

November 19, 2024

File: 161414396

Attention: David Ailles

York Developments
 303 Richmond Street #201
 London, ON, N6A 4L9

Dear David,

Reference: Arva Development – Sanitary Servicing Brief

This letter is written to support the future subdivision development located within the settlement boundary of Arva within the Municipality of Middlesex Centre, in providing information on the anticipated sewage flows of the development. The proposed Subdivision includes 23.516 Ha of land comprised of parcels west of Richmond Street and both north and south of Medway Road. The development is proposed to include approximately 932 residential units, as per the latest draft plan of subdivision completed by MHBC Ltd., attached. The development is comprised of a mix of low, medium and high density blocks for a total population of 1,950 as broken down below.

Table 1 – Proposed Population

Blocks	Residential Type	Area (ha)	No. Units	Population Density (P/unit)	Population
1, 3, 7, 16-21, 24, 25	LD	7.964	122	3	366
5, 9, 10, 12, 22, 27	MD Street Townhouses	1.594	49	2.4	118
13-15	MD Cluster Townhouses	1.893	62	2.4	149
8, 11	MD Apartments	2.314	247	2.4	593
23	HD Apartments	1.940	452	1.6	724
Total			932		1,950

**Population Densities based on City of London DSRM*

It is anticipated that the development will be broken down into several phases. However, for this analysis sanitary sewage flows will be calculated based on an ultimate condition with the aforementioned total population.



Reference: Arva Development – Sanitary Servicing Brief

Existing Sanitary Infrastructure & Sewage Flows

Currently there exists a 200mm sanitary gravity sewer along Medway Road that is capped approximately 100m west of Richmond Street. This sewer ultimately Leads to the existing Arva Pump Station along Richmond Street, approximately 400 meters south of Medway Road via a 250mm sanitary gravity sewer.

The pump station is comprised of a 3m diameter wet well equipped with two (2) submersible pumps (one standby), and a 3m square precast concrete chamber housing two (2) dry pit booster pumps (one standby). The submersible pump and dry pit booster pump operate in series to provide a firm station capacity of approximately 30 L/s at 60m TDH. The station discharges via a 150mm diameter forcemain, 1,713m along Richmond Street into a sanitary manhole located at the junction of Plane Tree Drive and Richmond Street.

Currently an agreement between the Municipality of Middlesex Centre and the City of London limits the discharge to 175 m³/day on a two-month rolling average. Based on recent data collection, the average daily flow over 2020 and 2021 is approximately 85 m³/day with one peak month averaging near 140 m³/day. An estimated annual average flow of 92.5 m³/day is used as further calculated in this brief. These flows are assumed to be contributed by a theoretical population of 600 as per the current build out. This results in an approximate average sewage flow of 154.2 L/cap/day.

Proposed Sanitary Flows

As mentioned in table 1, the proposed development is anticipated to introduce an additional population of 1,950 people in the community of Arva. The proposed peak sanitary flows based on the City of London standards (230 L/cap/day and 0.1 L/s/ha for infiltration) are broken down in the below table.

Table 2 – Proposed Peak Sanitary flow

Area (ha)	Population	Peaking Factor	Q _{people} (L/s)	Q _{infiltration} (L/s)	Q _{total} (L/s)	Q _{total} (m ³ /day)
23.516	1,950	3.59	20.52	2.35	22.88	1,977

Therefore, the ultimate buildout of the development is anticipated to contribute a maximum sanitary peak flow including inflow and infiltration of 22.88 L/s (1,977 m³/day). These flows will require to be conveyed to the City of London via a sanitary pump station, sanitary forcemain or gravity sewer. The average sanitary flow for the development can be calculated by removing the peaking factor, as a result the average sanitary flow is 8.06 L/s as broken down in the below table.



Reference: Arva Development – Sanitary Servicing Brief

Table 3 – Proposed Average Sanitary Flows

Area (ha)	Population	Q _{people} (L/s)	Q _{infiltration} (L/s)	Q _{total} (L/s)	Q _{total} (m ³ /day)
23.516	1,950	5.71	2.35	8.06	697

Arva Pump Station

Based on the previously mentioned discharge rate to the City of London, the existing Arva pump station is expected to be able to take on an additional 82.5 m³/day (82,500 L/day) on average, as broken down below:

$$\text{Annual Average Flow} = \frac{(85 \times 10 \text{ months}) + (140 \times 1 \text{ month}) + (120 \times 1 \text{ month})}{12 \text{ months}} = 92.5 \text{ m}^3/\text{day}$$

$$\text{City of London Discharge Agreement} = 175 \text{ m}^3/\text{day}$$

$$\text{Available Sanitary Discharge} = 175 \frac{\text{m}^3}{\text{day}} - 92.5 \frac{\text{m}^3}{\text{day}} = 82.5 \text{ m}^3/\text{day}$$

The above calculated flows are based on existing and anticipated average flows and not peak flows. Peak flows shall be used when designing the sanitary sewer collection system. Moreover, inflow and infiltration shall also be taken into consideration and will be dependent on the developable area. Therefore, using the city of London average sanitary flow of 230 L/capita/day the Arva pump station is anticipated to be capable of taking on an additional 359 people or 120 low-density residential units, as broken down below:

Table 3 – Arva Pump Station Available Capacity

	Total Available Flow (L/day)	Corresponding Population (230 L/cap/day)	Corresponding Low-density Units (3p/unit)
Average	82,500	359	120

Thus, contribution from the proposed development (697 m³/day) will require an increase in the agreed upon sanitary discharge rate to the City of London (175 m³/day of which 82.5 m³/day is available) as well as an expansion of the Arva pump station. The proposed development will require an additional sanitary discharge rate of 614.5 m³/day. Alternatively, a new pump station may be introduced with adequate capacity to take on the proposed sanitary flows of the



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Reference: Arva Development – Sanitary Servicing Brief

development with corresponding sanitary forcemain which outlets to the existing downstream sanitary infrastructure in the City of London.

Village Walk Boulevard Sanitary Sewer

The existing sanitary gravity sewer at the intersection of Village Walk Boulevard and Richmond Street within the City of London has available capacity of 29.6 L/s (peak flow) allocated to Arva. With this capacity allocated to Arva, there is enough to accommodate the proposed development with its estimated sanitary peak flow contribution of 22.88 L/s. The proposed subdivision would not be able to be conveyed to this sewer by gravity and would require a pumping station and forcemain.

Conclusion

We trust this meets your requirements for confirmation on the proposed development's sanitary peak flows in compliance with City of London Standards. Should you have any questions or require anything further, please do not hesitate to contact the undersigned.

Sincerely,

STANTEC CONSULTING LTD.

A handwritten signature in black ink, appearing to read 'A. Shaat'.

Abdalla Shaat, EIT
Civil Engineering Designer, Project Coordinator
Community Development
Phone: 519-670-7137
Abdalla.Shaat@stantec.com

A handwritten signature in black ink, appearing to read 'D. Hern'.

Darryl Hern, P.Eng.
Project Manager
Community Development
Phone: 519-675-6622
Darryl.Hern@stantec.com

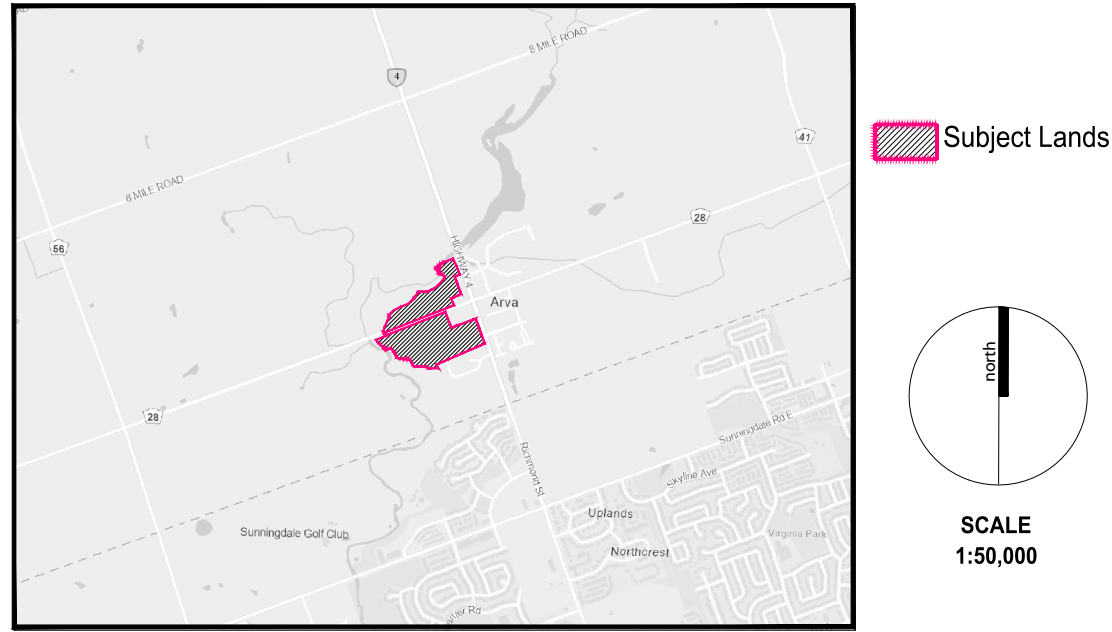
Attachment: - Preliminary Draft Plan of Subdivision MHBC, November 2024
- Arva Sanitary Sewage System as-builts



PART OF LOT 17,
CONCESSION 6 & 7
MUNICIPALITY OF MIDDLESEX CENTRE
COUNTY OF MIDDLESEX

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO
SUBMIT THIS PLAN FOR APPROVAL.

Surveyor's Certificate
I HEREBY AUTHORIZE CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS
PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY
SHOWN.



SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR IN OUR LETTER DATED _____, 2020
THIS DRAFT PLAN IS APPROVED UNDER SECTION 51 OF THE PLANNING ACT
_____ DAY OF _____, 2020

4	November 15, 2024	Request from Client	PL
3	October 18, 2024	Request from Client	PL
2	October 1, 2024	Revised Apartment blocks, SWM	PL
1	July 26, 2024	Issued	CCF
Date		Issued / Revision	By

Additional Information Required Under Section 51(17) of the Planning Act R.S.O. 1990, c.P.13 as Amended

A. As Shown	B. As Shown	C. As Shown
D. Residential	E. As Shown	F. As Shown
G. As Shown	H. Municipal Water Supply Available	I. Silt Loam
J. As Shown	J. All Services As Required	L. As Shown

Description	Lots/Blocks	Units	Area (ha)
Low Density Residential	1, 3, 7, 16 - 21, 24, 25	122	8.031
Medium Density Residential (Street Townhouses)	5, 9, 10, 12, 22, 27	49	1.594
Medium Density Residential (Cluster Townhouses)	13 - 15	62	1.893
Medium Density Residential (Apartments)	8, 11, 23	699	4.216
Park	35		0.603
Walkway	31, 43		0.082
Maintenance Setback	4, 6		0.584
Storm Water Management	30, 37		1.275
Pump Station	36		0.160
Open Space	2, 29		0.753
0.3m Reserves	40, 41		0.009
Road Widening	32, 33		0.457
Roads			3.860

Total 37 932 23.516 ha.

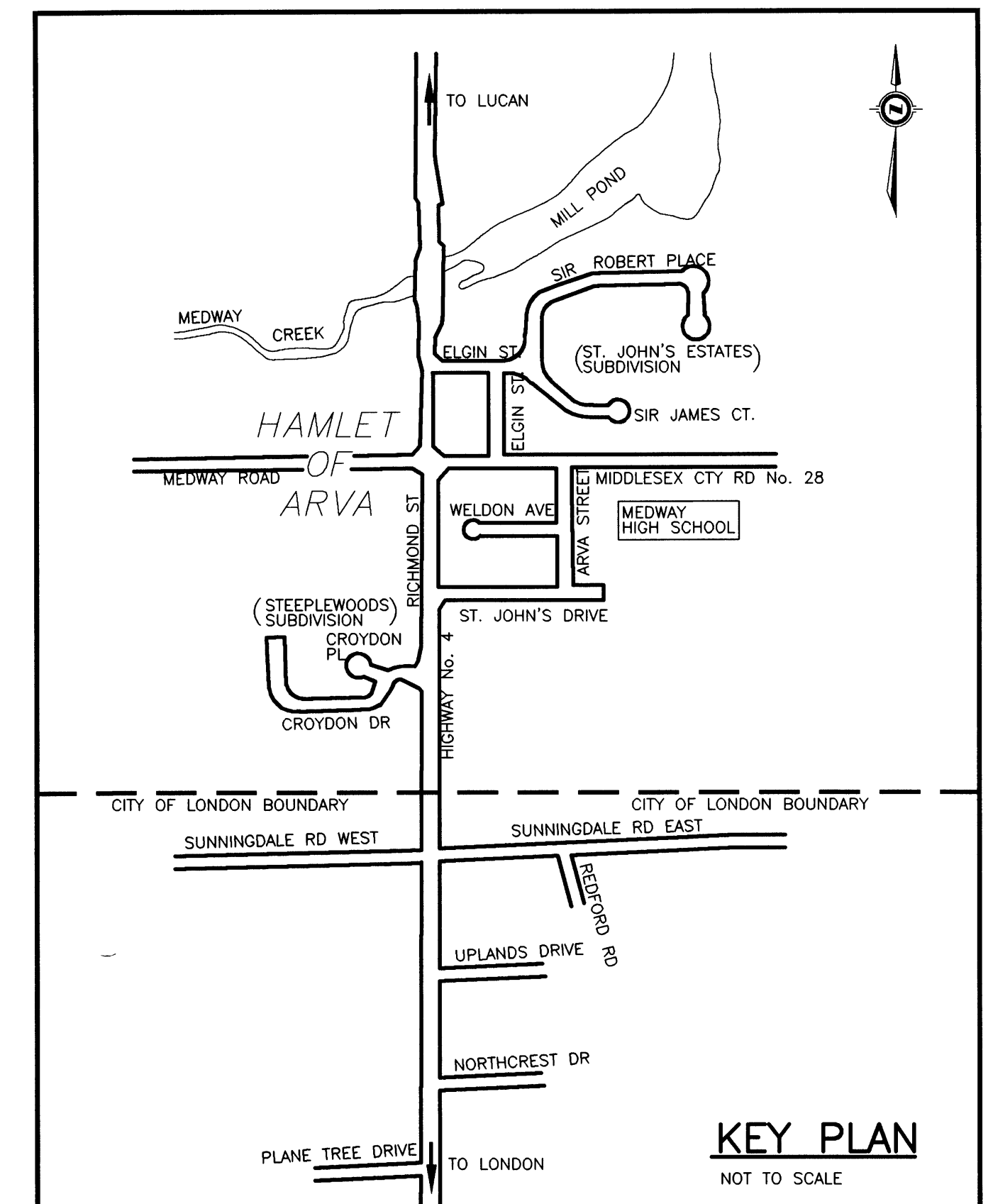
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

540 BINGEMANS CENTRE DRIVE, SUITE 200, KITCHENER, ON, N2B 3X9 | P: 519 576 3650 | WWW.MHBCPLAN.COM

File No. 1094 'BE'	Drawn By L.M./P.L./C.C.F.	Date November 15, 2024
PRELIMINARY DRAFT PLAN OF SUBDIVISION		
Plan Scale 1:2000		

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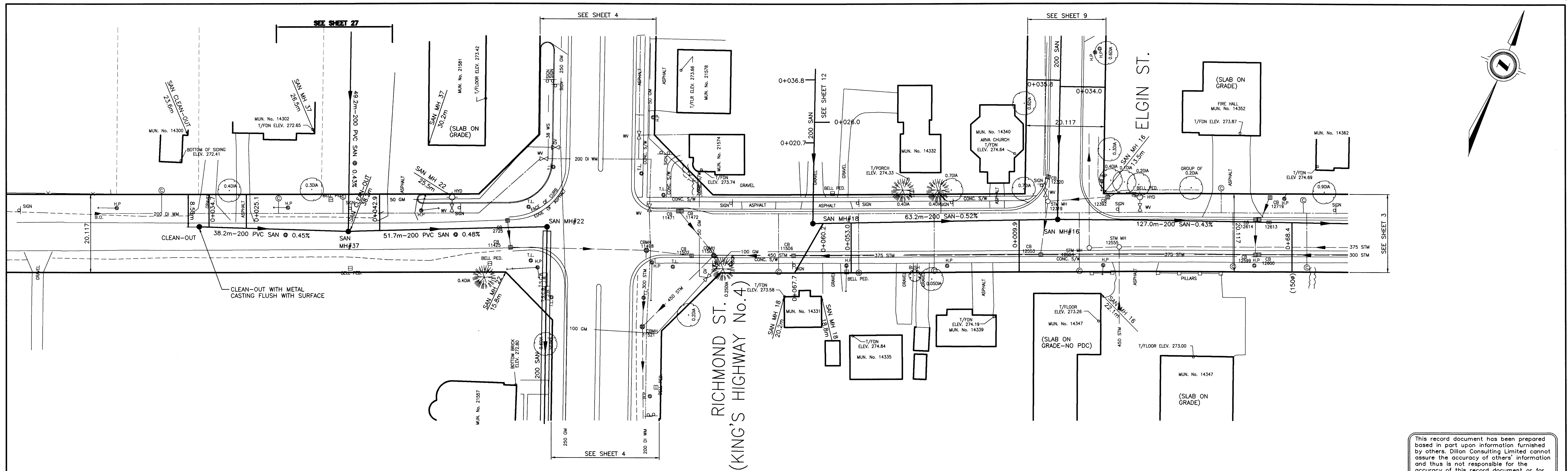
ARVA SANITARY SEWAGE SYSTEM



TOWNSHIP
OF
MIDDLESEX
CENTRE

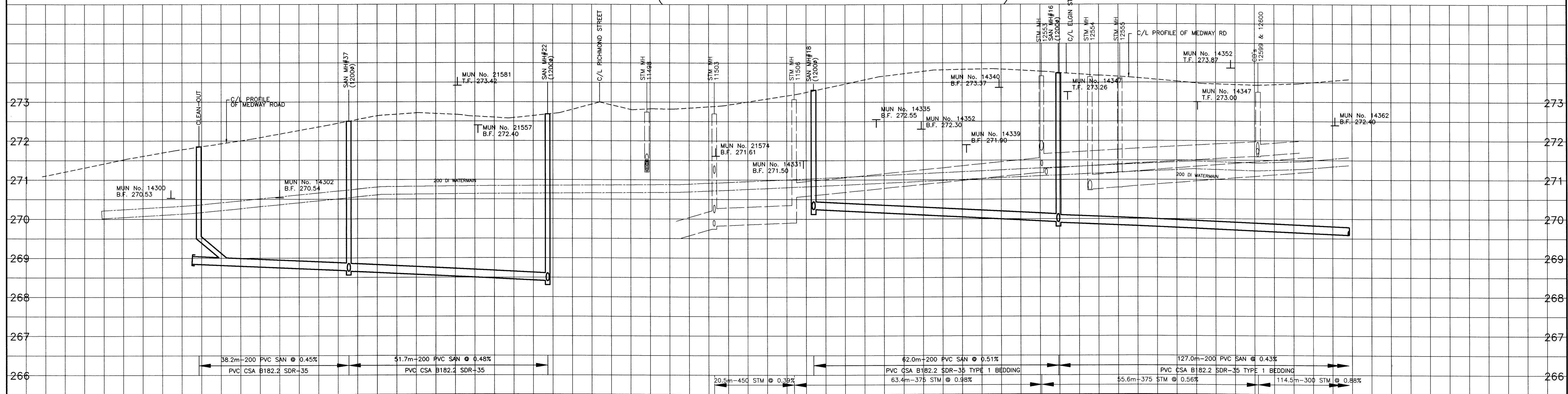
LIST OF DRAWINGS

1. GENERAL ARRANGEMENT OF SERVICES, SANITARY DRAINAGE PLAN AND DESIGN CHART
2. MEDWAY ROAD (MIDDLESEX COUNTY ROAD 28) – FROM 153m WEST OF RICHMOND ST TO 45m WEST OF ELGIN ST
3. MEDWAY ROAD (MIDDLESEX COUNTY ROAD 28) – FROM 45m WEST OF ARVA ST TO 320m EAST OF ARVA ST
4. RICHMOND ST (KING'S HIGHWAY No. 4) – FROM 78m NORTH OF ELGIN ST TO 151m SOUTH OF MEDWAY RD
5. RICHMOND ST (KING'S HIGHWAY No. 4) – FROM 145m NORTH OF ST. JOHN'S DRIVE TO 125m SOUTH OF CROYDON DRIVE
6. WELDON AVENUE – FROM RICHMOND ST TO ARVA ST
7. ST. JOHN'S DRIVE – FROM RICHMOND ST TO ARVA ST
8. ARVA STREET – FROM MEDWAY RD TO ST. JOHN'S DRIVE
9. ELGIN STREET – FROM RICHMOND ST TO MEDWAY RD
10. CROYDON DRIVE – FROM 435m WEST OF RICHMOND ST TO 120m WEST OF RICHMOND ST
11. CROYDON DRIVE – FROM 120m WEST OF RICHMOND ST TO RICHMOND ST CROYDON PLACE
12. MURPHY/VEEL PRIVATE LANE – FROM 70m NORTH OF MEDWAY ROAD TO MEDWAY ROAD, BLOCK 'D' FROM CROYDON DRIVE TO RICHMOND STREET
13. FORCEMAIN – FROM PUMPING STATION TO 660m NORTH OF SUNNINGDALE ROAD
14. FORCEMAIN – FROM 660m NORTH OF SUNNINGDALE ROAD TO 300m NORTH OF SUNNINGDALE ROAD
15. FORCEMAIN – FROM 300m NORTH OF SUNNINGDALE ROAD TO SUNNINGDALE ROAD
16. FORCEMAIN – FROM SUNNINGDALE ROAD TO 300m NORTH OF PLANE TREE DRIVE
17. FORCEMAIN – FROM 300m NORTH OF PLANE TREE DRIVE TO PLANE TREE DRIVE
18. PUMPING STATION – SITE LAYOUT & GENERAL ARRANGEMENT
19. PUMPING STATION – PLANS AND SECTIONS
20. WELDON / CARTER EASEMENT – FROM 168m NORTH OF MEDWAY RD TO MEDWAY RD
21. ELGIN STREET – SANITARY PRESSURE SEWER
22. MISCELLANEOUS DETAILS ONE – FORCEMAIN
23. MISCELLANEOUS DETAILS TWO – FORCEMAIN
24. MISCELLANEOUS DETAILS THREE – COLLECTION SYSTEM
25. MISCELLANEOUS DETAILS FOUR – COLLECTION SYSTEM



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MEDWAY ROAD - (MIDDLESEX COUNTY ROAD NO. 28)



STATION	C/L ROAD ELEV	STORM SEWER INVERT	SEWER INVERT
271.85	268.840E		
272.45	268.60E		
272.68	268.410W		
273.34	270.45E		
273.75	269.920N		
274.16	271.61E		
274.57	271.61E		
274.98	271.61E		
275.39	271.61E		
275.80	271.61E		
276.21	271.61E		
276.62	271.61E		
277.03	271.61E		
277.44	271.61E		
277.85	271.61E		
278.26	271.61E		
278.67	271.61E		
279.08	271.61E		
279.49	271.61E		
279.90	271.61E		
280.31	271.61E		
280.72	271.61E		
281.13	271.61E		
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281.95	271.61E		
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283.18	271.61E		
283.59	271.61E		
284.00	271.61E		
284.41	271.61E		
284.82	271.61E		
285.23	271.61E		
285.64	271.61E		
286.05	271.61E		
286.46	271.61E		
286.87	271.61E		
287.28	271.61E		
287.69	271.61E		
288.10	271.61E		
288.51	271.61E		
288.92	271.61E		
289.33	271.61E		
289.74	271.61E		
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290.56	271.61E		
290.97	271.61E		
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293.02	271.61E		
293.43	271.61E		
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2			CHECKED					
3			APPROVED	WAB				
4			DATE	APR 20/00				
5								

SCALE

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VERTICAL

TOWNSHIP OF MIDDLESEX CENTRE

ARVA SANITARY SEWAGE SYSTEM

MEDWAY RD (MIDDLESEX CNTY RD 28)

FROM 153m WEST OF RICHMOND STREET TO

TO 45m WEST OF ELGIN STREET

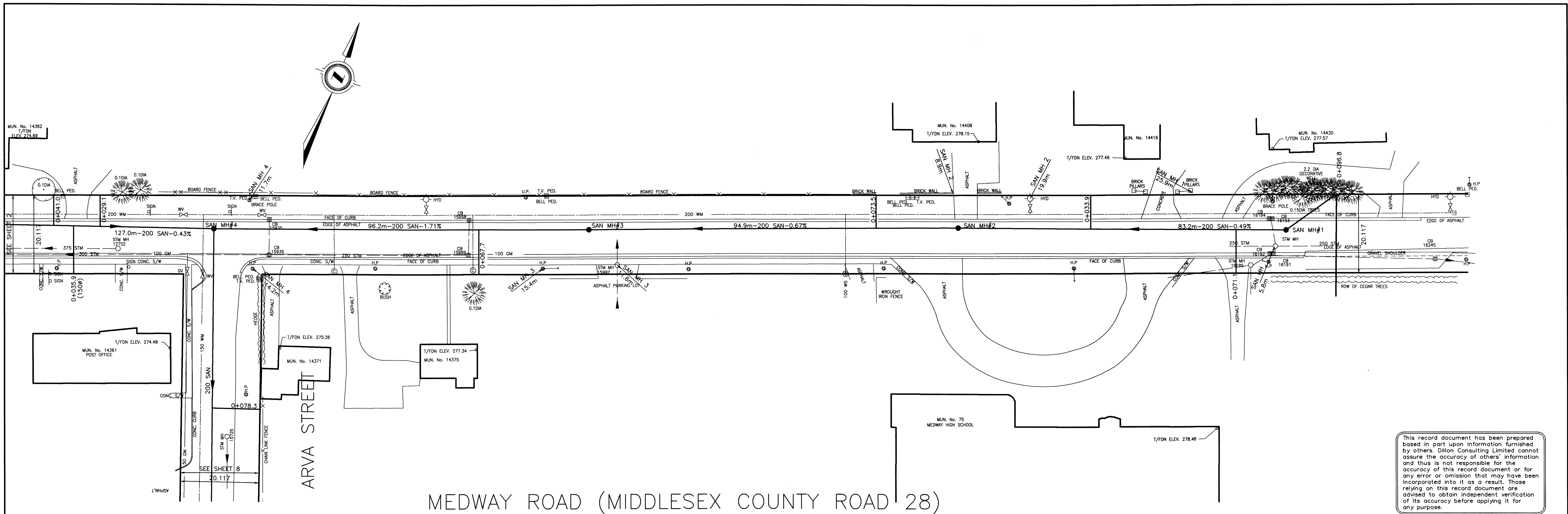
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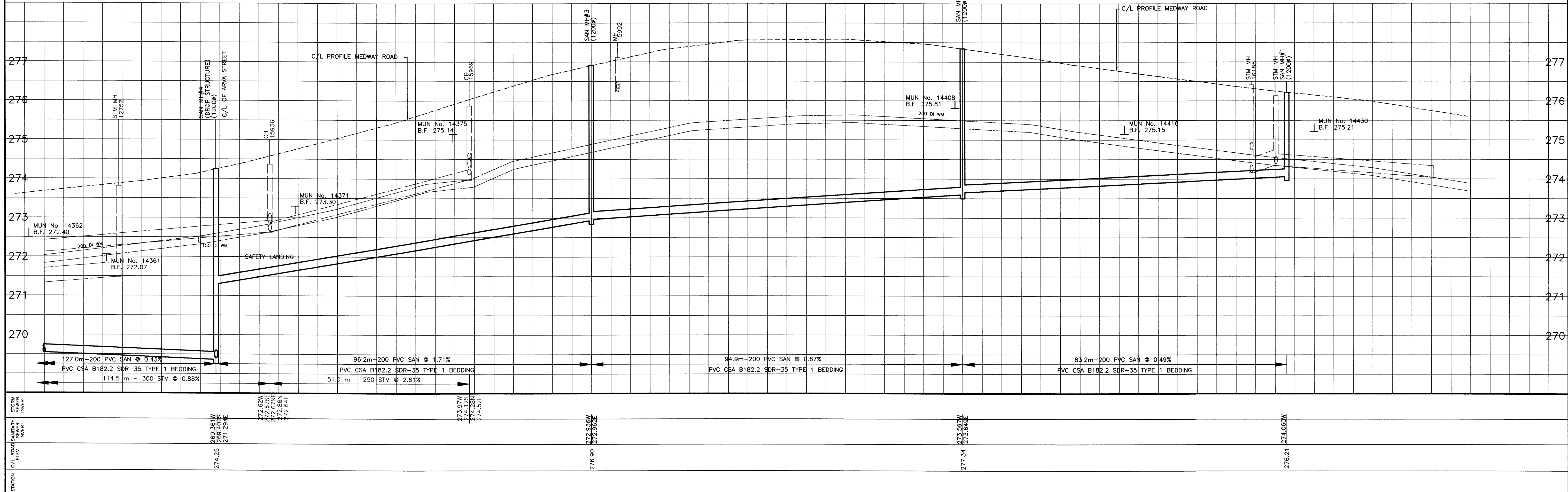
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2

PLAN FILE No



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2			DRAWN	EMB				
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4			APPROVED					
5			DATE	APR 20/00				

SCALE

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VERTICAL

ARVA SANITARY SEWAGE SYSTEM

MEDWAY RD (MIDDLESEX CNTY RD 28)

FROM 45m WEST OF ARVA

TO 320m EAST OF ARVA

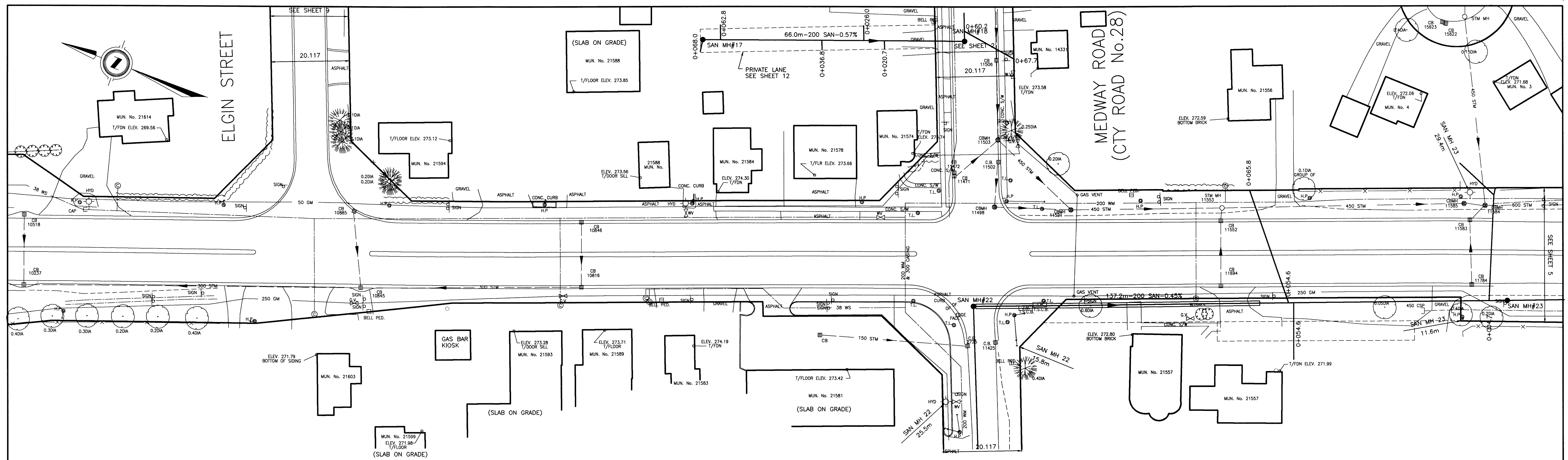
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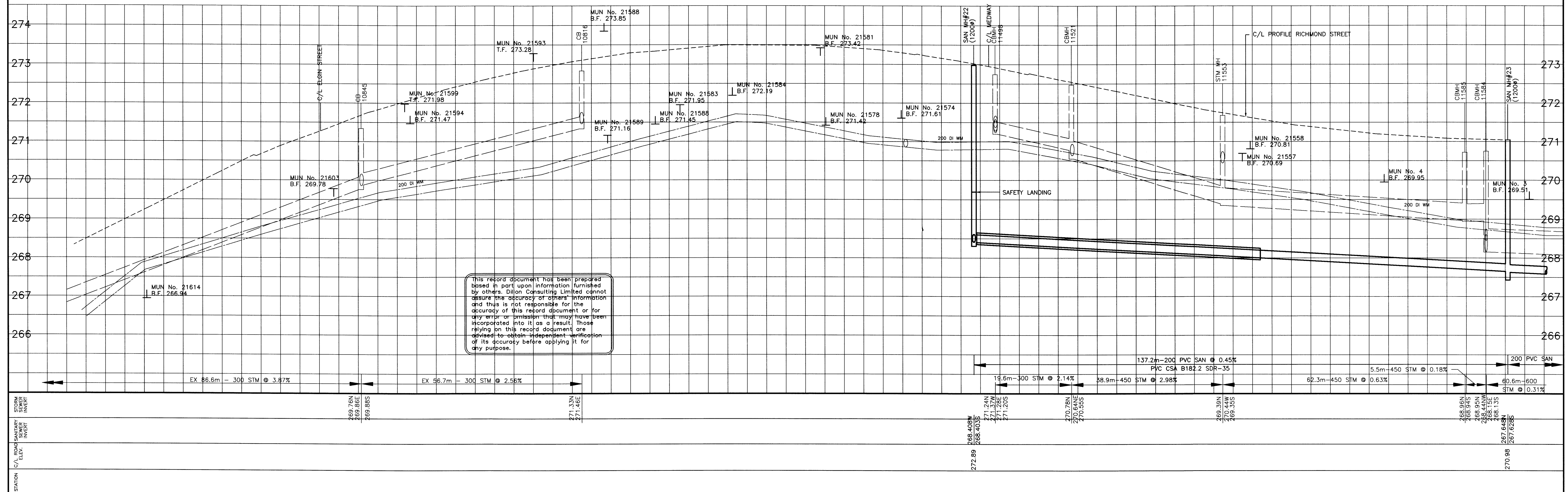
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PROOF LINE ROAD – (KING’S HWY No.4) RICHMOND STREET – (KING’S HWY No.4)

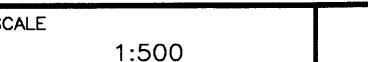


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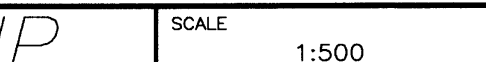
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2			DRAWN	EMB				
3			CHECKED	WAB				
4			APPROVED					
5			DATE	APR 20/00				



DILLON
CONSULTING



TOWNSHIP
OF
MIDDLESEX
CENTRE



8002.01.07
D.A. Conway



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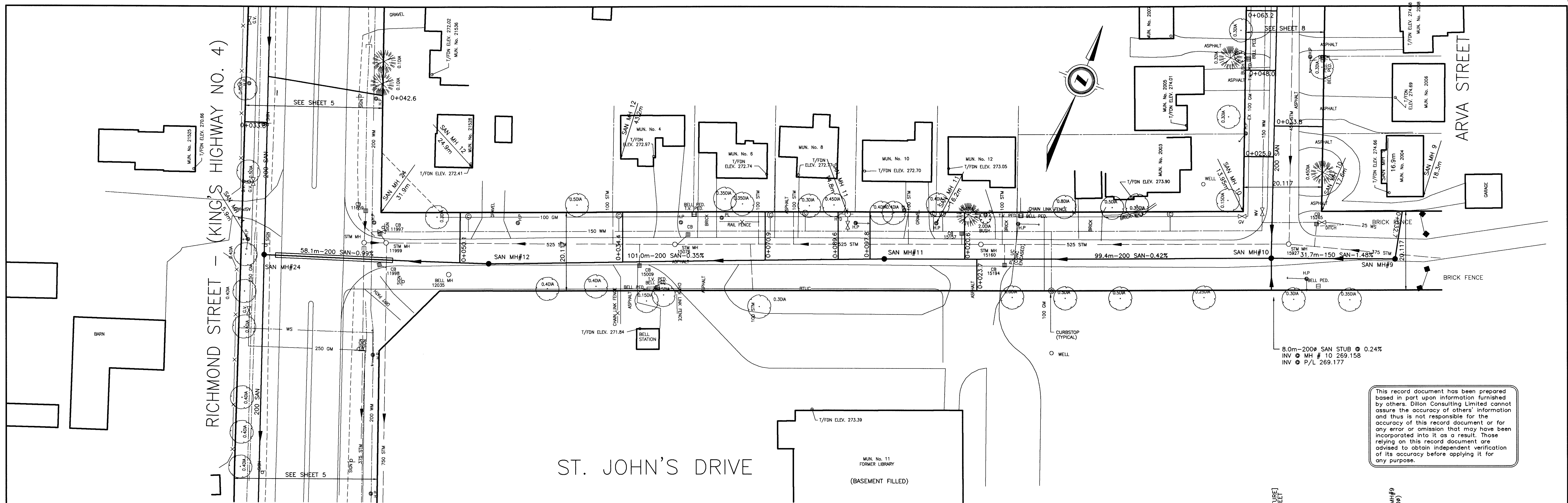
ARVA SANITARY SEWAGE SYSTEM

RICHMOND ST (KINGS'S HWY No. 4)
FROM 78m NORTH OF ELGIN ST TO
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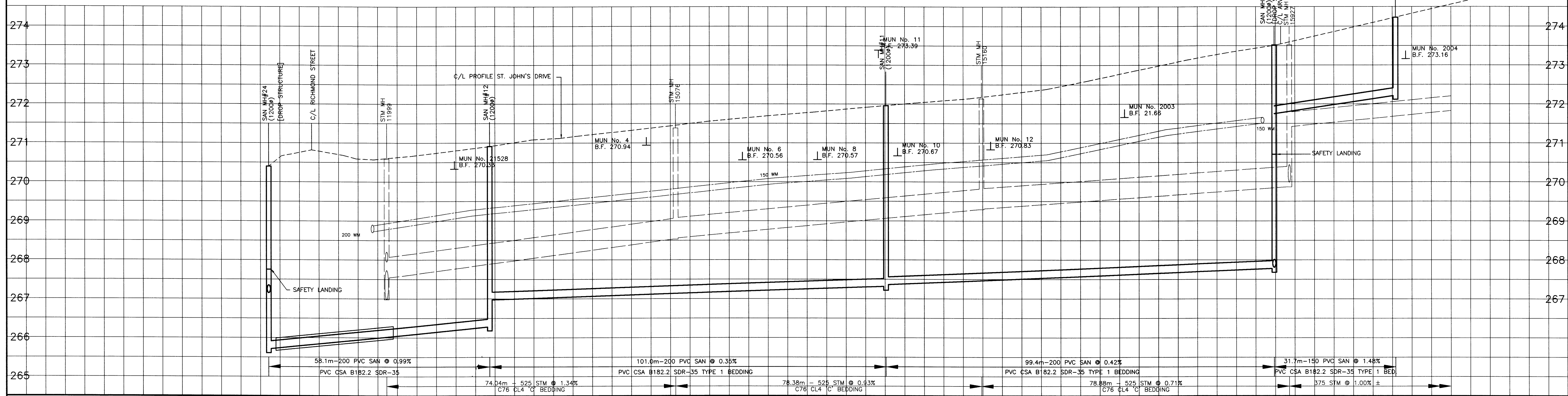
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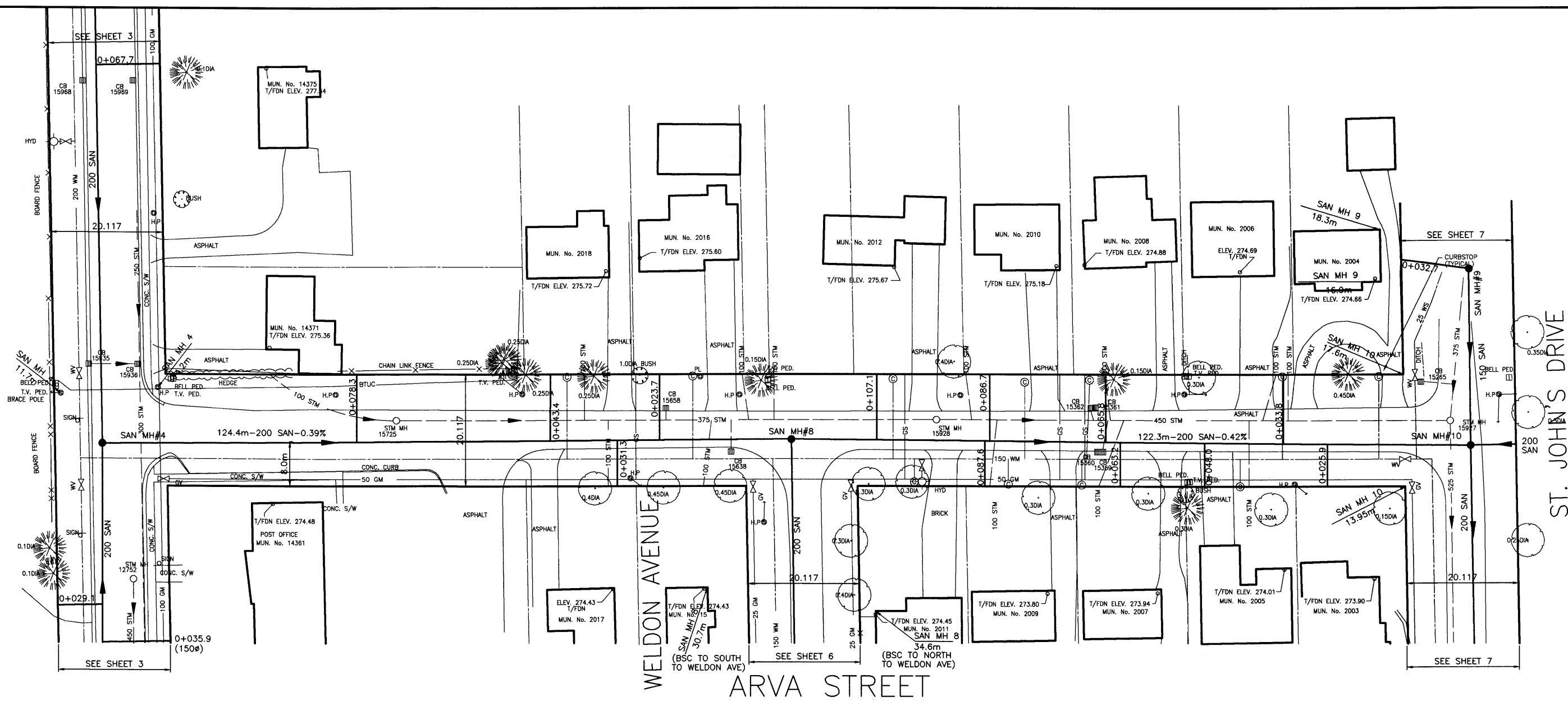


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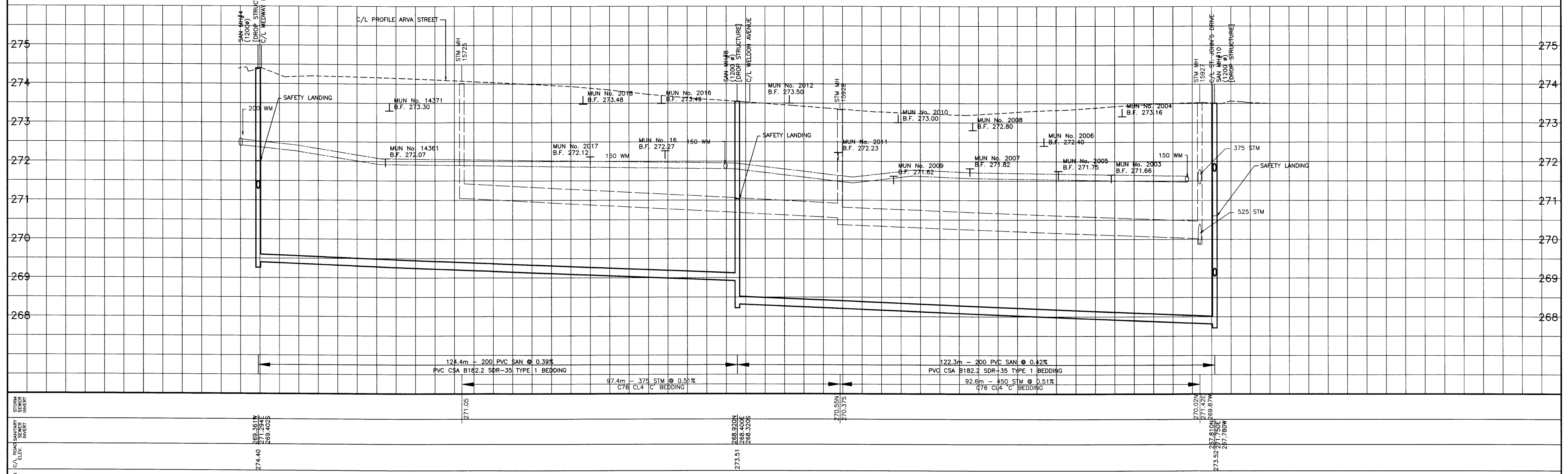


STORM SEWER INVERT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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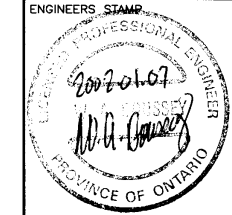
MEDWAY ROAD - (MIDDLESEX CNTY RD NO. 28)



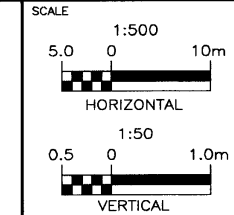
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AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	DESIGN	NO	REVISIONS	DATE	BY
1			DESIGN RJM	1	AS CONSTRUCTED	NOV/01	WAB
2			DRAWN EMB				
3			CHECKED WAB				
4			APPROVED				
5			DATE APR 20/00				



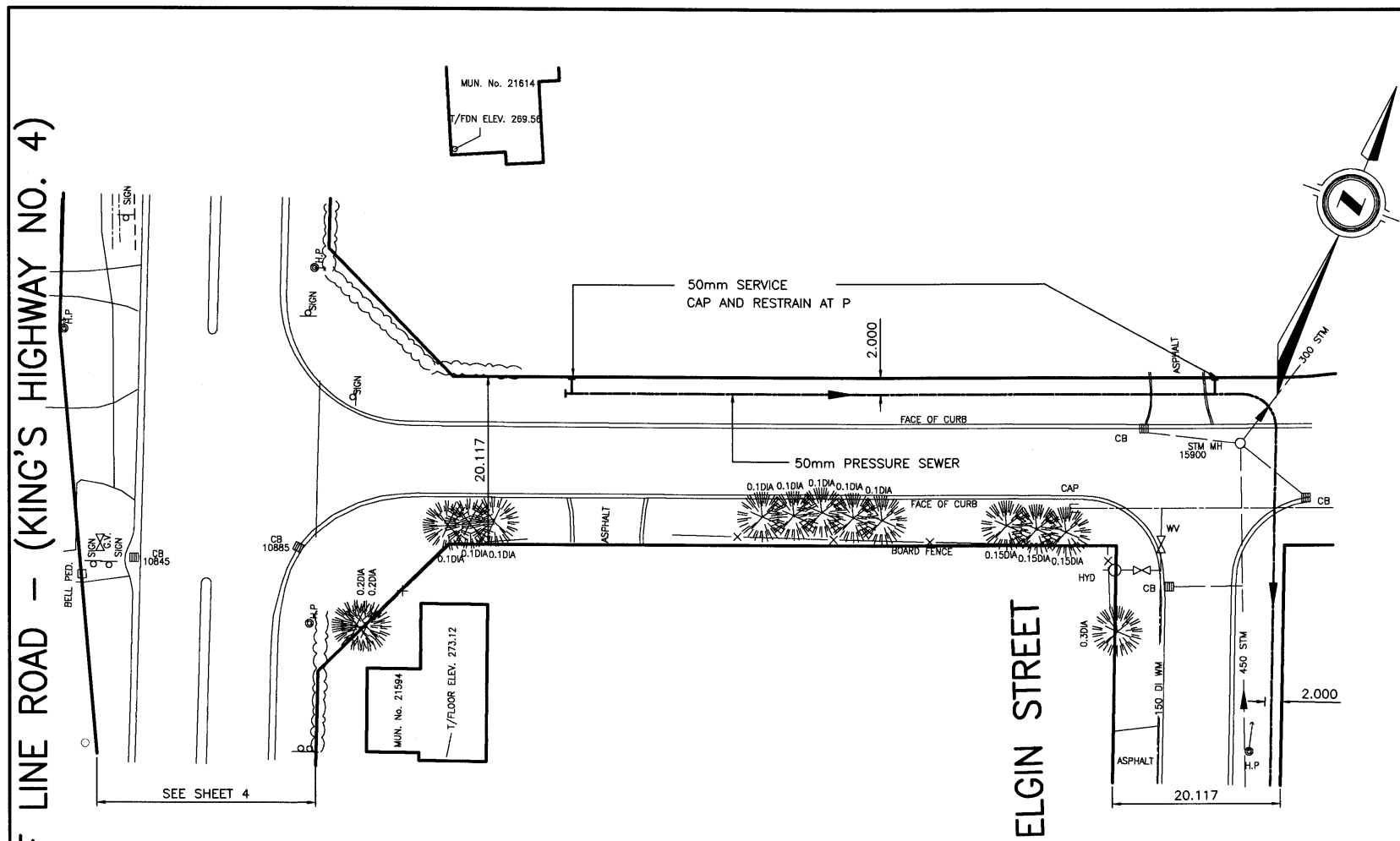
TOWNSHIP
OF
MIDDLESEX
CENTRE



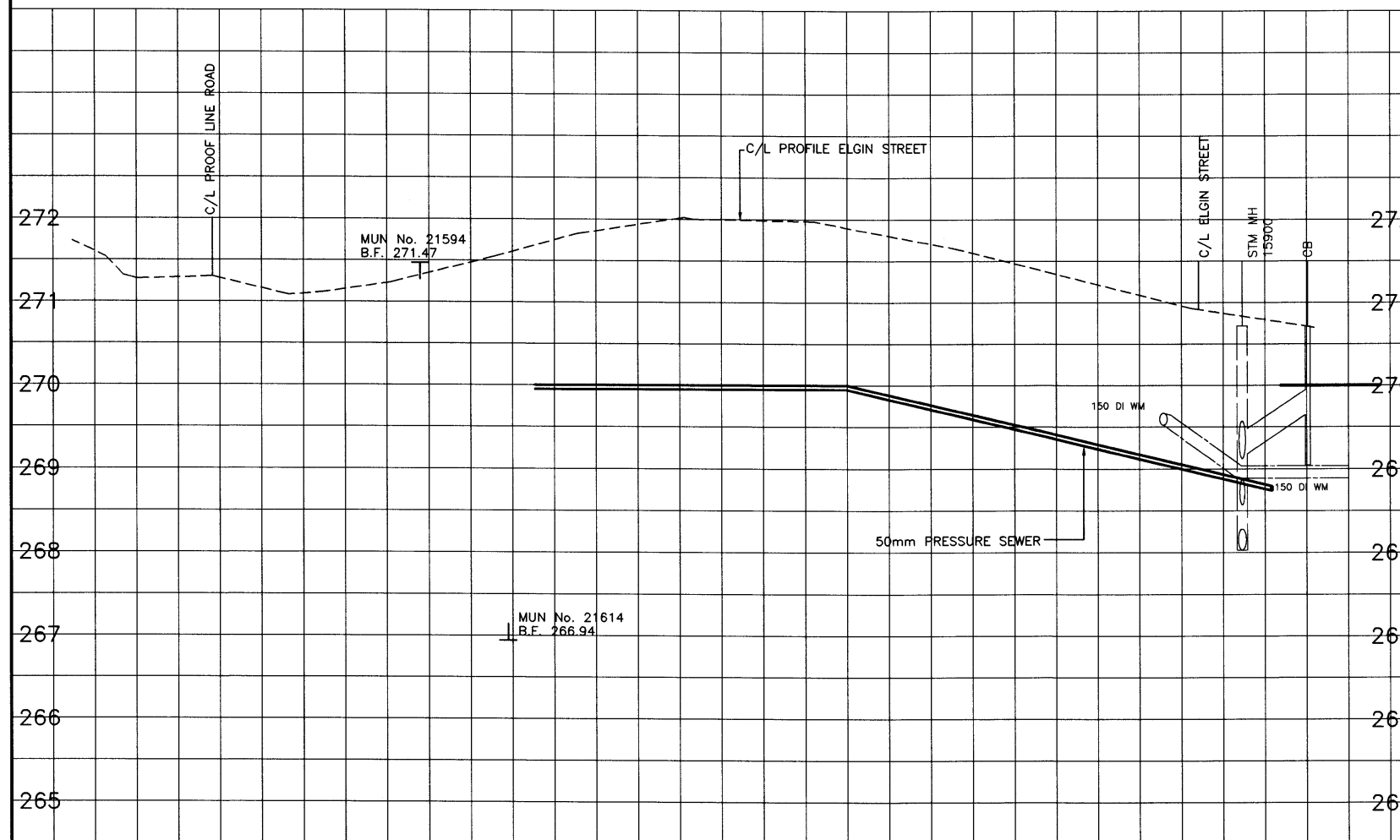
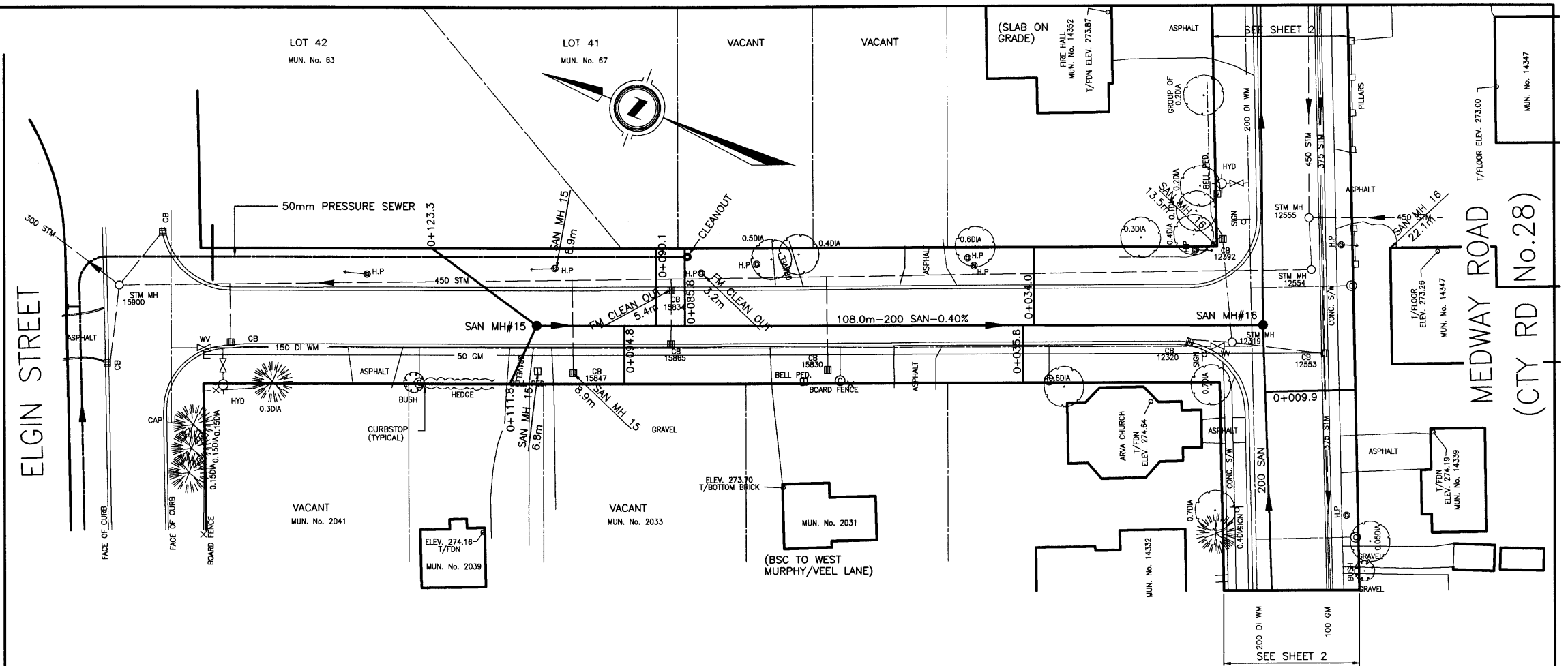
ARVA SANITARY SEWAGE SYSTEM
ARVA STREET
FROM MEDWAY ROAD TO ST. JOHN'S DRIVE

PROJECT No
00-7278
SHEET No
8
PLAN FILE No

PROOF LINE ROAD - (KING'S HIGHWAY NO. 4)

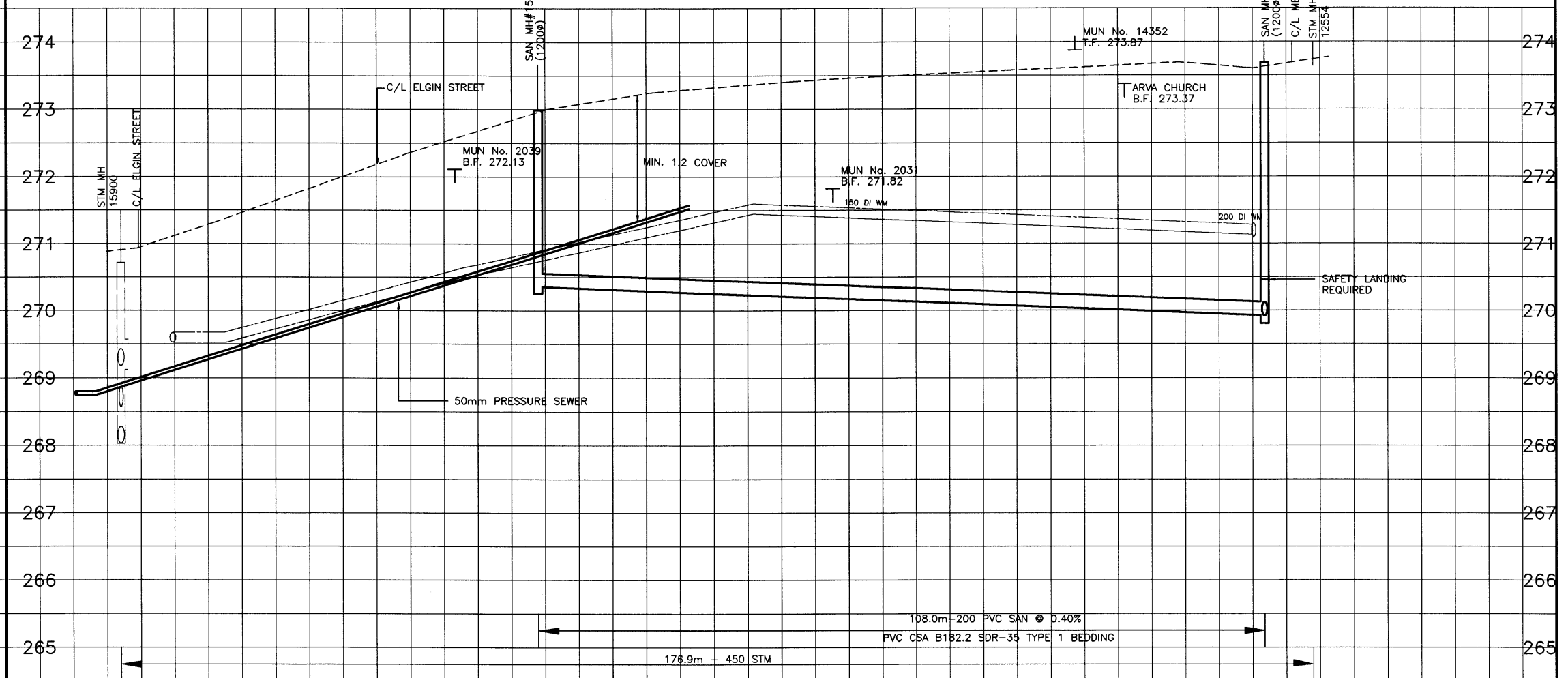


ELGIN STREET

[illegible]

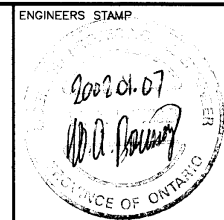
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ELGIN STREET

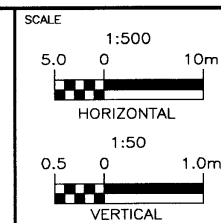


STATION	C/A ROADWAY ELEV.	ADJUTANT INVERT	STORM INVERT
			268.03N 268.51N 269.16W 269.12S
	270.92		268.03N 268.51N 269.16W 269.12S
	273.33	270.36S	
	273.69	268.92E 268.92W 269.06W	

AS CONSTRUCTED	NOTES	AS CONSTRUCTED SERVICES	COMPLETION		No	REVISIONS	DATE	BY
1			DESIGN	RJM	1	AS CONSTRUCTED	NOV/01	WAB
2			DRAWN	EMB				
3			CHECKED	WAB				
			APPROVED					
4			DATE	APR 20/00				
5								



TOWNSHIP
OF
MIDDLESEX
CENTRE

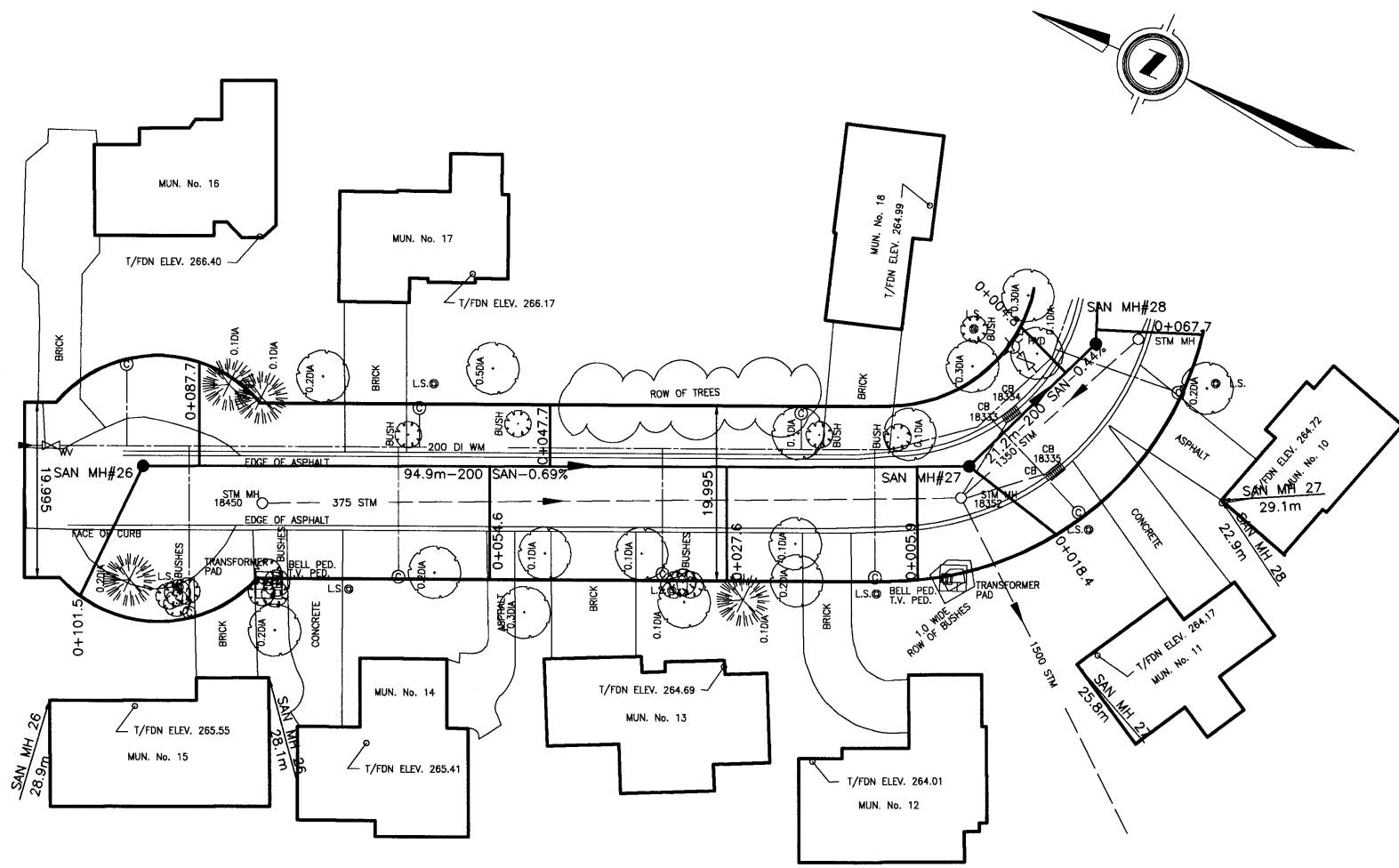


ARVA SANITARY SEWAGE SYSTEM

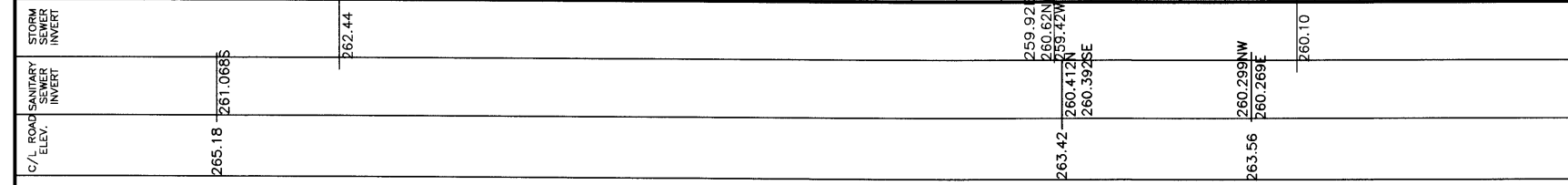
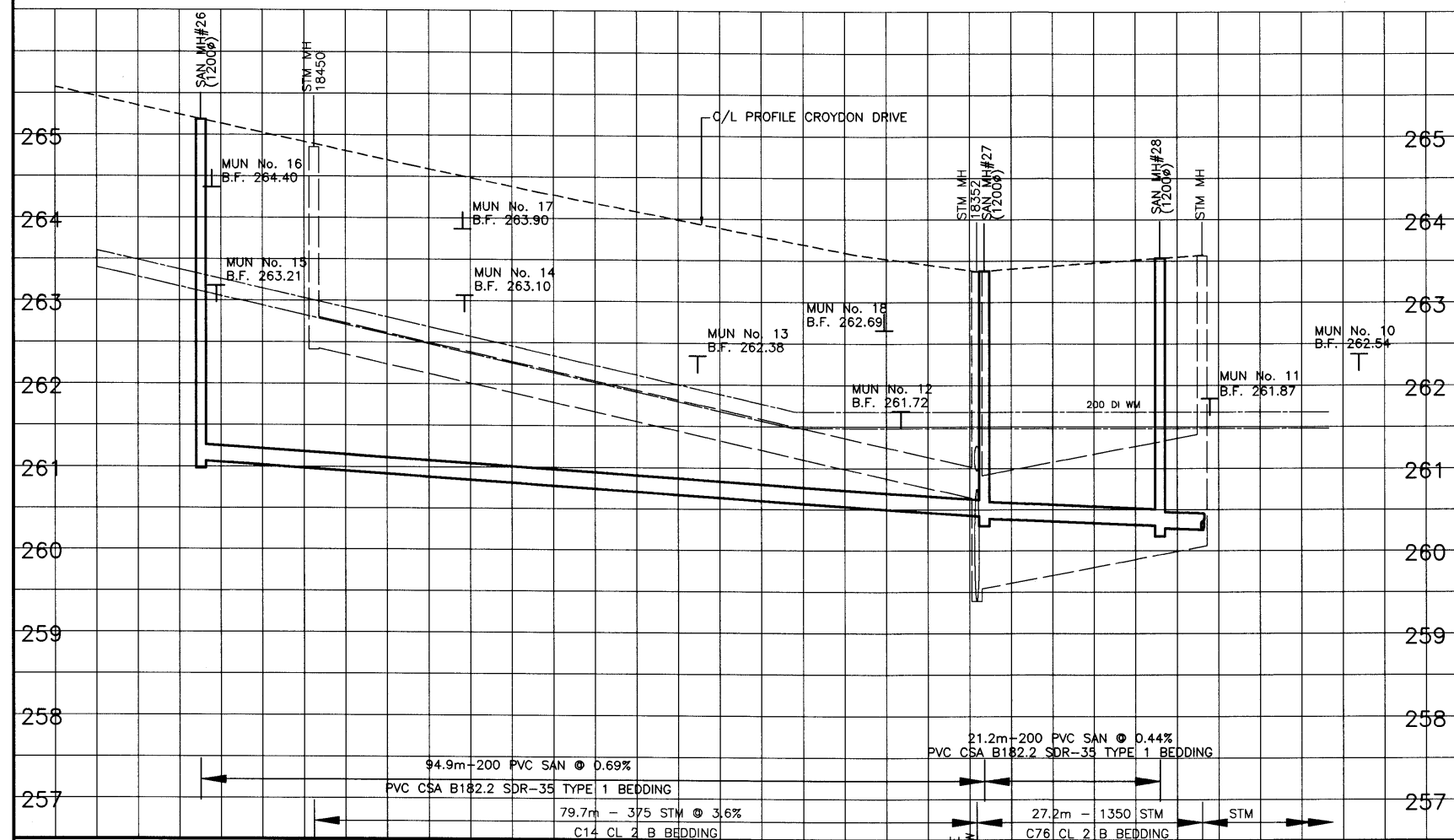
ELGIN STREET
FROM ELGIN STREET TO MEDWAY ROAD

PROJECT No	00-7278
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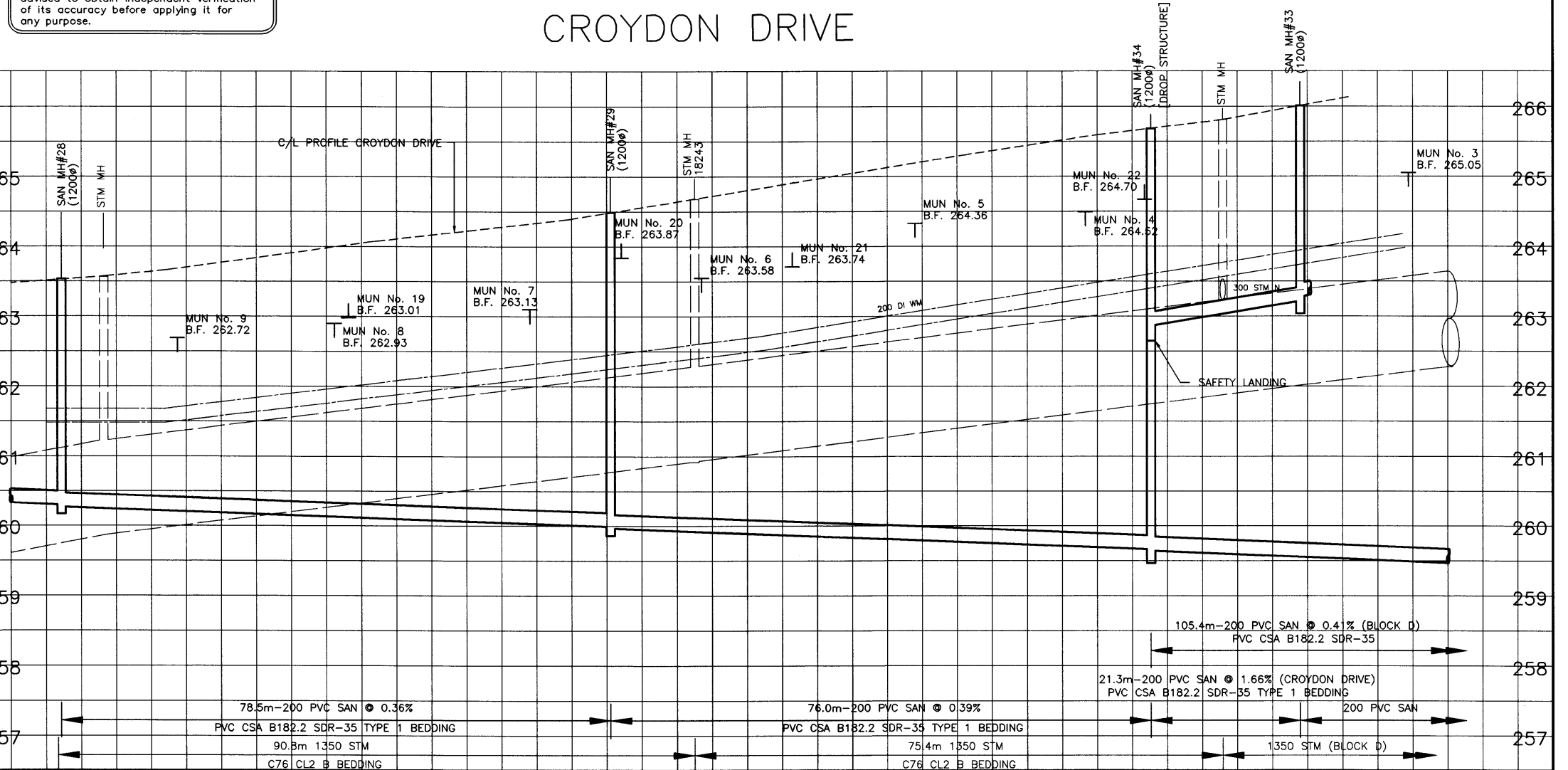
SHEET No 9



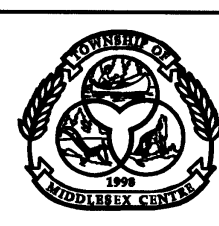
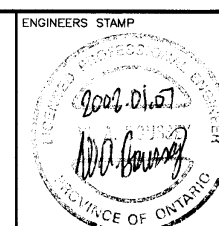
CROYDON DRIVE



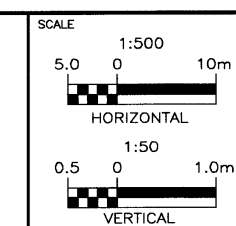
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AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY
1			1	AS CONSTRUCTED	NOV/01	WAB
2						
3						
4						
5						

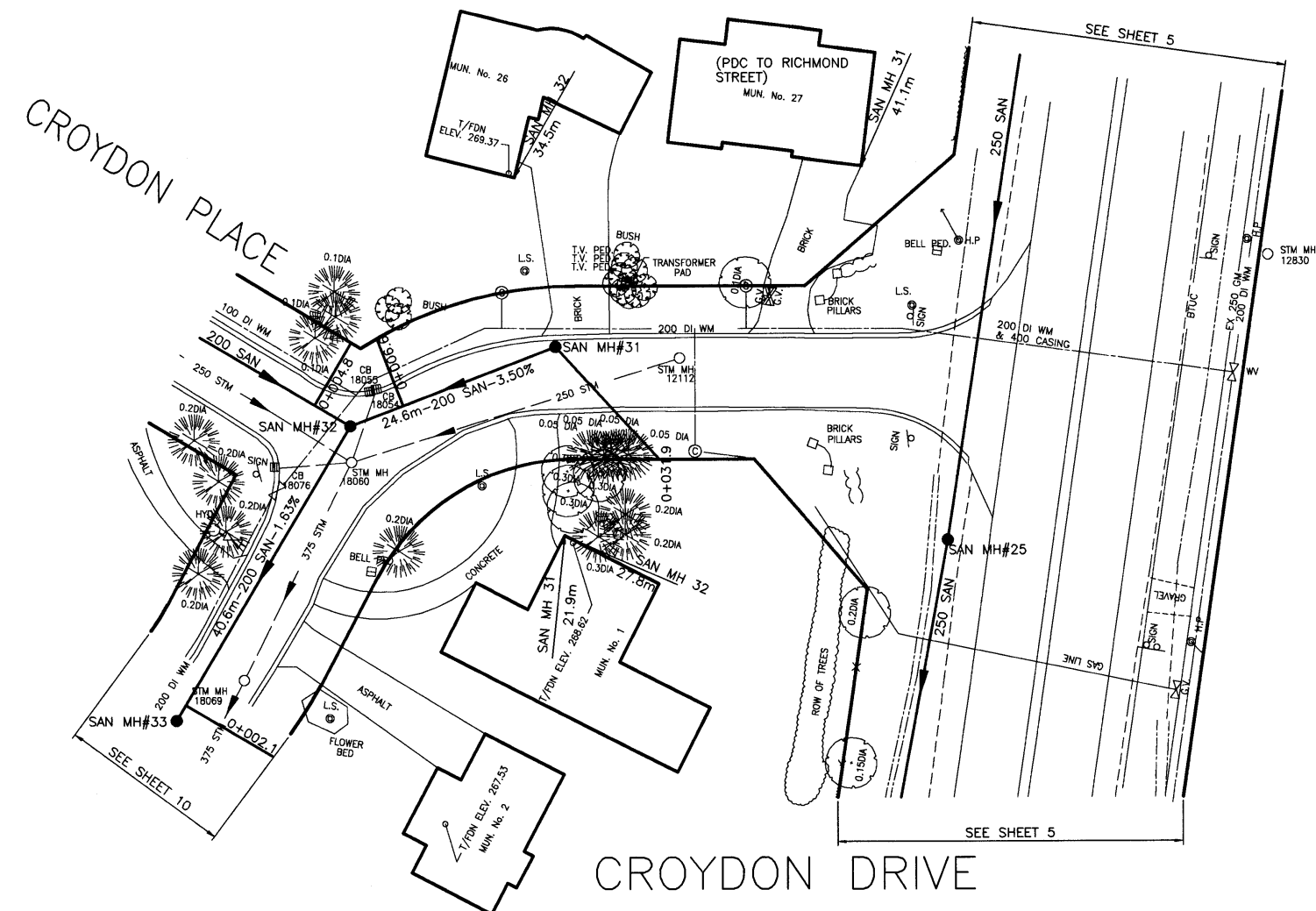


TOWNSHIP OF MIDDLESEX CENTRE



ARVA SANITARY SEWAGE SEWAGE	PROJECT No 00-7278
CROYDON DRIVE	SHEET No 10
FROM 435m WEST OF RICHMOND ST TO 120m WEST OF RICHMOND STREET	PLAN FILE No

CROYDON PLACE



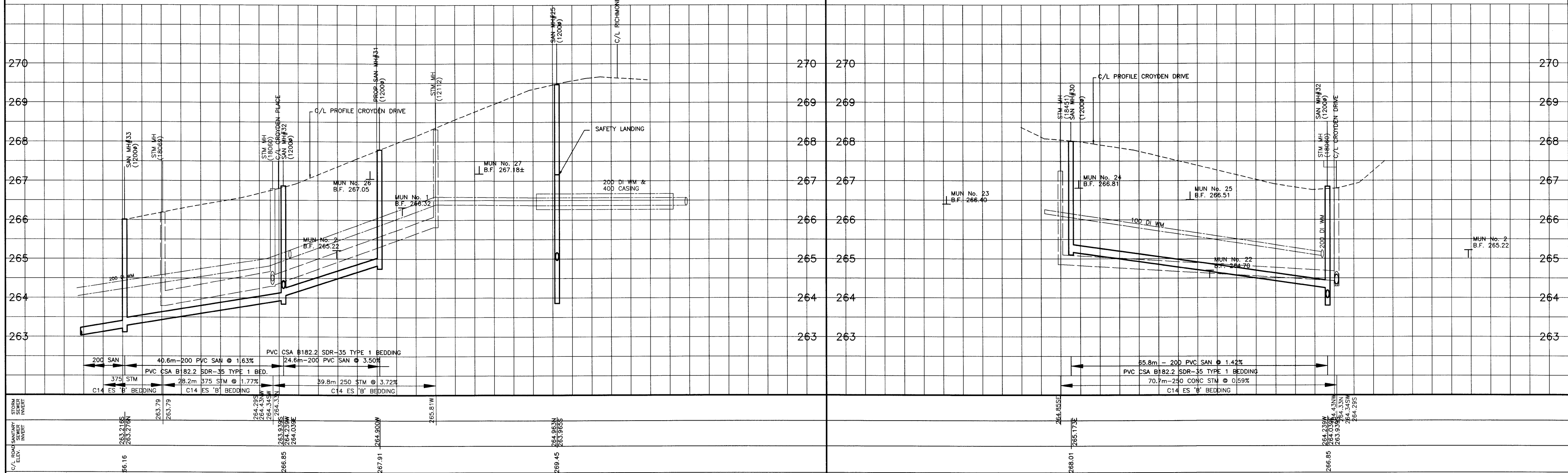
RICHMOND STREET

CROYDON DRIVE

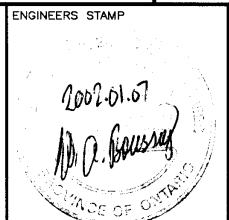
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CROYDON PLACE

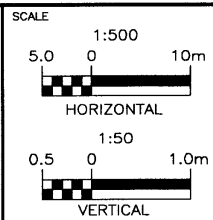
CROYDON DRIVE



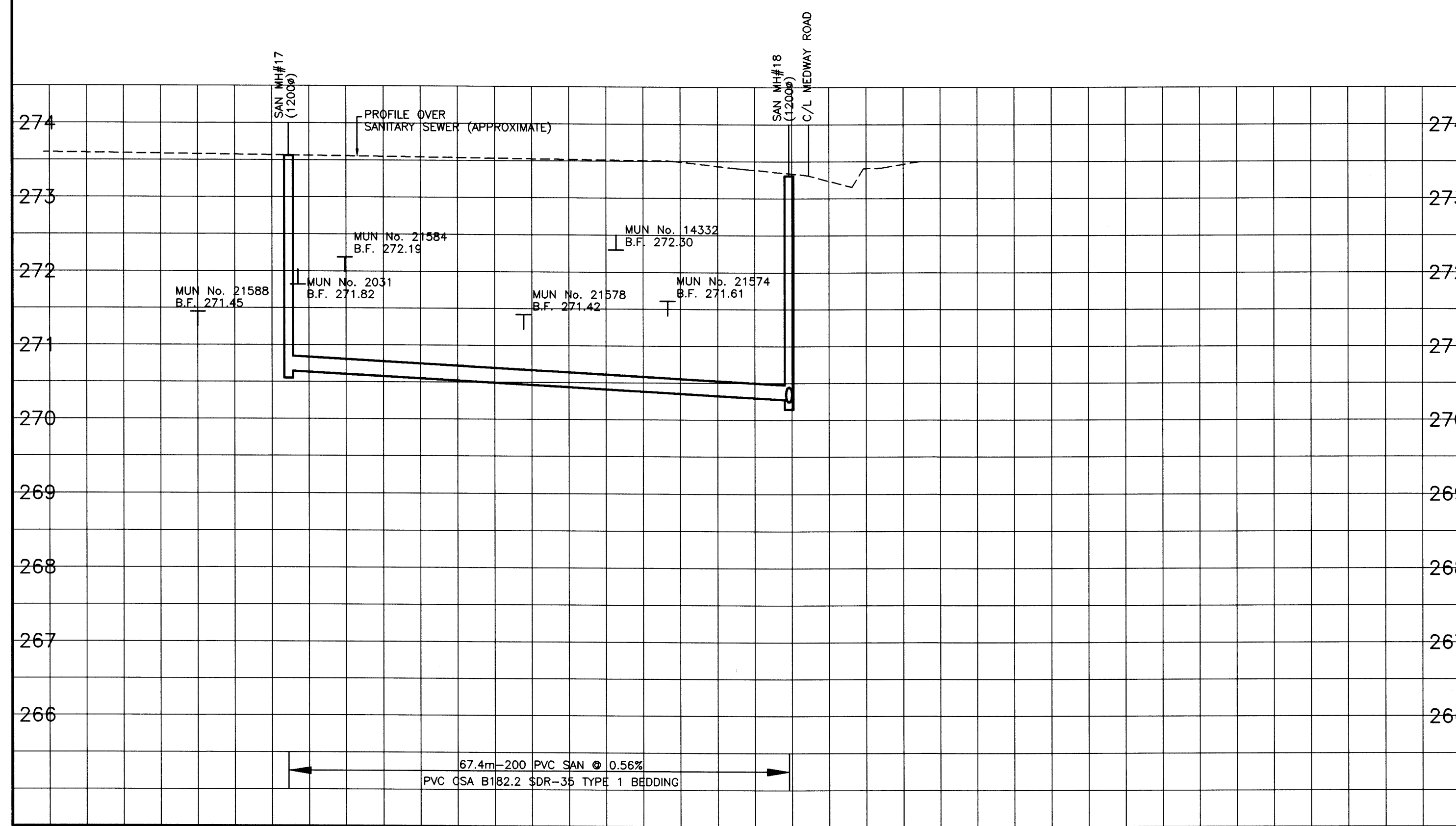
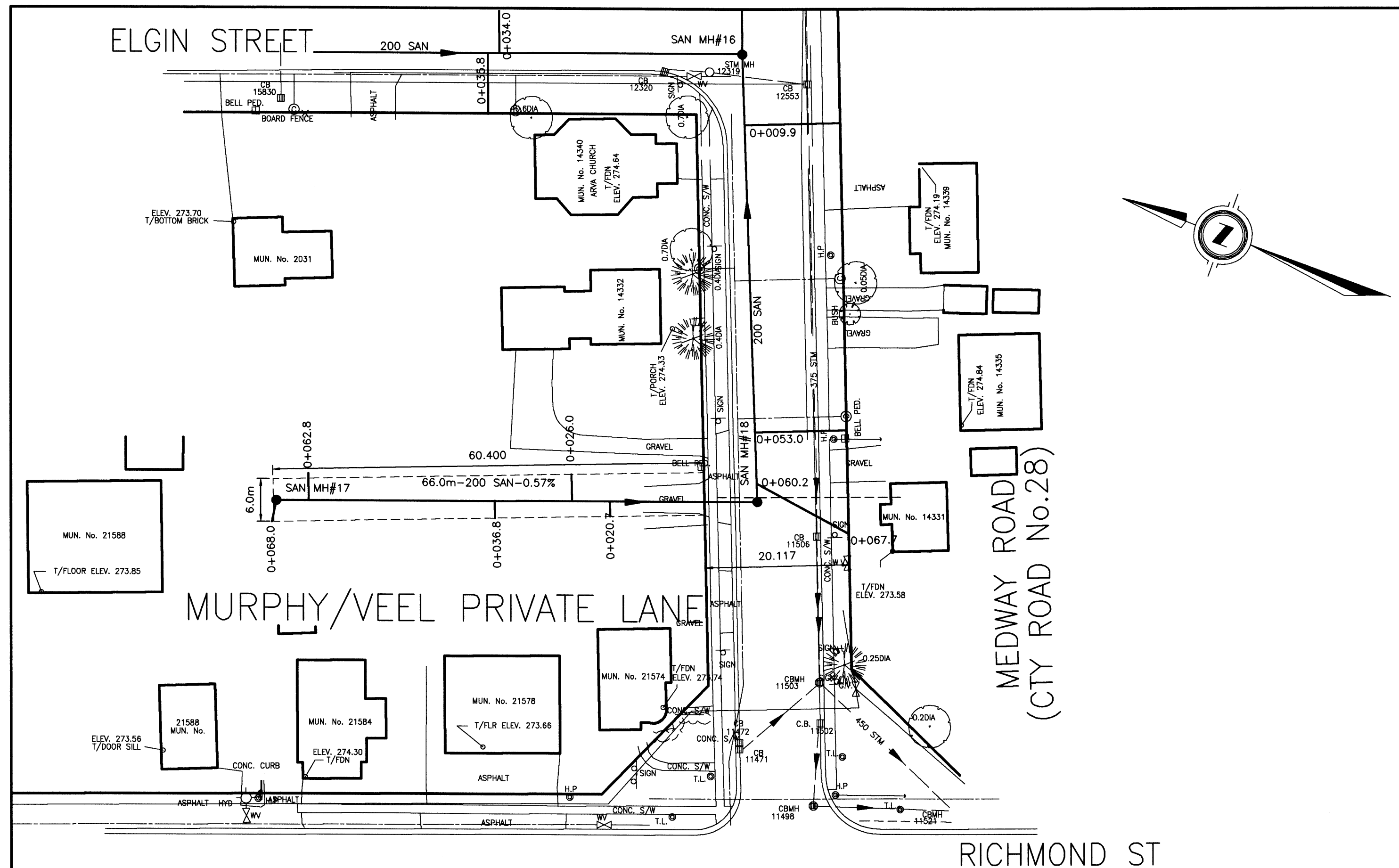
AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	DESIGN	NO	REVISIONS	DATE	BY
1			DESIGN RJM	1	AS CONSTRUCTED	NOV/01	WAB
2			DRAWN EMB				
3			CHECKED WAB				
4			APPROVED				
5			DATE APR 20/00				



TOWNSHIP OF MIDDLESEX CENTRE

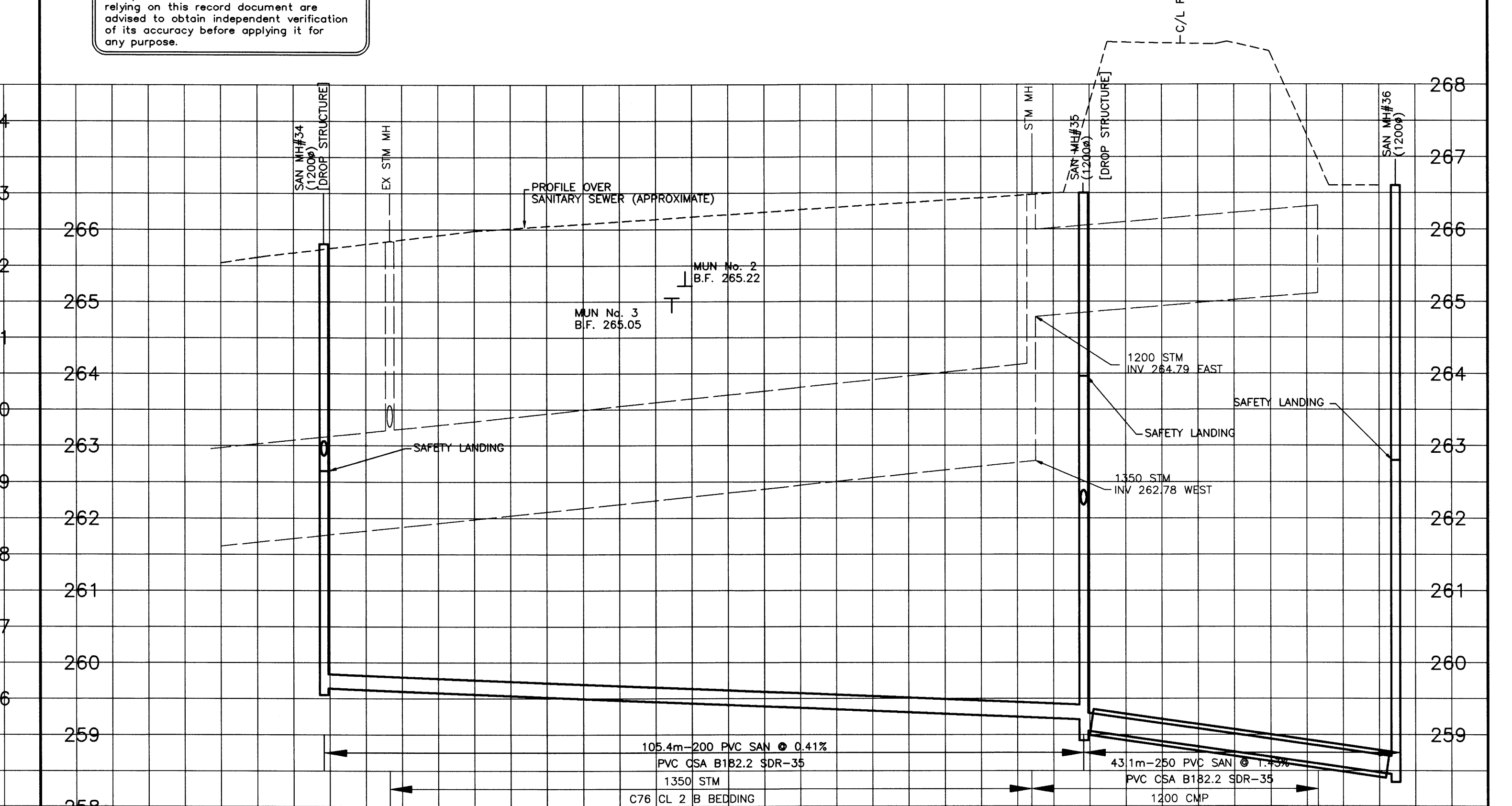
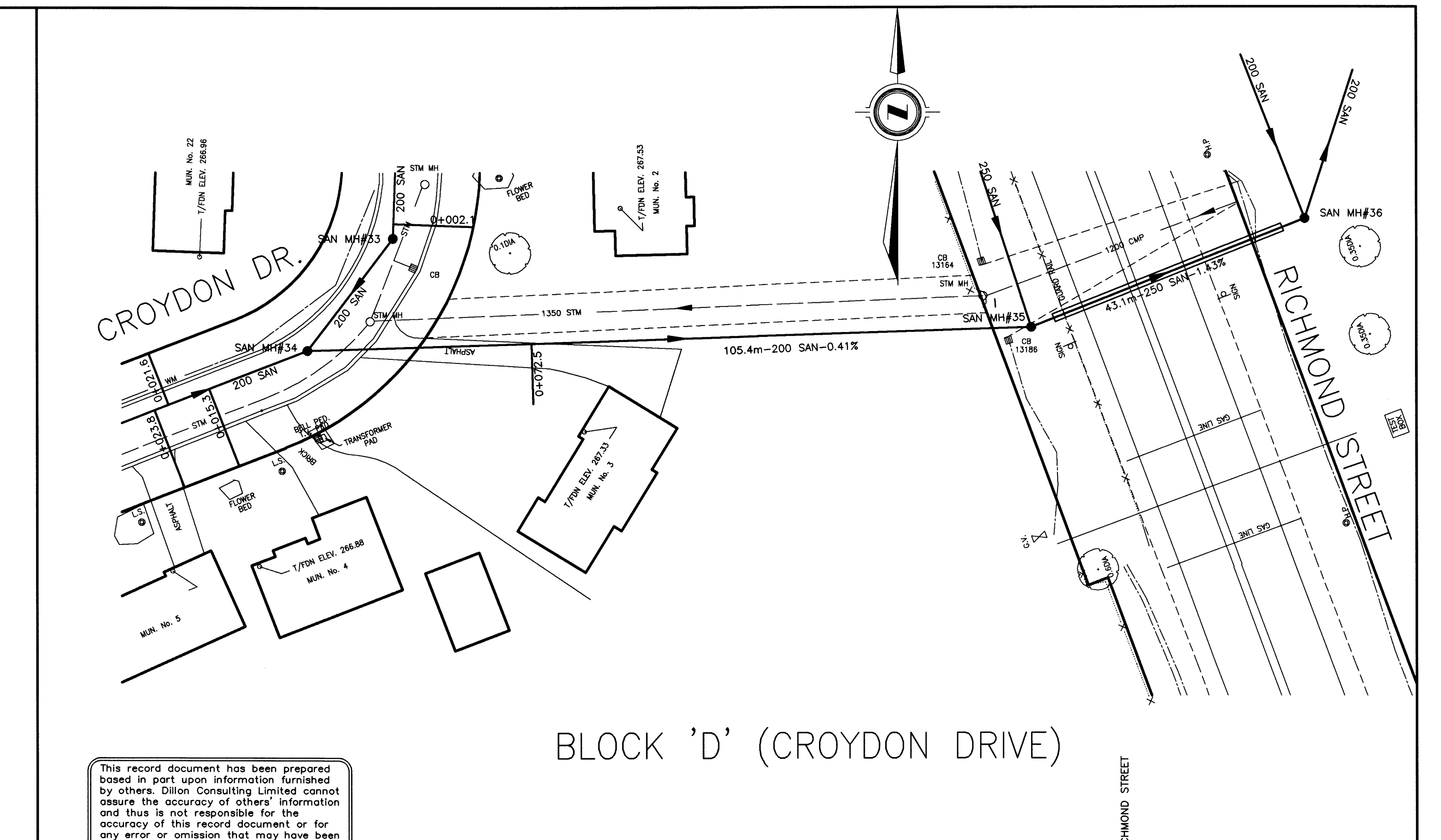


ARVA SANITARY SEWAGE SYSTEM	PROJECT No 00-7278
CROYDON DRIVE 120m W. OF RICHMOND ST TO RICHMOND ST	SHEET No 11
CROYDON PLACE	PLAN FILE No



STATION	C/L ROAD SANITARY SEWER INVERT ELEV.	C/L ROAD SANITARY SEWER INVERT ELEV.
0+000	273.56	270.6505
0+060	273.34	270.245E

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY
1			1	AS CONSTRUCTED	NOV/01	WAB
2						
3						
4						
5						



STATION	C/L ROAD SANITARY SEWER INVERT ELEV.	C/L ROAD SANITARY SEWER INVERT ELEV.
0+000	265.79	259.653E
0+060	266.50	259.062E

TOWNSHIP OF MIDDLESEX CENTRE

ENGINEERS STAMP

SCALE 1:500
HORIZONTAL 1:50
VERTICAL 1:50

ARVA SANITARY SEWAGE SYSTEM

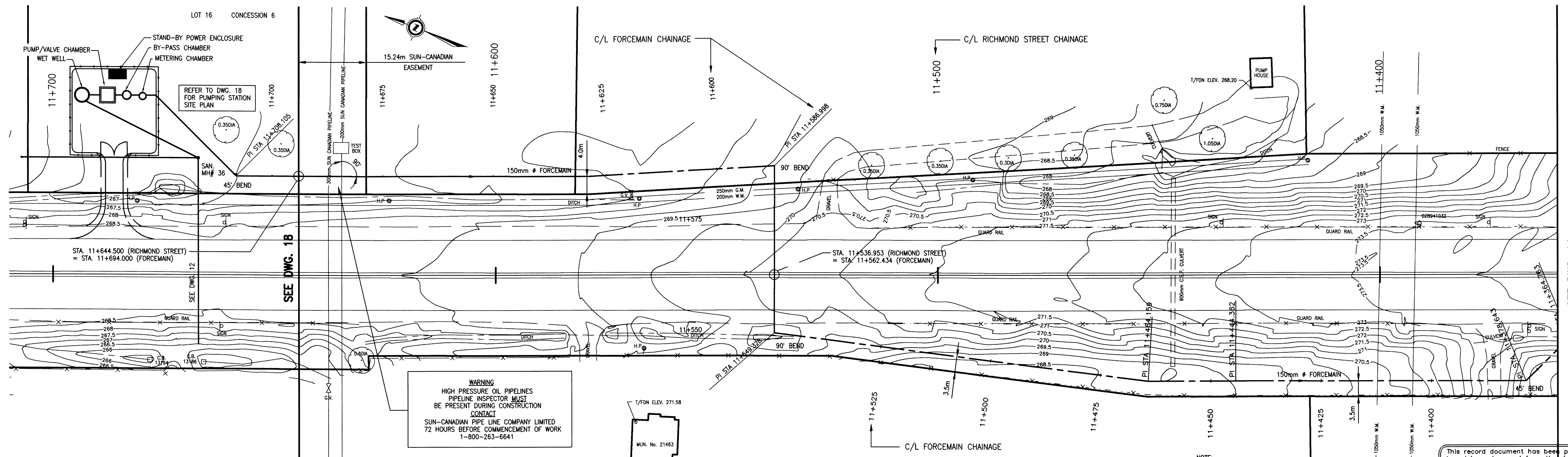
MURPHY/VEEL PRIVATE LANE - FROM 70m N OF MEDWAY ROAD TO MEDWAY ROAD

BLOCK 'D' - FROM CROYDON DR TO RICHMOND ST

PROJECT No 00-7278

SHEET No 12

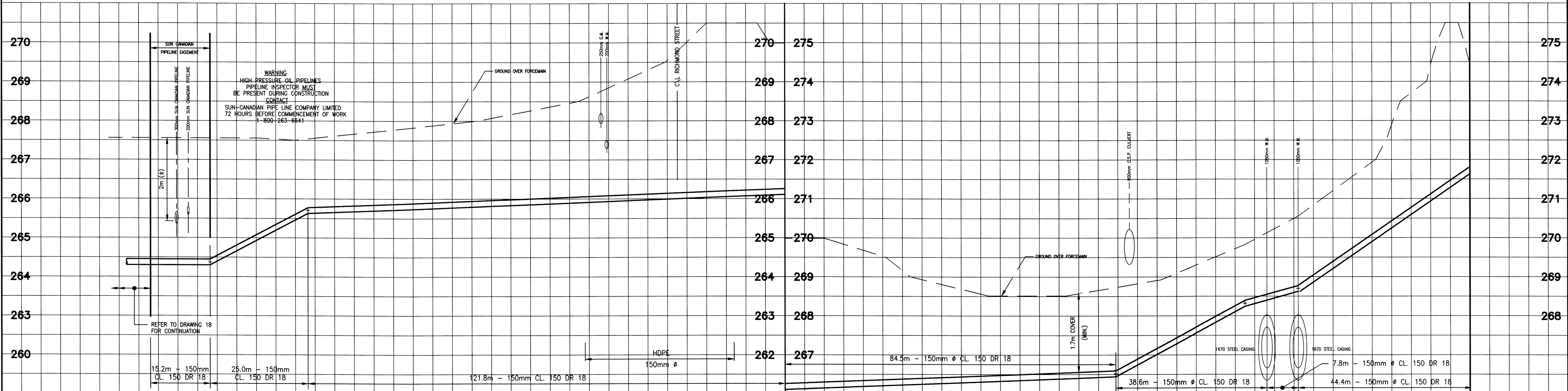
PLAN FILE No



RICHMOND STREET (HIGHWAY 4)

NOTE:
1. REFER TO DRAWINGS 23 & 24 FOR TYPICAL SECTIONS AND MISCELLANEOUS DETAILS
2. PROVIDE RESTRAINED JOINTS WHERE REQUIRED. SUBMIT CALCULATIONS TO SUPPORT NUMBER OF JOINT RESTRAINED.

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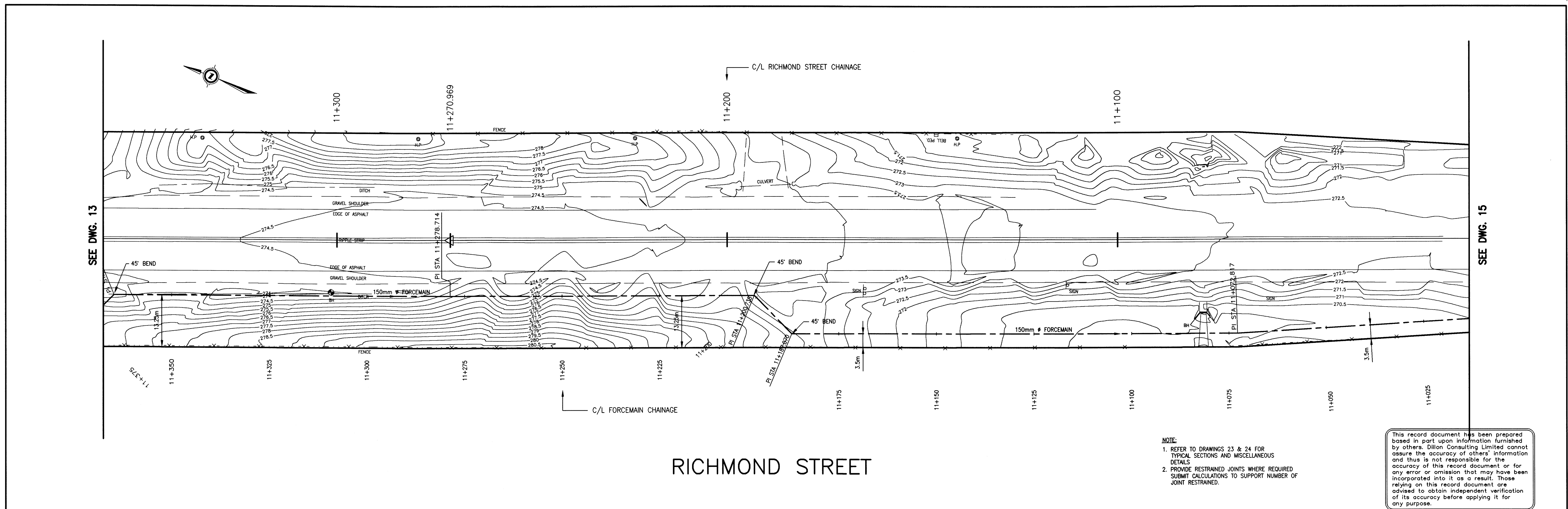


STATION	C/L RICHMOND STREET ELEV.	C/L FORCEMAIN CHAINAGE	AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	DESIGN	PAK	No	REVISIONS	DATE	BY
1	264.800	11+700				DESIGN	PAK	1	REVISED FM PROFILE AT WM CROSSING	28/04/00	WAB
2	264.800	11+700				DRAWN	PAK	2	AS CONSTRUCTED	NOV/01	WAB
3	265.703	11+700				CHECKED	GOH				
4						APPROVED	WAB				
5						DATE	APRIL/2000				

SCALE: 1:500
HORIZONTAL: 5.0 0 10m
VERTICAL: 0.5 0 1.0m

ARVA SANITARY SEWAGE SYSTEM
FORCEMAIN
FROM PUMPING STATION TO 660m
NORTH OF SUNNINGDALE ROAD

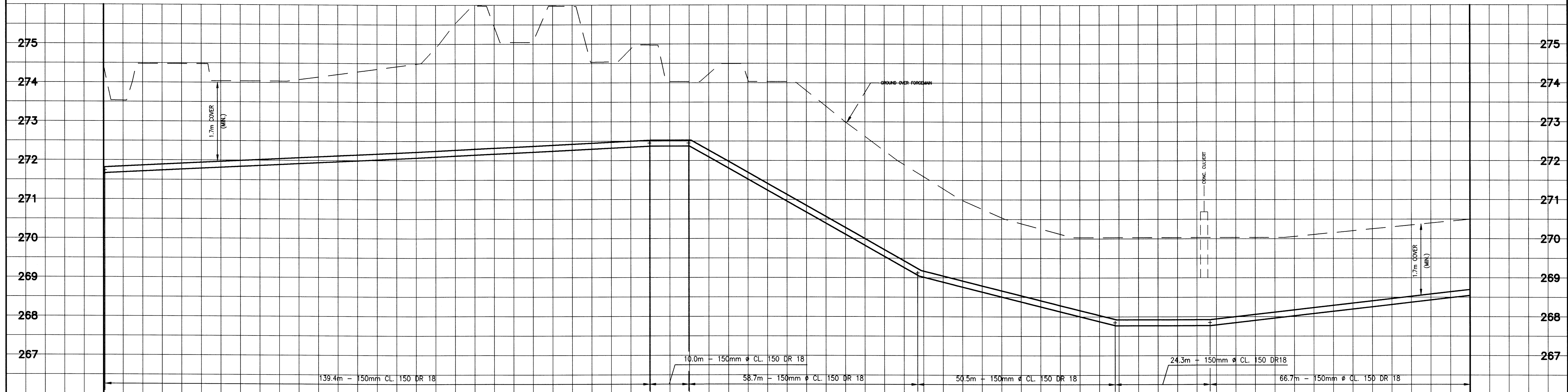
PROJECT No: 00-7278
SHEET No: 13
PLAN FILE No:



RICHMOND STREET

NOTE:
1. REFER TO DRAWINGS 23 & 24 FOR
TYPICAL SECTIONS AND MISCELLANEOUS
DETAILS
2. PROVIDE RESTRAINED JOINTS WHERE REQUIRED
SUBMIT CALCULATIONS TO SUPPORT NUMBER OF
JOINT RESTRAINED.

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any purpose.



STATION		11+350	11+300	11+250	11+200	11+150	11+100
C/L ROAD ELEV.		271.741	272.445	272.445	269.122	267.850	267.850
C/L FORCEMAIN ELEV.		271.741	272.445	272.445	269.122	267.850	267.850
C/L SANITARY SEWER INVERT		271.741	272.445	272.445	269.122	267.850	267.850
C/L STORM SEWER INVERT		271.741	272.445	272.445	269.122	267.850	267.850
AS CONSTRUCTED NOTES							
AS CONSTRUCTED SERVICES							
COMPLETION							
DESIGN		PAK	1	REVISED FM PROFILE AT WM CROSSING	28/04/00	WAB	
DRAWN		PAK	2	AS CONSTRUCTED	NOV/01	WAB	
CHECKED		GOH					
APPROVED		WAB					
DATE		APRIL/2000					
1							
2							
3							
4							
5							

DILLON CONSULTING

ENGINEERS STAMP

TOWNSHIP OF MIDDLESEX CENTRE

SCALE
1:500
HORIZONTAL
1:50
VERTICAL

ARVA SANITARY SEWAGE SYSTEM

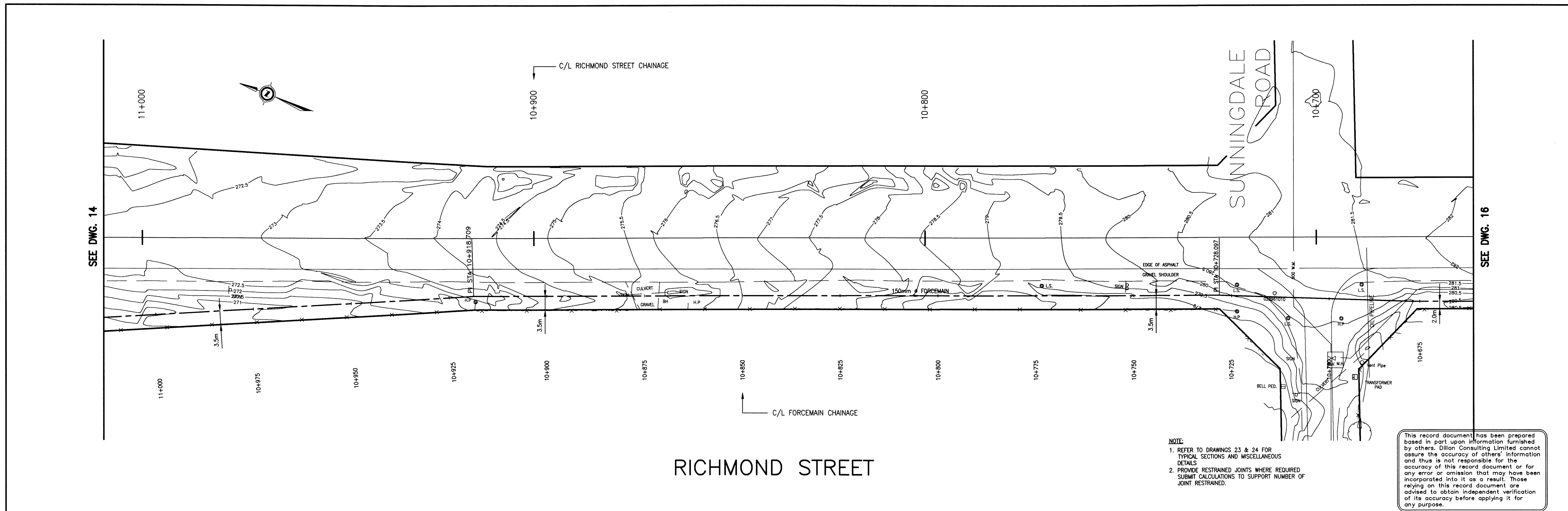
PROJECT No
00-7278

SHEET No
14

PLAN FILE No

FORCEMAIN

FROM 660m NORTH OF SUNNINGDALE ROAD
TO 300m NORTH OF SUNNINGDALE ROAD



STATION

C/L RICHMOND STREET

SEWER INVERT

11+000

10+900

10+800

10+700

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY		
1			DESIGN	PAK	1	REVISED FM PROFILE AT WM CROSSING	28/04/00	WAB
2			DRAWN	PAK	2	AS CONSTRUCTED	NOV/01	WAB
3			CHECKED	GOH				
4			APPROVED	WAB				
5			DATE	APRIL/2000				

ENGINEERS STAMP

TOWNSHIP
OF
MIDDLESEX
CENTRE

SCALE

1:500

5.0 0 10m

HORIZONTAL

1:50

0.5 0 1.0m

VERTICAL

ARVA SANITARY SEWAGE SYSTEM

FORCEMAIN
FROM 300m NORTH OF SUNNINGDALE ROAD
TO SUNNINGDALE ROAD

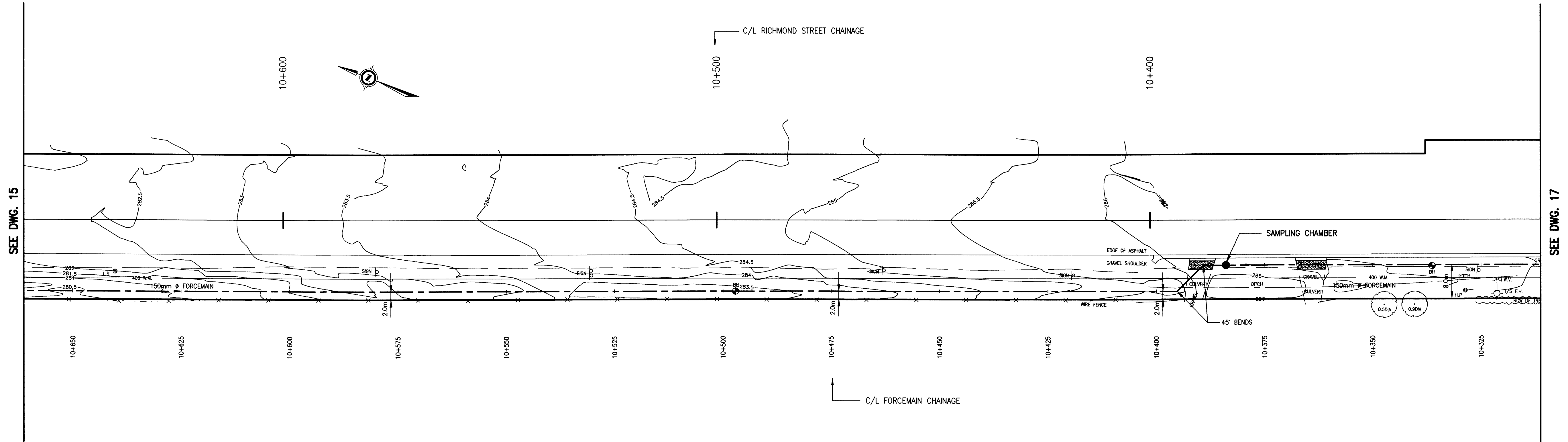
PROJECT No

00-7278

SHEET No

15

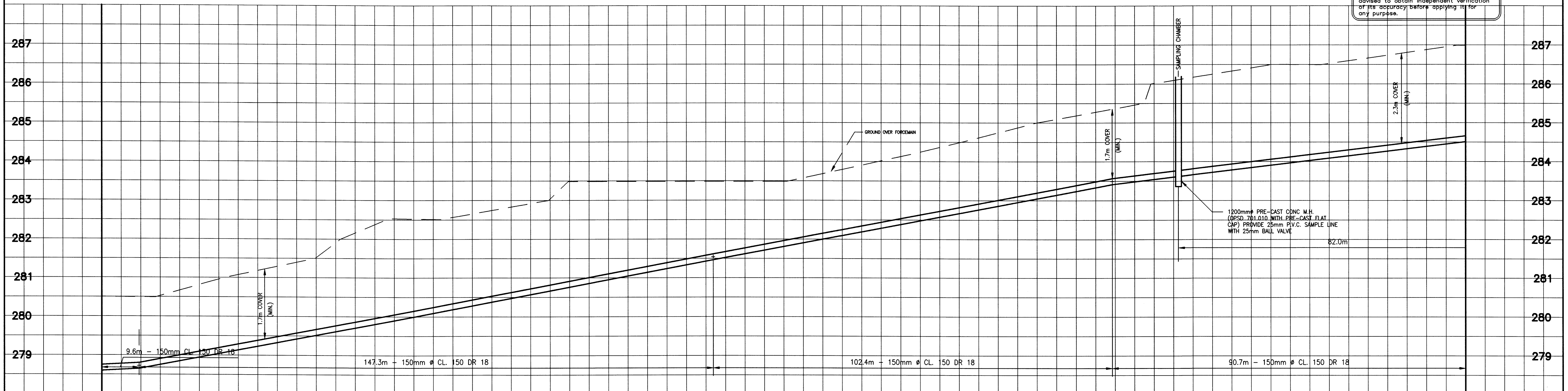
PLAN FILE No



RICHMOND STREET

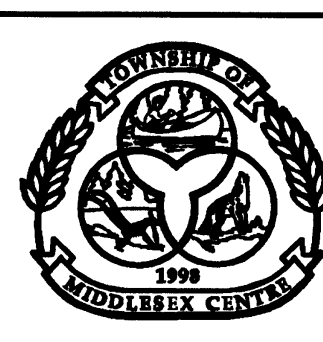
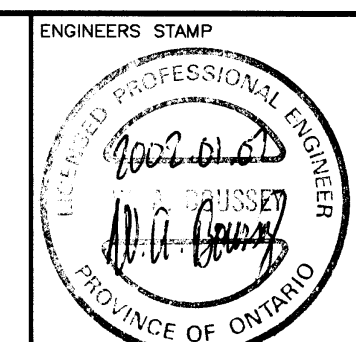
- NOTE:
1. REFER TO DRAWINGS 23 & 24 FOR TYPICAL SECTIONS AND MISCELLANEOUS DETAILS
 2. PROVIDE RESTRAINED JOINTS WHERE REQUIRED. SUBMIT CALCULATIONS TO SUPPORT NUMBER OF JOINT RESTRAINED.

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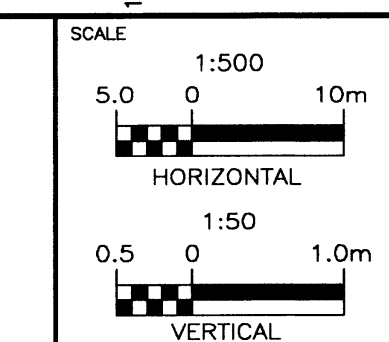


STATION	C/L ROAD ELEV.	STORM SEWER INVERT	SEWERY INVERT
10+650	278.721		
10+500	281.536		
10+400	283.479		

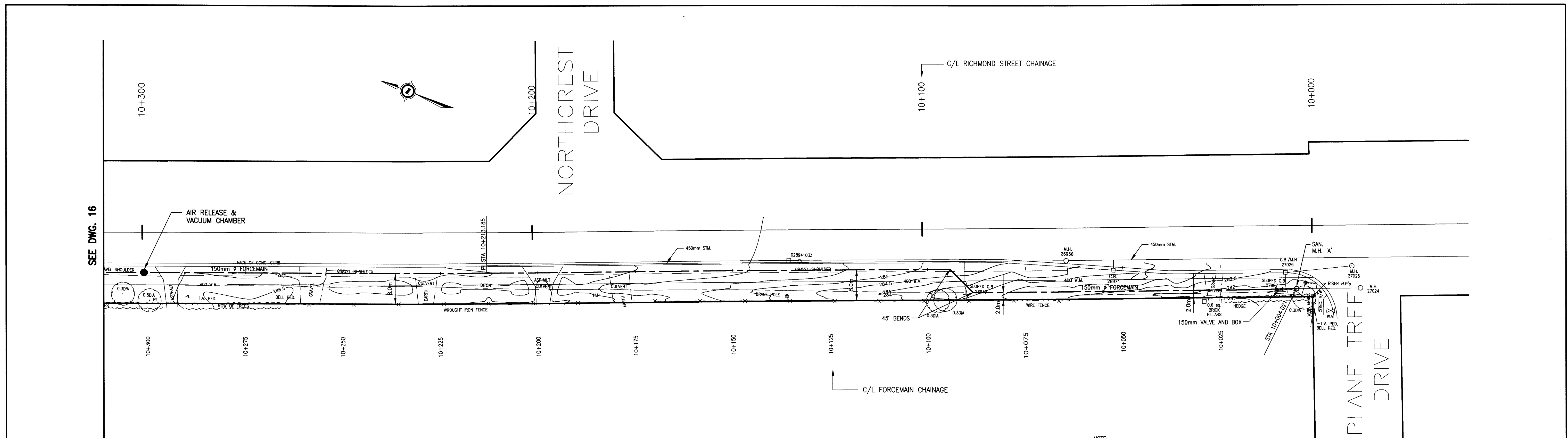
AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY	
1		DESIGN	PAK	1	REVISED FM PROFILE AT WM CROSSING	28/04/00	WAB
2		DRAWN	PAK	2	AS CONSTRUCTED	NOV/01	WAB
3		CHECKED	GOH				
4		APPROVED	WAB				
5		DATE	APRIL/2000				



TOWNSHIP OF MIDDLESEX CENTRE



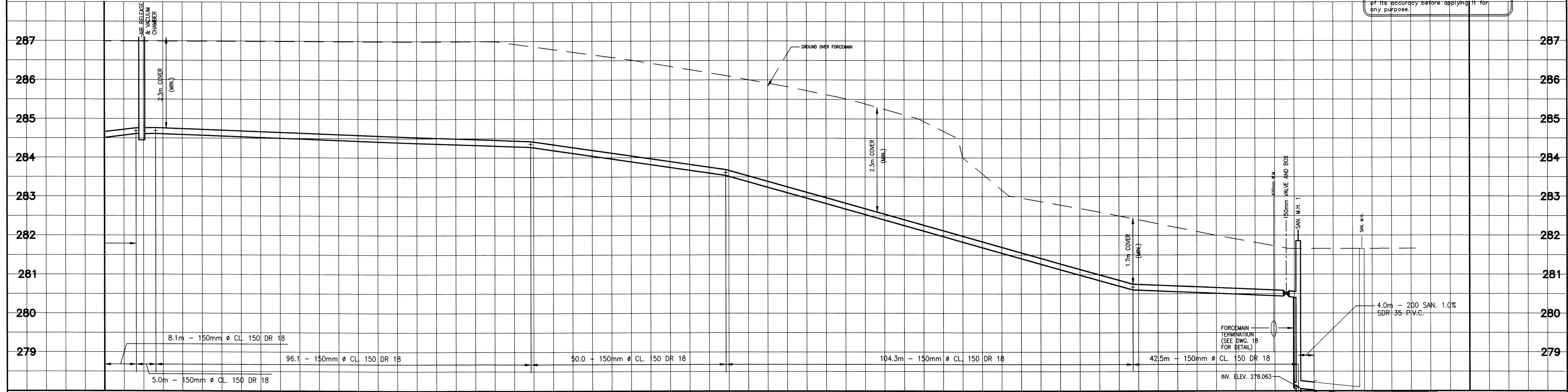
ARVA SANITARY SEWAGE SYSTEM	PROJECT No 00-7278
FORCEMAIN FROM SUNNINGDALE ROAD TO 300m NORTH OF PLANE TREE DRIVE	SHEET No 16
	PLAN FILE No



RICHMOND STREET

NOTE:
1. REFER TO DRAWINGS 23 & 24 FOR TYPICAL SECTIONS AND MISCELLANEOUS DETAILS
2. PROVIDE RESTRAINED JOINTS WHERE REQUIRED. SUBMIT CALCULATIONS TO SUPPORT NUMBER OF JOINT RESTRAINED.

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STATION	C/L RICHMOND STREET CHAINAGE	C/L FORCEMAIN CHAINAGE	INVERT ELEV.	COVER ELEV.	REMARKS
10+300	284.690	284.690	284.690	284.690	
10+200	284.356	284.356	284.356	284.356	
10+100	283.629	283.629	283.629	283.629	
10+000	280.073	280.073	280.073	280.073	

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY
1			1	REVISED FM PROFILE AT WM CROSSING	28/04/00	WAB
2			2	AS CONSTRUCTED	NOV/01	WAB
3				CHECKED	GOH	
4				APPROVED	WAB	
5				DATE	APRIL/2000	

DILLON CONSULTING

TOWNSHIP OF MIDDLESEX CENTRE

SCALE: 1:500
HORIZONTAL: 5.0 0 10m
VERTICAL: 0.5 0 1.0m

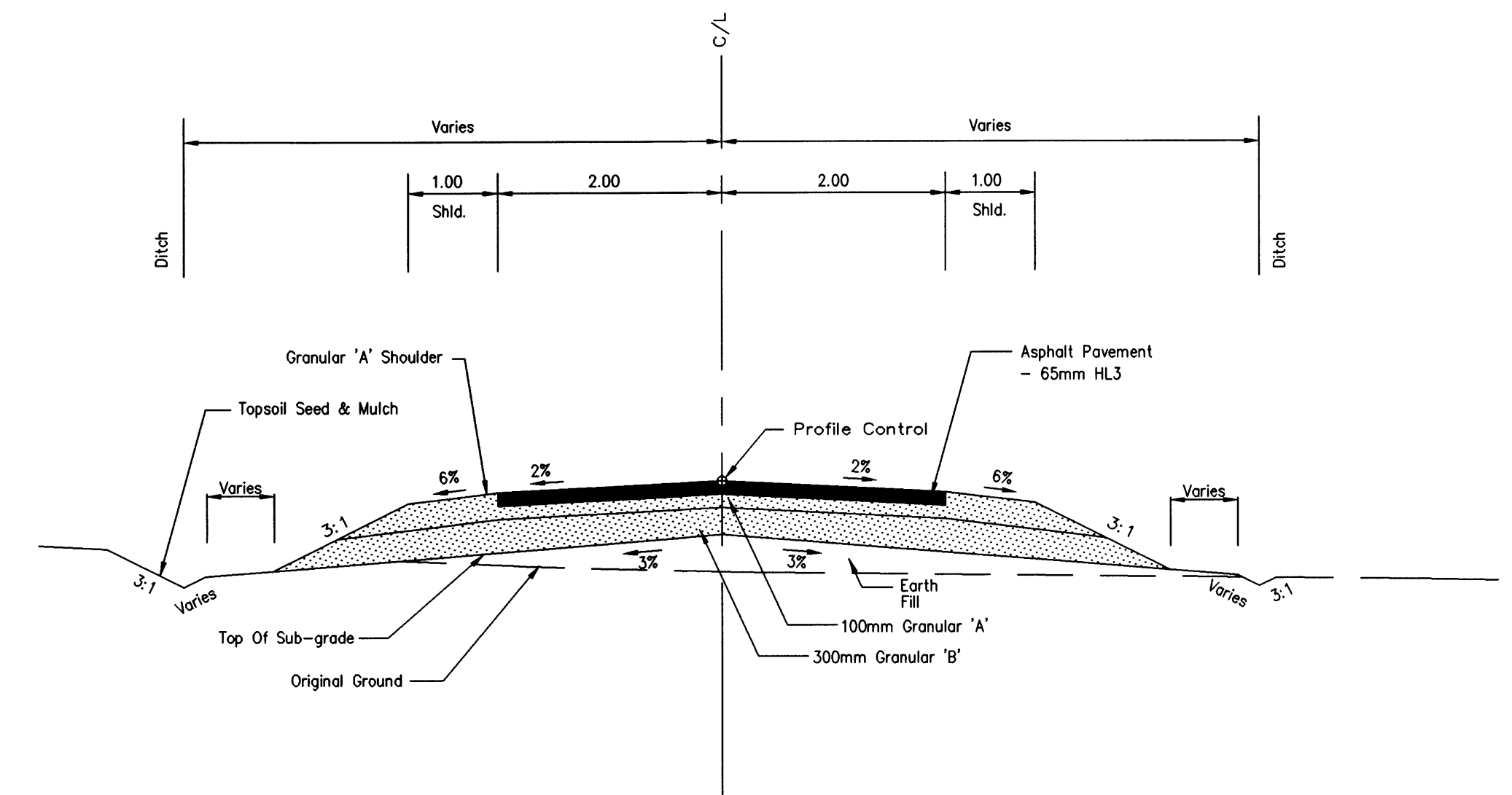
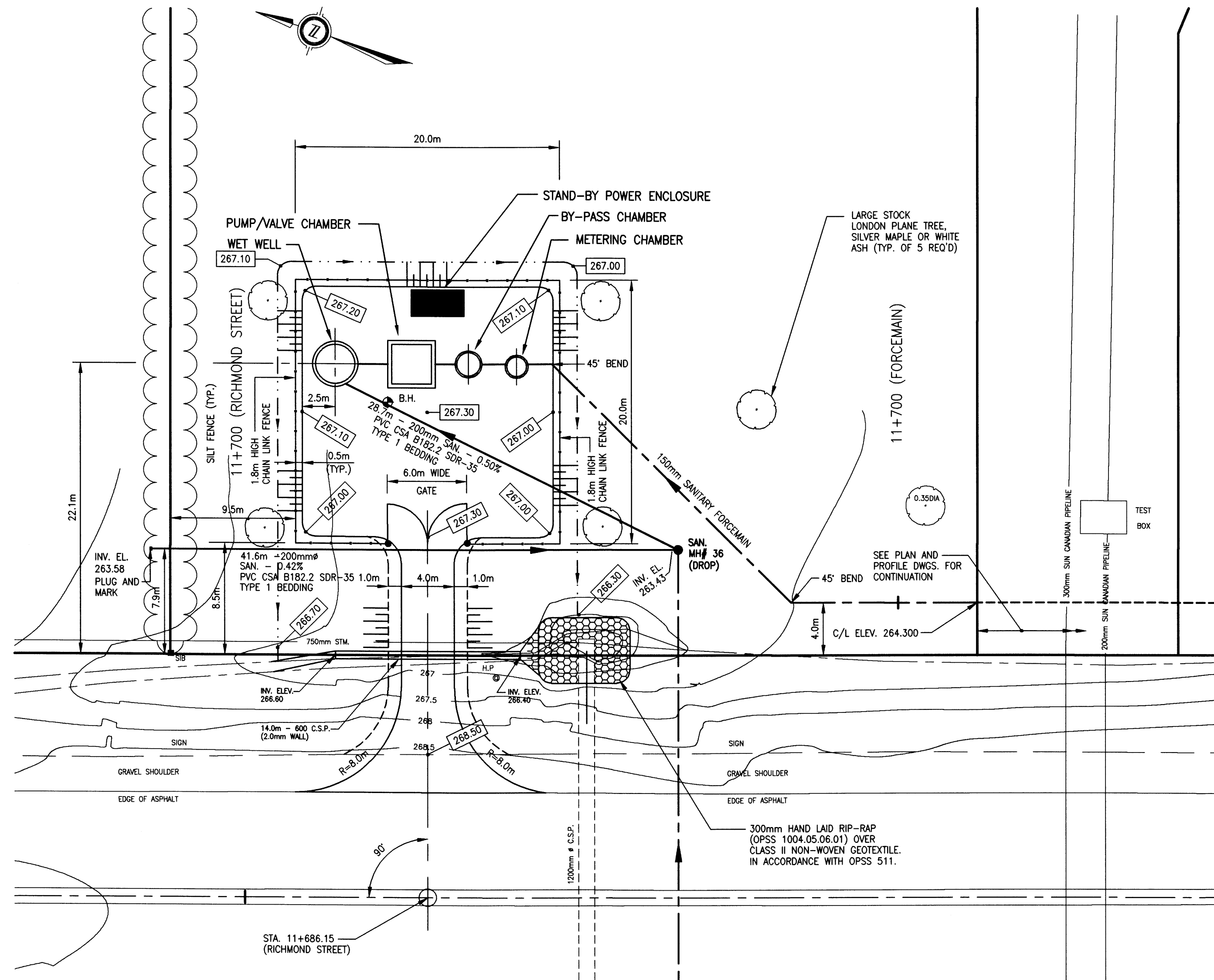
ARVA SANITARY SEWAGE SYSTEM

FORCEMAIN FROM 300m NORTH OF PLANE TREE DRIVE TO PLANE TREE DRIVE

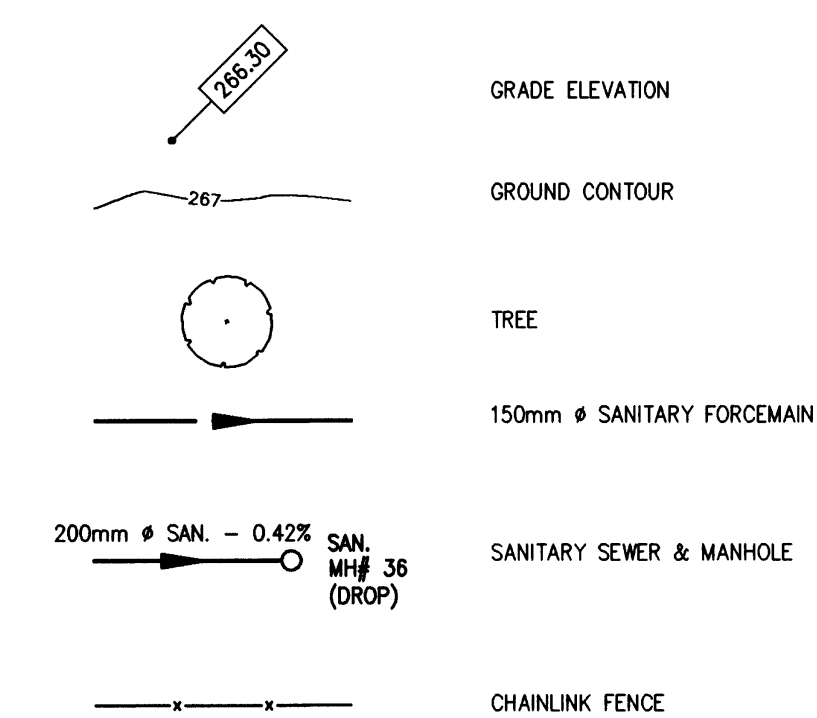
PROJECT No
00-7278

SHEET No
17

PLAN FILE No

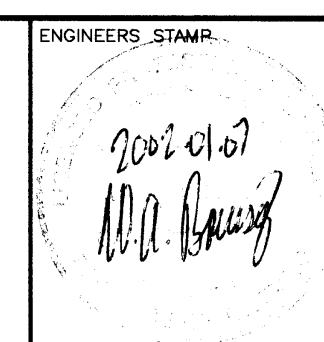


LEGEND



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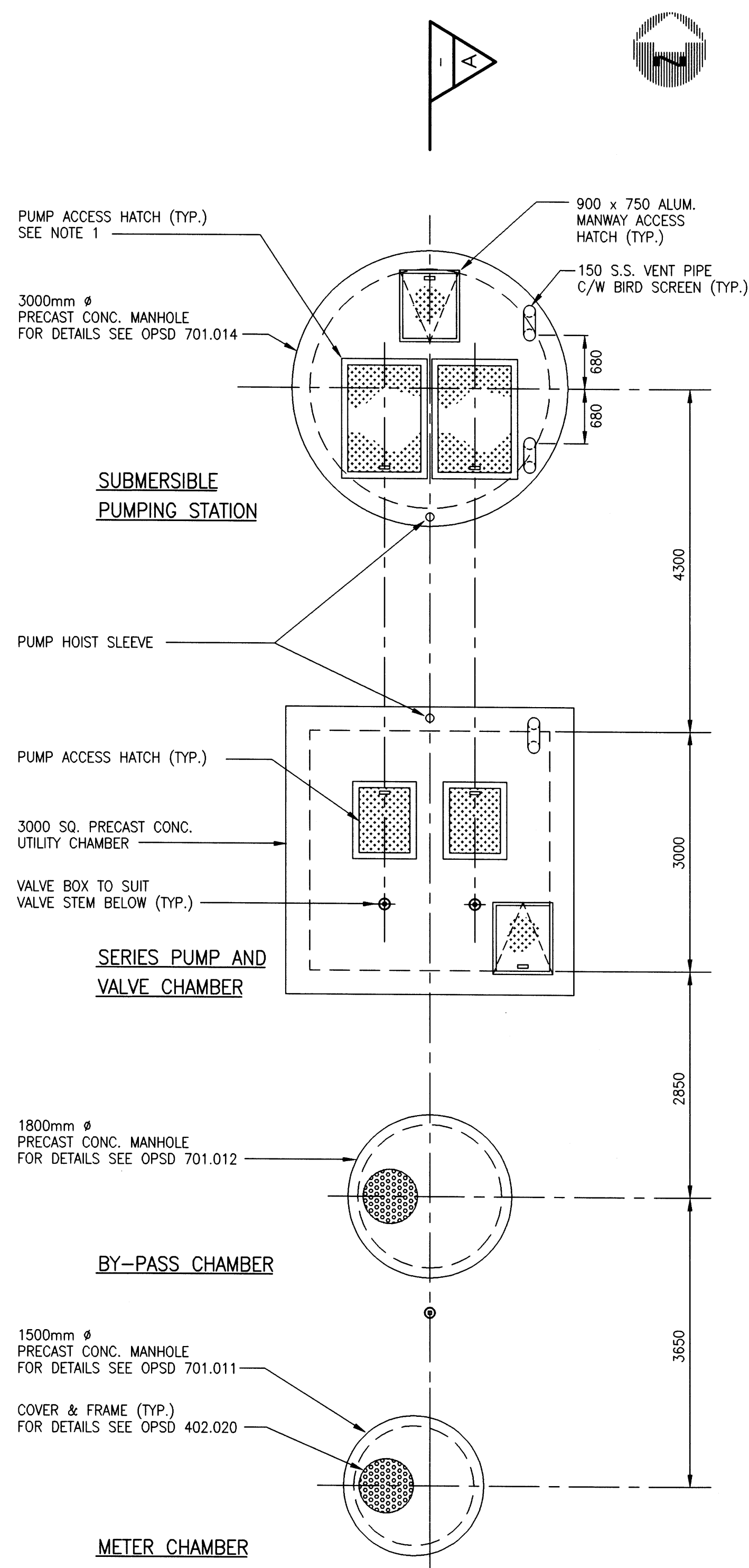
AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY	ENGINEERS STAMP	SCALE	AS NOTED	ARVA SANITARY SEWAGE PLAN	PROJECT No
1			DESIGN	WAB	1	AS CONSTRUCTED	NOV/01	WAB			00-7278
2			DRAWN	PAK							
3			CHECKED	WAB							
4			APPROVED	WAB							
5			DATE	APRIL/2000							



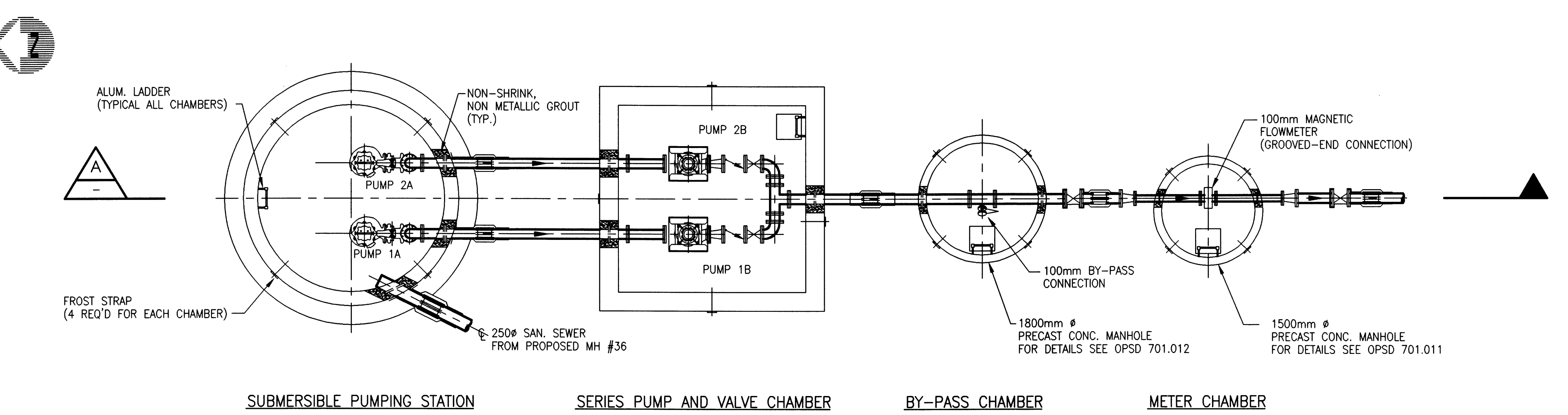
**TOWNSHIP
OF
MIDDLESEX
CENTRE**

**PUMPING STATION
SITE LAYOUT & GENERAL ARRANGEMENT**

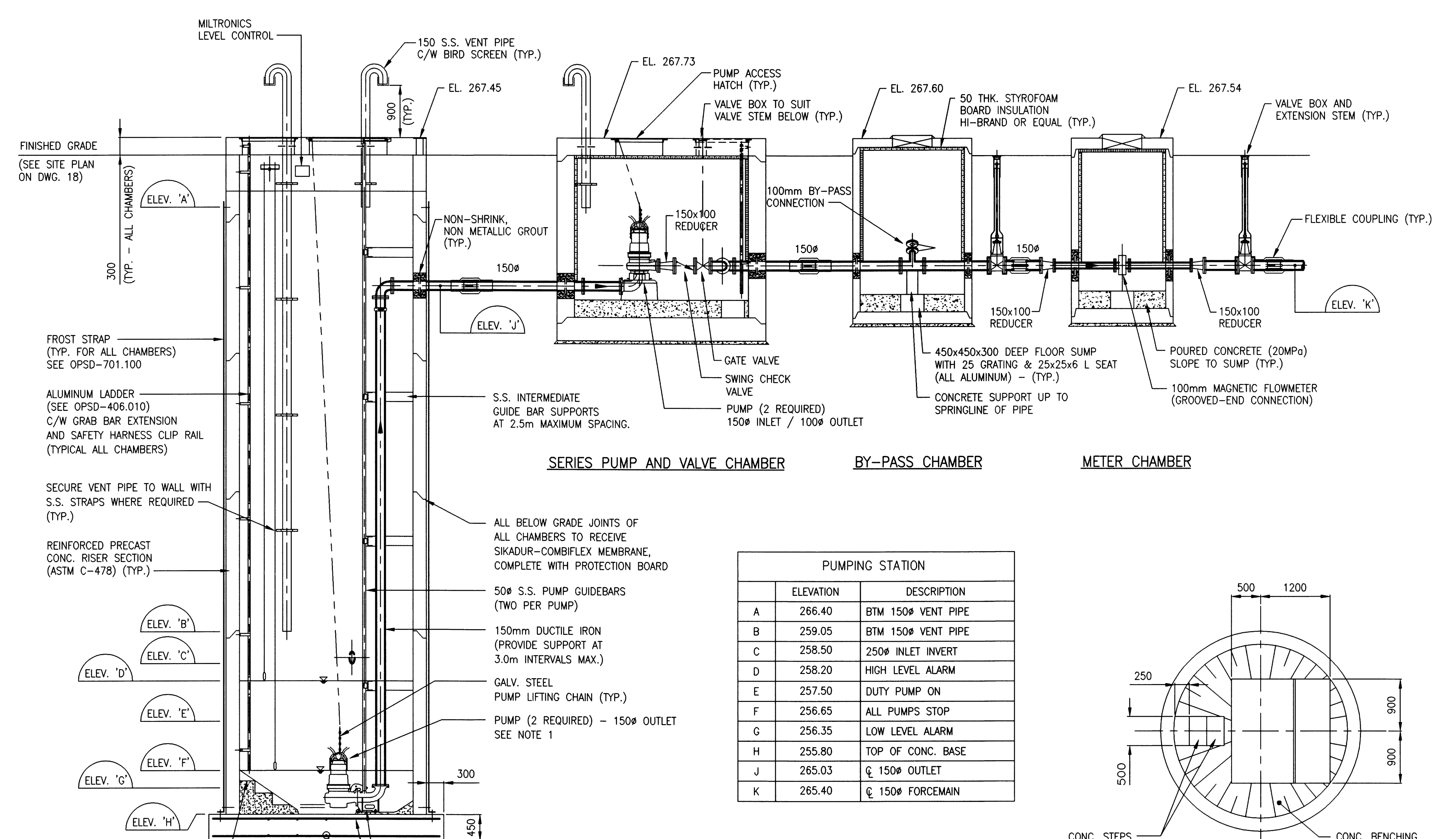
18
SHEET No
PLAN FILE No



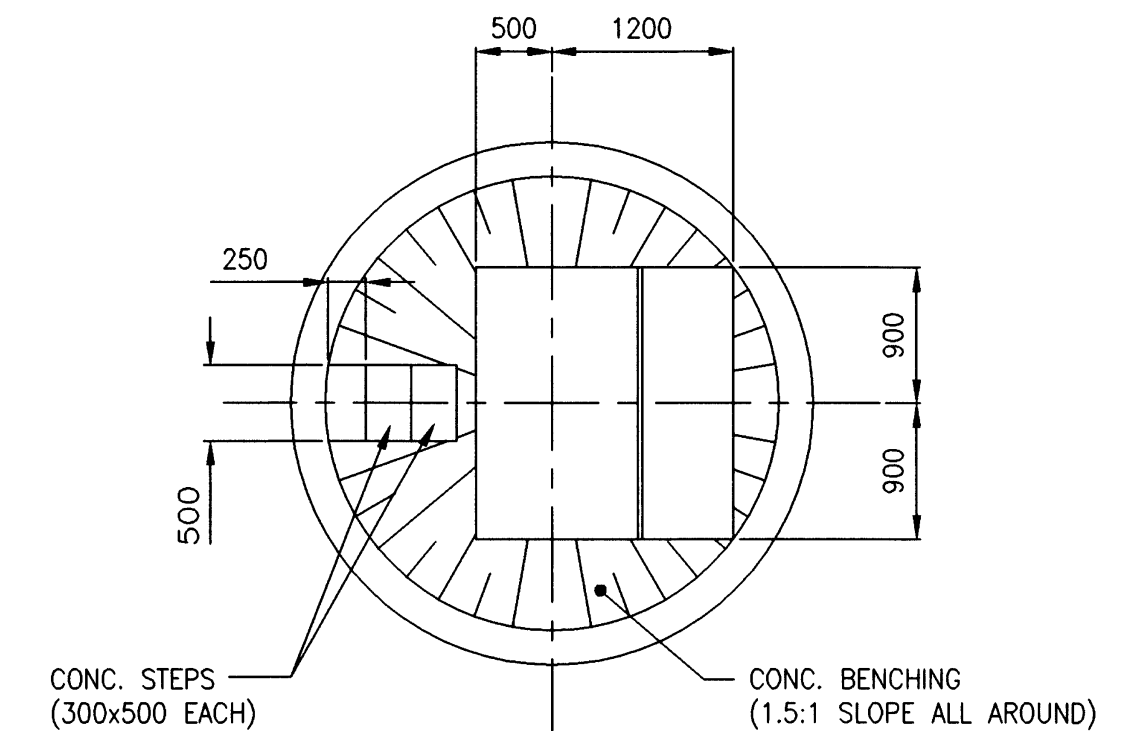
PLAN AT GRADE LEVEL



PLAN



PUMPING STATION		
	ELEVATION	DESCRIPTION
A	266.40	BTM 150Ø VENT PIPE
B	259.05	BTM 150Ø VENT PIPE
C	258.50	250Ø INLET INVERT
D	258.20	HIGH LEVEL ALARM
E	257.50	DUTY PUMP ON
F	256.65	ALL PUMPS STOP
G	256.35	LOW LEVEL ALARM
H	255.80	TOP OF CONC. BASE
J	265.03	Ø 150Ø OUTLET
K	265.40	Ø 150Ø FORCEMAIN



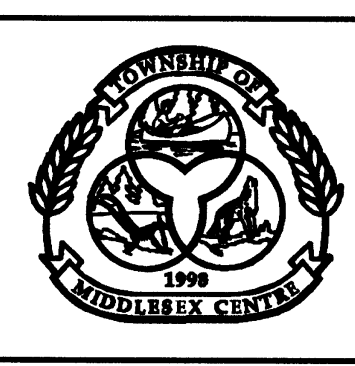
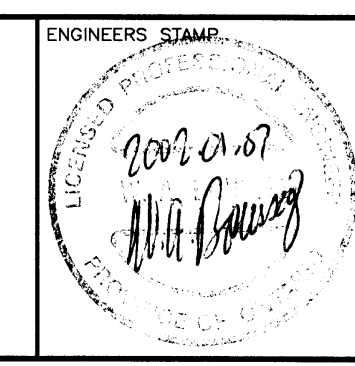
SUBMERSIBLE PUMPING STATION BENCHING PLAN

SECTION A-A

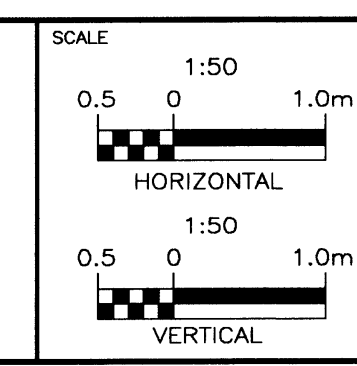
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- NOTES:**
- PUMP SETTING AND HATCHES ARE TO PERMIT FUTURE INSTALLATION OF C3300 FLYGT PUMPS IN THE WET WELL.
 - ALL CHAMBER BASES TO FOUND ON NATURAL UNDISTURBED SOIL WITH AN ALLOWABLE BEARING CAPACITY OF 200 KPa.

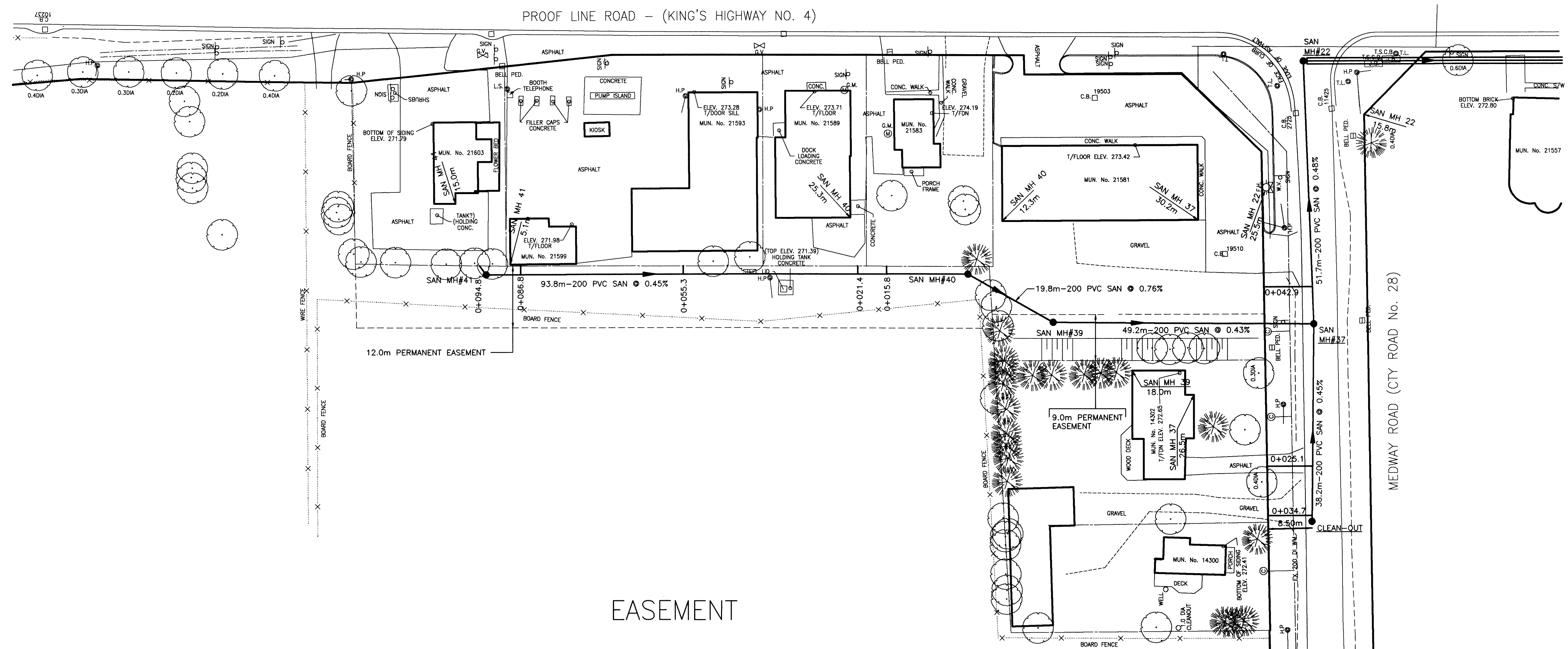
AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	DESIGN	GOH	No	REVISIONS	DATE	BY
1			DRAWN	JC				
2			CHECKED	GOH				
3			APPROVED	WAB				
4			DATE	APRIL/2000				
5								



TOWNSHIP OF MIDDLESEX CENTRE

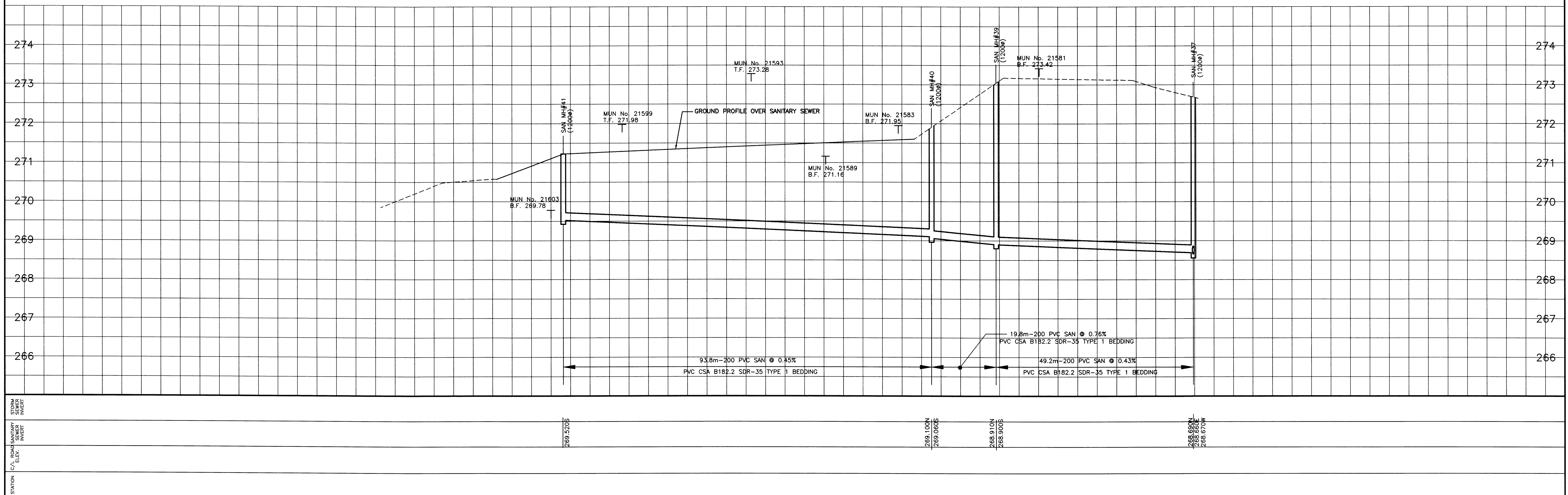


ARVA SANITARY SEWAGE SYSTEM		PROJECT No
PUMPING STATION PLANS AND SECTIONS		00-7278
		SHEET No
		19
		PLAN FILE No

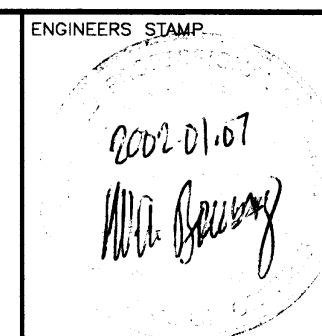


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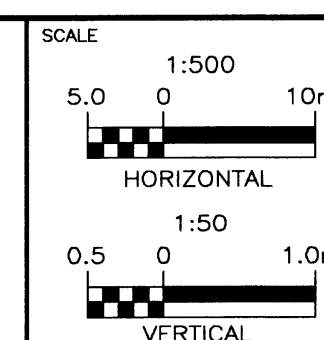
EASEMENT



AS CONSTRUCTED	NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY
1			DESIGN RJM	1	AS CONSTRUCTED	NOV/01	WAB
2			DRAWN EMB				
3			CHECKED WAB				
4			APPROVED				
5			DATE APR 20/00				



TOWNSHIP
OF
MIDDLESEX
CENTRE



ARVA SANITARY SEWAGE SYSTEM

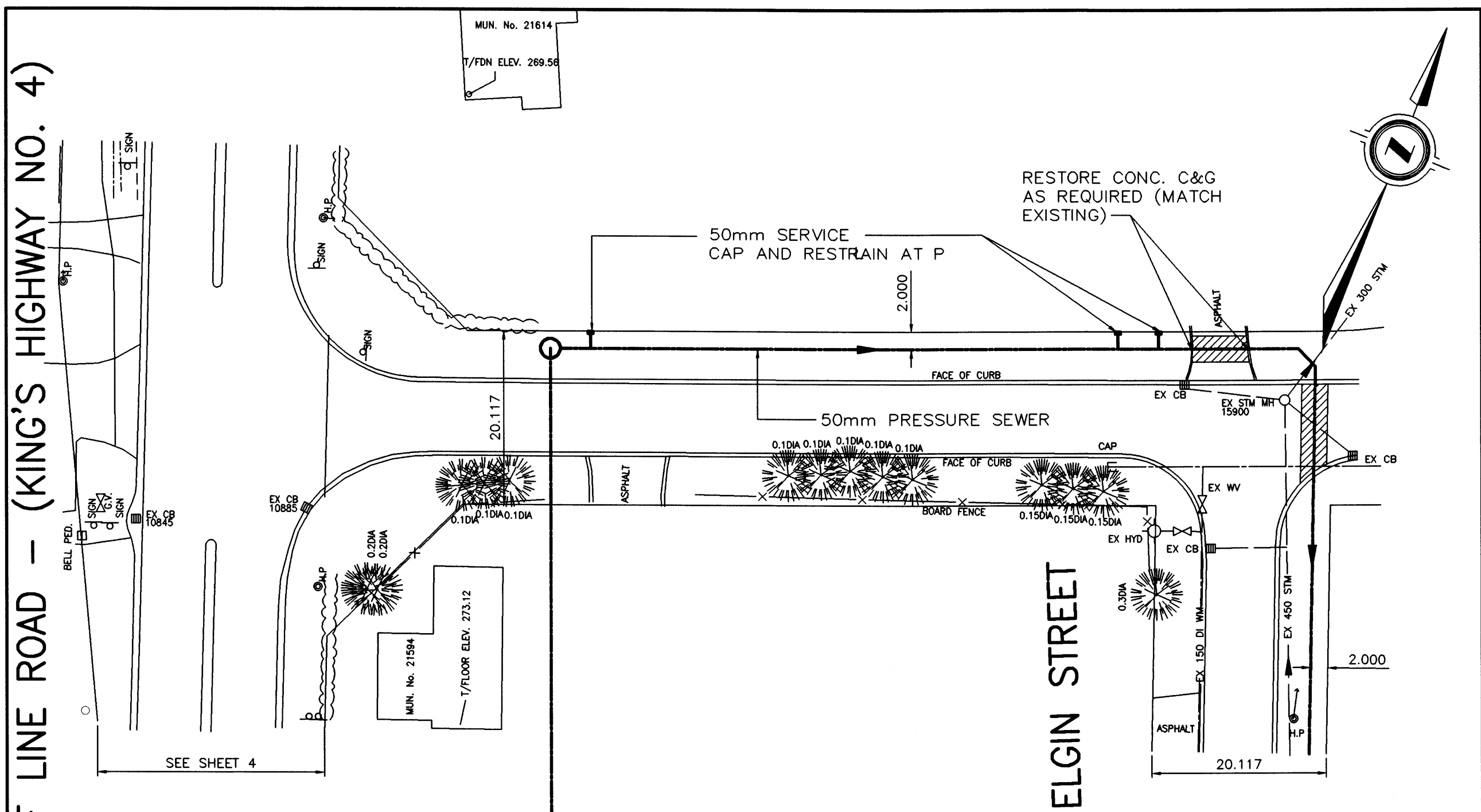
WELDON / CARTER EASEMENT
FROM 168m NORTH OF MEDWAY RD
TO MEDWAY ROAD

PROJECT No
00 7070

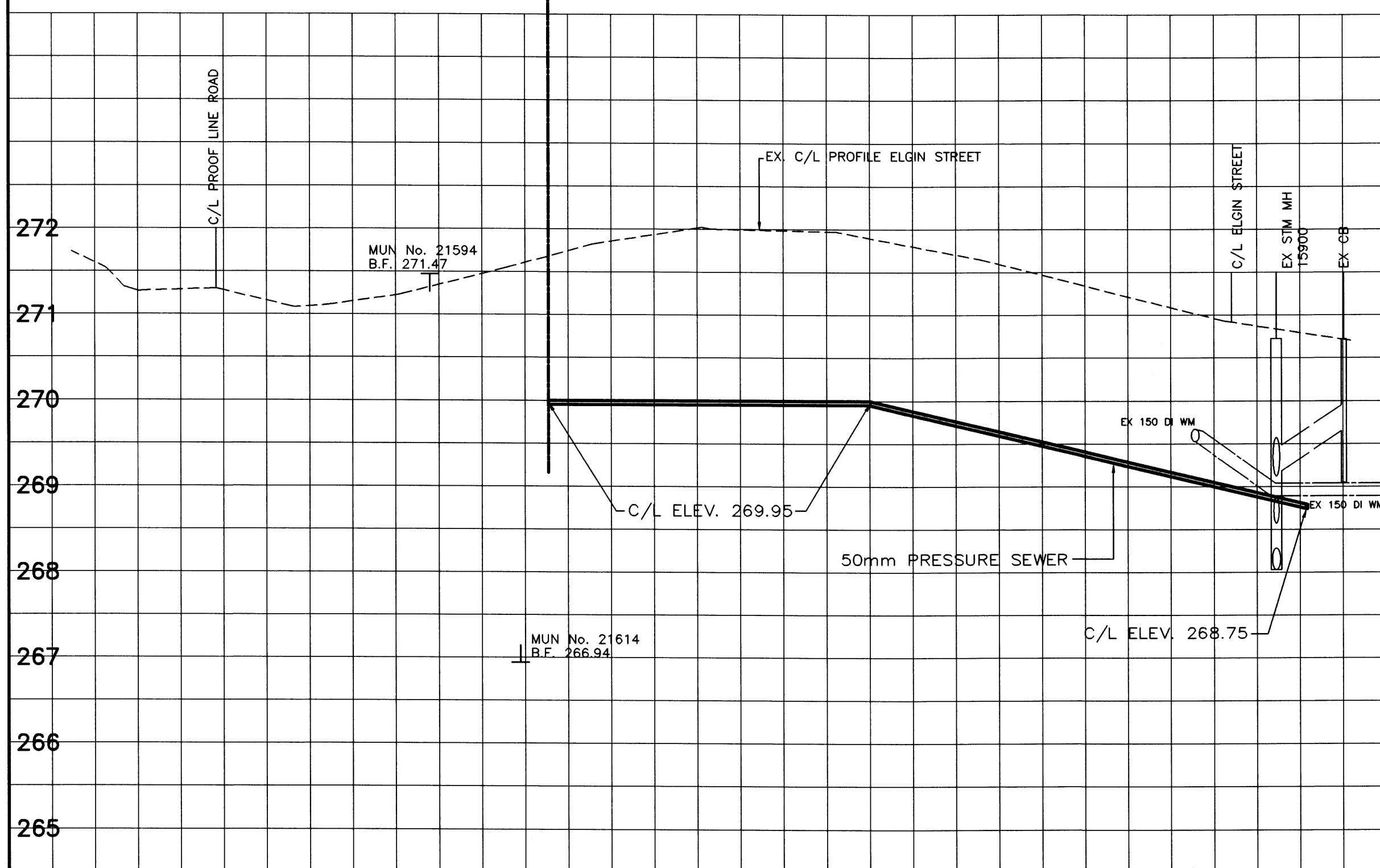
SHEET No 20

PLAN FILE No.

PROOF LINE ROAD - (KING'S HIGHWAY NO. 4)

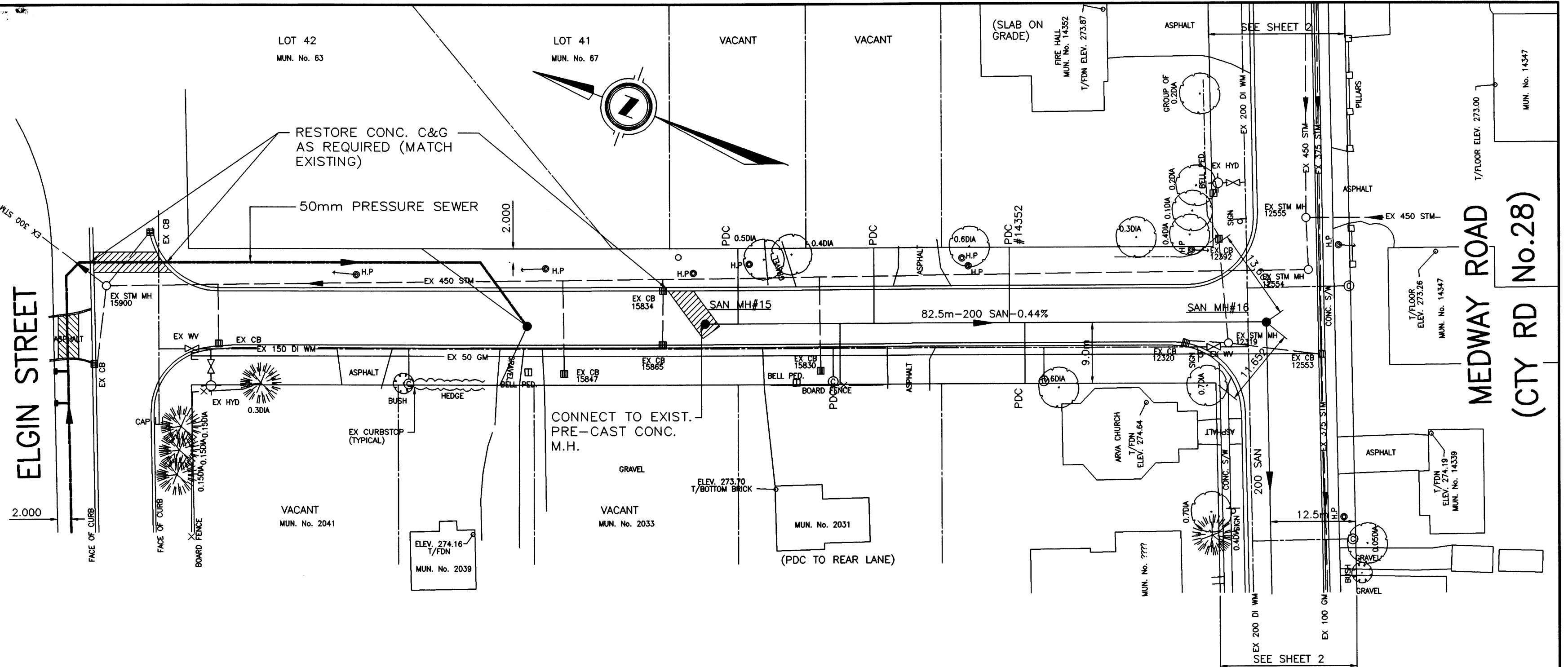


ELGIN STREET



C. ROAD STATION	C. ROAD ELEV.	SAN. INVERT	STORM INVERT
	271.56		268.03N 268.03N 268.03N 268.03N 268.03N
	270.92		

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY
1		DESIGN PAK				
2		DRAWN PAK				
3		CHECKED WAB				
4		APPROVED				
5		DATE SEPT 2000				



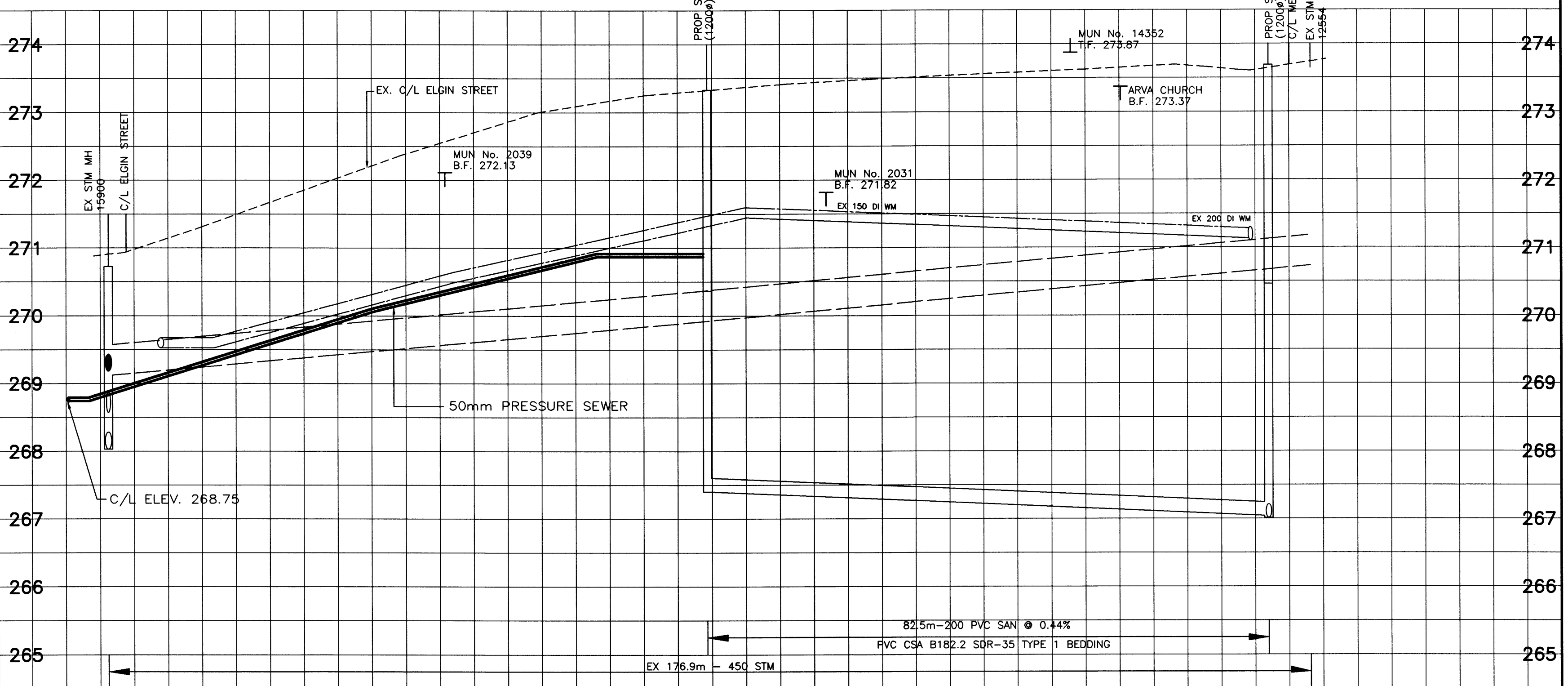
RESTORATION:

ROADS - 65mm HL3 OVER 300mm GRANULAR 'A'

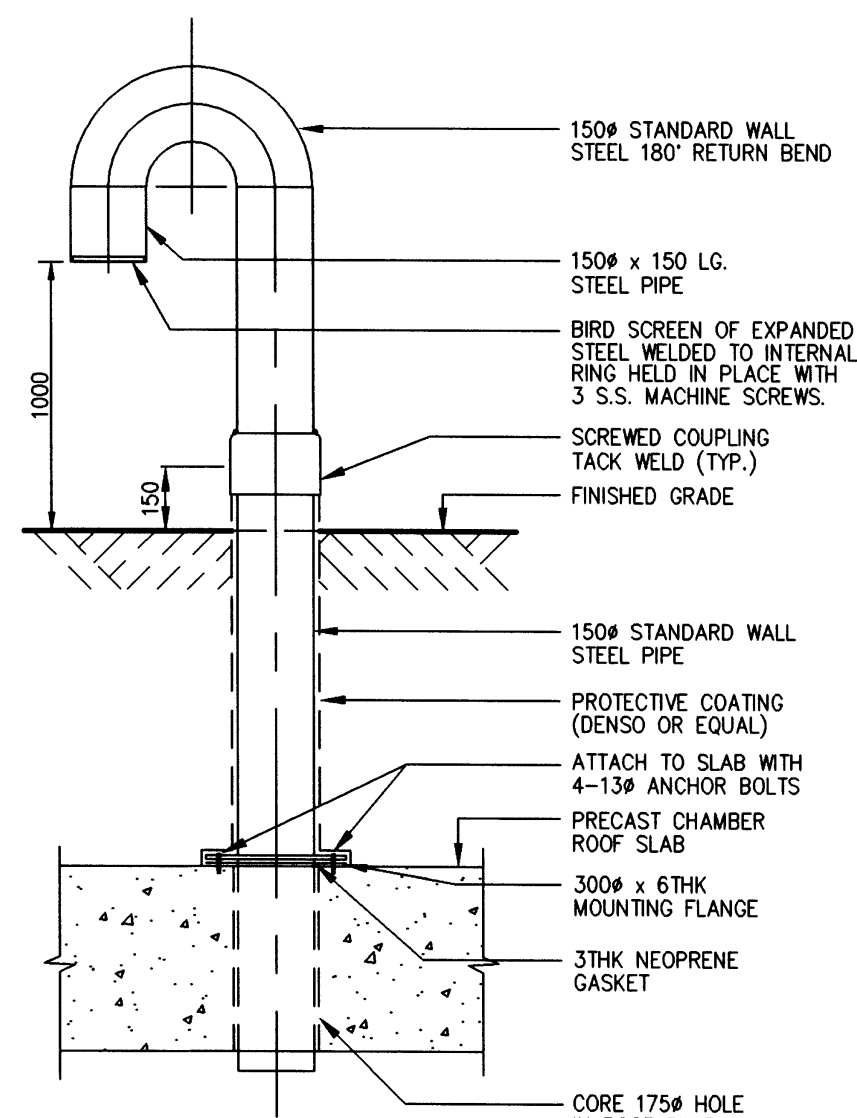
DRIVEWAYS - 40mm HL3 OVER 300mm GRANULAR 'A'

BOULEVARDS – SEED AND MULCH OVER 100mm TOPSOIL

ELGIN STREET

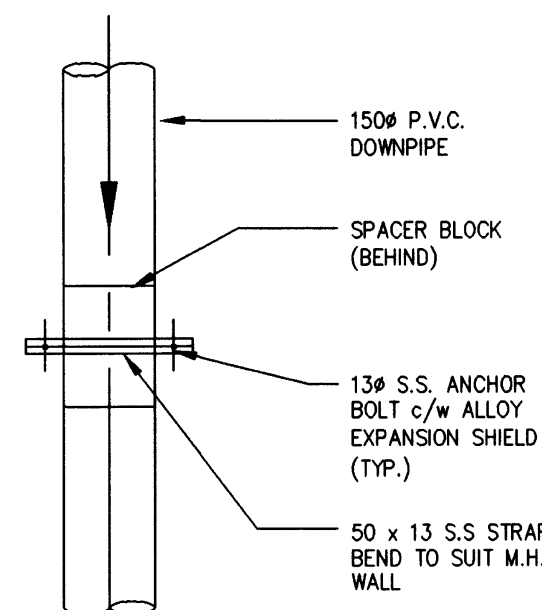
[illegible]

	ENGR'S STAMP 		TOWNSHIP OF MIDDLESEX CENTRE	SCALE HORIZONTAL - 1 : 500 5 0 10m  VERTICAL - 1 : 50 0.5 0 1m 	ARVA SANITARY SEWAGE SYSTEM 00-7278	PROJECT No
					ELGIN STREET SANITARY PRESSURE SEWER	SHEET No 21
					PLAN FILE No	

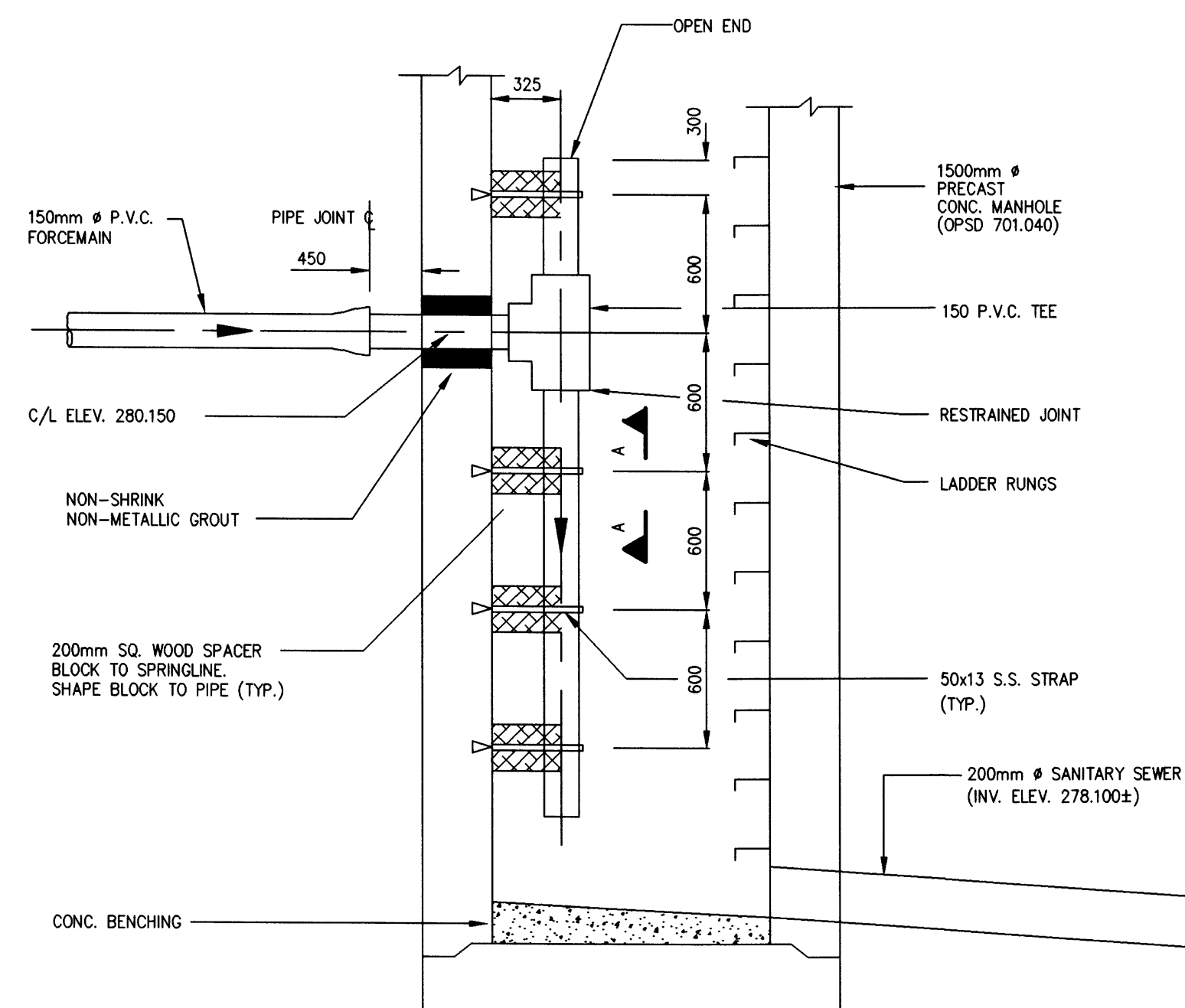


NOTE:
1. VENTILATION HOOK-UP ASSEMBLY
TO BE HOT DIP GALVANIZED AFTER
FABRICATION.

VENT DETAIL

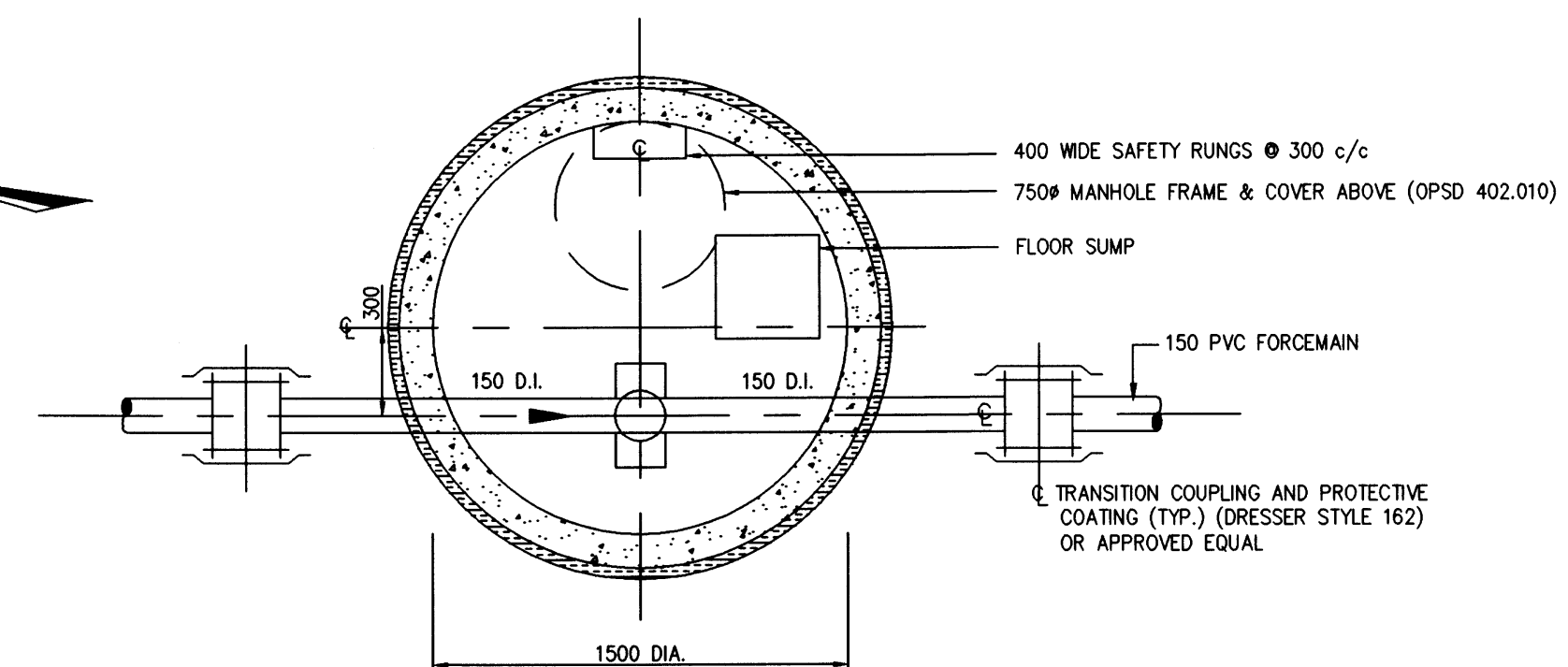


ELEVATION A-A

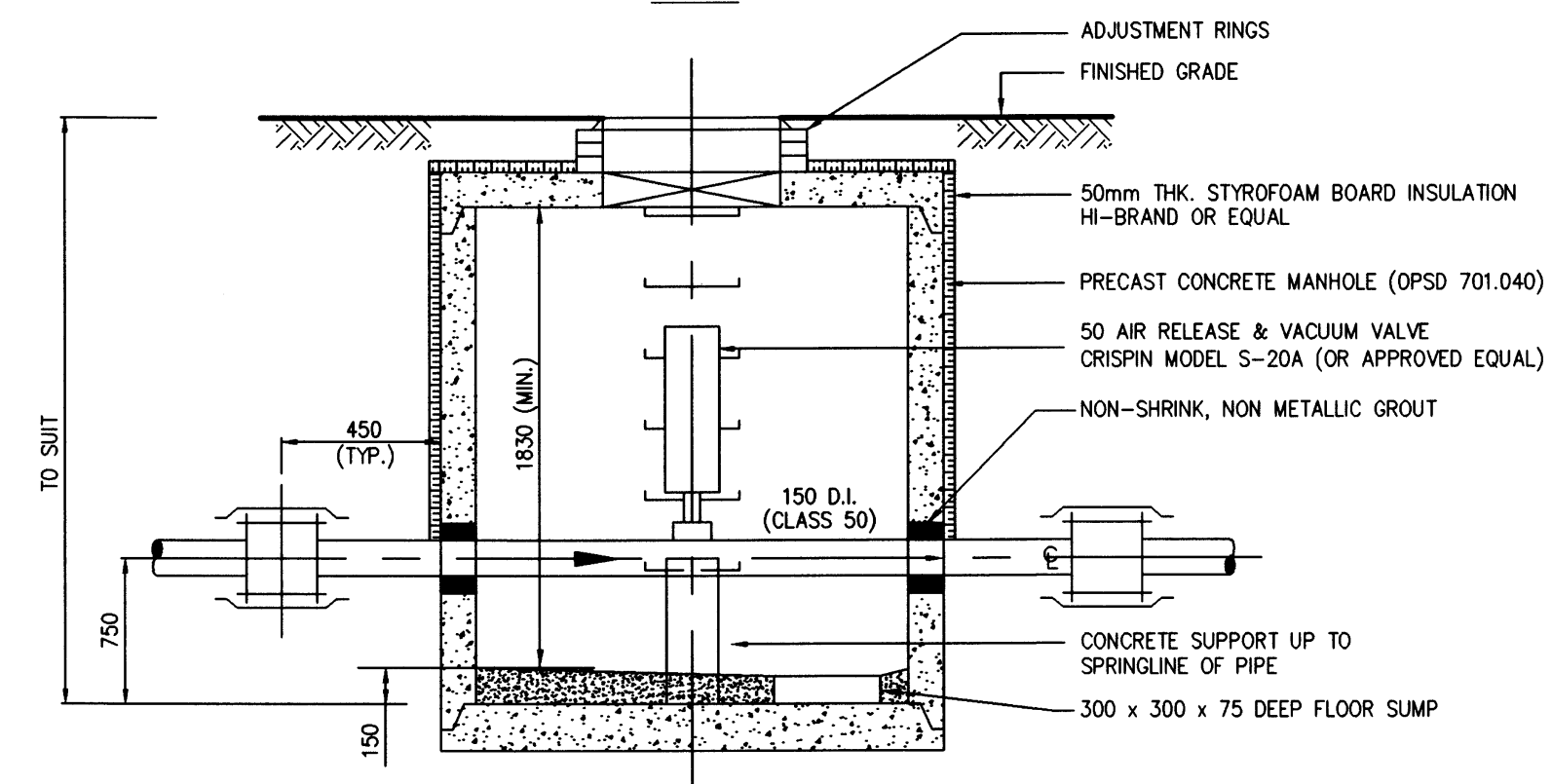


SECTION

FORCEMAIN TERMINATION DETAIL



PLAN

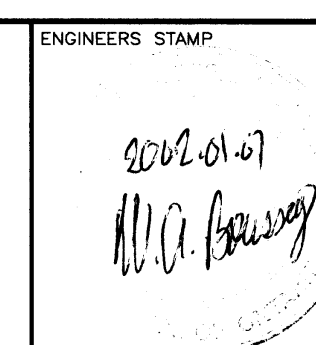


SECTION

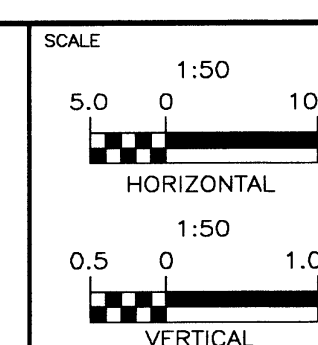
AIR RELEASE AND VACUUM CHAMBER

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AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	DESIGN	PAK	No	REVISIONS	DATE	BY
1			DESIGN	PAK	1	AS CONSTRUCTED	NOV/01	WAB
2			DRAWN	PAK				
3			CHECKED	GOH				
4			APPROVED	WAB				
5			DATE	APRIL/2000				



TOWNSHIP
OF
MIDDLESEX
CENTRE



ARVA SANITARY SEWAGE SYSTEM

MISCELLANEOUS DETAILS ONE

PROJECT No
00-7278

SHEET No
22

PLAN FILE No

GENERAL NOTES

All work shall be done in accordance with the minimum standards and specifications of the City of London, and The Ontario Provincial Standard Specifications.

Existing topographical information was obtained in the field by Archibald, Gray & McKay

Type II bedding shall be in accordance with OPSP 802.010 for flexible pipes. The Type II bedding and cover material shall consist of approved OPSP Form 1010 Granular 'A' material having a maximum aggregate size of 20mm.

All bedding material shall be compacted to a minimum of 95% of the material's Standard Proctor Maximum Dry Density (SPMDD).

Backfill shall be select native excavated material compacted to at least 98% Standard Proctor Maximum Dry Density (SPMDD).

All existing boulevards and road surfaces disturbed during construction shall be restored to a condition at least as good as original, all to the satisfaction of the Engineer.

All existing underground plant (hydro, telephone, gas mains, watermains, sewers) which will be crossed under during the installation of the services shall be supported by a support beam or by other methods, as may be required by the owners of the plant being crossed under.

Prior to commencement of any construction, benchmarks, elevations, and dimensions must be checked and verified, and any discrepancies reported to the Engineer.

Prior to commencing any work on the installation of services, an approved set of plans must be available on the site, and remain there while work is being done.

At least 48 hours prior to commencing construction on any existing Road Allowance maintained by the City of London, the Contractor shall obtain the necessary permits from the City, after discussion with the staff.

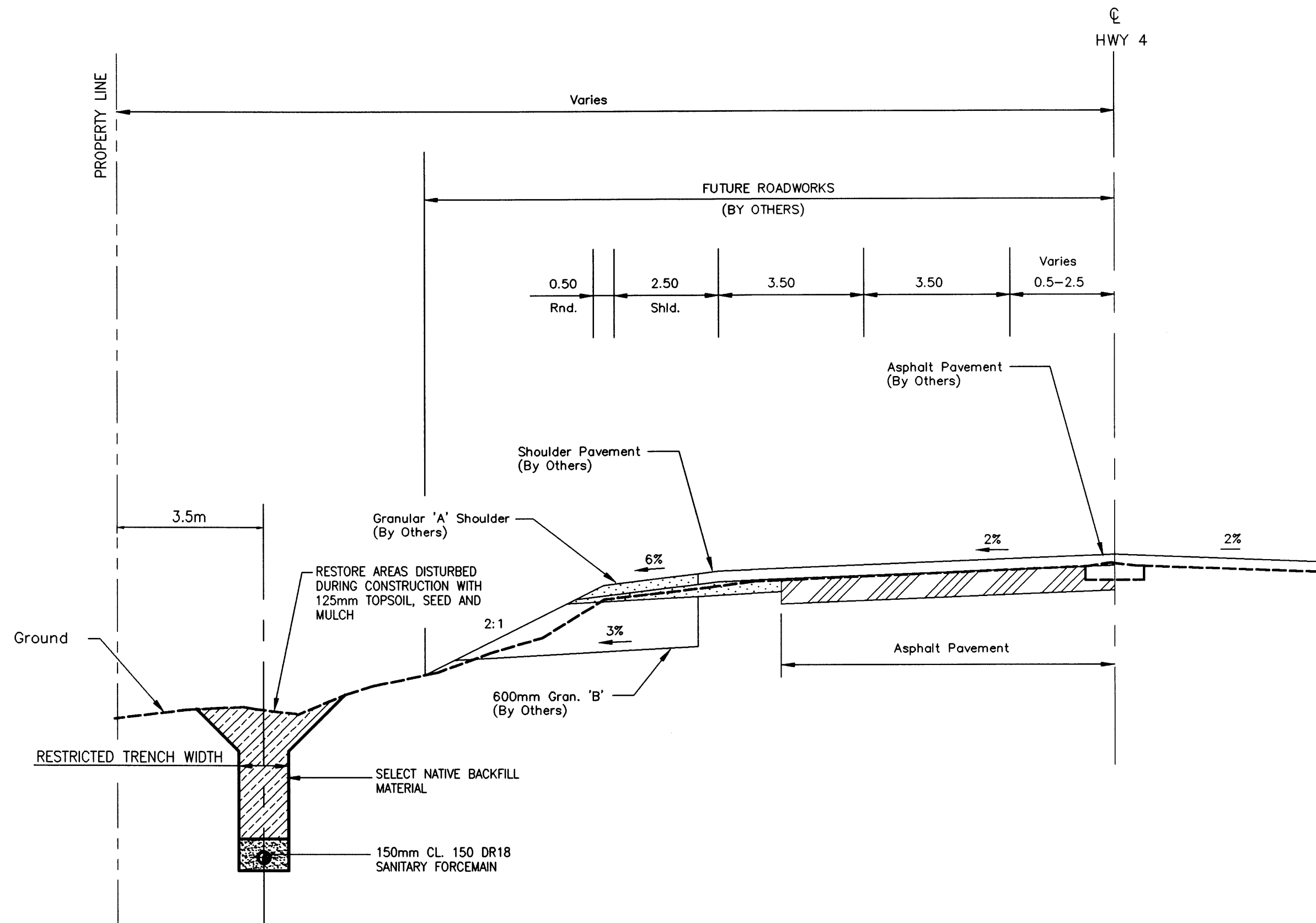
Prior to the commencement of construction, all existing underground utilities that will be affected by construction shall be located and marked. Any utilities damaged or disturbed during construction shall be repaired or replaced to the satisfaction of the governing body. The Contractor's expense in locating and marking utilities shall be the responsibility of the Contractor. The Contractor is to meet all the requirements of the Owners of the Utilities on this plan and must make satisfactory arrangements with the utility companies for crossing their installations and for providing adequate protection during construction.

The Contractor shall take all necessary precautions under The Occupational Health and Safety Act while working in the vicinity of overhead power lines.

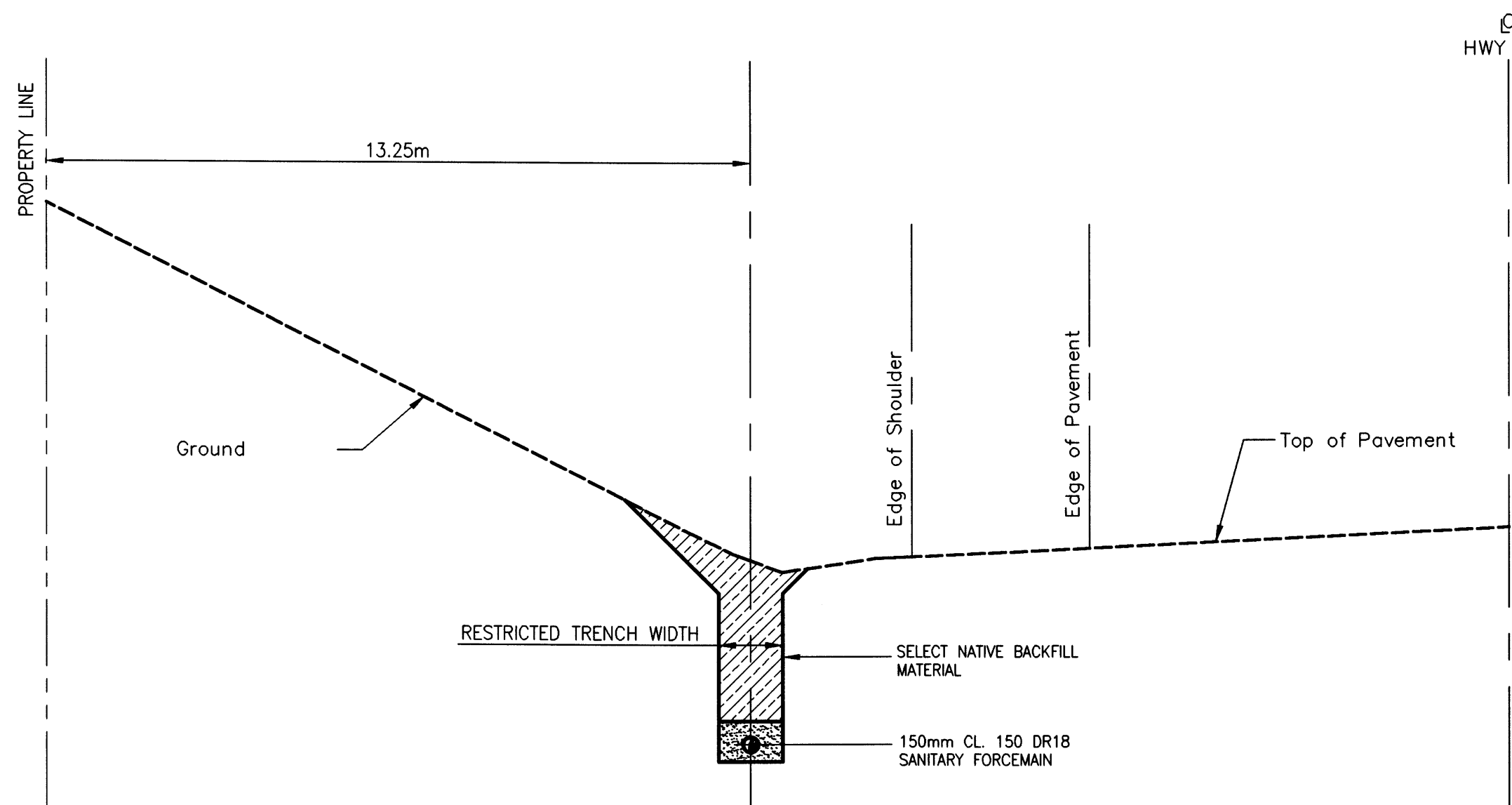
All excavation wholly or partly within proposed or existing roadways, shall be backfilled and compacted in accordance with Ontario Provincial Standard Specifications.

Existing trees damaged during construction shall be trimmed as directed. The contractor shall take precautions to minimize damage to any trees or overhanging limbs.

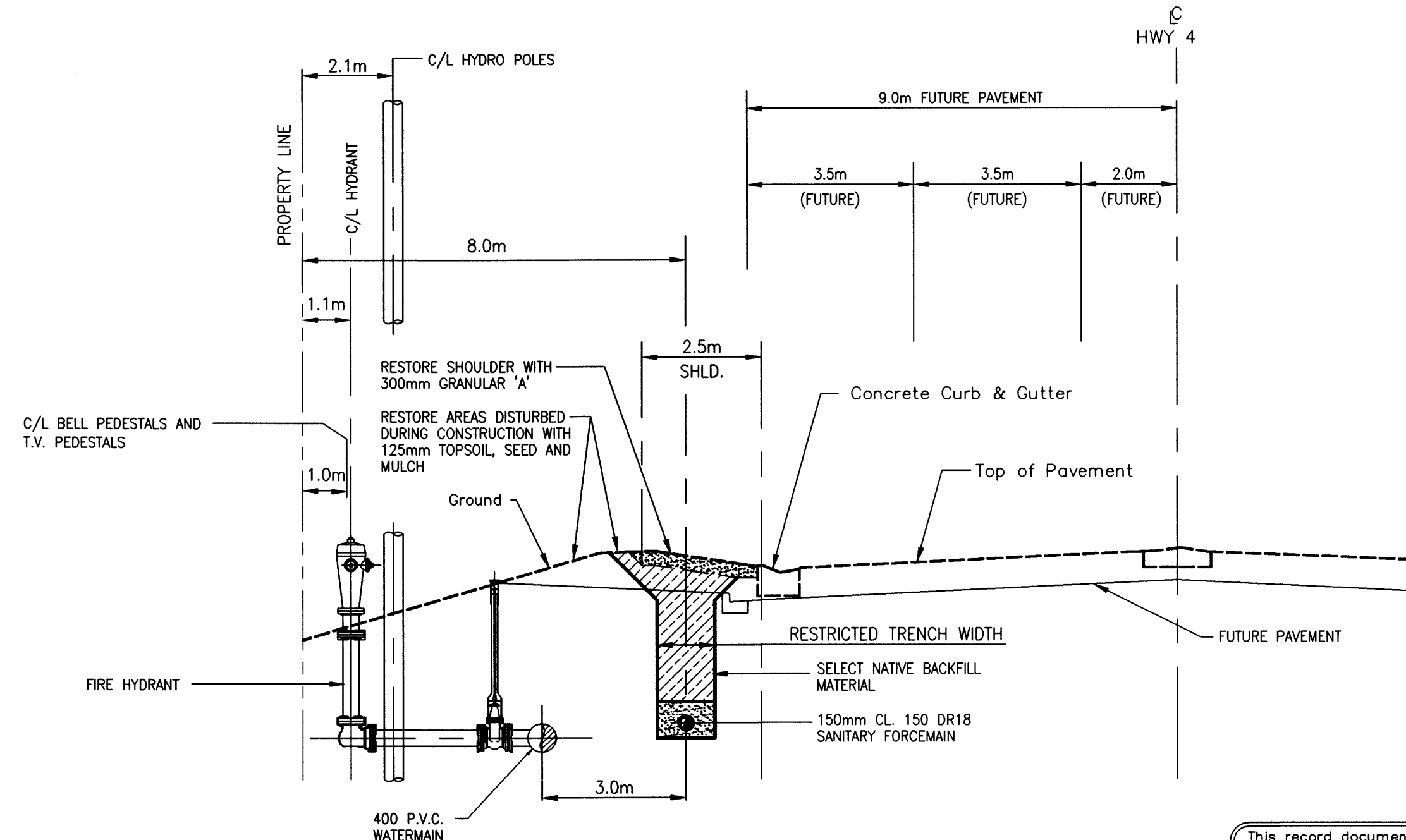
The Contractor is to contact London Hydro at least 3 working days prior to excavating within 1m (top of slope) of all hydro poles. The Contractor is not permitted to make support connections to London Hydro poles. London Hydro is required to attach and remove all supports from each pole and shall be compensated for all costs incurred by The Contractor.



RICHMOND STREET
(STA. 10+400 TO STA. 11+250 AND STA. 11+375 TO STA. 11+550)



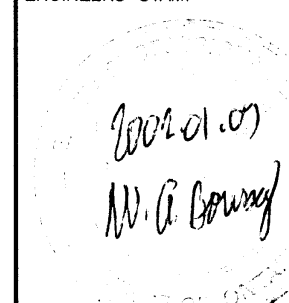
RICHMOND STREET
(STA. 11+250 TO STA. 11+375)



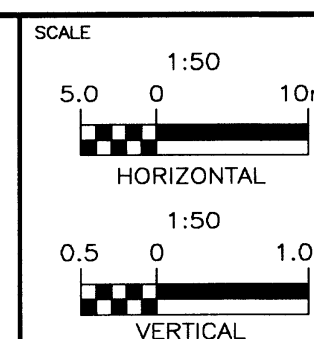
RICHMOND STREET
(STA. 10+095 TO STA. 10+400)

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AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION		No	REVISIONS	DATE	BY
1			DESIGN PAK	1	AS CONSTRUCTED	NOV/01	WAB
2			DRAWN PAK				
3			CHECKED GOH				
4			APPROVED WAB				
5			DATE APRIL/2000				



**TOWNSHIP
OF
MIDDLESEX
CENTRE**



ARVA SANITARY SEWAGE SYSTEM

MISCELLANEOUS DETAILS TWO

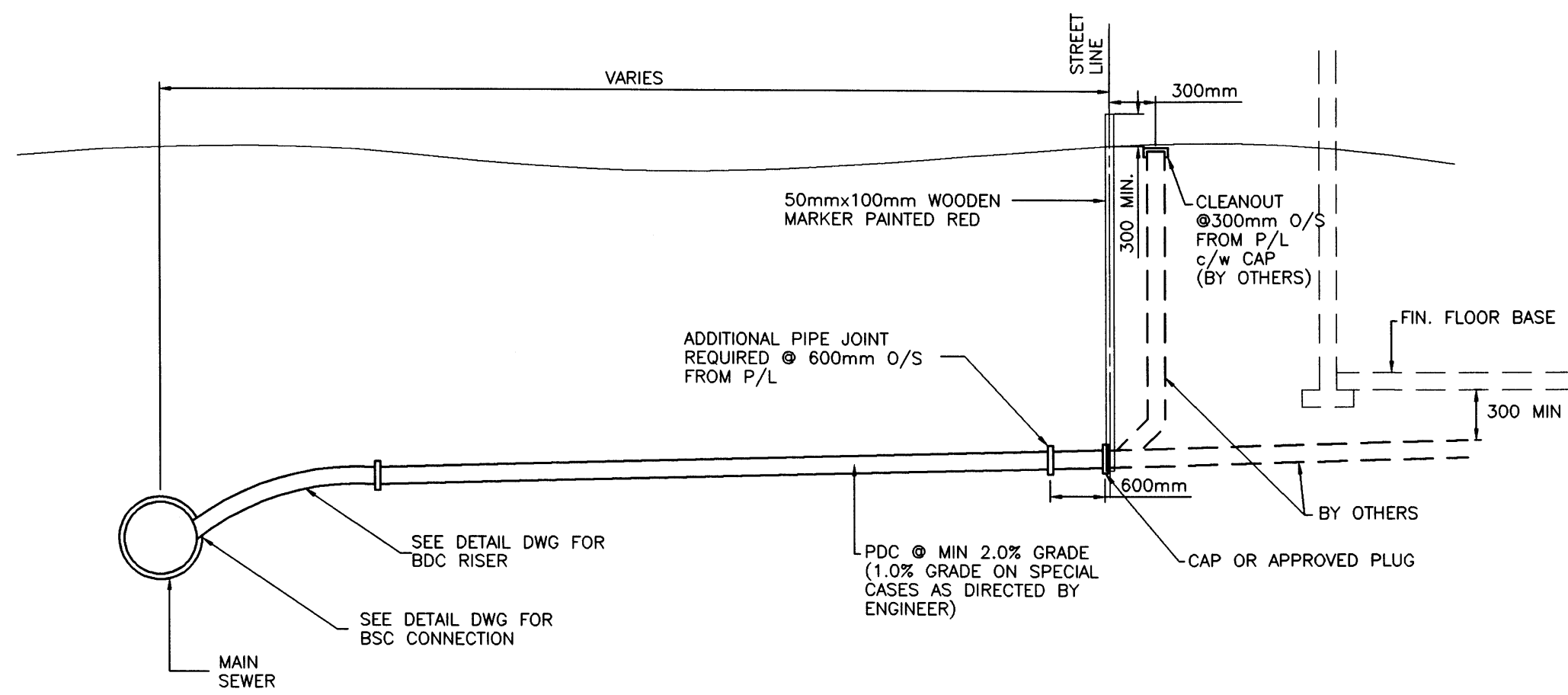
PROJECT No.

00-7278

HEET No

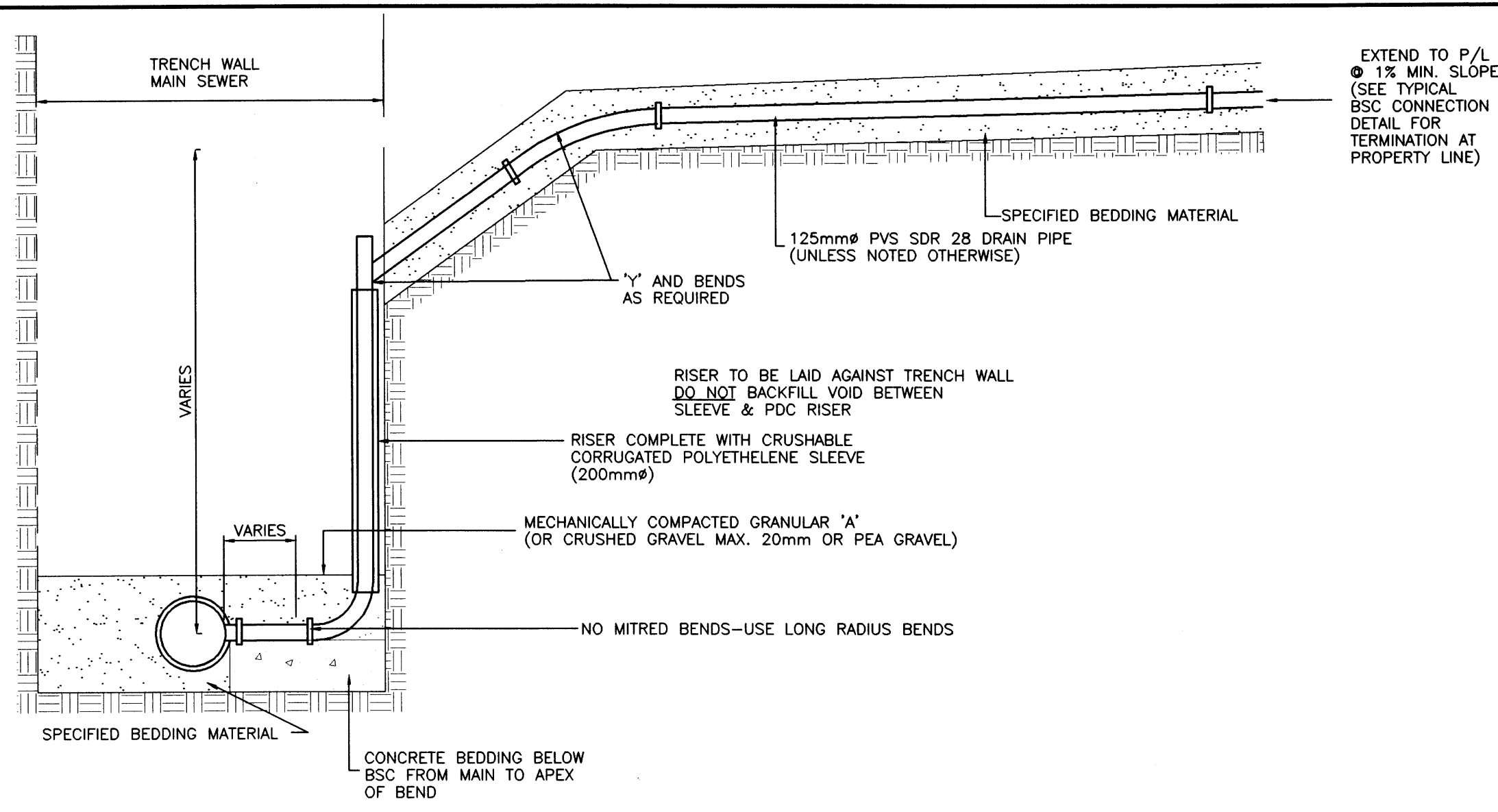
23

AN FILE NO

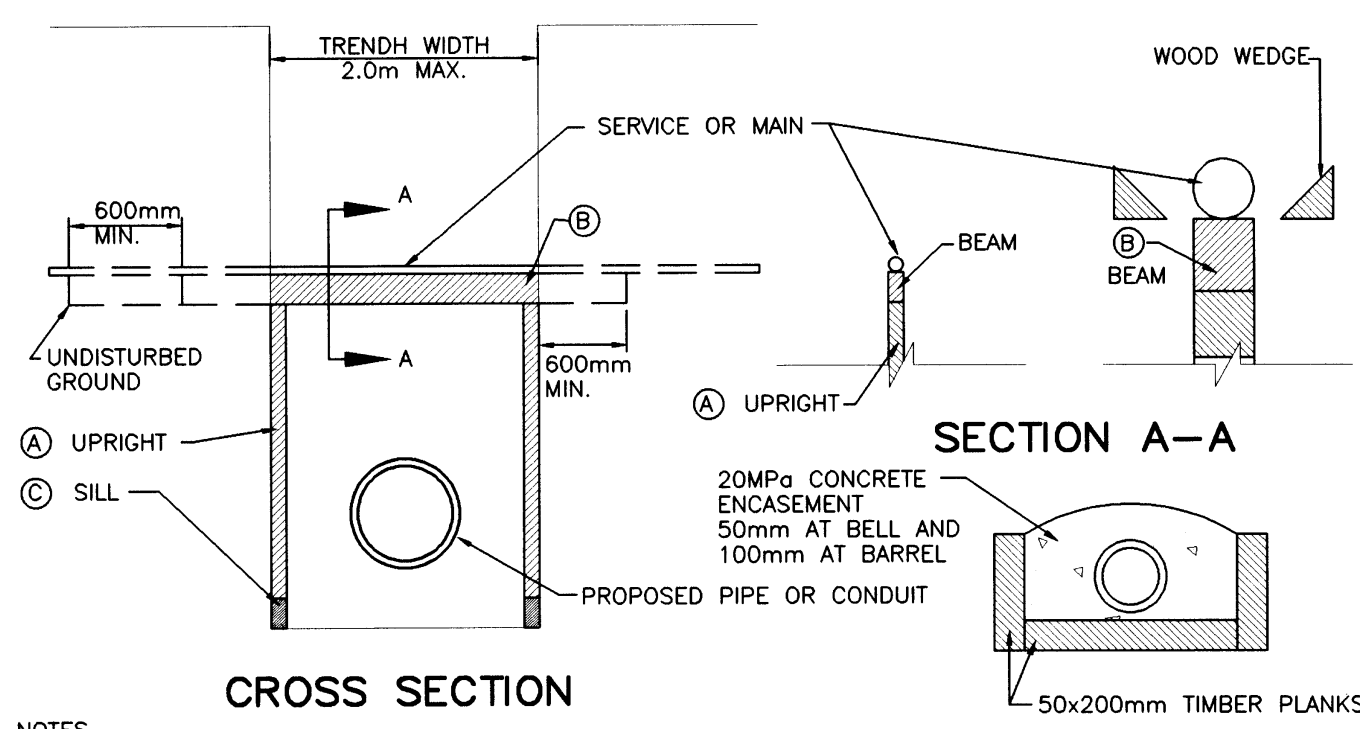


NOTE:
THE FIRST TWO LENGTHS OF BDC OFF THE MAIN SEWER OR MANHOLE SHALL BE 900mm LONG (MAX.)
WITH A FLEXIBLE JOINT IMMEDIATELY ADJACENT TO SEWER

TYPICAL PRIVATE DRAIN CONNECTION
NOT TO SCALE



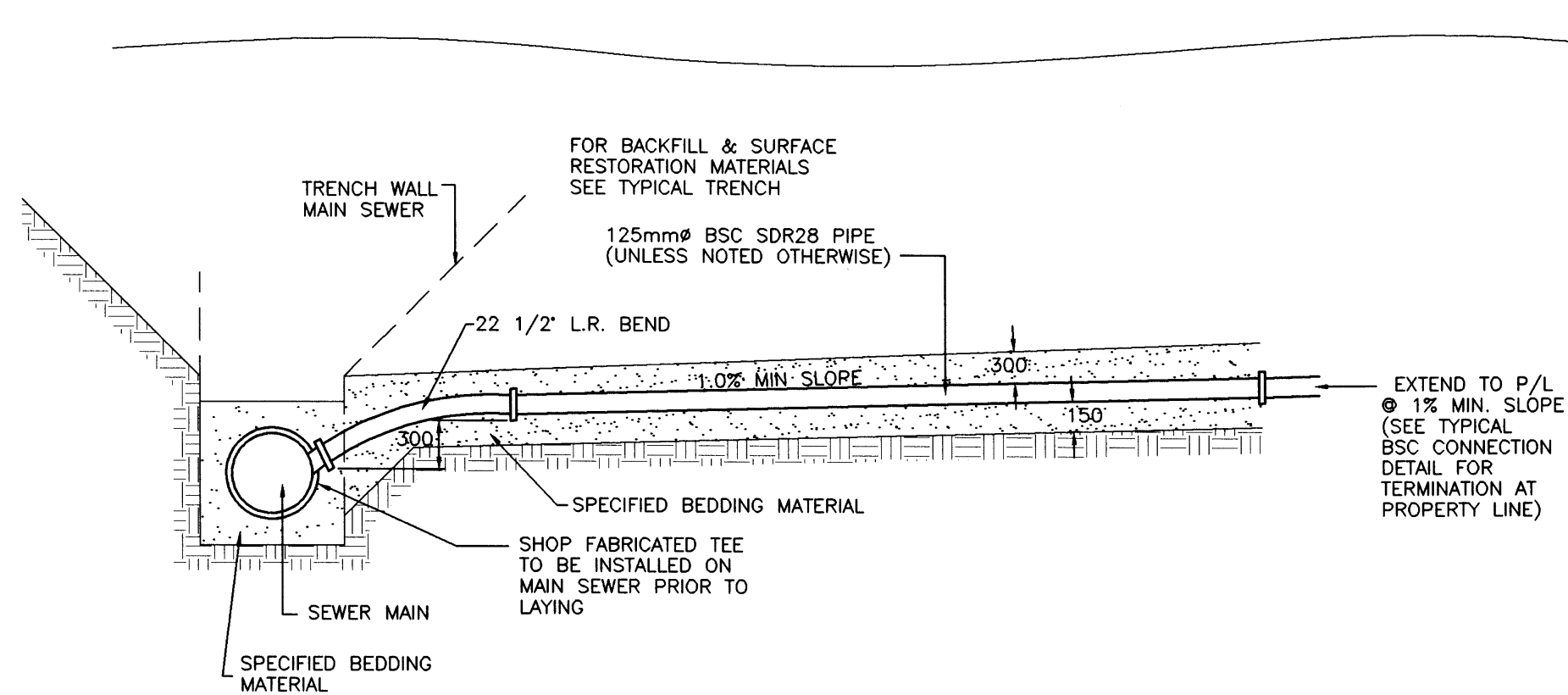
TYPE 3 - DEEP CONNECTION - (DEEPER THAN 4.9m DEEP)
NOT TO SCALE



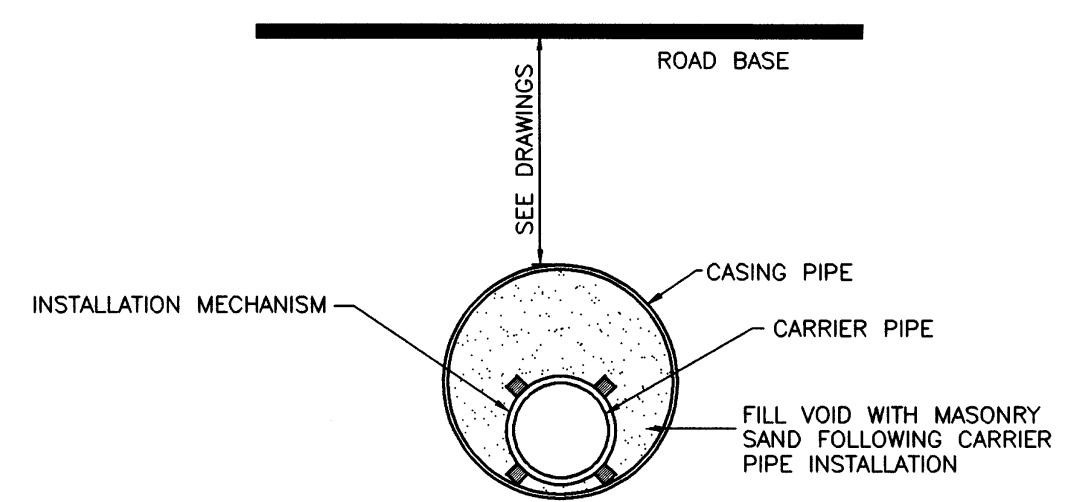
NOTES
A FOR WATER MAIN SUPPORT, REFER TO OPSD 1106.01
B ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN

MAX. SIZE OF PIPE SUPPORTED (mm)	A UPRIGHT (mm)	B BEAM (mm)	C SILL (mm)
75	100x100	1-150x150	50x200x600
125	150x150	2-250x250	50x200x600
200	200x200	2-200x200	50x200x600
300	300x300	2-300x300	50x200x600

UTILITY SUPPORTS UP TO 300mm DIAMETER
NOT TO SCALE (AS PER OPSD 1007.01)



TYPE 1 - SHALLOW CONNECTION - (TO 3.7m DEEP)
NOT TO SCALE



NOTES
1. SEE PLAN & PROFILE DRAWINGS FOR UNDERCROSSING LOCATION

SECTION

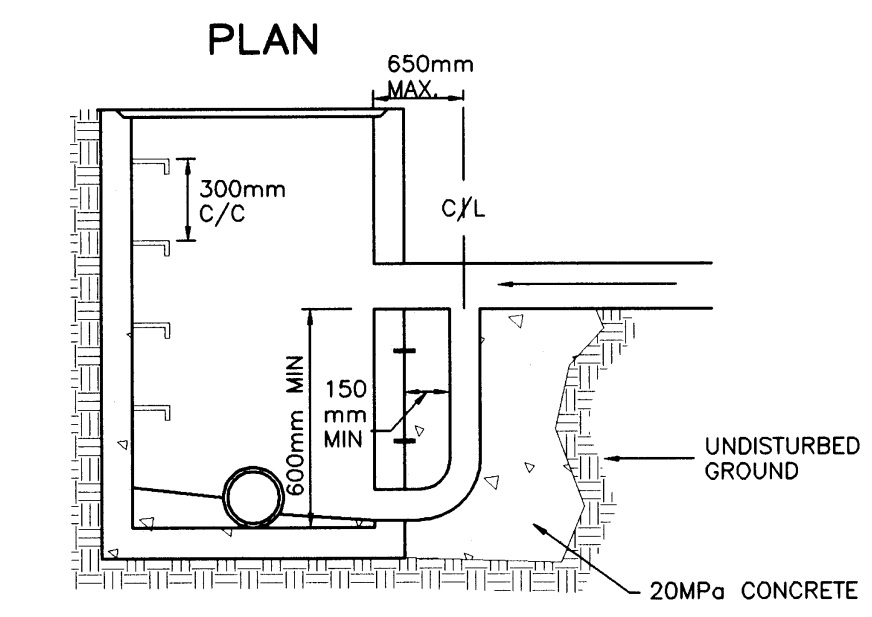
PARAMETER	CARRIER PIPE	CASING PIPE	CARRIER PIPE	CASING PIPE
CONTENTS TO BE HANDLED	SEWAGE	N/A	SEWAGE	N/A
NOMINAL PIPE DIAMETER	150mm(6")/125mm(5")	350mm (14")	200mm(8")/250mm(10")	450mm (18")
MATERIAL	PVC	STEEL	PVC	STEEL
SPECIFICATION	AWWA C900	ASTM A252	AWWA C900	ASTM A252
GRADE OR CLASS	SDR 28	GRADE 2	SDR 35	GRADE 2
WALL THICKNESS	5.1/5.7mm	6 mm	6.1/7.6 mm	8 mm
TYPE OF JOINT	BELL AND SPIGOT	WELDED	BELL AND SPIGOT	WELDED
TYPE OF COATING	N/A	N/A	N/A	N/A
CATHODIC PROTECTION	N/A	N/A	N/A	N/A
SEALS AT END OF CASING	N/A	CONC. PLUG (EACH END)	N/A	CONC. PLUG (EACH END)
METHOD OF INSTALLATION	JACKING	BORING & JACKING	JACKING	BORING & JACKING

DETAILS

JACK & BORE DETAIL
NOT TO SCALE

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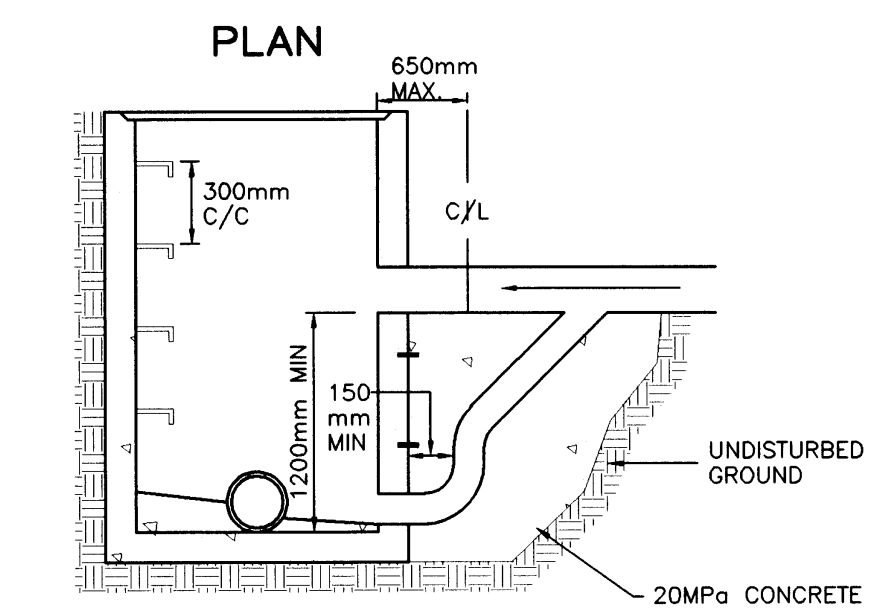
SIZE OF DROP PIPE	
SEWER ID (mm)	DROP PIPE ID (mm)
200	200
250	200
300	250
375	300



NOTES
A DROP STRUCTURE TO BE COMPLETELY ENCASED IN 150mm OF 20 MPa CONCRETE AND SECURED TO THE MANHOLE WITH 450mm LONG, 13mm THREADED RODS AND DRILLED EXPANSION ANCHORS DOWN BOTH SIDES OF THE DROP PIPE AT 300mm c/c
B ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN

SECTION A-A
MANHOLE DROP STRUCTURE TEE
NOT TO SCALE (AS PER OPSD 1003.01)

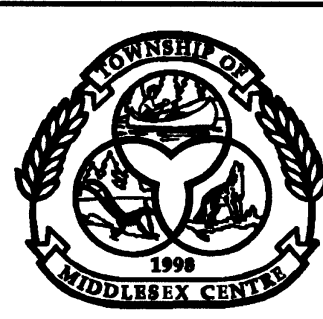
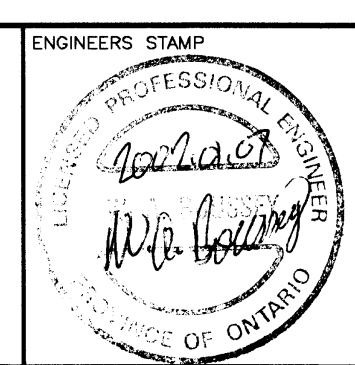
SIZE OF DROP PIPE	
SEWER ID (mm)	DROP PIPE ID (mm)
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250	200
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SECTION A-A
MANHOLE DROP STRUCTURE WYE
NOT TO SCALE (AS PER OPSD 1003.02)

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	DESIGN	NO	REVISIONS	DATE	BY
1			DESIGN RJM	1	AS CONSTRUCTED	SEPT 01	WAB
2			DRAWN EMB				
3			CHECKED WAB				
4			APPROVED				
5			DATE APR 20/00				



TOWNSHIP OF MIDDLESEX CENTRE

SCALE
AS SHOWN

ARVA SANITARY SEWAGE SYSTEM	PROJECT No 00-7278
MISCELLANEOUS DETAILS FOUR COLLECTION SYSTEM	SHEET No 25
	PLAN FILE No