

**Fairwinds Resort Community
The Lakes District
Neighbourhood Plan Servicing Report
November 23, 2009**

Introduction

As part of the Neighbourhood Planning Process for Fairwinds Resort Community, The Lakes District, this report has been prepared to provide details of the proposed servicing for the development area. Background information and reference details are located in the Fairwinds Resort Community, The Lakes District, Existing Servicing Inventory Report, October 2009.

It should be noted in reading this report to refer to Drawings 9919-017-125, -127, -129, and -131, enclosed at the rear of this report.

Water Servicing

1. Water Supply

Water supply is discussed at length in the Existing Servicing Inventory Report. As detailed, 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 new unit well below present bylaw requirements will be achieved. 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.

Due to a delay in implementation of adequate AWS water supply to support ongoing Fairwinds development, initial phases of the development would be supplied from the Wall Brook Well Site. Existing drilled wells on this site would be connected to the water system at Fairwinds’ cost, in accordance with the terms of a recently completed Letter of Intent (LOI) agreement between the RDN and Fairwinds.

2. Water Demand for Lakes District

Water demand requirements for the Lakes District Neighbourhood will be less than that indicated in the current (outdated) RDN Bylaw 500 Water Standards. Current demand requirements are based on an older RDN statistic of around 2.4 to 2.5 people per housing unit (ppu), derived from the typical more rural housing within the RDN areas beyond municipal boundaries. This also almost exclusively based on single family style of housing. In contrast, the proposed Lakes District UCB development is targeted to be more urban style, with greater than two-thirds of the units being compact single-family, duplex or multi-family. The current Statscan data, showing existing Fairwinds area development at 2.2 ppu is therefore used for single family development and duplex units, and 1.9 ppu for multi-family, strata type units for the Lakes District. Based on the 1.1

m³/person/day maximum day demand adopted in the RDN Nanoose System Integration Water Study Review, February 2007, design maximum day water demands of 0.37 Igpm/unit for single-family, and 0.32 Igpm/unit for multi-family development are obtained for Lakes District design.

As the Lakes District development will adopt many modern water-saving methods and Team Watersmart philosophy, actual water demands should prove to be even lower. With the reduction in irrigation water-use achieved in well-planned multi-family developments, demand per capita should be even further lowered from the design flows shown above.

3. Water Storage

Water storage requirement is detailed in the Existing Servicing Inventory Report. The existing available Fairwinds Lakes District storage of 1,774 m³, less 1,080 m³ fire storage, supports 1,050 units. When only the Fairwinds portion of the water system is reviewed in isolation, additional storage would be required to be in place by the time a total of 1,050 units, including Fairwinds Lakes District units are developed and occupied. As detailed in the RDN Nanoose System Integration Water Study Review, February 2007, a future additional reservoir of 660 m³ size will be needed on the Nanoose Peninsula when system population reaches 9,250 people (in approximately year 2028). This will satisfy the full storage needs of the entire Nanoose Peninsula, including this Neighbourhood, to build-out.

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 February 2007 Review 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, or how the AWS system will include this portion of the total storage need.

The additional required capacity will be located at the existing Arbutus Reservoir site. It is understood that the RDN has recognized the need to renew the aging Arbutus Reservoir in the future. With this in mind, cost recovery will be established for all future Nanoose development (including the Lakes District Neighbourhood) and existing system users to share in costs for construction of an integrated larger new reservoir with two

separate cells, for operational flexibility. Timing of construction would be in the 2015 to 2020 year range, well ahead of the projected year 2028 requirement, advanced as needed to co-incide with the need to replace the existing structure. Alternatively, a new reservoir could be built with 660 m³ capacity adjacent to the existing old tank, which would be replaced separately at the end of its useful life.

Upsizing of the existing Arbutus Pump Station and Pressure Reducing Valve (PRV), located at the intersection of Fairwinds Drive and Anchor Drive, will also be required in conjunction with an increase in Arbutus Reservoir size.

4. Water Pressure Zones and Water Distribution Mains

The proposed water distribution mains and pressure zones are shown on Drawing No. 9919-017-125. Pipes shown as RDN loop mains are sized at 250 mm diameter, and have been designated as necessary trunk mains through previous RDN studies. All other water distribution mains are sized at 200 mm diameter, except in cul-de-sacs where piping would be 100 mm diameter beyond the last fire hydrant. Pipe sizing would be checked by hydraulic network analysis as the design stage approval submissions are made for each subdivision phase. All works will be designed and constructed in accordance with the applicable RDN bylaw standards in effect at the time.

The water distribution mains are installed in extensions of the existing 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, generally based on the normal reservoir full water level, known as the hydraulic grade line (HGL). Actual system pressures drop as reservoir levels fluctuate, particularly for taller, standpipe-type of storage reservoirs. Peak-use pressures in the water distribution system also drop as a result of pipe friction causing pressure losses between the system reservoirs or pumps and the point of water use. 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), or by booster pumping to a higher HGL pressure zone.

Pressure zones are as detailed below and as shown on Drawing No. 9919-017-125.

4.1 125 m 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 Lakes District lands, as shown.

4.2 165 m HGL Pressure Zone 3A:

For the high elevation central 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.

It is recommended that the booster pump be located centrally to the area served, alongside Bonnington Drive near its present north end, as shown on the drawing. Alternatively it could be located to the south on Bonnington Drive near the north boundary of Rockcliffe Park strata. This alternate location would require further pipe duplication to be installed along the existing constructed section of Bonnington Drive.

4.3 171 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 (to be enlarged in the future), with a top level of 171 m. This pressure zone presently provides service to the Garry Oak subdivision area, outside the Fairwinds lands.

One area of this zone is immediately adjacent to the existing pressure zone 3, north of Fairwinds Drive and adjacent to the extended Schooner Cove Drive at Anchor Drive. Existing undersized distribution mains on Chain Way, Anchor Drive and Bosun Drive within the existing developed area will be upgraded to 200 mm diameter.

A second area of this pressure zone 3 is along the west side of the Lakes District Neighbourhood, near Transtide Drive. This would be served by a water distribution main extension along Schooner Cove Drive, such that parallel watermain are installed along this section of roadway, one in the 125 m HGL zone and the other in the 171 m HGL zone. A PRV would be installed at the north end of this zone, to provide redundancy in emergency water supply and fire flow to the northern area of the 125 m HGL zone, and to maintain flow and water quality through the 171 m HGL zone.

4.4 200 m HGL Pressure Zone 4:

Isolated developments along the base of Notch Hill require a link watermain from the 171 m HGL zone, with a fire booster pump station to provide required design pressures. Routing for the linking main between the development roads would be determined during detailed design, and a statutory right-of-way established along the route in favour of the RDN.

4.5 250 m HGL Pressure Zone 5:

The loop road serving adjacent development along the south side of Notch Hill requires construction of a fire booster station at the Arbutus Reservoir. This would draw water from the 171 m HGL pressure zone and pump through a 200 mm diameter watermain along the development area road to provide required design pressures at the varying operating conditions.

5. Water System Operation and Maintenance, and Fire Protection

Operation and maintenance of the Lakes District Neighbourhood water system will be carried out by the RDN as part of the Nanoose Peninsula Water System, Local Service Area, as described in the Existing Servicing Inventory Report. This information is repeated in this report as follows:

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. As the Lakes District development proceeds, the present high fire risk will reduce, as improved access and additional water distribution piping with fire hydrants become installed throughout much of the presently undeveloped land.

Trunk Sanitary Sewer System

1. Background

Fairwinds sanitary sewage flows are presently directed to the Nanoose Water Pollution Control Centre (WPCC) at the west end of Dolphin Lake. 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 existing RDN Liquid Waste Management Plan for Nanoose

shows the next expansion of the WPCC 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 includes flow contributions from initial phases of the Lakes District neighbourhood.

The RDN is presently completing a Liquid Waste Management Plan (LWMP) for Nanoose, to better determine future needs. This includes 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 Nanoose WPCC site, it is believed that other more central sites for treatment, which are located in a less urbanized area, will be reviewed. As construction of the new plant at a more central and rural site is both a preference for The Lakes District neighbourhood, and is in the best interest of existing Nanoose developed areas, Fairwinds will work with the RDN to achieve this concept.

Fairwinds contribution towards the cost of treatment facilities beyond the 1,250 unit level will be by way of Development Cost Charges (DCCs), in accordance with a Bylaw to be implemented by the RDN. Single family and duplex development units would be charged at the time of subdivision registration, and be applicable to fee-simple and bare-land strata development. Multi-family and commercial development DCCs will be charged at the time of building permit issue, when the exact building floor area or number of housing units as applicable can be accurately determined.

2. Sewer Design Flows for the Lakes District

The RDN anticipates updating its sanitary sewer design standards in year 2010. It is assumed that this will allow for the significant reduction in inflow and infiltration component which has been achieved in new systems. This has occurred with gasketed PVC pipe and improved manhole construction, complemented by video inspections of pipe and manhole interiors at initial construction and one year later. System design should also be based on pipes flowing 90% full at peak capacity.

For the Lakes District, where water-use reduction and green conservation will be fully integrated into the housing units, reduced sanitary sewage flows will be achieved. Due to the expected demographic distribution of the development, suiting more mature residents with many retired or partly retired with home-based businesses, times of peak sewage discharge are more spread out than in a typical urban setting, reducing peak-flow factors. This will be allowed for in developing pipe and pump station design flows, for facility sizing. As for water demand prediction, sewage flows will be based on 2.2 ppm for single-family and duplex units, and 1.9 ppm for multi-family strata type units, for the Lakes District.

As shown on drawing 9919-017-127, allowance is being made for possible future units contributing flow from outside the Fairwinds UCB, leading to the existing Nanoose

WPCC. This would be accounted for in facility sizing, with the oversizing component (and possibly proportional unit-benefit costing) eligible for latecomer fee collection if these areas proceed within the time frame allowable (presently within 15 years of the agreement date). As shown, 871 units from Dolphin, Beachcomber, Delanice and Cottam Point, 678 from Red Gap, 71 from Garry Oaks, and 41 units from Arbutus are potential additional flow contributors to the Lakes District servicing, subject to future confirmation and direction from the RDN. Allowance for such flows along alternative routing would be included in reviewing an off-site location for the new and upgraded WPCC.

3. Proposed Sanitary Trunk Collection System

The outcome of the current LWMP is critical in the sizing and routing of gravity mains, pump stations, and forcemains within the Lakes District. Different network routing applies to directing all flow to the existing WPCC site, compared to an alternative, central Nanoose site. Drawing No. 9919-017-127 shows the location of the Nanoose WPCC, and existing sanitary sewer pump stations (PS) to where some flows from the Lakes District Neighbourhood 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.

The drawing shows conceptual routing for future trunk gravity sewers and flow directions, with sanitary sewer pump stations at low points within the development areas (NEW PS), and sanitary sewer forcemains from the proposed pump stations to their point of discharge to the gravity flow system. Gravity mains and force mains, along with the sanitary pump stations, will be sized according to the current RDN Bylaw. Design flow will include allowance for specific Lakes District and possible future connection areas outside the Fairwinds UCB with confirmation from the RDN as described above, during detailed design of the various phases. An overall sanitary sewer model will be developed during the first phase of the Lakes District Neighbourhood design, to establish facility sizing in all areas beyond the immediate phase and ensure that any oversized facilities are appropriately planned for and constructed. This model would then be updated as the various phases proceed to design stage approval, when additional details confirming exact grades, routing, pipe lengths, and manhole locations are finalized.

Detailed drawings will be produced at the design stage approval for each phase of the Lakes District Neighbourhood. These show 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 Nanoose WPCC. 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 lakefront 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. 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 put in place for mains within back and side yards of private properties, and along the frontages of bare-land strata developments or some streets built to the approved Project Specific Street Standards, where mains would be located beyond the road allowance due to the limited or non-existent roadway boulevards within dedicated road allowances.

4. Sanitary Sewer Service Connections

Gravity sanitary sewer service connections will be 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, will be 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 will feed to a combined local forcemain, which discharges into the nearest suitable gravity sewer manhole.

Storm Water Management

1. Stormwater Collection System

Drawing 9919-017-129 shows the proposed storm drainage system. The larger piping networks flow towards the existing drainage systems leading 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 existing ditches on Fairwinds Drive and Dolphin Drive.

The stormwater facilities for Fairwinds will be owned and maintained by the Ministry of Transportation and Infrastructure (MoTI). Piped storm sewers with manholes that are complemented by ditches and swales, all to normal municipal standards following the Department of Fisheries and Oceans (DFO) Urban Stormwater Guidelines as approved by MoTI, will be installed throughout The Lakes District Neighbourhood. Rainwater from roadways, sidewalks, boulevards, and lot area sloping towards roadways will be collected in the roadway gutter, from where it drains to roadway catch basins, connected to the piped storm sewer mains. At some locally low boulevard areas, lawn catch basins would be similarly installed to provide drainage control. Wherever possible, and subject to approval of the proposed Project Specific Street Standards, 'green' stormwater management methods and facilities will be utilized, to minimize impervious areas and make the most use of natural infiltration and detention to reduce high runoff flows.

Some properties would have no individual connection, requiring rock pit installation during building. These occur where topography and environmental considerations would make the service connection impractical, and where seepage drainage leads to lakes and creeks or the golf course without crossing or adversely impacting other development properties. In these areas, and elsewhere where geotechnical conditions permit, on-site infiltration of rainwater should be utilized.

Rights-of-way and access provisions will be established 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 would be provided 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, will remain the responsibility of the strata to own, operate, and maintain.

An overall Stormwater Management Plan and a Hydrological Assessment will be undertaken in accordance with the RDN policy and commitments in the Environmental Impact Assessment. This will be developed during the first phase of The Lakes District Neighbourhood design, and will include a stormwater hydraulic network model to establish facility sizing in all tributary areas beyond the immediate phase and ensure that any oversized facilities are appropriately planned for and constructed. Integration and cross-referencing with the appropriate environmental consultant of the design team will be included. This model would then be updated as the various phases proceed to design stage approval, when additional details confirming exact grades, routing, pipe lengths, and manhole locations are finalized.

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 MoTI 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 where 20 or more parking stalls are being created (typically over 500 m² paved), an oil/water separator will be installed on the system, to remove oils and grit from the off-site discharge. An existing example of this is in use at the Fairwinds Centre commercial property. Proposed sites where this may be required include the Lakehouse Centre and Community Mixed-use sites.

An engineered wetland would be installed at the main proposed stormwater outlet discharging directly downstream of the north end of Enos Lake, alongside Schooner Cove Drive. This is to be sited approximately in the location shown on the plan, as adjusted during detailed design at the appropriate subdivision stage to suit discharge elevations, topography, excavation conditions and detailed environmental consultant input. The engineered wetland would be similar to that constructed at the southeast end of Enos Lake, and will include storage, primary sediment removal pond, outlet controls, and a series of additional wetland ponds in which various staged plantings provide silt reduction and flow treatment in advance of discharge. The MoTI will be responsible for approval and operation of the low-maintenance engineered wetland, for which a suitable right-of-way dedication will be provided.

Other main discharges at the downstream ends of main site development areas should have a temporary pond installed to provide primary sediment removal and detention, with a control outlet, in accordance with Ministry of Environment (MoE) standards. This would be installed during the early stage of immediately upstream site development, and remain in place until approximately 75% of the building and final landscaping has been completed in its tributary area. These temporary ponds will be designed and installed as part of the appropriate individual subdivisions.

For the area adjacent to and east of central Enos Lake, any existing stormwater flows down the steep rock slope directly to the lake. On-site detention of storm water flows will be utilized in this area to the maximum extent possible, to avoid concentration of outlet flows, through a combination of on-site tank and pipe storage systems, on-site infiltration ground beds, and road and boulevard subgrades constructed of natural or imported angular clean rockfill which can also function as detention areas. A similar system would be used in the southwest area of the site, where discharges from the Notch Hill area flow through existing developed properties and down steep slopes, without a strongly defined ditch or creek system.

Smaller drainage areas will have a piped outlet with headwall, or a swaled or ditched outlet, as appropriate, leading to existing roadway systems, existing small site ponds, or the Fairwinds Golf Course drainage system, as shown on the drawing.

Suitably sized land areas are required to be set aside for the storm water management facilities, and preserved from development on a permanent basis. Temporary ground cover and inlet siltation-control measures shall be carried out during site development construction, to limit sedimentation and siltation of storm flows. The building scheme will be modified to require implementation of similar measures, all as recommended by the environmental consultant, for similar control during building construction.

Road Network

1. Background

The Lakes District Neighbourhood, Street Hierarchy Plan is shown on Drawing 9919-017-131.

The Lakes District Neighbourhood 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 the completion of Schooner Cove Drive as a Community Parkway, to function as a Collector, provides the main transportation route through the neighbourhood. The completion of Bonnington Drive between Fairwinds Drive and Schooner Cove Drive, and the proposed new loop road in the northwest area of the neighbourhood, both as Neighbourhood Collector classification streets, serves to complement the Community Parkway.

The Lakes District Neighbourhood will be further serviced with Neighbourhood Local streets to access and service the new development, connecting to these main roads. Emergency access lanes, with removable bollard security, will continue to be installed at critical locations as shown on the plan. The connection to Dolphin Drive in the northwest area of The Lakes District will either be constructed as an emergency connector, or minor local connection, as agreed with MOTI.

2. Road Standards

Project-Specific Street Standards are being considered by MoTI for use in the Lakes District Neighbourhood of Fairwinds, in response to the designation as an Urban Containment Boundary (UCB) for more urban development, local topography and environmental conditions.

In strata developments, strata roadway standards as agreed by the MOTI and used on earlier phases of Fairwinds would be applied. This allows for maximum main strata

roadway grades of up to 15% for accessing areas of adverse terrain, and local accesses to a maximum of 18% grade. Road widths would be suited to the development, with maximum curb to curb widths matching those of the Project-Specific Street Standards for Neighbourhood Local streets.

Sidewalks and Trails

Existing Fairwinds development has concrete sidewalks in place on one side of most of the subdivision road rights-of-way, except for smaller cul-de-sacs with limited traffic. 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.

It is proposed that a connected system of dedicated sidewalks be installed throughout The Lakes District Neighbourhood. Wherever possible, and subject to acceptance of the proposed Project-Specific Street Standards, a dedicated combination pedestrian and bike-use path would be installed, separated from the travelled roadway by a landscaped or treed boulevard buffer strip. These paths have proposed widths of 3 m for Community Parkways, 2.4 m for Neighbourhood Collector, and 1.8 m for Neighbourhood Local street classifications.

Roadway sidewalks will connect to a trail system, including gravel trails, such as along the Fairwinds Golf Course frontage (maintained by the golf course), and through parks and greenways (maintained by the RDN). The expansive system of multi-use trails will be incorporated into The Lakes District Neighbourhood where practical and feasible, in accordance with a Trail Management Plan developed with the RDN.

Power Distribution

B.C. Hydro will continue to provide power distribution to Fairwinds for the Lakes District Neighbourhood. Three-phase power will be extended along Schooner Cove Drive and Bonnington Drive to further link and complement its existing system on Fairwinds Drive and Dolphin Drive, and to provide for potential requirements for condominium buildings within The Lakes District. Underground single-phase power will be provided to all other areas, from low-profile above-ground transformers and below-grade service boxes and junction boxes.

As development of The Lakes District proceeds, Fairwinds will decide whether to continue conversion of existing overhead three phase sections to underground service. For Schooner Cove Drive extension, deciding on elimination of further overhead distribution is required. Regardless of these considerations, it is assumed that underground service will be provided to all new units, to eliminate any further overhead distribution and service wiring.

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 arrangement will continue through the Lakes District Neighbourhood. 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. Telus has switches located 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 in 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, all streetlight systems are owned and operated by the

individual strata. Streetlighting will be similarly provided to The Lakes District Neighbourhood.

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.

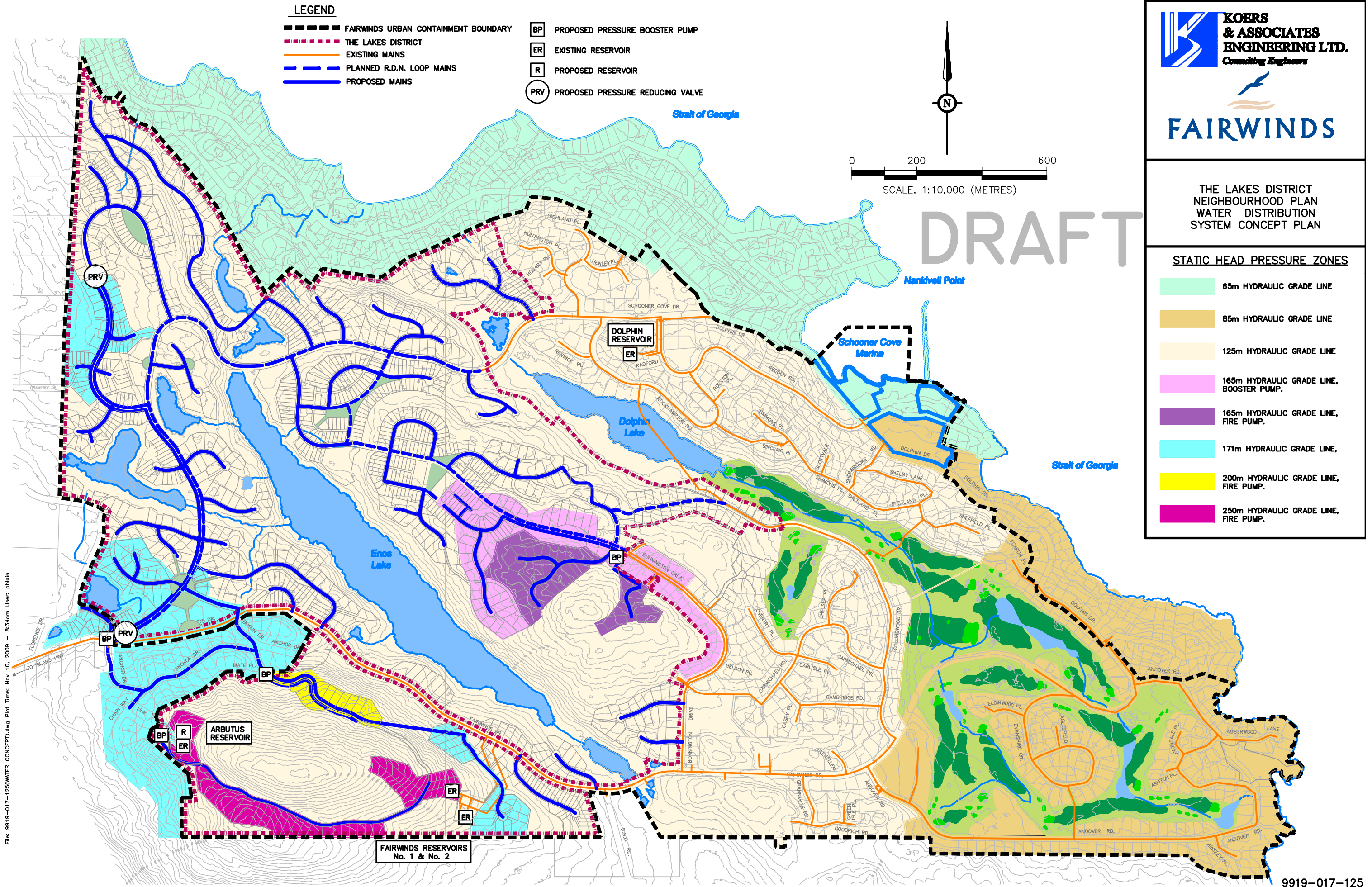
Fairwinds has committed that for all future streetlight systems, the modern 'dark sky' compliant lights will be used. These lights have the lamp shielded from side view, directing most of the light downward to the street, and significantly eliminating glare towards oncoming vehicles and into adjacent 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 Park 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, and would continue to be used throughout the Lakes District. As energy-efficient LED lamps become available at viable cost, Fairwinds will consider changing to using this style.

Summary report prepared by:

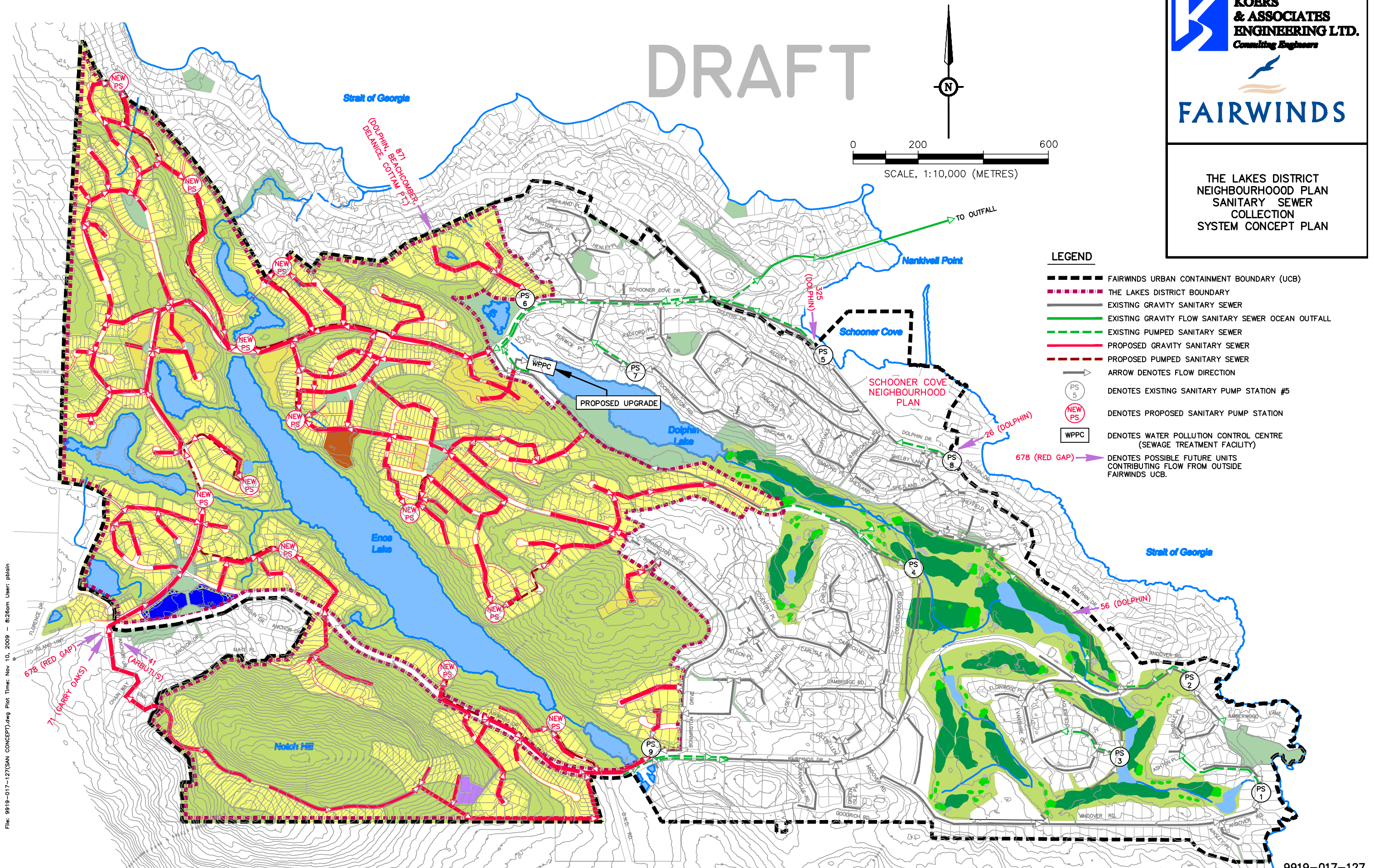
KOERS & ASSOCIATES ENGINEERING LTD.



Dave Shillabeer, P.Eng
Project Manager

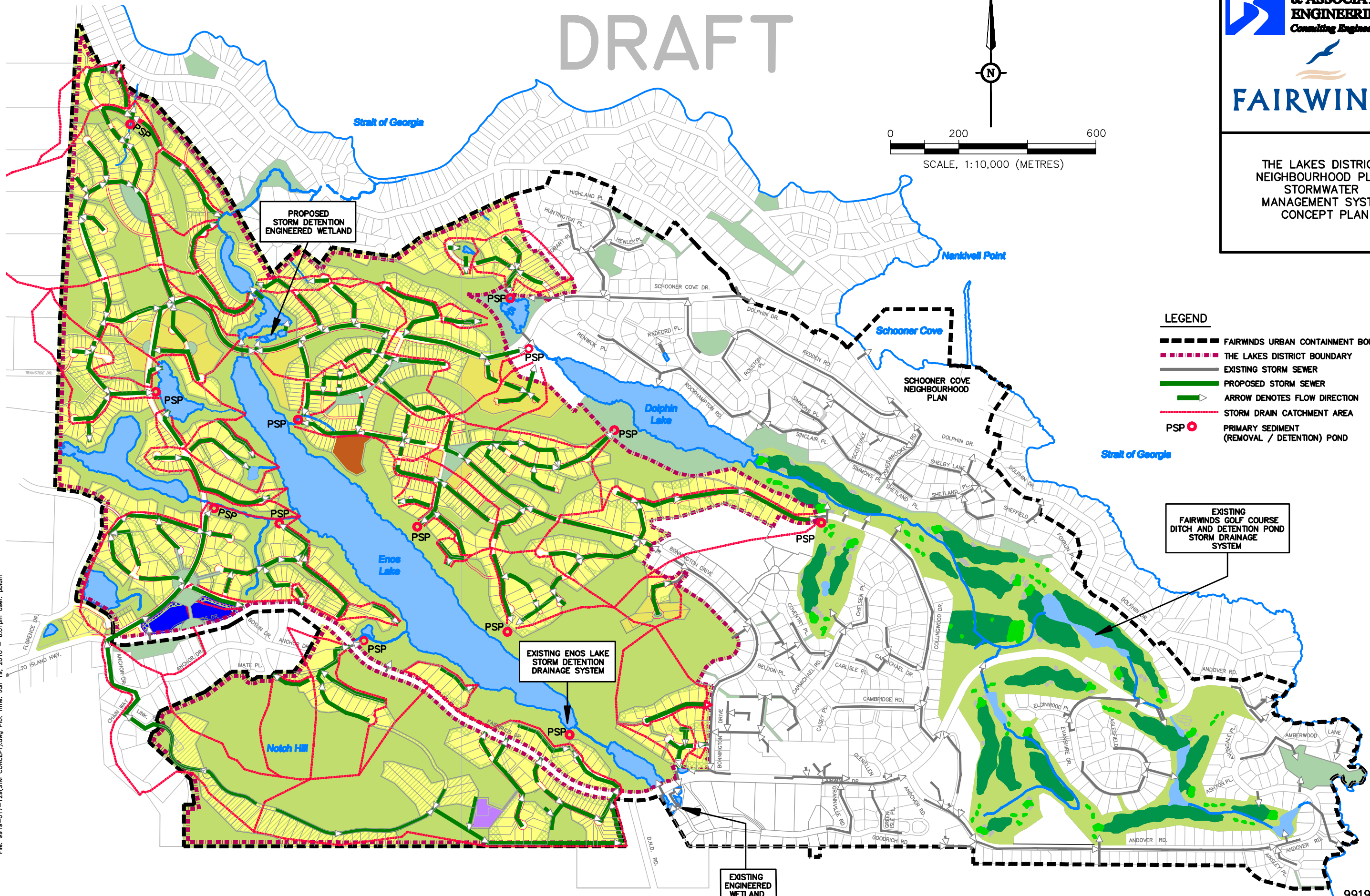
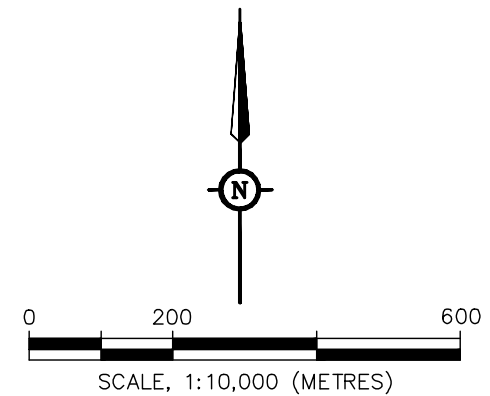


THE LAKES DISTRICT
NEIGHBOURHOOD PLAN
SANITARY SEWER
COLLECTION
SYSTEM CONCEPT PLAN



DRAFT

THE LAKES DISTRICT
NEIGHBOURHOOD PLAN
STORMWATER
MANAGEMENT SYSTEM
CONCEPT PLAN



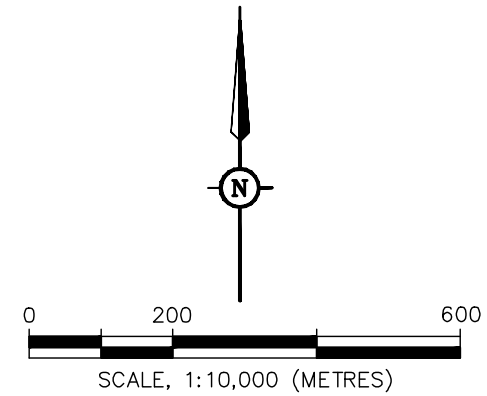
- LEGEND**
- FAIRWINDS URBAN CONTAINMENT BOUNDARY
 - THE LAKES DISTRICT BOUNDARY
 - EXISTING STORM SEWER
 - PROPOSED STORM SEWER
 - ARROW DENOTES FLOW DIRECTION
 - STORM DRAIN CATCHMENT AREA
 - PSP PRIMARY SEDIMENT (REMOVAL / DETENTION) POND

DRAFT

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Consulting Engineers

FAIRWINDS

THE LAKES DISTRICT
NEIGHBOURHOOD PLAN
STREET HIERARCHY PLAN



LEGEND

- FAIRWINDS URBAN CONTAINMENT BOUNDARY
- THE LAKES DISTRICT BOUNDARY
- PLANNED COMMUNITY PARKWAY
- NEIGHBOURHOOD COLLECTOR
- RESIDENTIAL LOCAL
- EMERGENCY ACCESS

