1230 Sandy Bay Road

Town of Penetanguishene

Functional Servicing Design Brief

December 2021

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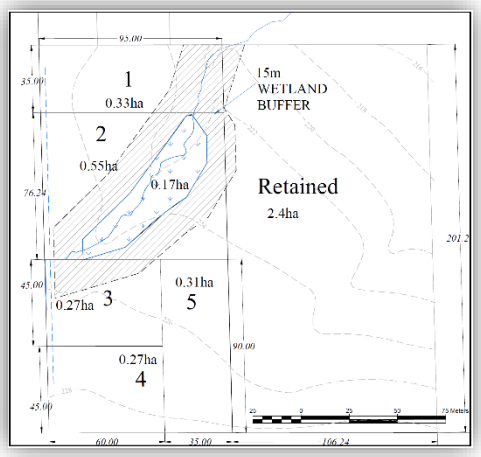

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1.0 INTRODUCTION

1.1 Introduction

This Functional Servicing Design Brief has been prepared in support of the proposed five residential lot severance application, from a 4.0 hectare property, located on the east side of Gilwood Park Drive, in Lots 14, Concession 3 of the Geographic Township of Tay, now in the Town of Penetanguishene.

1.2 Background Reports

Details from the following reports have been incorporated into this report.

- Preliminary Hydrogeologic and Servicing Concepts Assessment, Azimuth Environmental Consulting Inc., May 2003
- Functional Servicing Report, Gilwood Bay Development, R.G. Robinson and Associates (Barrie) Ltd., Aug 2003
- Planning Justification Report, 1293 Sandy Bay Road, Lots 14, Concession 3, Geographic Township of Tay, Town of Penetanguishene, Proposed Consent to Land Severance Application, November 2021

In preparation of this report the Town of Penetanguishene Specifications for design have been incorporated.

1.3 Site and Environmental Description

This Report will specifically address the area of proposed severance of five residential lots, as noted on **Figure 1**.

The proposed lots are a minimum of 35m wide minimum of 65m deep as shown on **Figure 2, Severance Plan** by Goodreid Planning

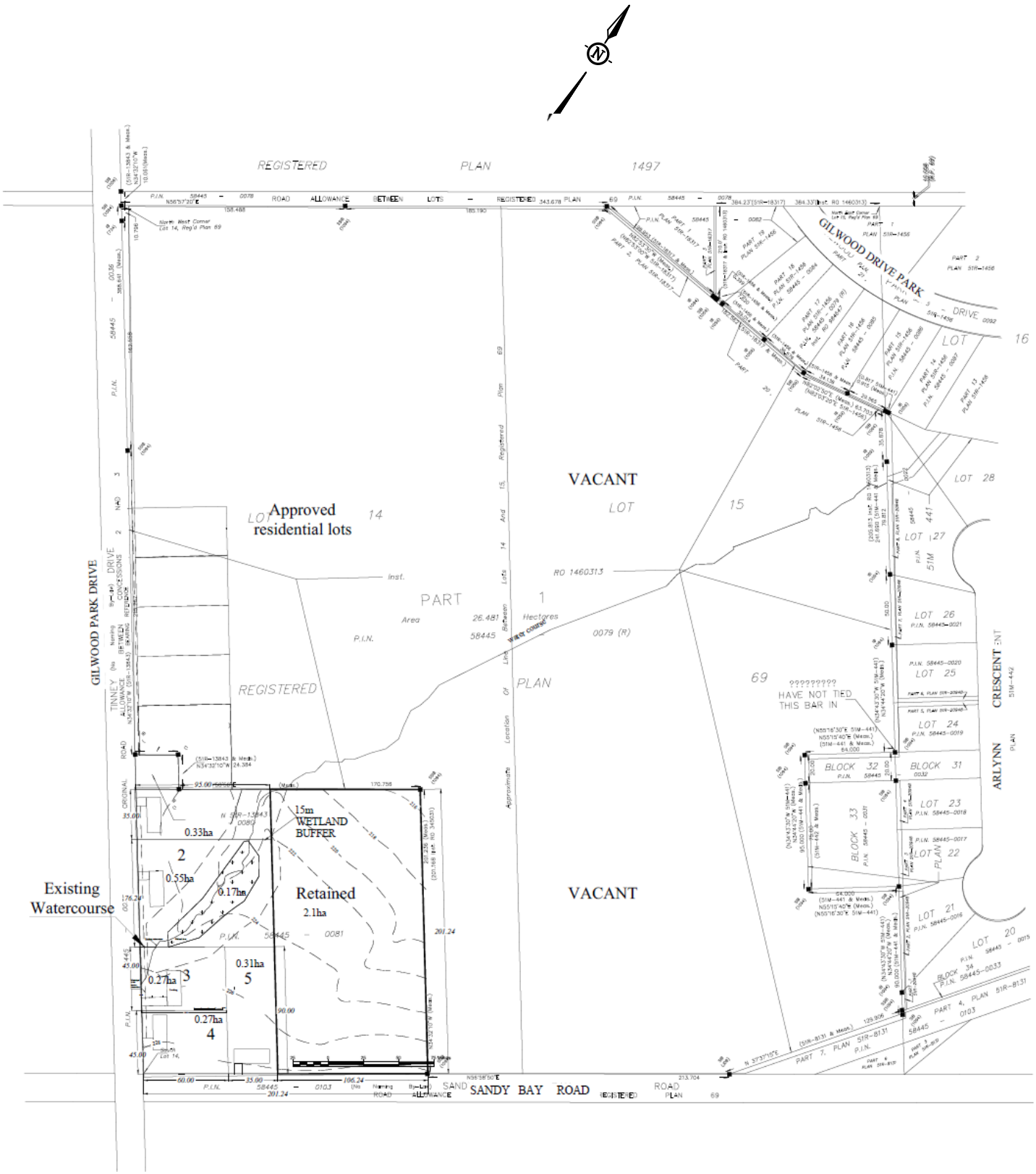
Vegetation on the lots consists of mixed deciduous trees. Topography of the lots is sloping to the north, slopes varying from 6% to 2%, with an overall slope of approximately 4%.

There is an existing seasonal watercourse located

Soils within the site are assumed to be similar to the reports and test pits of the adjacent 26.5ha site, as described in the Preliminary Hydrological Report, are composed of mixed sands, glacial till, stones, gravel and boulders, up to approximately 40m in thickness. Discontinuous seams of fine grain materials create localized perching of the water table. This creates localized areas of groundwater discharge within the site. Limestone is present at approximately 60m.

The Simcoe County Soils Map indicates site soils are comprised of Tioga series, sandy loam. A soils investigation, utilizing test pits, was carried out to evaluate the impact of septic systems. The investigation indicated that the surface soils are variable throughout the site ranging from coarse grained sands to finer materials. In most areas of the site the groundwater table is relatively close to the surface.

The presence of the existing watercourse can potentially lead to a shallow water table in some locations of lower elevation on the lots. Confirmation of seasonal surface water table should be confirmed prior to construction of houses and septic systems.



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Location Plan

FIGURE 1

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Not to Scale

Severance Plan 1230 Sandy Bay Road, Lot 14, Concession 3, Town of Penetanguishene Ontario

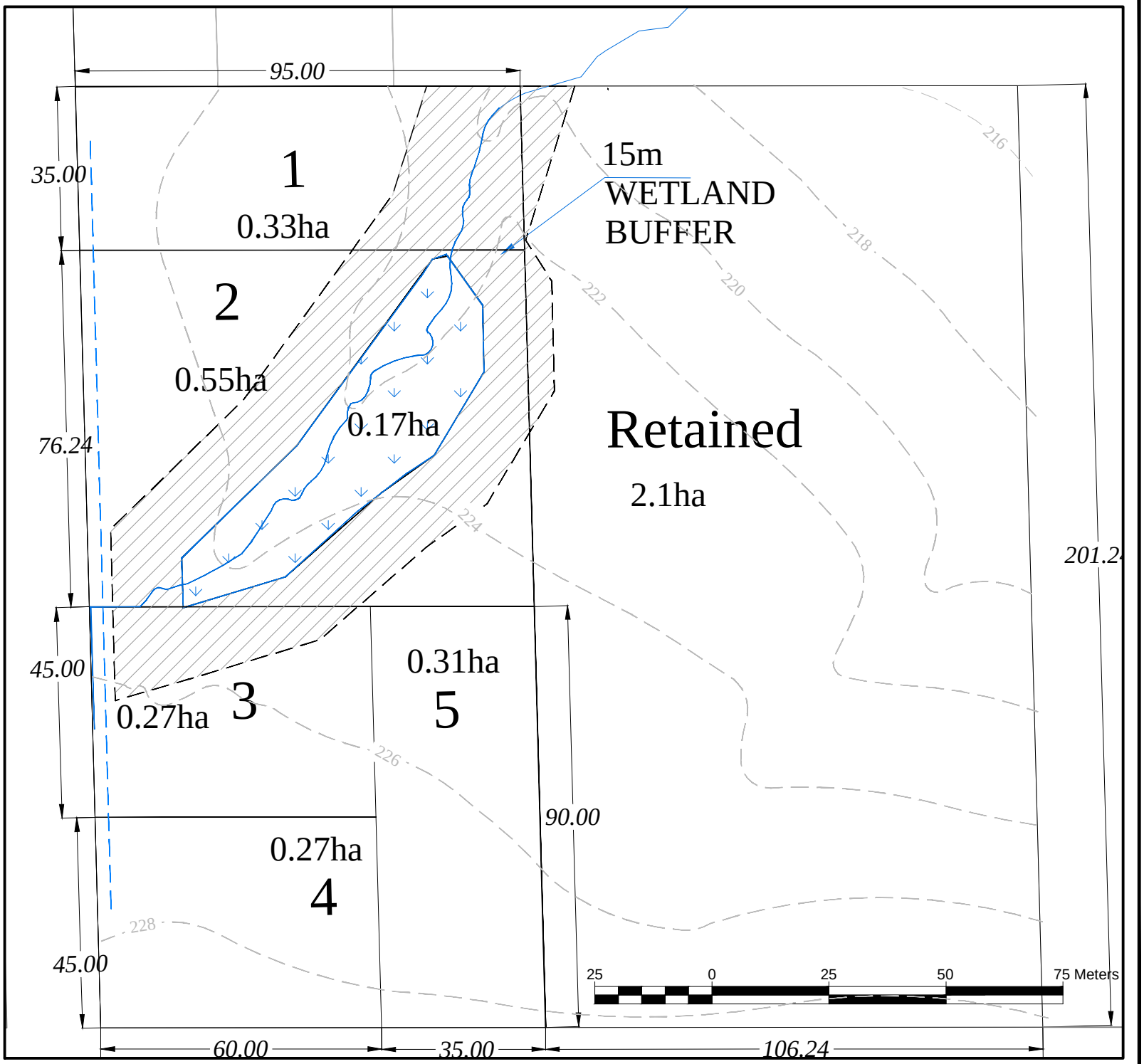

Figure 3

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2.0 SANITARY SERVICING

Sanitary servicing will be through the use of individual Class 4 septic systems. The recommended configuration is a filter bed or raised filter bed depending on goundwater elevation.

Septic systems are expected to be raised above existing ground due to high water elevations noted in the Preliminary Hydrogeologic Report. However it is noted that the elevation of the proposed house envelopes is generally several meters higher than the existing seasonal watercourse. Particularly Lots 1, 4 and 5. The groundwater table may be deeper below the surface, enabling the use of an in-ground, or partially in-ground system.

For the purposes of this design brief, a large house has been assumed, with a daily design flow of 3000 L/day. This equates to a house of up to approximately 3,000 sq ft, with 4 bedrooms and 4 bathrooms.

The soil described in TP-11 is fine sand, and the Hydrogeological Investigation suggested septic design based on a Percolation Rate (T) of 25 min/cm. Based on the description of the soil in TP-11, the actual Percolation Rate may be slighter faster when tested. The Percolation Rate of 25 min/cm will be used in the functional calculations as a worst case for functional servicing design purposes.

Percolation Rate (T time) = 25 min/cm

Daily Design Flow Rate = 3000 L/day

Filter Bed Area = 40 m^2

Filter Extended Area (includes Filter Bed) = 88 m^2

Mantle Area (including Extended Area) = 375 m^2

Mantle Area (excluding Extended Area) = 287 m^2

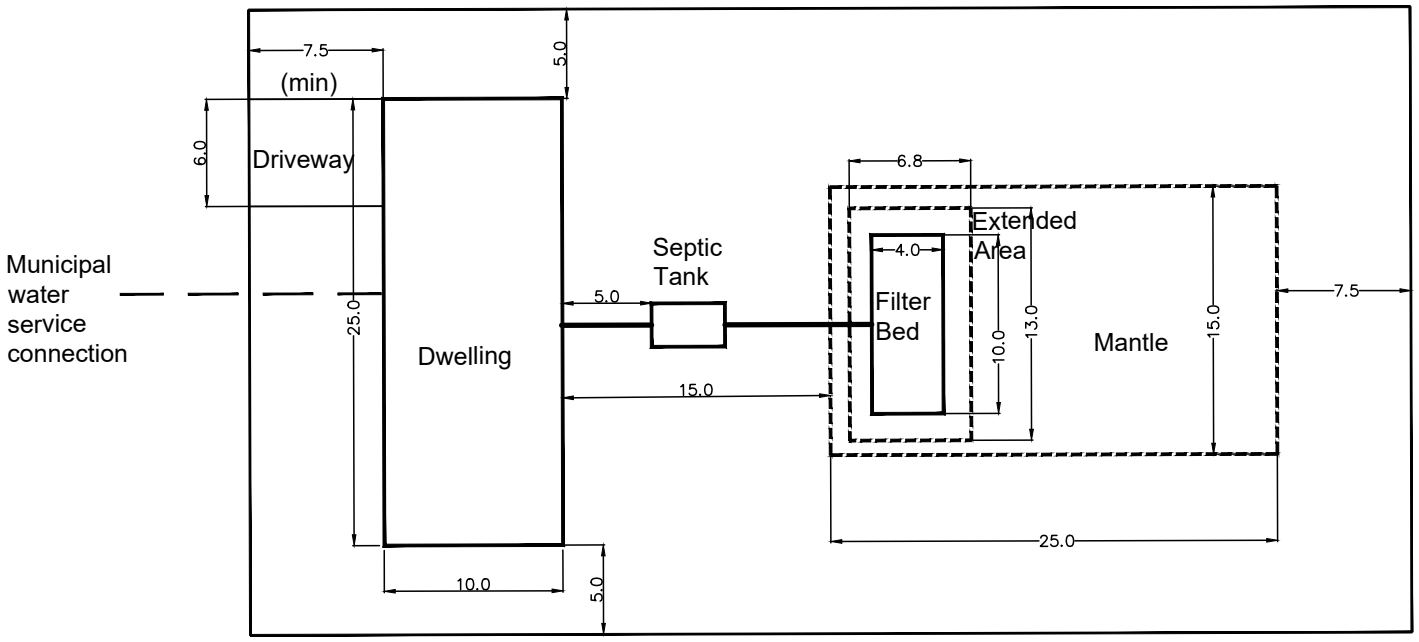
A sample configuration of this layout on a lot is shown in **Figure 3**. The assumptions are Filter Bed dimensions of 4m x 10m, with a 0.25m thick Extended Area of 6.8m x 13m and a 0.25m thick Mantle (including Filter and Extended areas) of 15m x 25m. The size of Mantle is the potential footprint of the septic bed system. Note that that configuration could be made slightly wider to reduce the depth. However a minimum mantle of 15m downgradient of the last distribution pipe is required. The layout in the figure assumes a raised bed, 1m above existing grade, with 4:1 slopes down to existing grade.

Clearance distances to the septic system as follows.

Piping Clearance to	– Dwelling	5m
	– Property Line	3m

If the existing sand at the septic bed location has a Percolation Time (T time) of 15 min/cm or less, a mantle is not required. However the overall configuration and depth to groundwater is to be taken into account.

In summary, the lots will be serviced by individual septic systems, consisting of filter beds, meeting Ontario Building Code. High water conditions identified in the Hydrogeological Report indicate partially or fully raised beds will be necessary on some lots. Design of the individual septic systems will occur at the Building Permit stage for the individual site plans.



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Typical Septic Bed Layout

FIGURE 3

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Not to Scale

3.0 DOMESTIC WATER SERVICING

Domestic water supply would be from individual services fed by the existing 150mm diameter municipal watermain running along the west side of Gilwood Park Drive as noted on **Figure 4.**

Lots 1 to 4 can be fed directly across Gilwood Park Drive. As there is no existing watermain on Sandy Bay Road, the potential of extending a service with the municipal Right of Way, across Lot 4 to service Lot 5. This water service would be approximately 100m long.

A future option will be to service Lot 5 from a future eastward extension of the existing watermain along Sandy Bay Road. However timing of this extension may necessitate a service from the existing watermain on Gilwood Park Drive.

Because of the distances and possible setback of residences on deep lots, in addition to larger residences, a minimum 25mm water service is recommended. This would be sufficient for a residence with a fixture count of up to 31 fixture units.

At the time of construction of the houses, the number of fixtures along with the total length of the service to the house, should be reviewed to ensure there is adequate supply.

4.0 STORM DRAINAGE

Runoff from the proposed 5 lots after construction will continue to be overland flow down gradient to the existing watercourse to the north. This watercourse conveys runoff to the north to Georgian Bay.

An existing culvert crosses Gilwood Park Drive approximately in front of Lot 3. This culvert previously discharged to a channel crossing the front NW corner of Lot3, but has been redirected to the roadside ditch flowing north for approximately 15m then discharging to the existing watercourse along the lot line between proposed Lots 2 and 3

4.1 Proposed Storm Drainage System

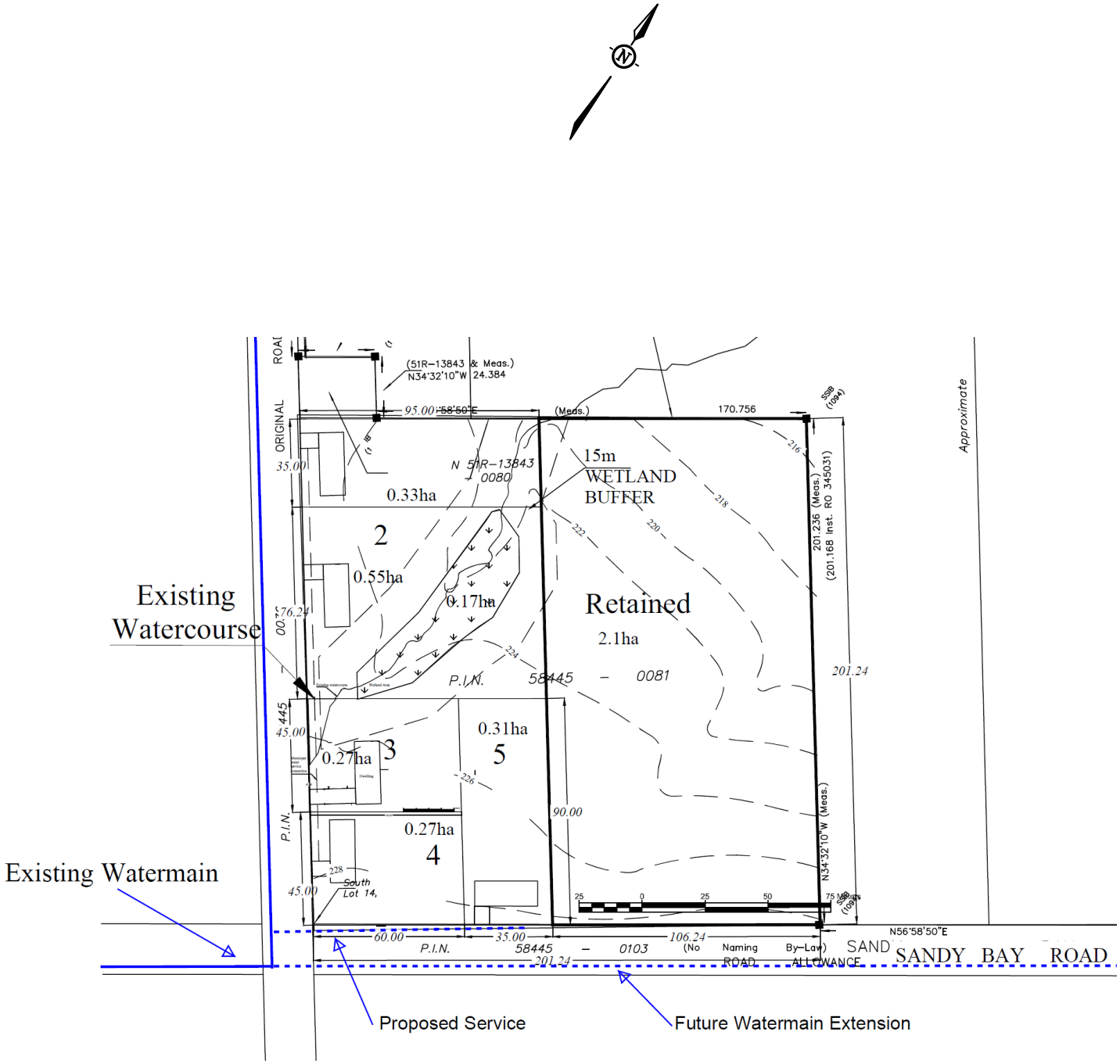
Stormwater runoff from of the roadway follows the roadside ditch to the north and does not enter the lots. As the lots slope down away from the road, drainage from the lots does not enter the roadside ditch.

No stormwater management controls are proposed. Since the lots are very large, the percentage impervious area on each lot is expected to be less than 15%. There will not be any directly connected impervious areas to a discharge point. Impervious areas will all discharge to pervious areas and are conveyed by sheet flow. The sandy, pervious nature of the soils in the area will infiltrate surplus runoff from impervious areas from typical rainfall events, and little to no runoff is expected for typical annual storm events.

In areas where there is a low groundwater table, roof runoff will be directed to soakaway pits.

In addition, lengths of infiltration swales will be added to the lots to capture and infiltrate runoff for up to the 10mm storm event.

Because of the pervious nature of the soil, limited impervious area, discharge as sheet flow across vegetated will create little to no runoff for typical annual storm events. Additional treatment of runoff beyond that provided by surface flow and infiltration swales is not necessary.



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Water Service

FIGURE 4

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4.2 Erosion Sediment Control

Development the individual lots will minimize tree clearing. Only a portion of the lots sufficient for house and septic system construction will be cleared.

The type of erosion and sediment control will generally consist of temporary silt fencing to capture runoff draining as sheet flow. The location and sizing of sediment control fencing is to be shown on Site Plan Drawings.

5.0 WATER BALANCE

The local water balance of the proposed lots and area down gradient of the lots will not be affected. The impervious areas are limited to less than 15% of the lot area, and all discharge from impervious area is to pervious areas is by sheet flow with no channelized, piped or impervious conveyance from the site. Soils in the area are sandy, contributing to infiltration potential of runoff from impervious areas. The use of soakaway pits for rooftop discharge and infiltration swales, will infiltrate additional runoff.

Domestic water supply is from a municipal source, domestic wastewater is discharged to individual, on site septic systems, slightly increasing local groundwater.

6.0 DRIVEWAY ENTRANCES

Driveways will enter onto Gilwood Park Drive and Sandy Bay Road at each lot. Each driveway will have a 400mm culvert with sufficient cover. There is sufficient sight distance at the proposed driveway entrances for safety.

7.0 CONCLUSIONS

This Functional Design Brief documents

Sanitary servicing and domestic water design recommendations remain unchanged, consisting of individual wells and individual tertiary septic systems.

Stormwater management and treatment is adapted to address the needs and constraints of a smaller development. The method of stormwater management and treatment is through the use of detention and treatment in modified roadside ditches, with detention created by orifice plates on the upstream of each driveway culvert.

The proposed servicing and stormwater management plan for the proposed 5 residential lot severance, satisfies requirements of the appropriate authorities, and will not have a detrimental impact to surrounding properties.

All of which is respectfully submitted,

Kardin Group

K. A. Bobechko, P.Eng.

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