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ENGINEERS  
PLANNERS

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## **Site Servicing & Stormwater Management Report**

### **Building Expansion 64 Cleopatra Drive**

**City of Ottawa**

**Project No. 15031-1**

Prepared for:

**2336925 Ontario Inc.**  
64 Cleopatra Drive  
Ottawa, Ontario  
K2G 0B4

**June 26, 2015**

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- Storm Drainage Area Plan (Dwg. 15031-STM1)

## **1.0 INTRODUCTION**

The subject site is located on the west side of Cleopatra Drive (#64), at the west end of Caesar Avenue in the City of Ottawa. The site currently has an existing two (2) storey industrial/office building and an asphalt parking lot. The existing building is to remain and shall be expanded with a proposed one (1) storey addition of approximately 3,820sq.ft. The existing asphalt parking lot (i.e. along the east and south sides of the existing building) will be reconfigured; therefore, increasing the landscaped area which in return reduces the imperviousness of the site. The north side of the existing building (i.e. gravel parking lot / storage area), will be removed to accommodate the new building addition. The overall site has an area of 0.28ha, however only 0.066ha is being redeveloped.

The existing building is serviced from a 10 inch (250mm) diameter sanitary sewer along Cleopatra Drive. As for water, the site is currently serviced by an on-site well. Approximately half the site drains overland to the existing hydro easement along the west side of the site, where as the other half of the site drains overland easterly ultimately draining to catchbasins along Cleopatra Drive.

A site investigation was undertaken to verify the existing site conditions and to establish the impact the new building expansion would have on the site. The City of Ottawa was contacted to verify existing civil infrastructure services along Cleopatra Drive, and information on the servicing requirements for this project were provided back in 2011.

## **2.0 WATER SERVICE**

As mentioned above, the building is currently serviced by an on-site water well. The intent is to decommission the existing water well and connect to the existing 12 inch (300mm) diameter watermain along Cleopatra Drive. Using the MOE guideline of 35 cu.m/ha.d for light industrial use, the anticipated average daily demand for the site has been calculated at 9.8cu.m/day or 0.11L/s. Therefore, the anticipated peak hourly rate shall be in the magnitude of 0.45L/s, which is minimal. No fire sprinklers are anticipated at this time.

## **3.0 SANITARY SEWER SERVICE**

As mentioned above, the site is currently serviced from a 10 inch (250mm) diameter sanitary sewer along Cleopatra Drive. Under City of Ottawa policy, secondary sanitary service connections to a property are not generally permitted. The intent is to provide a new sanitary service up to the Mechanical room of the existing building (decommissioning and/or removing the old service), and branching off a secondary line (on-site) towards the new building addition. The secondary line to the new building addition is intended to service the floor drains only, therefore no additional flows are expected.



#### **4.0 DRAINAGE & STORM WATER SYSTEM**

The stormwater management facility for this development has been designed to attenuate the release of stormwater runoff from the redeveloped area of the site to a rate not greater than the 5 year pre-development runoff rate of 9.5 l/s, (see section 4.1).

Due to the existing topography, a small section of the proposed redeveloped area (drainage area A-3) will drain uncontrolled to the west side of the site. As well, a small section of the proposed redeveloped area (drainage area A-2) will drain uncontrolled to the east towards Cleopatra Drive. Therefore, over controlling drainage area A-1 (proposed building and grassed area to the north) will be required.

This has been achieved by installing an inlet control device (vertical hydrovex valve) in the ditch inlet catchbasin and by providing the appropriate ponding volume within the swale/ditch system, (refer to the Removals, Site Servicing and Grading Plan (15031-GR1) contained in Appendix A).

#### **4.1 5 YEAR PRE-DEVELOPMENT FLOW**

$$Q = R \times A \times I \times N$$

Redeveloped Site Area	A =	0.066 hectares
Runoff Coefficient	R =	0.50 (gravel)
Time of Concentration	Tc =	10 min
Rainfall Intensity (5yr)	I =	104.19 mm/hr
5 year Pre-Dev. Flow:	Q =	0.50 x 0.066 x 104.19 x 2.778
	Q =	9.5 l/s

#### **4.2 100 YEAR POST-DEVELOPMENT FLOW (AREA A1)**

$$Q = R \times A \times I \times N$$

Redeveloped Site Area	A =	0.053 hectares
Runoff Coefficient	R =	$\frac{(0.014 \times 0.20) + (0.039 \times 0.90)}{0.053}$
	R =	0.72
Time of Concentration	Tc =	10 min
Rainfall Intensity (100yr)	I =	178.56 mm/hr
100 year Post-Dev. Flow:	Q =	0.72 x 0.053 x 178.56 x 2.778
	Q =	18.9 l/s

**4.3 100 YEAR POST-DEVELOPMENT FLOW (AREA A2)**

$Q = R \times A \times I \times N$

Redeveloped Site Area	A =	0.005 hectares
Runoff Coefficient	R =	$\frac{(0.003 \times 0.20) + (0.002 \times 0.90)}{0.005}$
	R =	0.43
Time of Concentration	Tc =	10 min
Rainfall Intensity (100yr)	I =	178.56 mm/hr
100 year Post-Dev. Flow:	Q =	$0.43 \times 0.005 \times 178.56 \times 2.778$
	Q =	1.1 l/s

**4.4 100 YEAR POST-DEVELOPMENT FLOW (AREA A3)**

$Q = R \times A \times I \times N$

Redeveloped Site Area	A =	0.008 hectares
Runoff Coefficient	R =	0.90 (asphalt)
Time of Concentration	Tc =	10 min
Rainfall Intensity (100yr)	I =	178.56 mm/hr
100 year Post-Dev. Flow:	Q =	$0.90 \times 0.008 \times 178.56 \times 2.778$
	Q =	3.6 l/s

**4.5 STORAGE REQUIREMENTS**

As noted previously, the site has been designed to limit the rate of runoff (for the redeveloped portion of the site) to the 5 year pre-development release rate of 9.5 l/s for rainfall events up to and including the 100 year post-development event.

Over controlling Area A1 to 4.8 l/s [9.5 l/s (pre-dev.) – 1.1 l/s (Area A2) – 3.6 (area A3)] ensures the 5 year pre-development release rate of 9.5 l/s is achieved.

Storage volume requirements were determined by applying the 5-year and 100-year rainfall intensity values at 10-minute intervals until a peak storage volume was attained.

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Release	Net Runoff To Be Stored (L/s)	Storage Req'd m <sup>3</sup>
5 Year	10	104.19	11.00	4.8	6.2	3.7
	20	70.25	7.42	4.8	2.6	3.1
	30	53.93	5.69	4.8	0.9	1.6
	40	44.18	4.67	4.8	-0.1	-0.3
	50	37.65	3.98	4.8	-0.8	-2.5
100 Year	10	178.56	18.85	4.8	14.0	8.4
	20	119.95	12.66	4.8	7.9	<b>9.4</b>
	30	91.87	9.70	4.8	4.9	8.8
	40	75.15	7.93	4.8	3.1	7.5
	50	63.95	6.75	4.8	1.9	5.8



**SITE SERVICING & STORMWATER MANAGEMENT REPORT**  
**BUILDING EXPANSION – 64 CLEOPATRA DRIVE**

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Therefore, the resulting 100-year release rate from the redeveloped portion of the site is less/equal to the allowable release rate of 9.5 l/s by providing 9.4 cu.m of storage within the swale/ditch system on the north side of the proposed building expansion.

**5.0 CONCLUSION**

1. The intent is to decommission the existing water well and connect to the existing 300mm diameter watermain along Cleopatra Drive. The anticipated peak hourly rate has been calculated at 0.45L/s.
2. No increase in sanitary flows is anticipated.
3. The redeveloped portion of the site has been designed to limit the rate of runoff to the 5 year pre-development release rate for rainfall events up to and including the 100 year post-development event.

We trust that this report meets all of your requirements.

Should you have any questions or require further clarification, please do not hesitate to contact our office.

Sincerely,

Prepared by:

**Ainley Graham and Associates Ltd.**



Professional Engineers  
Ontario

**Limited Licensee**

Name: G. STE-CROIX

Number: 100136659

Category: CIVIL: Sewers/Water Mains

Limitations:

This licence is subject to the limitations as detailed on the certificate.

Association of Professional Engineers of Ontario

June 26, 2015

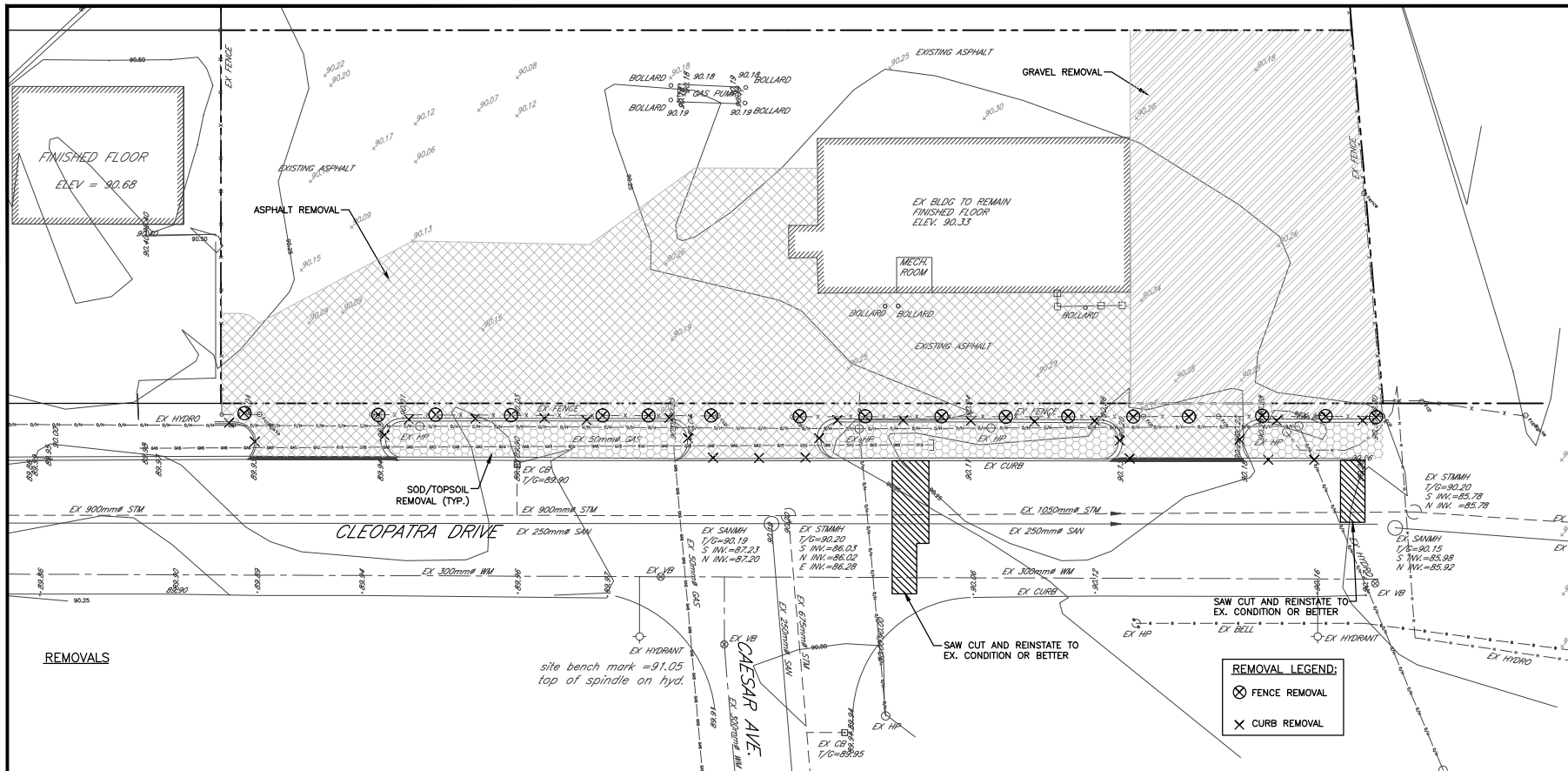
Guy Ste-Croix, LEL, C.E.T., PMP  
Branch Manager

***SITE SERVICING & STORMWATER MANAGEMENT REPORT***  
***BUILDING EXPANSION – 64 CLEOPATRA DRIVE***

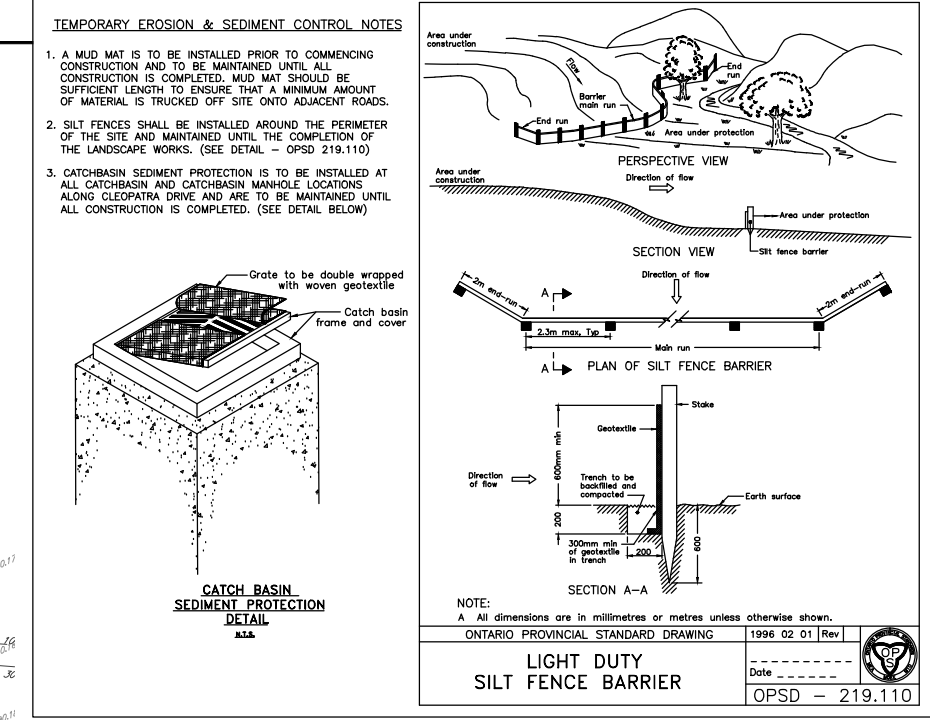
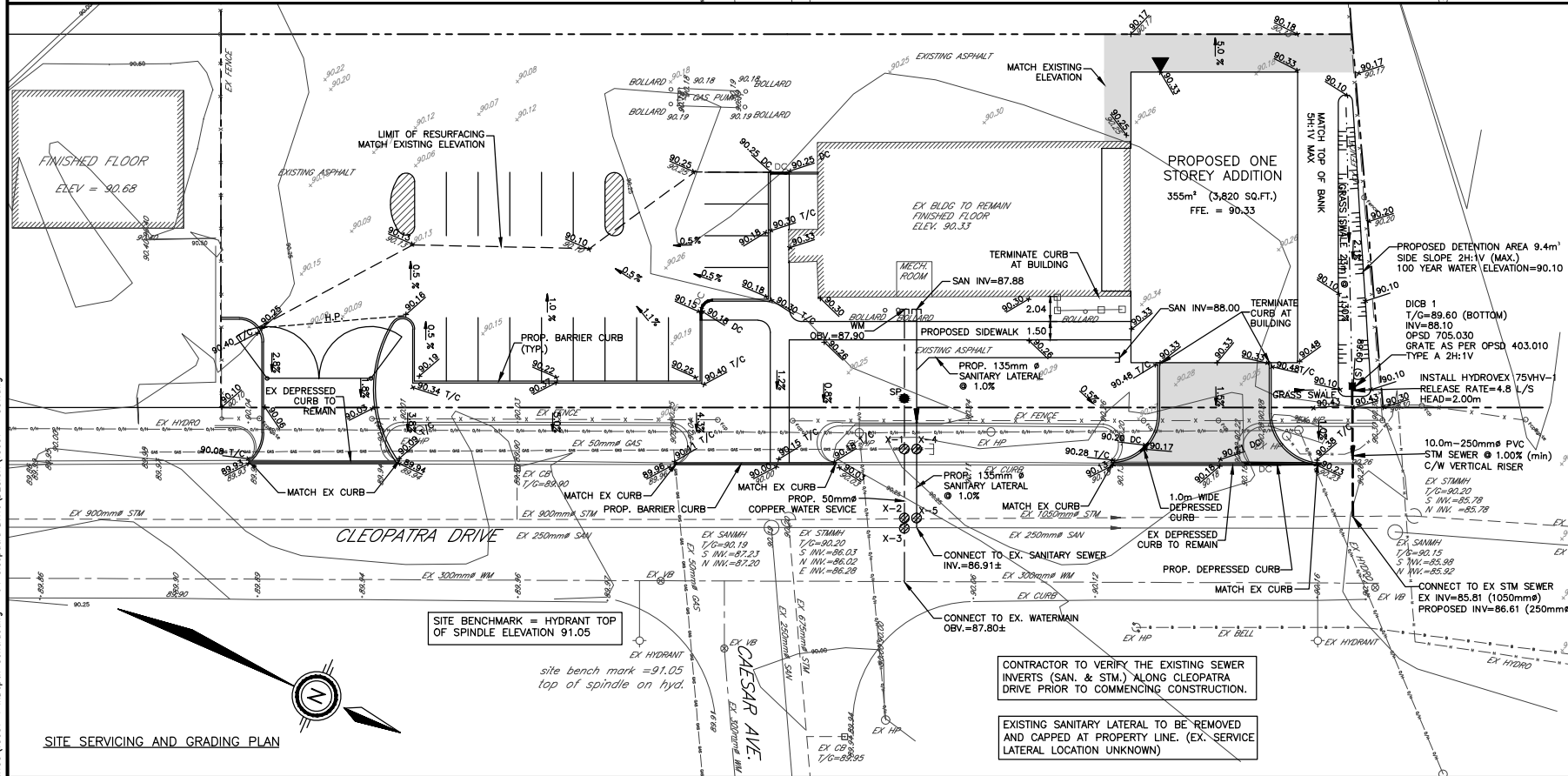
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**APPENDIX A**

- Removals, Site Servicing and Grading Plan (Dwg. 15031-GR1)
- Storm Drainage Area Plan (Dwg. 15031-STM1)



- NOTES: GENERAL**
- CONTRACTOR TO VERIFY ALL BUILDING AND SITE LAYOUT DIMENSIONS WITH THE ARCHITECT'S LATEST DRAWINGS PRIOR TO COMMENCEMENT OF CONSTRUCTION LAYOUT. ALL CONSTRUCTION LAYOUT SHALL BE CONFIRMED BY THE ARCHITECT PRIOR TO CONSTRUCTION.
  - ALL ELEVATIONS ARE SHOWN AS METRIC AND GEODETIC.
  - CONSTRUCTION LAYOUT SHALL BE DONE BY THE CONTRACTOR.
  - CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ANY EXISTING SERVICES AND FACILITIES THAT MAY BE DAMAGED DURING CONSTRUCTION. CONTRACTOR TO LOCATE ALL EXISTING UNDERGROUND SERVICES PRIOR TO ANY EXCAVATION.
  - CONTRACTOR IS RESPONSIBLE FOR THE REPAIR AND/OR REPLACEMENT OF ANY DAMAGED UNDERGROUND UTILITIES, SEWERS OR SERVICES AT NO ADDITIONAL COST TO THE OWNER. ALL FEES, INSPECTION, PERMITS AND COORDINATION WILL BE AT THE CONTRACTOR'S EXPENSE.
  - CONTRACTOR TO VERIFY ALL SURFACE AND SUBSURFACE CONDITIONS PRIOR TO CONSTRUCTION BY REVIEWING THE GEOTECHNICAL REPORT. IF A GEOTECHNICAL REPORT IS NOT AVAILABLE, THE CONTRACTOR IS RESPONSIBLE TO MAKE THEIR OWN INDEPENDENT ASSESSMENT OF THE SUBSURFACE CONDITIONS BY WHATEVER MEANS POSSIBLE. AT NO ADDITIONAL COST TO THE OWNER, THE CONTRACTOR SHALL NOT MAKE ANY CLAIMS FOR ADDITIONAL COMPENSATION AS A RESULT OF UNSUITABLE CONDITIONS.
  - CONTRACTOR TO COORDINATE ALL PERMITS, FEES, INSPECTIONS AND APPROVALS AS REQUIRED BY THE CITY, AT NO ADDITIONAL COST TO THE OWNER.
  - CONTRACTOR IS RESPONSIBLE FOR ALL DEWATERING, SUPPORT AND PROTECTION OF EXCAVATIONS. DISCHARGE OF WATER SHALL BE IN AN APPROVED MANNER AND CONSISTENT WITH THE MINISTRY OF THE ENVIRONMENT AND THE CITY OF OTTAWA.
  - ANY AND ALL CHANGES MUST BE APPROVED IN WRITING FROM THE ENGINEER PRIOR TO IMPLEMENTATION.
  - ALL UNSUITABLE OR EXCESS MATERIAL SHALL BE REMOVED, HAILED AND DUMPED AT A LOCATION APPROVED BY THE OWNER. THIS WORK WILL BE COMPLETED AT NO ADDITIONAL COST TO THE CONTRACTOR.
  - ALL DISTURBED AREAS SHALL BE REINSTATED TO EQUAL OR BETTER CONDITION TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA.
  - ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL FINAL VIDEO INSPECTION OF THE SEWERS HAVE BEEN COMPLETED AND APPROVED BY THE ENGINEER AND/OR CITY.
  - ALL UNSUITABLE MATERIAL SHALL BE EXCAVATED AND BACKFILLED WITH GRANULAR 'B'. COMPACTION TO CONFORM WITH CITY STANDARDS.
  - CITY OF OTTAWA STANDARD CONSTRUCTION & MATERIAL SPECIFICATIONS, THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS) AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), ALONG WITH THESE DRAWINGS SHALL FORM PART OF THE CONTRACT DOCUMENTS AND SHALL APPLY TO ALL CONSTRUCTION ACTIVITIES.
  - THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND CONSTRUCTION OF ALL SEDIMENT AND EROSION CONTROL MEASURES TO ENSURE THAT SEDIMENT DOES NOT MIGRATE FROM THE CONSTRUCTION SITE. SEDIMENTS SHALL BE CONTAINED AND DISPOSED OF IN A MANNER CONSISTENT WITH THE CITY OF OTTAWA SPECIFICATIONS.
- NOTES: SERVICE LATERALS**
- THE FOUNDATION DRAIN OF THE PROPOSED ONE STOREY ADDITION IS TO BE CONNECTED TO THE EXISTING BUILDING FOUNDATION DRAIN (IF APPLICABLE).
  - DIRECT ROOF LEADER CONNECTIONS TO THE STORM SEWER SYSTEM WILL NOT BE PERMITTED. ROOF LEADERS SHALL DISCHARGE TO THE SURFACE.
  - CONNECTION OF FOUNDATION DRAINS TO THE SANITARY SEWER IS NOT PERMITTED.
  - SANITARY SEWER LATERALS SHALL BE CONSTRUCTED AT A GRADIENT OF AT LEAST 1%.
  - SANITARY SEWER LATERALS SHALL BE SDR-28 PIPE.
  - THE MINIMUM DIAMETER FOR SANITARY SEWER LATERALS IS 135mm.
  - SANITARY SEWER LATERALS SHALL HAVE A MINIMUM OF 2.0m COVER. THERMAL INSULATION IS TO BE INSTALLED WHERE REQUIRED.
  - SANITARY SEWER LATERALS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS S11 AND S11.1.
  - WATER SERVICE TO BE 50mm COPPER, INSTALLED PER CITY OF OTTAWA STANDARD W33.
  - WATER SERVICE POST ASSEMBLY TO BE IN ACCORDANCE WITH STANDARD W35.
  - WATER SERVICE TO BE INSTALLED WITH A MINIMUM COVER OF 2.4m. THERMAL INSULATION IS TO BE INSTALLED WHERE REQUIRED.
  - WATER SERVICE INSTALLATION AT SEWER CROSSINGS PER STD. W38.
  - WATER SERVICE BEDDING SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17.
  - INSTALLATION OF WATER METER AND REMOTE RECEPTACLE SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS. (BY OTHERS).
  - CATHODIC PROTECTION IS REQUIRED FOR ALL IRON FITTINGS IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS.
  - CONNECTION TO EXISTING WATERMAIN ALONG CLEOPATRA DRIVE SHALL BE COMPLETED BY CITY FORCES. EXCAVATION, BACKFILL AND REINSTATEMENT SHALL BE COMPLETED BY THE CONTRACTOR.



**NOTES:**

**CONTRACT DRAWINGS:**  
Contractor must verify all dimensions and be responsible for same. Any discrepancies must be reported to the Engineer before commencing work. Drawings are not to be scaled. Drawings may not be used for any purpose other than that stipulated in the contract agreement between the owner/client and the Engineer without the express written consent of Ainley Graham & Associates Limited. Use of these drawings by any party for any other purpose is subject to the following condition.

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1	ISSUED FOR SITE PLAN APPROVAL	JUNE 26/15	GSC
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NO. \_\_\_\_\_ REVISIONS \_\_\_\_\_ DATE \_\_\_\_\_ INITIAL \_\_\_\_\_

Not Valid Unless Signed And Dated

Professional Engineers  
Ontario  
JUNE 26, 2015

**Limited Licensee**  
Name: G. STE-CROIX  
Number: 100136659  
Category: CIVIL Sewers/Water Mains  
Limitations: This license is subject to the limitations as detailed on the certificate.  
Association of Professional Engineers of Ontario

SCALE: 1 : 250

DESIGN: JX

DRAWN: MH

CHECKED: GS

DATE: JUNE 2015

**CITY OF OTTAWA**

64 CLEOPATRA DRIVE

REMOVALS, SITE SERVICING AND GRADING PLAN

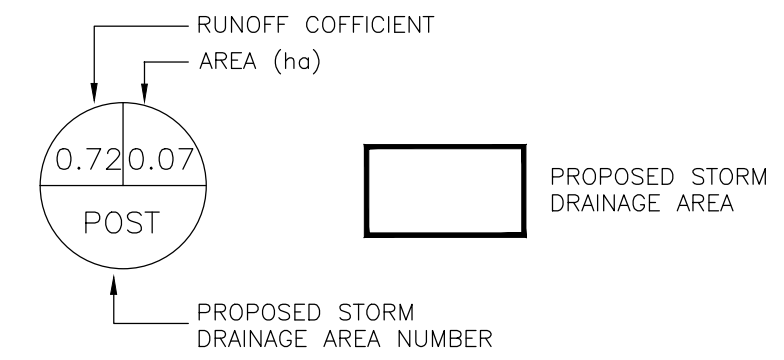
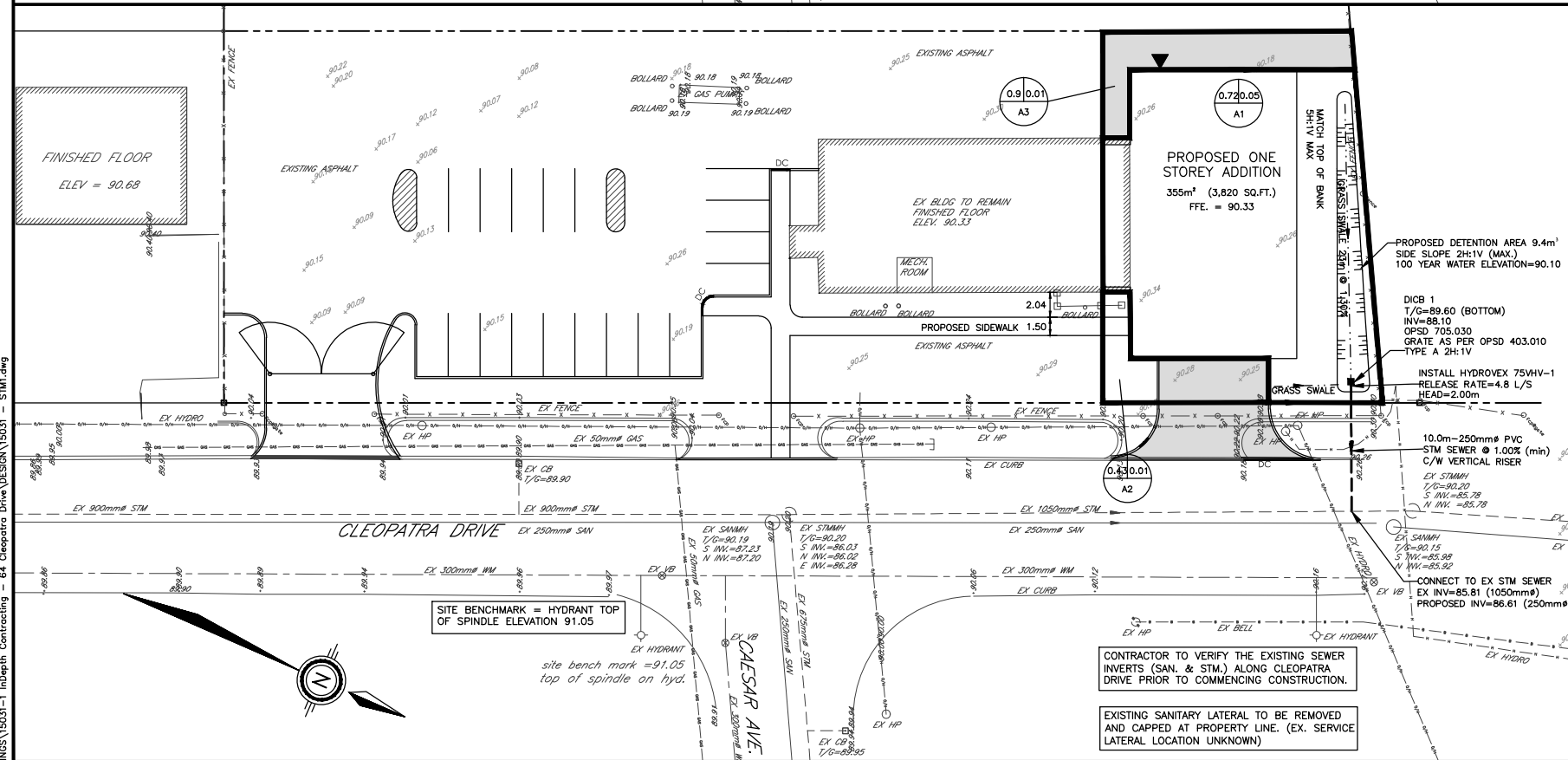
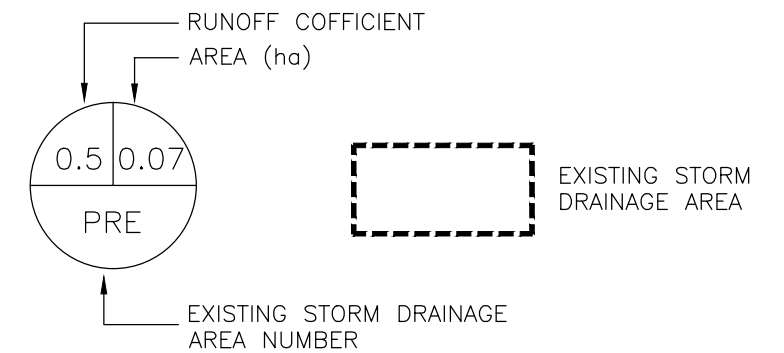
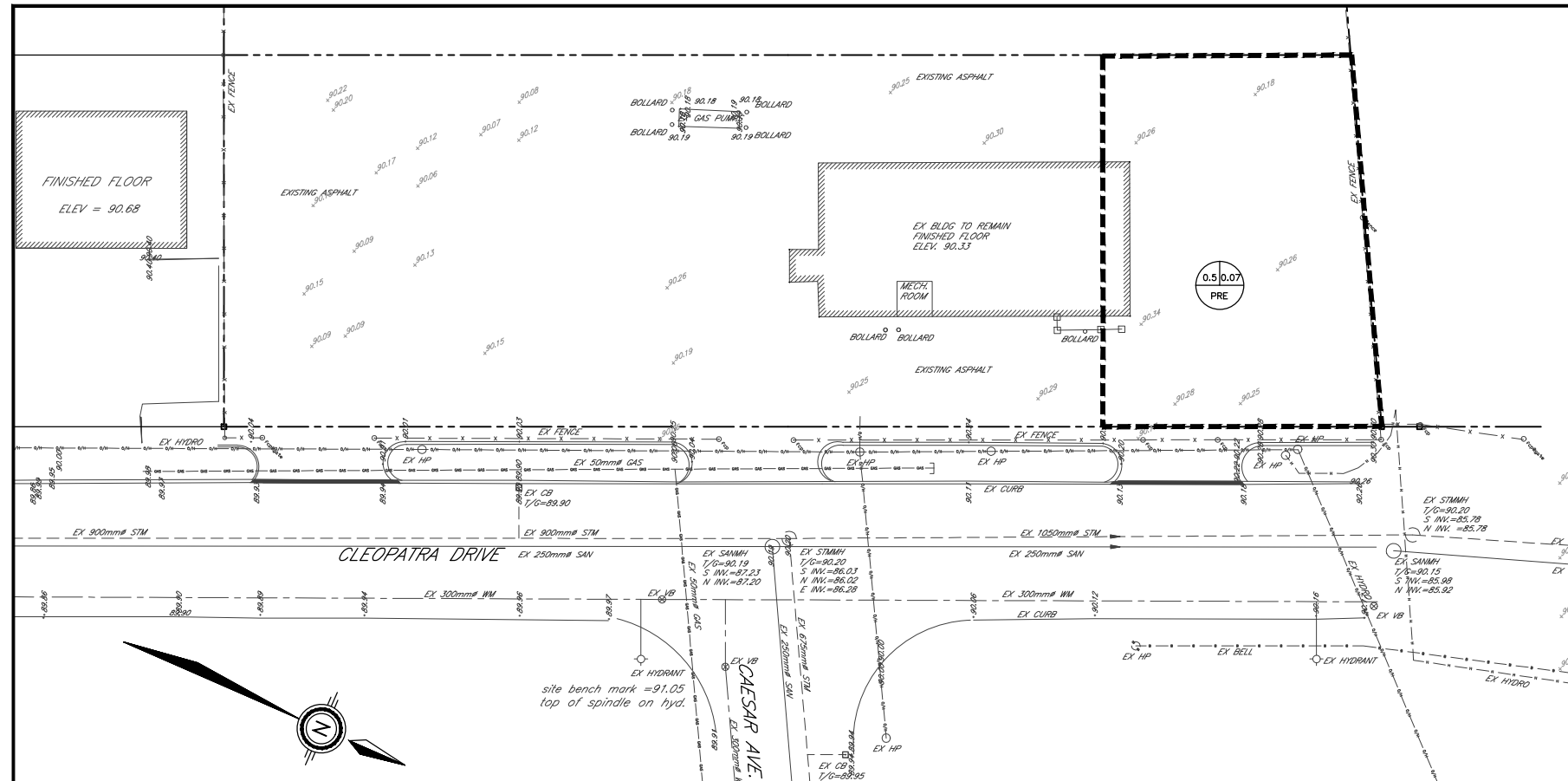
CONTRACT No. 15031

15031-GR1

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<p>NO.</p> <p>REVISIONS</p> <p>DATE</p> <p>INITIAL</p>											

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