

ISSUED FOR TENDER

APRIL 27, 2018



National Research
Council Canada

Conseil National de
Recherche Canada

NATIONAL RESEARCH COUNCIL CANADA (NRC)

SANITARY AND STORM SEWER SEPARATION (PHASE 3)
1200 MONTREAL ROAD CAMPUS, OTTAWA, ONTARIO

National Research Council Canada
Administrative Services and Property Management Branch

Conseil national de recherches Canada
Division des services administratifs et gestion de l'immobilier

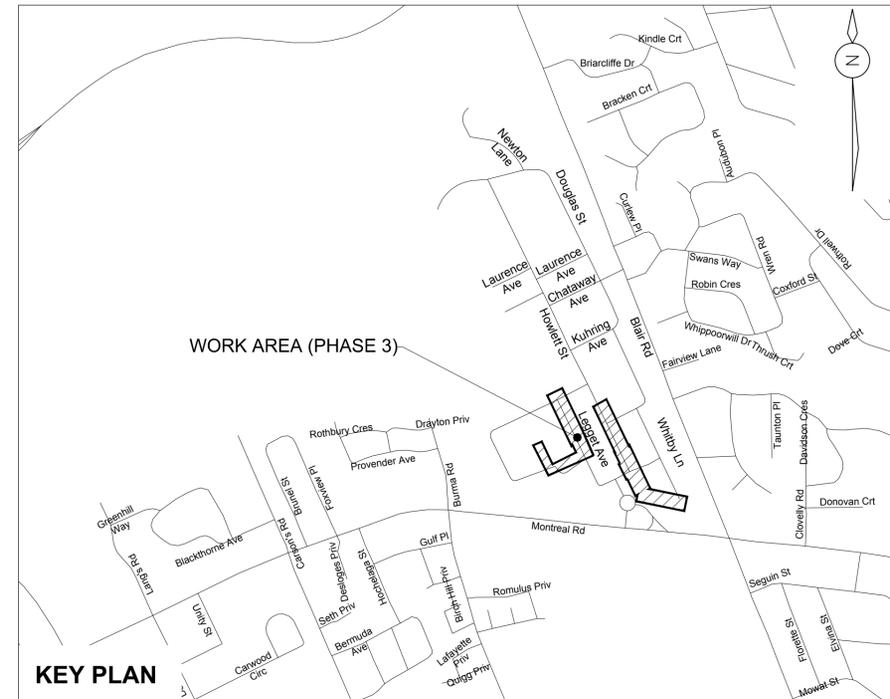
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- Verify all dimensions and site conditions and be responsible for same
- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité

A	A Detail no. No. du détail	A
C	B Location drawing no. sur dessin no.	B C
	C Drawing no. dessin no.	

project SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
OTTAWA, ONTARIO

drawing PHASE 3 - COVERSHEET

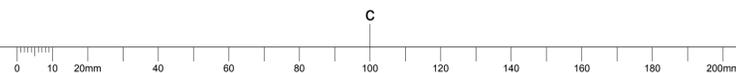
designed J.SAUVÉ congu date JANUARY 2017 date

drawn J.SAUVÉ dessiné scale NTS échelle

checked H.BISSON vérifié sheet 1 of/de 1 feuille

approved H.BISSON approuvé W.O.no. - D.T.no.

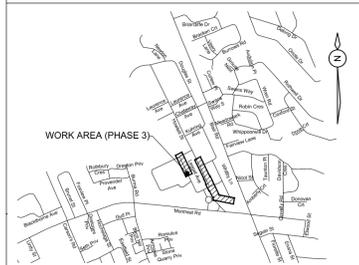
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GENERAL NOTES

- CONTRACTORS TO CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO DEMOLITION OR CONSTRUCTION AND REPORT ANY ERRORS OR OMISSIONS TO DEPARTMENTAL REPRESENTATIVE.
- CONTRACTORS MUST VISIT THE SITE & FULLY FAMILIARIZE THEMSELVES WITH THE SCOPE OF THE WORK.
- PREVENT THE SPREAD OF DUST & DEBRIS BEYOND THE WORK AREA AND CLEAN ALL SURFACES AT COMPLETION.
- MAKE GOOD ALL SURFACES AFFECTED BY THIS WORK.
- COORDINATE ALL SHUTDOWNS WITH THE DEPARTMENTAL REPRESENTATIVE.
- PROVIDE ALL LABOUR AND MATERIAL REQUIRED TO FORM A COMPLETE FUNCTIONAL SYSTEM AS DESCRIBED ON DRAWINGS.

KEY PLAN



No.	Date	Revision	By:	For:
3	2018-04-27	ISSUED FOR TENDER		HB
2	2017-11-14	ISSUED FOR TENDER		-
1	2017-01-23	PRELIMINARY 60%		-

Date Printed: _____ Date imprimée: _____

- Verify all dimensions and site conditions and be responsible for same
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project: **SANITARY AND STORM SEWER SEPARATION** projet

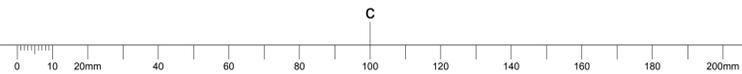
1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: **PHASE 3 - LEGEND** dessin

designed J.SAUVÉ	conçu	date JANUARY 2017	date
drawn J.SAUVÉ	dessiné	scale NTS	échelle
checked H.BISSON	vérifié	sheet 1 of/de 1	feuille
approved H.BISSON	approuvé	W.O.no. -	D.T.no. -
dwg.no. 5097-C301-1		dessin no.	



EXISTING	PROPOSED		EXISTING	PROPOSED	
WM	WM	WATERMAIN	(Symbol)	(Symbol)	WOOD AREA
SAN	SAN	SANITARY SEWER	(Symbol)	(Symbol)	TREE
STM	STM	STORM SEWER	(Symbol)	(Symbol)	CATCHBASIN
COMB	COMB	COMBINED SEWER	(Symbol)	(Symbol)	MANHOLE/CATCHBASIN
IOS	IOS	INTERCEPTOR OUTFALL SEWER	(Symbol)	(Symbol)	MANHOLE
G	G	GAS LINE (APPROX. LOC.)	(Symbol)	(Symbol)	FIRE HYDRANT
T	T	UNDERGROUND TELEPHONE (APPROX. LOC.)	(Symbol)	(Symbol)	VALVE
C	C	UNDERGROUND COMMUNICATION (APPROX. LOC.)	(Symbol)	(Symbol)	REDUCER
L	L	UNDERGROUND LIGHTNING (APPROX. LOC.)	(Symbol)	(Symbol)	TEE
CTR	CTR	UNDERGROUND COOLING TOWER RETURN (APPROX. LOC.)	(Symbol)	(Symbol)	VALVE CHAMBER
CTS	CTS	UNDERGROUND COOLING TOWER SUPPLY (APPROX. LOC.)	(Symbol)	(Symbol)	NATURAL GAS VALVE
HPC	HPC	UNDERGROUND STEAM CONDENSATE (APPROX. LOC.)	(Symbol)	(Symbol)	SIGN
F	F	UNDERGROUND PROPANE GAS (APPROX. LOC.)	(Symbol)	(Symbol)	STOP SIGN
CWR	CWR	UNDERGROUND CHILLED WATER RETURN (APPROX. LOC.)	(Symbol)	(Symbol)	ELECTRICITY POLE
CWS	CWS	UNDERGROUND CHILLED WATER SUPPLY (APPROX. LOC.)	(Symbol)	(Symbol)	TELEPHONE POLE
A	A	UNDERGROUND COMPRESSED AIR (APPROX. LOC.)	(Symbol)	(Symbol)	STREET LIGHT POLE
X	X	OVERHEAD WIRES	(Symbol)	(Symbol)	ELECTRICITY MANHOLE
		FENCE	(Symbol)	(Symbol)	TELEPHONE MANHOLE
		TOP OF SLOPE	(Symbol)	(Symbol)	
		DITCH	(Symbol)	(Symbol)	
		BOTTOM OF SLOPE	(Symbol)	(Symbol)	
		REMOVAL	(Symbol)	(Symbol)	



C

1.0 GENERAL - SITE WORKS

1.1 The Contractor must conform to all laws, codes, ordinances, and regulations adopted by federal, provincial or municipal government councils and government agencies, applying to work to be carried out.

1.2 Unless otherwise indicated, all materials and construction methods to be in accordance with the City of Ottawa municipal standard specifications and drawings, the requirements of the latest edition of the Ontario Provincial Standard Specifications and Drawings (OPSS and OPSD), the Ontario Ministry of Environment and Climate Change, the Ontario Ministry of Natural Resources, applicable Conservation Authorities, and all other governing authorities as they apply.

1.3 Wherever standards, laws and/or regulations are mentioned they refer to their current versions, modifications included.

1.4 The boreholes and test pits shown on the plan are for information purposes only. Their location on the plan is approximate. The Contractor shall refer to the boreholes and test pit records to obtain information about observed stratigraphy on site.

1.5 The Contractor is responsible for obtaining all permits required to complete all works and bear cost of same, including but not limited to Road Cut permit, Sewer Use permit and Permit to Take Water (as required).

1.6 If groundwater is encountered during construction, dewatering of excavations could be required as per OPSS 518. It is assumed that groundwater may be controlled by sump and pumping methods. As required under the "Ontario Water Resources Act (OWRA)", the Contractor must register all water taking activities on Ontario's "Environmental Activity and Sector Registry (EASR)" if water taking exceeds 50,000 l/day, and obtain a "Permit to Take Water (PTTW)" if water taking exceeds 400,000 l/day.

A City of Ottawa Sewer Use permit is required in order to discharge the construction water to the sanitary sewer. Groundwater pumped from the site during infrastructure work will need to be evaluated in accordance with City of Ottawa By-Law 2003-514 (Schedule A: Table 1 Limits for Sanitary and Combined Sewers Discharge; and Table 2 - Limits for Storm Sewer Discharge). The petroleum hydrocarbon (PHC) concentration at borehole BH16-105E was found to exceed the acceptable discharge limit of 500 ug/L. The applicability of this limit for this project must be confirmed by the City.

Suitable detention and filtration will be required before discharging the water to any sewers. The Contractor must prepare and submit an excavation and groundwater management plan to the Departmental Representative for review and approval.

1.7 The Contractor must maintain benchmarks and landmark references as is. Otherwise these references will be repositioned by a certified land surveyor at the Contractor's expense.

1.8 The Contractor is the only person in charge of safety on the site. The Contractor is responsible for providing adequate protection of the workers, other personnel and the general public, protection of materials, as well as maintaining in good condition the completed works and works to be completed.

The Contractor must supply, install and maintain an appropriate safety fence along the work perimeter until the work is complete.

1.9 The Contractor is responsible for the coordination of his activities with others on-site. The Contractor must inform Departmental Representative of upcoming work at least one week in advance.

1.10 Site preparation includes clearing, grubbing, stripping of topsoil, demolition, removal of unsuitable materials, cut, fill and rough grading of all areas to receive finished surfaces.

1.11 Grading work shall be completed in accordance with OPSS 206.

1.12 The location of existing underground municipal services and public utilities as shown on the plans are approximate. The Contractor must determine the exact location, size, material and elevation of all existing utilities (on-site and off-site) prior to any excavation work. Damage to any existing services and/or existing utilities during construction, whether or not shown on the drawings must be repaired by the Contractor at his own expense. The Contractor must comply to OPSS 504.

1.13 Temporary excavations in the overburden must be completed as per the requirements of the Occupational Health and Safety Act (OHS), O. Reg. 213/91. The fill soils and native overburden soils can be classified as Type 3 soil and accordingly side slopes must extend 1 horizontal and 1 vertical from the base of the excavation. If excavations extend below the water table then side slopes of 3 horizontal to 1 vertical, or gentler, may be required to maintain stability of the side slopes.

Where these slopes are not practical due to obstacles or space restrictions, a tightly fitting braced steel trench box must be implemented according to the OHS, O. Reg. 213/91.

1.14 The Contractor must pace deliveries and removals in order to minimize and control stockpiles.

1.15 Stockpile material must be stored away from excavations at a distance at least equal to the depth of the excavation. Construction traffic should be limited near open excavation.

1.16 All material shall be compacted as per the requirements of the governing authority and approved by the Departmental Representative prior to delivery to the site.

1.17 Compaction shall conform to OPSS 501 and the following requirements:

- **Exposed subgrade:**
95% Standard Proctor maximum dry density (SPMDD)
- **Granular foundations:**
98% Standard Proctor maximum dry density (SPMDD)
- **Asphalt pavement:**
As per OPSS 310
- **Subgrade fill:** (granular material meeting OPSS Granular B Type II):
95% Standard Proctor Maximum Dry Density (SPMDD)
- **Structural fill:** (light standard footprints - granular material meeting OPSS Granular A or Granular B Type II): 98% Standard Proctor Maximum Dry Density (SPMDD)

1.18 Cleanliness on the site:

- The Contractor shall clean roadways at his own cost as directed by the Departmental Representative;
- All site roads and walkways to and from the construction zone must be kept clean at all times, from mud, dirt, granular material, debris, etc.;
- The Contractor must leave work area clean at end of each day;
- Materials and equipment must be laid out in an organized and safe manner;
- All material, equipment and temporary structures which are no longer necessary for the execution of the Contract must be removed from the site;
- If required the Contractor must use screens, bulkheads, or any other recognized means in order to reduce noise, dust, interference, obstruction, etc., in conformity with the requirements of the provincial and municipal authorities having jurisdiction.

1.19 During the construction period the Contractor is responsible for installing and maintaining temporary traffic signage, including traffic signs, traffic markings and temporary traffic lights, and flagmen, as required by the Departmental Representative, the Municipality and other governing authorities. Provide safe access and egress from all buildings and parking areas at

all times. Provide temporary traffic control Plan to Departmental Representative (as required).

1.20 The Contractor must control surface runoff from precipitation during construction.

1.21 Protection of existing trees and shrubs:

- The Contractor must ensure that the existing trees and shrubs that are to remain on site are protected throughout the construction phase in order to minimize the risk of damaging the trunks and branches and to avoid the compaction of the roots;
- As required, the Contractor must coordinate his work with other professionals to ensure that the existing tree and shrub protection measures are in place prior to any other work and that these measures are maintained until the work is complete;
- The Contractor must protect the existing trees in accordance with OPSS 801 and OPSD 220.010;
- The Contractor must ensure that the protective fencing covers a minimum radius of 2.5 meters around the tree trunk;
- The Contractor must define paths for heavy machinery before construction to avoid compaction of the roots of existing trees and shrubs;
- The Contractor cannot store material at the base of trees and shrubs;
- The Contractor cannot backfill the trunk of existing trees and shrubs;
- The Contractor must aerate the soils around the trees to be preserved that are within 2.0 m.

1.22 The Contractor must comply with the Migratory Birds Convention Act, 1994 and prevent any harming or killing of migratory birds and prevent the destruction or disturbance of their nests or eggs.

Tree cutting should be performed outside of the core Migratory Birds nesting period specified by Environment and Climate Change Canada, April 15 to August 31. Should it be required, tree cutting during this period can only be performed after a qualified contractor has confirmed to the Departmental Representative the absence of any migratory bird nests. In the case where a nest would be found present, it must be protected by the contractor until the birds leave the nest.

Trees with DBH less than 300 mm that must be removed must be transplanted.

Trees with DBH greater than or equal to 300 mm that must be removed must be cut down, removed, de-stumped and replaced with new trees at a 2:1 ratio.

New trees and transplanted trees must be planted in the area south of Building M21, parallel to the roadway, away from existing underground utilities and services.

New trees must be "fast growing", have a minimum DBH of 100 mm, and be of the following type: Silver Fir, Blue Spruce, Crab Apple, Hackberry, Common Horse Chestnut, Autumn Blaze Maple, Red Maple, Sargur Maple or Japanese Lilac.

1.23 The Contractor must ensure the following mitigation measures are implemented in order to reduce the risk of ground contamination from petroleum products:

- The list of persons and agencies to contact in the event of an emergency must be posted in plain sight on the work site for the duration of the construction period;
- Machinery must be clean and kept clean to limit any grease or oil deposits inside the work area;
- Frequent inspections must be performed to detect any oil, fuel, grease or other leaks. If a leak is detected, the necessary corrective action must be taken immediately;
- An emergency kit for the recovery of petroleum products must be kept on site at all times. The kit must include at least 30 m of absorbent booms, a box of absorbent pads and solid absorbent material (powder or granules). The kit must be stored near the location of work and machinery, and kept within easy reach at all times to ensure a rapid response;
- In the event of a spill the Contractor must immediately report to the Spills Action Centre of the Ministry of Environment and Climate Change at 1-800-268-6060. Hydrocarbons and contaminated soils will be recovered by a specialized firm.

1.24 The Contractor must ensure the following measures are implemented regarding the handling of concrete:

- Concrete should either be mixed away from the site or should be prepared on paved surfaces if only small quantities are required (i.e. minor repairs);
- Excess concrete must be disposed off-site at a location that meets all regulatory requirements;
- The washing of concrete trucks and other equipment used for mixing concrete should not be carried out within 30 m of a watercourse or wetland and should take place outside of the work site;
- All concrete trucks should collect their wash water and recycle it back into their trucks for disposal off-site at a location meeting all regulatory requirements.

2.0 SEDIMENT AND EROSION CONTROL

2.1 Sediment and erosion control measures to be constructed as per OPSS 805.

2.2 The Contractor must implement best management practices and provide adequate sediment and erosion control measures during construction in order to:

- a) Prevent soil erosion which can result from stormwater runoff or wind erosion during construction;
- b) Prevent sediment deposits in the sewer and/or collecting streams and;
- c) Prevent air pollution from dust and particulate matter.

2.3 Provisions must be made for sediment and erosion control measures prior to stripping the site of vegetation and other deleterious materials. Measures such as phase stripping, vegetation buffer zones, silt fences, straw bales, sediment traps/basins, rock checks, etc. must be constructed and maintained in order to control sediment, as required by the provincial and municipal governing authorities.

2.4 The Contractor must set up the measures, inspect them frequently and clean and repair or replace the deteriorated structures.

2.5 When the sediment and erosion control measures must be removed in order to complete a portion of the work, these same measures must be reinstated.

2.6 When storing soil on site in piles the Contractor must cover each pile with tarps, straw or a geotextile fabric to avoid fine particle transport by wind and/or streaming rain water.

2.7 During the construction period, sediment capture silt sacks or filter cloths must be installed and maintained between the frame and cover of all catch basins and catch basin/manholes to minimize sediments entering the sewer system. All landscaping areas must be completed prior to the removal of the silt sacks or filter cloths.

2.8 At all times the Contractor must maintain the access roads clean and free of sediments. When cleaning the access roads, the Contractor must take the necessary precautions to clear the

surfaces covered with sediment prior to cleaning with water.

2.9 For dust control, Contractor to apply calcium chloride (Type I - OPSS 2501 and CAN/CGSB-15-1) and water with equipment approved by the Departmental Representative at rate in accordance with OPSS 506 when directed by Departmental Representative.

2.10 At the end of the construction period, the Contractor is responsible for removal of the temporary sediment and erosion control measures and reconditioning the affected areas.

3.0 DEMOLITION AND REMOVALS

3.1 Removals shall be completed in accordance with OPSS 510 and as follows.

3.2 The Contractor must visit the premises in order to be fully aware of existing conditions on site, including all elements to be removed and demolished. No claim will be accepted due to a poor evaluation of the work to be completed.

3.3 The Contractor must protect and maintain in service the existing works which must remain in place. If they are damaged, the Contractor must immediately make the replacements and necessary repairs to the satisfaction of the Departmental Representative at the Contractor's expense.

3.4 The Contractor must carry out necessary saw cuts.

3.5 The Contractor must entirely remove the demolition wreckage from the construction site in accordance with the requirements of the Ministry of Environment and Climate Change (MOECC).

- The Contractor must discard recyclable demolition materials in collaboration with a regional recycling company. The Contractor must provide proof to the Departmental Representative that the materials were properly recycled and that the chosen recycling company is recognized in the recycling field.
- All other demolition materials must be disposed off-site at authorized licensed landfills and in conformity with the applicable laws and regulations. The Contractor must be able to provide, upon request, copies of the disposal tickets to the Departmental Representative.
- The Contractor is to assume that all existing pipes having a 300mm diameter, or less, contain asbestos and that, if removed, these pipes are to be properly disposed off-site as per OPSS 510.

3.6 The Contractor is responsible for locating existing public utilities and (if required) submit a request for the interruption of public utility services, such as gas, telephone, power, cable, sewers, watermain, etc. to the appropriate governing authorities.

3.7 Sewer / watermain pipes to be abandoned must be cut, filled with unshrinkable backfill conforming to OPSS 1359, and capped all in accordance with OPSS 510.

3.8 The Contractor must complete all removals as shown on the drawings and as required to make the work complete. No claim will be accepted for removal not shown on drawings.

3.9 All materials, products and others coming from the demolition belong to the Contractor, unless specified otherwise.

3.10 All hard surfaces, soft surfaces and any other finished areas located outside as well as within the construction work limit must be reinstated as they were before beginning of work.

3.11 The Contractor must note the presence of sewer holding tanks/septic tanks within the work area. The existing sewer holding/septic tanks are made of concrete. Refer to Appendix D of the Specifications Document for additional information regarding existing sewer holding/septic tanks (shape, size, etc.).

-Decommission and full removal:
For those existing tanks not connected to the building foundations, the tanks must be decommissioned and fully removed by a licensed specialized Contractor as per provincial and municipal regulations and requirements, and are to be disposed of at a licensed landfill.

-Decommission and partial removal:
For those existing tanks connected to the building foundations, the tanks must be decommissioned and partially removed by a licensed specialized Contractor as per provincial and municipal regulations and requirements to allow for the construction of the service trenches. Service trenches shall be installed as specified through the existing tank and any additional fill (subgrade, surround, backfill) shall consist of OPSS Granular B Type I. Departmental Representative (experienced Geotechnical Engineer) shall be notified prior to holding tank removal such that the required removals and proposed trenching technique may be assessed and approved.

3.12 Working on live active sewer and connections: service to buildings must be maintained at all time.

3.13 Where an existing holding tank must be removed or partially removed, the Contractor must connect the new sewer connection to the building plumbing system.

4.0 GENERAL SUBGRADE PREPARATION

4.1 Earth removal shall be inspected by the Departmental Representative (experienced geotechnical engineer) to ensure that all unsuitable materials are removed prior to the placement of fill, including concrete and/or others, and to confirm the compaction degree and condition of the founding soils. All unsuitable materials must be hauled off site and disposed as per provincial and municipal regulations.

4.2 Subgrade must be approved by the Departmental Representative (experienced geotechnical engineer) before proceeding with placement of fill.

4.3 All soft, wet or disturbed areas revealed under surface compaction must be removed to a minimum depth of 500 mm and replaced with compacted suitable subgrade fill as directed by the Departmental Representative (experienced geotechnical engineer) and/or an approved non-woven Class I geotextile, as per OPSS 1860. Transition around sub-excavation, where backfill and native material are not of similar nature, shall be sloped at 3 horizontal to 1 vertical, within 1.8 m of finished surface. The frost taper and subexcavation requirements must be assessed at the time of construction by the Departmental Representative (experienced Geotechnical Engineer).

4.4 All granular subgrade or structural fill must be placed in maximum 200 mm thick loose lifts and compacted using suitable methods as per the requirements.

4.5 All heavy equipment shall not operate directly on the subgrade. A minimum of 600 mm of Granular B Type II or well shattered and graded blast rock shall be used to allow traffic over subgrade. A woven geotextile separator meeting OPSS 1860 Class II is required over the subgrade. Subgrade surfaces will be prone to disturbance by weather and traffic, therefore preparation of the subgrade shall be scheduled such that the granular materials are placed as quickly as possible.

4.6 The Contractor is responsible for constructing all temporary access roads, as required to complete the work. The Contractor must also maintain all temporary access roads in good and tidy condition at all times to the satisfaction of the Departmental Representative.

4.7 The Contractor is responsible for snow removal and spreading of abrasive throughout construction work area during the winter period.

4.8 The petroleum hydrocarbon (PHC) contaminated soil around borehole BH16-105E and any additional contaminated soils can be excavated and remediated (biopile, land farming, etc.) at a suitable location on the property upon approval by the Departmental Representative. Otherwise contaminated soils shall be transported offsite for disposal as waste in accordance with Ontario Regulation 347.

Prior to the start of work the Contractor must provide the name and location of landfill(s) where the contaminated materials will be disposed to the Departmental Representative. The Contractor must obtain from the landfill Owner documents confirming that he has the right to accept the contaminated material. During the work, the Contractor must provide the Departmental Representative a copy of all check-in receipts issued by the landfill Owner.

4.9 The Contractor is responsible to provide a confirmation that the imported material used as fill is free of any contaminants such as Petroleum Hydrocarbons (C10-C50), PAH (Polycyclic Aromatic Hydrocarbons), MAH (Monocyclic Aromatic Hydrocarbons) and metals like mercury, silver, arsenic, cadmium, cobalt, chromium, copper, tin, manganese, molybdenum, nickel, lead and zinc.

5.0 ROCK EXCAVATION

5.1 Bedrock excavation is anticipated along the proposed service trenches and shall be completed in accordance with OPSS 403 and all laws, codes, ordinances and regulations adopted by federal, provincial and municipal government councils and government agencies, applying to the work to be carried out.

5.2 Bedrock removal must be carried out using hoe ramming techniques in conjunction with line drilling on close centres. Provided that good bedrock excavation techniques are used, the bedrock may be excavated using near vertical side walls. Any loose rock must be scaled from the sides of the excavation.

Monitoring of the hoe ramming must be carried out to measure the vibrations at the nearest structure or service in order to ensure that they are below the acceptable threshold values shown in the following table:

Frequency of Vibration (Hz)	Vibration Limits (mm/s)
< 10	5
10 to 40	5 to 50 (interpolated)
> 40	50

These criteria, although conservative, were established to prevent damage to existing buildings and services in good condition more stringent criteria may be required to prevent damage to freshly placed (uncured) concrete or vibration sensitive equipment or utilities. Monitoring of the hoe ramming must be carried out to ensure that it meets the limiting vibration criteria. The Contractor must perform pre-construction condition surveys of nearby structures and existing buried services and provide copy of survey results to the Departmental Representative.

5.3 Bedrock excavation material may be reused as backfill material provided the size of particle is less than 300 mm along the longest face.

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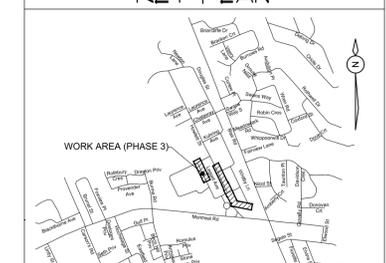
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CIMA A000646
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- GENERAL NOTES**
- CONTRACTORS TO CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO DEMOLITION OR CONSTRUCTION AND REPORT ANY ERRORS OR OMISSIONS TO DEPARTMENTAL REPRESENTATIVE.
 - CONTRACTORS MUST VISIT THE SITE & FULLY FAMILIARIZE THEMSELVES WITH THE SCOPE OF THE WORK.
 - PREVENT THE SPREAD OF DUST & DEBRIS BEYOND THE WORK AREA AND CLEAN ALL SURFACES AT COMPLETION.
 - MAKE GOOD ALL SURFACES AFFECTED BY THIS WORK.
 - COORDINATE ALL SHUTDOWNS WITH THE DEPARTMENTAL REPRESENTATIVE.
 - PROVIDE ALL LABOUR AND MATERIAL REQUIRED TO FORM A COMPLETE FUNCTIONAL SYSTEM AS DESCRIBED ON DRAWINGS.

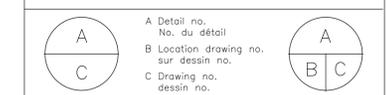
KEY PLAN



No.	Date	Revision	By:
4	2018-04-27	ISSUED FOR TENDER	HB
3	2017-11-14	ISSUED FOR TENDER	-
2	2017-09-18	ISSUED FOR FINAL DESIGN (100%)	-
1	2017-01-23	PRELIMINARY 60%	-

Date Printed: _____ Date imprimée: _____

o Verify all dimensions and site conditions and be responsible for same
o Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité



project: _____ projet: _____

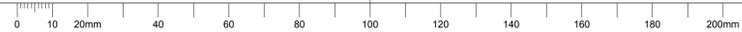
SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
OTTAWA, ONTARIO

drawing: _____ dessin: _____

PHASE 3 - NOTES

designed	conçu	date	date
J.SAUVÉ	J.SAUVÉ	JANUARY 2017	JANUARY 2017
drawn	dessiné	scale	échelle
J.SAUVÉ	J.SAUVÉ	NTS	NTS
checked	vérifié	sheet	feuille
H.BISSON	H.BISSON	1 of/de 2	1 of/de 2
approved	approuvé	W.O.no.	D.T.no.
H.BISSON	H.BISSON	-	-
dwg. no.	dessin no.		
5097-C302-1	5097-C302-1		



6.0 PAVEMENT STRUCTURES, CURBS, AND SIDEWALKS

- 6.1 Construction of granular foundations must conform to OPSS 314. Imported granular materials must be placed in maximum 200 mm thick loose lifts and compacted to at least 98% standard proctor maximum dry density (SPMDD).
- 6.2 Granular materials used on site must conform to the requirements of OPSS 1101.
- 6.3 Construction of asphalt must conform to OPSS 310.
- 6.4 Asphalt concrete material shall conform to OPSS 1151 for Superpave and Stone Mastic Asphalt Mixtures. Minimum Performance Graded (PG) 58-34 asphalt cement must be used for this project conforming to OPSS 1101.
- 6.5 Asphalt mix design shall be reviewed and approved by Departmental Representative prior to start of paving.
- 6.6 Asphalt pavement to be constructed per Detail 202 (Heavy Duty for roads) and Detail 203 (Light Duty for parking areas).
- 6.7 Where new pavement will abut the existing pavement along the service trench reinstatement areas and where full roadway reconstruction will terminate at an existing roadway the following is required in order to improve the joint between new and existing pavement:
 - Neatly saw cut the existing asphaltic concrete;
 - Remove the existing asphalt and slope the excavation within the existing granular base and subbase at 1 horizontal to 1 vertical (or flatter) per Detail 206;
 - To avoid cracking of the asphaltic concrete due to an abrupt change in the thickness of the roadway granular materials where new pavement areas join with existing pavements, the granular depths must taper up or down at 5 horizontal to 1 vertical to match the existing pavement structure per Detail 205;
 - Remove (mill) 50 mm of the existing concrete to a distance of at least 300 mm at the joint and tack coat the asphaltic concrete at the joint in accordance with OPSS 310, per Detail 206.

6.8 Concrete curbs

- a) Concrete curbs must conform to OPSS 353.
 - b) Concrete curbs to be constructed per OPSS 600.110.
 - c) Elevation at top of concrete curbs to be 150 mm above the asphalt, unless otherwise indicated on the drawings.
- 6.9 Sidewalks**
- a) Concrete sidewalks must conform to OPSS 351 and have a 2.4m width. Concrete sidewalk to be constructed as per City of Ottawa Detail SC4. Granular base shall consist of 150 mm of OPSS Granular A material.
 - b) Asphalt sidewalks must conform to OPSS 311 and have a 2.4m width. Asphalt sidewalk to be constructed as per City of Ottawa Detail SC20.

7.0 MISCELLANEOUS

- 7.1 Chain-link fences and gates must conform to OPSS 772 and OPSS 1541.
- 7.2 All chain-link fences and swing gates to match existing and to be constructed per OPSS 972.102, OPSS 972.130, and 972.132.
- 7.3 Pavement marking reinstatement to match existing (except otherwise shown on drawings) and must be in accordance with OPSS 710.
- 7.4 All disturbed areas must be reinstated to proposed conditions, as shown on engineering drawings. Otherwise, where not specified, disturbed areas must be reinstated to original conditions.
- 7.5 Where required, the Contractor must adjust existing structures (valves, hydrants, manholes, catch basins, etc.) to match proposed grade elevations.
- 7.6 Contractor must ensure safety of pedestrians, cyclist and vehicular traffic at all times. Contractor must prepare a Traffic Management Plan showing protective fencing, barricades, detour roads and signage to the satisfaction of the Departmental Representative.
- 7.7 Contractor must ensure day time access to loading docks and garbage enclosures remain active. The Contractor must prepare and submit a work plan to the satisfaction of the departmental representative.
- 7.8 All construction signage must be approved by Departmental Representative.
- 7.9 The Contractor is responsible for the design and construction of all concrete base required for the reinstatement of existing signage. The Contractor must prepare shop drawings, stamped and signed by a professional Engineer licensed in the province of Ontario, to the satisfaction of the Departmental Representative

8.0 GENERAL - SERVICES

- 8.1 The Contractor is responsible for arranging all connections to the existing sewers per municipal requirements. Prior to connection, the Contractor must provide, to the Departmental Representative, all test results performed on the internal services. Test results must include C.C.T.V. inspection of sewers, infiltration/exfiltration tests for sewers and manholes, deformation tests of sewers.
- 8.2 The Contractor shall determine the exact invert (geodetic elevation), diameter and construction material of the existing conduits at the proposed connections. He shall also carry out, if necessary, exploratory excavations in order to determine the exact location and inverts of existing underground infrastructure. This information shall immediately be provided to the Departmental Representative prior to undertaking any municipal services work and a 48 hour period must be allocated to the Departmental Representative for design review.
- 8.3 The Contractor is responsible for all excavation, backfill and reinstatement of all areas disturbed during construction to existing conditions or better and all associated works to the satisfaction of the Departmental Representative.
 - Asphalt reinstatement must be in accordance with OPSS 310.
 - Landscape areas to be reinstated with 150 mm of topsoil and sod in accordance with OPSS 802 and OPSS 803.
- 8.4 The Contractor is responsible for the removal and reinstatement and/or temporary support of existing underground infrastructure (tunnels, utility duct bank, utility conduits, sewers, watermains, etc.). The Contractor must prepare a Removal Plan to the satisfaction of the Departmental Representative. Temporary support for existing utility crossings shall be in accordance with Detail 337.

- 8.5 The Contractor must complete compaction as per OPSS 501 and note the following requirements for service trenching:

MATERIALS	COMPACTION
Pipe subbedding, bedding	95% Standard Proctor Maximum Dry Density
Trench backfill and pipe cover	95% Standard Proctor Maximum Dry Density
- 8.6 Length of new connections shown on drawings are measured horizontally. Exact length varies depending on depth of sewer.
- 8.7 Where the invert elevations of new and existing sewer connections are missing, the Contractor must assume the depth of the connections to be as deep as the existing combined sewer in proximity.

9.0 EXCAVATION, TRENCHING, BACKFILLING AND COMPACTING

- 9.1 Trenching, backfilling and compacting for sewers must conform to OPSS 401.
- 9.2 In areas where unsuitable materials exist below pipe subgrade level, or where the subgrade becomes disturbed, the unsuitable/disturbed material must be removed and replaced with a subbedding layer of compacted granular material meeting OPSS Granular B Type II. To provide adequate support for the pipe in the long term where subexcavation of material is required below design subgrade level, the excavations must be sized to allow a 2 horizontal to 1 vertical spread of granular material down and out from the bottom of the pipe.
 - This same method must be adhered to where light standard removal and reinstatement is required.
- 9.3 The subbedding, bedding and cover materials must be compacted in maximum 200 mm thick loose lifts to at least 95% of the Standard Proctor Maximum Dry Density (SPMDD).
- 9.4 The use of clear crushed stone as bedding or subbedding material is not permitted.
- 9.5 Trench backfill shall be compacted in maximum 300 mm thick loose lifts and compacted to at least 95% Standard Proctor Maximum Dry Density (SPMDD).
- 9.6 Below paved areas, backfill for service trenches must consist of frost compatible borrow fill (i.e. on site borrow) between the roadway subgrade level and the depth of seasonal frost penetration (i.e. 1.8 meters below finished grade). The backfill materials within this zone must match the materials exposed on the trench walls.
- 9.7 Backfill below the zone of seasonal frost penetration must consist of either acceptable native material, on site fill, or imported granular material conforming to OPSS Granular B Type 1.
- 9.8 Stones greater than 300 mm in their longest dimension and other deleterious materials must be removed prior to the re-use of materials.
- 9.9 Within landscaping areas, backfill for service trenches may consist of excavated material replaced and compacted in lifts.
 - Allow the overburden materials to dry prior to compaction;
 - Reuse any wet materials in the lower part of the trench and make provisions to defer final paving of surface course for 3 months to allow the trench backfill settlement to occur and thereby improve the final roadway appearance;
 - Avoid reusing any wet materials within the trench. Where additional material is required for trench backfill, use of relatively dry on-site material or imported fill, such as OPSS Select Subgrade Material or Granular B Type I materials, below the zone of frost penetration shall be used.
 - Method must be approved by the Departmental Representative.
- 9.10 The native silty clay, silty sand and glacial till materials are sensitive to changes in moisture content and precipitation. Depending on the weather conditions encountered during construction consideration must be given to the following measures in order to reach the specified densities and to reduce post construction settlement above the trench:
 - Allow the overburden materials to dry prior to compaction;
 - Reuse any wet materials in the lower part of the trench and make provisions to defer final paving of surface course for 3 months to allow the trench backfill settlement to occur and thereby improve the final roadway appearance;
 - Avoid reusing any wet materials within the trench. Where additional material is required for trench backfill, use of relatively dry on-site material or imported fill, such as OPSS Select Subgrade Material or Granular B Type I materials, below the zone of frost penetration shall be used.
 - Method must be approved by the Departmental Representative.

- 9.11 Contractor to stockpile existing granular base/subbase material for possible reuse as trench backfill, earth borrow, or possibly base/subbase material as part of the new pavement structure. The location of stockpiles on site must be to the satisfaction of the Departmental Representative. The material must be assessed by the Departmental Representative (experienced Geotechnical Engineer) to determine a suitable use.

- 9.12 In order to mitigate future differential frost heave at locations where existing service trenches (included as part of this contract) demonstrate previous frost heave issues, granular frost tapers (sloped at 5 horizontal to 1 vertical) and/or subexcavation of materials may be required. Areas of existing frost heave must be identified to the Departmental Representative (experienced Geotechnical Engineer) such that an appropriate frost heave treatment may be assessed.

- 9.13 If the granular materials above the trenches are to be used by construction traffic, it may be necessary to increase the thickness of the Granular B Type II, install a woven geotextile separator between the subgrade surface and the granular material, or a combination to prevent disturbance of the subbase material. The Contractor is responsible for their construction access and must coordinate with the Departmental Representative (experienced Geotechnical Engineer) prior to allowing construction traffic over the granular materials above the trenches, such that the necessary treatment may be assessed.

- 9.14 During winter construction (freezing temperatures) service trenches must be opened for as short a time as practical and the excavation must be carried out in lengths which allow all construction operations, including backfilling, to be fully completed in one working day. The materials on the sides of the trenches must not be allowed to freeze. In addition the backfill material must be excavated, stored and replaced without being disturbed by frost or contaminated by snow or ice.

- 9.15 The monitoring wells (standpipe piezometers) encountered during work must be decommissioned by a provincially licensed Well Contractor or Well Technician, in accordance with Ontario Regulation 903 ("well abandonment"):

- Remove the well PVC pipe and any protective casings by either:
 - over-drilling;
 - excavating; or,
 - manually.
- Dispose of PVC pipe, tubing and protective casings as non-hazardous waste;
- Fill the hole and remaining PVC pipe (if applicable) with a cement-bentonite mixture (5% bentonite) up to 30 cm below the ground surface or top of grade.

For monitoring wells where the entire depth of the well will be destroyed (base of planned excavation is deeper than the well bottom):

- Excavate and remove all well construction materials and dispose as non-hazardous

Decommissioning reports must be submitted to the Departmental Representative.

Refer to the Geotechnical Investigation Report prepared by Houle Chevrier for approximate location of existing monitoring wells.

- 9.16 Clay seals must be provided in the service trenches as per OPSS 1205 and OPSS 802.095 in order to reduce long-term lowering of the groundwater. Seals must be located at a horizontal spacing of 100 m and must be at least 1.5 m long and extend from trench wall to trench wall. The seals must also extend from the subgrade level and fully penetrate the bedding, sub-bedding and cover material. Seals must consist of relatively dry and compactable brown weathered silty clay placed in maximum 300 mm thick loose layers. The Contractor must confirm the location of all clay seals to the Departmental Representative.

10.0 TEMPORARY WATERMAIN

- 10.1 Where work is proposed near an existing watermain and/or when requested by Departmental Representative, the existing watermain must be depressurized and temporary potable water supply and firefighting services must be installed by the Contractor in accordance with OPSS 493. Temporary water supply services plans including installation and removal, operation, testing procedures, and a list of material and equipment to be used, as well as temporary hydrant details must be provided to the Departmental Representative for review.
- 10.2 Existing valves must be manipulated with care in the presence of Departmental Representative.

11.0 STORM AND SANITARY SEWERS

- 11.1 Sewers must be constructed in accordance with OPSS 410.
- 11.2 Concrete sewer material must conform to OPSS 1820.
- 11.3 PVC sewer material to conform to OPSS 1841.
- 11.4 All sewer pipe material shall be as follows:

PIPE DIAMETER (mm)	TYPE OF PIPE
≤ 150PVC (All services)	SDR-28
> 150 and ≤ 450PVC (Sanitary)	SDR-35
> 150 and ≤ 375PVC (Storm)	SDR-35
> 450 (Sanitary)	Concrete Pipes
	CSA A257 (pipe class as per OPSS 807.010, class B bedding)
	Concrete Pipes
	CSA A257 (pipe class as per OPSS 807.010, class B bedding)
> 375 (Storm)	

- 11.5 Pipe bedding cover and backfill must be in accordance with OPSS 802.010 and 802.031 (Class B Bedding) for flexible and rigid pipes in Type 3 overburden excavations, respectively.

- 11.6 Pipe bedding cover and backfill must be in accordance with OPSS 802.013 and 802.033 (Class B Bedding) for flexible and rigid pipes in bedrock excavations, respectively.

- 11.7 Embedment material for flexible pipes shall consist of OPSS Granular A material

- 11.8 Bedding material for rigid pipes shall consist of OPSS Granular A material. Cover material for rigid pipes shall consist of OPSS Granular A, or Granular B Type I or Type II, with 100% passing the 26.5 mm sieve.

- 11.9 The allowable deflected pipe diameter when using flexible pipe is as follows:

- Pipes 100 to 750 mm: 7.5% of the base inside diameter of the pipe
- Greater than 750 mm: 5.0% of the base inside diameter of the pipe

- 11.10 All sewers to be C.C.T.V. inspected by the Contractor per OPSS 409. Report must be provided to the Departmental Representative in two (2) copies and the C.C.T.V. inspection in DVD format only.

- 11.11 Maintenance holes, maintenance hole/catch basins to be as per OPSS 701.010 to OPSS 701.015 (sizes specified on drawings) and shall be equipped with safety platform as per OPSS 404.020 when exceeding 5.0 m in depth to the lowest invert and with additional knockouts where required for connection of subdrains. All 900 mm diameter sampling manholes are to be M-900 FLEX-LOK by LÉCUYER or approved equivalent. All 375 mm diameter catch basin are to be DRAIN BASINS-2815AG, complete with frame and grate, by ADS CANADA, or approved equivalent. All trench drain must be heavy duty with concrete box and are to be Z866-HDG by ZURN or approved equivalent.

- 11.12 Adjustment or rebuilding of maintenance holes, maintenance hole/catch basins, catch basins, ditch inlets and valve chambers to be completed as per OPSS 408.

- 11.13 Excavating, backfilling, and compacting for maintenance holes, maintenance hole /catch basins, catch basins, ditch inlets and valve chambers to be completed as per OPSS 402.

- 11.14 Maintenance holes, maintenance hole/catch basins and catch basin excavations to be backfilled with OPSS Granular A' to a minimum thickness of 300 mm around all sides of the unit, compacted to 95% Standard Proctor Maximum Dry Density (SPMDD).

- 11.15 Maintenance holes and maintenance hole/catch basins to be as per OPSS 701.010 to 701.015 (sizes specified on drawings) and shall be equipped with safety platform as per OPSS 404.020 when exceeding 5.0 m to the lowest invert. Additional knockouts needed for connection of subdrains to maintenance holes /catch basins where required.

- 11.16 Storm maintenance holes and maintenance hole/catch basins shall be equipped with 300 mm sumps per OPSS 701.010.

- 11.17 Storm maintenance hole frame and cover to be per OPSS 401.010 Type "B" open cover. The word "DANGER" on the cover is to be replaced by "STORM"

- 11.18 Storm maintenance hole/catch basin frame and cover to be as per OPSS 400.070.

- 11.19 Sanitary maintenance hole frame and cover to be per OPSS 401.010 Type "A" closed cover. The word "DANGER" on the cover is to be replaced by "SANITARY".

- 11.20 Benching is required inside the concrete bottom of sanitary maintenance holes per OPSS 701.021.

- 11.21 All catch basins to be per OPSS 705.010 complete with frame and grate as per OPSS 400.020 when in the right-of-way (along the roadway) and OPSS 400.070 when in

parking areas and landscaped area.

- 11.22 All catch basins shall be equipped with sumps (600 mm deep).

- 11.23 All catch basin leads to be 200 mm diameter, PVC SDR-35 with a minimum slope of 2.0% unless otherwise noted. The Contractor may use long radius bends as per OPSS 708.010 and OPSS 708.030 for connection to rigid and flexible main pipes, respectively.

- 11.24 A maintenance hole drop structure tee is to be used as per OPSS 1003.010 when the drop from the inlet invert to the outlet invert is greater than 600 mm and less than 1200 mm. A drop structure wye is to be used as per OPSS 1003.020 when the drop exceeds 1200 mm.

Where the main pipe size exceeds those listed in the details, the drop pipe shall not exceed 300mm in diameter and a maintenance hole drop structure tee shall be used per OPSS 1003.010 regardless of the drop height. PVC drop pipe shall be connected to main concrete sewer pipe using factory made tees, or approved equivalent field made connections, and shall be watertight.

- 11.25 Service connections to rigid main sewer pipe to be as per OPSS 1006.010. Connections to flexible main sewer pipe to be as per OPSS 1006.020.

- 11.26 Catch basins must be provided with 3 m long perforated stub drains which extend in at least two (2) directions from the catch basin at the pavement subgrade level. Subdrains must be constructed in accordance with OPSS 405 and provided with wrapped trench in accordance with OPSS 216.021.

- 11.27 When a minimum cover of 1.5 meters is not reached on storm sewers, frost protection must be installed per OPSS 1109.030. Insulation thickness and compressive strength shall be in accordance with Detail 314F. Extruded polystyrene material shall conform to OPSS 1605.

- 11.28 When a minimum cover of 1.8 meters is not reached on sanitary sewers, frost protection must be installed per OPSS 1109.030. Insulation thickness and compressive strength shall be in accordance with Detail 314A. Extruded polystyrene material shall conform to OPSS 1605. Insulated maintenance hole covers must also be provided per Detail 306.

12.0 TUNNEL CROSSINGS AND DIRECTIONAL DRILLING

- 12.1 Where proposed pipes cross below exist. tunnels and/or watermain, the Contractor must install the new pipe using directional drilling in accordance with OPSS 450.

- 12.2 The Contractor is responsible for protecting the structural integrity of the exist. tunnels and live watermains.

- 12.3 The Contractor must submit a detailed work method for approval to the departmental representative, including, but not limited to, shop drawings for temporary works and monitoring of exist. infrastructure.

13.0 MONITORING OF EXISTING WATERMANS AND TUNNELS

- 13.1 The Contractor is responsible for supplying, installing and maintaining appropriate equipment for the vibration monitoring of watermain (both City of Ottawa and NRC watermains) and of tunnels. Geophone sensors must be placed directly on top of watermains and tunnels at regular intervals to provide real time warning signals with flashing light and air horn. The trigger levels for the monitoring stations of the watermains and tunnels shall be programmed as follow:
 - 1st trigger level set at 5mm/s to trigger a flashing light;
 - 2nd trigger level set at 15mm/s to trigger a flashing light and air horn.

14.0 DISTURBED SUBGRADE DURING EXCAVATION

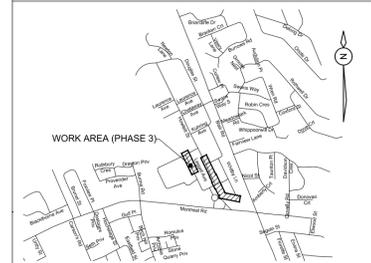
- 14.1 The Contractor must expect encountering disturbed subgrade during excavation at various locations specified in the drawings. When encountered, the Contractor must perform the following:
 - Control ground water during remediation work;
 - Place well graded blast rock generally less than 300mm in diameter. The blast rock must extend down and out from the outside edge of the pipe at 1H:2V to provide suitable support;
 - Cover blast rock with 300mm of granular material OPSS - Granular B Type II, compacted to 98% of SPMDD (min). In lifts of 200mm (max);
 - Cover granular material OPSS - Granular B type II - with 150mm of OPSS - Granular A bedding material, compacted to 98% of SPMDD (min). In lifts of 200mm (max).



GENERAL NOTES

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- PREVENT THE SPREAD OF DUST & DEBRIS BEYOND THE WORK AREA AND CLEAN ALL SURFACES AT COMPLETION.
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project _____ projet _____

SANITARY AND STORM SEWER SEPARATION

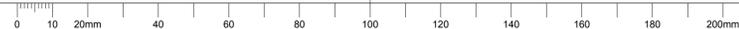
1200 MONTREAL ROAD CAMPUS
OTTAWA, ONTARIO

drawing _____ dessin _____

PHASE 3 - NOTES

designed	conçu	date	date
J.SAUVÉ		JANUARY 2017	
drawn	dessiné	scale	échelle
J.SAUVÉ		NTS	
checked	vérifié	sheet	feuille
H.BISSON		2 of / de 2	
approved	approuvé	W.O.no.	D.T.no.
H.BISSON		-	
dwg.no.	dessin no.		

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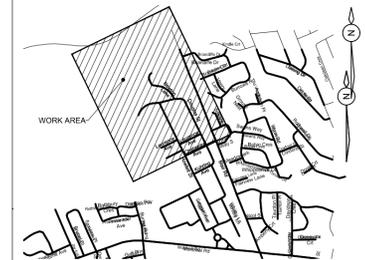


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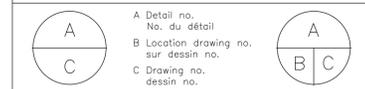
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project: _____ projet: _____

SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: _____ dessin: _____
**PHASE 3 - MASTER PLAN -
 SANITARY SEWER NORTH**

designed: J.SAUVÉ conçu: J.SAUVÉ date: AUGUST 2016 date: _____

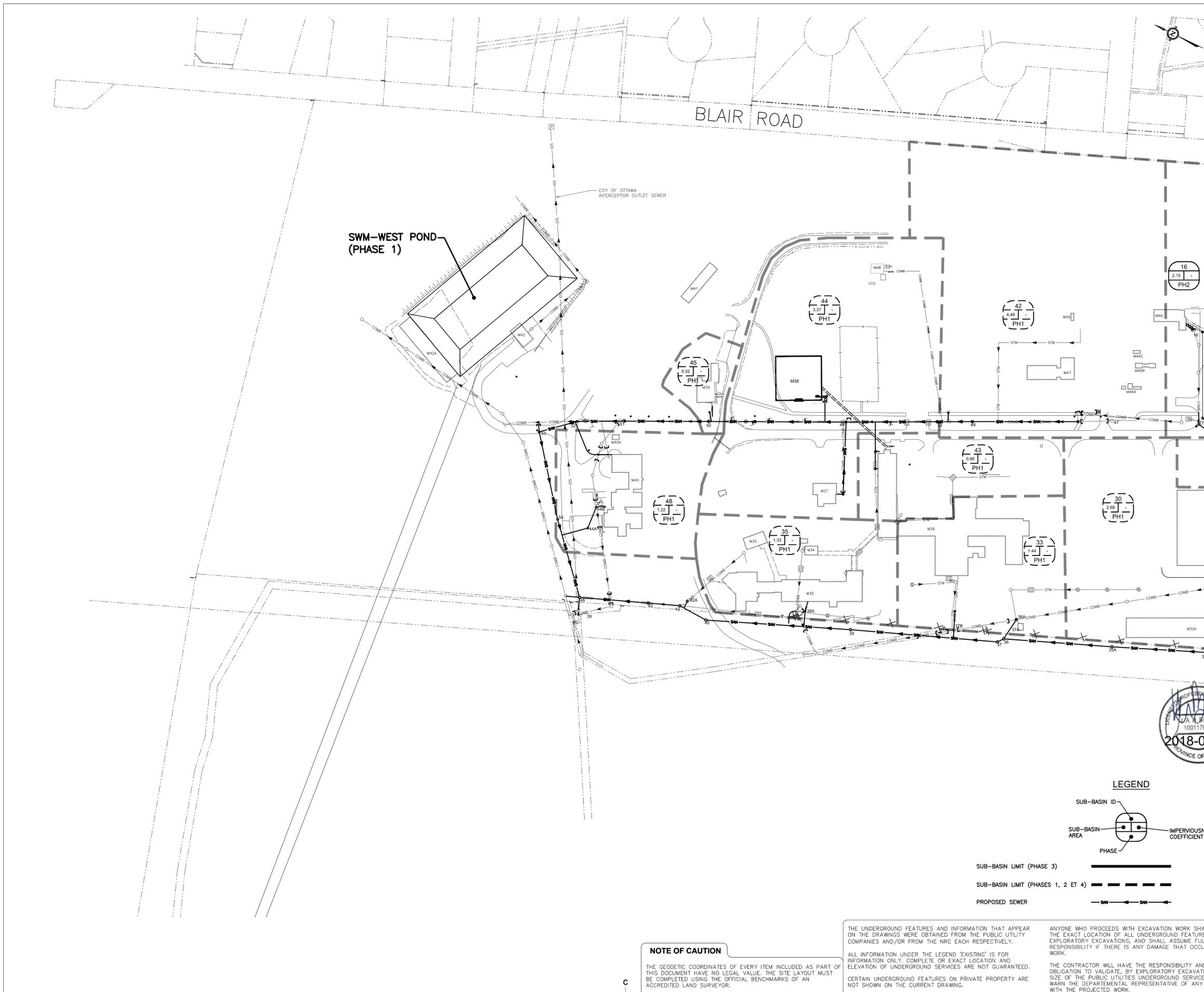
drawn: J.SAUVÉ dessiné: J.SAUVÉ scale: 1:1500 échelle: _____

checked: H.BISSON vérifié: H.BISSON sheet: 1 of/de 2 feuille: _____

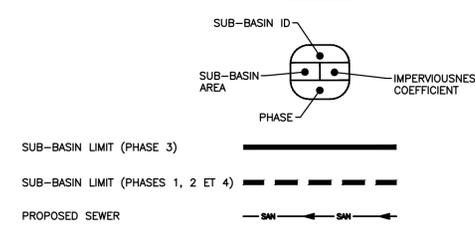
approved: H.BISSON approuvé: H.BISSON W.O.no.: _____ D.T.no.: _____

dwg.no.: _____ dessin.no.: _____

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LEGEND



NOTE OF CAUTION

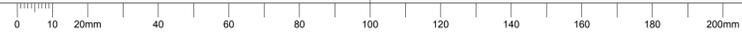
THE GEODETIC COORDINATES OF EVERY ITEM INCLUDED AS PART OF THIS DOCUMENT HAVE NO LEGAL VALUE. THE SITE LAYOUT MUST BE COMPLETED USING THE OFFICIAL BENCHMARKS OF AN ACCREDITED LAND SURVEYOR.

THE UNDERGROUND FEATURES AND INFORMATION THAT APPEAR ON THE DRAWINGS WERE OBTAINED FROM THE PUBLIC UTILITY COMPANIES AND/OR FROM THE NRC EACH RESPECTIVELY.

ALL INFORMATION UNDER THE LEGEND 'EXISTING' IS FOR INFORMATION ONLY. COMPLETE OR EXACT LOCATION AND ELEVATION OF UNDERGROUND SERVICES ARE NOT GUARANTEED. CERTAIN UNDERGROUND FEATURES ON PRIVATE PROPERTY ARE NOT SHOWN ON THE CURRENT DRAWING.

ANYONE WHO PROCEEDS WITH EXCAVATION WORK SHALL VERIFY THE EXACT LOCATION OF ALL UNDERGROUND FEATURES, BY EXPLORATORY EXCAVATIONS, AND SHALL ASSUME FULL RESPONSIBILITY IF THERE IS ANY DAMAGE THAT OCCURS DURING WORK.

THE CONTRACTOR WILL HAVE THE RESPONSIBILITY AND THE OBLIGATION TO VALIDATE, BY EXPLORATORY EXCAVATION, THE SIZE OF THE PUBLIC UTILITIES UNDERGROUND SERVICES AND TO WARN THE DEPARTMENTAL REPRESENTATIVE OF ANY CONFLICT WITH THE PROJECTED WORK.

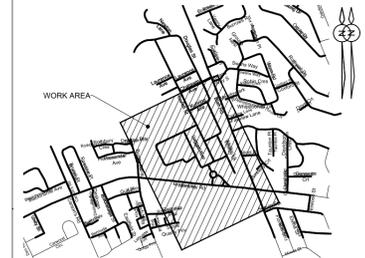


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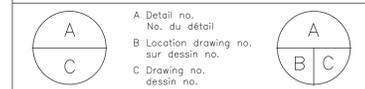
KEY PLAN



No.	Date	Revision	By:
3	2018-04-27	ISSUED FOR TENDER	HB
2	2017-11-14	ISSUED FOR TENDER	-
1	2017-01-23	PRELIMINARY 60%	-

Date Printed: _____ Date imprimée: _____

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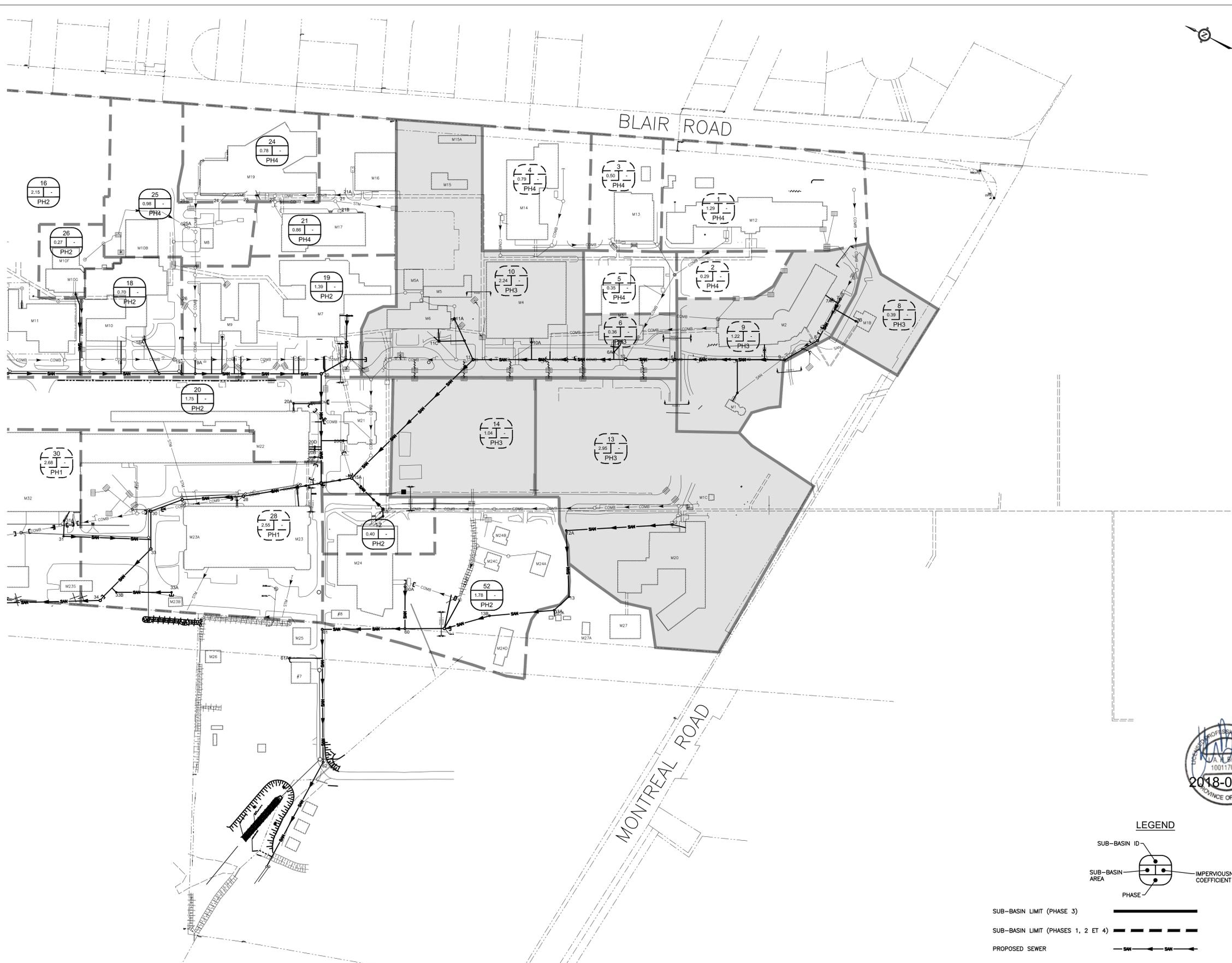
project: _____ projet: _____
SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

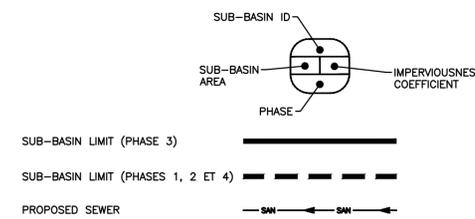
drawing: _____ dessin: _____
**PHASE 3 - MASTER PLAN -
 SANITARY SEWER SOUTH**

designed	conçu	date	date
J.SAUVÉ		AUGUST 2016	
drawn	dessiné	scale	échelle
J.SAUVÉ		1:1500	
checked	vérifié	sheet	of/de
H.BISSON		2	of/de 2
approved	approuvé	W.O.no.	D.T.no.
H.BISSON		-	-
dwg.no.	dessin no.		

5097-C303-2



LEGEND



NOTE OF CAUTION

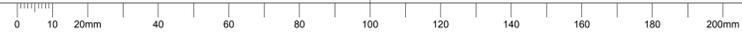
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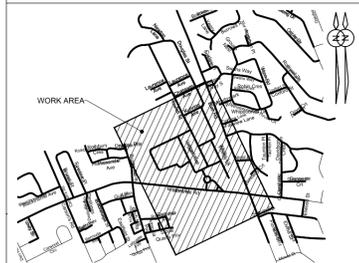


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project: _____ projet: _____

SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: _____ dessin: _____
**PHASE 3 - MASTER PLAN -
 STORM SEWER SOUTH**

designed: J.SAUVÉ conçu: J.SAUVÉ date: AUGUST 2016 date: _____

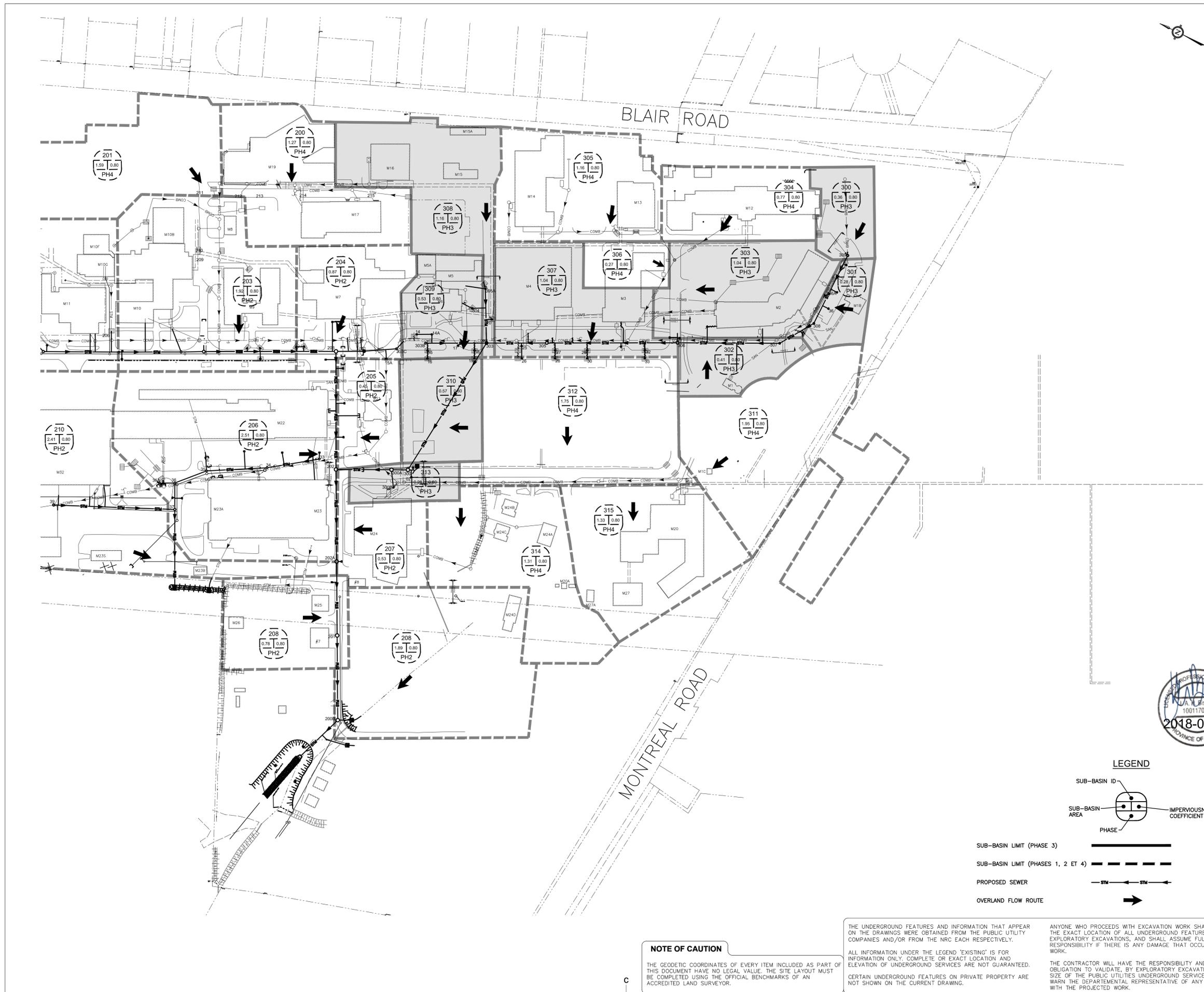
drawn: J.SAUVÉ dessiné: J.SAUVÉ scale: 1:1500 échelle: _____

checked: H.BISSON vérifié: H.BISSON sheet: 2 of/de 2 feuille: _____

approved: H.BISSON approuvé: H.BISSON W.O.no.: _____ D.T.no.: _____

dwg.no.: _____ dessin no.: _____

5097-C304-2



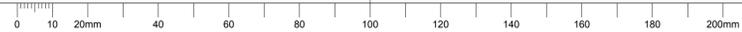
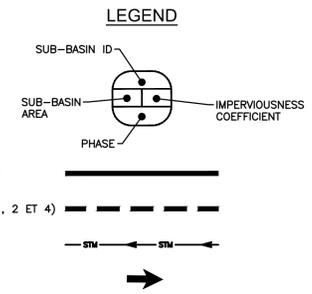
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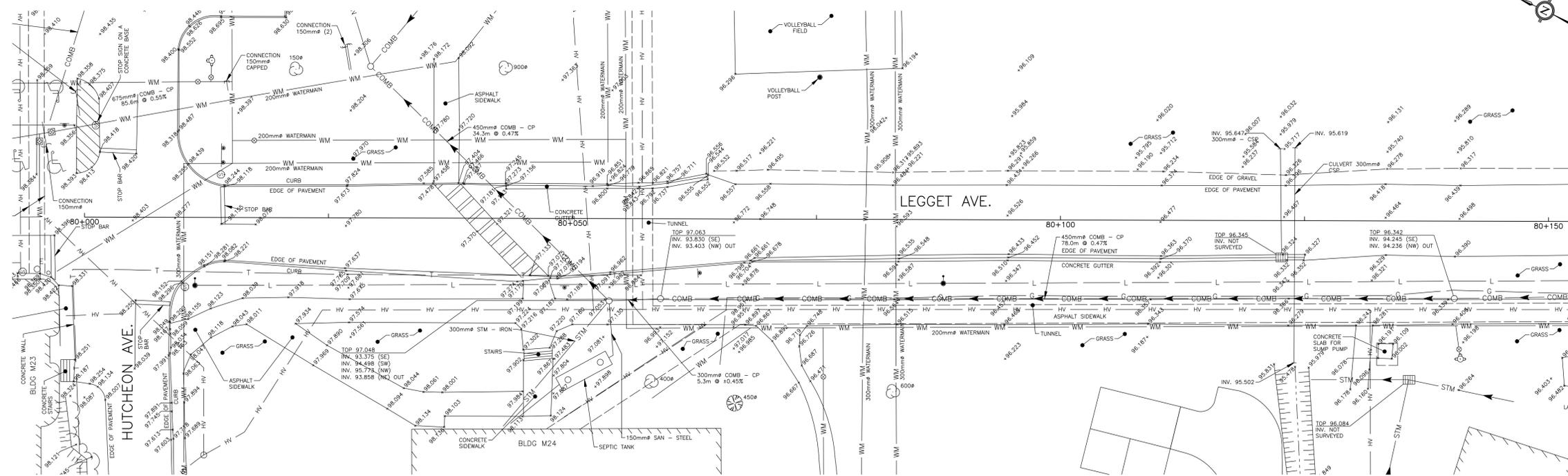
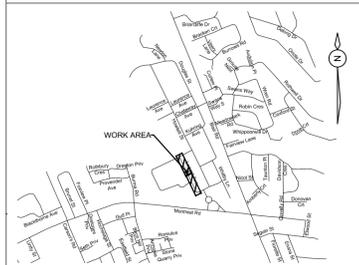


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KEY PLAN



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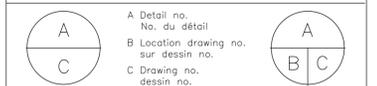
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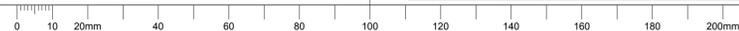
SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

PHASE 3 - TOPOGRAPHICAL SURVEY
 ALIGNMENT "B"
 80+000 TO 80+150

designed	conçu	date	date
J.SAUVÉ		JANUARY 2017	
drawn	dessiné	scale	échelle
J.SAUVÉ		1:250	
checked	vérifié	sheet	of/de
H.BISSON		1	3
approved	approuvé	W.O.no.	D.T.no.
H.BISSON		-	-
dwg.no.			dessin no.

5097-C305-1

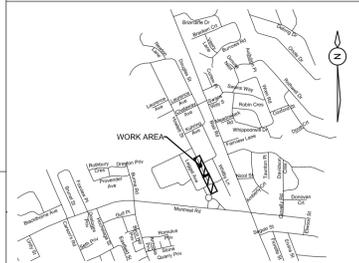


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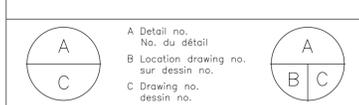


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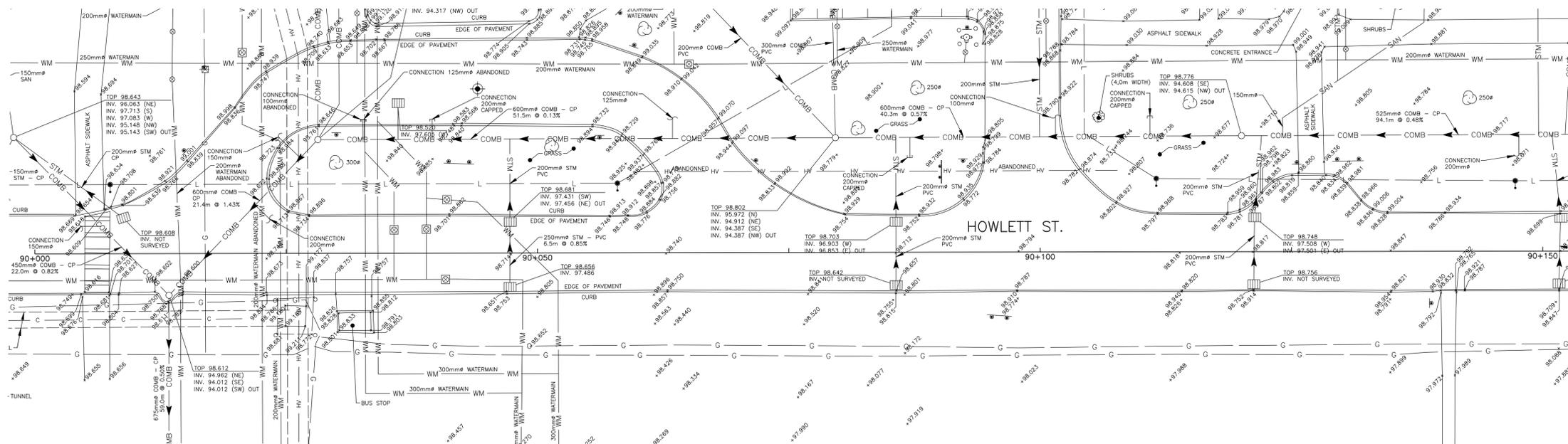
project: _____ project: _____
SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

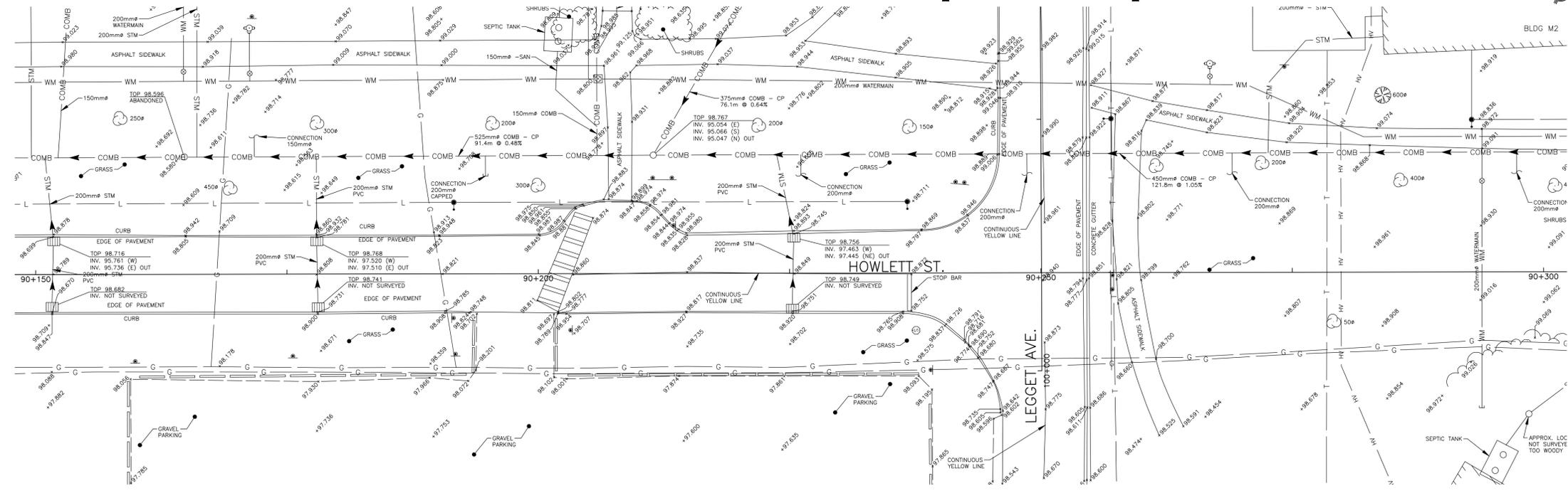
drawing: _____ dessin: _____
**PHASE 3 - TOPOGRAPHICAL SURVEY
 ALIGNMENT "E"
 90+000 TO 90+300**

designed	conçu	date	date
JSAUVE		JANUARY 2017	
drawn	dessiné	scale	échelle
JSAUVE		1:250	
checked	vérifié	sheet	of/de
HBISSON		2	of/de 3
approved	approuvé	W.O.no.	D.T.no.
HBISSON		-	-
dwg.no.			dessin no.

5097-C305-2



↑ SEE PLAN 5097-C305-4 ↑



SEE PLAN 5097-C305-3

NOTE OF CAUTION

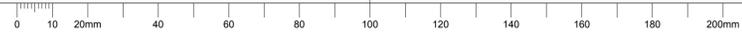
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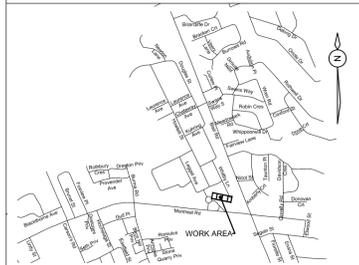


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project: _____ projet: _____

SANITARY AND STORM SEWER SEPARATION

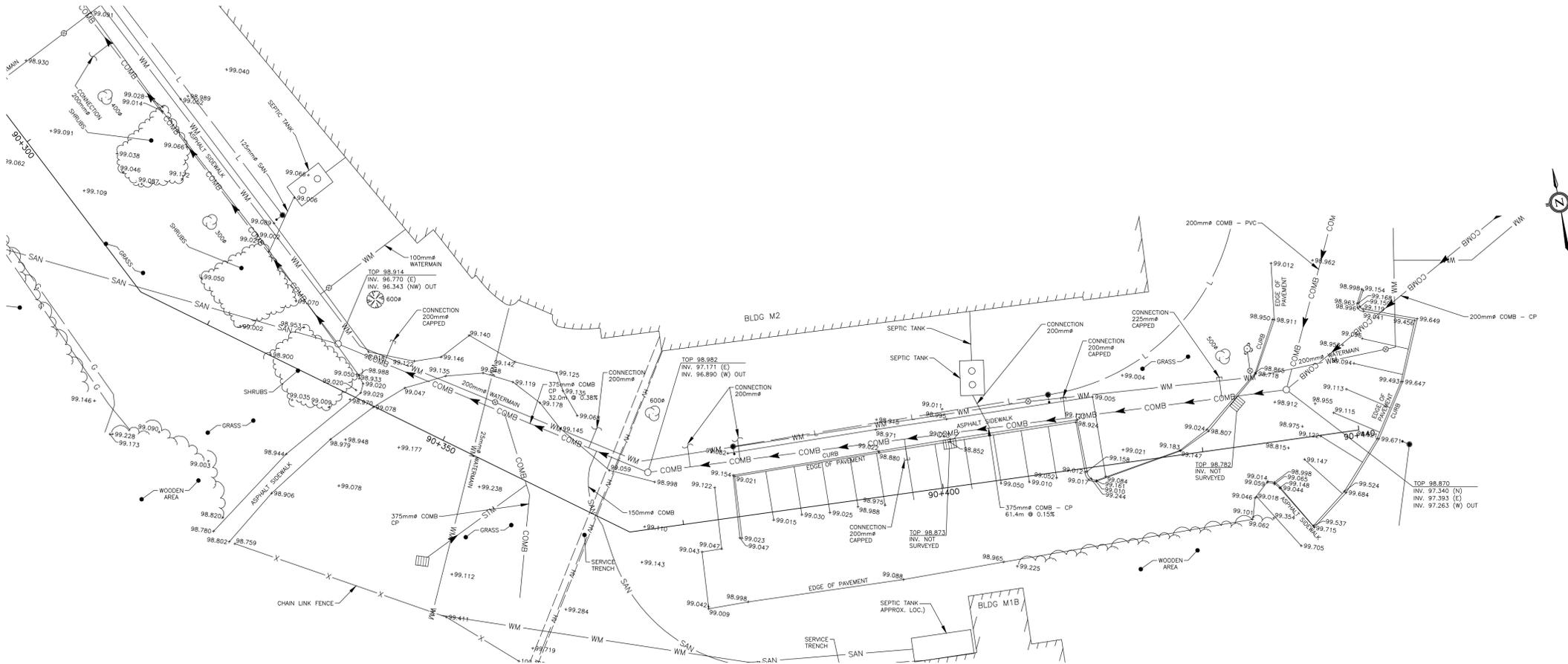
1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: _____ dessin: _____
**PHASE 3 - TOPOGRAPHICAL SURVEY
 ALIGNMENT "E"**
 90+300 TO 90+440

designed	conçu	date	date
J.SAUVÉ		JANUARY 2017	
drawn	dessiné	scale	échelle
J.SAUVÉ		1:250	
checked	vérifié	sheet	of/de
H.BISSON		3	3
approved	approuvé	W.O.no.	D.T.no.
H.BISSON		-	-
dwg.no.			dessin no.

5097-C305-3

SEE PLAN 5097-C305-2

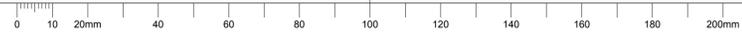


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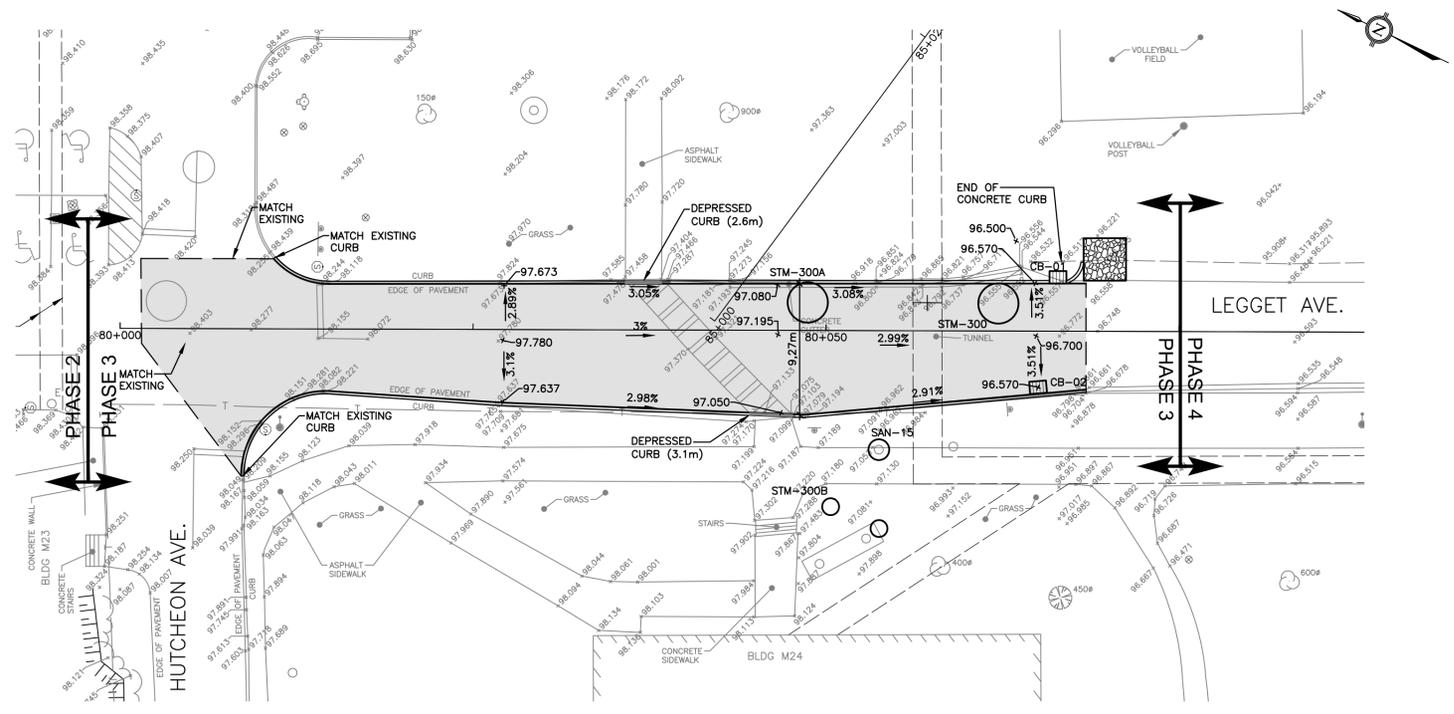
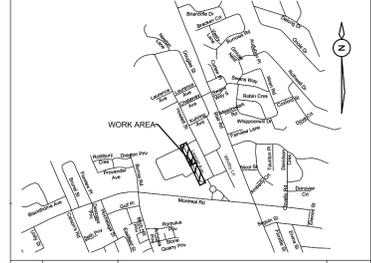


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KEY PLAN



LEGEND

	SAW CUT EXISTING ASPHALT AND TRANSITION BETWEEN EXISTING AND PROPOSED PAVEMENT PER DETAIL 206
	PROPOSED CURB AND EDGE OF PAVEMENT (OPSD 600.110)
	PROPOSED ELEVATION
	NEW ASPHALT TO PROPOSED GRADE (HEAVY DUTY - DETAIL 202)
	NEW ASPHALT TO PROPOSED GRADE (LIGHT DUTY - DETAIL 203)

- NOTE:**
- THE PROPOSED SAWCUT, ASPHALT AREAS AND CONCRETE CURBS SHOWN ON THIS PLAN REPRESENT THE MINIMUM REQUIRED REINSTATEMENT AND EXCLUDE THE AREAS THAT MUST BE DEMOLISHED AND REINSTATED DUE TO CONSTRUCTION.
 - CONTRACTOR MUST REINSTATE ALL AREAS AFFECTED BY CONSTRUCTION TO MATCH EXIST. CONDITIONS, EXCEPT WHERE OTHERWISE INDICATED ON THESE DRAWINGS.
 - REINSTATE PAVEMENT MARKINGS PER EXISTING CONDITIONS.

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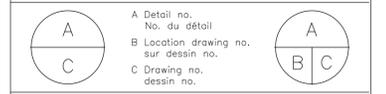
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No.	Date	Revision	By:
7	2018-04-27	ISSUED FOR TENDER	HB
6	2018-04-17	ISSUED FOR CLIENT REVIEW	-
5	2017-11-14	ISSUED FOR TENDER	-
4	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-
3	2017-06-05	APPROVAL 100%	-
2	2017-04-17	APPROVAL 90%	-
1	2017-01-23	PRELIMINARY 60%	-

Date Printed: _____ Date imprimée: _____

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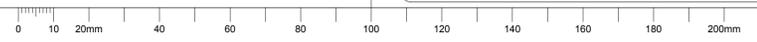
project: **SANITARY AND STORM SEWER SEPARATION**

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: **PHASE 3 - GEOMETRY, GRADING AND PAVEMENT MARKINGS ALIGNMENT 'B' 80+000 TO 80+080**

designed	conçu	date	date
J.SAUVÉ	J.SAUVÉ	SEPTEMBER 2017	SEPTEMBER 2017
drawn	dessiné	scale	échelle
J.SAUVÉ	J.SAUVÉ	1:250	1:250
checked	vérifié	sheet	feuille
H.BISSON	H.BISSON	1 of 4	4
approved	approuvé	W.O.no.	D.T.no.
H.BISSON	H.BISSON	-	-
dwg.no.	dessin no.		

5097-C306-1

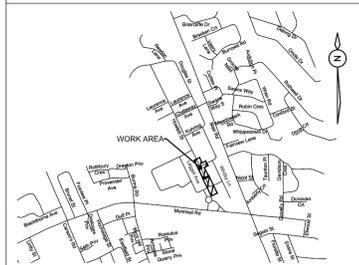


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KEY PLAN



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5	2018-04-11	ISSUED FOR CLIENT REVIEW	-
6	2011-11-14	ISSUED FOR TENDER	-
4	2011-09-28	ISSUED FOR FINAL DESIGN (100%)	-
3	2011-06-05	APPROVAL 100%	-
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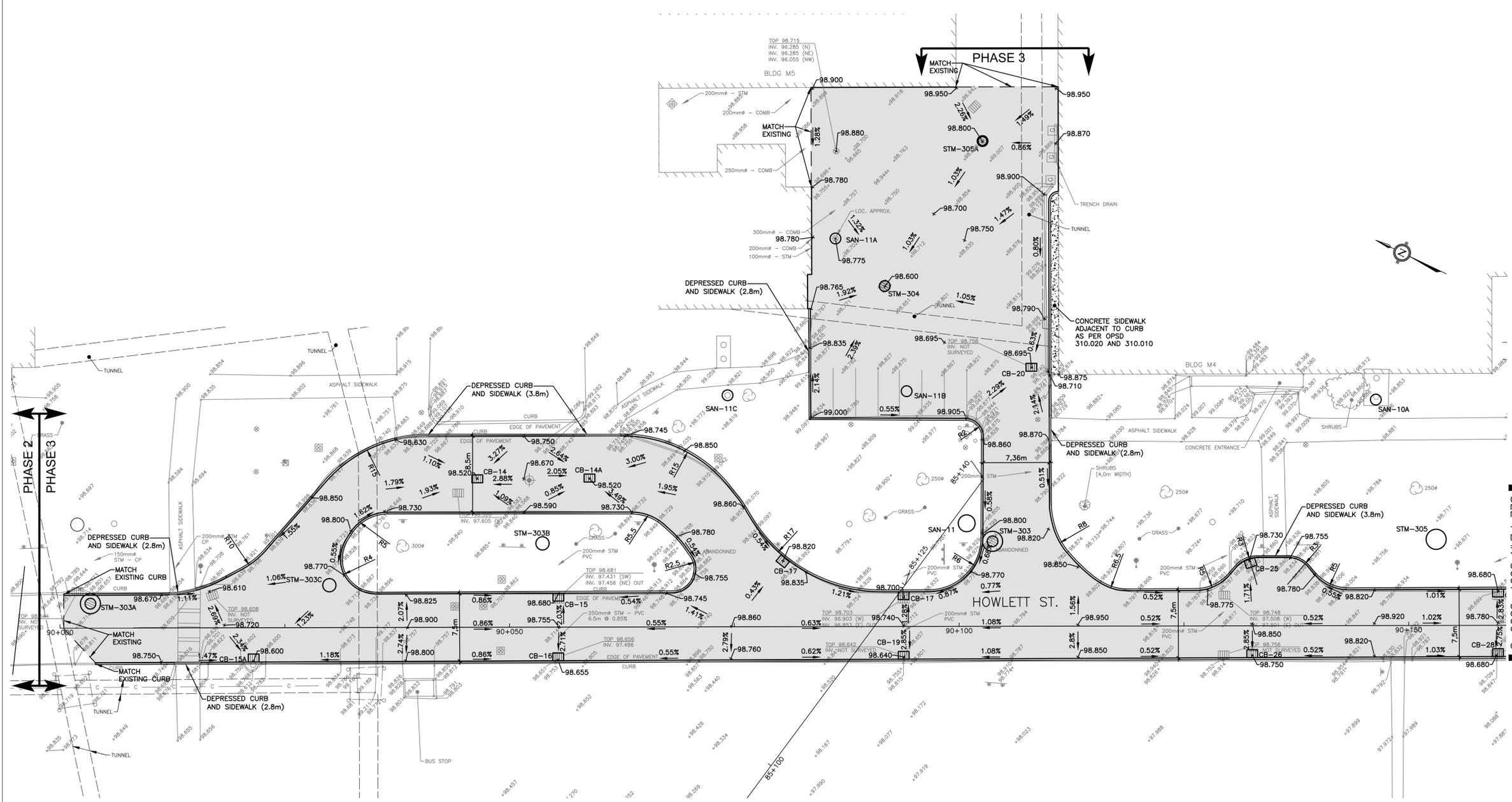


project: **SANITARY AND STORM SEWER SEPARATION** projet

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: **PHASE 3 - GEOMETRY, GRADING AND PAVEMENT MARKINGS ALIGNMENT 'E' 90+000 TO 90+150** dessin

designed	conçu	date	date
J.SAUVÉ		SEPTEMBER 2017	
drawn	dessiné	scale	échelle
J.SAUVÉ		1:250	
checked	vérifié	sheet	of/de
H.BISSON		2	4
approved	approuvé	W.O.no.	D.T.no.
H.BISSON		-	-
dwg.no.			dessin no.
5097-C306-2			



LEGEND

- SAW CUT EXISTING ASPHALT AND TRANSITION BETWEEN EXISTING AND PROPOSED PAVEMENT PER DETAIL 206
- PROPOSED CURB AND EDGE OF PAVEMENT (OPSD 600.110)
- +94.000 PROPOSED ELEVATION
- NEW ASPHALT TO PROPOSED GRADE (HEAVY DUTY - DETAIL 202)
- NEW ASPHALT TO PROPOSED GRADE (LIGHT DUTY - DETAIL 203)
- NEW CONCRETE SIDEWALK

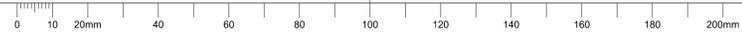
- NOTE:**
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 - CONTRACTOR MUST REINSTATE ALL AREAS AFFECTED BY CONSTRUCTION TO MATCH EXIST. CONDITIONS, EXCEPT WHERE OTHERWISE INDICATED ON THESE DRAWINGS.
 - REINSTATE PAVEMENT MARKINGS PER EXISTING CONDITIONS.

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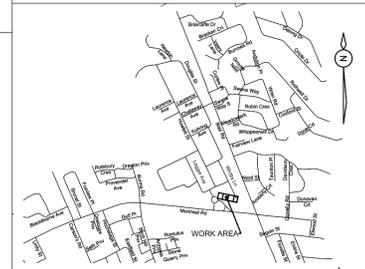


GENERAL NOTES

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- PROVIDE ALL LABOUR AND MATERIAL REQUIRED TO FORM A COMPLETE FUNCTIONAL SYSTEM AS DESCRIBED ON DRAWINGS.



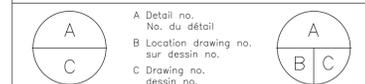
KEY PLAN



No.	Date	Revision	By:
1	2018-04-21	ISSUED FOR TENDER	HB
2	2018-04-11	ISSUED FOR CLIENT REVIEW	-
3	2017-11-14	ISSUED FOR TENDER	-
4	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-
5	2017-06-05	APPROVAL 100%	-
6	2017-04-11	APPROVAL 90%	-
7	2017-01-23	PRELIMINARY 60%	-

Date Printed: _____ Date imprimée: _____

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- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité.



project: _____ projet: _____

SANITARY AND STORM SEWER SEPARATION

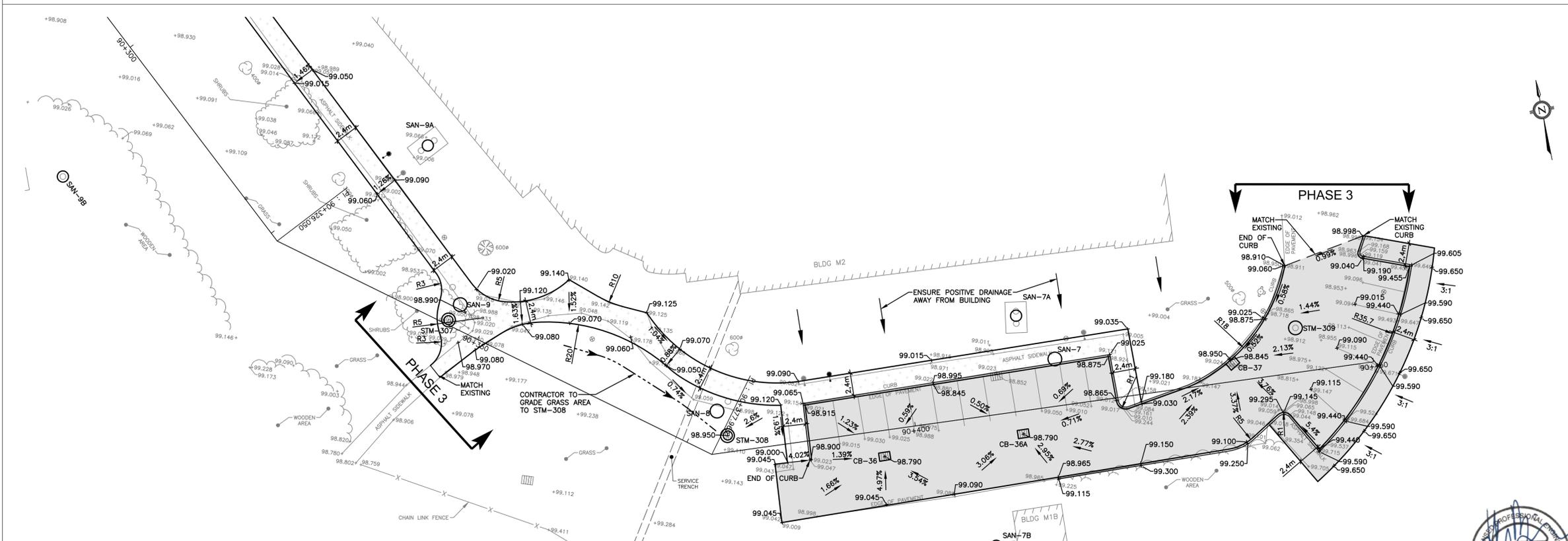
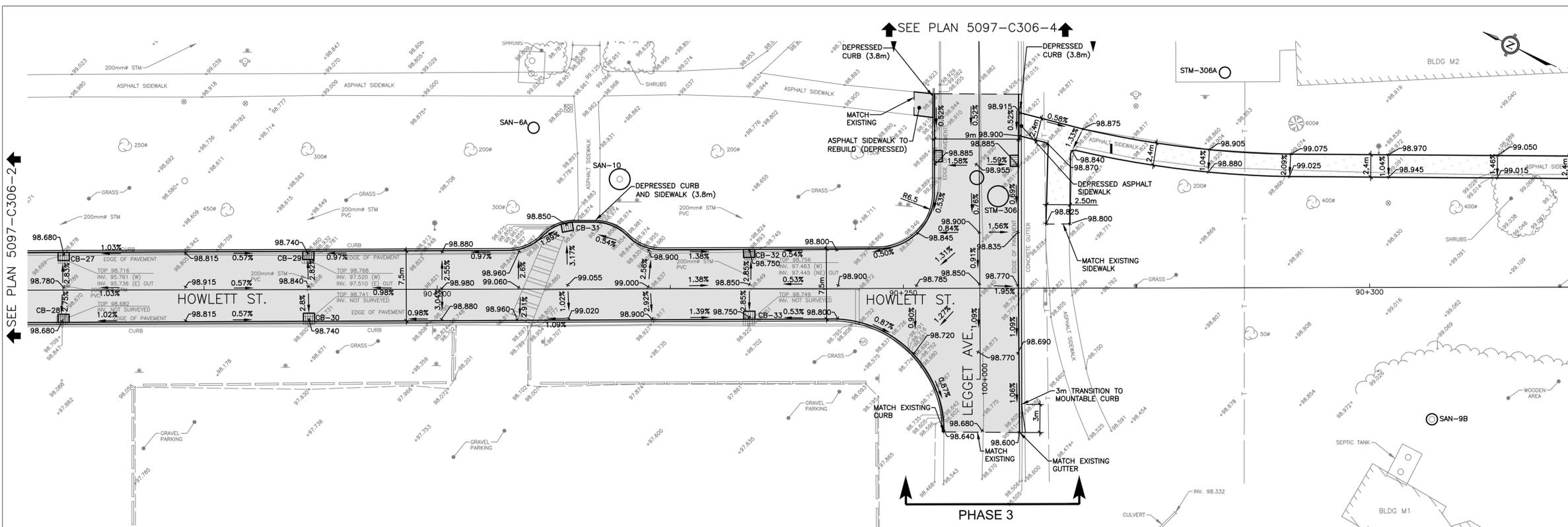
1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: PHASE 3 - GEOMETRY, GRADING AND PAVEMENT MARKINGS
 ALIGNMENT "E"
 90+150 TO 90+450

designed	conçu	date	date
J.SAUVÉ		SEPTEMBER 2017	
drawn	dessiné	scale	échelle
J.SAUVÉ		1:250	
checked	vérifié	sheet	of/de
H.BISSON		3	4
approved	approuvé	W.O.no.	D.T.no.
H.BISSON		-	-

dwg.no.: _____ dessin.no.: _____

5097-C306-3



LEGEND

- SAW CUT EXISTING ASPHALT AND TRANSITION BETWEEN EXISTING AND PROPOSED PAVEMENT PER DETAIL 206
- PROPOSED CURB AND EDGE OF PAVEMENT (OPSD 600.110)
- +94.000 PROPOSED ELEVATION
- NEW ASPHALT TO PROPOSED GRADE (HEAVY DUTY - DETAIL 202)
- NEW ASPHALT TO PROPOSED GRADE (LIGHT DUTY - DETAIL 203)

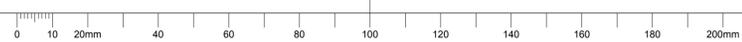
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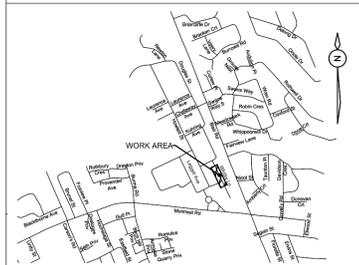


GENERAL NOTES

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KEY PLAN



No.	Date	Revision	By:
3	2018-04-27	ISSUED FOR TENDER	HB
2	2018-04-17	ISSUED FOR CLIENT REVIEW	-
1	2017-11-14	ISSUED FOR TENDER	-

Date Printed: _____ Date imprimée: _____

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A	A Detail no. No. du détail	A
B	B Location drawing no. sur dessin no.	B C
C	C Drawing no. dessin no.	

project: _____ projet: _____

SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: **PHASE 3 - GEOMETRY, GRADING AND PAVEMENT MARKINGS ALIGNMENT M-20** dessin: _____

designed: **J.SAUVÉ** conçu: _____ date: **SEPTEMBER 2017** date: _____

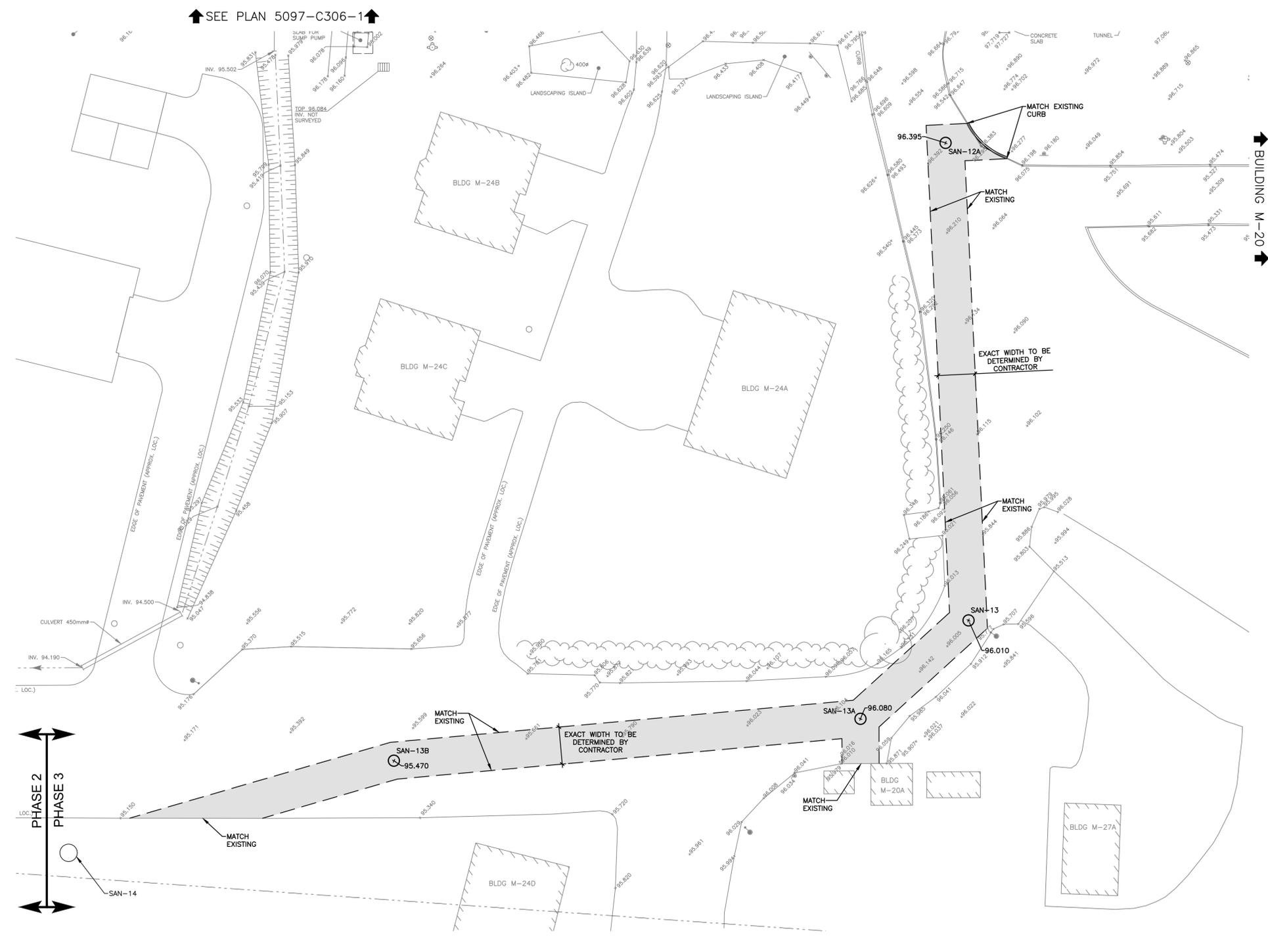
drawn: **J.SAUVÉ** dessiné: _____ scale: **1:250** échelle: _____

checked: **H.BISSON** vérifié: _____ sheet: **4** of/de **4** feuille: _____

approved: **H.BISSON** approuvé: _____ W.O.no.: _____ D.T.no.: _____

dwg.no.: _____ dessin no.: _____

5097-C306-4



PHASE 2
 PHASE 3

LEGEND

- SAW CUT EXISTING ASPHALT AND TRANSITION BETWEEN EXISTING AND PROPOSED PAVEMENT PER DETAIL 206
- ==== PROPOSED CURB AND EDGE OF PAVEMENT (OPSD 600.110)
- +94.000 PROPOSED ELEVATION
- NEW ASPHALT TO PROPOSED GRADE (HEAVY DUTY - DETAIL 202)
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NOTE OF CAUTION

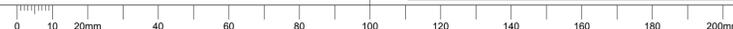
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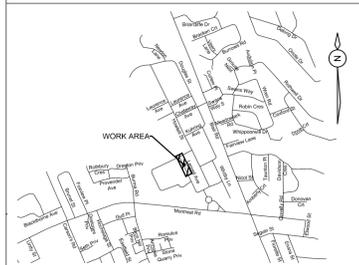
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SCALE 1:250



KEY PLAN



No.	Date	Revision	By:
1	2018-04-21	ISSUED FOR TENDER	HB
6	2018-04-11	ISSUED FOR CLIENT REVIEW	-
5	2017-11-14	ISSUED FOR TENDER	-
4	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-
3	2017-06-05	APPROVAL 100%	-
2	2017-04-11	APPROVAL 30%	-
1	2017-01-23	PRELIMINARY 60%	-

Date Printed: _____ Date imprimée: _____

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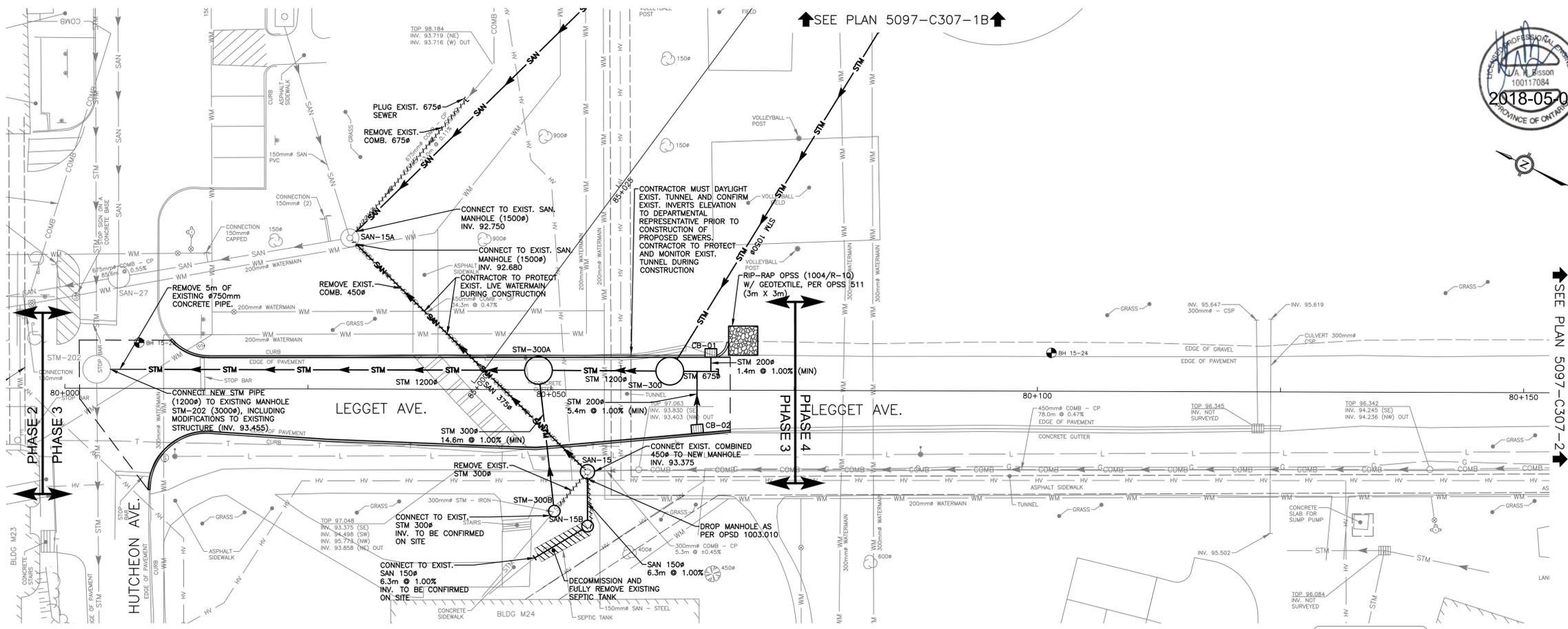
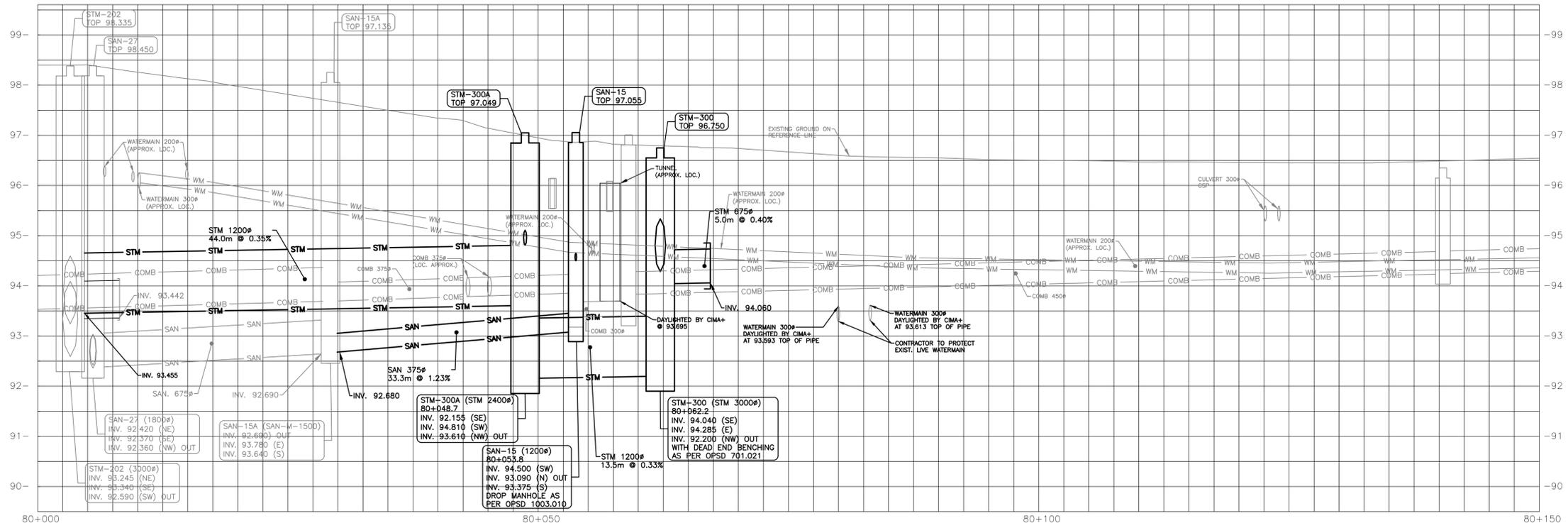
project: **SANITARY AND STORM SEWER SEPARATION** projet

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

Phase 3 - PLAN VIEW AND PROFILE
 ALIGNMENT "B"
 80+000 TO 80+150

designed	conçu	date	date
J.SAUVÉ		SEPTEMBER 2017	
drawn	dessiné	scale	échelle
J.SAUVÉ		H 1:250 V 1:50	
checked	vérifié	sheet	1 of/de 6
H.BISSON			
approved	approuvé	W.O.no.	D.T.no.
H.BISSON			
dwg.no.	dessin no.		

5097-C307-1A



MANHOLE #	TYPE	SIZE	TOP	INVERT	SPECIAL
CB-01	STM	600 X 600	96.570	95.170	CURB INLET/SUMP
CB-02	STM	600 X 600	96.570	95.170	SUMP
SAN-15B*	SAN	900#	97.380	94.595 94.565 (OUT)	BENCHING
STM-300B	STM	1200#	97.300	94.960 (OUT)	SUMP

* SAMPLING MANHOLE

- NOTES:**
- INVERT ELEVATIONS OF SERVICE CONNECTIONS TO EXISTING BUILDING ARE APPROXIMATE. THE CONTRACTOR MUST DETERMINE EXACT INVERT ELEVATIONS ON SITE PRIOR TO CONSTRUCTION START.
 - THE CONTRACTOR MUST DETERMINE ON SITE IF EXIST. SEWER CONNECTIONS ARE "STM" OR "SAN", AND MUST ENSURE TO CONNECT THEM ACCORDINGLY TO THE NEW SEWER NETWORKS.
 - PROJECT DESIGN IS INVERT SENSITIVE.
 - REINSTATEMENT BY CONTRACTOR (AS REQUIRED). REFER TO DRAWINGS C302 AND C306 FOR MINIMUM REQUIREMENT.

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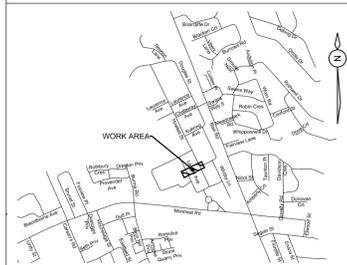
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SCALE 1:250



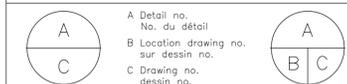
KEY PLAN



No.	Date	Revision	By:
4	2018-04-21	ISSUED FOR TENDER	HB
3	2018-04-21	ISSUED FOR CITY OF OTTAWA COORDINATION	HB
2	2018-04-17	ISSUED FOR CLIENT REVIEW	-
1	2017-01-23	PRELIMINARY 60%	-

Date Printed: _____ Date imprimée: _____

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project: _____ projet: _____

SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: _____ dessin: _____
PHASE 3 - PLAN VIEW AND PROFILE
ALIGNMENT "E"
 85+000 TO 85+140

designed: **J.SAUVÉ** congru: _____ date: **MARCH 2018** date: _____

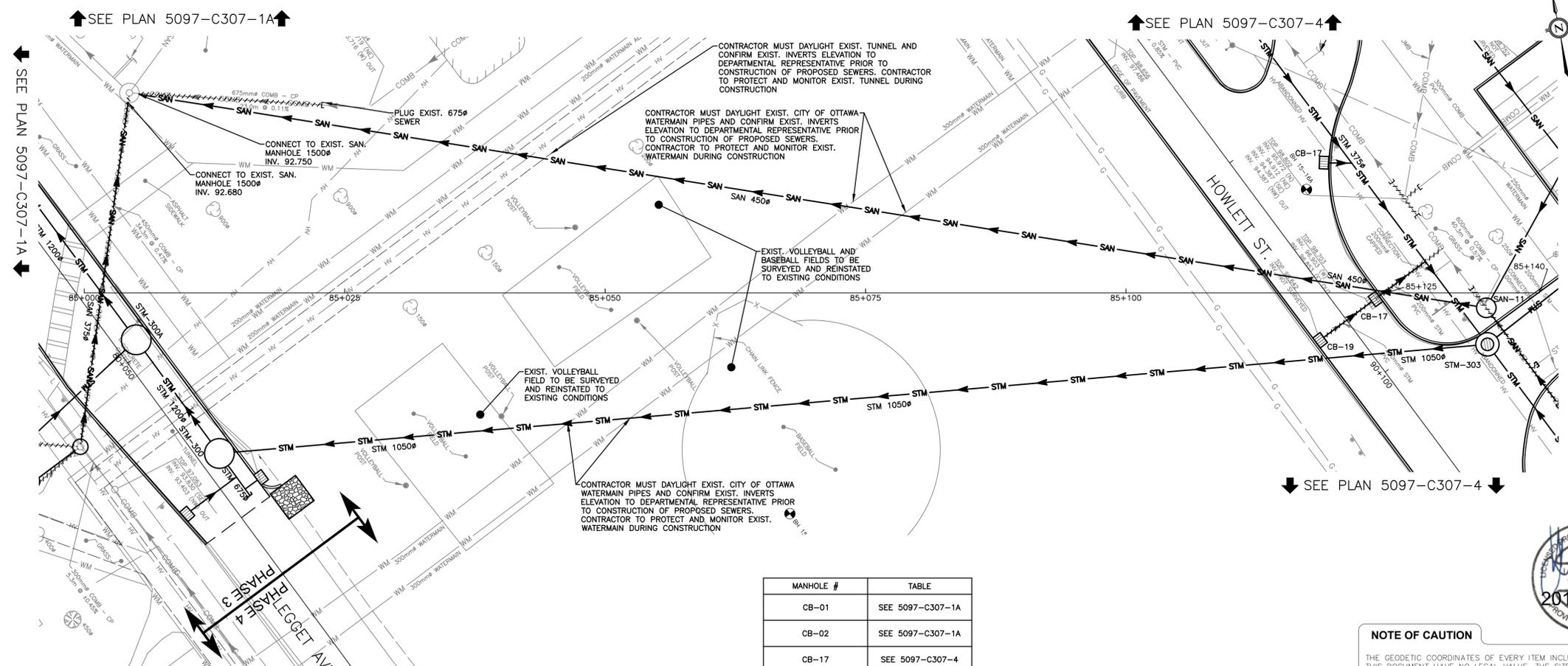
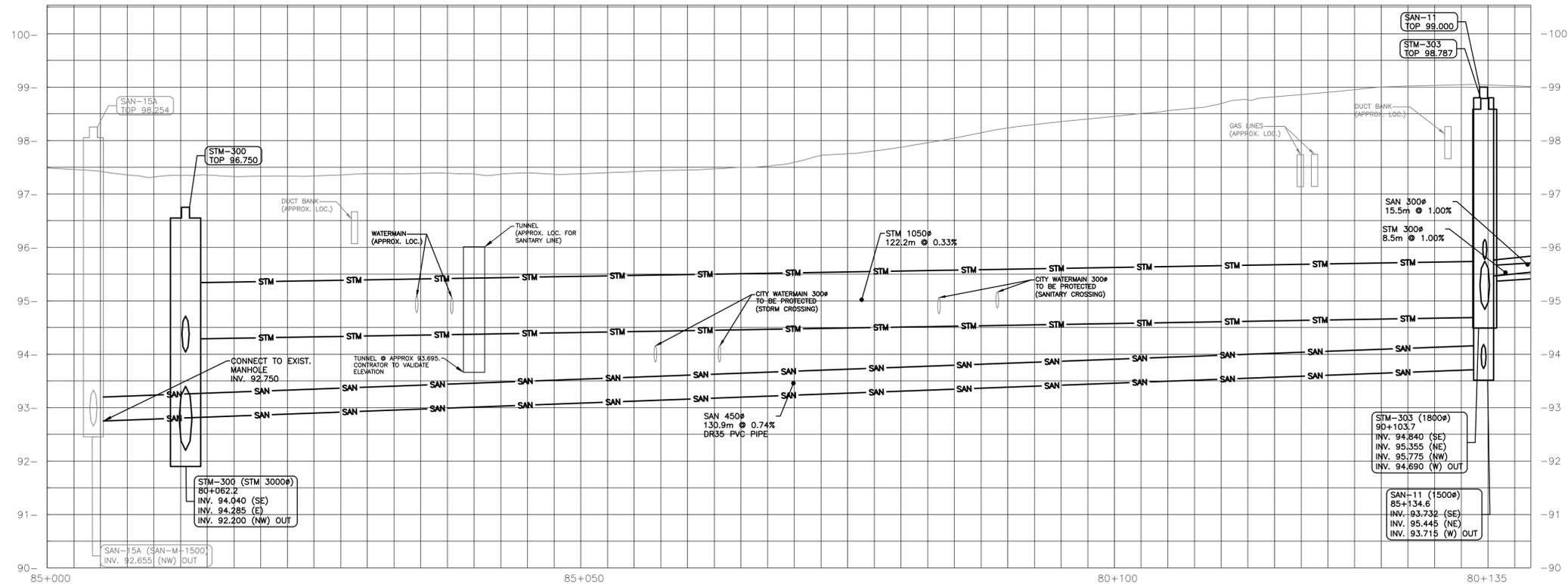
drawn: **J.HAMEL** dessiné: _____ scale: **H 1:250 V 1:50** échelle: _____

checked: **H.BISSON** vérifié: _____ sheet: **2** of/de **6** feuille: _____

approved: **H.BISSON** approuvé: _____ W.O.no.: _____ D.T.no.: _____

dwg.no.: _____ dessin no.: _____

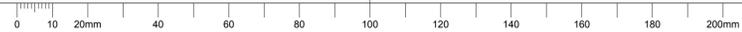
5097-C307-1B

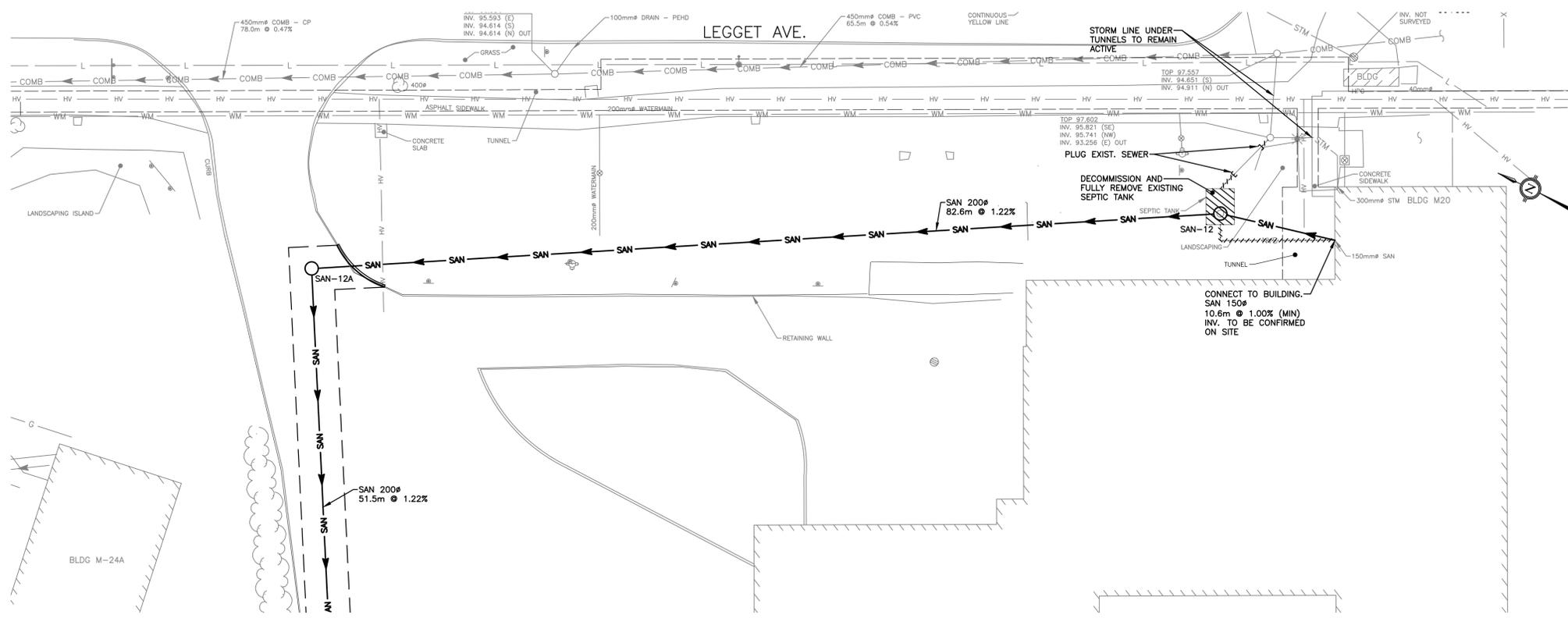


MANHOLE #	TABLE
CB-01	SEE 5097-C307-1A
CB-02	SEE 5097-C307-1A
CB-17	SEE 5097-C307-4
CB-18	SEE 5097-C307-4
CB-19	SEE 5097-C307-4

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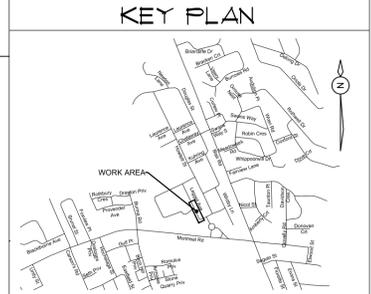




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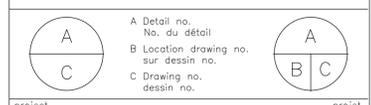
SCALE 1:250



No.	Date	Revision	By:
1	2018-04-21	ISSUED FOR TENDER	HB
6	2018-04-11	ISSUED FOR CLIENT REVIEW	-
5	2017-11-14	ISSUED FOR TENDER	-
4	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-
3	2017-06-05	APPROVAL 100%	-
2	2017-04-11	APPROVAL 30%	-
1	2017-01-23	PRELIMINARY 60%	-

Date Printed: _____ Date imprimée: _____

o Verify all dimensions and site conditions and be responsible for same
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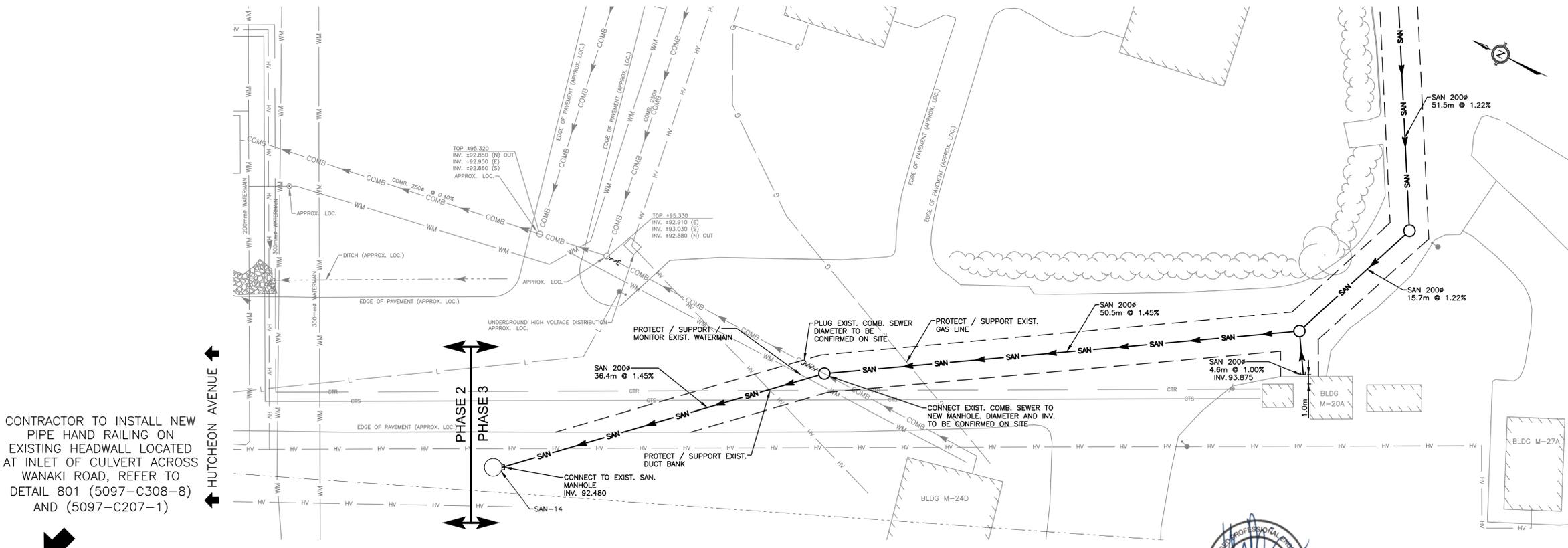


project: **SANITARY AND STORM SEWER SEPARATION**

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: **PHASE 3 - PLAN VIEW AND PROFILE ALIGNMENT M-20**

designed	conçu	date	date
JSAUVE	JSAUVE	SEPTEMBER 2017	SEPTEMBER 2017
drawn	dessiné	scale	échelle
JSAUVE	JSAUVE	H 1:250 V 1:50	H 1:250 V 1:50
checked	vérifié	sheet	of/de
HBISSON	HBISSON	3	of/de 6
approved	approuvé	W.O.no.	D.T.no.
HBISSON	HBISSON	-	-
dwg.no.	dessin no.		
5097-C307-3	5097-C307-3		



CONTRACTOR TO INSTALL NEW PIPE HAND RAILING ON EXISTING HEADWALL LOCATED AT INLET OF CULVERT ACROSS WANAKI ROAD, REFER TO DETAIL 801 (5097-C308-8) AND (5097-C207-1)

MANHOLE #	TYPE	SIZE	TOP	INVERT	SPECIAL
SAN-12*	SAN	900#	97.300	95.755 95.725 OUT	BENCHING
SAN-12A	SAN	1200#	96.395	94.715 94.655 OUT	BENCHING
SAN-13	SAN	1200#	96.010	94.025 93.995 OUT	BENCHING
SAN-13A	SAN	1200#	96.080	93.800 (E) 93.830 (S) 93.770 OUT	BENCHING
SAN-13B	SAN	1200#	95.395	93.040 (S) 93.010 OUT EXIST. (SW)	BENCHING

* SAMPLING MANHOLE

NOTES:

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- PROJECT DESIGN IS INVERT SENSITIVE.
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NOTE OF CAUTION

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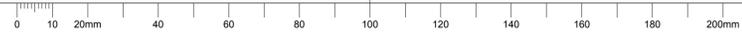
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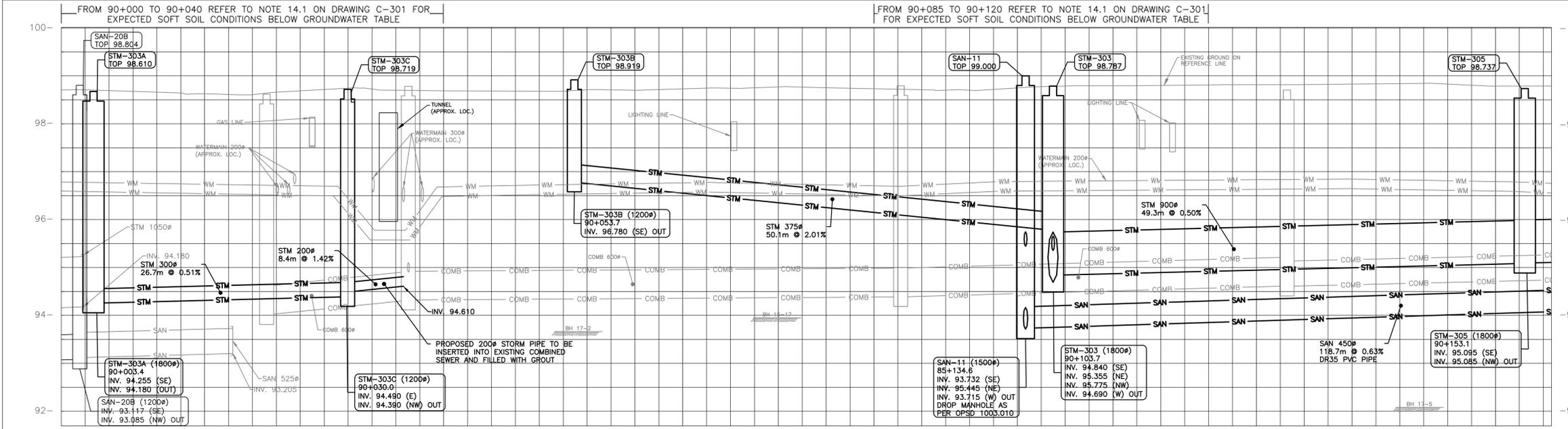
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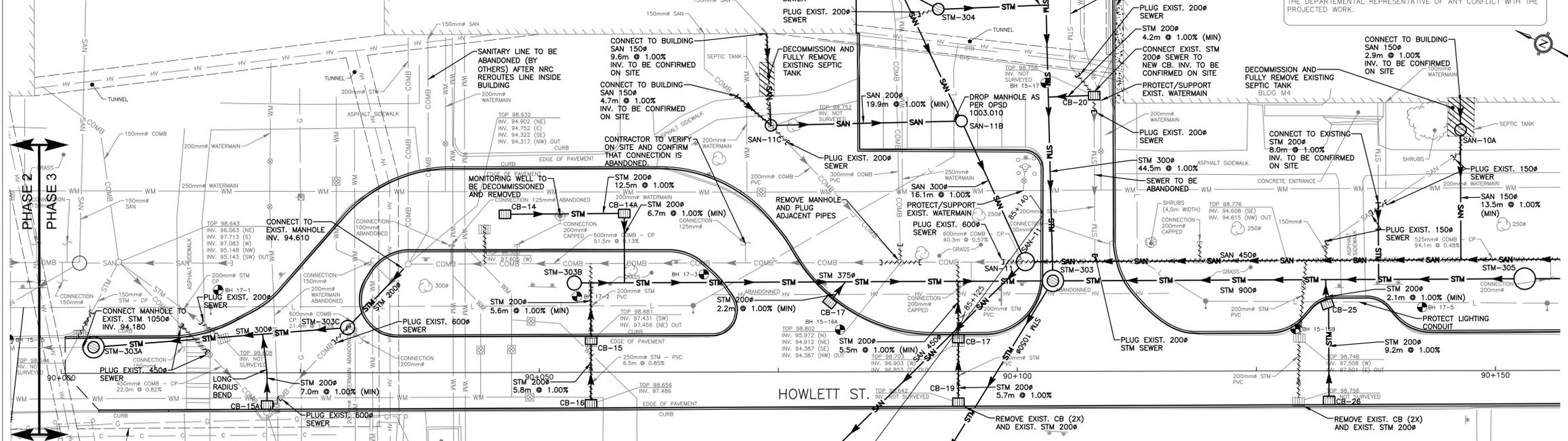
CERTAIN UNDERGROUND FEATURES ON PRIVATE PROPERTY ARE NOT SHOWN ON THE CURRENT DRAWING.





MANHOLE #	TYPE	SIZE	TOP	INVERT	SPECIAL
CB-14	STM	600 X 600	98.520	97.120	SUMP
CB-14A	STM	600 X 600	98.520	96.995 96.935 (OUT)	SUMP
CB-15	STM	600 X 600	98.680	97.200 97.190 (OUT)	SUMP
CB-15A	STM	600 X 600	98.600	97.200	SUMP
CB-16	STM	600 X 600	98.655	97.255	SUMP
CB-17	STM	600 X 600	98.820	97.420	SUMP
CB-18	STM	600 X 600	98.705	97.185 97.175 (OUT)	SUMP
CB-19	STM	600 X 600	98.640	97.240	SUMP
CB-20	STM	600 X 600	98.695	97.295	SUMP

* SAMPLING MANHOLE



MANHOLE #	TYPE	SIZE	TOP	INVERT	SPECIAL
CB-25	STM	600 X 600	98.730	97.260 97.250 (OUT)	SUMP
CB-26	STM	600 X 600	98.750	97.350	SUMP
STM-305A	STM	1200#	98.900	96.090(N) 95.900(SE) 95.800(SW) (OUT)	SUMP
STM-304	STM	1200#	98.600	95.945 95.845 (OUT)	SUMP

* SAMPLING MANHOLE

SAN-11A*	SAN	1200#	98.775	95.970 NW 95.970 NE 95.800 (OUT)	BENCHING
SAN-11B	SAN	1200#	98.850	95.615 (N) 96.690 (NW) 95.605 (OUT)	BENCHING DROP MANHOLE (OPSS 1003.010)
SAN-11C*	SAN	1200#	98.750	96.950 (NE) 96.950 (N) 96.890 (OUT)	BENCHING
SAN-10A*	SAN	900#	98.910	96.910 96.900 (OUT)	BENCHING

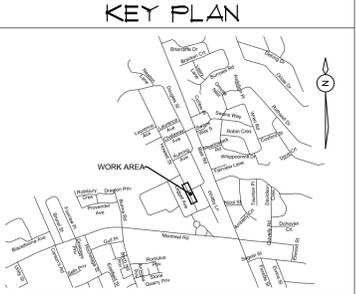
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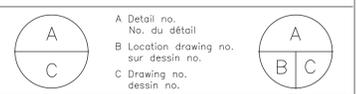
NRC - CNRC
National Research Council Canada / Conseil national de recherches Canada
Administrative Services and Property Management / Division des services administratifs et gestion de l'immobilier
A000646
CIMA
Partners in excellence
110-340 Catherine Street
Ottawa ON K2P 2S8
Phone: 613 860-2462
Fax: 613 860-1970
www.cima.ca

- GENERAL NOTES**
- CONTRACTORS TO CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO DEMOLITION OR CONSTRUCTION AND REPORT ANY ERRORS OR OMISSIONS TO DEPARTMENTAL REPRESENTATIVE.
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 - MAKE GOOD ALL SURFACES AFFECTED BY THIS WORK.
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No.	Date	Revision	By:	For:
1	2018-04-27	ISSUED FOR TENDER		HB
6	2018-04-17	ISSUED FOR CLIENT REVIEW		
5	2017-11-14	ISSUED FOR TENDER		
4	2017-09-28	ISSUED FOR FINAL DESIGN (100%)		
3	2017-06-06	APPROVAL 100%		
2	2017-04-11	APPROVAL 90%		
1	2017-01-23	PRELIMINARY 60%		

- Verify all dimensions and site conditions and be responsible for same
- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité



project: **SANITARY AND STORM SEWER SEPARATION**
1200 MONTREAL ROAD CAMPUS OTTAWA, ONTARIO
drawing: **PHASE 3 - PLAN VIEW AND PROFILE ALIGNMENT 'E' 90+000 TO 90+150**

designed	conçu	date	date
J.SAUVÉ		SEPTEMBER 2017	
drawn	dessiné	scale	échelle
J.SAUVÉ		H 1:250 V 1:50	
checked	vérifié	sheet	feuille
H.BISSON		4 of/de 6	
approved	approuvé	W.O.no.	D.T.no.
H.BISSON		-	
dwg.no.	dessin no.		
5097-C307-4			



- NOTES:**
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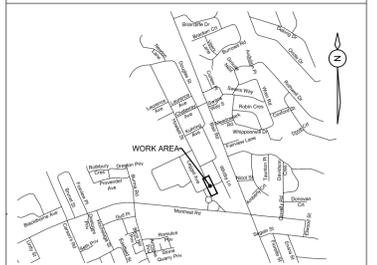
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SCALE 1:250



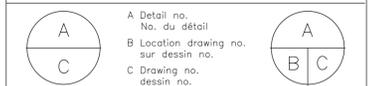
KEY PLAN



No.	Date	Revision	By:
1	2018-04-21	ISSUED FOR TENDER	HB
6	2018-04-11	ISSUED FOR CLIENT REVIEW	-
5	2017-11-14	ISSUED FOR TENDER	-
4	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-
3	2017-06-05	APPROVAL 100%	-
2	2017-04-11	APPROVAL 30%	-
1	2017-01-23	PRELIMINARY 60%	-

Date Printed: _____ Date imprimée: _____

- Verify all dimensions and site conditions and be responsible for same
- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité



project: _____ project

SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

PHASE 3 - PLAN VIEW AND PROFILE
 ALIGNMENT "E"
 90+150 TO 90+300

designed: **JSAUVE** congru date: **SEPTEMBER 2017** date

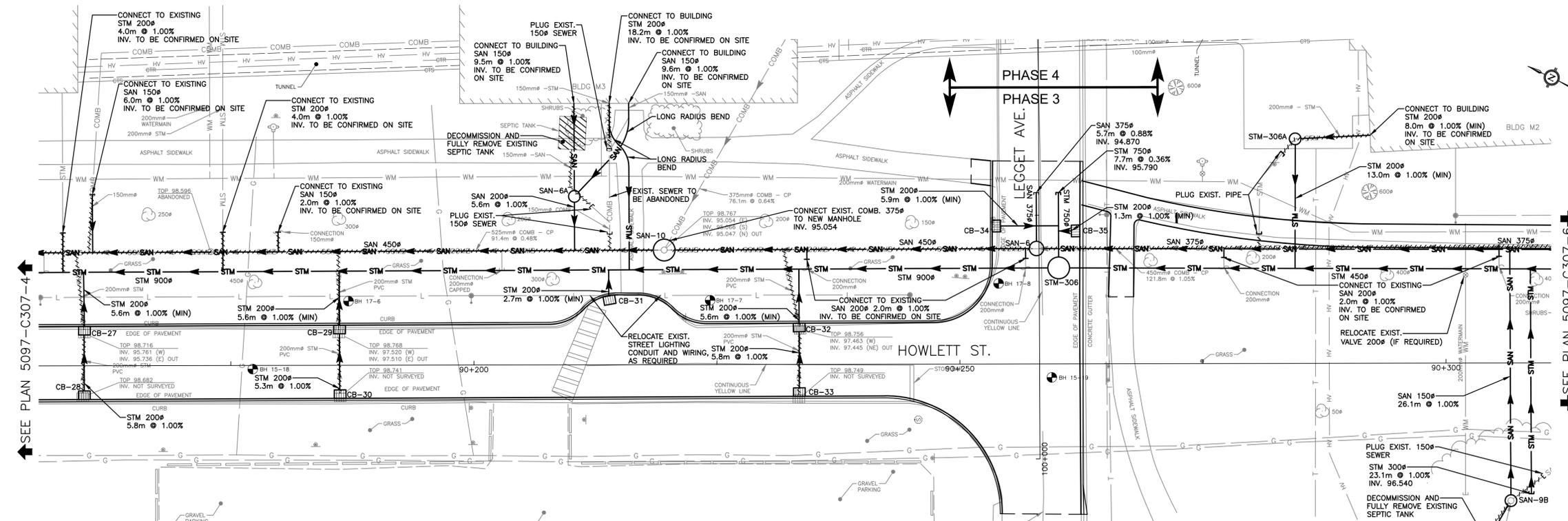
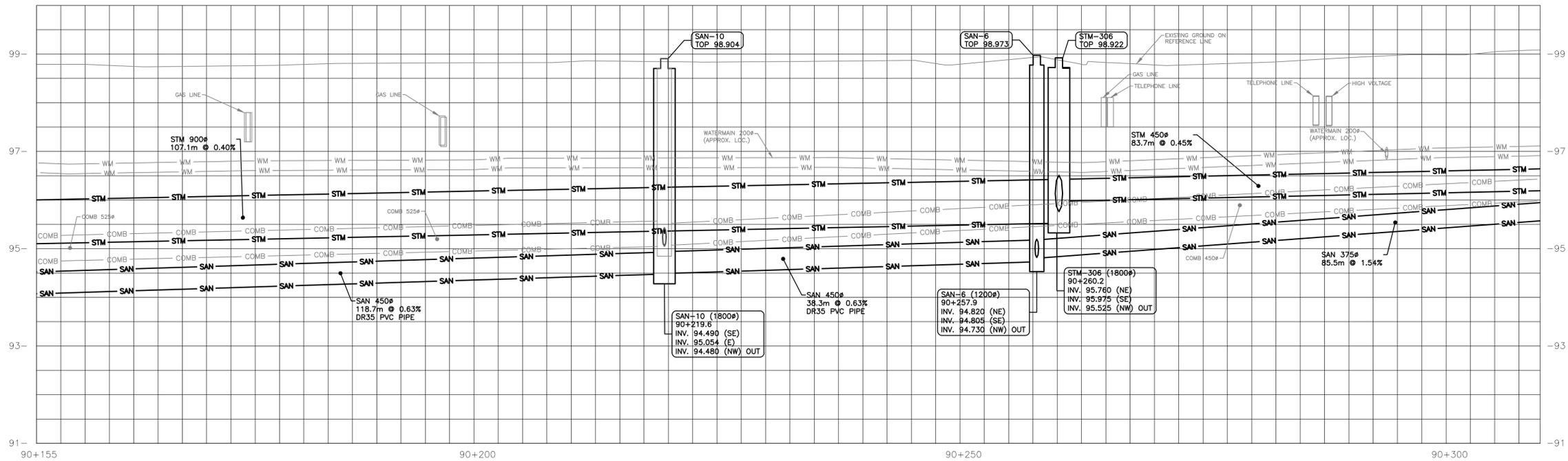
drawn: **JSAUVE** dessinée scale: **H 1:250 V 1:50** échelle

checked: **HBISSON** vérifiée sheet: **5** of/de **6** feuille

approved: **HBISSON** approuvé W.O.no.: _____ D.T.no.: _____

dwg.no.: _____ dessin no.: _____

5097-C307-5



MANHOLE #	TYPE	SIZE	TOP	INVERT	SPECIAL
CB-27	STM	600 X 600	98.715	97.225 (SW) 97.215 (OUT)	SUMP
CB-28	STM	600 X 600	98.680	97.280	SUMP
CB-29	STM	600 X 600	98.765	97.285 (SW) 97.275 (OUT)	SUMP
CB-30	STM	600 X 600	98.740	97.340	SUMP
CB-31	STM	600 X 600	98.750	97.350	SUMP
CB-32	STM	600 X 600	98.755	97.290 (SW) 97.280 (OUT)	SUMP
CB-33	STM	600 X 600	98.750	97.350	SUMP
CB-34	STM	600 X 600	98.885	97.485	SUMP
CB-35	STM	600 X 600	98.885	97.485	SUMP

MANHOLE #	TYPE	SIZE	TOP	INVERT	SPECIAL
SAN-6A*	SAN	Ø900	98.775	96.775 (E) 96.775 (NE) 96.745 (SW)(OUT)	BENCHING
SAN-9B*	SAN	Ø900	99.210	97.210 (W) 97.180 (NE)(OUT)	BENCHING
STM-306A	STM	Ø1200	98.975	96.665 (SE) 96.695 (SW)(OUT)	SUMP

- * SAMPLING MANHOLE
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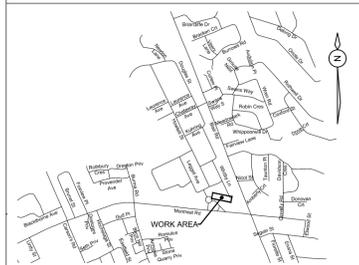
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SCALE 1:250



KEY PLAN



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5	2017-11-14	ISSUED FOR TENDER	-
4	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-
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2	2017-04-11	APPROVAL 90%	-
1	2017-01-23	PRELIMINARY 60%	-

Date Printed: _____ Date imprimée: _____

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project: **SANITARY AND STORM SEWER SEPARATION** project

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

PHASE 3 - PLAN VIEW AND PROFILE
 ALIGNMENT "E"
 90+300 TO 90+450

designed: **JSAUVE** congru date: **SEPTEMBER 2017** date

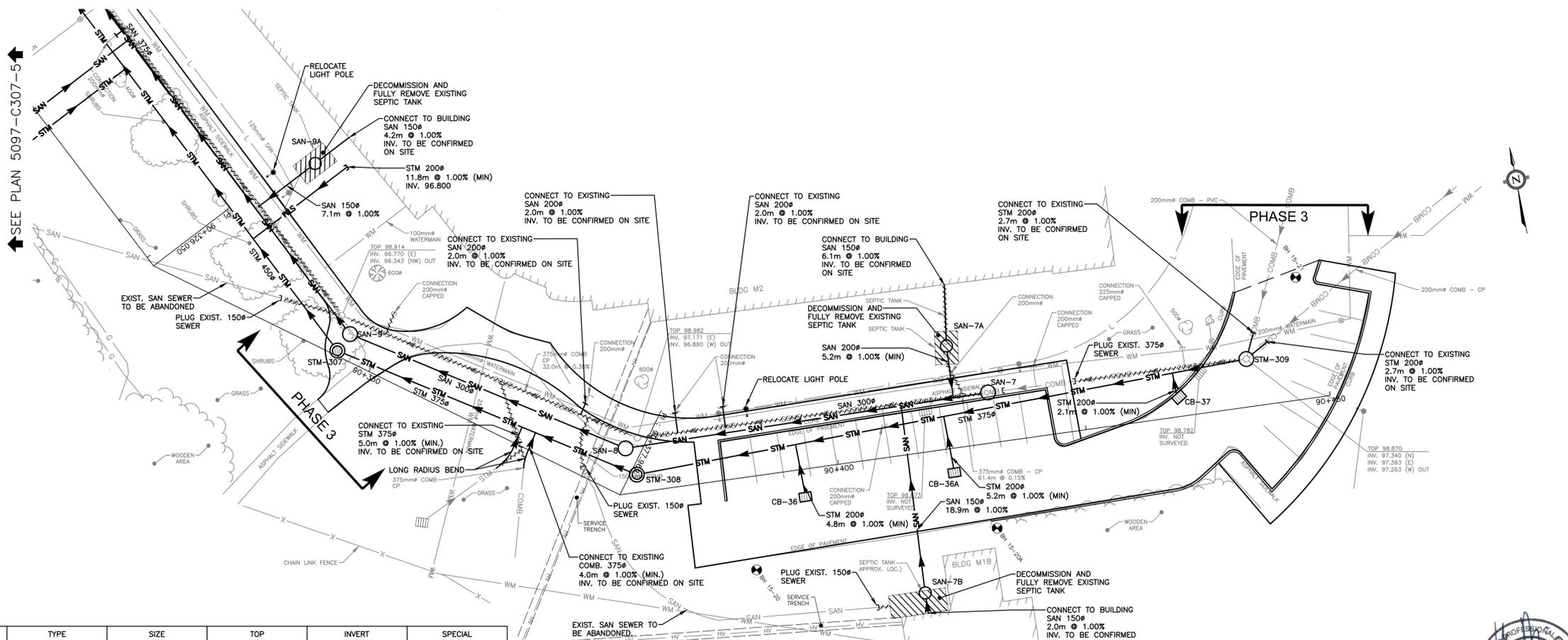
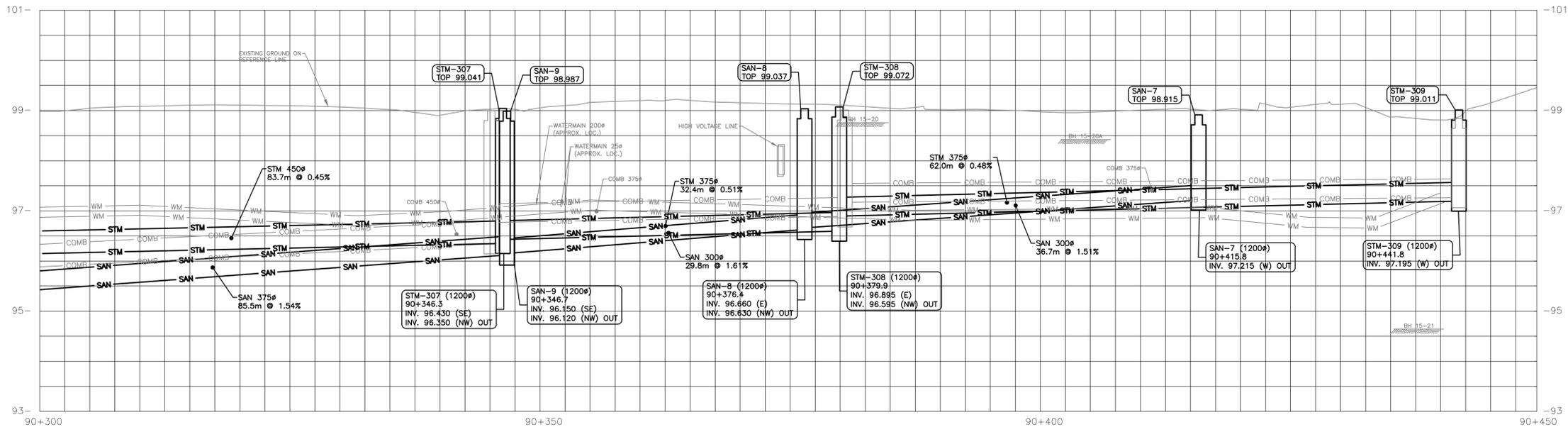
drawn: **JSAUVE** dessin# scale: **H 1:250 V 1:50** échelle

checked: **HBISSON** vérifié sheet: **6** of/de **6** feuille

approved: **HBISSON** approuvé W.O.no. _____ D.T.no. _____

dwg.no. _____ dessin no. _____

5097-C307-6



MANHOLE #	TYPE	SIZE	TOP	INVERT	SPECIAL
CB-36	STM	600 X 600	98.790	97.590	SUMP
CB-36A	STM	600 X 600	98.790	97.590	SUMP
CB-37	STM	600 X 600	98.800	97.600	SUMP
SAN-9A*	SAN	Ø900	99.055	97.055 97.045 (OUT)	BENCHING
SAN-7A*	SAN	Ø900	99.040	97.440 97.430 (OUT)	BENCHING
SAN-7B*	SAN	Ø900	100.870	98.870 97.800 (OUT)	DROP MH (OPSS 1003.010)

* SAMPLING MANHOLE

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GENERAL NOTES

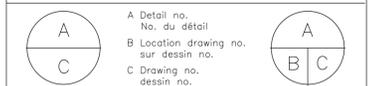
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KEY PLAN

No.	Date	Revision	By:
3	2018-04-27	ISSUED FOR TENDER	HB
2	2017-11-14	ISSUED FOR TENDER	-
1	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-

Date Printed: _____ Date imprimée: _____

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project: _____ projet: _____

SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing: _____ dessin: _____

PHASE 3 - DETAILS

designed: **JSAUVE** conçu: _____ date: **FEBRUARY 2017** date: _____

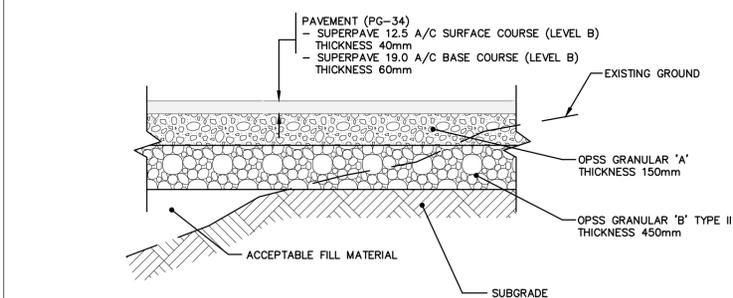
drawn: **JSAUVE** dessiné: _____ scale: **NTS** échelle: _____

checked: **HBISSON** vérifié: _____ sheet: **1** of/de **8** feuille: _____

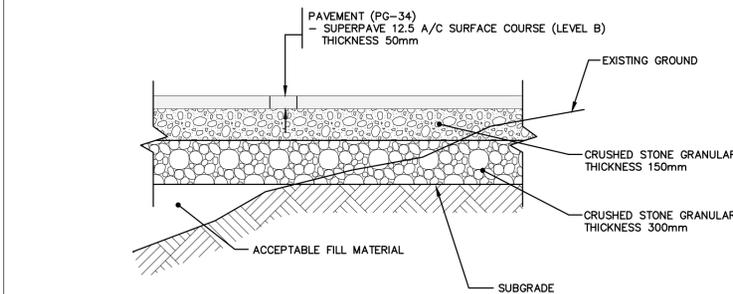
approved: **HBISSON** approuvé: _____ W.O.no.: _____ D.T.no.: _____

dwg.no.: _____ dessin no.: _____

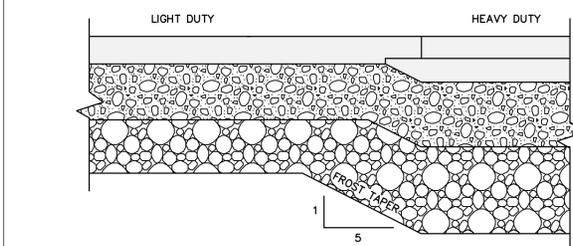
5097-C308-1



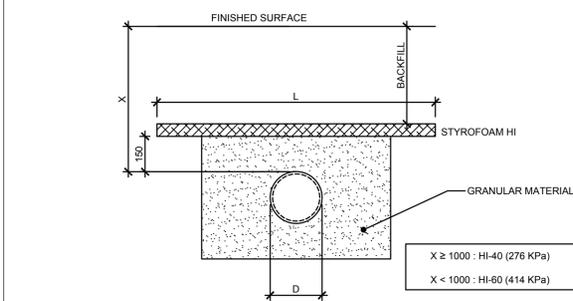
202 TYPICAL SECTION - GRANULAR FOUNDATION AND ASPHALT PAVEMENT HEAVY DUTY (ROADS)



203 TYPICAL SECTION - GRANULAR FOUNDATION AND ASPHALT PAVEMENT LIGHT DUTY (PARKING)



205 TYPICAL SECTION - TRANSITION BETWEEN DIFFERING PAVEMENT STRUCTURES

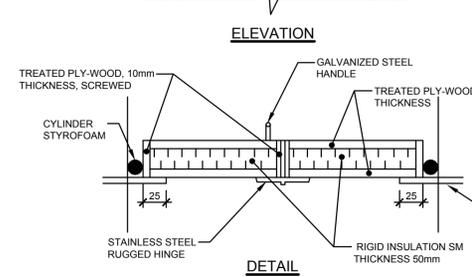
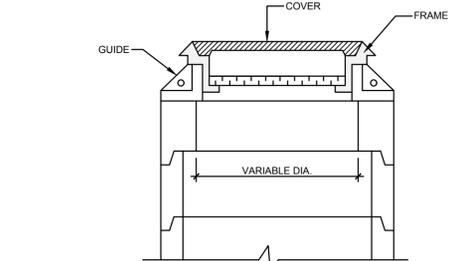
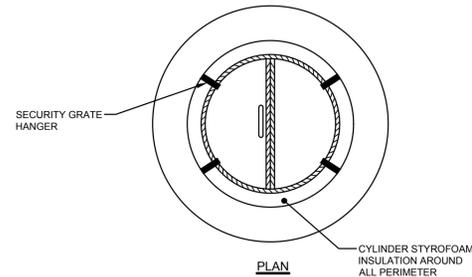


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750	2250	2300	2350	2400	2500	2600	2700
1000	1750	1800	1850	1900	2000	2100	2200
1250	1250	1300	1350	1400	1500	1600	1700
1500	750	800	850	900	1000	1100	1200
1750	600	600	600	600	600	600	700

L= INSULATION WIDTH (mm)
 D= PIPE DIAMETER (mm)

314A

PIPE INSULATION (1.8m-COVER)

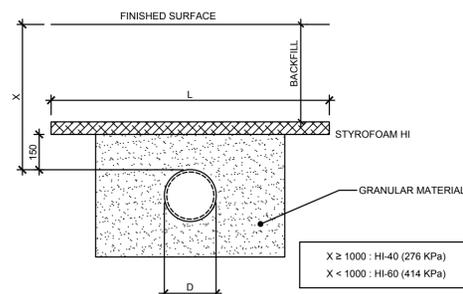
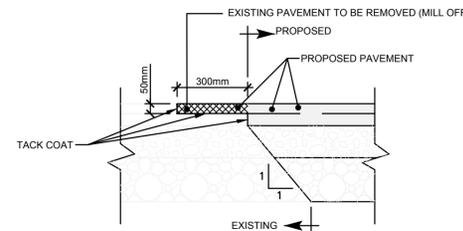


306

INSULATED MANHOLE COVER

206

TYPICAL SECTION - TRANSITION BETWEEN EXISTING AND PROPOSED PAVEMENT



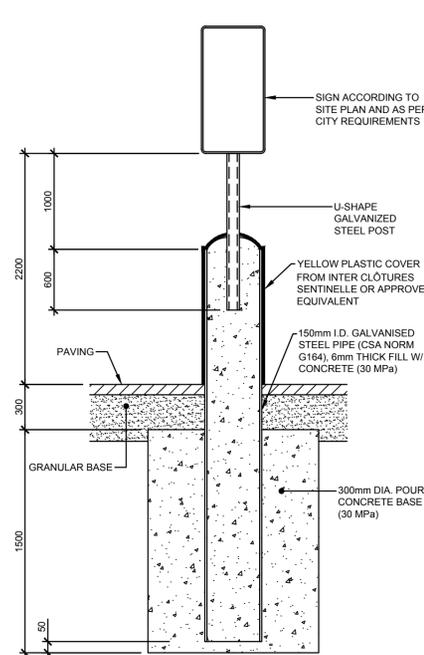
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1250	650	700	750	800	900	1000	1100
1450	650	600	600	600	600	600	700

L= INSULATION WIDTH (mm)
 D= PIPE DIAMETER (mm)

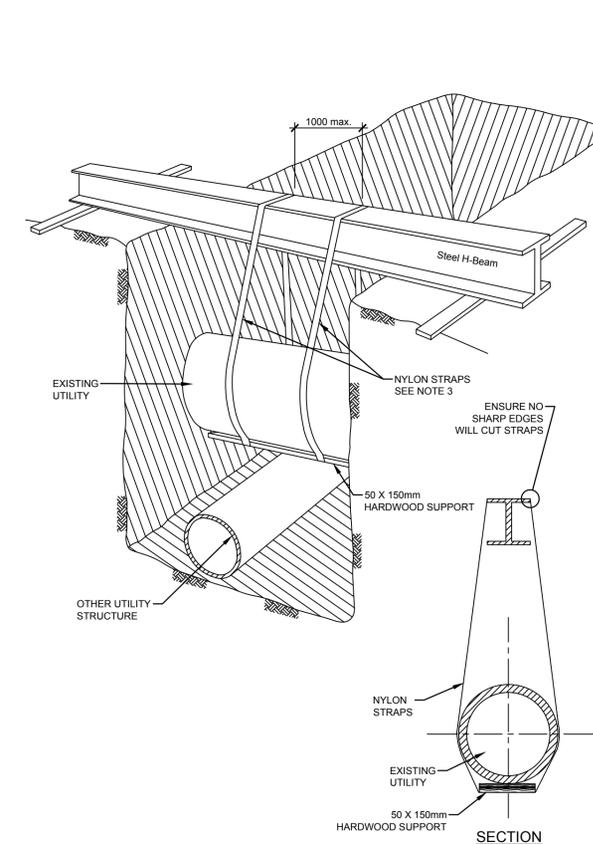
X ≥ 1000 : HI-40 (276 KPa)	100
X < 1000 : HI-60 (414 KPa)	100
X < 1000 : HI-60 (414 KPa)	75

314F

PIPE INSULATION (1.5m-COVER)



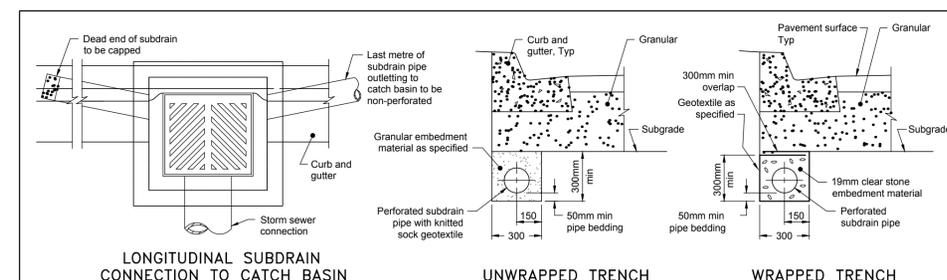
402 BOLLARD SIGN



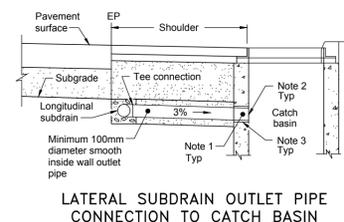
337

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
 - THE UNSUPPORTED LENGTH OF THE EXISTING UTILITY SHALL NOT EXCEED 1000mm.
 - STRAPS MUST MEET THE REQUIREMENTS OF THE O.H.S.A. CHAINS ARE NOT PERMITTED.

TEMPORARY SUPPORT FOR EXISTING UTILITY

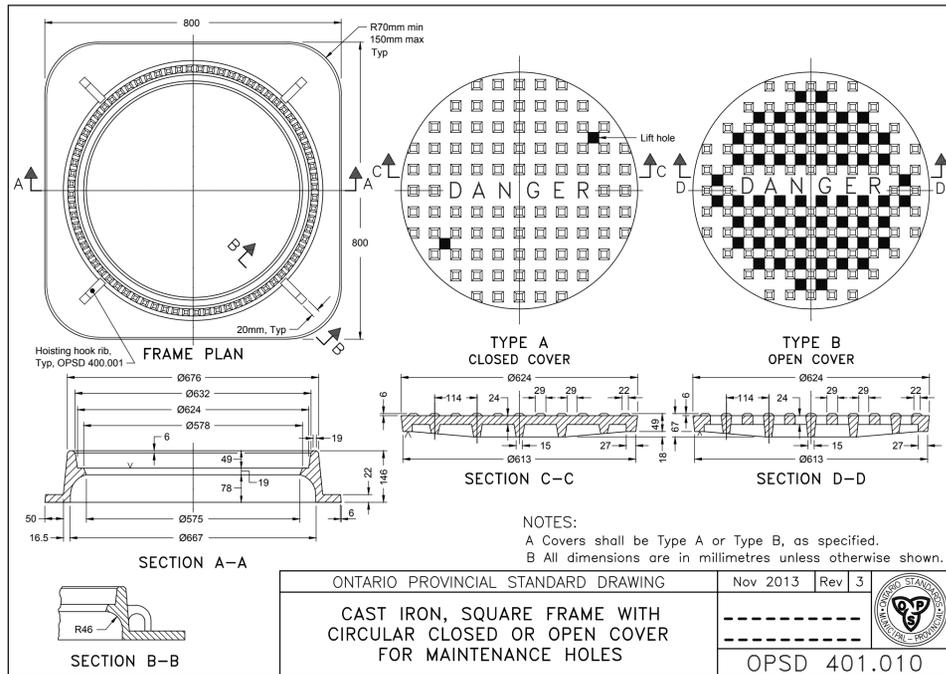


- NOTES:**
- Core hole diameter to allow outlet pipe into structure.
 - Install outlet pipe flush with inside face of catch basin.
 - Annular space around pipe to be filled with non-shrink grout.
- A Use compatible manufactured fittings for all connectors, couplings, and caps.
 B Trench dimensions shown to accommodate 100 or 150mm diameter subdrain pipe.
 C Longitudinal subdrain pipe shall be installed parallel to the grade of the gutter.
 D All dimensions are in millimetres unless otherwise shown.

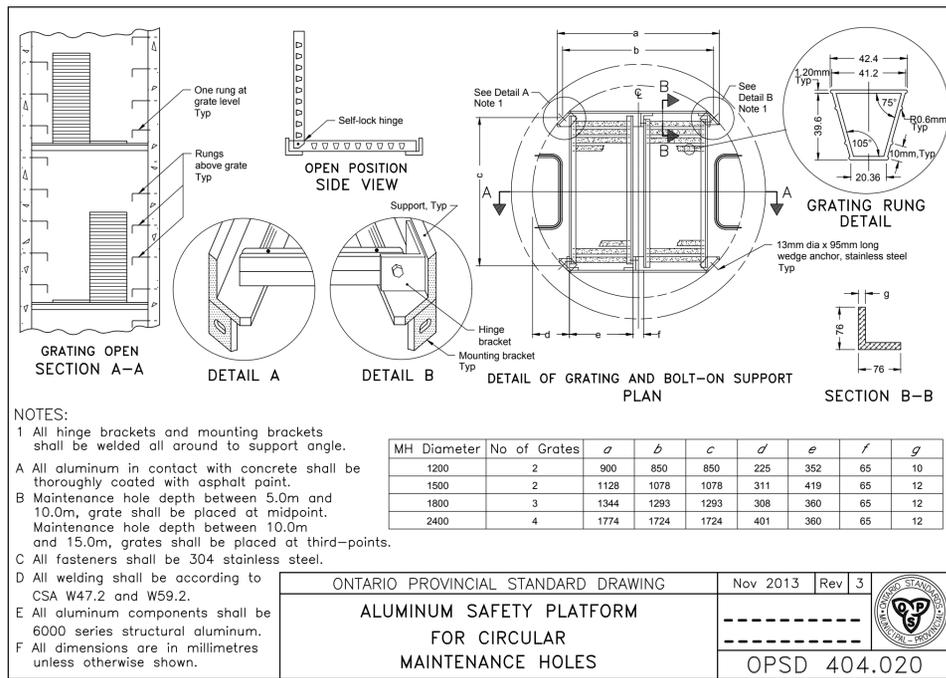


LATERAL SUBDRAIN OUTLET PIPE CONNECTION TO CATCH BASIN

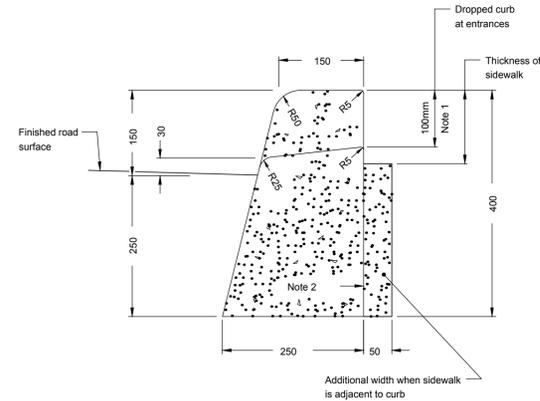
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2008	Rev 2
SUBDRAIN PIPE CONNECTION AND OUTLET URBAN		
OPSD 216.021		



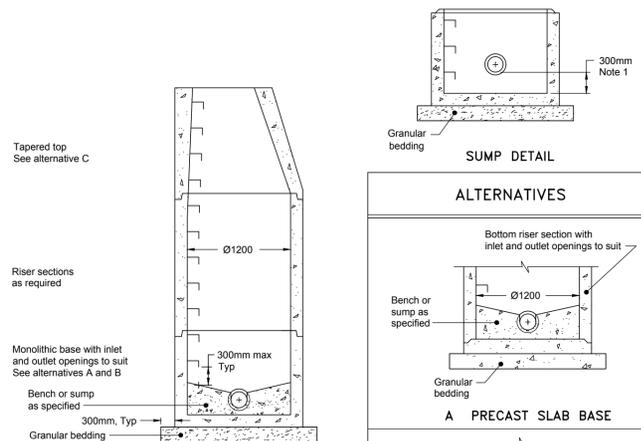
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2013	Rev 3	
CAST IRON, SQUARE FRAME WITH CIRCULAR CLOSED OR OPEN COVER FOR MAINTENANCE HOLES			
	OPSD 401.010		



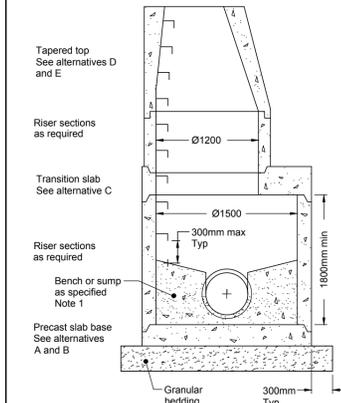
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2013	Rev 3	
ALUMINUM SAFETY PLATFORM FOR CIRCULAR MAINTENANCE HOLES			
	OPSD 404.020		



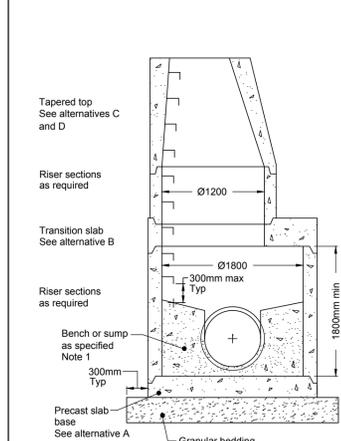
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2	
CONCRETE BARRIER CURB			
	OPSD 600.110		



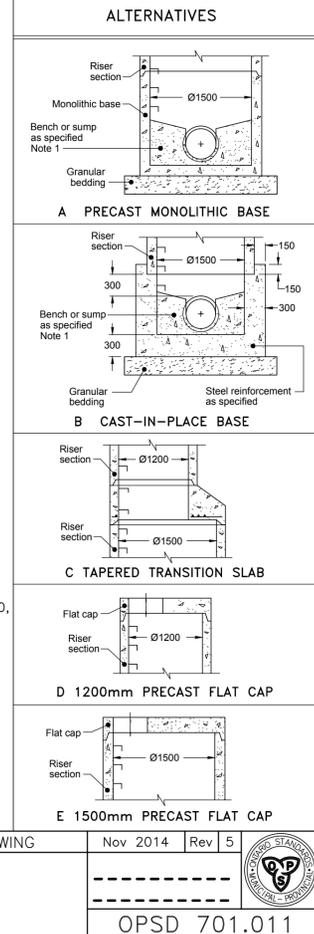
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5	
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER			
	OPSD 701.010		



ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5	
PRECAST CONCRETE MAINTENANCE HOLE 1500mm DIAMETER			
	OPSD 701.011		



ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5	
PRECAST CONCRETE MAINTENANCE HOLE 1800mm DIAMETER			
	OPSD 701.012		



NRC - CNRC
 National Research Council Canada / Conseil national de recherches Canada
 Administrative Services and Property Management Branch / Division des services administratifs et gestion de l'immobilier

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 Partenaire de génie / 420, boul. Mackenzie Est, bureau 201, Gatineau QC, J8P 1E7
 Téléphone : 819 663-0294 / Télécopie : 819 663-0084
 www.cima.ca

- GENERAL NOTES**
- CONTRACTORS TO CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO DEMOLITION OR CONSTRUCTION AND REPORT ANY ERRORS OR OMISSIONS TO DEPARTMENTAL REPRESENTATIVE.
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KEY PLAN

3	2018-04-21	ISSUED FOR TENDER	HB
2	2017-11-14	ISSUED FOR TENDER	-
1	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-

Date Printed: _____ Date imprimée: _____

o Verify all dimensions and site conditions and be responsible for same.
 o Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité

SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS OTTAWA, ONTARIO

drawing: PHASE 3 - DETAILS dessin: _____

designed	conçu	date	date
J.SAUVÉ		FEBRUARY 2017	
drawn	dessiné	scale	échelle
J.SAUVÉ		NTS	
checked	vérifié	sheet	feuille
H.BISSON		3 of/ de 8	
approved	approuvé	W.O.no.	D.T.no.
H.BISSON		-	-
dwg.no.			dessin no.
5097-C308-3			

ALTERNATIVES

A CAST-IN-PLACE BASE

B 1200mm PRECAST FLAT CAP

C 2400mm PRECAST FLAT CAP

NOTES:
 1 For sump detail, see OPSD 701.010.
 A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
 B Precast concrete components shall be according to OPSD 701.030, 701.031, 701.060, 701.061, 703.013, 703.023, 706.030 and 706.031.
 C Structures exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
 D Pipe support shall be according to OPSD 708.020.
 E For benching and pipe opening details, see OPSD 701.021.
 F For adjustment unit and frame installation, see OPSD 704.010.
 G All dimensions are nominal.
 H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 5

PRECAST CONCRETE MAINTENANCE HOLE
2400mm DIAMETER

OPSD 701.013

ALTERNATE STANDARD HEIGHTS

ALTERNATIVE	DIMENSION
A	1980
B	1830
C	1520
D	1380

PLAN

SECTION A-A

SECTION B-B

NOTES:
 1 Outlet hole size 525mm diameter maximum, location as required.
 2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
 A. Centre reinforcing in base slab and walls ≥ 20 mm.
 B. Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
 C. Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
 D. Pipe support shall be according to OPSD 708.020.
 E. All dimensions are nominal.
 F. All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 3

PRECAST CONCRETE CATCH BASIN
600x600mm

OPSD 705.010

ALTERNATIVES

A CAST-IN-PLACE BASE

B 1200mm PRECAST FLAT CAP

C 3000mm PRECAST FLAT CAP

NOTES:
 1 For sump detail, see OPSD 701.010.
 A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
 B Precast concrete components shall be according to OPSD 701.030, 701.031, 701.070, 701.071, 703.014, 703.024, 706.040 and 706.041.
 C Structures exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
 D Pipe support shall be according to OPSD 708.020.
 E For benching and pipe opening details, see OPSD 701.021.
 F For adjustment unit and frame installation, see OPSD 704.010.
 G All dimensions are nominal.
 H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 4

PRECAST CONCRETE MAINTENANCE HOLE
3000mm DIAMETER

OPSD 701.014

MAINTENANCE HOLE BENCHING AND PIPE OPENING ALTERNATIVES

1. Right angle bend

2. Tee connection

3. Three way junction

4. Four way junction

5. Straight through

6. Dead end

7. Wye connection

8. 45° bend

Section

Maintenance Hole Diameter	No. 1-4			No. 5 and 6			No. 8		
	No. 1-4	No. 5 and 6	No. 8	Inlet Hole	Outlet Hole	No. 7	Inlet Hole	Outlet Hole	
1200	700	860	780	700	860				
1500	860	1220	960	860	1170				
1800	1220	1485	1220	1220	1485				
2400	1485	2020	1760	1485	2020				
3000	1930	2450	2300	1930	2450				
3600	2470	3085	2730	2470	3085				

NOTES:
 1 Slopes shall be maintained from the outlet hole opening for top of benching.
 A. Concrete for benching shall be 30MPa.
 B. When benching is hand-finished, it shall be given wood float finish, channel shall be given steel trowel finish.
 C. Benching slope and height shall be as specified.
 D. When specified, maintenance holes that are 1200mm in diameter with a uniform channel for 200 or 250mm pipe may be prebenched at the manufacturer with standardized benching slope and channel orientation.
 E. All dimensions are nominal.
 F. All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 4

MAINTENANCE HOLE BENCHING AND PIPE OPENING ALTERNATIVES

OPSD 701.021

CATCH BASIN CONNECTION FOR RIGID MAIN PIPE SEWER

CONNECTION WITHOUT RISER

CONNECTION WITH RISER

NOTES:
 1 For sewers smaller than 450mm dia, connections shall be made using approved factory made tees. For all other sizes, either factory made tees or approved saddles may be used.
 2 Riser bedding shall have a minimum width of catch basin connection outside diameter plus 600mm.
 A Approved cut-in tool shall be used for field installed tees and saddles.
 B Maintenance holes shall be used at the main sewer to connect catch basin connections greater than 300mm.
 C All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2011 Rev 2

CATCH BASIN CONNECTION FOR RIGID MAIN PIPE SEWER

OPSD 708.010

National Research Council Canada Conseil national de recherches Canada
 Administrative Services and Property Management Branch Division des services administratifs et gestion de l'immobilier

NRC - CNRC

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GENERAL NOTES

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KEY PLAN

No.	Date	Revision	By:
3	2018-04-27	ISSUED FOR TENDER	HB
2	2017-11-14	ISSUED FOR TENDER	-
1	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-

Date Printed: _____ Date imprimée: _____

o Verify all dimensions and site conditions and be responsible for same
 o Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité

Detail No. / No. du détail	Location drawing no. / sur dessin no.	Drawing no. / dessin no.
A	A	A
B	B	B
C	C	C

project: **SANITARY AND STORM SEWER SEPARATION** projet

1200 MONTREAL ROAD CAMPUS
OTTAWA, ONTARIO

drawing: **PHASE 3 - DETAILS** dessin

designed: **J.SAUVÉ** conçu date: **FEBRUARY 2017** date

drawn: **J.SAUVÉ** dessiné scale: **NTS** échelle

checked: **H.BISSON** vérifié sheet: **4** of/de **8** feuille

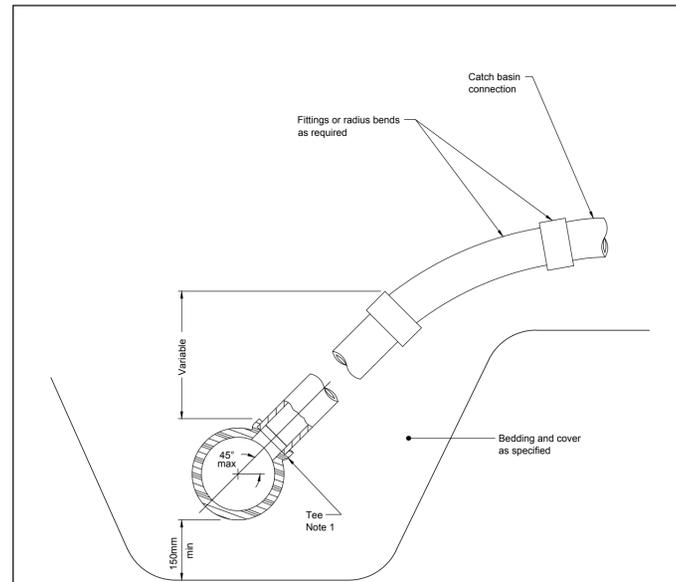
approved: **H.BISSON** approuvé W.O.no.: _____ D.T.no.: _____

dwg.no.: **5097-C308-4** dessin no.

GENERAL NOTES

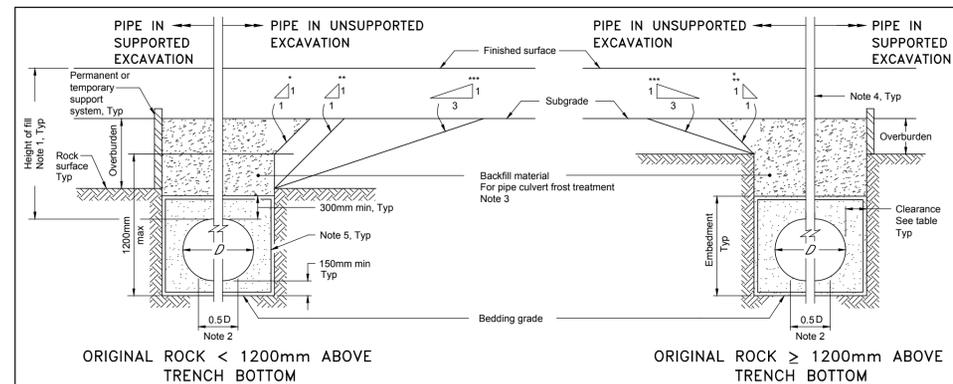
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KEY PLAN



- NOTES:**
- For catch basin connections 300mm in diameter or less, factory made tees shall be used.
 - For catch basin connections greater than 300mm, maintenance holes shall be used at the main sewer.
 - All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2011 Rev 2
CATCH BASIN CONNECTION FOR FLEXIBLE MAIN PIPE SEWER
 OPSD 708.030

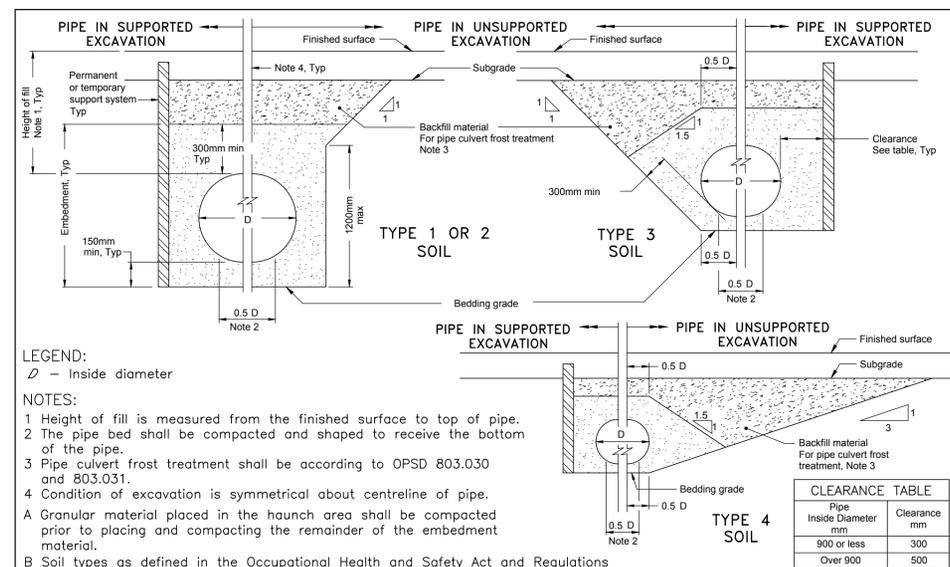


- NOTES:**
- Height of fill is measured from the finished surface to top of pipe.
 - The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
 - Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
 - Condition of excavation is symmetrical about centreline of pipe.
 - Embedment material shall be wrapped in non-woven geotextile when specified.

- LEGEND:**
- D - Inside diameter
 - * - Type 1 or 2 soil
 - ** - Type 3 soil
 - *** - Type 4 soil

Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL ROCK EXCAVATION
 OPSD 802.013



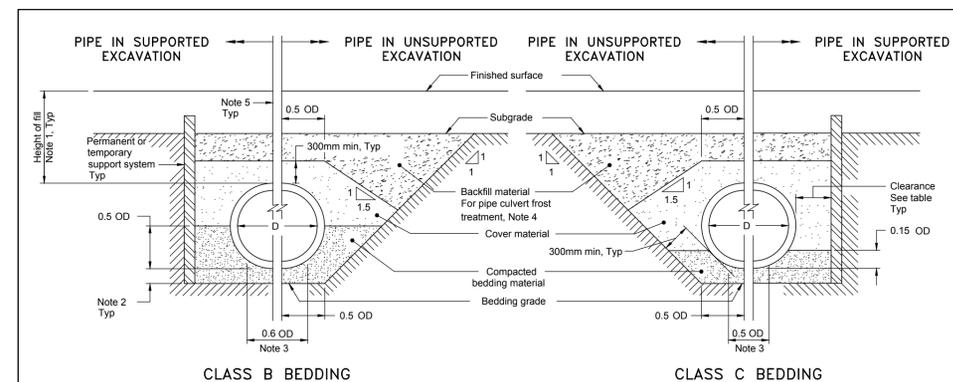
- LEGEND:**
- D - Inside diameter

- NOTES:**
- Height of fill is measured from the finished surface to top of pipe.
 - The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
 - Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
 - Condition of excavation is symmetrical about centreline of pipe.

- A** Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION
 OPSD 802.010

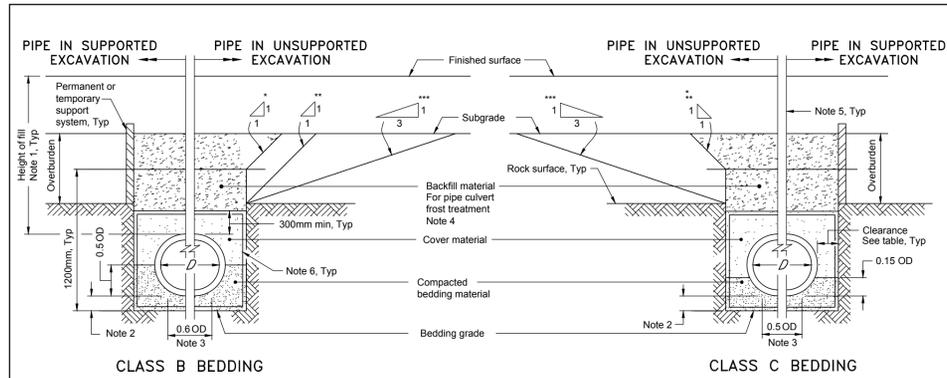


- NOTES:**
- Height of fill is measured from the finished surface to top of pipe.
 - The minimum bedding depth below the pipe shall be $0.15D$. In no case shall this dimension be less than 150mm or greater than 300mm.
 - The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
 - Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
 - Condition of excavation is symmetrical about centreline of pipe.

- LEGEND:**
- D - Inside diameter
 - OD - Outside diameter

Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2015 Rev 3
RIGID PIPE BEDDING, COVER, AND BACKFILL TYPE 3 SOIL - EARTH EXCAVATION
 OPSD 802.031

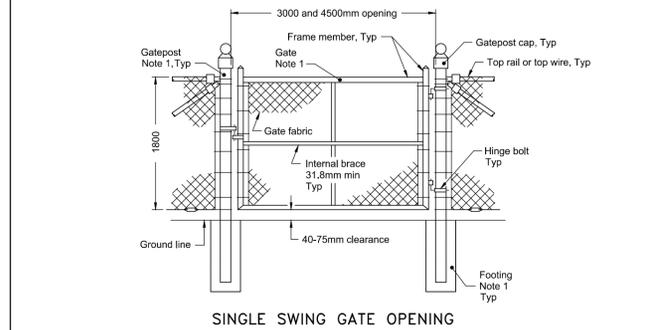
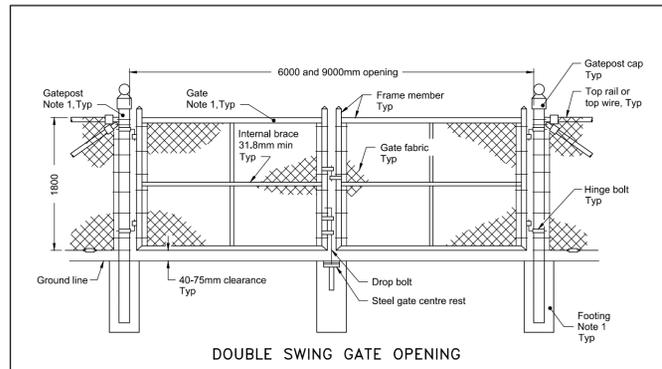


NOTES:
 1 Height of fill is measured from the finished surface to top of pipe.
 2 The minimum bedding depth below the pipe shall be 0.25D in no case shall this dimension be less than 150mm or greater than 300mm.
 3 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
 4 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
 5 Condition of excavation is symmetrical about centreline of pipe.
 6 Embedment material shall be wrapped in non-woven geotextile when specified.

LEGEND:
 D - Inside diameter
 OD - Outside diameter
 * - Type 1 or 2 soil
 ** - Type 3 soil
 *** - Type 4 soil

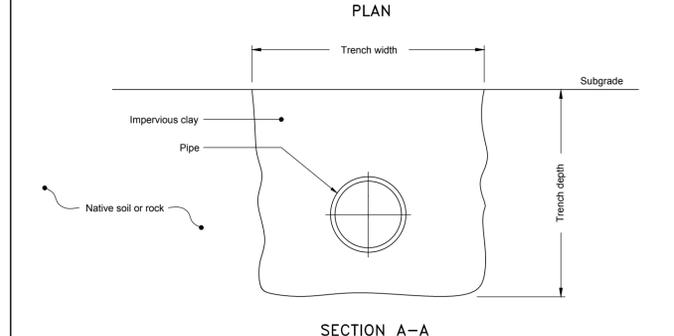
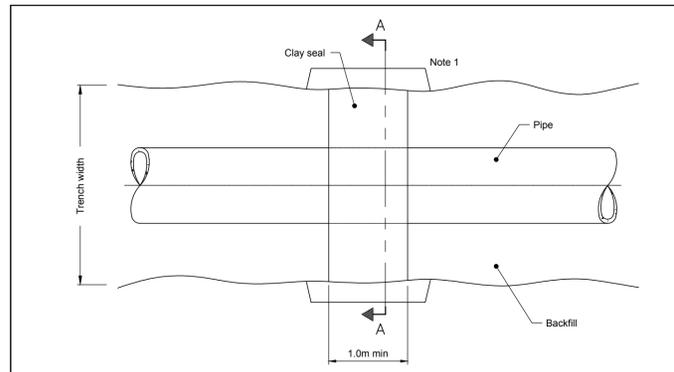
CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 3	
RIGID PIPE BEDDING, COVER, AND BACKFILL ROCK EXCAVATION			
			OPSD 802.033



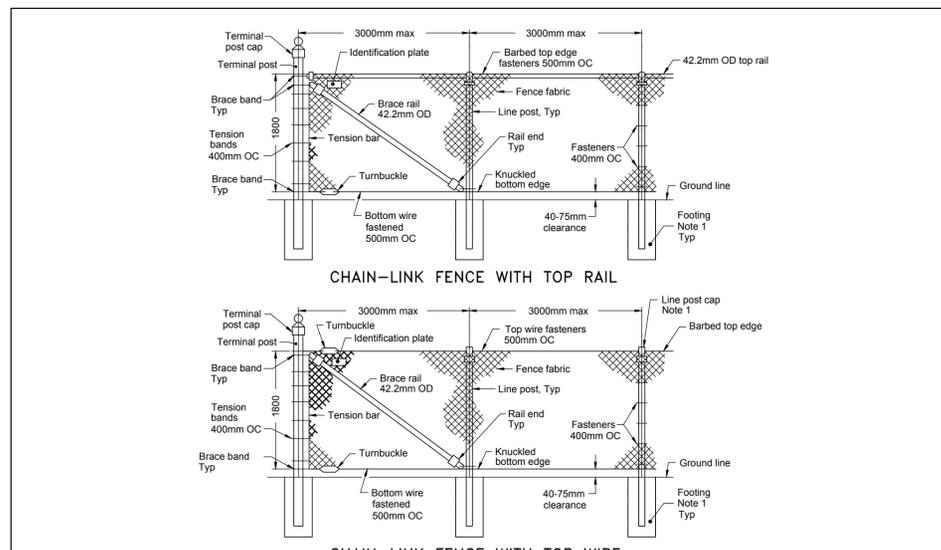
NOTES:
 1 For footing details and Gate and Gatepost Details Table refer to OPSD 972.132.
 A Gates as viewed from the roadway.
 B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2	
FENCE, CHAIN-LINK COMPONENT - GATE			
			OPSD 972.102



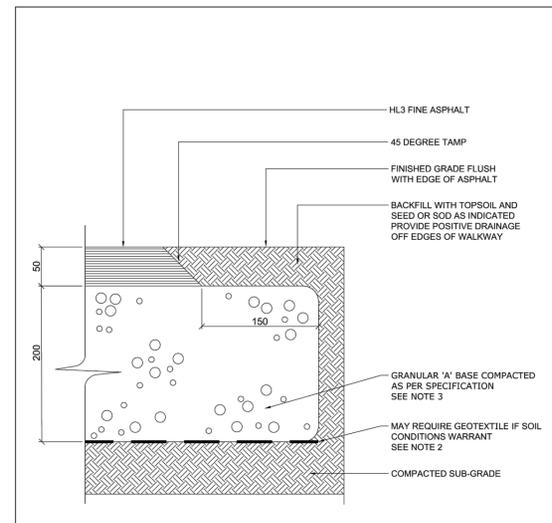
NOTES:
 1. Key into undisturbed trench soil.
 A Clay seal shall extend from bottom of trench excavation to the subgrade.
 B Clay seal shall be located so that no pipe joints are within the clay seal material.
 C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2011	Rev 1	
CLAY SEAL FOR PIPE TRENCHES			
			OPSD 802.095



NOTES:
 1 For footing details and line post cap detail refer to OPSD 972.132.
 A Fence as viewed from the roadway.
 B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2	
FENCE, CHAIN-LINK INSTALLATION - ROADWAY			
			OPSD 972.130



NOTE:
 1. ALL MEASUREMENTS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
 2. CROSS SLOPE SIDEWALK 1 TO 2% IN DIRECTION OF NATURAL DRAINAGE TO PROVIDE POSITIVE DRAINAGE OFF ALL WALKS.
 3. APPROVED NON-WOVEN CLASS 1 GEOTEXTILE AS PER MS-22.15 WHEN WARRANTED BY SOIL CONDITION, SUBJECT TO APPROVAL BY THE CONTRACT ADMINISTRATOR.
 4. GRANULAR 'A' SHALL MEET THE REQUIREMENTS OF OPSS 1010

TITLE:	ASPHALT WALKWAY	DATE:	FEB 2013
		REV:	FEB 2016
		DWG No:	SC20

GENERAL NOTES

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KEY PLAN



3	2018-04-21	ISSUED FOR TENDER	HB
2	2017-11-14	ISSUED FOR TENDER	-
1	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-

Date Printed: _____ Date imprimée: _____
 o Verify all dimensions and site conditions and be responsible for same
 o Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité



project: **SANITARY AND STORM SEWER SEPARATION** projet

1200 MONTREAL ROAD CAMPUS OTTAWA, ONTARIO

drawing: **PHASE 3 - DETAILS** dessin

designed: **J.SAUVÉ** conçu: **FEBRUARY 2017** date

drawn: **J.SAUVÉ** dessiné: **NTS** échelle

checked: **H.BISSON** vérifié: **6** of/de **8** feuille

approved: **H.BISSON** approuvé: **-** D.T.no.

dwg.no.: **5097-C308-6** dessin no.

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DETAIL A FOOTING IN EARTH
 60.3mm OD post
 88.9mm OD post
 114.3mm OD post
 Domed concrete
 Concrete
 25-50mm
 615
 1370
 1920

DETAIL B FOOTING IN SHALE, LOOSE OR FRIABLE ROCK, OR SOLID ROCK WITH MORE THAN 450mm OVERBURDEN
 Domed concrete
 Post
 Ground line
 Overburden
 Rock line
 If drilled, use non-shrink cement grout
 If excavated or blasted, use concrete
 840mm min
 50
 OD+25mm
 See Detail A

DETAIL C FOOTING IN SOLID ROCK LESS THAN 450mm OVERBURDEN
 Post
 Ground line
 Overburden
 Rock line
 Non-shrink cement grout
 450mm max
 380mm min
 OD+25mm

DETAIL D FOOTING IN RETAINING WALL
 Post
 Top of wall
 Steel post sleeve see table
 Non-shrink cement grout
 6.4mm thick steel plate cap welded to steel sleeve
 465
 40
 50

HOG RING TIE DETAIL
 Fence fabric
 Hog ring
 Fence fabric
 Top or bottom tension wire

MANUALLY FASTENED WIRE TIE DETAIL
 Line post or top rail
 Two 360 degree turns
 Wire tie
 Fence fabric

POWER FASTENED WIRE TIE DETAIL
 Line post or top rail
 Wire tie
 Bend down after twisted
 Fence fabric

62mm ID LINE POST CAP DETAIL
 010

Post/Frame Member Type	OD	Post Length		Wall Thickness	Nominal Weight kg/m (Note 2)
		Standard	Retaining Walls		
Line post	60.3	2.6	2.0	3.91	5.4
Terminal Post	88.9	2.9	2.3	5.49	11.3
Gates (Single 3.0m, Double 6.0m)	88.9	2.6	n/a	5.49	11.3
Frame Members	42.2	n/a	n/a	3.56	3.4
Gates (Single 4.5m, Double 9.0m)	114.3	2.9	n/a	6.02	16.1
Frame Members	48.3	n/a	n/a	3.68	4.0
Post Sleeves	88.9	n/a	0.455	5.49	11.3
Terminal Post	114.3	n/a	0.455	6.02	16.1

NOTES:
 1 All posts and frame members are Schedule 40, Regular Grade, steel pipe.
 2 The actual weight shall not vary by more than 10% of the nominal weight.
 A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2012 Rev 0
 FENCE, CHAIN-LINK DETAILS AND TABLE
 OPSD 972.132

KEY PLAN



PLAN
 75mm min Typ
 Note 2
 75mm min Typ
 Outlet pipe

SEWER ID	DROP PIPE ID
200	200
250	200
300	250
375	300

SECTION A-A
 650mm max
 300 mm o/c
 600mm min
 150 mm min
 Note 1
 Undisturbed ground
 Note 2

NOTES:
 1 Concrete shall be placed to undisturbed ground and the outside face of the maintenance hole, but there shall be a minimum of 150mm of 15MPa concrete around the drop pipe.
 2 Concrete shall be secured to the maintenance hole with 450mm long, 13mm diameter threaded rods and drilled expansion anchors down either side of the drop pipe at 300mm centres.
 A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2011 Rev 2
 CAST-IN-PLACE MAINTENANCE HOLE DROP STRUCTURE TEE
 OPSD 1003.010

PLAN
 75mm min Typ
 Note 2
 75mm min Typ
 Outlet pipe

SEWER ID	DROP PIPE ID
200	200
250	200
300	250
375	300

SECTION A-A
 650mm max
 300 mm o/c
 1200mm min
 150 mm min
 Note 1
 Undisturbed ground
 Note 2

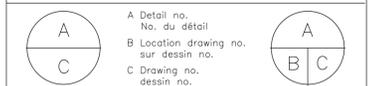
NOTES:
 1 Concrete shall be placed to undisturbed ground and the outside face of the maintenance hole, but there shall be a minimum of 150mm of 15MPa concrete around the drop pipe.
 2 Concrete shall be secured to the maintenance hole with 450mm long, 13mm diameter threaded rods and drilled expansion anchors down either side of the drop pipe at 300mm centres.
 A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2011 Rev 2
 CAST-IN-PLACE MAINTENANCE HOLE DROP STRUCTURE WYE
 OPSD 1003.020

No.	Date	Revision	By:	For:
3	2018-04-27	ISSUED FOR TENDER		HB
2	2017-11-14	ISSUED FOR TENDER		-
1	2017-09-28	ISSUED FOR FINAL DESIGN (100%)		-

Date Printed: _____ Date imprimée: _____

- Verify all dimensions and site conditions and be responsible for same
- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité



project / projet
SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

drawing / dessin
PHASE 3 - DETAILS

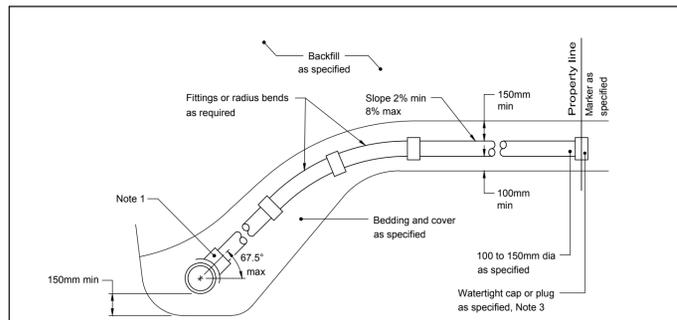
designed / conçu J.SAUVÉ date / date **FEBRUARY 2017**

drawn / dessiné J.SAUVÉ scale / échelle **NTS**

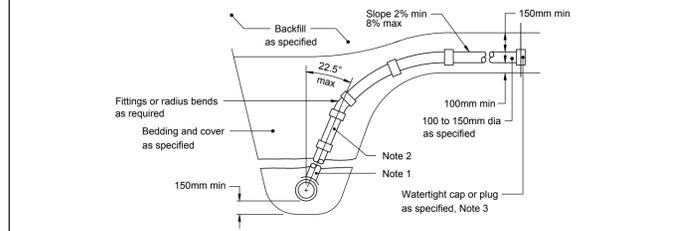
checked / vérifié H.BISSON sheet / feuille **7 of/de 8**

approved / approuvé H.BISSON W.O.no. / D.T.no. **-**

dwg.no. / dessin no. **5097-C308-7**



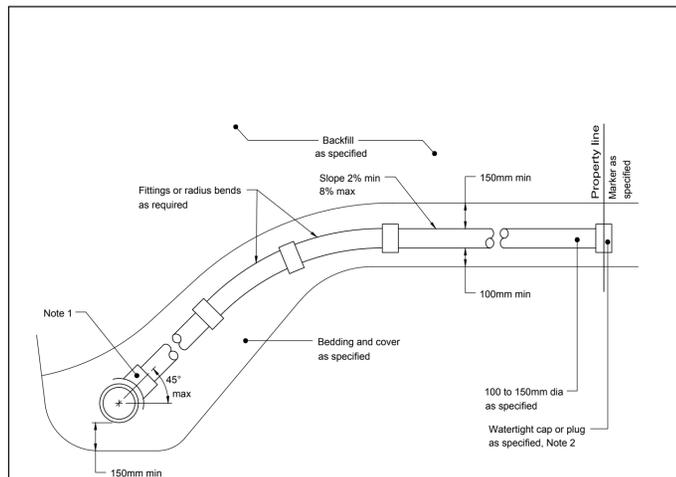
CONNECTION WITHOUT VERTICAL RISER



CONNECTION WITH VERTICAL RISER

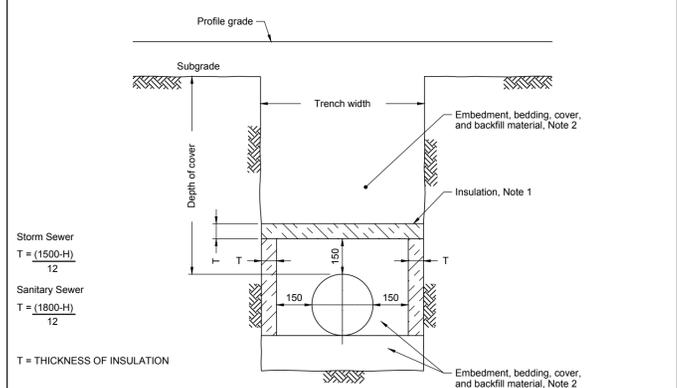
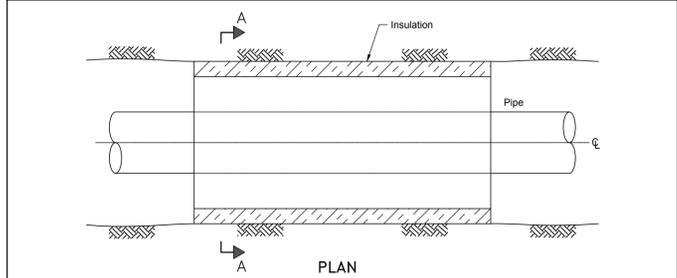
NOTES:
 1 Sewer service connections to the main pipe sewer shall be made using factory made tees, strap-on saddles, or other approved saddles.
 2 Vertical risers shall be as specified.
 3 Cap or plug at property line shall be adequately braced.
 A Maintenance holes shall be used at the main sewer to connect service connections greater than or equal to 200mm.
 B For new construction, saddles shall be installed on the main pipe before that pipe is laid.
 C Approved cut-in tool shall be used for field made connections.
 D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2011	Rev 2	
SEWER SERVICE CONNECTIONS FOR RIGID MAIN PIPE SEWER	OPSD 1006.010		



NOTES:
 1 Sewer service connections to the main pipe sewer shall be made using factory made tees or wyes, strap-on saddles, or other approved saddles.
 2 Cap or plug at property line shall be adequately braced.
 A Maintenance holes shall be used at the main sewer to connect service connections greater than or equal to 200mm.
 B For new construction, saddles shall be installed on the main pipe before that pipe is laid.
 C Approved cut-in tool shall be used for field made connections.
 D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2011	Rev 2	
SEWER SERVICE CONNECTIONS FOR FLEXIBLE MAIN PIPE SEWER	OPSD 1006.020		



NOTES:
 1 The insulation material shall be extruded polystyrene according to OPSS 1605 with a minimum compressive strength of 275 kPa.
 2 Pipe embedment or bedding, cover, and backfill shall be according to:
 a) Flexible OPSD 802.010, 802.013, 802.020, and 802.023
 b) Rigid - OPSD 802.030, 802.031, 802.032, 802.033, 802.050, 802.051, 802.052, and 802.053.
 A Minimum insulation thickness shall be 50mm.
 B Joints shall be staggered for multiple insulation sheets.
 C All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 0	
INSULATION FOR SEWERS AND WATERMANS IN SHALLOW TRENCHES	OPSD 1109.030		

GENERAL NOTES

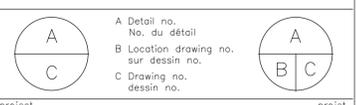
- CONTRACTORS TO CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO DEMOLITION OR CONSTRUCTION AND REPORT ANY ERRORS OR OMISSIONS TO DEPARTMENTAL REPRESENTATIVE.
- CONTRACTORS MUST VISIT THE SITE & FULLY FAMILIARIZE THEMSELVES WITH THE SCOPE OF THE WORK.
- PREVENT THE SPREAD OF DUST & DEBRIS BEYOND THE WORK AREA AND CLEAN ALL SURFACES AT COMPLETION.
- MAKE GOOD ALL SURFACES AFFECTED BY THIS WORK.
- COORDINATE ALL SHUTDOWNS WITH THE DEPARTMENTAL REPRESENTATIVE.
- PROVIDE ALL LABOUR AND MATERIAL REQUIRED TO FORM A COMPLETE FUNCTIONAL SYSTEM AS DESCRIBED ON DRAWINGS.

KEY PLAN



3	2018-04-21	ISSUED FOR TENDER	HB
2	2017-11-14	ISSUED FOR TENDER	-
1	2017-09-28	ISSUED FOR FINAL DESIGN (100%)	-
No.	Date	Revision	By: Pbr

Date Printed: _____ Date imprimée: _____
 o Verify all dimensions and site conditions and be responsible for same
 o Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité



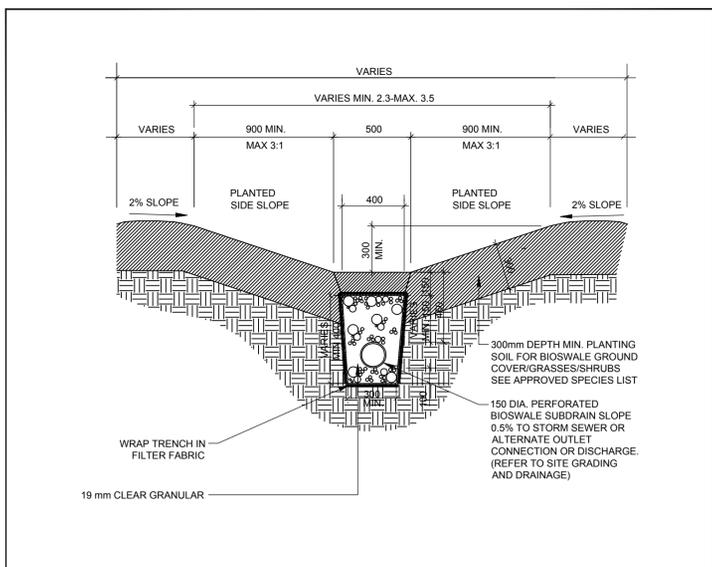
SANITARY AND STORM SEWER SEPARATION

1200 MONTREAL ROAD CAMPUS
 OTTAWA, ONTARIO

PHASE 3 - DETAILS

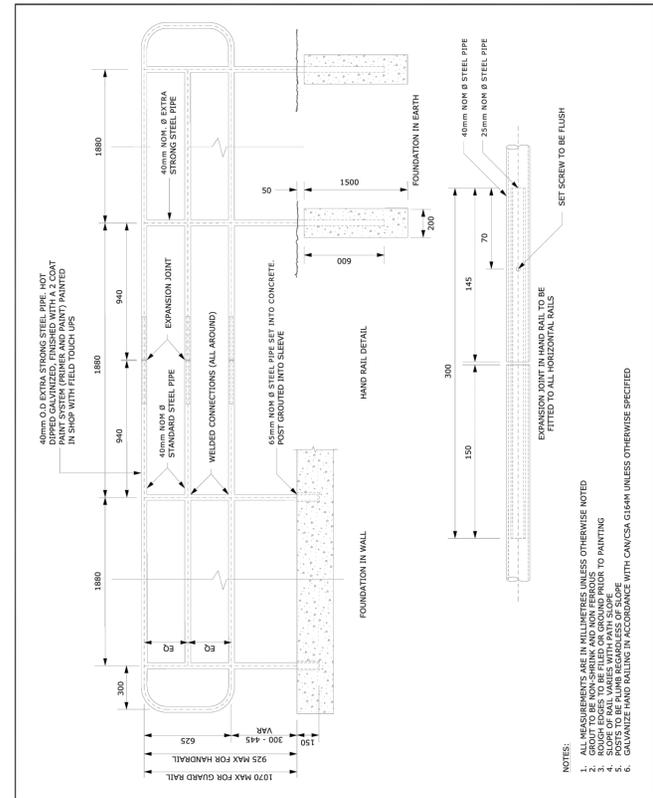
designed	J.SAUVÉ	conçu	date	FEBRUARY 2017	date
drawn	J.SAUVÉ	dessiné	scale	NTS	échelle
checked	H.BISSON	vérifié	sheet	8 of 8	feuille
approved	H.BISSON	approuvé	W.O.no.	-	D.T.no.
dwg.no.					dessin no.

5097-C308-8



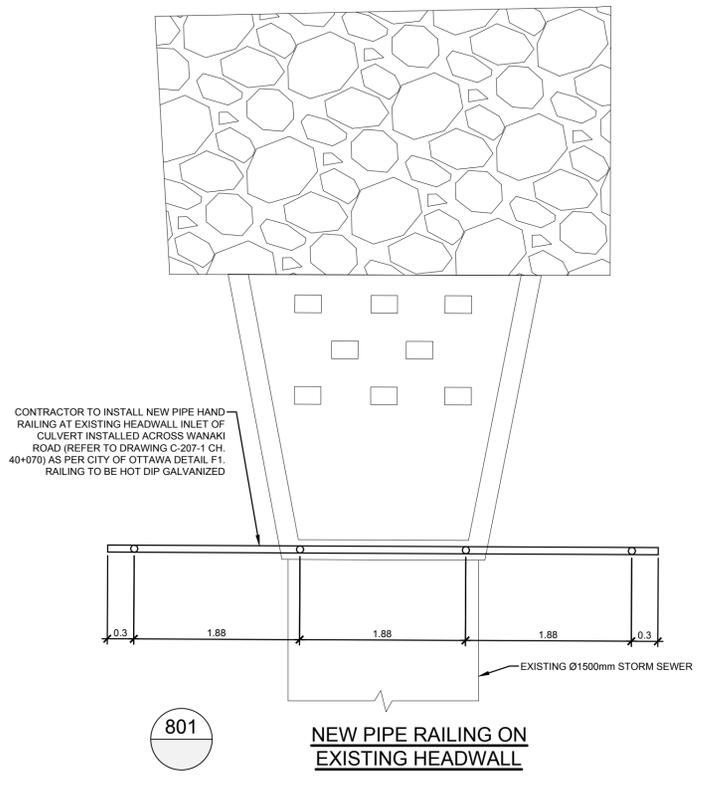
NOTE:
 1. MIN. WIDTH OF BIOSWALE IS 2.3m FROM TOP OF BANK. WIDTH VARIES FROM 2.3 TO 3.5 WHERE WIDTH ALLOWS.
 2. CENTRE LINE OF BIOSWALE TO MEANDER WHERE WIDTH ALLOWS.
 3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

TITLE:	BIO-SWALE	DATE:	FEB 2013
		REV:	FEB 2014
		DWG No:	L20



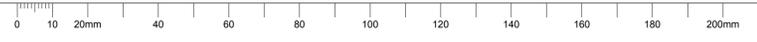
NOTES:
 1. ALL MEASUREMENTS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED
 2. ALL SURFACES TO BE PAINTED UNLESS OTHERWISE NOTED
 3. ROUGH EDGES TO BE FILED OR GRINDED PRIOR TO PAINTING
 4. ALL WELDS TO BE FULLY BEVELLED
 5. GALVANIZE HAND RAILING IN ACCORDANCE WITH CAN/CSA G40.21 UNLESS OTHERWISE SPECIFIED

TITLE:	PIPE HAND RAILING	DATE:	MAY 2001
		REV:	FEB 2017
		DWG No:	F1



801

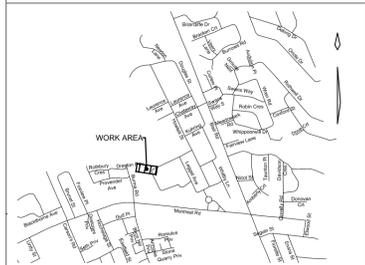
NEW PIPE RAILING ON EXISTING HEADWALL



GENERAL NOTES

- CONTRACTORS TO CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO DEMOLITION OR CONSTRUCTION AND REPORT ANY ERRORS OR OMISSIONS TO DEPARTMENTAL REPRESENTATIVE.
- CONTRACTORS MUST VISIT THE SITE & FULLY FAMILIARIZE THEMSELVES WITH THE SCOPE OF THE WORK.
- PREVENT THE SPREAD OF DUST & DEBRIS BEYOND THE WORK AREA AND CLEAN ALL SURFACES AT COMPLETION.
- MAKE GOOD ALL SURFACES AFFECTED BY THIS WORK.
- COORDINATE ALL SHUTDOWNS WITH THE DEPARTMENTAL REPRESENTATIVE.
- PROVIDE ALL LABOUR AND MATERIAL REQUIRED TO FORM A COMPLETE FUNCTIONAL SYSTEM AS DESCRIBED ON DRAWINGS.

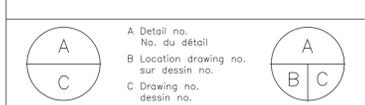
KEY PLAN



No.	Date	Revision	By:
4	2017-05-30	CONSTRUCTION	
3	2017-03-31	TENDER	
2	2017-03-03	APPROVAL 30%	
1	2016-12-21	PRELIMINARY 60%	

Date Printed: _____ Date imprimée: _____

- Verify all dimensions and site conditions and be responsible for same.
- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité.



project: **SANITARY AND STORM SEWER SEPARATION** projet

1200 MONTREAL ROAD CAMPUS OTTAWA, ONTARIO

drawing: **PHASE 2 - PLAN VIEW AND PROFILE ALIGNMENT 'I' 40+000 TO 40+110** dessin

designed: **J.SAUVÉ** conçu: _____ date: **NOVEMBER 2016** date

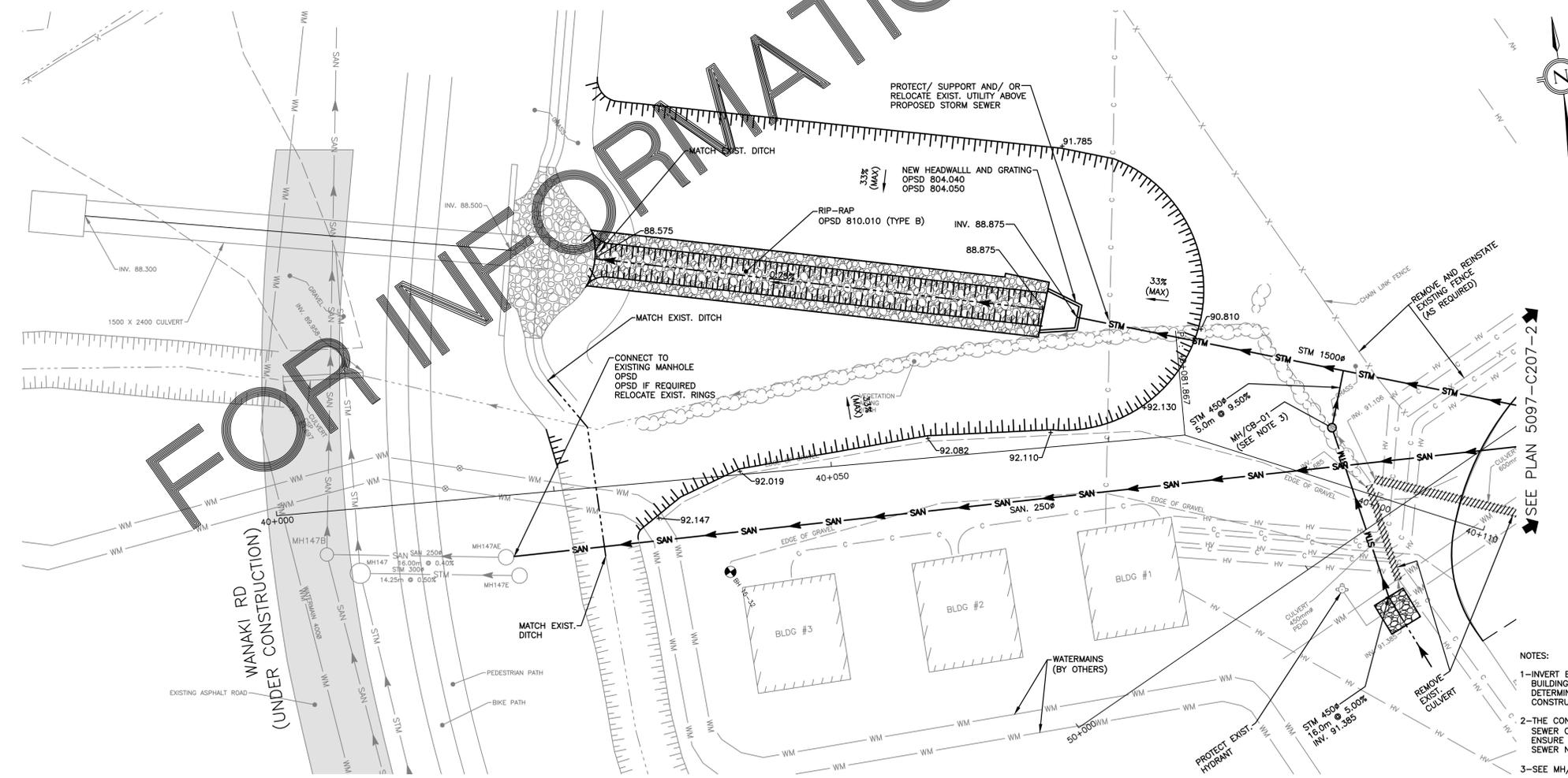
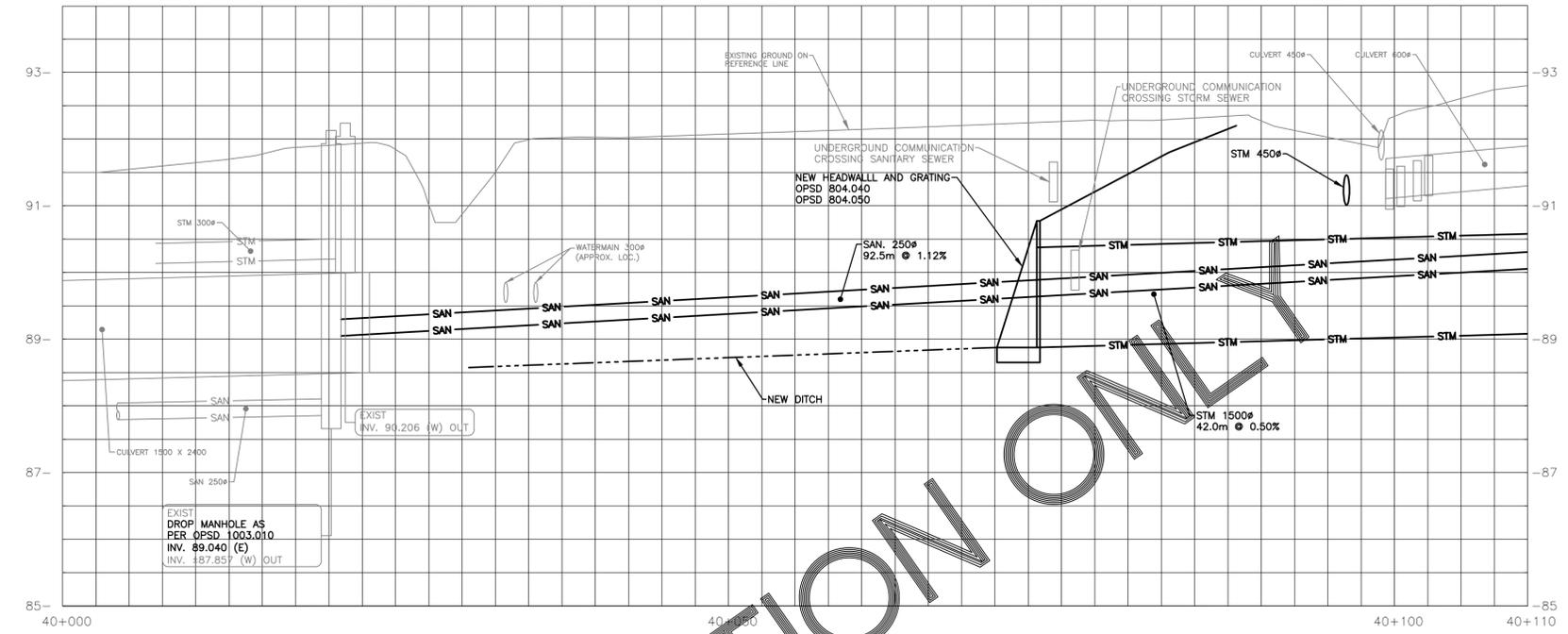
drawn: **P.MARTEL** dessiné: _____ scale: **H 1:250 V 1:50** échelle

checked: **S.BRUNET** vérifié: _____ sheet: **1** of/de: **11** feuille

approved: **H.BISSON** approuvé: _____ W.O.no.: _____ D.T.no.: _____

dwg.no.: _____ dessin no.: _____

5097-C207-1



SEE PLAN 5097-C207-2

- NOTES:**
- INVERT ELEVATIONS OF SERVICE CONNECTIONS TO EXISTING BUILDINGS ARE APPROXIMATE. THE CONTRACTOR MUST DETERMINE EXACT INVERT ELEVATIONS ON SITE PRIOR TO CONSTRUCTION START.
 - THE CONTRACTOR MUST DETERMINE ON SITE IF EXIST. SEWER CONNECTIONS ARE "STM" OR "SAN", AND MUST ENSURE TO CONNECT THEM ACCORDINGLY TO THE NEW SEWER NETWORKS.
 - SEE MH/CB TABLE ON C207-02 FOR MH/CB-01.
 - CONTRACTOR TO COORDINATE EXTENT OF WORK AND SCHEDULE W/ ONGOING PROJECT ON NEIGHBORING PROPERTY ALONG WEST PROPERTY LINE.

NOTE OF CAUTION

THE GEODETIC COORDINATES OF EVERY ITEM INCLUDED AS PART OF THIS DOCUMENT HAVE NO LEGAL VALUE. THE SITE LAYOUT MUST BE COMPLETED USING THE OFFICIAL BENCHMARKS OF AN ACCREDITED LAND SURVEYOR.

THE UNDERGROUND FEATURES AND INFORMATION THAT APPEAR ON THE DRAWINGS WERE OBTAINED FROM THE PUBLIC UTILITY COMPANIES AND/OR FROM THE NRC EACH RESPECTIVELY.

ALL INFORMATION UNDER THE LEGEND 'EXISTING' IS FOR INFORMATION ONLY. COMPLETE OR EXACT LOCATION AND ELEVATION OF UNDERGROUND SERVICES ARE NOT GUARANTEED. CERTAIN UNDERGROUND FEATURES ON PRIVATE PROPERTY ARE NOT SHOWN ON THE CURRENT DRAWING.

ANYONE WHO PROCEEDS WITH EXCAVATION WORK SHALL VERIFY THE EXACT LOCATION OF ALL UNDERGROUND FEATURES, BY EXPLORATORY EXCAVATIONS, AND SHALL ASSUME FULL RESPONSIBILITY IF THERE IS ANY DAMAGE THAT OCCURS DURING WORK.

THE CONTRACTOR WILL HAVE THE RESPONSIBILITY AND THE OBLIGATION TO VALIDATE, BY EXPLORATORY EXCAVATION, THE SIZE OF THE PUBLIC UTILITIES UNDERGROUND SERVICES AND TO WARN THE DEPARTMENTAL REPRESENTATIVE OF ANY CONFLICT WITH THE PROJECTED WORK.

