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FUNCTIONAL SERVICING BRIEF

DATE	May 20, 2020	PROJECT NO.	1877-5573
RE	420 Division Street, Cobourg Functional Servicing Brief In Support of Zoning By-Law Amendment Application		
TO	Rob Franklin, MCIP, RPP Manager of Planning 55 King Street West Cobourg, ON K9A 2M2		
FROM	Madeline Carter, P. Eng. Greg Burchell, EIT		
CC	Bryanne Robinson & Paul Tobia, Weston Consulting Justin Lebofsky, Canadian Centre for Addictions		

1.0 Introduction

Crozier Consulting Engineers (Crozier) was retained by the Canadian Centre for Addictions (the applicant) to prepare a Functional Servicing Brief in support of the Zoning By-Law Amendment application for the property located at 420 Division Street (the Site) in the Town of Cobourg, Northumberland County.

2.0 Site Background

The Site covers an area of approximately 0.59 ha and currently consists of the Woodlawn Inn with 18 guest rooms. The Site is located in a mixed residential and commercial neighbourhood and is bounded by existing residential and commercial developments to the north, John Street to the east, existing residential and commercial developments to the south and Division Street to the west. The Site is currently zoned as district commercial (DC-2) under the Town's Zoning By-Law (March 2004). The Town's Official Plan designates the Site as a "mixed use corridor" under the current Schedule "A" Land Use Plan (May 2018).

The proposed changes to the Site involve redeveloping the existing hotel into a residential treatment center, with accommodations to house 40 clients and 24/7 support staff. There are no material changes being proposed to the existing Site Plan, as the existing building will be retained. The extent, layout and design of existing municipal services for the Site were informed by the former Site Plan Application for the hotel (1987) which is appended to this memo.

As there are no material changes to the site plan and minimal changes proposed to the existing building layout as part of the Zoning By-law Amendment application, there will be no material changes to the grading and so the Site's stormwater management infrastructure has not been evaluated. From a stormwater management perspective, the Site will remain under existing conditions.

The material in this memo reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

3.0 Population Estimate

The Site was analyzed under existing and proposed conditions to understand the servicing requirements for the change of usage. Any change in servicing demand is used to determine the suitability of the existing infrastructure and the extent of any servicing upgrades that are required. The total population equivalents of the Site under existing and proposed conditions are discussed below and were used to inform the design water demand and sanitary flows.

3.1 Existing Conditions

Our discussions with the Planner, Weston Consulting, were used to estimate the total population of the Site under existing conditions. The total population is made up of the number of employees working at the existing hotel in a 24-hour period and the total number of residents. As mentioned above, the former Woodlawn Inn is a hotel with 18 rooms, which are split into rooms with one king size bed or two single size beds. The following assumptions were used to conservatively determine the total population:

- Two persons per King Bedroom
- Two persons per Single Bedroom
- Staff present on Site 24/7, with 3 shifts per day and 5 staff per shift, as per discussions Weston Consulting

The assumptions were made to estimate the total population of the hotel under maximum occupancy. The estimated population breakdown of the hotel is shown in Table 1 below.

Table 1: Estimated Existing Population

Category	Number of Rooms/Shifts	Persons per Room/Shift	Population
King Bedrooms	11	2	22
Single Bedrooms (2 single beds)	7	2	14
Employees	3 shifts	5 per shift	15
TOTAL	-	-	51

The estimated total population for the Site is 51 persons under existing conditions.

3.2 Proposed Conditions

The elements envisioned for the redevelopment include a treatment centre with 18 rooms and a total of 40 beds, with a maximum of 40 residents. Staffing for the proposed treatment centre will require 12 persons during the day, and 6 persons overnight for a total of 18 staff throughout the day. Therefore, the estimated total population for the proposed development under maximum occupancy is 58 persons.

4.0 Water Servicing

4.1 Design Water Demand

The design water demand for the Site was calculated under existing and proposed conditions to assess the net change in water demand as a result of the new usage. The design water demand was calculated assuming that, due to the residential nature of a hotel and the residential nature of the proposed treatment centre, residential water demands are the most representative water use designation. We reviewed the Design Guidelines for the Corporation of the Town of Cobourg (April 2015) and found that there are no average per capita demands, maximum day or peak hourly factors for residential usage with the Design Guidelines. Therefore, the design water demand was calculated using the Ministry of Environment (MOE) Design Guidelines for Drinking Water Systems (2008) as well as the population estimates described in Section 3.1 and 3.2.

The design water demand for the Site under existing and proposed conditions is displayed in Table 2 below.

Table 2: Design Water Demand

Design Scenario	Estimated Population (Persons)	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Peak Hourly Demand (L/s)
Existing Conditions	51	0.27	1.30	1.97
Proposed Conditions	58	0.30	1.48	2.24
Net Change	+7	+0.03	+0.18	+0.27

Note: An average per capita demand of 450 L/cap/day was used, along with a max day factor of 4.90 and peak day factor of 7.40 as per MOE Design Guidelines for Drinking Water Systems (2008).

The new usage results in an increase of the maximum daily and peak hourly water demand by 0.18 L/s and 0.27 L/s, respectively. The water service connection for the proposed redevelopment is required to convey the maximum daily demand of 1.48 L/s plus the required fire flow, or the peak hourly demand of 2.24 L/s per the Design Guidelines for the Corporation of the Town of Cobourg (April 2015).

The fire flow demand was not calculated as part of this Functional Servicing Brief, as the Site has an existing fire protection system and there are no changes proposed to the building structure that would materially alter the firefighting requirements. Further, it is anticipated that the proposed new usage of the Site will not affect the fire flow demand.

4.2 Existing Water Servicing

The development is serviced by an existing 50 mm diameter water service connected to the existing 300 mm watermain on John Street. A 20 mm water service formerly serviced the Site and was connected to the existing watermain on Division Street. We understand the 20 mm water service was decommissioned when the 50 mm water service was installed. An additional "underground water service" is shown on the former Site Plan Application for the development (1987) connecting to a watermain on University Avenue. The status of this service is unknown.

Based on the anticipated water demands discussed above, the existing 50 mm diameter water service should be sufficient to service the Site under the new usage.

5.0 Sanitary Servicing

5.1 Sanitary Design Flows

The sanitary design flow for the Site was calculated under both existing and proposed conditions to assess the net change in sanitary flows as a result of the new usage. The sanitary design flow was calculated assuming that, due to the residential nature of a hotel and the residential nature of the proposed treatment centre, residential sanitary flows are the most representative land use designation. The sanitary design flows were calculated using the Design Guidelines for the Corporation of the Town of Cobourg (April 2015), as well as the population estimates described in Section 3.1 and 3.2.

The sanitary design flow for the Site under existing and proposed conditions is displayed in Table 3, below.

Table 3: Sanitary Design Flow

Design Scenario	Estimated Population (Persons)	Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
Existing Conditions	51	0.21	3.80	0.82	0.15	0.97
Proposed Conditions	58	0.24	3.80	0.93	0.15	1.08
Net Change	+7	+0.03	-	+0.11	-	+0.11

Note: An average per capita flow of 364 L/cap/day was used, along with a maximum Harmon Peaking Factor of 3.8 and infiltration flow of 22 m³/ha/day as per Section D1.01 of the Design Guidelines for the Town of Cobourg (2015).

The total sanitary peak flow from the Site is increased by 0.11 L/s. The sanitary service connection for the proposed redevelopment shall be required to convey the peak flow of 1.08 L/s.

5.2 Existing Sanitary Servicing

The existing development is serviced by a 150 mm sanitary service connection, connecting to the existing 200 mm sanitary sewer on Division Street. The existing Site Plan (1987) does not show the slope of the sanitary service connection, however there is a fall of approximately 0.9 m over the 12.0 m service connection, based on the upstream and downstream inverts of the sanitary sewer system. It was assumed that, as per typical design standards, the sanitary service connection was installed with a minimum slope of 2%, corresponding to a capacity of 22 L/s based on the Manning's Equation.

The existing 150 mm diameter sanitary service connection will be flowing at 5% capacity when conveying the sanitary design flow of 1.08 L/s, therefore, the existing sanitary service has sufficient capacity to service the Site under the new usage.

6.0 Conclusions & Recommendations

Based on the information contained in this Brief, we offer the following conclusions:

Grading and Drainage

- As there are no material changes to the site plan and minimal changes proposed to the existing building layout as part of the Zoning By-law Amendment application, the Site's grading and stormwater management measures have not been evaluated.
- From a grading and stormwater management perspective, the Site will remain as existing conditions.

Water Servicing

- The proposed usage of the Site will result in an increase of the maximum daily and peak hourly water demand by 0.18 L/s and 0.27 L/s, respectively.
- The existing water service connection is required to convey the max daily flow plus the fire flow demand, or the peak hourly demand per Town of Cobourg Design Guidelines (2015).
- The Site has an existing fire protection system, and it is anticipated that the fire flow demand will not change as a result of the proposed usage.
- The existing 50 mm diameter water service is connected to the 300 mm diameter watermain on John Street and has sufficient capacity to service the proposed redevelopment.

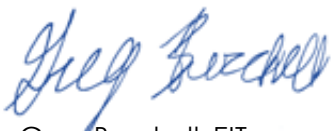
Sanitary Servicing

- The proposed usage of the Site will result in an increase of the sanitary design flow by 0.11 L/s. The existing sanitary service connection is required to convey the sanitary design flow of 1.08 L/s.
- The existing 150 mm diameter sanitary service is connected to the existing 200 mm diameter sanitary sewer on John Street and the sanitary service has sufficient capacity to service the proposed redevelopment.

Based on the above conclusions, we recommend the approval of the Zoning By-Law Amendment for the proposed development from a functional servicing perspective.

Sincerely,

CROZIER CONSULTING ENGINEERS



Greg Burchell, EIT
Land Development

CROZIER CONSULTING ENGINEERS



Madeline Carter, P. Eng.
Project Engineer

GB/ko

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Project: 420 Division Street,
Project No.: 1877-5573

Created By: GB
Checked By:

Date: 2020-04-30
Updated:

Domestic Water Demand Existing Conditions

Site Area: 0.59 ha
Population: 51

Notes & References

Maximum population under existing conditions

Design Parameters

Average Demand (L/capita/d)
450

Section 3.4 MOE Design Guidelines for Drinking Water Systems (2008)

Water Demand:

Average Daily Demand = 22,950 L/day
0.27 L/s

Peaking Factors

Max Day = 4.90
Peak Hour = 7.40

Table 3-3 of MOE Design Guidelines for Drinking Water Systems (2008)

Average Day = 0.27 L/s
Max Day = **1.30** L/s
Peak Hour = **1.97** L/s

Municipality	Average Daily Water Demand (L/s)	Max Day Demand (L/s)	Peak Hourly Demand (L/s)
Town of Cobourg	0.27	1.30	1.97

Max Day = Average Day Demand * Max Day
Peak Hour = Average Day Demand * Peak Hour



Project: 420 Division Street,
Project No.: 1877-5573

Created By: GB
Checked By:

Date: 2020-04-30
Updated:

Domestic Water Demand Proposed Conditions

Site Area: 0.59 ha
 Population: 58

Design Parameters

Average Demand (L/capita/d)
450

Water Demand:

Average Daily Demand = 26,100 L/day
0.30 L/s

Peaking Factors

Max Day = 4.90
 Peak Hour = 7.40

Average Day = 0.30 L/s
 Max Day = **1.48** L/s
 Peak Hour = **2.24** L/s

Notes & References

Maximum population under existing conditions

Section 3.4 MOE Design Guidelines for Drinking Water Systems (2008)

Table 3-3 of MOE Design Guidelines for Drinking Water Systems (2008)

Municipality	Average Daily Water Demand (L/s)	Max Day Demand (L/s)	Peak Hourly Demand (L/s)
Town of Cobourg	0.30	1.48	2.24

Max Day = Average Day Demand * Max Day
 Peak Hour = Average Day Demand * Peak Hour

Domestic Sanitary Design Flow Existing Conditions

Site Area: 0.59 ha
Population: 51

Design Parameters

Average Flow (L/capita/d)
364

Sanitary Design Flow:

Average Daily Flow = 364.0 L/capita/d
Average Daily Flow = **0.21** L/s

Harmon Peak Factor: M = 4.31
M Max = **3.80**

Peak Flow = **0.82** L/s

Infiltration Flow: Infiltration = 22.50 m³/ha/day
Total Infiltration = **0.15** L/s

Total Peak Flow = **0.97** L/s

Summary Table

Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
0.21	3.80	0.82	0.15	0.97

Notes & References

*Maximum population under existing conditions

Section D1.01 of Design Guidelines for the Town of Cobourg (2015)

Average Daily Flow = Average Daily Flow (m³/cap./day) * population / 86400

$M = 1 + 14 / (4 + (p/1000)^{.5})$

Section D1.01 of Design Guidelines for the Town of Cobourg (2015)

Peak Flow = Average Daily Flow * M

Section D1.01 of Design Guidelines for the Town of Cobourg (2015)

Total Peak Flow = Peak Flow + Total Infiltration

Domestic Sanitary Design Flow

Site Area: 0.59 ha
 Population: 58

Design Parameters

Average Flow (L/capita/d)
364

Sanitary Design Flow:

Average Daily Flow = 364.0 L/capita/d
 Average Daily Flow = **0.24** L/s

Harmon Peak Factor: M = 4.30
 M Max = **3.80**

Peak Flow = **0.93** L/s

Infiltration Flow: Infiltration = 22.50 m³/ha/day
 Total Infiltration = **0.15** L/s

Total Peak Flow = **1.08** L/s

Summary Table

Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
0.24	4.30	0.93	0.15	1.08

Notes & References

Maximum population under existing conditions

Section D1.01 of Design Guidelines for the Town of Cobourg (2015)

Average Daily Flow = Average Daily Flow (m³/cap./day) * population / 86400

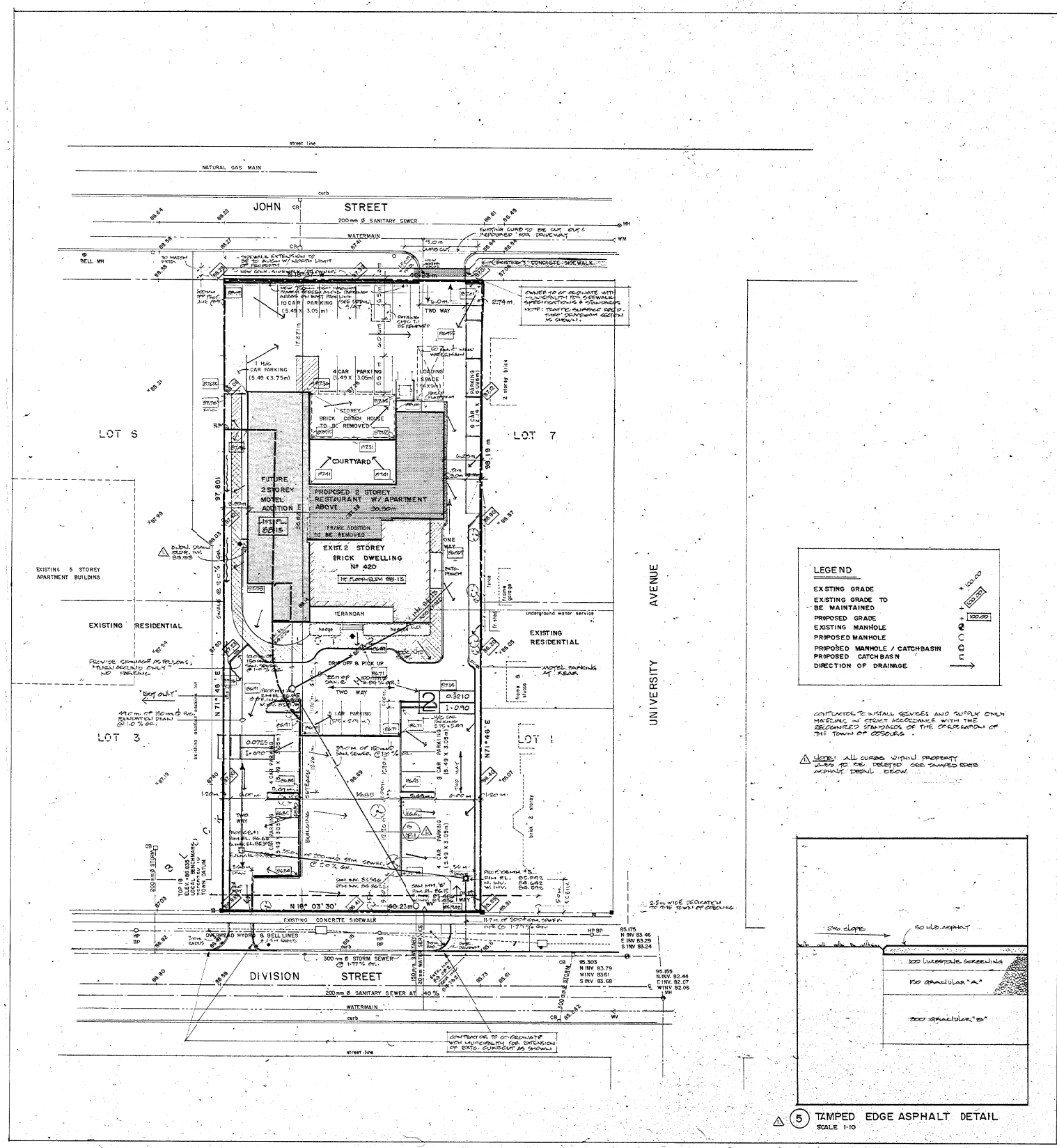
$M = 1 + 14 / (4 + (p/1000)^{.5})$

Section D1.01 of Design Guidelines for the Town of Cobourg (2015)

Peak Flow = Average Daily Flow * M

Section D1.01 of Design Guidelines for the Town of Cobourg (2015)

Total Peak Flow = Peak Flow + Total Infiltration



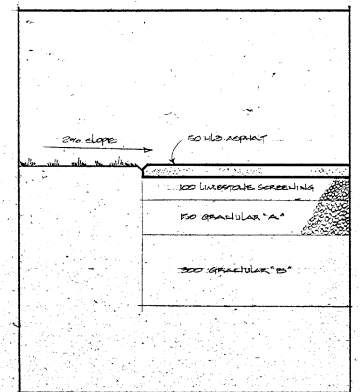
4 SITE PLAN
SCALE 1:250

LEGEND

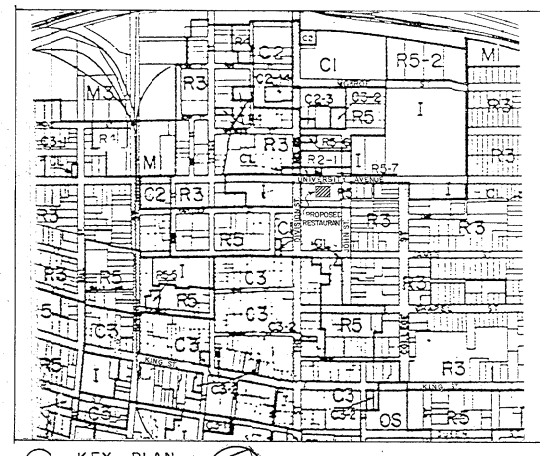
- EXISTING GRADE TO BE MAINTAINED
- PROPOSED GRADE
- EXISTING MANHOLE
- PROPOSED MANHOLE
- PROPOSED MANHOLE / CATCHBASIN
- PROPOSED CATCHBASIN
- DIRECTION OF DRAINAGE

CONTRACTOR TO INSTALL SERVICES AND SUPPLY ONLY MATERIALS IN STRICT ACCORDANCE WITH THE REGULATED STANDARDS OF THE CORPORATION OF THE TOWN OF COBOURG.

NOTE: ALL CURBS WITHIN PROPERTY MUST BE DELETED SEE SHARPER EDGE AGAINST DEPOT. EDCW.



5 TAMPED EDGE ASPHALT DETAIL
SCALE 1:10



SITE INFORMATION:

LOT AREA	3943m ²	100.0%
BUILDING AREA	708.98m ²	17.98%
LANDSCAPED AREA	1427.40m ²	36.20%
PAVED AREA	1806.61m ²	45.82%
PARKING REQ'D	33	
PARKING PROVIDED	42	
LOADING SPACES REQ'D	1	
LOADING SPACES PROVIDED	1	
ZONING	R2-1	
GROSS FLOOR AREA	1649m ²	
RESIDENTIAL	246 m ²	
NON COMMERCIAL	295 m ²	
COMMERCIAL	987 m ²	

PLAN OF SURVEY:
OF LOT 2, BLOCK H,
NORTH SIDE OF UNIVERSITY AV.
TOWN OF COBOURG
COUNTY OF NORTHUMBERLAND

TOPOGRAPHICAL INFORMATION & SURVEY PREPARED BY:
KEITH F. LASHLEY LTD. O.L.S.
P.O. BOX 26
COBOURG, ONT.

2 NOTES

1 967

205

3 LIST OF DRAWINGS

DATE	NO.	ISSUE
	1	ISSUE FOR CONSTRUCTION
	2	REVISIONS & AMENDMENTS
	3	SCALE OF ADJUSTMENT
	4	SCALE OF ADJUSTMENT
	5	SCALE OF ADJUSTMENT
	6	SCALE OF ADJUSTMENT
	7	SCALE OF ADJUSTMENT
	8	SCALE OF ADJUSTMENT
	9	SCALE OF ADJUSTMENT
	10	SCALE OF ADJUSTMENT

DATE	NO.	REVISION	BY

SCALES OF ADJUSTMENT VARIABLES REQUESTED:

- RELIEF FROM UNLAWFUL SPILLAGE SINGLE SIDE OF 10M TO ALLOW FOR 10M PLS SPACE
- RELIEF FROM UNLAWFUL SPILLAGE TO FRONT YARD OF 2.0M W/1.0M SETBACK TO ALLOW 1.0M SETBACK
- RELIEF FROM UNLAWFUL SIDE YARD SET BACK OF 6.0M TO 3.00M

DIMENSIONS MUST NOT BE SCALED
ALL MEASUREMENTS MUST BE CHECKED AND VERIFIED AND ALL ERRORS OR OMISSIONS SHALL BE REPORTED TO THE ARCHITECT
ALL PRINTS OF PLANS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECTS AND MUST BE RETURNED AT COMPLETION OF WORK
THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED BY THE ARCHITECT OF RECORD

DATED

R.W. BRUYNSON INC.
ARCHITECT & CONSULTING ENGINEER
71 SIMCOE ST. S. UNIT 101
OSHAWA, ONTARIO, L1H 4K6
(416) 411-1111

PROJECT: PROPOSED RESTAURANT & MOTEL ADDITION
FOR MR. & MRS. D. DELLACASA
420 DIVISION ST. COBOURG, ON

DRAWING: SITE PLAN, KEY PLAN & NOTES

DATE	SCALE	PROJECT NO.
JAN 2007	1:250	67032
DESIGNED BY: R.W.		
DRAWN BY: R.W.		
CHECKED BY: R.W.		