage systems*
4.2 Site and foundation *drainage systems*
4.3 *Plumbing systems* and devices
4.4 Continuity of *fire separations* at plumbing penetrations
4.5 Functional testing of plumbing related fire emergency systems and devices
4.6 Maintenance manuals for *plumbing systems*
4.7 Structural capacity of plumbing components, including anchorage and seismic restraint
4.8 Review of all applicable shop drawings
4.9 Plumbing systems, Part 10 – ASHRAE, NECB or Energy Step Code requirements
4.10 Plumbing systems, testing, confirmation or both as per Part 10 requirements

FIRE SUPPRESSION SYSTEMS

5.1 Suppression system classification for type of *occupancy*
5.2 Design coverage, including concealed or special areas
5.3 Compatibility and location of electrical supervision, ancillary alarm and control devices
5.4 Evaluation of the capacity of city (municipal) water supply versus system demands and domestic demand, including pumping devices where necessary
5.5 Qualification of welder, quality of welds and material
5.6 Review of all applicable shop drawings
5.7 Acceptance testing for "Contractor's Material and Test Certificate" as per NFPA Standards
5.8 Maintenance program and manual for suppression systems
5.9 Structural capacity of sprinkler components, including anchorage and seismic restraint
5.10 For partial systems — confirm sprinklers are installed in all areas where required
5.11 Fire Department connections and hydrant locations
5.12 Fire hose standpipes
5.13 Freeze protection measures for fire suppression systems
5.14 Functional testing of fire suppression systems and devices

ELECTRICAL

6.1 Electrical systems and devices, including high building requirements where applicable
6.2 Continuity of *fire separations* at electrical penetrations
6.3 Functional testing of electrical related fire emergency systems and devices
6.4 Electrical systems and devices maintenance manuals
6.5 Structural capacity of electrical components, including anchorage and seismic restraint
6.6 Clearances from *buildings* of all electrical utility equipment
6.7 Fire protection of wiring for emergency systems
6.8 Review of all applicable shop drawings
6.9 Electrical systems, Part 10 – ASHRAE, NECB or Energy Step Code requirements
6.10 Electrical systems, testing, confirmation or both as per Part 10 requirements

GEOTECHNICAL — Temporary

7.1 *Excavation*
~~7.2 Shoring~~
~~7.3 Underpinning~~
7.4 Temporary construction dewatering

GEOTECHNICAL — Permanent

8.1 Bearing capacity of the *soil*
~~8.2 Geotechnical aspects of *deep foundations*~~
8.3 Compaction of engineered fill
8.4 Structural considerations of *soil*, including slope stability and seismic loading
8.5 Backfill
~~8.6 Permanent dewatering~~
~~8.7 Permanent underpinning~~

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K.J. BODNAR # 37915

(Professional's Seal and Signature)

June 1, 2021
Date

CRP's Initials

BFL CANADA Insurance Services Inc
1177 West Hastings Street, Suite 200
Vancouver BC V6E 2K3
Tel: 604-669-9600
Toll Free: 1-866-669-9602
Fax: 604-683-9316

Certificate of Insurance

Certificate No: 2021-00002

This is to certify to: **To Whom It May Concern**

that the following described policy(ies) or cover note(s) in force at this date have been affected to cover as shown below:

Named Insured: **Geopacific Consultants Ltd.**
Address: **1779 West 75th Avenue, Vancouver, BC V6P 6P2**

Description of operations and/or activities and/or locations to which this certificate applies: Engineering and Surveying

Type	Insurer / Policy No.	Policy Period from (mm/dd/yyyy) to (mm/dd/yyyy)	Limits
General Liability	Intact Insurance Company of Canada Policy No: 5A1197902	01/24/2021 to 01/24/2022	
Bodily Injury and Property Damage Per Occurrence			$ 5,000,000
Personal & Advertising Injury			$ 5,000,000
Non Owned Automobile Liability			$ 5,000,000
Products/Completed Operations Aggregate			$ 5,000,000
Tenants Legal Liability			$ 500,000
Deductible			$ 1,000
PARTICULARS OF INSURANCE - General Liability Premises Property and Operations, Products and Completed Operations, Cross Liability, Blanket Contractual (all written agreements), Occurrence Bodily Injury and Property Damage, Broad Form Property Damage, Contingent Employers Liability, Cross Liability and Seperation of Insureds, Advertising and Personal Injury, Limited Pollution Liability Coverage Endorsement			
Professional Liability (Claims Made)	Victor Insurance Managers Inc. Policy No.ENG565081	01/24/2021 to 01/24/2022	
Each Claim			$ 2,000,000
Aggregate			$ 2,000,000
Deductible			$ 25,000

Additional Information

This certificate is issued as a matter of information only and is subject to all the limitations, exclusions and conditions of the above-listed policies as they now exist or may hereafter be endorsed. We accept no responsibility whatsoever for any inadvertent or negligent act, error or omission on our part in preparing these statements or for any loss, damage or expense thereby occasioned to any recipient of this certificate.

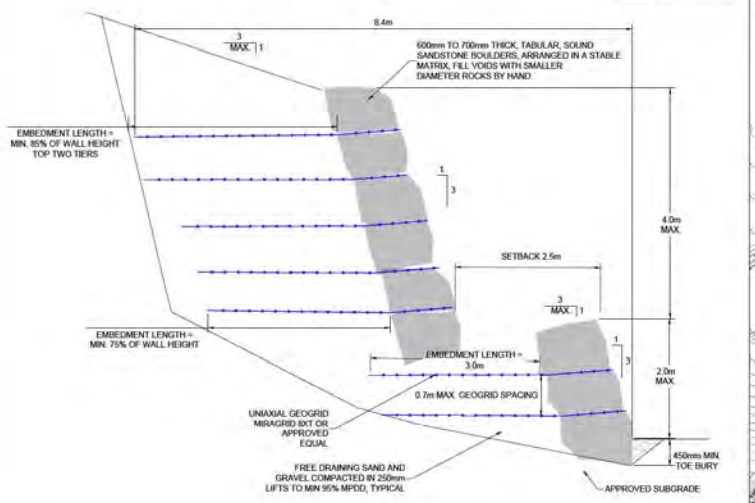
Limits shown above may be reduced by Claims or Expenses paid. This Policy contains a Clause(s) which may limit the amount payable.

BFL CANADA Insurance Services Inc.

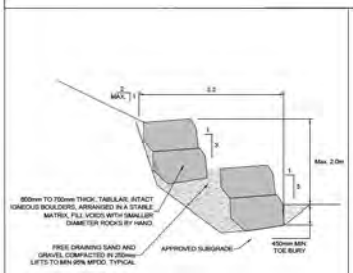
Authorized Representative

Jeff McLellan

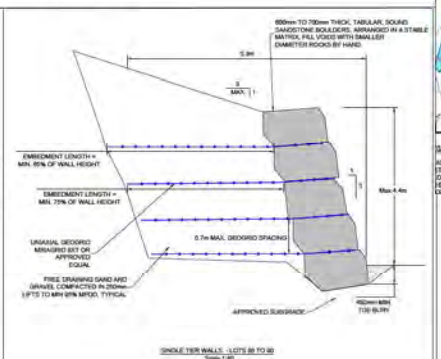
Signed in Vancouver this January 22, 2021



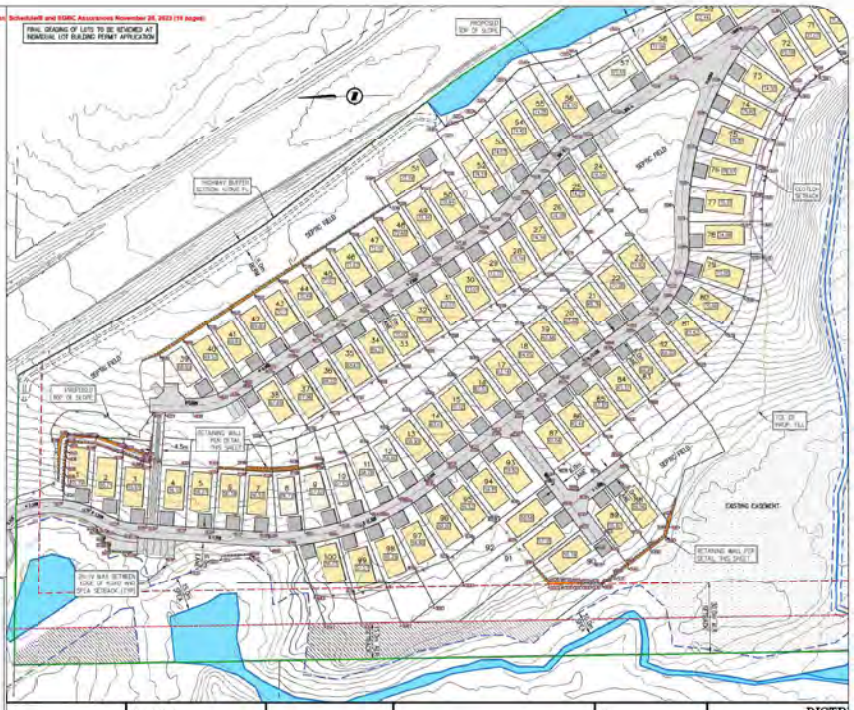
TWO TIER WALLS - LOTS 1 TO 3
Scale 1:40



LANDSCAPE WALLS GRAVITY (LOTS 6 TO 9)
NO GEOGRID
Scale 1:40



SINGLE TIER WALLS - LOTS 80 TO 90
Scale 1:40



SITE PLAN
SCALE 1:750

GENERAL NOTES:

1. REQUIRED GEOTECHNICAL INSPECTIONS:
   - 1.1. BEARING (SUBGRADE)
   - 1.2. BACKFILL GRADATION APPROVAL
   - 1.3. ROCK PLACEMENT (EACH COURSE)
   - 1.4. BACKFILL COMPACTION (EACH COURSE)
   - 1.5. GEOGRID PLACEMENT (EACH COURSE)
2. LINE AND LAYOUT TO BE CONFIRMED BY QUALIFIED PROFESSIONAL.
3. ROCK STACKED IN A STABLE MATRIX WITH NO CONTINUOUS VERTICAL JOINTS AND GOOD CONTACT BETWEEN ADJACENT ROCKS.
4. NO PERMANENT LOADS WITHIN A DISTANCE EQUAL TO 1.5x THE WALL HEIGHT.
5. RETAINING WALLS SHOULD NOT BE ALTERED ONCE INSTALLED.

STACKED ROCK WALL DESIGN NOTES:

1. BACKFILL SOIL, $\Phi' = 30°$, $\gamma' = 21$ kN/m³
2. RETAINED SOIL, $\Phi' = 40°$, $\gamma' = 22$ kN/m³
3. BEARING SOIL, $\Phi' = 40°$, $\gamma' = 22$ kN/m³
4. SURCHARGE - Maximum 20 Dogpoo
5. SEISMIC HAZARD VALUE: 0.561G (2% IN 50 YEAR SEISMIC EVENT)
6. DRAINAGE ACHIEVED BY USE OF FREE DRAINING BACKFILL AND VOIDS BETWEEN FACING ROCKS.
7. WALL DESIGN GENERALLY FOLLOWS FHWA, CFEM AND EGBC GUIDELINES.

REV No.	DATE	BY	P.Eng.	REVISION DESCRIPTION
01	Aug.01-23	JH	CH	Update to new Grading Plan
02	Nov.15 - 2023	JH	CH	Add Additional Wall
03	Nov.21 - 2023	JH	CH	Fix Section, Single Tier Wall Description

LEGEND:

DRAWING TITLE: STACKED ROCK WALLS

PROJECT NAME: MORGAN MAPLES
9090 HIGHWAY #1, CHEMAINUS , BC

LEGAL DESCRIPTION:

ENGINEER'S SEAL

PERMIT TO PRACTICE No: 1001882

PLOT DATE	DRAWN BY
2023-02-13	JH
REVIEWED BY	SCALE
CH/ DC	AS NOTED
PROJECT No.	DRAWING No.
F8718	F8718-03

Lewkowich Engineering Associates Ltd.

ENGINEER OF RECORD – RETAINING WALL ASSURANCE STATEMENT

Note: This Assurance Statement must be completed, signed. and sealed by an individual who:

(i) is a professional engineer or licensee registered or licensed by the Association of Professional Engineers and Geoscientists of the Province of British Columbia (the "Association");

(ii) has read the Association's *Professional Practice Guidelines – Retaining Wall Design* (the "Guidelines"), and has considered the guidance provided in the Guidelines;

(iii) is qualified by education, training, and experience to serve as "Engineer of Record", as that term is defined in the Guidelines; and

(iv) has undertaken responsibility for the project described below in the capacity of Engineer of Record.

[Print clearly and legibly]

TO: **OWNER / CLIENT** DATE: November 20, 2023

1251719 BC Ltd.

Name

320 - 8988 Fraserton Court

Address

Burnaby, BC V5J 5H8

FOR: **PROJECT**

ROCK RETAINING WALLS

MORGAN MAPLES MODULAR HOME DEVELOPMENT

9090 TRANS CANADA HIGHWAY, CHEMAINUS, BC

ENGINEER OF RECORD – RETAINING WALL ASSURANCE STATEMENT

In preparing the Retaining Wall design, I confirm that the following tasks have been completed:

RETAINING WALL CHECKLIST

General (all Retaining Walls):

Check that the following items have been addressed:

- [x] 1. Reviewed requirements of the governing jurisdiction, and documented all other codes, specifications, and guidelines used.
- [x] 2. Established design criteria based on applicable codes and confirmed criteria with owner.
- [x] 3. Completed a site assessment to determine site factors to be incorporated into the Retaining Wall design and construction.
- [x] 4. Conducted geotechnical investigation to determine site conditions and appropriate geotechnical parameters for analysis and design.
- [x] 5. Determined external loading conditions (for example, traffic and construction surcharge loads, potential scour, or flooding).
- [x] 6. Provided lateral earth pressures recommendations for static and seismic loading (these will vary based on the type of wall used).
- [x] 7. Analyzed static global stability of slope – minimum factor of safety >1.5 for N! cases where N is the number of terraces
- [x] 8. Analyzed seismic global stability of slope, if applicable – minimum factor of safety 1.1 or acceptable wall displacement
- [x] 9. Assessed liquefaction potential (provided mitigation measures, if applicable).
- [x] 10. Provided recommendations for general site and wall drainage.
- [x] 11. Provided recommendations for erosion protection, Slope Protection/Wall Facing.
- [x] 12. Assessed the potential impact of wall construction on the slopes above and below the wall.
- [x] 13. Assessed the potential impact of the wall on adjacent structures.

Gravity Walls:

Check that the following items have been addressed:

- [ ] 1. Analyzed for overturning, sliding, and bearing capacity under static conditions.
- [ ] 2. Analyzed for overturning, sliding, and bearing capacity under seismic conditions, if applicable.
- [ ] 3. Completed internal design of the wall (structural design).
- [ ] 4. Detailed an adequate drainage system.
- [ ] 5. Provided appropriate information and guidance for wall construction, including placement specifications, temporary slopes, drainage works, quality control requirements.

Stacked Rock Walls:

Check that the following items have been addressed:

- [x] 1. Analyzed for overturning, sliding, and bearing capacity under static conditions.
- [x] 2. Analyzed internal stability, including sliding between rocks at different heights within the wall.
- [x] 3. Analyzed for overturning, sliding, and bearing capacity under seismic conditions, if applicable.
- [x] 4. Detailed an adequate drainage system.
- [x] 5. Demonstrated by previous performance or laboratory testing that the rock proposed for use in the wall will be durable.
- [x] 6. Provided appropriate information and guidance for wall construction, including placement specifications, rock sizes/weights and stacking requirements, temporary slopes, drainage works, quality control requirements.

Mechanically Stabilized Earth Walls:

Check that the following items have been addressed:

- [ ] 1. Analyzed for overturning, sliding, and bearing capacity and internal stability under static conditions.
- [ ] 2. Analyzed for overturning, sliding, and bearing capacity and internal stability under seismic conditions, if applicable.
- [ ] 3. Analyzed the adequacy of the wall facing to withstand applicable loads, including the loads from connections to soil reinforcement.
- [ ] 4. Provided specifications for soil reinforcement.
- [ ] 5. Confirmed that minimum soil reinforcement length is 70% of the wall height, or provided justification for alternate length.
- [ ] 6. Detailed an adequate drainage system.
- [ ] 7. Provided appropriate information and guidance for wall construction, including placement specifications, temporary slopes, drainage works, quality control requirements.

Reinforced Concrete Cantilever Retaining Walls:

Check that the following items have been addressed:

- [ ] 1. Analyzed for overturning, sliding, and bearing capacity under static conditions.
- [ ] 2. Analyzed for overturning, sliding, and bearing capacity under seismic conditions, if applicable.
- [ ] 3. Completed internal design of the wall (structural design).
- [ ] 4. Detailed an adequate drainage system.
- [ ] 5. Provided appropriate information and guidance for wall construction, including placement specifications, temporary slopes, drainage works, quality control requirements.

ENGINEER OF RECORD – RETAINING WALL ASSURANCE STATEMENT

Submittals:

Check that the following items have been addressed:

- [x] 1. Site plan showing wall location; wall footprint; existing and proposed ground slopes behind and in front of wall; locations of roads, structures, utilities, and all other facilities in the vicinity of the wall; and locations of the wall foundation drainage and other appurtenant drains, including associated discharge locations.
- [ ] 2. Profile along the length of the wall showing variations in wall height, fill height behind the wall, invert elevations of wall foundation drains, and all other features that are included in the design or in close proximity to the wall.
- [x] 3. Cross-section showing typical wall details, including wall batter, foundation preparation, leveling pad details, drainage provisions, erosion protection of exposed slopes above the wall, guardrail details (if required), and other features that are included in the wall design.
- [x] 4. Specifications for backfill and retained soil gradation and all other materials to be incorporated into the Retaining Wall (i.e., geosynthetics, concrete, anchors, drainage media), placement and compaction requirements, field review and compaction testing to meet stability and performance design requirements, drains, erosion control during construction, and concrete, reinforcement, and other structural components.
- [ ] 5. Monitoring and maintenance plan, if applicable.

Field Reviews:

Check that the following item has been addressed:

- [x] 1. The obligation for field reviews as per Bylaw 14(b)(3) has been fulfilled to ascertain whether the implementation or construction of the work substantially complies in all material respects with the design.

ENGINEER OF RECORD – RETAINING WALL ASSURANCE STATEMENT

I certify that I am a professional engineer or licensee registered or licensed by the Association, that I am qualified to serve as Engineer of Record as defined in the Guidelines, and that I have undertaken responsibility for this project in the capacity of Engineer of Record.

Chris Hudec, M.A.Sc., P.Eng.
Name (print)

Signature

November 20, 2023
Date

1900 Boxwood Road
Address

Nanaimo, BC V9S 5Y2

250-756-0355
Phone

geotech@lewkowich.com
Email

(Affix Professional seal here)

If the Engineer of Record is a member of a firm, complete the following:

I am a member of the firm Lewkowich Engineering Associates Ltd., P2P No. 1001802
and I sign this letter on behalf of the firm. *(Print name of firm)*

SCHEDULE B

Forming Part of Subsection 2.2.7., Division C of the British Columbia Building Code

Building Permit Number
(for *authority having jurisdiction's* use)

ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW

Notes: (i) This letter must be submitted prior to the commencement of construction activities of the components identified below. A separate letter must be submitted by each *registered professional of record*.
(ii) This letter is endorsed by: Architectural Institute of BC, Association of Professional Engineers and Geoscientists of the Province of BC, Building Officials' Association of BC, and Union of BC Municipalities.
(iii) In this letter the words in italics have the same meaning as in the British Columbia Building Code.

To: The *authority having jurisdiction*

MUNICIPALITY OF NORTH COWICHAN
Name of Jurisdiction (Print)

Re: STACKED ROCK RETAINING WALLS (E2286)
Name of Project (Print)

9090 TRANS CANADA HIGHWAY (PID: 009-885-200)
Address of Project (Print)

PERMIT TO PRACTICE NUMBER: 1001802

The undersigned hereby gives assurance that the design of the

(Initial those of the items listed below that apply to this *registered professional of record*. All the disciplines will not necessarily be employed on every project.)

	ARCHITECTURAL
	STRUCTURAL
	MECHANICAL
	PLUMBING
	FIRE SUPPRESSION SYSTEMS
	ELECTRICAL
	GEOTECHNICAL — temporary
CMH	**GEOTECHNICAL — permanent**

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA C. M. HUDEC # 29249

2023-11-15

(Professional's Seal and Signature)

NOVEMBER 15, 2023
Date

components of the plans and supporting documents prepared by this *registered professional of record* in support of the application for the *building* permit as outlined below substantially comply with the British Columbia Building Code and other applicable enactments respecting safety except for construction safety aspects.

The undersigned hereby undertakes to be responsible for *field reviews* of the above referenced components during construction, as indicated on the "SUMMARY OF DESIGN AND FIELD REVIEW REQUIREMENTS" below.

CRP's Initials

Schedule B - *Continued*

Building Permit Number
(for *authority having jurisdiction's* use)

9090 TRANS CANADA HIGHWAY (PID: 009-885-200)
Project Address

GEOTECHNICAL
Discipline

The undersigned also undertakes to notify the *authority having jurisdiction* in writing as soon as possible if the undersigned's contract for *field review* is terminated at any time during construction.

I certify that I am a *registered professional* as defined in the British Columbia Building Code.

CHRIS HUDEC, P.ENG.
Registered Professional of Record's Name (Print)

1900 BOXWOOD ROAD
Address (Print)

NANAIMO, BC V9S 5Y2
Address (Print) (continued)

250-756-0355
Phone Number

PERMIT TO PRACTICE NUMBER: 1001802

2023-11-15

(Professional's Seal and Signature)

NOVEMBER 15, 2023
Date

(If the *Registered Professional of Record* is a member of a firm, complete the following.)

I am a member of the firm LEWKOWICH ENGINEERING ASSOCIATES LTD.
and I sign this letter on behalf of the firm. (Print name of firm)

Note: The above letter must be signed by a *registered professional of record,* who is a *registered professional*. The British Columbia Building Code defines a *registered professional* to mean

(a) a person who is registered or licensed to practise as an architect under the Architects Act, or
(b) a person who is registered or licensed to practise as a professional engineer under the Engineers and Geoscientists Act.

CRP's Initials

Schedule B - *Continued*

Building Permit Number
(for *authority having jurisdiction's* use)

9090 TRANS CANADA HIGHWAY (PID: 009-885-200)
Project Address

GEOTECHNICAL
Discipline

SUMMARY OF DESIGN AND FIELD REVIEW REQUIREMENTS

(Initial applicable discipline below and cross out and initial only those items not applicable to the project.)

_____ ARCHITECTURAL

1.1 Fire resisting assemblies
1.2 *Fire separations* and their continuity
1.3 *Closures*, including tightness and operation
1.4 Egress systems, including *access to exit* within *suites* and *floor areas*
1.5 Performance and physical safety features (guardrails, handrails, etc.)
1.6 Structural capacity of architectural components, including anchorage and seismic restraint
1.7 Sound control
1.8 Landscaping, screening and site grading
1.9 Provisions for firefighting access
1.10 *Access* requirements for *persons with disabilities*
1.11 Elevating devices
1.12 Functional testing of architecturally related fire emergency systems and devices
1.13 Development Permit and conditions therein
1.14 Interior signage, including acceptable materials, dimensions and locations
1.15 Review of all applicable shop drawings
1.16 Interior and exterior finishes
1.17 Dampproofing and/or waterproofing of walls and slabs below *grade*
1.18 Roofing and flashings
1.19 Wall cladding systems
1.20 Condensation control and cavity ventilation
1.21 Exterior glazing
1.22 Integration of building envelope components
1.23 Environmental separation requirements (Part 5)
1.24 Building envelope, Part 10 – ASHRAE, NECB or Energy Step Code requirements
1.25 Building envelope, testing, confirmation or both as per Part 10 requirements

PERMIT TO PRACTICE NUMBER: 1001802

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA M. HUDEC # 29249
2023-11-15

(Professional's Seal and Signature)

NOVEMBER 15, 2023
Date

_____ STRUCTURAL

2.1 Structural capacity of structural components of the *building*, including anchorage and seismic restraint
2.2 Structural aspects of *deep foundations*
2.3 Review of all applicable shop drawings
2.4 Structural aspects of unbonded post-tensioned concrete design and construction

_____ MECHANICAL

3.1 HVAC systems and devices, including high *building* requirements where applicable
3.2 *Fire dampers* at required *fire separations*
3.3 Continuity of *fire separations* at HVAC penetrations
3.4 Functional testing of mechanically related fire emergency systems and devices
3.5 Maintenance manuals for mechanical systems
3.6 Structural capacity of mechanical components, including anchorage and seismic restraint
3.7 Review of all applicable shop drawings
3.8 Mechanical systems, Part 10 – ASHRAE, NECB or Energy Step Code requirements
3.9 Mechanical systems, testing, confirmation or both as per Part 10 requirements

CRP's Initials

Schedule B - *Continued*

Building Permit Number
(for *authority having jurisdiction's* use)

9090 TRANS CANADA HIGHWAY (PID: 009-885-200)
Project Address

GEOTECHNICAL
Discipline

PLUMBING

4.1 Roof *drainage systems*
4.2 Site and foundation *drainage systems*
4.3 *Plumbing systems* and devices
4.4 Continuity of *fire separations* at plumbing penetrations
4.5 Functional testing of plumbing related fire emergency systems and devices
4.6 Maintenance manuals for *plumbing systems*
4.7 Structural capacity of plumbing components, including anchorage and seismic restraint
4.8 Review of all applicable shop drawings
4.9 Plumbing systems, Part 10 – ASHRAE, NECB or Energy Step Code requirements
4.10 Plumbing systems, testing, confirmation or both as per Part 10 requirements

FIRE SUPPRESSION SYSTEMS

5.1 Suppression system classification for type of *occupancy*
5.2 Design coverage, including concealed or special areas
5.3 Compatibility and location of electrical supervision, ancillary alarm and control devices
5.4 Evaluation of the capacity of city (municipal) water supply versus system demands and domestic demand, including pumping devices where necessary
5.5 Qualification of welder, quality of welds and material
5.6 Review of all applicable shop drawings
5.7 Acceptance testing for "Contractor's Material and Test Certificate" as per NFPA Standards
5.8 Maintenance program and manual for suppression systems
5.9 Structural capacity of sprinkler components, including anchorage and seismic restraint
5.10 For partial systems — confirm sprinklers are installed in all areas where required
5.11 Fire Department connections and hydrant locations
5.12 Fire hose standpipes
5.13 Freeze protection measures for fire suppression systems
5.14 Functional testing of fire suppression systems and devices

ELECTRICAL

6.1 Electrical systems and devices, including high building requirements where applicable
6.2 Continuity of *fire separations* at electrical penetrations
6.3 Functional testing of electrical related fire emergency systems and devices
6.4 Electrical systems and devices maintenance manuals
6.5 Structural capacity of electrical components, including anchorage and seismic restraint
6.6 Clearances from *buildings* of all electrical utility equipment
6.7 Fire protection of wiring for emergency systems
6.8 Review of all applicable shop drawings
6.9 Electrical systems, Part 10 – ASHRAE, NECB or Energy Step Code requirements
6.10 Electrical systems, testing, confirmation or both as per Part 10 requirements

GEOTECHNICAL — Temporary

7.1 *Excavation*
7.2 Shoring
7.3 Underpinning
7.4 Temporary construction dewatering

CMH **GEOTECHNICAL — Permanent**

8.1 Bearing capacity of the *soil*
8.2 Geotechnical aspects of deep foundations
8.3 Compaction of engineered fill
8.4 Structural considerations of *soil*, including slope stability and seismic loading
8.5 Backfill
8.6 Permanent dewatering
8.7 Permanent underpinning

PERMIT TO PRACTICE NUMBER: 1001802

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA
C.M. BOUDER
29249
2023-11-15

(Professional's Seal and Signature)

NOVEMBER 15, 2023
Date

CRP's Initials