

February 25, 2015
Revised January 23, 2018
21203-13

Dunnink Homes
4988 Jones Base Line
Guelph, Ontario
N0B 2J0

Attention: John Dunnink

Dear Sir:

**Re: Functional Servicing and
Stormwater Management Report
Hyland Road and Glenburnie Drive Extensions
City of Guelph, Ontario**

1.0 Introduction

Van Harten Surveying Inc. is pleased to submit this report regarding the proposed residential development located in the northeast section of Guelph. This work was authorized by Mr. John Dunnink of Dunnink Homes.

The project involves the proposed construction of eight (8) fully serviced single family homes as an extension of Hyland Road and an additional seven (7) fully serviced single family homes as an extension of Glenburnie Drive. The purpose of this functional servicing and stormwater management report is to evaluate the supply and distribution of municipal water; evaluate the sanitary servicing; and evaluate the general surface drainage characteristics of the development along with the stormwater management criteria. The wetlands, east of the proposed development, are presently owned by the applicant.

2.0 Site Location and Existing Conditions

The subject lands are located near Eramosa Road and Victoria Road in the northeast section of Guelph. The northern part of this development will be an eastern extension of Hyland Road and the southern part will be an eastern extension of Glenburnie Drive. The proposed Hyland Road extension is abutting existing residential developments and surface drainage is generally directed to an existing 450 mm diameter culvert in the southeast corner that conveys water to a protected wetland to the south. The proposed Glenburnie Drive extension is abutting existing residential developments to the north, west and south with overland surface flow towards protected wetlands to the east.

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Elmira, Ontario N3B 2R2
Phone: 519-669-5070

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Guelph, Ontario N1H 3X3
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Orangeville, Ontario L9W 5G5
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3.0 Proposed Development

The subject lands are located at the eastern limit of a fully serviced and established residential subdivisions in the northeast section of Guelph. The Hyland Road extension covers 0.96 ha and includes the development of nine (9) lots. The existing single family home located at 47 Hyland Road is to be removed and rebuilt as part of this development. The existing cul-de-sac at the east limit of Glenburnie Drive is to be extended further east to accommodate seven (7) new single family residences on 0.53 ha of land in accordance with the City of Guelph road (cul-de-sac) standards.

The proposed zoning for these residential developments are to be R-1B.

4.0 Water Supply

Both the Hyland Road development and Glenburnie Drive development will be serviced by an extension of the existing 150 mm diameter watermain. Fire hydrants will be added to satisfy spacing requirements of the municipality and Ontario Building Code. Domestic service connections (19mm diameter copper) will be provided for each individual home as per City of Guelph standards.

5.0 Sanitary Servicing

There are existing sanitary sewers on Hyland Road and Glenburnie Drive that will service the proposed residential building lots. The following subsections of this report provide a brief description of each proposal. groundwater was encountered in the test pits, dug to a maximum depth of 2.60 m.

5.1 Hyland Road

The existing sanitary sewer on Hyland Road is too shallow and direct gravity connection is not feasible. It is proposed to service the proposed subdivision with individual grinder pumps and a sanitary forcemain on a private easement to a proposed manhole located on an easement in front of Hyland Road 44. The said proposed manhole is then by gravity flow via a 200 diameter mm PVC pipe to the existing terminus manhole on Hyland Road. Both the gravity sewer and the forcemain will be protected by insulation as required.

5.2 Glenburnie Drive

It is proposed to extend the existing 200mm diameter sanitary sewer from the terminus manhole to a new installed manhole in the proposed cul-de-sac extension. The proposed homes will be serviced with individual 100mm diameter gravity service connections.

6.0 Stormwater Management Plan

6.1 Design Criteria

The design criteria are to model the development for the minor and major system conveyance using Miduss Version 2.25 for pre and post development with the City of Guelph design storms for the 2-, 5- and 100-year return period storms.

6.2 Hyland Road

The pre-development drainage is generally towards the south with an outlet (450mm culvert) crossing Hyland Road into the existing wetland. The post-development drainage remains identical to the pre-development as illustrated in figure 1, appended to this report. Roof drainage from Lots 4-8 will be discharged on the vegetative surface towards the wetlands.

The drainage of the eastbound lane of Hyland Road extension is dispersed in sheet flow over 150mm rip-rap on the ditch slopes into the wetlands. The drainage through the 450mm cross-culvert under Hyland Road extension will be dispersed by a flared configuration structure of 150mm rip-rap at the outlet of the culvert. Alternatively, a culvert end section may be installed at the outlet (OPSD 801.02).

The major system will be conveyed overland to the wetlands via Hyland Road.

6.3 Glenburnie Drive

The pre-development drainage is to the wetlands, located east of the proposed development. The post development drainage is divided into two drainage areas. One area is directed to the extended 300mm diameter storm sewer on Glenburnie Road and the second area is directed to the wetlands, east of the proposed development.

It is proposed to extend the existing 300mm diameter storm sewer into the newly constructed cul-de-sac to receive the right-of-way run-off, the front yards of the newly established lots, and the individual foundation drains via sump pumps. The side and rear lots will surface drain towards the existing wetlands, west of this development as illustrated in figure 2 appended to this report. Roof drainage will be discharged on the vegetative surface towards the wetlands.

The major storm system will be conveyed overland to the wetlands to the east of the development and to Glenburnie Drive.

A summary of the peak flow rates are illustrated below.

Storm Modelling Results						
Peak Flow Rate (m ³ /sec)						
Storm Event	Hyland Road To Wetland		Glenburnie Drive To Wetland		To Storm Sewer	
	Pre-Dev. Flow	Post-Dev. Flow	Pre-Dev. Flow	Post-Dev. Flow	Pre-Dev. Flow	Post-Dev. Flow
2 yrs	0.009	0.051	0.008	0.016	0.000	0.023
5 yrs	0.063	0.080	0.053	0.050	0.000	0.032
100 yrs	0.299	0.238	0.219	0.074	0.000	0.196

The infill development is adjacent to the existing wetlands and generally storage facilities are not provided due to insufficient area available.

Prior to construction, a heavy duty silt fence will be installed along the perimeter to protect the existing wetlands as well as straw bales at the inlet of the culvert to prevent silt entering the culvert/wetlands.

6.4 Water Balance

The water balance is reviewed based on pre and post development runoff volumes into the wetlands as illustrated below.

Water Balance							
Runoff Volume (m ³)							
Storm Event	Hyland Road To Wetland			Glenburnie Drive To Wetland			Net
	Pre-Dev. Volume	Post-Dev. Volume	Incr/ Decr/	Pre-Dev. Volume	Post-Dev. Volume	Incr/ Decr/	Incr/ Decr/
2 yrs	28.78	86.82	+58.04	19.76	26.31	+6.55	+64.59
5 yrs	124.46	191.34	+66.88	78.47	70.47	-8.00	+58.88
100 yrs	487.69	566.90	+79.21	300.61	231.97	-68.64	+10.57

The Miduss model shows a net volume increase of 64.59, 58.88 and 10.57 m³ increase in runoff volume directed towards the wetland for the 2-, 5-, and 100-year return period storm event, respectively, and the front yards of the remaining lots (4-8)

6.5 Water Quality

Lots 9 - 11 will drainage from the rear to the front and the remaining lots (12-16) will drain the front yards on the Hyland Road development into a double catchbasin (with a 3D sump) and/or gutter outlet and continues to the ditch inlet (with 3D sump) located at the inlet of the cross-culvert under the Hyland Road extension into the wetlands. The rear yards of Lot 12 – 16 will drain into a rear yard swale along the east property line to the said ditch inlet in the northern ditch of Hyland Road. The northern ditch of Hyland Road will be designed in accordance with the 2003 SWN Planning and Design Manual (Section 4.5.9). Rip-rap will be placed at the outlet of the culvert from the catchbasin and gutter outlet to trap the heavy TSS. In addition, a covered hood (90 degree downward elbow) may be installed in the catch basin and ditch inlet to trap floatable debris.

The front yards of the Glenburnie Development will drain in a normal manner into a double catchbasin (with 3D sump) on Glenburnie Drive. Similarly, a covered hood may be installed in the double

catchbasins on Glenburnie Drive. The rear yards will drain over the grassed surface in dispersed manner towards and over the retaining wall onto a rip-rap covered surface to the wetlands.

7.0 Conclusions

Dunnink Homes is applying for the infill development located north of Hyland Road and east of Glenburnie Drive. This report has been prepared to support the application.

The above concludes that municipal services are available for the sites as follows:

- Road access may be provided from Hyland Road and Glenburnie Drive.
- Municipal water supply for domestic use and fire protection will be provided from the existing 150mm diameter watermains on Hyland Road and Glenburnie Drive.
- Sanitary sewers services will be provided to the existing sanitary sewers on Hyland Road and Glenburnie Drive.
- Storm drainage will be provided via back yard swale directed to the wetlands and storm sewer.
- **Adequate** Quality control will be provided through the use of sump pumps, directing rooftop areas to vegetative swales, ditch inlet, and catch basins.

I trust that this report and design has been completed within our terms of reference and is suitable for your present requirements. Please contact our office if you have any questions or require further consultation.

Van Harten Surveying Inc.

Cope Otten, P. Eng.

John Duffy, P. Eng.
Consulting Engineer

Encl. Preliminary Grading and Servicing Plan – Hyland Road Extension
Encl. Preliminary Grading and Servicing Plan – Glenburnie Drive Extension



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