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# HAY ROAD SUBDIVISION FEASIBILITY AND PRELIMINARY CIVIL DESIGN BRIEF

PREPARED FOR: 0717133 BC LTD.

PREPARED BY:

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## EXECUTIVE SUMMARY

Lawson Engineering and Development Services Ltd. (LEDS) has been retained by 0717133 BC Ltd. to provide a preliminary feasibility analysis for the proposed Hay Road Subdivision in Revelstoke BC. The subdivision will be comprised of two separate parcels with the legal description:

LOT 1 SECTION 23 TOWNSHIP 23 RANGE 2 WEST OF THE 6TH MERIDIAN KOOTENAY DISTRICT PLAN 9206 EXCEPT PART INCLUDED IN PLANS 12689 AND NEP21406 & LOT A SECTION 23 TOWNSHIP 23 RANGE 2 WEST OF THE 6TH MERIDIAN KOOTENAY DISTRICT PLAN NEP21406

The development is currently proposed to be comprised of twenty-three (23) single family lots, sixteen (16) duplex units, twenty (20) townhome units, and 1,300m<sup>3</sup> of park/greenspace.

The site is to be accessed off Hay Road and is assumed to require road upgrades to both Hay Road (COR-H7) and Comozzi Road (COR-H4) along with the full construction of the interior road networks to the City of Revelstoke specification drawing COR-H7. The site is to be serviced by City of Revelstoke owned water and sanitary mains and will require off-site extensions of sanitary-main. Storm water will be detained on site and disposed of through infiltration systems (geotechnical constraints dependent).

In general, the site grading will match existing as much as practical. The stripping of surfaces will be limited to the proposed road right-of-way.

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## 1.0 INTRODUCTION

0717133 BC Ltd. has retained Lawson Engineering and Development Services Ltd. (LEDS) to provide a preliminary feasibility analysis for the proposed Hay Road Subdivision between Hay Road and Camozzi Road in Revelstoke, BC. The development is proposed to be comprised of twenty-three (23) single family lots, sixteen (16) duplex units, twenty (20) townhome units, and 1,300m<sup>3</sup> of park space. LEDS has reviewed preliminary Hay Road Subdivision 'concept' provided by Selkirk Planning and Design and from that derived *Class D – Opinion of Probable Costs* for both **on** and **off-site** anticipated civil construction works. LEDS has also outlined potential engineering requirements, off-site servicing requirements, potential service upgrades, and limitations and assumptions made within this report. LEDS understands that City of Revelstoke Subdivision and Servicing Bylaw Specification COR-H7 is for Hillside development application but has been directed by Selkirk Planning and Design (agent of 0717133 BC Ltd.) to rely upon this standard for design purposes.

## 2.0 SITE PREPARATION

### 2.1 ROAD CONSTRUCTION/UPGRADES

#### Off-site:

Camozzi Road is currently constructed to a paved rural road standard. The road is constructed to a variable width with a road-side swale on the east side. There are no street lights located along Camozzi Road with one fire hydrant being located towards the south end of the subject parcels frontage. Based off the City of Revelstoke Official Community Plan 'Schedule J' Camozzi Road is identified as a collector road. There is overhead BC Hydro and Telecommunications running down Camozzi Road across the subject property frontage.

A review of the necessary frontage improvements on Camozzi Road are subject to review by the City of Revelstoke – however, this cost analysis has been calculated to represent full road construction to COR-H4 standard (see below):

- Upgrade the West side of Camozzi Road to the full collector standard (COR-H4) – this would include widening of the East side of the road to the full 4.3m wide standard drive lane, extension of existing shoulder, street light installation and conversion of existing overhead electrical and telecommunications to underground.

Hay Road is currently constructed to a paved rural road standard. The road is constructed to an approximate 7.4m width with no apparent road-side swale on the either side of the road. There are davit-style street lights located along the entire frontage of Hay Road with apparent existing underground hydro/tel. It is the assumption that Hay Road will be required to be upgraded to the City of Revelstoke Specification drawing COR-H7 road standard.

A review of the necessary frontage improvements on Hay Road are subject to review by the City of Revelstoke – however, this cost analysis has been calculated to represent full road construction to COR-H7 road standard (see below):

- Upgrade the East side of Hay Road to the full local major standard (COR-H7) – this would include minimal widening of the East side of the road, including a 3.25m drive aisle, roll-over curb and gutter and installation of catch basins with proposed localized dry-well rock pits.

#### On-site:

The proposed on-site road right-of-way and composition are expected to align with the city of Revelstoke specification drawing COR-H7. The interior subdivision roadway is proposed to access off Hay Road and is anticipated to be required to be tied-in to Grizzly Lane. For the purpose of this assessment LEDS has removed minor roadway curvatures from feasibility calculations. The grade of the proposed road is expected to be gentle in nature varying from 1-5% draining back towards Hay Road (to be confirmed with topographic survey). Along with the proposed internal subdivision roadway, costing for a laneway conforming to the City

of Revelstoke specification drawing COR-H10 has been accounted for to access the rear of proposed twenty (20) town-homes. Pavement structure for roads and laneways will be constructed as per City of Revelstoke specifications (see below); however site conditions will require review by the site geotechnical engineer prior to construction:

- 300mm thick of 75mm WGB Sub-Base Aggregate
- 100mm thick of 25mm WGB Base Aggregate
- 75mm thick Hot mix asphalt

General Notes/Assumptions:

- Assumes off-site road upgrades on both Camozzi Road (COR-H4) and Hay Road (COR-H7);
- Assumes underground telecommunications infrastructure is already installed and adequate along Hay Road;
- Assumes no additional street lights will be required along Hay Road;
- Removal of organics within road ROW on-site has been accounted for within analysis;
- Individual driveway construction/works have not been accounted for within this analysis;
- All off-site road structure rehab works are to be in compliance with City of Revelstoke above noted specifications;
- If variances are pursued reducing road standard requirements proposed disbursements should be revisited;
- Retaining walls are not accounted for within analysis;
- Assumes no underlying geotechnical constraints in sub-grade material.

## 2.2 SITE GRADING/PREPARATION

As the property currently sits, the majority of the site consists of dense tree cover that will be required to be logged (excluded from analysis) whereas the remainder of the property consists of previously logged/cultivated land. The easternmost section of the subject parcel has challenging grades that will impact location of proposed townhouses and subsequent ability to construct laneway behind townhouses without substantial retaining walls. The rest of the subject parcel's gentle grades lends itself to constructing the development in a way that minimizes on-site grading and should in general, slope from east to west.

General Notes/Assumptions:

- Assumes removal of organics to the depth of 0.5m within road R/W;
- Site logging/de-rooting not included within cost analysis;
- Retaining walls not included within cost analysis;
- Site grades are to be revisited upon completion of topographic survey.

### 3.0 SITE SERVICING

#### 3.1 WATER

##### Off-site:

The subject parcel has 3 possible tie-in points for subdivision water servicing with an existing 300mm PVC water main running from north to south of the subject property along Camozzi Road (Pressure Zone A), a 150mm AC water main running north to south of the subject property along Hay Road to the west (Pressure Zone B), and a 150mm PVC water-main stubbed at property line at the southern extent of Grizzly Lane (Pressure Zone B). It is anticipated for the Hay Road Subdivision that the City of Revelstoke will require the water main to be looped from existing 150mm AC water main on Hay Road to 150mm PVC water main on Grizzly Lane.

##### On-site:

In anticipated water main looping from Hay Road to Grizzly Lane there is approximately 547m of 150mm PVC water main to be installed. Anticipated water works of proposed subdivision will also require the following:

- Tie-in to Existing 150mm PVC Stub on Grizzly Lane;
- Tie-in to Existing 150mm AC Water-main on Hay Road c/w Tee and Valve Assembly;
- Installation of 59 - 25mm water services c/w curb-stops to proposed units
- Installation of 4 Fire Hydrants
- Decommission of existing water service(s) to existing residence(s)
- Installation of approximately 547m of 150mm PVC DR18 Watermain.

##### General Notes/Concerns/Limitations:

- Available flows in the area will be required to be confirmed for flow adequacy & pipe sizing;
- Assumes water tie-in to existing 150mm AC water main on Hay Road will be completed via installation of TEE
- Assumes water-main will be required to be looped from Hay Road to Grizzly Lane;
- Assumes individual water services will be required/desired for each unit/dwelling/residence.

#### 3.2 SANITARY SEWER

##### Off-site:

The nearest sanitary sewer main to this site is located approximately 215m to the south of the subject property. City records indicate that a 250mm sanitary main is located near the intersection of Nichol Road and Hay Road. The proposed subdivision will require the City of Revelstoke sanitary main to be extended to the intersection of Hay Road and proposed subdivision access road.

##### On-site:

The sanitary main will be required to be extended for 487m internally within the subdivision to provide sewer services to all proposed dwellings. The sanitary sewer installations will include:

- The extension of approximately 487m of 200mm PVC Sanitary-main internally within the subdivision;
- Installation of 59m of 100mm PVC sanitary services to each dwelling/unit/residence;
- Installation of 9 sanitary manholes.

General Notes/Concerns/Limitations:

- Downstream capacity must be confirmed to ensure viable tie-in;
- Assumes sanitary main will only be required to be extended to the intersection of Hay Road and the proposed subdivision access road. The City of Revelstoke may request sanitary main to be extended to furthest extent of subject parcels frontage of Hay Road (additional 72m of 250mm sanitary main and one (1) 1050mm sanitary manhole);
- Assumes grades of existing sanitary main will allow for gravity drainage of sanitary main on-site;
- Assumes individual sanitary services to each dwelling/unit/house;
- Assumes Existing Sanitary Main located along Hay Road is 250mm PVC.

### **3.3 STORM WATER**

Off-site:

There is intermittent existing storm water collection system adjacent and surrounding the proposed development along Hay Road. The system is comprised of primarily drainage ditches and culverts with no clear outlet. Camozzi Road grades approximately +/-5% to the south and similarly has a vegetated drainage ditch along the east side of road. It is in anticipation that no off-site storm-water upgrades will be required.

On-site:

On-site storm water is proposed to be dealt with through infiltration and ditching and is to be designed in direct compliance with completed geotechnical report. It is assumed that all storm-water generated on each individual lot will be disposed of on that specific lot. Catch basins will also be required to be installed along gutter-line at spacing as specified by City of Revelstoke bylaw that will be tied in to a central dry-well rock-pit for infiltration. If variances are pursued and on-site curb and gutter is varied, roadside drainage swales/french-drains with localized inlets to infiltration systems will replace the need for gutter-line catch basins.

The storm sewer installations will include:

- Installation of 4 – two top-inlet catch basins c/w 250mm PVC lead to dry-well rock pit;
- Installation of 2 - single top-inlet catch basins c/w 200mm PVC lead to dry-well rock pit;



General Notes/Concerns/Limitations:

- If variances are pursued and on-site curb and gutter is varied, roadside drainage swales with localized inlets to infiltration system will replace the need for catch basins;
- Assumes infiltration coefficient of natural soils will allow for infiltration systems (geotechnical report to confirm);
- Assumes no off-site storm-sewer infrastructure upgrades;
- Assumes all individual lots will dispose of all generated storm-water on-site.

#### 4.0 GENERAL LIMITATIONS

Due to the preliminary nature and unavailability of prescribed subdivision requirements this analysis makes assumptions that in end could possibly limit the accuracy of this preliminary assessment. As a means to minimize limitations and provide the most accurate analysis possible LEDS has relied upon prior experience and knowledge of working and developing within the City of Revelstoke.

This report has been prepared for the sole use by our client (0717133 BC Ltd.). Any use which a third party may make of this report are the responsibility of such third parties. LEDS does not accept responsibility for damages suffered, if any, by any third party as a result of decisions made or actions taken based on this report.

## 5.0 CLOSURE

LEDS has prepared this Preliminary Design Brief to assist in the understanding of fees noted in preliminary civil feasibility analysis and *Class D – Opinion of Probable Costs*. LEDS has used prior experience and knowledge to ‘assume’ scenarios LEDS believes to be expected in the Hays Road Subdivision. Based on the preliminary nature of this analysis LEDS strongly encourages the developer to revisit price disbursements upon any new site-specific information (ie. issuance of a City PLA, site investigation, off-site infrastructure investigation, review of city infrastructure capacities, geotechnical report, topographic survey).

This Preliminary Design Brief should also assist in the planning and initial discussions and conversations with the City of Revelstoke regarding on and off-site civil works.

We trust that this preliminary design brief is satisfactory for your preliminary review of the proposed Hay Road Subdivision. Should you have any questions or comments, please contact our office at your earliest convenience.

Best Regards,

Lawson Engineering and Development Services Ltd.

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