EXISTING CONDITIONS REPORT

FOR

CARDINAL CREEK VILLAGE

TAGGART GROUP OF COMPANIES

CITY OF OTTAWA

PROJECT NO.: 11-513

NOVEMBER 7, 2012
REVISION 2, 2ND SUBMISSION

EXISTING CONDITIONS REPORT
FOR
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1.0 INTRODUCTION

This Existing Conditions Report is submitted in support of a City of Ottawa Official Plan Amendment for Cardinal Creek Village on behalf of the Taggart Group of Companies. The urban development site is a recent addition to the City of Ottawa urban area along the east edge of the urban area.

Cardinal Creek Village is approximately 225ha in size and is bound by Cardinal Creek to the west, existing residential development along Ted Kelly Lane to the east, Highway 174 and the Ottawa River to the north and Agricultural Lands to the south. Refer to ***Figure 1*** which depicts the study area and provides a key plan.

The proposed development is expected to provide municipal servicing to approximately 4800 residential dwellings, approximately 15,360 persons and an estimated 26.6ha of commercial / institutional lands.

This Existing Conditions Report is prepared to outline the existing water, sanitary, storm and stormwater management servicing for the development.

1.1 Existing Conditions

1.1.1 Environmental Features

The majority of Cardinal Creek Village is dominated by agricultural lands. Remnant forested parcels are to the south of Highway 174 and along the west and east edges of the site north of Old Montreal Road. The previously forested area south of Old Montreal Road has been removed with a remnant corridor remaining along an east-west tributary of Cardinal Creek and remnant hedgerows along the former forest edges.

The major natural environment features in the general area are the Cardinal Creek corridor to the west and the Ottawa River Corridor to the north.

Further information on the natural environment features within the study area of Cardinal Creek Village is provided in the Natural Environment Existing Conditions

Report (Muncaster Environmental Planning, July 2012). The existing natural environment features are depicted on ***Figure 2***.

1.1.2 Preliminary Geotechnical Investigation

Preliminary geotechnical investigations have been undertaken by Paterson Group, with all results of the investigation presented on ***Figure 3***. A slope stability analysis has been completed to define the minimum setbacks from the existing drainage corridors.

The preliminary geotechnical investigation was based on a series of boreholes to provide testing on-site. The borehole locations are depicted on ***Figure 3*** as well as existing well locations.

The preliminary geotechnical investigation indicated that there is existing rock within the Cardinal Creek Village lands. The preliminary rock contours, provided by Paterson Group are depicted on ***Figure 3***.

Full details are provided in the Supplemental Geotechnical Investigation prepared by Paterson Group on May 8, 2012.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following studies were utilized in the preparation of this report.

East Urban Community Sewer and Water Study
McNeely Engineering Consultants Ltd, June 1992
(1992 McNeely Report)

East Urban Community Sewer Servicing Study
Novatech Engineering Consultants Ltd, July 1997
(1997 Novatech Report)

Ottawa River Sub-Trunk and Trim Road Sanitary Sewer Assessment
Stantec Consultants Ltd, February 28, 2001

City of Ottawa Official Plan Review,
Urban Residential Land Needs, Municipal Servicing Review
Taggart Cumberland Expansion Lands
IBI Group, December 2008
(2008 IBI Report)

Engineering Servicing Evaluation
Cardinal Village In Support of an Official Plan Amendment Submission
David McManus Engineering Ltd, March 2009
(*2009 DME Report)*

Sewer Design Guidelines,
City of Ottawa, November 2004
(City Standards)

Ottawa Design Guidelines – Water Distribution,
City of Ottawa, July 2010
(Water Supply Guidelines)

City of Ottawa Official Plan,
adopted by Council 2003.
(Official Plan)

Stormwater Management Planning and Design Manual,
Ministry of Environment, March 2003
(*SWMP Design Manual)*

Erosion & Sediment Control Guidelines for Urban Construction,
Greater Golden Horseshoe Area Conservation Authorities, December 2006
(E&S Guidelines)

Technical Bulletin ISDTB-2012-1, City of Ottawa, January 31, 2012

Supplemental Geotechnical Investigation
Proposed Cardinal Creek Residential Development
Paterson Group, May 8, 2012
(*Paterson Report)*

Existing Conditions, Natural Environment Features, Cardinal Creek Village
Muncaster Environmental Planning Inc, July 2012
(Muncaster Report)

3.0 EXISTING WATER SUPPLY SERVICES

Based on information contained in background reports, Cardinal Creek Village is located adjacent to the current boundary of the 1E and 2E Pressure Zones. As noted in the 2009 DME Report, given the site location and the adequate static pressure available, the lands should be connected to the 1E Pressure Zone infrastructure.

A summary of existing watermain locations in the vicinity of Cardinal Creek Village is presented in ***Table 1***.

Table 1: Summary of Existing Watermains

Existing Watermain – Location	Size	Year Constructed
St. Joseph Boulevard, ending at Trim Road	406mm	1983
Trim Road from St. Joseph Boulevard to Taylor Creek Boulevard / Dairy Drive	406mm	1985
Dairy Road ROW from Trim Road to the cul-de-sac end of Dairy Road	406mm	1992
North Service Road from Trim Road to East Extent	406mm	1996
Watermain east of Trim Road from Dairy Road to the North Service Road	406mm	1996

The existing watermains are depicted on ***Figure 4***.

Boundary conditions were requested from the City of Ottawa at three (3) locations as depicted on ***Figure 4***:

- Location 1: St Joseph Boulevard and Trim Road;
- Location 2: Dairy Road, end of cul-de-sac (existing elevation 61.4m); and
- Location 3: North Service Road and East Extent (existing elevation 52.4m).

The City of Ottawa provided boundary condition information for Zone 1E, which does not include fire flow demand. The boundary conditions have been applied at each of the three locations to determine the range of pressures, which are presented in ***Table 2*** for existing conditions.

Table 2: Existing Watermain Pressures

Existing (assuming Orleans Watermain Link is built)					
	Max HGL	Min HGL	Existing Grade	Max Pressure	Min Pressure
Location 1	115.1m	109.0m	65.6m	70.4psi (485.6kPa)	61.7psi (425.8kPa)
Location 2	115.1m	109.0m	61.4m	76.4psi (526.8kPa)	67.7psi (467.0kPa)
Location 3	115.1m	109.0m	54.2m	86.6psi (597.4kPa)	78.0psi (537.6kPa)

Ministry of the Environment and City of Ottawa Guidelines indicate that it is best practice to have normal operating pressures between the range of 50psi to 80psi (345kPa to 552kPa). The information presented in Table 2 demonstrates that there are sufficient watermain pressures available at the connection points to Pressure Zone 1E for the Cardinal Creek Village to connect to.

Background studies have also concluded that Cardinal Creek Village can be adequately serviced by connecting to the existing municipal water distribution system. Further detailed hydraulic water servicing analysis will be completed as the project progresses.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The Cardinal Creek Village lands were included in the former City of Cumberland 50 year urban development expansion boundary, as noted in the 1992 McNeely Report. The 1992 McNeely Report also identified a 1200mm diameter trunk sewer named the “Cardinal East Trunk” and the “Ottawa River Sub Trunk”, tying in at the intersection of

the existing Hydro corridor and Trim Road. The Cardinal Creek Village lands were included in the tributary sanitary drainage area to these trunk sewers.

Further to the 1992 McNeely Report, Novatech Engineering completed a Sewer Servicing Study in 1997, which recommended the "Ottawa River Sub Trunk" be sized as an 825mm diameter sewer (reduced from 1200mm). The 2001 Stantec Report was prepared to confirm and/or modify the recommendations in the 1997 Novatech Report due to changes in land uses and changes in the sanitary sewer system at that time. The 2001 Stantec Report recommended that the "Ottawa River Sub Trunk" sanitary pipe size form Tenth Line Road to Trim Road would need to be 900mm in size. The 900mm diameter trunk sewer what is constructed and is existing infrastructure.

The 2008 IBI Report identified a reserve sanitary capacity of approximately 195 L/s available in the Orleans Cumberland Collector (otherwise known as the "Ottawa River Sub Trunk").

A review of existing sanitary sewer infrastructure was undertaken to determine that the subject lands are well surrounded by existing sanitary sewers.

A summary of existing sanitary sewer locations in the vicinity of Cardinal Creek Village is presented in ***Table 3***.

Table 3: Summary of Existing Sanitary Sewers

Existing Sanitary Sewer – Location	Size
Dairy Drive ROW from Trim Road to the cul-de-sac end of Dairy Drive	375mm
Trim Road ROW from Old Montreal Road to Dairy Drive	450mm / 525mm
Trim Road ROW from Dairy Drive across Highway 174 to the North Service Road	825mm

The existing sanitary sewers are depicted on ***Figure 4***.

The City of Ottawa requested that the downstream sanitary trunk infrastructure be analyzed from Trim Road to Bilberry Creek, which varies in size from 900mm in diameter to 1350mm in diameter. The existing tributary area to this trunk sewer is

depicted on ***Figure 5***. The as-built drawings for the trunk sewer from Trim Road to Bilberry Creek are enclosed in ***Appendix A*** for reference.

The City of Ottawa provided their GIS data for sanitary drainage areas. The GIS data was used to prepare a sanitary design sheet for the tributary area, which is enclosed in ***Appendix B***.

Referring to the sanitary design sheet, the residual capacity in the trunk sewer is estimated as follows:

- 900mm diameter sewer at 0.12%, residual capacity = 345 L/s
- 1200mm diameter sewer at 0.15%, residual capacity = 787 L/s
- 1350mm diameter sewer at 0.08%, residual capacity = 487 L/s

4.2 Proposed Wastewater Demand

Preliminary sanitary sewer demand calculations have been completed for the Cardinal Creek Village lands. ***Table 4*** summarizes the City of Ottawa Design Guidelines which have been used to calculate the sanitary sewer demand calculations.

Table 4: Wastewater Design Criteria

Design Parameter	Value
Low Density Residential	3.4p/unit
Medium Density Residential	2.7p/unit
Residential Average Flow	350L/p/d
Peaking Factor Applied	Harmon's Equation
Commercial / Institutional Flows	50,000 L/ha/day
Commercial / Institutional Peaking Factor	1.5
Industrial Flows	35,000 L/ha/day
Industrial Peaking Factor	Per Figure in Appendix 4-B
Infiltration and Inflow Allowance	0.28L/s/ha
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, November 2004.	

A sanitary design sheet has been prepared to estimate the sanitary flow from Cardinal Creek Village. The sanitary design sheet is enclosed in ***Appendix B***.

The proposed flows from Cardinal Creek Village are made up of residential flows, commercial flows and institutional flows. The total residential peak flow is estimated at 172 L/s and the total commercial / institutional peak flow is estimated at 23.1 L/s. The total infiltration flow is estimated at 52.1 L/s. The total peak flow from Cardinal Creek Village is estimated at 247 L/s.

Based on the residual flow in the downstream trunk sewer, there is adequate sanitary capacity for Cardinal Creek Village.

5.0 STORM SERVICING

5.1 Existing Storm Drainage

Cardinal Creek Village lies primarily within the Cardinal Creek Subwatershed, with a small portion in the northeast located within Ottawa 1 Subwatershed.

The site is bisected by a tributary to Cardinal Creek, known as the “South Tributary” and abuts Cardinal Creek and the Ottawa River.

A Subwatershed Study is being completed by AECOM that will be available for public review in the fall of 2012.

The existing drainage catchments are depicted on ***Figure 6***. The following information is provided to describe the methods used by JF Sabourin and Associates to delineate the catchments:

Using detailed Lidar point data and contour intervals, ArcGIS extension ArcHydro was used to generate the flow path network based on the existing conditions. Following the contours and flow paths, a manual delineation of the catchment areas and subwatersheds was created across the study area. There are 5 areas draining to the Cardinal Creek (areas 0,2,3,4 and 5) and 1 to the Ottawa River (area ID = 1). Field surveys and additional information may be acquired to augment the delineation and increase its precision.

5.2 Storm Servicing

Storm servicing to the site will be via stormwater management ponds on site which will outlet directly to Cardinal Creek or the Ottawa River. Pond outlet requirements for the ponds tributary to Cardinal Creek will be provided in the completed Subwatershed Study.

Generally, the ponds which discharge to the Ottawa River will be required to meet the following objectives:

- Not required to provide quantity control treatment.
- Quality control objectives will be to the MOE Enhanced level of protection.

Generally, the ponds which discharge to Cardinal Creek will be requird to meet the following objectives:

- Quantity control objectives pre = post
- Not to exceed erosion thresholds
  Quantity control objectives to the MOE Enhanced level of protections

6.0 CONCLUSION AND RECOMMENDATIONS

It has been determined that existing watermain and sanitary sewer infrastructure can support the Cardinal Creek Village development. Storm servicing will be completed by on-site stormwater management ponds discharging to both Cardinal Creek and the Ottawa River.

Further analysis will be completed as Concept Plans are developed.

Prepared by, **David Schaeffer Engineering Ltd.**	Reviewed by, **David Schaeffer Engineering Ltd.**
Per: Jennifer Ailey, P.Eng.	Per: Stephen Pichette, P.Eng.

Z:\Projects\11-513 Cardinal Village Community\B_Design\B3_Reports\B3-2_Servicing (DSEL)\2012-07-20_existing_services\2012-07-20_existing_services.doc

APPENDIX A

As-Built Drawings

SYMBOLS

	EXISTING	PROPOSED	REMOVALS
Edge of Road & Type 1 : 500			CONC. ASPH.
Concrete Curb Type 1 : 1000			
Concrete Curb Type 1 : 500		ROAD OR PARKING SIDE	
Ditches and Creeks etc. over 0.6m wide			
Ditch			
Storm Sewer & Manhole	MH ST	MH ST	
San. Sewer & Manhole	MH SA	MH SA	
Water Main & Valve Chamber	VC W	VC W	
Gas Main & Valve	G	G	
Rogers Cable Conduit & Manhole	MH T	MH T	
Rogers Fibre Optic Conduit & Manhole	MH F	MH F	
Culvert			
Culvert with Headwalls			
Bell Telephone Conduit & Manhole	BMH B	BMH B	
Hydro Conduit & Manhole	MH H	MH H	
Hydro Street Lighting Conduit			
Single Catch Basin or Ditch Inlet			
Double Catch Basin			
Hydrant & Valve Box	VB	VB	
Bell Utility Pole & Anchor	B	(BY OTHERS) B	
Hydro Utility Pole & Anchor	H	(BY OTHERS) H	
Street Light			(BY OTHERS) (BY OTHERS)
Traffic Manhole			
Traffic Handhole			
"170" Traffic Controller Foundation			
Traffic Mast Arm Foundation			
Traffic Tubular Foundation			
Joint Use Pole Foundation			
Traffic Controller Foundation			
Detector Loop			
51 mm (2") Conduit, Conc. Encased			
76mm (3") Conduit, Conc. Encased			
102mm (4") Conduit, Conc. Encased			
127mm (5") Conduit, Conc. Encased			
Steel Hydro Tower			
Trees			
Hedge			
Bush Area			
Property Line			
Centre Line			
Reference Point H. O. T.			
P. I. (Point of Intersection)			
Fence & Gate	(TYPE)	(TYPE)	(TYPE)
Guide Rail		(TYPE)	
Retaining Wall	RET WALL	(TYPE)	RET. WALL
Adjust Surface Iron Works	MH	MH	
Sidewalks ASPH.		CONC. STAIRS	CONC.
Roadway, Laneways & Entrances ASPH.		CONC. ASPH.	ASPH.
Perforated Pipe Sub - Drain		(SIZE)	
Concrete Precast Curb			

REFERENCE POINTS

BM ELEV.	BENCH MARK
CM	CONCRETE MONUMENT
	ROCK BAR
IP	IRON TUBE OR PIPE
IB	IRON BAR
WS	WOOD STAKE
ICM 2-	2ND ORDER INTEGRATED SURVEY CONTROL MONUMENT
ICM 3-	3RD ORDER INTEGRATED SURVEY CONTROL MONUMENT
	CUT CROSS
	CUT VEE
RIB	ROUND IRON BAR
	REINFORCING BAR
SIB	STANDARD IRON BAR
SSIB	SHORT STANDARD IRON BAR
	WORK POINT

RAILWAYS

	1:500, 1:1000 SCALE, SINGLE (MULTIPLE) TRACK
GFL-B	GATE, FLASHING LIGHT AND BELL
WW	WIG - WAG
WWB	WIG - WAG AND BELL
RCS	RAILWAY CROSSING SIGN
FL	FLASHING LIGHT
FL-B	FLASHING LIGHT AND BELL

MISCELLANEOUS

	AREA TO BE CLEARED
	AREA TO BE GRUBBED
	AREA TO BE CLEARED AND GRUBBED
	EDGE OF LAKE OR RIVER
	SWAMP AND EDGE OF SWAMP
	ROCK SECTION IN PROFILE
CUT ROADWAY FILL	GRADING
OSF	OVERHEAD SIGN FOOTING
OS OS	OVERHEAD SIGNS
	BOREHOLE
	FOUNDATION ONLY
	BUILDINGS

L. MOFFATT 01:08 31 — LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

R.W. WINGATE 01 08 31 — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
1	ISSUED FOR CONSTRUCTION	R.W.W.	01:11:19

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
CUMBERLAND WARD

LEGEND AND INDEX

Ottawa
CONTRACT NO. ETL01-2113
DWG. NO. 10940-1
SHEET 2 OF 20
Date: AUG 31, 2001
Scale: N.T.S.

R.G. HEWITT, P.Eng. — Senior Infrastructure Services
W. NEWELL, P.Eng. — Manager Construction Services - Structures
Dsn: D. Dore | Chkd: R.W. Wingate | Dsn: R.W. Wingate | Chkd: J.L. Moffatt

INDEX

DRAWING NO.	DESCRIPTION
10940-0	COVER SHEET
10940-1	LEGEND AND INDEX
10940-2	STA. 1+000 TO STA. 1+300 NORTH SERVICE ROAD
10940-3	STA. 1+300 TO STA. 1+600 NORTH SERVICE ROAD
10940-4	STA. 1+600 TO STA. 1+900 NORTH SERVICE ROAD
10940-5	STA. 1+900 TO STA. 2+200 NORTH SERVICE ROAD
10940-6	STA. 2+200 TO STA. 2+500 NORTH SERVICE ROAD
10940-7	STA. 2+500 TO STA. 2+800 NORTH SERVICE ROAD
10940-8	STA. 2+800 TO STA. 3+100
10940-9	STA. 3+100 TO STA. 3+400
10940-10	STA. 3+400 TO STA. 3+600 TRIM ROAD
10940-11	STA. 0+000 TO STA. 0+300 NORTH SERVICE ROAD
10940-12	STA. 0+000 TO STA. 0+175 PUMP STATION TO MH 29A
10940-13	EROSION AND SEDIMENT CONTROL PLAN
10940-14	EROSION AND SEDIMENT CONTROL PLAN
10940-15	HEADWALL STRUCTURE STA 0+068 GENERAL ARRANGEMENT
10940-16	HEADWALL STRUCTURE STA 0+068 REINFORCING DETAILS
10940-17	HEADWALL STRUCTURE STA 2+008.5 GENERAL ARRANGEMENT
10940-18	HEADWALL STRUCTURE STA 2+008.5 REINFORCING DETAILS
10940-19	TUNNEL BORING AND SEWER PIPE INSTALLATION STA 3+078.25

3.0m GRANULAR ACCESS ROUTE
SEE DWG __10940-3 FOR DETAILS

REGRADED AREA

OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
-
CUMBERLAND WARD

PLAN AND PROFILE
STA 1+000 TO STA 1+300

R.G. HEWITT, P.Eng.	W. NEWELL, P.Eng.
Dwn: D. Dore / Chkd: R.W. Wingate	Des: R.W. Wingate / Chkd: J.I. Moffatt

Ottawa
CONTRACT NO. ETL01-2113
DWG. NO. 10940-2
SHEET 3 OF 20
Date: AUG 31, 2001
Scale: HORIZONTAL 0m 5 10 20; VERTICAL 0m 0.5 1 2

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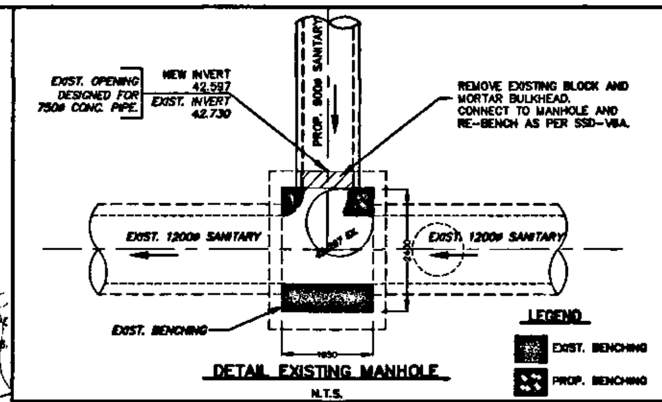
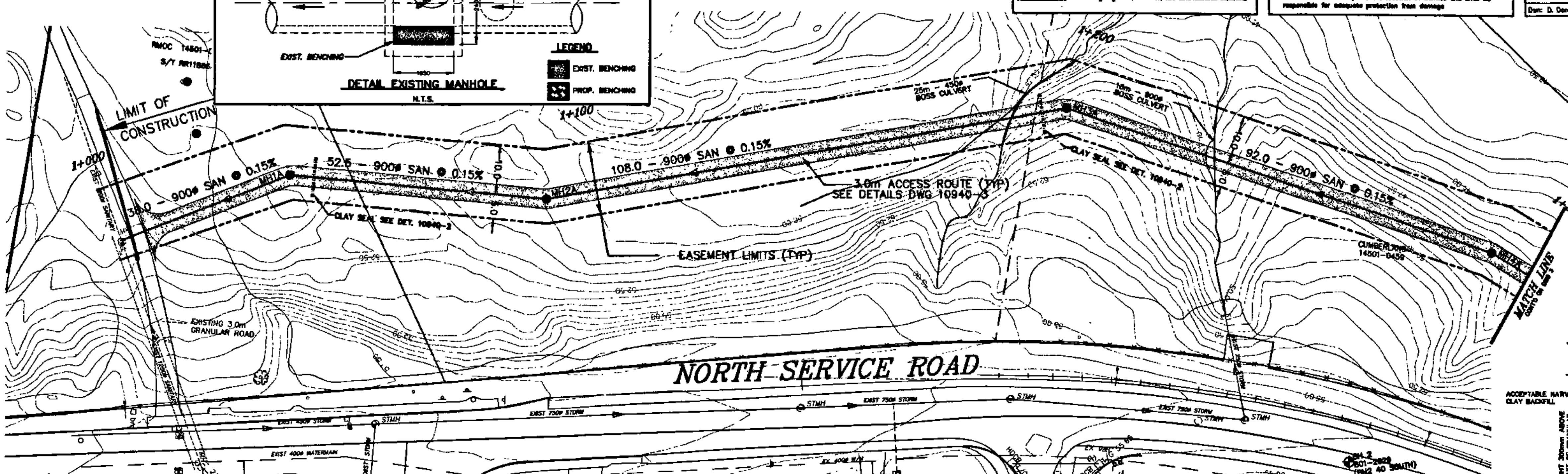
LICENSED PROFESSIONAL ENGINEER J. I. MOFFATT 01·08·31 PROVINCE OF ONTARIO
REGISTERED PROFESSIONAL ENGINEER R. W. WINGATE 01 08 31 PROVINCE OF ONTARIO

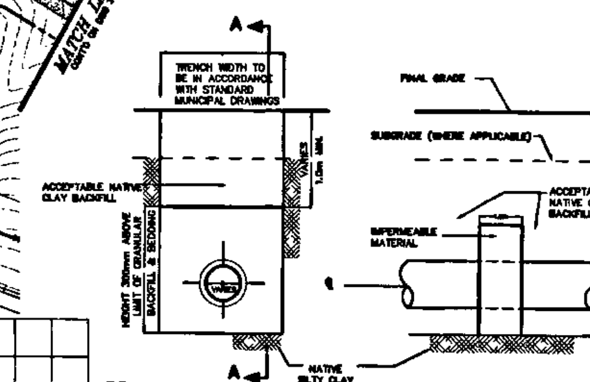
Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

Layout	Northing	Easting
1+000	5039347.638	382498.057
MH1A	5039376.518	382521.294
MH2A	5039398.569	382569.219
MH3A	5039467.956	382652.118
MH4A	5039486.778	382742.148



DETAIL EXISTING MANHOLE
N.T.S.

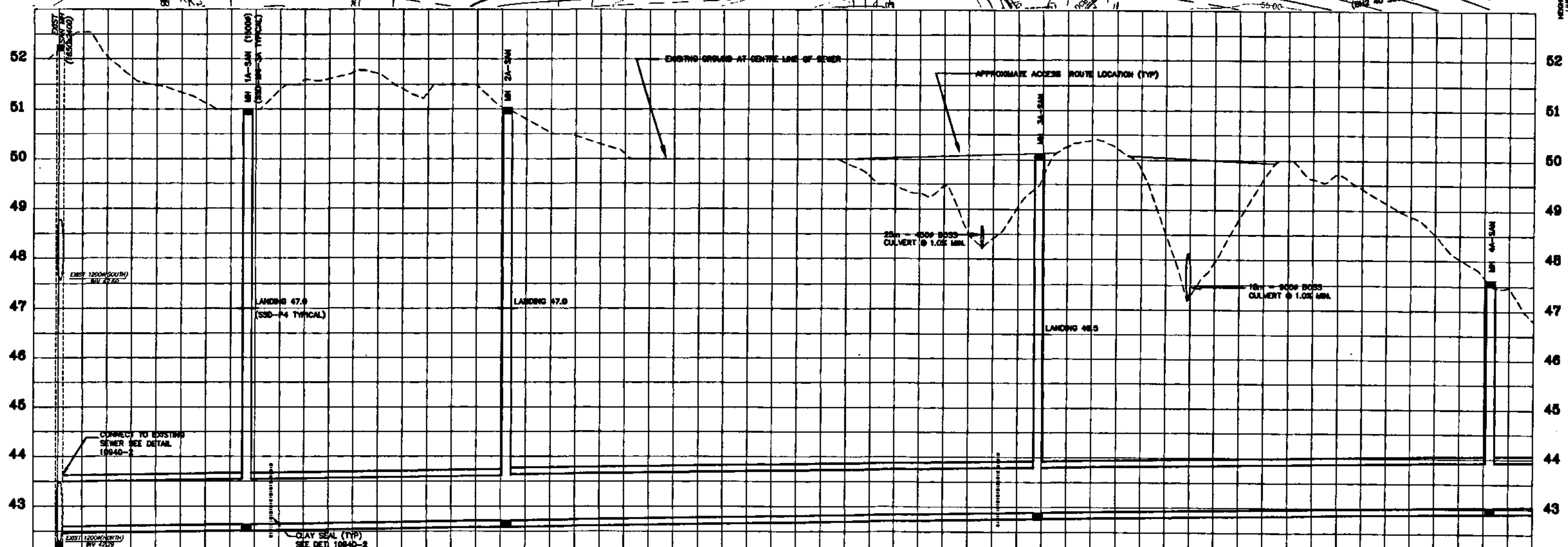




CLAY SEAL DETAIL
N.T.S.

SECTION A–A
N.T.S.

CUT–OFF WALL MATERIAL TO BE IMPERMEABLE CLAY AS PER OPSS 1205 (APPROVED BY SOILS CONSULTANT). HEIGHT AND SPACING OF CUT–OFF WALLS AS PER PLAN AND PROFILE DRAWING. TRENCH WIDTH, PIPE BEDDING AND BACKFILL TO BE IN ACCORDANCE WITH RELEVANT STANDARD MUNICIPAL DRAWINGS.



EXISTING GROUND ELEVATION	52.20	51.34	51.80	51.38	50.52	50.00	50.00	49.31	49.67	48.52	50.00	48.86	48.82
PROPOSED SANITARY SEWER INVERT	42.597	38.0 – 900ø CONC. SAN. CLASS 140–D @ 0.15%	42.654 42.654	52.5 – 900ø CONC. SAN. CLASS 140–D @ 0.15%	42.733 42.733		108.0 – 900ø CONC. SAN. CLASS 140–D @ 0.15%		42.895 42.895		92.0 – 900ø CONC. SAN. CLASS 140–D @ 0.15%		43.033 43.033
PROPOSED STATION ON SEWER	1+000		1+050		1+100		1+150		1+200		1+250		1+300

NOTES:

ACCESS ROUTE TO BE PROVIDED CONTINUOUSLY OVER CENTRE LINE OF SEWER AND MATCH EXISTING GRADE. GRADE TO BE FIELD DETERMINED TO PROVIDE SMOOTH ALIGNMENT AS PER DETAIL DRAWING 10940–3.

ALL ACCESS ROAD CULVERTS TO BE BOSS 2000 NON PERFORATED WITH 300mm MINUS RIP–RAP ON FILTER CLOTH TYPE TERRAFIX 270R OR EQUIVALENT FOR 3.0m BEYOND BOTH ENDS TO OBVERT OF CULVERT. CULVERT INVERT TO MATCH EXISTING DITCH BOTTOM.

ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

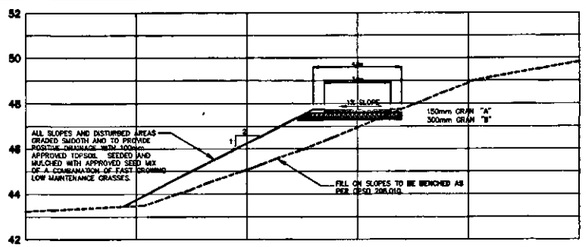
BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

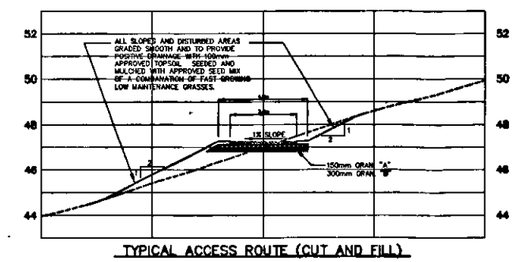
CLEARING AND GRUBBING COMPLETED BY OTHERS.

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

DWG FRAME 790mm x 534mm RMEC-D6/93-WG



TYPICAL ACCESS ROUTE (CUT AND FILL)



TYPICAL ACCESS ROUTE (CUT AND FILL)

L. L. MOFFATT — 01.08.31 — PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

R. W. WINGATE — 01.08.31 — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

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CUMBERLAND WARD

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STA 1+300 TO STA 1+600

Ottawa

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SHEET 4 OF 20
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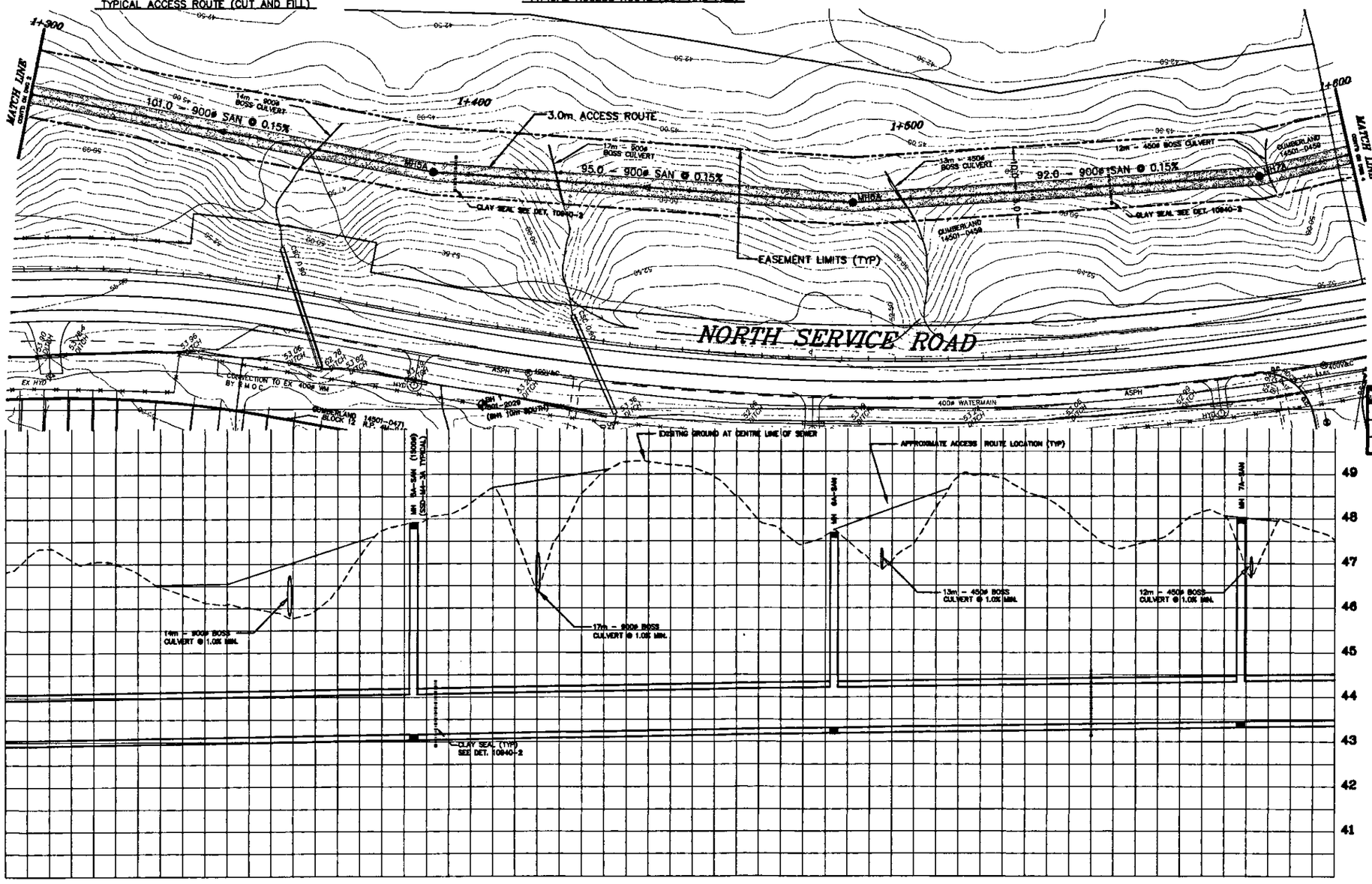
R.G. HEWITT, P.Eng. — Director Infrastructure Services
W. NEWELL, P.Eng. — Manager Construction Services - Wastewater

Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.L. Moffatt



Layout	Northing	Easting
MH5A	5039485.001	382843.005
MH6A	5039494.686	382937.339
MH7A	5039516.435	383026.558

NOTES:
ACCESS ROUTE TO BE PROVIDED CONTINUOUSLY OVER CENTRE LINE OF SEWER AND MATCH EXISTING GRADE. GRADE TO BE FIELD DETERMINED TO PROVIDE SMOOTH ALIGNMENT AS PER DETAIL DRAWING 10940-3.

ALL ACCESS ROAD CULVERTS TO BE BOSS 2000 NON PERFORATED WITH 300mm MINUS RIP-RAP ON FILTER CLOTH TYPE TERRAFIX 270R OR EQUIVALENT FOR 3.0m BEYOND BOTH ENDS TO OBVERT OF CULVERT. CULVERT INVERT TO MATCH EXISTING DITCH BOTTOM.

ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

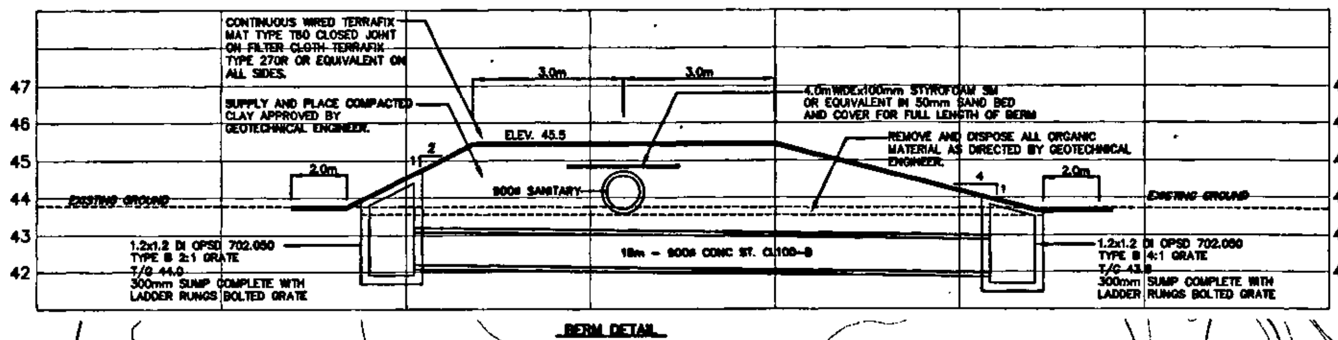
ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

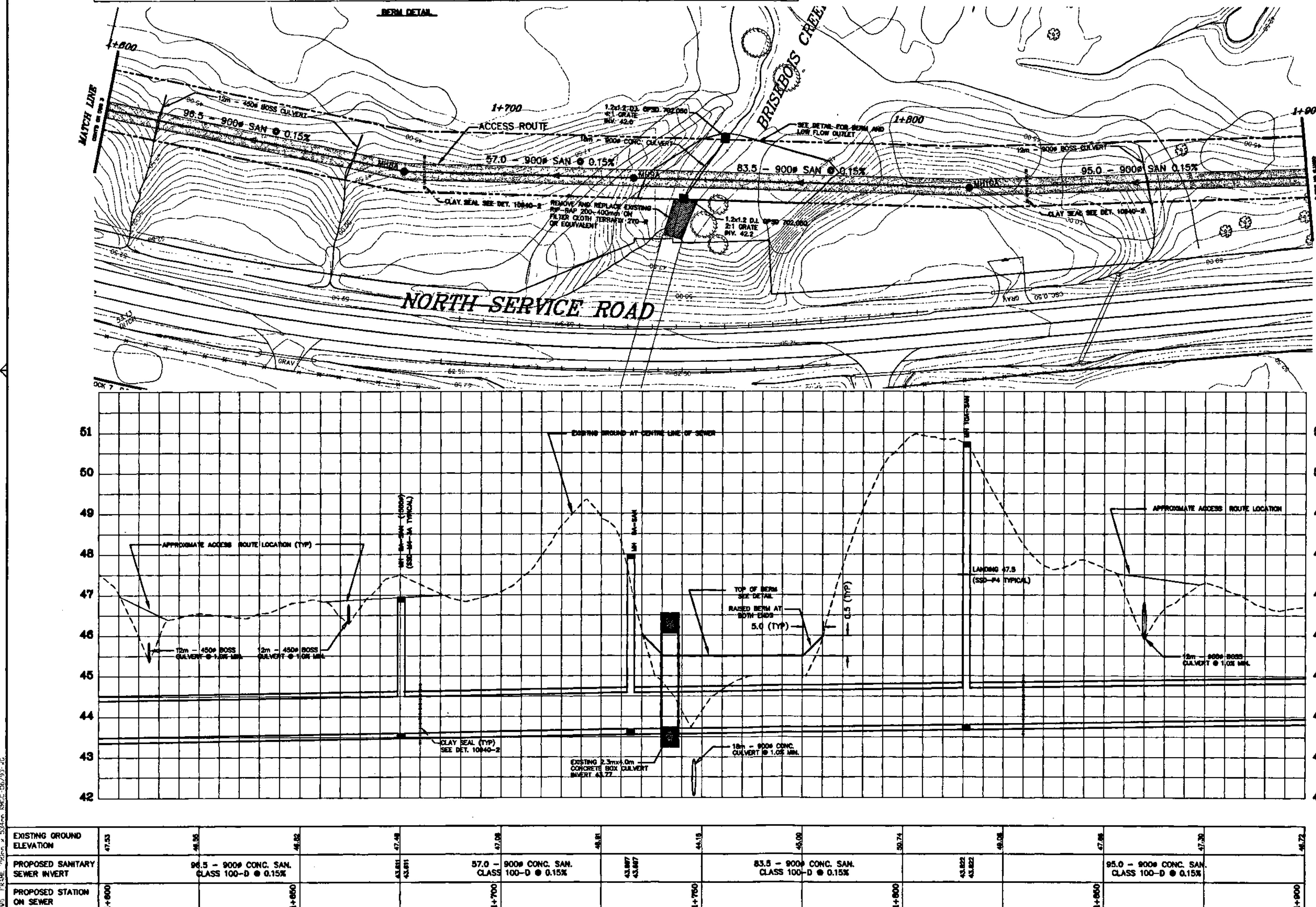
CLEARING AND GRUBBING COMPLETED BY OTHERS.

EXISTING GROUND ELEVATION	48.82	47.00	46.10	46.42	46.11	47.67	49.21	47.75	47.08	48.91	47.38	48.07	47.83
PROPOSED SANITARY SEWER INVERT			101.0 - 900ø CONC. SAN. CLASS 100-D @ 0.15%		43.185 43.185		95.0 - 900ø CONC. SAN. CLASS 100-D @ 0.15%		43.328 43.328	92.0 - 900ø CONC. SAN. CLASS 100-D @ 0.15%			43.466 43.466
PROPOSED STATION ON SEWER	1+300		1+350		1+400		1+450		1+500		1+550		1+600

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

DWG FSIZE 750mm x 431mm RMIC-06/93-WG





Layout	Northing	Easting
MH8A	5039554.638	383115.208
MH9A	5039585.992	383162.809
MH10A	5039631.863	383232.447

NOTES:

ACCESS ROUTE TO BE PROVIDED CONTINUOUSLY OVER CENTRE LINE OF SEWER AND MATCH EXISTING GRADE. GRADE TO BE FIELD DETERMINED TO PROVIDE SMOOTH ALIGNMENT AS PER DETAIL DRAWING 10940-3.

ALL ACCESS ROAD CULVERTS TO BE BOSS 2000 NON PERFORATED WITH 300mm MINUS RIP-RAP ON FILTER CLOTH TYPE TERRAFIX 270R OR EQUIVALENT FOR 3.0m BEYOND BOTH ENDS TO OBVERT OF CULVERT. CULVERT INVERT TO MATCH EXISTING DITCH BOTTOM.

ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

CLEARING AND GRUBBING COMPLETED BY OTHERS.

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
1	REVISED AS PER CITY COMMENTS	R.W.W.	01:10:18
2	REVISED AS PER CITY COMMENTS	R.W.W.	01:11:06
3	ISSUED FOR CONSTRUCTION	R.W.W.	01:11:19

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
-
CUMBERLAND WARD

PLAN AND PROFILE
STA 1+600 TO STA 1+900

R.G. HEWITT, P.Eng. | W. NEWELL, P.Eng.

Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.J. Moffatt

Ottawa
CONTRACT NO. ETL01-2113
DWG. NO. 10940-4
SHEET 5 OF 20
Date: AUG 31, 2001
Scale: HORIZONTAL 0m 5 10 20; VERTICAL 0m 0.5 1 2

OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
-
CUMBERLAND WARD

PLAN AND PROFILE
STA 1+900 TO STA 2+200

Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

J. L. MOFFATT — 01 08 31 — LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

R. WAINGATE — 01 08 31 — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
1	REVISED AS PER CITY COMMENTS	R.W.W.	01:10:18
2	REVISED AS PER CITY COMMENTS	R.W.W.	01:11:09
3	ISSUED FOR CONSTRUCTION	R.W.W.	01:11:19

NOTE:
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R.G. HEWITT, P.Eng. — Director Infrastructure Services

W. NEWELL, P.Eng. — Manager Construction Services – Structures

Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.L. Moffatt

Ottawa

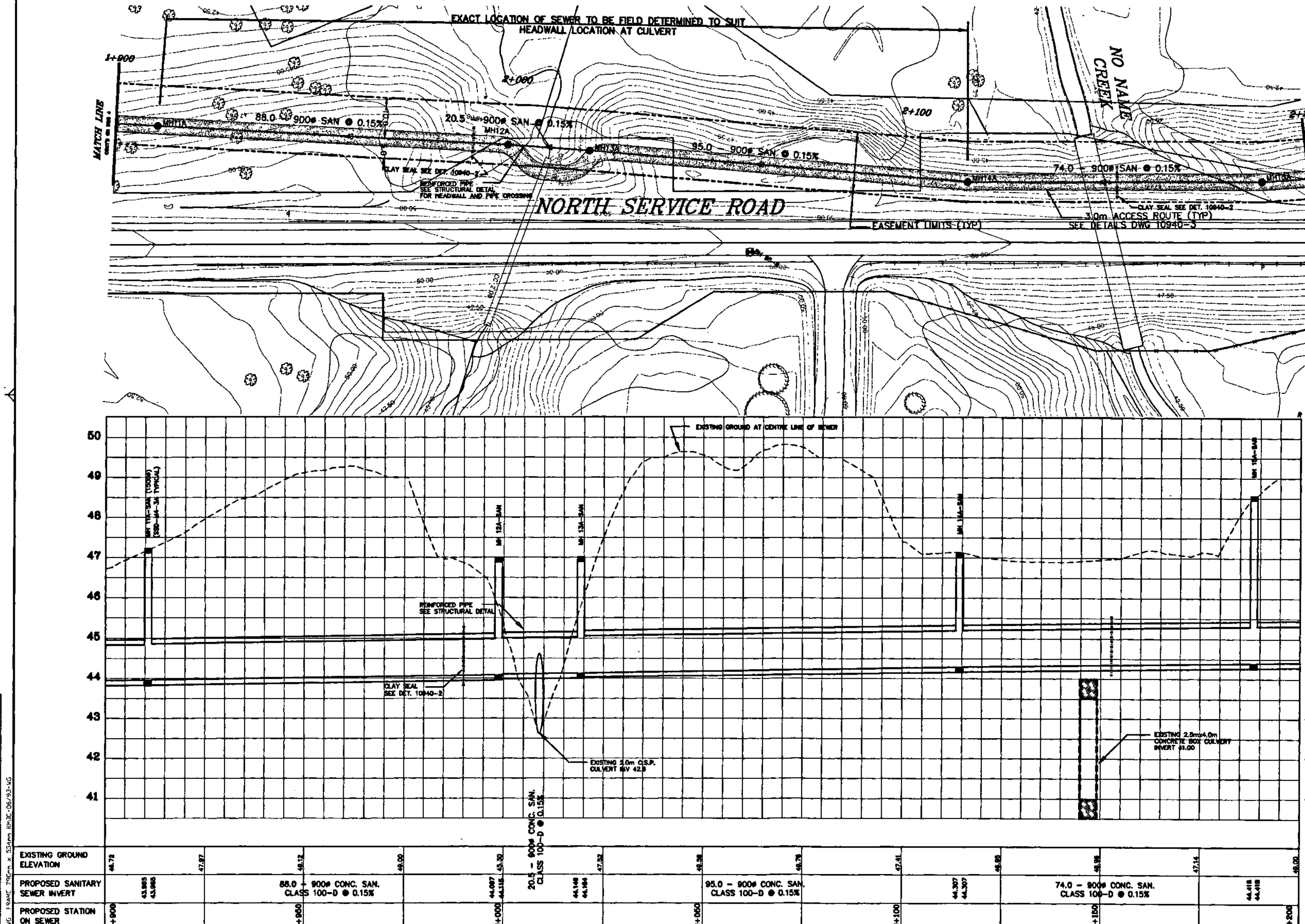
CONTRACT NO. ETL01-2113

DWG. NO. 10940-5

SHEET 6 OF 20

Date: AUG 31, 2001

Scale: HORIZONTAL 0m 5 10 20; VERTICAL 0m 0.5 1 2



Layout	Northing	Easting
MH11A	5039688.900	383308.419
MH12A	5039741.803	383378.742
MH13A	5039753.829	383395.344
MH14A	5039808.997	383472.890
MH15A	5039856.728	383529.411

NOTES:

ACCESS ROUTE TO BE PROVIDED CONTINUOUSLY OVER CENTRE LINE OF SEWER AND MATCH EXISTING GRADE. GRADE TO BE FIELD DETERMINED TO PROVIDE SMOOTH ALIGNMENT AS PER DETAIL DRAWING 10940-3.

ALL ACCESS ROAD CULVERTS TO BE BOSS 2000 NON PERFORATED WITH 300mm MINUS RIP-RAP ON FILTER CLOTH TYPE TERRAFIX 270R OR EQUIVALENT FOR 3.0m BEYOND BOTH ENDS TO OBVERT OF CULVERT. CULVERT INVERT TO MATCH EXISTING DITCH BOTTOM.

ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

CLEARING AND GRUBBING COMPLETED BY OTHERS.

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
1	REVISED AS PER CITY COMMENTS	R.W.W.	01:10:18
2	REVISED AS PER CITY COMMENTS	R.W.W.	01:11:09
3	ISSUED FOR CONSTRUCTION	R.W.W.	01:11:19

NOTE:
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Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
-
CUMBERLAND WARD

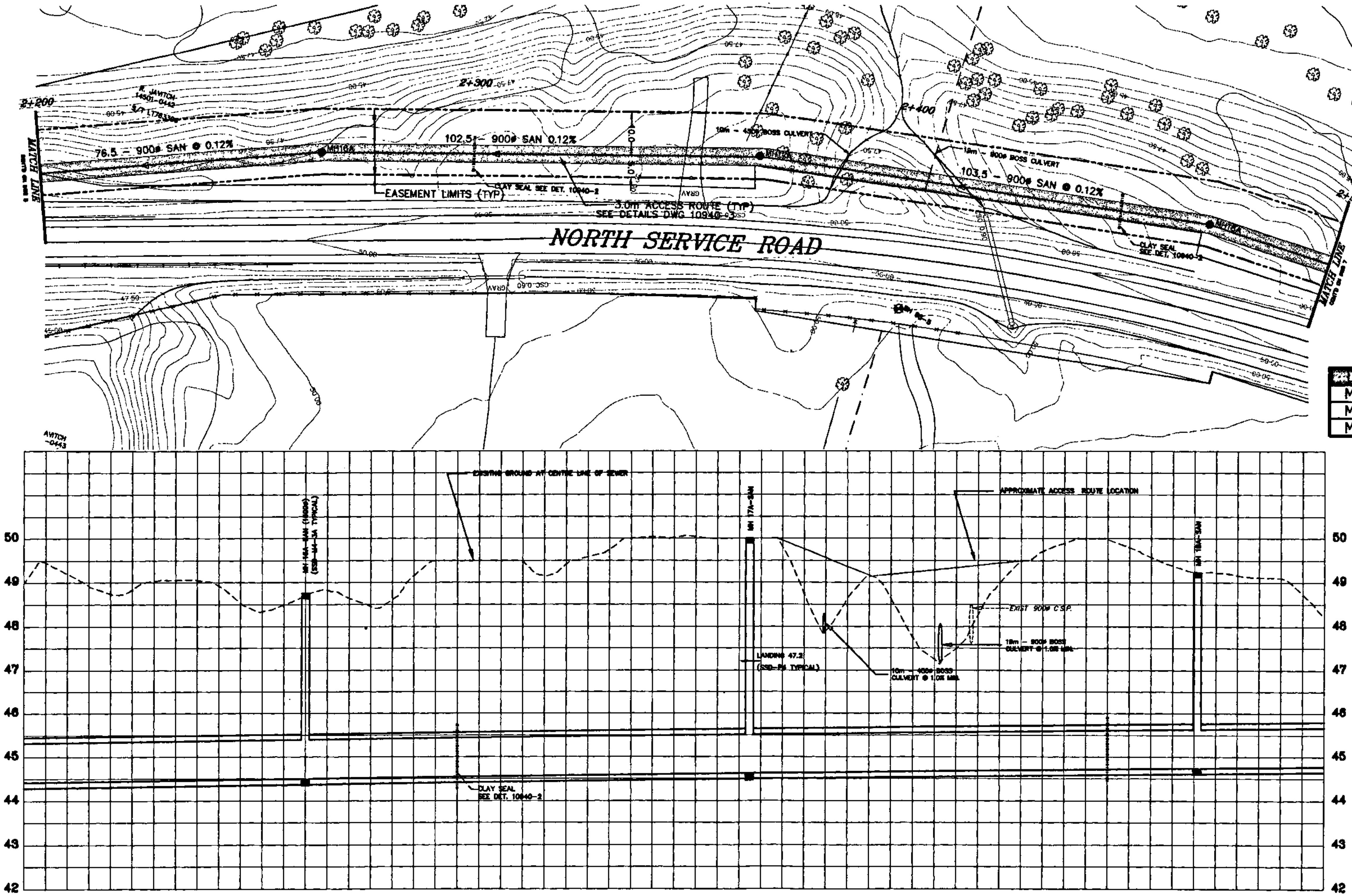
PLAN AND PROFILE
STA 2+200 TO STA 2+500

R.G. HEWITT, P.Eng.
Director Infrastructure Services

W. NEWELL, P.Eng.
Manager Construction Services – Structures

Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.I. Moffatt

Ottawa
CONTRACT NO. ETL01-2113
DWG. NO. 10940-6
SHEET 7 OF 20
Date: AUG 31, 2001
Scale: HORIZONTAL 0m 5 10 20; VERTICAL 0m 0.5 1 2



Layout	Northing	Easting
MH16A	5039910.033	383584.390
MH17A	5039974.220	383662.300
MH18A	5040028.993	383751.710

NOTES:
ACCESS ROUTE TO BE PROVIDED CONTINUOUSLY OVER CENTRE LINE OF SEWER AND MATCH EXISTING GRADE. GRADE TO BE FIELD DETERMINED TO PROVIDE SMOOTH ALIGNMENT AS PER DETAIL DRAWING 10940-3.

ALL ACCESS ROAD CULVERTS TO BE BOSS 2000 NON PERFORATED WITH 300mm MINUS RIP-RAP ON FILTER CLOTH TYPE TERRAFIX 270R OR EQUIVALENT FOR 3.0m BEYOND BOTH ENDS TO OBVERT OF CULVERT. CULVERT INVERT TO MATCH EXISTING DITCH BOTTOM.

ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

CLEARING AND GRUBBING COMPLETED BY OTHERS.

EXISTING GROUND ELEVATION	48.00, 48.84, 48.54, 48.64, 49.50, 49.43, 50.02, 49.80, 48.63, 48.99, 49.87, 49.23, 48.22
PROPOSED SANITARY SEWER INVERT	76.5 – 900ø CONC. SAN. CLASS 100-D @ 0.12%; 44.510 / 44.510; 102.5 – 900ø CONC. SAN. CLASS 100-D @ 0.12%; 44.633 / 44.633; 103.5 – 900ø CONC. SAN. CLASS 100-D @ 0.12%; 44.757 / 44.757; 100.0 – 900ø CONC. SAN. CLASS 100-D @ 0.12%
PROPOSED STATION ON SEWER	2+200, 2+250, 2+300, 2+350, 2+400, 2+450, 2+500

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
-
CUMBERLAND WARD

PLAN AND PROFILE
STA 2+500 TO STA 2+800

Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
1	REVISED AS PER CITY COMMENTS	R.W.W.	01:10:18
2	REVISED AS PER CITY COMMENTS	R.W.W.	01:11:09
3	ISSUED FOR CONSTRUCTION	R.W.W.	01:11:19

NOTE:
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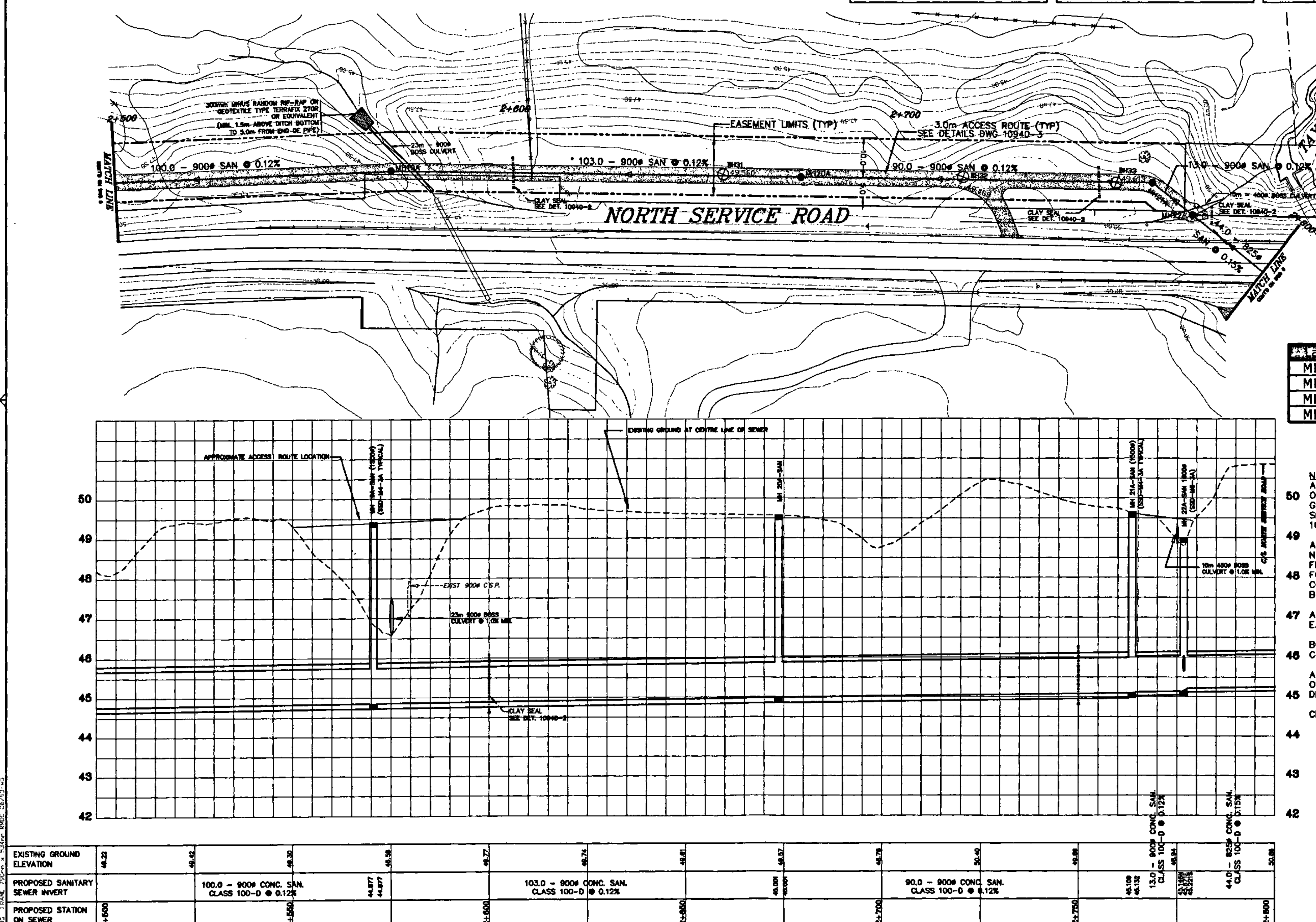
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

R.G. HEWITT, P.Eng. — W. NEWELL, P.Eng.

Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.I. Moffatt

Ottawa
CONTRACT NO. ETL01-2113
DWG. NO. 10940-7
SHEET 8 OF 20
Date: AUG 31, 2001
Scale: HORIZONTAL 0m 5 10 20 / VERTICAL 0m 0.5 1 2



Layout	Northing	Easting
MH19A	5040065.894	383842.440
MH20A	5040100.118	383941.706
MH21A	5040129.449	384026.728
MH22A	5040125.272	384039.201

NOTES:

ACCESS ROUTE TO BE PROVIDED CONTINUOUSLY OVER CENTRE LINE OF SEWER AND MATCH EXISTING GRADE. GRADE TO BE FIELD DETERMINED TO PROVIDE SMOOTH ALIGNMENT AS PER DETAIL DRAWING 10940-3.

ALL ACCESS ROAD CULVERTS TO BE BOSS 2000 NON PERFORATED WITH 300mm MINUS RIP-RAP ON FILTER CLOTH TYPE TERRAFIX 270R OR EQUIVALENT FOR 3.0m BEYOND BOTH ENDS TO OBVERT OF CULVERT. CULVERT INVERT TO MATCH EXISTING DITCH BOTTOM.

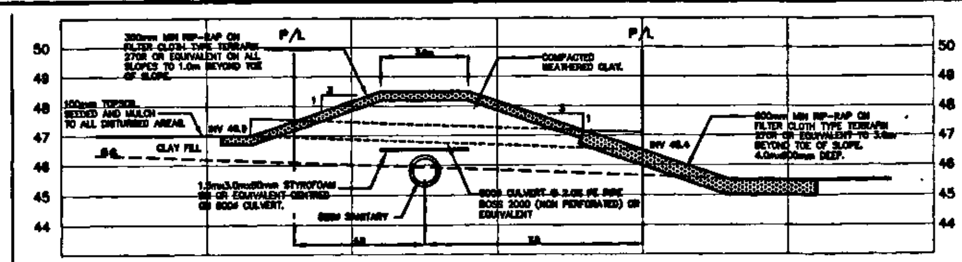
ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

CLEARING AND GRUBBING COMPLETED BY OTHERS.

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	



L. MOFFATT
01.08.31
LICENSED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO
R.W. WINGATE
01.08.31
REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO
Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
1	REVISED AS PER CITY COMMENTS	R.W.W.	01:10:18
2	REVISED AS PER CITY COMMENTS	R.W.W.	01:11:09
3	ISSUED FOR CONSTRUCTION	R.W.W.	01:11:19

NOTE:
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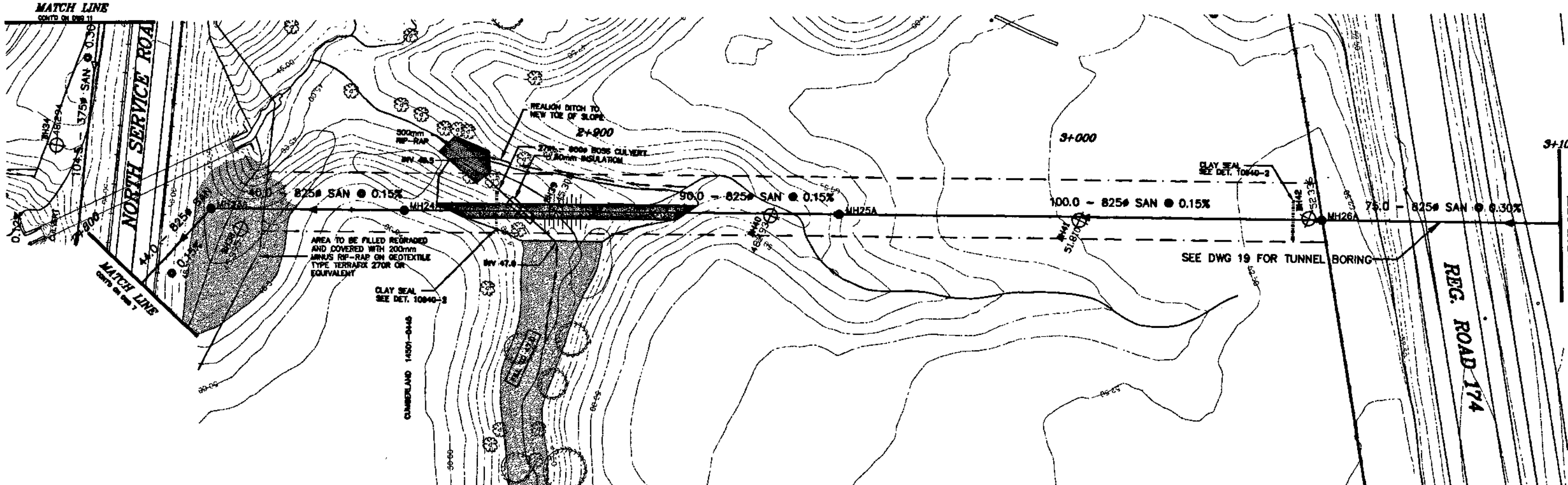
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
-
CUMBERLAND WARD

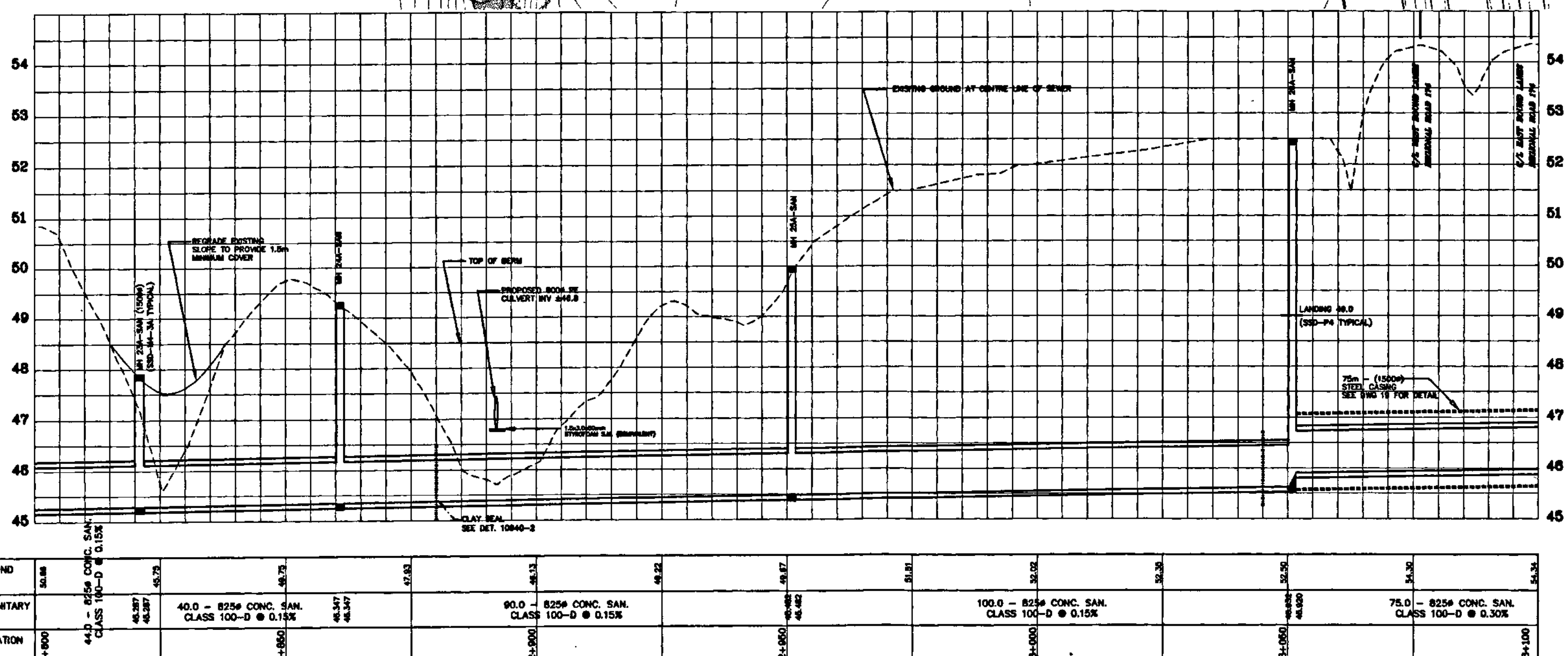
PLAN AND PROFILE
STA. 2+800 TO STA. 3+100

R.G. HEWITT, P.Eng. — Director Infrastructure Services
W. NEWELL, P.Eng. — Manager Construction Services
Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.I. Moffatt

Ottawa
CONTRACT NO. ETL01-2113
DWG. NO. 10940-8
SHEET 9 OF 20
Date: AUG 31, 2001
Scale: HORIZONTAL / VERTICAL



Layout	Northing	Easting
MH23A	5040111.231	384081.131
MH24A	5040074.744	384097.524
MH25A	5039992.649	384134.408
MH26A	5039901.395	384175.408



NOTES:
ACCESS ROUTE TO BE PROVIDED CONTINUOUSLY OVER CENTRE LINE OF SEWER AND MATCH EXISTING GRADE. GRADE TO BE FIELD DETERMINED TO PROVIDE SMOOTH ALIGNMENT AS PER DETAIL DRAWING 10940-3.

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ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

CLEARING AND GRUBBING COMPLETED BY OTHERS.

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

Layout	Northing	Easting
MH27A	5039832.983	384206.144
MH28A	5039804.784	384218.814
MH29A	5039795.574	384293.130
MH30A	5039788.233	384352.371
MH31A	5039800.406	384414.897

NO.	REVISIONS	BY	DATE
5	REVISED MH SIZES	J.I.M.	02:01:03
6	ADD LAYOUT POINTS	J.I.M.	02:02:20

As Built Catchbasin and Maintenance Hole Data

No.	Station	Type Structure	Elevation T/G	Landing	Low Inv.	High Inv	Other Inv.	comments
MH#27A	3+121.75	1500mm dia	52.998	50.883	46.273	46.513		Drop Manhole
MH#28A	3+154.40	1800mm dia	53.860	49.638	46.523NW	46.528E		
MH#29A	3+224.75	1800mm dia	54.273	50.056	46.646W	46.631E	47.481S	16 mils backfall
MH#30A	3+289.65	1800mm dia	54.079	49.837	46.722	46.737		
MH#31A	3+353.75	1800mm dia	55.317	50.469	46.639W	46.654S	46.649S(Drop)	Drop Manhole

J. I. MOFFATT 01:08:31 — LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

R.W. WINGATE 01:08:31 — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

CCL Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
1	REVISED AS PER CITY COMMENTS	R.W.W.	01:10:18
2	REVISED AS PER CITY COMMENTS	R.W.W.	01:11:09
3	ISSUED FOR CONSTRUCTION	R.W.W.	01:11:19
4	REVISE SEWER MH29A LOCATION	R.W.W.	01:11:27

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
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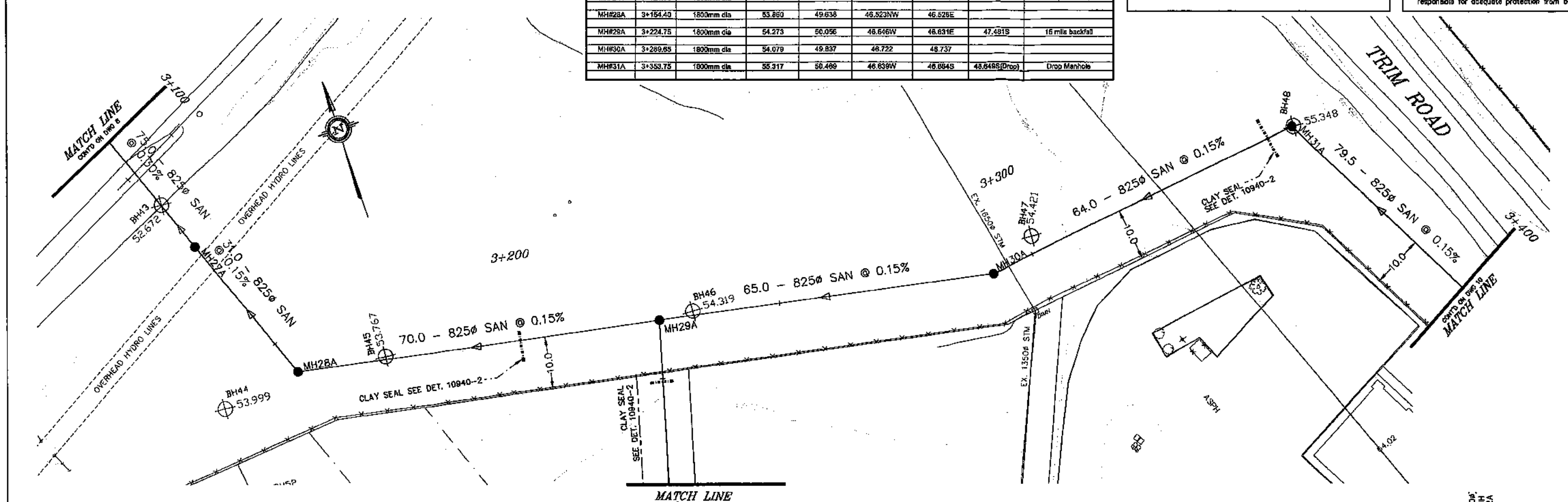
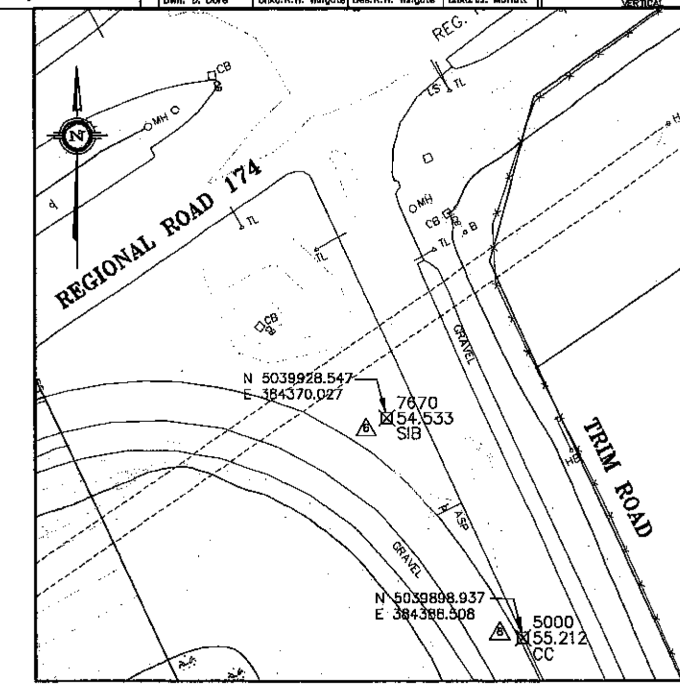
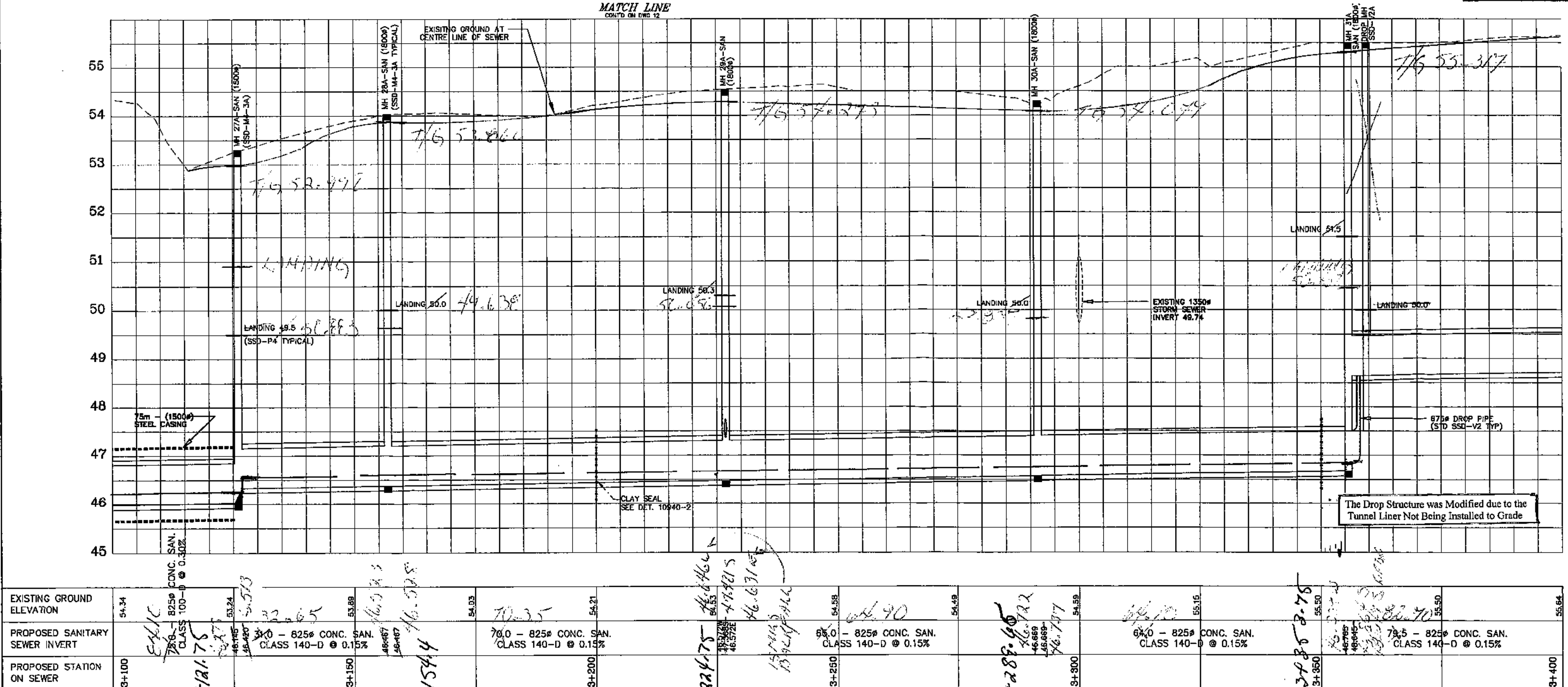
OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
CUMBERLAND WARD
PLAN AND PROFILE STA. 3+100 TO STA. 3+400

R.G. HEWITT, P.Eng. — Director Infrastructure Services
W. NEWELL, P.Eng. — Manager Construction Services – Structures
Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.I. Moffatt

Ottawa
CONTRACT NO. ETL01-2113
DWG. NO. 10940-9
SHEET 10 OF 20
Date: AUG 31, 2001
Scale: HORIZONTAL 0m 5 10 20; VERTICAL 0m 0.5 1 2







NOTES:

ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

CLEARING AND GRUBBING COMPLETED BY OTHERS.

AS BUILT

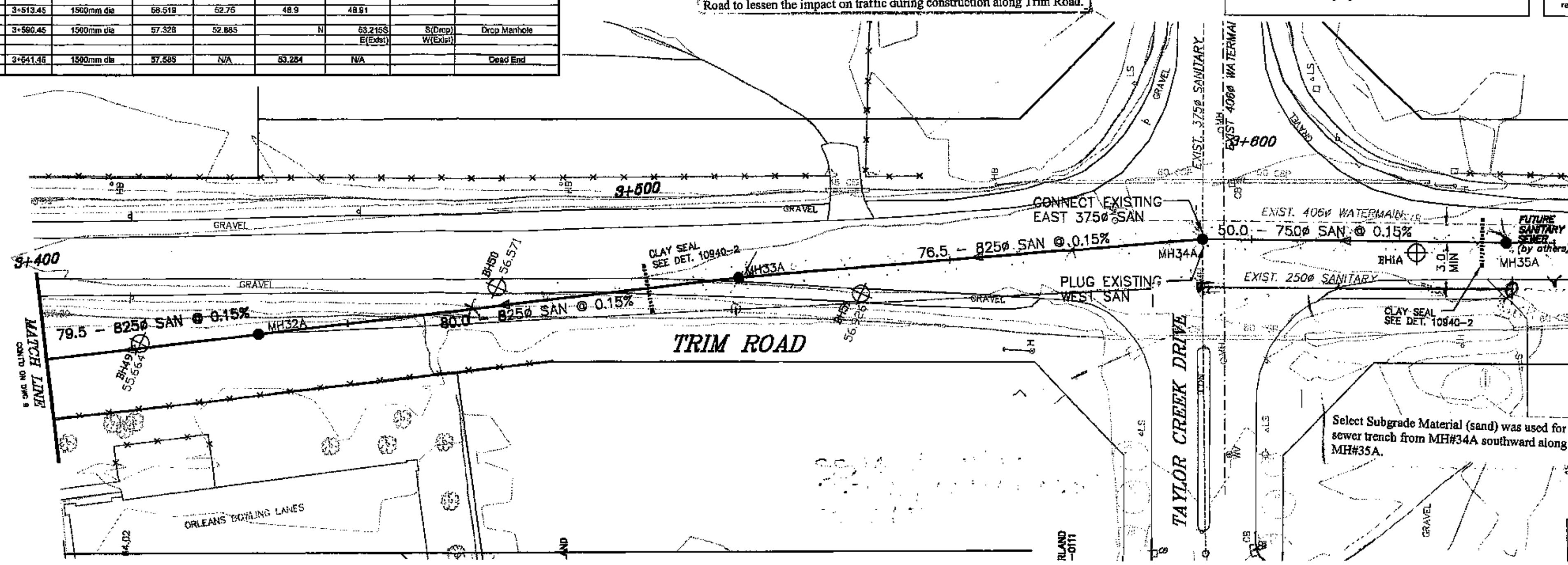
EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

[illegible]	Northing	Easting
MH32A	5039732.334	384456.922
MH33A	5039664.263	384498.947
MH34A	5039597.526	384536.962
MH35A	5039552.044	384557.731

As Built Catchbasin and Maintenance Hole Data

No.	Station	Type Structure	Elevation T/G	Landing	Low Inv.	High Inv	Other Inv.	comments
MH#32A	3+436.45	1500mm dia	56.023	51.211	48.805	48.811		
MH#33A	3+513.45	1500mm dia	56.519	52.75	48.9	48.91		
MH#34A	3+590.45	1500mm dia	57.328	52.885	N	53.215S E(Exist)	S(Drop) W(Exist)	Drop Manhole
MH#35A	3+641.45	1500mm dia	57.585	N/A	53.284	N/A		Dead End

Manholes #33A, #34A, and #35A were moved west off of Trim Road to lessen the impact on traffic during construction along Trim Road.



Select Subgrade Material (sand) was used for backfill of the sewer trench from MH#34A southward along Trim Road towards MH#35A.

NOTES:

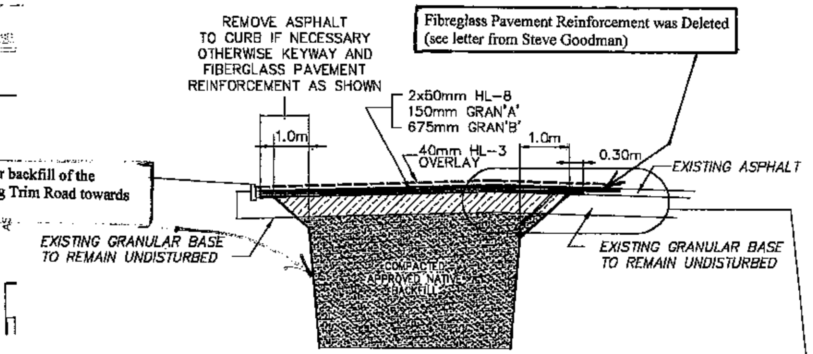
ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS, UNLESS OTHERWISE SPECIFIED.

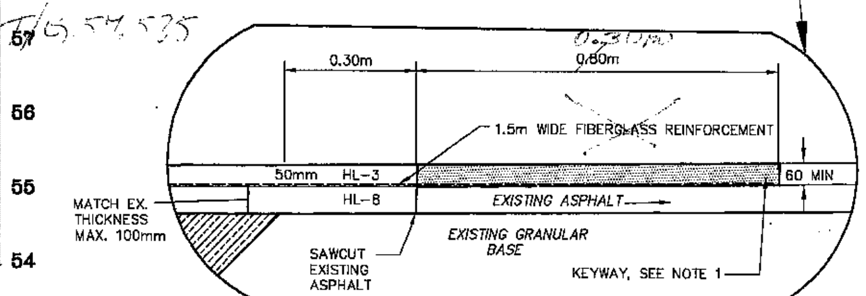
CLEARING AND GRUBBING COMPLETED BY OTHERS.

Fibreglass Pavement Reinforcement was Deleted (see letter from Steve Goodman)



PAVEMENT RESTORATION AND JOINT DETAIL

N.T.S.

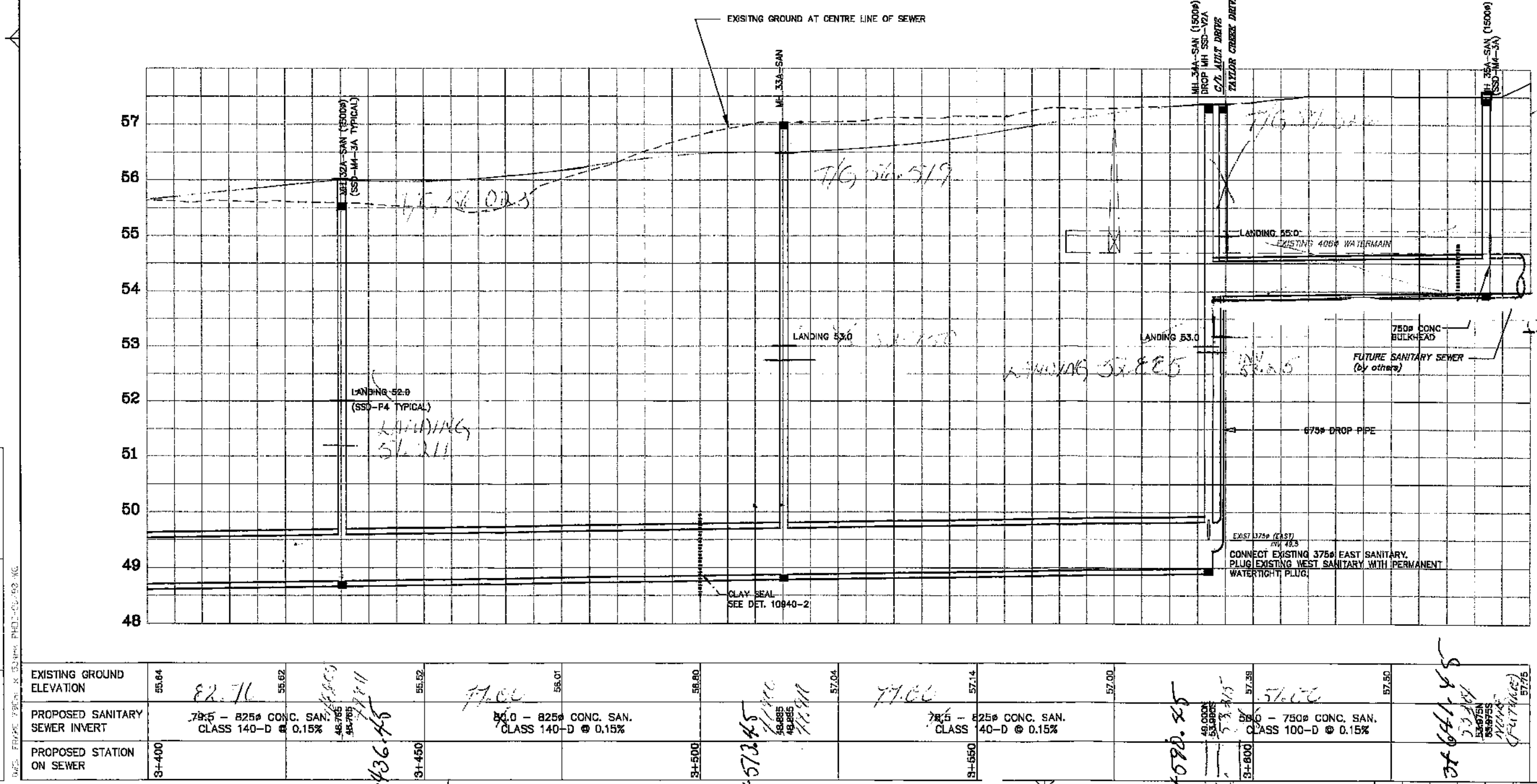


DRY GRINDING, SEE NOTE 4

N.T.S.

NOTES:

1. SHADED AREA TO BE MILLED 60mm IN DEPTH MIN. AND REMOVED TO FORM KEY TO ACCEPT HL-3 WEAR COURSE ASPHALT AS IN NOTE 4.
2. IN SOME CASES THE 300mm SAWCUT FROM EXISTING PAVEMENT EDGE WILL BE WIDER SO AS TO PAVE TO A SOUND PAVEMENT EDGE.
3. IF DRY GRINDING METHOD IS USED, A 20mm LEVELLING COURSE OF HL2 SHALL BE EMPLOYED PRIOR TO INSTALLING FIBREGLASS PAVEMENT REINFORCEMENT.
4. 50mm – HL-3 ASPHALT TOP COURSE TO BE LAID FLUSH WITH TOP OF EXISTING WEAR COURSE ASPHALT.
5. TWO LIFTS OF HL-8 REQUIRED TO MATCH EXISTING DEPTH. TOP LIFT OF HL-8 TO BE 50mm.



NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
1	REVISED AS PER CITY COMMENTS	R.W.W.	01:10:18
2	REVISED AS PER CITY COMMENTS	R.W.W.	01:11:09
3	ISSUED FOR CONSTRUCTION	R.W.W.	01:11:19

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

LICENSED PROFESSIONAL ENGINEER J. I. MOFFATT 01:08:31 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER R.W. WINGATE 01:08:31 PROVINCE OF ONTARIO

Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

OTTAWA RIVER SUB TRUNK

NORTH SERVICE ROAD
-
CUMBERLAND WARD

PLAN AND PROFILE
STA. 3+400 TO STA. 3+600

R.G. HEWITT, P.Eng. — Director Infrastructure Services
W. NEWELL, P.Eng. — Manager Construction Services – Structures

Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.I. Moffatt

Ottawa

CONTRACT NO. ETL01-2113
DWG. NO. 10940-10
SHEET 11 OF 20
Date: AUG 31, 2001
Scale: HORIZONTAL 0m 5 10 20; VERTICAL 0m 0.5 1 2

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
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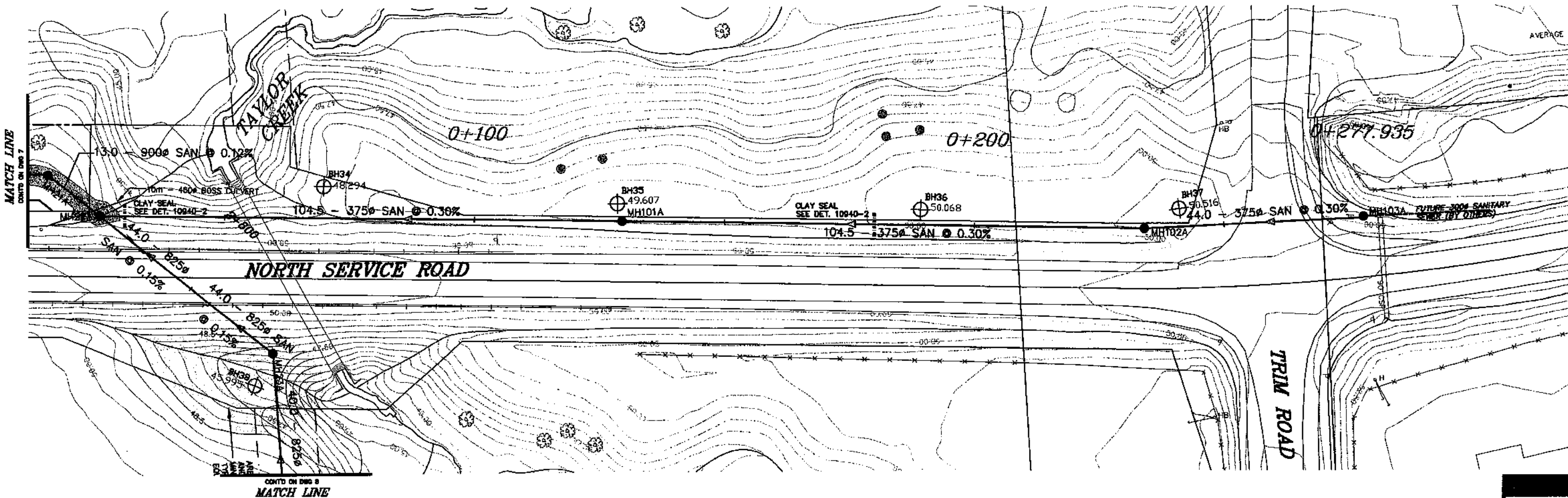
OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
-
CUMBERLAND WARD

PLAN AND PROFILE MH22A TO TRIM ROAD

R.G. HEWITT, P.Eng. — Director Infrastructure Services
W. NEWELL, P.Eng. — Manager Construction Services - Structures
Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.I. Moffatt

Ottawa
CONTRACT NO. ETL01-2113
DWG. NO. 10940-11
SHEET 12 OF 20
Date: AUG 31, 2001
Scale: HORIZONTAL 0m 5 10 20; VERTICAL 0m 0.5 1 2



MH101A	5040159.359	384138.007
MH102A	5040193.446	384236.813
MH103A	5040210.602	384277.158

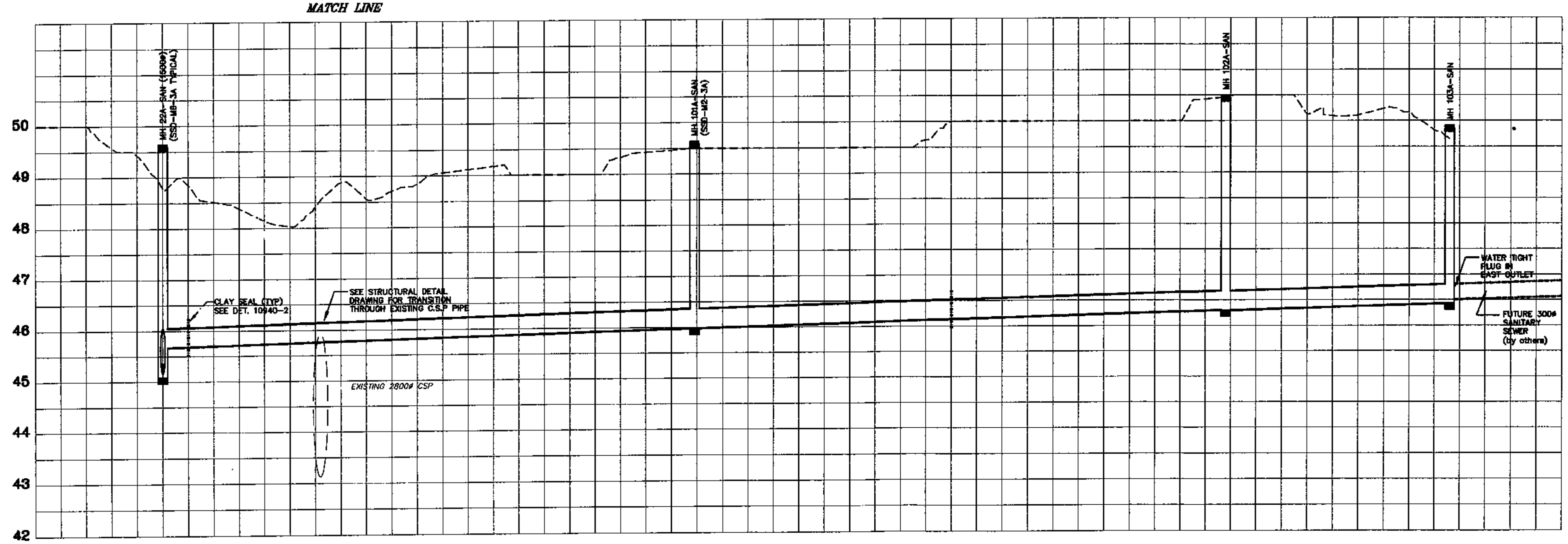
NOTES:

ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

CLEARING AND GRUBBING COMPLETED BY OTHERS.



EXISTING GROUND ELEVATION	48.8	48.0	48.8	49.0	49.5	49.5	49.8	50.0	50.0	50.1	49.8	49.7	
PROPOSED SANITARY SEWER INVERT	45.146 / 45.723 / 45.676	104.5 - 375ø CONC. SAN. CLASS 140-D @ 0.30%			45.985 / 45.985	104.5 - 375ø CONC. SAN. CLASS 140-D @ 0.30%			46.299 / 46.299	44.0 - 375ø CONC. SAN. CLASS 140-D @ 0.30%		46.431 / 46.506	
PROPOSED STATION ON SEWER	0+000	0+050	0+100	0+150	0+200	0+250							

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

NO.	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R.W.W.	01:08:31
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2	REVISED AS PER CITY COMMENTS	R.W.W.	01:11:09
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Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

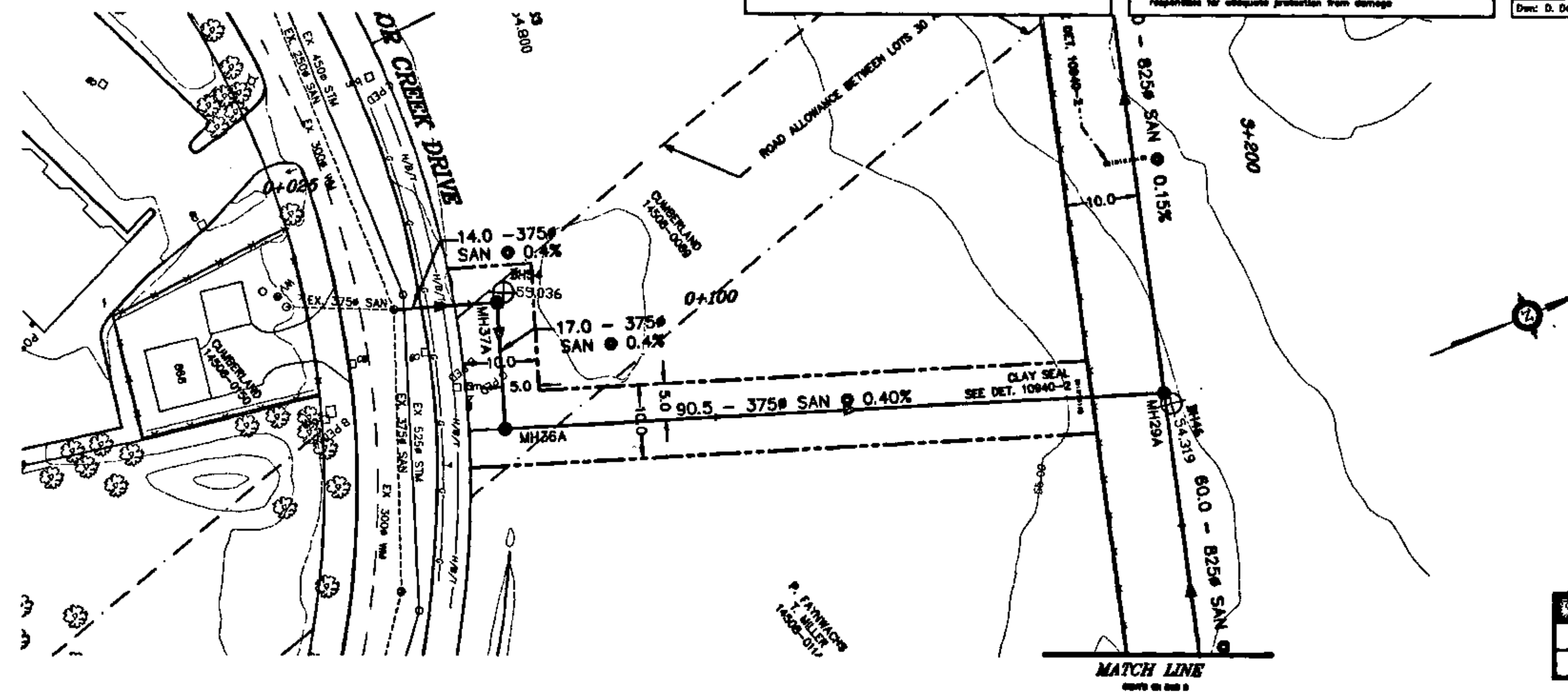
OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
-
CUMBERLAND WARD

PLAN AND PROFILE FROM PUMP STATION TO MH29A

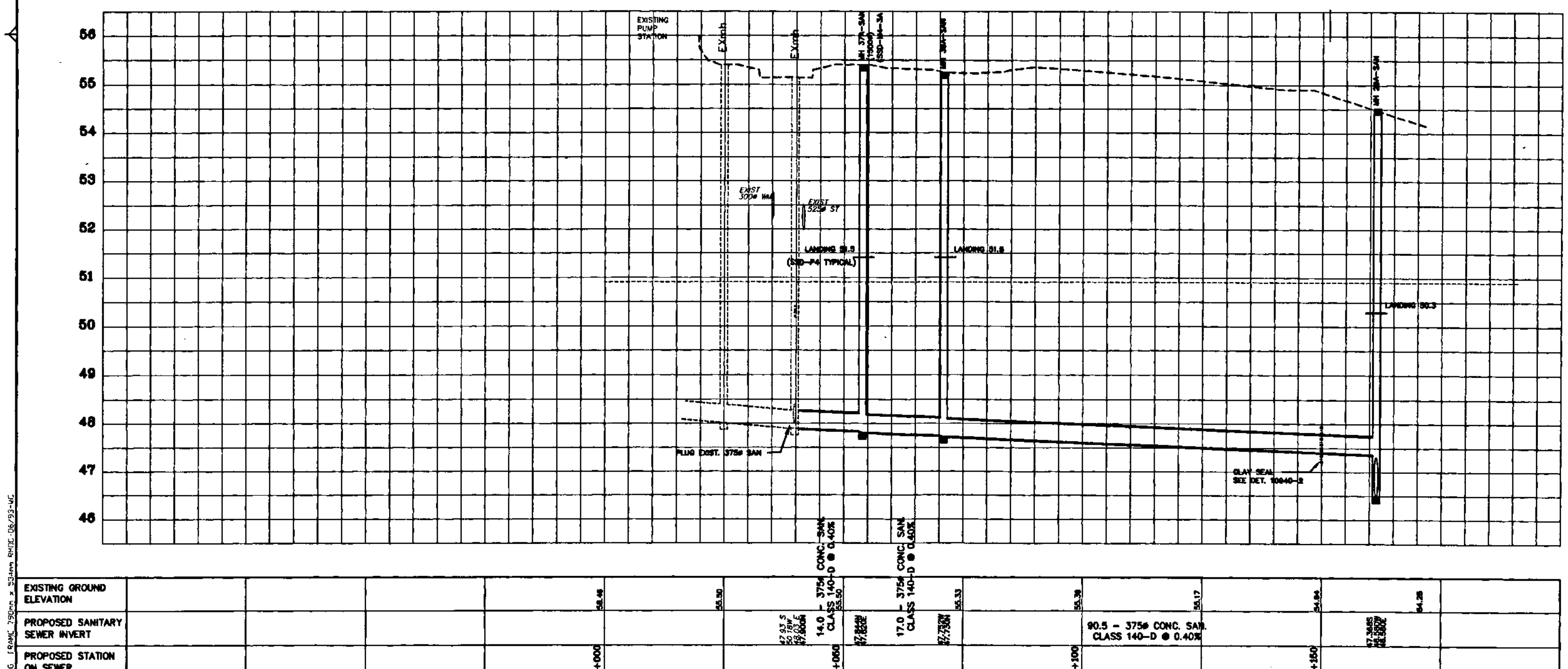
R.G. HEWITT, P.Eng. | W. NEWELL, P.Eng.

Dwn: D. Dore | Chkd: R.W. Wingate | Des: R.W. Wingate | Chkd: J.J. Moffatt

Ottawa
CONTRACT NO. ETL01-2113
DWG. NO. 10940-12
SHEET 13 OF 20
Date: AUG 31, 2001
Scale: HORIZONTAL 0m 5 10 20; VERTICAL 0m 0.5 1 2



Layout	Northing	Easting
MH36A	5039707.003	384274.782
MH37A	5039710.294	384257.897



NOTES:

ALL CONSTRUCTION ACTIVITY TO BE CONFINED TO EASEMENT LIMITS.

BOREHOLE INFORMATION AVAILABLE FOR REVIEW AT CUMMING COCKBURN LTD.

ALL MATERIAL AND INSTALLATION TO BE TO CITY OF OTTAWA STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS. UNLESS OTHERWISE SPECIFIED.

PLUG OVERFLOW MH14 TAYLOR CREEK BLVD FROM SANITARY MANHOLE TO STORM MANHOLE WITH PERMANENT CAST IN PLACE REINFORCED CONCRETE PLUG POURED MONOLITHIC WITH EXISTING REINFORCING IN MANHOLES AFTER DECOMISSIONING PUMPING STATION.

CLEARING AND GRUBBING COMPLETED BY OTHERS.

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

mmddyy

DGN_FILE_NAME

L L MOFFATT
01 08.31
PROVINCE OF ONTARIO

R W WINGATE
01 08.31
PROVINCE OF ONTARIO

Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Specialists

NO	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R W W	01 08.31
1	REVISED AS PER CITY COMMENTS	R W W	01 10 18
1	ISSUED FOR CONSTRUCTION	R W W	01 11 19

NOTE
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OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
CUMBERLAND WARD

EROSION AND SEDIMENT CONTROL PLAN

R.G. HEWITT, P.Eng.
Director Infrastructure Services

W. NEWELL, P.Eng.
Manager Construction Services - Structures

Des'd R W Wingate | Chk'd J J Moffatt | Dwn D Dore | Chk'd R W Wingate

Ottawa

CONTRACT NO.
ETL01-2113

DWG. NO.
10940-13

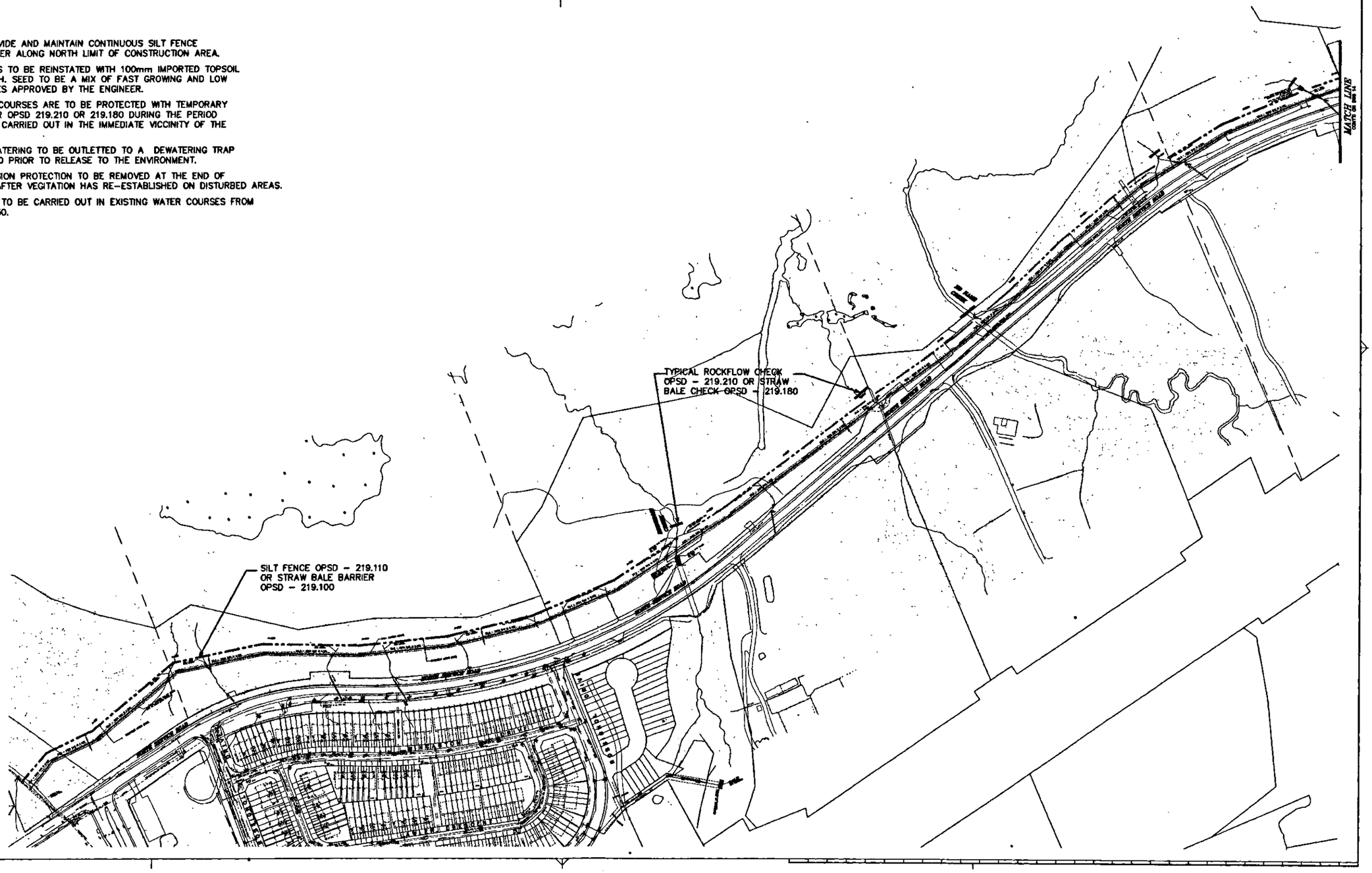
SHEET 14 OF 20

Date AUG 31, 2001

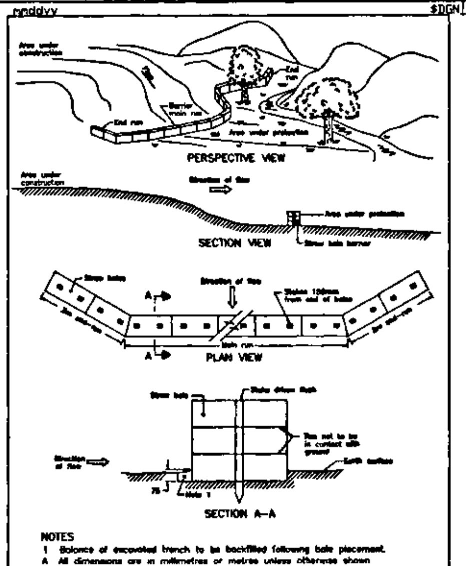
Scale
0m 40 80

NOTES:

- CONTRACTOR TO PROVIDE AND MAINTAIN CONTINUOUS SILT FENCE OR STAW BALE BARRIER ALONG NORTH LIMIT OF CONSTRUCTION AREA.
- ALL DISTURBED AREAS TO BE REINSTATED WITH 100mm IMPORTED TOPSOIL AND SEED AND MULCH. SEED TO BE A MIX OF FAST GROWING AND LOW MAINTENANCE GRASSES APPROVED BY THE ENGINEER.
- ALL EXISTING WATER COURSES ARE TO BE PROTECTED WITH TEMPORARY FLOW CHECKS AS PER OPSD 219.210 OR 219.180 DURING THE PERIOD THAT WORK IS BEING CARRIED OUT IN THE IMMEDIATE VICCINITY OF THE WATER COURSE.
- ALL TEMPORARY DEWATERING TO BE OUTLETTED TO A DEWATERING TRAP AS PER OPSD 219.240 PRIOR TO RELEASE TO THE ENVIRONMENT.
- ALL TEMPORARY EROSION PROTECTION TO BE REMOVED AT THE END OF CONSTRUCTION AND AFTER VEGITATION HAS RE--ESTABLISHED ON DISTURBED AREAS.
- NO CONSTRUCTION IS TO BE CARRIED OUT IN EXISTING WATER COURSES FROM MARCH 15 TO JUNE 30.



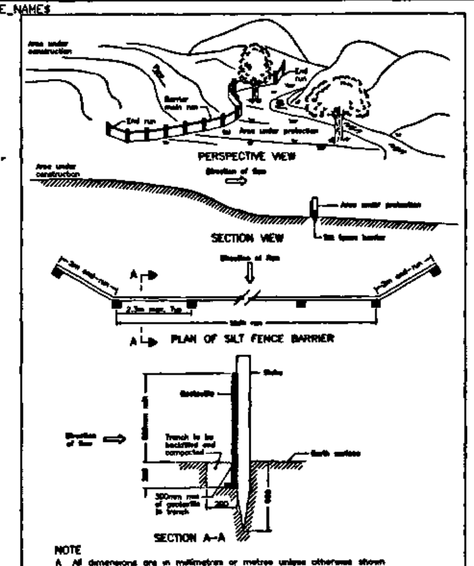
DWG. FRAME 790mm x 534mm RMDD-06/93-VG



ONTARIO PROVINCIAL STANDARD DRAWING | 1996 02 01 | Rev

LIGHT DUTY STRAW BALE BARRIER

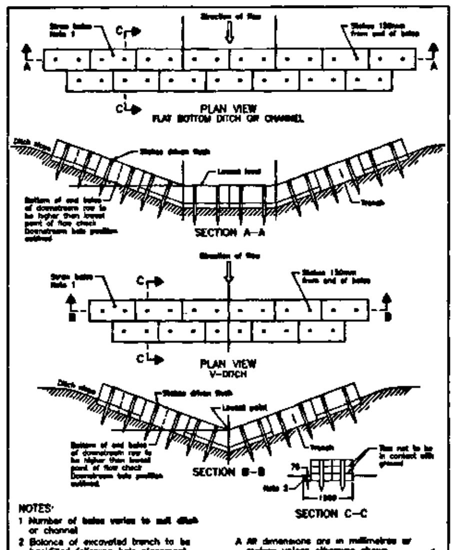
OPSD – 219.100



ONTARIO PROVINCIAL STANDARD DRAWING | 1996 02 01 | Rev

LIGHT DUTY SILT FENCE BARRIER

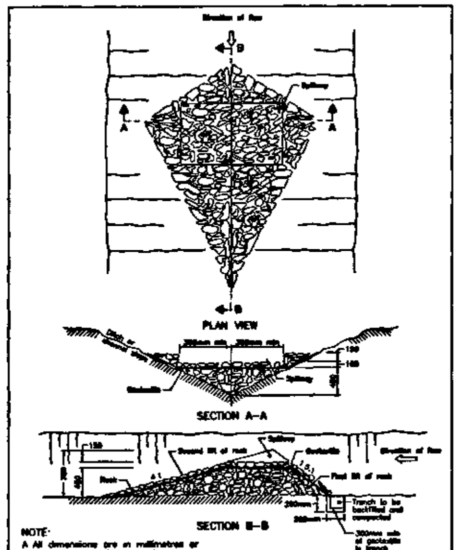
OPSD – 219.110



ONTARIO PROVINCIAL STANDARD DRAWING | 1996 02 01 | Rev

STRAW BALE FLOW CHECK

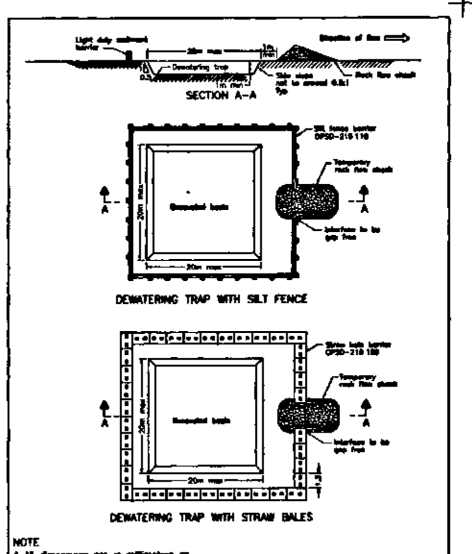
OPSD – 219.180



ONTARIO PROVINCIAL STANDARD DRAWING | 1996 02 01 | Rev

TEMPORARY ROCK FLOW CHECK
V–DITCH

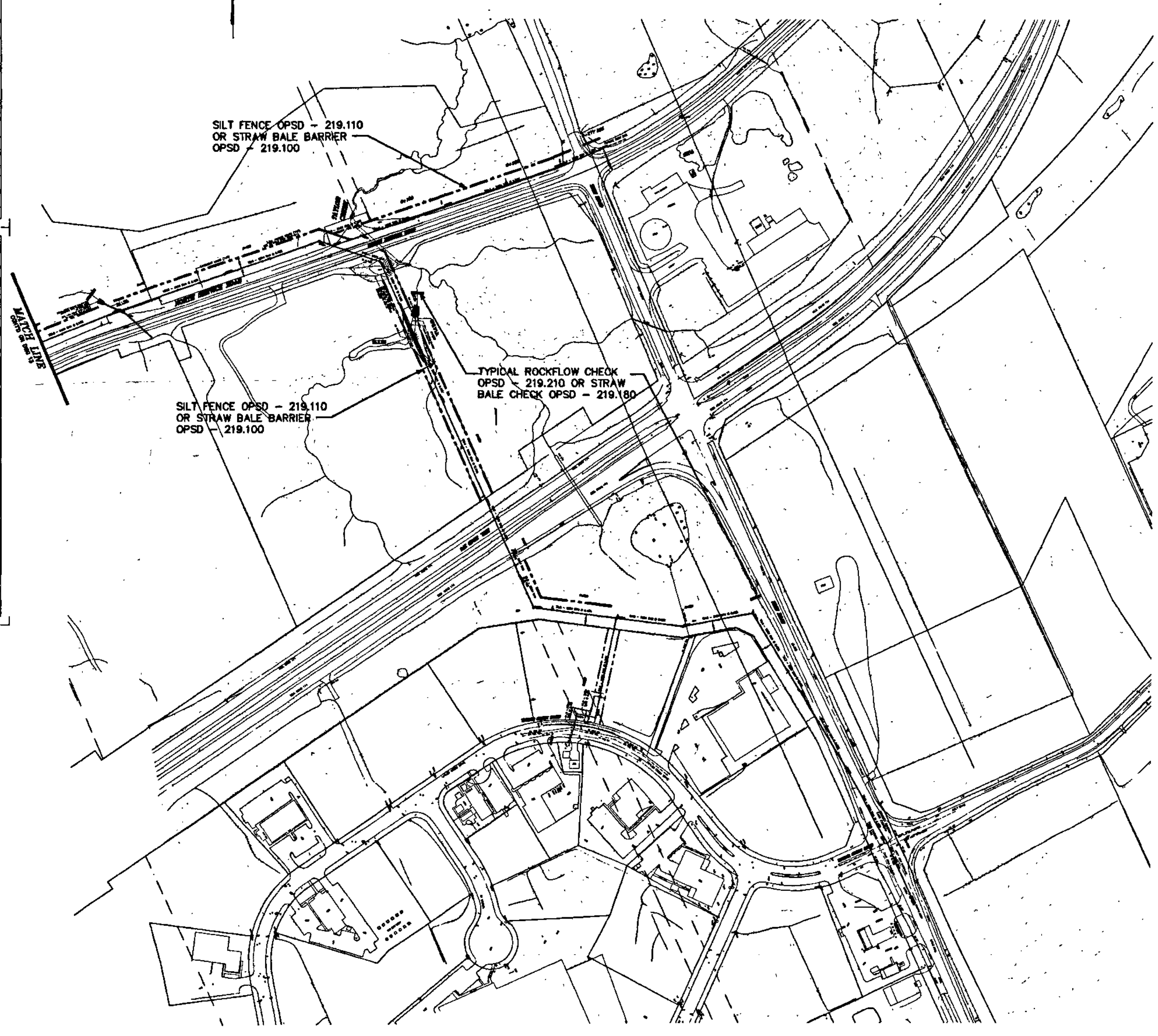
OPSD – 219.210



ONTARIO PROVINCIAL STANDARD DRAWING | 1996 02 01 | Rev

DEWATERING TRAP

OPSD – 219.240



Cumming Cockburn Limited
Consulting Engineers, Planners, and Environmental Scientists

NO	REVISIONS	BY	DATE
0	ISSUED FOR MOEE APPROVAL	R W W	01 08:31
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OTTAWA RIVER SUB TRUNK
NORTH SERVICE ROAD
-
CUMBERLAND WARD

EROSION AND SEDIMENT CONTROL PLAN

R.G. HEWITT, P.Eng. — Director Infrastructure Services
W. NEWELL, P.Eng. — Manager Construction Services – Structures

Dwn D Dore | Chkd R W Wingate | Des R W Wingate | Chkd J I Moffatt

Ottawa

CONTRACT NO. ETL01-2113

DWG. NO. 10940-14

SHEET 15 OF 20

Date AUG 31, 2001

Scale 0m 40 80

DWG FRAME 790mm x 534mm RMOC-06/93-VG

APPENDIX B

Sanitary Design Sheets

SANITARY SEWER CALCULATION SHEET - EXISTING FLOW

PROJECT: **Cardinal Creek Village**
LOCATION:
FILE REF: **11-513**
DATE: **20-Jul-12**

DESIGN PARAMETERS

Avg. Daily Flow Res.	350	L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0	Infiltration / Inflow	0.28 L/s/ha
Avg. Daily Flow Comm.	50,000	L/ha/d	Peak Fact. Comm. 1.5	Min. Pipe Velocity	0.60 m/s full flowing
Avg. Daily Flow Instit.	50,000	L/ha/d	Peak Fact. Instit. 1.5	Max. Pipe Velocity	3.00 m/s full flowing
Avg. Daily Flow Indust.	35,000	L/ha/d	Peak Fact. Indust. per MOE graph	Mannings N	0.013

Location			Residential Area and Population					Commercial		Institutional		Industrial			Infiltration				Pipe Data							
Area ID	Up	Down	Area	Pop.	Cumulative Area	Cumulative Pop.	Peak. Fact.	Q_{res}	Area	Accu. Area	Area	Accu. Area	Area	Accu. Area	Q_{C+I+I}	Total Area	Accu. Area	Infiltration Flow	Total Flow	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Q_{cap}	Q / Q full
			(ha)		(ha)		(-)	(L/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(-)
V			7.500	575.0	7.500	575.0	3.94	9.18		0.00		0.00		0.00	0.0	7.500	7.500	2.100	11.28								
W			61.400	4285.0	68.900	4860.0	3.26	64.11	1.60	1.60	15.60	15.60	1.10	1.10	15.8	79.700	87.200	24.416	104.35								
X			85.100	7655.0	154.000	12515.0	2.86	144.86	4.80	6.40	13.80	29.40		1.10	32.0	103.700	190.900	53.452	230.28								
Y			30.900	2156.0	184.900	14671.0	2.79	165.69		6.40		29.40		1.10	32.0	30.900	221.800	62.104	259.76								
L	1	2	11.000	118.0	195.900	14789.0	2.78	166.81	1.10	7.50		29.40	15.80	16.90	45.7	27.900	249.700	69.916	282.45	900	0.12		0.636	0.225	0.99	627.1	0.45
J			12.000	608.0	12.000	15397.0	2.77	172.57		7.50		29.40		16.90	45.7	12.000	261.700	73.276	291.57								
K			0.000	0.0	12.000	15397.0	2.77	172.57	8.80	16.30		29.40		16.90	53.4	8.800	270.500	75.740	301.67								
M			1.100	14.0	13.100	15411.0	2.77	172.70	4.30	20.60	6.00	35.40		16.90	62.3	11.400	281.900	78.932	313.94								
N			229.000	14921.0	242.100	30332.0	2.47	303.81	11.30	31.90		35.40	15.50	32.40	84.7	255.800	537.700	150.556	539.03								
R			34.900	2112.0	277.000	32444.0	2.44	321.20	15.80	47.70		35.40	5.70	38.10	103.0	56.400	594.100	166.348	590.55								
S			1.800	21.0	278.800	32465.0	2.44	321.37		47.70		35.40		38.10	103.0	1.800	595.900	166.852	591.22								
T			44.000	3916.0	322.800	36381.0	2.40	353.05	10.90	58.60		35.40	8.80	46.90	119.6	63.700	659.600	184.688	657.34								
U	2	3	44.000	3916.0	366.800	40297.0	2.35	384.09	10.90	69.50		35.40	8.80	55.70	136.2	63.700	723.300	202.524	722.80	1200	0.15		1.131	0.300	1.34	1510.0	0.48
D			4.700	238.0	4.700	40535.0	2.35	385.96		69.50		35.40		55.70	136.2	4.700	728.000	203.840	725.98								
E			14.200	656.0	18.900	41191.0	2.34	391.09		69.50		35.40		55.70	136.2	14.200	742.200	207.816	735.10								
F			6.000	453.0	24.900	41644.0	2.34	394.63		69.50		35.40		55.70	136.2	6.000	748.200	209.496	740.31								
G			12.900	571.0	37.800	42215.0	2.33	399.08		69.50		35.40		55.70	136.2	12.900	761.100	213.108	748.38								
H			9.900	793.0	47.700	43008.0	2.33	405.24		69.50		35.40		55.70	136.2	9.900	771.000	215.880	757.31								
I			8.400	663.0	56.100	43671.0	2.32	410.37		69.50		35.40		55.70	136.2	8.400	779.400	218.232	764.79								
O			71.700	4705.0	127.800	48376.0	2.28	446.40	3.20	72.70	3.30	38.70		55.70	141.8	78.200	857.600	240.128	828.36								
P			86.300	5614.0	214.100	53990.0	2.23	488.54	20.70	93.40	8.10	46.80		55.70	166.8	115.100	972.700	272.356	927.72								
Q	3	4	34.900	2112.0	249.000	56102.0	2.22	504.17	15.80	109.20		46.80	5.70	61.40	185.2	56.400	1029.100	288.148	977.48	1350	0.08		1.431	0.338	1.05	1509.6	0.65
A			21.800	1607.0	270.800	57709.0	2.21	516.00	0.40	109.60		46.80	2.20	63.60	187.3	24.400	1053.500	294.980	998.27								
B			27.600	1586.0	298.400	59295.0	2.20	527.61		109.60		46.80	2.20	65.80	189.1	29.800	1083.300	303.324	1020.01								
C	4	OUTLET	3.800	190.0	302.200	59485.0	2.20	529.00		109.60		46.80		65.80	189.1	3.800	1087.100	304.388	1022.46	1350	0.08		1.431	0.338	1.05	1509.6	0.68

SANITARY SEWER CALCULATION SHEET - PROPOSED DEVELOPMENT

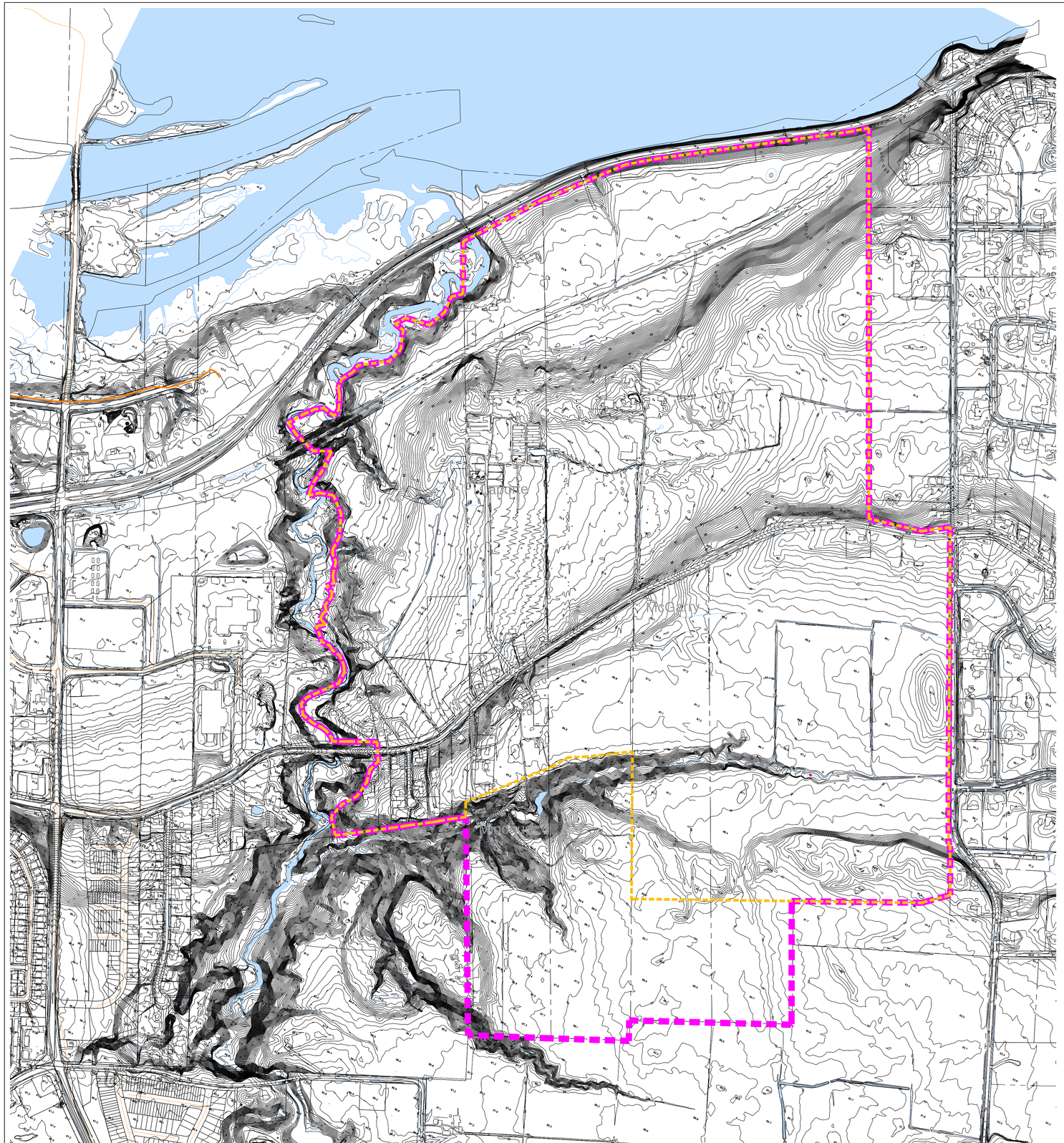
PROJECT: **Cardinal Creek Village**
LOCATION:
FILE REF: **12-513**
DATE: **20-Jul-12**

DESIGN PARAMETERS

Avg. Daily Flow Res.	350	L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0	Infiltration / Inflow	0.28 L/s/ha
Avg. Daily Flow Com	50,000	L/ha/d	Peak Fact. Comm. 1.5	Min. Pipe Velocity	0.60 m/s full flowing
Avg. Daily Flow Instit	50,000	L/ha/d	Peak Fact. Instit. 1.5	Max. Pipe Velocity	3.00 m/s full flowing
Avg. Daily Flow Indus	35,000	L/ha/d	Peak Fact. Indust. per MOE graph	Mannings N	0.013

Location	Residential Area and Population						Commercial		Institutional		Industrial			Infiltration			
Area ID	Area	Pop.	Cumulative Area	Cumulative Pop.	Peak. Fact.	Q_{res}	Area	Accu. Area	Area	Accu. Area	Area	Accu. Area	Q_{C+I+I}	Total Area	Accu. Area	Infiltration Flow	Total Flow
	(ha)		(ha)		(-)	(L/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)
Proposed Development	159.5	15360.0	159.5	15360.0	2.77	172.22	14.0	14.0	12.6	12.6	0.00	0.00	23.1	186.1	186.1	52.1	247.4

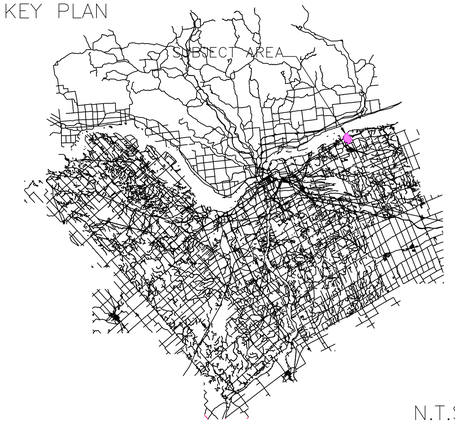
*** See Figure-5 assumes 3.2 people per unit**



LEGEND

- STUDY AREA
- URBAN GROWTH BOUNDARY
- PROPERTY LINES

KEY PLAN



N.T.S.

Cardinal Creek VILLAGE

TAMARACK
TAMARACKHOMES.COM

Richard W. Harrison & Associates
Consultancy in Urban Planning & Land Development

Walker, Nott, Dragicevic Associates Limited
Planning + Urban Design

Delcan

DSEL
david schaeffer engineering ltd
SMART SUBDIVISIONS™

IBI GROUP

JFSA Water Resources and Environmental Consultants

Muncaster Environmental Planning Inc.

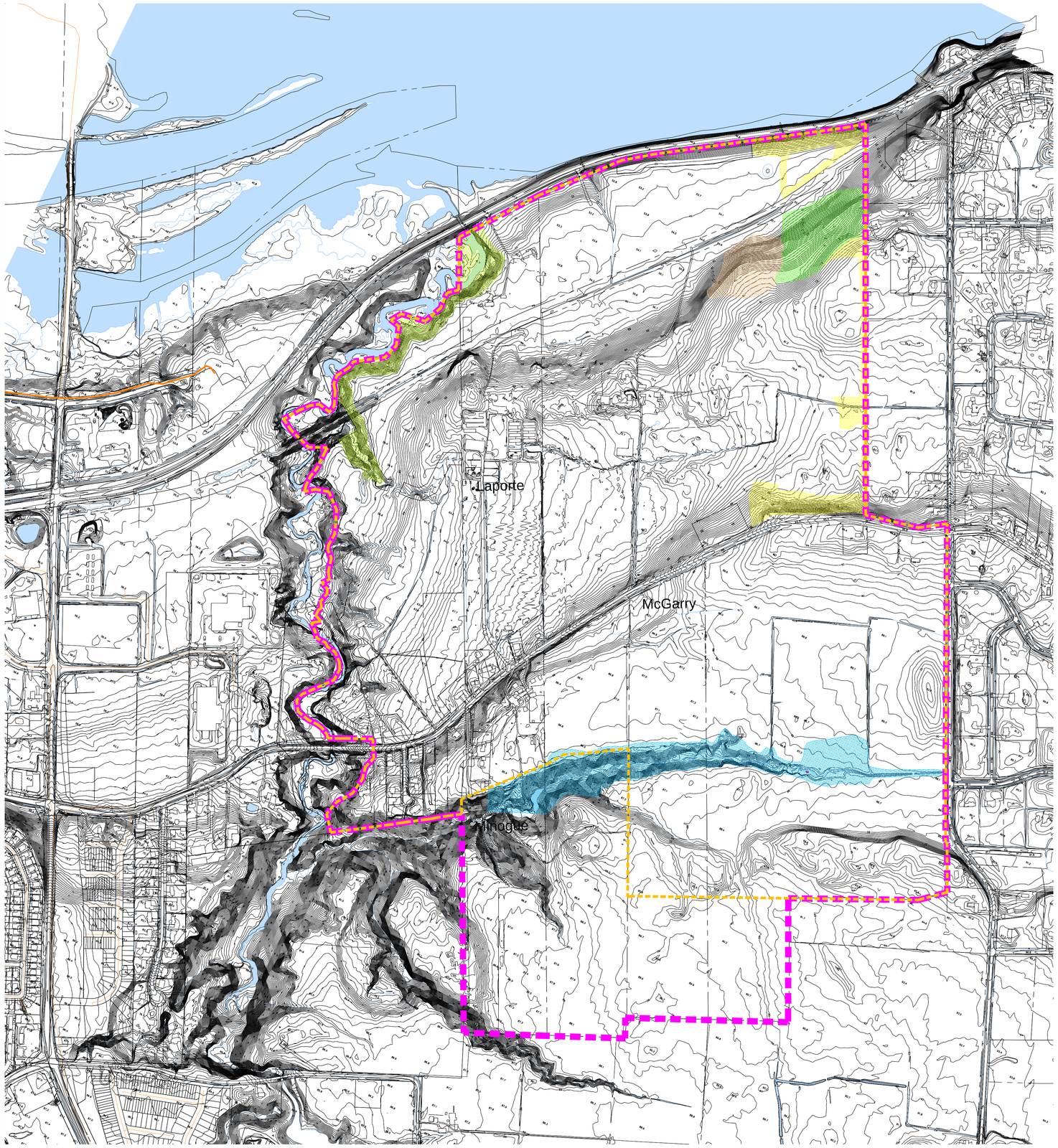
patersongroup

No.	BY	YY.MM.DD	DESCRIPTION
1	LM	12.11.07	Existing Conditions Report – November 2012

STUDY AREA

DRAWN BY:	A.D.F.	CHECKED BY:	S.J.P.	DRAWING NO.	SHEET NO.
SCALE: 1:5000	0 25 50 125 250m			FIGURE-1	1 of 6

z:\projects\11-513 cardinal village community\b_design\b2_drawings\b2-2_main (dsel)\existing-conditions_report\sub-2\2012-11-07_513_ex_cond_fig.dwg



LEGEND

- STUDY AREA
- URBAN GROWTH BOUNDARY
- PROPERTY LINES
- CEDAR FOREST
- MAPLE FOREST
- OTHER COMPONENTS OF NATURAL SYSTEM
- CARDINAL CREEK FEATURE
- SOUTH TRIBUTARY CORRIDOR

Cardinal Creek VILLAGE

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Richard W. Harrison & Associates
Consultancy in Urban Planning & Land Development

Walker, Nott, Dragicevic Associates Limited
Planning + Urban Design

Delcan
DSEL
david schaeffer engineering ltd
SMART SUBDIVISIONS™

IBI GROUP

JFSA Water Resources and Environmental Consultants

Muncaster Environmental Planning Inc.

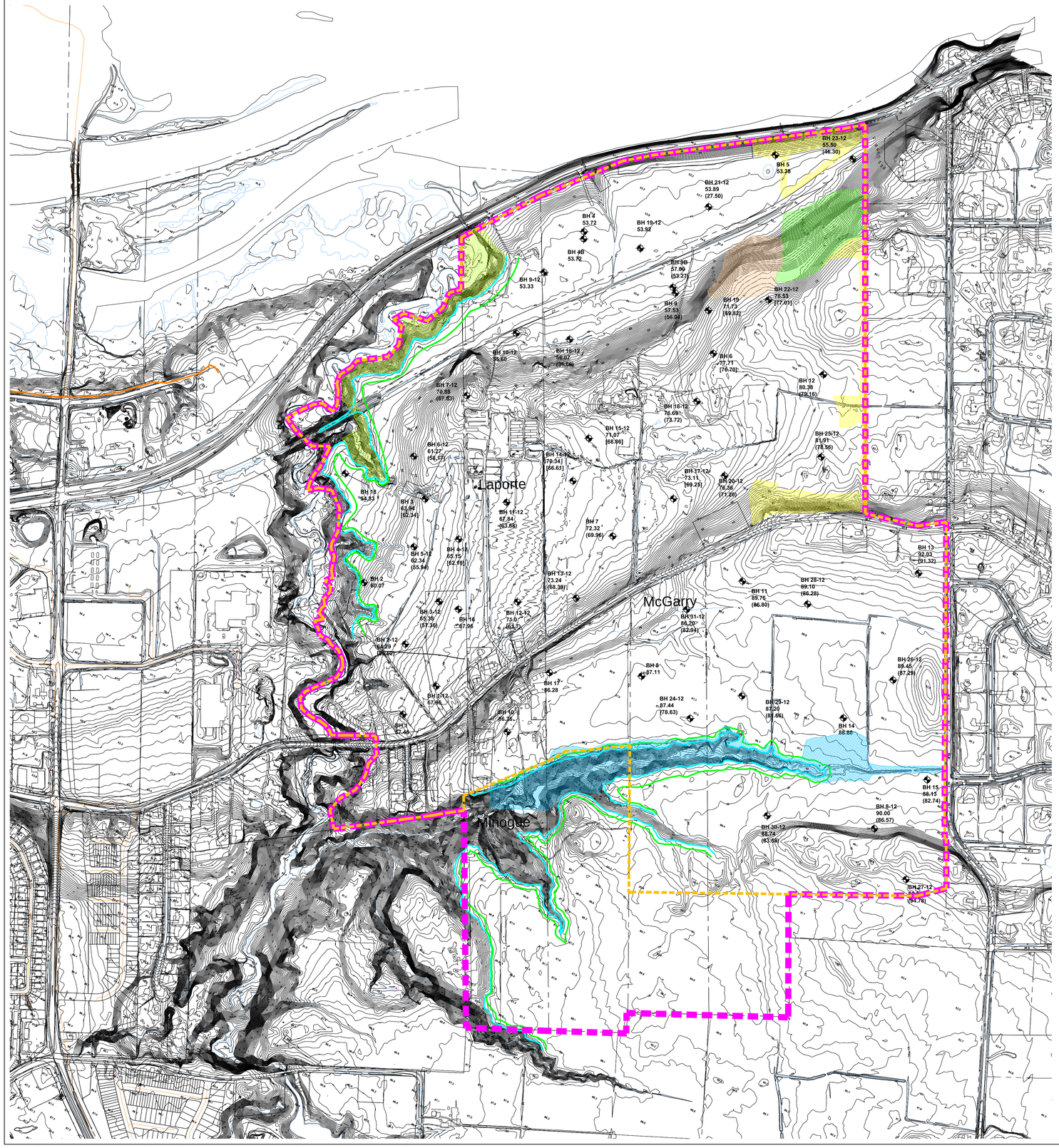
paterson group

No.	BY	YY.MM.DD	DESCRIPTION
1	LM	12.11.07	Existing Conditions Report – November 2012

ENVIRONMENTAL FEATURES PLAN

DRAWN BY:	A.D.F.	CHECKED BY:	S.J.P.	DRAWING NO.	SHEET NO.
SCALE: 1:5000	0 25 50 125 250m			FIGURE-2	2 of 6

z:\projects\11-513 cardinal village community\b_design\b2_drawings\b2-2_main (dsel)\existing-conditions_report\sub-2\2012-11-07_513_ex_cond_fig.dwg



LEGEND

- STUDY AREA
- URBAN GROWTH BOUNDARY
- PROPERTY LINES
- BH 23-12 55.50 (46.30) — BOREHOLE LOCATIONS (PATERSON GROUP – PG1796) GROUND ELEVATION (PRACTICAL REFUSAL TO AUGERING) [INFERRED BEDROCK ELEVATION]
- LIMIT OF HAZARD (PATERSON GROUP – PG1798)
- TOP OF SLOPE (PATERSON GROUP – PG1798)
- TERRESTRIAL AREA (MUNCASTER ENVIRONMENTAL)

Cardinal Creek VILLAGE

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Consultancy in Urban Planning & Land Development

Walker, Nott, Dragicevic Associates Limited
Planning + Urban Design

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DSEL
david schaeffer engineering ltd
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GEOTECHNICAL PLAN

DRAWN BY: A.D.F.	CHECKED BY: S.J.P.	DRAWING NO.	SHEET NO.
SCALE: 1:5000 (0 25 50 125 250m)		FIGURE-3	3 of 6

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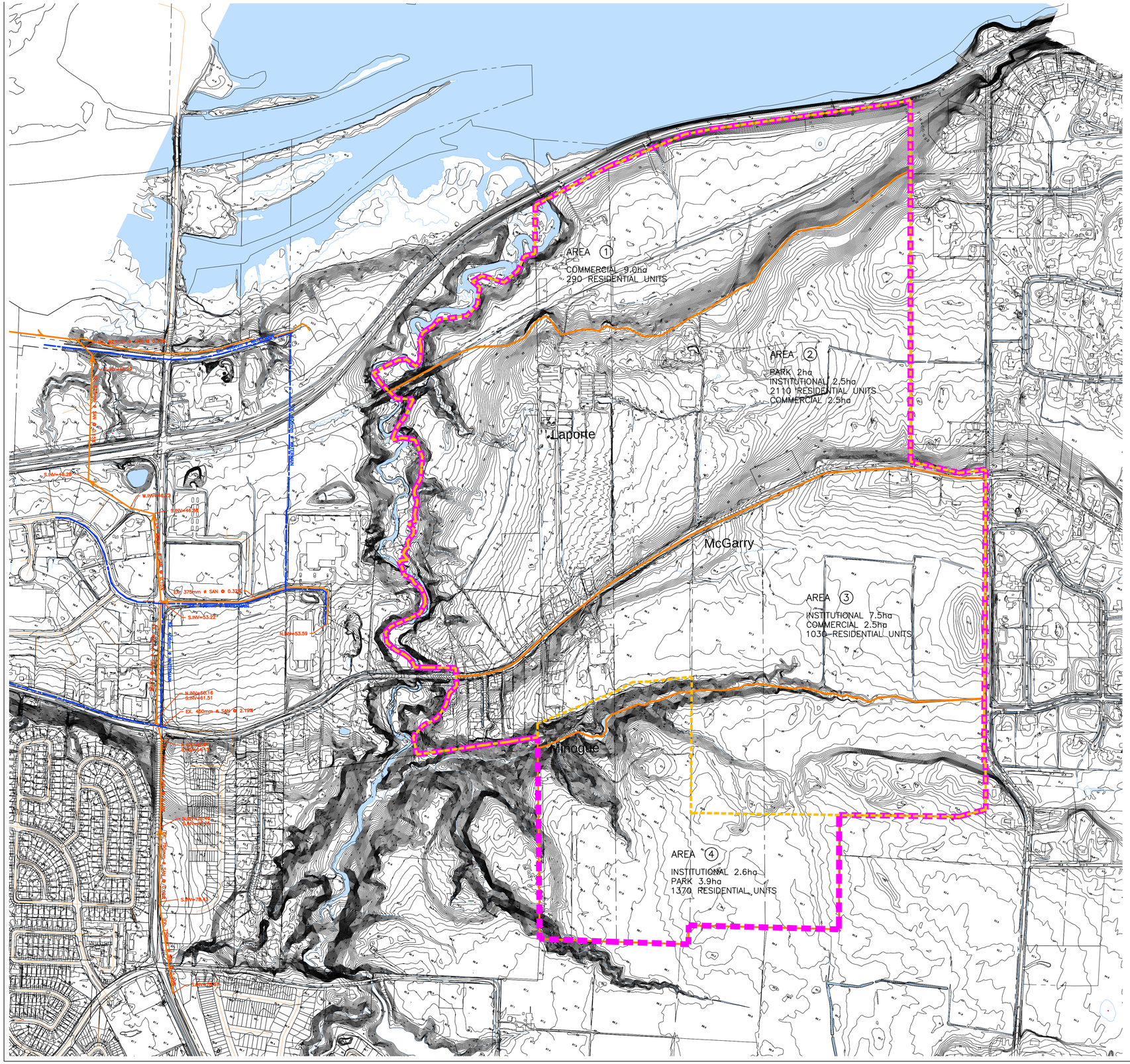

LEGEND

- STUDY AREA
- URBAN GROWTH BOUNDARY
- PROPERTY LINES

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EXISTING SERVICES

DRAWN BY:	A.D.F.	CHECKED BY:	S.J.P.	DRAWING NO.	SHEET NO.
SCALE: 1:5000	0 25 50 125 250m			FIGURE-4	4 of 6

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LEGEND

- STUDY AREA
- URBAN GROWTH BOUNDARY
- PROPERTY LINES
- TRUNK SEWER

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1	LM	12.11.07	Existing Conditions Report – November 2012

SANITARY ANALYSIS

DRAWN BY:	B.N.C.	CHECKED BY:	S.J.P.	DRAWING NO.	SHEET NO.
SCALE: 1:15000	0 75150 375 750m			FIGURE-5	5 of 6

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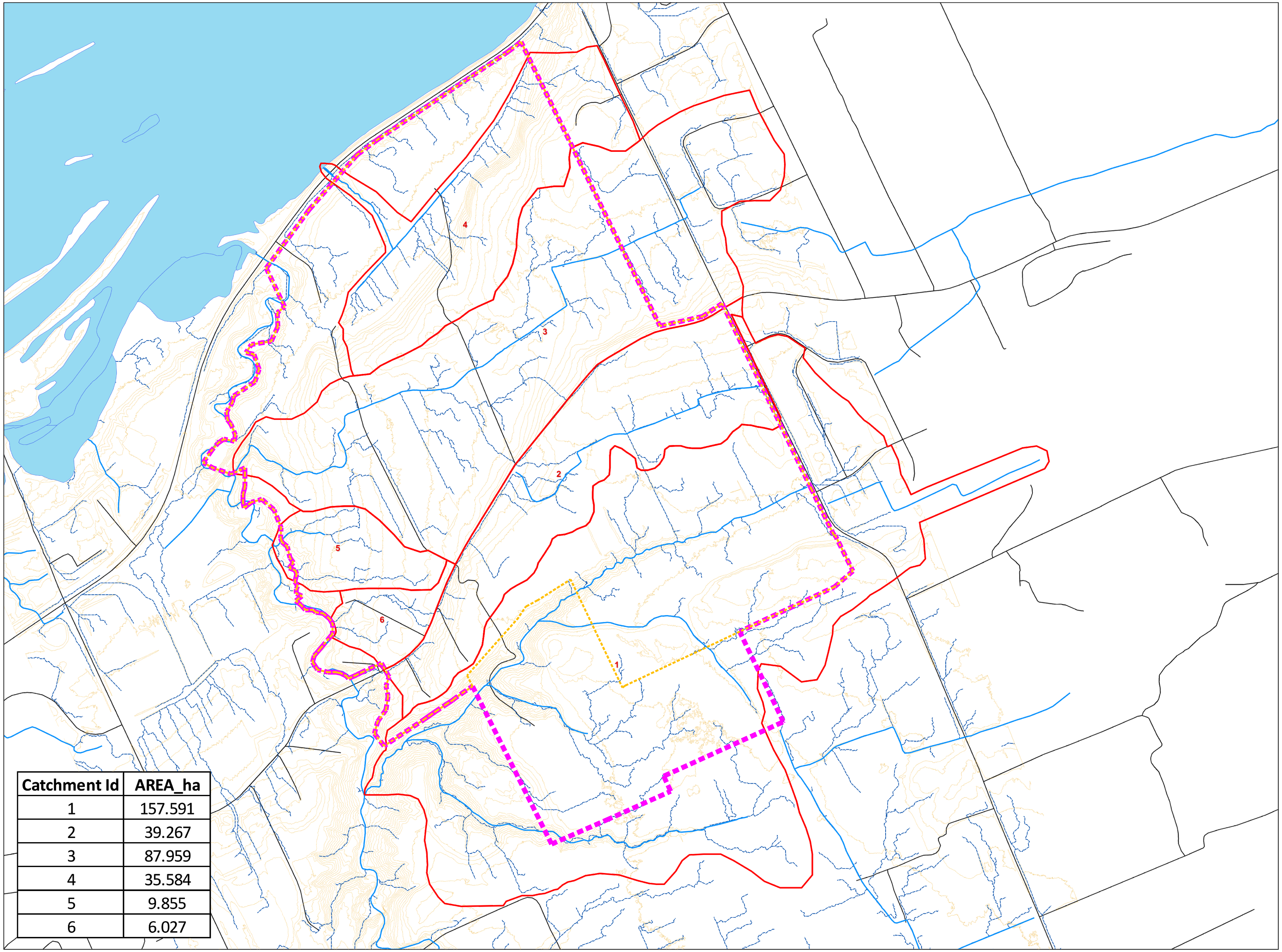

Catchment Id	AREA_ha
1	157.591
2	39.267
3	87.959
4	35.584
5	9.855
6	6.027

LEGEND:

- Rivers and Streams (OBM data)
- Modelled Overland Flow Paths
- Contours (2m)
- Roads (OBM data)
- Catchments
- Ottawa River (OBM data)
- Study Area
- Urban Growth Boundary

NOTES:

- The road and water data was provided by the OBM database.
- The contours and modelled overland flow paths were generated from Lidar data using ArcGIS and the ArcHydro extension.
- The existing condition catchment areas were then delineated based on the model generated overland flow paths and contours. These catchments can be augmented by field surveys and additional information gained on the study area.

0 65 130 260 390 520 Meters

N

BY:

JFSA Water Resources and Environmental Consultants

CLIENT:

PROJECT:

CARDINAL CREEK VILLAGE

TITLE:

Existing Condition Drainage Areas

NOVEMBER 2012	REV. 1

PROJECT No. 959

DESIGN	KM	
GIS	KM	
CHECK	JFS	
REVIEW	JFS	

FIGURE 6

MAP REF.:
Revised by DSEL (LM.12.11.07)
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