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Civil Engineering Design

Project: 3186

The civil infrastructure for this project is based on the District of North Vancouver Development Servicing Bylaw No. 7388 (2005) and supplemented by the Master Municipal Construction Document 2000 (MMCD), Storm Water Best Management Practices as noted in the GVRD Source Control Guidelines and good engineering practice.

Demonstrated Sustainability Principals

Recent studies in Washington State have indicated that rainwater controls on the lots are often the most effective measures at maintaining environmental health. As such, Best Management Practices (BMP's) will be employed where appropriate. Some potential BMP's include curbless roads, disconnected roof leaders, vegetated bioswales, infiltration fields, and/or absorbent landscaping.

After site review and discussions with the Geotechnical consultant for this project, it was determined that direct infiltration methods would have limited effectiveness for this development, particularly near the foreshore. As such, the following BMP's are being proposed:

- Permeable Pavers on Round-A-Bout
- Reduced Impervious Surfaces
- Disconnected Roof Leaders
- Stepped Planters

All of these systems will benefit the local environmental health by reducing peak runoffs from the development, attenuating the time to peak flows and reducing pollutant discharges to Burrard Inlet by directing runoff through natural systems.

Proposed Roads

Offsite:

Dollarton Highway will be upgraded to provide a sidewalk on the south side of the road and two driveway letdowns will be provided to access the new subdivision.

Lots 1 & 2

The access to the existing dwelling on Lot 1 and proposed dwelling on Lot 2 will be via the existing driveway that currently provides access to Lot 1.

Onsite:

Lots 3-7

Access to the remaining lots will form a 6.0m wide road with a maximum grade of 20%. The steeper portions of this road will be asphalt and the flatter round-a-bout will be

constructed with permeable pavers. The downhill side of this road will be supported by an engineered Allan block wall system with geogrid. The roadworks will include a rollover curb and gutter on each side of the road, a 2% crown profile, a minimum 20m centerline radius and a 9.14m radius cul-de-sac.

The roadworks has been designed for fire truck access providing a minimum 6.0m clearance and 8%/15m ($k=1.88$) vertical curvature.

Drainage

Best Management Practices for Source Control measures as noted above will be utilized on each Lot. The location of this project and the steep grade from Dollarton Highway to the shoreline will limit some of these measures and will be reviewed with geotechnical engineer during detailed design. The main roads cul-de-sac will incorporate permeable pavers to provide storm water absorption. The remaining runoff will be collected by a new 250mm storm sewer system that will discharge into Burrard Inlet with a new outfall. This system will be designed to accommodate the 10 and 100 year storm events.

Watermain

The water system will be designed to meet the D.N.V., fire department, fire underwriters 1996 and B.C.B.C. requirements/standards. The existing fire hydrant is within the 90m to all units and the main water supply Lots 4-7 will be from a 100mm main. Service to each lot will include a water meter with a remote reader. The low point in the water system will include a blow off assembly.

Sanitary Sewer

An existing 450mm GVRD sanitary sewer crosses through this site. There are multiple existing unused services connection on this sewer main that will be utilized for this development. Lot 1, the existing house, is currently connected to this system, Lots 2 and 3 will connect to a common manhole which will connect to the existing GVRD service between Lot 2/3 and Lot 4-7 will have individual grinder pumps that pump into a common forcemain and terminate into a manhole that will connect to the existing GVRD main by gravity.

Electrical

These utilities will all be provided via underground ducting. The route will follow the proposed driveway. BC Hydro, Telus, and Cable are responsible for their system designs but they will be installed in a common trench. Routing will be along road shoulders. Street lighting will be provided as required by the street lighting designer and will utilize illumination standards that reduce light pollution, energy usage and result in a more aesthetically, light-friendly environment in and around the project.