THE DISTRICT OF OAK BAY COMMITTEE OF THE WHOLE

Uplands Combined Sewer Separation Project

Predesign report

February 2, 2016

Why Separate Combined Sewers?

- Core Area Liquid Waste Management Plan

'On or before March 31, 2008, complete cost/benefit studies and an implementation schedule directed at the elimination of combined sewers in Oak Bay to be consistent with the Municipal Sewage Regulation'

Why Separate Combined Sewers?

- MWR Section 42 (1):

A discharger must ensure that an overflow does not occur during storm or snowmelt events with less than a 5-year return periods, unless … the person responsible for the municipal wastewater collection system develops and implements, as part of a liquid waste management plan, measures to eliminate overflows, ..

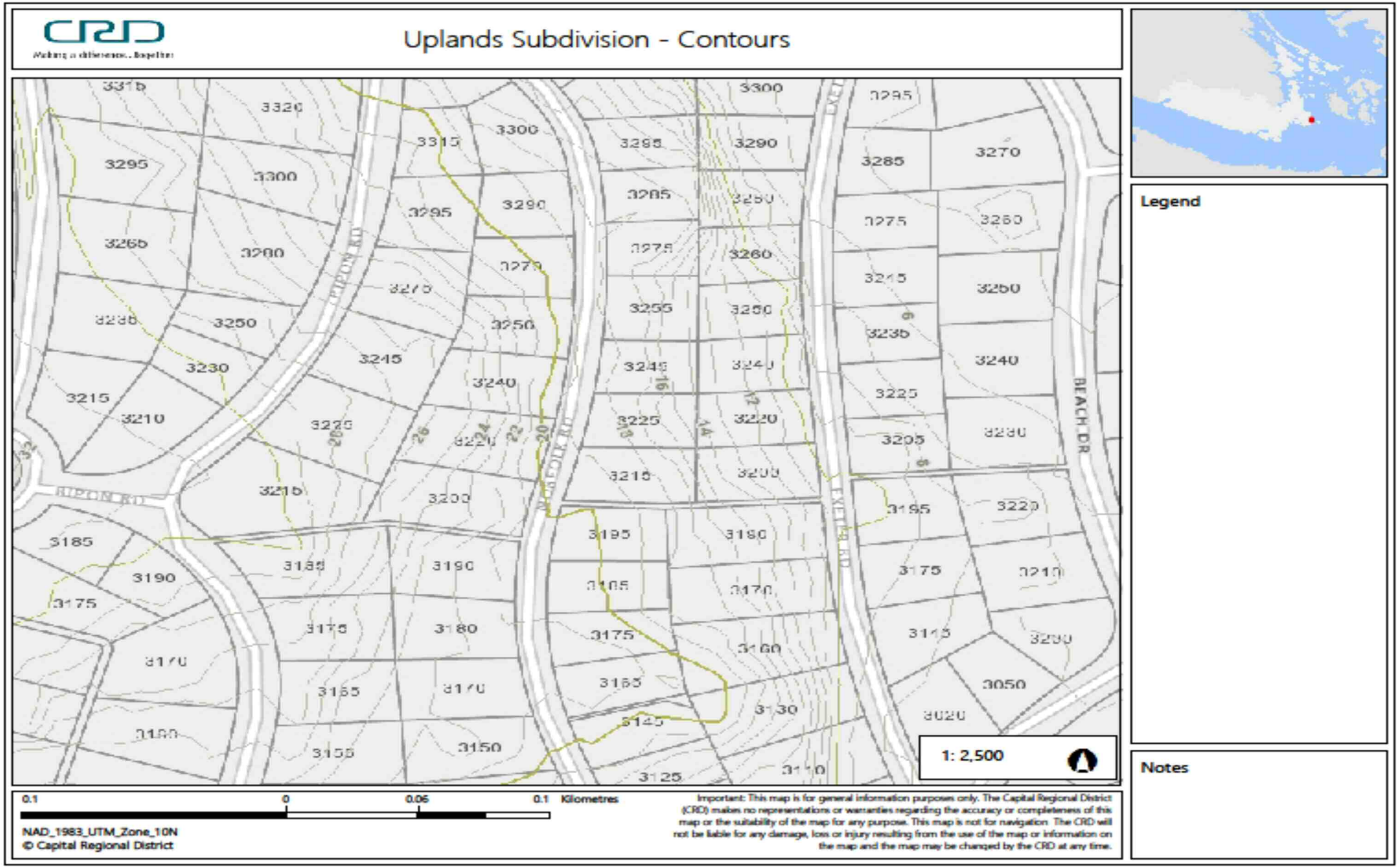
Will the MOE Grant Exemptions?

- Currently no provision for exemptions in the Regulation
- Following up with MOE

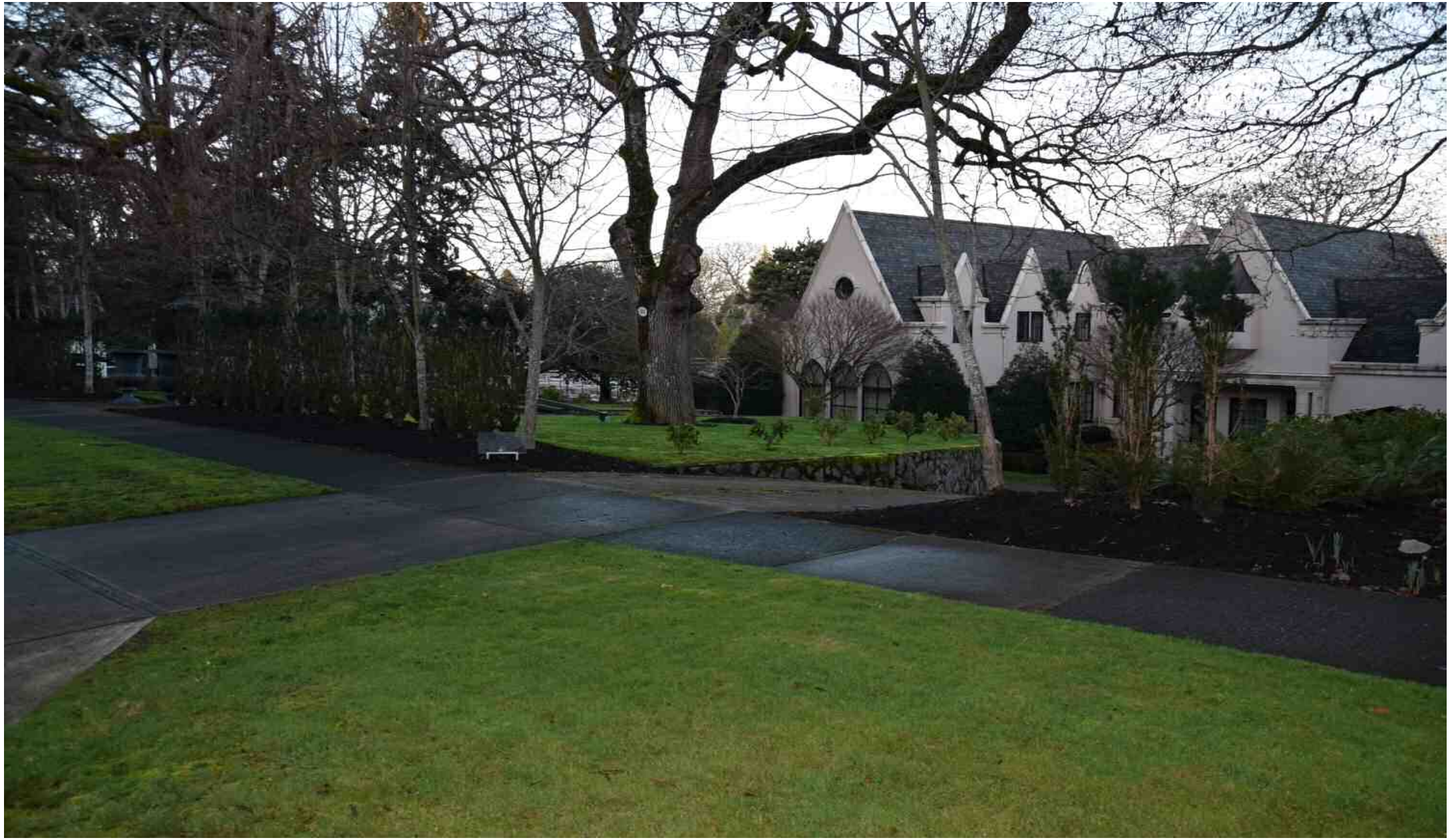
Uplands Sewer Servicing Issues

- Topography – Slopes from +50 metres to sea level
- Uplands road design unique in Oak Bay
- Easements dedicated at the side, rear and across lots to provide gravity service
- Archaeology potential (public and private lands)

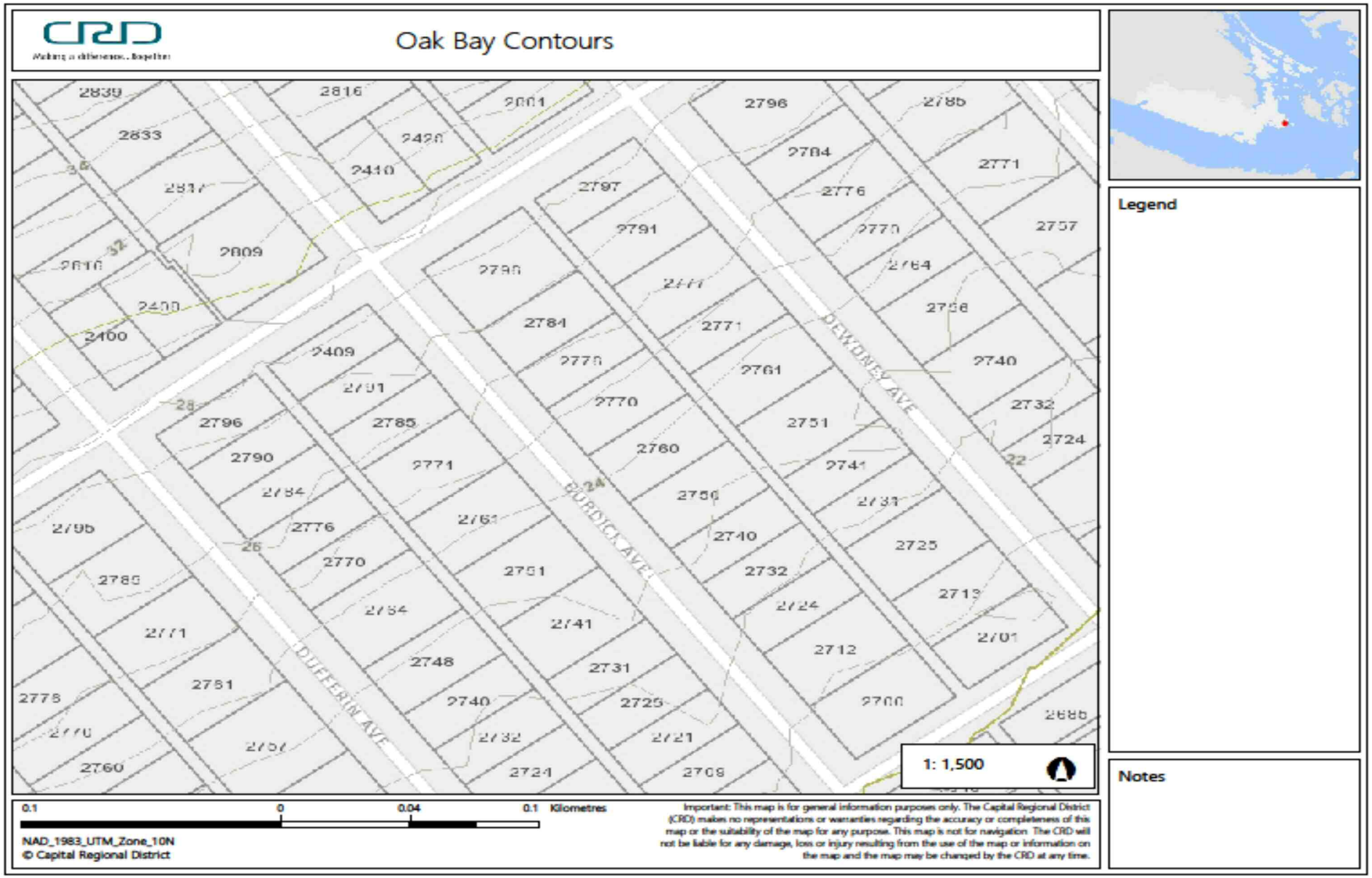
Uplands Combined Sewer Separation Project



Uplands Combined Sewer Separation Project



Uplands Combined Sewer Separation Project



Assumptions

1. The goal of the project is to eliminate the combined sewers in Oak Bay (the Minister of Environment's condition for approval of the CALWMP) to eliminate overflows in compliance with of the MWR (Section 42).
2. A second pipe would not be installed in the existing easements;
3. The lining of the existing pipe was not part of this project (from the grant funding perspective);

Assumptions

4. The existing pipe would continue to be utilized for either sanitary sewer or stormwater conveyance.
5. A maximum practical trench depth was considered to be five metres;
6. Trenchless technology, specifically directional drilling, is not viable for the installation of the new pipe;

Assumptions

7. The District would be responsible for compliance with the Heritage Conservation Act on District property;
8. Property owners would be responsible for compliance with the Heritage Conservation Act on private property;
9. Given the limitation on trench depth, sanitary and/or stormwater pumps would factor in all options.

Assumptions

10. Stormwater would not be treated (decontaminated) prior to discharge to the sea;
11. Based on the statistics on the duration of power outages, the use of pumps on private property is viable.
12. On-site stormwater management would not be an alternative to a storm sewer connection;

Assumptions

13. In the absence of detailed geotechnical information, assumptions would be made on the occurrence of rock in generating cost estimates;
14. The cost estimates developed for private property are the average of the total cost to all property owners, that is, cost estimates were not developed on a site specific basis; and,
15. At this stage, pre-design, operation and maintenance costs estimates are based on a percentage of the capital costs.

The Options

1. New deep gravity sanitary sewer, with sanitary sewage pumps, existing pipe for stormwater
2. New deep gravity stormwater sewer, with stormwater pumps and existing pipe for sanitary sewage
3. Low pressure sanitary sewer, existing pipe for stormwater

The Options

4. Shallow gravity stormwater pipe, with stormwater pumps and new municipal stormwater pump stations, existing pipe for sanitary sewage
5. Shallow gravity sanitary sewer, with sanitary sewage pumps, existing pipe for stormwater
6. Shallow gravity sanitary sewer, with sanitary sewage pumps and newmunicipal sanitary sewage pump stations, existing pipe for stormwater

Servicing with Pumps

- All of the options involve the use of pumps
- Under Bylaw 3891 Section 14, pumps are considered to be an acceptable means of providing a service connection to a public sewer.
- Pumps are installed in other parts of Oak Bay
- There are hundreds of pump installations in the CRD

Proposed Pump installations

Option	Proposed	Existing	Total
Option 1	68	17	85
Option 2	72	13	85
Option 3	369	17	386
Option 4	166	13	179
Option 5	174	17	191
Option 6	136	17	153

Public Engagement Overview

What we heard.

Public Engagement Overview

What we heard.

Public Engagement

Objectives: Oak Bay Residents

- understand the need for the project
- have access to clear and accurate project information in a format that is accessible and easily understood
- have access to the consulting engineers and District staff in person, by phone and online
- are encouraged to bring forward questions and concerns to enable meaningful discussions that test project assumptions
- have an opportunity to record their opinions and that this personal feedback will be received by Council

Public Engagement

Objectives: Project Team and District Staff

- meet and engage with Oak Bay property owners over a period of time
- listen to residents and to respond directly to questions and concerns
- identify gaps in the information and gather new information
- incorporate public opinion and ideas, as appropriate, in any modifications to the options presented for Council's consideration
- understand how the project impacts all residents in Oak Bay

Outreach and Engagement Oct. 30 - Dec. 11

District website: www.oakbay.ca

Open Houses:

- 2 North Oak Bay – 2 South Oak Bay, 1 in the Uplands neighbourhood
- Oak Bay News – Articles, editorials and advertisements

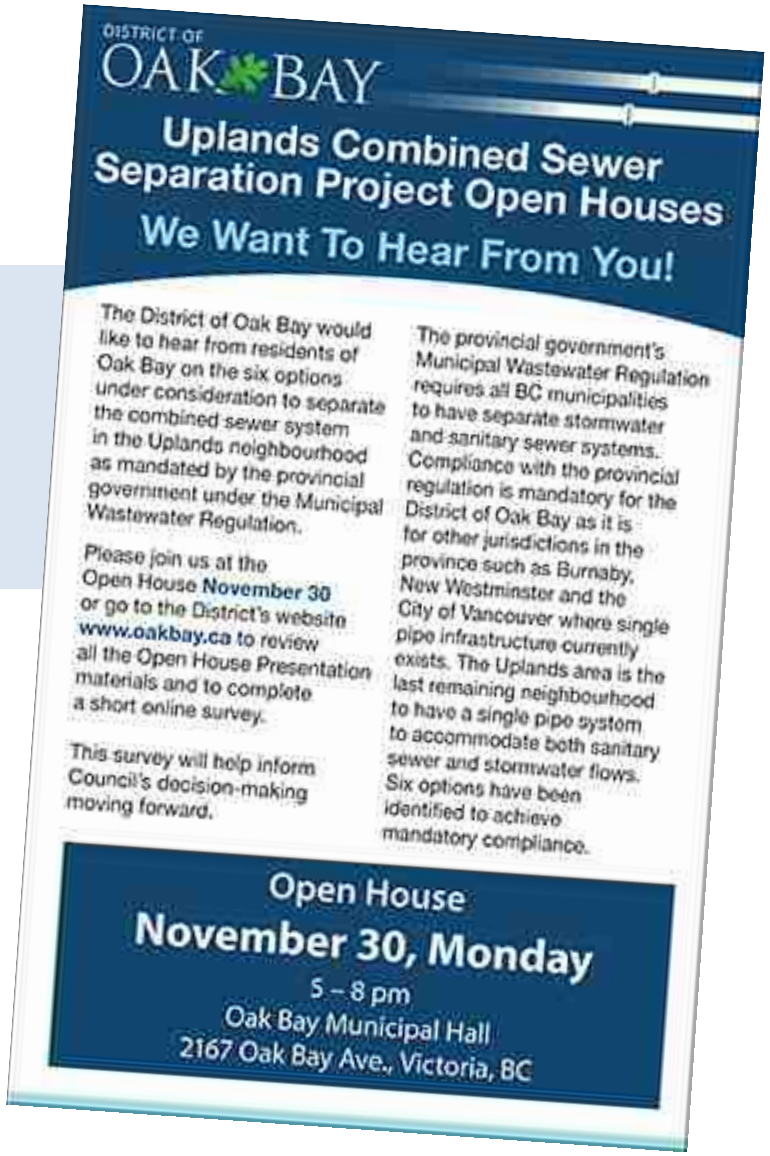
Public Opinion Survey:

- was available online, PDF for printing and in hard copy

Municipal Hall:

- all presentation materials were available to view in hard copy

- Open Houses: 247 registered
- 75% residents living in the Uplands
- Additional meeting – Nov. 30



DISTRICT OF OAK BAY

Uplands Combined Sewer Separation Project Open Houses

We Want To Hear From You!

The District of Oak Bay would like to hear from residents of Oak Bay on the six options under consideration to separate the combined sewer system in the Uplands neighbourhood as mandated by the provincial government under the Municipal Wastewater Regulation.

Please join us at the Open House **November 30** or go to the District's website **www.oakbay.ca** to review all the Open House Presentation materials and to complete a short online survey.

This survey will help inform Council's decision-making moving forward.

The provincial government's Municipal Wastewater Regulation requires all BC municipalities to have separate stormwater and sanitary sewer systems. Compliance with the provincial regulation is mandatory for the District of Oak Bay as it is for other jurisdictions in the province such as Burnaby, New Westminster and the City of Vancouver where single pipe infrastructure currently exists. The Uplands area is the last remaining neighbourhood to have a single pipe system to accommodate both sanitary sewer and stormwater flows. Six options have been identified to achieve mandatory compliance.

Open House

November 30, Monday

5 – 8 pm

Oak Bay Municipal Hall

2167 Oak Bay Ave., Victoria, BC

Uplands Combined Sewer Separation Project

Report on Survey Research

PREPARED BY:
STRATEGIC INITIATIVES INC.
305-5332 SAYWARD HILL, VICTORIA, BC V8Y 3H8
250-381-3376
info@StrategicInitiatives.ca
www.StrategicInitiatives.ca

January, 2016

117 Survey respondents

- Small sample size
- 70% identified as living in the Uplands neighbourhood
- 95% of this group identified as owning property in either the Humber or Rutland catchment areas
- Information gathered must be viewed in this context

Which of these project considerations is most important to you?

- Preserve mature trees and landscaping
- Minimize energy consumption
- Most environmentally appropriate use of existing pipe
- Project is completed in a timely fashion
- Minimize length of time of neighbourhood disruption
- Minimize capital costs to the District
- Minimize capital costs to Uplands property owners
- Minimize operations/maintenance costs to the District
- Minimize operations/maintenance costs to Uplands property owners

Very important or somewhat important:

- Minimizing operations/maintenance costs to Uplands property owners
- Most environmentally appropriate use of existing pipe
- Minimizing capital costs to Uplands property owners

The least important considerations:

- Project is completed in a timely fashion
- Minimizing capital costs to the District
- Minimizing length of neighbourhood disruption

Property owners outside of the Uplands were significantly more likely than owners of property in the Uplands to rate as important:

- Minimizing capital costs to the District
- Minimizing operations/maintenance costs to the District
- Most environmentally appropriate use of pipe
- Project is completed in a timely fashion

Ranking of Six Technical Options

- Uplands homeowners ranked Option 1 and Option 2 (deep gravity) as their most preferred options
- Homeowners living outside of the project area ranked Option 3 (100% pumps) as their most preferred option
- **When looking at the average rankings of the remaining technical options, the differences between Uplands homeowners and homeowners living outside of the project area were not significant**

Reasons Given for Selection of Preferred Option

- Preference was related to gravity systems being “better”
- Negative feelings about pumps
- Cost issues (pumps, generators, installation, maintenance, lifecycle costs)

More than 1/3 of respondents indicated that their preferred option was related to cost concerns (whether minimizing costs to Uplands property owners, or minimizing costs to the District)

What We Heard

Key Themes:

- Affordability
- Pumps
- Stormwater management – on private property and on the roadways
- Easements should be part of the solution
- Most appropriate use of existing pipe
- Options in relation to timely environmental impact
- Costs estimates unrealistic for some property owners

Affordability

- Perspective is related to how this project personally impacts property owners
- Concern expressed around cost estimates (site specific property impacts, project impacts, absence of information on lifecycle costs, concern generally for budget overruns)
- How is this project being financed?
- Invest with a long term view

Pumps

- Negative feelings about pumps and generators
- Sense that the level of service currently provided (gravity) should be maintained
- The easements should play into the solution (directional drilling)
- Perception that pumps:
  - are a risk due to reliance on electricity
  - have a negative impact on property values
  - are an expensive burden: operating & maintenance & replacement costs

Stormwater Management

- District should take care of water on the streets
- Properties in the Uplands are large enough for stormwater management solutions
- Returning stormwater to the ground is better for the environment
- Properties with stormwater management solutions that have been approved by / or directed by the District should be grandfathered
- Returning stormwater to the ocean untreated is not environmentally responsible
- Plan for impacts of climate change

Easements

- Easements should be part of the solution
- Directional drilling should be explored
- Negative impact on those who have already invested in separating their combined system to the property line on an easement (having to invest now to pump)
- Distinction between laneways and easements should be made

What we also heard:

- There are other pockets of Oak Bay neighbourhoods with combined sewers
- There are older homes throughout Oak Bay that have not hooked up to the separated stormwater sewers where they exist

Is there an Option 7?

- Deeper gravity
- Directional drilling
- Potential for a different option for each catchment
- Can we just address the overflows at the pump stations?
- Can we repurpose the existing pressurized water supply for an appropriate use?
- Can we partner with other utilities like Hydro (cost efficiencies)?

Assumptions Reconsidered

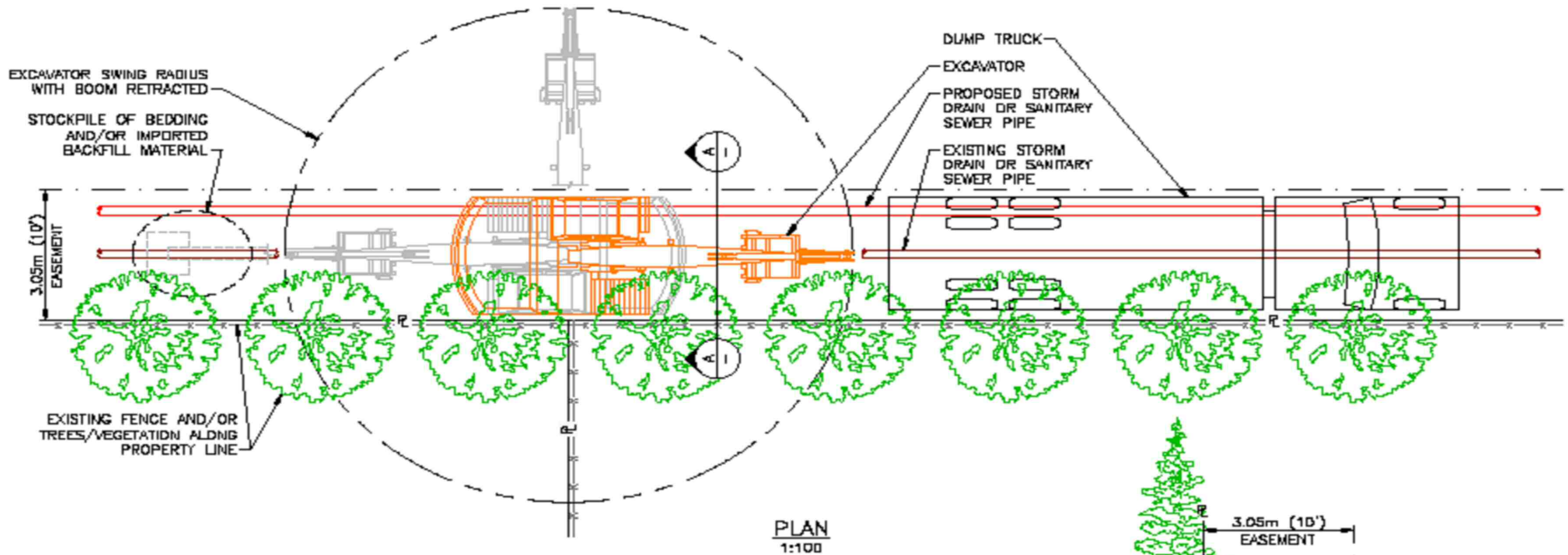
- On-site stormwater management
- Reuse of existing easements
- Trenchless technologies
- Deeper gravity sewers to eliminate domestic pumps
- Best use of existing pipe

On-site Stormwater Management Considerations

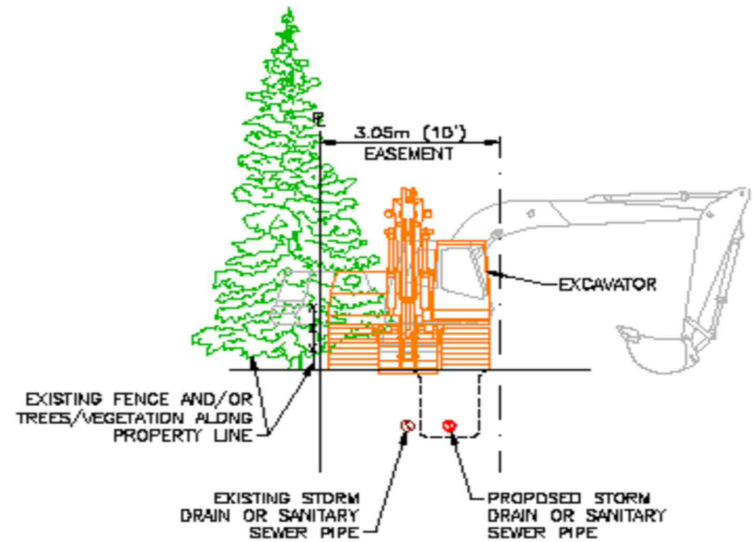
- Lot size
- Geotechnical conditions – sands and gravel, clay or rock
- Climate change – more intense rainstorms
- Potential for runoff to neighbouring properties
- Archaeological
- On-site storage

Not an alternative to a storm sewer water connection

EASEMENT REUSE



PLAN
1:100



SECTION A–A
1:100

1:100 0 2 6m

McElhanney
McElhanney Consulting Services Ltd.

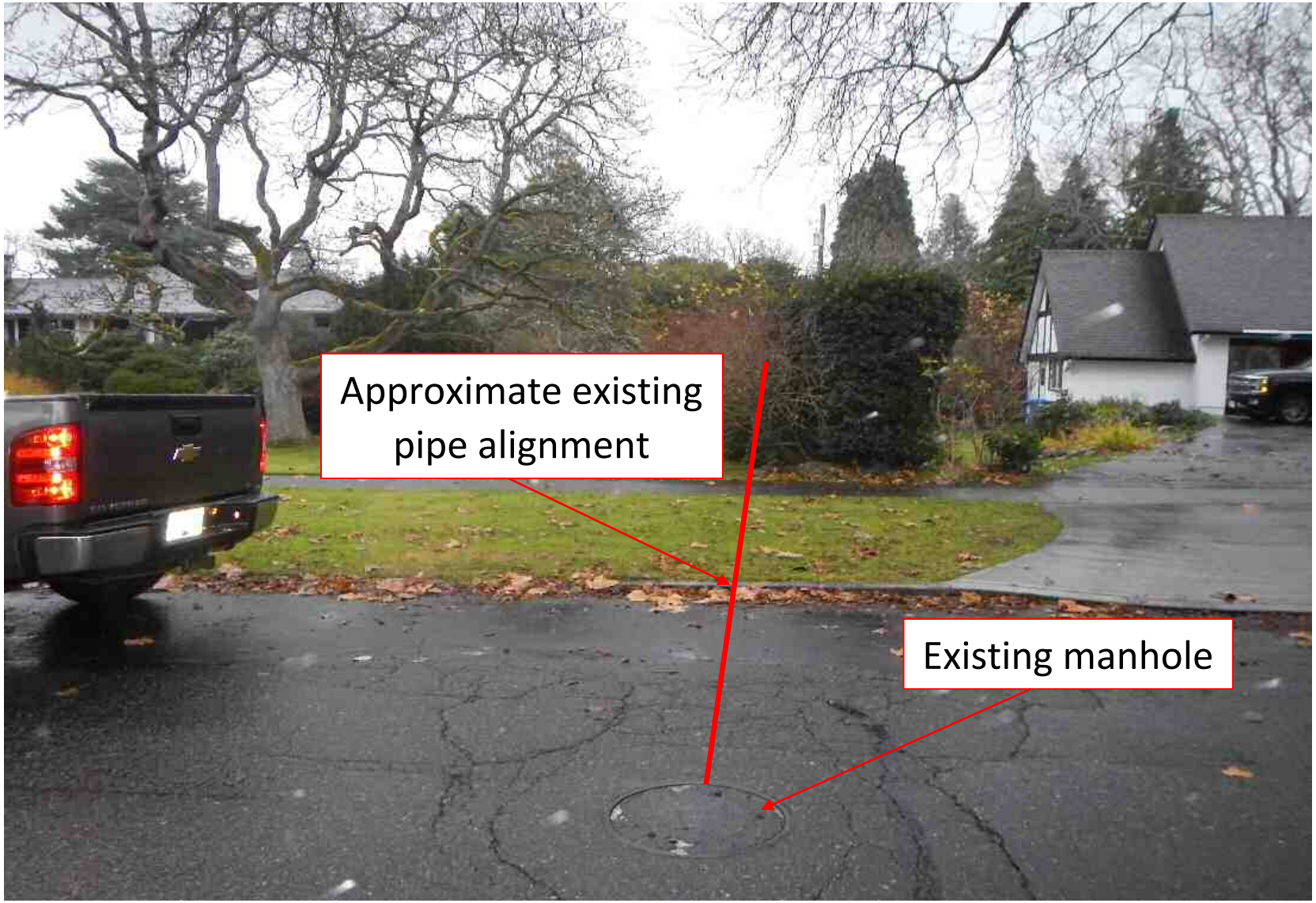
PIPE INSTALLATION IN 3.05m (10') EASEMENT

SCALE:	1:100
DRAWN BY:	MTK
DATE:	2015–12–03
DRAWING No:	15–326–SK.4

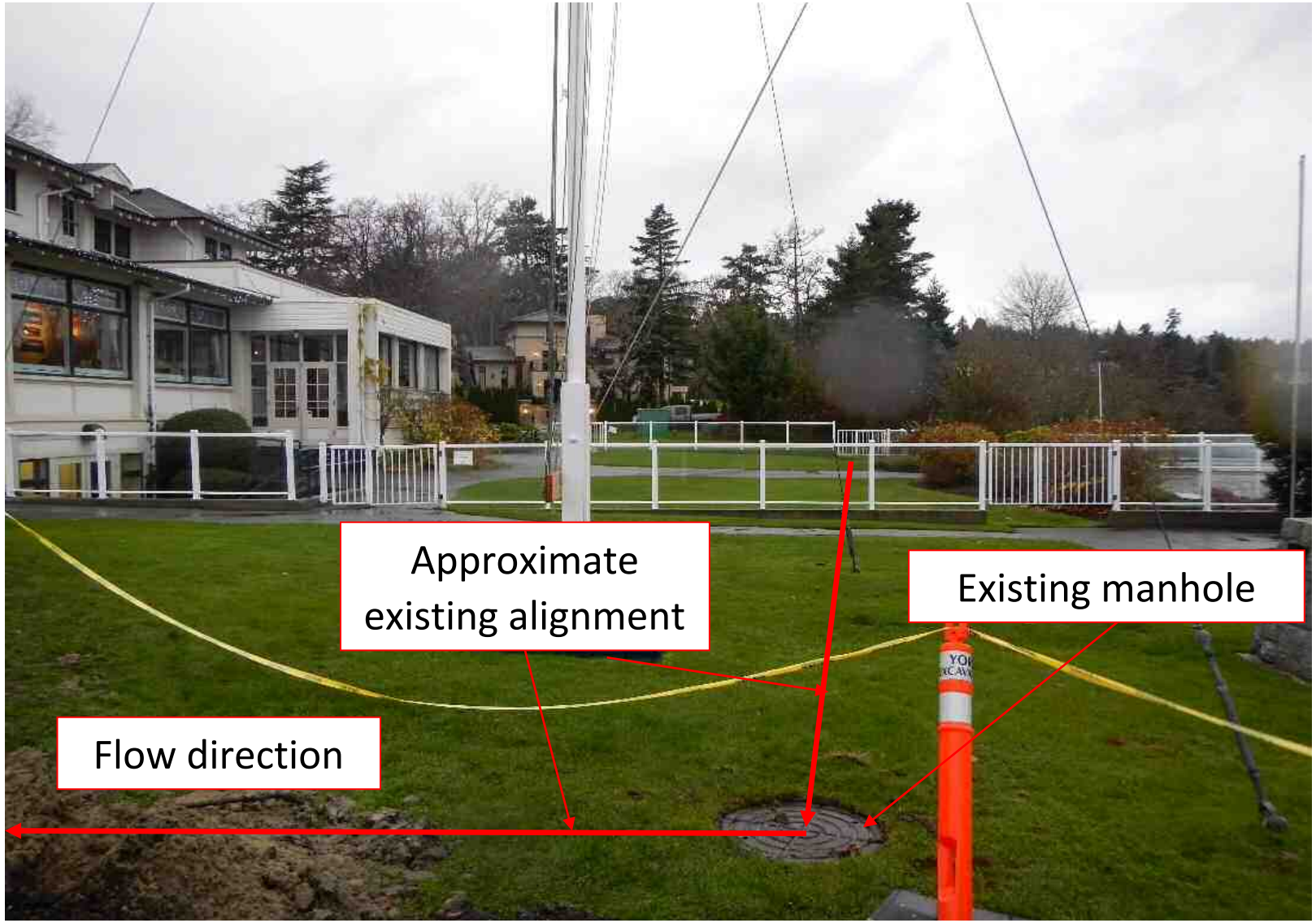

3315 Norfolk
Alignment crosses backyard towards power pole


Existing alignment


Existing alignment


Approximate existing pipe alignment
Existing manhole

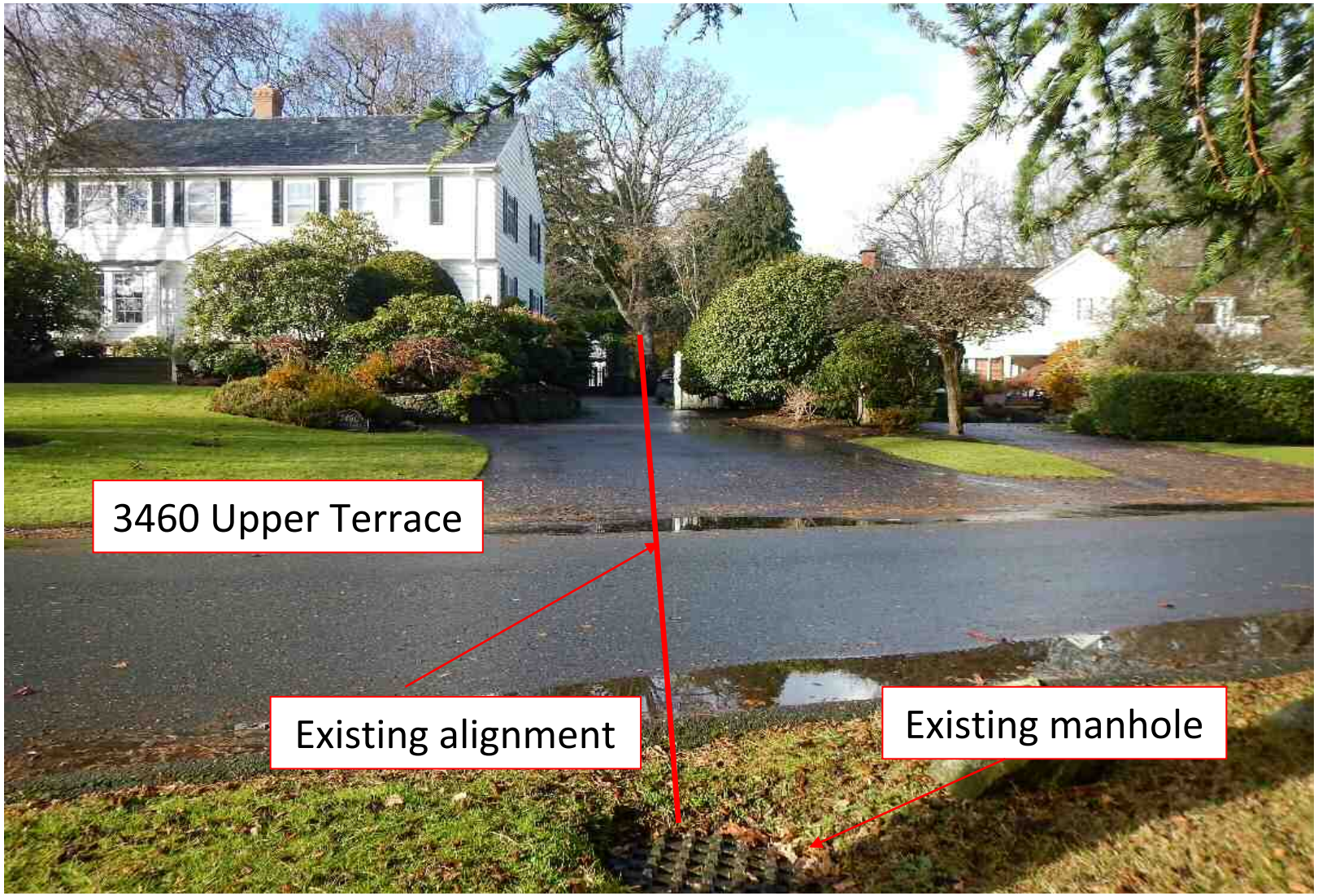
Uplands Combined Sewer Separation Project


Approximate existing alignment
Existing manhole
Flow direction

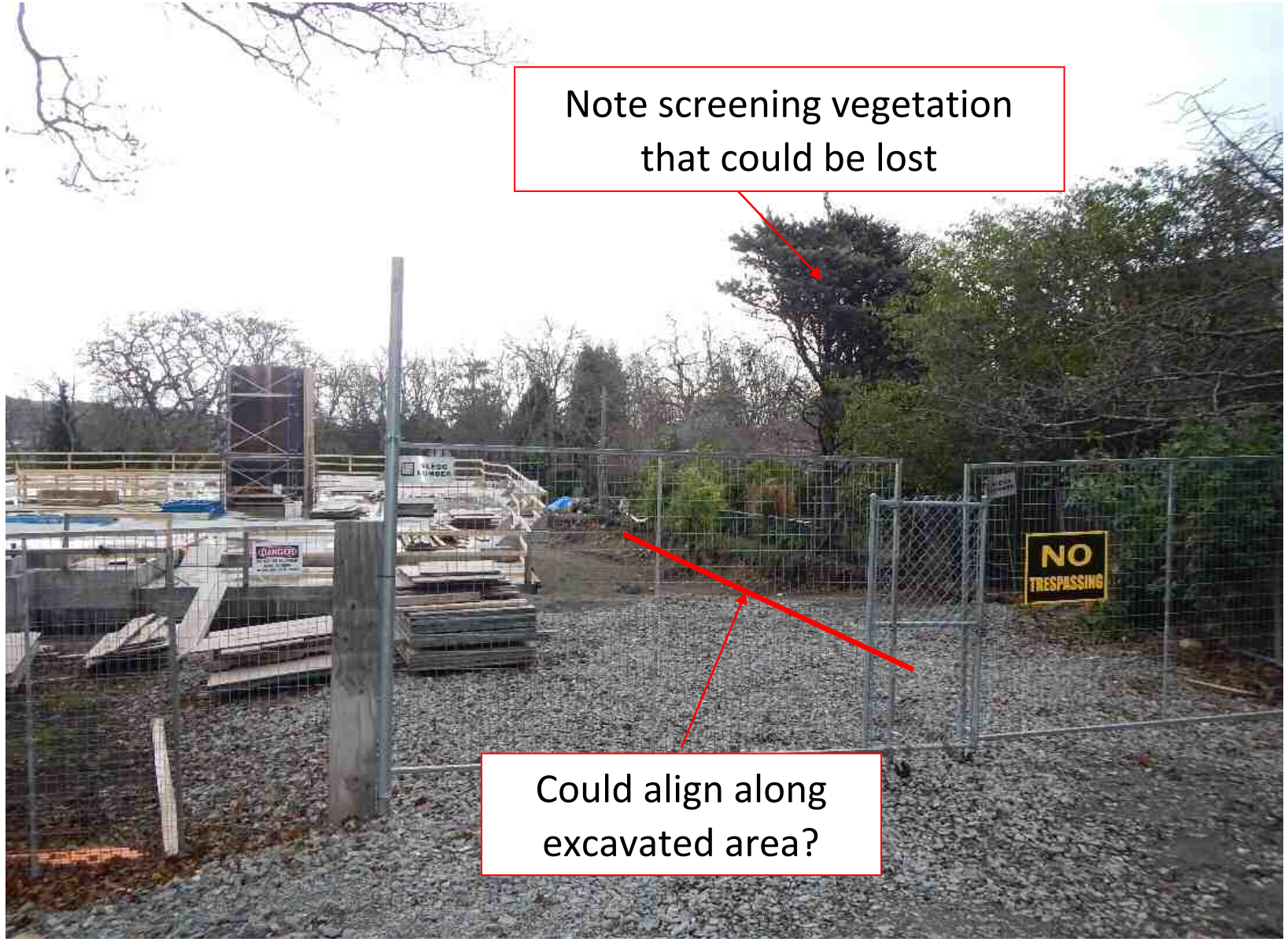

R-3 alignment


Corridor
Existing manhole


Existing sewer alignment


3460 Upper Terrace
Existing alignment
Existing manhole

H-6


Note screening vegetation that could be lost
Could align along excavated area?
NO TRESPASSING
DANGER

Uplands Combined Sewer Separation Project

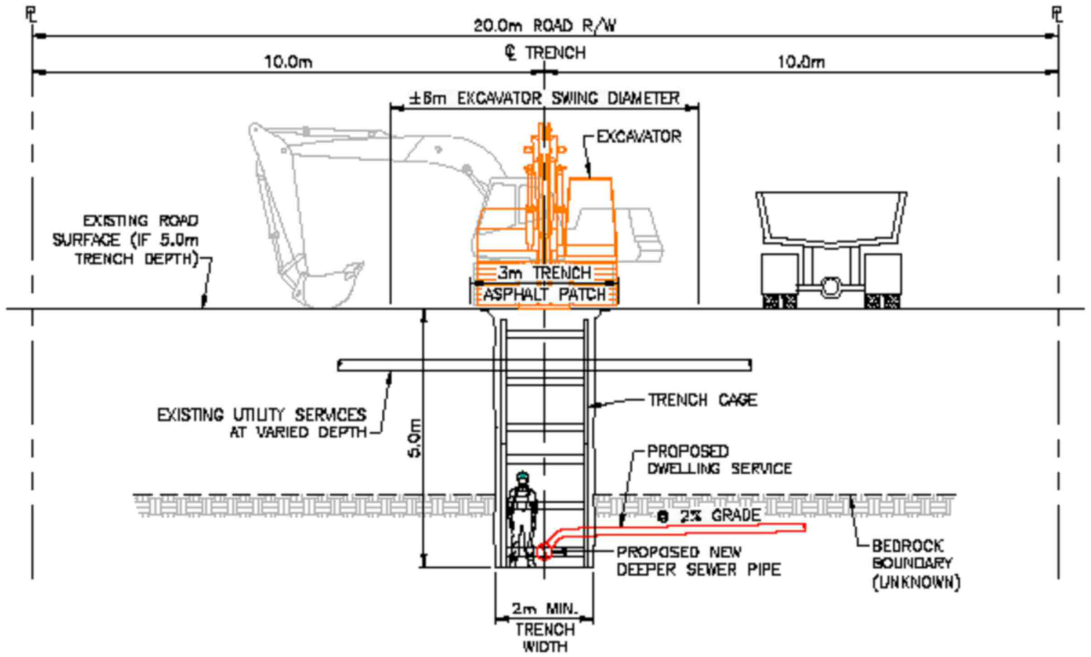
Trenchless Technologies

- Discussed with Contractors and North American Society of Trenchless Technology
- Pipe Bursting – Suitable for pipe replacement
- Pipe Lining – Suitable for rehabilitation of structurally sound pipes
- Directional Drilling – Suitable for small diameter pressure pipes

Directional drilling is not a viable option for installing a gravity sewer

Deeper Gravity Sewers

- Re-evaluated in increments 5-6, 6-7, 7-8 and > 8 metres
- Tiered or benched excavation
- Higher risk of encountering rock
- Increased cost to municipality and homeowner
- Estimated 50% increase in cost
- Greater disturbance to private property



NOTES:

1. TRENCH CAGE(S) ASSUMED.
2. 5.0m MAXIMUM DEPTH BY MODERATELY SIZED EXCAVATION EQUIPMENT.
3. UTILITY CONFLICTS WILL OCCUR. SOME RECONSTRUCTION/REPAIR OF OTHER UTILITIES WILL BE REQUIRED.
4. ONE FULL LANE WILL BE RECONSTRUCTED/REPAIRED (½ OF THE ROAD).
5. BOULEVARDS WILL REMAIN INTACT, FOR THE MOST PART.

1:100 0 2 5m

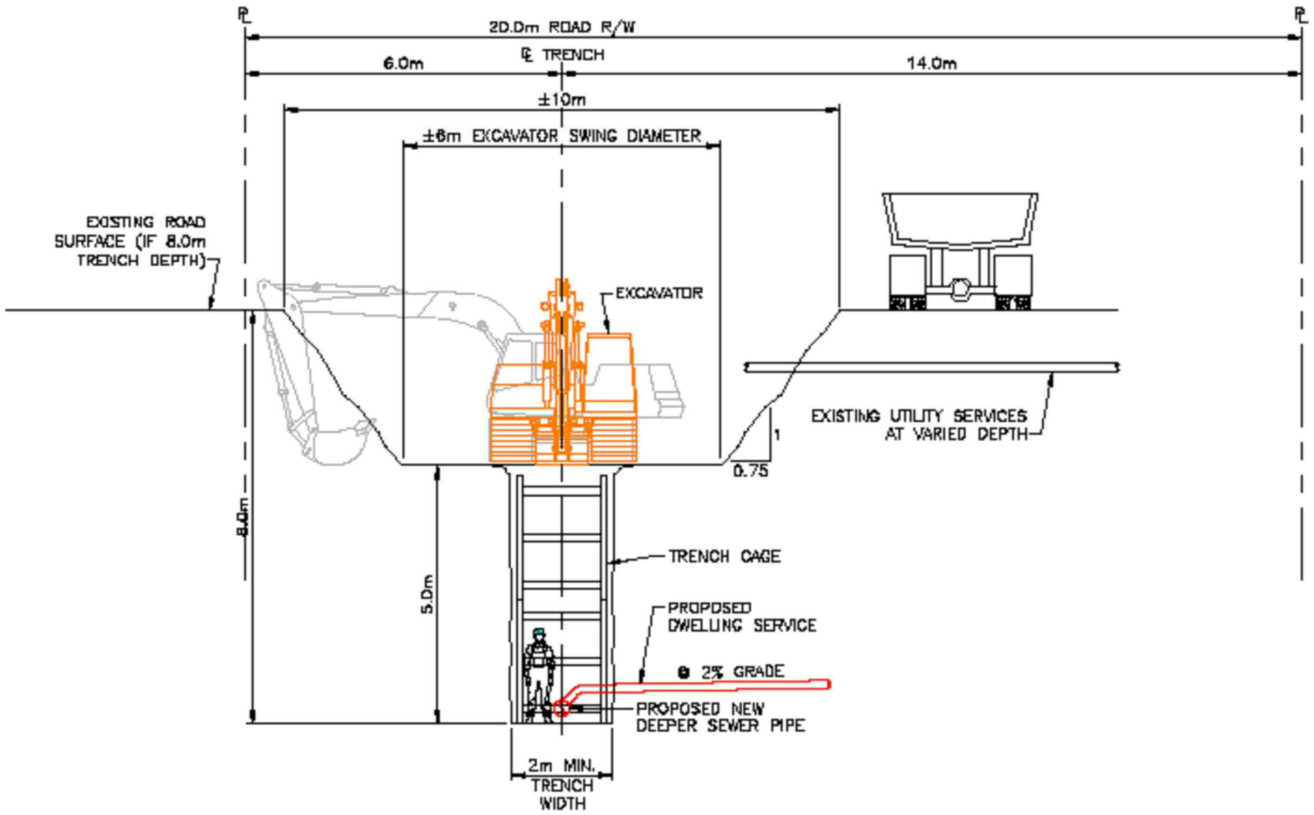
McElhanney
McElhanney Consulting Services Ltd.

TYPICAL 5m DEEP GRAVITY SEWER TRENCH DETAIL

SCALE:	1:100
DRAWN BY:	PL/MTK
DATE:	2016-02-01
DRAWING No:	15-326-SK.5

P:\15-326 UPLANDS COMBINED SEWER SEPARATION PROJECT PRE-DESIGN\(10) DRAWINGS\SK.5 & SK.6.DWG 2/1/2016 1:30 PM SK. 5

Trench depth approximately 4 metres:



NOTES:

1. AT 8m DEPTH, EXCAVATOR MAY NOT BE ABLE TO REACH DUMP TRUCK FOR SPOIL DISPOSAL.
2. PROBABILITY OF TREES & MATURE BOULEVARD VEGETATION DISRUPTION IS HIGH.
3. ENTIRE ROAD RECONSTRUCTION IS LIKELY FOR VERY DEEP SEWERS (>5M DEPTH).
4. WOULD NEED TO SUPPORT OR TEMPORARILY RE-ROUTE/RECONSTRUCT EXISTING UTILITIES & SERVICE CONNECTIONS.
5. TRENCH WILL NEED TO BE OFFSET ±6m FROM ROAD ℄, IN ORDER TO ALLOW ROOM FOR TRUCKS, ETC. WITHIN 20m ROAD R/W.

1:100 0 2 6m

McElhanney
McElhanney Consulting Services Ltd.

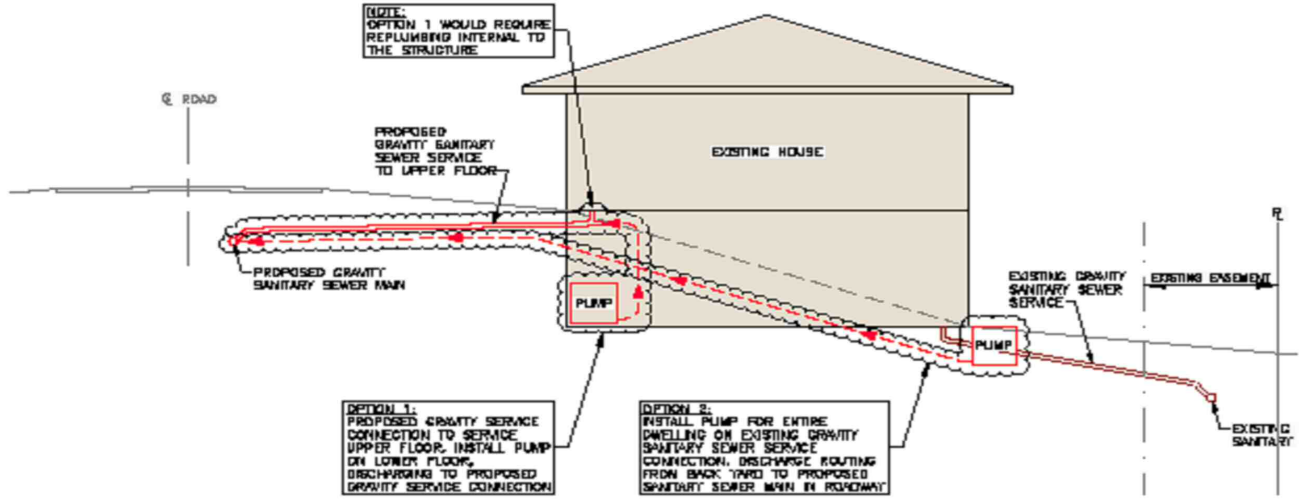
TYPICAL 8m DEEP GRAVITY SEWER TRENCH DETAIL

SCALE:	1:100
DRAWN BY:	PL/MTK
DATE:	2016-02-01
DRAWING No:	15-326-SK.6

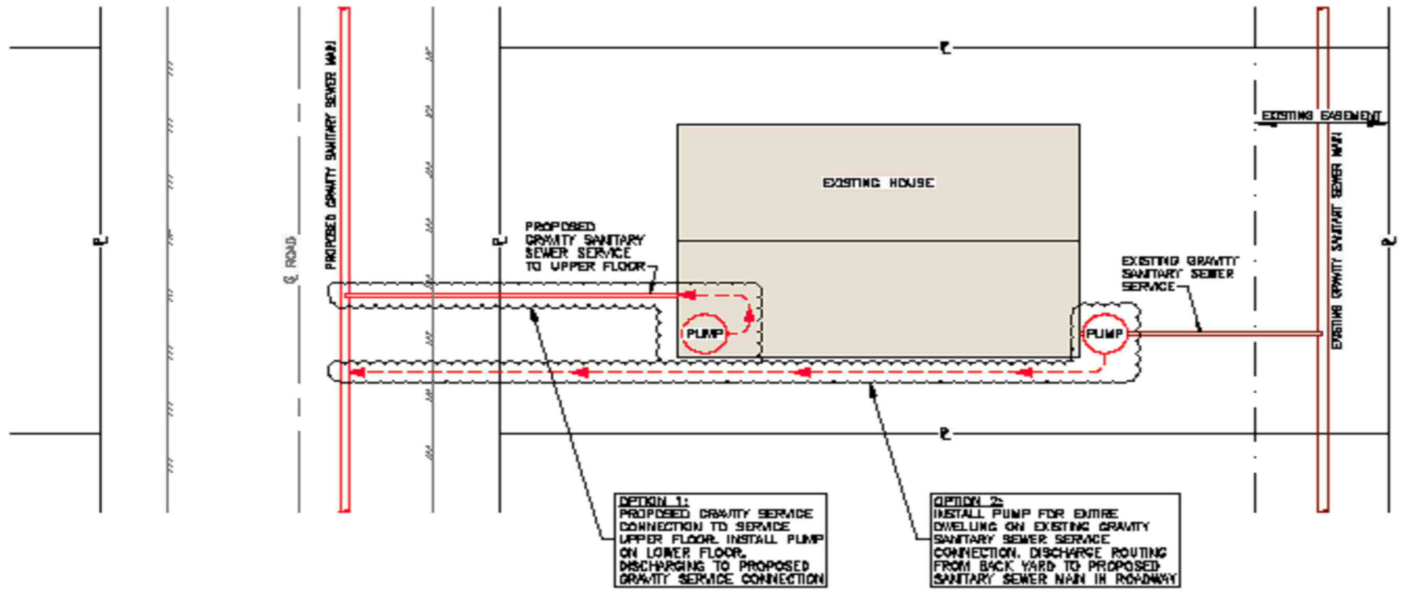
P:\15-326 UPLANDS COMBINED SEWER SEPARATION PROJECT PRE-DESIGN\(10) DRAWINGS\SK.5 & SK.6.DWG 2/1/2016 1:30 PM SK. 6

Options for Pumped Service

- Main floor drainage by gravity
- Basement and perimeter drain serviced by pump
- Eliminates perceived risk with power outages
- Will be assessed at the design stage



PROFILE



PLAN

NOTE:
PUBLIC FEEDBACK INDICATES SOME RELUCTANCE OR HESITANCE TOWARD PUMPING. IMPACT DUE TO OPERATIONAL STATUS DURING POWER FAILURE(S).

McElhanney
McElhanney Consulting Services Ltd.
VICTORIA, BC

OPTION OF GRAVITY SERVICE TO UPPER FLOOR & PUMP BASEMENT AS OPPOSED TO PUMPING ENTIRE DWELLING

SCALE:	N.T.S.
DRAWN BY:	MTK
DATE:	2016-01-06
DRAWING No:	15-326-SK.3

New Sanitary Sewer or a New Stormwater sewer?

New Sanitary Sewer

Advantages	Disadvantages
Designed for flows	Combined system until last house separated
Smaller pipe than existing	Continuing overflows
I&I significantly reduced	Delays compliance with MWR

New Sanitary Sewer or a New Stormwater sewer?

New Stormwater Sewer

Advantages	Disadvantages
Designed to today's standards	Higher flows in existing pipe due I&I
Eliminates surcharging	Higher maintenance in existing pipe because of oversized pipe
Progressive reduction in volume to Humber and Rutland pump stations	Potential for more odour occurrences
Progressive reduction in overflows	
Achieves compliance with MWR earlier	

Funding Alternatives

1. Dedicate existing reserve, annual Gas Tax funds and user fees contributions to the project - Completion in about 12 years
2. Annual average funding $855,000 - Completion in about 20 years
3. Utilize existing reserve funds and borrow balance of funds - Completion in about 5 years
4. Use District funds and federal and provincial grants (if future grant application successful) - Completion in about 5 years

Uplands Project Connection Policies

1. Homeowners with separated sewers connected by contractor at time of construction at no charge
2. Homeowners requesting separation on municipal property connected to property line by contractor at homeowners' cost
3. Homeowners who separate after construction connected by the District at full cost to the homeowner

Options for Sewer Separation on Private Property

1. Rely on home replacements and renovations to achieve separation (current council direction)
2. Mandate separation as project proceeds
3. Mandate separation within one year of the municipal sewer being separated in each catchment

Bylaw amendment required

Criteria for Mandatory Sewer Separation

- New homes – mandatory sewer separation and connection to separated municipal sewers (if available)
- Renovations >$100,000, or new bathroom or bathroom renovation
- Replacement of perimeter drain
- Replacement of a single service pipe

Next steps

- Council provide direction to staff on what additional information they may need in order to make an informed decision
- Council to direct staff if further public consultation is required and for what specific information
- And/or direct staff to bring forward a preferred option to an upcoming COW (for further discussion) or an upcoming Council meeting (for decision)

Questions?