LAKESTONE MASTERPLAN

SUMMARY OF REVISIONS FROM 2006 – 2012 SUBMISSIONS

Executive Summary

The most obvious changes involve the removal of the golf course, vineyards, and the lakefront "boat cave" facility. Removal of these elements was supported by Council in 2010.

There are a series of changes and enhancements in the revised LakeStone Masterplan that more than mitigate the removal of the above features. These are clearly delineated – in each case allowing a direct comparison between the original and revised masterplan submissions.

The LakeStone 2012 Masterplan achieves a much higher level of resolution in all aspects of its design than the previous plan. By implementing fundamentally sound design principles, and dealing with the various site constraints in a very detailed manner, LakeStone will become one of the most highly desirable places to live and recreate in the North Okanagan.

Comparison Between Previous and New Masterplan Developments

2006 Masterplan Development	**2012 Masterplan Development**
- Golf Course and Clubhouse	- Additional Park added (Summit Park) with pavilion and amphitheatre available for events, receptions or simple passive uses – this park replaces some 200 units (a mix of single and multi-family, much of it in 3 – 4 floor configuration) originally proposed, reducing the feeling of dense development. - Significant increase in natural, undisturbed open space
- 100 Unit Lakeside hotel with pool and food / beverage operation	- Lake Club facility with swimming pool, two hot tubs, fitness facility, outdoor kitchen / barbecue area, and rooftop reception terraces - Public washroom and shower facility provided proximate to the beach area - District program to provide for usage of the pool facilities at certain hours per day - Facility for the rental and storage of kayaks, stand up paddleboards, and other water-related items
- Marina and Subterranean boat storage	- Subterranean Boat Storage removed. - Discussions are ongoing with the District to relocate the Marina to a site north of the property to eliminate potential conflict with the water intake
- Small sections of Vineyard	- Increased undisturbed natural open space on the site

- Parks and Trails Trail system conceptually designed in some very challenging terrain	- Tennis courts and park areas in the Tyndall / Benchlands neighbourhood - Major Regional Trail along Tyndall Road and Okanagan Centre Road - Addition of approximately 24 km of a variety of trails open to the public, including parking, signage, seating, water stations, and viewpoint outlooks - Park and School sites already dedicated to the District on prime sites along Okanagan Centre Road
- Dedication of Lakeside park only where current beach is located	- Dedication of Lakefront Park and beach along the entire width of the site from the Pump Station to the north property line, including new washroom and shower facilities for public use - Public parking for those using the beach
- Small Village off Tyndall with central commons, 30 unit condo hotel, restaurants, recreation and fitness facilities	- Small residential village in the Tyndall / Benchlands neighbourhood with 80 unit resort – condo apartment building - Additional community building with fitness facility, retail / commercial development, swimming pool, hot tub, picnic area and tennis courts

OCP and Zoning – 2.A

Overall compliance with the OCP and Zoning is similar to the earlier submission, with proposed densities unchanged in terms of total numbers. The allocation of densities on the site has changed to reflect current market and phasing considerations, while responding to detailed site planning and grading studies that place specific housing types on the most suitable pieces of land.
Development will include single family homes, duplexes, townhomes and hospitality oriented condominiums that are well suited to short term rentals. Limited commercial facilities (focusing on service-oriented retail) will also be included, with an opportunity, based on market demand, for future expansion to provide possible food services and other resort supporting venues.

Development Land Use and Phasing – 2.B

The proposed phasing at LakeStone is different from the previous proposal. One of the key design principles is that the various phases of development align with the timing for the installation of both on-site and off-site services. This alignment is covered in Section 2.E, Infrastructure / Engineering.
Proposed land uses at LakeStone are consistent with the original submission to include Urban Residential, Resort Commercial, Industrial (Glenmore Road), and Parks and Conservation areas.

Scale of Development Comparison

Lakeside Master Plan - May 2006	LakeStone Master Plan - March 2012
Total Development Area: 201.23 ha (adjusted for actual area)	Total Development Area: 201.23 ha
Total Open Space: 105.0 ha (52% - including private golf course)	Total Open Space: 105 ha (52%)
Development	
Foreshore Neighbourhood • 19 Single Family Homes • 176 Townhomes/Multifamily Units **Total: 195 Units**	**Foreshore Neighbourhood** Phase I (already approved) • 20 Single Family Homes Phase II (DP approved) • 57 Single Family Homes • 46 Duplexes • 16 Townhomes **Total: 139 Units**
Tyndall Neighbourhood • 30 Unit Condo Hotel • 10 Single Family Homes • 396 Townhomes/Multifamily Units **Total: 436 Units**	**Tyndall (Benchlands) Neighbourhood** Phase III • 80 Unit Resort Condo/Apartments • 63 Single Family Homes • 97 Townhomes/Multifamily Units – designed for maximum rental compatibility **Total: 225 Units**
Ridgeline Neighbourhood • 282 Single Family Homes • 337 Townhomes/Multifamily Units • 18 hole Golf Course **Total: 619 Units**	**Ridgeline (Highlands) Neighbourhood** Phases IV - Phase VIII • 448 Single Family Homes • 273 Townhomes/Multifamily Units (relocated to create Summit Park) • Summit Park, Pavilion and Trails **Total: 736 Units**
Glenmore / Chase Neighbourhood • 63 Single Family Homes • 42 Townhomes/Multifamily Units **Total: 105 Units**	**Glenmore / Chase Neighbourhood** • 265 Townhomes/Multifamily Units • Commercial / Industrial Buildings along Glenmore Road frontage **Total: 265 Units**
Overall Total: 1365 Units	**Overall Total: 1365 Units**

Architectural Form and Character – 2.C

The Architectural form and character proposed for LakeStone is very similar to the original submission, using high quality natural materials and a philosophy that strives to define a regional architecture for the North Okanagan. Architectural controls through a set of Design Guidelines for each Phase will ensure that the quality of the architecture at LakeStone is kept at a very high level.

Traffic Impact – 2.D

The updated Traffic Impact Study identified a 24% lower traffic flow over the previous master plan design. The study will be further updated when the development reaches a 50% build out.

Infrastructure / Engineering – 2.E

The overall infrastructure proposed is similar to the original submission, but with two less lift stations and a much reduced number of homes serviced by a pressurized system. Installation of all the off-site services at LakeStone will be aligned with the development phasing, to proceed as the various phases are introduced to the market.

Water Supply
The removal of the requirement for golf course irrigation will allow the downsizing of certain reservoirs, resulting in a projected decrease in overall water consumption.

Sanitary Sewer
There are no anticipated revisions in the overall design concept from the 2006 to 2011 submissions.

Storm Drainage
Consistent with the original intent, the stormwater management has been designed such that the stormwater runoff will be limited to pre-development flows.

Current Ministry of Environment Department of Fisheries and Oceans' requirements for Kokanee spawning areas have changed since 2006, requiring the relocation of certain outfall designs to areas outside the sensitive spawning grounds.

A series of detailed strategies for buildings are being created to maximize the retention and re-use of stormwater on site.

Environmental Impact – 2.F

The original Environmental Report has been fully updated to reflect the new masterplan, the biggest difference being the size and use of the green areas. The current plan calls for 52% of the overall site area to be retained in its natural condition. Due to the natural state of the retention areas, the green areas in the current plan are of much higher value than a golf course or other "altered" open space. Wildlife habitat and corridors are improved by the additional natural open space, which is included in the new design. Greenhouse Gas Reduction strategies are proposed, which was not a specific requirement at the time of the original submission.

Topography / Steep Slope Analysis – 2.G

The current plan represents a more detailed planning exercise as it relates to the feasibility of every site, whether single or multi-family in concept. Layouts have been tested with specific product types for each multi-family designated parcel to ensure that they will be achievable at the time of development. Additionally, the development has been concentrated in areas that are not steeply sloped, making sure that the more sensitive land can be retained in its natural state. The new masterplan identifies a significant area of land along virtually the entire west flank of the hill that will remain as unaltered natural open space. In the previous submission, much of this area would have been extensively altered to allow for construction of the golf course.

Open Space – Parks and Trails – 2.H

As previously stated, the current masterplan shows 52% of the overall site area as park or open green space. A great deal of attention has been paid to this area of the planning, evidenced by the detailed design of the 23.90 kilometers of trails, trail head signage, and lookout / resting areas. Wherever possible, the trails follow existing paths and natural wildlife corridors that have evolved over time, connecting to Regional trail systems at the property boundaries so that they will become a valued public amenity.

There have been 8.9 hectares of land (mostly on the south end of the site along Okanagan Center Road) already transferred to the District of Lake Country by MLP for community parks and a school site. In addition, there are three significant park areas within the site, identified as the Lakeside Park (with public beach and amenities), Benchland Park (with tennis courts etc), and Summit Park (passive park with amphitheater). Land has also been allocated for a series of smaller neighbourhood parks which connect to the extensive trail system.

Geotechnical – 2.I

The Geotechnical information on the overall LakeStone property has not changed, and the areas of the site that have undergone further investigation (such as Phase 2) indicate consistency with the original studies. As each phase of the project proceeds, detailed geotechnical studies with be undertaken prior to commencement of construction in accordance with District regulations and best practices.

Financial Implications – 2.J

Given that the overall proposed development is of a similar size to the previous proposal, it is anticipated that the financial implications will be analogous. Some relevant statistics include:
- Approximately 300 full time jobs for the duration of the project
- DCC revenue of approximately $15M
- Direct District Impact (parks, offsites, DCC, Fees) – approximately $86M
- Overall Economic Impact of over

Wildfire Impact – 2.K

The Wildfire Hazard Assessment has been fully updated by the original consultant for the 2012 submission.

Archaeology – 2.L

The original Archaeological report has been completely updated as of March 2012, and is consistent with the original review. As development proceeds, MLP will conduct additional Archaeological studies as necessary or as required by the District.

DISTRICT OF LAKE COUNTRY

LAKESTONE

MASTER PLAN 2012

Table of Contents

1. Executive Summary

The purpose of this master plan is to provide sufficient detail to describe the phased development for the LakeStone Community in the District of Lake Country, British Columbia. In the summer of 2010, Macdonald Lakeshore Properties Ltd. (MLP) engaged in a discussion with Council about a series of revisions to the master plan prepared by the previous developer. Based on those discussions, MLP transferred 3 parcels of land for parks and potential future school to the District. After a submission and subsequent meetings and discussions with District Staff, this document is being re-submitted for consideration of both Staff and Council. A companion report has also been prepared to highlight the significant differences between the MLP proposal and that of the previous developer.

This document is organized such that at the end of each individual section. The relevant drawings, maps, or reports are inserted for reference.

OCP and Zoning (Section A)

LakeStone is located in the District of Lake Country, British Columbia, and is roughly bordered by Chase Road, Okanagan Center Road, Lake Okanagan, and Long Road. The main portions of the property have previously been rezoned (DC-3), and are subject to definition of this master plan to satisfy the requirements at subdivision stage. The total number of homes proposed (1365) is unchanged, yielding an overall density of 6.8 dwelling units (du) /hectare.

Development Land Use and Phasing (Section B)

Residential and resort living constitute the majority of the LakeStone land use. This includes multi-family residential and ground oriented residential (single family, duplex homes and townhomes). The bylaws relating to the operations of a number of the multi-family and townhome complexes will be set in a manner which will enable nightly / weekly rental use, in keeping with the resort living designation contemplated within the zoning. Proposed amenities include a lakeside pool and fitness facility (Phase 2) and an extensive trail system which connects to the public parks and trails. On the west side of Tyndall Road in Phase 3, there will be another community building with additional pool and exercise facilities, along with a retail / commercial component suitable for specialty shops and services. Because of the steep slopes and natural vegetation, over half of the total land will remain in its existing natural condition, or in dedicated parkland area created for the District of Lake Country. The open space / park area in the current plan contemplates 105 ha (not including previous 8.9 ha park dedication), with most of this area preserved in a natural,

undisturbed state.

As none of the LakeStone lands have ever been utilized for agriculture, it is appropriate to maintain as much of the site as possible in its current state rather than impose a use on the land to which it is not ideally suited. Adjacent to and in various locations around LakeStone, there are many fine vineyards and orchards providing a variety of crops which add greatly to the reputation of both Lake Country specifically and the region overall.

Additionally, not having agricultural land within the master plan means that any potential interface issues between residential development and farming (noise generation and chemical usage) will not arise.

The phasing of the development is indicated in the overall master plan, with the actual timing of each phase tied to economic conditions. With Phase 1 completed under the previous ownership group and the Phase 2 PLR and Development Permit now approved, the intention is to proceed with development of that Phase once the master plan revisions have been approved. Subsequent phases of the master plan are aligned with the site servicing requirements for offsite works and water reservoirs. It is anticipated that there will be multiple market releases within each delineated construction phase. Refer to the conceptual Phasing diagram for the entire master plan.

Architectural Form and Character (Section C)

LakeStone will become a community that accentuates the natural beauty of the existing site. As such, development guidelines will provide for a number of measures to ensure a complementary fit between buildings and the landscape. Required building materials will emphasize the natural site assets – rock and wood, with glass infill. Massing will emphasize low scale and horizontal lines with deep porches and eaves encouraging informal indoor/outdoor Lake Country living. Tree removal will be minimized wherever possible, and terraces in building and landscaping will be required to work sympathetically with the sloping land character. Sustainable and 'green' building practices will be encouraged. Maintenance of night-sky conditions will be established in the design guidelines for each component of the community.

Traffic Impact (Section D)

The traffic impact of the development is assessed in the enclosed Traffic Impact Study (TIS), which has been updated as of March 2012. This report outlines the traffic expectations to the year 2030, and makes recommendations for mitigating the effect of increased traffic, largely through the alterations to the intersections currently under pressure. Further, it is recognized by the report that the role and interface with Highway 97 is a major obstacle to smooth traffic patterns within Lake Country – and notes that ongoing DOLC negotiation with the provincial Highways staff will be required to achieve a satisfactory resolution. It is also contemplated that the Traffic Impact Study will be updated at approximately 50% build-out stage.

The LakeStone development assists with managing traffic growth – both through directly undertaken improvements to the existing road system, and through the substantial DOLC revenues created through DCC charges. In addition, the overall planning of this community (with its extensive amenities) emphasizes the trail system experience with the goal of replacing a certain number of automobile trips with walking or biking. Residents of both LakeStone and neighbouring properties will have easy access to the pedestrian and/or bike trails.

Engineering Services (Section E)

Engineering systems have been conceptually determined in the enclosed report.

Road construction on Chase, Okanagan Center and Tyndall will be conducted in addition to the onsite roads serving the development. The traffic implications have been studied and can be managed with the detailed recommendations provided.

Water supply and pressure for Phases 1 to 3 will be taken from the existing Okanagan Lake pump and reservoir system (which is currently under capacity utilization) and the overall neighbourhood supply and pressure will be improved substantially with the addition of increased reservoir capacity at higher elevations within LakeStone. Water conservation is a fundamental objective in the design of this development, with requirements for xeriscape landscaping and water conserving measures incorporated into both the building and landscape design.

Sewer connection of the lands to Highway 97 has already been constructed, and will be extended throughout the development. The opportunity to service the adjacent lands with sewer is also seen as a major benefit to the environmental quality of Okanagan Lake – to the extent that septic fields to the north along Okanagan Center Road may be eliminated, thereby reducing the potential of septic effluent draining to the lake.

Environmental Impact (Section F)

Maintenance of the existing natural qualities at LakeStone is fundamental to the proposed neighbourhood concept and character. Given that over half of the site is to be retained as open space, and the emphasis on enjoyment of the natural setting within this master planned community, a detailed environmental report is incorporated into this document.

In completing the detailed planning for each phase of the project, each individual ESA has been carefully studied to make sure that development and environmental objectives are fully aligned. One of the key Environmental objectives from the outset has been to maintain unique features of the site such as rock outcroppings, vegetation, wildlife corridors, and wetlands. Wildlife corridors are maintained through the site, and wherever possible, trails follow existing paths.

MLP is currently reviewing with the District the possibility of locating a marina on a site to the north of LakeStone. When this marina is approved, motorized boat movements at Lakestone would be reduced to a drop-off / pick up wharf, placed in the water on a seasonal basis. The existing dock at the lakefront will remain as a feature of the dedicated public beach area, with no motorized craft in this area.

Topography / Steep Slope Analysis (Section G)

The site contains approximately 40% steep slopes, and specific areas of this land will be utilized as part of the parks and trail system and ecological preserve. Road location, services trenching, and residential development have all been located and detailed to minimize disturbance of the existing topography – promoting a more natural feeling to the development and minimizing scarring normally associated with developing on sloped sites. A Site Disturbance map has been prepared to delineate the disturbed areas, consisting of 50.1% of the site area. It is important to note that this calculation assumes 100% disturbance on the single family lots, which will not be at all true based on the Design Guidelines. If we assume that 70% is the maximum disturbed area on each single family lot, the percentage of disturbed area goes down to approximately 43%.

Open Space - Park Lands and Trails (Section H)

Parkland is a priority for the District of Lake Country. Currently, 8.9 hectares of land (mostly on the south end of the site along Okanagan Center Road) has already been transferred to the District of Lake Country by MLP for community parks and a school site. It is proposed that MLP will fund the construction of a full size playfield in one of these locations (TBC in conjunction with DOLC) by

means of a 'sinking fund' where a specific amount will be contributed from each unit or homesite sold to fund the construction of this important community amenity.

In addition, there are three significant park areas to be developed within the site, identified as the Lakeside Park (with public beach and amenities), Benchland Park (with tennis courts and trail connections), and Summit Park (passive park with amphitheater). Land will also be allocated for a series of neighbourhood parks with an extensive trail system and viewing / resting areas, providing a large variety of natural settings including waterfront, lake view, rock bluff, forest, sloped and flat open space. The internal trails also connect to the Regional trail system such that they will become a valued public amenity. Location of low slope park settings (less than 20% slope) has been a priority and parks occupy the prime low slope lands with southern exposure. The parks and trails will follow the natural wildlife corridors that have evolved over time wherever possible. A comprehensive Parks and Trail plan is provided to detail each of these spaces.

In order to allow for the future possibility of a school in this area, one of the most level and best-located sites just west of the McCoubrey/Okanagan Center intersection has been transferred by MLP to the District of Lake Country.

LakeStone will protect the natural state of any remaining lands that are not developed or planned for other recreational uses – these lands will be dedicated to the District to ensure their status as natural open space in perpetuity.

Geotechnical Review (Section I)

Geotechnical review of the site has indicated that this location is fully stable, and development will recognize site-specific characteristics to maintain that stability. The overall Geotechnical report prepared for the previous ownership group is included in this document. Its findings are still relevant, and therefore it is not necessary to revise the report at this time. Detailed geotechnical reporting will occur as each portion of the site is developed in accordance with DOLC requirements.

Financial Implications (Section J)

The development of any master planned community of this scale results in significant direct and indirect economic benefits for many stakeholders including local government (ongoing tax revenue, DCC and other fees), regional job creation, and updated infrastructure systems. Some of the significant improvements that will come as a result of the LakeStone development include

improvements to water, sewer, traffic, road, and park systems. This is delineated on a phased basis. The overall economic impact of this development is over $650 million.

Wildfire Impact (Section K)

Effective management of any conditions that influence wildfire threat is essential to the wellbeing of the community. The enclosed Fire Mitigation report indicates typical areas of concern, and suggests measures for reduction of the threat. This report represents a comprehensive update of earlier work on this site. Detailed examination of each location will be conducted at subdivision stage, and appropriate mitigation measures confirmed with the District as a part of the approval for each individual phase.

Archaeology (Section L)

An archaeological study of the areas comprising Phases 1 and 2 of the Lakestone development was included as a part of the previous submission. A review (in September of 2011) by the Archaeology Branch of the Ministry of Forests, Lands and Natural Resource Operations confirmed that no further archaeological work is necessary in this area and advised that it has no objections or archaeological concerns should the overall development proceed. Notwithstanding that, MLP has commissioned an update to previous work done on this site (some of which dates back to 1977), and incorporated the March 2012 Archaeological Impact Assessment into this document.

2. Master Plan Organization

2.A Overview and OCP / Zoning / Covenants

Location:

LakeStone is a community development situated on 201.23 hectares in the District of Lake Country – the site is located west of Lake Country Town Centre, with agricultural lands to the east and Okanagan Lake to the west. The community features a varied topography – rising approximately 300 meters from the lakefront to the easterly ridge. The attached drawing indicates general location and zoning status of the lands – there is no proposed rezoning of any of the parcels. The Survey drawing (plus appended sheets) indicates the legal description and ownership of the lots included.

Development Overview:

Development of the land will include 1365 residential units, with a range of amenities distributed throughout the property. There will be a variety of housing types, comprised of single family homes, duplexes, townhomes and hospitality oriented condominiums that are well suited to short term rentals. Limited commercial facilities (focusing on service-oriented retail) will also be included in the master plan, with an opportunity (based on market demand), for future expansion to provide possible food services and other resort supporting venues. The plan attempts to cluster development to create a community that will incorporate substantial open space in the form of existing forest conservation, new parks and trails, and steep slope lands.

LakeStone Community / Lake Country OCP Policies and Objectives

OCP Development Principles for the District of Lake Country (page 11 of the OCP) provide an outline for considering the overall contribution of LakeStone to the broader Lake Country objectives.

1 *A comprehensively planned community including a network of open space, parks, agricultural lands, and environmentally sensitive areas* (Development Principle 1): The plan proposed for LakeStone offers Lake Country a unique opportunity to consider effective, comprehensive planning for this 201.23 hectares, incorporating the elements listed in the OCP. LakeStone is strongly committed to the open space, parks, and environmentally sensitive areas noted in the OCP development objectives (see other sections of this document), and adds the opportunity for recreational facilities to the program. Agricultural

lands are largely situated to the north and east of LakeStone, on land that has been cultivated for decades.

2. *A strong rural character recognizing the four communities of the District* (Development Principle 2): While LakeStone is located in Okanagan Center, it is a goal to both strengthen the Okanagan Center community and the Lake Country Town Centre core, while providing homes, recreation, and specialized commercial activities that are appealing to all Lake Country residents.

3. *A vibrant downtown core and neighbourhood commercial areas* (Development Principle 3): Due to close proximity to the Lake Country Town Centre, homes in LakeStone will offer strong commercial support for this core: the neighbourhood commercial proposed for Lakestone consists of specialty shops and services related to tourism / recreational and convenience use only – therefore it is not seen as a competitive alternative to the growing health of the downtown core as the center for daily Lake Country life. Additionally, a key component of the LakeStone development will include a strengthened trail network, including pedestrian and bike linkages – all leading to roads and corridors that provide connectivity with the Town Centre.

4 *A mix of housing types* (Development Principle 4): LakeStone offers a wide range of housing choice including single family homes of various sizes, duplex homes, townhouses, and apartments, some of which will be specifically oriented toward providing short term accommodations in a resort-style environment. A mix of prices and markets (from young families to retirement to recreational second homes), sizes, and settings are planned. While a mix of housing types is essential to provide for individuality and choice, the range of style is proposed as limited to definition of a distinct Lake Country character – emphasizing the naturally occurring Lake Country materials, defined by response to the land, views, climate, and lifestyle. Stylistic homes 'themed' to locations, histories, and character outside the Okanagan are not proposed.

5. *An appropriately serviced community* (Development Principle 5): Development of LakeStone will require a significant investment in upgrading the water, sewer, roads, and general District services. Responding to the District initiative to plan for a clustered community will allow for cost effective services to be established for the benefit of the entire community of Lake Country.

6. *An integrated transportation network* (Development Principle 6): Lakestone will participate in significant improvements to the Lake Country road system, but will also make a strong commitment to the pedestrian and bike trail systems, with a major regional trail connection running along Okanagan Center and Tyndall Roads.

7. *A managed pattern of growth* (Development Principle 7): Lakestone strongly supports the Lake Country initiatives articulated through the OCP for a managed approach to growth, and is therefore presenting the entire LakeStone land holding for DOLC comprehensive review. Developing a project of this magnitude will take over a decade to complete, giving a great deal of certainty as to the overall density and site layout. Nevertheless, some minor refinements will likely occur in each phase or subdivision plan as influenced by topographical, engineering, or market forces.

In addition, the LakeStone planning responds to the detailed objectives and policies noted in the various sections of the OCP. A sampling of the Lake Country goals found in the OCP, and most relevant to this development, are indicated below.

Lake Country Economic Development

Objectives include the expansion of the non-resident tax base - a portion of the product (and its subsequent purchaser target market) at LakeStone will provide tourism based taxation directly benefiting all residents of Lake Country.

OCP policies call for concentration of infrastructure (implementing cost effective systems for the District), and diversifying the tax base.

Agricultural

Agricultural objectives are generally neither strengthened nor reduced by LakeStone - but the project does respond to the DOLC directive to "maintain low levels of taxation for agricultural parcels". By clustering proposed development on non-agricultural lands, Lakestone has assisted with preservation of existing productive lands.

Rural Resource

Objectives recognize that Lake Country character is inherent in the existing forests and wooded areas, agricultural lands, and water bodies. The main contribution of Lakestone in achieving this goal is the proposed clustering of development, thereby removing the pressure for growth from areas identified elsewhere in the OCP as significant areas of conservation. All planning and

documentation within this master plan is provided to promote precisely the preservation of "biodiversity and ecological capability, significant view and vistas, landscape features with cultural and ecological value, and development only within concentrated clusters of services". The resultant proposal for LakeStone clusters growth as anticipated by the OCP, to the extent that 52% of the land base is held as open land (conservation areas, parks, and trails).

Residential – Urban

OCP objectives include encouragement of clustered development to provide a variety of housing types - single family, townhouses, apartments, and duplexes (all of which are represented in the LakeStone mix) – with a variety of residential densities (inherent in the current master plan). Planning a large scale, highly amenitized community such as LakeStone affords the opportunity to achieve other OCP objectives, such as minimizing conflict between single family and multi-family residences, providing large amounts of greenspace and amenities, and ensuring that differing forms of housing, densities, and tenures are available.

Neighbourhood commercial

The OCP encourages commercial development that serves a neighbourhood differently than the Town Center – three of the four planned development areas of LakeStone are designed to accommodate a variety of commercial activities.

Lakeside

There is a 16 unit, strata titled Townhome building within the Lakeside area which will have a restrictive covenant on each title relating to the short-term rental of the unit. This covenant will require the rental of any unit within the strata corporation to be managed by a professional rental agency who will represent each owner in the rental of all the available units within the project. Two local examples where this type of rental arrangement is operating effectively are the Mission Shores Residences in Kelowna and the Outback Resort in Vernon. It is expected that the Lakeside Townhomes would be managed by the same Resort manager as referenced below for the Benchlands.

The Lakeside Amenity includes a kayak/paddleboard storage facility which includes a small area for handling the storage and rental of these items. Depending on demand, this space could also be used as a fast food and soft drink concession stand for members of the public and the Lakestone community.

The promenade deck at the second level of the Amenity Building is designed to support portable food and beverage equipment, and it is anticipated that this area will be used for catered events for members of the Lakestone community and, subject to the strata corporation's decision, wine tasting or other events where the public would be invited to attend.

Benchlands

The 80 unit multi-family condo building which is located at the center of the Benchlands area has been designed to operate as a strata-titled resort which will have a front desk/concierge/reception area and, based upon market demand, a restaurant/bar and possibly a spa. This facility will be operated by both a professional property manager and a pre-appointed Resort Manager.

Any owner who wishes to collect rental revenue from his or her unit, must sign a Resort Management Agreement with the Resort Manager to place it under a pooled management system which enables the Resort Manager to assume full responsibility for the unit and rent, maintain and operate the unit as part of the Resort, with a proportionate share of the revenue earned from the pool being paid to the owner on a scheduled basis. Under such an arrangement, the owner can schedule various stays in his or her unit, with an associated deduction from the share of rental pool revenues. This arrangement will not preclude an owner from living in his or her unit on a full time basis or keeping it as a vacation home for personal use only; however, there are many examples which demonstrate that the majority of owners who buy a property of this type usually do so based in part on the income from the Rental Pool to offset some of their costs. The best local example is the Cove Lakeside Resort, which operates in exactly the manner as outlined above, and where over 100 of the 150 units in the development are part of the Resort Management Agreement.

Of the Townhome structures planned for the Benchlands area, there will be a 24 unit, strata-titled Townhome project which will have a restrictive covenant on each title relating to the short-term rental of the unit under the same conditions as outlined for the Lakeside Townhome. As with the 16 unit Lakeside Townhome property, it is expected that the Benchlands Townhomes would also be managed by the Resort Manager.

The Community Building component of the Benchlands Amenity will be designed to support portable food and beverage equipment. In addition to this area being used in a similar manner as anticipated for the Lakeside Amenity (i.e., catered events for members of the Lakestone community and, subject to the strata corporation's decision, wine tasting or other events where the public would be invited to attend), it is expected the Benchlands community building will host more indoor events during the fall and winter months due in part to its central location.

Adjoining the Community Building will be a small convenience store/delicatessen/newsstand outlet which will be visible from Tyndall Road and readily available to all members of the Lakestone community and the public. This facility will have convenient parking and a large patio-styled entry deck, which could be used in the warmer months for serving light breakfasts, lunches and coffee. The intent of the design will be to attract the community to use the facility as a local stopping place for a coffee, community chatting and to pick up convenience items without having to drive into the Town Center.

Glenmore Road Commercial/Residential

The commercial component of the Glenmore Road Commercial/Residential phase abuts Glenmore Road. This area will be developed for commercial use (such as offices and light assembly/storage) when the market demand exists. The master plan contemplates up to 80,000 sq ft of space on this site. In summary, the commercial components of the LakeStone development will include:

Lakeside units for weekly / nightly rental (Phase 2)	16
Benchland condo units for weekly / nightly rental (Phase 3)	80
Benchland townhome units for weekly / nightly rental (Phase 3)	24
Total resort residential units	120
Note: assuming 2 beds per unit = 240 bed units of accommodation	
Benchland store / coffee shop	600 sq ft
Allocation for potential future (market driven) commercial	up to 5,000 sq ft
Glenmore commercial / industrial space	up to 80,000 sq ft

Parks and Recreation

The proposed LakeStone park and trail system incorporates the main OCP defined park locations (including views, waterfront, forests, and specific ecological zones) and connects them with a comprehensive trail network. The park lands provided exceed both the area of those in the OCP and the area specified by the park dedication requirements – with the net result that the natural open space including parks and trails add up to 52% of the site remaining in open green space (over and above the already dedicated 8.9 ha of park area). The trail system, including the LakeStone Loop Trail, secondary and connector trails, roadside trails and primary regional trail total approximately 24.06 kilometers in length and connect directly to the Regional trail to be constructed along Okanagan Center and Tyndall Roads.

Environmental Area Protection

The environmentally sensitive areas identified in the revised Environmental report have all been incorporated within the LakeStone planning to the greatest degree possible. The development is planned around the significant areas of ESA 1, particularly those which contain land that can hold some water on a seasonal basis. These will be maintained in their natural state, with a certain amount of storm drainage directed toward these areas to further enhance the existing vegetation. There are some minor areas where it will be necessary to provide for additional lands to offset intrusions (for roads etc.) into sensitive areas, all of which is addressed in the Environmental Report (Section 2.F). More than half (52%) of the site is to be dedicated to non-urban uses (parks, trails, and conservation areas), which will allow for the provision of extensive wildlife corridors and maintenance of a consistent Lake Country character.

Infrastructure

Objectives are extensively detailed in the OCP, and LakeStone will be a catalyst behind initiating long-outstanding improvements in the road, sewer, and water systems - benefiting not only existing residents of Lake Country, but also assisting with maintaining the natural quality of lands designated in the OCP for Urban Growth.

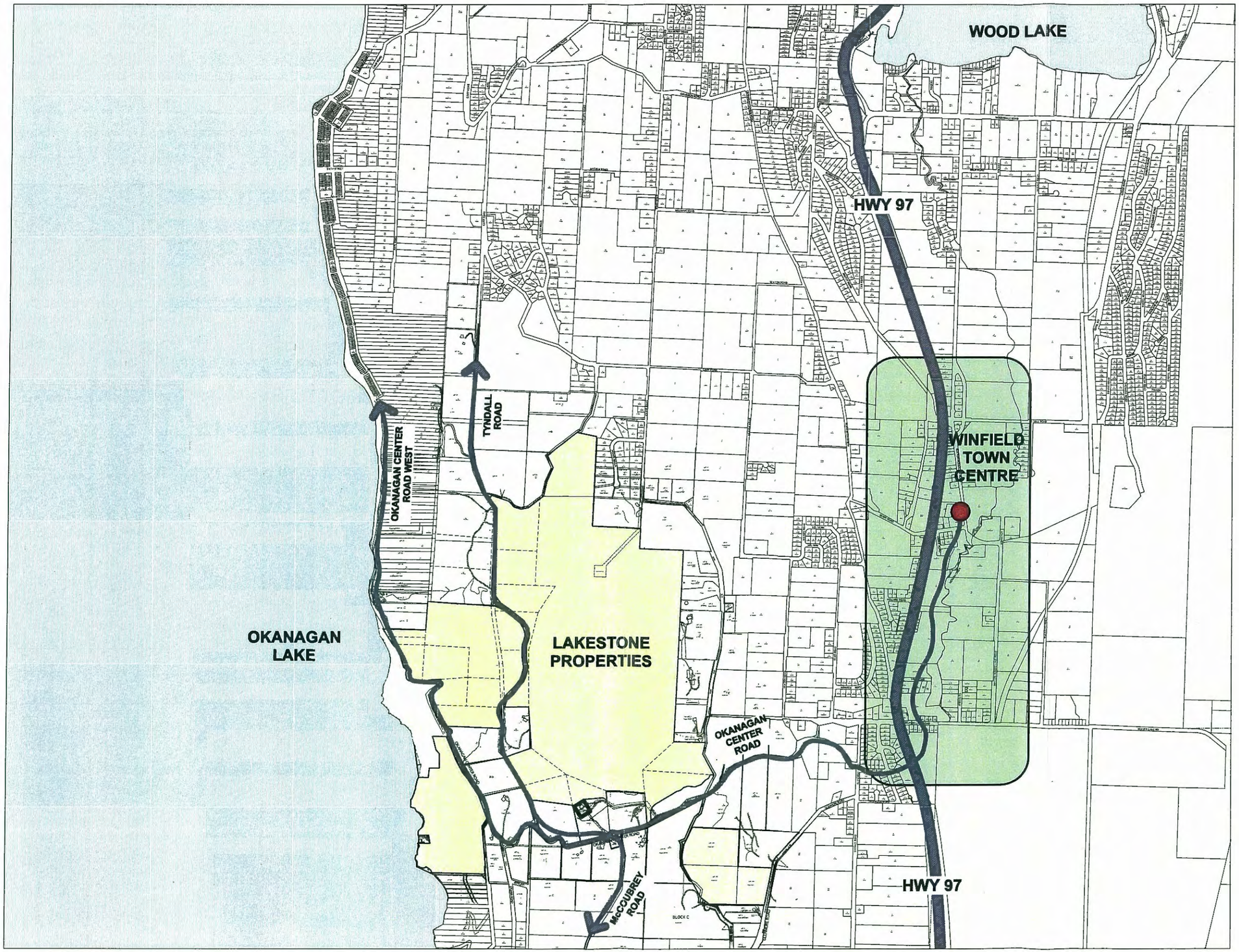
The above indicates some of the major OCP policy congruence with LakeStone planning - more detail is included in the individual sections of the master plan. In summary, the current plan is in conformance with the OCP and its stated objectives.

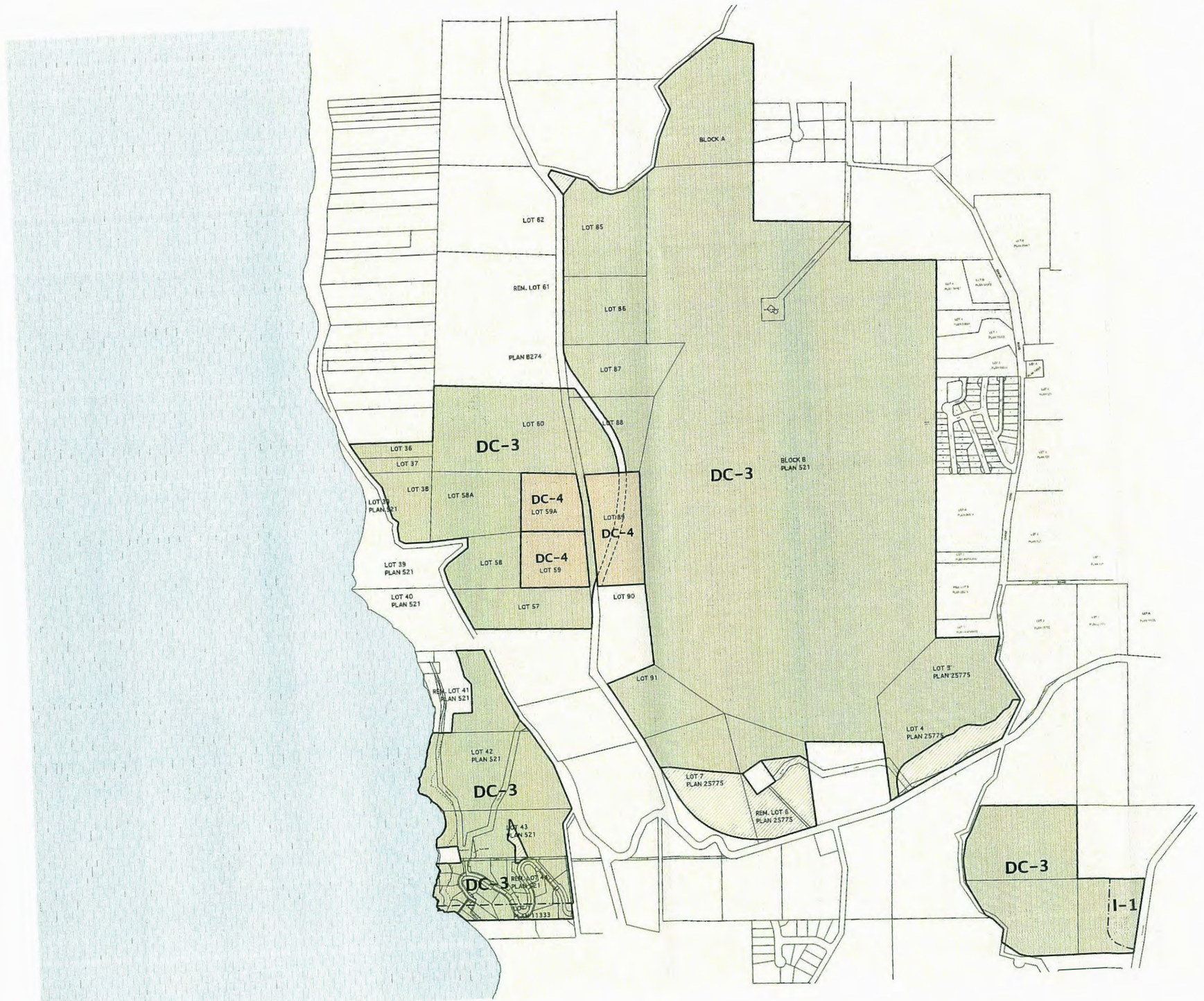
Covenants – DOLC Section 219 Covenant

There are a number of existing Section 219 Covenants which either pre-date the original Lakestone Master Plan or were registered in connection with the original Lakestone Master Plan. They do not reflect the New Master Plan terms, and therefore need to be discharged.

A new Section 219 Covenant can be registered in favour of the DOLC to reflect the new Master Plan. If permitted by the Land Title Office, the new Section 219 Covenant could attach the Master Plan in its entirety as a schedule. Otherwise, if the DOLC prefers, or if the Land Title Office requires us to delete those Master Plan terms that they do not consider to be "negative covenants", we can attach a schedule of specific "negative covenants" from the Master Plan which the DOLC requires.

The form and content of the 219 Covenant will otherwise include the DOLC's customary terms.


WOOD LAKE
HWY 97
TYNDALL ROAD
OKANAGAN CENTER ROAD WEST
WINFIELD TOWN CENTRE
OKANAGAN LAKE
LAKESTONE PROPERTIES
OKANAGAN CENTER ROAD
McCOUBREY ROAD
HWY 97



ZONING STATUS:
LAKESTONE LANDS

LEGEND

- DC -3 ZONING
- DC -4 ZONING
- DEDICATED AREAS

NORTH

1 ZONING AND OCP SUMMARY
Scale: 1:5000

The following site descriptions and areas are provided by Ferguson Land Surveying & Geomatics Ltd. and are shown on the accompanying Drawing A2.

Description	**Area**
1. Lot 57, Plan 521, Section 4, Township 20, O.D.Y.D. Except Plan H18860 PID: 001-836-773	3.85 HA
2. Lot 58, Plan 521, Section 9, Township 20, O.D.Y.D. PID: 001-836-781	2.53 HA
3. Lot 58A, Plan 521, Section 9, Township 20, O.D.Y.D. PID: 012-273-872	4.17 HA
4. That Part of Lot 59, Plan 521, Shown on Plan B13454: Section 9, Township 20, O.D.Y.D. Except Plan H18660 PID: 012-273-911	2.73 HA
5. That Part of Lot 59A, Plan 521, Shown On Plan B13454: Section 9, Township 20, O.D.Y.D. Except Plan H18660 PID: 012-273-945	2.56 HA
6. That Part of Lot 60, Plan 521, Shown on Plan B13454: Section 9, Township 20, O.D.Y.D. Except Plan H18660 PID: 012-273-961	8.35 HA
7. That Part of Lot 85, Plan 521, Shown on Plan B13454: Section 9,Township 20, O.D.Y.D. Except Plan H18660 And KAP90967 PID: 012-274-267	5.49 HA
8. That Part of Lot 86, Plan 521, Shown on Plan B13454: Section 9, Township 20, O.D.Y.D. Except Plan H18660 PID: 012-274-283	4.14 HA
9. That Part of Lot 87, Plan 521, Shown on Plan B13454: Section 9, Township 20, O.D.Y.D. Except Plan H18660 PID: 012-274-305	4.00 HA
10. That Part of Lot 86, Plan 521, Shown on Plan B13454: Section 9, Township 20, O.D.Y.D. Except Plan H18660 PID: 012-274-330	3.95 HA

11. That Part of Lot 89, Plan 521, Shown On Plan B13454: Section 9, Township 20, O.D.Y.D. Except Plan H18660 PID: 012-274-364	4.12	HA
12. Lot 36, Plan 521, Sections 8 and 9, Township 20, O.D.YD. PID: 001-836-706	0.848	HA
13. Lot 37, Plan 521, Sections 8 and 9, Township 20, O.D.Y.D. PID: 001-836-714	0.733	HA
14. Lot 38, Plan 521, Sections 8 and 9, Township 20, O.D.Y.D. PID: 001-836-722	2.19	HA
15. Lot 42, Plan 521, Section 4, Township 20, O.D.Y.D. PID: 001-836-749	7.09	HA
16. Lot 43, Plan 521, Section 4, Township 20, O.D.Y.D. PID: 001-836-757	4.44	HA
17. Lot 136, Plan 521, Sections 3, 4 and 9, Township 20, O.D.Y.D. Except Plan H10875 PID: 012-274-500	3.33	HA
18. Lot 137, Plan 521, Sections 3, 4 and 9, Township 20, O.D.Y.D. PID: 012-274-518	4.72	HA
19. Lot 138, Plan 521, Sections 3, 4 and 9, Township 20, O.D.Y.D. PID: 012-274-526	5.88	HA
20. Block B, Plan 521, Sections 3, 4 and 9, Township 20, O.D.Y.D. PID: 012-274-551	103.70	HA
21. Lot 3, Plan 25775, Sections 3 and 4, Township 20, O.D.Y.D. PID: 005-321-832	4.27	HA
22. Lot 4, Plan 25775, Sections 3 and 4, Township 20, O.D.Y.D. Except Plan KAP90965 PID: 005-321-859	4.03	HA
23. Lot B, Plan KAP87286, Sections 4, Township 20, O.D.Y.D. PID: 027-854-264	2.26	HA
24. Lot 1, Plan KAP91504, Section 4, Township 20, O.D.Y.D. PID: 028-363-965	4.47	HA

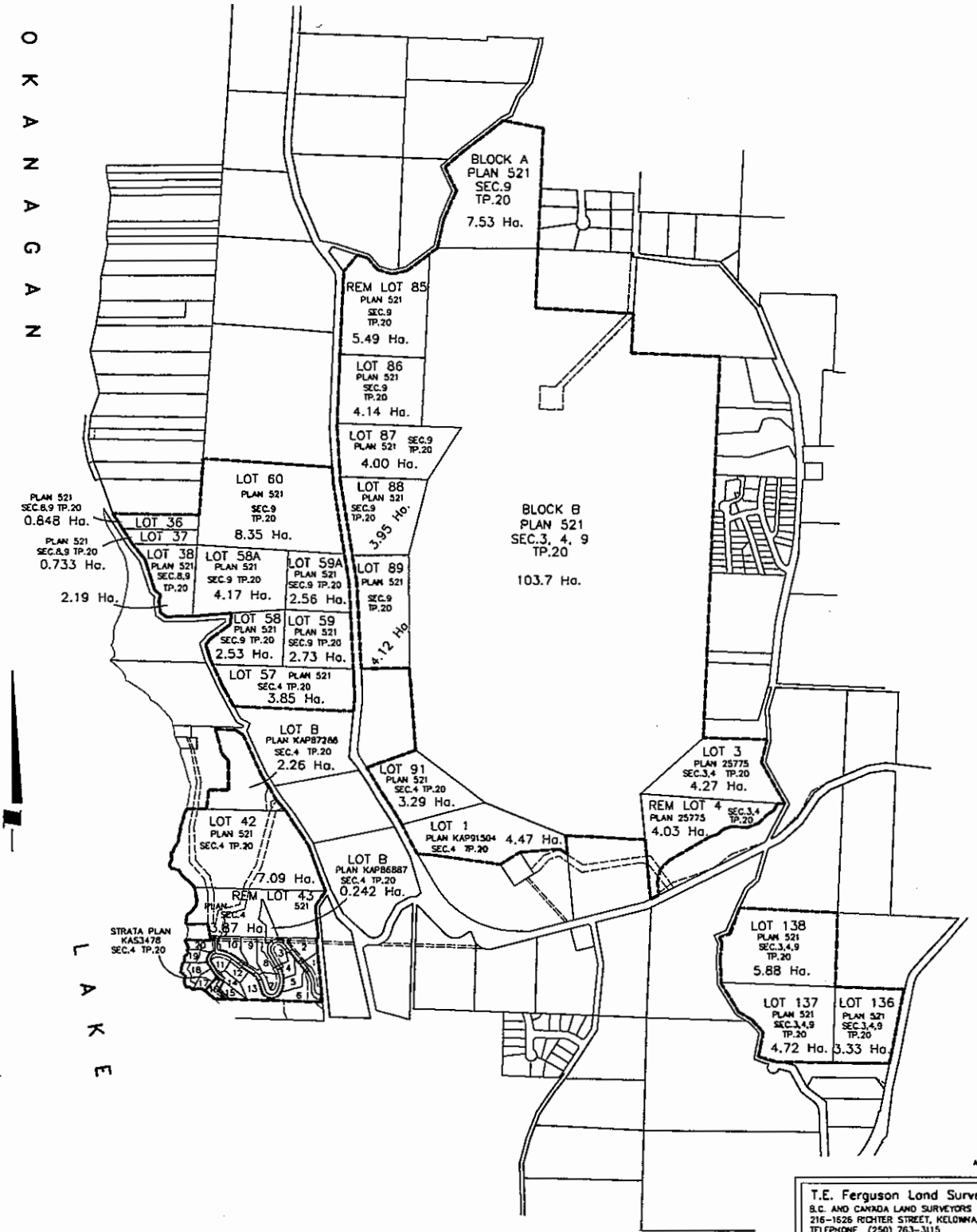
25.	Block A, Plan 521, Section 9, Township 20, O.D.Y.D. PID: 012-275-417	7.53 HA
26.	Strata Lot 1, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-747	0.244 HA
27.	Strata Lot 2, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-755	0.352 HA
28.	Strata Lot 3, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-763	0.198 HA
29.	Strata Lot 4, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-771	0.198 HA
30.	Strata Lot 5, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-780	0.252 HA
31.	Strata Lot 6, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-798	0.415 HA
32.	Strata Lot 7, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-801	0.224 HA

33.	Strata Lot 8, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-810	0.318 HA
34.	Strata Lot 9, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-828	0.340 HA
35.	Strata Lot 10, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-836	0.320 HA
36.	Strata Lot 11, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-844	0.191 HA
37.	Strata Lot 12, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-852	0.199 HA
38.	Strata Lot 13, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-861	0.338 HA
39.	Strata Lot 14, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-879	0.165 HA

40.	Strata Lot 15, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-887	0.165HA
41.	Strata Lot 16, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-895	0.167 HA
42.	Strata Lot 17, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-909	0.189 HA
43.	Strata Lot 18, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-917	0.333 HA
44.	Strata Lot 19, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-925	0.191 HA
45.	Strata Lot 20, Strata Plan KAS3478, Section 4, Township 20, O.D.Y.D. Together With An Interest In The Common Property In Proportion To The Unit Entitlement Of The Strata Lot As Shown On Form V PID: 027-549-933	0.214 HA

SCALE: 1:7500 METRES

225 150 75 0 150 300 600 METRES



AUGUST 12, 2011

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TELEPHONE (250) 763-3115
FAX. (250) 763-0321

JOB NO. #18834

A2

SCALE: 1:7500 METRES

225 150 75 0 150 300 600 METRES

OKANAGAN LAKE

BLOCK A
PLAN 521
SEC.9
TP.20
7.53 Ha.

REM LOT 85
PLAN 521
SEC.9
TP.20
5.49 Ha.

LOT 86
PLAN 521
SEC.9
TP.20
4.14 Ha.

LOT 87 PLAN 521 SEC.9 TP.20
4.00 Ha.

LOT 88
PLAN 521
SEC.9
TP.20
3.95 Ha.

LOT 89
PLAN 521
SEC.9
TP.20
4.12 Ha.

BLOCK B
PLAN 521
SEC.3, 4, 9
TP.20
103.7 Ha.

LOT 60
PLAN 521
SEC.9
TP.20
8.35 Ha.

PLAN 521
SEC.8,9 TP.20
0.848 Ha.

LOT 36

LOT 37

PLAN 521
SEC.8,9 TP.20
0.733 Ha.

LOT 38
PLAN 521
SEC.8,9
TP.20

2.19 Ha.

LOT 58A
PLAN 521
SEC.9 TP.20
4.17 Ha.

LOT 59A
PLAN 521
SEC.9 TP.20
2.56 Ha.

LOT 58
PLAN 521
SEC.9 TP.20
2.53 Ha.

LOT 59
PLAN 521
SEC.9 TP.20
2.73 Ha.

LOT 57 PLAN 521
SEC.4 TP.20
3.85 Ha.

LOT B
PLAN KAP87286
SEC.4 TP.20
2.26 Ha.

LOT 91
PLAN 521
SEC.4 TP.20
3.29 Ha.

LOT 3
PLAN 25775
SEC.3,4 TP.20
4.27 Ha.

REM LOT 4
PLAN 25775
SEC.3,4
TP.20
4.03 Ha.

LOT 1
PLAN KAP91504
SEC.4 TP.20
4.47 Ha.

LOT 42
PLAN 521
SEC.4 TP.20
7.09 Ha.

LOT B
PLAN KAP86887
SEC.4 TP.20
0.242 Ha.

REM LOT 43
PLAN 521
SEC.4
3.87 Ha.

STRATA PLAN
KAS3478
SEC.4 TP.20

LOT 138
PLAN 521
SEC.3,4,9
TP.20
5.88 Ha.

LOT 137
PLAN 521
SEC.3,4,9
TP.20
4.72 Ha.

LOT 136
PLAN 521
SEC.3,4,9
TP.20
3.33 Ha.

AUGUST 12, 2011

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JOB NO. #18834

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A2

2.B Land Use and Phasing

Land Use and Density by Phase or Neighbourhood

The attached drawing indicates the major phases or neighbourhoods of the project, and the overall distribution of residential densities throughout. Overall density for specific projects or phases ranges from 10 units/hectare to 30 units per hectare, with the overall site density at 6.8 units per hectare. This range is consistent with the zoning and OCP objective of diversity in mix.

The Development Summary table indicates the detailed statistics associated with each phase. There has been an attempt to obtain diversity of product type in each phase to create a range of housing types in each neighbourhood – both from a planning and marketing perspective, this is a desirable goal. The plan indicates a range of single family lot sizes, townhomes at varying sizes and densities plus apartment structures in the Benchland area.

While included within the LakeStone master plan, the Glenmore Road Commercial / Residential site is located in a distinctly separate area from the predominantly lake view properties which comprise the majority of the development. This phase of LakeStone has been designed to appeal to the first-time, price-sensitive purchaser who falls within a different (and non-competitive) market segment than the potential purchaser identified for other phases of the development.
Before construction can begin, the 600m Reservoir water service will need to be in place. Thereafter, the Glenmore Road phase can "float" and be introduced to the market at any time. The entry level homes which have been built along Glenmore Road toward Kelowna have been well accepted by the market; the homes contemplated for this phase will be similar in size, quality, and target market. For this reason, and recognizing the District's desire to see the Glenmore Road phase begin early in the LakeStone development program, assuming favourable market conditions, the intent is to initiate pre-sales of the residential component of this phase contemporaneously with, or close to, the introduction of Phase 4. Similarly, the commercially zoned portion of the site on Glenmore Road can be developed whenever market conditions dictate.

Transferability of Land Use and Density:

Large planned communities such as LakeStone take a long time to be fully realized. Over the development life of this community, change is inevitable, so planning with built in flexibility is one of the principles utilized from the outset. While all the home sites and multi-family housing have been laid out in harmony with the site, it is possible that market forces may indicate a preference for smaller or larger lots, or more or less multi-family development. With that in mind, it is a principle of this master plan that both land use and density are transferable among and within the neighbourhoods that make up LakeStone in response to changing markets, detailed environmental and site review, and changes in community values – provided always that the overall density indicated (1365 residential units) is not exceeded, new uses are not introduced, and that in no case can more than 10% of the density from any particular phase be transferred to another. The table below illustrates this principle.

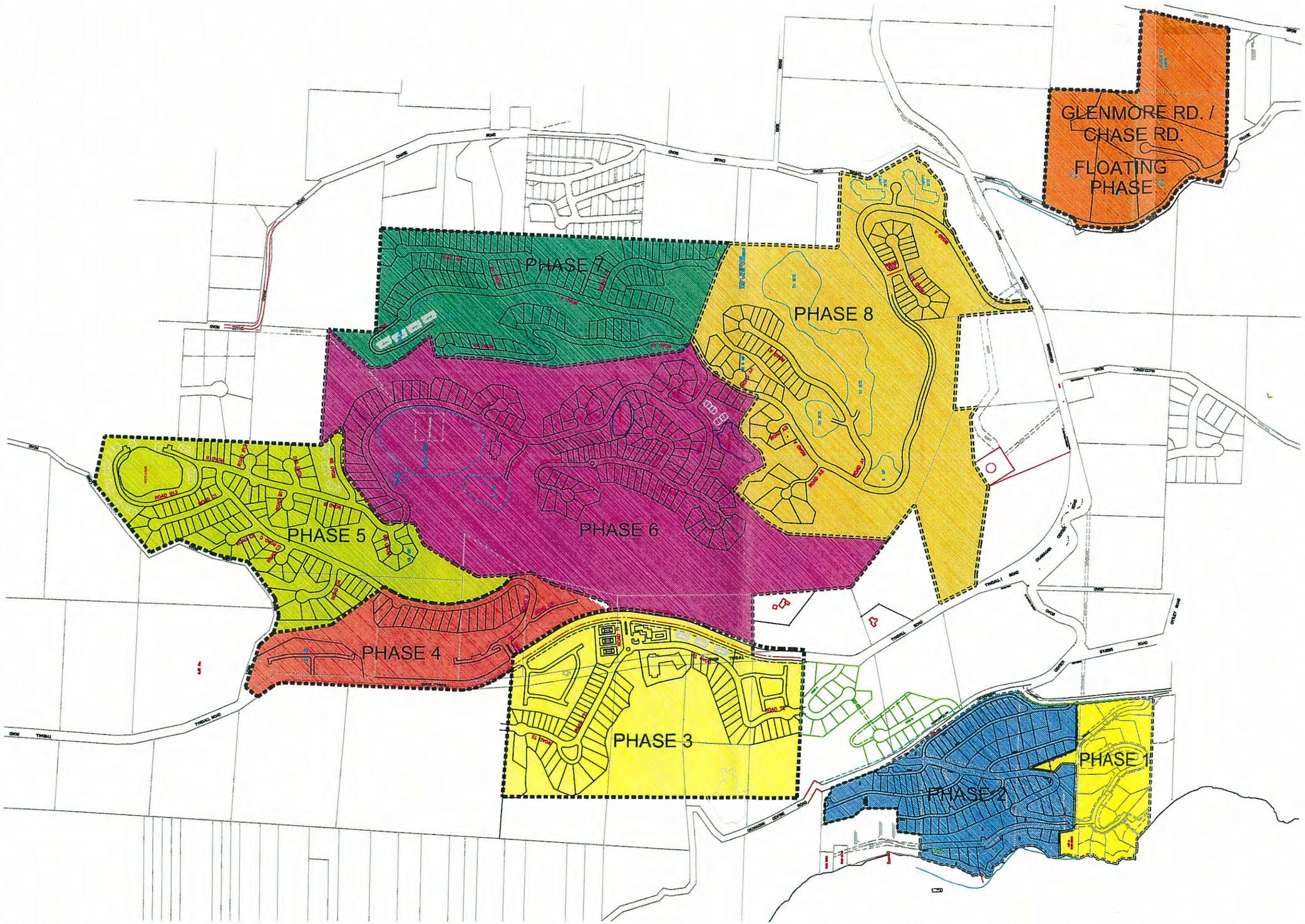
Phase	Single Family	Townhome	Apartment	TOTAL	Density Transfer Range
Phase 1	*20*	*0*	*0*	***20***	*N/A (approved)*
Phase 2	*57*	*62*	*0*	***119***	*N/A (approved)*
Phase 3	63	82	80	**240**	216-266
Phase 4	17	50	0	**67**	60-74
Phase 5	103	30	0	**133**	120-146
Phase 6	139	12	0	**151**	136-166
Phase 7	118	16	0	**134**	121-147
Phase 8	71	180	0	**236**	213-259
Glenmore	0	265	0	**265**	238-302
Total:	**588**	**697**	**80**	**1365**	**< 1,365**

DEVELOPMENT SYNOPSIS

Phase	SF Lots & Duplexes					TH's	Apart's	Totals
1	20							20
2	103					16		119
Subtotal 1 + 2	**123**					**16**		**139**
	40'	50'	60'	60'+	**Total**			
3	23	19	10	11	**63**	97	80	240
4	0	0	17	0	**17**	50	0	67
5	0	55	35	13	**103**	30	0	133
6	24	45	56	14	**139**	12	0	151
7	0	80	34	4	**118**	16	0	134
8	20	30	10	11	**71**	165	0	236
Subtotal 3-8	67	229	162	53	**511**	370	80	961
Subtotal 1-8	**634**					386	80	961
Glenmore						265		265
Overall Totals	**634**					651	80	1365

Preliminary Subdivision and Phasing Plans:

The phasing drawing attached illustrates the conceptual subdivision / phasing plan for the overall LakeStone community. This layout is aligned with the site servicing requirements for the site such that phasing and infrastructure improvements are happening concurrently. It is anticipated that within each Phase, there could be multiple subdivision plans, depending on market conditions and the timing for introduction of a given product type.



SCALE 1:4000

DRAWING
PHASING PLAN

PROJECT
LAKESTONE

CLIENT
MACDONALD LAKESHORE PROPERTIES

10018--PHASING.dwg

PROTECH CONSULTANTS LTD. 200 - 1461 ST. PAUL STREET, KELOWNA, BC, V1Y 2E4 | TEL: (250) 860 1771 RECEPTION@PROTECH - CONSULTING.COM

ISSUE DATE: MARCH 2012

Fig. 2

2.C Architectural Form and Character

The design mandate at LakeStone is to pursue a strong and simple architectural character that is specifically responsive to the site, climate, and lifestyle conditions that particularly define the Okanagan. Style will be defined not by 'foreign' building styles but by quality, natural site materials (stone and timber), simplicity, and homes that can both age gracefully and are capable of change and variety. Careful resolution of massing and forms will define the character, and be articulated by architectural elements and materials. The following are representative of design policies that will establish the specific form and character at LakeStone. These policies will be incorporated in the Design Guidelines to provide a design framework for all of Lakestone architectural character. The Design Guidelines for Phases 1 and 2 have already been completed and will form the basis for subsequent revisions for each specific phase from 3 through 8.

Site Responsive Design Policies:

Enhancing the existing site character at LakeStone is a key principle in defining architectural character for this development. Preservation of quality and the natural setting will emphasize buildings designed to fit the existing environmental, landscape, and site character with respect. Specific design guidelines will address the following:

Streetscape: Clustering of residential neighbourhoods to highlight retention of trees, and create a feeling of open space between buildings.

Skyline Retention Policy: The sky/tree canopy line often defines the current skyline – and specific design guidelines will control both an emphasis on horizontal housing form (minimizing two or three storey one-plane construction), and siting to retain the existing tree canopy wherever possible. Select buildings will retain stronger vertical elements to promote significant common building images.

Roofscape Policy: The site is sloping (strongly in many locations) and the clustering of housing will afford a strong impression of viewing other homes as a clustered roofscape. Roofscapes will be simple, avoid excessive penetration by mechanical devices, and incorporate durable materials that will age gracefully under the strong sun conditions. Roof overhangs will offer sheltering shade from the sun, and become a major determinant of

architectural character.

Landscape Policy: Landscaping will emphasize the preservation of the existing rock and plant material where possible, augmented by xeriscape planting to reinforce the existing natural Okanagan character. Landscape section includes a specific guideline on xeriscaping that will apply throughout the community.

Night Sky Policy: This part of the Lake Country enjoys a good night sky condition – and lighting regulations (both for public and private conditions) will minimize unnecessary brightness. A proposed standard is incorporated into the Infrastructure / Engineering section 2.E

Wildfire Mitigation Policy: The LakeStone design will respect the natural landscape, avoiding large cleared areas wherever possible. Further, the building materials will emphasize non-combustible materials – particularly because of their aging abilities and the natural site materials connection to stone and long lasting roof materials. Refer to Section 2.K for specifics on the Wildfire management strategy.

Engineering Standards: Section 2.E outlines the engineering services intended for the site. Routing of underground services will be selected to maximize under-road construction, avoiding separate trenches that will scar the landscape. Road surfaces will be minimized wherever possible.

Architectural Style: Builds on qualities of the Site

Natural Materials: Wood and stone abound on the site. Wherever possible, stone from on site will be re-used in road and retaining wall construction. Tree removal will be accomplished in such a way that the material can be shipped to a facility close by for milling into framing materials.

Lasting Materials: consistent with the objective of high quality, building elements must weather gracefully.

Architectural Massing & Form

Terraced buildings will be used to be responsive to the natural slope of the land.

Cluster buildings to create neighbourhoods and allow the natural setting to predominate – as recommended by DOLC policies for "smart growth".

Low Scale buildings will reinforce the existing setting character

Horizontal forms – strong eave lines - emphasized by selective vertical elements:

Architectural Materials

Building Base (Basement): Stone or concrete with stone accents – particularly either using stone from the site, or specifying a material that matches the colour of the existing rock. On steeper sites the desire is to have the building base set back such that the main floor is cantilevered to minimize the perceived height and visual impact on the landscape.

Building Midsection (Living Area): Lighter expression - glass and structure with strong overhang: Large areas of glazing. Mid-section walls to be visually less dominant than the building base, providing texture between the base and roof in the shadow of the roof overhang.

Roof: Sheltering forms will be used with large overhangs. Durable non-reflective materials will assist with the roofscape quality. Upper floor space will be concealed within the lower roofline, with windows and massing making use of dormers.

Colours: Exterior colours will be derived from the natural colours of the vegetation, rock and earth of the landscape - and accent colours will reflect the geology, vegetation, flora and fauna of the site.

Continuity and Individuality: The Lakestone community will be a richer experience due to a clear definition of architectural elements that define the place, but with a variety of choice for elements that allow individuality of each neighbourhood and resident to be expressed.

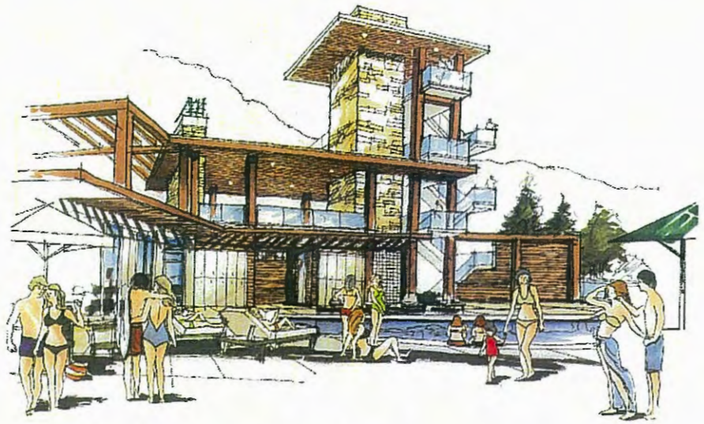
Landscaping: elements such as trellises, retaining walls, patios and decks will be used to help articulate individual identity of the buildings, accommodate grade changes, and provide an effective transition between the building and its surroundings by reducing the apparent mass through a terraced appearance.

Sustainable Buildings:

Lakestone buildings will make strong use of design decisions that promote sustainable buildings. Policies will include:

- Low energy consumption features
- Natural energy conservation such as shade devices
- On-site retention of natural features
- Geothermal energy source alternative, if practical
- Native landscaping, low water usage landscape
- Low flow dual flush toilets
- Rain barrels for stormwater detention and irrigation
- Rough in all homes for future solar panel installation

The attached drawings illustrate general building character that incorporates the above principles in siting considerations, and demonstrate the overall advantages of clustering buildings to emphasize continuity of open space. Drawings are also included that show the general building character for the Phase 2 townhomes and the Lakeside Amenity, which will be available to enhance public access to the beach during normal hours of operation.



POOL AMENITY BUILDING- POOL DECK VIEW

POOL AMENITY BUILDING- AERIAL VIEW

BENCHLANDS AMENITY BUILDING- AERIAL VIEW

POOL AMENITY BUILDING-VIEW NORTH

STRING OF DUPLEXES

SINGLE FAMILY HOME

TYPICAL DUPLEX

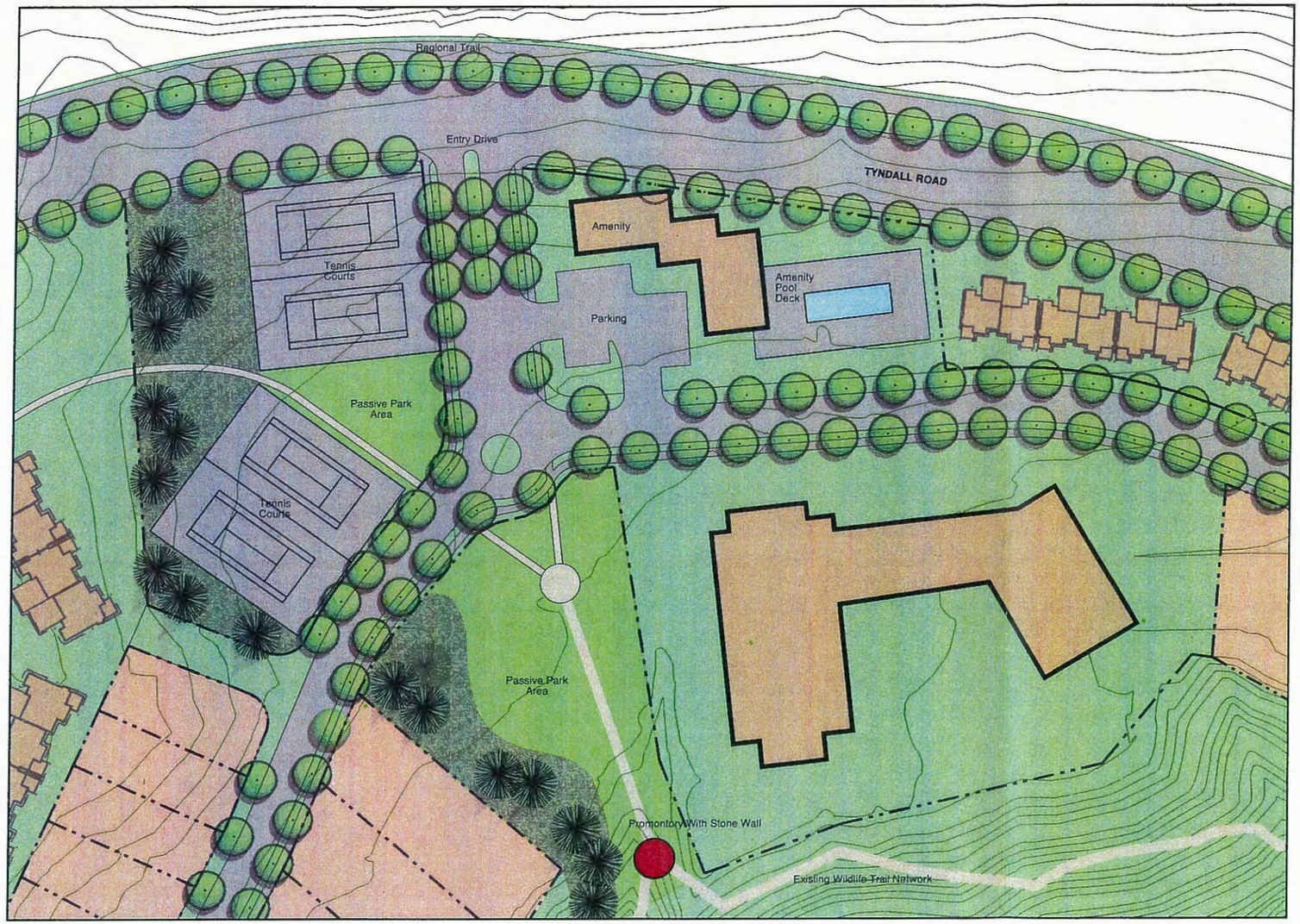
DRAWING
FORM AND CHARACTER

PROJECT
LAKESTONE

CLIENT
MACDONALD LAKESHORE PROPERTIES


SRIGLEY


SRISLEY



OVERALL PLAN TO SHOW PRELIMINARY PARKS DESIGN CONCEPT FOR BENCHLANDS NEIGHBOURHOOD

CHARACTER IMAGES

CHARACTER IMAGES

CHARACTER IMAGES

ROSITC
HEMPHIL
a n
ASSOCIATE
ARCHITEC

PILKINGTON HOU
10 - 120 POWELL ST
VANCOUVER, B.
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V 6 A 1 G
TEL. (604) 669-6C
FAX. (604) 669-1C

NO.	ISSUED
1.	ISSUED FOR REVIEW
2.	ISSUED FOR REVIEW
3.	ISSUED FOR REVIEW

DURANTE KREUK LTD. LANDSCAPE AF
102 - 1637 West 5th Avenue Vancouver B.
P 604.684.4611 | F 604.684.0577 | ww

NO. REVISION

ARCHITECTURAL SEAL:

CLIENT:
MACDONALD DEVELOPME
CORPORATION
11th Floor, 938 Howe Street
Vancouver, BC V6Z 1N9, Can

PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

DRAWING TITLE:
BENCHLANDS PARK
CONCEPT PLAN

DATABASE:
PLOT FACTOR: 1-1
SCALE: 1:500
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

PROJ. NO. 10098

2.D Traffic Impact

A new Traffic Impact Study (TIS) by CTQ Consultants has been prepared as of March 2012. In general, the traffic impact as a result of the LakeStone development is reduced from earlier projections for this area by 24%.

The TIS makes recommendations for road and control implementation to effectively manage the phased integration of LakeStone into DOLC, particularly the intersections of Glenmore and Okanagan Center Road, and Glenmore and Seaton Road.

The TIS further indicates that there are a number of measures currently being pursued by DOLC that are particularly related to resolution of traffic flow along the Highway 97 corridor, specifically at the intersection of Beaver Lake Road and Highway 97.

As part of the overall development of the LakeStone master plan, the Traffic Impact Study will be updated again at 50% buildout of the project.

Concealed parking will be emphasized throughout the development, principally in attached garages.

CTQ Consultants Ltd

COST

TIME

QUALITY

Project No.: 12009
File No.: 5-L-002

March 8, 2012

Macdonald Development Corporation
11th Floor 938 Howe Street
Vancouver, BC
V6Z 1N9

Attention: Mr. Donal O'Callaghan; MAIBC

Dear Sir:

Reference: Lakestone Residential Development, Lake Country BC
Traffic Impact Study

We are pleased to present the updated Traffic Impact Study for the above-mentioned project. This report is based on the June 6, 2006 Report prepared by our office, for the 20/20 Properties, discussions with Lake Country Staff, and our work on previous traffic studies for similar projects in the Okanagan.

The Traffic Impact Study has been prepared to determine the effect the revisions to the original 20/20 Properties development plan and the passage of time will have on the mixed use development, and the anticipated community growth will have on adjacent roadways and District of Lake Country Infrastructure. This report addresses the off-site planning, traffic generation and distribution, traffic analysis, and recommendations for major street improvement requirements.

A) SITE CONTEXT

The site covers an extensive area in the southwest sector of Lake Country. The appended **Overall Master Plan** figure identifies the proposed layout and anticipated number of units for each neighbourhood of the development. The new site layout no longer includes a golf course or a hotel.

It is anticipated the complete site will be developed with a staged build out for each of the neighbourhoods. Due to the size of the complete development, it is anticipated that the full build out will take in the range of 20 years. Half of the development is anticipated to be completed by the year 2020.

The properties adjacent to the site are a mix of rangelands and large lot single-family homes. The McKinley Landing Project located to the south within the City of Kelowna is contemplated to be well underway by the anticipated 2025 completion of the Lakestone Project, yet the McCoubrey Roadway link is no longer on the City of Kelowna OCP Future Roadway Network Plan.

The projections for the revised full build out of each neighbourhood of the development are as follows:

Phase 1 and 2 (partially complete)

- 77 Single Family Homes
- 46 Duplex Units
- 16 Townhomes

Benchlands Neighbourhood

- 183 Single Family Homes
- 162 Townhomes
- 80 Multi Family units

Highlands Neighbourhood

- 328 Single Family Homes
- 208 Townhomes

Glenmore Neighbourhood

- 265 Townhomes

Total Development

- 588 Single Family Homes
- 46 Duplex Units
- 651 Townhomes
- 80 Multi Family units

B) BACKGROUND INFORMATION

The District of Lake Country 2009 Traffic Monitoring Report was used as a basis to determine the projected growth in the background traffic. The projected 2025 Week Day PM Peak Hour Traffic was reviewed to determine the projected yearly growth in Lake Country. The area of the proposed Lakestone Development was excluded from the Transportation Plan growth projections, to determine the yearly growth in background traffic. Based on a review of the above, it is anticipated the average yearly growth in Lake Country will be 3%.

The District of Lake Country provided the following PM Peak Hour traffic count information:

- Glenmore Road and Okanagan Centre Road West – September 2009;
- Glenmore Road and Seaton Road – September 2009;
- Camp Road and Okanagan Centre Road East – September 2009.

The traffic monitoring also included two way peak hour volumes for Highway 97 just to the west of the Beaver Lake Road intersection.

Existing and Future Traffic - Peak Hour Traffic Volumes

The existing and future (2012, 2025) traffic volumes were prepared based on the assessment of the traffic information listed above. The previous traffic analysis was based on the inclusion of the future McCoubrey Road extension being in place by 2020. The recently completed City of Kelowna 2030 Official Community Plan does not include the McCoubrey Road extension as part of the 20 Year Major Road Network and Road Classification Plan. The projected 2025 background traffic has been adjusted to reflect the change in the future grid road network.

The existing 2012, and projected 2020 and 2025 AADT (Average Annual Daily Traffic) background PM Peak Hour traffic for the study area intersections are shown in **Exhibit 1 Exhibit 2** and **Exhibit 3.** The 2012 background traffic volumes were increased by 3% per year to determine the 2020 and 2025 background traffic volumes.

The Peak Hour Traffic Volumes used in the analysis are based on the Average Annual Week Day, occurring in the spring and fall. The total amount of traffic occurring during an Average Summer Week Day in the Okanagan tends to be 10% greater than the spring and fall traffic, but the traffic is disbursed over the entire day, and the peak hour volumes tend to be lower. During the spring and fall the traffic tends to be highest during the period from 7:00 Am to 9:00 Am in the morning and from 3:00 Pm to 5:00 Pm in the afternoon, as a result of school and work related trips overlapping. The afternoon peak hour traffic tends to have 20 to 30 % higher volumes than the morning peak hour. During the summer school trips are infrequent and work related trips are reduced, and the morning and afternoon peak hour traffic volumes are lower than during the spring and fall. The sensitivity of the operational roadway requirements is best suited to a review of the average spring and fall weekday afternoon Peak Hour traffic volumes.

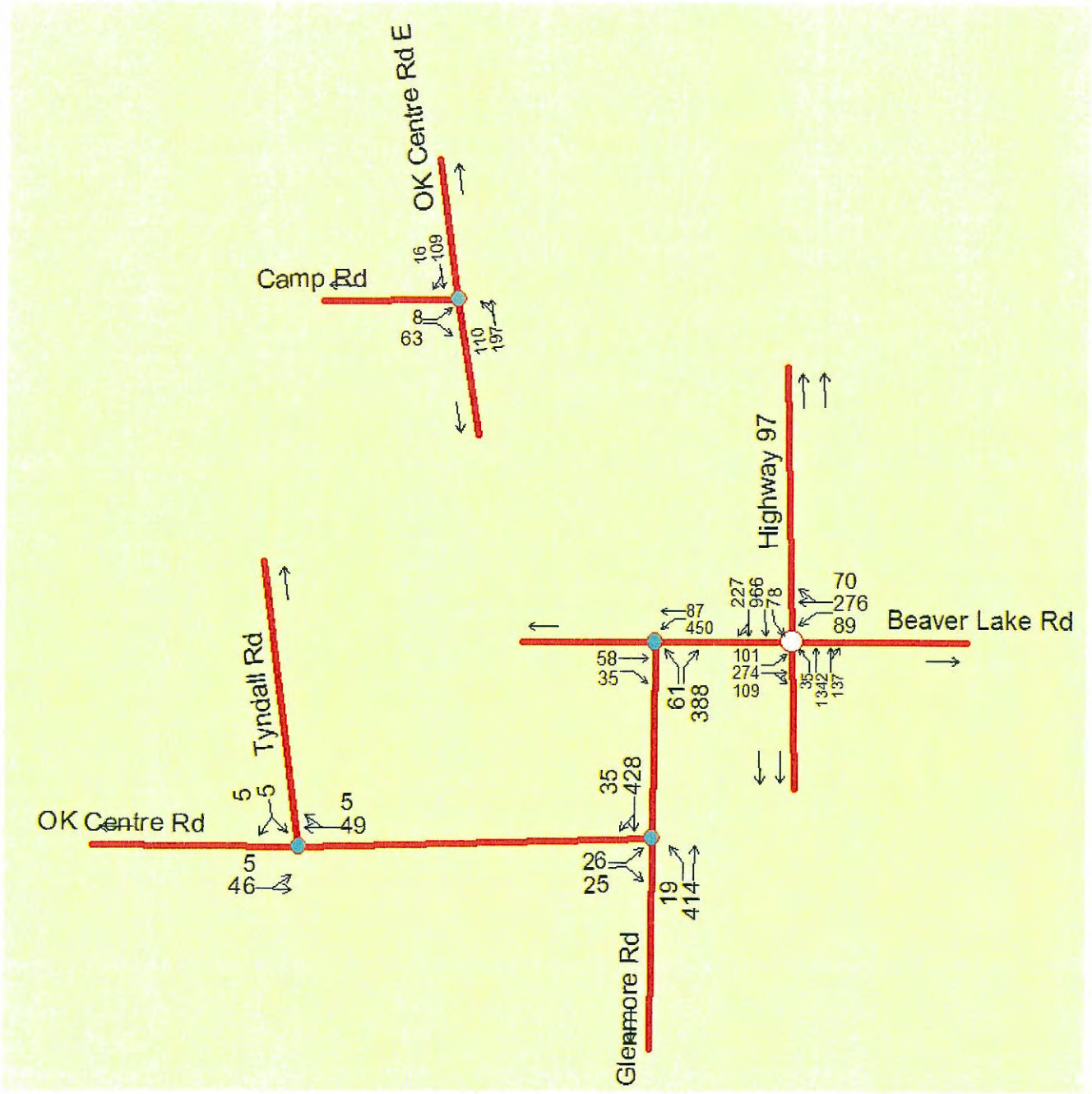


Exhibit 1

2012 PM Peak Hour Background Traffic

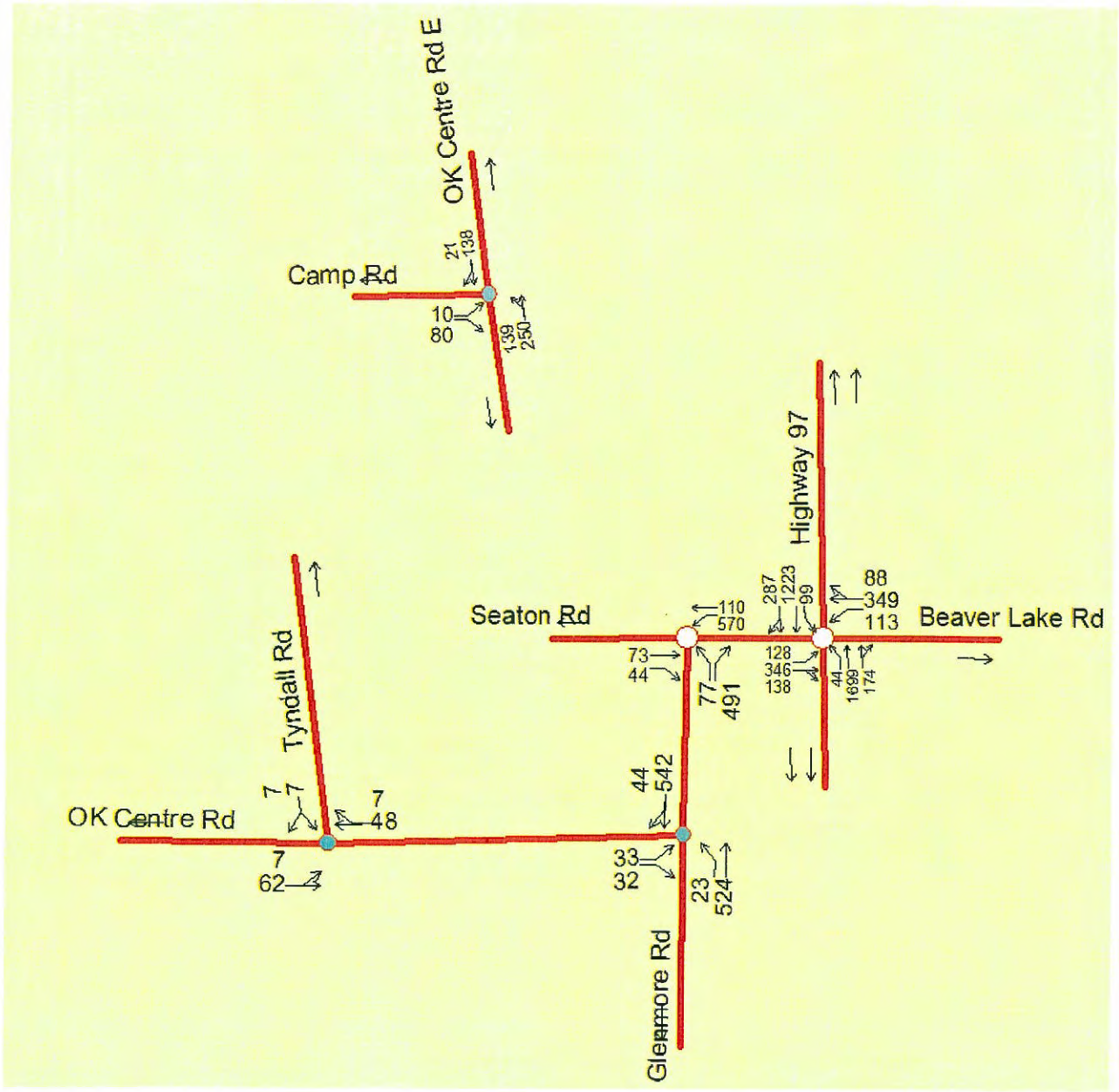


Exhibit 2

2020 PM Peak Hour Background Traffic

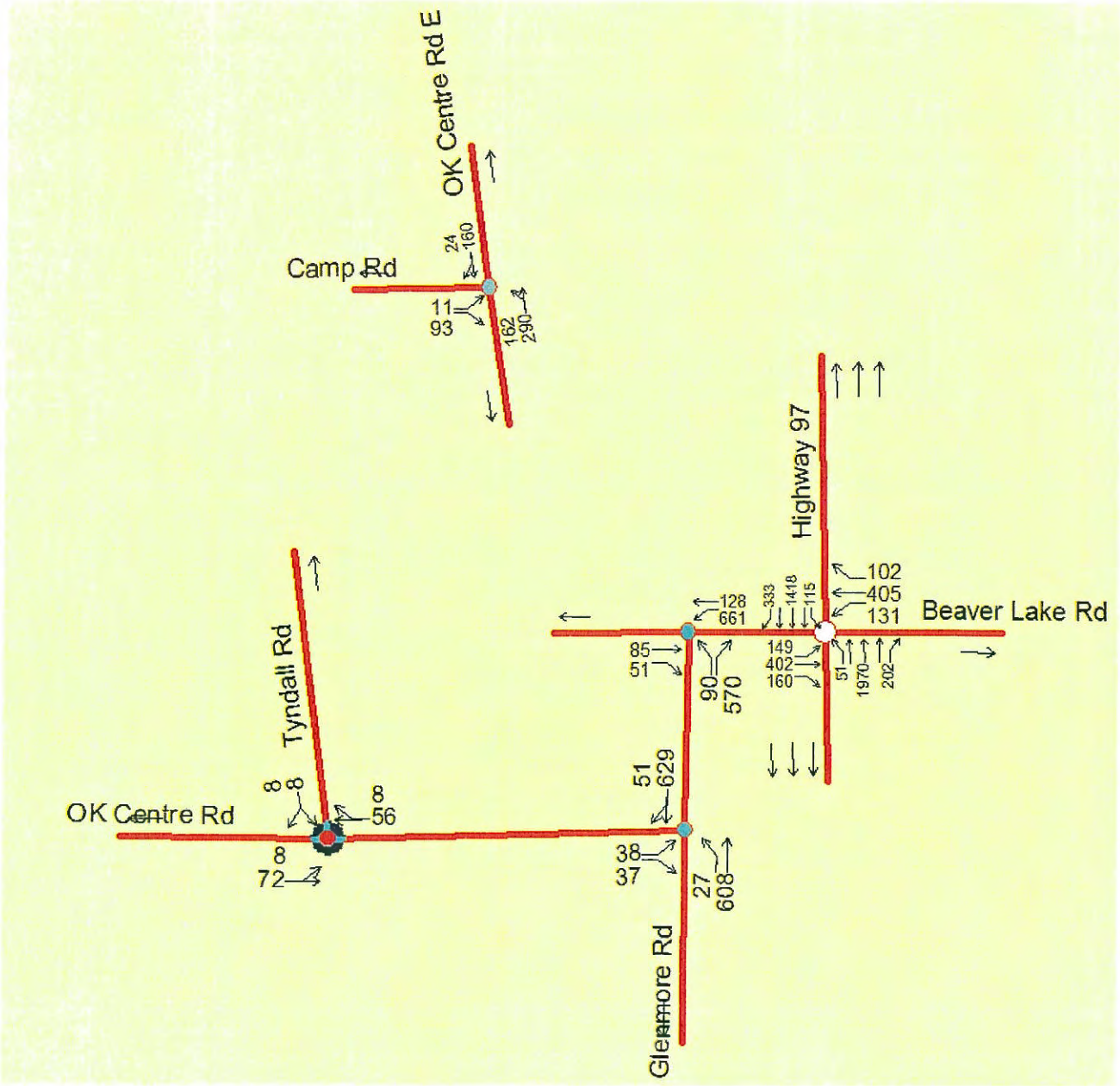


Exhibit 3

2025 PM Peak Hour Background Traffic

C) TRAFFIC GENERATION and DISTRIBUTION

Development Traffic

The analysis period used in this study is the weekday PM peak hour, that coincides with the peak hour period on the adjacent streets. The basis of traffic generation data used for the study is the Institute of Transportation Engineers Trip Generation Rates Manual 8th Edition. The AM and PM Peak Hour Rates to determine the development traffic generation, per unit, are as follows:

	AM Peak Hour	PM Peak hour
	(% Inbound, % Outbound)	
Single Family Home	0.77 (In 26%, Out 74%)	1.02 (In 64%, Out 36%)
Duplex Unit	0.65 (In 27%, Out 73%)	0.65 (In 60%, Out 40%)
Town Home	0.44 (In 19%, Out 81%t)	0.52 (In 64%, Out 36%)
Multi Family Unit	0.35 (In 29%, Out 71%)	0.44 (In 59%, Out 41%)

Following are the site generated traffic volumes for each neighbourhood, based on the proposed development build out, as identified in **Development Build Out Plan** and the Peak Hour trip generation rates for each proposed type of development, as noted above.

Phase I and II			Rate	Total		in		out
77	SFU	AM	0.77	59	26%	15	74%	44
		PM	1.02	79	64%	50	36%	28
46	Duplex	AM	0.65	30	32%	10	68%	20
		PM	0.65	30	60%	18	40%	12
16	Town House	AM	0.44	7	19%	1	81%	6
		PM	0.52	8	64%	5	36%	3
Total		AM		96		26		70
		PM		117		74		43
Benchlands			Rate	Total		in		out
183	SFU	AM	0.77	141	26%	37	74%	104
		PM	1.02	187	64%	119	36%	67
162	Town House	AM	0.44	71	19%	14	81%	58
		PM	0.52	84	64%	54	36%	30
80	MFU	AM	0.35	28	29%	8	71%	20
		PM	0.44	35	59%	21	41%	14
Total		AM		240		58		182
		PM		306		194		112
Highlands			Rate	Total		in		out
328	SFU	AM	0.77	253	26%	66	74%	187
		PM	1.02	335	64%	214	36%	120
208	Town House	AM	0.44	92	19%	17	81%	74
		PM	0.52	108	64%	69	36%	39
Total		AM		344		83		261
		PM		443		283		159
Glenmore			Rate	Total		in		out
265	Town House	AM	0.44	117	19%	22	81%	94
		PM	0.52	138	64%	88	36%	50
Total		AM		117		22		94
		PM		138		88		50

Total Development			Rate	Total		in		out
588	SFU	AM	0.77	453	26%	118	74%	335
		PM	1.02	600	64%	384	36%	216
46	Duplex	AM	0.65	30	32%	10	68%	20
		PM	0.65	30	60%	18	40%	12
651	Town House	AM	0.44	286	19%	54	81%	232
		PM	0.52	339	64%	217	36%	122
80	MFU	AM	0.35	28	29%	8	71%	20
		PM	0.44	35	59%	21	41%	14
Total		AM		797		190		607
		PM		1003		639		364

Development Traffic

The 2006 20/20 Properties Development Plan and Traffic Impact Report anticipated the completed project generating a total of 975 AM peak hour trips and 1,264 PM peak hour trips. The elimination of the golf course and hotel site, plus the significant reduction in multifamily units from the 20/20 plan to the current Lakestone Development plan, results in an overall reduction in the anticipated trips generated by the project of approximately 24%.

For most developments, there are four types of trips generated by a development:

- Primary trips;
- Diverted link trips;
- Pass-by trips; and
- Internal trips.

Primary trips are trips completely devoted to the proposed development and only result because of the development. These are primarily home-based trips. Diverted link trips are made by vehicles already on the road network, but are diverting from their travel pattern to access the development. Pass-by trips are trips to the development that are caused by vehicles on the road network that pass by the development and decide to enter. For both the pass-by trip and the diverted link trip, the vehicles are on the roadway for final destinations other than the proposed development.

Due to the size of the development, and the proximity to services, it is anticipated that there will be internal traffic within the site that will not have an impact on the adjacent roadways. We have made the conservative assumption that 10% of the development traffic will be internal. The revised traffic trip generations for each sector of the development are presented on the attached **Peak Hour Development Traffic** Figure.

The additional traffic generated from the proposed developments is anticipated to have a similar distribution to the existing traffic patterns. Based on the existing traffic patterns and a review of the population distribution and the year 2020 (projected traffic volumes) from the Transportation Plan for the District of Lake Country.

The distribution of the inbound and outbound Weekday PM peak hour trips resulting from the development were assigned to the road network for the study area, as shown in **Exhibit 4** and **Exhibit 5**. It is anticipated half of the project will be built out buy the year 2020, with full build out complete by 2025.

Exhibit 6 and **Exhibit 7** present the combination of the development traffic and the background traffic for the 2020 and 2025 analysis periods.

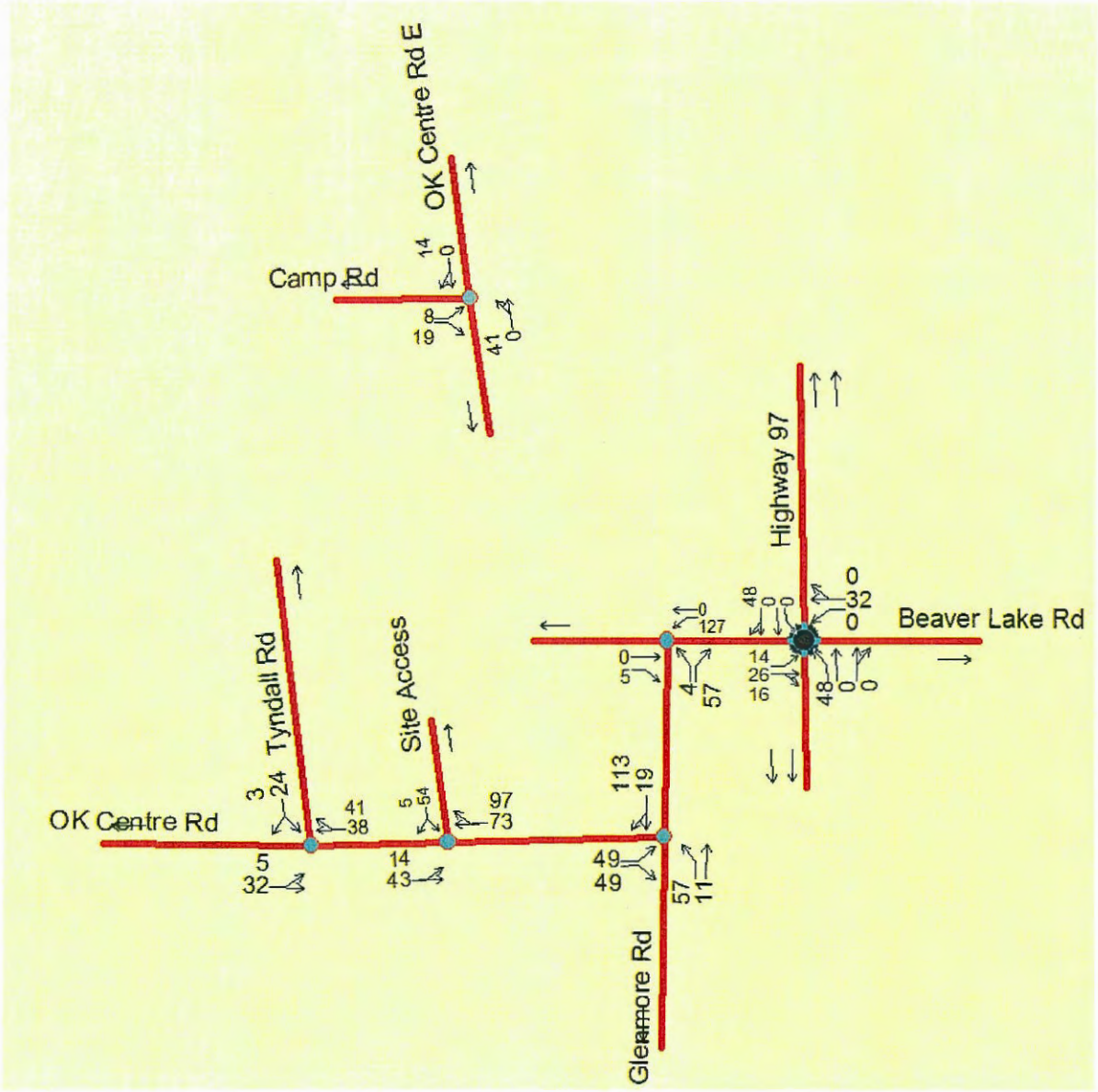


Exhibit 4

2020 Horizon Build Out Development Traffic

PM Peak Hour Distribution

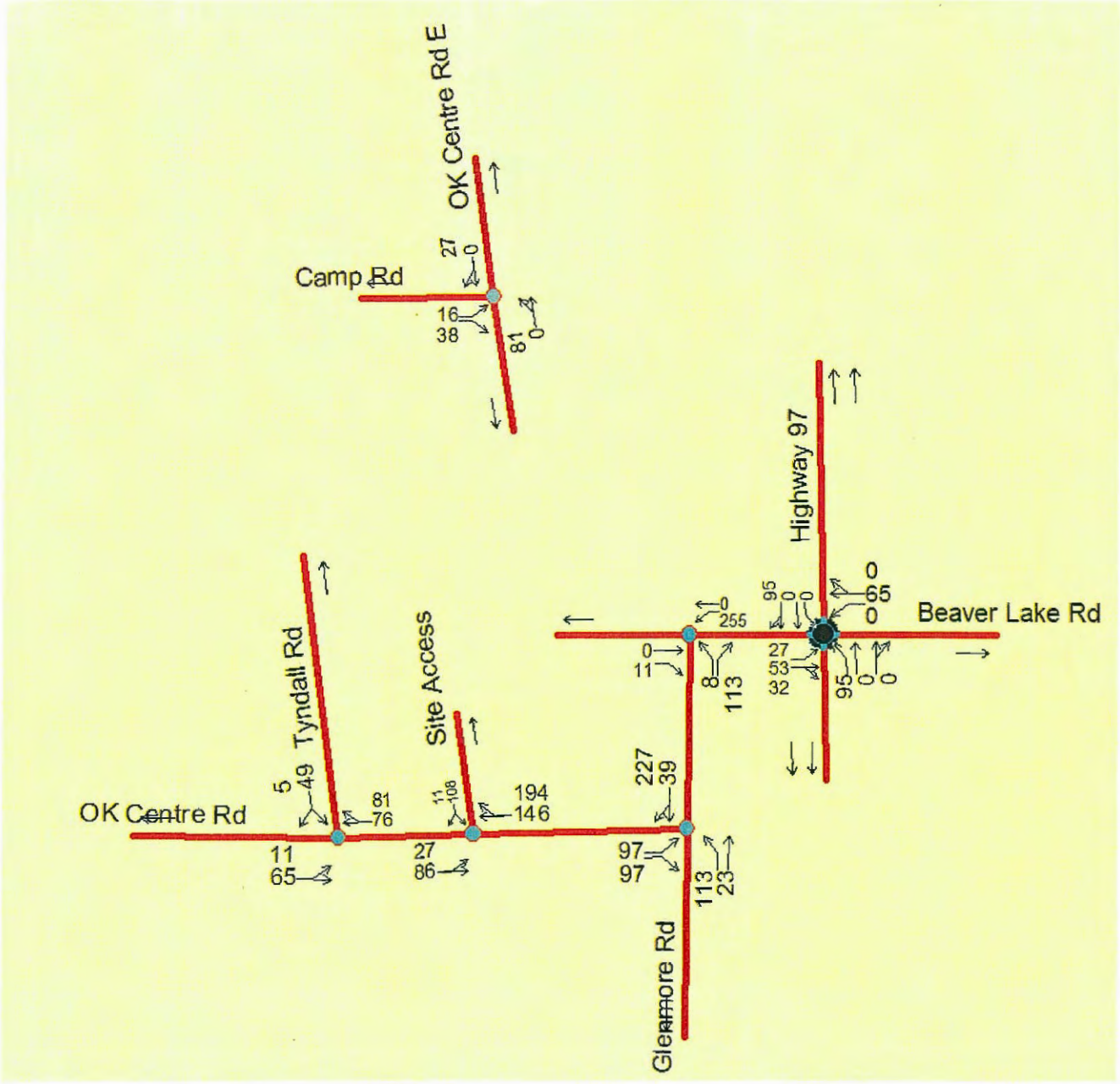


Exhibit 5

Full Build Out Development Traffic

PM Peak Hour Distribution

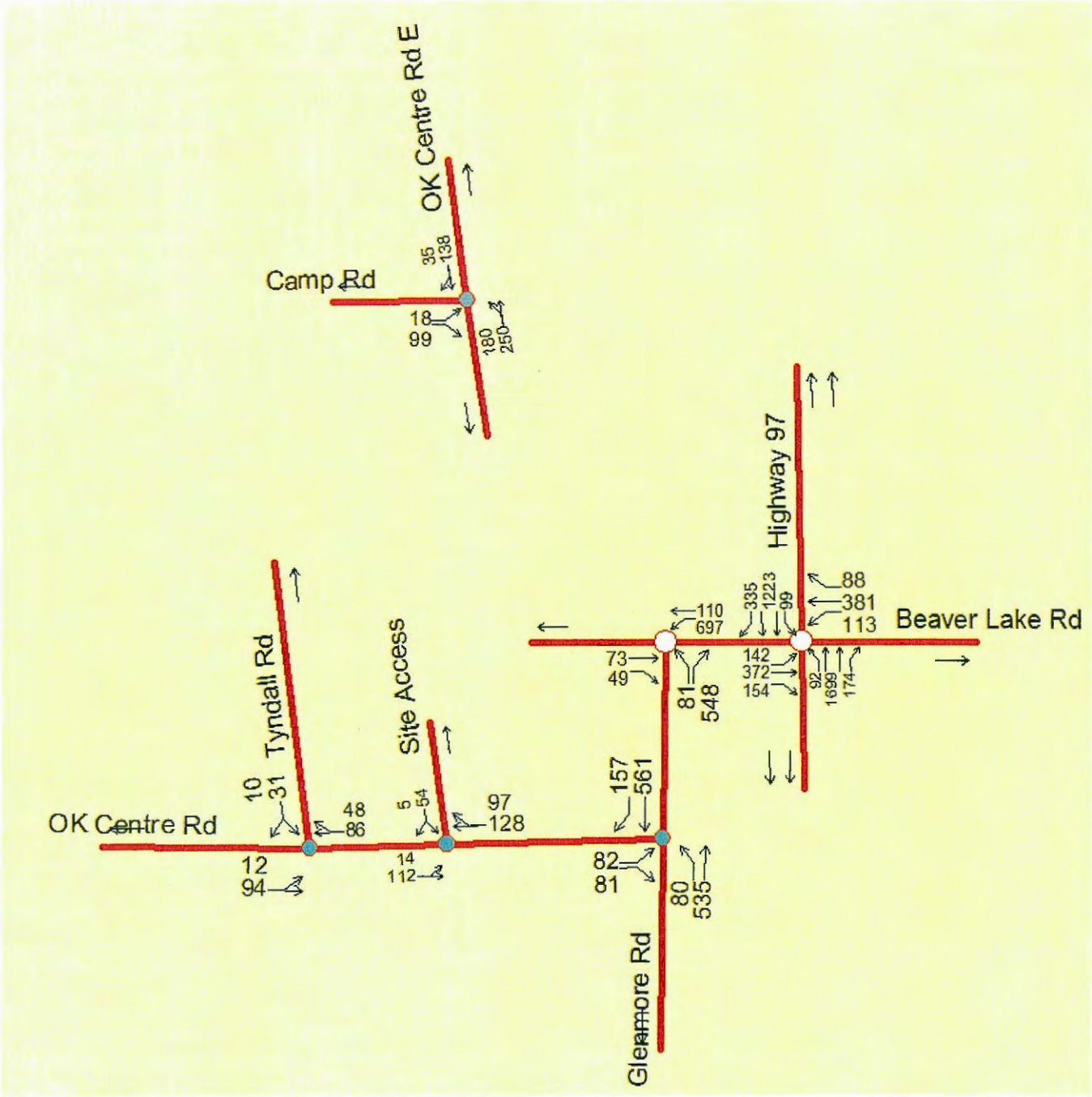


Exhibit 6

2020 Background plus 2020 Horizon Build Out of Development Traffic

PM Peak Hour Distribution

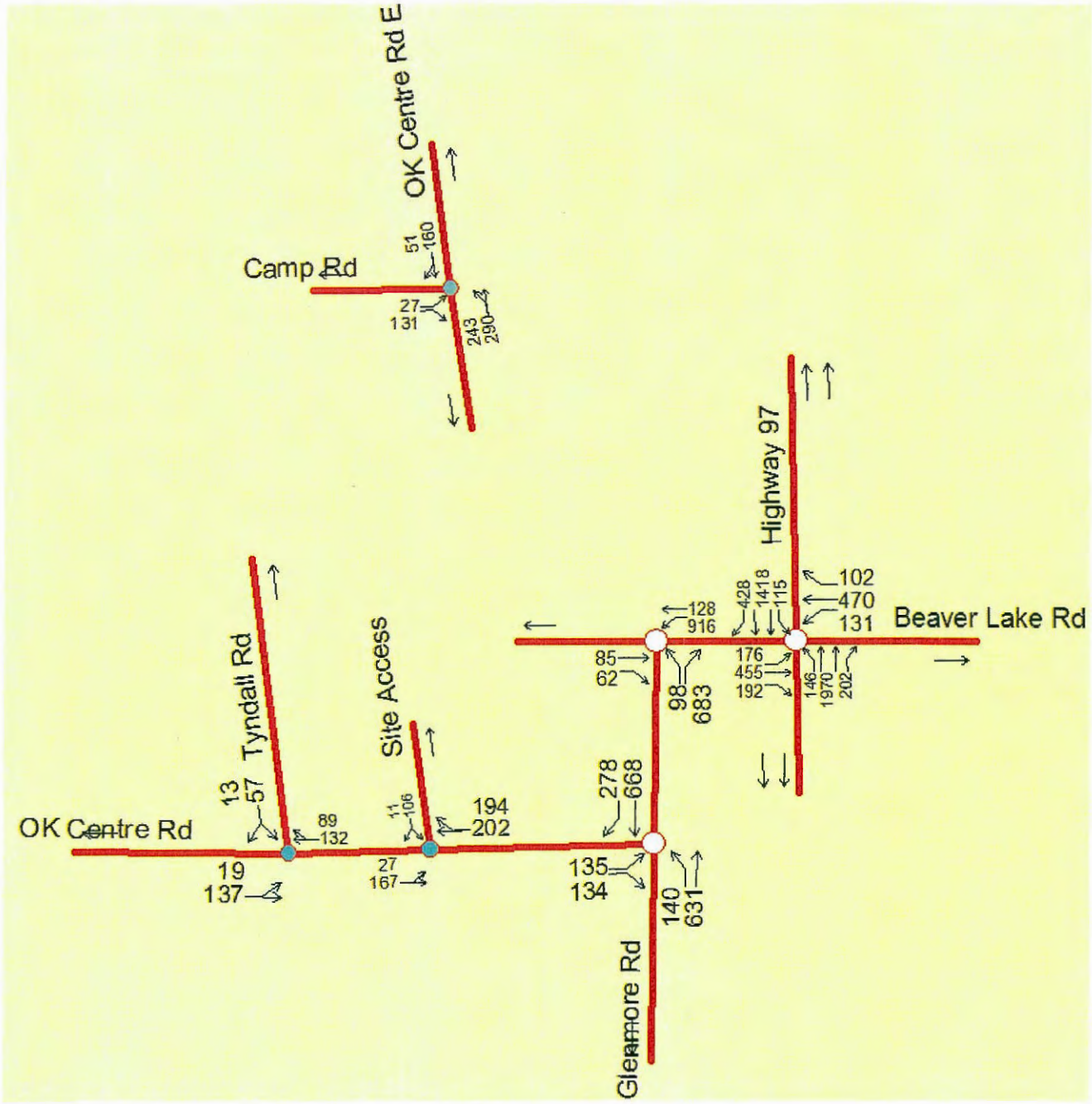


Exhibit 7

2025 Background plus Full Build Out of Development Traffic

PM Peak Hour Distribution

D) TRAFFIC ANALYSIS

The operations of the intersections have been analyzed utilizing Highway Capacity Manual Synchro 6 software for signalized and unsignalized intersections. An operational level of service is determined for each movement based upon the calculated delay.

The Levels of service for signalized intersections are as follows:

- Level of Service (LoS) A represents less than 10 seconds of average delay and is considered a good operating condition.
- Level of Service (LoS) B represents greater than 10 seconds and less than 20 seconds of average delay and is considered a good operating condition.
- Level of Service C represents greater than 20 seconds and less than 35 seconds of average delay and is considered a fair operating condition.
- Level of Service D represents greater than 35 seconds and less than 55 seconds of average delay and is considered a fair operating condition.
- Level of Service E represents greater than 55 seconds and less than 80 seconds of average delay and is considered a poor operating condition.
- Level of Service F represents more than 80 seconds of average delay and is considered a failed operating condition.

The Levels of service for unsignalized intersections are as follows:

- Level of Service (LoS) A represents less than 10 seconds of average delay and is considered a good operating condition.
- Level of Service (LoS) B represents greater than 10 seconds and less than 15 seconds of average delay and is considered a good operating condition.
- Level of Service C represents greater than 15 seconds and less than 25 seconds of average delay and is considered a fair operating condition.
- Level of Service D represents greater than 25 seconds and less than 35 seconds of average delay and is considered a fair operating condition.
- Level of Service E represents greater than 35 seconds and less than 50 seconds of average delay and is considered a poor operating condition.
- Level of Service F represents more than 50 seconds of average delay and is considered a failed operating condition.

Generally, and in accordance with the Ministry of Transportation Site Impact Analysis Requirements Manual, in urban areas, improvements are considered when the overall intersection performance nears Level of Service 'D' for Collector Road through traffic, and 'D' / 'E' for all other signalized and unsignalized movements. Volumes to Capacity Ratios are also reviewed. Acceptable v/c ratios of 0.85 and level of service D (based on delay) are acceptable for the overall intersection; v/c ratios of 0.90 are acceptable for individual movements.

The background PM Peak Hour traffic was analyzed for the existing 2012 traffic, and for the 2025 horizon year. Background plus development traffic was analyzed for the 2025 background plus the full build out of the development for the PM Peak Hour traffic volumes.

Background Traffic Analysis

Tables 1, 2 and **3**, present the results of the 2012, 2020 and 2025 PM Peak Hour background traffic intersection analysis.

Table 1
2012 Background Intersection Performance

	Control	Period	Critical V/C	Delay (Sec)	LOS	Comment
Highway 97 and Beaver Lake Road	Signal	PM	0.96	26.0	C	EB Trough LoS E SB Left LoS F
			0.90	27.5	C	Addition of Advance EB and WB Left Phase EB Trough LoS E
Glenmore Road and Okanagan Centre Road W	Stop Sign	PM	0.30	1.0	A	
Glenmore Road and Seaton Road	Stop Sign	PM	0.72	12.8	B	
Camp Road and Okanagan Centre Road E	Stop Sign	PM	0.08	3.3	A	

Table 2
2020 Background Intersection Performance

	Control	Period	Critical V/C	Delay (Sec)	LOS	Comment
Highway 97 and Beaver Lake Road	Signal	PM	1.16	70.6	E	EB, WB and NB Trough LoS F
			0.93	31.3	C	Addition of dedicated right turn lanes for all directions Addition of Advance SB Left Phase
Glenmore Road and Okanagan Centre Road W	Stop Sign	PM	0.38	1.3	A	EB Left LoS D
Glenmore Road and Seaton Road	Stop Sign	PM	0.93	22.1	C	WB Left LoS E
Camp Road and Okanagan Centre Road E	Stop Sign	PM	0.11	3.6	A	

Table 3
2025 Background Intersection Performance

	Control	Period	Critical V/C	Delay (Sec)	LOS	Comment
Highway 97 and Beaver Lake Road	Signal	PM	1.09	52.7	D	EB and WB Los F Intersection Beyond Operational Capacity
Tyndall Road and Okanagan Centre Road W	Stop Sign	PM	0.10	7.4	A	
Glenmore Road and Okanagan Centre Road W	Stop Sign	PM	0.43	1.7	A	Eastbound Left LoS E
Glenmore Road and Seaton Road	Stop Sign	PM	1.09	39.8	E	WB Left LoS F
	Signal	PM	0.81	12.9	B	
Camp Road and Okanagan Centre Road E	Stop Sign	PM	0.13	3.7	A	

The 2012 Background Traffic analysis identified a minor system deficiency at the Highway 97 and Beaver Lake Road intersection. The addition of a left turn advance for the southbound traffic on the highway, brought the intersection back to within satisfactory operation.

The 2020 Background Traffic analysis identified the need to add dedicated right turn lanes for each leg of the Highway 97 and Beaver Lake Road intersection, plus the addition of an advance left turn phase for the south bound traffic. Prior to any major intersection upgrades to the existing intersection, the development of the relocated intersection, to the south, with the extension of the Town Centre Road as planned by the Regional District, prior to the establishment of the Municipality of Lake Country should be further investigated. The requirement for signalization of the Glenmore Road and Seaton Road intersection would then not be required.

The 2025 Background Traffic analysis identified that the Highway 97 and Beaver Lake Road signalized intersection as having reached the operational limit of the current configuration, even with the addition of the dedicated right turn lanes. The District of Lake Country Transportation Plan identifies the relocation of the intersection to the south, where Beaver Lake Road would line up with Okanagan Center Road, with a new intersection on Highway 97. The Glenmore Road and Seaton Road intersection would require the installation of a signal to meet acceptable operational requirements. The realigned Highway 97 intersection configuration would also rectify the operational constraints with the Glenmore Road and Seaton Road intersection, as described above.

The District of Lake Country is actively working with the Ministry of Transportation, to determine how the projected growth in the District will interact with the requirements of the Highway 97 Inter Provincial corridor.

Background Plus Development Traffic Analysis

Table 4 and **5** present the results of the 2020 development horizon and background traffic, and the full build out of the development combined with the 2025 background traffic.

Table 4
2020 Background plus 2020 Horizon Development Intersection Performance

	Control	Period	Critical V/C	Delay (Sec)	LOS	Comment
Highway 97 and Beaver Lake Road	Signal	PM	0.96	37.4	D	EB Trough and EB Left LoS E WB Left LoS E
Tyndall Road and Okanagan Centre Road W	Stop Sign	PM	0.09	1.8	A	
Glenmore Road and Okanagan Centre Road W	Stop Sign	PM	0.42	3.2	A	Eastbound Left LoS D
Glenmore Road and Seaton Road	Stop Sign	PM	0.83	18.0	B	
Camp Road and Okanagan Centre Road E	Stop Sign	PM	0.14	4.3	A	

Table 5
2025 Background plus Full Build Out Development Intersection Performance

	Control	Period	Critical V/C	Delay (Sec)	LOS	Comment
Highway 97 and Beaver Lake Road	Signal	PM	0.96	37.4	D	EB Trough and EB Left LoS E WB Left LoS E
Tyndall Road and Okanagan Centre Road W	Stop Sign	PM	0.14	2.1	A	
Glenmore Road and Okanagan Centre Road W	Stop Sign	PM	0.99	10.9	B	Eastbound Left LoS F
	Signal	PM	0.66	10.4	B	Addition of Signal
Glenmore Road and Seaton Road	Signal	PM	0.97	27.9	C	

Camp Road and Okanagan Centre Road E	Stop Sign	PM	0.20	5.1	A	

Other than the deficiencies identified for the 2020 background traffic at the Beaver Lake Road and Highway 97 intersection, no other system deficiencies were identetified to accommodate the combination of 2020 background plus the 2020 horizon build out development traffic.

With the addition of the traffic generated by the proposed development, the following intersections will require modification to accommodate the combination of 2025 background plus the full build out of the development traffic:

- Glenmore Road and Okanagan Centre Road W – Due to a failure in the eastbound left turn, the replacement of the stop sign control with a signal is recommended;
- Glenmore Road and Seaton Road – As discussed with the 2025 Background Traffic, due to a failure in the eastbound though, the replacement of the stop sign control with a signal is recommended. As discussed with the background traffic analysis, the overall intersection configuration should be reviewed prior to a decision on the installation of a signal.
- Highway 97 and Beaver Lake Road - As discussed with the 2025 Background Traffic, the current intersection is well beyond its operational limit. The combination of the 2025 background plus development traffic is beyond the operational limit and either additional highway lanes, additional side street lanes, or relocation of the intersection will be required to adequately meet both the District and Ministry service requirements.

The increase in traffic resulting from the development represents up to a two fold increase in the traffic on some of the existing district roadways. Not to down play the increase in overall traffic, the volumes are still well within the acceptable operational range for a two lane rural roadway system.

E) RECOMMENDATIONS

The projected growth in background traffic will place constraints on the ability of the Highway 97 corridor to provide the combined needs of a regional transportation link and a major commercial and service spine for the community of Lake Country.

The impact on the Lake Country arterial and collector road system, as a result of the proposed development, is consistent with the projections presented in the District of Lake Country Transportation Plan.

The year a large scale development will be completed can be effected by numerous factors, such as economic trends and the overall market performance of a region over the life of the project (a fifteen year build out is projected for the proposed development).

It is also difficult to determine the actual regional and local growth beyond a ten year horizon. The combination of the pace of the development build out and the determination of the increases in background traffic is not an exact science and as such we recommend when the development reaches 2020 Horizon (50% build out), the Traffic Impact Study should be updated.

The update should be based on the actual traffic resulting from the first half of the development, thus confirming and or modifying the trip generation rates established in the current report, with the trip generation rates then applied to the remainder of the development. The operation of the Highway 97 corridor, and the District of Lake Country arterial and collector road system can then be updated to reflect the actual increase in background traffic.

The anticipated impacts on the District of Lake Country roadway infrastructure resulting from the overall development in combination with the projected growth in background traffic can then be modified based on the updated findings.

We would be pleased to meet and discuss the findings presented above.

Yours truly,

CTQ CONSULTANTS LTD.
Per:

Mr. David D. Cullen, P.Eng.
Transportation Engineer
DDC:ddc

2.E Infrastructure / Engineering

A Servicing Brief for the overall LakeStone site has been prepared by Protech Engineering, and is included as an appendix to this section. Both engineering design standards and implementation will emphasize retention of the natural quality of the land.

Natural Character Retained: LakeStone is characterized by strong natural slopes. All servicing and development is to maximize retention of the natural condition by minimizing excavation, scarring and unnecessary tree removal. To encourage retention of the natural character, specific design policies have been incorporated below – general routing of all services is to be below road paving wherever possible, with all services located to minimize trenching.

Sustainable Development: Policies promoting conservation of resources and sustainable development are to be incorporated. Water is a precious commodity in the Okanagan, and water conservation measures will be incorporated in residential, recreational and commercial development. This will include the use of xeriscape strategies and landscaping that retains the existing site character.

Water: Water supply will be provided from the existing Okanagan Lake pumphouse. The development will establish the supply and reservoir system as part of the overall project infrastructure.

Sewer: Sewer system schematics are indicated in the Protech study. Work already completed includes connection of the system through to Highway 97. The on-site system will incorporate the minimum number of lift stations possible, to be phased with development progress.

Drainage: Drainage will be accommodated through surface management and the use of retention ponds in specific ESA 1 areas and throughout the development as required in order to maintain post development flows at pre development levels. Roof drains on all the homes at LakeStone will be directed to rock pits adjacent to the structures, further reducing the loads on stormwater drainage systems. Rain barrels will be used to reduce storm surges while also providing for irrigation in dry months of the year.

Road System: Road standards are all outlined in the Servicing brief, but it is possible that their actual location may be altered slightly in the field to accommodate specific site conditions. Lakestone will build all roads to meet Lake Country construction standards, and Lake Country ownership of the road rights of way – provided that road planning standards can be determined in each subdivision to maximize respect for retaining existing grades and vegetation, and minimize scarring from cut and fill requirements. Creation of public roads inevitably requires setbacks from property lines, and these would also require careful and creative resolution at each subdivision to avoid scarring of the existing landscape by cut and/or fill if public ownership of the right-of-way is to be concluded.

Existing Road Adjustments

Due to the complexity and planning goals at LakeStone, there are a number of revisions to roads that are required to complete the overall development. These transfers are indicated on the attached drawings, and are described below:

1. Long Road (partial) Transfer to Pedestrian Trail: Since Long Road alignment has significant sections of unacceptable grade, and since the necessity for Long Road to connect has not been a District priority, it is proposed to turn the unused portion of Long Road into part of the Lake Country pedestrian trail system.

2. Tyndall Road Re-alignment: Realignment of Tyndall is proposed to be located proximate to the foot of the cliff face. This routing will provide for a phase of development that is not divided by an arterial road. The resulting drive will provide traffic calming, views and interest not currently available to Tyndall, while placing the commercial development and one of the key community amenities in this central location. This alignment will also form the backbone of the Regional trail as it moves from north to south.

3. Tyndall / McCoubrey Intersection Re-alignment: The District has initiated review of the Tyndall alignment as it connects with Okanagan Center Road and McCoubrey. The enclosed drawings represent resolution of that objective, and indicate the land arrangements necessary for finalization.

4. Okanagan Center Road Realignment: The realignment of a series of curves previously on Okanagan Centre Road west of McCoubrey is partially completed and will be fully realized as part of the Phase 2 construction.

5. Chase Road Re-alignment: Existing Chase Road alignment proximate to the west side of the South Valley (Glenmore) site is proposed to be realigned to achieve a solution with minimized environmental impact.

6. Egress at Sage Glen Subdivision: An additional emergency egress will be provided to connect to the existing roads in this adjacent subdivision. It will be located in Phase 7, connecting to the northwest corner of this existing subdivision. The road will be closed with bollards or a gate (as required by DOLC) unless access is required in case of emergency. The road surface will be gravel, prepared and maintained to DOLC standards.

LAKESTONE NIGHT SKY LIGHTING GUIDELINES

Overview and Principles

According to many environmentalists, naturalists, and researchers, light pollution is one of the most pervasive forms of environmental degradation, having adverse effects on wildlife and wasting energy,

One-quarter of all energy consumption worldwide is used for lighting, and lights in homes and offices account for 20%-50% of this.

Natural resources are wasted (millions of barrels of oil and tons of coal burned needlessly, hydroelectric energy wasted).

LakeStone promotes a "night sky" protection policy to encourage retention of the night sky visibility characteristic of Lake Country.

In order to achieve protection of the night sky, specific exterior lighting guidelines must be implemented. Exterior lighting will be regulated both in the number of fixtures and the lighting level of each fixture – location policies will be provided consistent with night security of residents. These guidelines may periodically be revised as permitted by the District of Lake Country to align with community regulations. Efforts will be made (in discussions with the District, and as technology evolves) to implement LED or solar technology where possible.

Design Goals

- create aesthetically attractive lighting while enhancing neighbourhood appearance and maintaining the country residential character that is a part of this area
- allow pedestrians, bicycles, and vehicles to move safely, such that they are not blinded by glare
- focus on keeping light on the ground plane where it is needed
- prevent light trespass onto adjacent properties
- save energy, money, and the environment
- maintain a pleasing, unpolluted night sky condition

Lighting Hierarchy – Public Realm

Arterial roads

On main roads such as Okanagan Center and Tyndall, it will be necessary to incorporate lamp standards to comply with DOLC standards. Fixtures shall be of a modest height to create a residential feel, and have 'cut offs' to focus light toward the ground, minimizing spillage into the sky. LED fixtures shall be utilized to maximize efficiency and energy savings.

Main spine road

In the Highlands neighbourhood, the main spine road will have a certain number of lamp standards in the same style as the arterial roads, but installed strategically at specific intersections where additional lighting is required for safety (potentially also utilizing shorter pole lengths). In other areas of this road, lower level lighting will be utilized, spaced such that it delineates the road edge and sidewalk / trail as applicable. This will mean that in conditions where there are no homes at the road edge, lights will be more closely spaced, and in other situations where light will wash from the homes, spacing can be adjusted accordingly.

Neighbourhood roads

In these conditions, where there will be homes on one or both sides of the street, low level bollard lighting can be utilized as the main light source, in combination with light coming from both the homes and garage fronts. Detailed design to be confirmed on a phased basis.

Regional trail

The main regional trail along Okanagan Center / Tyndall Roads shall have separate lighting, with bollards to cast a glow on the trail surface, providing modest visibility while greatly enhancing the feeling of personal safety. The goal for any trail lighting should be to have it off the grid, powered by solar collectors.

Other trails

In situations where the trail follows the roadway, lighting design should take this into account, making sure that a certain amount of light spills onto the trail to enhance activities like dog walking etc. All other narrow wildlife trails should be left without lighting to discourage night usage.

Entry monuments

For each proposed entry monument, the most important aspect of the night sky constraint is to make sure there is no uplighting of signage or plant material, with the attendant spillage of light into the sky vault.

Lighting – Single and Multi-Family Residential Properties

All light sources on individual homes shall adhere to the following directives:

- recessed lighting in soffits – in specific cases such as street front facing garages, this light style can be considered as supplemental to the community (bollard) lighting. Light on soffits of decks shall all be recessed style.
- Surface mount fixtures – if this type of light is proposed, it shall be of a style that directs light downward, not horizontally. Exact fixture selection to be approved by Design Consultant as part of the Design Review process.
- Uplighting for building or landscape elements is not permitted.
- Address / identification signs and lighted entry markers shall comply with the design intent of the other conditions above.
- Coloured lighting is not permitted except for seasonally displayed Christmas lighting.
- All light sources shall be confined to the Disturbed area of each individual homesite, and be concealed, providing indirect illumination, with opaque glass. They should be activated by a timer device where practicable.
- If safety and security light fixtures are attached to the building, they shall be a maximum 8'- 0" (wall mounted) or 10'- 0" (ceiling mounted) above the area served. All other light fixtures shall be a maximum of 3'- 0" above natural or excavated grade, whichever is lower.

LAKESTONE DEVELOPMENT
SERVICING BRIEF

Reference No. 10018

INTRODUCTION

PROTECH Consultants Ltd. has been retained by MacDonald Lakestone Properties as civil engineers for the Lakestone Development in the District of Lake Country.

The purpose of this Servicing Brief is to concisely outline the extent and timing of off-site and on-site works required in order to service the development on a phase by phase basis as the development progresses.

PROPOSED DEVELOPMENT

The proposed development consists of approximately 29 properties located generally north of Okanagan Centre Road West and East of Tyndall Road. There are several properties located to the west of Tyndall Road as well as to the west of Okanagan Centre Road West and Finch Road. There are additional properties located between Glenmore Road and Chase Roads. The development will consist of a mix of single family and multi- family developments, along with a considerable amount of open space, parks, and amenity areas. The Glenmore Road/Chase Road site will allow for some light industrial development as well as a mixture of single family or multifamily development. The proposed development of these lands is shown on Figure 1 attached.

PROPOSED PHASING PLAN

The Lakestone Master Plan area is defined within the District of Lake Country's Official Community plan as an urban area and development is intended to proceed in a logical, sequential and orderly fashion with a full level of urban services. The accompanying Figure 2 details the anticipated order and extent of each phase. Phase 1 is already complete. A PLR for Phase II has been issued and detailed engineering have been submitted for review. The timing of subsequent phases will be dependent on market conditions and the logical and economic expansion of servicing infrastructure. No specific dates are attached, but the logical and anticipated sequence is outlined in Figure 2. It is proposed that the development will be completed in eight phases. Phase 3 consists of the lands located to the west of the new Tyndall Road alignment. Phases 4 to 8 consist of the balance of the lands north of Okanagan Centre Road West and east of Tyndall Road. It is proposed that the Glenmore/Chase Road lands be a floating phase that could proceed at any time during the progress of the development, as market conditions dictate.

Objectives

.1 To allow development to proceed in a logical and orderly fashion concurrent with the provision of appropriate infrastructure upgrades and the provision of amenities.

Policies

.1 Phasing will be generally as shown on Figure 2.

.2 Infrastructure requirements at the time of development will be as stated in the Subdivision and Development Servicing Bylaw, and as required by the District's Engineering Department and Approving Officer.

.3 The minimum requirements relating to road and water infrastructure improvements for each phase are shown in Table 1. Figure 3 attached shows the required off-site road improvement requirements on a phase by phase basis.

.4 Temporary or interim servicing solutions will be minimized in favor of accommodating the ultimate development scenario envisioned in the Official Community Plan.

.5 The District will adapt the scope of the off-site servicing requirements, as a result of adjustments in phasing and engineering design considerations in order to ensure the most timely and cost effective installation of those services.

TABLE 1
ROAD AND WATER SUPPLY INFRASTRUCTURE PHASING PLAN

Phase II - Foreshore

Road Network

- Upgrade OKCRW for the full length of site frontage, plus OKCRW to the new Tyndall intersection, including a WB left turn lane on OKCRW at the Tyndall Road intersection. Upgrade to full urban standards on the side adjacent to the development and to rural standards on the opposite side.

Phase III – Benchlands

Road Network

- Upgrade Tyndall Road from OKCRW to north end of site frontage. Site frontage will be to full urban standards and to rural standards on opposite sides or frontage not belonging to Lakestone.

Phase IV

Road Network

- Upgrade Tyndall road north to Camp Road to full urban standards along development frontage (east) to rural standards on the opposite side.

Water Supply

Design and construction of the following works:

- Construct booster station at the existing Okanagan Centre Road Reservoir
- Construct water main to reservoir for PZ600
- Construct reservoir at PZ600 (2000 m^3)
- Construct water main from PZ600 to Chase Road
- Construct valve chamber interconnection between to allow flow to/from the existing Lake Country Distribution System.

Phases V, VI, VII, & VIII

Road Network

- Upgrade OKCRW from Tyndall Road intersection (east side) to Glenmore Road to urban standards on the side adjacent to the development (north side) to the limit of the site and to rural standards to the opposite side of the road or frontages not belonging to Lakestone, including pedestrian walkway. The road standard will be to a Neighborhood Connector as per the Master Transportation Plan. DCC credits will apply for OKCRW from McCoubrey Road to Glenmore Road.

Phases V, VI, VII, & VIII (cont)

Water Supply

- Construct water main from PZ536 reservoir to PZ655
- Construct Reservoir at PZ655 (3,250 m^3)
- Construct booster pump station for areas above PZ655 at time of development

Glenmore / Chase Site (Floating)

Road Network

- Upgrade Glenmore Road for the full length of the site frontage to full urban standards on the side adjacent to the development (west side) to the limit of the site and to rural standards to the opposite side of the road or frontages not belonging to Lakestone.

- Upgrade Chase Road from OKCRW to south side of property to full urban standards on the side adjacent to the development (east half of road) and to rural standards on the opposite side of the road.

- Upgrade Chase Road from the south side of the property to Glenmore Road to Rural Standards.

- Upgrade Glenmore Road access to industrial site by adding turn lanes on Glenmore Road as necessary.

Water Supply

- Construction of reservoir and Okanagan Lake-Vernon Creek Interconnection

All necessary underground services including shallow utilities will be constructed within the off-site road SROWs as required to service the phases as they proceed.

LAKESTONE DEVELOPMENT SERVICING REQUIREMENTS

WATER SUPPLY

Introduction:

The proposed water distribution concept for the Lakestone Master Plan is shown in Figures 4A, 4B and 4C. There is sufficient capacity from the existing reservoir off Okanagan Centre Road West to service Phase 2 and 3 of the development. Any development beyond that will require the construction of additional storage at the existing reservoir, as well as a new pump station adjacent to the existing reservoir and the construction of 2 additional upper reservoirs at elevation 600 and 655m respectively. These reservoirs will be designed to provide domestic and fire storage for the upper zones. A dedicated main from the Okanagan Lake pump station to the existing reservoir has already been built.

A valve chamber at the 600m reservoir will allow an interconnection between Vernon Creek and Okanagan Lake water if needed. The upper most portion of the development (above 625m) cannot be supplied with gravity pressure and will be serviced with a booster pump station. This system will consist of pumps for domestic flows and a fire pump with backup generator power.

All water lines are proposed within statutory rights of way or under municipally owned roads.

B.1 Objectives:

.1 To design and build system redundancy into the water supply system so that the Lakestone Development may be serviced by either Okanagan Lake or Vernon Creek water sources or a combination of the two.

.2 The use of pressurized systems will be limited to the uppermost area of the property.

.3 To design the development for the conservation of water.

.4 To integrate and facilitate the improvement of the existing District water supply system such that a greater number of existing water users can be served by the Okanagan Lake water source.

Policies:

.1 As shown on Figures 4A, 4B and 4C, the concept for the water system for Lakestone is that it be interconnected with the Okanagan Lake and Vernon Creek water systems. The water system servicing the development will be owned and operated by the District.

.2 At the time of subdivision, the Approving Officer will determine the construction standards to be used for the water system in consultation with the Engineering Department, the Subdivision and Servicing Bylaw and Master Plan fiving consideration to site constraints, land use, looping of water mains and integration into the District infrastructure.

.3 At the time of subdivision, where the Approving Officer or the Engineering Department requires the developer to oversize certain water infrastructure, the District will provide a Water DCC rebate in accordance with the DCC Bylaw or enter into a cost sharing agreements. In addition, latecomers for oversizing for other proposed developments will be applicable.

.4 Offsite improvements and any applicable DCC credits will be determined at the time of development. The District may require the developer to provide additional engineering studies as part of determining offsite improvements.

.5 Lands for a future water treatment facility adjacent to the existing reservoir will be identified in the concept plan within lands already dedicated to the District.

.6 Every effort will be made to keep water lines in the road rights of way and the use of statutory rights of way will be minimized. Statutory rights of way shall be landscaped with natural vegetation to minimize scarring.

.7 Reservoirs and pump stations will be located and sited with careful consideration given to impacts on adjacent and distant views.

.8 Consideration will be given to exterior materials and landscaping adjacent to reservoirs and pump stations to minimize impact and provide adequate security.

.9 The number of pressure regulating stations will be kept to a minimum and standardized in so far as practical.

.10 All development will require individual water meters.

.11 Water conservation principles will be encouraged in the design of all development.

.12 A pressurized water system for lands above the 625m level will be required. The pressurized system serving this portion of the development will be limited to 90 litres per second fire flow standard or to the minimum required for single family/ townhouse residential development as calculated by FUS standards to meet District of Lake Country Fire Department requirements. The development proposed for this location must be consistent with this limitation and be approved by the Fire Underwriters Survey and Engineering Department. District of Lake Country staff have provided their consent to this type of water system for this pressure zone.

Water calculations confirming reservoir sizing, pump selection, etc. are found in Appendix A.

The detailed design of the water system will generally follow the Lakestone Development Master Water Plan as prepared by Agua Consulting Inc. for 20/20 Properties and dated Oct 19/2007. Appendix C of the Agua report also sets out a Cost Sharing Strategy between Lakestone and The District of Lake Country which we understand was previously agreed to.

SANITARY SEWER

Introduction:

A new trunk main on Okanagan Centre Road West from the highpoint to Glenmore Road through to the Highway 97 connection to the existing sanitary sewer has been constructed as part of Phase 1. A series of lift stations and force mains to pump sewage from Phase 1 and Phase 2 have also been constructed.

Due to the topographic conditions of the development additional lift stations will be required. Figures 5A, 5B and 5C shows the conceptual trunk main locations and lift station locations. The location of the lift stations is conceptual only and lift

stations will be utilized only where gravity sewer cannot be achieved. Detail design of lift stations and sanitary sewers will be completed at subdivision stages.

Objectives:

.1 To provide for appropriate and economic sewer service to the development.

.2 To minimize maintenance and future replacement costs to the District.

Policies:

.1 The number of lift stations will be kept to an absolute minimum and standardized in so far as practicable in consideration of future District maintenance obligations. Wherever possible, lift stations will not be used to service small numbers of units or development lots.

.2 At the time of subdivision, the Approving Officer will determine the construction standards to be used in consultation with the Engineering Department, the Subdivision Development and Servicing Bylaw and the Master Plan, giving consideration to site constraints, land use, and integration into the District infrastructure.

.3 At the time of subdivision, where the Approving Officer or the Engineering Department requires the developer to oversize certain sanitary sewer infrastructure, the District will provide a Sewer DCC rebate in accordance with the DCC Bylaw.

.4 The Glenmore /Chase Road development site shall be serviced by gravity sewer along Glenmore Road.

STORM DRAINAGE

Introduction:

Figure 6A, 6B and 6C shows the conceptual trunk main routing for the Lakestone Development. The stormwater management plan will use existing wetland areas to store and treat stormwater. Additional detention facilities will be required in order to maintain post development flows at pre-development rates. These may consist of open ponds or in ground facilities.

The storm sewer system will consist of piped system for urban development and open ditches in rural development areas. These will be designed to handle the 1 in 10 year return storm event. Flows for the major storm events (1 in 100 years) which exceed the capacity of the storm sewers will be carried via overland flow routes and diverted to detention facilities or to natural drainage courses.

Where feasible and as approved by the geotechnical engineer, storm drainage from more frequent storm events will be discharged into the ground through the use of drywells and perforated pipes.

The major ravine located between Tyndall Road and Okanagan Centre Road is a significant environmentally sensitive area and care will be required in order to prevent erosion of this ravine area.

Objectives:

.1 To protect property and the natural environment from the impacts of storm runoff.

.2 To maximize opportunities for water reuse and recharge into the groundwater system.

Policies:

.1 The storm drainage system will be designed to retain and re-use storm water run-off on site.

.2 Storm runoff will be limited to pre-development levels.

.3 At the time of subdivision, the Approving Officer will determine the construction standards to be used in consultation with the Engineering Department, the Subdivision Development and Servicing Bylaw and the Master Plan, giving consideration to site constraints, land use, protection of the natural environment and integration into the District infrastructure and having regard to Best Management Practices.

.4 At the time of subdivision, where the Approving Officer or the Engineering Department requires the developer to oversize certain storm drainage infrastructure, the District will provide a Drainage DCC rebate in accordance with the DCC bylaw.

.5 Offsite improvements and the proportionate share of costs will be determined at the time of development. The District may require the

developer to fund engineering studies as part of determining offsite improvements.

.6 Roof drainage from individual lots will be directed to rock pits or to storage tanks for reuse.

TRANSPORTATION NETWORK

Introduction:

The major road network for the Lakestone Development is shown on Figure 7. It identifies the proposed major road alignments at build out of the development.

The Master Plan area is currently serviced by 2 major roads: Okanagan Centre Road West and Tyndall Road. In addition to these, a new internal connector is proposed to service the Highland area and will serve as an alternate link between Okanagan Centre Road West and Tyndall Road. These roads are designated in the Lake Country Master Transportation Plan as Neighborhood Connectors. The District of Lake Country Transportation Plan indicates that these Neighborhood Connectors will have a ten metre wide pavement for the urban cross section and 9.6m wide pavement for the rural cross section. These cross sections are shown on Figure 3.

Neither Tyndall Road nor Okanagan Centre Road West are considered to be within hillside conditions and any deviations from the standards outlined in the District of Lake Country Subdivision and Development Servicing Bylaw would be localized and minor and subject to the discretion of the engineering department at detailed design stages in context to local topographic and environmental conditions. The new internal connector through the Highland area is within hillside conditions and variance from these standards may be considered in order to reduce site grading and hillside scarring.

Local roads are generally indicated on Figure 7. Due to challenging topographic constraints of the development and to minimize site grading and hillside scarring, alternative road design standards may be considered for local roads. Access to multi-family sites will be generally through private roads, while access to single family homes will be provided through the public road network. Figure 7 illustrates which roads are anticipated to be public and private. Actual intersection locations and local road layouts will be determined at the detailed design stage.

The Tyndall-Okanagan Centre Road West intersection will be reconstructed as part of Phase II to provide a safer intersection and to service anticipated increases to traffic generated by this development.

Emergency access routes will be provided where possible to ensure an alternate access or escape route if a primary route of access is blocked. Actual emergency access alignments will be determined at subdivision stage.

Objectives.

.1 To provide primary connections to the existing District road network consistent with the Official Community Plan and Lake Country Master Transportation Plan.

.2 To consider alternative hillside standards for roads in order to minimize site grading impacts where it can be shown that safety and road function are not compromised,

.3 To reduce reliance on the private automobile by providing for alternative modes of transportation including transit, pedestrian and bicycle links to open spaces and high activity areas.

.4 To provide for emergency access routes where possible that allow for alternate access to and from neighborhoods.

.5 To consider impacts of street lighting on the night sky and minimize those impacts where safe to do so.

.6 To design a project that promotes cost effective maintenance for the District and for the developer.

.7 To provide a transportation network that is generally open and available to all residents of Lake Country and is integrated within the broader Lake Country network.

Policies:

.1 As shown on Figure 7, major roads are designated as Neighborhood Connectors as defined in the Transportation Master Plan.

.2 At the time of subdivision, the Approving Officer will determine the construction standard to be used for each road in consultation with the Engineering Department and the Master Plan, giving consideration to site constraints, hillside standards, lane use, traffic and maintenance requirements, and the need to accommodate parking within the road right of way for trail heads and parks identified in the Master Plan.

.3 At the time of subdivision, where the Approving Officer or Council requires the developer to construct excess or extended services for roads, the District will enter into a Latecomer Agreement with the developer.

.4 Offsite improvements and any applicable road DCC credits will be determined at the time of development. The District may require the developer to provide additional traffic impact studies as part of determining offsite improvements. Table 1 on Page 2 – Phasing, shows offsite improvements to be provided by the developer.

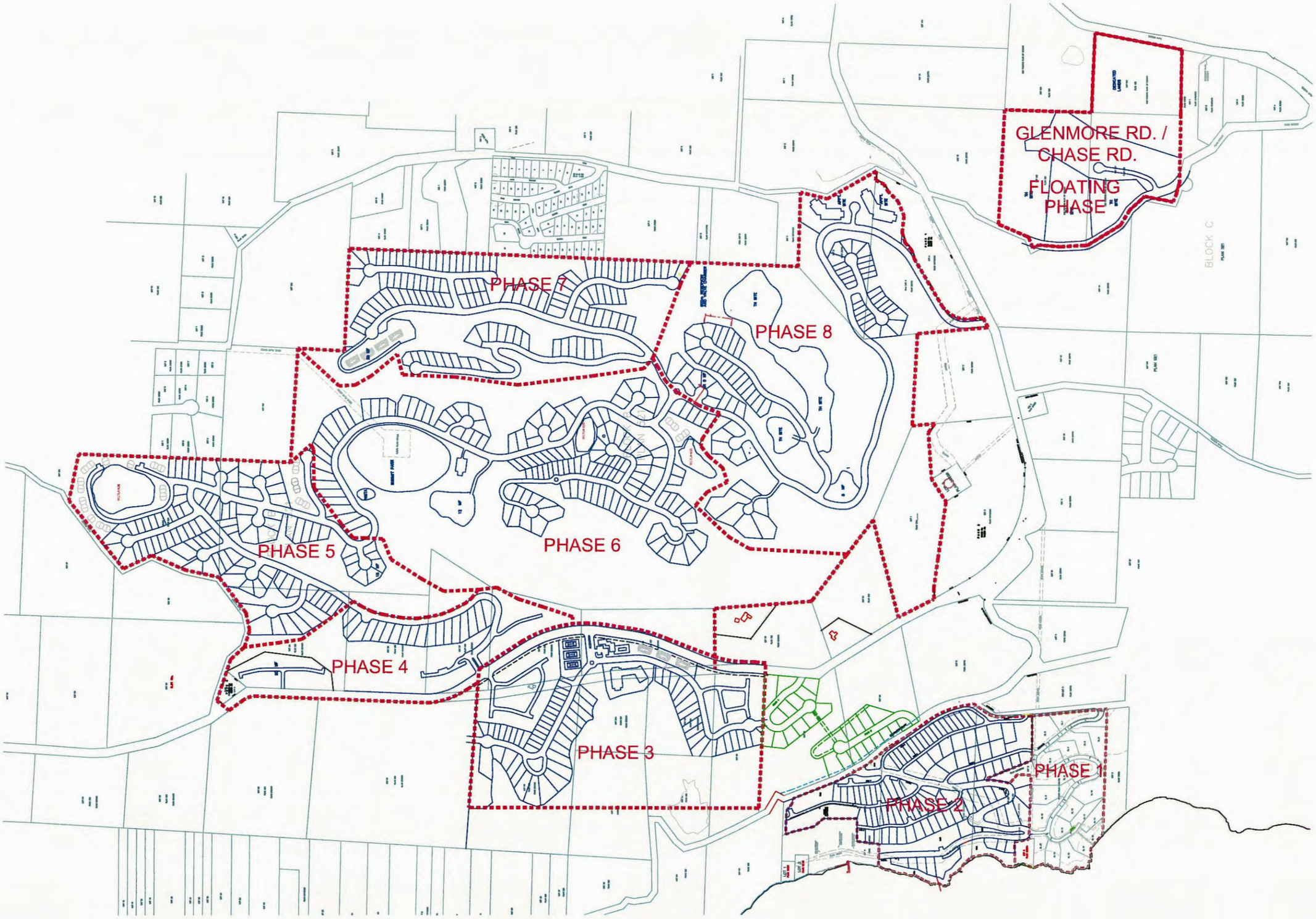
.5 The District will consider a lighting plan from the developer that directs ambient light downwards and provides adequate illumination for vehicular and pedestrian traffic while minimizing spillover onto adjacent property and the night sky.

.6 Roads servicing single-family lots and parks shall be public roads.

.7 Road construction will endeavor to minimize disturbance and delay to the public, and contractors will be required to follow Subdivision and Development Servicing Bylaw requirements, Best Management Practices, as well as all applicable Council policies.

APPENDIX A

PROPOSED WATER SYSYTEM CALCULATIONS



DRAWING
OVERALL MASTER PLAN

PROJECT
LAKESTONE

CLIENT
MACDONALD LAKESHORE PROPERTIES

Fig. 1

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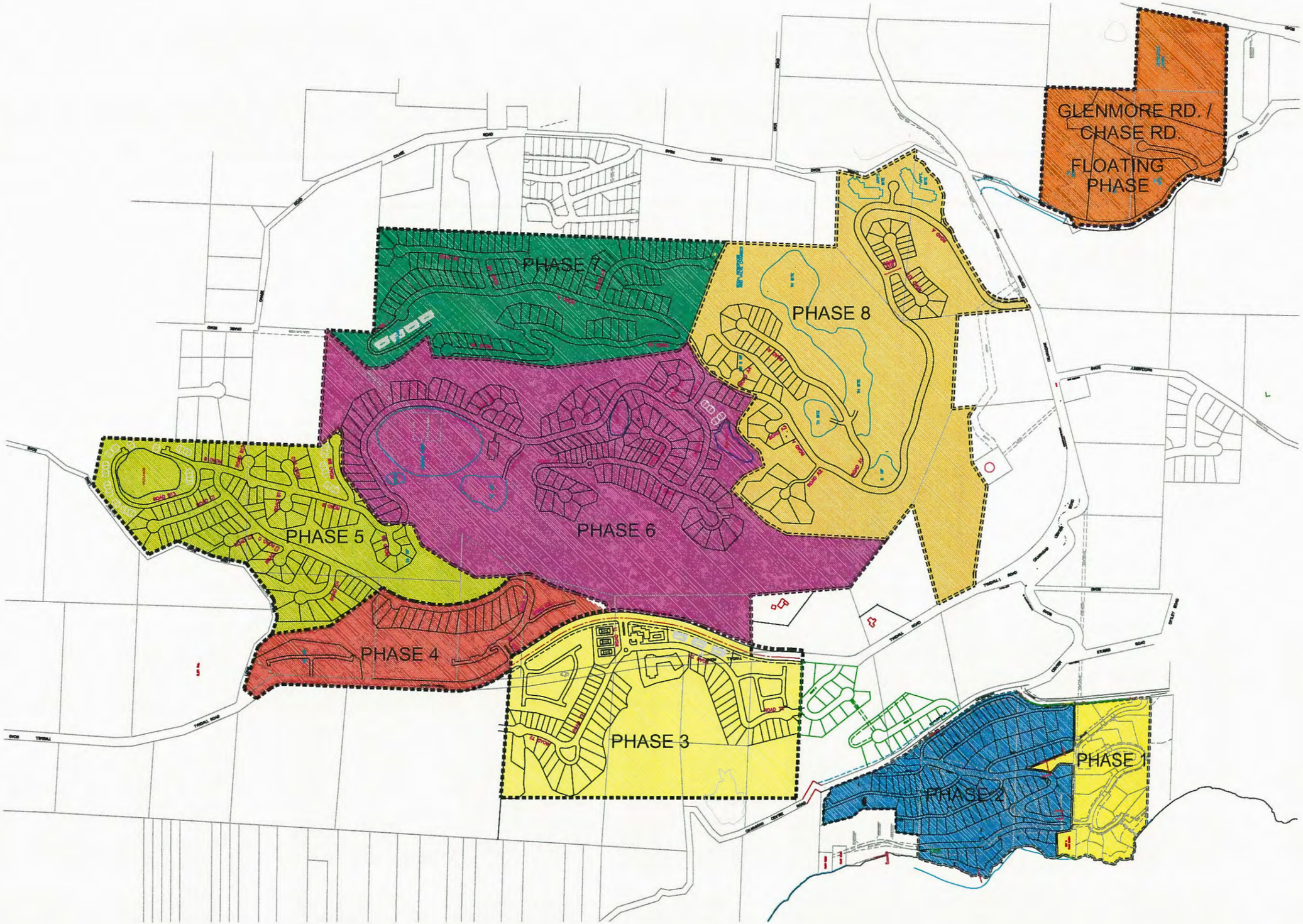

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DRAWING
PHASING PLAN

PROJECT
LAKESTONE

CLIENT
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LAKESHORE
PROPERTIES

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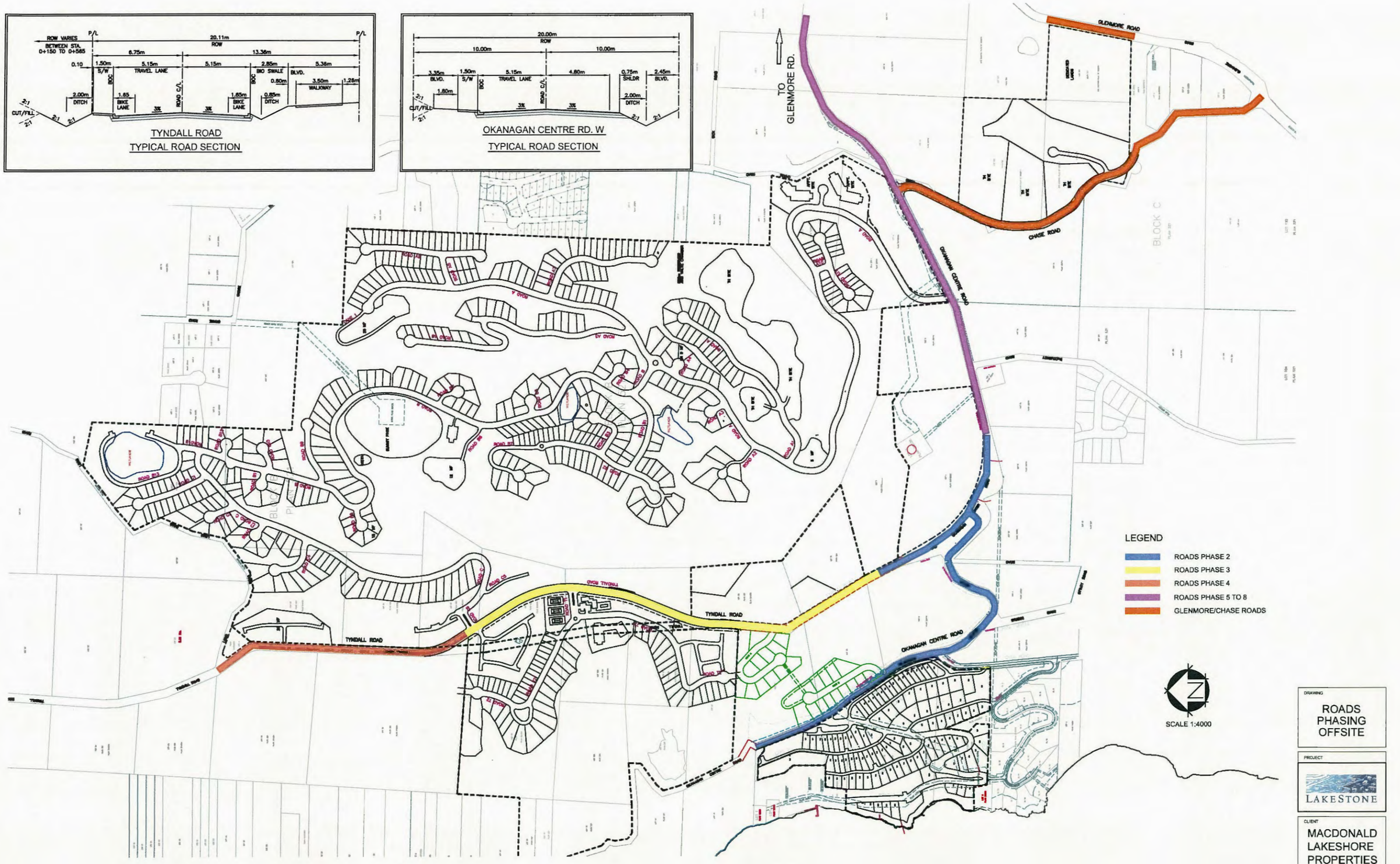
Fig. 2

TYNDALL ROAD
TYPICAL ROAD SECTION

OKANAGAN CENTRE RD. W
TYPICAL ROAD SECTION



DRAWING
ROADS PHASING OFFSITE

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Fig. 3

LEGEND

- 680m PRESSURE ZONE
- 655m PRESSURE ZONE
- 600m PRESSURE ZONE
- 536m PRESSURE ZONE

N

SCALE 1:3000

DRAWING
WATER
PRE-DESIGN

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Fig. 4A

600m RESERVOIR
2,000 m3

PUMP MAIN TO
600m RESERVOIR

PUMP MAIN TO
655m RESERVOIR

BOOSTER STATION
TO 680m PRESSURE
ZONE

655m RESERVOIR
3,250 m3

EXISTING 536m
RESERVOIR

PUMP STN TO
655 RESERVOIR

PUMP STN TO
600m RESERVOIR

LEGEND

- 680m PRESSURE ZONE
- 655m PRESSURE ZONE
- 600m PRESSURE ZONE
- 536m PRESSURE ZONE

SCALE 1:3000

DRAWING
WATER
PRE-DESIGN

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Fig. 4B

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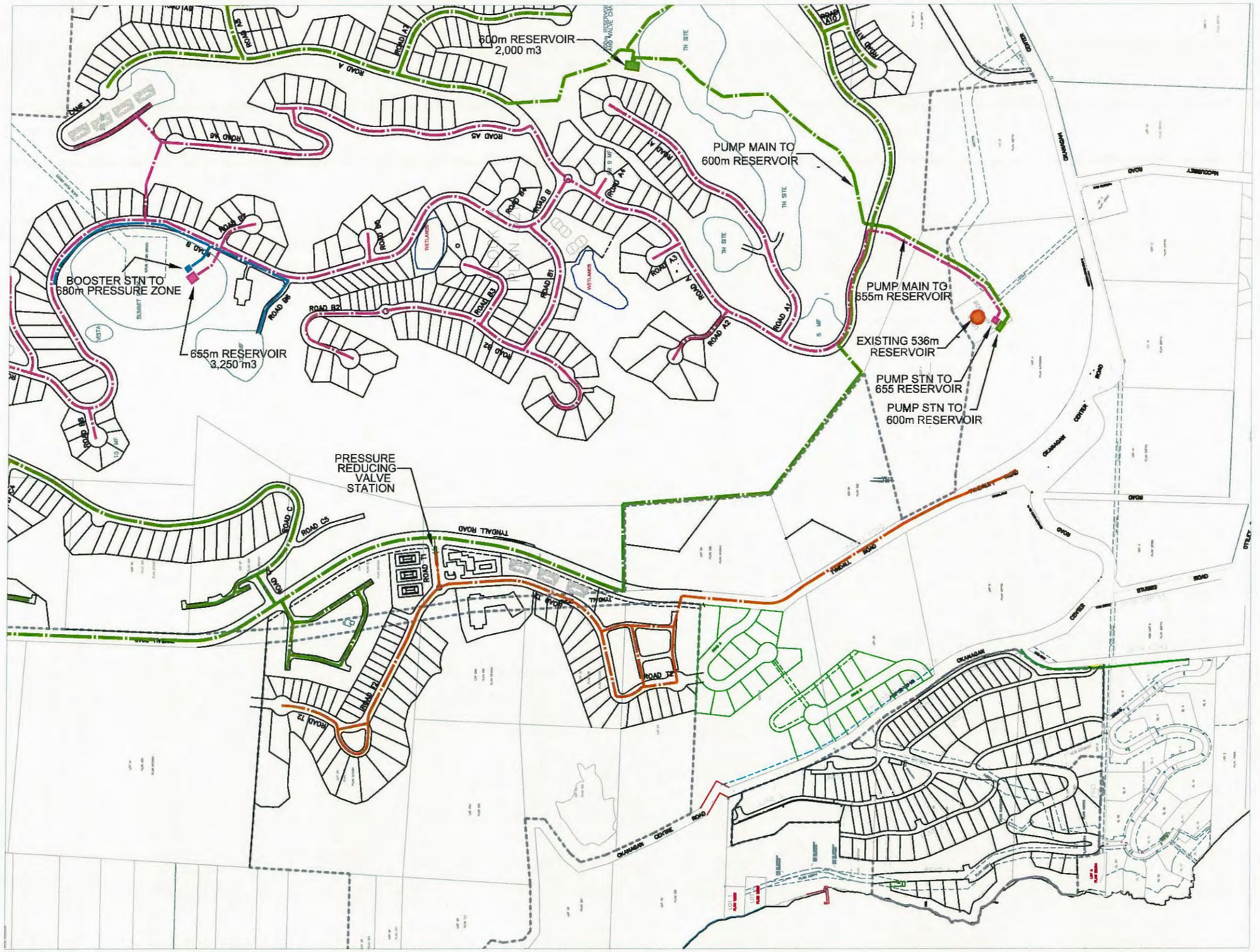

LEGEND

- 680m PRESSURE ZONE
- 655m PRESSURE ZONE
- 600m PRESSURE ZONE
- 536m PRESSURE ZONE

N

SCALE 1:3000

DRAWING
WATER
PRE-DESIGN

PROJECT
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Fig. 4C

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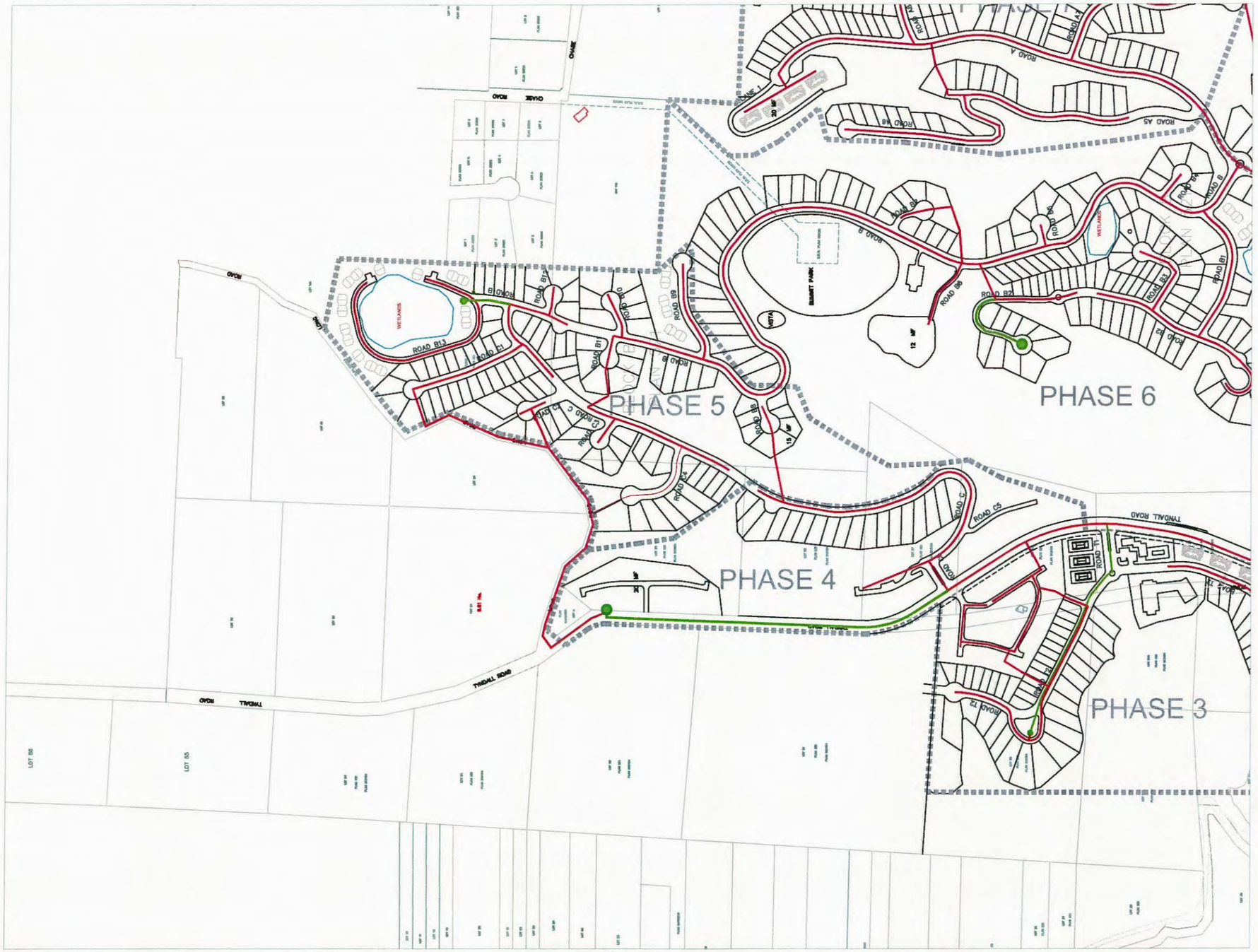

LEGEND

- GRAVITY SEWER
- FORCEMAIN
- PUMP STATION
- HP ▲ HIGH POINT
- LP ▼ LOW POINT

SCALE 1:3000

DRAWING
SANITARY PRE-DESIGN

PROJECT
LAKESTONE

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Fig. 5A

LEGEND

▬	GRAVITY SEWER
▬	FORCEMAIN
●	PUMP STATION
HP ▲	HIGH POINT
LP ▼	LOW POINT

SCALE 1:3000

DRAWING
SANITARY PRE-DESIGN

PROJECT
LAKESTONE

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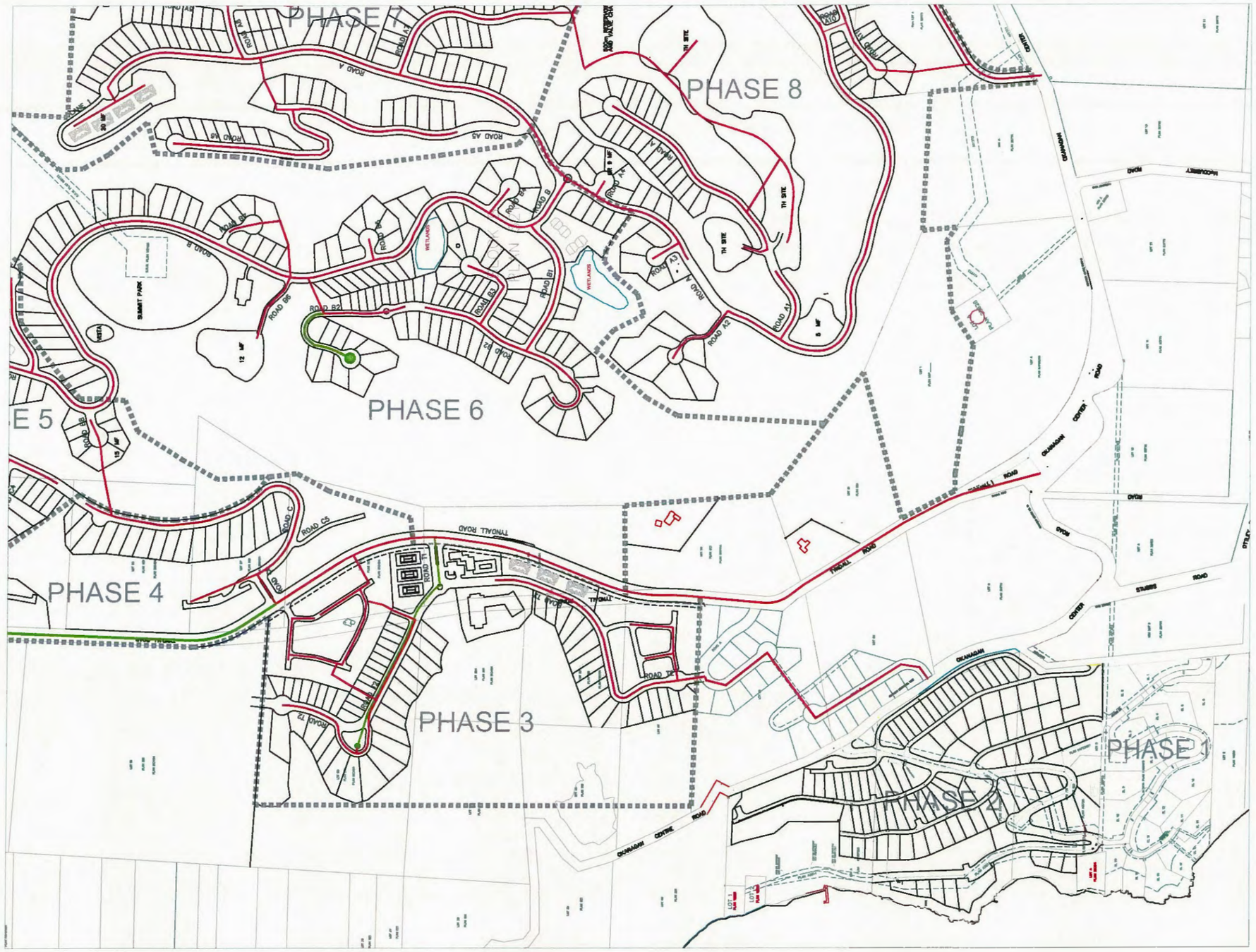
Fig. 5B



DRAWING
SANITARY PRE-DESIGN

PROJECT
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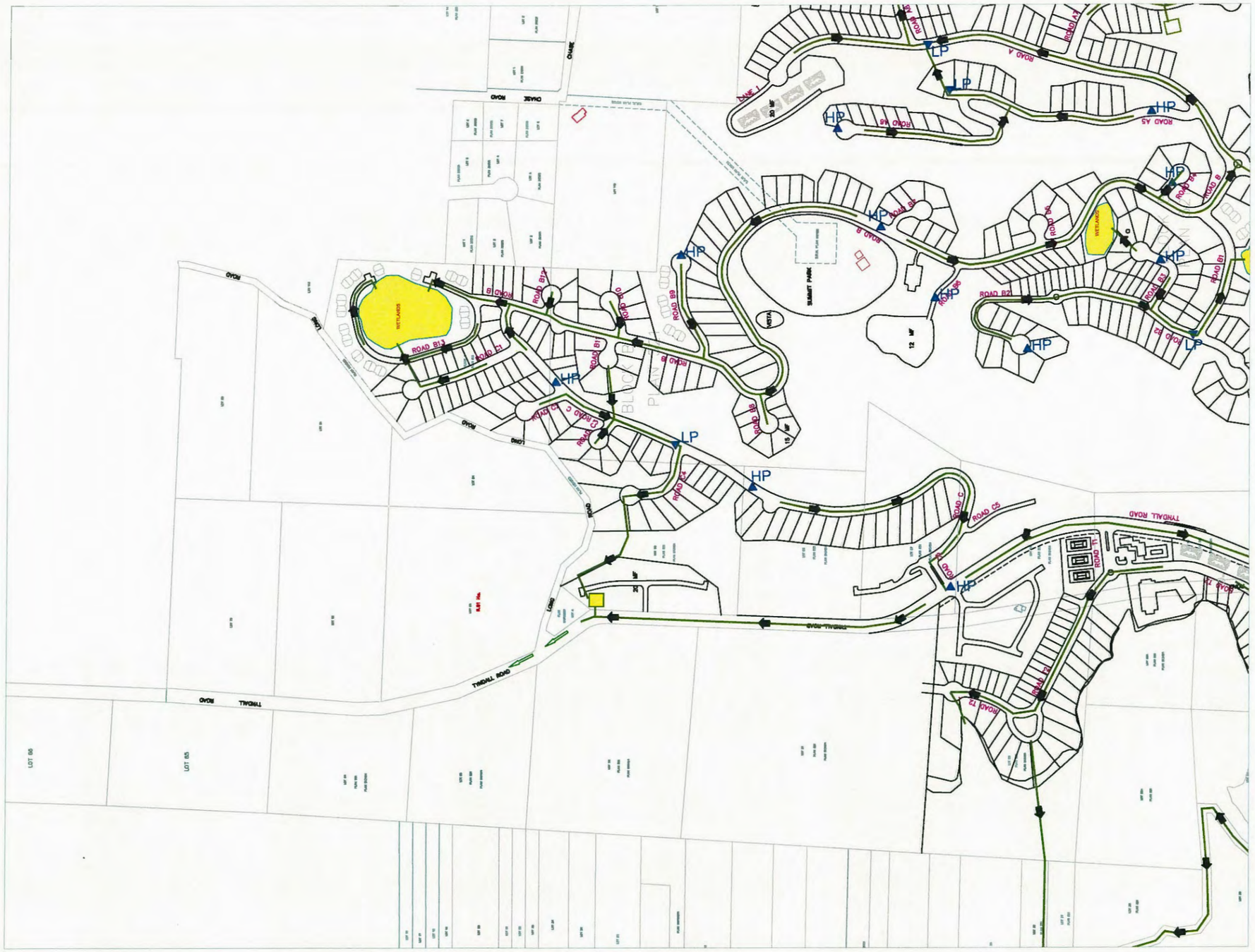
Fig. 5C



DRAWING
STORM PRE-DESIGN

PROJECT
LAKESTONE

CLIENT
MACDONALD LAKESHORE PROPERTIES

10016-STM1.dwg

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ISSUE DATE: MARCH 2012

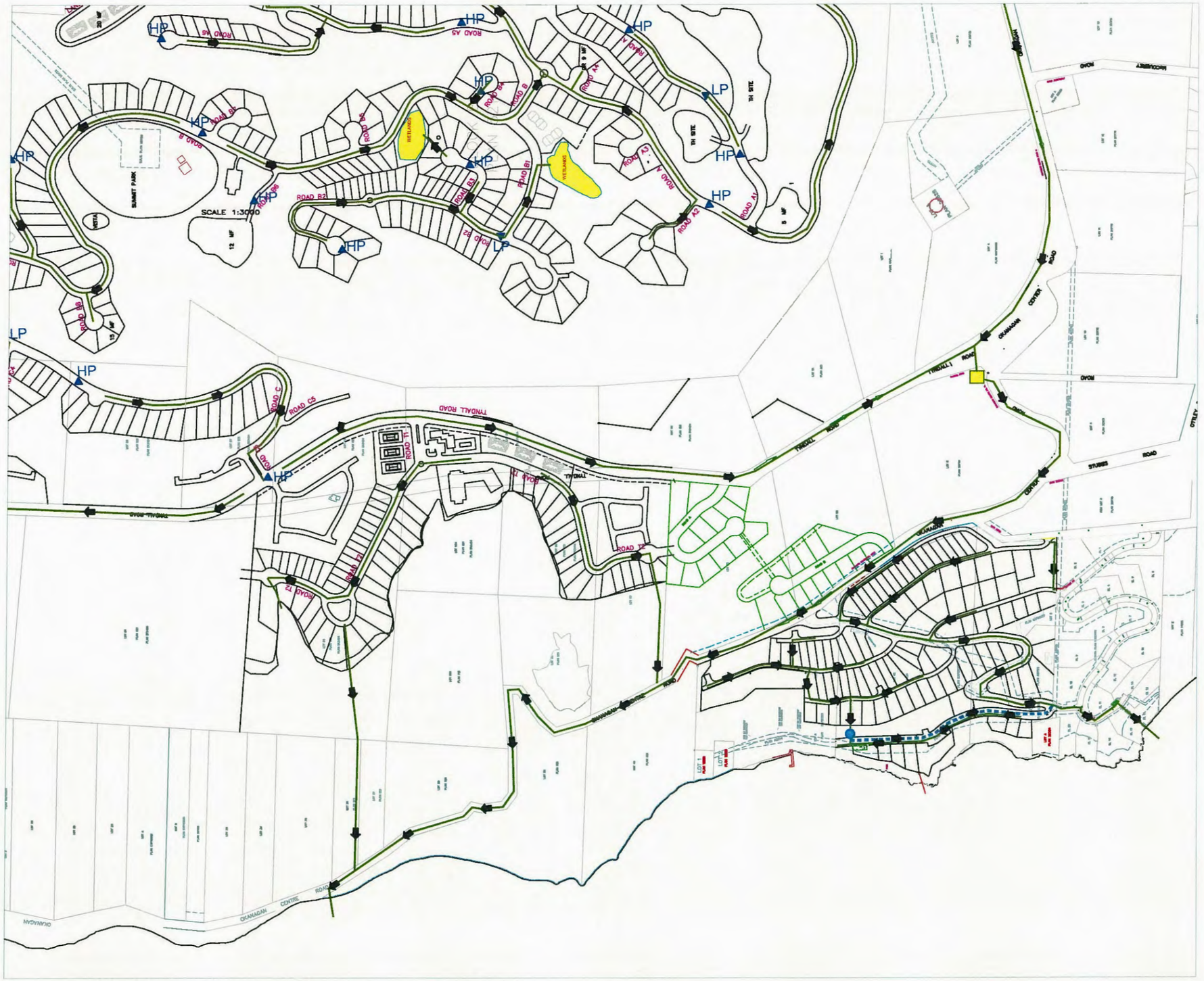
Fig. 6A

DRAWING
STORM PRE-DESIGN

PROJECT
LAKESTONE

CLIENT
MACDONALD LAKESHORE PROPERTIES

10018-STM1.dwg



LEGEND

- GRAVITY SEWER
- FORCEMAIN
- PUMP STATION
- DIRECTION OF FLOW
- DETENTION FACILITY
- HP HIGH POINT
- LP LOW POINT

SCALE 1:3000

10018-STM1.dwg

DRAWING: STORM PRE-DESIGN

PROJECT: LAKESTONE

CLIENT: MACDONALD LAKESHORE PROPERTIES

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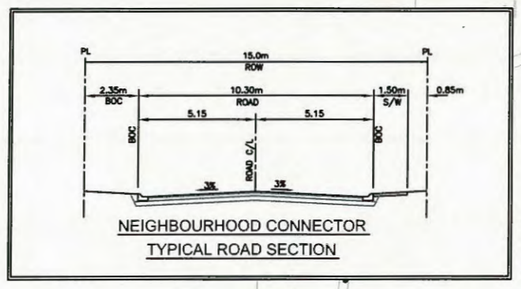
Fig. 6C



NEIGHBOURHOOD CONNECTOR
TYPICAL ROAD SECTION

LEGEND

- CONNECTOR ROAD
- LOCAL ROAD
- PRIVATE ROAD

SCALE 1:4000

10018-ROADS.dwg

DRAWING
ROADS

PROJECT
LAKESTONE

CLIENT
MACDONALD
LAKESHORE
PROPERTIES

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Fig. 7

2.F Environmental Impact

Environmental retention is at the core of LakeStone's approach to development. This master plan places a premium on environmental co-existence through introduction of the following -

- clustering of development to allow for retention of substantial areas of existing forest, wetlands, rock outcroppings, and other natural features;
- extensive open space provision, which depends on retention of the natural setting with the residential, amenity, and foreshore facilities;
- significant trail system, which also provides wildlife movement and habitat opportunities;
- limited development at the environmentally sensitive foreshore, consisting of a drop-off / pickup wharf (assuming the marina is relocated to the north of LakeStone), encouraging the use of kayaks, canoes, and other non-motorized water craft.
- Building Design Guideline process which maximizes retention of existing site conditions through to the end of construction;
- Specific road and servicing standards designed for hillside conditions that minimize scarring and maximize retention of the natural surround.

The on-site environmental impact of LakeStone is reviewed in the Environmental Report prepared by Makonis Consultants. The retention of significant pieces of the environment is also at the core of other LakeStone development policies as outlined in the sections on Steep Slopes, Parks and Trails, and Infrastructure. With over half of the site remaining undeveloped, there are multiple opportunities for a strong environmental platform in this project.

The attached drawing maps the environmental zones and detail resulting from Makonis's field survey. The master plan maintains the isolation of the 3 significant ESA 1 areas on the upper portion of the site through detailed planning of the development areas and roads. Any infringements into these areas are carefully managed per the recommendation, and with specific mitigation areas provided.

Also shown are the areas where development and sensitive environmental areas overlap (Environmental Nodes). Specific recommendations for these areas are addressed in the Makonis Study.

Foreshore Development

The 2006 Master Plan included a 105 slip permanent floating marina with sewage pump-outs and a grotto-styled underground storage area for approximately 250 boats. MLP holds a Licence of Occupation for the area planned for the marina, which is located approximately 100 meters north of the District water supply pump house and immediately below the lakeshore amenity facilities. In early 2011, MLP submitted an application to the BC Ministry of Environment ("MOE") for approval to install a smaller, more environmentally sensitive, 73 slip marina within the same area. The application is pending.

The District recently learned it will be required to make some significant upgrades to its water system over the next 10 years or so to meet some increasing health department standards. To avoid accelerating the deadline to complete the water system upgrade work, the District will be required to maintain a prescribed purity level of the water which is currently being drawn from the District water pump house. Upon learning this news, the District asked MLP to relocate the Lakestone marina. Accordingly, MLP and the District are working together with an objective to enter into an Agreement to build a marina to be installed by MLP at a District-owned site which is north of the Lakestone property, just below DL 32, 33, 34 & 35, all of which would be subject to the approval of the District Council and the MOE. If approved, this relocation would eliminate any concerns which possibly could have been raised by the health department in the event marina had been installed so close to the District pump house. If the proposed relocation of the marina is approved, the existing application will be withdrawn and the Licence of Occupation will be permitted to lapse.

Greenhouse Gas Reduction

As the District of Lake Country has signed on to the BC Provincial Climate Action Charter, which has the objective of reducing community wide greenhouse gas emissions by 33% below 2007 levels by 2020, all new development must align itself with that goal..

There are a number of strategies for the reduction of greenhouse gas emissions at LakeStone that are relevant based on the current planning and locational characteristics for this site:

- Of primary importance is the preservation of open space in the form of retaining existing stands of mature trees. Replacement of trees after development will be as per the Design Guidelines.
- In a master planned community, the opportunity to cluster development such that it maximizes the open space (in this case 52% of the site), is inherently more efficient than

within the community will (as the project evolves) allow the exploration of new and innovative ideas in sustainable housing.

- The desire is to create LakeStone as a walkable community with a connected street network that will ultimately have transit connectivity. This will result in a reduced number of vehicle miles travelled, a key part of reducing greenhouse gas emissions.
- This site has great proximity to goods and services at the Lake Country Town Center a short distance away, making it a logical adjunct to the Town Center commercial and cultural activities, further reducing the number of automobile trips.
- In Lake Country there is an abundance of agriculture, with a wide variety of fruits and vegetables available within a very small perimeter, resulting in significant saved transportation costs and consequent GHG emissions. With the growth of the local food movement, there are few better places to be than Lake Country in terms of self-sufficient food sources.
- As a highly amenitized master planned community, LakeStone will have many of the features and services desired by on-site residents and the resort visitor – examples include pools and exercise facilities, community gathering places, and convenience commercial space.

In the detailed design of buildings, energy efficiency is clearly of primary importance in reducing GHG emissions, and while it is addressed largely in the Design Guidelines, it is relevant to provide some strategy highlights here.

- High performance building envelopes including low e glazing
- Solar control by utilizing building designs that are climatically responsive with significant overhangs
- Use of local materials – in Lake Country, we have ready access to wood, stone, and other materials, reducing travel distances for these components
- High efficiency mechanical equipment will be utilized in all Amenity buildings, and for our lakeside pool amenity (scheduled for construction start in late 2012), rooftop solar panels are incorporated to heat the pool water
- Low flow fixtures, including dual flush toilets (or other water efficient fixtures), will be required throughout the community
- Alternate energy sources such as geothermal are encouraged, and detailed discussions are ongoing about how this can be implemented efficiently
- For all homes, either single or multi-family projects, rough-in provision will be made such

that they can be retrofitted with solar panels for either electricity generation or hot water heating.

There are a number of additional strategies at LakeStone that may not neatly fit into the GHG reduction category, but are clearly relevant from an overall environmental / sustainability perspective, including:

- Design techniques that allow stormwater runoff to infiltrate into the ground or be collected close to its source. This could include bioswales and other strategies.
- All homes to have rain barrels to reduce storm water surges onto the ground, and also to function as supplemental irrigation during the dry periods of the year
- Minimizing impermeable surfaces is also a goal, recognizing that this must be considered in the context of DOLC Engineering requirements.
- Utilize native plant species to reduce the use of chemical pesticides and herbicides
- Install water meters in all homes to control and reduce water usage
- Landscape throughout the community must conform to the xeriscape guidelines appended to Section 2.H, using native plant materials wherever possible

Makonis Consulting Ltd

Mapping Solutions

February 29, 2012

MacDonald Lakeshore Properties
11th Floor 938 Howe Street
Vancouver, British Columbia
Attn: Mr Donal O'Callaghan

Re: Lakestone Master Plan Environmental Amendment 2012

Donal,

Note:

- Changes to this document from 2011 Amendment are toward the revised wildlife corridors plan. Protech provided a revise concept plan with improvements to the overall corridors throughout the plan area.

Background

MacDonald Lakeshore Properties retained Makonis Consulting Ltd (Makonis) to complete a revision to the 2006 Lakestone Master Plan[1]. The 2006 Lakestone Master Plan was undertaken under the directions of the previous owners, 2020 Properties. MacDonald/Lakeshore Properties, new owners, have revised the development design for the Lakestone Master Plan area located in the Okanagan Centre – Tyndall Road Neighbourhood. This environmental assessment amendment will build upon the previous environmental inventories and sensitivity analysis from 2005 – 2006 without any changes. The following will focus on the changes to the development design from 2006 and report on these changes and address impacts and environmental gains; as well update the recommendations to incorporate the new development design (Replacing sections 3.0 – 4.0 in the previous 2006 Master Plan reporting).

In summary the revised 2012 Lakestone Master Plan designs begin in Phase II along the foreshore of Okanagan Lake where the previous plans implemented were left in partial development. Here Phase II has been revised and put forward to the District of Lake Country in July of 2011[2]. Phases III to VIII are contained up slope within the main body of the subject area's parcels, leaving a remnant parcel along Chase - Glenmore Road. Figure one, from Protech Consultants Ltd illustrate the overall revised designs and the proposed phasing. Distinct differences in the two Master Plan designs are the elimination of the golf course and vineyards leaving a significant amount of green space – park to be left in natural state. Proposed numbers of single / multifamily units in both Master plans are 1365 units. This includes the existing numbers for Phase I and currently purposed Phase II.

Proposed 2011 Master Plan design designates 57% of the Master Plan areas as natural areas (open space – parks). Figure two illustrates the overall proposed footprint of the revised design with

[1]Makonis Consulting Ltd and Okanagan Wildlife Consulting. 2006. 20/20 Properties: Lakeside Terrestrial Environmental Master Plan. Kelowna, B.C. 33p.
[2]Grods, J. 2011. Lakestone Phase II DP. West Kelowna, B.C. 10p

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proposed natural areas. Previous 2006 Master Plan design only proposed 6% park, or 13.1ha and 6% of trails (~green space), or 13.59ha, totalling 26.6ha (12%) as natural areas. Revised 2011 Master Plan is 116.62ha, or 57% of the total area of 204ha as open space - parks. A fourfold increase in natural areas.

Environmental Impact Assessment

Large – scale development of what is currently a relatively natural area will impact wildlife currently residing in, or using this area. This will result from loss of habitat, as well as disturbances that will limit the usefulness of remaining habitat from people and their pets. If development is accepted as a given, then it remains to mitigate the losses of habitat so that the most significant and useful pieces of habitat remain for the most significant species. The impacts of most concern would be fragmentation, disruption of the natural disturbance regime, encroachment of invasive species, edge effects, and changes of hydrological patterns.

Historically and prior to our investigations a number of disturbance types were identified during the site investigation, although the timing of these disturbances is not known. Portions of the native forested community have been removed. Previous access roads into the site, which may have been constructed in conjunction with the logging, have also created minor cut slopes and landings. A prior quarry was also found mid section of the steep escarpment of the property.

Large portions of the forest on the property have suffered extensively from in growth, fire suppression, drought and beetle attacks, as with most forests in the Okanagan Valley. This will become evident in forest health and fire mitigation reports.

Where impacts into sensitive sites cannot be avoided or some development has been proposed for Environmentally Sensitive Areas, impacts can be mitigated by restoration and enhancement in other ecosystems. Further specifics are addressed below.

Wherever possible, the project design should avoid impacts to the sensitive areas and valued ecosystem components such as den sites, veteran trees and wildlife corridors. Ecosystem fragmentation may have significant impacts as a result of development in specific sites of the area. As a result of this report, we have identified general habitats to address where these sites may occur in the area and immediate surrounding areas and have provided overall sensitivity ratings based on each of the species of concern.

However, part of the challenge of minimizing the impacts that any suburban development will have on wildlife habitat is retaining the wildlife values of those natural areas that are kept within and adjacent to the development. The terrestrial portions of the area are currently isolated from undeveloped Crown Land by rural and increasing suburban development to the north, south and east, and by Okanagan Lake to the west. The area is therefore already naturally isolated from wilderness areas and is recognized as an urban growth area under the Official Community Plan, making the challenge of retaining wildlife use of this area even more important.

One of the best tools for maintaining wildlife values will be encouraging the pride of public ownership and stewardship of the valuable remaining open spaces within the area. The adjacent land owners as well as others resident in the area will need to feel, and to see, that these areas have some value other than a "natural" extension of the backyards of those residing next to these areas. Public use of these areas needs to be well defined during final stages of development to best manage them for both human use (trail corridors or walkways, particular as unpaved, minimal impact trails) and for wildlife use. Trails are important to keep people on certain areas so that more sensitive areas do not get

trampled. When people regularly use these as walkways they will also appreciate the value of these areas as open space and will not be as likely to abuse them.

Encouraging stewardship of people's own private yards in a manner conducive to wildlife will help these same people value the wildlife that may use the natural areas that occur within and adjacent to the development. Publications that could be made available to private land holders within the development include the Naturescape B.C. publication from the Stewardship Series (Campbell et al. 1995) which encourages planting and maintaining backyard wildlife habitat. The Naturescape Southern Interior Kit includes this publication as well as native plant and animal booklets and resource booklets. Other publications available that outline the values of habitat to wildlife in the dry forests of the southern interior include the Stewardship Options handbook of the Stewardship Series (Penn 1996), and several Wildlife Tree publications including Steeger et al. (undated) as well as pamphlets available from B.C. Ministry of Environment.

Within these open spaces, some of the more important features to retain will be rocky areas as hibernacula and refugia for snakes (Gopher Snakes and Racers). Large trees should be allowed to remain for cavity-nesting birds, bats and other creatures. Dense smaller trees could be thinned out to reduce fire hazard while still retaining the larger trees, or a number of medium-sized trees that will someday become larger trees that will be suitable for wildlife use Domestic cats that are allowed to roam will take a large toll on ground-nesting birds and other small wildlife in these open spaces, and can cause needless aggravation to other owners who have made their own backyards particularly attractive to birds. New owners should be made aware of the detriment that cats can be to all manner of small wildlife when roaming free and should be encouraged to keep cats indoors.

To develop an ecosystem sensitivity rating for the area, the area was correlated to the recently completed Sensitive Ecosystem Inventory (SEI) for the Central Okanagan TEM, based on the important ecosystem features that could be met on site. These included:

- Species Diversity,
- Landscape fragmentation,
- Distribution,
- Fragility,
- Disturbances, and
- Rarity.

Ecosystems were considered on the above points directly and in relation to the Central Okanagan SEI, which classified groups of generally similar ecosystems and habitat. For example the many types of grasslands, wetlands and riparian ecosystems were lumped into general areas of "Grasslands, Wetlands and Riparian" in the Central Okanagan SEI. The aim of our efforts is to extend these toward specific ecosystem types such as marsh or swamp wetlands which respond quite differently to environmental constraints and contribute varied ecological values, i.e., wildlife habitat. This approach was taken to better address the major differences in scale and inventory resolution between this study (1:10,000 – 5,000) and the Central Okanagan SEI (1:20,000).

The result produced significance ratings for Environmentally Sensitive Areas (ESA) and is an amalgamation of wildlife habitat and vegetation community ratings (figure 1). The resulting Environmentally Sensitive Areas represented in these categories contribute high habitat and conservation values, relatively unmodified, ecologically fragile or recognized as rare in the provincial landscape (Iverson and Cadrin 2003). These significance ratings are ranked as:

ESA – 1:	High Values
ESA – 2:	Moderate Values
ESA – 3:	Low Values
ESA – 4:	No Significant Value

ESA were identified on the property of varying significance ratings and the general mitigation guidelines are presented below as follows (figure 1):

ESA – 1 contains significant vegetation and wildlife characteristics representing a diverse range of sensitive habitat. These features contribute significantly to the overall connectivity of the habitat and ecosystems. A no development buffer should be incorporated into the design, and generally should be at least 10 meters (Okanagan Lake would require minimum of 15 meters). If development should occur within these areas mitigation will promote no net loss to the habitat (typically with a 3:1 replacement), which may include recruitment and enhancement of ESA 2.

ESA – 2 or moderate significance were found on the property and contribute toward the overall diversity and contiguous nature of the surrounding natural features. If development is pursued in these areas portions of the habitat should be retained and integrated to maintain the contiguous nature of the landscape. Development impacts in these areas can also be mitigated with clustered, multi-family housing rather than standard single-family subdivision.

ESA – 3 polygons were delineated as low significance representing disturbed forested habitats. These areas contribute to the diversity to the landscape, although based on the condition and adjacency of each habitat the significant function within the landscape is limited. If development is pursued in these areas the impacts should be offset by habitat improvements in other more sensitive natural areas found on property.

ESA – 4 polygons delineated contributes little or no value to the overall diversity or vegetation, soils, terrain and wildlife characteristics of the area. Development is encouraged to be focused to these sites before consideration developing higher rated sites of the area. These areas shall not be considered as areas for restoration and enhancement or as recruitment as higher value ESA in offsetting development in other areas.

Lakeside - Environmentally Sensitive Areas

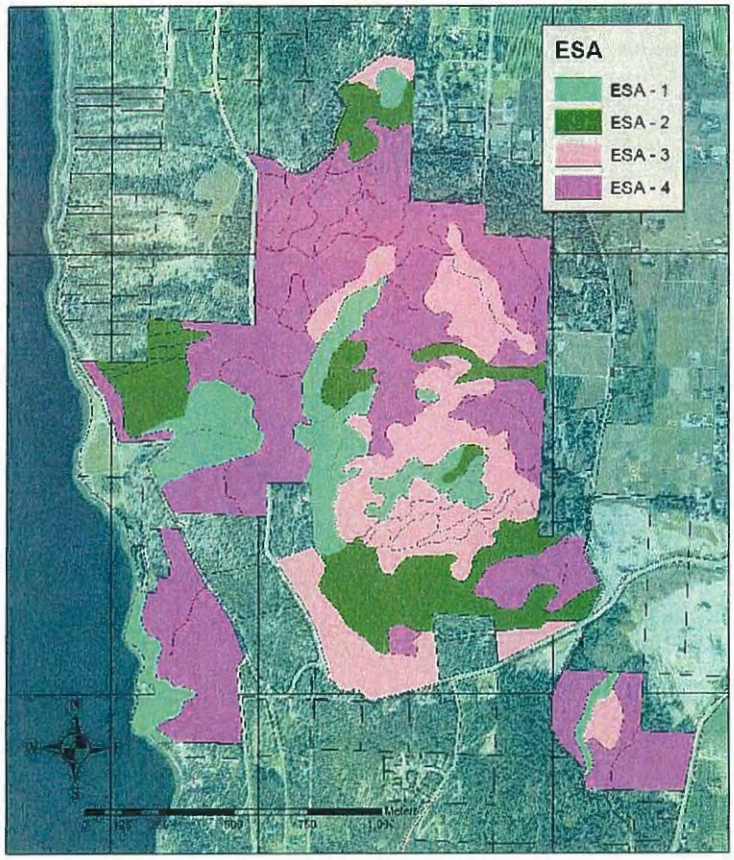

Figure 1. Environmentally Sensitive Areas (ESA) for the proposed Lakestone development in Okanagan Center – District of Lake Country. (illustration was previously figure six in the 2006 Masterplan)

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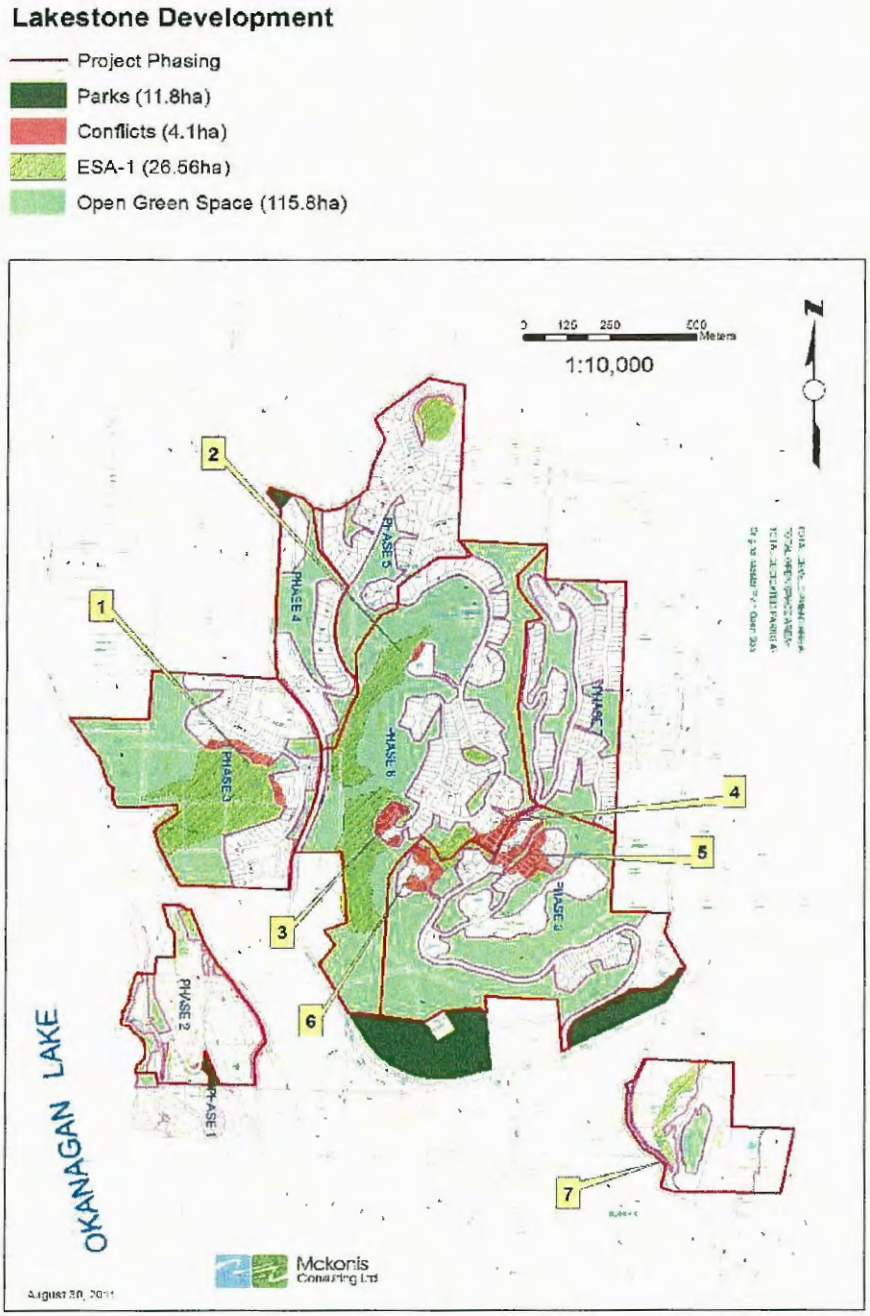

Figure 2. Environmentally Sensitive Areas (ESA) and the proposed 2011 Lakestone development. A significant increase of green space – parks from the older 2006 plans.

Review of the 2011 Lakestone Masterplan design shows several ESA – 1 conflicts with the proposed development, figure 2. From the 2011 conceptual design overlaid onto the existing ESA – 1 areas identified in the 2005 – 2006 inventories and reporting a total of 4.3ha of ESA-1 will be impacted. The impacts by phase are as follows:

- Phase – 2: none
- Phase – 3: 0.7ha
- Phase – 4: none
- Phase – 5: none
- Phase – 6: 1.6ha
- Phase – 7: none
- Phase – 8: 1.8ha
- Chase: 0.2ha (approximated for road crossing)

As 4.3ha of ESA - 1 is anticipated to be impacted under the current 2011 Lakestone Master Plan design it is recommended a minimum of 13ha be provided as compensation of protected green space. If current design plans are implemented the increase in greens pace from the 2006 Masterplan addressing the ESA – 1 impact – compensation criteria.

Phase – 3

There is 8.2ha of ESA – 1 to be left intact and protected. 0.7ha of ESA-1 maybe impacted along the backside of several properties in this phase. Some of the anticipated impacts maybe avoided with a no disturbance protected covenant on the ESA – 1 with fencing to reduce the overall impact in this phase. (Node 1). 10.53ha of Phase – 3 is further designated as open green space. Connected directly to the ESA – 1 this is adequate compensation for the ESA -1 impacts of Phase – 3.

Phase – 4

No ESA – 1 impacts in this phase. However, an additional 4.6ha of green space is proposed for this phase. As well 0.24ha of dedicated Park space.

Phase – 5

No ESA – 1 impacts in this phase. The 1.1ha wetland found within this phase will be preserved with additional green space surrounding the feature. Additional green space proposed for this phase is 4.9ha.

Phase – 6

8.1ha of ESA – 1 is remaining intact of 9.7ha within Phase – 6. This includes the prominent rock bluff facing Okanagan Lake and the two remaining wetlands found in the Lakestone Masterplan area. The remaining ESA – 1 and an additional 26.8ha is proposed for the green space within this phase. Bringing the total green space for this phase to 34.9ha. Exceeding the minimum 3:1 ESA replacement criteria.

The ESA – 1 impacts maybe reduced further at the time of design by rear yard setbacks and fencing with No Disturb Covenants on individual lots anticipated to impact the ESA – 1. This is reflected in Nodes 2, 3 and 4 in figure 2.

Phase – 7

No ESA – 1 impacts in this phase. However, an additional 8.4ha of green space is proposed for this phase.

Phase – 8

The phase has proposed 23.5ha of green space with 1.6ha of this of ESA – 1. 1.8ha of the original 3.4ha of ESA – 1 is anticipated to be impacted. These impacts maybe reduced at time of design – build out with rear yard setbacks and No Disturb Covenants on individual lots. These impacts is reflected in Node 5.

Chase Road

No design plans have been provided for the Chase Road area. However, it is still anticipated a road – access in this area will impact a portion of ESA – 1, 0.2ha is estimated. 1.1ha of green space is anticipated in addition to the remaining 1.1ha of ESA – 1. Bringing the total green space for this Phase up to 2.2ha.

In summary it is anticipated some ESA – 1 is to be impacted, as seen in figure 2. These impacts are compensated by exceeding the amount of green space under a 3:1 replacement. As well during the design build out of each phase the anticipated impacts can be reduced with a closer detailed review of individual lots and placement of rear yard setbacks, fencing and No Disturb Covenants. As well the review should include identification of opportunities for rehabilitation, restoration and enhancements to remaining ESA – 1 and all open green spaces.

Under the previous plan wildlife corridors were addressed (drawing 3.2) as broad conceptual features to be no less than 30 meters in width connecting the natural features in Lakestone to surrounding habitat. This has not changed, figure 3. With the increased amount of green space in this revised plan the connections are natural and exceed the minimum 30 meters. This is in line with Development with Care Best Management Practices[3] (BMP) corridor recommendations. Overall there will be points where the corridor pinches below the 30 meters, however the overall corridor widths assessed on average are greater than 50 meters.

[3]Polster, D., et al. 2006. Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia. Ministry of Environment, Victoria.

2011 Lakestone Masterplan - Corridors

- Project Phasing
- ESA-1 (26.56ha)
- Conflicts (4.1ha)
- Open Green Space (115.8ha)
- Parks (11.8ha)
- Proposed 2011 Wildlife Corridors
- Proposed 2011 Masterplan Design

SCALE: 1:10,000

August 30, 2011

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With the change in overall Master Plan design to eliminate the golf course from the 2006 plans and adjustments to the footprint the green space – parks currently provide sufficient buffers and connections of these sensitive features. Figure 2 clearly shows buffering along most sides of each ESA – 1 that exceeds the Best Management Practices recommended distances. Including a revised corridor plan that also exceeds provincial BMP's.

The following table summarizes the differences between the two Master Plans. The areas were of differing sizes so the comparison can be made in percent of total area for each of the plans. What is noticeably a significant improvement between plans is the decreased sizing of development footprint and the significant increase in natural areas to be kept in parks, open green space and ESA-1 protected areas.

	2006 Plan		2011 Plan	
Proposed Development	178.31 ha	71%	87.38 ha	42%
Conflicts of ESA 1	12.0 ha (approx)	4%	4.1 ha	2%
ESA - 1	20.1 ha	8%	22.46 ha	11%
Open Green Space	19.6 ha (approx)	8%	78.9 ha	39%
Parks	23.9 ha	9%	11.8 ha	6%
Total Natural Areas	63.36 (approx)	25%	113.2 ha	56%

Recommendations

A portion of the subject property has been designated as a sensitive habitat, and as such, we have made recommendations to:

- Identify and protect these sites from degradation, prevent development in non-disturbed areas, and protect the remaining natural features of the site from other negative impacts; and
- Recommend rehabilitation, restoration, and enhancement opportunities.

Further considerations and recommendations were also given to the entire subject property within context of the natural features in the surrounding areas as within the Best Management Practices. General recommendations are as follows:

- Development should not occur in ESA – 1 designated areas and adjoining green space - parks should be integrated into the development plans to maintain the feature. Development should not occur within these areas unless mitigation promotes no net loss to the habitat (typically with a 3 :1 replacement). These were identified in the previous section and initial 2011 Lakestone Master Plan concepts exceed the minimum requirement of 3:1 for each phase.

- Integration of "green space networks" associated with ESA – 2 designated areas to serve as wildlife corridors, preserve ecosystem connectivity, and high scenic values associated with neighbourhoods.
- Trails and pathways should be carefully designed and constructed to avoid impacts to ESA – 1 designated area. If development is pursued in these areas the impacts should be offset by habitat improvements in other natural areas found on property.

Other general recommendations to development for the 2011 Lakestone Master Plan area are as follows:

1. Slopes of 30% need to be delineated to identify areas towards which development should not be directed without the detailed planning to lessen the impacts, such as lower density;
2. Integrate water and drainage of the site into wetland features. This will be followed up with detail design plans and approvals from the province;
3. Minimize cut and fill slopes and, where possible, utilize natural topography in the development design;
4. Minimize fencing to locations absolutely required. It is anticipated fencing maybe part of the design plans on individual lots along ESA – 1 areas. Fencing prevents wildlife movement and defeats preservation of wildlife corridors. If fencing is required, post and rail is the preferred construction. Height of fencing should be restricted to 42 inches to allow passage of larger mammals such as deer; ,
5. Services should be located outside ESA 1 where possible;
6. Trail networks to be established should utilize service corridors where possible to minimize the impact and loss of habitat;
7. Trails should be constructed to minimize habitat impacts and only approximately 2.5 meters in width, maximum and utilize the natural topography or existing trail system;
8. Minimize the road construction, including crossing of gullies and natural corridors, as well;
    a. *Integrate reptile and amphibian habitat where roads may bisect and maintain significant travel corridors between them; and*
    b. *Follow natural topography of the terrain;*
9. Designate no disturb areas prior to construction with flagging and/or temporary fencing;
10. Invasive and Noxious weeds are a consistent threat during development and the following prescriptions will assist to minimize this impact:
    a. Hydro-seed disturbed sites shortly after construction, during appropriate times of the year, to limit the potential of erosion and introduction of invasive weeds;
    b. All contractors and residents should inspect their equipment and vehicles and remove noxious weeds to ensure they do not transport noxious weed seeds onto the property.

11. Ensure construction activities are conducted during appropriate times of the year to avoid potential impacts to nesting and breeding wildlife;
12. Habitat corridors will be incorporated into the development design to provide access between significant Environmental Sensitive Areas and avoid fragmentation and alienation of habitat and species. The current layout of the 2011 Lakestone Masterplan addresses the overall connectivity well. Any proposed changes to the 2011 Lakestone Masterplan in the future will need to address this aspect is kept;
13. Retain Habitat Trees where possible as part of the overall development design;
14. Designs and habitat management should focus toward key species, such as Flammulated Owl, Lewis Woodpecker and other species typically found in ESA 1 habitat and within the surrounding areas. This would include integrated fire mitigation plans with conservation and habitat requirements;
15. Replant and restore habitat areas only with native plant species. Much of this material can be obtained from the site prior to site grading;
16. Works around water – wetland, ESA – 1and green space features should include comprehensive Environmental Monitor Plans. Which include comprehensive erosion and sediment control measures as it should be noted discharge of deleterious materials into Okanagan Lake is a Federal Offence under the Fisheries Act;
17. Road crossings occurring on natural drainage or seepage sites should integrate measures to ensure the hydrological patterns are not altered to avoid impacts on riparian and wetland communities down slope;
18. Storm water management plans can be implemented in establishment of several retention ponds. These can serve as temporary wetland features when constructed well;
19. Integrating box culverts or bridges as wildlife corridors under roadways could reduce impacts from road mortality.
20. During construction follow Best Management Practices for sediment and erosion controls to prevent deleterious substances entering local water ways.

Environmental Monitor

An environmental monitor (EM) should be retained for the duration of the proposed development to periodically inspect and ensure compliance of the recommendations presented in this report. We recommend the EM complete at least one visit every week during site grading and landscaping activities.

Environmental Monitor has the authorization to stop works if there is a perceived or known situation detrimental to environmental values, and/or in contradiction to this reporting, DP requirements, federal – provincial legislation.

Reporting will be submitted to District of Lake Country with copies to the contractors and owners of the project.

The Environmental Monitor will make themselves readily available to provide advice in a timely mannar to District of Lake Country, contractors and development owners.

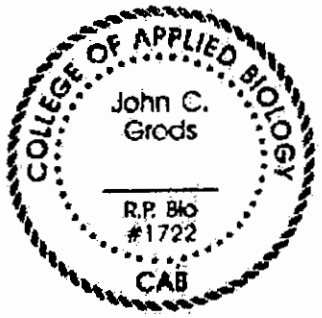
Conclusion

The proposed revised 2011 Lakestone Masterplan is expected to slightly impact the existing ESA – 1 or surrounding habitats. However the revised 2011 plans more than exceeds the the compensation requirements for "No Net Loss" and we have provided recommendations that should help guide an environmentally responsive development and ensure that potential detrimental impacts to the natural environment will be mitigated.

Sincerely,

John Grods R.P. Bio

MAKONIS CONSULTING LTD



955 Westbrook Drive, West Kelowna, British Columbia V1Z 1R5
Tel: 250.469.1087 – Internet: john@makonis.com

2.G Topography / Steep Slope Analysis

A major part of LakeStone's natural environment contains steep slopes. To retain the existing character, specific measures for development on all slopes will be required – including an on-going process of adapting building to setting, as more detailed information is available through the development process.

Master plan / Natural Setting Respected: A particular emphasis of this master plan is on retention of the natural setting – slopes, trees, vegetation, and rock outcroppings – as well as a significant amount of open space. Building lots will not be defined by complete re-grading of each site to a 'building platform' but will require special measures to encourage development that respects site character. Roads and services design will emphasize working with the existing grade, including development of details and layout that maximize retention of the natural setting and minimize the disturbed area.

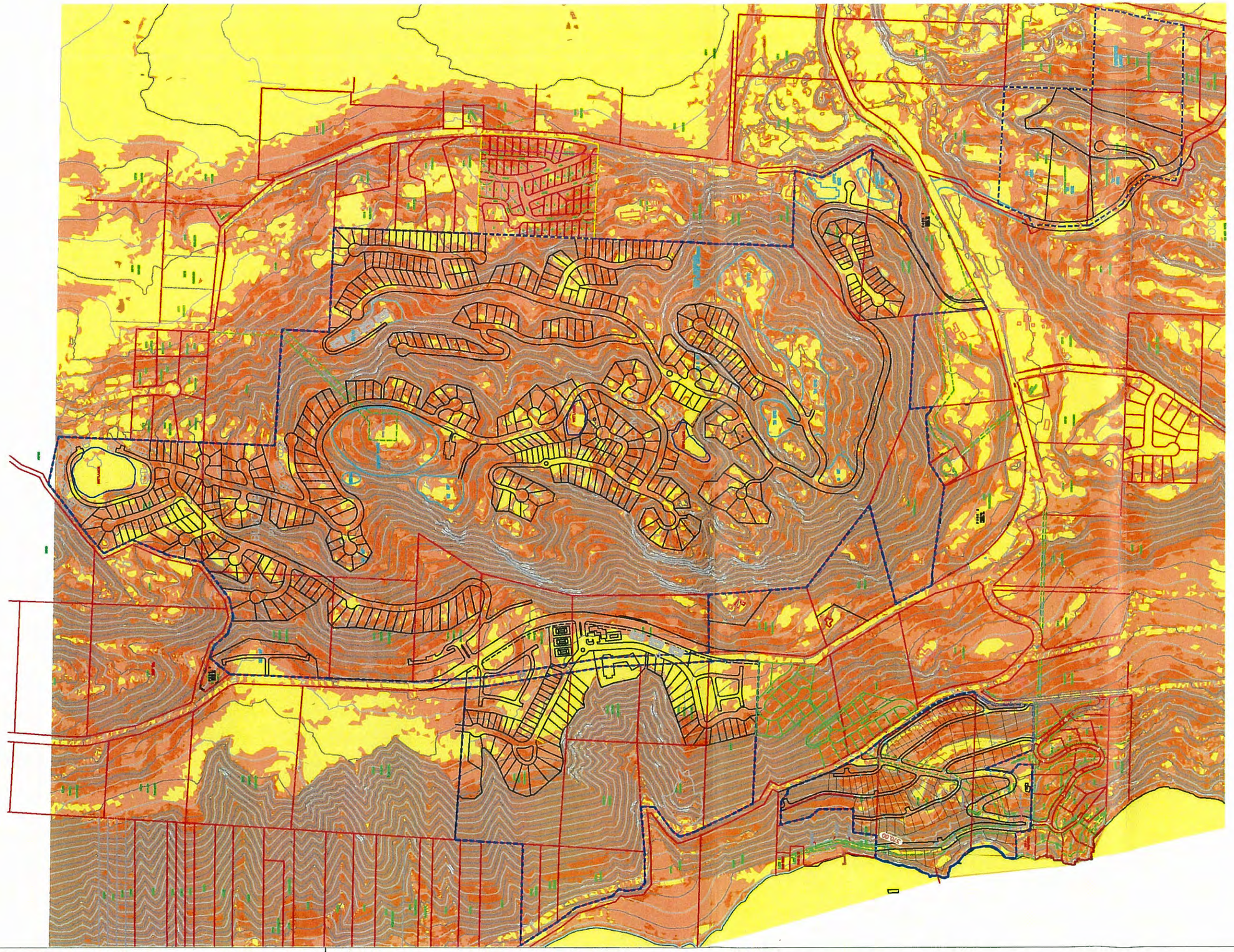
Steep Slopes Defined: Steep Slopes delineation for LakeStone is shown on the attached drawing. In this master plan, steep slopes are indicated at a slope of 30% or greater.

Steep Slope Area to Minimize Infrastructure Intrusion: The planning for roads, utilities, and garage locations have all been optimized in order to have the least intrusion on the existing landscape character. At slopes steeper than 1:2, these works can severely scar hillsides and add unnecessary cost unless carefully managed through specific design standards. In contrast, building structures can often be achieved on inclines significantly steeper than 1:2 and fully co-exist with existing vegetation outside the immediate drip-line – particularly if reviewed and designed on a case-by-case basis.

Building Lot Subdivision and Steep Slopes: Even though they are planned on a conceptual level, all building lots identified on the master plan have been reviewed for effective garage and entry locations. As each phase proceeds, the detailed design for individual sites will likely entail a series of minor adjustments to adapt to the existing terrain.

Building Design Guidelines: At subdivision, Building Design Guidelines will establish specific servicing, driveway width and location, and preferred building envelopes appropriate to each site. The appointed Design Consultant will review and approve each submission to ensure that it complies with all aspects of the detailed Design Guidelines.

Buildings within Steep Slopes: All buildings proposed will be subject to review for conformance with the Building Design Guidelines. Each development at this stage will have available more detailed site information, including topography, geotechnical information, and tree survey. This detailed information will allow quality design to respond to and respect the natural setting. Once approved, construction will be monitored by the developer, and typically, substantial penalties will be required if any infringement on the natural surround occurs. Retention areas will be required to be fenced off with snow fencing or other suitable material to prevent the intrusion of heavy machinery and work activities.



LEGEND

- 0 TO 10% SLOPES
- 10 TO 20% SLOPES
- 20 TO 30% SLOPES
- 30% & GREATER SLOPES

1:4000

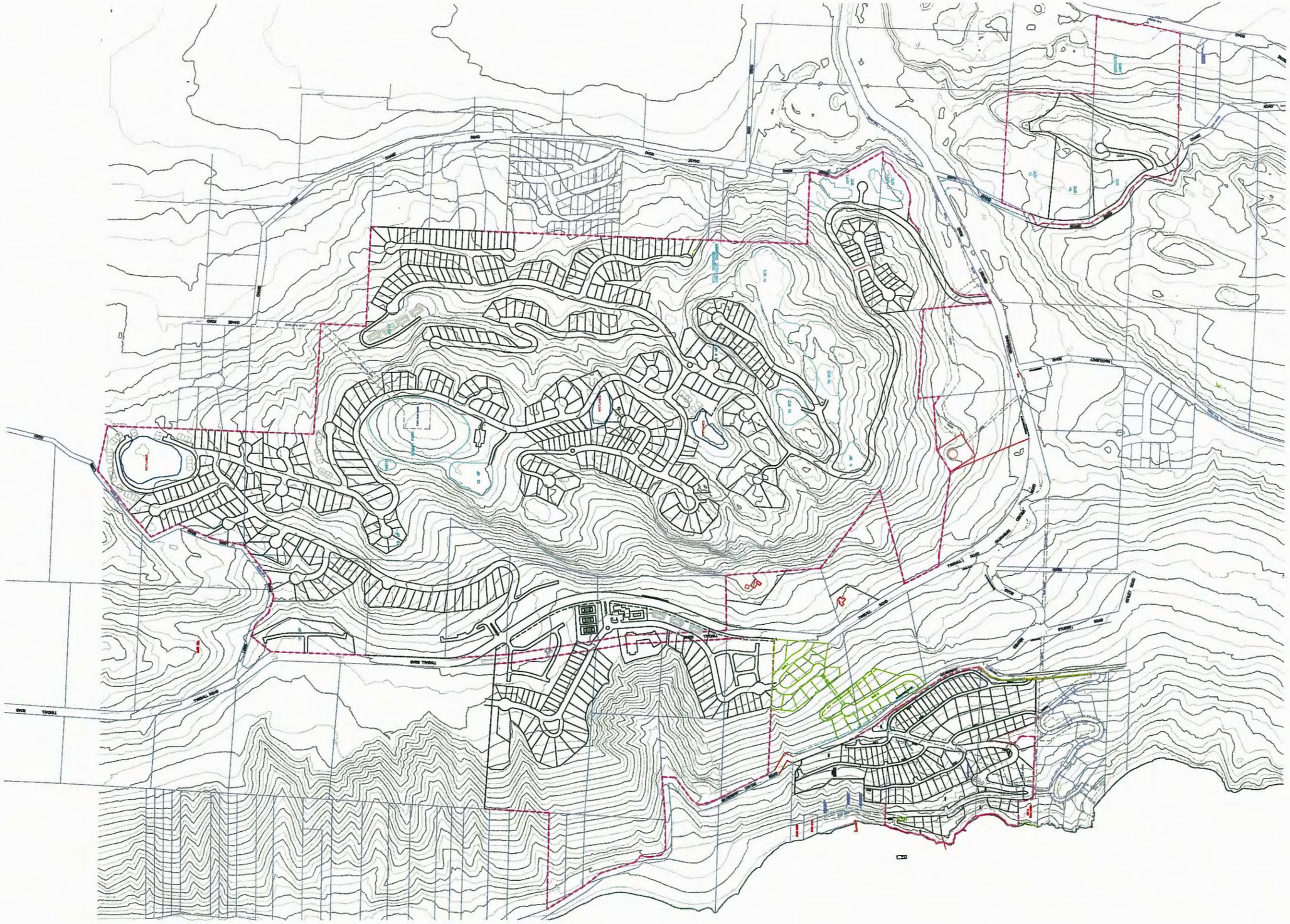
DRAWING
SLOPE ANALYSIS

PROJECT
LAKESTONE

CLIENT
MACDONALD LAKESHORE PROPERTIES

PROTECH CONSULTANTS LTD. 200 - 1461 ST. PAUL STREET, KELOWNA, BC, V1Y 2E4 | TEL: (250) 860 1771 RECEPTION @ PROTECH - CONSULTING.COM

ISSUE DATE: MARCH 2012



DRAWING
TOPOGRAPHY

PROJECT
LAKESTONE

CLIENT
MACDONALD LAKESHORE PROPERTIES

10018-TOPOG.dwg

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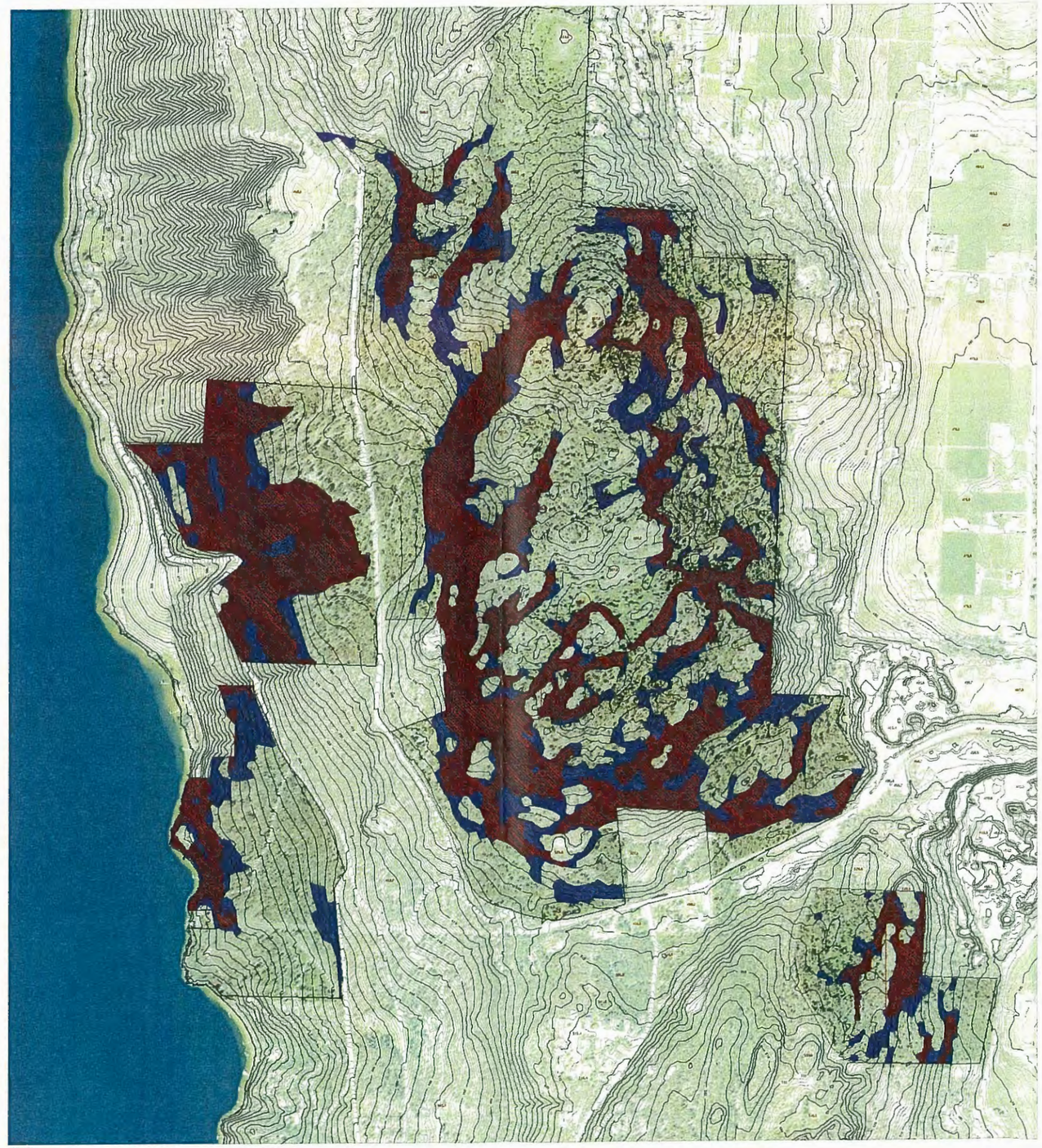
ISSUE DATE: MARCH 2012



NORTH

1 : -

STEEP SLOPE ANALYSIS

Scale: 1:5000

LEGEND

- STEEP SLOPE > 30% AREA 85.9547 HA
- STEEP SLOPE > 40% AREA 30.602 HA

2.H Open Space - Parks and Trails

Trails and Destination Parks:

LakeStone is a unique setting within Lake Country, and demands a responsive approach to resolve the best park and open space system. Given the outstanding views, ecological and geological diversity, and the strong topography, it is proposed to implement a varied and extensive trail system to fully connect the on-site park framework (an overview of the Developer's specific undertakings in this regard is carried on page 36). Currently there is significant public use of the existing trails and site features, many of which will be incorporated into the new network totaling 24.06 kilometers of trail / pathway in various configurations.

The opportunity at LakeStone is not only to fulfill park requirements calculated as a percentage, but to also amplify access to the quality of trail experience that now exists on the property. The attached master plan drawing indicates the proposed trail system including both the parks and trails onsite, and also the park and trail system extended according to the intent expressed in the OCP. This is most clearly shown in the Regional Trail that is being incorporated in the road right of way along Okanagan Center and Tyndall Roads. The concept of the chain of small parks is to highlight specific site characteristics (such as viewpoints, rock outcroppings, or unique ecological conditions) that provide destinations and reason to pause for the hiker. These viewpoints incorporate a number of favorites with the current hikers, and will introduce a number of new locations. Certain small parks (typically those located more proximate to the residential development) are suitable for more traditional park uses such as dog walking or unprogrammed play, and in specific locations, incorporation of play equipment. A number of the trails terminate at the top of the site, in the Summit Park open space. This location will have washrooms, drinking fountain, benches, and an amphitheatre for LakeStone or Lake Country community events.

This trail system is open to all of Lake Country, and will encourage more connections to be made on foot and by bicycle, particularly to the emerging Lake Country Town Center commercial and cultural activity.

In the park and trail network on the upper portions of the LakeStone site – where there is very little flat land – only a certain number of the parks represent destinations for flat land activities, while the rest provide locations to enjoy the particular character of views, environment, or location. A full sized playfield will be incorporated in a location to be confirmed with Lake Country Parks Department, funded by a 'sinking fund' whereby each homesite or home sold will generate revenue

to be allocated to the project. One potential location would be the 'school site' already dedicated to the District along Okanagan Center Road.

The trails in steep slope conditions continue the existing patterns of use already established by the Lake Country public and generally follow wildlife corridors wherever possible.

Amenities Accessibility:

At LakeStone, most of the key amenities of the community have either full public access, or at least components such as the pools and hot tubs that will be publicly available during specific times as agreed with the District. For example, at the Lakeside Amenity, the general public will have access to kayak rentals and a food concession (which will be leased to a third party), as well as shower and washroom facilities to complement the beach experience. It will also be possible to access the beach by using the building elevator, thereby increasing universal accessibility to the lake shore.

The Phase 3 Benchland Park will form the hub of the LakeStone Community. The Benchlands will be the location of the second major LakeStone community structure, which will include a swimming pool, a fitness facility, and a retail/cafe space to be leased to a third party tenant. As with the Lakeside Amenity, access to the pool will be made available to the public at specific times to allow for Lake Country programs such as swimming lessons or other aquatic activities. This area will also include four tennis courts for public ownership and use.

At Summit Park (which effectively represents the peak of LakeStone and the culmination of the trail system), the washroom facilities will provide additional utility to what will be a spectacular passive outdoor space with the potential for amphitheater seating for community events.

Open Space Provision

Substantial land will remain undeveloped - the current plan will retain the majority of the open space in its natural state at a ratio of over 52% of the total site area. The overall impact on the proposed DOLC recreational system will be the clear provision of a strong open space setting. As the overall development progresses, all open space conservation areas, parks and trail network, and the road and engineering services corridors will be turned over to the District.

Individual parks and trails proposed on LakeStone lands are indicated in detail on the landscape drawings. As the individual phases proceed, the size of these elements may be slightly adjusted to suit detailed review of site conditions and proposed surrounding development. Any of these adjustments will respect the use, area and trail connections identified in this master plan – and the total of park area provided to the District will meet or exceed the total indicated in this master plan.

School Site:

The School site has already been transferred to the DOLC - the land is one of the lowest slope sites within the property, approximately 6.0 hectares in size, located along Okanagan Center Road.

Developer's Undertaking – Parks and Trails

The following is the scope of work to be conducted by the Developer at the cost of the Developer with respect to the Park and Trail facilities to be constructed within the LakeStone development.

Destination Parks

Summit Park – This park will include washroom facilities and a sloped grass area suitable for un-programmed recreation or community gatherings. An electrical connection will be located in an area which will be suitable to support small entertainment or community events (details to be resolved at design development stage).

Benchland Park – In addition to the LakeStone amenities to be built within the Benchland Park as described above, the Developer will construct and dedicate to the District four tennis courts for public ownership and use.

Playfield – a full sized playing field will be constructed at a location to be determined by the District of Lake Country in conjunction with the Developer. This will be funded by real estate sales, to a maximum amount of $400,000. Starting with Phase 3, the Developer will contribute $1,000 into a special-purpose (park construction) sinking fund for each single family lot or Townhome unit sold within the LakeStone development, and this will continue until the full $400,000 objective is accumulated. The District and the Developer will use their best efforts to locate the playing field in a mutually agreeable District-owned site, the intent being, if practical, to find a relatively close proximity to the LakeStone lands.

Neighbourhood Parks

A series of neighbourhood parks will be constructed in accordance with the Site Features Plan from Durante Kreuk. The Master Plan identifies a number of park areas which are close to the single family homes. These park areas will consist of open green space where un-programmed activities can occur (e.g., dog walking, tossing a Frisbee, etc.). One of these park spaces will be outfitted with playground equipment. In other locations, where the topography permits along the trail system, open spaces will be created for outlooks with park benches or interpretative signage. Within these areas the emphasis will be on retaining the natural vegetation and maintaining the character of the trail system. Where it is possible to provide District access for servicing, waste receptacles will be

provided. In locations where this is impractical, signage will be posted requesting that users not leave any waste in these areas.

Detailed design of these park spaces will be undertaken as the trail system is developed and built as it would be very difficult to understand the opportunities presented by each individual location until that time.

Wetland Parks

There are three principal ESA 1 areas where there may be some water at specific times of the year. In building out these spaces, the approach will be minimal. The Developer will erect a simple barrier around the sensitive area and provide an interpretive marker or markers to highlight the features of the specific location. A narrow gravel path may also be included, with the primary goal being the retention of the natural features.

Trails

The trail system will be constructed in accordance with the drawings and cross sections as prepared by Durante Kreuk, including trail head markers and interpretive stations as shown. Hierarchy of trails range from the major regional trail along Okanagan Center and Tyndall Roads to the re-purposing of those existing wildlife trails such which will be able to provide a safe environment for walkers and hikers. Trail construction will proceed in conjunction with the project phasing. The trails for any lands previously dedicated to the District will be built after Phase 3 at a time as requested by the District.

Final Specifications

The final specifications for the above work will be compatible with existing code requirements and District requests, acting reasonably. These details will be determined during each sub-division stage.

TOTAL DEVELOPMENT AREA= 201.23 HA
TOTAL OPEN SPACE AREA= 104.95 HA (52%)
TOTAL DEDICATED PARKS AREA= 8.9 HA

Original Master Plan Open Space/Parks = 105.0± ha

PROTECH
CONSULTANTS LTD.
200 – 1461 St. Paul Street Kelowna B.C. Phone 860–1771
FAX 860–1994

MACDONALD / LAKESTONE SUBDIVISION

PARKS & OPEN SPACE AREAS

1:2000

February 22, 2012

10018–OPEN SPACES.dwg

1 TYNDALL ROAD

REGIONAL TRAIL ALONG TYNDALL

2 PROPOSED ROAD A

3 PROPOSED SPINE ROAD

OKANAGAN CENTER ROAD

DESIRABLE LOCATIONS FOR ROADSIDE PARKING

GLENMORE PARK

PARK EXTENSION

DISTRICT OWNED PARK NO. 1

DISTRICT OWNED PARK NO. 2

MCCOUBREY ROAD

TREED PARKSPACE

SLOPING MEADOWS WITH SOME TREES

TREED PARKSPACE WITH CLEARINGS

SLOPING MEADOWS

WETLAND PARKSPACE WITH BOARDWALK

HIGHLAND PARKSPACE

SUMMIT PARK

TREED PARK WITH WETLANDS MEADOW AND A BOARDWALK

TREED PARK

SLOPING MEADOW PROMONTORY

TREED PARKSPACE TWIN PEAKS WITH CLEARINGS

BENCHLANDS PARK

TYNDALL ROAD

ASSUMED TRAIL NOT IN LAKESTONE DEVELOPMENT

LAKESIDE PARK

ROSITC
HEMPHIL
a n
ASSOCIATE
ARCHITECT

PILKINGTON HOUS
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VANCOUVER, B.
C A N A D
V 6 A 1 G
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FAX: (604) 669-10

NO.	ISSUED:	DA
1.	ISSUED FOR REVIEW	20
2.	ISSUED FOR REVIEW	09
3.	ISSUED FOR REVIEW	15

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102 - 1637 West 5th Avenue Vancouver B.C
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NO. REVISION: DA

ARCHITECTURAL SEAL:

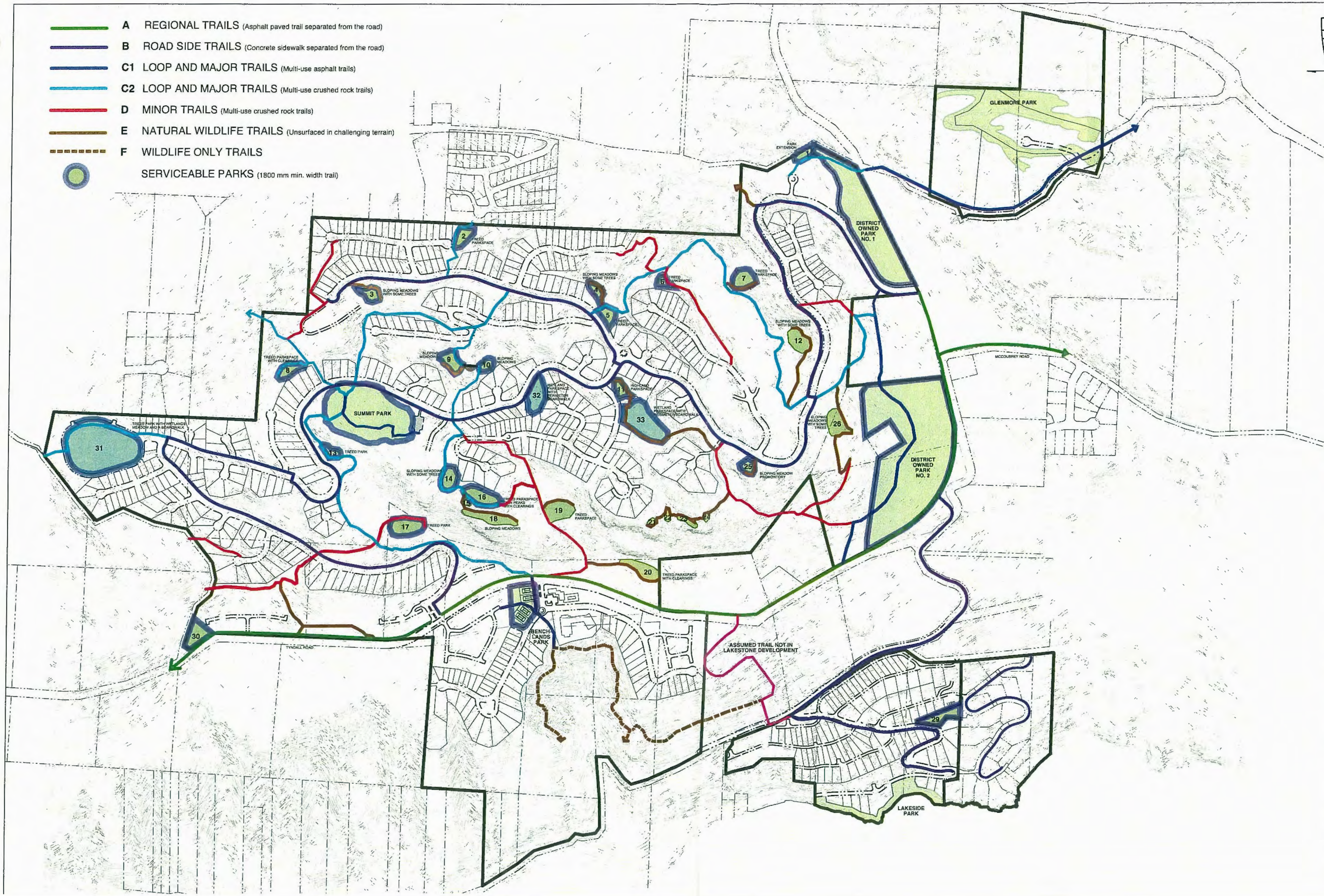
CLIENT:
MACDONALD DEVELOPME
CORPORATION
11th Floor, 938 Howe Street
Vancouver, BC V6Z 1N9, Can

PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

DRAWING TITLE:
MASTER PLAN
ROADS & PARKING

DATABASE:
PLOT FACTOR: 1-1
SCALE: 1:4000
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

PROJ. NO. 10098


A REGIONAL TRAILS (Asphalt paved trail separated from the road)
B ROAD SIDE TRAILS (Concrete sidewalk separated from the road)
C1 LOOP AND MAJOR TRAILS (Multi-use asphalt trails)
C2 LOOP AND MAJOR TRAILS (Multi-use crushed rock trails)
D MINOR TRAILS (Multi-use crushed rock trails)
E NATURAL WILDLIFE TRAILS (Unsurfaced in challenging terrain)
F WILDLIFE ONLY TRAILS
SERVICEABLE PARKS (1800 mm min. width trail)
GLENMORE PARK
DISTRICT OWNED PARK NO. 1
DISTRICT OWNED PARK NO. 2
SUMMIT PARK
BENCH LANDS PARK
LAKESIDE PARK
ASSUMED TRAIL NOT IN LAKESTONE DEVELOPMENT
MCCOUBREY ROAD
TYNDALL ROAD
PARK EXTENSION

ROSITC
HEMPHIL
ASSOCIATE
ARCHITECT

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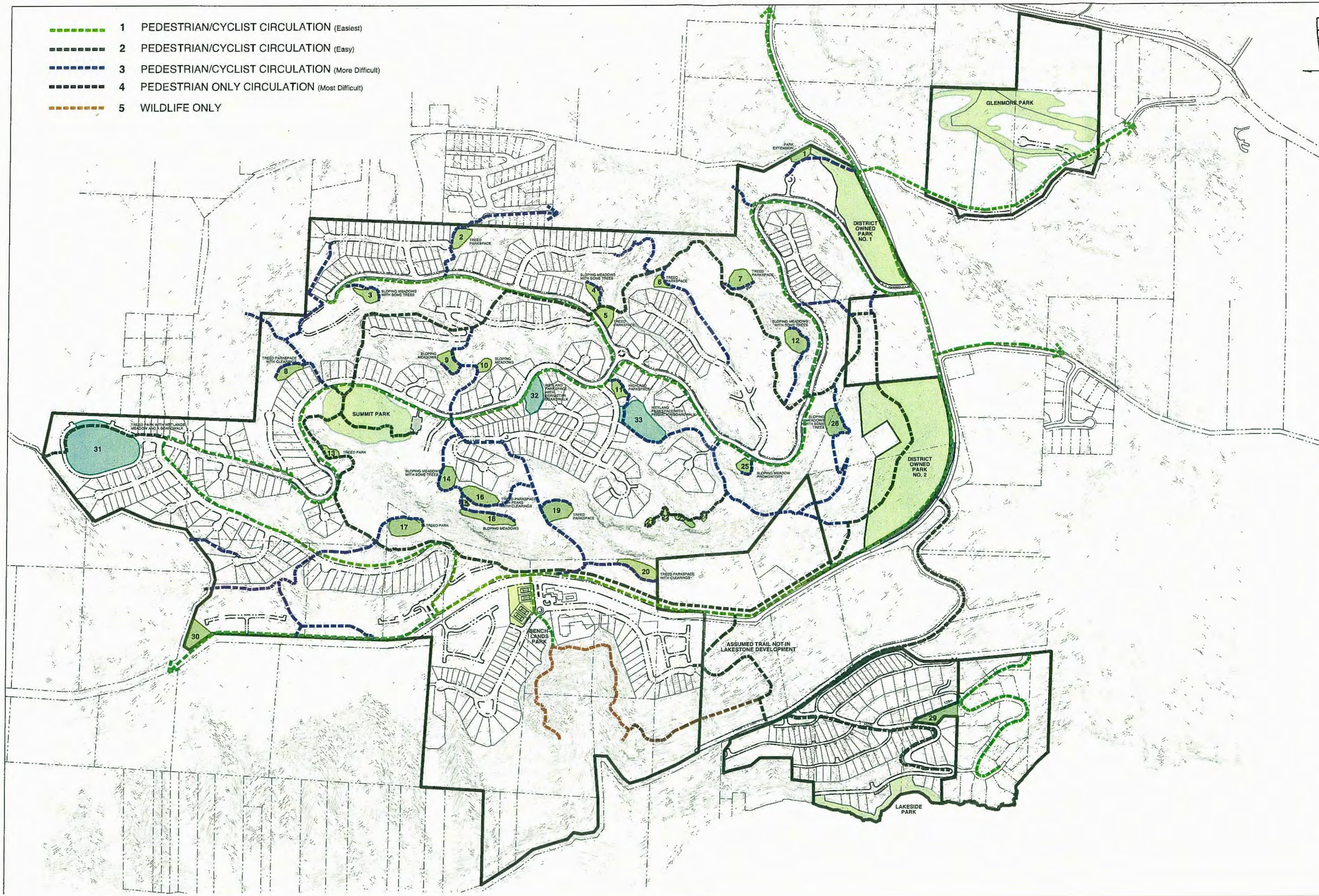
PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

DRAWING TITLE:
MASTER PLAN
PARKS & TRAIL NETWC

DATABASE:
PLOT FACTOR: 1-1
SCALE: 1:4000
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

PROJ. NO. 10098


1 PEDESTRIAN/CYCLIST CIRCULATION (Easiest)
2 PEDESTRIAN/CYCLIST CIRCULATION (Easy)
3 PEDESTRIAN/CYCLIST CIRCULATION (More Difficult)
4 PEDESTRIAN ONLY CIRCULATION (Most Difficult)
5 WILDLIFE ONLY
GLENMORE PARK
DISTRICT OWNED PARK NO. 1
DISTRICT OWNED PARK NO. 2
SUMMIT PARK
BENCH LANDS PARK
LAKESIDE PARK
ASSUMED TRAIL NOT IN LAKESTONE DEVELOPMENT
TREED PARKSPACE
SLOPING MEADOWS WITH SOME TREES
TREED PARKSPACE WITH CLEARINGS
TREED PARK
SLOPING MEADOWS

ROSITCH HEMPHILL and ASSOCIATES ARCHITECTS

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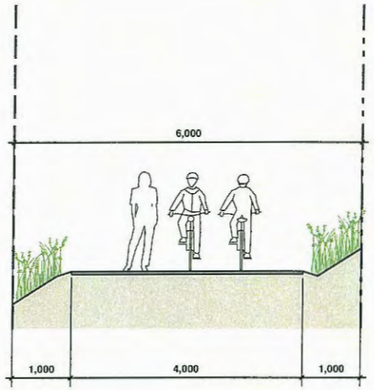
11th Floor, 938 Howe Street
Vancouver, BC V6Z 1N9, Can

PROJECT:
LAKESTONE SUBDIVISION
LAKE COUNTRY, B.C.

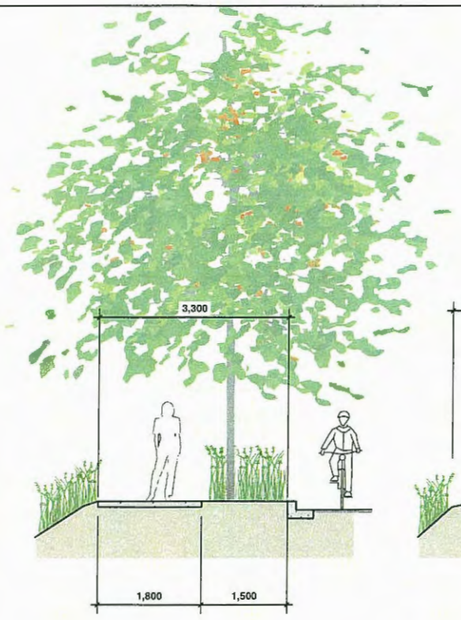
DRAWING TITLE:
MASTER PLAN CIRCULATION DIAGRAM

DATABASE:
PLOT FACTOR: 1-1
SCALE: 1:4000
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

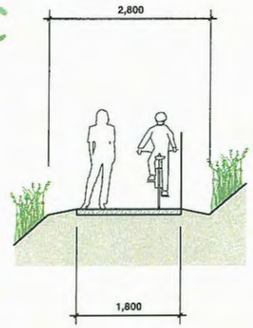
PROJ. NO. 10098



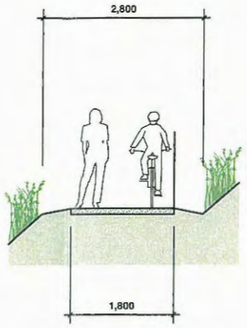
A REGIONAL TRAIL
Asphalt paved trail separated from road



B ROAD SIDE TRAIL
Concrete sidewalk separated from road

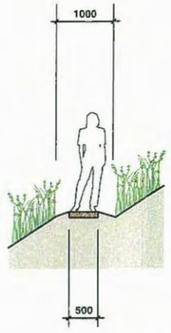


C1 LOOP AND MAJOR TRAILS
Multi-use asphalt trails



C2 LOOP AND MAJOR TRAILS
Multi-use crushed rock trails

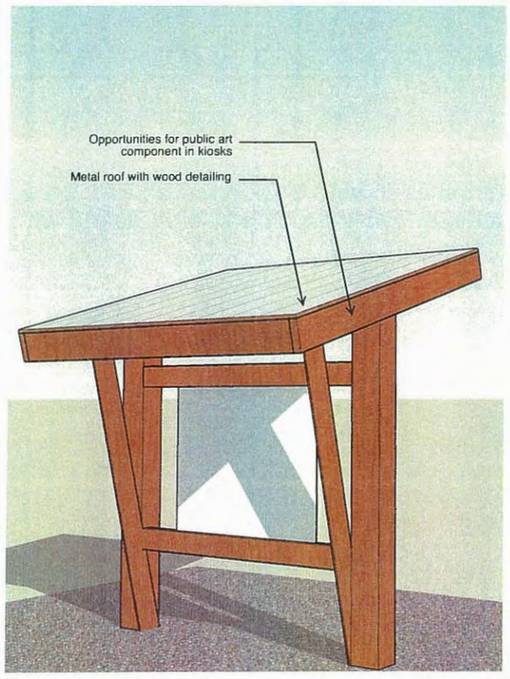
D MINOR TRAILS
Multi-use crushed rock trails

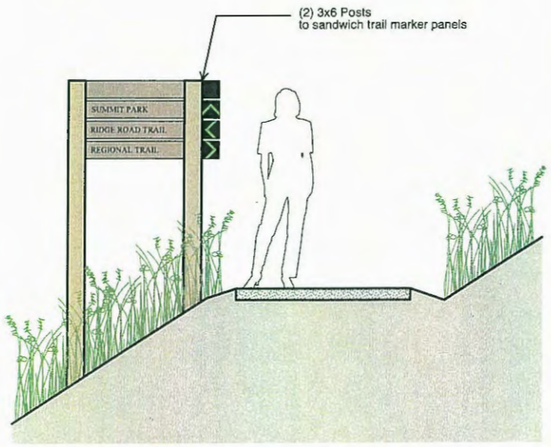


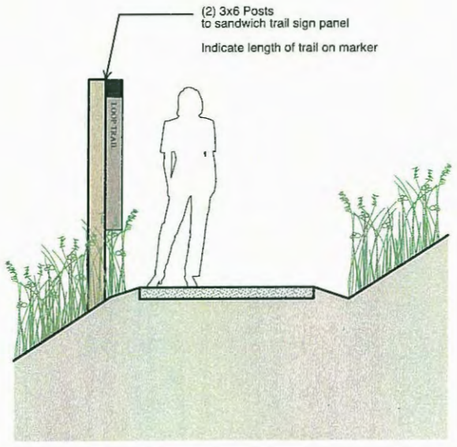
E NATURAL WILDLIFE TRAILS
Width varries 300-500mm
Unsurfaced in challenging terrain

F NATURAL WILDLIFE ONLY TRAILS
Unsurfaced in challenging terrain

1 LR02 TRAIL TYPE SECTIONS
SCALE 1:50







ROSITC
HEMPHILL
a n
ASSOCIATES
ARCHITECT

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ARCHITECTURAL SEAL:

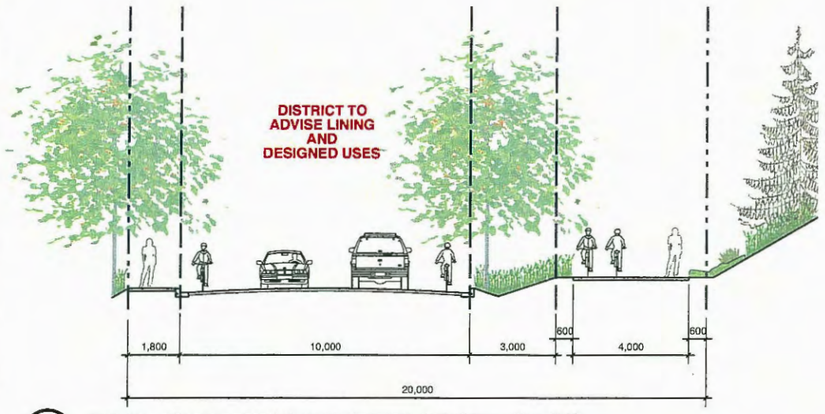
CLIENT:
MACDONALD DEVELOPME
CORPORATION
11th Floor, 938 Howe Street
Vancouver, BC V6Z 1N9, Can

PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

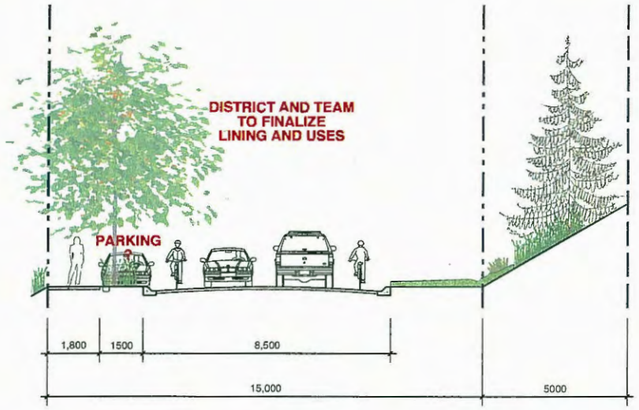
DRAWING TITLE:
TRAIL SECTIONS

DATABASE:
PLOT FACTOR: 1-1
SCALE: NOTED
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

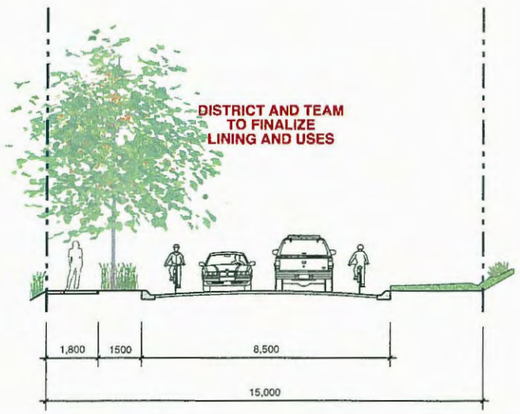
PROJ. NO. 10098

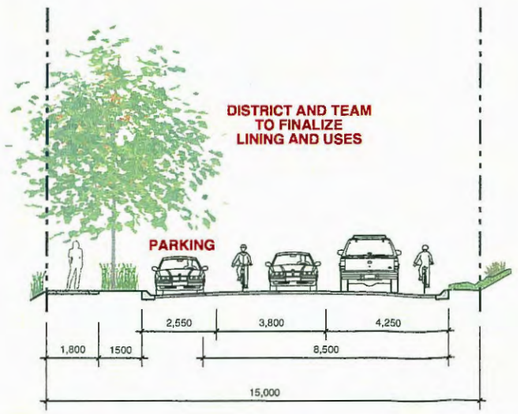


1 LR-01 **TYNDALL ROAD & REGIONAL TRAIL SECTION (REVISED FEB15 - 2012)**
SCALE 1:100



2 LR-01 **PHASE 2 - ROAD A**
SCALE 1:100





ROSITC
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ARCHITECT

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CORPORATION
11th Floor, 938 Howe Street
Vancouver, BC V6Z 1N9, Can

PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

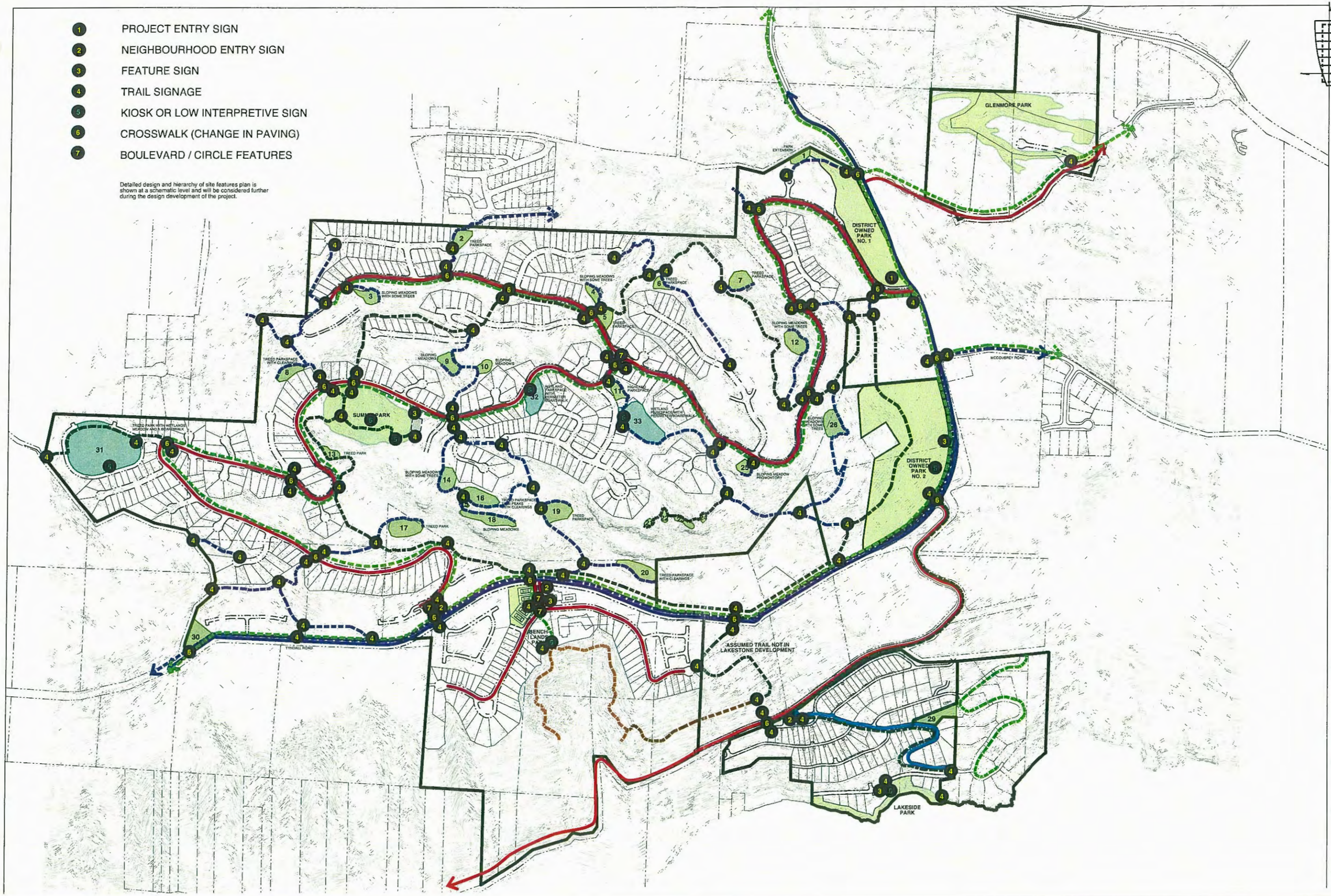
DRAWING TITLE:
ROAD SECTIONS

DATABASE:
PLOT FACTOR: 1-1
SCALE: NOTED
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

PROJ. NO. 10098

1. PROJECT ENTRY SIGN
2. NEIGHBOURHOOD ENTRY SIGN
3. FEATURE SIGN
4. TRAIL SIGNAGE
5. KIOSK OR LOW INTERPRETIVE SIGN
6. CROSSWALK (CHANGE IN PAVING)
7. BOULEVARD / CIRCLE FEATURES

Detailed design and hierarchy of site features plan is shown at a schematic level and will be considered further during the design development of the project.



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ASSOCIATE
ARCHITECT

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V6A 1G
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NO.	ISSUED:	D
1.	ISSUED FOR REVIEW	20
2.	ISSUED FOR REVIEW	09
3.	ISSUED FOR REVIEW	15

DURANTE KREUK LTD. LANDSCAPE AF
102 - 1637 West 5th Avenue Vancouver B.
P 604.684.4611 I F 604.684.0577 I ww

NO. REVISION: D

ARCHITECTURAL SEAL:

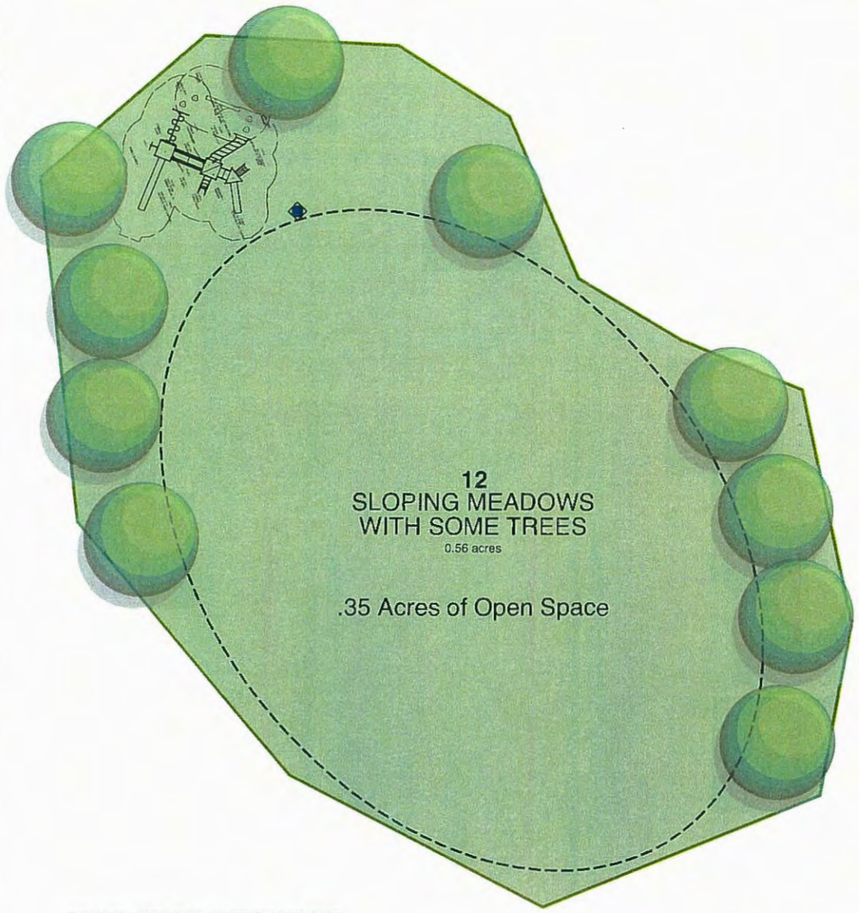
CLIENT:
MACDONALD DEVELOPME
CORPORATION
11th Floor, 938 Howe Street
Vancouver, BC V6Z 1N9, Can

PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

DRAWING TITLE:
MASTER PLAN
SITE FEATURES PLAN

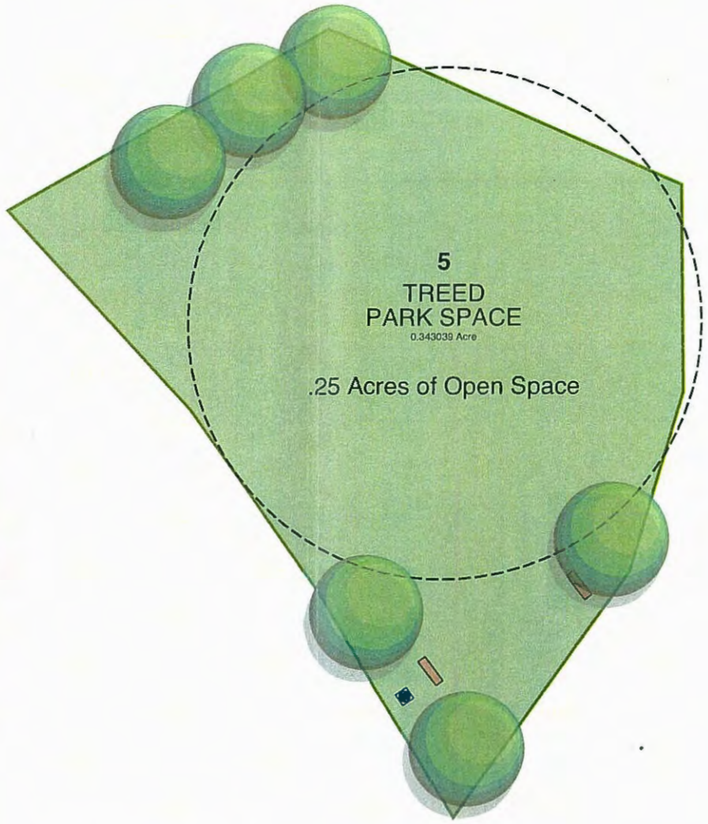
DATABASE: .
PLOT FACTOR: 1-1
SCALE: 1:4000
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

PROJ. NO. 10098



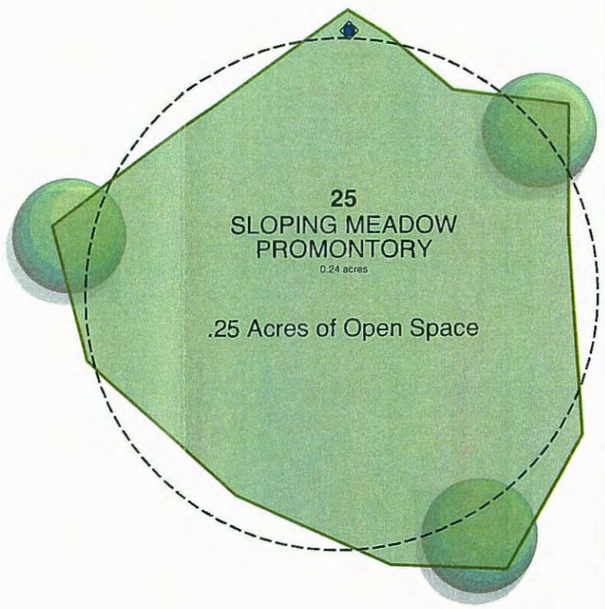
OPPORTUNITY FOR PLAY EQUIPMENT
AND OPEN PLAY AREA

1 / L02 NEIGHBOURHOOD PARK - 12
SCALE 1:200



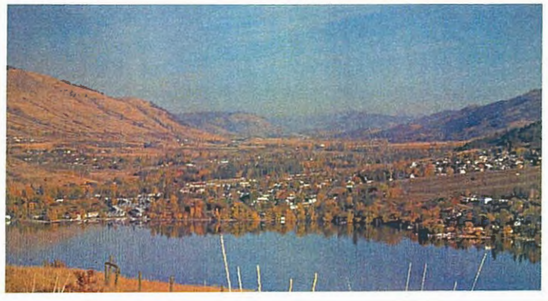
OPPORTUNITY FOR SEATING
AND SMALL OPEN PLAY AREA

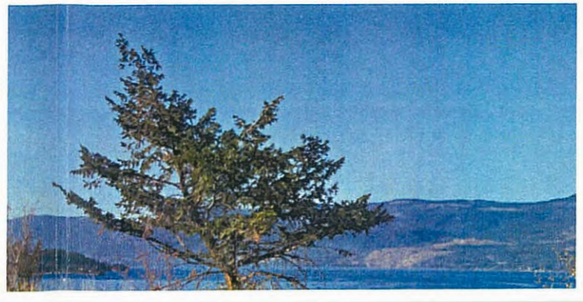
NEIGHBOURHOOD PARK - 5
SCALE 1:200



OPPORTUNITY FOR SMALL
OPEN PLAY AREA

NEIGHBOURHOOD PARK - 25
SCALE 1:200





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NO. REVISION: DA

ARCHITECTURAL SEAL:

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Vancouver, BC V6Z 1N9, Can

PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

DRAWING TITLE:
NEIGHBOURHOOD PAR
EXAMPLES OF PROGR

DATABASE: .
PLOT PRODR: 1-1
SCALE: NOTED
DATE: 20 FEBRUARY 2012
DRAWN: nb
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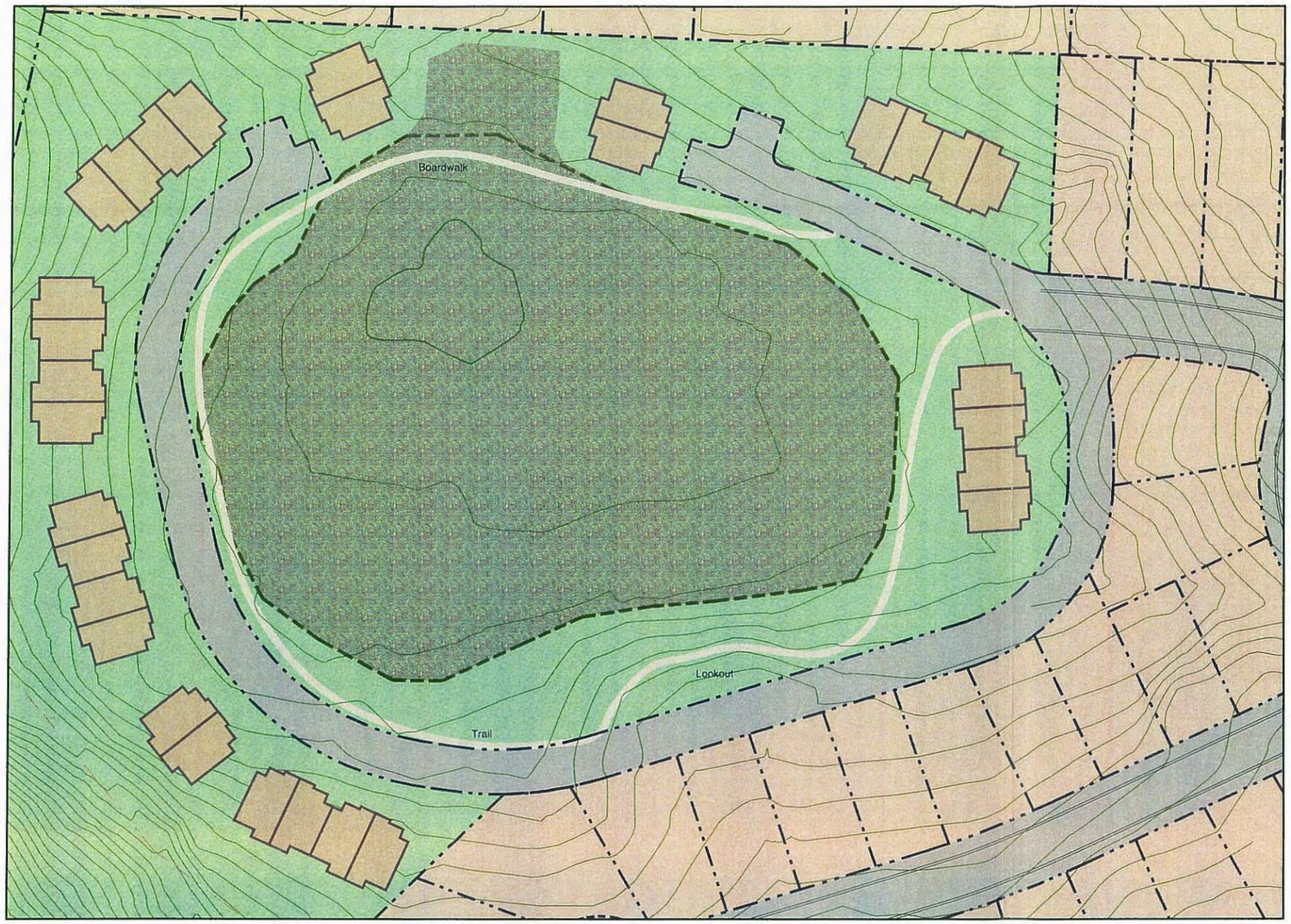
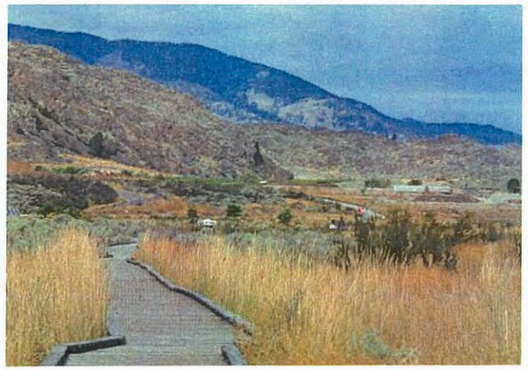
PROJ. NO. 10098



OVERALL PLAN TO DISCUSS PRELIMINARY CONCEPT FOR FENCING, PROGRAM AND ACCESS



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3.	ISSUED FOR REVIEW	15

DURANTE KREUK LTD. LANDSCAPE AR
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NO.	REVISION:	DA

ARCHITECTURAL SEAL:

CLIENT:
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Vancouver, BC V6Z 1N9, Can

PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

DRAWING TITLE:
WETLANDS PARK
CONCEPT BASE PLAN

DATABASE: .
PLOT FACTOR: 1-1
SCALE: 1:500
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

PROJ. NO. 10098

SPORTS FIELD

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NO.	ISSUED.	DA
1.	ISSUED FOR REVIEW	20
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3.	ISSUED FOR REVIEW	15

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NO. REVISION: DA

ARCHITECTURAL SEAL:

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PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

DRAWING TITLE:
SCHOOL SITE PARK
CONCEPT BASE PLAN

DATABASE:	.
PLOT FACTOR:	1-1
SCALE:	1: 500
DATE:	20 FEBRUARY 2012
DRAWN:	nb
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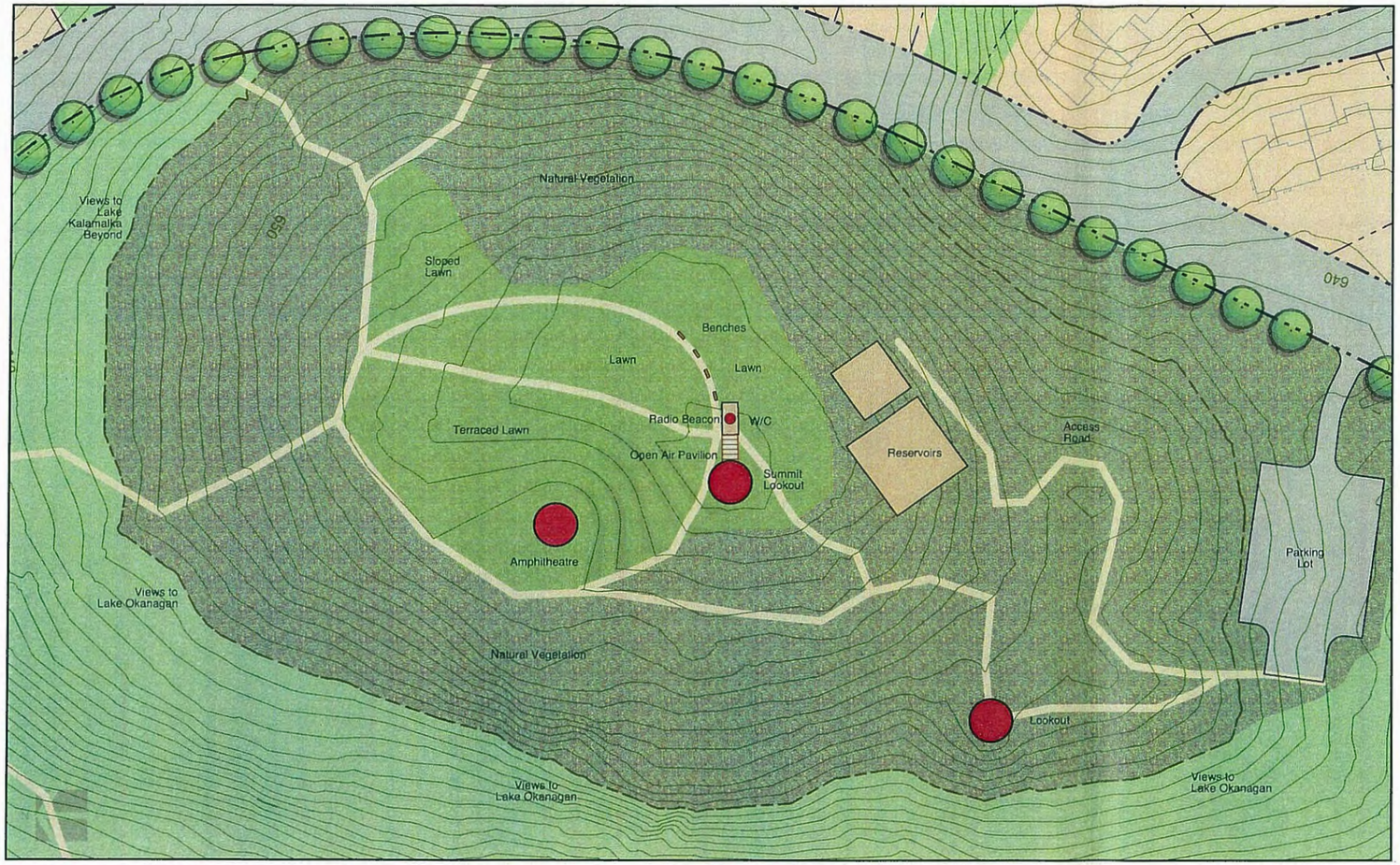
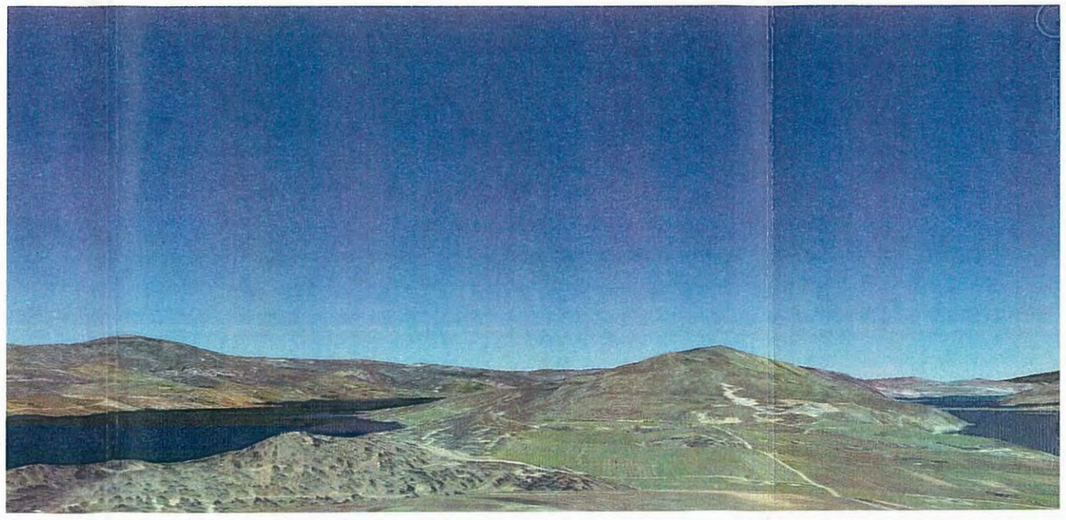
PROJ. NO.	10098



OVERALL PLAN TO SHOW PRELIMINARY DESIGN CONCEPT FOR SUMMIT PARK

TIMBER SEATING

OPEN AIR PAVILION



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1.	ISSUED FOR REVIEW	26
2.	ISSUED FOR REVIEW	09
3.	ISSUED FOR REVIEW	15

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NO.	REVISION:	DA

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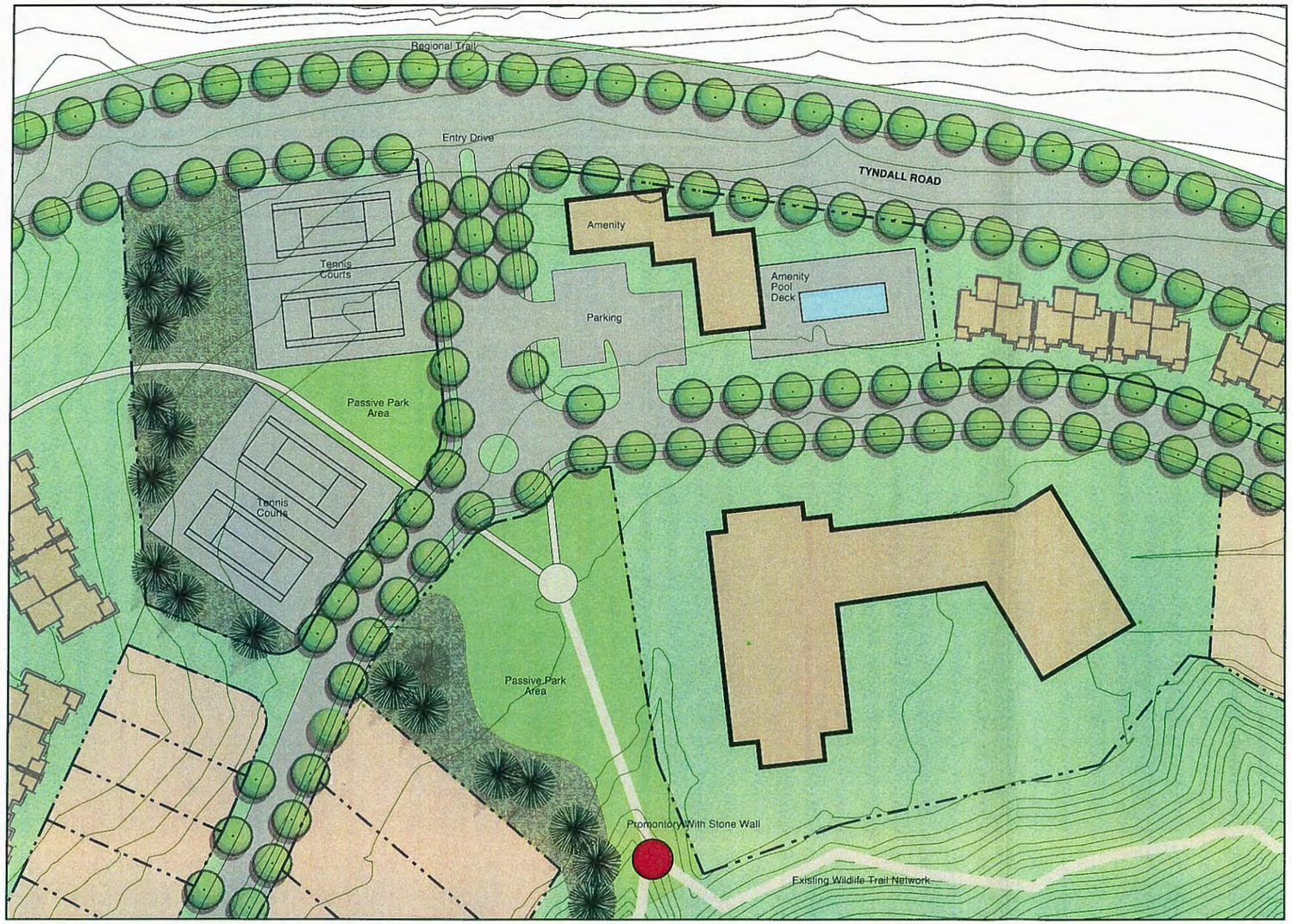
PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

DRAWING TITLE:
SUMMIT PARK
CONCEPT DESIGN

DATABASE: .
PLOT FACTOR: 1-1
SCALE: 1:500
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

PROJ. NO. 10098



OVERALL PLAN TO SHOW PRELIMINARY PARKS DESIGN CONCEPT FOR BENCHLANDS NEIGHBOURHOOD

CHARACTER IMAGES

CHARACTER IMAGES

CHARACTER IMAGES

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PROJECT:
LAKESTONE
SUBDIVISION
LAKE COUNTRY, B.C.

DRAWING TITLE:
BENCHLANDS PARK
CONCEPT PLAN

DATABASE:
PLOT FACTOR: 1-1
SCALE: 1:500
DATE: 20 FEBRUARY 2012
DRAWN: nb
CHECKED: dc

PROJ. NO. 10098

LAKESTONE
XERISCAPE GUIDELINES

Overview and Principles

LakeStone promotes the principle of Xeriscape, which is a water conscious, creative landscape, based on the use of indigenous and native planting. It also deals with moisture retention techniques that increase survival rates in this type of climate. All landscape areas in this master plan shall be designed to the xeriscape standards outlined in this document.

Landscaping will emphasize the preservation of the existing rock and plant material where possible, augmented by xeriscape planting to reinforce the existing natural Okanagan character.
All servicing and development is to maximize retention of the natural condition by minimizing excavation, scarring and unnecessary tree removal.

Policies promoting conservation of resources and sustainable development are to be incorporated. Water is a precious commodity in the Okanagan, and water conservation measures will be incorporated in residential, recreational and commercial development. This includes the use of rainwater storage barrels or tanks (above or below ground), as well as use of xeriscape landscaping to retain the existing site character.

The Okanagan Xeriscape Association (OXA) has excellent resources with specific local applicability. This includes a list of appropriate plant material, including both native and adapted species.

Indigenous Landscape and Plant Selection

Consistent with the LakeStone Vision to respect and preserve the existing indigenous landscape setting, manicured landscape materials are not permitted except within Disturbed Areas as defined in the Design Guidelines for each Phase of development.

Plants shall be selected from the Approved Plant List below to achieve an ongoing native landscape character for Disturbed Areas that is appropriate to the specific microclimatic conditions and vegetation character of each site. To avoid browsing by deer and elk, species that are less

palatable to big game (identified from the Approved Plant List), shall be used on lots within or adjacent to wildlife movement corridors. Where the landscaped area meets building structure, a roof drip edge shall be established to mitigate soil erosion from roof runoff.

Design and Plant Selection (Disturbed Area)

The Disturbed Area may contain landscape elements of native or non-native plant material combined with hard landscaping – provided that they are limited to areas such as courtyards or screened, edged, or blended landscape areas proximate to the residential buildings – and serve to define the home from the natural surroundings.

Design and Plant Selection (Undisturbed Area)

All changes to the indigenous landscape in the Undisturbed Area are to incorporate only plant material from the Indigenous Plantings list – any proposed change is to be pre-approved by Design Consultant prior to any alteration of the Undisturbed Area conditions. Approved changes, once established, become a part of the ongoing Indigenous Landscape, and will require resubmission for approval of any further changes.

Irrigation and Water Conservation

Water conservation is an essential component of LakeStone building practice, and water metering will be incorporated for all homes. Homeowners are required to practice water conservation measures as delineated in the Design Guidelines - this must be incorporated at the Design phase to most effectively implement water saving technologies.

Pools, hot tubs, water features, and other potentially water consumptive amenities are to be carefully considered for minimal impact. Incorporation of rain barrels in each home is mandated to both assist in storm water management and also to assist in providing supplemental irrigation during the drier seasons of the year. Wherever possible, rain barrels should be located such that overflow is directed to a natural bio-swale to allow maximum penetration into the ground.

Temporary above ground irrigation systems shall be allowed for one growing season. Permanent or underground irrigation systems are not permitted except within the Disturbed area. Requests for additional time for vegetation to re-establish will be reviewed by the Design Consultant on a case-by-case basis. Once vegetation has been established, the system shall be removed gradually to allow the new vegetation to adjust to natural site conditions. Low water use plants shall be used even in non-native areas.

Limited permanent irrigation may be allowed in some areas in accordance with the detailed Landscape Design Guidelines for each neighbourhood, or in specific areas dedicated to the District, for example, boulevards with street trees. In all cases where permanent irrigation is permitted, it shall be accomplished with drip irrigation systems.

Native plants are accustomed to the local environment and often require less frequent watering. In many cases, these plant selections will not require any additional water once established.

Designs are to be terraced, where appropriate, with pressure regulating devices to prevent downslope water loss.

Recommended Plant List

Soils in this region are well-drained and suited for agriculture and grazing. When designing gardens it is important to include a deep layer of absorbent soil with organic material that will help retain water and nutrients for root growth – provide a minimum of 150 mm (6") for lawn areas and 300mm to 450mm (12" – 18") for shrubs..

Plants shall be grouped according to their water requirements (hydrozones), and sun and wind exposure.

A list of plant material is provided as a reference, but all planting plans are to be reviewed by either the Design Consultant in accordance with the Design review process, or the District when a Development Permit is applicable.

The LAT (Landscape Assessment Tool), produced by the Okanagan Xerixcape Association should be used to assess lawn areas being proposed in a lot design.

Lawn alternatives

Dutch White Clover
Creeping Stonecrop (Sedum)
Turkish Speedwell (Veronica Liwanensis)
Blue Rug Juniper
Wooly or Creeping Thyme
Kinnikinnick (Bearberry)
Common Yarrow

Alternatives to Cedars and High Water Use Shrubs

Hedging Yew
Pyramidal Junipers
Oregon Grape
Privet

Low Water Deciduous Shrubs

Arnold's Red Honeysuckle
Forsythia
Wayfaring Tree
Smokebush (Cotinus coggygria)
Mock Orange
Lilac
Beauty bush
Barberry
Saskatoon
Rosa rubrifolia

Ornamental grasses

There is a wide variety of low water use grasses that can be utilized for screening and to great dramatic effect

For other options, refer to the plant database at www.okanaganxeriscape.org

DESTINATION PARKS

Description	Area		Description
District Owned Park No. 1	2.40	(ha)	Park at the South entry to the development
District Owned Park No. 1	6.00	(ha)	South Facing site located along the OCR
Summit Park	2.30	(ha)	A 360 degree view site at the top of the Development
Benchlands Park	1.25	(ha)	An actively programmed park in the heart of the Development
Lakeside Park	1.00	(ha)	Located at the amenity complex on the lake front
Neighbourhood Parks	4.31	(ha)	Strategically located along the trail network
Wetland Parks	2.65	(ha)	Strategically located along the trail network
	19.91	(ha)	Total Parklands
	13.10	(ha)	PARKLANDS IN ORIGINAL PROPOSAL

NEIGHBOURHOOD PARKS

Description	Area		Description
Neighbourhood Park No. 1	0.11	(ha)	Park extension
Neighbourhood Park No. 2	0.15	(ha)	Treed parkspace
Neighbourhood Park No. 3	0.14	(ha)	Sloping meadows with some trees
Neighbourhood Park No. 4	0.10	(ha)	Sloping meadows with some trees
Neighbourhood Park No. 5	0.14	(ha)	Treed parkspace
Neighbourhood Park No. 6	0.07	(ha)	Treed parkspace
Neighbourhood Park No. 7	0.21	(ha)	Treed parkspace
Neighbourhood Park No. 8	0.15	(ha)	Treed parkspace with clearings
Neighbourhood Park No. 9	0.18	(ha)	Sloping meadows
Neighbourhood Park No. 10	0.09	(ha)	Sloping meadows
Neighbourhood Park No. 11	0.11	(ha)	Highland parkspace
Neighbourhood Park No. 12	0.23	(ha)	Sloping meadows with some trees
Neighbourhood Park No. 13	0.09	(ha)	Treed park
Neighbourhood Park No. 14	0.19	(ha)	Treed park
Neighbourhood Park No. 15	0.02	(ha)	Sloping meadows with some trees
Neighbourhood Park No. 16	0.27	(ha)	Treed parkspace, twin peaks with clearings
Neighbourhood Park No. 17	0.30	(ha)	Treed parkspace, twin peaks with clearings
Neighbourhood Park No. 18	0.26	(ha)	Sloping meadow Promontory
Neighbourhood Park No. 19	0.28	(ha)	Treed parkspace
Neighbourhood Park No. 20	0.24	(ha)	Treed parkspace with clearings
Neighbourhood Park No. 21	0.03	(ha)	Treed parkspace
Neighbourhood Park No. 22	0.04	(ha)	Treed parkspace
Neighbourhood Park No. 23	0.06	(ha)	Treed parkspace
Neighbourhood Park No. 24	0.03	(ha)	Treed parkspace
Neighbourhood Park No. 25	0.10	(ha)	Sloping meadow Promontory
Neighbourhood Park No. 26	0.25	(ha)	Sloping meadows with some trees
Neighbourhood Park No. 29	0.23	(ha)	Linear neighbourhood park
Neighbourhood Park No. 30	0.24	(ha)	Treed parkspace with clearings
	4.31	(ha)	Total Parklands

WETLAND PARKS

Description	Area		Description
Neighbourhood Park No. 31	1.73	(ha)	Wetland parkspace with path as applicable
Neighbourhood Park No. 32	0.29	(ha)	Wetland parkspace with path as applicable
Neighbourhood Park No. 33	0.63	(ha)	Treed park with wetlands meadow and path as applicable
	2.65	(ha)	Total Wetland Parklands

TRAILS

Description	Area		Description
Regional Trail (Type A)	2.76	(km)	Trail along Tyndall
Roadside Trails)Type B)	8.00	(km)	Trail system along road ROW
Loop and Major Trails (Type C1)	1.96	(km)	Loop, multipurpose trail around Lakestone Development
Loop and Major Trails (Type C2)	4.44	(km)	Loop, multipurpose trail around Lakestone Development
Minor Trails (Type D)	3.12	(km)	Connector trails to features and to tie in trail network
Natural Wildlife Trails (Type E)	2.56	(km)	Connector trails unsurfaced in challenging terrain
Minor and Wildlife Trails	1.06	(km)	Unsurfaced in challenging terrain
	23.90	(km)	
	13.59	(km)	TRAILS IN ORIGINAL PROPOSAL

2.I Geotechnical

Geotechnical review of the LakeStone site by Beacon Geotechnical is provided in the attached report. The scope of this document is to examine the general ability to implement the master plan given the existing geological conditions on-site. Further detailed geotechnical studies will be a requirement at the subdivision or building permit stage of development according to standard DOLC practice. Specific geotechnical investigations were conducted in the summer of 2011 for the site where the lakefront amenity will be constructed. The findings of this comprehensive site investigation were consistent with the original overall report.

The general conclusion to date establishes that the proposed plan is fully supported by the appropriate geology. All the above will be subjected to detailed geotechnical review and the development of structural recommendations through the subdivision or Development Permit process.

B BEACON GEOTECHNICAL LTD.

October 17, 2005 Beacon File No: 05—J00322

20/20 Properties Ltd.
c/o Sproule & Associates Ltd.
Suite 100 – 1525 West Eighth Avenue
Vancouver, B.C.
V6J 1T5

Attention: Mr. John Sproule

Dear Sir,

Re: Preliminary Geotechnical Assessment
Lakeside Resort Development, Lake Country, B.C.

1.0 Introduction

Beacon Geotechnical Ltd. has been retained by 20/20 Properties Ltd. as the Geotechnical Consultant for the Lakeside Resort Development, in Lake Country, B.C. Our scope of work will be to carry out detailed geotechnical investigations on the site in order to determine the physical and engineering properties of the subsurface soil, bedrock, and groundwater conditions, in order to provide recommendations for design and construction of the development. This letter summarizes our understanding of the project, and presents our preliminary geotechnical assessment of the site.

2.0 Project Description

The proposed development is a comprehensive project, including a resort golf course, marina, yacht club, hotel, restaurant, commercial and mixed density residential developments. The Lakeside development encompassing approximately 250 hectares, divided into four separate neighbourhoods. Each neighbourhood includes residential development, as well as other amenities, suited to the surroundings.

Each neighbourhood is also defined by distinct geological conditions, identifying a set of parameters that must be defined in order that the development can be safely used fro the intended purpose.

The following sections provide a brief description of the development within the proposed neighbourhoods, as well as an outline of the geologic conditions, and parameters that will be required for design of the development. Where required, additional work has been outlined.

3.0 Preliminary Geotechnical Assessment

Ridgeline Neighbourhood and Golf Course Development: The Ridgeline Neighborhood and golf course development is located on the eastern side of the assembled land package. This portion of the Lakeside Development encompasses approximately 147 hectares, and will include an 18 hole golf course with club house, as well as 730 of the 1700 total residential units within the Lakeside Development. Tyndall Road will be re-aligned through this area to provide better land use.

The proposed Ridgeline Neighbourhood is situated on a large rocky protrusion, approximately 150 metres above the Village Neighbourhood and 300 metres above Okanagan Lake. Bedrock outcrops of granitic and volcanic rock dominate the area, in some cases forming very steep rock faces. Since deglaciation of the area, between 10,000 and 15,000 years ago, talus slopes has formed at the base of the steep rock faces.

Beacon has carried out a site reconnaissance of the area, and from a geotechnical perspective, development in the Ridgeline Neighbourhood will have to respect the potential for falling rock. Rock fall shadow zones will have to be determined in order that set forward lines can be established for buildings in the area. Where development is proposed within rockfall shadow zones, the geotechnical engineer must provide suitable recommendations for rock fall protection. These measures may include, but not limited to, berms constructed of earth or concrete, collection ditches, or rock fall fences.

Setback lines from the crest of the rock faces will also have to be established. Weathering of the rock, and orientation of the joint sets and fractures will have to determined in order that effective setback lines can be determined. Development will have to be limited to areas behind the setback line.

Other geotechnical related issues include construction of the development on the undulating and hummocky bedrock topography. The civil design consultant must work with the geotechnical consultant to ensure that the grading parameters used for design are suitable for the ground conditions encountered on site.

Village Neighbourhood: The Village Neighbourhood is located in the northwest corner of the Lakeside Development, located east of Okanagan Centre Road West, and west of Tyndall Road. The area encompasses 58 hectares, and will include 386 residential units, a hotel, retail development, and amenities.

Topographically, the area is defined by a large, flat bench. To the west, the topography slopes down steeply to Okanagan Lake, and to the east, the bench is defined by the large rocky outcrop of the Ridgeline Neighbourhood. Soil exposures on the west slopes indicate that the in the soil profile consists of outwash deposits of dense sand and gravel.

Several ravines, associated with the retreat of the last glacial period are located in the steep slopes to the west of the development. In particular, one large ravine is located near the south end of the Village Neighbourhood. The top of this ravine will be the focal point of several of the areas major buildings, including the hotel, retail area and the amenities. Several active erosion areas were noted along the crest of the ravine,

From a geotechnical perspective, development in the area must consider the stability of the steep slopes to the west of the proposed development areas, and along the crest of the ravines. Preliminary work completed to date indicates that a 1.75(H):1(V) setback line from the toe of the steep slopes would be suitable for the soil profile exposed in the area. In order to minimize the distance from the crest of the slopes, the development in the area may be excavated below the existing site grade, provided that the foundation does not encroach on the setback line.

Additional subsurface investigation must be carried out in this area to determine strength of the soil profile, and to confirm the setback requirements prior to detailed design of the development.

Foreshore Neighbourhood: The Foreshore Neighbourhood is situated in the southwest corner of the Lakeside Development, along Okanagan Lake. The area includes 28 hectares, and 425 residential units. In addition, development in the area will include a marina, yacht club and dry storage for 500 boats. It is proposed to re-align Okanagan Centre Road West through this area to provide better traffic flow and aesthetics. The Foreshore Neighbourhood is the most intrusive of the Lakeside Development, requiring a significant amount of site grading to achieve the proposed design grades, and construction of the proposed buildings in the marina area. Some retaining structures will be required to achieve design grades.

The Foreshore Neighbourhood is also the most geotechnically diverse of the Lakeside Development. Exposures in the area include glacial-fluvial deposits of sand and gravel, glacial – lacustrine deposits of silt, granitic bedrock, and sand and gravel deposited by mass wasting.

Additional geotechnical investigation of the soil profile in the area will be required to determine the physical and engineering properties of the soil profile, in order to provide recommendations for design and construction of the development in the area. In particular, investigation will be required in the marina area to delineate the sand and gravel material deposited by mass wasting.

Tram: Another feature of the Lakeside Development is a tram proposed to convey pedestrians from the Ridgeline Neighbourhood clubhouse to the marina on Okanagan Lake, with a stop at the Village Centre. The tram will require the construction of several heavily loaded columns along the alignment to support the weight of the tram. The tram alignment will generally follow a steep ravine. The ravine is an ancient drainage relic from the retreat of the glaciers. Areas of active erosion were noted in the ravine at several locations, particularly along the crest.

The proposed alignment of the tram is situated in a several soil profiles. From a geotechnical perspective, several issues must be determined for the successful design of the tram foundation. At each tower location, the bearing capacity of the soil profile must be determined. This will required a subsurface investigation using a drill rig. Access to several of the tower locations may be difficult due to the terrain, and hand held equipment will be required. Other design considerations include the slope stability along the tram alignment. Once the physical and engineering parameters of the soil profile have been determined, a slope stability analysis must be carried out to ensure that final tower locations will not affect the stability of the slope, or if the tower locations should be moved.

South Valley Neighbourhood: The South Valley Neighbourhood is situated in the southeast corner of the Lakeside Development. It encompasses approximately 14 hectares, and will include 144 residential units, and is typical of residential development in the area. The development will include the construction of roads and building lots for single family and multifamily buildings.

The soil profile encountered in exposures on the site includes glacial outwash deposits of sand and gravel, and significant extent of bedrock exposures. Detailed geotechnical investigation will be required to delineate bedrock in the area to define design parameters for site grading and construction costs.

4.0 Conclusions

The previous sections have described our understanding of the Lakeside Development, the geologic conditions of the provided our preliminary geotechnical assessment of the development, outlining the geotechnical parameters required for development.

Based on our preliminary assessment, the site is well suited for the proposed development. Additional, more detailed geotechnical work will be required to finalize the design of the development. The additional work will be carried out on a priority basis, as development proceeds.

We trust that this report satisfies your present requirements. If you have any questions regarding this report, please feel free to call.

Yours truly,
Beacon Geotechnical

Chris Wallis, P.Eng.
Geotechnical Engineer

B BEACON GEOTECHNICAL LTD.

October 17, 2005 Beacon File No: 05—J00322

20/20 Properties Ltd.
c/o Sproule & Associates Ltd.
Suite 100 – 1525 West Eighth Avenue
Vancouver, B.C.
V6J 1T5

Attention: Mr. John Sproule

Dear Sir,

Re: Preliminary Geotechnical Assessment
Lakeside Resort Development, Lake Country, B.C.

1.0 Introduction

Beacon Geotechnical Ltd. has been retained by 20/20 Properties Ltd. as the Geotechnical Consultant for the Lakeside Resort Development, in Lake Country, B.C. Our scope of work will be to carry out detailed geotechnical investigations on the site in order to determine the physical and engineering properties of the subsurface soil, bedrock, and groundwater conditions, in order to provide recommendations for design and construction of the development. This letter summarizes our understanding of the project, and presents our preliminary geotechnical assessment of the site.

2.0 Project Description

The proposed development is a comprehensive project, including a resort golf course, marina, yacht club, hotel, restaurant, commercial and mixed density residential developments. The Lakeside development encompassing approximately 250 hectares, divided into four separate neighbourhoods. Each neighbourhood includes residential development, as well as other amenities, suited to the surroundings.

Each neighbourhood is also defined by distinct geological conditions, identifying a set of parameters that must be defined in order that the development can be safely used fro the intended purpose.

The following sections provide a brief description of the development within the proposed neighbourhoods, as well as an outline of the geologic conditions, and parameters that will be required for design of the development. Where required, additional work has been outlined.

3.0 Preliminary Geotechnical Assessment

Ridgeline Neighbourhood and Golf Course Development: The Ridgeline Neighborhood and golf course development is located on the eastern side of the assembled land package. This portion of the Lakeside Development encompasses approximately 147 hectares, and will include an 18 hole golf course with club house, as well as 730 of the 1700 total residential units within the Lakeside Development. Tyndall Road will be re-aligned through this area to provide better land use.

The proposed Ridgeline Neighbourhood is situated on a large rocky protrusion, approximately 150 metres above the Village Neighbourhood and 300 metres above Okanagan Lake. Bedrock outcrops of granitic and volcanic rock dominate the area, in some cases forming very steep rock faces. Since deglaciation of the area, between 10,000 and 15,000 years ago, talus slopes has formed at the base of the steep rock faces.

Beacon has carried out a site reconnaissance of the area, and from a geotechnical perspective, development in the Ridgeline Neighbourhood will have to respect the potential for falling rock. Rock fall shadow zones will have to be determined in order that set forward lines can be established for buildings in the area. Where development is proposed within rockfall shadow zones, the geotechnical engineer must provide suitable recommendations for rock fall protection. These measures may include, but not limited to, berms constructed of earth or concrete, collection ditches, or rock fall fences.

Setback lines from the crest of the rock faces will also have to be established. Weathering of the rock, and orientation of the joint sets and fractures will have to determined in order that effective setback lines can be determined. Development will have to be limited to areas behind the setback line.

Other geotechnical related issues include construction of the development on the undulating and hummocky bedrock topography. The civil design consultant must work with the geotechnical consultant to ensure that the grading parameters used for design are suitable for the ground conditions encountered on site.

Village Neighbourhood: The Village Neighbourhood is located in the northwest corner of the Lakeside Development, located east of Okanagan Centre Road West, and west of Tyndall Road. The area encompasses 58 hectares, and will include 386 residential units, a hotel, retail development, and amenities.

Topographically, the area is defined by a large, flat bench. To the west, the topography slopes down steeply to Okanagan Lake, and to the east, the bench is defined by the large rocky outcrop of the Ridgeline Neighbourhood. Soil exposures on the west slopes indicate that the in the soil profile consists of outwash deposits of dense sand and gravel.

Several ravines, associated with the retreat of the last glacial period are located in the steep slopes to the west of the development. In particular, one large ravine is located near the south end of the Village Neighbourhood. The top of this ravine will be the focal point of several of the areas major buildings, including the hotel, retail area and the amenities. Several active erosion areas were noted along the crest of the ravine,

From a geotechnical perspective, development in the area must consider the stability of the steep slopes to the west of the proposed development areas, and along the crest of the ravines. Preliminary work completed to date indicates that a 1.75(H):1(V) setback line from the toe of the steep slopes would be suitable for the soil profile exposed in the area. In order to minimize the distance from the crest of the slopes, the development in the area may be excavated below the existing site grade, provided that the foundation does not encroach on the setback line.

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The Foreshore Neighbourhood is also the most geotechnically diverse of the Lakeside Development. Exposures in the area include glacial-fluvial deposits of sand and gravel, glacial – lacustrine deposits of silt, granitic bedrock, and sand and gravel deposited by mass wasting.

Additional geotechnical investigation of the soil profile in the area will be required to determine the physical and engineering properties of the soil profile, in order to provide recommendations for design and construction of the development in the area. In particular, investigation will be required in the marina area to delineate the sand and gravel material deposited by mass wasting.

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The proposed alignment of the tram is situated in a several soil profiles. From a geotechnical perspective, several issues must be determined for the successful design of the tram foundation. At each tower location, the bearing capacity of the soil profile must be determined. This will required a subsurface investigation using a drill rig. Access to several of the tower locations may be difficult due to the terrain, and hand held equipment will be required. Other design considerations include the slope stability along the tram alignment. Once the physical and engineering parameters of the soil profile have been determined, a slope stability analysis must be carried out to ensure that final tower locations will not affect the stability of the slope, or if the tower locations should be moved.

South Valley Neighbourhood: The South Valley Neighbourhood is situated in the southeast corner of the Lakeside Development. It encompasses approximately 14 hectares, and will include 144 residential units, and is typical of residential development in the area. The development will include the construction of roads and building lots for single family and multifamily buildings.

The soil profile encountered in exposures on the site includes glacial outwash deposits of sand and gravel, and significant extent of bedrock exposures. Detailed geotechnical investigation will be required to delineate bedrock in the area to define design parameters for site grading and construction costs.

4.0 Conclusions

The previous sections have described our understanding of the Lakeside Development, the geologic conditions of the provided our preliminary geotechnical assessment of the development, outlining the geotechnical parameters required for development.

Based on our preliminary assessment, the site is well suited for the proposed development. Additional, more detailed geotechnical work will be required to finalize the design of the development. The additional work will be carried out on a priority basis, as development proceeds.

We trust that this report satisfies your present requirements. If you have any questions regarding this report, please feel free to call.

Yours truly,
Beacon Geotechnical

Chris Wallis, P.Eng.
Geotechnical Engineer

2.J Financial Impact

DURING DEVELOPMENT

A. Site Construction Activity

This section of the Master Plan identifies the key areas where the LakeStone development program will generate construction activity, all of which will have a positive financial impact for the District of Lake Country. The estimates are based on today's values and an assumed development period which is expected to take no less than 12 years. In addition to providing a cost estimate to install the LakeStone services, the intent of the schedule which follows is to assist District staff in aligning their overall planning program.

Lakestone Servicing (2012 Pricing)

Phase	Offsite Works Road Length (km)	Hard Cost	Onsite Works Road length (km)	Hard Cost	Total
1	0.00	$ 4,750,000	0.73	$ 2,259,959	$ 7,009,959
Sub Total Phase 1		$ 4,750,000		$ 2,259,959	$ 7,009,959
2	1.40	$ 1,840,000	2.42	$ 7,528,000	$ 9,368,000
3	1.10	$ 1,445,714	1.13	$ 3,506,832	$ 4,952,546
4	0.65	$ 854,286	1.07	$ 3,335,387	$ 4,189,673
4	Pumphouse	$ 600,000			$ 600,000
4	600 Reservoir	$ 1,500,000			$ 1,500,000
Glenmore	1.24	$ 1,623,143	0.15	$ 467,578	$ 2,090,721
5	0.00	$ -	2.95	$ 9,195,694	$ 9,195,694
5	655 Reservoir	$ 1,815,000			$ 1,815,000
5	Pumpstation UG	$ 320,000			$ 320,000
6	0.60	$ 788,571	1.68	$ 5,221,284	$ 6,009,855
7	0.00	$ -	2.40	$ 7,481,242	$ 7,481,242
8	1.60	$ 2,102,857	2.51	$ 7,824,133	$ 9,926,990
Sub Total Phases 2 to Glenmore		$ 12,889,571		$ 44,560,150	$ 57,449,721
Total:		**$ 17,639,571**		**$ 46,820,109**	$ **64,459,680**

Note: Phase 1 servicing has been completed.

B. DCC Contributions

DCC Contributions generated by the LakeStone development program will be applied by the District against the cost of various infrastructure improvement projects throughout Lake Country (not just around LakeStone) that the District has determined will be necessary in order to effectively manage and meet future growth forecasts for area. The LakeStone DCC contributions as outlined below will provide funding for several such improvements:

Table – DCC Contributions

Phase 2	$	1,812,500
Phase 3	$	2,389,500
Phase 4	$	704,500
Glenmore	$	2,517,500
Phase 5	$	1,675,500
Phase 6	$	1,990,500
Phase 7	$	1,745,000
Phase 8	$	2,668,500
Total	**$**	**15,503,500**

C. Dedicated Lands

In addition to the park lands, school sites and trails transferred to date at an assessed value of $755,920. Future additional dedications and transfers will be made as the development continues. Therefore, the aggregate value of these transactions is estimated to be as follows:

Dedicated Lands

Area		**Value**	**Area (Ha)**	**Per Ha**
Dedicated to Date	$	775,920	8.90	$ 87,182
Future Dedications				
- Parklands	$	959,874	11.01	$ 87,182
- Remaining Green Areas			93.94	
Total	**$**	**1,735,794**	**113.85**	

D. Permits and Fees Revenue

The anticipated development and building permit fees and inspection revenue to be generated by the LakeStone development for the benefit of the District inspection services is anticipated to be approximately $5.5 million.

Summary A to D - Development Period

The collective financial impact of the infrastructure improvements to Phase 2 through 8 are estimated to be as follows:

On-Site Improvements	$ 46,820,109
Off-Site Improvements	$ 17,639,571
DCC Contributions	$ 15,503,500
Dedicated Lands	
- To Date	$ 755,000
- Future	$ 2,585,818
Permits and Fees Revenue	$ 5,500,000
Total	**$ 88,803,998**

E. Employment – Construction Period

Based on information from the NAHB, a single family home generates 3 person years of work. We have conservatively assumed 1.5 person years for multifamily construction. Therefore, using this accepted rationale, the construction at LakeStone will result in approximately 3000 person years of work. Over a period of 12 years, this project will generate 250 full time jobs, most of which will be highly skilled, high compensation positions.

In addition to the direct job creation impact of 250 jobs, it is estimated that each job in construction typically supports 3 other jobs in the community, resulting in a potential employment spin-off of 750 additional jobs to be generated by this development.

F. Residential, Resort & Commercial Construction Spending

In addition to the $6 million of amenities to be constructed within the Lakestone development, construction of the 1365 residential and resort units to be built within the community (assuming an average cost of $400,000 for each unit) will create over $545 million of construction spending within the District. As well, the commercial construction within the Glenmore Road site will total approximately $8 million, for a total construction spending at LakeStone of over $555 million.

POST DEVELOPMENT

G. On-going Financial Impact

Based upon today's estimated costs and mil rates, it is anticipated the annual municipal portion of the levies and property taxes to be generated by the LakeStone development upon completion will be approximately $4 million.

H. Economic Impact on the Lake Country Community

In addition to the direct financial benefits to be generated by Lakestone during its development stage, the completed community will become a catalyst for substantial economic stimulus for the District. For example, As the LakeStone units are completed, there will be a growing demand for maintenance related services, which will equate to additional permanent jobs within the District.

SUMMARY – OVERALL IMPACT

With over $625 million of hard construction activity in today's dollars, it is anticipated that The LakeStone development will become one of the largest economic contributors to the economy of the District of Lake Country over the next 12 to 15 years.

2.K Wildfire Plan

A Wildfire Plan has been prepared by Mosaic Forest Management. This report (attached) establishes the approach for fire mitigation on the overall site, and lists a number of measures to be considered when developing the site-specific fire plan for each phase of development. All lands to be turned over to the DOLC shall have mitigation measures in place prior to dedication of those lands.

Mitigation work shall be conducted on a phased basis, and performed at the time of land preparation / site servicing, prior to construction of buildings.

Following are some relevant assumptions and fire mitigation elements which will be put in place:

- As a part of the OCP urban designation, this site will become further impacted by increasing surrounding development
- Building materials proposed by the Design Guidelines emphasize the use of non-combustible materials
- Additional emergency egress will be provided through the Sage Glen project (northwest corner of the subdivision) in Phase 7. This road will remain closed with bollards or a gate unless it is required in an emergency. Road surface would be gravel, prepared and maintained to DOLC standards

February 26, 2012

Donal O'Callaghan
MacDonald Development Corp.
11th Floor 938 Howe Street,
Vancouver, BC
V6Z 1N9

re: Addendum to ***Wildland Fire Hazard Assessment and Forest Health Report*** for Lakeside - dated September 8th, 2005

Dear Mr. O'Callaghan:

This letter and attached map constitute an addendum to the "*Wildland Fire Hazard Assessment and Forest Health Report for Lakeside*", completed in September 2005 by Mosaic Forest Management.

The management structure associated with the original "Lakeside Development" has recently undergone a change. MacDonald Lakeshore Properties is now managing this development, now named "**LakeStone**". With this change has come a request to review the original Wildland Fire Assessment Report in light of both the proposed changes planned for the development and any on-the-ground changes which may have occurred over the past six years.

Dave Gill, RPF of Mosaic Forest Management completed an office review of the new development proposal followed with a site visit to determine if a new Wildfire Hazard report would be required to address the changes, or whether an addendum to the existing report would suffice.

A review of the revised development project revealed that there are no new, previously unassessed additions to the development property. The outside boundaries have been revised; some areas included in the 2005 development are no longer part of the new development project. The internal configuration of roads and open spaces has changed as well, however the overall building density is similar. Most notably the proposed golf course is no longer planned. Because this course was proposed as a "link style" course (no manicured and irrigated fairways), it had little impact on the fire hazard potential to proposed adjacent residences. Thus these revisions to the development are not significant in terms of assessing wildfire hazard.

The site visit to the property revealed that there has been significant Ponderosa Pine mortality in the past few years due to bark beetles. With more dead, dry trees

on the site the wildfire hazard potential has temporarily increased across the property. This increased potential is temporary because beetle attacked Ponderosa Pine has a tendency to fall over in a relatively short period of time (2 – 3 years) after succumbing to bark beetles. Once in contact with the ground, the elevated hazard created by standing dead trees abates somewhat over a period of time, but still remains higher than what it would have been had the mortality not occurred in the first place. These forested stands consist of a mix of Douglas-fir and Ponderosa Pine. The condition of the Douglas-fir has not significantly changed. Since the writing of the original report, mitigation works have been completed on the two smaller parcels of the development (the Waterfront and Glenmore subdivisions). The fire hazard zones outlined on the map in Appendix 2 of the original report remain valid, albeit with a higher level of tree mortality than six years ago. These changes will be addressed in the prescribed treatments discussed below under "Recommendations".

Considering the proposed changes to the development and the conditions on the ground, Mosaic Forest Management recommends that this letter be attached as an addendum to the existing Wildland Fire Assessment report as opposed to the completion of a re-write.

With the effects of the bark beetle, and what we've learned in the field of fire mitigation over the past six years, the recommendations in this addendum will replace *Section 9.0 Recommendations* of the original report, and the attached Treatment Map will replace *Appendix 3 Areas Proposed for Mitigation Map* of the original report. The objective of the original report, reducing the wildfire hazard potential on lands adjacent to proposed developments, has not changed however the recommendations for attaining this objective have been revised to reflect today's conditions on the property.

The following recommendations pertain to the large contiguous portion of the development area and not the two smaller parcels to the southeast and southwest where fire mitigation works and clearing for the installation of infrastructure have already taken place. It is suggested that the mitigation works be conducted as the subdivision is developed (i.e. in conjunction with the clearing required for infrastructure, roads, and building footprints) and before construction on residential structures begins.

These recommendations to reduce wildfire hazard potential within the development area are directed at protecting residences and infrastructure from wildfire. These measures are prescribed for portions of the open spaces and proposed parks as shown on the attached Treatment Map. Much of this Treatment Zone occurs on steep rocky slopes where site conditions are too dangerous and sparsely vegetated to conduct mitigation work. **It is not the intent of this prescription to treat all parts of the Treatment Zone as outlined on the attached map. Mitigation works will be confined to those areas within the Treatment Zone**

that are less than 40% slope and where the contractor conducting the work feels safe in doing so.

All mitigative measures will be completed in a manner compatible with geotechnical, environmental, and engineering issues. These recommendations to reduce the wildfire hazard will replace those found in Section 9.0 of the original report referenced above:

1) Mitigation works will be conducted at the interface of the proposed open spaces and proposed lot boundaries, as indicated on the attached map. The interface treated will consist of a 50 meter wide Treatment Zone along the edge of the planned open spaces.

2) This Treatment Zone will consist of two Treatment Units. The first Treatment Unit (TU "A") will be 10 meters wide and begin at the boundary between proposed lots and open areas. The second Treatment Unit (TU "B") will be the remaining 40 meters of the Treatment Zone.

3) **TU "A"** - Where terrain conditions permit, the treatment prescription is to:
   a. Thin existing coniferous trees so that the crowns of the trees are separated. Focus on retaining a mix of healthy mature Ponderosa Pine and Douglas-fir.
   b. Prune the branches of the remaining trees to a height of 4 meters above ground.
   c. Remove all dead or dying trees and trees with significant leans.
   d. Remove all woody debris (pre-existing and debris associated with conducting the mitigation works).

4) **TU "B"** - Where terrain conditions permit, the treatment prescription is to:
   a. Thin the existing conifers to achieve a minimum inter-tree spacing of approximately 5 meters in the first 20 meters adjacent to TU "A", and 3 meters in the remaining 20 meters.
   b. Prune the branches of the remaining trees to a height of 3 meters above ground.
   c. Fall all dead and dying trees except for those which have been identified by a Qualified Professional as wildlife habitat trees.
   d. Fall all trees with a significant lean.
   e. Retain a mixture of species and diameters (i.e. a mix of mature and immature trees) where possible.
   f. Remove the coarse woody debris (piece size greater than 10cm in diameter) associated with the mitigation works.
   g. On areas where coarse woody debris cannot be easily removed (i.e. where pulling the debris uphill is the only option) arrange the debris (for debris larger than 10cm in diameter only) into piles of no more than 1.5 meters high, 2 meters in diameter, and spaced no less than 15 meters apart. This is expected to occur on less than 10 percent of

the TU. Pending approval of appropriate permits, these piles could be burned. Pre-existing woody debris may remain on site provided it is in direct contact with the ground and the accumulations do not exceed 10 cm.

h. Fine woody debris (branches less than 10 cm in diameter) and needles may remain on site provided the accumulations do not exceed 10 cm in depth.

5) Consider using deciduous shrubs, ground cover, lawn, and landscape rock in the lots between the residence and the open space. Avoid landscaping with coniferous trees, shrubs, and hedges and refrain from using combustible mulches (i.e. bark or wood mulches) as ground cover. Utilize xeriscape landscaping techniques **or** install underground irrigation in these areas.

6) Maintain the integrity of the treated areas by periodically reassessing their effectiveness and, if necessary, conducting maintenance works.

7) Consider incorporating "Fire Smart" construction materials and methods into building plans. Ensure roofing products are made of fire resistant materials.

8) Ensure potential emergency access routes are detailed at the subdivision planning level.

Mitigation works completed with adherence to these recommendations will result in reducing the fire hazard potential to proposed residences within this development.

Please contact the undersigned if you have any questions.

Yours Truly,
MOSAIC FOREST MANAGEMENT

Dave Gill, RPF

2 L. Archaeology

MLP has commissioned an archeological study of the overall site, comprising an update of many previous studies dating back to 1977 – it is incorporated into this document.

A September 2011 review by the Archaeology Branch of the Ministry of Forests, Lands and Natural Resource Operations (attached), concurred with the findings of the previous study, and confirmed that no further archaeological work is necessary in this area and advised that it has no objections or archaeological concerns should the development proceed. However if an archaeological find is discovered during development, MLP will halt all activities until a proper examination can be conducted.

In the various studies that have been undertaken over the last 3 decades, there are a couple of very small areas in road rights of way that have not been fully investigated. They are highlighted in the current report, and at the recommendation of Golder Associates, MLP has commissioned a desktop review to ensure that a full signoff is obtained for the entire site.

March 14, 2012 Project No. 1214910016-001-L-Rev0

Donal O'Callaghan
Macdonald Development Corporation
11th Floor, 938 Howe Street
Vancouver, BC
V6Z 1N9

COMPARISON OF 2012 MACDONALD/LAKESTONE SUBDIVISION AND THE GOLDER ASSOCIATES LTD. ARCHAEOLOGICAL IMPACT ASSESSMENT (*HCA* PERMIT 2006-0135) CONDUCTED FOR SOLERA DEVELOPMENTS LTD AND 20/20 PROPERTIES LTD., OKANAGAN CENTRE, BC

Dear Mr. O'Callaghan:

1.0 INTRODUCTION

At the request of Macdonald Development Corporation (MDC), Golder Associates Ltd. (Golder) has undertaken a desktop review of the proposed Macdonald/Lakestone Subdivision Project (the Project Area) in regards to an Archaeological Impact Assessment (AIA) that Golder conducted for Solera Developments Ltd. and 20/20 Properties Ltd. on the Lakeside Development and adjacent District Lots 39, 40 and the shorefront portion of Lot 41. The AIA was conducted under *Heritage Conservation Act* (*HCA*) Section 14 Inspection Permit 2006-0135 issued by the Archaeology Branch (then under the Ministry of Tourism, Sport and the Arts). Golder understands that the District of Lake Country has required MDC to undertake such a review and provide a statement as to the applicability of the 2006 AIA to the current Project.

2.0 OBJECTIVES

The objectives of the desktop review were to: 1) determine if the proposed Project Area is encompassed within or extends beyond the 2006 AIA; 2) determine if the 2006 AIA addresses the scope of development associated with the current Project; 3) identify any archaeological concerns or recommendations arising from the 2006 AIA that are applicable to the current Project; and 4) identify the need and scope of further archaeological assessment studies in advance of Project-related land-altering activities.

3.0 METHODOLOGY

The desktop information review consisted of accessing the following resources:

- Golder's 2006 AIA report and associated geo-referenced digital data;
- British Columbia's Provincial Heritage Register (PHR) using RAAD (Remote Access to Archaeological Data);
- MDC-supplied Project Area geo-referenced plans and Project development information; and
- the Consultative Areas Database (CAD) map service for First Nations' boundary information.

4.0 RESULTS

4.1 Review of 2006 AIA

The 2006 AIA was conducted in three separate field programs. As such, three separate interim reports were produced as a means to initiate regulatory reviews for the specific land parcels inspected during the field programs.

The first of these assessments was for the proposed 219 ha Lakeside Development (residential and resort development) during which two archaeological sites (EaQu-51 and 53) protected under the *HCA* were confirmed along the lakeshore within the very southwest portion of the Lakeside Development property. Avoidance of land-altering activities was recommended as the primary mitigation strategy for both sites. If avoidance is not possible, the following recommendations have been provided:

- Site alterations must be conducted under the authority of a *HCA* Section 12 Site Alteration Permit *at a minimum,* and concurrent archaeological work may be required.
- In regards to EaQu-51, additional mitigation recommendations are to be made in concert with the Archaeology Branch and relevant First Nations.
- Efforts are to be made to reduce indirect impacts, such as vandalism, to EaQu-51 by limiting opportunities for site visitation (e.g. avoidance of the area by walking paths, not erecting any structures or signs in proximity to the site that would attract attention, etc.).

No further archaeological work was recommended for the remainder of the Lakeside Development project area as defined for the 2006 AIA.

The second assessment was conducted on District Lots 39 and 40 but was limited to a visual examination and a restricted judgemental subsurface testing program because specific development plans had not been designed by the time of the AIA. One archaeological site was recorded (EaQu-65) along the beach and shoreline within the Lots and three other areas with potential for buried archaeological sites were identified. The following recommendations have been made regarding District Lots 39 and 40:

- Avoid EaQu-65 and the three high potential areas.
- If avoidance is not practical, then further assessment involving systematic shovel testing would be necessary at EaQu-65 and the three potential areas prior to development, to devise appropriate management strategies.

It should be noted that District Lots 39 and 40, including EaQu-65 and the three areas of archaeological potential, are not within the Lakestone Project Area as currently proposed.

The third assessment was focussed on the 1.9 ha western/shorefront portion of Lot 41 in advance of a housing development with associated pathways, roads and utility services, and a park with picnic areas. The upland portion of Lot 41 had been assessed during the Lakeside Development field program with negative results. While site EaQu-65 and an area of high potential had been identified immediately to the north, no archaeological sites or areas of high potential were identified during the field assessment of this 1.9 ha project area. No further archaeological work was recommended for the project area as defined for the 2006 AIA.

4.2 Review of the Provincial Heritage Register

Golder conducted a search of the PHR via RAAD on February 24, 2012. The purpose of this search was to determine if any archaeological programs resulting in the identification of additional archaeological sites had been conducted within or adjacent to the Project Area following the Golder AIA completed under *HCA* S.12 Permit 2006-0135.

The results of the search indicate that no new sites had been identified within the Macdonald/Lakestone Project Area since the Golder 2006 AIA.

4.3 Review of Project Area plans and Project development information

MDC provided a general statement about the anticipated development impacts associated with the Project (Donal O'Callaghan, pers. comm. February 23, 2012), which include the following:

- Access road construction: variable amount of cut and fill.
- Utilities: installation of subsurface utilities below the roads.
- Residential structures: single family lots and townhomes will involve excavation and foundation work.

The Project is proposed within nine phases. Phases 1 and 2 will be initiated in the southwestern portion of the Project Area (e.g. below Okanagan Centre Road West and including shoreline locations). Phase 3 will take place north-northeast of Phases 1 and 2, between Okanagan Centre Road West (north-south routing) and Tyndall Road. Phases 4 through 8 are located east and up-slope from Tyndall Road, contained between Tyndall Road, Okanagan Centre Road West (east-west routing), Long Road, and Chase Road. The Glenmore Road/Chase Road Floating Phase is southeast of Phase 8 on the south side of Okanagan Centre Road West (east-west routing), bounded by Chase Road and Glenmore Road.

The aim of the Project master plan is to preserve approximately half of the Project Area as natural space with minimal disturbance. The focus of this natural space will be environmentally sensitive areas (ESA), as well as locations that will provide habitat for wildlife.

Golder received detailed, geo-referenced digital data from Protech Consultants Ltd. on February 24, 2012, and additional revisions from MDC on March 8, 2012, onto which Golder AutoCAD technical staff overlaid geo-referenced information associated with the Golder 2006 AIA, (Figure 1, attached). The purpose of this detailed comparison was to determine if the proposed Project Area was encompassed with the 2006 AIA. If portions of the Project Area were not encompassed, these could be identified and recommendations made.

It was determined that Phases 1, 2, 5, 7 and 8, and the Glenmore/Chase Road Floating Phase have been subject to AIA under *HCA* Permit 2006-0135. More specifically, these phases have been encompassed by the AIA conducted on the 219 ha Lakeside Development. Phase 1 contains *HCA* protected archaeological sites EaQu-51 and 53 along the lake shore. Specific recommendations were provided in the AIA report and apply in light of any proposed Project-related activities within Phase 1. No archaeological sites were identified within Phases 5, 7 and 8 and the Glenmore/Chase Road Floating Phase and the recommendation for no further archaeological work is applicable for these phases.

The majority of Phases 3, 4 and 6 has been inspected through the 2006 AIA conducted by Golder, as part of the 219 ha Lakeside Development. The recommendation for no further archaeological work for the areas covered under the AIA is considered appropriate and applicable. However, minor portions of these phases encompass terrain that fall beyond the 2006 AIA. This discrepancy appears to be a result of a slight gap in the 2006 project scope as provided to Golder for AIA. More specifically, this includes the following:

- Phases 3, 4 and 6: portions of these polygons encompass a space between two of the 2006 project area polygons (e.g. a space between the Ridgeline Lots polygon and the Village Lots polygon) that was not subject to assessment during the 2006 AIA. MDC has indicated that the unassessed space in the southeastern corner of Phase 3 is the existing right-of-way for Tyndall Road. The unassessed space along the western side of Phase 6 is outside any proposed areas of development under the current Project. Likewise, the southernmost section of the unassessed space at the southern end of Phase 4 is outside any proposed areas of development under the current Project.

  Project development activities are proposed within a portion of this unassessed space, in Phases 3 and 4 (Figure 1, attached). Additional review is recommended to determine what level of archaeological assessment,
  if any, is needed to address those sections of the unassessed gap that may be subject to land alterations. See section 5.0 for additional details.

It should be noted that District Lots 39 and 40 from the 2006 AIA, including EaQu-65 and the three identified areas of archaeological potential, are not within the Macdonald/Lakestone Subdivision Project Area as currently proposed.

4.4 Consultative Areas Database – First Nations

A review of the CAD in regards to First Nations traditional territories and overlap with the Project Area was conducted on February 22, 2012. This review was conducted because formal assertions of traditional territory have changed since the 2006 AIA was completed. Further review of CAD should be undertaken when/if future archaeological work is planned to determine if modifications have occurred to the list of First Nations with interests in the Project Area.

The following First Nations bands and agencies, based on the February 22, 2012 review, would require notification should MDC need to initiate future archaeological work:

- Okanagan Indian Band
- Westbank First Nation
- Penticton Indian Band
- Lower Similkameen Indian Band
- Coldwater Indian Band
- Cook's Ferry Indian Band
- Siska Indian Band
- Okanagan Nation Alliance
- Esh-kn-am Cultural Resources Management Services

5.0 RECOMMENDATIONS

While the majority of the Macdonald/Lakeshore Project Area has been subject to AIA by Golder under *HCA* S.14 Permit 2006-0135, there are portions that extend beyond the 2006 AIA. While no documented archaeological sites are present in these portions of the Project Area, areas of archaeological potential (i.e. locations where archaeological sites could be expected) may be present. It is recommended that MDC initiate a desktop Archaeological Overview Assessment (AOA) of any Project-related developments in these previously unassessed portions to identify appropriate management strategies. A summary of the objectives and levels of effort associated with AOA are presented below.

5.1 Archaeological Overview Assessment

An AOA can be conducted without need for *HCA* permit issued by the Archaeology Branch, Ministry of Forests, Lands and Natural Resource Operations and provides the opportunity to gather information useful for Project planning purposes, particularly at an early stage in the Project lifespan. Such an AOA would be conducted under Archaeology Branch Standards and Guidelines[1]

An AOA generally involves 1) conducting a background desktop review of readily available ethnographic, archaeological and environmental data pertinent to a Project Area with a focus on identifying overlap with documented archaeological sites and areas of high archaeological potential; 2) conducting a preliminary assessment of anticipated impacts in light of proposed development plans; and 3) develop recommendations concerning the need for permitted archaeological studies (e.g. AIA), if warranted.

If deemed necessary, a preliminary field reconnaissance (PFR) may be undertaken as part of an AOA. The aim of PFR is to conduct a field inspection to confirm/refine areas of archaeological potential arising from the desktop review and to identify surface expressions of archaeological sites, if present.

Consistent with industry practice and the bylaws of the BC Association of Professional Archaeologists (BCAPA), First Nations who are identified through the Consultative Areas Database (CAD) would be contacted to discuss the nature of the proposed project and AOA. Information and concerns that the First Nations may have regarding the Project Area would be solicited.

Many of British Columbia's First Nations groups have developed their own heritage policies and permitting systems. The archaeological community has largely respected these requirements. Where identified, First Nations permits would be applied for after discussion with the client.

6.0 CLOSURE

This report was prepared for Macdonald Development Corporation. Any use, reliance, or decisions made by third parties on the basis of this report are the responsibility of such third parties. The study was not specifically designed to address issues of traditional aboriginal use of the Project Area and does not constitute a traditional use study. This report was written without prejudice to issues of aboriginal rights and/or title.

[1] Archaeological Overview Assessment as General Land Use Planning Tool – Provincial Standards and Guidelines (March 2009).

We trust the information contained in this report is sufficient for your present needs. Should you have any questions regarding the project, please do not hesitate to contact the undersigned.

Yours truly,

GOLDER ASSOCIATES LTD.

ORIGINAL SIGNED

Todd Paquin, M.A., R.P.C.A.
Senior Archaeologist

ORIGINAL SIGNED

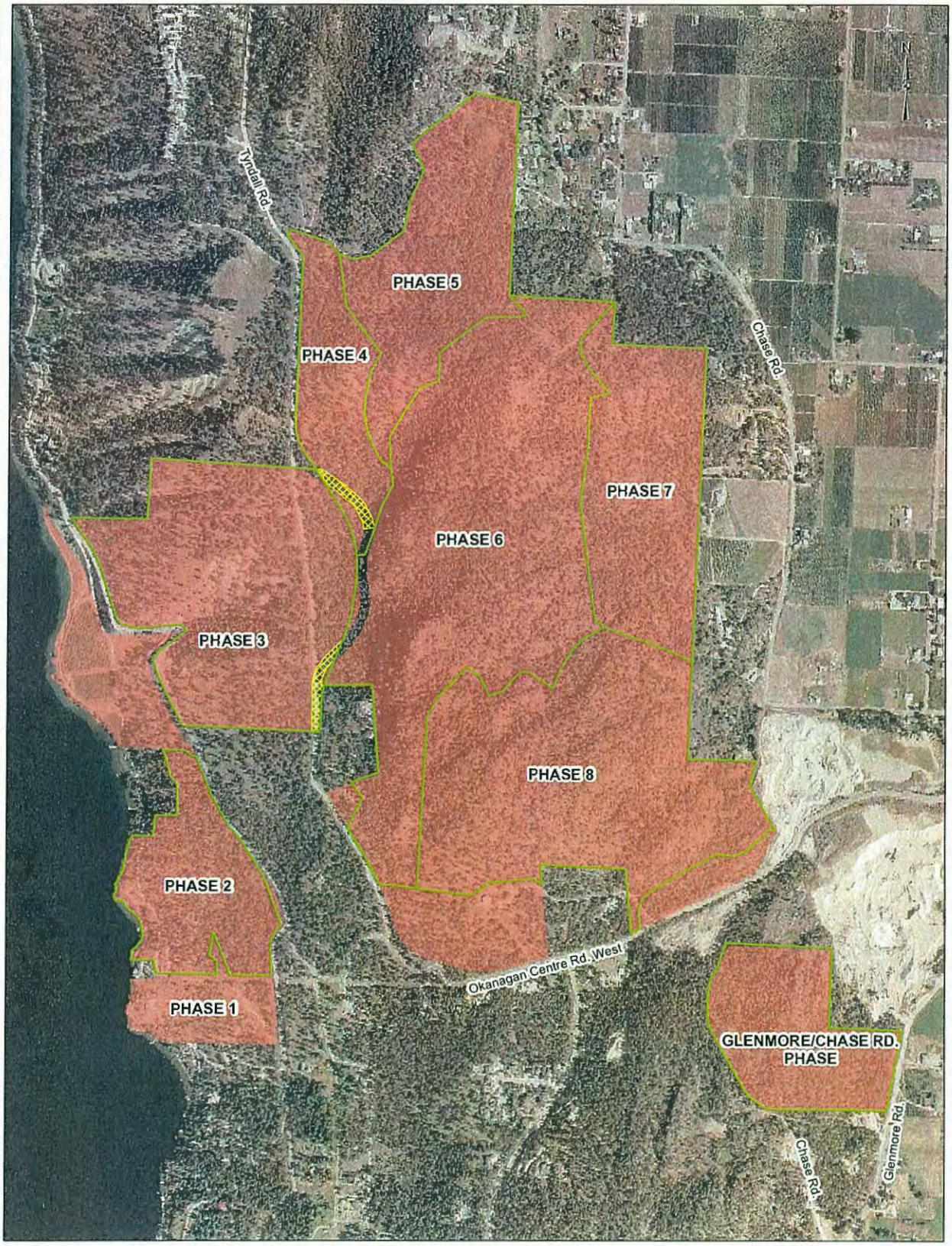
Karen Brady, B.A., R.P.C.A.
Associate, Senior Archaeologist

TP/KB/ak

Attachments: Figure 1: Key Plan

\\kam1-s-filesrv1\data\active\2012\1491 crm\12-1491-0016 mdc - aia review - lakestone property\07 deliverables\1214910016-001-l-rev0- mdc aia review lakestone property-14mar_12.docx

N:\Active\Proposals\Proposals 2012\1491 CRM\P2-1491-0016 Macdonald - Review of AIA - Okanagan Centre\Lakestone AIA background\Drafting\GIS\Figure - Key Plan.mxd



LEGEND

- Proposed 2012 MDC/Lakestone Subdivision boundaries
- Areas assessed during 2006 AIA
- Approximate development areas identified for AOA

250 0 250

SCALE 1:9,000 Meters KILOMETRES

PROJECT MACDONALD DEVELOPMENT CORPORATION
AIA REVIEW
OKANAGAN CENTRE

TITLE **KEY PLAN**

LEGEND

1. BASE IMAGERY FROM BC GOV. WEB MAPPING SERVICE.
2. MAP DATA PROVIDED BY PROTECH CONSULTANTS LTD AND MACDONALD DEVELOPMENT CORPORATION

Golder Associates
Kamloops, BC

PROJECT NO. 12-1491-0016			FILE No.	
DESIGN	TP	28 Feb. 2012	SCALE AS SHOWN	REV. 0
GIS	BKL	14 Mar. 2012		
CHECK	TP	14 Mar. 2012	FIGURE: 1	
REVIEW	KSB	14 Mar. 2012		

Donal O'Callaghan

From: Bond, Hayley FLNR:EX <Hayley.Bond@gov.bc.ca>
Sent: Monday, September 12, 2011 1:18 PM
To: 'Paul Wolanski'
Cc: Donal O'Callaghan; 'Carl Humphrey (Carl@rositchhemphill.com)'
Subject: RE: Referral Response ~ LakeStone Development

Hello Paul,

Thank you for the additional information regarding previous archaeological work conducted within the LakeStone Development, Lots 42 and 43, Sect 4, Township 20, ODYD, Plan 521 and Lot B, Sect 4, Township 20 ODYD, Plan KAP87286, PID 027-854-264, 001-836-749 and 001-836-757 (File No DP2011-016). After searching our records I understand that an archaeological impact assessment involving these three lots (as part of a larger study) was conducted in 2006 by Golder Associates at the request of Solera Developments under *Heritage Conservation Act* heritage inspection permit 2006-153. The Archaeology Branch concurs with the 2006-153 study findings by the professional consulting archaeologist that no further archaeological work is necessary for the three lots. The Archaeology Branch has no objections or archaeological concerns should this development proceed.

However, despite the most thorough inspection there is always a limited possibility for unknown archaeological sites to exist on the properties. Archaeological sites (both recorded and unrecorded) are protected under the *Heritage Conservation Act* and must not be altered or damaged without a site alteration permit from the Archaeology Branch. Owners and operators should be notified that if an archaeological site is encountered during development, activities must be halted and the Archaeology Branch contacted at 250-953-3334 for direction.

The Golder Associates 2006-153 final report is on file at the Archaeology Branch and I would be happy to send it to you or proponents if requested. Please feel free to contact me should you have any questions regarding my response above.

Thank you,
Hayley

Hayley E. Bond
Archaeological Site Inventory Info and Data Administrator
Archaeology Branch
Ministry of Forests, Lands and Natural Resource Operations
Phone: (250) 953-3343
Fax: (250) 953-3340
Visit our Website at: http://www.for.gov.bc.ca/archaeology/

From: Paul Wolanski [mailto:pwolanski@lakecountry.bc.ca]
Sent: Friday, September 9, 2011 4:23 PM
To: Bond, Hayley FLNR:EX
Cc: Donal@macdevcorp.com; Carl Humphrey (Carl@rositchhemphill.com)
Subject: Referral Response ~ LakeStone Development

Hi Hayley. Thanks for your comments regarding the proposed development of the LakeStone Phase 2 site. You have recommended that an archaeological assessment be conducted on the 3 lots prior to development. I understand it this would not preclude the District from issuance of a development permit however – is this still correct?

I have some history with this file I recall that Golder & Associates conducted an initial assessment and ID'd 3 sites for the entire project (not just Phase 2) but I do not have the site locations. I am attaching a letter from Golder to the former proponent's agent should you wish to review.

April 27, 2012

ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Macdonald Development Corporation Lakestone Subdivision Project, Winfield

Submitted to:
Donal O'Callaghan
Macdonald Development Corporation
11th Floor 938 Howe Street
Vancouver, BC
V6Z 1N9

Report Number: 1214910016.5001-R-Rev0

Golder Associates

Distribution:

1 Copy – MacDonald Development Corporation (+1 CD)

1 Copy – Okanagan Indian Band

1 Copy – Westbank First Nation

1 Copy – Penticton Indian Band

1 Copy – Lower Similkameen Indian Band

1 Copy – Okanagan Nation Alliance

1 Copy – Cook's Ferry Indian Band

1 Copy – Coldwater Indian Band

1 Copy – Siska Indian Band

1 Copy – Esh-kn-am Cultural Resources Management Services

1 Copy – Archaeology Branch (+1 CD)

2 Copies – Golder Associates Ltd.

Executive Summary

Golder Associates Ltd. (Golder) has been retained by the Macdonald Development Corporation (MDC) to conduct a desktop archaeological overview assessment (AOA) of previously unassessed portions of the proposed Lakestone Subdivision Project in which development activities are planned (the Project Area). The approximately 204 hectare (ha) Lakestone Subdivision Project is located west of Winfield and south of Okanagan Centre, BC, overlooking Okanagan Lake to the west (Figure 1). In 2006, Golder conducted an archaeological impact assessment (AIA) under *Heritage Conservation Act* (*HCA*) Section 14 Permit 2006-0153 for the proposed 219 ha Lakeside Development on behalf of Solera Developments Ltd. and 20/20 Properties Ltd., which has addressed the majority of the Lakestone Subdivision Project. As part of a 2012 review of the 2006 AIA, Golder identified two small polygons encompassing proposed Lakestone Subdivision developments that had not been specifically addressed in the AIA and warranted AOA.

The AOA involved background research pertinent to the Project Area. The objectives of the AOA were to 1) conduct an assessment of the archaeological potential of the Project Area; and 2) provide recommendations for further archaeological work, if necessary.

The results of the AOA led to an overall assessment of low archaeological potential for the Project Area. It is recommended that no further archaeological work be conducted in advance of the Project. The proponent is cautioned that low potential does not mean "no" potential and the possibility remains that archaeological sites may be present in areas identified as low potential.

Credits

Project Director	Karen Brady, B.A., R.P.C.A.
Project Manager	Todd Paquin, M.A., R.P.C.A.
Drafting	Brandon Loehr
Report Author	Todd Paquin
Senior Technical Review	D'Arcy Green, B.Ed, M.A.

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FIGURES

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by the Macdonald Development Corporation (MDC) to conduct a desktop archaeological overview assessment (AOA) of previously unassessed portions of the proposed Lakestone Subdivision Project in which development activities are planned (the Project Area). The approximately 204 hectare (ha) Lakestone Subdivision Project is located west of Winfield and south of Okanagan Centre, BC, overlooking Okanagan Lake to the west (Figure 1). In 2006, Golder conducted an archaeological impact assessment (AIA) under *Heritage Conservation Act* (*HCA*) Section 14 Permit 2006-0153 for the proposed 219 ha Lakeside Development on behalf of Solera Developments Ltd. and 20/20 Properties Ltd. (Golder 2006). The 2006 AIA formally addressed the majority of the Lakestone Subdivision, which is contained within the 219 ha Lakeside Development. However, as part of a 2012 review, Golder identified two small polygons encompassing proposed Lakestone Subdivision developments that had not been specifically addressed in the AIA and which warranted AOA.

1.1 Report Format

This final report includes the results of the background review, and provides recommendations regarding the need for additional archaeological work within the Project Area. It follows the Guidelines for Report Content as outlined in the BC Archaeological Impact Assessment Guidelines (Archaeology Branch 1998). Copies of this report will be forwarded to: Okanagan Indian Band (OKIB), Westbank First Nation (WFN), Penticton Indian Band (PIB), Lower Similkameen Indian Band (LSIB), Siska Indian Band (SIB), Coldwater Indian Band (CIB), Cooks Ferry Indian Band (CFIB), Okanagan Nation Alliance (ONA) and Esh-kn-am Cultural Resource Management (Esh-kn-am).

1.2 Objectives

The objectives of this AOA include: 1) an assessment of the archaeological potential of the Project Area; and 2) provision of recommendations for further archaeological work, if necessary.

2.0 BACKGROUND

2.1 Project Area Description

The Project Area is within the proposed Lakestone Subdivision, which is located approximately 3 km west of the community of Winfield. The southern Project Area polygon originates from Tyndall Road, while the northern polygon is within 150 m east of Tyndall Road (Figures 1 and 2). The northern polygon, oriented northwest to southeast, is approximately 525 m above sea level (asl) and encompasses an area of approximately 0.4 ha (approximately 200 m by 20 m). This is located within the southern portion of Phase 4 of the Lakestone Subdivision plan. The southern Project Area polygon is oriented south to north along Tyndall Road then deflects to the northeast, and is located at approximately 500 m asl. This southern polygon is located in the southeastern corner of Phase 3 and encompasses an area of approximately 0.5 ha (approximately 250 m by 20 m). However, approximately half of the southern polygon overlaps with the fully constructed Tyndall Road (Figure 2).

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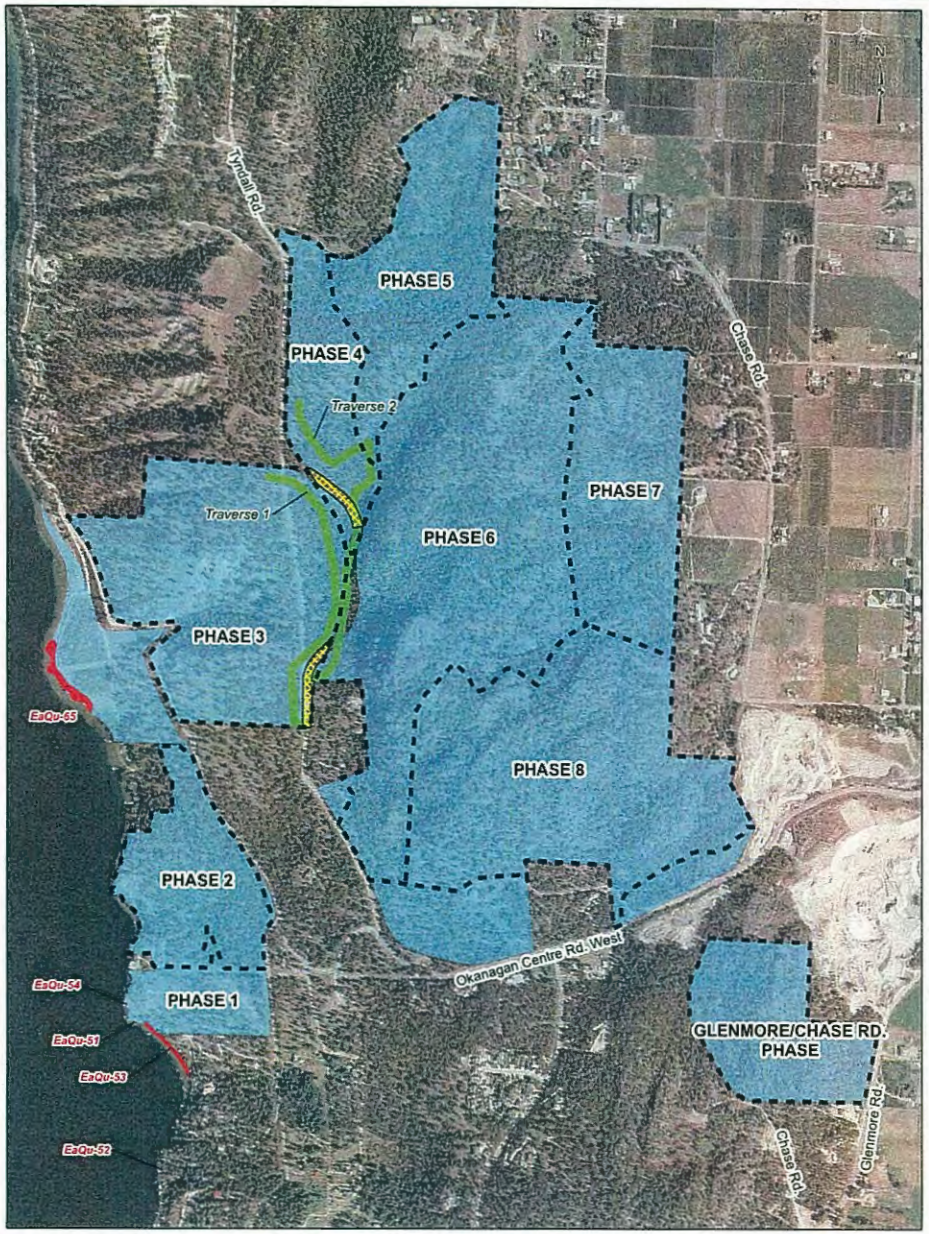


LEGEND

- AOA Project Area
- Proposed 2012 Lakestone Subdivision boundaries
- Areas assessed during 2006 AIA
- Archaeological Site
- 2006 Traverse Route

250 0 250

SCALE 1:9,000 Meters KILOMETRES

PROJECT MACDONALD DEVELOPMENT CORPORATION
ARCHAEOLOGICAL OVERVIEW ASSESSMENT
OKANAGAN CENTRE

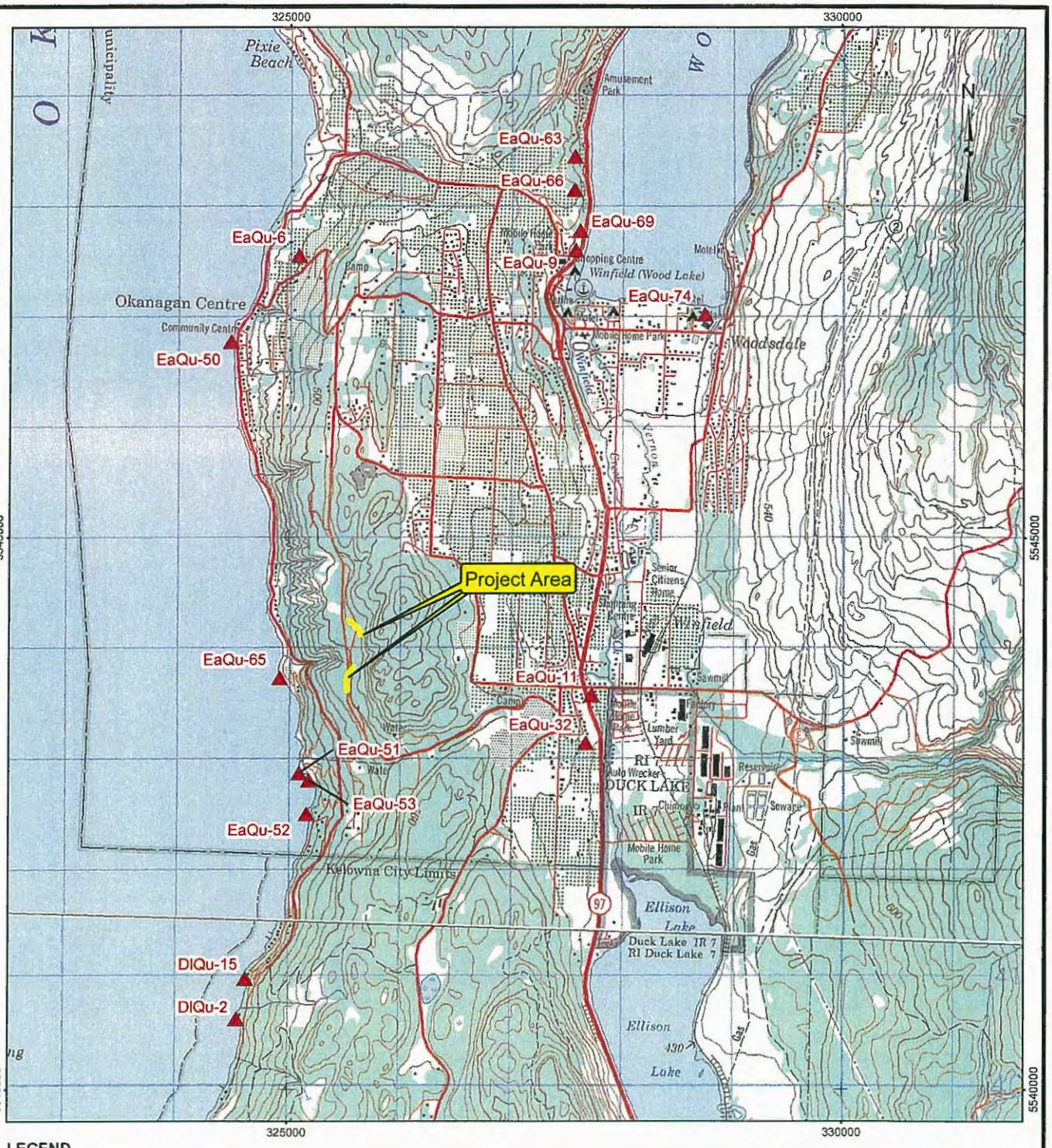
TITLE **AOA PROJECT AREA, PROPOSED LAKESTONE SUBDIVISION AND 2006 AIA**

LEGEND

1. BASE IMAGERY FROM BC GOV. WEB MAPPING SERVICE.
2. MAP DATA PROVIDED BY PROTECH CONSULTANTS LTD AND MACDONALD DEVELOPMENT CORPORATION

Golder Associates Kamloops, BC

PROJECT NO. 12-1491-0016			FILE No.
DESIGN	TP	28 Feb. 2012	SCALE AS SHOWN REV. 0
GIS	BWL	5 Apr. 2012	
CHECK	TP	5 Apr. 2012	FIGURE: 2
REVIEW	DG	5 Apr. 2012	



LEGEND

- Project Area
- ▲ Recorded Archaeological Site

REFERENCE

BASE MAPPING FROM ETOPO 1:50,000 NTS MAPSHEETS 82E14 AND 82L03.

DATUM: NAD83 PROJECTION: UTM ZONE 11

PROJECT: MACDONALD DEVELOPMENT CORPORATION
ARCHAEOLOGICAL OVERVIEW ASSESSMENT
OKANAGAN CENTRE

TITLE: **KEY PLAN**

Golder Associates
Kamloops, BC

PROJECT NO. 12-1491-0016			FILE No.	
DESIGN	TP	2 Apr. 2012	SCALE AS SHOWN	REV. 0
GIS	BKL	5 Apr. 2012		
CHECK	TP	5 Apr. 2012		
REVIEW	DG	5 Apr. 2012		

FIGURE: 1

n:\graphics\2012\1491 archaeology\12-1491-0016\gis\1214910016_figure 1.mxd

The Project Area is located near the base of the western flank of a large, north-south oriented, bedrock-dominated ridge where the toe of the rugged and rocky slope transitions to a broad bench landform further to the west. Vegetation consists of open Ponderosa Pine and grasslands. No extant water sources are present within or adjacent to the Project Area. At its closest, Okanagan Lake is approximately 500 m to the west of the Project Area.

MDC provided a general statement about the anticipated development impacts associated with the Lakestone Subdivision (Donal O'Callaghan, pers. comm. February 23, 2012) that may occur within the Project Area. These include the following:

- Access road construction: variable amount of cut and fill.
- Utilities: installation of subsurface utilities below the roads.
- Residential structures: single family lots and townhomes will involve excavation and foundation work.

It should be noted that the aim of the Project master plan is to preserve approximately half of the Lakestone Subdivision area as natural space with minimal disturbance. The focus of this natural space will be environmentally sensitive areas, as well as locations that will provide habitat for wildlife.

3.0 METHODS

The AOA involved a background review to provide cultural, environmental, and archaeological context for the Project Area.

3.1 First Nations Communications

According to the Consultative Areas Database (CAD) map service maintained by the Ministry of Aboriginal Relations and Reconciliation and the Ministry of Lands, Forests and Natural Resource Operations, the Project Area is located within the traditional territories of OKIB, WFN, PIB, LSIB, SIB, CIB, and CFIB. The above First Nations, along with the ONA and Esh-kn-am, were contacted via email and telephone to provide summary information pertaining to the Project and discuss any questions regarding the AOA. In addition, First Nations were invited to contribute information they would like included in the AOA.

Many of British Columbia's First Nations groups have developed their own heritage policies and permitting systems. The archaeological community has largely respected these requirements. For this AOA, Golder applied for and received WFN Heritage Investigation Permit 2012-03-20-01 and OKIB Cultural Heritage Investigation Permit 104-2012.

3.2 Archaeological Potential

Archaeological sites are those locations that contain evidence of past human activity. Archaeological potential relates to those biophysical characteristics (aquatic features, slope, forest cover, aspect, etc.) that typically correlate with archaeological site locations. Per Archaeology Branch AOA Guidelines (Archaeology Branch 2009), archaeological potential is classified as either "low" or "high". Areas often considered to have high archaeological potential for sites typical of the Okanagan region include those places with gently sloping south, southeast or southwest aspect; proximity to food, water and construction material resources; as well as micro-environmental features such as benches, knolls and ridges or areas with deep sediment deposits such as alluvial fans. Characteristics that reduce the likelihood of encountering archaeological sites include steep,

rocky or rough terrain and poorly drained sediments. Further, the possibility of discovering archaeological sites on landforms may be reduced, or even eliminated, if sediments likely to contain archaeological materials are extensively altered by construction activities.

3.3 Background Research

A review of relevant, readily available information was undertaken as part of the AOA, and included the following sources:

- The Consultative Areas Database (CAD) map service for First Nations' areas of interest information;
- Previous local and regional ethnographic, environmental, and archaeological studies;
- British Columbia's Provincial Heritage Register (PHR) using Remote Access to Archaeological Data (RAAD);
- MDC-supplied geo-referenced Project plans and Project development information; and
- NTS Topographical maps and digital terrain imagery as accessed through GoogleEarth.

4.0 RESULTS

4.1 Cultural Setting

Based on a March 20, 2012, review of the Consultative Areas Database (CAD) map service, the Project Area is within the traditional territories of seven First Nations bands belonging to the Syilx (Okanagan) peoples and the Nlaka'pamux peoples. Those First Nations bands who are members of the Sylix include OKIB, WFN, PIB, and LSIB. Those First Nations bands who are members of the Nlaka'pamux include SIB, CIB, and CFIB. Syilx and Nlaka'pamux peoples make up two of the five Interior Salish linguistic families.

Ethnographic works pertaining to the Okanagan include Teit (1930), Ray (1939) and Kennedy and Bouchard (1998). Ethnographic works pertaining to the Nlaka'pamux include Teit (1900) and Wyatt (1998). A summary of these works is presented below.

Similar to other Interior Plateau groups, the Syilx and Nlaka'pamux followed a semi-sedentary settlement system and an economy based on hunting, fishing and plant gathering, and trade activities. Tools were made from variety of materials, including stone, plant materials, bone and native metals. Due to preservation factors, stone tools are the most common artifact type found in archaeological sites within the Okanagan region.

Settlement locations and sizes depended on the distribution of food and other resources. The most common winter dwellings were semi-subterranean pithouses, usually clustered in small groups adjacent to main waterways and fishing stations to provide access to early-season subsistence resources, although other locations were also used. Hearths, earth ovens and food storage pits were also constructed and used at habitation sites. Smaller habitation sites were used intermittently, while larger villages may have been re-occupied for many years.

Mid-elevation and high-elevation locations above the main lake and river valleys, as well as locations associated with secondary valleys, were accessed for fishing; hunting land mammals, upland birds and waterfowl; and, plant gathering (e.g. berry picking, root digging and cambium collecting locations). Such resources became available

at different times and elevations during the entire warm season, during which Syilx and Nlaka'pamux peoples lived in conical and/or oblong mat lodges. Smaller, less intensively-used camp and resource processing sites were typical of these locations in comparison to the valley-bottom winter village sites. The archaeological manifestation of the higher-elevation activities tend to comprise small, low density surface and subsurface lithic scatters associated with short-duration campsites and hunting structures, as well as hearths, earth ovens, trails and CMTs.

Further information about Syilx peoples can be found at http://www.syilx.org/governance-memberbands.php. Further information about the Nlaka'pamux peoples can be found at http://www.nntc.ca/default.htm.

4.2 Surficial Geology

A review of the surficial geology and geomorphology of the Project Area (Fulton 1975) and immediately surrounding terrain indicates that sediments are typically undifferentiated, ice-deposited tills comprising minor sand, gravel and silt deposits underlain by unconsolidated pre-glacial or glacial sediments. There are no terrain features in proximity to the Project Area that would provide for deep sediment deposits, such as a fan. Documented fan structures are present along the lakeshore, further west and at lower elevation than the Project Area. Rock outcrops and areas of near-surface rock form the extensive ridge bordering the Project Area to the east. Post-glacial sediment deposition has been slow and, in many areas, non-existent or has been eroded away. Archaeological sites would be expected to be found in a surficial or near-surface context due to this limited depositional or erosional environment.

4.3 Previous Archaeology

A March 27, 2012, search of the PHR via RAAD revealed that eight archaeological sites are located within 3 km of the Project Area (Table 1; Figure 1). Archaeological sites EaQu-11 and EaQu-32 are human burials with associated artifacts recorded in 1969 and 1976 in the inter-lake region between Duck and Wood lakes along Vernon Creek (Provincial Heritage Register 2012). Archaeological sites DlQu-15, EaQu-50, 51, 52, and 53 were recorded during a shoreline survey of Okanagan Lake (Rousseau and Wales 1977). DlQu-15, EaQu-50 and 53 are surface lithic scatter sites while EaQu-51 and 52 are pictograph sites. An AIA conducted by Golder Associates in 2006 (Golder 2006) under *HCA* permit 2006-0153 resulted in the documentation a surface lithic scatter (EaQu-65) in a shoreline context.

Table 1: Recorded Archaeological Sites within 3 km of the Project Area

Site #	Site Type	Distance and Direction (closest Project Area boundary)
DlQu-15	Surface lithic scatter	2.7 km at 198°
EaQu-11	Lithic scatter and human burial	2.2 km at 90°
EaQu-32	Lithic scatter and human burial	2.2 km at 100°
EaQu-50	Surface lithic scatter	2.7 km at 334°
EaQu-51	Pictograph	0.9 km at 206°
EaQu-52	Pictograph	1.2 km at 195°
EaQu-53	Surface lithic scatter	0.9 km at 207°
EaQu-65	Surface lithic scatter	0.6 km at 268°

In each of these cases, the archaeological sites were recorded at lower elevations in different terrain settings compared to the Project Area. The Okanagan Lake sites DlQu-15, EaQu-51 to 53 and EaQu-65 are at an elevation of approximately 345 m asl and are located on the beach or shoreline rock outcrops. The inter-lake sites EaQu-11 and 32 are located at approximately 445 m asl in sand and gravel kettle terrace deposits immediately above Vernon Creek and its associated fan landform.

Based on existing information about archaeological site distribution in the Okanagan Lake area, including archaeological sites that have been recorded in settings comparable to the Project Area, and review of ethnographic sources, the most likely site types that may be present in the Project Area include surface and subsurface lithic scatters, rock art (pictographs and petroglyphs), rock features (hunting blinds, cairns, shelters), trail remnants and culturally modified trees. While cultural depression sites typical of semi-subterranean habitation and human burial sites have more usually been identified in lower elevation locations in the Okanagan region, their presence is not ruled out.

Of prime relevance to the Project Area is an AIA conducted by Golder under *HCA* permit 2006-0153 (Golder 2006). The AIA dealt specifically with a proposed 219 ha Lakeside Development project on behalf of Solera Developments Ltd. The 2006 proposed project overlaps with, or encompasses most of, the 2012 Lakestone Subdivision Project (Figure 2). A detailed summary of this AIA as it pertains to the 2012 Project Area is presented below.

4.3.1 Golder 2006 AIA of the Lakeside Development Project

Two Lakeside Development components examined during the Golder 2006 AIA are of particular relevance to the 2012 Project Area. These include the western flank of the 2006 Ridgeline Lots and the eastern portion of the 2006 Village Lots. The results of the AIA pertinent to the Project Area are presented below.

Ridgeline Lots

The western boundary area of the Ridgeline Lots (e.g. 2012 Phases 4 and 6 region) is a transition from steep rocky slopes to more level terrain present further to the west. Slopes of the extensive, north-south, bedrock-dominated ridge landform were investigated for level bench features. Two level bench features were observed along the western slopes of the ridge with testable areas and measured approximately 10 m by 20 m to 25 m. These were located in excess of 250 m from the Project Area. Subsurface testing in the shallow sediments was negative for archaeological material. Other bench areas exhibited limited sediment deposition and/or exposed bedrock. No subsurface testing was undertaken at these locations and inspection did not identify surface archaeological materials. Vertical rock faces were inspected for their potential for rock shelters and pictographs or petroglyphs but none were observed. Overall, the AIA of the Ridgeline Lots, including that portion adjacent to the Project Area, did not result in the identification of surface or subsurface archaeological sites.

Village Lots

The eastern boundary area of the Village Lots (e.g. 2012 Phases 3 and 4 region) is adjacent to the western boundary area of the Ridgeline Lots and shares terrain transitioning from the toe of a steep rocky slope to a level and rolling bench further to the west. The bench extends westward across the Village Lots area before descending steeply to the shoreline of Okanagan Lake. During the 2006 pedestrian reconnaissance of this bench landform no surface archaeological features or artifacts were observed but three areas considered to have high potential for buried archaeological sites were identified. These were located in the western portion or

crest areas of the broad bench, between 100 m and 250 m west of the Project Area. However, these were negative for archaeological sites. Overall, the AIA of the Village Lots, including that portion adjacent to the Project Area, did not result in the identification of surface or subsurface archaeological sites.

2006 Pedestrian Traverse Comparison

An additional review was conducted on the 2006 pedestrian traverses in light of the 2012 Project Area. The traverses were part of the process to identify areas of high potential to contain buried archaeological sites or surficial evidence of archaeological sites. As part of the inspection for surficial evidence of archaeological sites, the field crew examined exposures measuring up to 15 m by 20 m wherever they were encountered. These included natural erosional areas, road cuts, cattle trails, farm trails, timber harvest exposures, skidder trails, recreational trails, and tree throws. It was determined that two of the pedestrian traverse routes paralleled or passed through the 2012 Project Area (Figure 2) in terrain transitioning from the toe of a steep rocky slope to the level and rolling bench and, therefore, have direct bearing on the AOA. The first three bullets below pertain to the northern polygon of the current Project Area.

1) One traverse (Traverse 1) parallels the entire south/west side of Project Area northern polygon, coming to within approximately 30 m of the Project Area. No areas of high potential to contain buried archaeological sites were identified along or adjacent to this traverse route nor were any surface archaeological sites encountered.

2) The second pedestrian traverse (Traverse 2) partially parallels the north/east side of the Project Area northern polygon; the closest edge of the traverse route gets within approximately 35 m of the Project Area before deflecting away to the northeast. No areas of high potential to contain buried archaeological sites were identified along or adjacent to this traverse route nor were any surface archaeological sites encountered.

3) Traverse 2 deflects back to the south and approaches the 2012 Project Area northern polygon from the north and then crosses through its southern end. No areas of high potential to contain buried archaeological sites were identified along or adjacent to this traverse route nor were any surface archaeological sites encountered.

The same pedestrian traverse routes are pertinent to the 2012 Project Area southern polygon:

1) Traverse 1 parallels the entire western side of the 2012 Project Area southern polygon; the traverse route is typically less than 20 m from the Project Area. No areas of high potential to contain buried archaeological sites were identified along or adjacent to this traverse route nor were any surface archaeological sites encountered.

2) Traverse 2 parallels the east side of the northern portion of the 2012 Project Area southern polygon. The traverse joins the mid-point of the east side of this polygon, at the point from which the Project Area deflects from Tyndall Road. The traverse remains within 30 m of the northern portion of this southern polygon. No areas of high potential to contain buried archaeological sites were identified along or adjacent to this traverse route nor were any surface archaeological sites encountered.

In summary, no terrain features encountered in proximity to the Project Area during the 2006 field program were considered to have high potential for buried archaeological sites nor was any surface evidence of archaeological sites encountered. Sediment deposition was minimal or non-existent in adjacent areas and examined surface exposures did not contain archaeological materials. The closest high potential areas were in excess of 100 m from the Project Area (e.g. no portion of these extended into the Project Area) and subsurface testing of these and other high potential locations in the 2006 Lakeside Development were negative for subsurface archaeological sites.

5.0 RECOMMENDATIONS

Golder has conducted a review of readily available data sources such as surficial geology and geomorphology resources, the Provincial Heritage Register, and previous archaeological studies including a 2006 AIA (Golder 2006) that involved inspection of terrain in proximity to the Project Area. As a result, Golder has interpreted
the Project Area as having low potential to contain archaeological sites. No further archaeological work is recommended for the proposed Project Area in advance of the Project.

5.1 LIMITATIONS

Low potential does not mean "no" potential and it remains possible that archaeological sites are located in areas identified as low potential. In the unlikely event that archaeological materials are observed during construction, the proponent is advised to halt work in the immediate vicinity and contact Golder, the Archaeology Branch and concerned First Nations in order to discuss management options.

6.0 CLOSURE

This report was prepared for MDC and is specific to the proposed development described herein. Any use, reliance, or decisions made by third parties on the basis of this report are the sole responsibility of such third parties. The study was not specifically designed to address issues of traditional aboriginal use of the Project Area and does not constitute a traditional use study. This report was written without prejudice to issues of aboriginal rights and/or title.

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