



Planning & Building Safety Department
 638 Princess Avenue. Brandon MB. R7A 0P3
 T: 204.729.2110 F: 204.728.2406
 www.brandon.ca/planning

Amendment to Zoning By-law 6642

Name of Property Owner: WAVERLY DEVELOPMENTS LTD.
 Name of Applicant: WAVERLY DEVELOPMENTS LTD.
 Civic Address of Property: 1910 & 2218 Bell Avenue
 Legal Description of Property: Part of the NE 1/4 34-10-19 WPM Lots 32 & 72, Plan 48868 BLTO

References:

BAPD Development Plan By-law No. 78/01/04
 Applicable Secondary Plan By-law
 City of Brandon Zoning By-Law No. 6642

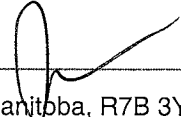
Prior to submitting a formal application, the Planning & Building Safety Department strongly recommends that all applicants meet with a Community Planner to complete a pre-application review

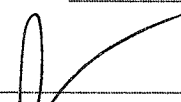
Proposal:

To rezone the properties as follows:

1. Rezone property located at 2218 Bell Ave from Parks and Recreation PR Zone to Residential Single Family RSF Zone
2. Rezone westernmost 12m (approximate) portion of eastern property from Parks and Recreation PR Zone to Residential Moderate Density Multiple Family RMD Zone.
3. Rezone west property from Development Reserve DR Zone to Residential Moderate Density Multiple Family RMD Zone and Open Space OS Zoe (9M easternmost portion for buffer).

I undertake to observe and perform all provisions of The Planning Act, the Development Plan, the Zoning By-law, and the provisions of other relevant laws, by-laws or agreements.

Signature of Owner:  Date: August 24 15
 Address: 3000G Victoria Avenue, Brandon, Manitoba, R7B 3Y3 E-Mail: brandon@burgesslawoffice.net
Street Address Postal Code City/Province
 Home Phone: _____ Cell Phone: _____ Work Phone: 204-725-7070

Signature of Applicant:  Date: August 24 15
 Address: 3000G Victoria Avenue, Brandon, Manitoba, R7B 3Y3 E-Mail: brandon@burgesslawoffice.net
Street Address Postal Code City/Province
 Home Phone: _____ Cell Phone: _____ Work Phone: 204-725-7070

The personal information which you are providing is being collected under the authority of The Planning Act and will be used for the purpose of approving this application. Information is also being collected for the purpose of statistical reporting. It is protected by the Protection of Privacy provisions of The Freedom of Information and Protection of Privacy Act. If you have any questions about the collection and/or use of information, contact Jennifer Houlihan, FIPPA Coordinator, City of Brandon Planning & Building Safety Department, 638 Princess Avenue Brandon, Manitoba, R7A 0P3, Telephone 204-729-2116

FOR PLANNING DEPARTMENT USE ONLY:

Community Planner: Robert Z. Planning File No.: Z-02-15-B CityView No.: PLZ BLA 2015-83
 Date Application Received: Aug. 25/15 Payment Date: Aug 25/15 Receipt No.: 2015-3118 Amount: \$2,900.00
 Re-Zoning - Application REV01/13



Planning & Building Safety Department
638 Princess Avenue. Brandon MB. R7A 0P3
T: 204.729.2110 F: 204.728.2406

Application for Subdivision

Name of Property Owner: WAVERLY DEVELOPMENTS LTD.
Name of Applicant: WAVERLY DEVELOPMENTS LTD.
Civic Address of Property: 1910 Bell Avenue
Legal Description of Property: Part of the NE 1/4 of 34-10-19 WPM Lot 72, Plan 48868 BLTO

References:

BAPD Development Plan By-law No. 73/01/04
Applicable Secondary Plan By-law
City of Brandon Zoning By-Law No. 6642

Prior to submitting a formal application, the Planning & Building Safety Department strongly recommends that all applicants meet with a Community Planner to complete a pre-application review

Subdivision Request:

To subdivide the next phase of the Oakridge area to create a multifamily complex consisting of six four story buildings with a total of 254 units.

I undertake to observe and perform all provisions of The Planning Act, the Development Plan, the Zoning By-law, and the provisions of other relevant laws, by-laws or agreements.

Signature of Owner: [Signature] Date: August 24 15

Address: 3000G Victoria Avenue Brandon, MB, R7B 3Y3 E-Mail: brandon@burgesslawoffice.net
Street Address Postal Code City/Province

Home Phone: _____ Cell Phone: _____ Work Phone: 204-725-7070

Signature of Applicant: [Signature] Date: August 24 15

Address: 3000G Victoria Avenue, Brandon, MB, R7B 3Y3 E-Mail: brandon@burgesslawoffice.net
Street Address Postal Code City/Province

Home Phone: _____ Cell Phone: _____ Work Phone: 204-725-7070

The personal information which you are providing is being collected under the authority of The Planning Act and will be used for the purpose of approving this application. Information is also being collected for the purpose of statistical reporting. It is protected by the Protection of Privacy provisions of The Freedom of Information and Protection of Privacy Act. If you have any questions about the collection and/or use of information, contact Jennifer Houlihan, FIPPA Coordinator, City of Brandon Planning & Building Safety Department, 421 - 9th Street, Brandon, Manitoba, R7A 4A9, Telephone 204-729-2116

FOR PLANNING DEPARTMENT USE ONLY:

Community Planner: Robert Z. Planning File No.: 4500-15-615 CityView No.: PLSUB2015-82
Date Application Received: Aug. 25/15 Payment Date: Aug 25/15 Receipt No.: 2015-3118 Amount: \$1,230-
Subdivision - Application - Copy REV01/13

BURGESS LAW OFFICE*

John W. Burgess, Q.C.
C.A.

Karen L. Webb*
B.Sc. Agric LL.B.
*also a member of the Ontario Bar

Alexander K. Burgess
B.A. J.D.

August 25, 2015

City of Brandon
Planning & Building Safety Department
638 Princess Avenue
Brandon, Manitoba, R7A 0P3

Dear Sirs:

**RE: Waverly Developments Ltd.
Application for Approval of Subdivision/Application for Zoning Amendment
Part of NE 1/4 9-10-19 WPM (2218 Bell Avenue, Brandon)
Letter of Intent**

Further in this matter please be advised that the intent of the applicant for the subdivision and rezoning is to subdivide the property and create a multi family complex area consisting of six four story buildings with a total of 254 units.

In support of said application, the applicant is applying to have the subject property rezoned as follows to allow the required designations for the building and surrounding area:

1. Rezone property located at 2218 Bell Avenue from Parks and Recreation PR Zone to Residential Single Family RSF Zone.
2. Rezone westernmost 12m (approximate) portion of eastern property from Parks and Recreation PR Zone to Residential Moderate Density Multiple Family RMD Zone,.
3. Rezone west property from Development Reserve DR Zone to Residential Moderate Density Multiple Family RMD Zone and Open Space OS Zone (9M easternmost portion for buffer)

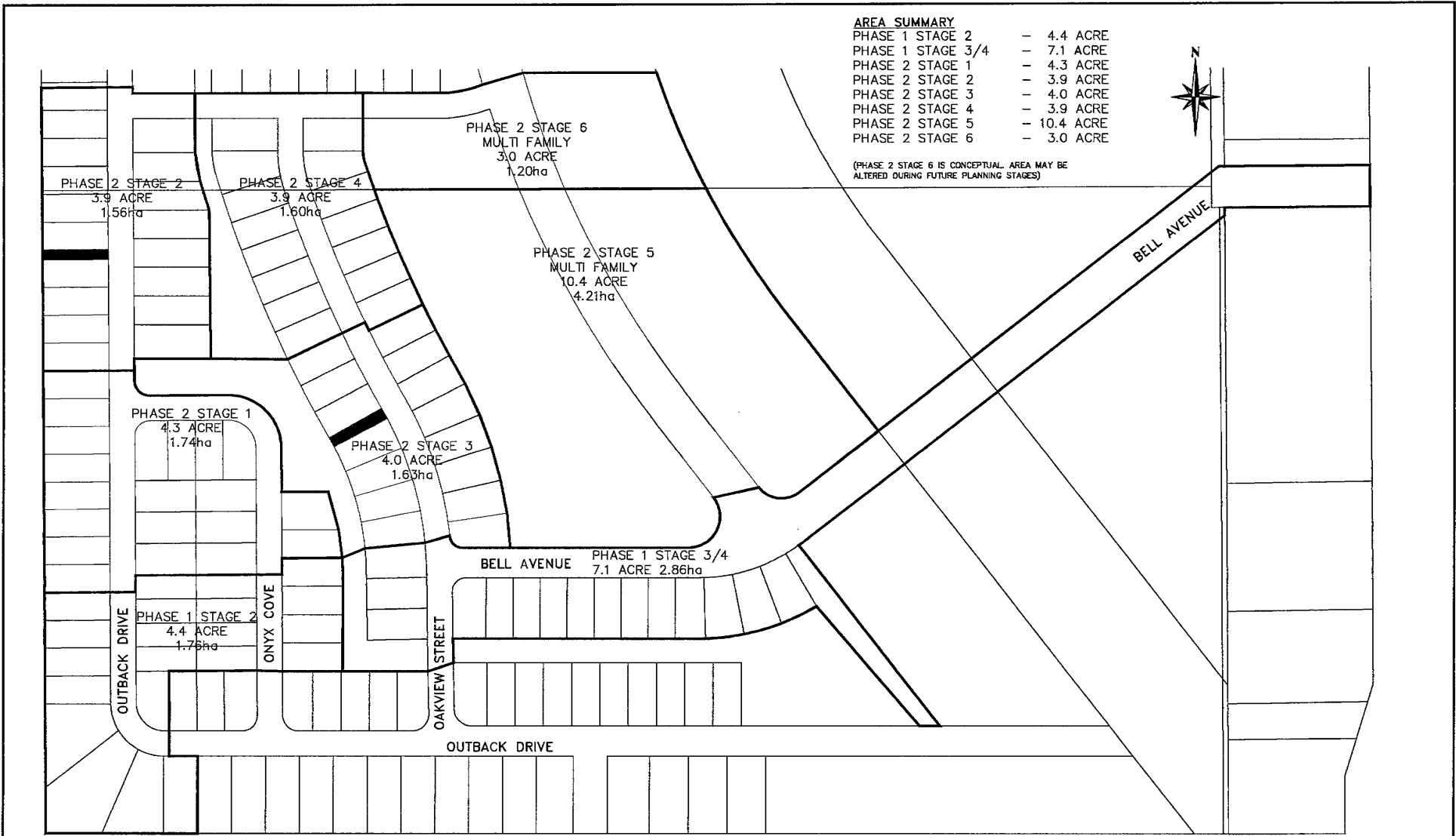
Yours truly,

WAVERLY DEVELOPMENTS LTD.
PER:

JOHN W. BURGESS
JWB/ms

BRANDON OFFICE:
3000G Victoria Avenue
Brandon, Manitoba R7B 3Y3
Telephone: (204) 725-7070
Fax: (204) 727-5995
Email brandon@burgesslawoffice.net

MINNEDOSA OFFICE:
Box 65
Minnedosa, Manitoba R0J 1E0
Telephone: (204) 867-2935
Fax: (204) 867-3448



AREA SUMMARY

PHASE 1 STAGE 2	- 4.4 ACRE
PHASE 1 STAGE 3/4	- 7.1 ACRE
PHASE 2 STAGE 1	- 4.3 ACRE
PHASE 2 STAGE 2	- 3.9 ACRE
PHASE 2 STAGE 3	- 4.0 ACRE
PHASE 2 STAGE 4	- 3.9 ACRE
PHASE 2 STAGE 5	- 10.4 ACRE
PHASE 2 STAGE 6	- 3.0 ACRE

(PHASE 2 STAGE 6 IS CONCEPTUAL. AREA MAY BE ALTERED DURING FUTURE PLANNING STAGES)

ALL WORK IN THE PUBLIC RIGHT-OF-WAY SHALL BE PERFORMED AS STATED IN THE LATEST EDITION OF THE CITY OF BRANDON STANDARD CONSTRUCTION SPECIFICATIONS.
 ALL DIMENSIONS ARE IN METRES
 ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL.

LOCATION OF UNDERGROUND STRUCTURES ARE APPROXIMATE ONLY. EXACT LOCATION MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES PRIOR TO CONSTRUCTION.

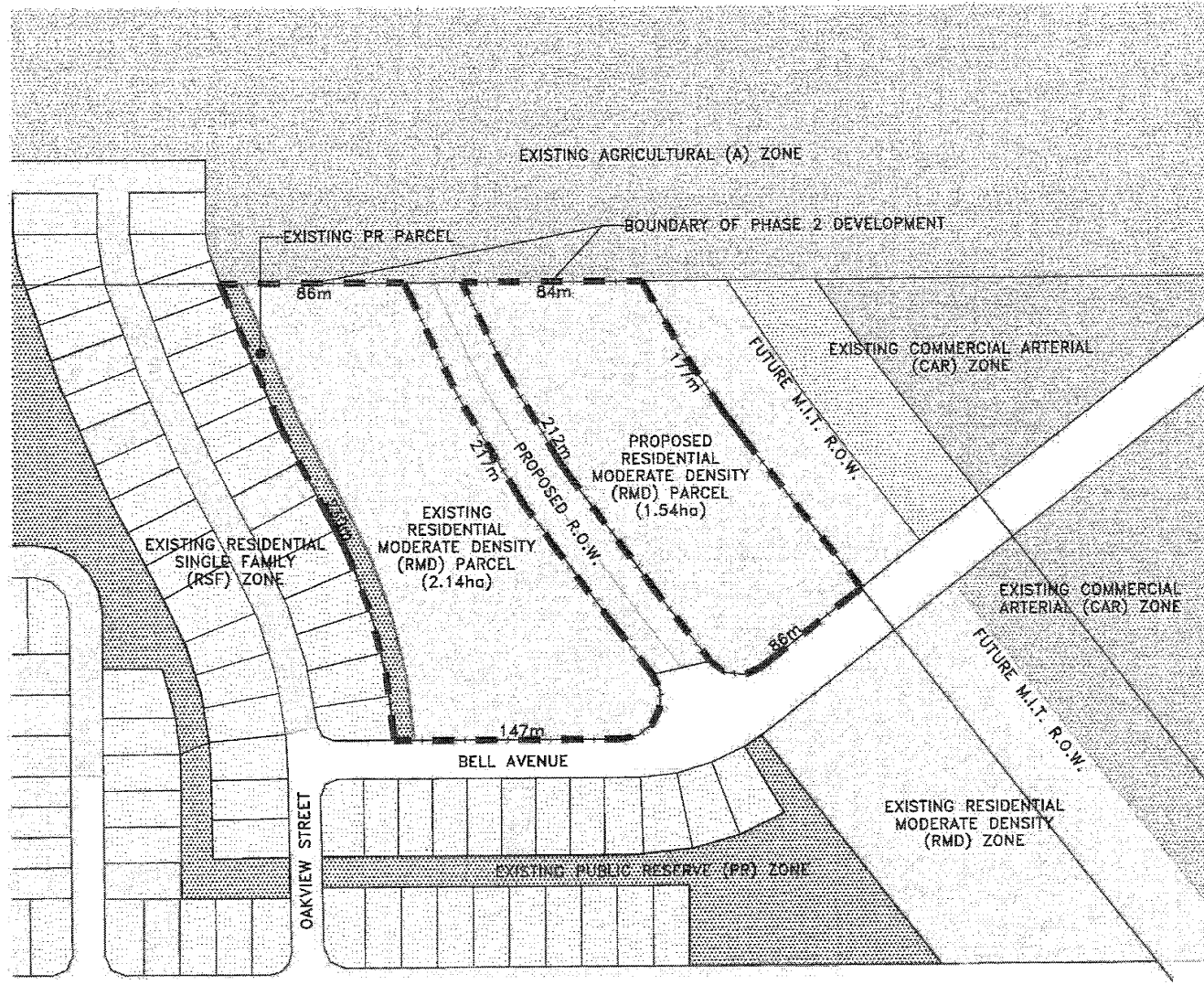
REVISIONS	

G.D. NEWTON AND ASSOCIATES INC.
 727A 10TH STREET
 BRANDON, MANITOBA
 R7A 4G7

DATE: 2015/08/05 SCALE: N.T.S.

WAVERLY DEVELOPMENTS LTD.
 DEVELOPMENT AREAS
 AUGUST 2015

DRAWING 1



ALL DIMENSIONS ARE IN METRES

LOCATION OF UNDERGROUND STRUCTURES ARE APPROXIMATE ONLY. EXACT LOCATION MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES PRIOR TO CONSTRUCTION.

REVISIONS	

G.D. NEWTON AND ASSOCIATES INC.
727A 10TH STREET
BRANDON, MANITOBA
R7A 4G7

DATE: 2015/08/26 SCALE: N.T.S.

WAVERLY DEVELOPMENTS LTD.
OAKRIDGE ESTATES PHASE 2
MODERATE DENSITY DEVELOPMENT
PROPOSED LAND USE AND PARCELS

DRAWING 2



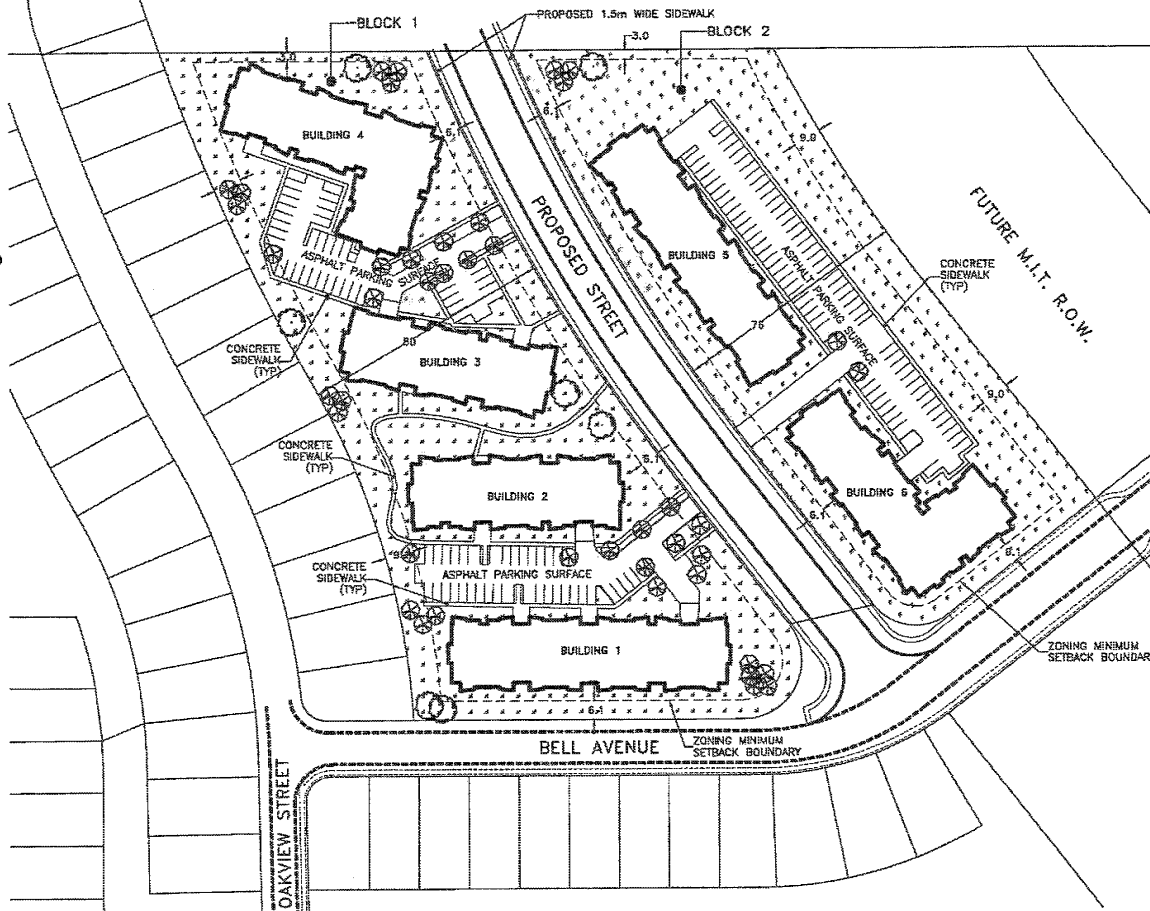
ZONING SETBACKS
RESIDENTIAL MODERATE DENSITY
MULTIPLE FAMILY ZONE (RMD)

SITING REQUIREMENT	MINIMUM	PROVIDED (BLOCK 1)	PROVIDED (BLOCK 2)
SITE AREA	670m ²	2.14ha	1.54ha
SITE WIDTH	18.2m	30m	79m
FRONT YARD	6.0m	6.1m (MIN)	6.1m (MIN)
SIDE YARD (INTERIOR)	3.0m	3.0m (MIN)	3.0m (MIN)
SIDE YARD (CORNER)	3.0m	3.0m (MIN)	3.0m (MIN)
REAR YARD (LANE)	7.6m	N/A	N/A
REAR YARD (NO LANE)	9.1m	9.1m (MIN)	9.1m (MIN)
DWELLING UNIT AREA	38.0m ²	1440m ² (MIN)	1440m ² (MIN)
SITING REQUIREMENT	MAXIMUM	PROVIDED (BLOCK 1)	PROVIDED (BLOCK 2)
BUILDING HEIGHT	14.0m	T.B.D.	T.B.D.
STOREYS	3.0 STOREYS	3.0 STOREYS	3.0 STOREYS
UNITS PER HECTARE	66 UNITS/ha	68 UNITS/ha	58 UNITS/ha
TOTAL BUILDING COVERAGE	-	31%	25%

PARKING REQUIREMENTS (MINIMUM)

MULTIPLE FAMILY DWELLING
 (1.3 SPACES PER DWELLING UNIT)

BLOCK 1 -	STALLS REQUIRED: 216 (7 ACCESSIBLE)	
	SUB-SURFACE PARKING STALLS	-- 149
	SURFACE PARKING STALLS	-- 67
	ACCESSIBLE PARKING STALLS	-- 8
	TOTAL PROVIDED:	224
BLOCK 2 -	STALLS REQUIRED: 132 (6 ACCESSIBLE)	
	SUB-SURFACE PARKING STALLS	-- 68
	SURFACE PARKING STALLS	-- 70
	ACCESSIBLE PARKING STALLS	-- 5
	TOTAL PROVIDED:	143



BUILDING SUMMARY:

BUILDING 1
 RESIDENTIAL BUILDING
 1900m²
 3 STOREY / 44 UNITS

BUILDING 2
 RESIDENTIAL BUILDING
 1440m²
 3 STOREY / 28 UNITS

BUILDING 3
 RESIDENTIAL BUILDING
 1440m²
 3 STOREY / 28 UNITS

BUILDING 4
 RESIDENTIAL BUILDING
 1890m²
 3 STOREY / 44 UNITS

BUILDING 5
 RESIDENTIAL BUILDING
 1900m²
 3 STOREY / 44 UNITS

BUILDING 6
 RESIDENTIAL BUILDING
 1890m²
 3 STOREY / 44 UNITS

(BUILDING AREA IS APPROXIMATE AND
 MAY VARY UPON DETAILED DESIGN)

ALL DIMENSIONS ARE IN METRES

LOCATION OF UNDERGROUND STRUCTURES ARE
 APPROXIMATE ONLY. EXACT LOCATION MUST BE OBTAINED
 FROM THE INDIVIDUAL UTILITIES PRIOR TO CONSTRUCTION.

REVISIONS

NO.	DESCRIPTION	DATE

G.D. NEWTON AND ASSOCIATES INC.
 727A 10TH STREET
 BRANDON, MANITOBA
 R7A 4G7

DATE: 2015/06/26

SCALE: N.T.S.

WAVERLY DEVELOPMENTS LTD.
 OAKRIDGE ESTATES PHASE 2
 MODERATE DENSITY DEVELOPMENT
 CONCEPTUAL SITE PLAN

DRAWING 3



ZONING SETBACKS
RESIDENTIAL MODERATE DENSITY
MULTIPLE FAMILY ZONE (RMD)

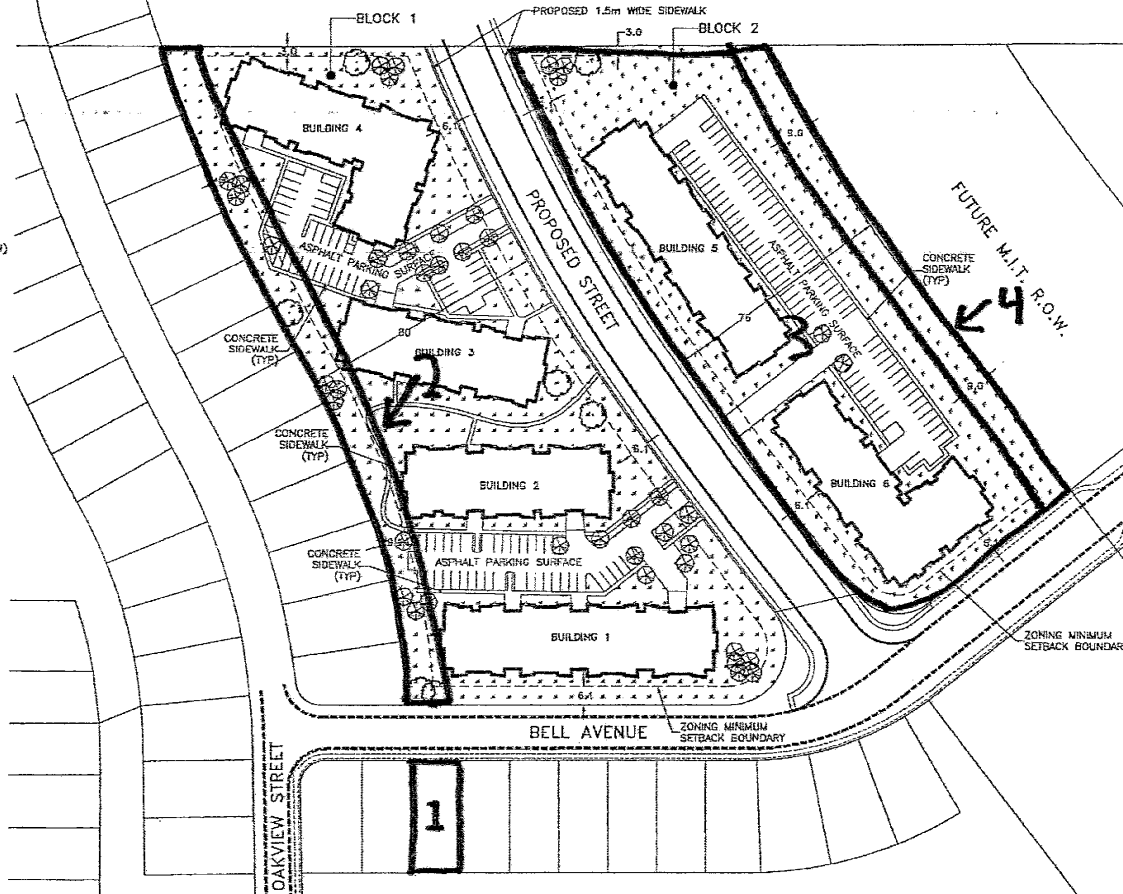
SITING REQUIREMENT	MINIMUM	PROVIDED (BLOCK 1)	PROVIDED (BLOCK 2)
SITE AREA	670m ²	2.14ha	1.54ha
SITE WIDTH	18.2m	80m	78m
FRONT YARD	6.0m	6.1m (MIN)	6.1m (MIN)
SIDE YARD (INTERIOR)	3.0m	3.0m (MIN)	3.0m (MIN)
SIDE YARD (CORNER)	3.0m	3.0m (MIN)	3.0m (MIN)
REAR YARD (LANE)	7.8m	N/A	N/A
REAR YARD (NO LANE)	9.1m	9.1m (MIN)	9.1m (MIN)
DWELLING UNIT AREA	38.0m ²	1440m ² (MIN)	1440m ² (MIN)

SITING REQUIREMENT	MAXIMUM	PROVIDED (BLOCK 1)	PROVIDED (BLOCK 2)
BUILDING HEIGHT	14.0m	15.0m	15.0m
STOREYS	3.0 STOREYS	3.0 STOREYS	3.0 STOREYS
UNITS PER HECTARE	86 UNITS/ha	63 UNITS/ha	58 UNITS/ha
TOTAL BUILDING COVERAGE	-	51%	25%

PARKING REQUIREMENTS (MINIMUM)

MULTIPLE FAMILY DWELLING
 (1.5 SPACES PER DWELLING UNIT)

BLOCK 1 -	STALLS REQUIRED: 218 (7 ACCESSIBLE)	148
	SUB-SURFACE PARKING STALLS	67
	SURFACE PARKING STALLS	6
	ACCESSIBLE PARKING STALLS	5
	TOTAL PROVIDED:	224
BLOCK 2 -	STALLS REQUIRED: 132 (5 ACCESSIBLE)	65
	SUB-SURFACE PARKING STALLS	70
	SURFACE PARKING STALLS	5
	ACCESSIBLE PARKING STALLS	5
	TOTAL PROVIDED:	145



BUILDING SUMMARY:

BUILDING 1	RESIDENTIAL BUILDING	1500m ²	3 STOREY / 44 UNITS
BUILDING 2	RESIDENTIAL BUILDING	1440m ²	3 STOREY / 28 UNITS
BUILDING 3	RESIDENTIAL BUILDING	1440m ²	3 STOREY / 28 UNITS
BUILDING 4	RESIDENTIAL BUILDING	1800m ²	3 STOREY / 44 UNITS
BUILDING 5	RESIDENTIAL BUILDING	1900m ²	3 STOREY / 44 UNITS
BUILDING 6	RESIDENTIAL BUILDING	1800m ²	3 STOREY / 44 UNITS

(BUILDING AREA IS APPROXIMATE AND MAY VARY UPON DETAILED DESIGN)

1-PR to RSF
 2-PR to RMD
 3-DR to RMD
 4-DR to OS

ALL DIMENSIONS ARE IN METRES

LOCATION OF UNDERGROUND STRUCTURES ARE APPROXIMATE ONLY. EXACT LOCATION MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES PRIOR TO CONSTRUCTION.

REVISIONS

G.D. NEWTON AND ASSOCIATES INC.
 727A 10TH STREET
 BRANDON, MANITOBA
 R7A 4E7

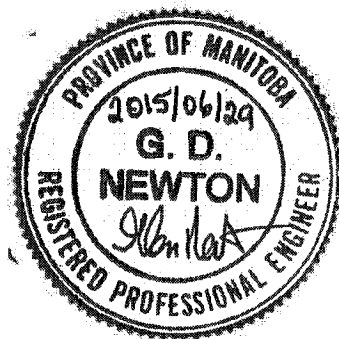
WAVERLY DEVELOPMENTS LTD.
 OAKRIDGE ESTATES PHASE 2
 MODERATE DENSITY DEVELOPMENT
 CONCEPTUAL SITE PLAN

DATE: 2015/05/26

SCALE: N.T.S.

DRAWING 3

Waverly Developments Ltd.
Oakridge Estates Phase 2
Residential Moderate Density Development
Site Design Analysis



Prepared by:

Sarah Santiago, E.I.T.

G.D. Newton and Associates Inc.

Approved by:

Glen Newton, P.Eng

G.D. Newton and Associates Inc.

727A 10th Street

Brandon, Manitoba

R7A 4G7

204-725-1688

EXECUTIVE SUMMARY

The following report has been prepared at the request of Waverly Developments Ltd. to provide information regarding the requirements to service Phase 2 of Oakridge Estates within the City of Brandon. Specifically, the report outlines the requirements for the wastewater, water and stormwater management systems for the Residential Moderate Density (RMD) Multiple Family Zone within the second phase of development.

The RMD zone within Phase 2 of the development will occupy a total of 3.68 hectares and is located in SE 34-10-19WPM. The proposed RMD development includes the construction of four 3-storey, 44 unit condominiums and two 3-storey, 28 unit condominiums. The total number of residential units proposed to be constructed is 232 units.

The RMD portion of Phase 2 is proposed to be serviced by a 250mm wastewater main, a 200mm water main and a 375mm land drainage sewer main. The stormwater management plan for this portion of the development also includes the installation of curb and gutter with catch basins along paved roads and parking lots.

The design of the wastewater, water and stormwater management systems within the development is based on a 2008 Development Report prepared by Genivar.

The wastewater flows that will be generated by the entire development (Phases 1 and 2) have been estimated to be 22.3 L/s. The peak hourly water demand for the entire development was estimated to be 15.8 L/s. The proposed and existing wastewater sewer collection systems and water distribution systems within the development and outside the development have sufficient capacity to convey the peak flow rates from the Oakridge development.

To meet City of Brandon requirements regarding stormwater runoff rates from new developments, it was determined that 10,800m³ of storage would need to be provided within the development. The retention ponds designed for the Oakridge development have the capacity to handle a 1 in 25 year storm and a 1 in 100 year storm.

It should be noted that the number of residential units proposed to be constructed in Phases 1 and 2 of the development have increased since the Genivar study was performed. This resulted in an increase in the total projected wastewater and water flow for the development. However, there is enough capacity within the proposed wastewater and water systems to handle this increase in flow.

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1.0 BACKGROUND

The following report has been prepared at the request of Waverly Developments Ltd. to provide information regarding the servicing requirements for Phase 2 of Oakridge Estates within the City of Brandon. Specifically, this report outlines the requirements for the wastewater, water and stormwater management systems for the Residential Moderate Density (RMD) Multiple Family Zone within Phase 2 of the development

1.1 Site Overview

Oakridge Estates is a 24.3 hectare development located in SE 34-10-19WPM. Development has been divided into two phases. Phase 1 of construction has already been completed. Phase 2 is currently in the design process. Phase 2 will involve the construction of Residential Single Family (RSF) units and Residential Moderate Density (RMD) Multiple Family units. This report will only focus on the RMD portion of Phase 2 of development.

The RMD zone within Phase 2 of the development occupies a total of 3.68 hectares. The proposed RMD development includes the construction of four 3-storey, 44 unit condominiums and two 3-storey, 28 unit condominiums. The total number of residential units proposed to be constructed is 232 units.

To service the condominiums, wastewater sewer, water and land drainage piping will be constructed. Asphalt parking and paved roads, along with curb and gutter and catch basins are also proposed to be constructed.

1.2 Site Zoning and Adjacent Land Use

The site is currently zoned as Residential Moderate Density (RMD) and Development Reserve (DR). The site will be re-zoned as RMD with the exception of the eastern 9.0m of land adjacent to the highway right-of way being re-zoned as Open Space (OS) Zone.

The adjacent land south of the site is also zoned RSF and has been constructed as part of Phase 1 of the development. The adjacent undeveloped land to the west is zoned Residential Single Family (RSF) and is part of Phase 2 of the development. Undeveloped land to the north is zoned Agricultural (A). Developed land to the east is zoned Commercial Arterial (CAR). Within this zone are commercial establishments.

1.3 Previous Studies

In 2008, Genivar prepared a Development Report for the Oakridge development. The report outlined projected wastewater and water flows for the development, as well as post-development stormwater runoff rates. It also analyzed the capacities of proposed wastewater and water systems, as well as capacities of existing City of Brandon wastewater and water infrastructure to ensure it can handle flows from the development.

The design of the wastewater, water and stormwater management systems within the development is based on the findings and recommendations of the 2008 Development Report.

2.0 WASTEWATER SEWER SYSTEM

2.1 Estimated Wastewater Flows

The wastewater flows that will be generated by the entire development (Phases 1 and 2) have been estimated to be 22.3 L/s. This figure is the sum total of the wastewater flows generated by the estimated population for the entire development, as well as any extraneous and infiltration flows. Extraneous and infiltration flows are flows from stormwater runoff and groundwater entering the wastewater sewer system through manholes. The projected wastewater flow stated above was calculated as follows:

1. Resident-generated wastewater

- The average daily flow was calculated by using a per capita daily consumption of 270 L/day* and by assuming either 2.5 or 3 residents per residential unit, depending on the zoning type (see Table 1 below).
- The peak hourly flow rate was calculated by using a Harmon Peaking Factor of 4.

2. Extraneous and Infiltration Flows

- Infiltration into the wastewater system was calculated by assuming an infiltration rate of 23,000 litres/hectare/day†.

The projected total wastewater flow for the entire Oakridge development is shown in Table 1.

Table 1: Water/Wastewater Flow Calculations for Oakridge Estates

	PHASE 1		PHASE 2		TOTAL
	Residents per Residential Unit	# of Units	# of Residents	# of Units	
Residential Single Family Zone	3	69	207	68	204
Residential Low Density Multiple Family Zone	2.5	26	65	0	0
Residential Moderate Density Multiple Family Zone	2.5	72	180	232	580
Commercial Arterial Zone	3	0	0	9	27
Estimated Total Number of Residents			452	811	1263
			PHASE 1	PHASE 2	TOTAL
Water/Wastewater Flow – Resident Generated					
Average Daily Flow (L/s)			1.41	2.53	3.95
Peak Hourly Flow (L/s)			5.6	10.1	15.8
Wastewater Flow – Extraneous & Infiltration Flows (L/s)					
			2.8	3.7	6.5
Total Projected Wastewater Flow (L/s)			8.4	13.8	22.3

* The assumed per capita consumption of 270L/day was obtained from the City of Winnipeg website. The same number was used within the 2008 Genivar Study.

† Obtained from the 2008 Genivar Study

2.2 Proposed Wastewater Sewer System

See Drawing 4 for a drawing of the proposed wastewater system.

The RMD portion of Phase 2 will be serviced by a 250mm sewer main. The proposed sewer main will connect to an existing 250mm wastewater sewer main installed during Phase 1 of the development. This existing 250mm sewer main conveys wastewater from the entire development to the City of Brandon wastewater sewer system.

The proposed 250mm sewer main and the existing 250mm wastewater sewer main downstream of the RMD site have a capacity of 35 L/s at a slope of 0.25%. This is more than sufficient to handle the projected peak hourly wastewater flow of 22.3 L/s.

The extra 12.7L/s of capacity available within the 250mm wastewater sewer main allows for possible future development to be constructed north of the Oakridge development.

2.3 Capacity of the Existing Wastewater Sewer System

The existing 250mm sewer main that was installed in Phase 1 to service the Oakridge Development runs southeast towards Outback Drive, then runs east along Outback Drive towards 18th Street North. The sewer system ties into the City of Brandon's existing wastewater system at a manhole located at the west ditch of 18th Street North. From there, wastewater flows south into the Hilton Avenue Lift Station, where it is pumped to the wastewater treatment plant.

The 2008 Genivar study assessed the downstream capacity and present loading of the existing wastewater conveyance system between the Oakridge development and the Hilton Avenue Lift Station. According to their findings, all downstream piping that will receive wastewater from the Oakridge development has sufficient capacity to handle the projected peak hourly flow of 22.3 L/s. The study also found that the Hilton Avenue Lift Station had an available capacity of 98 L/s, and therefore can handle the peak flows from the development. The findings from the Genivar study are shown in Table 3.

In summary the wastewater sewer collection system both within the development and outside the development have sufficient capacity to convey the peak wastewater flow rates from the Oakridge development.

Table 3: Sewer Pipe Capacities and Unused Peak Hour Flow Capacities
(from 2008 Genivar Study)

Pipe Diameter and Description	Capacity	Estimated Current Flow	Unused Capacity
250mm – along 18 th St. N to Braecrest Drive	62.3	9.6	52.7
250mm – after Braecrest Drive down to the hill	>60	16.72	>43.3
250mm – down the hill to bottom of hill	>60	31.0	>29.0
375mm – bottom of hill to Kircaldy Drive	67.9	38.0	29.9
600mm – Kircaldy Drive to Hilton Ave. Lift Station	173.6	110.5	63.1

2.0 WATER DISTRIBUTION SYSTEM

3.1 Estimated Water Demand

The water demand for the development is calculated the same way as the resident-generated wastewater flow. Using a 270L per capita consumption, the total average daily flow for the development was estimated to be 3.95 L/s. Using a Harmon Peaking Factor of 4, the peak hourly demand was estimated to be 15.8 L/s.

As mentioned in the previous section, the proposed number of units for Phases 1 and 2 have increased since the Genivar Study was performed, resulting in higher water and wastewater flows than originally estimated. As shown in Table 2, the original total estimated peak hourly flow for the entire development was only 8.5 L/s.

The proposed water distribution system for Oakridge has the capacity to handle the increase in peak hourly flow from what was originally proposed. This will be discussed in more detail in Section 3.3.

3.2 Proposed Water Distribution System

See Drawing 4 for a drawing of the proposed system.

The RMD portion of Phase 2 will be serviced by a 200mm water main. The proposed water main will connect to the existing 250mm water main installed during Phase 1 of the development.

The existing 250mm water main installed during Phase 1 of construction connects to the City of Brandon's existing 250mm watermain running along the west ditch of 18th Street North. There are two connection points to the City's existing watermain:

1. at Bell Avenue
2. at Outback Drive

3.3 Capacity of the Water Distribution System

The Genivar study addressed the capacity of the water system leading to and within the development. According to the Genivar study, the water mains within the development need to have a capacity of 114L/s available for fire flows, while maintaining a minimum pressure of 20psi. The development was designed to meet these criteria.

The Genivar study used WATERCAD modelling to determine whether the proposed and existing watermain have enough capacity to service not only the entire Oakridge development but also a possible future development to north, with a magnitude equal to Oakridge. Their findings state that *“the existing 18th Street watermain is able to provide adequate pressure to Oakridge Estates Subdivision. The WATERCAD model also showed that the proposed water distribution system in Oakridge Estates Subdivision has enough capacity to extend the distribution system north into a development of equal magnitude.”*

As previously mentioned, the projected peak hourly flow has increased from 8.5 L/s to 15.8 L/s since the Genivar study was performed. Since the study stated that there is enough water system capacity leading to and within the development to service not only Oakridge but also a possible future development equal to the size of Oakridge, this indicates that there is enough capacity to handle the increase in the projected peak hourly flow.

However, this may mean that further calculations may need to be done to verify whether or not there is still enough capacity to service a future development north of Oakridge.

4.0 STORMWATER MANAGEMENT

The Oakridge development will utilize curb and gutter, catch basins, underground storm sewers and two retention ponds to collect, convey and store runoff from the site. Runoff is discharged at a rate that does not exceed the pre-development discharge rate.

The Oakridge development's stormwater management system was designed based on the findings of the 2008 Genivar Study.

4.1 Design Criteria

At the time of the Genivar study, the City of Brandon's criteria for stormwater management required 1 in 25 year post-development runoff rates to not exceed 1 in 5 year pre-development runoff rates. Therefore, the stormwater management structures for Oakridge are designed to handle a 1 in 25 year storm. However, the Genivar report also states that the Stormwater system has the capacity to handle post-development runoff rates for a 1 in 100 year storm.

4.2 Pre-Development and Post-Development Conditions

The pre-development and post-development conditions for the entire Oakridge development were assessed by Genivar. The results of their findings as stated in the 2008 Genivar study is as follows:

Table 4: Pre and Post Development Conditions (2008 Genivar Study)

	Pre-Development	Post-Development
Runoff Coefficient	0.1	0.4
Storm Event	1 in 5 year	1 in 25 year
Runoff Rate	0.49 m ³ /s	4.49 m ³ /s
Required Storage	-	10,800 m ³

As shown in Table 4, it was estimated that the post-development discharge rate needed to be limited to 0.49m³/s to meet the City of Brandon's criteria for stormwater management. As a result, 10,800m³ of storage would need to be provided.

4.3 Capacity of the Stormwater Management System

The Oakridge development's stormwater management system was designed based on the findings of the 2008 Genivar Study. The study divided the development into 4 catchment areas. A retention pond in the southeast end of the site and a smaller detention pond in the northwest end of the site were designed to have enough capacity to hold runoff from specific catchment areas (see Drawing 5). Runoff from each area was to be stored in one of two retention ponds.

A retention pond was built on the southeast end of the development during Phase 1 of construction. The pond was designed to have the capacity to handle all the runoff from 52 acres within in the 60 acre development, for a 1 in 25 year storm. A smaller detention pond, proposed to be constructed on the northwest end of the site, will be designed to store runoff from the other 8 acres of the development. This pond is also designed to have the capacity to store runoff for a 1 in 25 year storm.

According to the Genivar study, the two ponds combined have sufficient capacity to store runoff for the entire development during a 1 in 100 year storm.

A drainage channel will connect the two ponds. Runoff from the northwest pond will discharge onto the drainage channel at a controlled rate and drain towards the existing southeast pond. Water stored in the southeast pond will be discharged via a 600mm LDS outfall at pre-development rate of $0.49\text{m}^3/\text{s}$. Water from the pond flows east via underground LDS piping towards the ditch on the west side of the 18th Street North, then continues south for around 200m before being discharged onto ground surface within the ditch. Water then continues south along ditches towards the Assiniboine River.

4.4 Proposed Stormwater Management System for Phase 2's RMD Zone

Runoff from Phase 2's RMD units will be conveyed to the existing southeast pond via a collection system comprised new curb and gutter and catch basins. The outflow from the catch basins within the RMD property will be restricted to stay within original design flow rates. Catch basins within the proposed public right of way will not have the flow restricted. Underground 375mm LDS piping will be used to convey the storm water to the connection point with the existing system. That point will be an existing underground LDS pipe located on the northside of Bell Ave.

As previously stated, the existing southeast pond has sufficient capacity to store runoff from a 1 in 25 year storm. In addition, the two ponds combined have the capacity to store runoff from a 1 in 100 year storm.

5.0 CONCLUSION

Based on the findings of the Genivar Study, site servicing for the Oakridge development is feasible.

The proposed and existing wastewater sewer collection systems and water distribution systems within the development and outside the development have sufficient capacity to convey the peak flow rates from the Oakridge development.

The number of residential units proposed to be constructed in Phases 1 and 2 of the development have increased since the Genivar study was performed. This resulted in an increase in the total projected wastewater and water flow for the development. However, there is enough capacity within the proposed wastewater and water systems to handle the increase in flow.

The stormwater management plan for the development meets City of Brandon requirements regarding pre and post development discharge rates, as well as requirements for on-site storage.