

**Fairwinds Resort Community
The Lakes District
Existing Servicing Inventory Report
October, 2009**

Introduction

As part of the Neighbourhood Planning Process for Fairwinds Resort Community, The Lakes District, this report has been prepared to provide an inventory and comments on existing site servicing for the proposed development area.

The Fairwinds Resort Community is located in the Regional District of Nanaimo (RDN) designated as an Urban Area within inside an Urban Containment Boundary (UCB) in the RDN Regional Growth Strategy (RGS). With a unique geographical location on the steep and undulating terrain of the Nanoose Peninsula, Fairwinds is an urban-styled community within a rural electoral area. It has typical municipal-type services for its water system, sanitary sewage collection and treatment, piped storm sewers, wide paved roads with concrete curb and gutters and drainage catch basins, concrete sidewalks and gravel paths, streetlighting systems with underground power feed, underground electrical, telephone and cablevision servicing, and some communal landscaped areas. When natural gas service recently became available on central Vancouver Island, distribution was extended into this UCB area to meet the anticipated demands of the Fairwinds development.

This more urban-style development differs from the adjacent subdivision areas along Dolphin Drive and in the Garry Oaks areas, which were developed earlier to more rural standards, with communal water systems, individual-lot sewage systems, overhead servicing from B.C. Hydro poles, and simpler roads with open ditch drainage and no sidewalks.

The existing Fairwinds Resort Community servicing has been installed incrementally with separate regulatory approval of its components. Ministry of Transportation and Infrastructure (MoTI) subdivision regulations covers roadwork, curb and gutter, and storm drainage requirements, and underground utilities under specific permit to BC Hydro, Telus, Shaw Cablesystems and Terasen Gas. Water and sanitary sewer servicing has been installed by Fairwinds under RDN Bylaw 500 regulations and approvals and is owned and operated by the RDN as utility Local Service Areas. Streetlighting systems are installed to RDN requirements, and owned and operated by the RDN as a utility Local Service Area. Existing sidewalks are presently somewhat of a regulatory oversight, being allowed and approved by MoTI, but continuing to be a Fairwinds asset as an interim measure until a RDN Local Service Area or other management process is implemented in the future.

This existing servicing inventory report provides background for a separate infrastructure and servicing report to be prepared for the proposed Neighbourhood Plan (NP). It should be noted in reading this report to refer to Drawings 9919-017-124, -126, -128, and -130, enclosed at the rear of this report.

Water Servicing

1. Water Supply

Supply of water for the Fairwinds urban containment boundaries as identified within the RDN's RGS should be the responsibility of the RDN through a combination of groundwater from wells and surface water through the Arrowsmith Water Service (AWS). Fairwinds Resort Community (Fairwinds) is charged a Development Cost Charge (DCC) to cover water supply, transmission and bulk storage from the AWS system. Earlier phases of AWS included construction of the Arrowsmith Dam water storage facility, construction of an increased volume Industrial Park Reservoir (a joint venture with the City of Parksville), capacity increase at the downstream site of the existing City of Parksville intake, supply main extension along Northwest Bay Road to Nanoose Road, plus metering and interim pumping facilities along this main route.

The RDN has continued to develop some extra groundwater, to support some losses of capacity from its existing wells through a combination of deteriorating quality and diminishing yields. This is also required to be maintained as the RDN is obligated to supply a percentage of groundwater supply in accordance with the AWS agreement. Concurrently, the City of Parksville and the Town of Qualicum Beach have continued to develop their independent local groundwater sources at a rate to meet development growth demands, allowing a postponement of their AWS supply need. This has delayed completion of the full AWS system, which was initially planned to have a new intake, treatment needs, and distribution piping system phased into full operation during the years 2007 to 2009, for full supply volume availability by this time. Instead, the site and construction of the intake and treatment plant, and necessary connecting works, remain in the earliest concept stage with pre-design study recently having commenced.

Fairwinds has been advised by the RDN that AWS source supply cannot be expected before the year 2015. Even then, there is no guarantee that date will stand. For Fairwinds development to continue to proceed before increased AWS bulk water is available, the RDN has advised that Fairwinds has to find, pay for, and connect additional groundwater source to support the additional development, in accordance with RDN standards.

As a second, and interim option for water supply as described in this report, it is assumed that additional wells are required to support the planned build-out of Fairwinds UCBs, and that with improved conservation measures as detailed herein, water use per unit is maintained at present bylaw requirements. There is an existing well supply of 380 imperial gallons per minute (Igpm) capacity connected to the system, documented as supporting the existing 702 units of previous Fairwinds development. Recent well exploration by Fairwinds on property southeast of the Terrien Road intersection with Northwest Bay Road (known as the "Madrona Well Site" but now called the Wall Brook Well Site) has produced a total theoretical capacity rating of 479.6 Igpm. This would

support an additional 1,115 new units based on the RDN bylaw requirement of 0.43 Igpm/unit.

The additional units supported by the recently constructed “Madrona 7 Well”, on the Wall Brook Well Site, can supply the RDN requirement for existing approved Fairwinds subdivision. The Wall Brook Well Site could support new development of the Lakes District and Schooner Cove Neighbourhoods. Beyond the 1,115 new units, supply would be from AWS, or additional groundwater sources. Groundwater availability would need to be from sources close to the existing Northwest Bay Road trunk supply main or from the Island Highway area.

2. Water Conservation

Water conservation for Fairwinds is a priority, particularly in view of the historically recorded higher than average usage per capita. Voluntary conservation measures already undertaken (eg. Team Watersmart) and the proposed greater mix of development types will assist this, as multi-family zones traditionally have a lesser usage rate and include efficient automatic irrigation systems. Smaller lot sizes, increased use of drought-tolerant vegetation in landscaping, maintenance of existing undisturbed ground cover that does not need irrigation, environmental covenant areas on properties, potential storage and use of rainwater and grey water for irrigation purposes as mentioned in the stormwater management section, are all means to assist in the achievement of reduced water consumption.

3. Existing Water Quality

The existing water supply is good quality, meeting the required drinking water standards for all parameters except for some significantly elevated aesthetic element levels, which cause occasional visual issues with colour and staining which are caused by iron and manganese in the water. Many recent Fairwinds homes have installed water treatment systems, for removal of the visual issues from the early groundwater source supply. These facilities require frequent back-flushing to waste, using additional water, to maintain operational capability. The RDN is currently planning for the financing and construction of a single or few centralized water treatment facilities to treat selected wells, operated by the RDN, as a cost-effective solution for providing improved source water quality. In the interim, the RDN is commencing primary use of the best quality wells (such as the Wall Brook Well Site) and selective source water mixing, which should significantly improve the existing aesthetic water quality. Removing a need for individual in-home treatment units could reduce multiple back-flushing water wastage, and avoid the need for costly treatment systems to be installed and maintained as part of the new home construction.

4. Water Storage

The existing available storage of the two Fairwinds Reservoirs located on Notch Hill is 1,364 m³, supported by an additional 410 m³ contribution from Arbutus Reservoir,

totaling 1,774 m³. The RDN Nanoose System Integration Water Study Review, February 2007, shows that with the integration of all existing storage facilities in the greater service area, 660 m³ of additional storage is needed to be constructed on the peninsula to accommodate full build-out for the entire amalgamated Nanoose Peninsula water systems. This study examined servicing needs to meet estimated demands to build-out in accordance with land-use provisions laid down in the Official Community Plan (OCP) for Nanoose. It is understood that the RDN has contributed to the capital cost equivalent to 580 m³ of capacity within the recently constructed City of Parksville reservoir, which was recommended in the Review (ie. 1,240 m³ total storage required to build-out of the Nanoose Peninsula, of which 580 m³ has been secured). This cash contribution is understood to be an interim arrangement to support continuation of current flows of AWS water from Parksville to Nanoose. It is believed that future study, including water system modeling and analysis, will determine whether this arrangement becomes a permanent part of the AWS system, whether the AWS system will include additional storage to the benefit of the integrated Nanoose Peninsula water systems, or whether there is a need for the integrated systems to provide storage in addition to the 660 m³ planned for future construction on the Nanoose Peninsula.

The existing Dolphin Reservoir was funded and built on land donated by Fairwinds to service the former RDN local service area outside of Fairwinds, for properties mostly north of Dolphin Drive including Schooner Cove properties.

The existing available Fairwinds Lakes District storage of 1,774 m³, less 1,080 m³ fire storage, supports 1,050 units. Additional storage will be required to be in place by the time 1,050 Fairwinds Lakes District units are developed and occupied. As detailed in the RDN 2007 Study, the future building of one extra water storage reservoir of 660 m³ adjacent to the existing two Fairwinds Reservoirs, or a partial contribution to the RDN construction of a new and larger Arbutus Reservoir, should meet the anticipated RDN storage requirement to build-out development level in Fairwinds, including both the Schooner Cove and Lakes District Neighbourhoods. As the existing storage is estimated to support 1,050 units of total development within Fairwinds (includes existing Fairwinds development and initial additional demands from The Lakes District and Schooner Cove (re) development), the third reservoir should therefore be planned to be built as the 1,050 unit level is approached. As it is believed that the future additional storage capacity of 660 m³ may meet ultimate needs on the Nanoose Peninsula to satisfy the full storage requirement to build-out of the entire Nanoose Peninsula, including this UCB, some cost-sharing may be possible for this facility.

5. Water Pressure Zones and Water Distribution Mains

The existing water distribution mains are shown on Drawing No. 9919-017-124. These are in varying pressure zones, to suit the undulating terrain and provide appropriate operating pressures throughout the system. The pressure zones are designated by the static pressure head in metres, as detailed below and as shown on Drawing No. 9919-017-124. The pressure zones are generally based on the normal reservoir full water level, known as the hydraulic grade line (HGL). Sometimes, where practical or necessary for

provision of adequate service, additional supporting flow is provided to a pressure zone through pressure reducing valves (PRVs), which supply water to lower ground areas from a higher HGL pressure zone.

5.1 65 m HGL Pressure Zone 1:

It should be noted that Dolphin Drive and adjacent roads west of Outrigger Road are served by Dolphin Reservoir and other reservoirs beyond the Fairwinds system, at a lower HGL of 65 m, known as Pressure Zone 1. Although this zone provides generally good static pressures to the properties served, higher lots and buildings are provided with less desirable peak-demand period pressures. For this reason, the 85 m zone was established at the time of initial subdivision phases for Fairwinds lands, to provide more desirable operating pressures.

5.2 85 m HGL Pressure Zone 1A:

Twin pressure reducing valves on Andover Road reduce the 125 m HGL pressure zone to 85 m HGL, to provide suitable service to the low-lying areas of Fairwinds. Secondary pressure reducing valves on Dolphin Drive near Sherbrooke Road provide an additional feed to this zone, to maintain pressures during peak demand periods.

5.3 125 m HGL Pressure Zone 2:

This is the existing main Fairwinds pressure zone, fed from the Fairwinds Reservoirs No. 1 and No. 2 located on Notch Hill. It serves most of the Fairwinds lands, as shown on the enclosed drawing.

5.4 165 m HGL Pressure Zone 3A:

At the higher elevation lands in the 125 m HGL zone, service to areas as shown above the approximately 90 m contour to the 105 m contour can be extended by installation of a small booster pump (BP), containing electric pumps to meet normal domestic and peak demands of service pressures over 40 psi (the RDN minimum requirement for domestic supply). Fire flow to these areas is still available without pumping at the required 20 psi minimum pressure. No costly backup generator is required, as homes still receive the minimum required pressure during emergency power outage or breakdown situations when the electric pumps are not functioning.

To service lands above the 105 m contour will require a large pump station with fire booster pumps (BP), diesel generator, and improved looping mains from the pump station to limit pressure losses when the fire pumps are operational.

5.5 171 m HGL Pressure Zone 3:

Lands in the southwest area of the site are of higher elevation, and require service from the existing Arbutus Reservoir, with a top level of 171 m. This pressure zone presently provides service to the Garry Oak subdivision area, outside the Fairwinds lands.

6. Water System Operation and Maintenance, and Fire Protection

All water system supply, storage, pumping, pressure reducing valves, fire hydrants and flushouts, air valves, distribution piping and services to the meter box location, and any other water system appurtenances are turned over to the RDN following completion of subdivision servicing. The RDN carries out operation and maintenance under a Local Service Area arrangement. This agreement extends to strata properties, in which the RDN has appropriate registered rights-of-way to allow necessary access. Similar rights-of-way and access provisions are in place for mains within back and side yards of private properties, and along the frontages of bare-land strata developments, where mains and fire hydrants are often located beyond the road allowance due to the limited or non-existent roadway boulevards of such developments.

Fire protection is provided by the Nanoose Volunteer Fire Department, from its firehall on Nanoose Road. Nanoose Road is located off Northwest Bay Road, near the Red Gap commercial area. In developed areas, where fire hydrants are available, the fire department uses flow from the hydrants, supplied automatically by flow through the distribution system from fire storage in the system reservoirs. In undeveloped areas, where hydrants are not available within any practical distance, fire suppression would be provided by the volunteer fire department using its tanker and pumper trucks. The Nanoose Fire Department calls in the BC Forest Service for additional assistance in suppressing bush fires, as necessary. Fire risk remains high in The Lakes District owing to limited access and absence of fire hydrants throughout much of the undeveloped land.

Trunk Sanitary Sewer System

1. Background

Fairwinds sanitary sewage flows are directed to the Nanoose Water Pollution Control Centre (NWPPC) at the west end of Dolphin Lake. Sewage is treated to a primary level at the NWPPC, before it is pumped through a sewer forcemain eastward along Schooner Cove Drive to a high point of land east of Dolphin Drive, from where it flows by gravity to Nankivell Point on the north side of Schooner Cove, and through a deep ocean outfall with an end diffuser on the ocean floor. The existing primary treatment plant, built and paid for by Fairwinds, has a capacity of 1,250 units, and is owned and operated by the RDN. The size of the NWPPC site that Fairwinds was originally required to possibly suit future expansion to serve as many as 30,000 people with full secondary treatment. This large population included Lantzville to Madrona Point, near Parksville. Since that time,

sewer extension has been built from the Nanaimo WPCC to service the District of Lantzville, and sewer planning for Madrona Point shows flow directed to the French Creek WPCC, both changes significantly reducing the ultimate NWPCC design population.

The RDN is presently completing a Liquid Waste Management Plan (LWMP) for Nanoose, to better determine future needs. This may include a review of the most suited location for a secondary-level treatment plant for the entire anticipated service area, which has been recommended in the Nanoose OCP. In addition to the current NWPCC site, it is believed that other more central sites for treatment, such as the Moorecroft site off Stewart Road may be considered.

The existing RDN LWMP for Nanoose shows the next expansion of the NWPCC to be using secondary treatment processes. In accordance with the existing Fairwinds servicing agreement with the RDN, start on design for the expansion is timed at 1,100 total contributing units, to allow the plant construction to be completed by the 1,250 unit level. This lot count should include flow contributions from existing Fairwinds development, Fairwinds Golf Course and Fairwinds Centre, the DND, Schooner House and a few other non-Fairwinds lots that the RDN has allowed to connect to the system, plus initial phases of development within the new Schooner Cove and Lakes District Neighbourhoods.

2. Existing Sanitary Collection System and Future Collection System Facilities

Drawing 9919-017-126 shows the existing constructed sanitary sewage collection system. This generally consists of gravity sanitary sewer mains to which the individual lot services connect, with manholes for inspection and maintenance purposes. Manholes are located at road intersections and other junctions, bends, significant grade changes, and at maximum 120 m spacing on straight runs to suit operation and maintenance parameters. Cleanouts are installed on the upstream end of mains with shorter length or those having few service connections, where manholes are not necessary. Gravity sanitary sewer mains lead to pump stations located at the low point of each sub-system. A pressure main (forcemain) from each pump station moves the collected sewage to the next suitable downstream gravity sewer main, from sub-system to sub-system, until it is delivered to the NWPCC. Forcemains have air release valves installed at any high points along their length to release any sewage gases, with blowdowns at low points for flushing of any sediment build-up. In some limited areas where the developed land is low relative to the roadway, at waterfront areas, and similar adverse areas where it is too environmentally disruptive to install a separate system of backyard gravity sewers, individual lot pumps feed to a combined local forcemain, which discharges into the nearest suitable gravity sewer manhole (Amberwood Lane for example). A forcemain cleanout is installed on the upstream end of such local forcemains, for pressure flushing maintenance purposes.

Except for piping in a few private easements for individual home service connection from one lot over adjacent properties, all sanitary sewer collection, treatment, and discharge facilities are turned over to the RDN following completion of subdivision servicing. The RDN carries out operation and maintenance under a Local Service Area arrangement.

This agreement extends to strata properties, in which the RDN has appropriate registered rights-of-way to allow necessary access. Similar rights-of-way and access provisions are in place for mains within back and side yards of private properties, and along the frontages of bare-land strata developments, where mains are often located beyond the road allowance due to the limited on non-existent roadway boulevards of such developments.

Drawing No. 9919-017-126 shows the location of the NWPCC, and existing sanitary sewer pump stations (PS) to where some flows from future development would be directed. Main collection systems are already in place along Schooner Cove Drive east, Fairwinds Drive east, and the Dolphin Lake Trunk sewer along the south side of the lake. Schooner Cove area flows would connect to the existing adjacent trunk sewer on Dolphin Drive, from where mains and pumping stations are already suitably sized for delivery to the NWPCC.

3. Service Connections

Gravity sanitary sewer service connections are provided to properties, wherever reasonably feasible. These services typically extend 3 m into the property from the inspection chamber location at the time of subdivision servicing, which is at the interface of private and public sections of the service. Low lots relative to roadway, in waterfront areas, and other adverse areas where it is too environmentally disruptive to install a separate system of backyard gravity sewer to collect from lots sloping away from roadways, are designated as individual pumped lots. For such lots, the building construction will require the supply and installation of an individually owned pump in a collection tank, and its forcemain to the service connection at property line.

As preferred by the RDN, service connections are installed as gravity flow from the main to property line where possible, even if the serviced lots are pumped to the inspection chamber, for ease of RDN system operation. In limited areas where a gravity main in the roadway is not possible to service pumped lots, individual lot pumps feed to a combined local forcemain, which discharges into the nearest suitable gravity sewer manhole.

Storm Water Management

1. Stormwater Collection System

Drawing 9919-017-128 shows the existing constructed storm drainage system. The existing larger constructed systems lead through Dolphin Lake and the constructed Fairwinds Golf Course drainage and ponds system to the Strait of Georgia ocean outlet at the eastern extremity of Fairwinds; through Enos Lake and its drainage system and ponds to its outlet to the Strait of Georgia north of Dolphin Drive; or to a piped outlet into Schooner Cove. A few, small and localized drainage systems, outlet either directly to the ocean, or discharge through ditch systems within oceanfront park and road-allowance properties. At low points along the southern boundary of the property, provision for

future increased drainage across the boundary with these Department of National Defence (DND) lands has been allowed for. Details of the storm drainage facilities and appurtenances show on the many individual phase record drawings.

The stormwater facilities for Fairwinds are owned and maintained by the Ministry of Transportation and Infrastructure (MoTI). For the rural sections of Fairwinds Drive, which have been constructed with gravel shoulders, crown and crossfall on the road surface directs drainage to the adjacent open ditches, which have corrugated steel pipe (CSP) culverts at drainage crossings. Culverts are also installed along the ditched drainage and detention pond system through the Fairwinds Golf Course, and at various access road crossings through undedicated areas of the future development.

Piped storm sewers and manholes, to normal municipal standards as approved by MoTI, are installed at all other areas throughout the existing Fairwinds development. Rainwater from roadways, sidewalks, boulevards, and lot areas sloping towards roadways is collected in the roadway gutter, from there it drains to roadway catch basins, connected to the piped storm sewer mains. At some locally low boulevard areas, lawn catch basins are similarly installed to provide drainage control.

For the first phases of development in the late 1980's, no individual lot services were provided, and home builders directed driveway and roof drainage to seepage pits on the individual lots. As this resulted in drainage problems from some properties surfacing on adjacent lots and roadways, all later phases have included individual storm sewer services to most of the lots. A few properties have no individual connection, and require rock pit installation during building. These occur where topography and environmental considerations would make the service connection impractical, and where seepage drainage leads to the golf course, or lakes and creeks without crossing or adversely impacting other development properties.

Rights-of-way and access provisions are in place to allow MoTI access for maintenance, for mains and drainage courses which cross the back and side yards of private properties in fee-simple subdivision areas. Similar provisions are in place for through-drainage in strata developments, to allow MoTI maintenance access to ensure continuity of flow. All other drainage facilities within strata developments, including piped storm sewer systems away from the through-drainage course, and all catch basins, remain the responsibility of the strata to own, operate, and maintain.

2. Stormwater Discharges

Typically, the existing Fairwinds development discharges storm sewer flows from the piped or ditched system either directly into golf course ponds or Dolphin Lake which are integral parts of the stormwater retention and management system, with a headwall at the outlet, or where suitable, into an existing or newly constructed ditch system or existing small stream, again with a headwall outlet at the end of the piped system. The MoT is responsible for the drainage function, and requires a registered right-of-way over all drainage pipes, ditches and detention facilities, and enough surrounding land to permit access for maintenance, for all areas beyond the road right-of-way.

Where an individual development site has a large paved area, such as the Fairwinds Centre commercial property, an oil/water separator is installed on the system, to remove oils and grit from the off-site discharge.

Where outlet flow from a large development area enters directly into a fishery resource (Enos Lake for Fairwinds), a wet detention pond is built between the end of the piped system and the discharge into the existing natural pond ahead of the entrance into Enos Lake. Discharge from Bonnington Drive and surrounding area, leads into an existing natural treatment wetland which was an old industrial-use pond ahead of Enos Lake. Flow is first directed into an engineered-wetland on the opposite side of Fairwinds Drive, and then discharged to the pond at the south end of Enos Lake. Construction of this engineered wetland was completed in the fall of 2008, and vegetation around and in the wetland is continuing to propagate. This wetland provides capacity and treatment for all drainage from existing and future planned development to the southeast of Enos Lake.

Road Network

1. Background

The Fairwinds existing road network is shown on Drawing 9919-017-130.

Fairwinds is accessed off Highway 19 via Northwest Bay Road from two trunk roads, Powder Point Road which becomes Fairwinds Drive, and Stewart Road which becomes Dolphin Drive with access and looping through the existing development site. In accordance with Ministry of Transportation and Infrastructure (MoTI) requirements for network roads to the development, Fairwinds Drive was completed in conjunction with the first phase of Fairwinds, to provide a looped trunk road. Future MoTI requirements include the completion of Schooner Cove Drive as the second trunk road through the site, and construction of Bonnington Drive as a connector road as development proceeds.

The current RDN Road Network Plan shows a future connector road from the northwest area of the future Schooner Cove Drive, to the existing Transtide Road. The connection is intended as an emergency-only link, which MoTI has adopted for its planned future alignments.

The Lakes District will include completion of the MoTI required network and connector roads except the Transtide connection, as agreed in consultation with MoTI and RDN. Additional local roads will be required to access and service the new development, connecting to these named main roads. Emergency access lanes, with removable bollard security, will continue to be installed at required locations.

2. Road Standards

All existing roads have been constructed to MoTI approved standards. As initial roadworks were completed around 20-years ago, they generally have a lesser thickness of road base and sub-base gravels compared to more recent construction, due to changes in MoTI requirements over time.

The rural sections of Fairwinds Drive have been constructed with gravel shoulders, and open ditches, with corrugated steel pipe (CSP) culverts at drainage crossings. All other roadways are built with piped storm sewers and manholes, concrete curb and gutter road drainage control with catch basins, to normal rural municipal standards as specifically approved by MoTI. Manholes located within the travelled portion of roadways are located outside of the normal vehicle wheel-path, where feasible.

Project-specific Hillside Street Standards are being considered by MoTI for the future of Fairwinds in response to the designation as an Urban Containment Boundary (UCB) and local topography.

Sidewalks

Fairwinds has concrete sidewalks in place on most of the subdivision road rights-of-way, except for smaller cul-de-sacs with limited traffic. MoTI agreed to accept installation of the concrete sidewalks desired by Fairwinds within its right-of-way, but would not agree to assume maintenance responsibility on completion of construction. This was based on no other similar installations within its jurisdiction, and not having maintenance arrangements for these works in its contract with the roadway maintenance contractor.

As the sidewalks are not universal, the RDN has been unable to establish a Local Service Area to cover the long-term maintenance. It is understood that Fairwinds is pursuing an arrangement under which the RDN would assume maintenance responsibility of sidewalks, given its designation of Fairwinds as an UCB.

Concrete sidewalks connect to gravel trails, such as along the Fairwinds Golf Course frontage (maintained by the golf course), and through linear parkways (maintained by the RDN). Main trails of the expansive system of informal trails through presently undeveloped areas of the development are maintained by Fairwinds, including the bridge crossings where Fairwinds holds stream crossing permits and maintains the bridging structures.

Power Distribution

B.C. Hydro provides power distribution to Fairwinds. Three-phase power is available off generally overhead pole lines on Fairwinds Drive, Dolphin Drive, and the existing constructed portion of Schooner Cove Drive. The initially overhead power distribution on Fairwinds Drive, from Dolphin Drive near the Fairwinds Golf Course clubhouse to just west of Bonnington Drive has been relocated to underground facilities at Fairwinds cost. This has proceeded in sections, as the adjacent areas were serviced for local development, for aesthetic and improved view considerations.

Except for the small portion of development fronting Dolphin Drive, including Foxrun Place, all other existing Fairwinds development has been serviced with underground BC Hydro power distribution. The Bonnington Drive feed is three-phase to provide a central link between Fairwinds and Schooner Cove Drives, and to provide for potential requirements for condominium buildings within The Lakes District. All other existing distribution adjacent to The Lakes District is underground, single phase, from low-profile above ground transformers and below-grade service boxes and junction boxes. Where underground service is available, all development is required to build with underground service into the building, to eliminate any further aerial wires.

Due to requirements for the distribution routing to permanently cross private lands in the golf course, panhandle lots, long driveways, and strata properties, a blanket right-of-way agreement was established with B.C. Hydro at commencement of Fairwinds Development. This agreement also covers telephone servicing. For land registration purposes, at final plan submission for registration of each phase of the development, BC Hydro has to sign a text block on the subdivision plan, discharging the blanket right-of-way over the road dedication areas of the plan.

Gas Service

Fairwinds is provided with gas service from the Terasen Gas underground distribution system. Existing mains are available for extending into The Lakes District. The normal procedure for gas servicing is provision and installation of suitable buried carrier pipes by Fairwinds during site servicing, at intersections and other locations agreed with Terasen Gas. Terasen then proceeds to install the distribution and service piping on a customer demand basis, as actual building proceeds on the subdivided lands.

All facilities are underground, except for piping and the meter and shutoff at the buildings' exteriors.

Telephone and Cablevision Service

Fairwinds is provided with telephone and internet service by Telus and Shaw Cablesystems, and cablevision by Shaw Cablesystems. These services are provided through cabling installed by the utility companies in mostly buried conduit and junction boxes which are pre-installed at the development's cost during site servicing. Some major junction and splice boxes, of limited number and widely spaced, are required by the utility companies. In the initial phases of Fairwinds, cablevision cabling was installed in common conduit with Telus wiring, under a joint-use agreement between the companies. Due to changing conditions, and these two companies competing for some service provision to users, separate underground conduit systems and splice boxes are required.

Telus has now located switches within Fairwinds on Fairwinds Drive and Schooner Cove Drive, each of which has fibre-optic feed.

The blanket right-of-way agreement with BC Hydro, also covers Telus conduit, cable, equipment and plant installed on private property. Specific rights-of-way if favour of Shaw Cablesystems will be needed to cover any of that company's plant situated on future developable lots.

Streetlighting

Streetlighting is provided throughout Fairwinds. All streetlight systems within public road rights-of-way having underground BC Hydro service are owned and operated by the RDN as a Local Service Area (LSA) Utility, with charges levied against properties within the LSA. In strata developments (except Rockcliffe Park and Schooner Ridge bareland stratas which are RDN owned and operated), all streetlight systems are owned and operated by the individual strata. For limited public road areas along Dolphin Drive, with overhead BC Hydro distribution on poles, standard BC Hydro pole-mounted, ornamental streetlights are in place. These are each operated off local pole power, and have individual photocells to control operation during periods of darkness.

At all other areas, local systems of separate decorative lights are installed on concrete bases, with linked underground power distribution. The lights are suitably separated (approximately 60 m spacing) to provide even light distribution. Each local system is grouped and served from its own service base, fed off a BC Hydro service connection, which has a single photocell control for its system of lights.

To date, two styles of light and lamp combination have been used for fee-simple subdivision areas. Early phases had tall round poles, with a small round top-mounted style luminaire. More recent phases of Fairwinds, including Bonnington Drive, have utilized the more standard RDN system of square poles, with offset 'shoe-box' style luminaires.

The RDN has recently indicated that for all future streetlight systems, the modern 'dark sky' compliant lights will be required. These lights have the lamp shielded from side view, directing most of the light downward to the street, and significantly eliminating glare towards oncoming vehicles and into adjacent homes. It is understood that Fairwinds management wishes to establish a standard style of 'dark sky' compliant light for fee-simple development, and a separate style for strata development. The recently completed Rockcliffe strata, off Bonnington Drive, has utilized the selected strata style of lights. The style for use in fee-simple development areas is expected to be selected when the next such phase (likely a westerly extension of Goodrich Road) of Fairwinds proceeds.

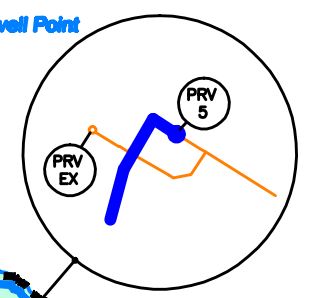
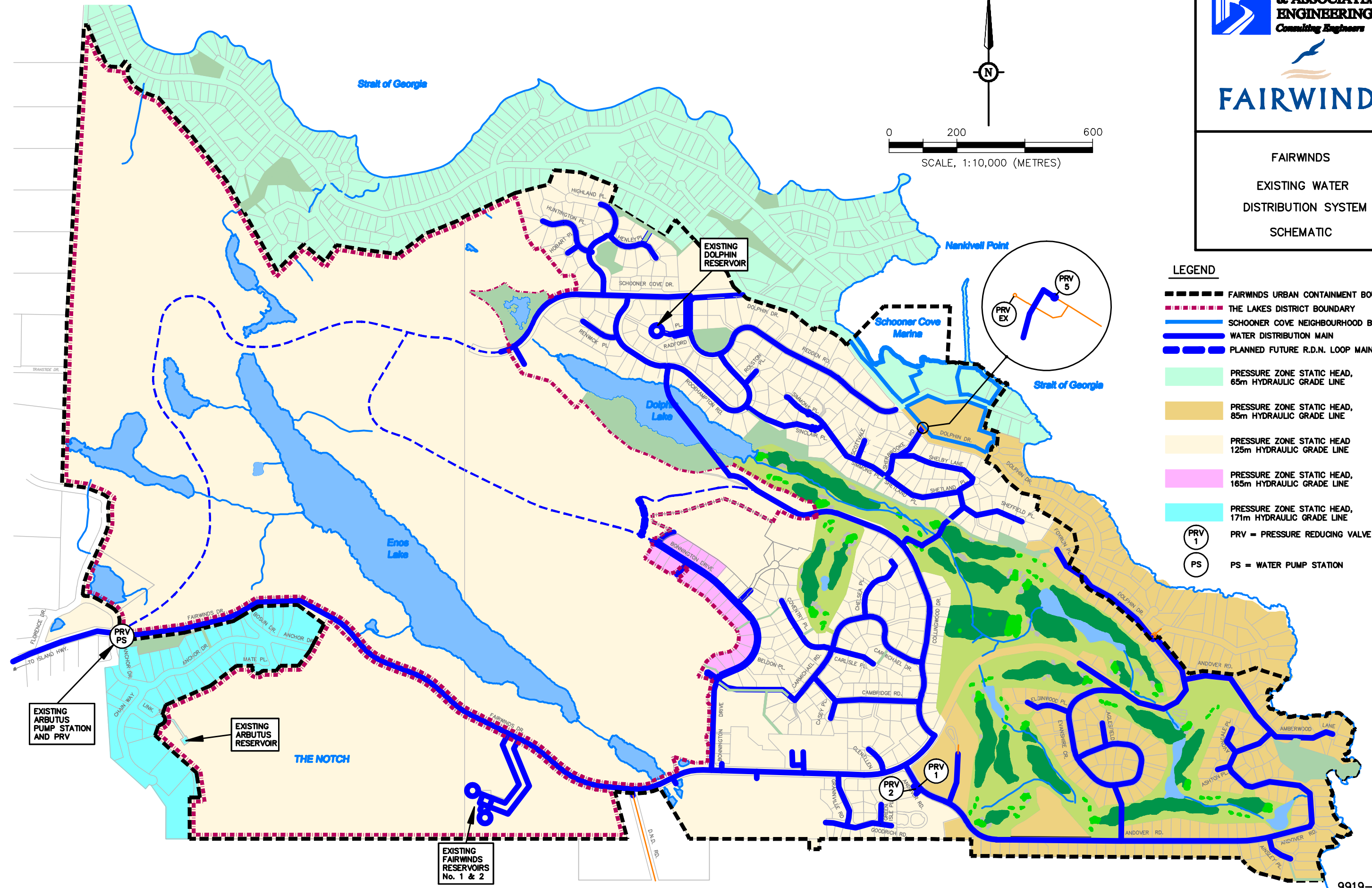
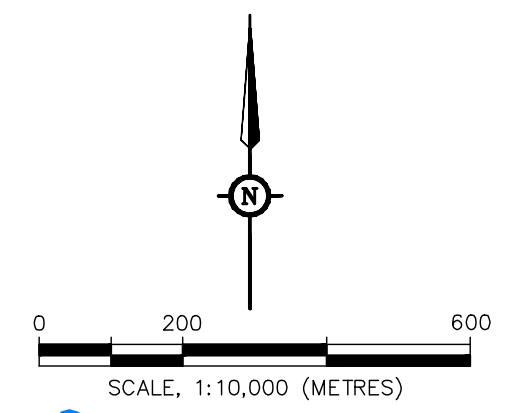
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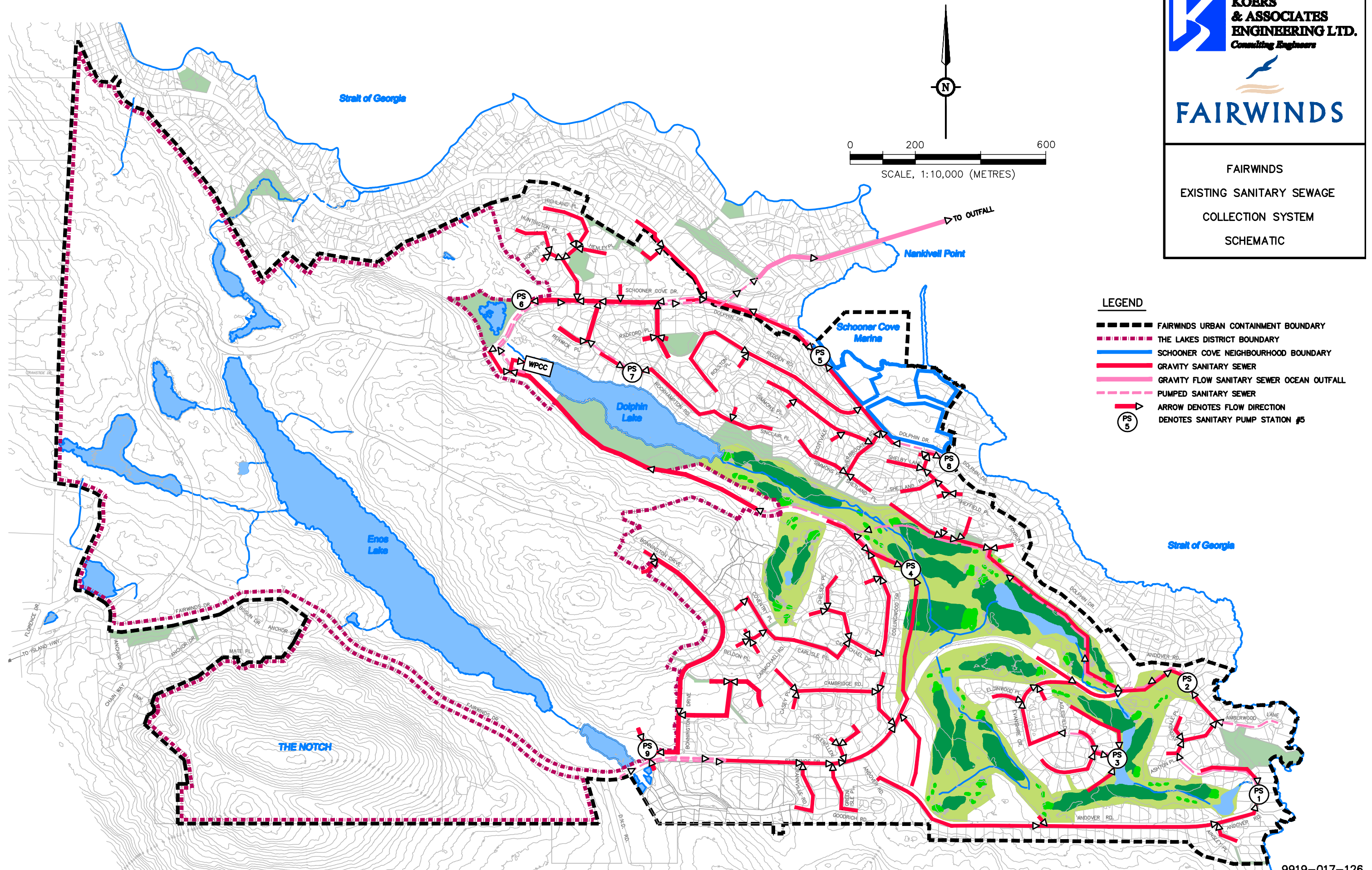
**FAIRWINDS
EXISTING WATER
DISTRIBUTION SYSTEM
SCHEMATIC**



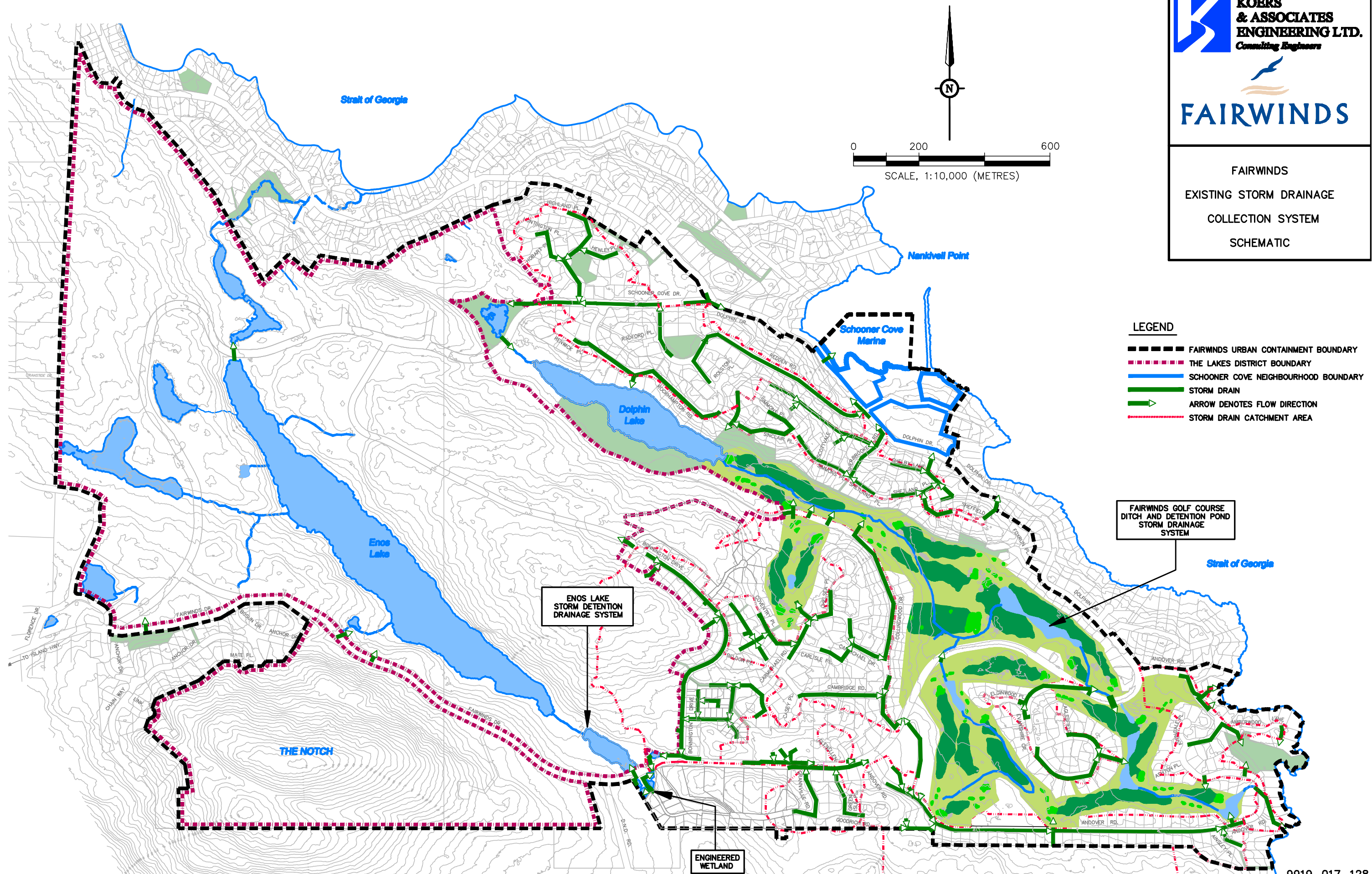
LEGEND

- FAIRWINDS URBAN CONTAINMENT BOUNDARY
- THE LAKES DISTRICT BOUNDARY
- SCHOONER COVE NEIGHBOURHOOD BOUNDARY
- WATER DISTRIBUTION MAIN
- PLANNED FUTURE R.D.N. LOOP MAIN
- PRESSURE ZONE STATIC HEAD, 65m HYDRAULIC GRADE LINE
- PRESSURE ZONE STATIC HEAD, 85m HYDRAULIC GRADE LINE
- PRESSURE ZONE STATIC HEAD 125m HYDRAULIC GRADE LINE
- PRESSURE ZONE STATIC HEAD, 165m HYDRAULIC GRADE LINE
- PRESSURE ZONE STATIC HEAD, 171m HYDRAULIC GRADE LINE
- PRV 1
○ PRV 2
○ PRV 5
○ PRV EX
○ PS
- PRV = PRESSURE REDUCING VALVE
- PS = WATER PUMP STATION

FAIRWINDS
EXISTING SANITARY SEWAGE
COLLECTION SYSTEM
SCHEMATIC












FAIRWINDS
EXISTING STORM DRAINAGE
COLLECTION SYSTEM
SCHEMATIC



**FAIRWINDS
EXISTING ROAD NETWORK**

LEGEND

-  FAIRWINDS URBAN CONTAINMENT BOUNDARY
-  THE LAKES DISTRICT BOUNDARY
-  SCHOONER COVE NEIGHBOURHOOD BOUNDARY
-  PLANNED FUTURE COLLECTOR
-  COLLECTOR
-  MINOR COLLECTOR
-  LOCAL RESIDENTIAL STREET
-  STRATA STREET
-  EMERGENCY ACCESS

