

**GEM PROPERTIES
6550 Tecumseh Road East**

City of Windsor, Essex County

SITE SERVICING REPORT



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Consulting Engineers

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25 May 2015



File: 15-452

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EXECUTIVE SUMMARY

The GEM Properties Site is located behind and around the Home Depot at Municipal Address, 6550 Tecumseh Road East in the City of Windsor.

It is an ideal site for proposed Acute Care Hospital Facility as all of the required infrastructure is in place. It is also served by a Class II Arterial Road (Tecumseh Road East) which links to an adjacent N-S Class I Arterial Road (Lauzon Parkway).

The planned southerly extension of Lauzon Parkway to Highway 401 will provide an even more direct route (than E.C. Row Expressway presently) for the County of Essex residents in the future.

The estimated external servicing cost for the Site Development is only \$125,000 (for an on-site stormwater pumping station).

I. INTRODUCTION

1.1 Site Location

The Site is located in the City of Windsor, (Geographic Township of Sandwich East), Part of Lots 119 and 122 Concession 1. The location of the Site is shown on Figure 1, designated as Parts 1 to 17 and is 74.86 acres in area. Its submission address is 6550 Tecumseh Road East.

1.2 Land Use

The area is designated in the Official Plan as Business Park and zoned mainly for light industrial and commercial land use. The lands will be required to be rezoned in future.

1.3 Existing Infrastructure

Figure 1 describes the existing infrastructure located on the south (Tecumseh Road East) and east (Catherine Street) municipal roadways adjacent to the Site.

There is an existing sanitary sewer (250mm diameter) on the north side of Tecumseh Road East, over 3m deep. There is a manhole located near the south east corner of the Site as shown. In addition, there is an existing 450mm diameter sanitary sewer 4.5m deep at the end of Catherine Street, 60m east of the Site's east boundary.

The Site is presently serviced with water by an existing 750mm diameter feeder main on the north side of Tecumseh Road East. A 250mm diameter service main, which services Home Depot, extends to the rear of the property. There is also a 300mm diameter watermain at the west terminus of Catherine Street. Fire flows checked in 2012 yielded over 4500 gpm at a 20psi residual for the Tecumseh Road main and 4000 gpm at a 20 psi residual for the Catherine Street main.

There is a 1500mm x 1650mm concrete storm sewer on Tecumseh Road East, which is sized for commercial property frontages only. The Hawkins Drain, an open ditch, traverses the Site in an east-west direction along the CN Rail line to the north, and is identified as Part 13 on Figure 1.

Tecumseh Road East is designated a Class II Arterial Road and Lauzon Parkway is a Class I Arterial Road according to the City's Official Plan. Catherine Street is an internal City road which intersects with Lauzon Parkway at a signalized intersection and proceeds westerly within 60m of the Site (cul-de-sac within 180m of the Site). It is designated as a Class 1 Collector Road.

There is 27.6 kV hydro distribution in the proximity with 3 different feeders from 2 stations. One feeder is on the south side of Tecumseh Road East. There is also a 10 inch diameter NPS gas main on Tecumseh Road East.

II SERVICING REQUIREMENTS

2.1 General Considerations

The topography and existing infrastructure adjacent to the Site, described in Figure 1, are discussed relative to the development of the Site as an Acute Care Hospital Facility as follows:

2.2 Sanitary Sewer

The existing sanitary sewer on Tecumseh Road East is sized to service the Site. The Catherine Street 450mm diameter sanitary sewer is an available alternative approximately 60m east of the Site.

2.3 Water Mains

As noted in Section 1.3, there is excellent available water supply adjacent to the Site. The Hospital Facility designer has an alternative service available off the Catherine Street main, approximately 180m to the east of the Site.

2.4 Storm Drainage

We are advised by the City of Windsor that they have NOT completed the Stormwater Management Study identified in their Forest Glade North Planning Area Secondary Plan Report. However, the report identifies a linear stormwater management pond solution adjacent to the CN Rail to attenuate flow into the Hawkins Drain.

It will be necessary to restrict runoff from the Site to agricultural runoff for a 1:2 year storm event. Because there is 40% parking coverage anticipated for the site development (based on Stantec Generic Hospital Layout Plan – Figure 1.0), sufficient parking lot storage is available for the 1:5 year event (150mm depth at catchbasins) and the 1:100 year event. There will also be storage available in the

aisles and accesses (10% of site area) but it was not considered in our preliminary calculations. The required storage volume is approximately 6300 cubic metres for the 1:5 year event and 9100 cubic metres for the 1:100 year event. See Appendix 'A'.

Stormwater quality will be treated using a proprietary treatment system (OGS). Our preliminary design requires two Unit No. 6040WQA by ADS Hancor. We have included the design chart for same.

2.5 Road Access and Site Grading

Access to the Site will be via Tecumseh Road East which is an E-W Class II arterial road within the City of Windsor, which links Lauzon Parkway to the east and Walker Road to the west, both N-S arterial roads which serve the residents of the neighbouring County Municipalities via E.C. Row Expressway, Manning Road and Highway 401. Catherine Street can also be a secondary direct access to Lauzon Parkway.

It should be noted that the planned southerly extension of Lauzon Parkway to Highway 401, as described in the May 2013 Lauzon Parkway Improvements Class EA Study will provide an even more direct route to the Hospital Facility for the County of Essex residents.

Site grading will follow the gentle contour of the lands with little or no importing of fill anticipated.

2.6 Hydro Distribution

It is the opinion of ENWIN Utilities that the required load can be absorbed into the system.

III PRELIMINARY COST ESTIMATES

3.1 Sanitary Sewers

As noted in Section 2.2, the Tecumseh Road East sanitary sewer will service the Site. An available option is to extend the Catherine Street sanitary sewer westerly approximately 60m to the east limit of the Site.

Total estimated cost including engineering and contingencies: **\$ NIL**

3.2 Water Mains

As noted in Section 2.3, the Tecumseh Road East mains will more than adequately service the Site. The 300mm diameter Catherine Street main easterly extension is an available alternative.

Total estimated cost including engineering and contingencies: \$ NIL

3.3 Storm Drainage

As noted in Section 2.4, the Site can be developed conventionally relative to grading, stormwater storage, etc.

It will be necessary to supply and install the two OGS units and construct a pumping station in combination with a gravity discharge pipe to discharge the restricted flow of 20.0 cfs into the shallow Hawkins Drain and dry out the system after each storm event.

Total estimated cost including engineering and contingencies: \$ 250,000

The surface water treatment units are considered internal servicing whereas the pumping station and discharge pipe to the Hawkins Drain are deemed to be external servicing.

3.4 Road Access and Site Grading

Section 2.5 addresses the standard grading anticipated for the Site with little or no additional cost implications.

Tecumseh Road East is a 7 lane cross-section (3 EB, 3WB & 1 TWL) fronting the Site. No improvements are required.

Total estimated cost including engineering and contingencies: \$ NIL

3.5 Hydro Distribution

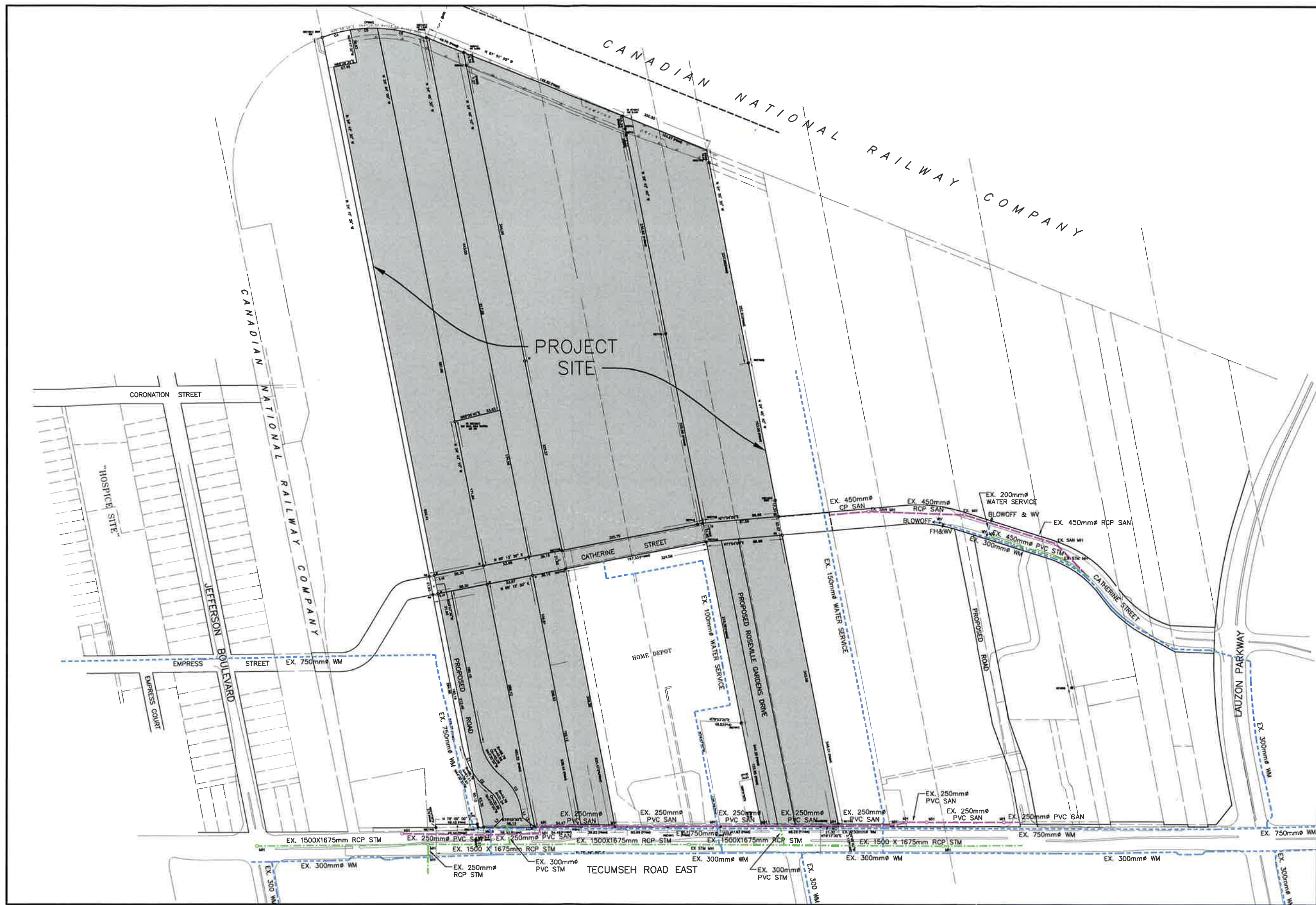
Total estimated cost including engineering and contingencies: \$ NIL

3.6 Summary of External Costs

It is therefore estimated that the cost for **External Services** for the development of the Site will be a total of: \$ 125,000

The estimated cost of **Internal Services** for the development of the Site will be: \$ 125,000

This does not include HST but does include an allowance of 25% for engineering and contingencies.




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NO.	REVISION	DATE	BY	APP.	NO.	REVISION	DATE	BY	APP.

DESIGN	R.C.S.
CHECKED	R.C.S.
DRAWN	D.S.
CHECKED	R.C.S.
DATE	MAY 2015
SCALE	NTS

GEM PROPERTIES SERVICING STUDY
EXISTING INFRASTRUCTURE

PROJECT NO. 15-452
 SHEET NO. FIG 1
 OF 2



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NO.	REVISION	DATE	BY	APP.	NO.	REVISION	DATE	BY	APP.

DESIGN	R.C.S.
CHECKED	R.C.S.
DRAWN	D.S.
CHECKED	R.C.S.
DATE	MAY 2013
SCALE	NTS

GEM PROPERTIES SERVICING STUDY

PROPOSED SERVICES

PROJECT NO. 15-452
SHEET NO. FIG 2
OF 2

APPENDIX 'A'

**Stormwater Management
Calculations**

**Preliminary SWM Calculations
GEM Properties**

**13 May 2015
File No. 15-452**

$$A = 74.86 \text{ acres}$$

$$C_{\text{ex}} = 0.20$$

Length of travel = 800m (N – S)

$$\text{Fall} = 181.1 - 180.1 = 1.0\text{m}$$

$$t_c = 40 \text{ mins (Fig 5)}$$

$$t_c = 125 \text{ mins (v=0.35 ft/s Fig. 15.2)}$$

$$t_c = 87 \text{ mins (v=0.50 ft/s Fig 15.2)}$$

$$\therefore \text{ Use } t_c = 60 \text{ mins} \Rightarrow i_{2\text{ year}} = 42.05 / (60+7)^{8192} = 1.34 \text{ in/hr.}$$

$$Q = 74.86 \times 0.20 \times 1.34$$

$$= 20.0 \text{ cfs (568 l/s)}$$

Qnew: AC = ?

$$\begin{aligned} C &= \frac{10 \text{ acres} \times 0.95 + 20 \text{ acres} \times 0.90 + 5 \text{ acres} \times 0.90 + 15 \text{ acres} \times 0.20}{50 \text{ acres}} \\ &= (9.5 + 18 + 4.5 + 3) / 50 \\ &= \underline{0.70} \end{aligned}$$

$$\therefore \text{ AC} = 74.86 \times 0.70 = 52.4 \text{ acres}$$

For 5 year event					
<i>t</i>	<i>i</i>	Qp	V(ft³)	V_{ret} (ft³)	V_{req'd} (ft³)
20	3.125	109.2	131,040	24,000	107,040
25	2.778	121.3	181,959	30,000	151,959
*30	2.50	131	235,800	36,000	199,800
35	2.273	119.1	250,121	42,000	208,121
40	2.08	109.0	261,581	48,000	213,581
45	1.92	100.6	271,642	54,000	217,642
50	1.785	93.5	280,602	60,000	220,602
55	1.667	87.35	288,255	66,000	222,255
60	1.563	81.9	294,844	72,000	222,844
65	1.47	77.0	300,409	78,000	222,409
70	1.389	72.8	305,691	84,000	221,691
75	1.315	68.9	310,077	90,000	220,077
80	1.25	65.5	314,400	96,000	218,400

∴ Peak Storage Required = 222,844 C.F.

Parking area only = 40% of 75 acres
= 30 acres
= 1,306,800 S.F.

∴ Avg depth of storage = 0.50
V avail = 1,306,800 x 0.50/3 = 217,800 C.F.

∴ OK since aisles and accesses of 10% or 6 acres not included along with storm sewers, catchbasins, etc.

For 100 year event					
<i>t</i>	<i>i</i>	Qp	V(ft³)	V_{rel} (ft³)	V_{req'd} (ft³)
20	4.3	75.1	90,128	24,000	66,128
25	3.68	80.3	120,520	30,000	90,520
30	3.24	84.9	152,798	36,000	116,798
35	2.9	88.6	186,151	42,000	144,151
40	2.64	92.2	221,338	48,000	173,338
45	2.43	95.5	257,847	54,000	203,847
50	2.25	98.3	294,900	60,000	234,900
55	2.11	101.4	334,456	66,000	268,456
* 60	1.98	103.7	373,507	72,000	301,507
65	1.87	98.0	382,153	78,000	304,153
70	1.78	93.3	391,742	84,000	307,742
75	1.70	89.1	400,860	90,000	310,860
80	1.64	85.9	412,493	96,000	316,493
85	1.58	82.8	422,239	102,000	320,239
90	1.52	79.6	430,099	108,000	322,099
95	1.46	76.5	436,073	114,000	322,073
100	1.40	73.4	440,160	120,000	320,160

∴ Required Total Storage = 322,099 C.F.

Less 6" Parking Lot Storage = 222,844 C.F.
99,255 C.F.

Additional depth of storage over entire parking lot for 1:100 year event

$$= \frac{99,255}{1,306,800} = 0.076' = 1 \text{ inch}$$