REGIONAL DISTRICT OF NANAIMO

REQUEST FOR PROPOSALS No. 24-004

French Creek Sewer Master Plan

ISSUED: January 25, 2024

CLOSING DATE AND TIME:
Submissions must be received on or before:
3:00 PM (15:00 hrs) Local Time on February 27, 2024

Submissions and Questions are to be directed to:
Rocky Chowdhury, M.Sc., P.Eng.
Project Engineer, Water Services
Email: rchowdhury@rdn.bc.ca

Questions are requested at least five (5) business days before the closing date.

Proposals will not be opened in public.

1. Instructions to Proponents

1.1 Closing Date/Time/Submission Method
Submissions must be received on or before 3:00 PM (15:00 hrs), Local Time, on February 27, 2024.

Submission Method:

By Email: In PDF format with "24-004 French Creek Sewer Master Plan**"** as the subject line at this electronic address:

rchowdhury@rdn.bc.ca

Please note: Maximum email file size limit is 20MB, or less. The RDN will not be liable for any technological delays of submissions.

Submissions received in any other manner will not be accepted.

1.2 Amendment to Proposals
Proposals may be amended in writing and sent via email to the RDN contact person identified on the cover page on or before the closing. Such amendments should be signed by the authorized signatory of the Proponent.

1.3 Addenda and Questions & Answers
If the RDN determines that an amendment or questions & answers are required for this RFP, the RDN will post the Addendum on the RDN (https://www.rdn.bc.ca/current-bid-opportunities) and BC Bid (https://bcbid.gov.bc.ca/) websites. Each addendum will be incorporated into and become part of the RFP. No amendment of any kind to the RFP is effective unless it is contained in a written addendum issued by the RDN. It is the sole responsibility of the Proponent to check and ensure all amendments are included prior to submitting their final Proposal submission.

1.4 Withdrawal of Proposals
The Proponent may withdraw their Proposal at any time by submitting a written withdrawal email to the RDN contact person identified on the cover page on or before the closing.

1.5 Unsuccessful Vendors
The Regional District will offer debriefings to unsuccessful Proponents, on request, at a mutually agreeable time. Proponents must submit the request for debriefing within 15 calendar days after the RFP result is notified to the Proponent.

2. INTRODUCTION

The purpose of this Request for Proposal is to solicit submissions from qualified firms to prepare a sewer master plan for the French Creek Water Service Area.

The sewer master plan will include the capacity analysis of the existing sewage collection system for current population in the service area as well as the full build out scenario area in accordance with the Official Community Plan (OCP). If any part of the sewage collection system capacity needs to be increased, the design will be done as per the RDN standard, and the recommendations will be provided accordingly. In case of OCP build-out scenario, the lots that will primarily be responsible for requiring the sewer infrastructure upgrade, if developed, will be identified.

The desired completion date for this project is September 30, 2024.

3. BACKGROUND

French Creek Sewer Service Area currently does not have a master plan. Different sizes of developments happen sporadically in this area and the developers usually ensure the sewer pipe on their lot frontage have sufficient capacity. The downstream capacity analysis is done for any major developments; however, often without consideration of the future development of the other lots in the local service area.

This master plan will provide a comprehensive analysis of the sewage collection system with the full OCP buildout.

4. SCOPE OF SERVICES

The master plan will cover the sewage collection system (except the Interceptors) of the French Creek Sewer Service Area. The scope of work includes –

1. Collect and review the available documents – record drawings, downstream sewer capacity reports, pump station details, OCP bylaw, existing major properties, development plan of larger lots, land use pattern, local water consumption data etc.
2. Develop a computer model of the existing sanitary sewage collection system of the French Creek Sewer service area using record drawings and RDN GIS data. RDN currently does not have a sanitary sewer hydraulic model. The new hydraulic model needs to be compatible with RDN GIS software.
3. Visit the study area as necessary to confirm various features in the model.
4. Carry out flow monitoring on key sites in both dry and wet period and calibrate and validate the model using flow monitoring data. Consider five (5) flow monitoring sites for this RFP purpose.
    - If the plan is to hire a subconsultant or a contractor for flow monitoring, please include that subconsultant or contractor's details in the proposal. Any subconsultant/contractor fee or other additional cost for flow monitoring should be included with the overall proposed fee.

5. Run the model for existing scenarios and identify the bottleneck locations. If any sewer infrastructure upgrade is needed, identify those, and provide memo with justifications.
    - If any of the existing sewer pipes in the existing scenario carries peak sewage flow with flow depth exceeding 70% of pipe diameter, those pipes need to be upgraded.
    - If any of the existing sewer pipes in the existing scenario carries peak sewage flow with flow depth exceeding 50% of the pipe diameter, those pipes need to be identified for future monitoring and upgrades.
    - Check the pump station capacities with the peak sewage flow volume.
    - If there are manholes that are more than 150 m apart, additional manhole will need to be added.
    - Prepare map showing the peak flow depth at each pipe at the existing scenario.
6. Develop a capital plan and timeline for any upgrades that may be necessary to maintain the current level of service in the future for the existing population and existing infrastructure (i.e. without consideration for the future development).
7. Update the model for OCP buildout with the consideration of subdivision potential of the larger lots and climate change, run the model and note the infrastructure upgrade that would be required for the OCP buildout scenario. Some instances in which case the pipe upgrades will be needed before approving any new developments/subdivisions are -
    - if the peak flow depth in any existing sewer pipe along the downstream sewage flow path from the proposed development to the sewage treatment plant exceeds 50% of the pipe diameter due to the impact of proposed developments /subdivisions.
    - If any existing sewer pipe along the downstream sewage flow path from the proposed development to the treatment plan is already flowing with peak flow depth exceeding 50% of pipe diameter before adding the additional sewage from the new development.
    - if the existing sewer pipe within the new development catchment area does not meet the minimum pipe size requirement.
    - Prepare map(s) showing the new sewer main sizes and grades and the pump station capacities if they need to be upgraded at the OCP build out scenario.
8. Develop capital plan and timelines for upgrades or additional infrastructure that would be necessary to accommodate future development or subdivision. Additionally –
    i) Identify the future development or lots with subdivision potentials that are within the catchment areas of each future sewer infrastructure upgrade.
    ii) Identify the sewage contribution percentage from those NEW lots (with subdivision potentials) that could be identified as contributing to the sewer infrastructure upgrade needs.
    iii) Provide this information in a presentable format.
9. Prepare sewer master plan report.
10. Attend regular meetings with RDN staff at the project start and at different stages of the project. Plan for 4 meetings for this RFP purpose.
11. The consultant shall provide monthly written memos to the RDN summarizing the progress to date and the monthly memo will accompany the monthly invoice.

5. *DELIVERABLES AND OUTCOMES*

The deliverables are –

1) Sewer master plan report for the French Creek Sewer Service Area that includes –
   a) Capital project plan and timeline for existing infrastructure without the consideration of the new development.
   b) The sewer infrastructure bottlenecks and peak sewage flow depth at the sewer mains with the existing scenario.
   c) Capital project plan and timeline to accommodate the new developments at OCP Buildout scenario.
   d) all design calculations for sewer flows and attach the spreadsheets as appendices to the report.
   e) Criteria and assumptions that were used for capacity analysis and design using hydraulic model.
2) Flow monitoring data.
3) Sewer model files for RDN to use in the future.

6. *REFERENCE/BACKGROUND INFORMATION*

The following reference documents are included –

1) Sewer infrastructure map for the French Creek Sewer Service Area.
2) Subdivision potential map (this is an older version of the map. This map is currently being updated and the updated map will be shared with the successful proponent).
3) 1999 French Creek Pre-design Study.

7. *Budget*

The project budget is $125,000 + G.S.T.

8. *PROPOSAL SUBMISSION AND EVALUATION*

To assist in receiving similar and relevant information, and to ensure your Proposal receives fair evaluation, the RDN asks Proponents to provide the following information. Proposals will be evaluated on the following basis 60% Technical, 40% Financial.

Please include with your proposal:

<u>Technical 60%</u>

   a) Corporate background, history, areas of expertise and practice of corporate sustainability; (5 Point)
   b) Curriculum vitae of personnel that will perform the work and that shows the experience and expertise of the team; (5 point)
   c) At least two (2) but no more than five (5) references involving similar work. The references of the highest ranked proponent may be contacted for confirmation. (10 Point)

d) Layout the plan to accomplish the project including methodology, work plan and schedule; (25 Point)
e) Submit the conflict-of-interest disclosure form with the proposal and disclose any actual, potential, or perceived conflict of interest in details and explain what measures have been or will be taken to mitigate any conflict of interest. (10 Point)
f) Provide detailed breakdown of the proposed fee, in Canadian Dollars, in a Schedule of Effort Table, identifying all project contributors, their per hour charge out rates, individual tasks, hours and all disbursements including travel. (5 Point)

Financial 40%

The lowest price proposal will receive full marks. Other proposals will receive reduced scores based on the proportion higher than the lowest price. i.e. Score = Min Cost/Cost x Fee Points.

Proposals submitted should be in enough detail to allow the RDN to determine the Proponent's qualifications and capabilities from the documents received. The selection committee, formed at the RDN's sole discretion, will score the Proposals in accordance with the criteria provided.

The RDN may evaluate proposals on a comparative basis by comparing one proponent's proposal to another proponent's proposal. The RDN reserves the right to not complete a detailed evaluation if the RDN concludes the proposal is materially incomplete or, irregular or contain any financial or commercial terms that are unacceptable to the RDN.

The selection committee may proceed with an award recommendation or the RDN may proceed to negotiate with the highest evaluated proponent with the intent of developing an agreement. If the parties after having bargained in good faith are unable to conclude a formal agreement, the RDN and the Proponent will be released without penalty or further obligations other than any surviving obligations regarding confidentiality and the RDN may, at its discretion, contact the Proponent of the next best rated Proposal and attempt to conclude a formal agreement with it, and so on until a contract is concluded or the proposal process is cancelled.

The RDN reserves the right to award the assignment in whole or in part or to add or delete any portion of the work. Throughout the evaluation process, the evaluation committee may seek additional clarification on any aspect of the Proposal to verify or clarify the information provided and conduct any background investigation and/or seek any additional information it considers necessary.

9. *PROPOSED PURCHASE CONTRACT*

The RDN's preferred form of Contract is attached herein. Proponents should carefully review this form of Contract. Should any vendors request that RDN consider revisions to the form of Contract, Proponents should include any clauses of concern in their proposal submission and suggest replacement language.

10. GENERAL CONDITIONS

10.1 No Contract
By submitting a Request for Proposal and participating in the process as outlined in this RFP, proponents expressly agree that no contract of any kind is formed until a fully executed contract is in place.

10.2 Privilege Clause
The lowest or any proposal may not necessarily be accepted.

10.3 Acceptance and Rejection of Submissions
This RFP does not commit the RDN, in any way to select a preferred Proponent, or to proceed to negotiate a contract, or to award any contract. The RDN reserves the right in its sole discretion cancel this RFP, up until award, for any reason whatsoever.

The RDN may accept or waive a minor and inconsequential irregularity, or where applicable to do so, the RDN may, as a condition of acceptance of the Submission, request a Proponent to correct a minor or inconsequential irregularity with no change in the Submission.

10.4 Relationship Disclosure
A Proponent should complete and submit a "Relationship Disclosure Statement: Conflict of Interest and Unfair Advantage" (attached to the RFP) that fully discloses the following relationships:

(a) The Proponent as an organization or any members of the Proponent's team who currently has contract or were in contractual relationship during the last two-year period with any real estate developer that may have interest in land development in the French Creek Sewer Service Area.

(b) all other known relationship, contract or any other matter that might give rise, to:
- (i) a conflict of interest; or
- (ii) an unfair advantage,

with the knowledge and intention that the Owner may rely on any such disclosure.

At the time of such disclosure, the Proponent should include sufficient information and documentation to demonstrate that appropriate measures have been, or will be, implemented to mitigate, minimize, or eliminate the actual, perceived, or potential conflict of interest or unfair advantage, as applicable. The Proponent will provide such additional information and documentation and implement such additional measures as the Owner may require in its discretion in connection with the Owner's consideration of the disclosed relationship and proposed measures. If, at any time before award of the Contract, the Proponent becomes aware of any such relationship that was not disclosed in its Proposal, then the Proponent will, by written notice addressed to the Contact Person, promptly disclose such relationship.

10.5 Conflict of Interest and Unfair Advantage
The Owner reserves the right in its absolute and sole discretion to:

(a) disqualify any Proponent that in the Owner's opinion has a conflict of interest or an unfair advantage (including access to any confidential information not available to all Proponents), whether actual, perceived, or likely to arise in the future; and
(b) may permit a Proponent to continue in this competitive procurement process and impose such conditions as the Owner may consider to be in the public interest or otherwise required by the Owner with respect to an actual, potential, or perceived conflict of interest.

10.6 Solicitation of Board Members and RDN Staff
Proponents and their agents will not contact any member of the RDN Board or RDN Staff with respect to this RFP, other than the RDN Contact named in this document.

10.7 Litigation Clause
The RDN may, in its absolute discretion, reject a Proposal submitted by Proponent, if the Proponent, or any officer or director of the Proponent is or has been engaged either directly or indirectly through another corporation in legal action against the RDN, its elected or appointed officers and employees in relation to:

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

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

10.8 Exclusion of Liability
Proponents are solely responsible for their own expenses in preparing and submitting a Proposal and for any meetings, negotiations, or discussions with the RDN. The RDN will not be liable to any Proponent for any claims, whether for costs, expense, losses or damages, or loss of anticipated profits, or for any other matter whatsoever, incurred by the Proponent in preparing and submitting a Proposal, or participating in negotiations for a Contract, or other activity related to or arising out of this RFP. Except as expressly and specifically permitted in these Instructions to Proponents, no Proponent shall have any claim for compensation of any kind whatsoever, as a result of participating in this RFP, and by submitting a Proposal each Proponent shall be deemed to have agreed that it has no claim.

10.9 Ownership of Proposals
All Proposals, including attachments and any documentation, submitted to and accepted by the RDN in response to this RFP become the property of the RDN.

10.10 Freedom of Information

All submissions will be held in confidence by the RDN. The RDN is bound by the Freedom of Information and Protection of Privacy Act (British Columbia) and all documents submitted to the RDN will be subject to provisions of this legislation. The successful vendor and value of the award is routinely released.

REGIONAL DISTRICT OF NANAIMO

CONFLICT OF INTEREST DISCLOSURE FORM

Project Information
Project Name: French Creek Sewer Master Plan
Project Number: 24-004

Proponent's Information
Name:
Title:
Organization:

Part A: Reporting Conflict of Interest
Please check the box that applies to your situation: ☐ There is no conflict of interest to report. ☐ Potential Conflict(s) ☐ Perceived Conflict(s) ☐ Real Conflict(s)
If there is potential, perceived, or real conflict, please answer the question below.
Describe the Circumstances that may be considered as Conflict of Interest (attach additional pages, as necessary):

REGIONAL DISTRICT OF NANAIMO

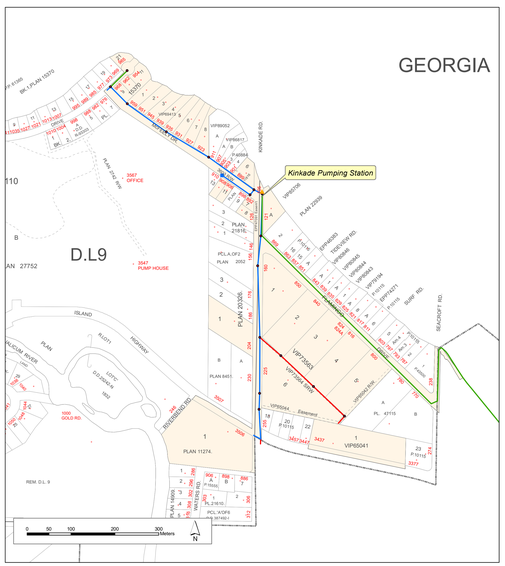
Part B: Conflict Management Plan
☐ There is no conflict, so a conflict management plan is not required. ☐ The situation described in Part A is a conflict of interest and the conflict management plan is given below.
Describe the conflict management plan to eliminate the conflict of interest(s):

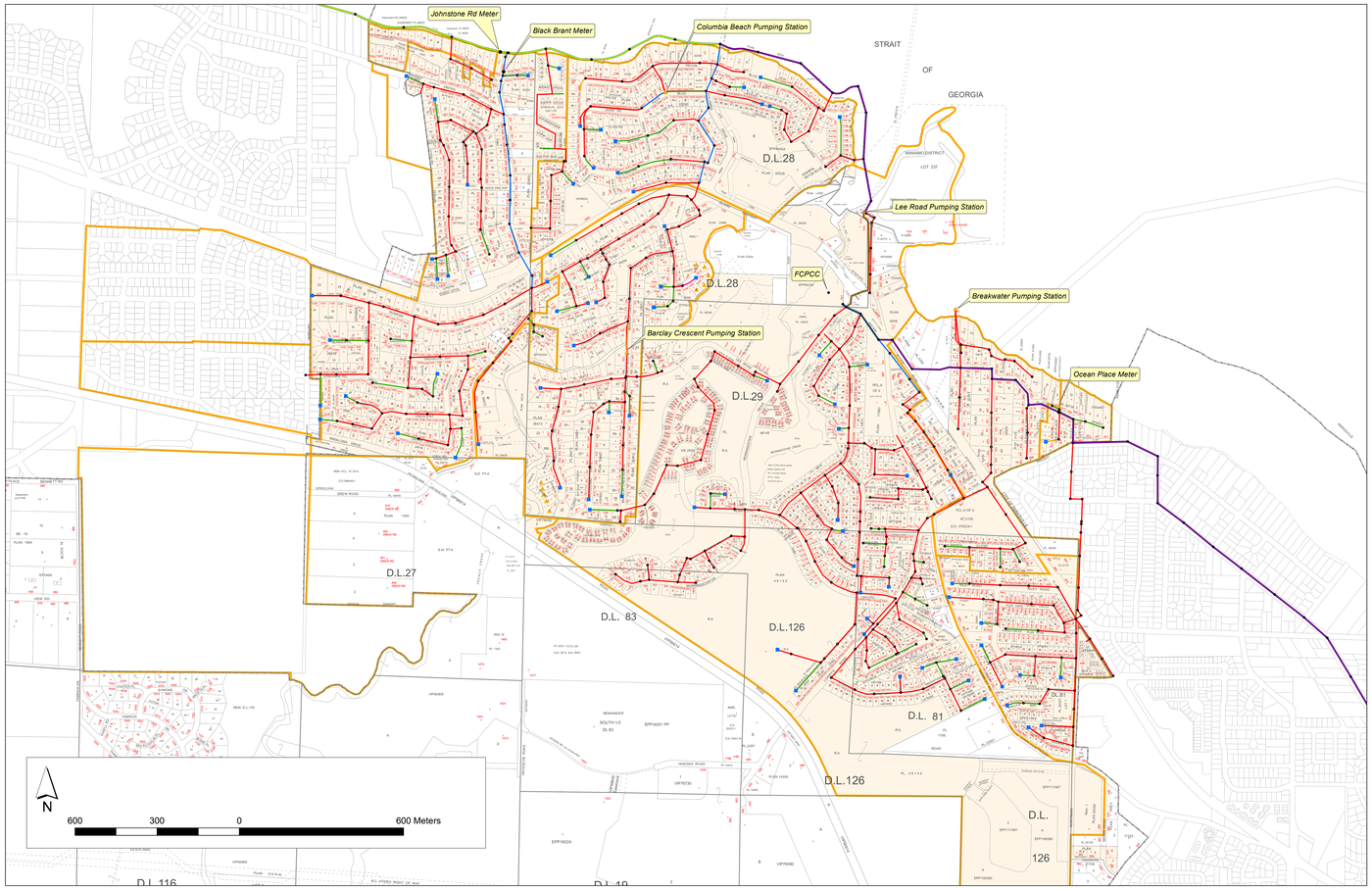
In signing and submitting this form, I certify that the above information is true to the best of my knowledge.

Name: _____

Signature: _____

Date: _____





French Creek Sewer System

Sewer Lines Pipe Size

50
75
100
150
200
250
300
375
450
525
600

Interceptor Pipe Size

150
200
250
300
350
375
400
450
455
525
600
610
675
750
900

Sewer Points

- Manhole
- Clean Out
- Pumping Station
- Flow Station
- Treatment Plant

Sewer Local Service Area

Sewer Catchment Area

BL 1021 Pacific Shores

BL 1124 Surfside

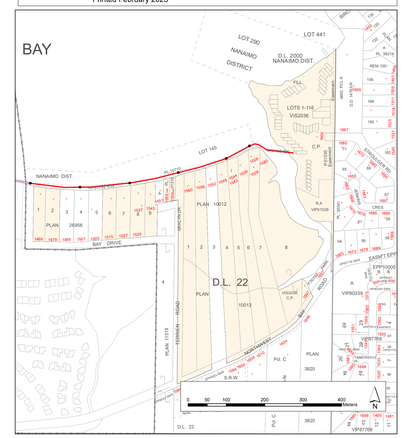
BL 1391 Barclay

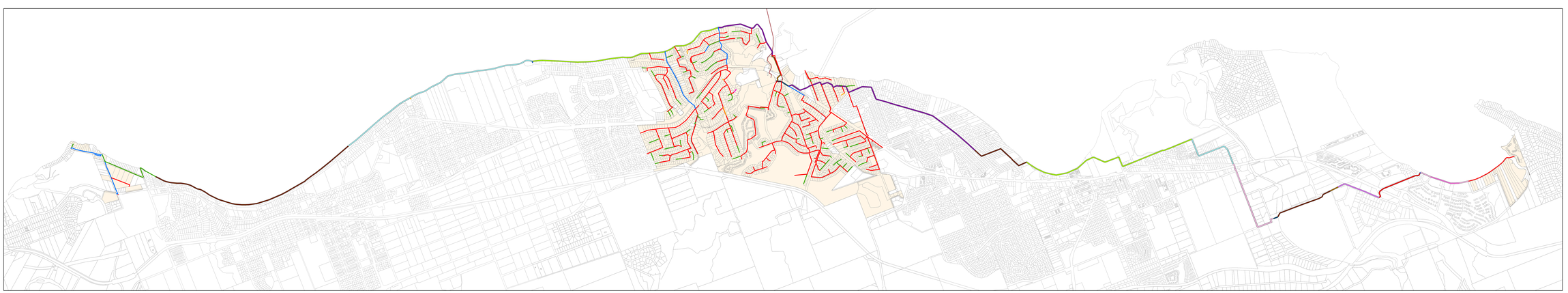
BL 1445 Cedar

BL 813 French Creek Sewer

BL 947 Fairwinds

Printed February 2023





SALISH SEA

Strait of Georgia

French Creek Potential New Lots (based on Zoning)

* assumed that all properties in the GCB have sewer

- 1-3 Potential New Lots
- 4-9 Potential New Lots
- 10-19 Potential New Lots
- 20-88 Potential New Lots
- Growth Containment Boundary
- Agricultural Land Reserve
- Electoral Area Boundary

REGIONAL DISTRICT OF NANAIMO

0 100 200 300 400 500 Meters

September 2020

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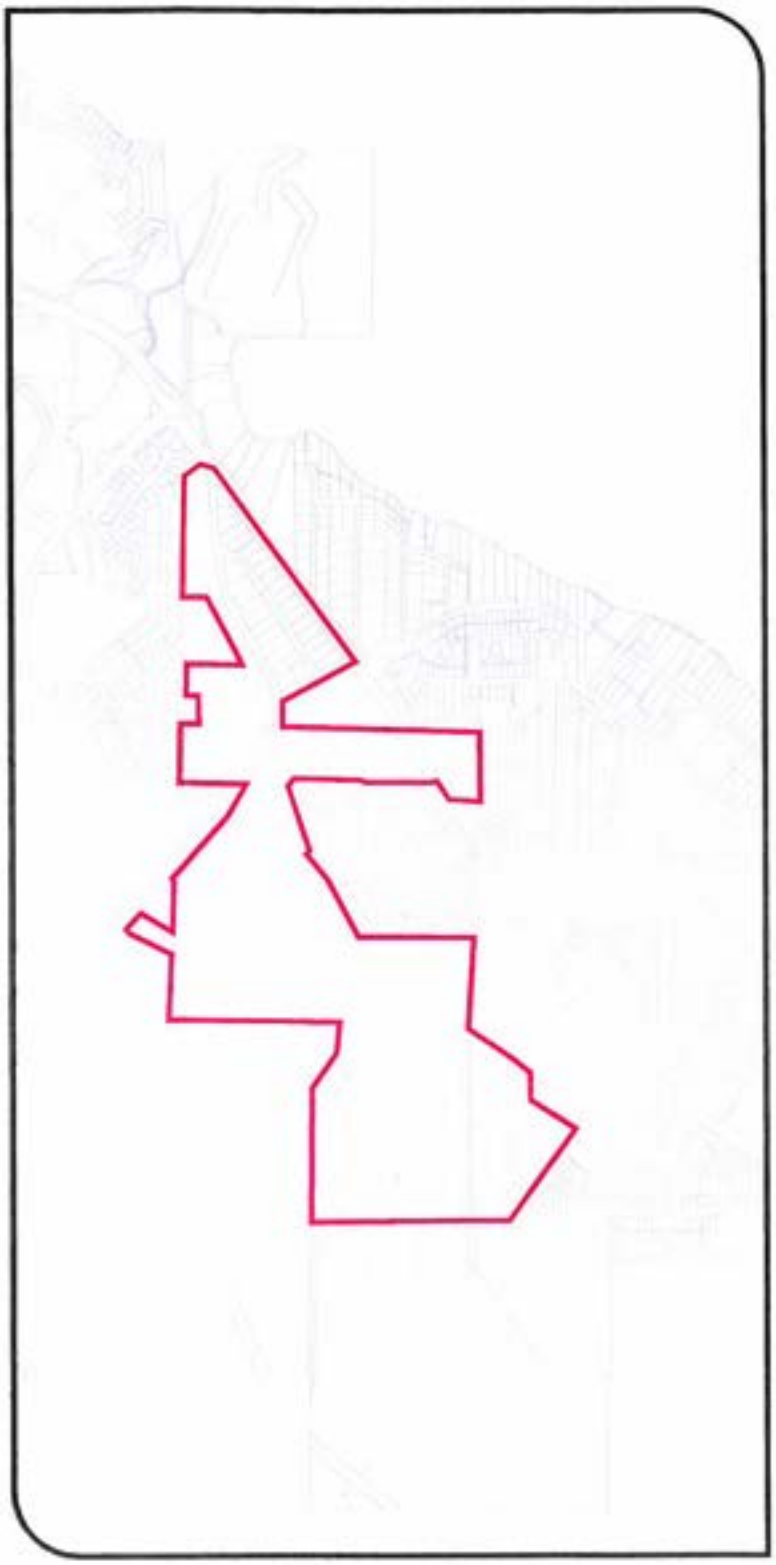

WEMBLEY ROAD / FRENCH CREEK SANITARY SEWER

PRE-DESIGN STUDY

Prepared for:

THE REGIONAL DISTRICT OF NANAIMO

File: 5500-20-01-FC

October, 1999

PROPERTY OF RDN
ENVIRONMENTAL
SERVICES
PLEASE RETURN

ANDERSON
Civil Engineering

ANDERSON
Civil Engineering

Regional District of Nanaimo
Environmental Services
6300 Hammond Bay Road
P.O.Box 40
Lantzville, BC
V0R 2H0

5500-20-01-FC
file: 2019
October 4,1999

Attention: Wayne Moorman, P.Eng.
Manager of Engineering and Utilities

Dear Wayne,

Re: Wembley Road - French Creek
Sewer Predesign Study

We are pleased to submit four bound and one unbound copies of the completed Final Report on this study.

It has been an exciting challenge to work on this report, and we thank you for your support and cooperation.

Yours truly,

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA D.M.A. FOURNIER

Doris M. A. Fournier, P.Eng
Project Engineer

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA D. W. ANDERSON

Douglas W. Anderson, P.Eng
Principal

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Suite K-427 Fitzwilliam Street, Nanaimo, B.C. V9R 3A9
Tel 250 754 1877 Fax 250 754 4375 email civileng@bc.sympatico.ca

ANDERSON

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1. INTRODUCTION

1.1 Context

The French Creek Official Community Plan (OCP), Bylaw No. 1115, was prepared following a four phase public consultation process and published in 1998 by the Regional District of Nanaimo (RDN). [A] *"The purpose of the French Creek Official Community Plan is to provide a comprehensive set of guidelines and policies for managing existing and future uses of land and water surfaces in the Plan Area. The French Creek Official Community Plan will provide citizens and the RDN with a framework for decision making in light of pressure for growth and change."*

The most recent sewer collection study for the entire French Creek area was completed by Dayton and Knight Ltd. (D & K) in March of 1989. Dayton and Knight prepared a pre-design and construction cost estimate for collector sewers to service the densely populated unserviced areas.

The current study for the Wembley Road/French Creek area is based on the D & K study and incorporates the French Creek OCP and RDN Bylaw 500 - Land Use and Subdivision regulations.

1.2 Background

The Wembley Road/French Creek study area is located immediately adjacent to the north end of the west boundary of the City of Parksville. The study area is approximately triangular in shape and has a total area of approximately 92 ha. It is bounded by the Island Highway and Wembley Road on the east, Lowry's Road and Arrowsmith Way on the west and Church Road on the south. Refer to Figure 1.

A section of the study area has been developed already and includes institutional facilities on the north end (Ascension Church and St.-Columbia Church), commercial establishments on the north and east ends (Thrift store, restaurant and bakery at north and gas bar, restaurant, market and video store at east), residential single family dwelling units at north and south ends and mobile homes at the north end. The Morningstar Golf Course maintenance building and fairways 3, 4, 6 and 7 are located in the south end of the study area.

Fairways 6 and 7 and associated future subdivisions are within the Agricultural Land Reserve (ALR). The Morningstar Golf Course has applied to the Agricultural Land Commission for land removal from the ALR to build a subdivision. We understand that this application was rejected due to the proposed subdivision proximity to an existing pig farm. This is the only section of the study area that is within the ALR. Refer to Figure 2.

French Creek OCP Map No. 7 shows no Forest Land Reserve in the study area.

[A] Regional District of Nanaimo, French Creek Official Community Plan Bylaw No. 1115, October 1998

Watermains in the study area have been installed and are maintained by Breakwater Enterprises Ltd. of Parksville, BC. All of the residents have access to connect to the watermains except for residents on Cannon Road and a section of Manse Road.

Most of the single family dwelling units in the study area are on septic fields. The following properties are or will be connected to the existing RDN sewer collection system west of the study area and were removed from the proposed study area:

- 9 single family lots on corner of Arrowsmith Way and Roberton Road
- 3 single family lots on corner of Arrowsmith Way and Yellowbrick Road
- 24 of the new 31 lot single family subdivision on Wembley Road (Lot 2, Plan 17590, District Lot 29, Nanoose District)
- Lot 2, Plan 41955, District Lot 29, Nanoose District
- Morningstar Golf Course Maintenance building lot on Lowry's Road.

The study area has an existing road network composed of major network and local roads mostly used by local residents. Wembley Road stretches from the south to the north of the study area. Two future road connections are proposed for this area and identified in the OCP (Map 9):

- Extension of Lowry's Road north to the Wright Road and Wembley Road intersection and
- Extension of Church Road north to the Island Highway.

A section of the proposed Church Road extension is within the ALR. The Ministry of Transportation and Highways (MOTH) has previously applied to the Agricultural Land Commission for land removal from the ALR. We understand that this application was rejected due to the proximity to an existing pig farm, since the ALR does not wish to encourage the intrusion of a non-farming population into farming areas.

1.3 Objectives

This sanitary sewer pre-design study was required to confirm the concept and details of servicing the remaining undeveloped Wembley Road/French Creek area. The study was also to confirm that the stubs and blank ends left by adjacent servicing are correct.

Following is an outline of the methodology used for this study:

- Meet RDN staff and confirm schedule and scope
- Collect as-built drawings, cadastral map, design reports for adjacent areas, adjoining servicing agreements (e.g., SD 69), survey point data (1996)
- meet RDN planning staff for population and land development projections for the area
- Contact utilities and authorities with infrastructure or jurisdiction in the area (MOTH, Breakwater, BC Tel/Telus, BC Hydro, Centra Gas & Shaw Cable)
- Confirm and refine catchments from mapping and previous designs
- Visit the study area to confirm boundaries, confirm grades with hand clino, revise catchments as necessary
- Contact with Ministry of Environment and DFO was not required as affected watercourses were not found during site inspection or from topographic mapping
- Calculate sewage design flows for projected populations based on RDN engineering standards; develop phasing of construction if appropriate

- Define required pipe sizes and grades
- Review downstream capacities to confirm earlier designs and identify any bottlenecks
- Suggest effective solutions to any bottlenecks by upgrading, or diversion of upstream flows
- Prepare draft report with concept drawings, submit for review
- Review meeting with RDN
- Complete supplementary topographic survey
- Complete report: Drawings
  Text
  Schedule of Quantities
  Construction cost estimate
- Submit draft of final report
- Review meeting with RDN
- Publish and submit

2. ZONING DENSITIES AND DESIGN POPULATION

2.1 Zoning Densities

Future development is based on the RDN Bylaw 500 and the French Creek OCP Bylaw 1115. RDN Bylaw 500 zoning and French Creek OCP land use designations are shown in Table 1 at the end of this section.

Types and densities of future development are governed by RDN Bylaw 500. The study area includes seven zones:

	Total area (ha)
• PU1Q – Public 1	2.97
• CM2Q – Commercial 2	2.04
• RS1Q – Residential 1	39.39
• RU1F – Rural 1	26.15
• RC1Z – Recreation 1	15.48
• PU1F – Public 1	2.65
• CD5Z – Wembley Comprehensive Development	2.72

The French Creek OCP represents the future goals of the community and reflects slightly higher land use densities than Bylaw 500. The Regional Board can choose to retain RDN Bylaw 500 zoning and is not obligated to approve any rezoning application where higher density development is listed in the OCP.

The study area has five OCP zones:

	Total area (ha)	Density
• Rural	32.61	1 DU/ha
• Neighbourhood Residential	38.33	15 DU/ha
• Commercial	2.54	50 pers/ha
• Wembley Comprehensive Development Area		
- Residential Comprehensive	11.75	25 DU/ha
- Multi-family	2.72	102 DU
• French Creek Harbour CDA		
- Institutional	2.0	50 pers/ha
- Commercial	0.86	50 pers/ha

For the purpose of this study, the French Creek OCP higher zoning densities have been used to determine ultimate population in the study area. A zoning of 15 DU/ha (Neighbourhood Residential) was used for all rural areas (RU1) within the sewer service area. This will accommodate possible future rezoning for higher density development. The area outside the sewer service boundary was reviewed for development at 15 DU/ha as proposed by the owners of the golf course.

The French Creek OCP has designated areas where the Regional Board may require Development Permit Areas (DPA) prior to commencement of development. DPA's have been designated for the following purposes:

- Protecting the environment,
- Protecting development from hazardous conditions,
- Protecting farmland,
- Revitalising commercial areas or
- Establishing objectives and providing guidelines for commercial, industrial or multiple family residential developments.

The study area has two DPA's identified:

- DPA 1 – Wembley Centre, composed of residential, comprehensive, and multi-family developments, and
- DPA 2 – French Creek Harbour Centre, composed of institutional, greenspace and commercial developments.

All lands within the DPA's can be considered for public uses.

2.2 Design Population

A density of 2.4 persons per dwelling units (DU) was used for this study and is assumed to remain unchanged in the future. *(Population, Demographic and Economic Forecasts for the Regional District of Nanaimo, Westland Resource Group and Economic Planning Group, March 1995).*

For existing residential development, the design population is obtained by multiplying the number of DU by 2.4 persons. For future residential development, the design population is obtained by multiplying the maximum permitted DU under the applicable land zoning by 2.4 persons. For existing institutional, commercial and industrial zoned land, the design population is based on a population density of 50 persons/ha.

The following table shows the ultimate population in the study area for development in accordance with the OCP.

	DU	Total Pop.
Sewer Service Area		
• Neighbourhood Residential	578	1387
• Commercial		127
• Wembley CDA		
- Residential Comprehensive	309	741
- Multi-family	102	245
• French Creek Harbour CDA		
- Institutional		100
- Commercial		73
Sewer Service Area Total		2673
Unserviced Area		
• Rural	259	620
Unserviced Area Total		620

2.3 Table 1 - Sub Area Land Use Descriptions

Area Key	Sewage Sub-Areas ha		OCP Landuse	Bylaw 500 Zoning	OCP DU/ha Pop/ha	OCP Sewer Area	SD69 Latecomers
A	0.29		Wembley Residential	RS 1	25		
B	0.53		Wembley Residential	RS 1	25		
C	2.05		Wembley Residential	RS 1	25		
D	2.92		Wembley Residential	RS 1	25		
E	0.50		Wembley Residential	RS 1	25		
F	2.72		Wembley Multi	CD5	102		
G	0.60		Wembley Residential	RS1	25		
H	2.72		Rural	RU1	1 *	No	
J	2.00		Wembley Residential	RS1	25		
K	3.45		Wembley Residential	RS1	25		
L	1.37		Neighbourhood Residential	RS1	15		
M	1.10		Neighbourhood Residential	PU1	50		
N	1.44		Commercial	CM4/CM2	50		
P	10.80		Rural	RC1	1	No	
Q	4.58		Rural	RC1	1	No	
R	13.81		Rural	RU1	1 *	No	
S	0.70		Rural	RS1	1 *	No	
T	6.89		Neighbourhood Residential	RS1	15		Yes
U	7.11		Neighbourhood Residential	RU1	1 *		Yes
V	1.14		Neighbourhood Residential	RS1	15		Yes
W	2.62		Neighbourhood Residential	RU1	1 *		Yes
X	2.50		Neighbourhood Residential	RS1/RU1	15		Yes
Y	1.25		Neighbourhood Residential	RS1	15		Yes
Z	2.06		Neighbourhood Residential	RS1	15		
AA	1.34		Neighbourhood Residential	RS1	15		
AB	1.53		Neighbourhood Residential	RS1	15		
AC	1.97		Neighbourhood Residential	RS1	15		
AD	0.76		Neighbourhood Residential	RS1	15		
AE	0.93		Neighbourhood Residential	RS1	15		
AF	0.42		Neighbourhood Residential	RS1	15		
AG	1.66		Neighbourhood Residential	PU7	50 *		
AH	0.99		Institutional (FC)	PU7	50		
AJ	0.63		Neighbourhood Residential	RS1	15		Part
AK	1.52		Neighbourhood Residential	RS1	15		
AL	1.23		Neighbourhood Residential	RS1	15		
AM	0.60		Neighbourhood Residential	RS1	15		
AN	0.60		Commercial (FC)	CM2	50		
AP	1.87		Institutional/ Commercial (FC)	PU1/CM2	50		
AQ	2.37		Neighbourhood Residential	RS1	15		

* 15 DU/ha assumed for this study

3. WASTE WATER COLLECTION SYSTEM

3.1 Existing Facilities

The existing sewage facilities that service the study area include local collector sewers, the Parksville interceptor and the French Creek Water Pollution Control Centre.

The Parksville interceptor begins at the RDN Bay Avenue Pump Station as a forcemain up to Doehle Avenue and continues as a gravity interceptor to the French Creek Water Pollution Control Centre. Capacities of the affected interceptors have been confirmed in earlier studies.

Some small sections of the study area are or will be connected to the existing RDN sewer collection system west of the study area and were removed from the proposed study area:

- 9 single family lots on corner of Arrowsmith Way and Roberton Road
- 3 single family lots on corner of Arrowsmith Way and Yellowbrick Road
- 24 of the new 31 lot single family subdivision on Wembley Road (Lot 2, Plan 17590, District Lot 29, Nanoose District)
- Lot 2, Plan 41955, District Lot 29, Nanoose District
- Morningstar Golf Course Maintenance building lot on Lowry's Road.

3.2 Design Criteria

The RDN Bylaw 500 – Schedule 7E contains standards for public sewer system design. These standards were used to prepare the Wembley Road/French Creek Sanitary Sewer Pre-Design Study.

3.2.1 Design Peak Flows

Following are the design standards used to determine design peak flows:

- Design Contributing Population is developed from the criteria in Section 2 above
- The peak sewage flow is calculated by multiplying the design peak unit flow (DPUF) by the design contributory population. The DPUF is shown on a chart in the Schedule 7E Sewer Standards.
- Peak storm water infiltration is calculated on the basis of 10 m^3/ha/day of design tributary area.
- Design Sewage Flow is computed by adding peak sewage flow to peak storm water infiltration.

3.2.2 Sewage Collection System

Following are the design standards used for the preliminary design of the sewage collection system:

- Facilities are designed to convey peak sewage flow plus peak stormwater infiltration (Design Flow).

- Gravity sewers are designed to carry design flow at a minimum velocity of 0.67 m/s.
- When carrying the design flow, the maximum depth of flow does not exceed the following:
  250 mm and smaller – one-half pipe diameter
  300 mm to 400 mm – three-quarter pipe diameter
- A Manning Roughness Coefficient of 0.013 was used for design of gravity sewers
- Lateral sewers are not less than 200 mm in diameter, except 150 mm diameter is used in the final section of laterals that cannot be extended.
- Manholes are a minimum 1050 mm in diameter. Distance between manholes does not exceed 120 m. Manholes are located at grade changes, at sewer size changes, at the upstream end of all sewers, and at the junction of all sewers.

3.3 Sewage Sub-areas

Sewage sub-areas and characteristics were determined from the following:

- Site inspections of the Wembley Road/French Creek area.
- Existing sewage collection system locations.
- Topographic sheets 92F.039.022, 023, 032, 033, 042 & 043, Ministry of Environment (aerial photography 1980), vertical contour interval 1 meter, map scale of 1:2000.
- RDN overall cadastral mapping.

Within the area, sub-areas were defined and drawn into AutoCAD. Refer to Figure 1 for study area and Figure 3 for sub-area boundaries and designations; refer to Table 1 for areas and details (Section 2 above).

3.4 Proposed Gravity Sewage Collection System Layout

The collection system layout was designed to service all areas by gravity as far as possible. All areas within the sewer service area (OCP - Map #6) can be served by gravity. Sewers were located in existing road alignments as far as possible. As the proposed road network plan includes an extension of Lowry's Road from Lowry's Place through to Wright Road, a sewer was shown along this alignment.

Most of the sanitary sewers for the Wembley Comprehensive Development Area (CDA) have already been designed by Newcastle Engineering. Their layout grades were followed and extensions added where necessary. A future sewer on Ackerman Road was added to service potential development to the west.

The collection system is divided into three separate areas (refer to Figure 4 for sewer system layout):

- The first lies to the east and contributes into the upstream end of the regional system through the City of Parksville. A large part of this area lies within the City of Parksville.

- The second area includes most of the study area and leads to the end of the sewer system on Wright Road installed by School District 69 when the Middle School was constructed. This system runs north on Breakwater Road to the regional trunk.
- The third system runs north on Wembley and Reid Roads into an existing larger diameter system connecting directly to the regional trunk.

3.4.1 Area Outside Service Area

At the southwest of the Study Area there is a large section of property outside the sewer service area boundary (areas H, P, Q, R, & S). The section includes holes No. 3, 4, 6 and 7 of Morningstar Golf Course (areas P & Q) and a large area currently set aside by the owner for residential development (areas R & S). Although most of the areas are in the ALR, and an initial application has been refused, possible service routes were investigated. Servicing by gravity to the northeast is not practical due to the height of land along Wembley Road. There are also downstream capacity problems in that direction. Alternate servicing in a northwest direction towards Lowry's road and thence northward was investigated. From topographic mapping information and spot heights taken for this study, it appears feasible to convey the sewage by gravity from this property. Diligent and detailed design on behalf of the developer will be required.

Part of the proposed residential development (area H), also outside the sewer service area boundary, can be serviced by gravity to the existing northeast Aberdeen Drive / Field Crescent section of sewer. These small flows do not have a significant impact on this section of sewer.

A conceptual layout of future sewers has been shown on the drawings, but the detailed design and construction costs should be the responsibility of future developers. The areas of land to the south (R, S & H) and outside the sewer service area have not be included in the basic flow calculations. An additional set of calculations to include these areas is shown on Table 3 in Appendix C.

3.4.2 Isolated Lots on Wembley Road

There are five existing lots on Wembley Road (area L, opposite Riley Road) which are not included in the specified area for the Latecomers Agreement with School District 69. From the topographic information collected, it does not appear feasible to direct this sewage westwards to the end of Lowry's Place without significant lowering of the proposed manhole SMH 18. As the gravity main from the end of Lowry's Place to Wright Road would also need to be lowered, it may not be economic to service in this direction.

As discussed below, there are concerns about the capacity of the downstream sewers through Parksville on Aberdeen Drive. Although it would be desirable to direct the sewage from these five lots (and the assumed future subdivision into smaller lots) away from the Parksville system, these small flows do not have a significant impact on the overall problem. Since these lots are not included in the Latecomers Agreement, it simplifies the issue not to direct them in a northerly direction. We have assumed that the sewage flow from the five lots will be directed to the 150 mm diameter pipe on Riley Road. This short section of 150 mm diameter will not require upgrading since the existing pipe has adequate capacity.

3.4.3 Lots South of Oceanside Middle School

Lot 1, Plan 50465, Lot 2, Plan 30553 and Part of Lot 1, Plan 6179 (West of Plan 814R/W) along Wembley Road have a topography rolling down towards the north east. Sewage from these three lots (Area AQ) can be collected easily by gravity to the proposed mains along the Island Highway. Sewage from part of these three lots can also be collected by gravity on Wembley Road and directed to the Wright Road collection system. Since Lot 1, Plan 50465 and Lot 2, Plan 30553 only front Wembley Road, the proposed collection system (MH 25 to MH 26) was placed on Wembley Road. This sewer is designed at 0.5% and as deep as possible to serve the back of the lots. This sewer can also collect flows from a section of Part of Lot 1, Plan 6179. The rest of Part of Lot 1 (Area AB) drains towards the proposed sewage collection system on the Island Highway (MH 14 to MH 16).

3.5 Sewage Design Flows

Sewage design flows were developed from the anticipated land use and in accordance with Section 3.2.1 above. Detailed calculations are shown on Table 2 - Sewer Service Area Flows - following this section.

Design flows were calculated through the collection system and as far as the regional trunk interceptor. Pipes with design peak flows greater than pipe capacity (flowing half full) have been highlighted in red.

3.5.1 Downstream System within Parksville

The initial calculations used flows generated from the Parksville Sewer Study Update. (Appendix D). These flows resulted in significant overloading of the existing sewage collection system at the north end. The principle reason for this overloading is the RDN standard requiring that the pipes carry the design flow when only half full. In the City of Parksville study, Koers and Associates used the Parksville design standards which allow the pipe to flow full and with an improved roughness coefficient N=0.011. Using these allowable figures resulted in a significantly improved situation.

To provide consistency within the study, the sewage flows were revised to the same criteria for land use and population density used elsewhere. This resulted in a slightly lower design flow, although the half full capacity was still exceeded in the downstream pipes. Without extensive pipe replacement, the design flows cannot be handled with the pipes flowing only half full. If it is acceptable that the pipe capacity allow the pipes to flow full, then a critical situation can be avoided. The Aberdeen Drive / Field Crescent section of sewer is the natural recipient for three sections of the study area (Areas A through K, Area L and Areas M and N). Refer to Figure 3.

The natural routing from the Wembley CDA is north into Parksville, and the only alternative would be to pump westwards towards the Lowry's Road system. This would result in overloading downstream in the Wright Road area and consequently upsizing or redirection of the flow north on Wembley Road.

The small section of sewer diverted at the top of Riley Road (Area L) into the Parksville system could be directed to the west, although at increased cost. The small quantity of sewage generated from this area does not materially affect the downstream situation.

The commercial areas to the east of the highway naturally lead to Aberdeen Drive. Any alternative redirection would require a pumping station and a highway crossing. The volume of sewage does not materially affect the magnitude of the problem, and we recommend that this flow be accommodated in the sewer on Aberdeen Drive.

3.5.2 Wright Road at the Island Highway

In the collection system northwards on Lowry's Road, there is a potential bottleneck at the end of Wright Road before the system crosses the highway. This is an extremely short section of pipe and the capacity is available if the flow is allowed to exceed half full. We recommend that no improvements be required on this section of pipe. A detailed inspection by the RDN operations staff should be undertaken to confirm that there are no operational difficulties with allowing this sewer to flow in excess of half full and that benching and drop through manhole are up to standard.

3.5.3 Future Service Area South of Lowry's Road

Sewage design flows on Lowry's Road are critical to the size of main selected. When only the area within the sewer service area is contributing, the standard 200 mm diameter pipe laid at minimum gradient (0.41%) is adequate to serve the proposed area. If further subdivision and extension of sewer service southwards takes place (Areas R & S), additional sewage loading will exceed the capacity of the main. A 250mm diameter pipe will be required. One alternative would be for the developer to install the increased capacity at his own expense in anticipation that the future development will eventually take place.

3.6 Right-of-Ways Required

Generally all sewers have been located in existing roadways, except in a few instances.

The conceptual layout of sewers to service the properties at the south end of the study area assumes that the developer will place these in the future dedicated roads or will provide Rights-of-Way in favour of the RDN to cover the sewers installed.

At the north end of Lowry's Place there is a future road alignment identified in the OCP for continuation through to Wright Road. If the gravity sewer must be constructed before the roadway is dedicated, then a Right of Way should be obtained covering the sewer alignment. This alignment appears on the RDN cadastral mapping, and may represent an existing right-of-way.

Rights-of-ways will be required through the following lots to construct sanitary sewers: (Refer to Figure 7)

- Lot 1, Plan 1799
- Lot 4, Plan 53745

REGIONAL DISTRICT OF NANAIMO
WEMBLEY ROAD/FRENCH CREEK
PRE-DESIGN SANITARY SEWER STUDY

TABLE 2

SEWER SERVICE AREA FLOWS

ANDERSON
Civil Engineering

MANNING'S FORMULA:
V=(R^(2/3)*S^(1/2))/n
Q=VA N=0.013

MANHOLE UP	MANHOLE DOWN	LOCATION	Sewer Sub-Area	AREA (ha)	DENSITY UNITS	DENSITY DU/ha	DENSITY pop/ha	EQUIV POP POP.	EQUIV POP CUM.	SEWAGE FLOW PEAK FLOW FLOW m3/cap/d	SEWAGE FLOW PEAK FLOW CUM. m3/d	INFILTRATION INFILTRATION FLOW m3/d	INFILTRATION INFILTRATION CUM. m3/d	TOTAL FLOW m3/d	TOTAL FLOW l/s	PROPOSED OR EXISTING SEWER GRADE %	DIAM mm	VEL m/s	CAP Half Full l/s
1	N-8	Manse Rd	A	0.29		25		18	18	1.95	34.32	2.93	2.93	37.25	0.43	0.50%	200	0.74	11.59
2	N-8	Cannon Rd	B	0.53		25		32	49	1.95	95.79	5.25	8.19	103.97	1.20	0.05%	200	0.23	3.67
N-8	N-7	Manse Rd	C	2.05		25		123	172	1.75	301.46	20.52	28.71	330.17	3.82	0.50%	200	0.74	11.59
N-7	N-6	Manse Rd	D	2.92		25		175	348	1.40	486.60	0.00	28.71	515.31	5.96	1.00%	200	1.04	16.39
N-6	N-5	Manse Rd		0.00		25		0	348	1.40	486.60	0.00	28.71	515.31	5.96	1.04%	200	1.06	16.72
N-5	N-4	Wembley Rd	E	0.50		25		30	378	1.40	528.79	5.02	33.73	562.52	6.51	0.50%	200	0.74	11.59
N-4	N-3	Wembley Rd	F	2.72	102			245	623	1.20	747.01	27.15	60.89	807.89	9.35	0.85%	200	0.96	15.11
N-3	N-2	Ackerman Rd	G	0.60		25		36	659	1.20	790.21	6.00	66.00	876.20	10.14	1.15%	200	1.12	17.58
N-2	N-1	Ackerman Rd	J	2.01		25		121	779	1.10	857.23	20.13	106.13	963.36	11.15	2.33%	200	1.59	25.02
N-1	266	Ackerman Rd	K	3.45		25		207	986	1.00	986.42	34.52	140.65	1127.07	13.04	3.42%	200	1.93	30.31
17	18	Wembley Rd	-					0	0	1.10	0.00	0.00	0.00	0.00	0.00	5.00%	150	1.93	17.02
18	264	Riley Rd	L	1.37		15		49	49	1.95	96.24	13.71	13.71	109.95	1.27	0.75%	200	0.90	14.19
264	263	Riley Rd	-						49	1.95	96.24	0.00	13.71	109.95	1.27	0.90%	200	0.99	15.55
266	241	Ackerman Rd		16.24		15		585	1571	0.80	1256.85	162.40	303.05	1559.90	18.05	3.18%	200	1.86	29.23
241	240	Highway		0.00		15		0	1571	0.80	1256.85	0.00	303.05	1559.90	18.05	0.50%	200	0.74	11.59
240	236	Aberdeen Dr.		15.04			50	752	2323	0.73	1695.84	150.40	453.45	2149.29	24.88	1.19%	200	1.14	17.86
-	236		M+N	2.55			50	128	128	1.85	1.85	25.50	25.50	27.35	0.32	0.50%	200	0.74	11.59
236	212	Aberdeen Dr.		4.00		15		144	2595	0.70	1816.19	40.00	518.95	2335.14	27.03	1.16%	200	1.12	17.65
212	233	Aberdeen Dr.		4.00		15		144	2739	0.70	1916.99	40.00	558.95	2475.94	28.66	1.16%	200	1.12	17.65
233	232	Marsh Pl.		5.56		15		200	2939	0.69	2027.72	55.60	614.55	2642.27	30.58	1.16%	200	1.12	17.65
232	TRUNK	ROW		3.79		15		136	3075	0.65	1998.86	37.90	652.45	2651.31	30.69	1.27%	200	1.18	18.47
3	4	ROW	T	6.89		15		248	248	1.60	396.88	68.90	68.90	465.78	5.39	0.41%	200	0.67	10.50
4	5	ROW	-	0.00		15		0	248	1.60	396.88	0.00	68.90	465.78	5.39	0.41%	200	0.67	10.50
5	6	Lowry's Rd	U	7.11		15		256	504	1.25	630.07	71.11	140.02	770.09	8.91	0.41%	200	0.67	10.50
6	7	Lowry's Rd	-	0.00		15		0	504	1.25	630.07	0.00	140.02	770.09	8.91	0.41%	200	0.67	10.50
7	8	Lowry's Place	V	1.14		15		41	545	1.25	681.35	11.40	151.41	832.76	9.64	2.50%	200	1.65	25.92
8	9	Future Lowry's Rd	-	0.00		15		0	545	1.25	681.35	0.00	151.41	832.76	9.64	3.30%	200	1.90	29.78
9	12	Future Lowry's Rd	W	2.62		15		94	639	1.20	767.27	26.20	177.61	944.88	10.94	3.90%	200	2.06	32.37
10	11	Yellow Brick Rd	-	0.00		0		0	0	0.90	0.00	0.00	0.00	0.00	0.00	0.50%	200	0.74	11.59
11	12	Yellow Brick Rd	X	2.50		15		90	90	1.95	175.73	25.03	25.03	200.76	2.32	0.50%	200	0.74	11.59
12	13	Future Lowry's Rd	-	0.00		15		0	730	1.10	802.46	0.00	202.64	1005.10	11.63	2.00%	200	1.48	23.18
26	25	Wembley Road	AQ	2.37		15		85	85	1.95	166.59	23.73	23.73	190.32	2.20	0.50%	200	0.74	11.59
25	13	Wembley Road	-	0.00		0		0	85	1.95	166.59	0.00	23.73	190.32	2.20	0.50%	200	0.74	11.59
13	X-1	Wright Rd	Y	1.25		15		45	860	1.05	902.83	12.47	215.11	1117.95	12.94	1.80%	200	1.40	21.99
U-1	X-1	Reid Rd	Z	2.06		15		74	74	1.95	144.94	20.65	20.65	165.59	1.92	0.41%	200	0.67	10.50
X-1	X-2	Wright Rd	-	0.00		15		0	934	1.05	980.88	0.00	235.76	1216.64	14.08	1.08%	200	1.08	17.03
14	15	Island Hwy	AA	1.34		15		48	48	1.95	94.11	13.41	13.41	107.52	1.24	1.00%	200	1.04	16.39
15	16	Island Hwy	AB	1.53		15		55	103	1.90	196.60	15.34	28.74	225.35	2.61	1.00%	200	1.04	16.39
16	X-2	Island Hwy	-	0.00		0		0	103	1.90	196.60	0.00	28.74	225.35	2.61	1.00%	200	1.04	16.39
X-2	X-3	Island Hwy	SCHOOL	3.72				160	1198	0.95	1137.76	37.20	301.70	1439.46	16.66	0.48%	200	0.72	11.38
X-3	X-4	Island Hwy		0.00	0			0	1198	0.95	1137.76	0.00	301.70	1439.46	16.66	1.01%	200	1.05	16.47
X-4	X-5	Breakwater Rd		0.97		15		35	1233	0.90	1109.36	9.72	311.42	1420.78	16.44	1.97%	200	1.47	23.01
X-5	X-6	Breakwater Rd		1.87		15		67	1300	0.70	909.86	18.66	330.08	1239.93	14.35	1.61%	200	1.32	20.80
X-6	TRUNK	Breakwater Rd		1.74		15		63	1362	0.85	1158.11	17.41	347.49	1505.60	17.43	4.15%	200	2.13	33.39
VR-A	VR-B	Wembley Rd	AC	1.97		15		71	71	1.95	138.62	19.75	19.75	158.36	1.83	0.92%	200	1.00	15.76
VR-B	VR-C	Wembley Rd	AD	0.76		15		27	98	1.95	191.92	7.59	27.34	219.26	2.54	0.60%	200	0.81	12.70
VR-C	19	Wembley Rd	AE	0.93		15		33	132	1.95	257.16	9.29	36.63	293.79	3.40	1.00%	200	1.04	16.39
19	20	Wembley Rd	AF	0.42		15		15	147	1.95	286.65	4.20	40.83	327.48	3.79	2.10%	200	1.51	23.75
20	21	Wembley Rd	AG	1.66		15		60	207	1.80	372.11	16.59	57.43	429.54	4.97	2.50%	200	1.65	25.92
21	Z-4	Wembley Rd	AH	0.99			50	50	256	1.65	422.79	9.90	67.33	490.11	5.67	6.10%	200	2.58	40.48
22	23	Reid Rd	AJ	0.63		15		23	23	1.95	43.98	6.27	6.27	50.25	0.58	0.50%	200	0.74	11.59
23	24	Reid Rd	AK	1.52		15		55	77	1.95	150.89	15.23	21.50	172.39	2.00	0.50%	200	0.74	11.59
24	Z-1	Reid Rd	AL	1.23		15		44	122	1.90	231.16	12.30	33.80	264.96	3.07	0.50%	200	0.74	11.59
Z-1	Z-2	EXIST. ROW	AM	0.60		15		22	143	1.90	272.26	6.01	39.80	312.06	3.61	3.33%	200	1.91	29.91
Z-2	Z-3	Island Hwy	-	0.00		0		0	143	1.90	272.26	0.00	39.80	312.06	3.61	2.00%	250	1.71	42.03
Z-3	Z-4	Island Hwy	AN	0.60			50	30	173	1.75	303.34	6.01	45.81	349.15	4.04	3.41%	250	2.24	54.88
Z-4	TRUNK	Island Hwy	AP	1.87			50	93	523	1.30	679.74	18.66	131.80	811.54	9.39	1.95%	250	1.69	41.50

4. PRE-DESIGN CONSTRUCTION COST ESTIMATES

Construction cost estimates have been prepared for the gravity sewers shown in this report for servicing the Sewer Service Area (OCP):

- Costs are only for sewage collection mains to parcel boundaries. Details inside individual lots are to be designed and constructed by the property developers.
- Costs are in 1999 dollars and the estimates are Class C. Refer to Appendix E for Class C Estimate Definition
- An allowance for engineering and construction contingency is shown, but no costs for legal, property, financing and other similar items.
- No significant rock excavation is expected on the alignments shown. A small amount of rock will not affect this Class C cost estimate
- Because improvements have not been recommended, no costs have been included for upgrading existing sanitary sewers

The following cost estimates are compiled into summary format which generally follow the grouping of contributing areas.

	Units	Quantities	Unit Rate	Cost
Areas A through N: (Aberdeen/Field)				
150 mm dia. sewer	m	240	$ 125	$ 30,000
Manholes	ea	1	$3,000	$ 3,000
Cleanouts	ea	3	$2,000	$ 6,000
Tie to existing	ea	3	$1,500	$ 4,500
Construction under paved road	m	240	$ 100	$ 24,000
			Subtotal	$ 67,500
Areas T through AB: (Breakwater)				
200 mm dia. sewer	m	1500	$ 175	$262,500
Manholes	ea	13	$3,000	$ 39,000
Cleanouts	ea	4	$2,000	$ 8,000
Tie to existing	ea	2	$1,500	$ 3,000
Deep trench from SMH 3 to SMH 7	m	370	$ 50	$ 18,500
Construction under paved road	m	1000	$ 100	$100,000
			Subtotal	$431,000
Areas AC through AP: (French Creek)				
200 mm dia. sewer	m	600	$ 175	$105,000
Manholes	ea	5	$3,000	$ 15,000
Cleanouts	ea	1	$2,000	$ 2,000
Tie to existing	ea	2	$1,500	$ 3,000
Construction under paved road	m	600	$ 100	$ 60,000
			Subtotal	$185,000
			Total Construction Cost	$683,500
			Contingency (15%)	$102,525
			Engineering (20%)	$136,700
			Subtotal	**$922,725**
			GST (7%)	$ 64,591
			Total Project Cost	**$987,316**

Unit Costs: 1371 Dwelling Units @ $ 720.14
62.3 ha (serviced) @ $15,847.77

5. APPROVALS

5.1 Communications with Utilities

We wrote to each of the appropriate utilities advising them of the study area and the intention to design gravity sewers. A copy of this letter is enclosed in Appendix A.

- A written response was received from Ministry of Transportation and Highways indicating that there were no particular concerns at this time. Detailed discussion and information will be required at the time of final design.
- Verbal response was received from BC Hydro, BC Tel, Breakwater Enterprises, Centra Gas and Shaw Cable indicating that there were no particular concerns at this time. Detailed discussion and information will be required at the time of final design.
- BC Tel & BC Hydro have underground lines on Lowry's Road, Roberton Boulevard, and Arrowsmith Way; all installed to service the subdivisions. These are not directly in the area proposed for new sewers.
- Centra gas has provided copies of their record drawings and these record drawings show mains on the following streets:
  - Church Road
  - Wembley Road - Church to Ackerman
  - Lowry's Road - most
  - Lowry Place
  - Yellow Brick Road/ Wembley Road/ Wright Road
  - Reid Road/ Wembley Road
- Breakwater Enterprises has also provided copies of their record drawings and these record drawings show mains on the following streets:
  - Church Road
  - Manse Road – Church to Cannon
  - Ackerman Road – Church to Wembley
  - Wembley Road - Church to Wright
  - Lowry's Road - most
  - Lowry Place
  - Yellow Brick Road/ Wright Road
  - Reid Road/ Wembley Road

5.2 Ministry of Transportation and Highways

Approval from the Ministry of Transportation and Highways is required for the construction of sanitary sewer works within road right-of-ways. A normal application for Permission to Construct Works in Crown Lands will be required for each construction project.

5.3 Other Utilities

Approvals of pipe alignment and grades from BC Hydro, BC Tel, Centra Gas, Breakwater Enterprises and Shaw Cable will be required for underground crossings. Coordination-ordination with these agencies will be required during the design period.

6. CONCLUSIONS AND RECOMMENDATIONS

General conclusions and recommendations are developed in the body of the report and summarised here.

6.1 Service Area

Areas outside the sewer service area are not included in the proposed works. To add Areas R & S, the 200 mm diameter sewer main proposed from SMH 3 - 7 beside Lowry's Road will require upgrading to 250 mm diameter. Refer to Figure 3. This can be achieved by cost sharing the installation of the larger 250 mm diameter pipe during initial construction, through a latecomers agreement or by requiring replacement at the developers expense at the time of development.

Area H outside the sewer service area can be serviced by gravity to the existing northeast Aberdeen Drive / Field Crescent section of sewer. These small flows do not have a significant impact on the overall problem of this section of sewer.

6.2 Five Lots on Wembley Road

The five lots on Wembley Road at Riley Road are best serviced by connecting to the existing 150 mm diameter main on Riley Road (SMH 264 - 263). This short section of 150 mm diameter will not require upgrading since the existing pipe has adequate capacity. All basements are above the existing road centreline and proposed sewer. This area was not included in the latecomers agreement with SD 69 for the Middle School.

6.3 Lots South of Oceanside Middle School

Even though the topography flows in a north east direction, sewage from Lot 1, Plan 50465 and Lot 2, Plan 30553 and a section of Part of Lot 1, Plan 6179 should be collected on Wembley Road (MH 25 to MH 26) with a 0.5% grade and directed to the Wright Road system since Lot 1, Plan 50465 and Lot 2, Plan 30553 front only onto Wembley Road.

6.4 Capacity in Parksville

Downstream pipes on Aberdeen Drive and Marsh Place in the City of Parksville are under capacity using RDN design requirement with pipes flowing half full. The condition exists at present without the addition of any further areas.

If a pipe at full capacity can be accepted, sewer mains will have sufficient capacity. As the pipes are located in a residential area, a detailed examination should be carried out to confirm the grades and condition.

Replacement will be very expensive, even if trenchless technology such as pipe bursting is used.

6.5 Commercial areas west of Highway

The two commercial properties west of the highway (Areas M & N) are adjacent to the existing sewer on Aberdeen Drive. A direct connection is the simplest and least expensive servicing option. The extra load placed on the Aberdeen system by these two properties is not significant, and does not materially affect the downstream problems.

6.6 Wright Road at Island Highway

The short section of sewer parallel to the highway (SMH X2 - X3) carries a flow in excess of the design allowable. This is only a short section of sewer and is laid at a flat grade (0.48%). If the existing pipe were replaced with a pipe having a larger diameter than the downstream pipe, sewage flow would constrict into the downstream pipe. Increasing the grade will require relaying of a section of pipeline upstream (where there is excess capacity). The least expensive, and probably most effective option is to accept a pipe capacity in excess of half full. A detailed examination should be carried out to confirm the grades and condition of the pipe and manholes.

Any significant additional sewage flow added to the Wright Road collection main (from areas R & S) will exceed the capacity of some of the downstream mains. The existing sewers north on Wembley Road have extra capacity which would be able to handle the additional flows directed towards SMH VR-A.

7. REFERENCES

French Creek Sewage Collection Study, Regional District of Nanaimo, Dayton and Knight Ltd., March 1989.

Population, Demographic and Economic Forecasts for the Regional District of Nanaimo, Westland Resource Group and Economic Planning Group, March 1995.

Regional District of Nanaimo, *French Creek Official Community Plan Bylaw No. 1115*, October 1998

Regional District of Nanaimo, *Land Use and Subdivision Bylaw No. 500*, December 1998

Regional District of Nanaimo Land Use Zones and Subdivision Districts Maps, map scale at 1:5000:

- 92F/8W19 (RDN Ref 18 20)
- 92F/8W22 (RDN Ref 17 20)
- 92F/8W23 (RDN Ref 17 19)

Sanitary Sewer Study Update, City of Parksville, Koers and Associates Engineering Ltd. September 1996,

APPENDIX A

Correspondence

ANDERSON
Civil Engineering

FILE COPY

Centra Gas
PO Box 3777
1675 Douglas Street
Victoria, BC
V8W 3V3

File: 2019
RDN File: 5500-20-01-FC
May 31, 1999

Attention: Stirling Fraser,

Dear Mr. Fraser,

Re: Wembley Road - French Creek Sewer Pre-Design Study

The Regional District of Nanaimo has engaged Anderson Civil Engineering to complete a sanitary sewer pre-design study for the Wembley Road - French Creek area. The study area is located on the City of Parksville west boundary as outlined on the following sketch. This study will confirm the concept and details of servicing the area and that the stubs and blank ends left by adjacent servicing are correct.

Please review the study area, identify any special issue(s) regarding utilities and/or others that may affect the study and forward your comments to our office at your earliest convenience.

If you require additional information, please do not hesitate to contact the undersigned at (250) 754-1877.

Yours truly,

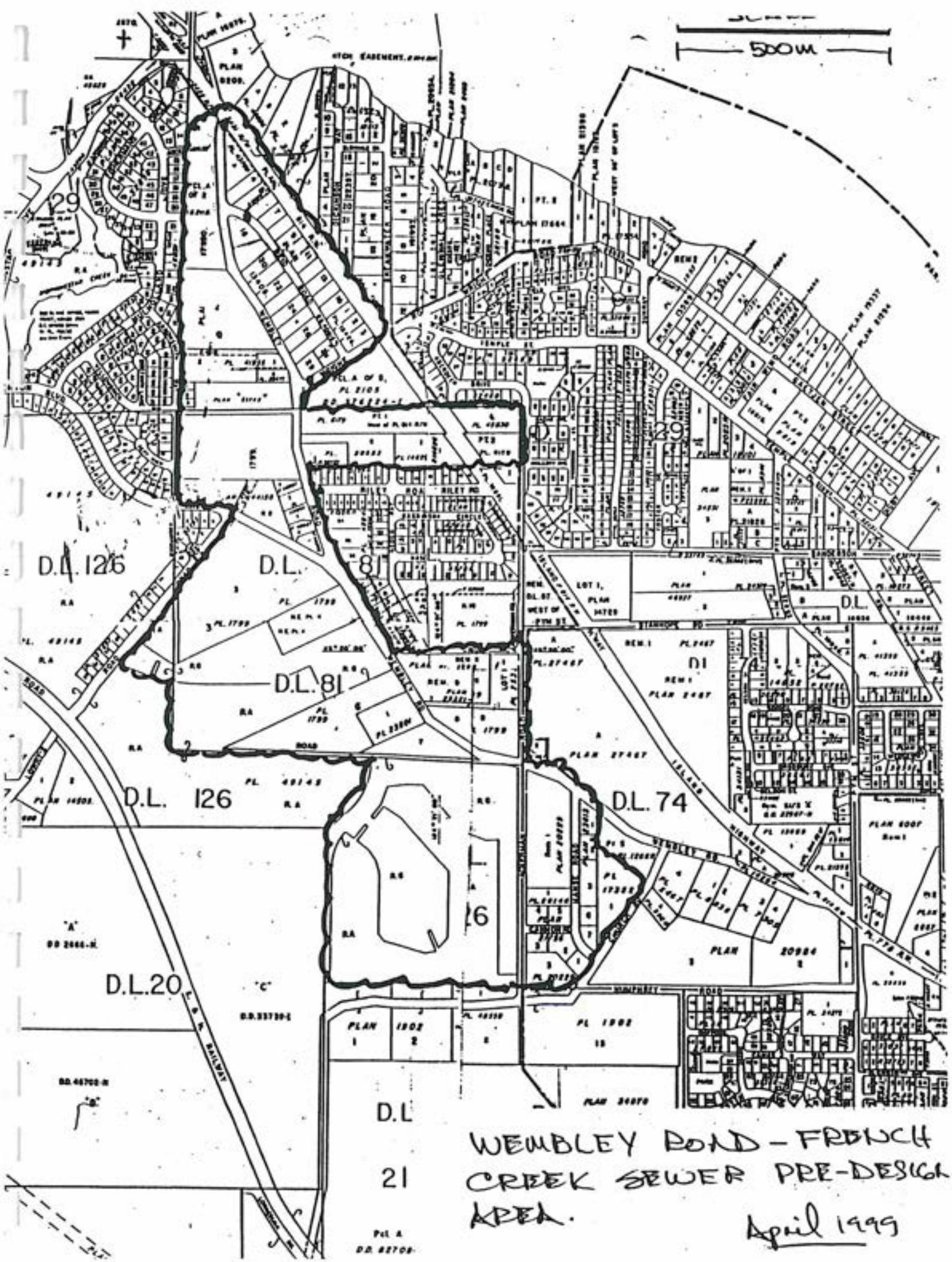
Doris M.A. Fournier, P.Eng

o:\engineer\2019\2019lt2g.doc

ORIGINAL OF PREVIOUSLY FAXED DOCUMENT

Suite K-427 Fitzwilliam Street, Nanaimo, B.C. V9R 3A9
Tel 250 754 1877 Fax 250 754 4375 email civileng@bc.sympatico.ca

ANDERSON


500M
D.L. 126
D.L. 81
D.L. 74
D.L. 20
D.L.
21
WEMBLEY ROAD - FRENCH CREEK SEWER PRE-DESIGN AREA.
April 1999

BRITISH COLUMBIA

"THIS IS THE ONLY COPY YOU WILL RECEIVE UNLESS YOU REQUEST THE ORIGINAL."

June 3, 1999

Our File: 68520-01

Doris Fournier, P.Eng.
Anderson Civil Engineering
Suite K - 427 Fitzwilliam Street
NANAIMO BC V9R 3A9

Re: Wembley Road - French Creek Sewer Pre-Design Study

Thank you for your recent letter. At this early stage of design, I can only provide you with some general comments.

1. A standard offset be chosen, if possible.
2. Any proposed open cuts of existing paved road surfaces to be kept to a minimum.
3. All natural drainage courses are to be respected and should be considered in sewer design.

Should you have any questions, please do not hesitate to contact this office.

Yours truly,

Nick Vandermolen
District Development Technician

NV/kp

Ministry of Transportation and Highways
Central Island District Development Approvals
Mailing Address: 3rd Floor, 6475 Metral Drive Nanaimo, B.C. V9T 2L9
Telephone: (250) 390-6100
Facsimile: (250) 390-6297

CENTRA GAS BRITISH COLUMBIA INC.
1675 DOUGLAS STREET, VICTORIA, B.C. V8W 3V3
PHONE: (250) 480-4300 FAX: (250) 480-4453

Centra Gas

DRAWING TRANSMITTAL RECORD

DATE: June 2, 1999

TO: Doris M.A. Fournier, P.Eng.
COMPANY: Andersen Civil Engineering
Suite K-427 Fitzwilliam St.
Nanaimo, BC V9R 3A9
TEL: (250) 754-1877
FAX: (250) 754-4375

FROM: Dick Johnston
DEPT: ENGINEERING
TEL: (250) 480-4349
FAX: (250) 480-4453

SUBJECT: Requested as builts for French Creek Sewer Pre-Design Study

Enclosed herewith please find:

NO. OF COPIES	DESCRIPTION
1	1653-A
1	1653-C
1	1708-B
1	1708-D
1	1709-A
1	1709-C
1	1764-B

(See DWGS IN P-PI + MAPS FILE)

If quantity or numbers of items listed do not check, please notify at once.

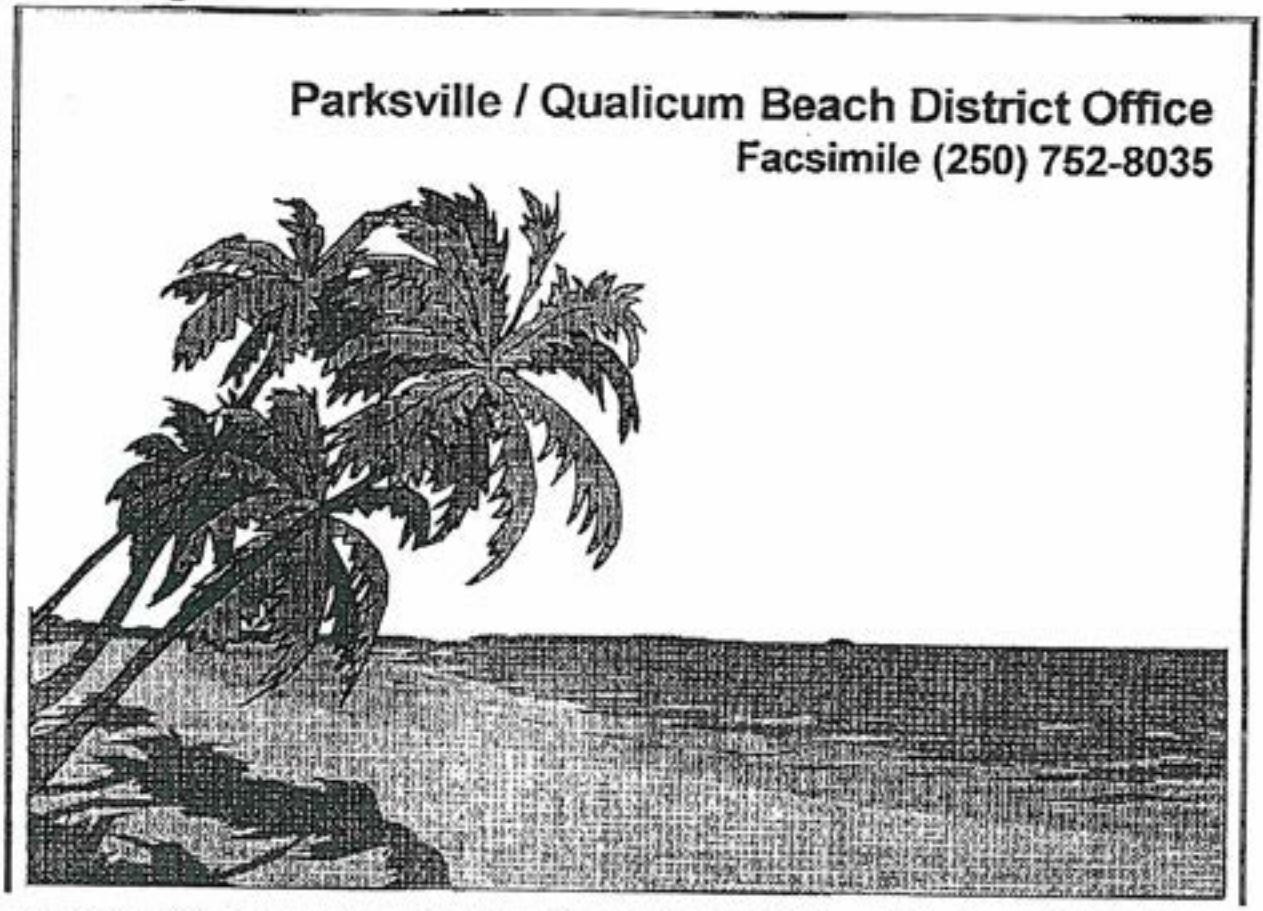
COMMENTS:

Enclosed	☐	For Signature	☐
Under Separate Cover	☐	Information Only	☐
As Requested By Doris Fournier	☑	Other	☐

DISTRIBUTION: WHITE - To Addressee YELLOW - Chrono File PINK - File Copy

4600.0

BC hydro



BC Hydro, 271 E Fern Road, Qualicum Beach, BC, V9K 1R1 Telephone (250)752-8629

Facsimile Cover Sheet

Date: June 3, 1999

Send To: Doris

At Facsimile: 250-754-4875

Sent From: Mike (752-8009)

Message: RE: FRENCH CREEK SEWER PRE-DESIGN STUDY:
WITH THE EXCEPTION OF SECTIONS AT LOWRY'S LN, ROBERTON AND ARROWSMITH WAY, ALL PLANT IS OVERHEAD AT TIME OF CONSTRUCTION PLEASE CALL FOR LOCATES OF UND MAPS IF REQUIRED. THANKS.
Mike

Number of copies including cover sheet: 3

WRIGHT FOCUS
Professional Land Surveyors & Consulting Engineers

Fax

To:	Anderson Civil Engineering	**From:**	Michelle T. Jones, P. Eng.
Attn:	Doris Fournier, P. Eng.	**Pages:**	2
Fax:	250-754-4375	**Date:**	June 1, 1999
Re:	Wembley Road Sanitary Sewer	**File:**	P2941

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**
Doris

Further to your request of May 31, 1999 regarding Wembley Road French Creek Sanitary Sewer Study.

We are currently working on Lot 4 Plan VIP 53745 fronting on Yellowbrick Road.

We have been informed by the RDN that this lot is part of a Latecomer's Agreement with the School District and should be serviced through the Wright Road sewer. For you information I have included a sketch of the Sanitary Sewer Area used to design the Wright Road sewer as prepared by Koer's in 1992.

Also of note Newcastle Engineering has completed a design to service the Manse Road area via a sanitary sewer down Ackerman Road connecting to the sewer at Esslinger Road.

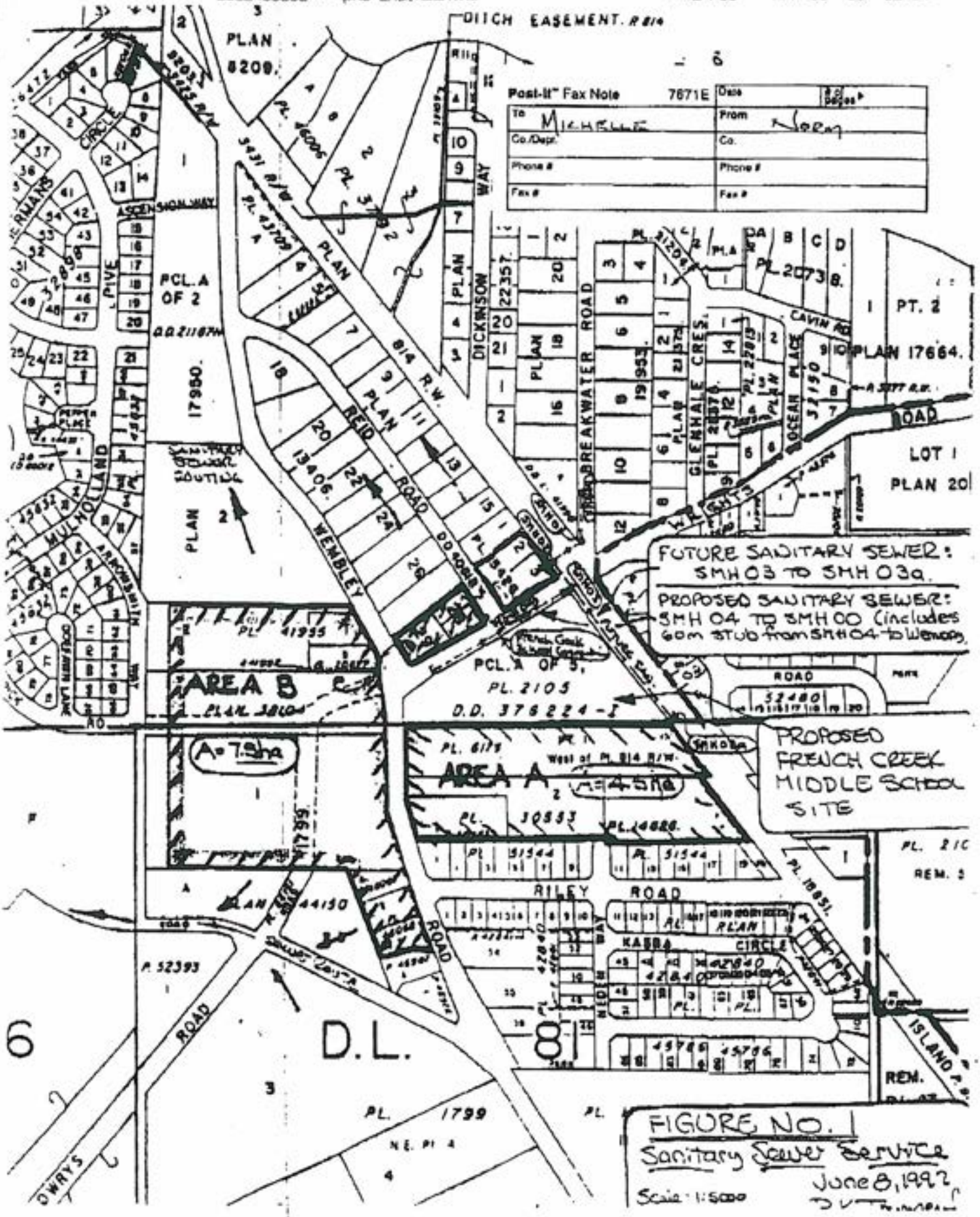
I hope this helps.

If you have any questions please don't hesitate to call

Michelle.

PARKSVILLE
#200, 180 McCarter Street, P.O. Box 89, Parksville, BC V9P 2G3
Phone: (250) 248-2001 Fax: (250) 248-2553

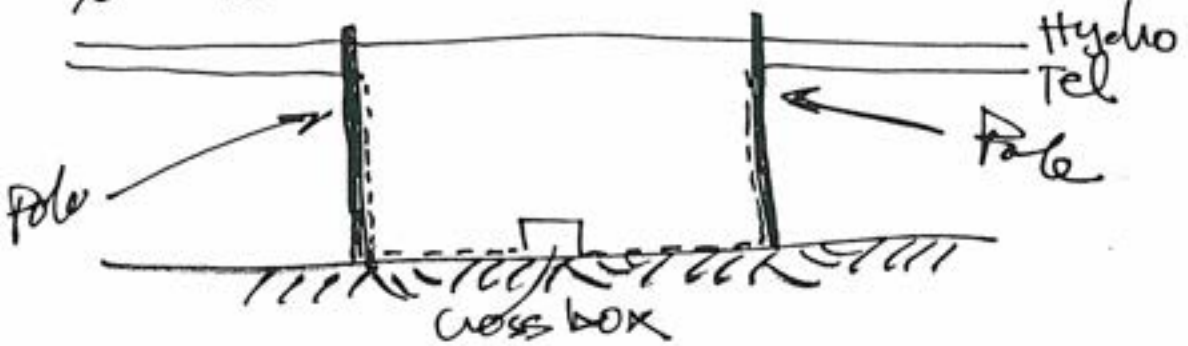
[illegible]OOK • DUNCAN • FORT ST. JOHN • PARKSVILLE • VICTORIA


DITCH EASEMENT. PLAN 8209.
Post-it™ Fax Note 7671E
To MICHAEL
From Morag
Co./Dept.
Co.
Phone #
Fax #
PLAN 8209.
PCL. A OF 2
PLAN 17950.
PLAN 22357.
PLAN 19933.
PLAN 17664.
PT. 2
LOT 1
PLAN 20
BREAKWATER ROAD
GLENHALE CRES.
OCEAN PLACE
CAVIN RD.
DICKINSON WAY
REID ROAD
WEMBLEY ROAD
MULHOLLAND DRIVE
814 R.W.
FUTURE SANITARY SEWER: SMH 03 TO SMH 03a.
PROPOSED SANITARY SEWER: SMH 04 TO SMH 00 (includes 60m STUB from SMH 04 to Wembley)
PCL. A OF 3, PL. 2105 D.D. 376224-I
AREA B
AREA A
A=7.9ha
PROPOSED FRENCH CREEK MIDDLE SCHOOL SITE
RILEY ROAD
KASBA CIRCLE
ISLAND HWY.
REM.
6
D.L.
8
3
PL. 1799
N.E. PT. 4
OWRYS ROAD
FIGURE NO. 1
Sanitary Sewer Service
Scale: 1:5000
June 8, 1992

Call From: Joe Stevens (BC Tel)
Nanaimo 729-7654
Call to : Doris Fournier
754-1827
Date : 9 June 99 @ 12h00
Re : French Creek Sewer Study.

— There is some underground in the area, but most of BC Tel lines are overhead. (Same as Hydro in this area) ~~i~~ Sections of Lowry's Rd Roberton & Arrowsmith Way have underground Rest is overhead. Nothing to alert us.

— At ~~corner~~ Unit. of Mulholland and Lee Rd, they have a cross box on ground. Tel lines go ~~down~~ from aerial to down in ground ~~at~~ each pole ~~to~~ from ~~cross box~~ on either side of and into cross box. Hydro lines remain in the air.

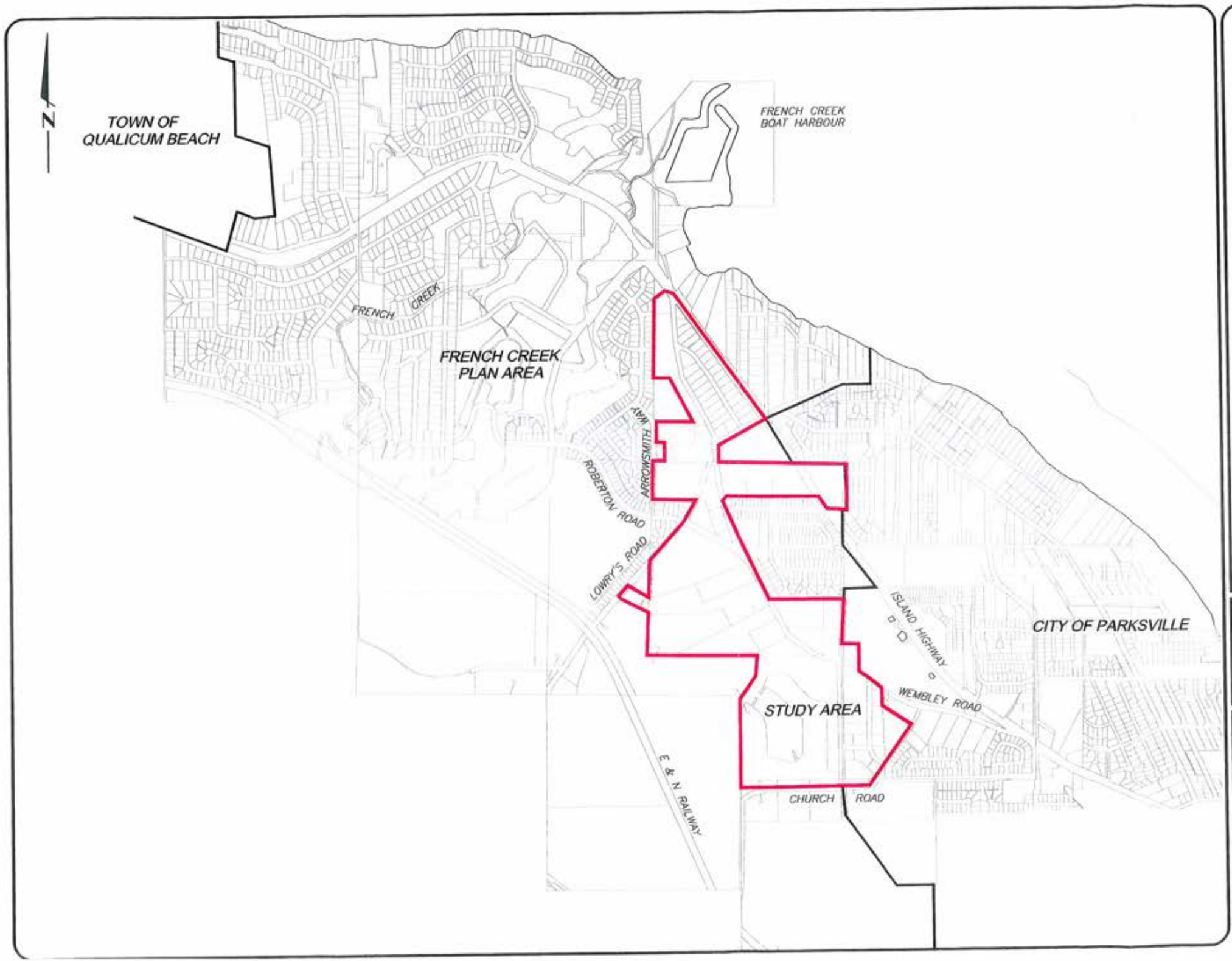


— Joe also indicated that contractors need to call them before construction.

APPENDIX B

Drawings

FIGURE 1	Location Plan
FIGURE 2	Limiting Area Boundaries
FIGURE 3	Sewage Sub-areas
FIGURE 4	Collection System Details
FIGURE 5	Plan and Profile - Key plan
FIGURE 6	Plan and Profile - Manse & Wembley Roads
FIGURE 7	Plan and Profile - Lowry's Road & Wright Road
FIGURE 8	Plan and Profile - Wembley Road & Yellow Brick Road
FIGURE 9	Plan and Profile - Island Highway
FIGURE 10	Plan and Profile - Wembley Road
FIGURE 11	Plan and Profile - Reid Road



© \ENGINEER\2019\2019ssn

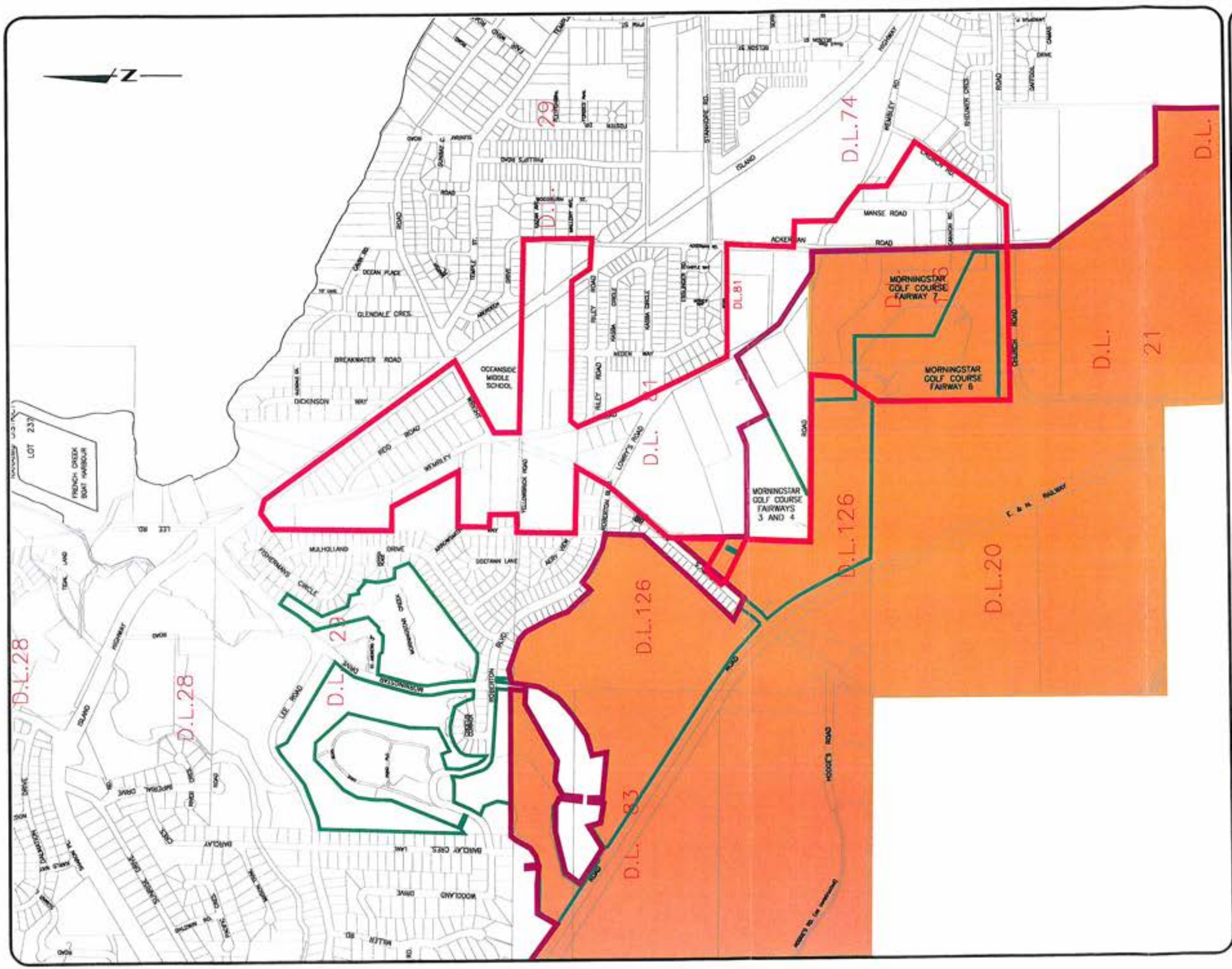
ANDERSON
Civil Engineering

REGIONAL DISTRICT OF NANAIMO
WEMBLEY ROAD–
FRENCH CREEK SEWER
PREDESIGN STUDY

LOCATION PLAN

DATE: 99/06/07
SCALE: 1:15,000

FIGURE 1



ANDERSON
Civil Engineering

REGIONAL DISTRICT OF NANAIMO
WEMBLEY ROAD–
FRENCH CREEK SEWER
PREDESIGN STUDY

LIMITING BOUNDARIES

DATE: 99/06/07
SCALE: 1:10,000

FIGURE 2

Q:\ENGINEER\2018\2018psan

	AREA
1	18.96ha
2	28.76ha
3	13.3ha

REFER TO TABLE 1 FOR DETAILS OF SUB-BASIN AREAS AND LAND USE

Q:\ENGINEER\2019\2019\sewer

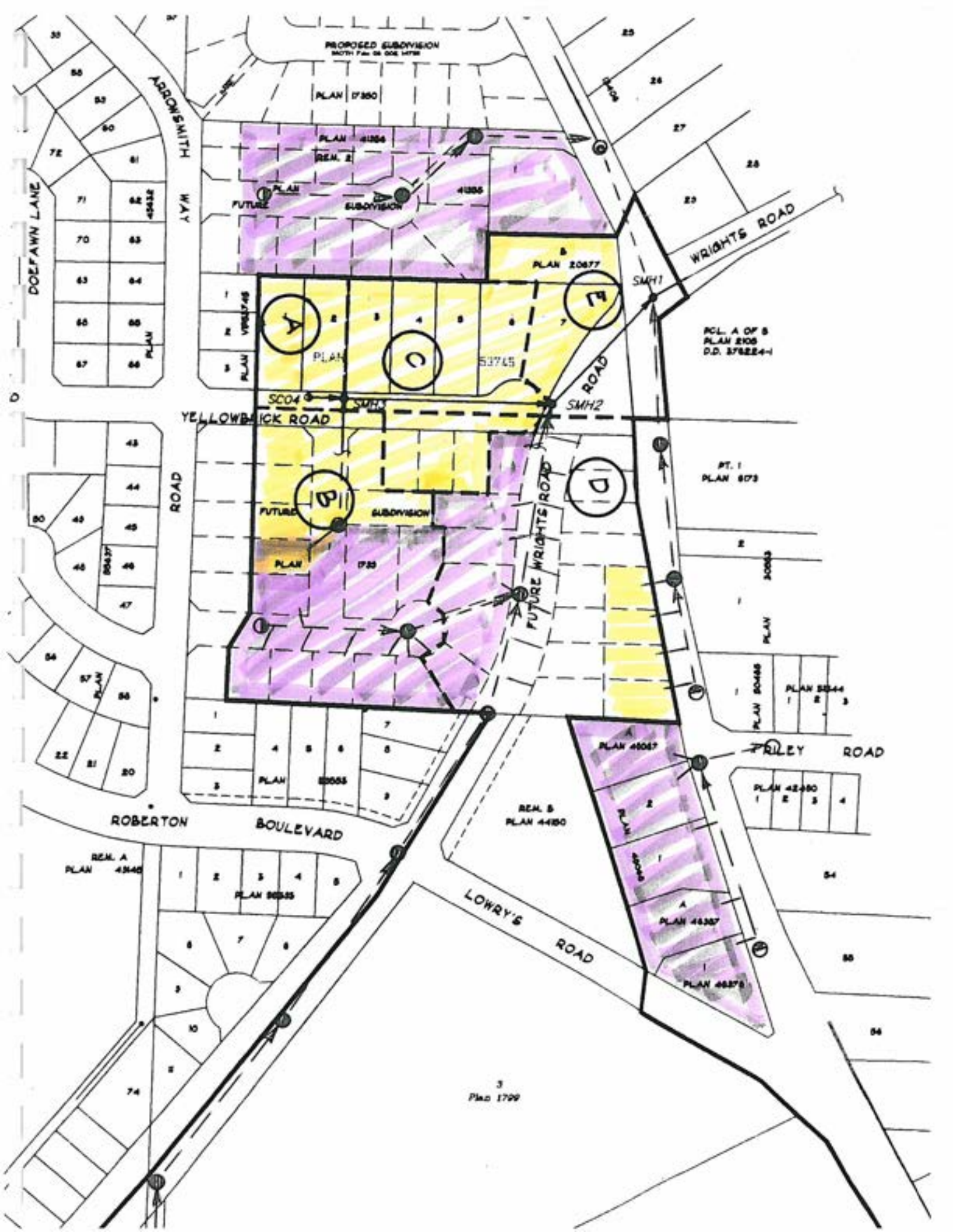
ANDERSON
Civil Engineering

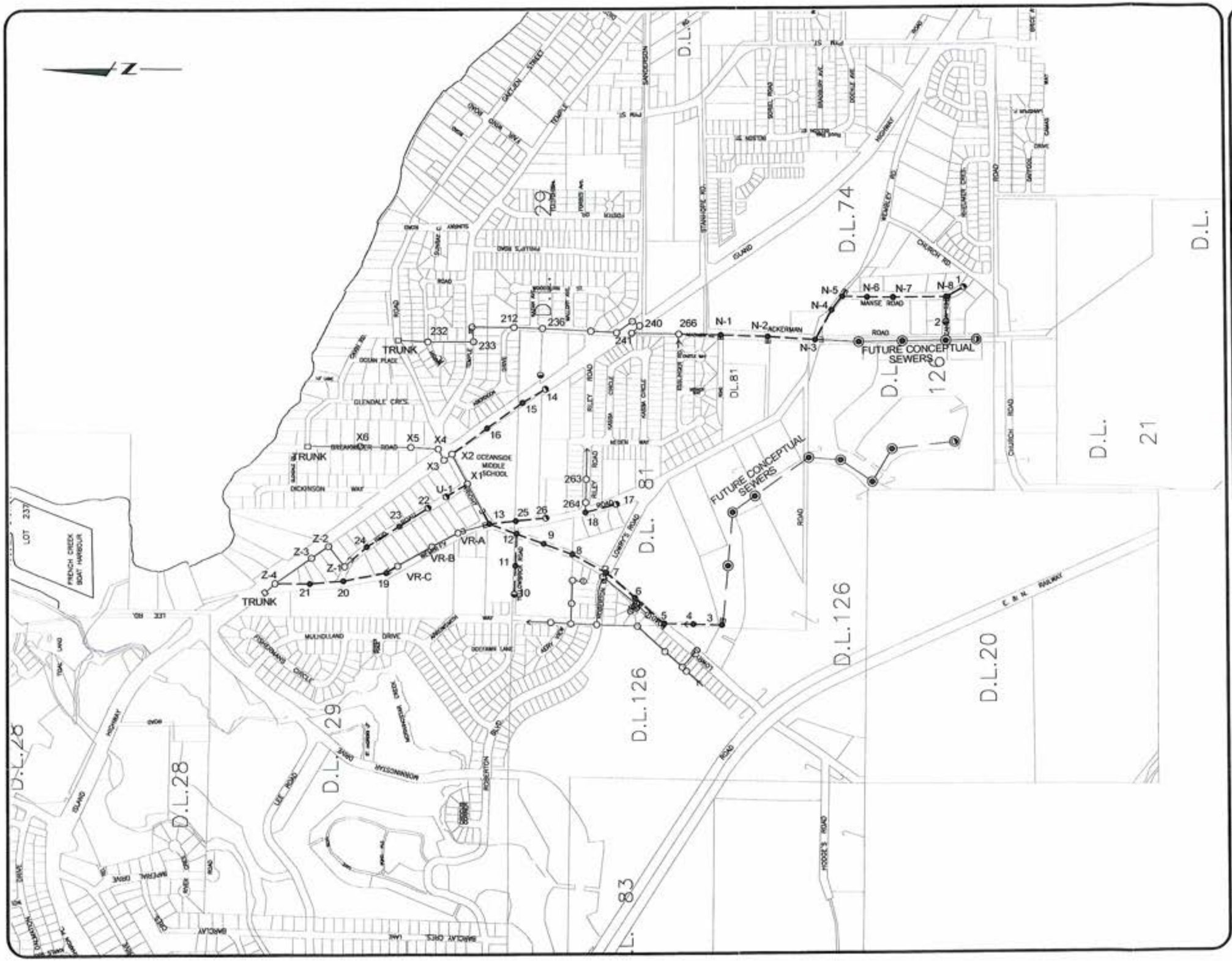
REGIONAL DISTRICT OF NANAIMO WEMBLEY ROAD– FRENCH CREEK SEWER PREDESIGN STUDY

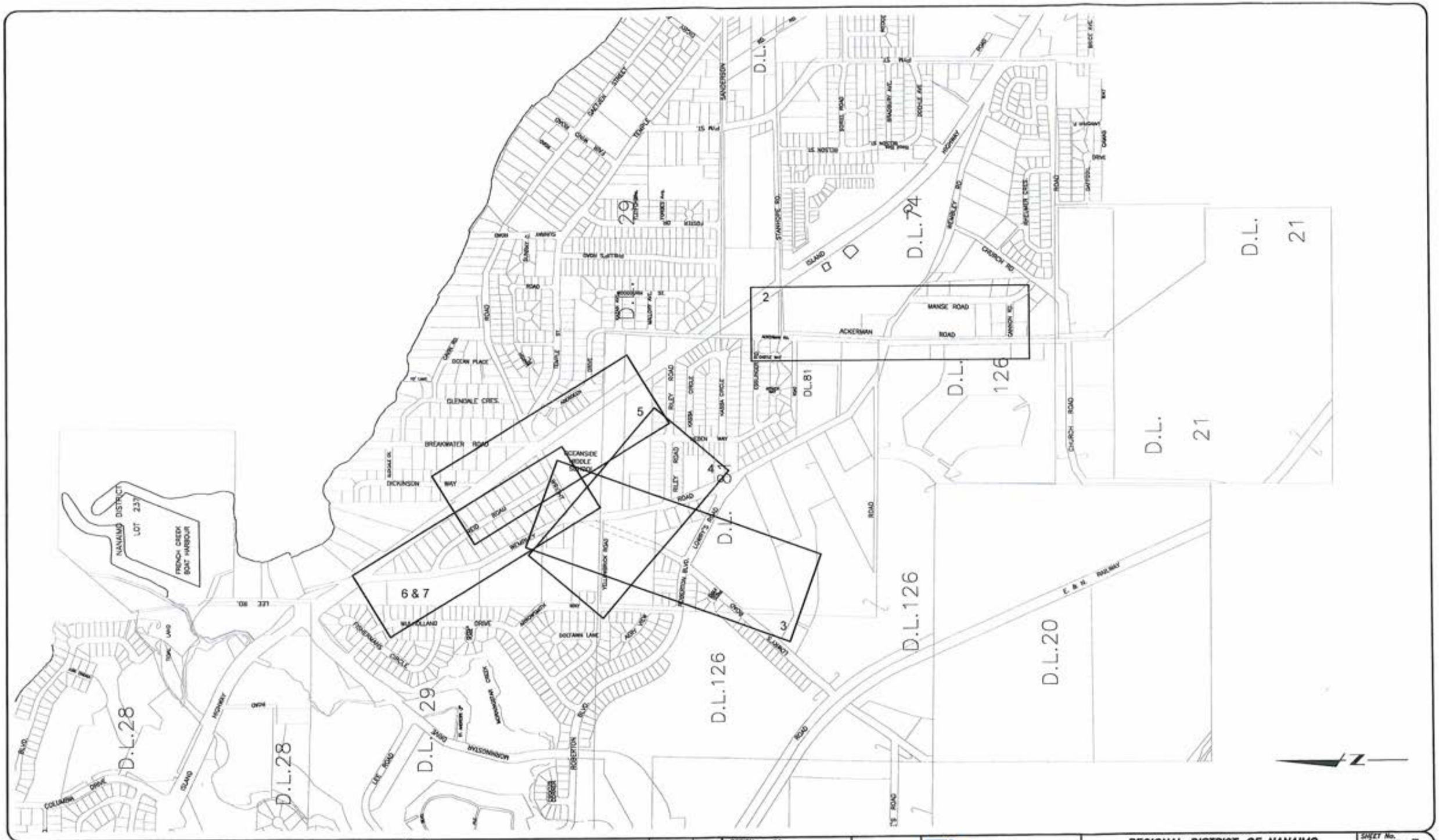
SEWAGE SUB-AREAS

DATE: 99/06/07
SCALE: Not to Scale

FIGURE 3


PROPOSED SUBDIVISION
PLAN 17350
PLAN 41356
REM. 2
PLAN 41355
FUTURE SUBDIVISION
PLAN 20677
WRIGHTS ROAD
SMH1
PCL. A OF 5 PLAN 2105 D.D. 376224-I
ARROWSMITH WAY
DOEFAWN LANE
PLAN 53745
SCO4
SMH3
SMH2
YELLOWBRICK ROAD
FUTURE WRIGHTS ROAD
PT. 1 PLAN 6173
PLAN 1735
PLAN 30053
PLAN 50488
PLAN 52644
PLAN 46067
RILEY ROAD
PLAN 42480
REM. B PLAN 44150
ROBERTON BOULEVARD
REM. A PLAN 43445
PLAN 50835
LOWRY'S ROAD
PLAN 46357
PLAN 46275
A
B
C
D
E


N
PROPOSED SEWERS
EXISTING SEWERS
FUTURE SEWERS
11 MANHOLE THIS STUDY
N-6 NEWCASTLE ENGINEERING
VR-B V. ROBERTS AND ASSOCIATES ENGINEERING LTD.
226 CITY OF PARKSVILLE UPDATE REPORT
X-2 Z-4 EXISTING MANHOLES
TRUNK CONNECTION AT REGIONAL INTERCEPTOR
TRUNK
FUTURE CONCEPTUAL SEWERS
OCEANSIDE MIDDLE SCHOOL
FRENCH CREEK BOAT HARBOUR
D.L.74
D.L.81
D.L.126
D.L.20
D.L.29
D.L.28
D.L.83
E & N RAILWAY
ANDERSON
Civil Engineering
REGIONAL DISTRICT OF NANAIMO
WEMBLEY ROAD–
FRENCH CREEK SEWER
PREDESIGN STUDY
COLLECTION SYSTEM DETAILS
DATE: 99/06/07
SCALE: 1:10,000
FIGURE 4



LEGEND

PROPOSED		EXISTING	
WATERMAIN	WATER VALVE	DITCH	ANCHOR
SANITARY SEWER	HYDRANT	CULVERT	UTILITY POLE
STORM DRAIN	WATER METER	CATCH BASIN	FENCE
CURB AND GUTTER	AIR VALVE	MANHOLE	SLOPE
EDGE OF PAVEMENT	CLEANOUT		

No.	REVISION DESCRIPTION	DATE	BY

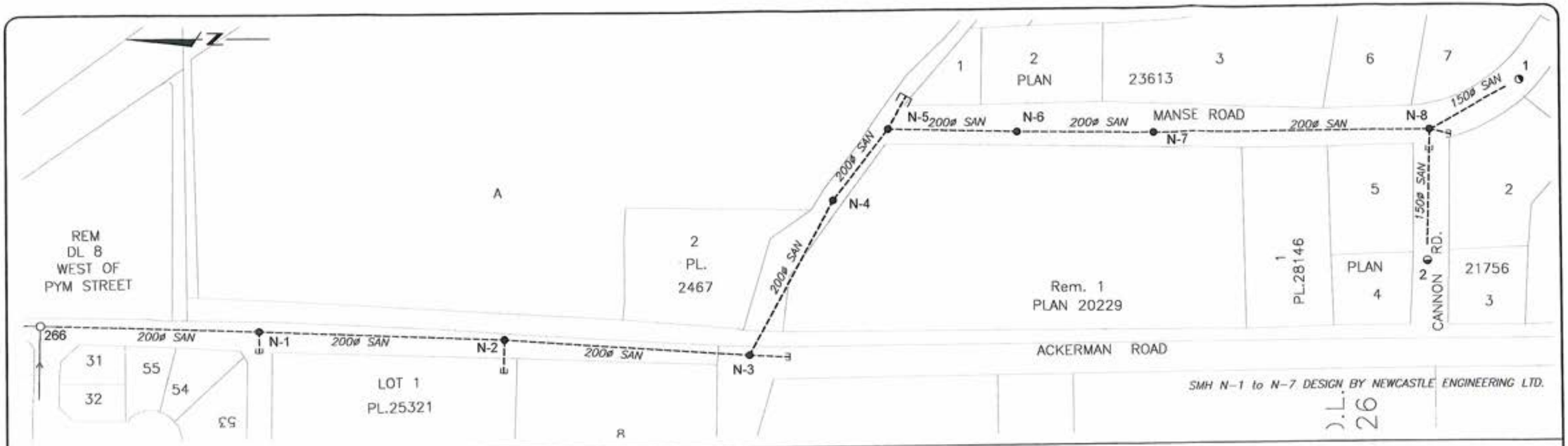
DESIGN: DF
DRAWN: ECK
APPROVED: DWK
DATE: 99/09/10
SCALE: 1:10000
BENCHMARK:

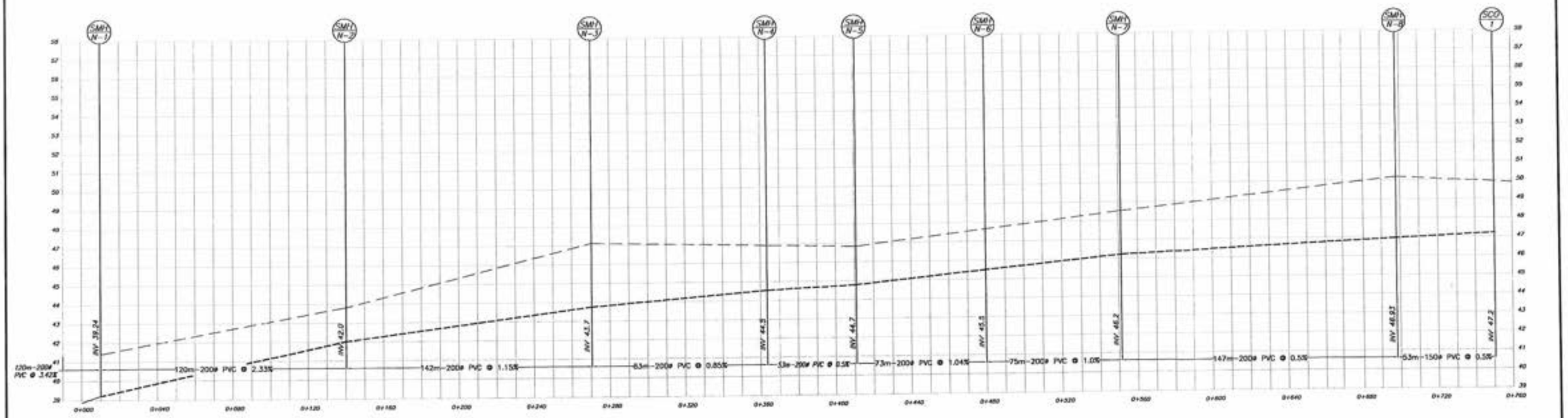
ANDERSON
Civil Engineering
Suite 1-627 Cloverdale Street Nanaimo, B.C. V9R 2N9
Tel 250 754 1977 Fax 250 754 1979 email info@ande.qwestoffice.net

CLIENT: REGIONAL DISTRICT OF NANAIMO
PROJECT: WEMBLEY ROAD/FRENCH CREEK PRE-DESIGN SANITARY SEWER STUDY
KEY PLAN

SHEET No. 1 OF 7
DRAWING No. FIG 5
CAD FILE No. 2019SAN
REV.

DESTROY ALL DRAWINGS BEARING LETTER PRECEDING THIS





LEGEND

PROPOSED			EXISTING
WATERMAIN	WATER VALVE	DITCH	ANCHOR
SANITARY SEWER	HYDRANT	CULVERT	UTILITY POLE
STORM DRAIN	WATER METER	CATCH BASIN	FENCE
CURB AND GUTTER	AIR VALVE	MANHOLE	SLOPE
EDGE OF PAVEMENT	CLEANOUT		

No.	REVISION DESCRIPTION	DATE	BY

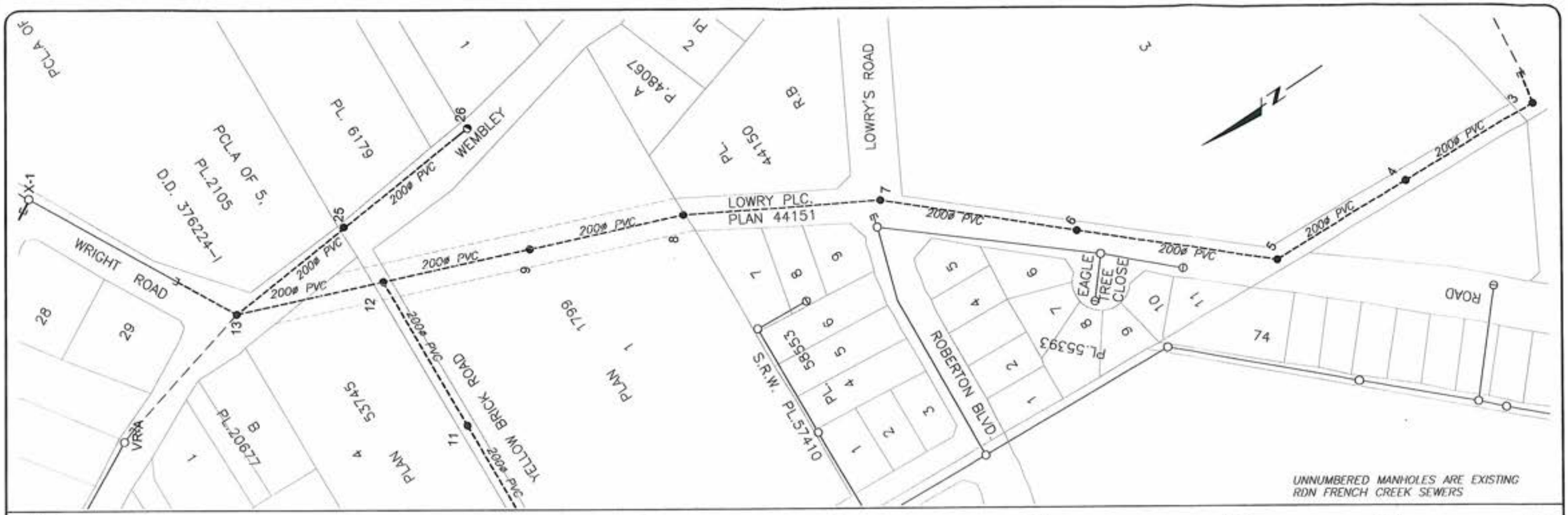
DESIGN: DMF
DRAWN: ECK
APPROVED: DMA
DATE: 99/06/08
SCALE: Hz 1:2000 Vt 1:200
BENCHMARK:

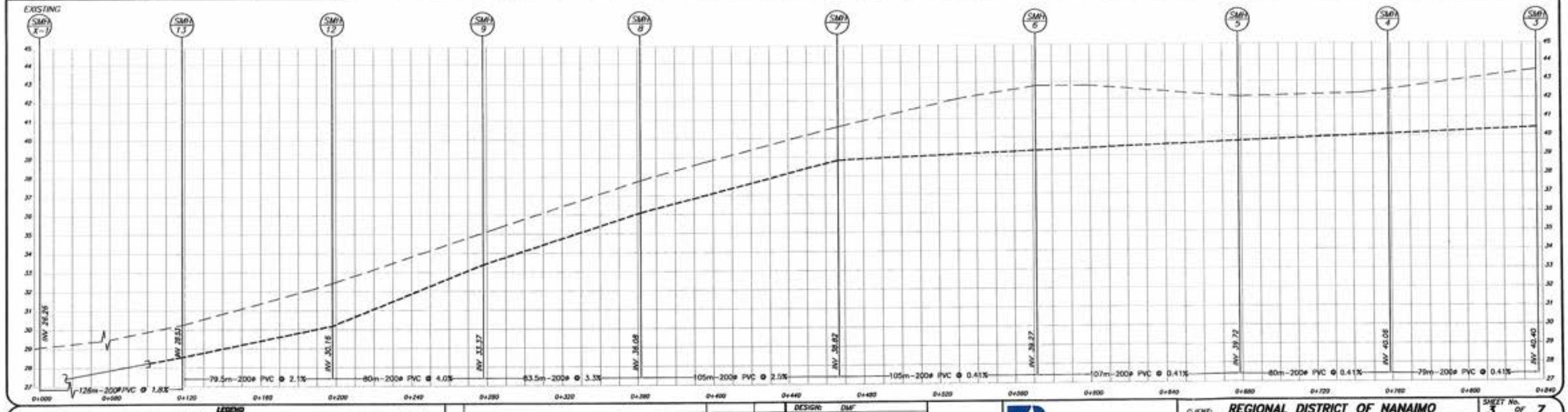
ANDERSON
Civil Engineering

CLIENT: REGIONAL DISTRICT OF NANAIMO
PROJECT: WEMBLEY ROAD/FRENCH CREEK
PRE-DESIGN SANITARY SEWER STUDY
MANSE AND WEMBLEY ROADS
PLAN AND PROFILE

SHEET No. 2 OF 7
DRAWING No. FIG 6
CAD FILE No. 2019san
REV.

DESTROY ALL DRAWINGS BEARING LETTER PRECEDING THIS





LEGEND

PROPOSED			EXISTING
WATERMAIN	WATER VALVE	DITCH	ANCHOR
SANITARY SEWER	HYDRANT	CULVERT	UTILITY POLE
STORM DRAIN	WATER METER	CATCH BASIN	FENCE
CURB AND GUTTER	AIR VALVE	MANHOLE	SLOPE
EDGE OF PAVEMENT	CLEANOUT		

No.	REVISION DESCRIPTION	DATE	BY

DESIGN: DMF
DRAWN: ECK
APPROVED: DWA
DATE: 98/06/15
SCALE: Hz 1:2000 Vt 1:200
BENCHMARK:

ANDERSON
Civil Engineering
Suite 1-627 Fitzwilliam Street Nanaimo, B.C. V9R 3A8
Tel 250 754 1627 Fax 250 754 4979 email dwa@dwa.anderson.ca

CLIENT: REGIONAL DISTRICT OF NANAIMO

PROJECT: WEMBLEY ROAD/FRENCH CREEK
PRE-DESIGN SANITARY SEWER STUDY
LOWRY'S ROAD AND WRIGHT ROAD
PLAN AND PROFILE

SHEET No. 3 OF 7
DRAWING No. FIG 7
CAD FILE No. 2019SAN
REV.

DESTROY ALL DRAWINGS BEARING LETTER PRECEDING THIS

PL 41955 P.41957

1 PL.20677 B

4 53745 PLAN 1799

1 PLAN 1

7622A-1 PL.2105 PCL A OF 5.

PL. 6179

2 30553 PL. 1 P.50465

PL. 51544 1 1 3 5 7 9

PL. 1 1 3 5 7 9 10 P.42841 54 55 56

#691 #683 A P.48067 #673 2 PL. #663 48068 1 #1009 16987 #999 PL.

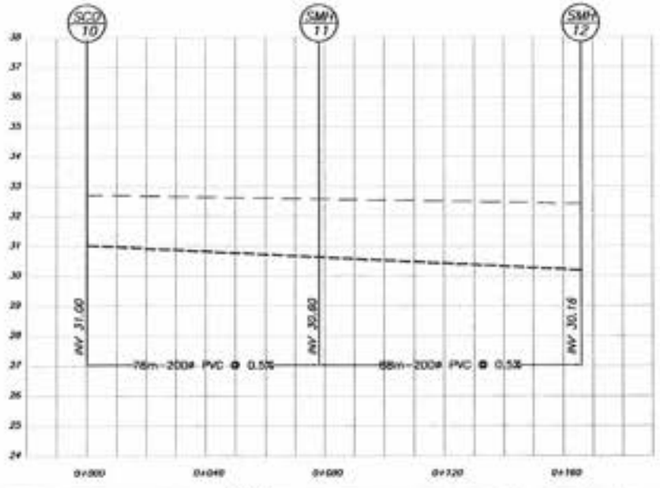
13 12 11 10 9 8 25 26 WEMBLEY 263 RILEY ROAD 264 18 ROAD 17

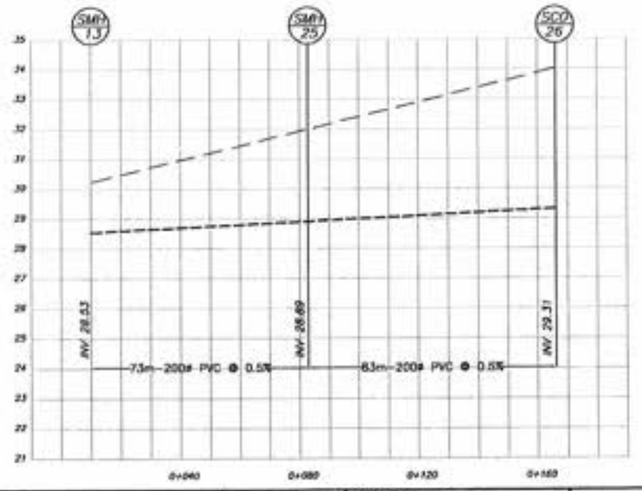
200ø PVC 200ø PVC 200ø PVC 200ø PVC 200ø PVC 200ø PVC 150ø 150ø PVC

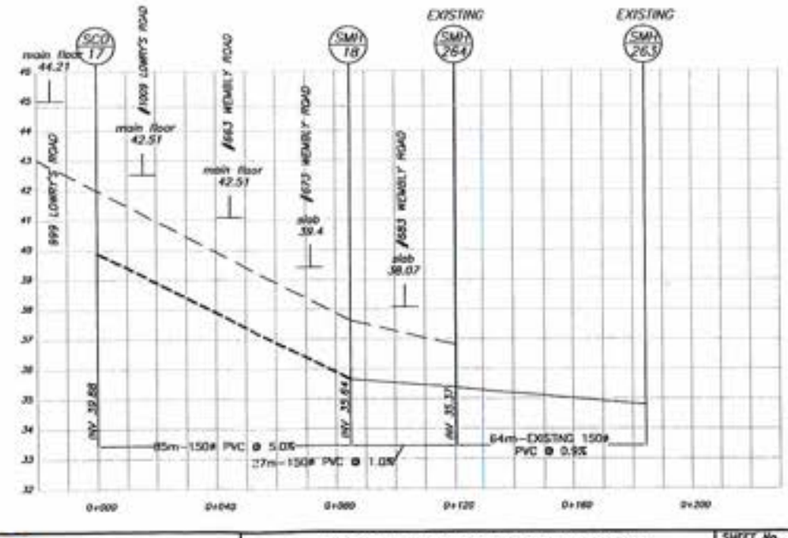
YELLOW BRICK ROAD

N

SMH 264 TO 263 ARE EXISTING CITY OF PARKSVILLE







LEGEND

PROPOSED			EXISTING
—W— WATERMAIN	WATER VALVE	DITCH	ANCHOR
—S— SANITARY SEWER	HYDRANT	CULVERT	UTILITY POLE
—D— STORM DRAIN	WATER METER	CATCH BASIN	FENCE
—C— CURB AND GUTTER	AIR VALVE	MANHOLE	SLOPE
—EP— EDGE OF PAVEMENT	CLEANOUT		

No.	REVISION DESCRIPTION	DATE	BY

DESIGN: DF
DRAWN: ECK
APPROVED: DWR
DATE: 99/06/10
SCALE: Hz 1:2000 Vt 1:200
BENCHMARK:

ANDERSON
Civil Engineering
Suite 3-421 Woodhaven Street Nanaimo, B.C. V9R 5A9
Tel 250 754 1877 Fax 250 754 4375 email anderson@anderson.bc.ca

CLIENT: REGIONAL DISTRICT OF NANAIMO

PROJECT: WEMBLY ROAD/FRENCH CREEK PRE-DESIGN SEWER STUDY
WEMBLY ROAD/YELLOW BRICK ROAD PLAN AND PROFILE

SHEET No. 4 OF 7
DRAWING No. FIG 8
CAD FILE No. 2019SAN
REV.

DESTROY ALL DRAWINGS BEARING LETTER PRECEDING THIS

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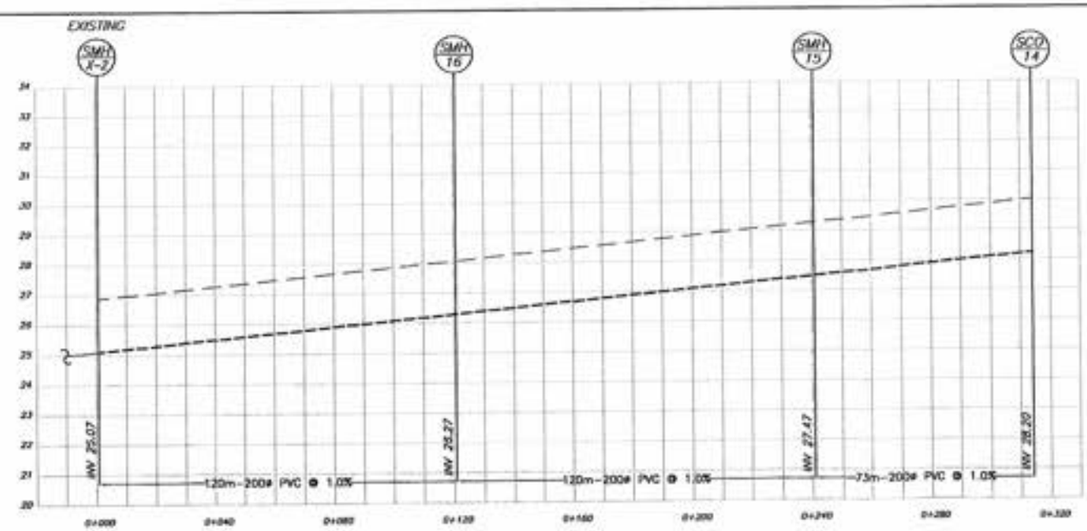

LEGEND

PROPOSED			EXISTING
WATERMAIN	WATER VALVE	DITCH	ANCHOR
SANITARY SEWER	HYDRANT	CULVERT	UTILITY POLE
STORM DRAIN	WATER METER	CATCH BASIN	FENCE
CURB AND GUTTER	AIR VALVE	MANHOLE	SLOPE
EDGE OF PAVEMENT	CLEANOUT		

No.	REVISION DESCRIPTION	DATE	BY

DESIGN: DF
DRAWN: ECK
APPROVED: DMA
DATE: 99/06/10
SCALE: Hz 1:2000 Vt 1:200
BENCHMARK:

ANDERSON
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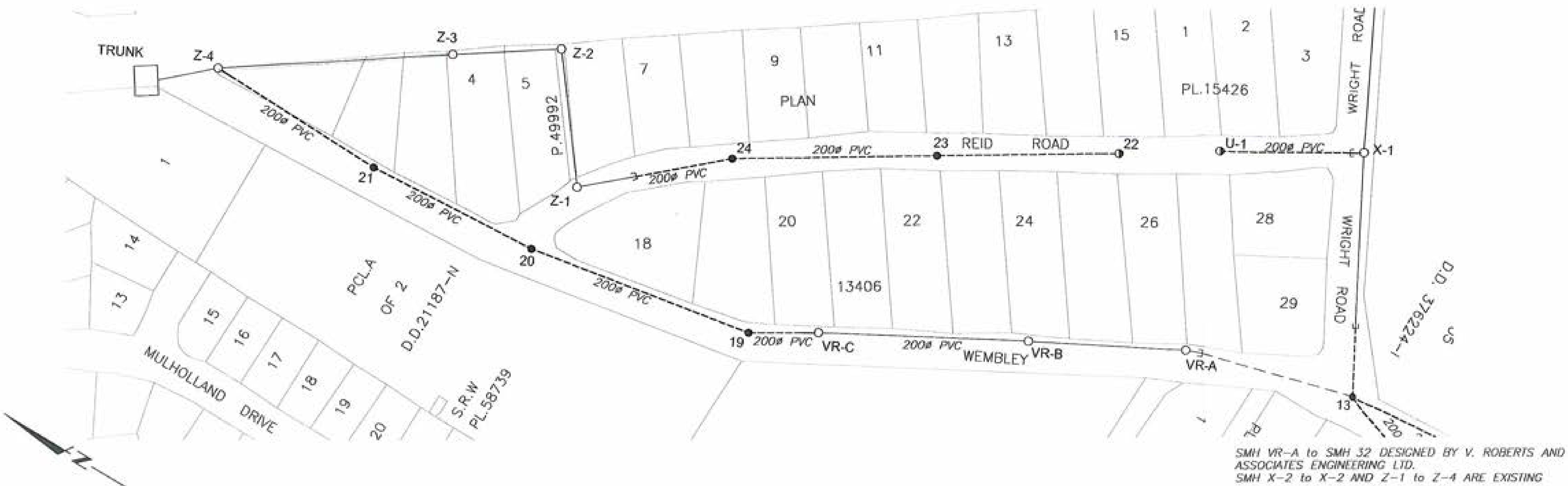
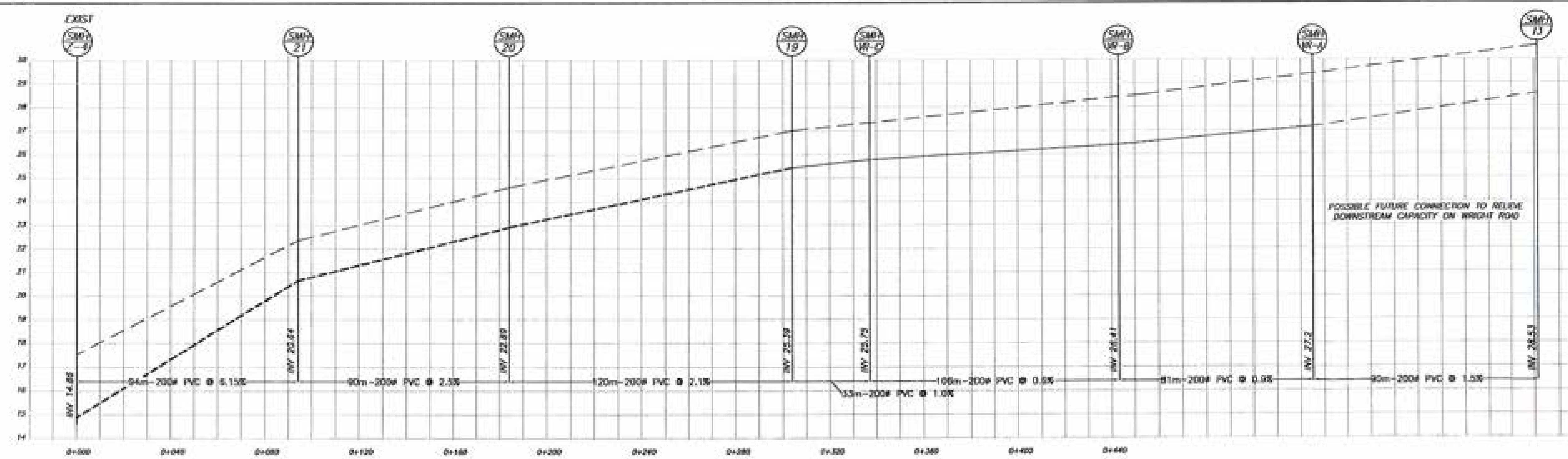
Suite 1-457 Woodburn Street Nanaimo, B.C. V9R 3A8
Tel 250 754 1977 Fax 250 754 4259 email info@anderson-engineering.ca

CLIENT: REGIONAL DISTRICT OF NANAIMO
PROJECT: WEMBLEY ROAD/FRENCH CREEK PRE-DESIGN SANITARY SEWER STUDY
ISLAND HIGHWAY
PLAN AND PROFILE

SHEET No. 5 OF 7
DRAWING No. FIG 9
CAD FILE No. 2019SAN
REV.

DESTROY ALL DRAWINGS BEARING LETTER PRECEDING THIS





LEGEND

PROPOSED		EXISTING	
WATERMAIN	WATER VALVE	DITCH	ANCHOR
SANITARY SEWER	HYDRANT	CULVERT	UTILITY POLE
STORM DRAIN	WATER METER	CATCH BASIN	FENCE
CURB AND GUTTER	AIR VALVE	MANHOLE	SLOPE
EDGE OF PAVEMENT	CLEANOUT		

No.	REVISION DESCRIPTION	DATE	BY

DESIGN: DF
DRAWN: CCK
APPROVED: DWA
DATE: 99/06/10
SCALE: Hz 1:2000 Vt 1:200
BENCHMARK:

ANDERSON Civil Engineering

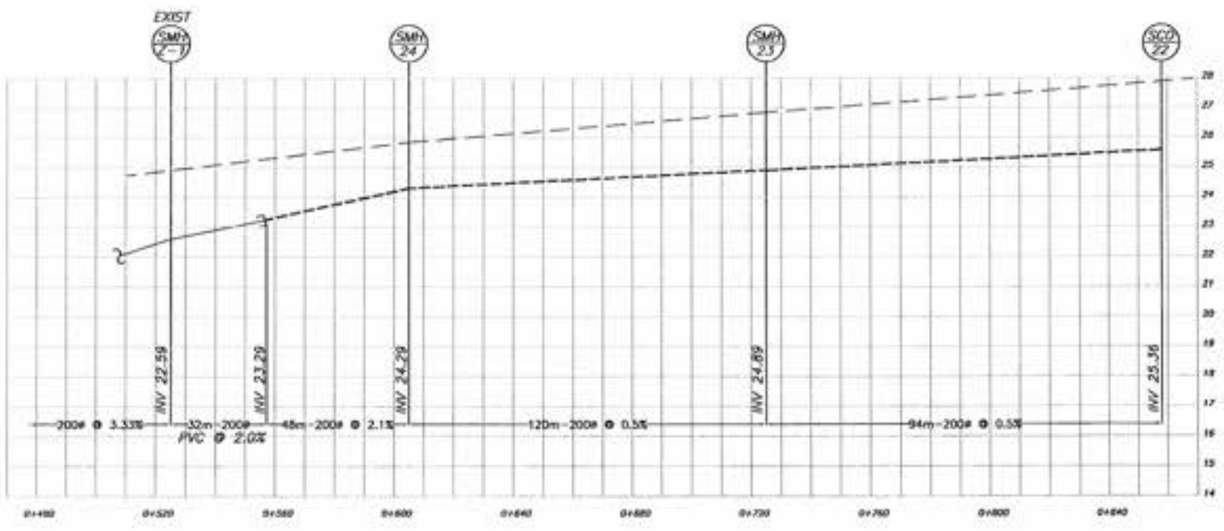
CLIENT: **REGIONAL DISTRICT OF NANAIMO**

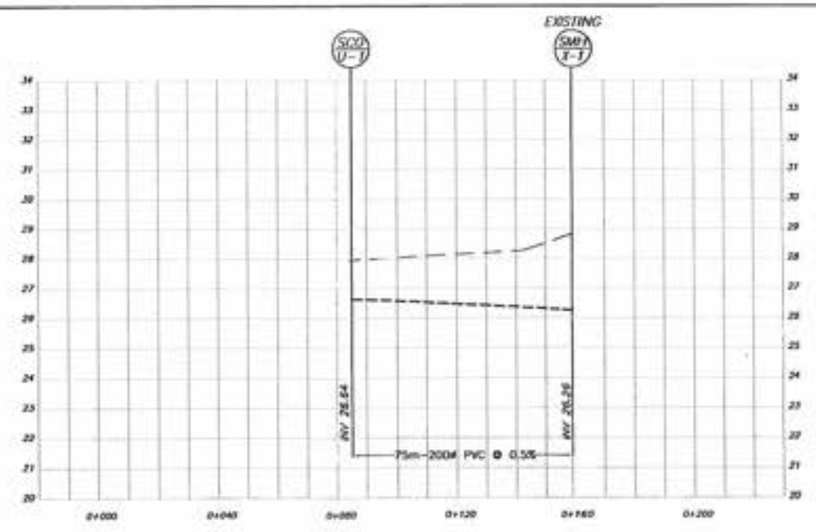
PROJECT: **WEMBLEY ROAD/FRENCH CREEK PRE-DESIGN SANITARY SEWER STUDY WEMBLEY ROAD PLAN AND PROFILE**

SHEET No. 6 OF 7
DRAWING No. FIG 10
CAD FILE No. 2019SAN
REV.

DESTROY ALL DRAWINGS BEARING LETTER PRECEDING THIS

SMH X-1 to X-5 ARE EXISTING





LEGEND

PROPOSED			EXISTING
WATERMAIN	WATER VALVE	DITCH	ANCHOR
SANITARY SEWER	HYDRANT	CULVERT	UTILITY POLE
STORM DRAIN	WATER METER	CATCH BASIN	FENCE
CURB AND GUTTER	AIR VALVE	MANHOLE	SLOPE
EDGE OF PAVEMENT	CLEANOUT		

No.	REVISION DESCRIPTION	DATE	BY

DESIGN: DF
DRAWN: ECK
APPROVED: DWA
DATE: 99/06/10
SCALE: Hz 1:2000 Vt 1:200
BENCHMARK:

ANDERSON
Civil Engineering

CLIENT: REGIONAL DISTRICT OF NANAIMO
PROJECT: WEMBLEY ROAD/FRENCH CREEK PRE-DESIGN SANITARY SEWER STUDY
REID ROAD
PLAN AND PROFILE

SHEET No. 7 OF 7
DRAWING No. FIG 11
CAD FILE No. 2019SAN
REV.

DESTROY ALL DRAWINGS BEARING LETTER PRECEDING THIS

APPENDIX C

Table 3 - Extended service area flows

REGIONAL DISTRICT OF NANAIMO
WEMBLEY ROAD/FRENCH CREEK
PRE-DESIGN SANITARY SEWER STUDY

TABLE 3

EXTENDED SERVICE AREA FLOWS

ANDERSON
Civil Engineering

MANNING'S FORMULA:
V=(R^(2/3)*S^(1/2))/n
Q=VA N=0.013

MANHOLE		LOCATION	Sewer	AREA	DENSITY			EQUIV POP	SEWAGE FLOW		INFILTRATION		TOTAL FLOW		PROPOSED OR EXISTING SEWER			
									PEAK FLOW		INFILTRATION				GRADE	DIAM	VEL	CAP
UP	DOWN		Sub-Area	(ha)	UNITS or LOTS	DU/ha	pop/ha	POP	CUM.	FLOW m3/cap/d	CUM. m3/d	FLOW m3/d	CUM. m3/d	m3/d	l/s	%	mm	m/s	Half Full l/s
1	N-8	Manse Rd	A	0.29		25		18	18	1.95	34.32	2.93	2.93	37.25	0.43	0.50%	200	0.74	11.59
2	N-8	Cannon Rd	B	0.53		25		32	49	1.95	95.79	5.25	8.19	103.97	1.20	0.05%	200	0.23	3.67
N-8	N-7	Manse Rd	C	2.05		25		123	172	1.75	301.46	20.52	28.71	330.17	3.82	0.50%	200	0.74	11.59
N-7	N-6	Manse Rd	D	2.92		25		175	348	1.40	486.60	0.00	28.71	515.31	5.96	1.00%	200	1.04	16.39
N-6	N-5	Manse Rd		0.00		25		0	348	1.40	486.60	0.00	28.71	515.31	5.96	1.04%	200	1.06	16.72
N-5	N-4	Wembley Rd	E	0.50		25		30	378	1.40	528.79	5.02	33.73	562.52	6.51	0.50%	200	0.74	11.59
N-4	N-3	Wembley Rd	F	2.72	102			245	623	1.20	747.01	27.15	60.89	807.89	9.35	0.85%	200	0.96	15.11
N-3	N-2	Ackerman Rd	G+H	3.32		25		199	822	1.05	862.79	33.20	94.09	956.88	11.07	1.15%	200	1.12	17.58
N-2	N-1	Ackerman Rd	J	2.01		25		121	943	1.01	951.93	20.13	114.22	1066.15	12.34	2.33%	200	1.59	25.02
N-1	266	Ackerman Rd	K+L	3.45		25		207	1150	0.95	1092.14	34.52	148.74	1240.88	14.36	3.42%	200	1.93	30.31
17	18	Wembley Rd	-					0	0	1.95	0.00	0.00	0.00	0.00	0.00	5.00%	150	1.93	17.02
18	264	Riley Rd	Q	1.37		15		49	49	1.95	96.24	13.71	13.71	109.95	1.27	0.75%	200	0.90	14.19
264	263	Riley Rd	-						49	1.95	96.24	0.00	13.71	109.95	1.27	0.90%	200	0.99	15.55
266	241	Ackerman Rd		16.24		15		585	1734	0.80	1387.41	162.40	311.14	1698.55	19.66	3.18%	200	1.86	29.23
241	240	Highway		0.00		15		0	1734	0.80	1387.41	0.00	311.14	1698.55	19.66	0.50%	200	0.74	11.59
240	236	Aberdeen Dr.		15.04			50	752	2486	0.70	1740.38	150.40	461.54	2201.92	25.49	1.19%	200	1.14	17.88
-	236		M+N	2.55			50	128	128	1.95	1.95	25.50	25.50	27.45	0.32	0.50%	200	0.74	11.59
236	212	Aberdeen Dr.		4.00		15		144	2758	0.71	1958.01	40.00	527.04	2485.05	28.76	1.16%	200	1.12	17.65
212	233	Aberdeen Dr.		4.00		15		144	2902	0.70	2031.23	40.00	567.04	2598.27	30.07	1.16%	200	1.12	17.65
233	232	Marsh Pl.		5.56		15		200	3102	0.69	2140.33	55.60	622.64	2762.97	31.98	1.16%	200	1.12	17.65
232	TRUNK	ROW		3.79		15		136	3238	0.65	2104.94	37.90	660.54	2765.47	32.01	1.27%	200	1.18	18.47
3	4	ROW	R+S+T	21.41		15		771	771	1.05	809.13	214.06	214.06	1023.19	11.84	0.41%	250	0.78	19.03
4	5	ROW	-	0.00		15		0	771	1.05	809.13	0.00	214.06	1023.19	11.84	0.41%	250	0.78	19.03
5	6	Lowry's Rd	U	7.11		15		256	1027	0.98	1006.08	71.11	285.17	1291.25	14.95	0.41%	250	0.78	19.03
6	7	Lowry's Rd	-	0.00		15		0	1027	0.98	1006.08	0.00	285.17	1291.25	14.95	0.41%	250	0.78	19.03
7	8	Lowry's Place	V	1.14		15		41	1068	0.95	1014.25	11.40	296.57	1310.82	15.17	2.50%	200	1.65	25.92
8	9	Future Lowry's Rd	-	0.00		15		0	1068	0.95	1014.25	0.00	296.57	1310.82	15.17	3.30%	200	1.90	29.78
9	12	Future Lowry's Rd	W	2.62		15		94	1162	0.9	1045.75	26.20	322.76	1368.52	15.84	3.90%	200	2.06	32.37
10	11	Yellow Brick Rd	-	0.00		0		0	0	1.95	0.00	0.00	0.00	0.00	0.00	0.50%	200	0.74	11.59
11	12	Yellow Brick Rd	X	2.50		15		90	90	1.95	175.73	25.03	25.03	200.76	2.32	0.50%	200	0.74	11.59
12	13	Future Lowry's Rd	-	0.00		15		0	1252	0.9	1126.86	0.00	347.80	1474.66	17.07	2.00%	200	1.48	23.18
26	25	Wembley Road	AQ	2.37		15		85	85	1.95	166.59	23.73	23.73	190.32	2.20	0.50%	200	0.74	11.59
25	13	Wembley Road	-	0.00		0		0	85	1.95	166.59	0.00	23.73	190.32	2.20	0.50%	200	0.74	11.59
13	X-1	Wright Rd	Y	1.25		15		45	1382	0.85	1175.04	12.47	360.27	1535.30	17.77	1.80%	200	1.40	21.99
U-1	X-1	Reid Rd	Z	2.06		15		74	74	1.95	144.94	20.65	20.65	165.59	1.92	0.41%	200	0.67	10.50
X-1	X-2	Wright Rd	-	0.00		15		0	1457	0.8	1165.38	0.00	380.92	1546.30	17.90	1.08%	200	1.08	17.03
14	15	Island Hwy	AA	1.34		15		48	48	1.95	94.11	13.41	13.41	107.52	1.24	1.00%	200	1.04	16.39
15	16	Island Hwy	AB	1.53		15		55	103	1.9	196.60	15.34	28.74	225.35	2.61	1.00%	200	1.04	16.39
16	X-2	Island Hwy	-	0.00		0		0	103	1.9	196.60	0.00	28.74	225.35	2.61	1.00%	200	1.04	16.39
X-2	X-3	Island Hwy	SCHOOL	3.72				160	1720	0.8	1376.16	37.20	446.85	1823.01	21.10	0.48%	200	0.72	11.35
X-3	X-4	Island Hwy		0.00	0			0	1720	0.8	1376.16	0.00	446.85	1823.01	21.10	1.01%	200	1.05	16.47
X-4	X-5	Breakwater Rd		0.97		15		35	1755	0.80	1404.15	9.72	456.57	1860.72	21.54	1.97%	200	1.47	23.01
X-5	X-6	Breakwater Rd		1.87		15		67	1822	0.77	1403.21	18.66	475.23	1878.44	21.74	1.61%	200	1.32	20.80
X-6	TRUNK	Breakwater Rd		1.74		15		63	1885	0.77	1451.48	17.41	492.64	1944.12	22.50	4.15%	200	2.13	33.39

APPENDIX D

Parksville Sanitary Sewer Update (selected pages)

3 DESIGN CRITERIA

3.1 POPULATION DISTRIBUTION AND LAND USE

Population and land use data were provided by the City's planning department, based on the current Official Community Plan (OCP) and RDN Planning Areas.

Table 3.1 shows the estimated existing dwelling unit distribution among the City's planning areas, and projected dwelling unit capacity of each of the planning areas at full build-out.

The conversion from dwelling units to population is an average factor of 2.3 people per dwelling unit, as per 1991 census, and expected to be the same for the 1996 census.

The existing population of the City is estimated at 9,743 people and the ultimate build-out population is estimated at 41,600 people. This includes an allowance for 1,272 units in the Rathtrevor Resort area, recently incorporated into the City. This number may vary after completion of the OCP for that area.

Areas outside the City, which are tributary to the City's collection system, were estimated based on RDN land use designations and estimated build-out densities. Total estimated ultimate contributions to the City system from outside City boundaries are 115 dwelling units at the west end of the City, and 520 dwelling units at the east end of the City system.

3.2 SANITARY SEWAGE LOADING

The City of Parksville Engineering Standards have been used as the basis for average per capita sanitary sewage design flows in this study. An average per capita design flow of 410 litres per capita per day (lpcd) is specified. When combined with normally accepted peaking factors, this results in peak flows that are considerably higher than the RDN peak sewage flow design criteria of 600 lpcd for populations greater than 6,000.

It should be recognized, however, that higher peaks would be expected in smaller sub-drainage areas within the City's collection system, as compared to regional criteria for larger trunk sewer systems.

In the absence of calibration data for smaller sub-areas, it was felt that the use of the City's design unit flows would be appropriate for analysis of the smaller sub-systems. It is expected to introduce considerable conservancy in the analysis of the larger sub-systems.

Tourist commercial, highway commercial, and industrial areas were initially modeled on the basis of the City's design criteria, namely 22,500 l/day/ha. This resulted in an equivalent population of 3,618 for the industrial park and adjacent industrial area. This was considered unrealistically high. Instead, the population equivalent for the industrial park was reduced to a still very conservative figure of 2,500. This kept the ultimate projected flows tributary to the Craig Bay trunk sewer to within the criteria used for design of that sewer.

Without the ability to calibrate the model at this time, it must be recognized that results are to be considered relatively coarse, and purposely conservatively high. This is illustrated by comparing the peak 1995 flow rate for the entire City, measured at the RDN flow meter at manhole 113 with the model flow at that location for existing conditions (see Appendix A). The measured peak flow was 160 lps and the model flow for the existing condition is 281 lps, or a factor 1.75 higher than measured. This factor is expected to be less as the drainage area under consideration gets smaller.

Nevertheless, this means that in areas where the model shows that pipes are flowing only slightly over 100% of capacity, field measurements should be conducted to verify actual conditions, before a decision is made to upgrade a particular sewer section. Design criteria for new pipes should remain conservative, as they currently are, until further calibration of the model shows clearly that design criteria can be reduced for smaller catchment areas.

The peaking factor used is the Harmon formula, which is applied in the model to domestic sewage flows, as well as the population flow equivalents for tourist commercial and industrial.

3.3 INFILTRATION AND INFLOW

Infiltration and inflow allowances were based on the quantities derived in the I/I analysis presented in a separate report. No additional I/I allowance has been added for future development areas, as these will be newer systems, and overall I/I is expected to decrease over time, because of the planned I/I control program.

3.4 TOTAL FLOWS

Total flows generated by the model are the total of the sanitary loading multiplied by a peaking factor, the industrial loading, based on flow per unit area, multiplied by a peaking factor, and infiltration and inflow, based on flow per unit pipe length and diameter. Pump station flows are modeled as constant outflow, based on installed pump capacity.

Table 3.2 shows the existing and ultimate population estimates, industrial area, infiltration/inflow allowances and corresponding peak flows for the City.

TABLE 3.2
PROJECTED PEAK SEWAGE FLOWS
(Litres Per Second)

YEAR	Population			Indust.	Indust.	Infilt.	Sewage	Total Peak Flow
	Parksville	RDN	Total	(ha)	(lps)	(lps)	(lps)	(lps)
1996	9,743	238	9,981	19	13.5	80	196	266
Build-out	41,600	1,783	43,383	66	41.5	80	539	612

It should be noted that these peak flows do not coincide with the peak flows in the model, as the latter assumes that all pump stations pump at the same time, and thus the peaks include the actual pump station output. This has a more significant influence in the existing condition, as the new capacity of the Bay Avenue pump station is much larger than the present peak flow tributary to it.

3.5 PIPE CAPACITY PARAMETERS

Pipe flow capacity is calculated using Manning's formula and the following roughness coefficients:

Concrete Pipe	n = 0.013
Asbestos Cement Pipe	n = 0.012
Ductile Iron Pipe	n = 0.012
PVC Pipe	n = 0.011

6 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are presented as a result of this study:

1. The existing City of Parksville sanitary sewer system is adequate to handle projected sewage flows for several more years.

2. The first part of the sewer system to become overloaded is the sewer on Morison leading to the Island Highway. This can be avoided by constructing the Finholm Diversion as recommended in the 1990 report. Recommended date of implementation is 1997.

3. The outdated and troublesome Despard pump station can be eliminated by construction of a relatively short gravity sewer bypass, to be implemented by upstream development. Recommended date of implementation is 1997.

4. Future upgrading of the Island Highway sewer, after completion of the Finholm diversion, can be avoided by construction of the McMillan diversion.

5. Sanitary sewers adjacent to future growth areas are sufficient to handle expansion of the sewer system when development occurs within City boundaries, with the possible exception of sections of sewer on Corfield Street and Moilliet/Hirst Street, which may require upgrading when upstream development occurs. Additional trunk sewers into new development areas should be provided as part of new developments.

6. Unit sewage flow values used in the computer model at this time are as specified in the City's Engineering Standards, and are very conservative, compared to RDN design standards and measured flows for large tributary areas. The computer model needs to be calibrated, to fine-tune it closer to actual flows generated in the system.

7. Independent analysis by others has shown that the existing Parksville Interceptor has sufficient capacity to support build-out within City limits to a total level of 32,000 people, as well as provision of service to Pacific Shores, the Madrona peninsula, and San Pareil. This is predicated on less conservative flow estimates (RDN design standards), and allowing a 600 mm surcharge at Corfield and also at Wright Road. It has not been verified if the existing collection system in these areas can handle such a surcharge without flooding service connections. It is expected that the Parksville Interceptor will need to be upgraded before a total City population of 42,000 can be accommodated.

8. Any sewer sections identified in yellow on Figures 1 and 2 need to be closely monitored and re-modeled prior to any decisions for replacement or upgrading. It is recommended that the City monitor critical sewer sections using the portable flow meter purchased under the I/I control program.

9. It is recommended that the improvements listed in Section 5.3 be included in the City's sanitary sewer DCC bylaw.

10. It is recommended that, in designing the proposed diversions, the City investigate the desirability of installing sluice gates or differential inverts, instead of capping the original sewer, so that it would be possible to route sewage either way in the future, if necessary for maintenance purposes.

11. It is recommended that the City and the RDN review the total design build-out population tributary to the Parksville Interceptor. If the build-out is 32,000 people, as assumed in Dayton & Knight's recent capacity review, the effect of a 600 mm surcharge in various locations should be investigated. If the build-out is 42,000 people, as assumed in the current sewage collection system study, or if the surcharge conditions are unacceptable, financial planning should be put in place to allow future twinning of the interceptor, from the foot of Corfield Street to the French Creek Water Pollution Control Centre.

Design Criteria File: C:\SANSYS\2OCPBONC.DCT City of Parksville Pop (Build Out)
Sewerage System File: C:\SANSYS\2OCPBONC.SAN Existing Pipe Network
Metric units
Residential Flow= 410.0 lpcd
Infiltration= 9299 lphd + 0 l/mm/km/d
Peaking Factor= Harmon formula* 1.00
<=5.00, Industrial Peaking Factor=1.00

Pipe Up	Manholes Down	Description	External File	Pump Rate lps	Meas Flow lps	Grade %	Mannings n	Dia mm	Area+Addnl Population
139	138					0.120	0.013	610	0+ 0
140	139					0.110	0.013	610	0+ 0
141	140					0.120	0.013	610	0+ 0
142	141					0.130	0.013	610	0+ 0
201	115					1.000	0.011	200	0+ 20
203	233					1.580	0.011	200	0+ 20
204	203					0.960	0.011	200	0+ 20
205	204					1.100	0.011	200	0+ 20
206	205					0.880	0.011	200	0+ 20
207	206					1.850	0.011	200	0+ 20
208	204					1.590	0.011	200	0+ 20
209	208					1.470	0.011	200	0+ 20
210	209					1.510	0.011	200	0+ 20
211	234					0.890	0.011	200	0+ 20
212	234					1.170	0.011	200	0+ 20
213	212					1.030	0.011	200	0+ 20
214	213					0.710	0.011	200	0+ 20
215	212					0.420	0.011	200	0+ 20
216	215					0.450	0.011	200	0+ 20
217	216					0.420	0.011	200	0+ 20
218	216					0.530	0.011	150	0+ 20
219	217					0.660	0.011	200	0+ 20
220	219					2.070	0.011	150	0+ 20
221	219					0.830	0.011	200	0+ 20
222	221					6.000	0.011	200	0+ 20

Up	EXISTING.... Dia mm	Capacity lps	REQ'D Dia mm	PROPOSED..... Dia mm	Capacity lps	Vfull mps	Vpart mps	Q/Qf	DESIGN FLOWS..... Infiltr lps	Average lps	Peak lps
139	610*	222.3	808	610	222.3	0.8	.	2.12	46.4	232.5	470.2
140	610*	212.8	821	610	212.8	0.7	.	2.21	46.2	232.3	470.0
141	610*	222.3	806	610	222.3	0.8	.	2.10	45.1	228.9	466.6
142	610*	231.4	793	610	231.4	0.8	.	2.02	44.9	228.7	466.4
201	200	38.8	40	200	38.8	1.2	0.4	0.01	0.1	0.2	0.5
203	200	48.7	75	200	48.7	1.6	0.9	0.07	0.4	1.1	3.6
204	200	38.0	78	200	38.0	1.2	0.7	0.08	0.3	0.9	3.1
205	200	40.7	55	200	40.7	1.3	0.6	0.03	0.1	0.4	1.3
206	200	36.4	50	200	36.4	1.2	0.5	0.02	0.1	0.3	0.9
207	200	52.7	34	200	52.7	1.7	0.4	0.01	0.1	0.1	0.5
208	200	48.9	52	200	48.9	1.6	0.6	0.03	0.1	0.4	1.3
209	200	47.0	45	200	47.0	1.5	0.5	0.02	0.1	0.2	0.9
210	200	47.6	35	200	47.6	1.5	0.4	0.01	0.0	0.1	0.4
211	200	36.6	41	200	36.6	1.2	0.4	0.01	0.1	0.2	0.5
212	200	41.9	181	200	41.9	1.3	1.5	0.77	4.5	12.1	32.3
213	200	39.3	52	200	39.3	1.3	0.5	0.03	0.3	0.4	1.1
214	200	32.7	41	200	32.7	1.0	0.3	0.01	0.1	0.2	0.5
215	200	25.1	98	200	25.1	0.8	0.6	0.15	0.6	1.3	3.8
216	200	26.0	92	200	26.0	0.8	0.6	0.13	0.5	1.2	3.3
217	200	25.1	83	200	25.1	0.8	0.5	0.10	0.4	0.9	2.4
218	150	13.1	44	150	13.1	0.7	0.3	0.04	0.1	0.2	0.5
219	200	31.5	70	200	31.5	1.0	0.5	0.06	0.3	0.7	1.9
220	150	25.9	34	150	25.9	1.5	0.5	0.02	0.1	0.2	0.5
221	200	35.3	51	200	35.3	1.1	0.5	0.03	0.1	0.3	0.9
222	200	95.0	28	200	95.0	3.0	0.7	0.01	0.1	0.2	0.5

Design Criteria File: C:\SANSYS\2OCPBONC.DCT City of Parksville Pop (Build Out)
Sewerage System File: C:\SANSYS\2OCPBONC.SAN Existing Pipe Network
Metric units
Residential Flow= 410.0 lpcd
Infiltration= 9299 lphd + 0 l/mm/km/d
Peaking Factor= Harmon formula* 1.00
<=5.00, Industrial Peaking Factor=1.00

Pipe Up	Manholes Down	Description	External File	Pump Rate lps	Meas Flow lps	Grade %	Mannings n	Dia mm	Area+Addnl Population
223	258					1.194	0.012	150	0+ 101
224	232					2.780	0.011	150	0+ 20
225	232					1.200	0.011	200	0+ 20
226	232					0.480	0.011	200	0+ 20
227	226					1.100	0.011	150	0+ 20
228	227					0.480	0.011	200	0+ 20
229	228					0.520	0.011	200	0+ 20
230	229					0.960	0.011	200	0+ 20
232	115					1.269	0.011	200	0+ 20
233	232					1.160	0.011	200	0+ 20
234	233					1.160	0.011	200	0+ 20
235	212					1.170	0.011	200	0+ 20
236	235					1.240	0.011	200	0+ 20
237	236					2.750	0.011	200	0+ 20
238	237					1.240	0.011	200	0+ 20
239	238					2.480	0.011	200	0+ 20
240	239					1.189	0.011	200	0+ 20
241	240					0.500	0.011	200	0+ 20
242	241					0.726	0.011	200	0+ 20
243	242					5.000	0.011	200	0+ 20
244	243					2.800	0.011	200	0+ 20
245	244					4.100	0.011	150	0+ 20
246	242					0.350	0.011	200	0+ 20
247	246					0.950	0.011	200	0+ 20
248	247					2.495	0.011	200	0+ 20

Up	EXISTING.... Dia mm	Capacity lps	REQ'D Dia mm	PROPOSED..... Dia mm	Capacity lps	Vfull mps	Vpart mps	Q/Qf	DESIGN FLOWS..... Infiltr lps	Average lps	Peak lps
223	150	18.0	67	150	18.0	1.0	0.7	0.12	0.0	0.5	2.1
224	150	30.0	32	150	30.0	1.7	0.6	0.02	0.1	0.2	0.5
225	200	42.5	37	200	42.5	1.4	0.4	0.01	0.1	0.2	0.5
226	200	26.9	80	200	26.9	0.9	0.5	0.09	0.3	0.8	2.3
227	150	18.9	63	150	18.9	1.1	0.7	0.10	0.2	0.6	1.8
228	200	26.9	66	200	26.9	0.9	0.4	0.05	0.2	0.5	1.4
229	200	28.0	56	200	28.0	0.9	0.4	0.03	0.1	0.3	0.9
230	200	38.0	39	200	38.0	1.2	0.4	0.01	0.1	0.2	0.5
232	200	43.7	193	200	43.7	1.4	1.6	0.90	5.7	15.1	39.5
233	200	41.7	190	200	41.7	1.3	1.5	0.87	5.2	13.8	36.5
234	200	41.7	183	200	41.7	1.3	1.5	0.79	4.6	12.5	33.1
235	200	41.9	172	200	41.9	1.3	1.4	0.66	3.5	10.1	27.9
236	200	43.2	169	200	43.2	1.4	1.5	0.64	3.5	10.0	27.5
237	200	64.3	145	200	64.3	2.0	2.0	0.42	3.4	9.8	27.1
238	200	43.2	167	200	43.2	1.4	1.4	0.62	3.3	9.5	26.6
239	200	61.0	146	200	61.0	1.9	1.9	0.43	3.1	9.3	26.2
240	200	42.3	166	200	42.3	1.3	1.4	0.61	3.1	9.2	25.8
241	200	27.4	151	200	27.4	0.9	0.9	0.47	2.4	5.1	12.9
242	200	33.0	100	200	33.0	1.1	0.8	0.16	0.9	2.0	5.2
243	200	86.7	43	200	86.7	2.8	0.9	0.02	0.2	0.5	1.4
244	200	64.9	42	200	64.9	2.1	0.7	0.02	0.2	0.4	1.0
245	150	36.4	31	150	36.4	2.1	0.6	0.01	0.1	0.2	0.5
246	200	22.9	98	200	22.9	0.7	0.5	0.15	0.6	1.3	3.4
247	200	37.8	77	200	37.8	1.2	0.7	0.08	0.5	1.1	2.9
248	200	61.2	60	200	61.2	1.9	0.9	0.04	0.4	0.9	2.5

Design Criteria File: C:\SANSYS\2OCPBONC.DCT City of Parkeville Pop (Build Out)
Sewerage System File: C:\SANSYS\2OCPBONC.SAN Existing Pipe Network
Metric units
Residential Flow= 410.0 lpcd
Infiltration= 9299 lphd + 0 l/mm/km/d
Peaking Factor= Harmon formula* 1.00
<=5.00, Industrial Peaking Factor=1.00

Pipe Up	Manholes Down	Description	External File	Pump Rate lps	Meas Flow lps	Grade %	Mannings n	Dia mm	Area+Addnl Population
249	248					6.035	0.011	200	0+ 20
250	248					0.650	0.011	200	0+ 20
251	250					2.950	0.011	200	0+ 20
252	251					0.600	0.011	200	0+ 20
253	240					1.510	0.011	200	0+ 101
254	253					1.540	0.011	200	0+ 101
255	254					1.350	0.011	200	0+ 101
256	255					2.666	0.011	200	0+ 101
257	256					1.475	0.011	200	0+ 101
258	257					4.080	0.011	200	0+ 101
260	241					0.500	0.011	200	0+ 20
261	260					0.500	0.011	200	0+ 20
262	261					2.490	0.011	200	0+ 20
263	262					1.700	0.011	200	0+ 20
264	263					0.900	0.011	150	0+ 20
265	241					3.180	0.011	200	0+ 20
266	265					3.240	0.011	200	0+ 20
267	266					3.050	0.011	200	0+ 20
268	267					0.300	0.011	150	0+ 20
269	267					3.350	0.011	200	0+ 20
270	269					4.000	0.011	200	0+ 20
271	270					6.200	0.011	150	0+ 20
272	269					4.360	0.011	200	0+ 20
273	272					1.310	0.011	200	0+ 20
274	273					0.510	0.011	200	0+ 20

Up	EXISTING.... Dia mm	Capacity lps	REQ'D Dia mm	PROPOSED..... Dia mm	Capacity lps	Vfull mps	Vpart mps	Q/Qf	DESIGN FLOWS..... Infiltr lps	Average lps	Peak lps
249	200	95.2	28	200	95.2	3.0	0.7	0.01	0.1	0.2	0.5
250	200	31.3	63	200	31.3	1.0	0.5	0.05	0.2	0.5	1.4
251	200	66.6	42	200	66.6	2.1	0.7	0.02	0.2	0.4	1.0
252	200	30.0	45	200	30.0	1.0	0.3	0.02	0.1	0.2	0.6
253	200	47.6	125	200	47.6	1.5	1.3	0.29	0.6	4.0	13.7
254	200	48.1	118	200	48.1	1.5	1.3	0.25	0.6	3.4	11.8
255	200	45.0	114	200	45.0	1.4	1.2	0.22	0.4	2.8	9.9
256	200	63.3	92	200	63.3	2.0	1.4	0.13	0.4	2.3	8.1
257	200	47.1	93	200	47.1	1.5	1.0	0.13	0.3	1.7	6.1
258	200	78.3	67	200	78.3	2.5	1.3	0.05	0.2	1.2	4.2
260	200	27.4	83	200	27.4	0.9	0.5	0.10	0.6	1.1	2.6
261	200	27.4	76	200	27.4	0.9	0.5	0.08	0.4	0.8	2.1
262	200	61.2	50	200	61.2	1.9	0.8	0.03	0.3	0.6	1.5
263	200	50.5	46	200	50.5	1.6	0.6	0.02	0.2	0.4	1.0
264	150	17.1	39	150	17.1	1.0	0.4	0.03	0.1	0.2	0.5
265	200	69.1	76	200	69.1	2.2	1.3	0.08	0.9	1.9	5.2
266	200	69.8	73	200	69.8	2.2	1.3	0.07	0.8	1.8	4.8
267	200	67.7	71	200	67.7	2.2	1.2	0.06	0.7	1.6	4.3
268	150	9.9	48	150	9.9	0.6	0.3	0.05	0.1	0.1	0.5
269	200	70.9	64	200	70.9	2.3	1.1	0.05	0.6	1.3	3.4
270	200	77.5	38	200	77.5	2.5	0.7	0.01	0.1	0.3	0.9
271	150	44.8	27	150	44.8	2.5	0.7	0.01	0.0	0.1	0.5
272	200	80.9	50	200	80.9	2.6	1.0	0.02	0.4	0.8	2.0
273	200	44.4	56	200	44.4	1.4	0.6	0.03	0.3	0.5	1.5
274	200	27.7	45	200	27.7	0.9	0.3	0.02	0.1	0.2	0.5

Design Criteria File: C:\SANSYS\2OCPBONC.DCT City of Parksville Pop (Build Out)
Sewerage System File: C:\SANSYS\2OCPBONC.SAN Existing Pipe Network
Metric units
Residential Flow= 410.0 lpcd
Infiltration= 9299 lphd + 0 l/mm/km/d
Peaking Factor= Harmon formula* 1.00
<=5.00, Industrial Peaking Factor=1.00

Pipe Up	Manholes Down	Description	External File	Pump Rate lps	Meas Flow lps	Grade %	Mannings n	Dia mm	Area+Addnl Population
275	273					0.670	0.011	200	0+ 20
301	118					0.640	0.011	200	0+ 20
302	119					2.000	0.011	200	0+ 20
303	302					0.400	0.011	200	0+ 20
304	303					0.400	0.011	200	0+ 20
305	304					0.400	0.011	200	0+ 20
306	305					2.700	0.011	200	0+ 20
307	306					3.150	0.011	200	0+ 20
308	117					0.300	0.011	200	0+ 20
309	308					0.300	0.011	200	0+ 20
310	309					0.300	0.011	200	0+ 20
311	310					0.550	0.012	150	0+ 20
312	310					0.300	0.011	200	0+ 20
313	312					0.810	0.011	150	0+ 20
314	312					0.400	0.011	200	0+ 20
315	314					0.400	0.011	200	0+ 20
316	315					0.400	0.011	200	0+ 20
317	121					0.500	0.011	150	0+ 20
318	122					0.616	0.011	250	0+ 20
319	318					0.583	0.011	250	0+ 20
320	319					0.464	0.011	200	0+ 110
321	320					0.465	0.011	200	0+ 110
322	321					0.807	0.011	200	0+ 110
323	322					0.400	0.011	200	0+ 20
324	319					0.500	0.011	200	0+ 20

Up	EXISTING.... Dia mm	Capacity lps	REQ'D Dia mm	PROPOSED..... Dia mm	Capacity lps	Vfull mps	Vpart mps	Q/Qf	DESIGN FLOWS..... Infiltr lps	Average lps	Peak lps
275	200	31.7	42	200	31.7	1.0	0.3	0.02	0.1	0.2	0.5
301	200	31.0	43	200	31.0	1.0	0.3	0.02	0.1	0.2	0.5
302	200	54.8	106	200	54.8	1.7	1.3	0.18	1.2	3.4	10.1
303	200	24.5	141	200	24.5	0.8	0.7	0.39	1.1	3.2	9.6
304	200	24.5	138	200	24.5	0.8	0.7	0.37	0.9	3.0	9.1
305	200	24.5	135	200	24.5	0.8	0.7	0.35	0.7	2.7	8.5
306	200	63.7	92	200	63.7	2.0	1.4	0.13	0.6	2.4	8.0
307	200	68.8	87	200	68.8	2.2	1.4	0.11	0.4	2.2	7.5
308	200	21.2	126	200	21.2	0.7	0.6	0.29	1.6	2.7	6.2
309	200	21.2	122	200	21.2	0.7	0.6	0.27	1.4	2.5	5.7
310	200	21.2	118	200	21.2	0.7	0.6	0.25	1.3	2.2	5.2
311	150	12.2	45	150	12.2	0.7	0.3	0.04	0.1	0.2	0.5
312	200	21.2	109	200	21.2	0.7	0.5	0.20	1.0	1.8	4.2
313	150	16.2	41	150	16.2	0.9	0.4	0.03	0.1	0.2	0.5
314	200	24.5	93	200	24.5	0.8	0.5	0.13	0.8	1.4	3.2
315	200	24.5	87	200	24.5	0.8	0.5	0.11	0.7	1.1	2.7
316	200	24.5	79	200	24.5	0.8	0.5	0.08	0.5	0.8	2.1
317	150	12.7	45	150	12.7	0.7	0.3	0.04	0.1	0.2	0.5
318	250	55.2	198	250	55.2	1.1	1.1	0.54	5.1	11.7	29.7
319	250	53.7	199	250	53.7	1.1	1.1	0.54	4.9	11.4	29.2
320	200	26.4	123	200	26.4	0.8	0.7	0.27	0.5	2.2	7.2
321	200	26.4	108	200	26.4	0.8	0.7	0.19	0.4	1.6	5.1
322	200	34.8	79	200	34.8	1.1	0.7	0.08	0.3	0.9	2.9
323	200	24.5	47	200	24.5	0.8	0.3	0.02	0.1	0.2	0.5
324	200	27.4	62	200	27.4	0.9	0.4	0.04	0.4	0.6	1.2


RON MEIER
PARKSVILLE
INTERCEPTOR
100
200
300
633
304
EATON STREET
TEMPLE STREET
ISLAND HIGHWAY
NEWBURY ROAD

APPENDIX E

Classes of Cost Estimates

CLASSES OF COST ESTIMATES FOR CAPITAL PROJECTS

A. Class A Estimate:
This is a detailed estimate based on quantity take-off from final drawings and specifications. It is used to evaluate tenders or as a basis of cost control during day-labour construction.

B. Class B Estimate:
This estimate is prepared after site investigations and studies have been completed and the major systems defined. It is based on project brief and preliminary design. It is used for obtaining approvals, budgetary control and design cost control.

C. Class C Estimate

This estimate, which is prepared with limited site information, is based on probable conditions affecting the project. It represents the summation of all indentifiable project component costs. It is used for program planning; to establish a more specific definition of client needs and to obtain approval in principle.

D. Class D Estimate:

This is a preliminary estimate which, due to little or no site information indicates the approximate magnitude of cost of the proposed project, based on the client's broad requirements. This overall cost estimate may be derived from lump sum or unit costs as identified in the construction cost manual for a similar project. It may be used to obtain approval in principle and for discussion purposes.

REGIONAL DISTRICT OF NANAIMO

CONSULTING SERVICES AGREEMENT

THIS AGREEMENT made the <Day> day of <Month>, 20<XX>.

BETWEEN:

REGIONAL DISTRICT OF NANAIMO
6300 Hammond Bay Road
Nanaimo, BC
V9T 6N2

(hereinafter called the "Regional District" or "Client")

AND:

<VENDOR NAME>
<Street Address>
<City, Province>
<Postal Code>

(hereinafter called the "Consultant")

NOW THIS AGREEMENT WITNESSETH:

THAT in consideration of the terms, conditions and covenants hereinafter set forth, the Regional District and the Consultant covenant and agree each with the other as follows:

1 Appointment

The Regional District retains the Consultant to provide the Services (herein called the "Services") described in Schedule 'B' which is attached hereto and forms part of this Agreement.

2 Term

The Consultant will provide the Services during the period (hereinafter called the "Term") commencing on <Enter Start Date> and ending on <Enter End Date>, unless sooner terminated as hereinafter provided.

3 Payment

The Regional District will pay to the Consultant, for the Services, the amount, in the manner and at the times set out in Schedule 'A' attached hereto. The Consultant agrees to accept the amount as full payment and reimbursement. No additional amounts may be charged by the Consultant unless pre-approved by the Regional District in writing.

SAMPLE

4 Independent Consultant

The Consultant will be an independent Consultant and not the servant, employee, or agent of the Regional District. The Consultant is not, and must not claim to be the Regional District's agent for any purpose unless the Regional District gives the Consultant authorization in writing to act as the Regional District's agent for specific purposes that are reasonably necessary to the Consultant's rendering of the Services pursuant to this Agreement.

5 Assignment and Sub-Consultants

The Consultant will not, without the prior written consent of the Regional District, assign or subcontract this Agreement or any portion thereof. The Consultant may retain subconsultants to assist in the performance of the Services provided that the terms of this Agreement shall apply to the subconsultants and provided that the Consultant shall be wholly responsible for the professional standards, performance and all actions of the subconsultants. The Consultant shall only employ subconsultants having the appropriate standards, qualifications, and experience in their respective areas of expertise. Notwithstanding the foregoing, Consultant may, where appropriate, subcontract any portion of the Services its affiliates without the Regional District's prior written consent and Consultant shall remain liable for the performance of such affiliates.

6 Intellectual Property

If any Intellectual Property is developed by the Consultant in the course of or in connection with the performance of the Services, the Consultant retains ownership of such Intellectual Property. Provided the Regional District has paid the Consultant for the Services, the Regional District will have a non-exclusive license to use any proprietary concept, product or process of the Consultant which relates to or results from the Services for the life of the Project and solely for purposes of its own internal use and for maintenance and repair including updating the original work, with respect to that part of the Project to which the Services relate.

7 Conflict

The Consultant shall not, during the term, perform a service for or provide advice to any person, firm or corporation where the performance of the service or the provision of the advice may or does, in the reasonable opinion of the Regional District, give rise to a conflict of interest between the obligations of the consultant to the Regional District under this Agreement, and the obligations of the Consultant to such other person, firm or corporation.

8 Limits of Liability and Consequential Damages Waiver

In consideration of the provision of the Services by the Consultant to the Client under this Agreement, the Client agrees that any and all claims which the Client may have against the Consultant, its employees, officers, agents, representatives and Sub-Consultants in respect of the Services, howsoever arising, whether in contract or in tort, save and except for claims arising out of or in connection with any malicious act or malicious omission under paragraph 9, shall be absolutely limited to $1,000,000 or the insurance limits as set out in Clause 10, whichever is lower.

No action or proceedings for any breach of this Agreement shall be commenced by either party after the expiry of 6 years after the completion of the Services.

The Consultant's liability to the Client is limited to that proportion of the Client's losses for which the Consultant is responsible under this contract and for which the Consultant has a legal liability. For the avoidance of doubt, the Consultant shall not be held liable for special, indirect, economic or consequential damages, including for loss of profit.

9 Indemnity

Notwithstanding the provision of any insurance coverage by the Client, and subject to paragraph 8, the Consultant shall indemnify and save harmless the Client, its officers, employees, agents, successors, assigns, representatives, Consultants and Other Consultants from and against any losses, claims, damages, actions and causes of action, costs, expenses, judgments and proceedings arising out of or in connection with any error, or negligent or malicious act or omission, by the Consultant or any of its officers, agents, representatives, employees or Sub-Consultants, except to the proportionate extent of any contributing negligent or wrongful act or omission of the Client, or any of its officers, agents, representatives, employees, Consultants or Other Consultants. The terms and conditions, of this indemnity provision shall survive the completion of all Services and the termination of this Agreement for any reason.

10 Insurance

At the Consultant's expense, provide and maintain any insurance that the Consultant is required to provide by law. The Consultant must provide satisfactory proof of insurance coverage to the Regional District upon request.

Comprehensive General Liability Insurance in an amount not less than two million dollars ($2,000,000.00) inclusive per occurrence against bodily injury and property damage. The Regional District is to be added as an additional insured under this policy, is to be endorsed to provide the Regional District with 30 days advance written notice of cancellation or material change and include a cross liability clause.

Professional liability (errors and omissions) insurance coverage shall be maintained to a limit of not less than $250,000 per claim, $1,000,000 aggregate.

Automobile third party liability insurance in an amount not less than $2,000,000 inclusive per occurrence for bodily injury, death, and damage to property, covering all vehicles owned or leased by the Consultant.

The Consultant will responsible for paying any insurance deductibles.

11 Termination

Notwithstanding any other provision of this Agreement:

a) If the Consultant fails to comply with any provision of this Agreement, then, and in addition to any other remedy or remedies available to the Regional District, the Regional District may, at its

option, terminate this Agreement immediately by giving written notice of termination to the Consultant.

b) Either Party may terminate this Agreement at any time upon giving the other Party seven (7) days' notice of such termination.

If either such option is exercised by the Regional District, the Regional District will be under no further obligation to the Consultant except to pay the Consultant such amount as the Consultant may be entitled to receive, pursuant to Schedule 'A', for services provided and expenses incurred to the date the said notice is given or delivered to the Consultant. The Consultant will refund to the Regional District any payment already made to the Consultant not yet earned.

12 Prior Dealings

All prior negotiations and agreements between the parties relating to the subject matter of this Agreement are superseded by this Agreement. There are no representations, warranties, understandings, or agreements other than those expressly set forth in the Agreement or subsequently agreed to in writing, which writing shall be executed by a duly authorized officer of the party to be bound thereby prior to the commencement of the work.

13 Waiver

The failure of either party at any time to require the other party's performance of any obligation under this Agreement shall not affect the right to require performance of that obligation in the future. Any waiver by either party of any such breach or any such provision hereof shall not be construed as a waiver or modification of this provision itself, or a waiver or modification of any other right under this Agreement.

14 Counterparts

This Agreement may be executed in counterparts with the same effect as if both parties had signed the same document. Each counterpart shall be deemed to be an original. All counterparts shall be construed together and shall constitute one and the same Agreement.

15 Dispute Resolution

If the parties to this Agreement are unable to agree on the interpretation or application of any provision in the Agreement, or are unable to resolve any other issue relating to this Agreement, the parties agree to the following process in the order it is set out:

a) the party initiating the process will send written notice to the other party (the "Dispute Notice"); and;
b) the parties will promptly, diligently and in good faith, including the senior management of both parties, take all reasonable measures to negotiate an acceptable resolution to the disagreement or dispute.

c) if the dispute is not resolved through collaborative negotiation within 30 Business Days of the dispute arising, the parties should then attempt to resolve the dispute through mediation under the rules of the Mediate BC Society and will be held in Nanaimo, BC. unless otherwise agreed.

16 Governing Law

This Agreement is governed by and is to be interpreted and construed in accordance with, the laws applicable in British Columbia.

17 Worksafe BC Coverage

Prior to the commencement of the work, all employers with employees must be registered with WorkSafe BC and remittance up to date. Self-employed proprietors or partners in a partnership, must have Personal Optional Protection coverage.

18 Delay in Performance

Neither the RDN nor the Consultant shall be deemed to be in default of this Agreement for delays in performance caused by circumstances beyond the reasonable control of the non-performing party. For purposes of this Agreement, such circumstances include, but are not limited to abnormal weather conditions, flood, earthquake, fire, epidemic, pandemic, war, riot and other civil disturbance, strike, lockout, work slowdown and other labour disturbances, sabotage, judicial restraint and inability to procure permits, licenses or authorizations from any local, provincial or federal agency for any of the supplies, materials, accesses or services required to be provided by either the RDN or the Consultant under this Agreement. If any such circumstances occur, the non-performing party shall, as soon as possible after being prevented from performing, give written notice to the other party describing the circumstances preventing continued performance and the efforts being made to resume performance of this Agreement.

19 Confidentiality and Privacy

Confidentiality

The Consultant will keep strictly confidential any information supplied to, obtained by, or which comes to the knowledge of the Consultant as a result of, relating to or arising out of the performance of the Services and this Contract (the "Confidential Information") and will not disclose such Confidential Information.

Notwithstanding the preceding sentence, the Consultant may disclose the Confidential Information:

(a) with the prior written consent of RDN;

(b) in strict confidence to the Consultant's professional advisors;

(c) to Subconsultants who, in each case, need to know the applicable Confidential Information for the purposes of performing the Services; and

(d) as otherwise required by law or permitted by this Contract.

The Consultant will require all Personnel and SubConsultants to enter into an agreement with the Consultant containing provisions in the same form as those found herein.

Exceptions to Confidentiality Obligations

The obligations of confidentiality will not apply to:

(a) information that is, or subsequently becomes, publicly available other than through a breach of this Contract or through a breach of a confidentiality agreement which another person has entered into concerning the Confidential Information;

(b) information that the Consultant already possessed independently before commencing the Services;

(c) information that is rightfully received from a third party without breach of any obligation of confidentiality by such third party; or

(d) information which is independently developed without the use of the Confidential Information.

Collection or Use of Confidential Information

Except with the prior written consent of the RDN, the Consultant will not collect or use, and will ensure that its professional advisors and Subconsultants do not collect or use, the Confidential Information for any purpose other than complying with the terms of this Contract or performing the Services. Without limiting the generality of the foregoing, except with the prior written consent of RDN, the Consultant will not collect or use, and will ensure that its professional advisors and Subconsultants do not collect or use, the Confidential Information to advance the commercial or other interests of the Consultant or any Subconsultant or any entity affiliated with the Consultant or any Subconsultant.

Privacy

The Consultant acknowledges that the RDN is subject to the Freedom of Information and Protection of Privacy Act, R.S.B.C. 1996, c. 165, as amended ("FOIPPA"), and accordingly, any documents, information and data submitted to RDN by the Consultant under this Contract, as well as any resultant studies, documents, information, and date received by the RDN may be disclosed under FOIPPA. The Consultant will not do or omit to do anything that causes the RDN to be not in compliance with FOIPPA.

Publicity

The Consultant will not issue any press release or speak to the media about this Contract or the subject matter of this Contract without the prior written consent of the RDN, which consent may be unreasonably withheld. The Consultant will refer all media inquiries relating to the Services or the Contract to the RDN.

SIGNATORIES

IN WITNESS WHEREOF the parties hereto have executed this Agreement the day and year first above written.

For the Regional District of Nanaimo:

_____
Signature

_____
Printed Name, Title

For the Consultant, <Company Name or Consultant's Name>:

_____
Signature

_____
Printed Name, Title

REGIONAL DISTRICT OF NANAIMO

SCHEDULE 'A'
FEES & EXPENSES

Total compensation to be paid to the Consultant by the Regional District of Nanaimo shall not exceed a maximum of **$<Enter Amount>** in Canadian Dollars. This compensation includes all fees and expenses including GST. If the services are completed by the consultant at less cost than maximum amount, the Regional District shall be billed only for actual hours worked and actual expenses incurred. If the Consultant receives the Maximum Fee, but has yet to complete the Services, it shall continue to provide the Services until it has provided all the Services.

The Consultant shall submit invoices to the Regional District for Services performed monthly (the "billing period") during which the Services are performed under this Agreement; such invoices to be submitted as soon as practicable after each billing period. The invoice submitted for each billing period shall be clearly itemized to show the amount of work performed, the billing rates, the reimbursable expenses and the costs incurred to employ any subconsultants. Except for the amounts which the Regional District in good faith is disputing and except for invoices (or portions of invoices) in respect of which the Regional District has requested and not received supporting evidence, the Regional District shall pay invoices submitted to it for the Services within 30 days' receipt thereof.

REGIONAL DISTRICT OF NANAIMO

SCHEDULE 'B'
SCOPE OF WORK

Enter/Attach RFP Response, Scope of Work, Deliverables and Timeframe