



Functional Servicing Report
for
Walkerville Multi-use Development
1880 Assumption Street, Windsor, Ontario

By

D.C. McCloskey Engineering Ltd.

Certification of Authorization No. 11557479



Project No: M24-308

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TABLE OF CONTENTS

LIST OF TABLES	i
LIST OF APPENDICES.....	i
1.0 Property and Development Description	1
1.1 Report References	1
2.0 Report Objective.....	1
3.0 Sanitary Sewer	2
4.0 Domestic Water Demand	4
5.0 Stormwater Management	4
5.1. Municipal Infrastructure	4
5.2. Current Lot Grading and Site Servicing	5
5.3. Proposed Stormwater Management	5
6.0 Combined Sewer Conveyance Capacity	8
6.1. Combined Sewer Assessment and Recommendations	9
7.0 Municipal Servicing Assessment and Conclusion	10

LIST OF TABLES

Table 1. Existing commercial building fixture and water calculation

Table 2. Proposed development fixture and water calculation

LIST OF APPENDICES

Appendix A: Topographic Survey

Appendix B: City of Windsor Sewer Map

Appendix C: Assumption Street Storm Sewer Plan and Profile Drawings

Appendix D: Development Program

Appendix E: City of Windsor Sewer Drawings (Chilver Road)

Appendix F: Combined Sewer Service Area Map and Table 3 – Combined Sewer Service Area – Population and Drainage Area

Appendix G: Proposed Servicing Plan (Figure 1)



1.0 Property and Development Description

The property at 1880 Assumption Street occupies 0.37 ha and contains a 1,500 m² single-storey commercial office building, a 120 m² accessory building at the northwest corner, and an asphalt parking lot along the north and east sides (see Topographic Survey, Appendix A). The site fronts Assumption Street and has a single driveway at the Kildare Street intersection. The property abuts a municipal alley along the west lot line. The north and east boundaries adjoin vacant commercially zoned parcels.

1.1 Report References

The following drawings and standards were referenced in the preparation of this report:

- Topographic Survey prepared by Verhaegen Land Surveyors dated 02 January 2024
- City of Windsor sewer map, from Mapp My City (Appendix B)
- Assumption Street Storm Sewer Plan and Profile (sheets 1 to 4) prepared by Hanna, Ghobrial and Spencer Ltd. Consulting Engineers (Appendix C)
- Hill et al. Influences of Four Extensive Green Roof Design Variables on Stormwater Hydrology, published in Journal of Hydrological Engineering, Vol. 22, Issue 8 (8 pages)
- City of Windsor Development Manual (refer to City website for document)
- Ministry of Environment, Conservation and Parks (MECP) Stormwater Management Design Guidelines
- MECP Design Criteria for Sewers and Forcemains (2019)
- MECP Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains for Alterations Authorized under Environmental Compliance Approval (version 2.0, 31 May 2023)

2.0 Report Objective

The following sections of this report will develop a comparison of the demand on municipal services from the current commercial building and the proposed development. The objective of this report is to evaluate the domestic and fire protection water demand, wastewater flow, and provide the design criteria for the stormwater management.



3.0 Sanitary Sewer

The proposed development program in Appendix D is a 19-storey condominium with an additional penthouse level, comprising 204 residential units, one level of underground parking, and two ground-floor retail units. The building footprint will occupy the entire site area of 3,700 m² (0.37 ha). Sanitary wastewater discharges to the Assumption Street combined sewer were estimated for both the existing commercial building and the proposed development. Probable drainage flow rates were calculated from plumbing fixture counts: the existing commercial building's fixture units were determined from our company's interior fit-up drawings and construction oversight records; the proposed development's fixture units were derived from the preliminary floor plans prepared by Architectura (Appendix D). A summary of the fixture counts and calculated flows is provided in Tables 1 and 2.

Table 1. Existing commercial building fixture and water calculation

Item No.	Item	Qty	Water		Waste		
			Fixture Units per Item ¹	Total Fixture Units	Trap Size	Fixture Units per Item	Total Fixture Units
1.	Water closet (direct flush)	11	6	66	3"	3.0	33
2.	Urinal	6	2.0	12	1-1/2"	1.5	9
3.	Sinks	15	1.5	23	1-1/2"	1.5	22.5
Total Fixture Units:				101			66

¹ – Fixture units per fixture referenced from Ontario Building Code (OBC) table 7.4.9.3



Table 2. Proposed development fixture and water calculation

Item No.	Item	Qty	Water		Waste		
			Fixture Units per Item	Total Fixture Units	Trap Size	Fixture Units per Item	Total Fixture Units
1.	Bathroom Group (direct flush valve)	204	8.0	1,632	2"	6	1,224
2.	Clothes Washer (commercial)	204	1.0	204	2"	1.5	306
3.	Water Closet (direct flush valve)	2	6.0	12	3"	3.0	6
4.	Sinks	3	1.5	4.5	1-1/2"	1.5	6
Total Fixture Units:				1,853			1,536
Maximum GPM:							201
Minimum Service Size:				8"			

Note: Dishwashers in residential units connected to the domestic sink, and therefore no load is added (ref. Ontario Building Code (OBC) table 7.4.9.3).

The total waste water fixtures units are converted to a maximum probable flow using table 7.4.10.5 in the Ontario Building Code and results in a maximum probable flow rate from the existing commercial building of 66 USGPM (4.2 L/s) and 249 USGPM (15.7 L/s) for the proposed building.

The ultimate population is calculated using 2.5 persons per condominium unit and 204 residential units:

- P (ultimate population) = 2.5 persons/unit $\times$ 204 units = 510 persons.
- p (population, thousands) = 0.51.
- Residential flow q = 365 L/day/person
- Ultimate Flow Factor (UFF) = 6.0
- Infiltration (I) = 0.156 L/s/ha.
- Property area A = 0.37 ha.

Apply the design formula:

$$Q_{ULTIMATE} = P \times q \times UFF + I \times A \text{ (L/s)}$$

$$86,400 \text{ s/day}$$

$$Q_{ULTIMATE} = 13.0 \text{ L/s.}$$



The increase of the maximum probable flow from 4.2 L/s to 15.7 L/s is used to proportionately reduce the post-development ultimate flow rate to determine the current ultimate flow rate. The current ultimate flow rate is estimated to be 3.5 L/s.

4.0 Domestic Water Demand

The domestic water demand is calculated used an average of 250 L/day/person, a peak factor of 2.0, and an equivalent residential population (calculated in the previous section) of 382 persons:

$$Q = 510 \text{ persons} \times 250 \text{ L/day/person} \times 2.0 / 1,000 = 255 \text{ m}^3/\text{day}$$

The domestic water demand for this development can be supplied by the 300mm cast iron municipal watermain located on the north side of Assumption Street with this conclusion derived from conversations with Enwin Water Engineering Department. Flow tests to be completed by the fire protection engineer to confirm the water supply and pressure in order to complete the fire protection design.

5.0 Stormwater Management

5.1. *Municipal Infrastructure*

Existing municipal storm sewer infrastructure in the vicinity of this development includes the following:

- Combined sewer: 375 mm × 500 mm brick combined sewer running northerly in the alley along the west property line of 1880 Assumption Street; connects to the 1125 mm sewer in the same alley and conveys flows westerly to Chilver Road. An overflow pipe at the north end of the alley conveys excess flow northerly to the Riverfront Trunk Sewer. (See Appendix B, City of Windsor sewer map, Manholes # 2C3490 to # 2C116)
- Storm sewer: 300 mm PVC storm sewer located in the centre of the ROW with its upstream end at Devonshire Road; this connects downstream to a 450 mm storm sewer between Lincoln Road and Windemere Street, which in turn connects to the



- Lincoln Road storm sewer and outlets to the Detroit River. (See Appendix C, Plan & Profile Sheets)
- Catchment note: The 300mm storm sewer catchment plan prepared by Hanna, Ghobrial, and Spencer (Appendix C) does not include the subject property; drainage routing for the subject property must be confirmed.

5.2. Current Lot Grading and Site Servicing

The current lot grading and storm sewer system on this property consists of the following: A 150 mm PDC connects the building roof (1,500 m²) to the 375 mm × 500 mm brick combined sewer on Assumption Street. The north accessory building discharges via splash blocks onto the asphalt pavement. The northern asphalt parking lot drains by overland sheet flow onto the adjacent north property. There are no lot-level controls to divert runoff around the building or to route parking-lot runoff to the Assumption Street combined sewer.

- A 150mm PDC connects the 1,500m² building roof to the 375mm x 500mm brick combined sewer on Assumption Street.
- North accessory building is splash-blocked onto the asphalt pavement.
- The northern asphalt parking lot has overland sheet flow draining onto the north adjoined property.

There are currently no lot level controls conveying runoff from the property into the PDC connection from the Assumption Street combined sewer.

5.3. Proposed Stormwater Management

Stormwater – Existing Development

The existing building roof is the primary source of runoff from this property into the combined sewer and a 2-year storm runoff rate is calculated using the Manning's equation, a time of concentration (T_c) of 20 minutes, a 2-year intensity of 57.6mm/hr, a runoff coefficient of 0.95 and an area of 1,500 m² as shown below:

$$Q_{\text{Roof}} = 2.78 \times 0.95 \times 57.6 \times 1,500 / 10,000 = 22.8 \text{ L/s}$$



The flow from the remaining 1,700m² property area is estimated using a runoff coefficient of 0.6, a Tc of 20 minutes resulting in a flow of 16.33 L/s.

The total current maximum flow rate into the combined sewer during the 2-year storm event is 39 L/s.

Stormwater – Proposed Development

The stormwater management design criteria for the proposed condominium building will use the WERSWM standards and best practices to determine the current flow rates entering the combined sewer and reduce the net increase in the total stormwater and wastewater flow rates into the combined sewer on Assumption Street.

The building roof occupying the entire property area proposes a green roof system located on several different roof levels with the exception of the penthouse having an impervious roofing system. The green roof system occupies 3,100 m² of the total 3,700 m² roof area (84%).

Green roofs significantly reduce stormwater runoff, with retention rates varying based on design and climate, and the reduction is generally ranges from 50% to 85% annually for extensive green roofs and 60% to 100% for intensive green roofs. Extensive roofs consist of a lightweight, low-maintenance, and conducive for environmental benefits. Intensive roofs are heavier with more organic substrate to support trees and vegetation. Extensive green roofs without irrigation in Southern Ontario can achieve a 57-70% rainwater retention, while intensive green roofs can reduce annual runoff by 65-85% (reference studies completed by the University of Toronto - Green Roof Innovation Testing Laboratory (GRIT Lab)).

An intensive green roof system is recommended for this development in addition to a holding tank. This holding tank could be located within the underground parking area or upper floor levels and used primarily for irrigation and potentially grey water for non-potable plumbing fixtures such as the water-closets in the commercial units.



The proposed building roof 2-year storm runoff rate with out a green roof system is calculated using the Manning's equation, a time of concentration of 20 minutes, a 2-year intensity of 57.6mm/hr, a runoff coefficient of 0.95 and an area of 3,700 m² as shown below:

$$Q \text{ (entire roof area)} = 2.78 \times 0.95 \times 57.6 \times 3,700 / 10,000 = 56 \text{ L/s}$$

The pro-rated flow rate from the penthouse roof having no green roof area is 9 L/s as shown in the following calculation

$$Q \text{ (penthouse roof)} = 56 \text{ L/s} \times (600\text{m}^2 / 3,700 \text{ m}^2) = 9 \text{ L/s}$$

Using a conversative green roof reduction in stormwater runoff of 60% for an intensive green roof system the 2-year flow rate from the proposed development is calculated as:

$$Q \text{ post} = (56 - 9) \text{ L/s} \times 60\% + 9 \text{ L/s} = 37 \text{ L/s}$$

The 37 L/s post-development flow rate is a 5% reduction form the current estimated stormwater flow rate of 39 L/s

Water Quality

Stormwater runoff from building roofs and in particular green roofs is considered “polished” water and no further treatment is required in order to meet the water quality requirements of the MECP.



6.0 Combined Sewer Conveyance Capacity

An assessment of the combined sewer conveyance capacity was undertaken to determine if the 450mm sewer located at the municipal manhole (no. 2C116) located in the alley abutting 1880 Assumption has capacity to accept the wastewater flows from the proposed condominium development.

Municipal manhole 2C116 is a concrete chamber having a 42" (1050mm) inlet pipe, an 18" (450 mm) outlet pipe and a 42" (1050mm) overflow pipe as shown on the plans prepared by C.G. Russell Armstrong Ltd. referenced in Appendix E. A weir is located within the chamber directing the dry-weather flow to the 18" outlet pipe and any flow exceeding the weir elevation directed to the 42" overflow pipe.

The assessment of combined sewer service area upstream of manhole 2C116 referenced the following information:

- Population data (2021 census) in the data files provided by City of Windsor (Appendix F).
- Estimation of the service area provided by City of Windsor (Appendix F).

The 2021 census data files are superimposed on the combined sewer service area as shown of Figure 2 in Appendix F. Table 3 in Appendix F summarizes the subcatchment drainage areas and the population in each area. The combined sewer drainage area provided by the City of Windsor was compared to the City of Windsor sewer atlas and the drainage limits of manhole no. 2C116 in Figure 2 is a conservative representation.

The ultimate wastewater flow rate measured at MH2C116 is derived using the following formula and design criteria:

- Population (table 3): 8,689 persons
- Population from development: 510 persons
- Total population (P): 9,199 persons
- Service area (A): 4.65 ha (used in formula)



- Service area excluding Stellantis property: 3.98 ha
- Ultimate Flow Factor: 4.0
- Infiltration (I) = 0.156 L/s / ha
- Residential flow (q): 365 L/day / person

$$Q_{ULTIMATE} = \frac{P \times q \times UFF}{86,400 \text{ s/day}} + I \times A \text{ (L/s)}$$

$$Q_{ULTIMATE} = 156.2 \text{ L/s (including new development)}$$

$$Q_{ULT} = 150 \text{ L/s (current estimated flow rate)}$$

The full-flow conveyance capacity of the 450 mm concrete pipe discharging from MH2C116 is derived from the following data and formula:

- Pipe area (A) = 0.159 m²
- Manning n (concrete) = 0.013
- Wetted perimeter = 1.4 m
- Hydraulic radius (R) = 0.113 m
- Slope (S) = 0.0033 m/m

$$\text{Manning formula: } Q = 1/n \times A \times R^{2/3} \times S^{1/2} = 0.164 \text{ m}^3/\text{s}$$

6.1. Combined Sewer Assessment and Recommendations

The ultimate flow including the new condominium development is 156 L/s compared with the full-flow capacity of the 450 mm sewer of 164 L/s. The ultimate flow has a depth of 351 mm or 78% of the nominal sewer pipe diameter. The hydraulic grade line within the 450 mm sewer is calculated using the following as-built information:

- Upstream invert of 450 mm (at MH2C116) = 576.38 ft. (175.68 m)
- Weir elevation = 577.88 ft (176.138 m)



The post-development hydraulic grade line (HGL) is 176.03 m and current HGL is 176.02 m and situated 98 mm below the concrete weir. A steel plate is fastened to the concrete wall at the weir and the top of this plate slightly raises the elevation of the weir approximately 125 mm providing an additional surcharge capacity.

The assessment of the 450 mm combined sewer hydraulic capacity concludes this sewer pipe has adequate conveyance capacity and maintains a hydraulic grade lower than the overflow weir and concludes the post-development wet-weather flow will be contained within the 450 mm pipe.

7.0 Municipal Servicing Assessment and Conclusion

This functional servicing report and assessment has concluded that the proposed re-development of this property will not have a measurable impact on the municipal domestic water, sanitary sewers, or storm sewers. The following is a summary of the assessment of each of the municipal services and the design criteria to be incorporated into the final building design for each municipal service:

Domestic and Fire Protection Water Services

- The domestic water demand for this development can be supplied by the 300mm cast iron municipal watermain located on the north side of Assumption Street. This conclusion is derived from conversations with Enwin Water Engineering Department.
- Flow tests to be completed by the fire protection engineer to confirm the water supply and pressure in order to complete the fire protection design.
- Abandon any redundant water connections to the 300mm watermain.
- A water meter pit is to be installed at the property line with a 200 mm service connection for fire protection and a 150mm for domestic water service.



Stormwater Management and Wastewater

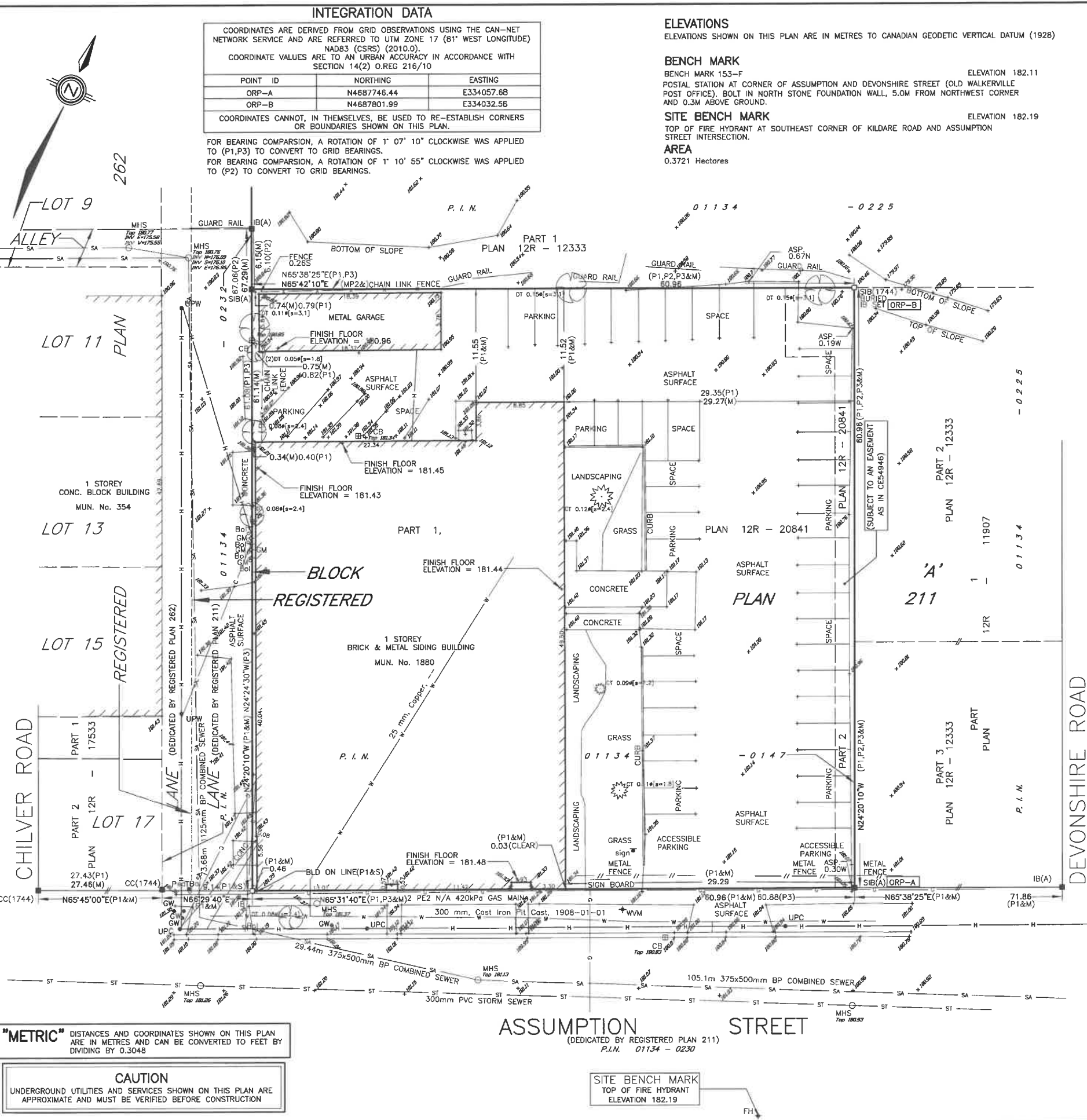
- Stormwater management to be designed in accordance with the Windsor/Essex Region Stormwater Manual.
- Incorporate a minimum 20,000 liter holding tank to capture stormwater runoff for grey water and irrigation purposes.
- Incorporate an intensive green roof system having a minimum 60% annual reduction in stormwater runoff.
- Design sanitary and storm connections for a maximum combined flow rate of 50 L/s.
- 450 mm combined sewer outletting from MH2C116 has sufficient conveyance capacity to contain the ultimate dry-weather wastewater flow within the sewer pipe without the flow exceeding the over-flow weir elevation.

END OF REPORT



APPENDIX A

Topographic Survey



INTEGRATION DATA

COORDINATES ARE DERIVED FROM GRID OBSERVATIONS USING THE CAN-NET NETWORK SERVICE AND ARE REFERRED TO UTM ZONE 17 (81° WEST LONGITUDE) NAD83 (CSRS) (2010.0).		
COORDINATE VALUES ARE TO AN URBAN ACCURACY IN ACCORDANCE WITH SECTION 14(2) OREG 216/10		
POINT ID	NORTHING	EASTING
ORP-A	N4687745.44	E334057.68
ORP-B	N4687801.99	E334032.55
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

FOR BEARING COMPARISON, A ROTATION OF 1° 07' 10" CLOCKWISE WAS APPLIED TO (P1,P3) TO CONVERT TO GRID BEARINGS.
FOR BEARING COMPARISON, A ROTATION OF 1° 10' 55" CLOCKWISE WAS APPLIED TO (P2) TO CONVERT TO GRID BEARINGS.

ELEVATIONS

ELEVATIONS SHOWN ON THIS PLAN ARE IN METRES TO CANADIAN GEODETIC VERTICAL DATUM (1928)

BENCH MARK

BENCH MARK 153-F
POSTAL STATION AT CORNER OF ASSUMPTION AND DEVONSHIRE STREET (OLD WALKERVILLE POST OFFICE), BOLT IN NORTH STONE FOUNDATION WALL, 5.0M FROM NORTHWEST CORNER AND 0.3M ABOVE GROUND.

SITE BENCH MARK

TOP OF FIRE HYDRANT AT SOUTHEAST CORNER OF KILDARE ROAD AND ASSUMPTION STREET INTERSECTION.

AREA

0.3721 Hectares

TOPOGRAPHIC SURVEY
OF
PART OF BLOCK 'A',
REGISTERED PLAN 211

IN THE
CITY OF WINDSOR
COUNTY OF ESSEX, ONTARIO

© VERHAEGEN LAND SURVEYORS - J. D. BARNES LIMITED.

SCALE = 1:250

0 2.50 5.00 10.00 15.00 25.00 METRES

LEGEND AND NOTES

BEARINGS ARE UTM GRID DERIVED FROM OBSERVED REFERENCE POINTS 'A' AND 'B' BY REAL TIME NETWORK OBSERVATIONS AND ARE REFERRED TO UTM ZONE 17 (81° WEST LONGITUDE) NAD83 (CSRS) (2010.0).

DISTANCES ON THIS PLAN ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999917.

ALL SET SSB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF OREG. 525/81.

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
▣	DENOTES	STANDARD IRON BAR
▤	DENOTES	SHORT STANDARD IRON BAR
▥	DENOTES	IRON BAR
▦	DENOTES	PLASTIC BAR
▧	DENOTES	WITNESS
▨	DENOTES	MEASURED
▩	DENOTES	SET
▪	DENOTES	PERPENDICULAR
▫	DENOTES	DEED
▬	DENOTES	ORIGIN UNKNOWN
ORP	DENOTES	OBSERVED REFERENCE POINT
(P)	DENOTES	REGISTERED PLAN 211
(P1)	DENOTES	PLAN OF SURVEY BY (1744), DATED: NOVEMBER 7, 2000, PLAN FILE: B-3897
(P2)	DENOTES	PLAN OF SURVEY BY (A), DATED: OCTOBER 4, 1968, (68-1081)
(P3)	DENOTES	PLAN 12R-20841
(JDB)	DENOTES	J.D. BARNES LIMITED
(A)	DENOTES	C. G. RUSSEL ARMSTRONG
(1744)	DENOTES	VERHAEGEN LAND SURVEYORS

○ MHS	DENOTES	HYDRO MANHOLE	✚ FH	DENOTES	FIRE HYDRANT
○ MHS	DENOTES	SEWER MANHOLE	✚ WM	DENOTES	WATER METER
○ MHS	DENOTES	TELEPHONE MANHOLE	✚ WVS	DENOTES	WATER VALVE (Service)
○ MHS	DENOTES	TRAFFIC MANHOLE	✚ WVM	DENOTES	WATER VALVE (Main)
○ MHS	DENOTES	WATER MANHOLE	✚ GM	DENOTES	GAS METER
BB	DENOTES	CATCH BASIN	✚ GV	DENOTES	GAS VALVE
BB	DENOTES	DOUBLE CATCH BASIN	✚ HM	DENOTES	HYDRO METER
LS	DENOTES	LIGHT STANDARD CONCRETE	✚ PadT	DENOTES	TELEPHONE PEDESTAL
LS	DENOTES	LIGHT STANDARD STEEL	✚ PadCTV	DENOTES	CABLE TV PEDESTAL
LS	DENOTES	LIGHT STANDARD WOOD	✚ TRS	DENOTES	TRAFFIC SIGN
UPC	DENOTES	UTILITY POLE CONCRETE	✚ TRag	DENOTES	TRAFFIC SIGNAL
UPC	DENOTES	UTILITY POLE STEEL	✚ TRab	DENOTES	TRAFFIC SIGNAL BOX
UPC	DENOTES	UTILITY POLE WOOD	✚ TH	DENOTES	TESTHOLE
GP	DENOTES	GUY POLE	✚ BM	DENOTES	BENCH MARK
GW	DENOTES	GUY WIRE	△ HCP	DENOTES	HORIZONTAL CONTROL POINT
Bo	DENOTES	BOLLARD	○ VCP	DENOTES	VERTICAL CONTROL POINT
PM	DENOTES	PARKING METER	✚ SC	DENOTES	SEWER CLEANOUT

DECIDUOUS AND CONIFEROUS TREES ARE DENOTED BY "D" AND "C" RESPECTIVELY. A PREFIX TO THE DESCRIPTION DESIGNATES THE NUMBER OF TREE TRUNKS WHEN TREES ARE CLUMPED TOGETHER AND A SUFFIX DENOTES THE TREE DIAMETER OR (NTS) NOT TO SCALE.

C	(pipe size)	C	DENOTES	OVERHEAD CABLE TV LINE
G	(pipe size)	G	DENOTES	GAS LINE
H	(pipe size)	H	DENOTES	OVERHEAD HYDRO LINE
CS	(pipe size)	CS	DENOTES	COMBINED SEWER
SA	(pipe size)	SA	DENOTES	SANITARY SEWER
ST	(pipe size)	ST	DENOTES	STORM SEWER
T	(pipe size)	T	DENOTES	OVERHEAD TELEPHONE LINE
W	(pipe size)	W	DENOTES	WATER LINE

UNDERGROUND CABLE, HYDRO OR TELEPHONE LINES ARE PREFIXED WITH THE LETTER "u" (CABLE = UC HYDRO = uH TELEPHONE = uT)

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
- THIS SURVEY WAS COMPLETED ON THE 18th, DAY OF DECEMBER, 2023

DATE JANUARY 2, 2024

Roy A. Simone
ROY A. SIMONE
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER 2212520



VERHAEGEN
LAND SURVEYORS
A DIVISION OF J.D. BARNES LTD.
944 OTTAWA STREET, WINDSOR, ON, N8X 2E1
T: (519) 258-1772 F: (519) 258-1791 www.jdbarnes.com

DRAWN BY:	Y.P.	CHECKED BY:	K.H./R.A.S.	REFERENCE NO.:	23-47-624-00
FILE:	23-47-624-00.dwg	E-211-BLK A		CAD Date:	January 2, 2024 11:45 AM
				CAD File:	23-47-624-00.dwg

"METRIC" DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

CAUTION
UNDERGROUND UTILITIES AND SERVICES SHOWN ON THIS PLAN ARE APPROXIMATE AND MUST BE VERIFIED BEFORE CONSTRUCTION

SITE BENCH MARK
TOP OF FIRE HYDRANT
ELEVATION 182.19



Appendix B

City of Windsor Sewer Map

ArcGIS Web Map



2/11/2026, 11:23:16 AM

- Combined Manhole

Combined Plug

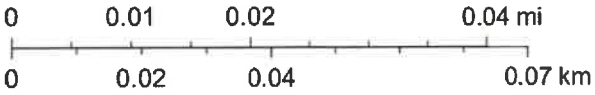
Sanitary Manhole
- Storm Manhole

Combined Sewer

Sanitary Sewer
- Storm Sewer

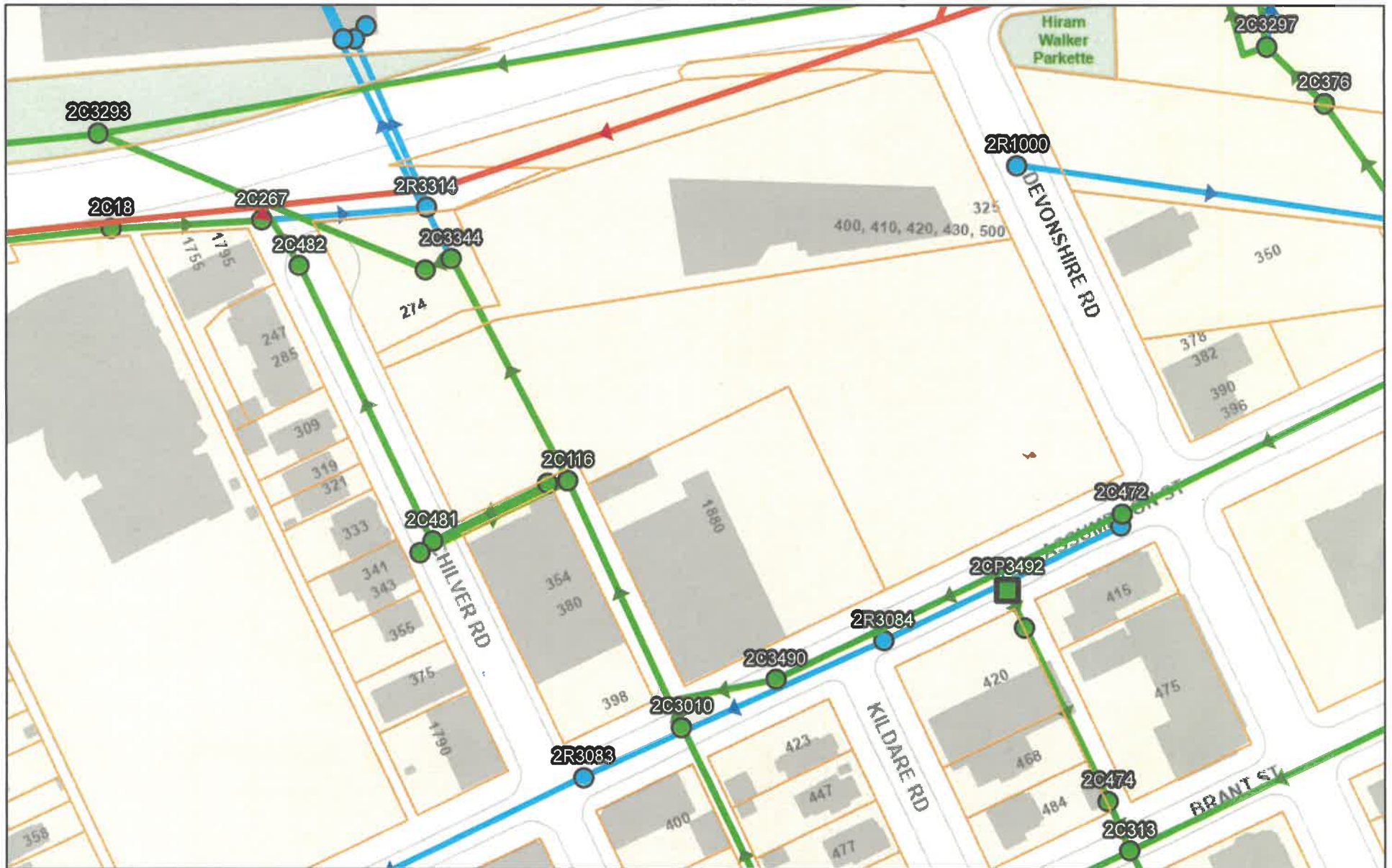
World_Hillshade

1:951



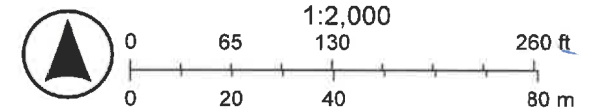
Sources: Esri, Vantor, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community

ArcGIS Web Map



4/19/2024, 8:58:34 AM

- Sanitary Sewers
- Parcels
- Combined Sewer Manholes
- Combined Plugs
- Combined Sewers
- Storm Sewers
- Storm Sewer Manholes





Appendix C

Assumption Street Storm Sewer Plan and Profile Drawings

C102-954



CITY OF WINDSOR BENCHMARK No. 796 ELEV. = 182.050
ROMAN CATHOLIC CHILDRENS AID, 1700 ASSUMPTION STREET;
THE PLATE IS LOCATED ON THE MOST SOUTHERLY FACE,
1.520m WEST OF THE EAST WALL AND 0.450m ABOVE GROUND.

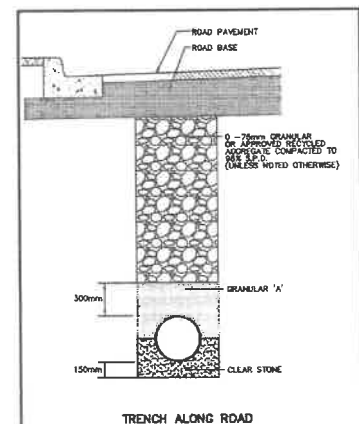
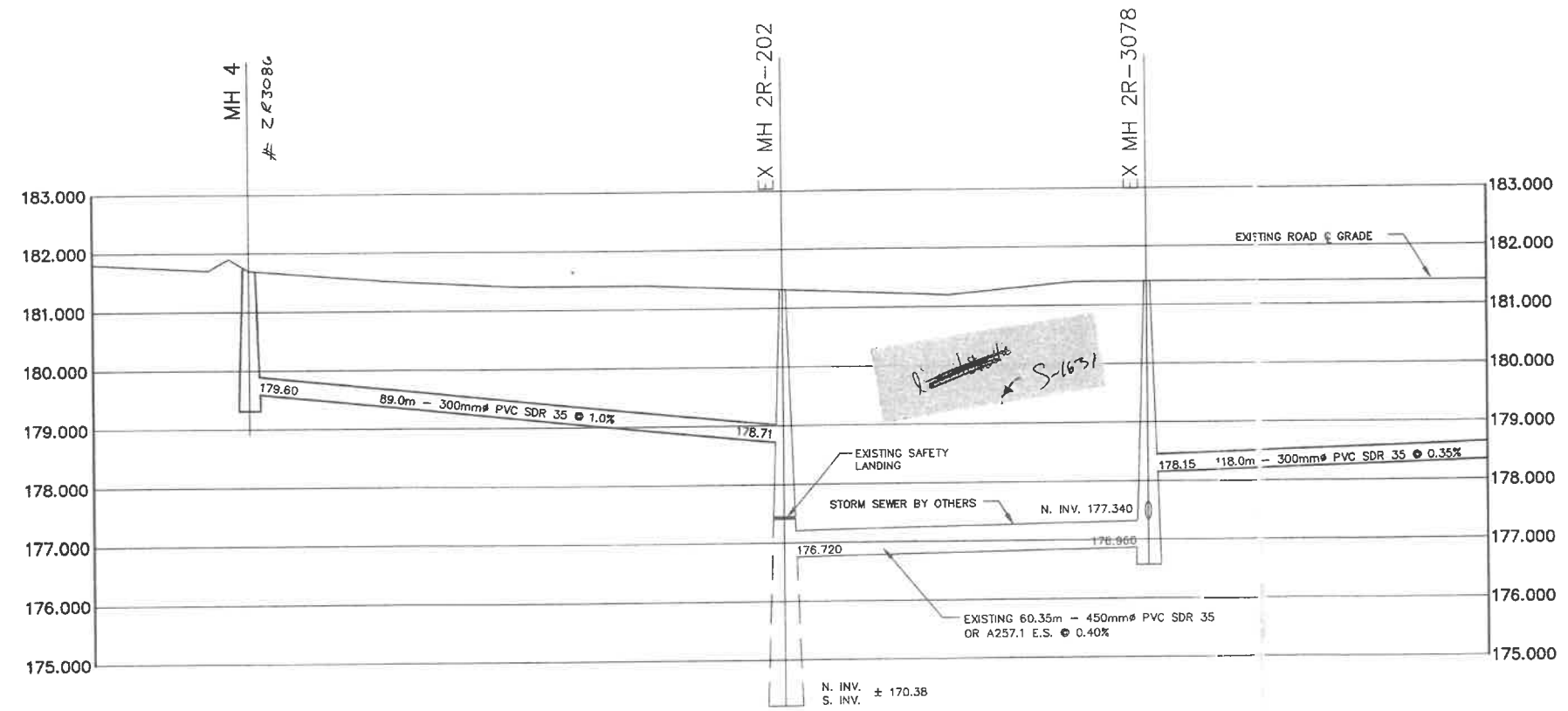
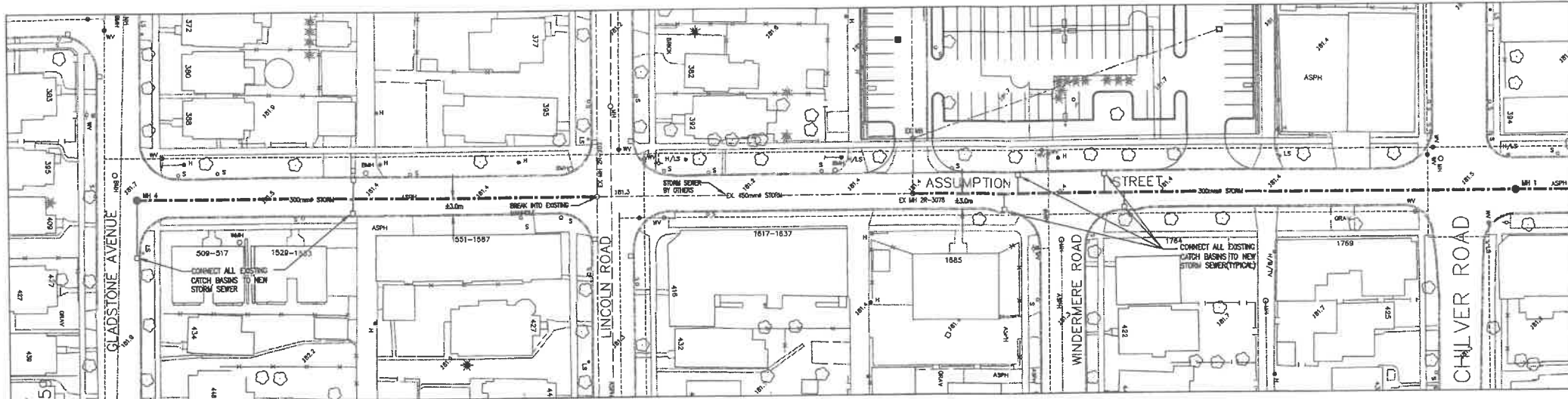
LEGEND		
DESCRIPTION	EXISTING	NEW
STORM SEWER	----- EX 450mm ST -----	----- NEW 450mm ST -----
SANITARY SEWER	----- EX 250mm SAN -----	
WATER MAIN	----- EX 200mm W -----	
GAS MAIN	----- G -----	
GAS MARKER	□ G.M.	
BELL, HYDRO, & CABLE TV	----- B H TV -----	
BELL, & CABLE TV PED.	□ B.P.C.P.	
WATER VALVE	○ W.V.	
FIRE HYDRANT & WATER VALVE	⊕ F.H.	
CATCH BASIN	□ C.B.	
MANHOLE	○ M.H.	● M.H. 1
LOT ELEVATION	① 183.70	
ROAD ELEVATION	187.40	
TRANSFORMER	□ M.T.W.S.	
TRAFFIC SIGN	• T.S.	

C10295401.DWG 16 JULY 2002

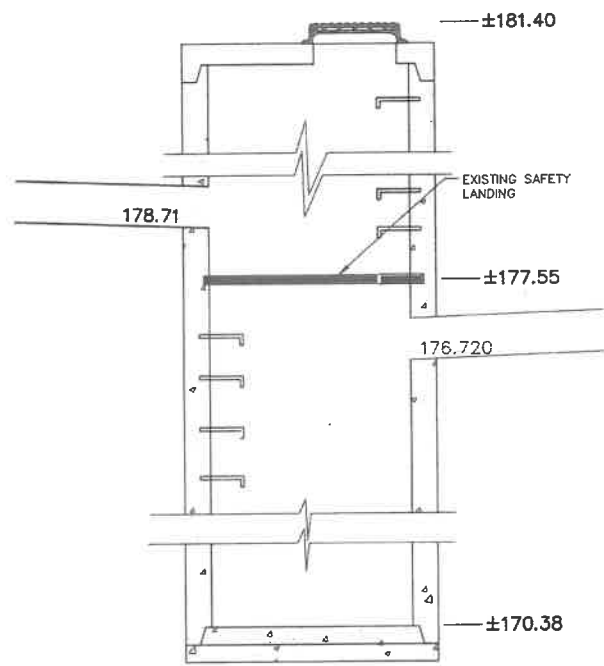


GENERAL NOTES:

1. PERFORM ALL WORK TO CITY OF WINDSOR STANDARDS.
2. RESTORE ALL DISTURBED AREAS WITHIN EXISTING R.O.W. LIMITS TO CITY OF WINDSOR STANDARDS
3. CONTRACTOR TO CONFIRM LOCATION OF EXISTING UTILITIES PRIOR TO PROCEEDING WITH ANY WORK AND REPORT ANY DISCREPANCIES TO THE ENGINEER
4. ALL MANHOLES TO BE 1200mm DIAMETER UNLESS OTHERWISE NOTED
5. NO BENCHING IN STORM MANHOLES. 0.45m SUMP TO BE PROVIDED IN STORM MANHOLES
6. CONTRACTOR TO SAWCUT ASPHALT ALONG BOTH SIDES OF TRENCH FULL DEPTH. TRENCH AREA TO BE REPLACED TO MATCH EXISTING CONDITIONS MINIMUM: 300mm GRANULAR 'A', 40mm HL3, 50mm HL 4
7. CONNECTIONS TO PVC PIPE: THE CONTRACTOR SHALL BE REQUESTED TO USE ONLY PLANT MANUFACTURED TEES WHEN INSTALLING PRIVATE DRAIN CONNECTIONS OR C.B. LEADS. THE ANGULAR RISE OF THE CONNECTIONS SHALL BE BETWEEN 5' AND 85'. IF ANGULAR RISE EXCEEDS 45' THE CONTRACTOR SHALL PROVIDE AN ADDITIONAL PVC COUPLING WITH STOP IMMEDIATELY BEYOND THE TEE FITTING. A SHORT SECTION OF PVC PIPE IS TO BE USED TO CONNECT THE COUPLING TO THE TEE FITTING. THE COUPLING SHALL REST DIRECTLY UPON THE BELL PORTION OF THE TEE FITTING.
8. CONNECTIONS TO CONCRETE PIPE: ALL PLANTS OR FIELD MANUFACTURED TEES SHALL CONSIST OF AN ASBESTOS CEMENT STOP COUPLER GROUTED IN PLACE WITH A NON-SHRINK GROUT. ALL GROUTED STOP COUPLERS SHALL BE ALLOWED TO CURE FOR A MINIMUM OF 12 HOURS BEFORE USE. ALL ASBESTOS CEMENT STOP COUPLERS ARE TO HAVE A 0.25" INTERNAL MONOLITHIC STOPPER AS WELL AS AN INTERNAL RUBBER GASKET WHICH IS TO BE GLUED IN PLACE. THE USE OF WINGED PVC SAND COATED BELL WILL NOT BE PERMITTED IN TAPPING CONCRETE PIPE.
9. CATCH BASIN LEADS SHALL BE 8" DIAMETER PVC SDR 35.



TRENCH BACKFILL DETAIL



EXISTING MANHOLE 2R-202
NTS

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF HANNA, GHOBRIAL AND SPENCER LTD., CONSULTING ENGINEERS, AS TO DESIGN AND SPECIFICATIONS.

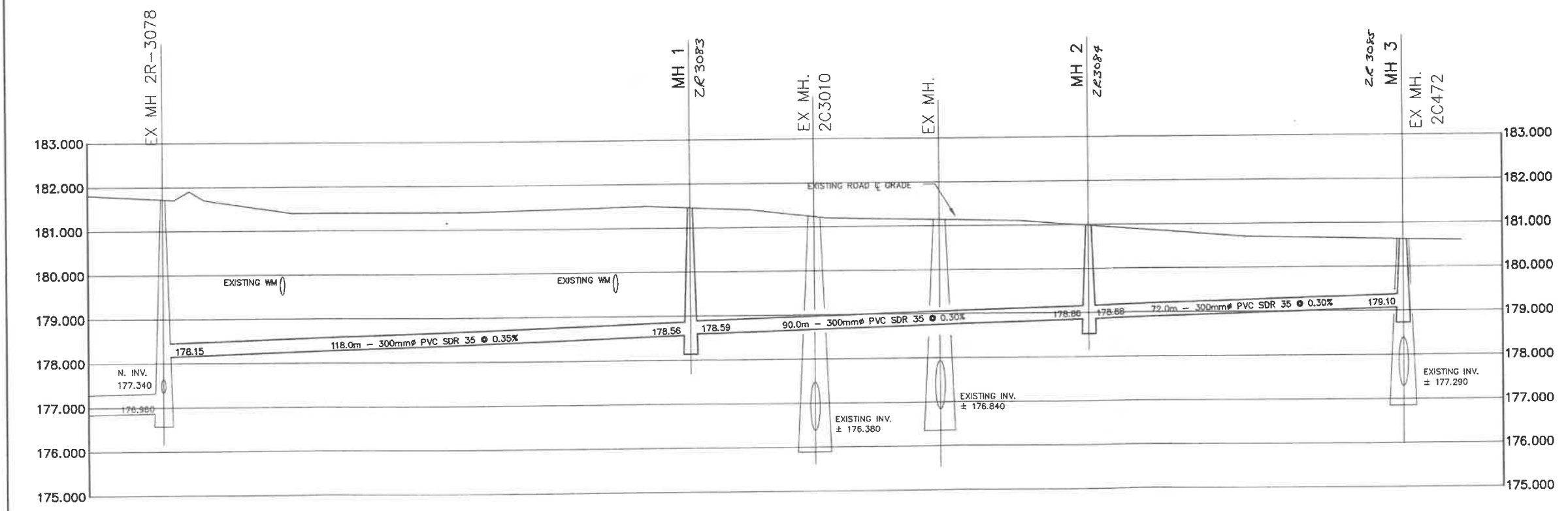
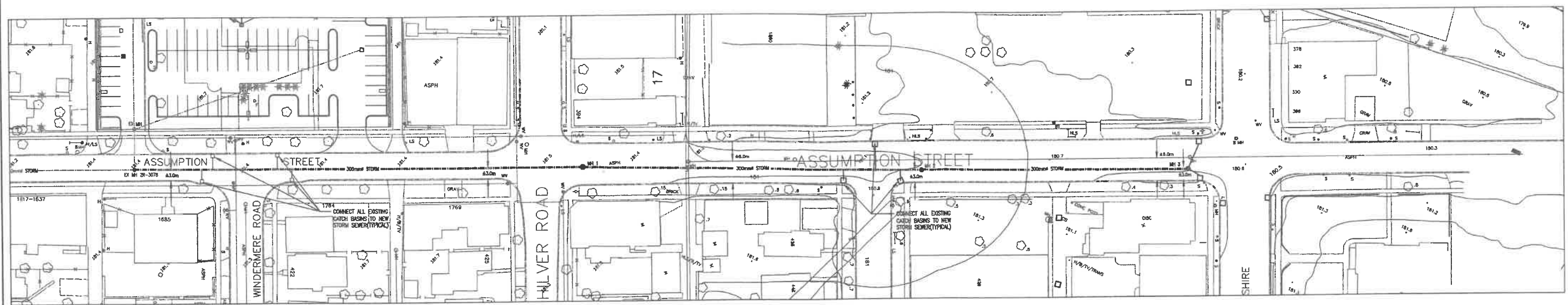
COMMISSIONER OF WORKS
WINDSOR, ONTARIO

hgs Hanna, Ghobrial and Spencer Ltd.
Consulting Engineers
WINDSOR , ONTARIO

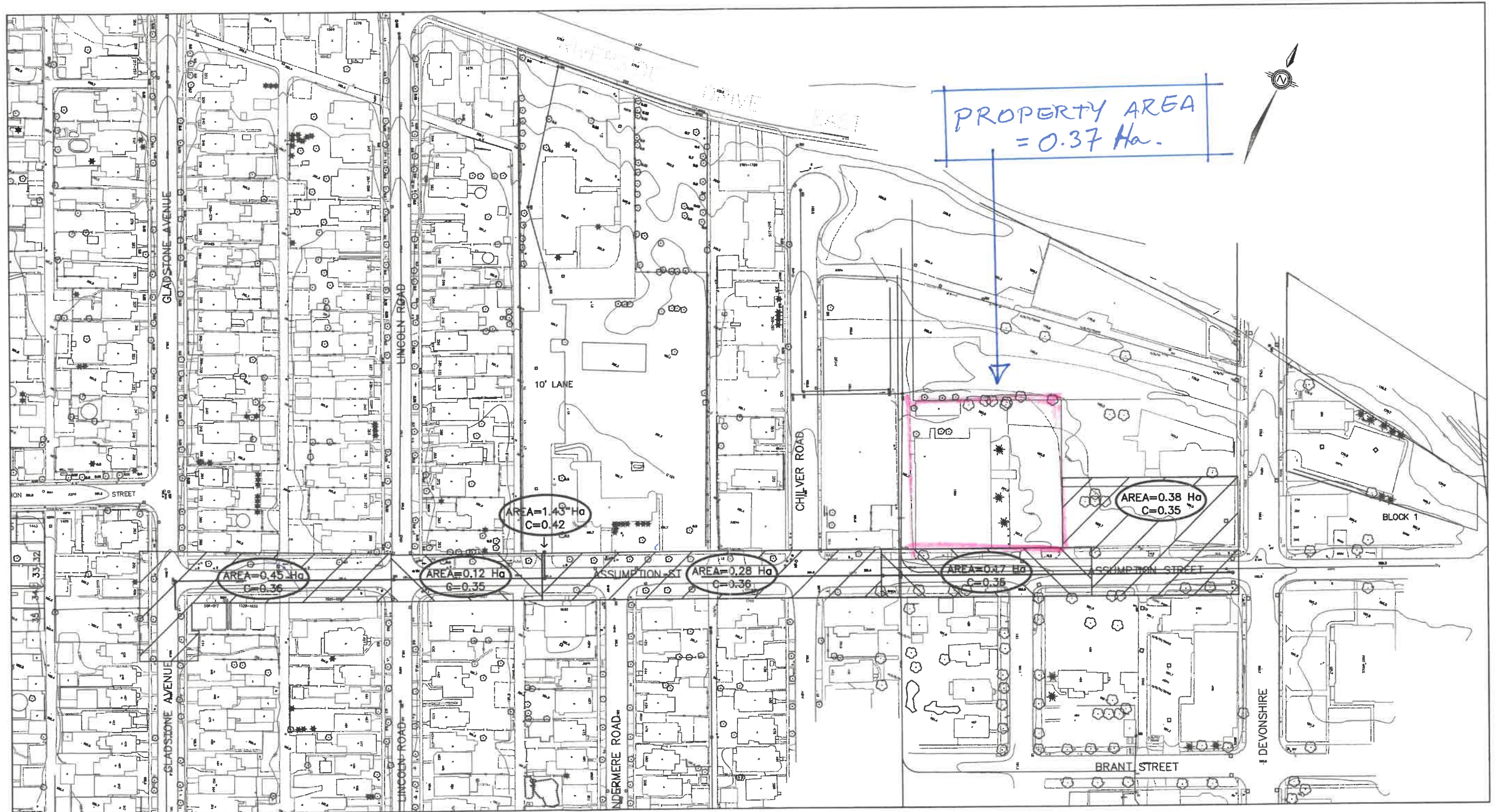
		DESIGN	D.A.I.
		CHECKED	R.C.S.
		DRAWN	D.L.
		CHECKED	R.C.S.
1.	ISSUED FOR CITY APPROVALS	9 AUG. 2002	R.C.S. DATE APRIL 2002
NO.	REVISION	DATE	BY SCALE 1 : 500

ASSUMPTION STREET STORM SEWER		PROJECT NO. C102-954
PLAN & PROFILE		SHEET NO. 2
		OF 4

INTERSECTING
STREET
NAMES



				APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF HANNA, GHOBRIAL AND SPENCER LTD., CONSULTING ENGINEERS, AS TO DESIGN AND SPECIFICATIONS.		hgs Hanna, Ghobrial and Spencer Ltd. Consulting Engineers WINDSOR , ONTARIO		DESIGN D.A.I. CHECKED R.C.S. DRAWN D.L. CHECKED R.C.S. DATE APRIL 2002 SCALE 1 : 500		ASSUMPTION STREET STORM SEWER		PROJECT NO. C102-954
				COMMISSIONER OF WORKS WINDSOR, ONTARIO						PLAN & PROFILE		SHEET NO. 3 OF 4
1.	ISSUED FOR CITY APPROVALS	9 AUG. 2002	R.C.S.									
NO.	REVISION	DATE	BY									



				APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF HANNA, GHOBRIAL AND SPENCER LTD., CONSULTING ENGINEERS, AS TO DESIGN AND SPECIFICATIONS.				hgs Hanna, Ghobrial and Spencer Ltd. Consulting Engineers WINDSOR, ONTARIO				DESIGN D.A.I. CHECKED R.C.S. DRAWN H.M.K. CHECKED R.C.S. DATE APRIL 2002 SCALE 1 : 750				ASSUMPTION STREET STORM SEWER STORM DRAINAGE PLAN				PROJECT NO. C102-954
1. ISSUED FOR CITY APPROVALS				9 AUG. 2002				R.C.S.												SHEET NO. 4
NO.				REVISION				DATE				BY								OF 4



Appendix D

Development Program

 RADICAL CAPITAL
1880 ASSUMPTION
PART 2

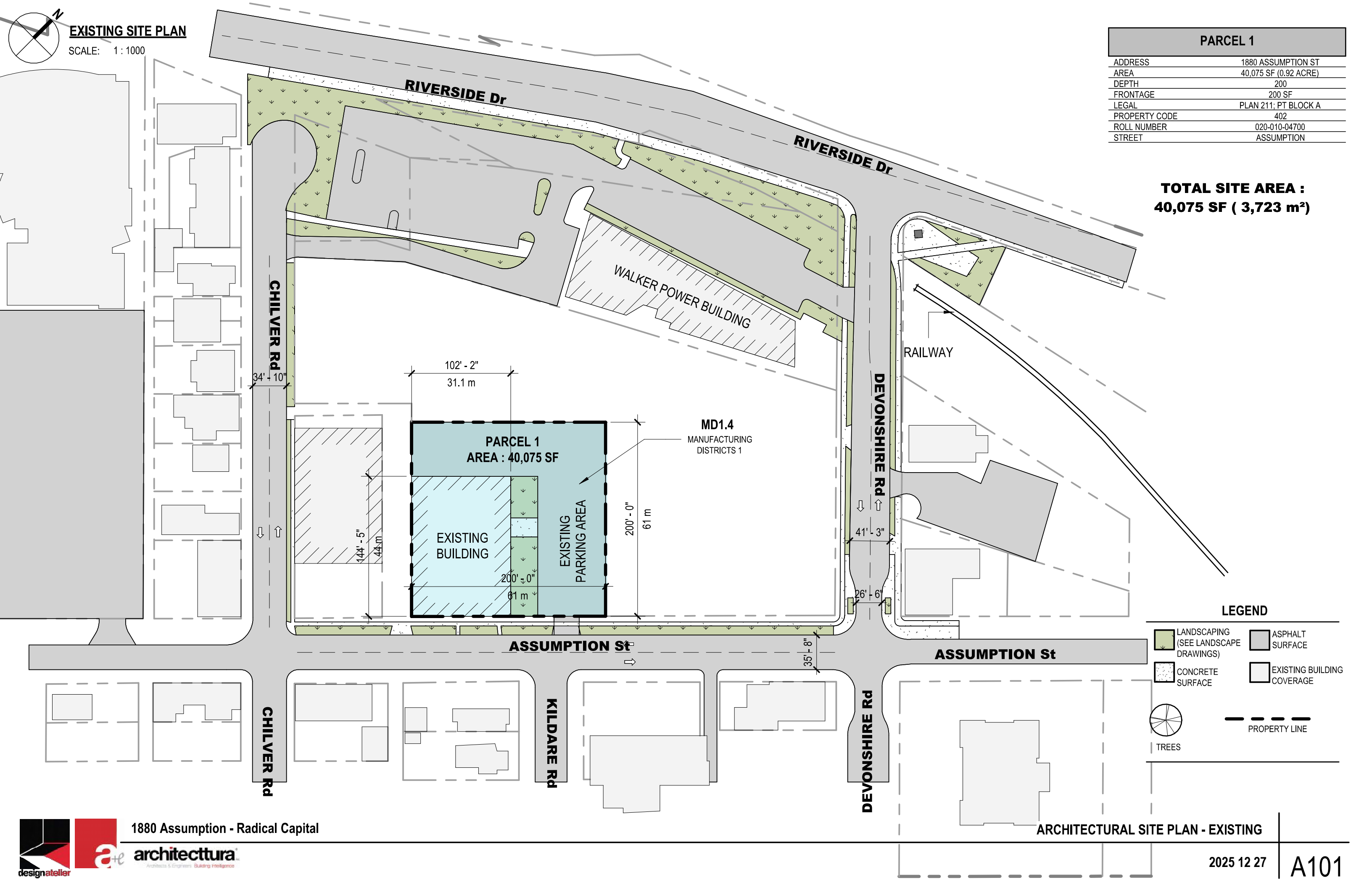
TOTAL UNITS SUMMARY MATRIX		
CATEGORY	UNIT COUNT	
- BACHELOR (650 SF)	4	
- 1 BR UNITS (850 SF)	64	
- 2 BR UNITS (1150 SF)	114	
- 2 BR + DEN (1400 SF)	22	
TOTAL UNITS	204	

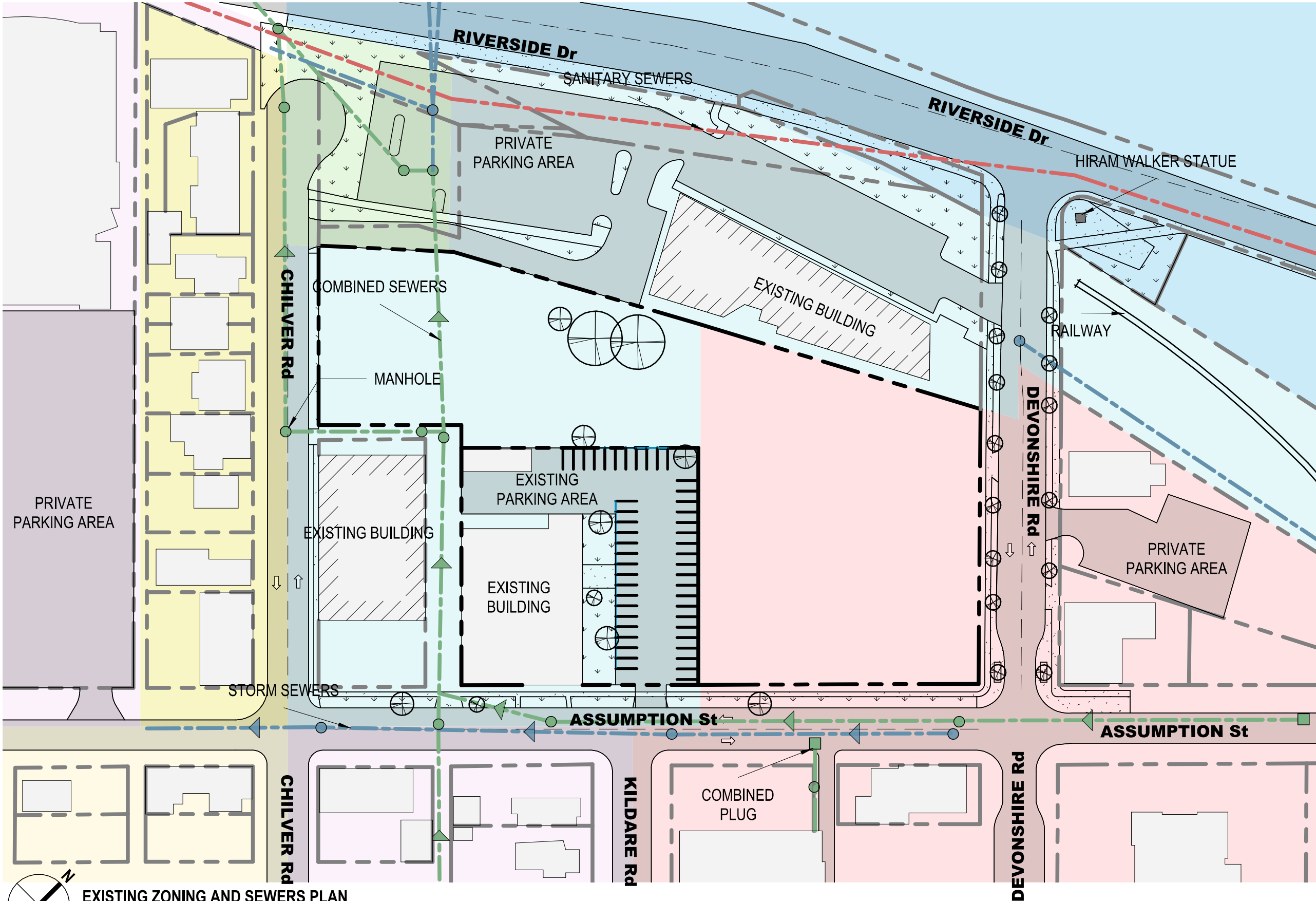
SUMMARY OF NON-PARKING FLOOR AREA		
CATEGORY	UNITS AREA (SF)	UNITS COUNT
- Penthouse	13,681	4
- level 19	13,681	8
- level 18	13,681	8
- level 17	13,681	8
- level 16	13,681	8
- level 15	13,681	8
- level 14	20,581	14
- level 13	20,581	14
- level 12	20,581	14
- level 11	20,581	14
- level 10	20,581	14
- level 09	20,785	15
- level 08	20,785	15
- level 07	20,785	15
- level 06	20,785	15
- level 05	13,240	10
- level 04	19,919	10
- level 03	11,618	10
- level 02	8,187	-
- level 01	9,192	-
- level 00 (Below grade)	935	-
TOTAL	331,658 SF 30,812 m²	204

PROJECT SUMMARY MATRIX			
CATEGORY	AREA (SF)	STOREY	UNIT COUNT
RESIDENTIAL			
- CONDOS	230,496	18	204
- BALCONIES	27,351		
COMMERCIAL			
- RETAIL	4,221	2	
- CAFE	921		
AMENITIES			
- LOBBY	1007		
- GYM	1252		
- EVENTS ROOM	3,048		
- POOL	1804		
- CHANG / WASH RM.	1121		
SERVICES AND UTILITIES			
- BOH/MEC	2,141		
- CIRCULATION SPACES	47,607		
- SECURITY	230		
- REFUSE	613		
- STORAGE	9,846		
TOTAL	331,658 SF 30,812 m²	19	204

PARKING SUMMARY	
CATEGORY	PARKING COUNT
PROVIDED PARKING	
- Level 01	52 + 6 BF
- Level 02	68
- Level 03	68
- Level P1 (Underground Garage)	89 + 2 BF
TOTAL PROVIDED PARKING	285
REQUIRED PARKING	
- Residential Units (204 x 1.25)	255
- Retail (392 m² ÷ 22.5 m²)	17
- Cafe (85.5 m² ÷ 7.5 m²)	11
- Visitor Parking	2
TOTAL REQUIRED PARKING	285
Bicycle Parking spaces	15

PARKING SUMMARY MATRIX	
CATEGORY	PARKING AREA (SF)
- Level 03	25,727
- Level 02	25,699
- Level 01	28,728
- Level P1 (U/G)	36,986
TOTAL PARKING AREA	117,140



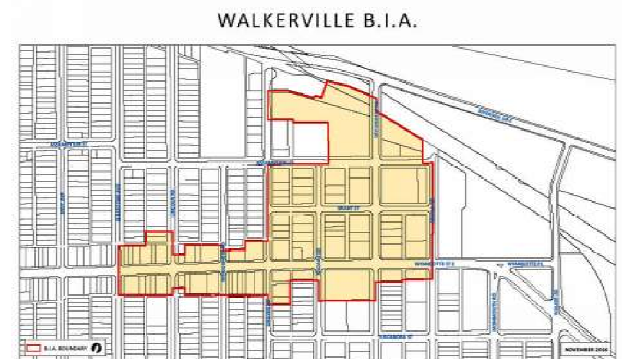
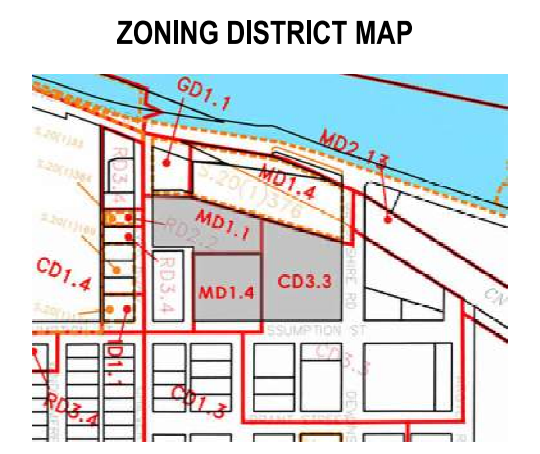


LEGEND

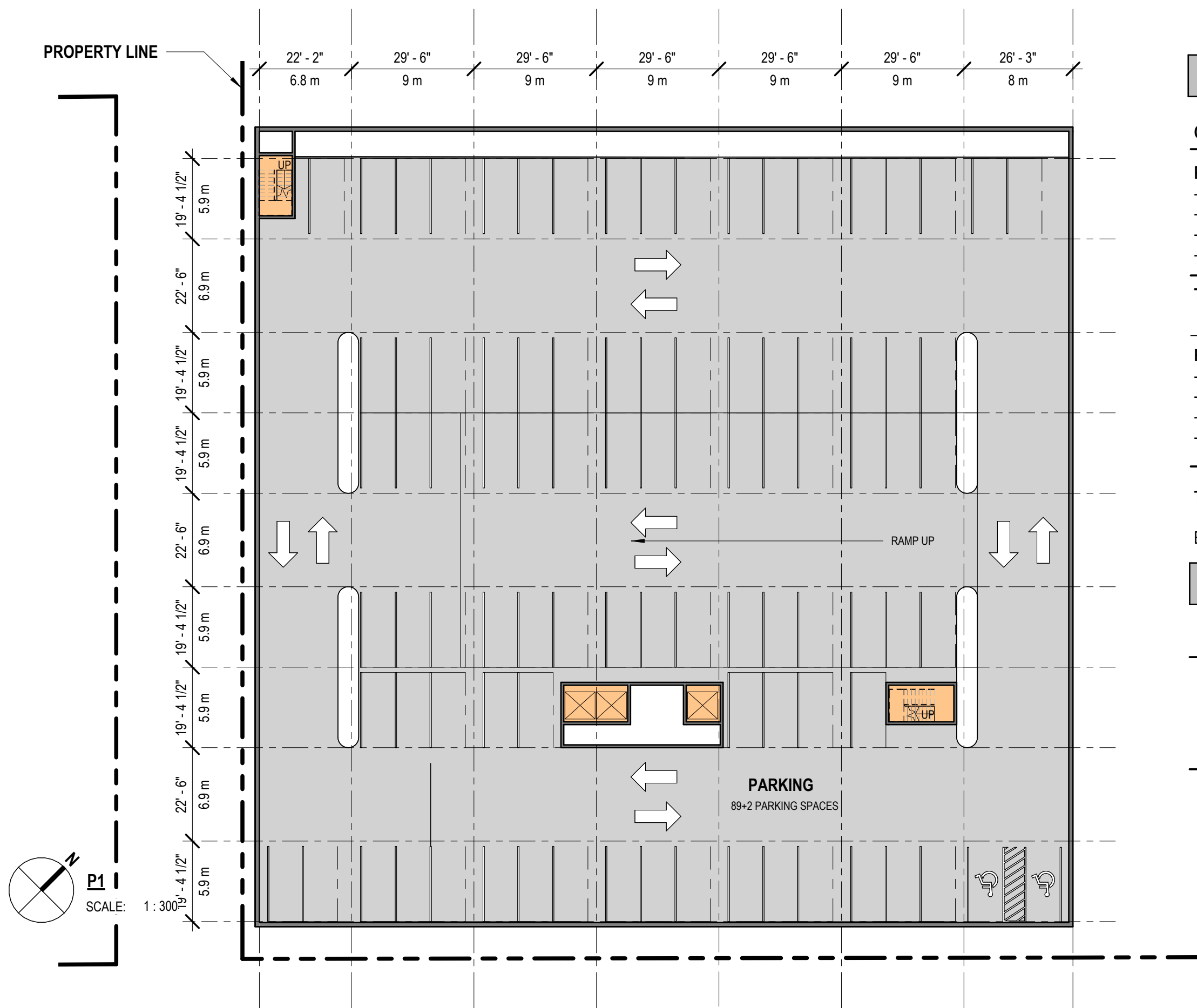
LANDSCAPING (SEE LANDSCAPE DRAWINGS)	ASPHALT SURFACE
CONCRETE SURFACE	EXISTING BUILDING COVERAGE
TREES	PROPERTY LINE

ZONING CLASSIFICATIONS (BY-LAW 8600)

MANUFACTURING DISTRICTS 1	MANUFACTURING DISTRICTS 2
COMMERCIAL DISTRICTS 1	COMMERCIAL DISTRICTS 2
RESIDENTIAL DISTRICTS 2	RESIDENTIAL DISTRICTS 3
GREEN DISTRICTS	



EXISTING ZONING AND SEWERS PLAN
SCALE: 1 : 1000

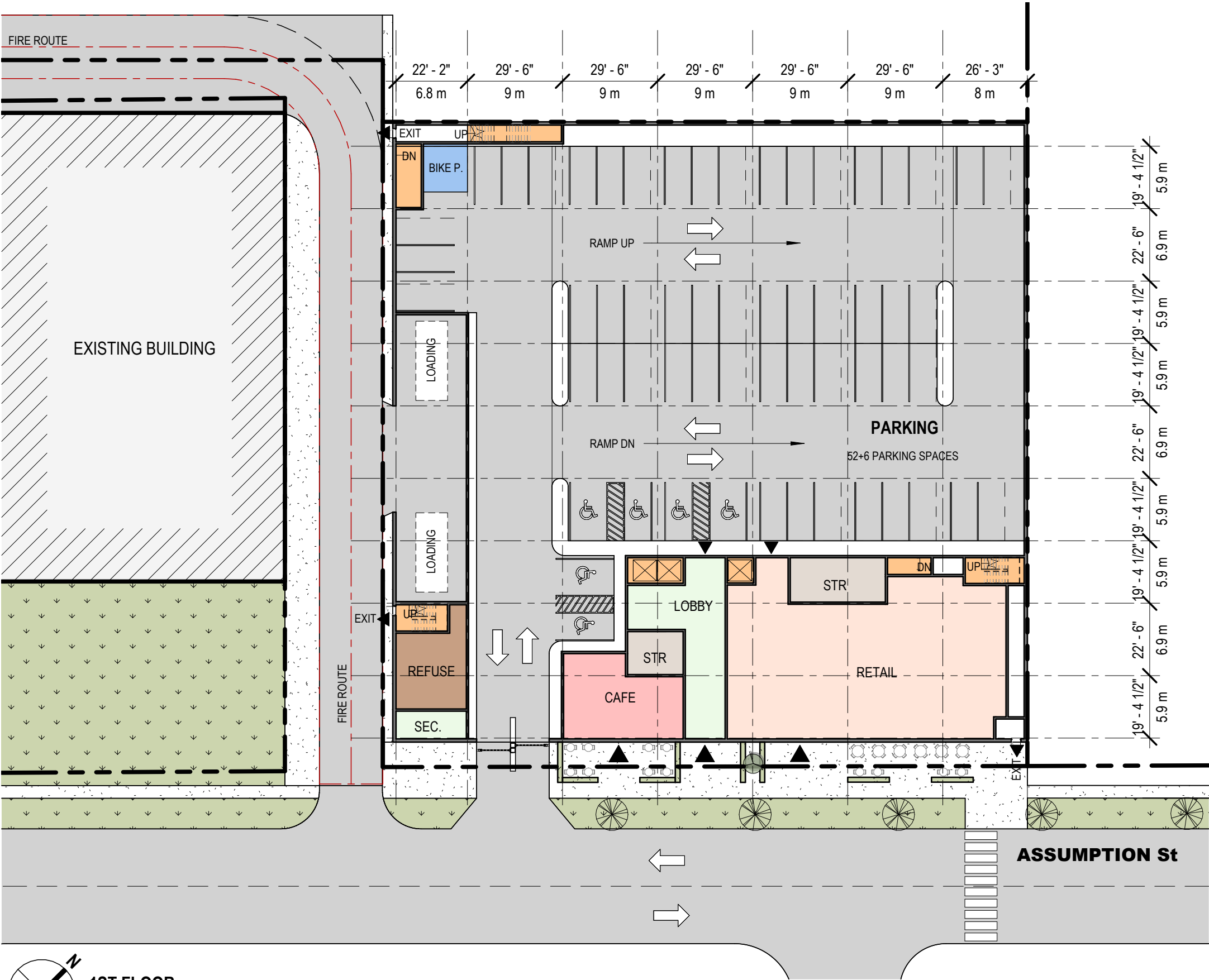


PARKING SUMMARY

CATEGORY	PARKING COUNT
PROVIDED PARKING	
- Level 01	52 + 6 BF
- Level 02	68
- Level 03	68
- Level P1 (Underground Garage)	89 + 2 BF
TOTAL PROVIDED PARKING	285
REQUIRED PARKING	
- Residential Units (204 x 1.25)	255
- Retail (392 m² ÷ 22.5 m²)	17
- Cafe (85.5 m² ÷ 7.5 m²)	11
- Visitor Parking	2
TOTAL REQUIRED PARKING	285
Bicycle Parking spaces	15

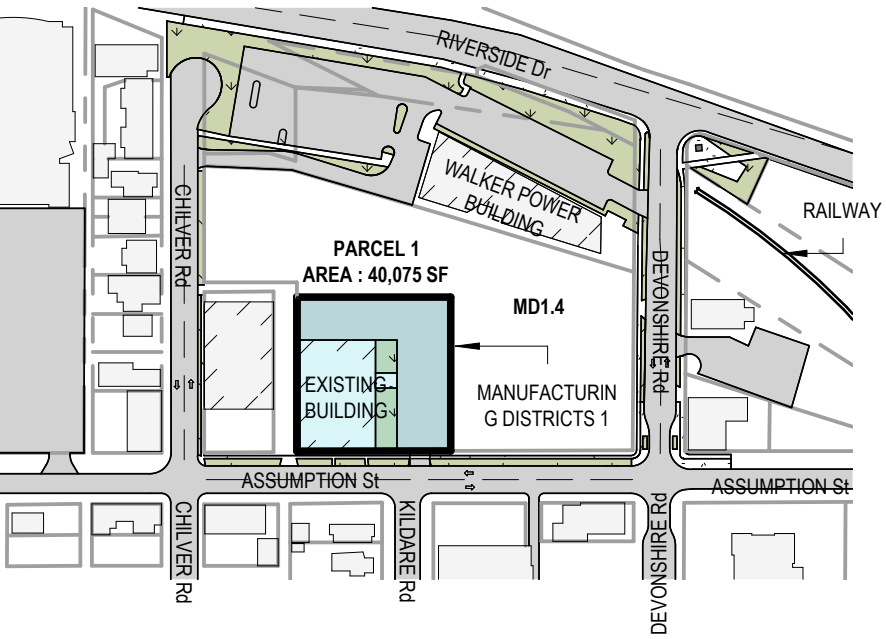
PARKING SUMMARY MATRIX

CATEGORY	PARKING AREA (SF)
- Level 03	25,727
- Level 02	25,699
- Level 01	28,728
- Level P1 (U/G)	36,986
TOTAL PARKING AREA	117,140



1ST FLOOR SUMMARY MATRIX

CATEGORY	AREA (SF)
- PARKING	28,728
- RETAIL	4,221
- CIRCULATION SPACES	1,513
- LOBBY	1007
- REFUSE	613
- SECURITY	230
- STORAGE	687
- CAFE	921
TOTAL	37,920 SF

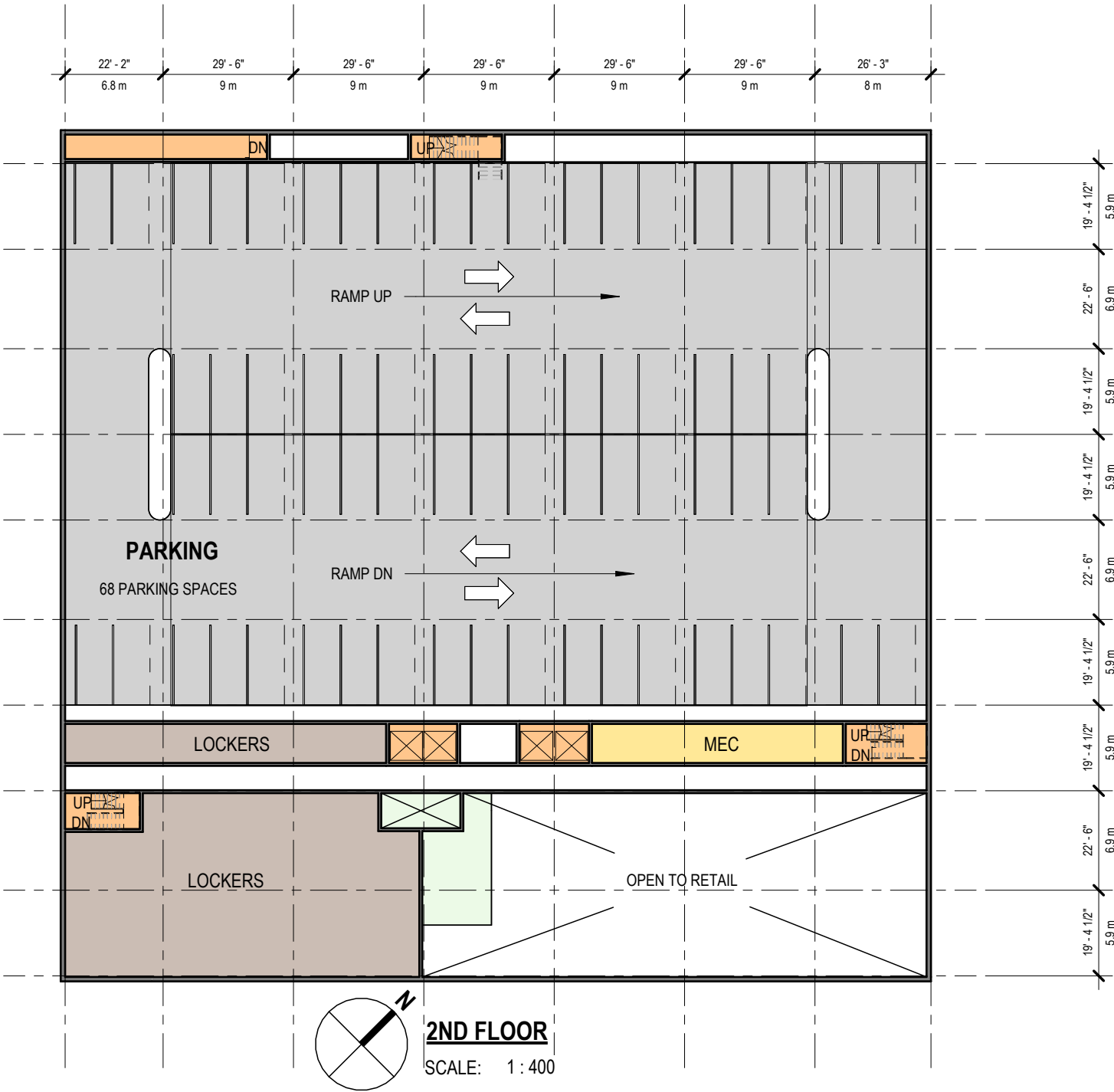


1ST FLOOR
SCALE: 1 : 400

EXISTING SITE PLAN

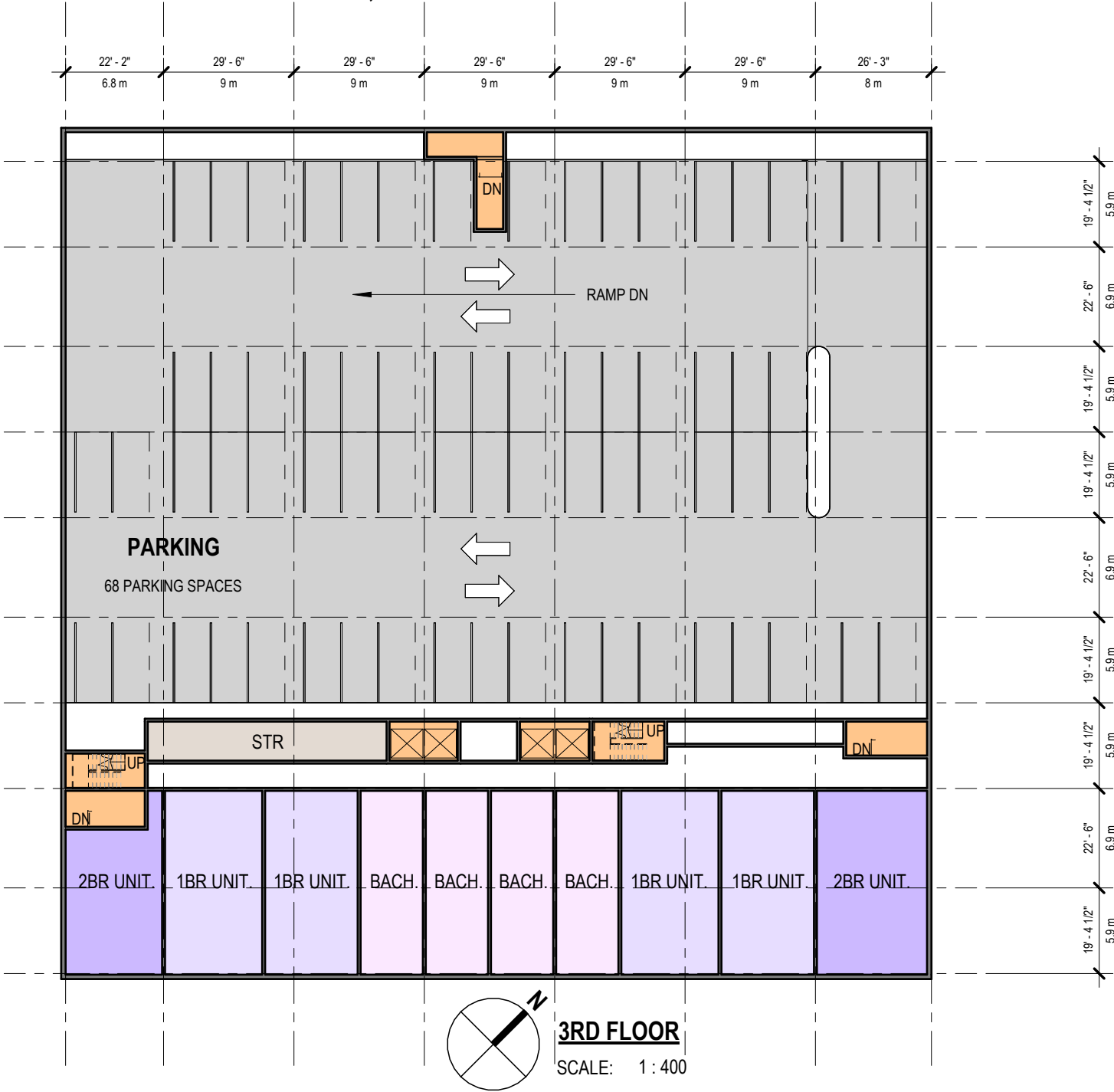
2ND FLOOR SUMMARY MATRIX

CATEGORY	AREA (SF)
- PARKING	25,699
- MEC.	545
- CIRCULATION SPACES	3,684
- STORAGE / LOCKERS	3,958
TOTAL	33,886 SF



3RD FLOOR SUMMARY MATRIX

CATEGORY	AREA (SF)
- PARKING	26,302
- RESIDENTIAL	8,282
- CIRCULATION SPACES	2,817
- STORAGE	519
TOTAL	37,920 SF



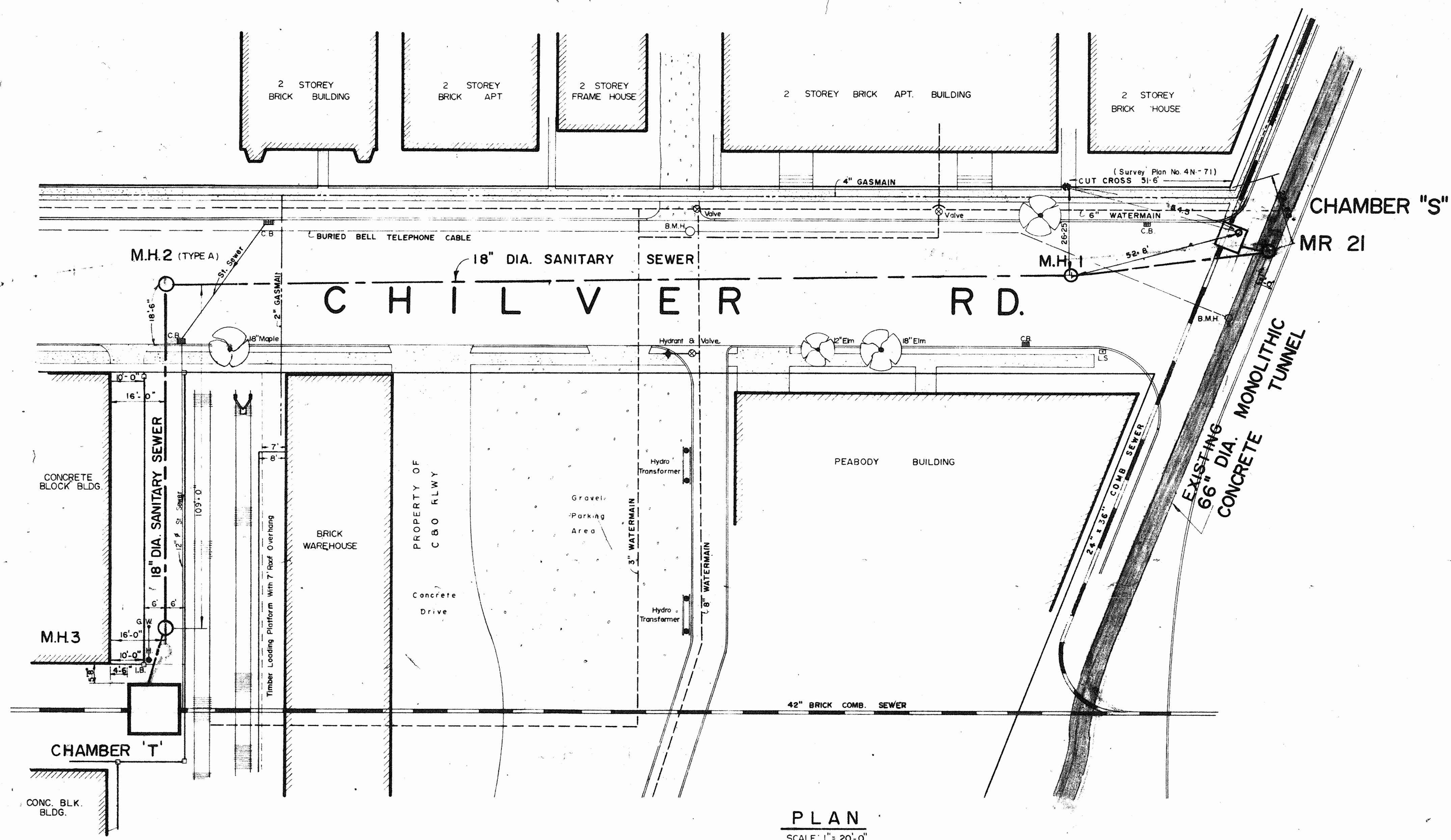
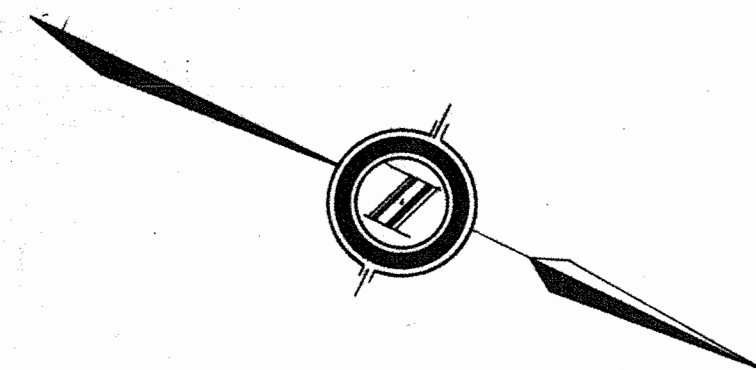
3RD - 4TH - 5TH FLOORS AFFORDABLE UNITS

CATEGORY	UNIT COUNT
- BACHELOR (650 SF)	4
- 1 BR UNITS (850 SF)	13
- 2 BR UNITS (1150 SF)	13
TOTAL UNITS	30

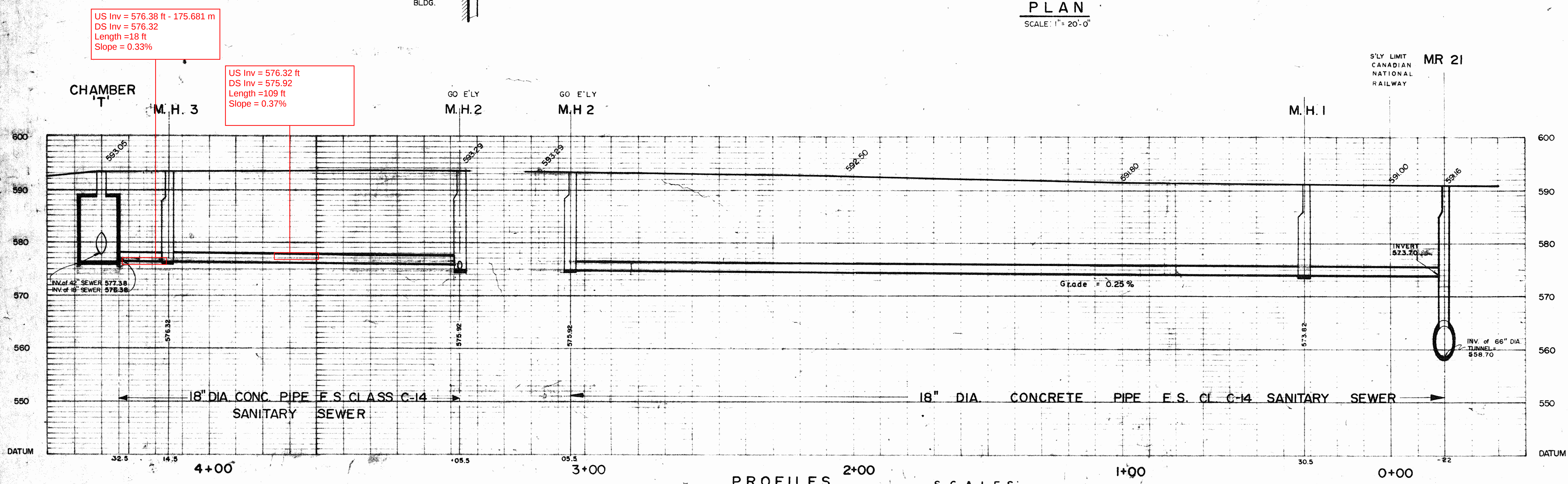


Appendix E

City of Windsor Sewer Drawings (Chilver Road)



PLAN
SCALE: 1" = 20'-0"



US Inv = 576.38 ft - 175.681 m
DS Inv = 576.32
Length = 18 ft
Slope = 0.33%

US Inv = 576.32 ft
DS Inv = 575.92
Length = 109 ft
Slope = 0.37%

PROFILES

SCALE: 1" = 20'-0"
HORIZ. 1" = 20'-0"
VERT. 1" = 10'-0"

AS CONSTRUCTED MAY 10, 1971

REV	BY	CHK'D	DESCRIPTION	DATE
A	M.B.		Changed Location of Chamber "T", Added M.H.S. And Revised Grade, of 18" Dia. Sewer Connection.	Mar. 11, 1969

CITY OF WINDSOR
RIVERFRONT INTERCEPTOR SEWER

C. G. RUSSELL ARMSTRONG ASSOCIATES LTD.
CONSULTING ENGINEERS
WINDSOR - ONTARIO

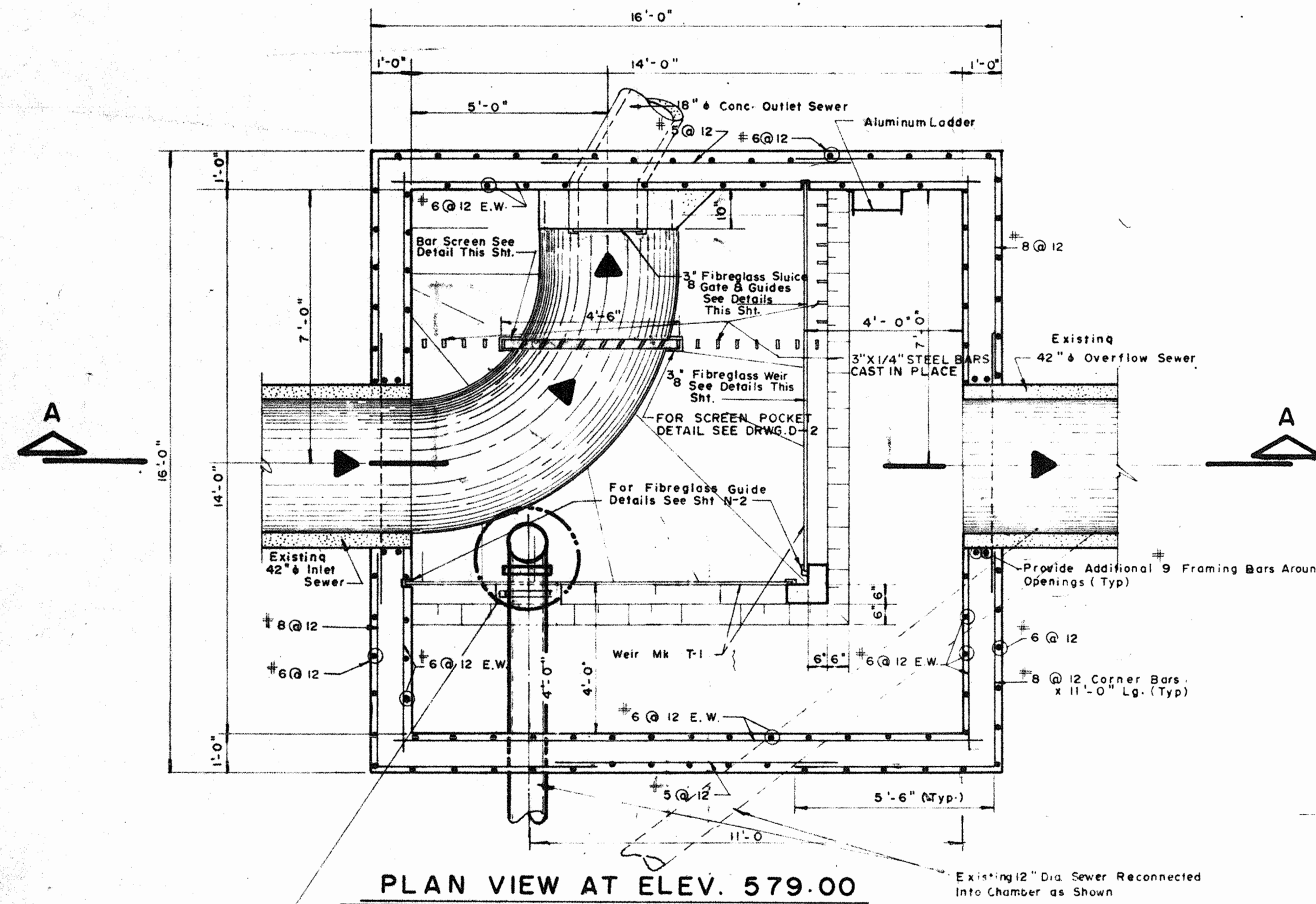
PROJECT
CHAMBER "T"
CHILVER RD.

SHEET TITLE
PLAN & PROFILE

DRAWN: J.S.K.
CHECKED:
OFFICE FILE NO.: WD - 128 - 67
SHEET NO.: T-1

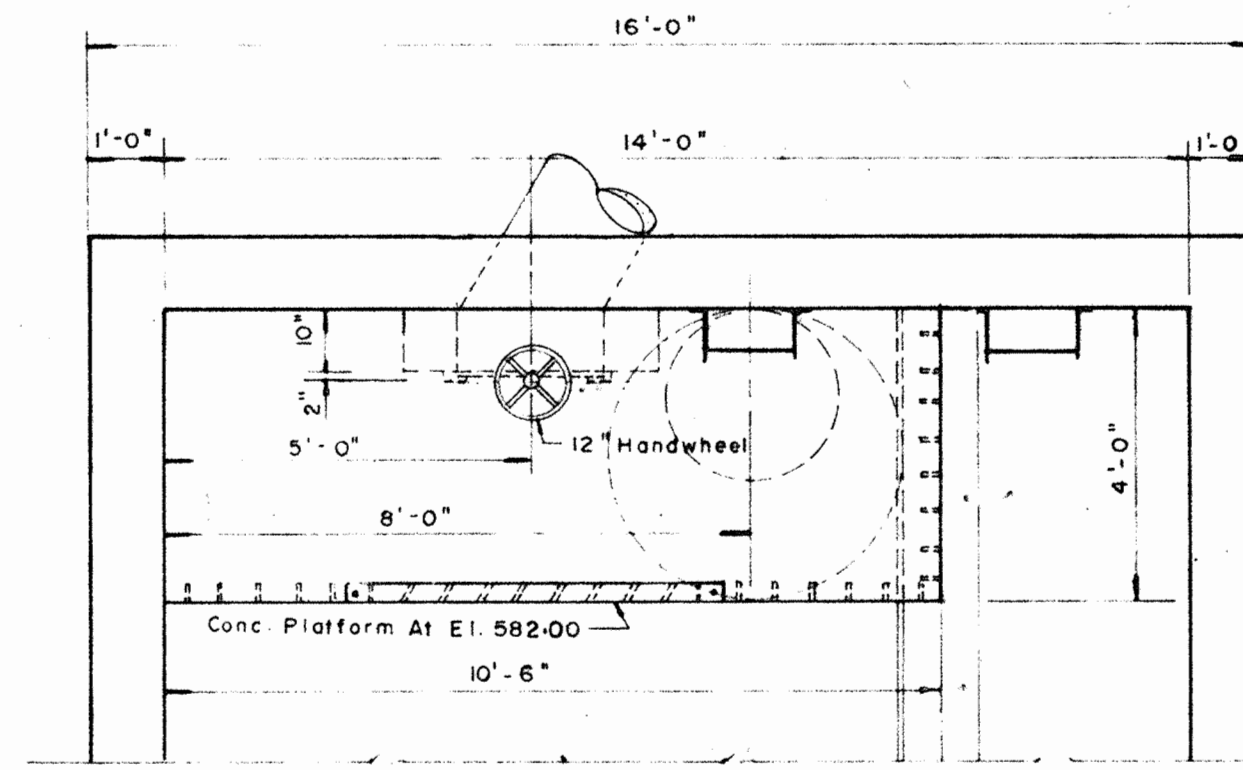
APPROVED:
SCALE: AS NOTED
CONTRACT NO.: 5B
DRAWING NO.: 3F-596

DATE: JULY 5/68
FIELD BOOK: L.B. 783



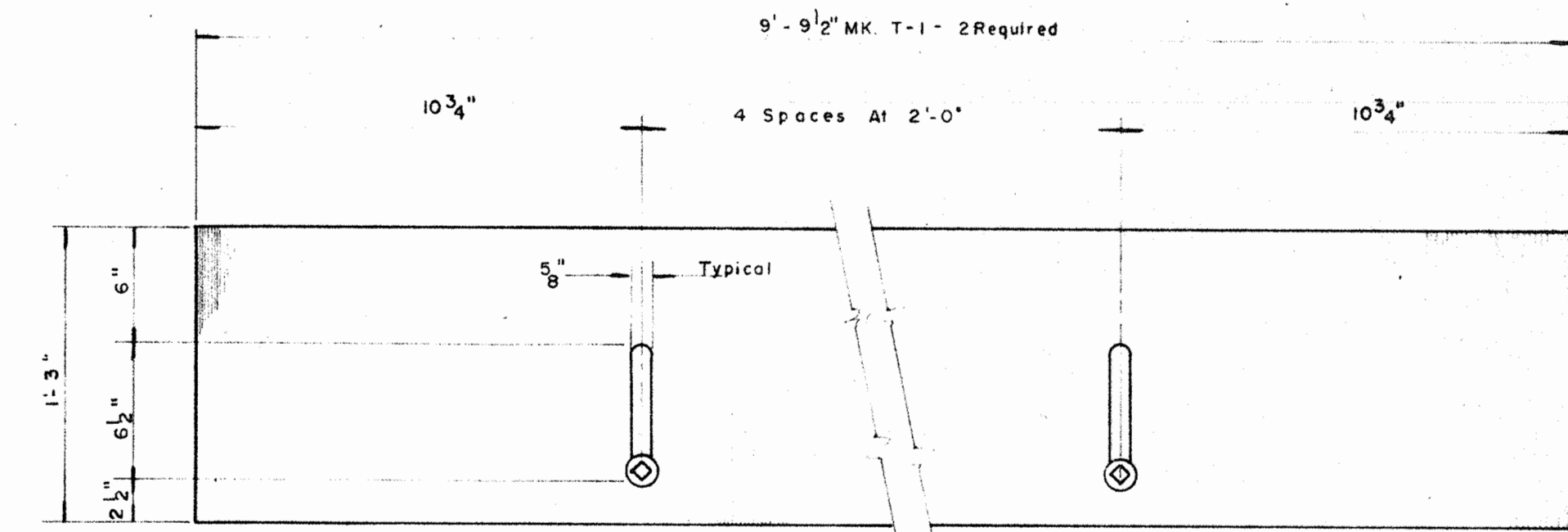
PLAN VIEW AT ELEV. 579.00

SCALE: $\frac{3}{8}'' = 1'-0''$



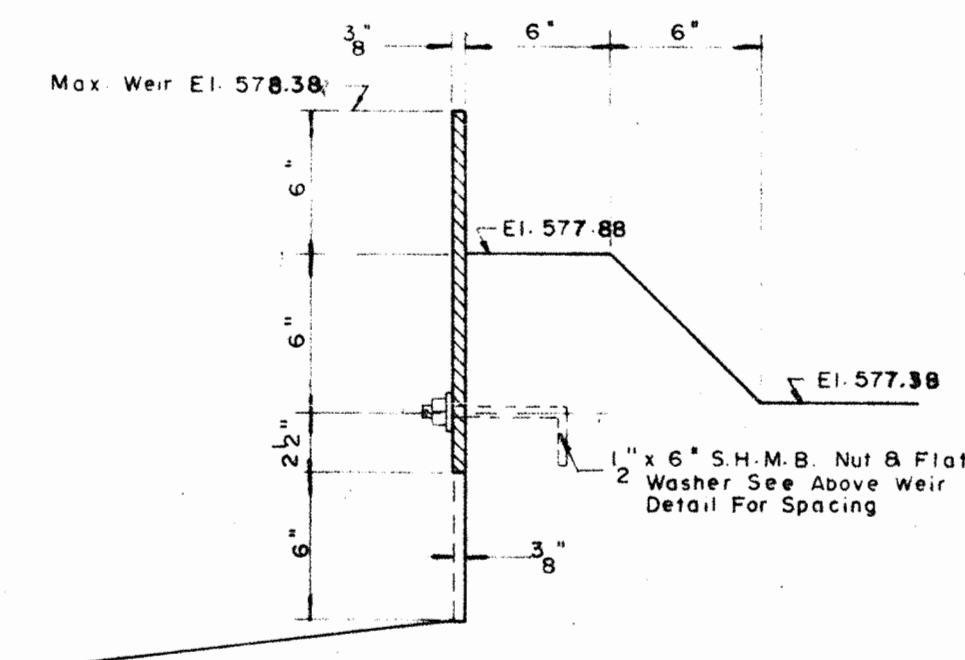
PARTIAL PLAN AT ELEV. 582.00

SCALE: $\frac{3}{8}'' = 1'-0''$



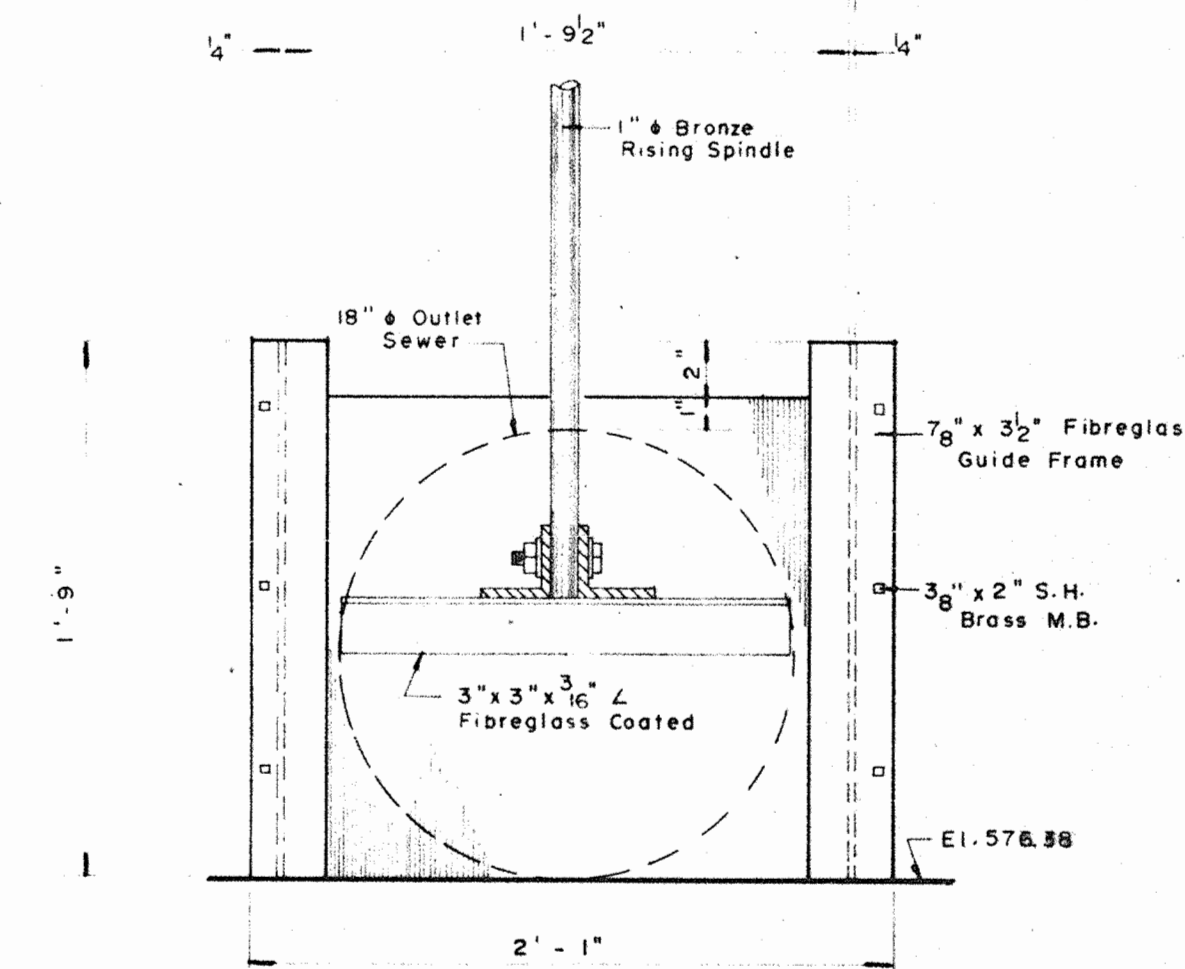
ELEVATION OF WEIR PLATE

SCALE: NONE



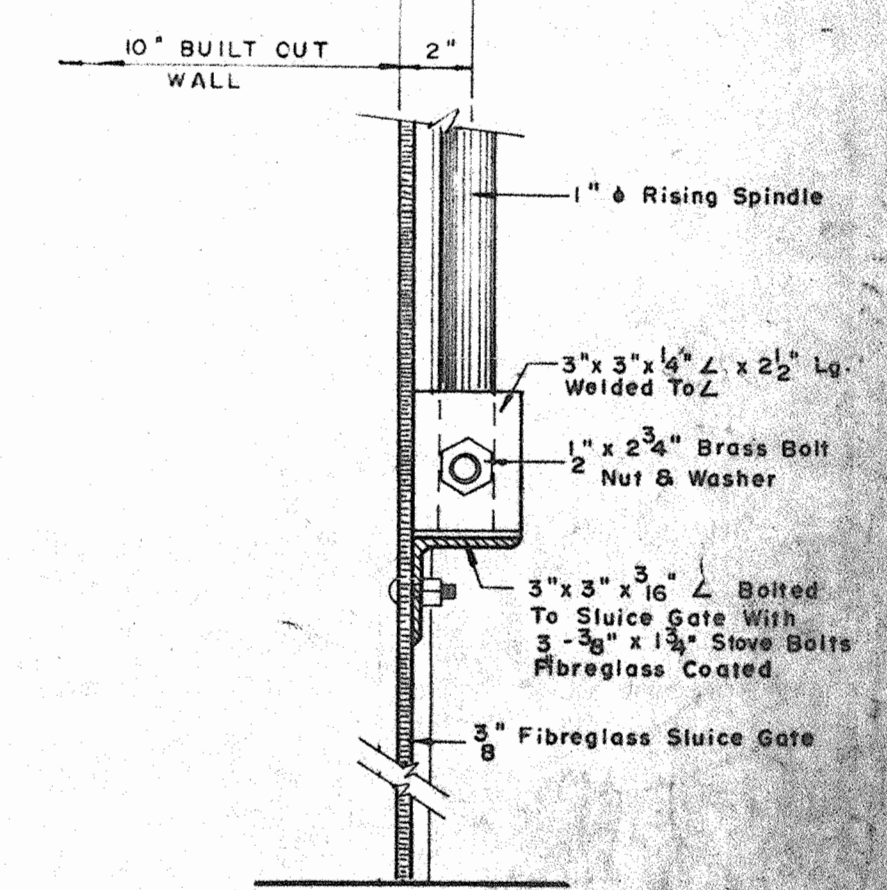
SECTIONAL DETAIL THRU WEIR

SCALE: $\frac{1}{2}'' = 1'-0''$



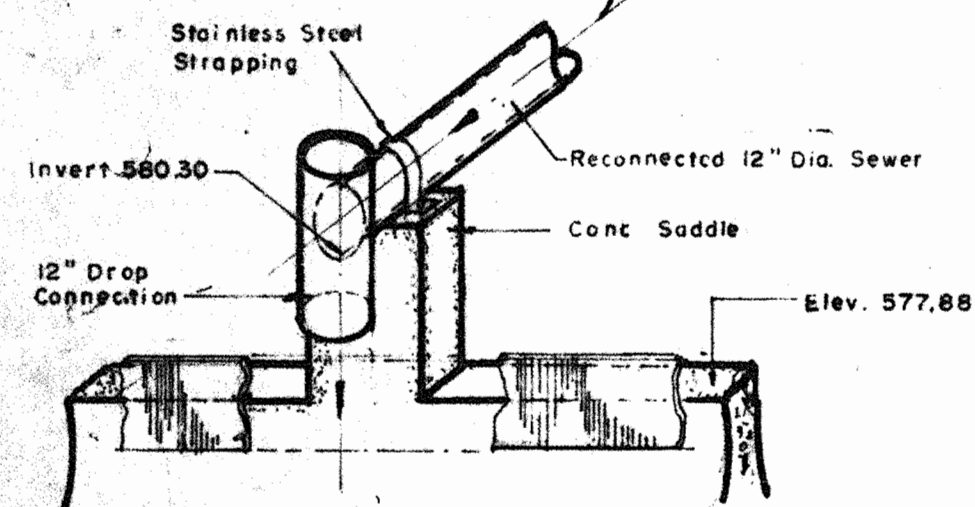
ELEVATION DETAIL OF SLUICE GATE

SCALE: NONE



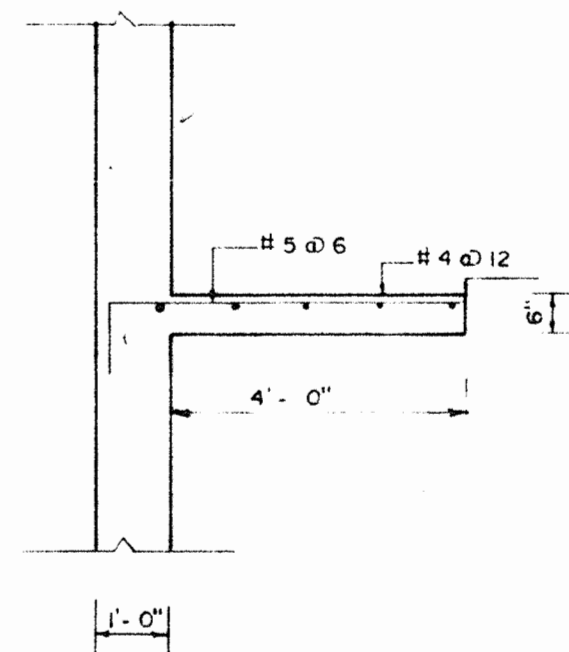
SECTION THRU SLUICE GATE

SCALE: NONE



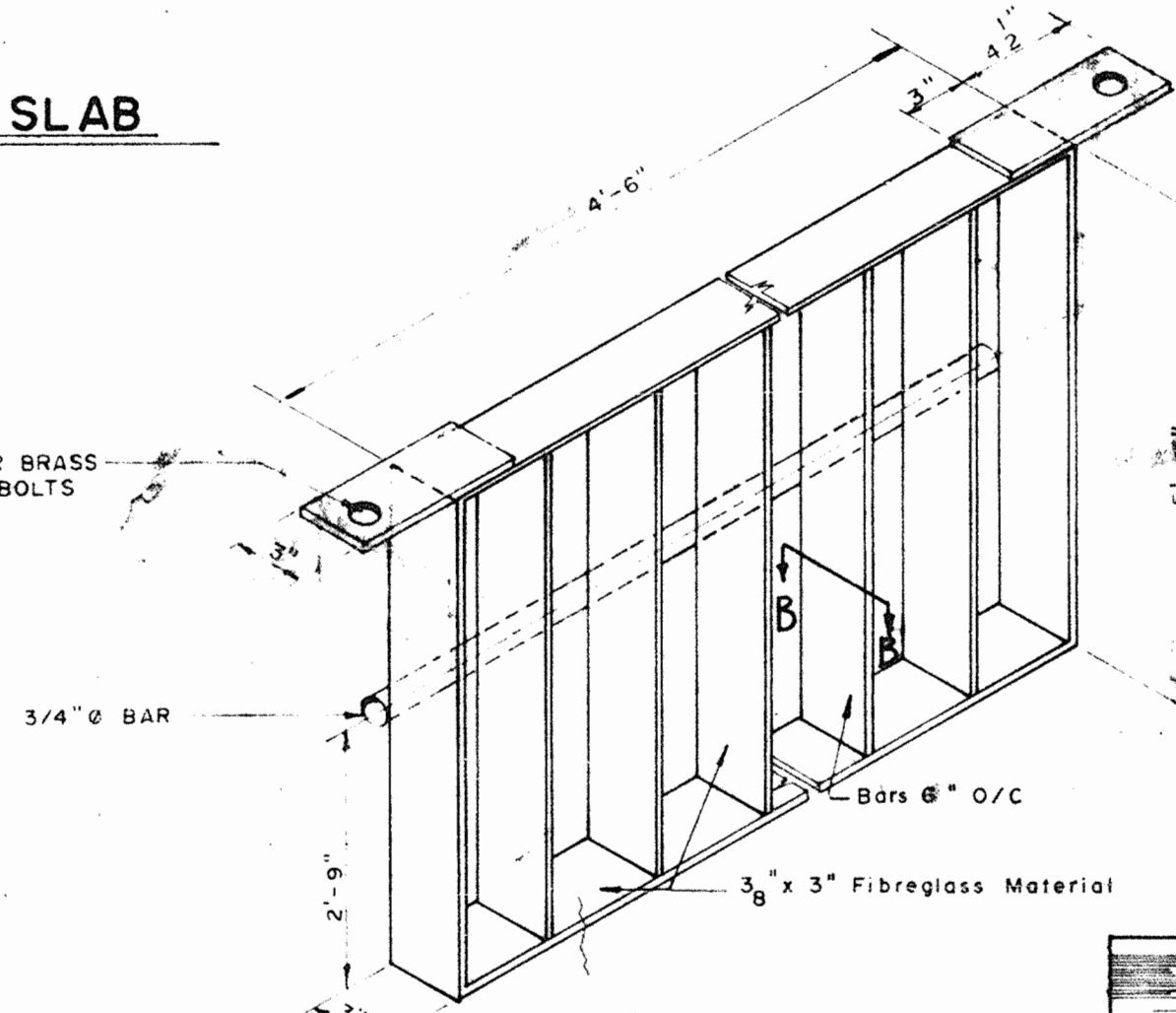
DETAIL OF ADDITIONAL CONNECTION OF EXISTING 12" SEWER

Scale $\frac{3}{8}'' = 1'-0''$



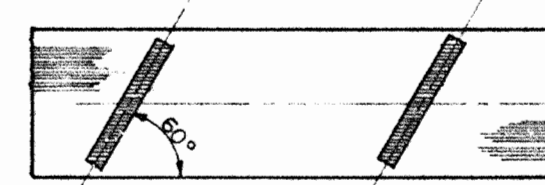
DETAIL OF CANTILEVER SLAB

SCALE: $\frac{3}{8}'' = 1'-0''$

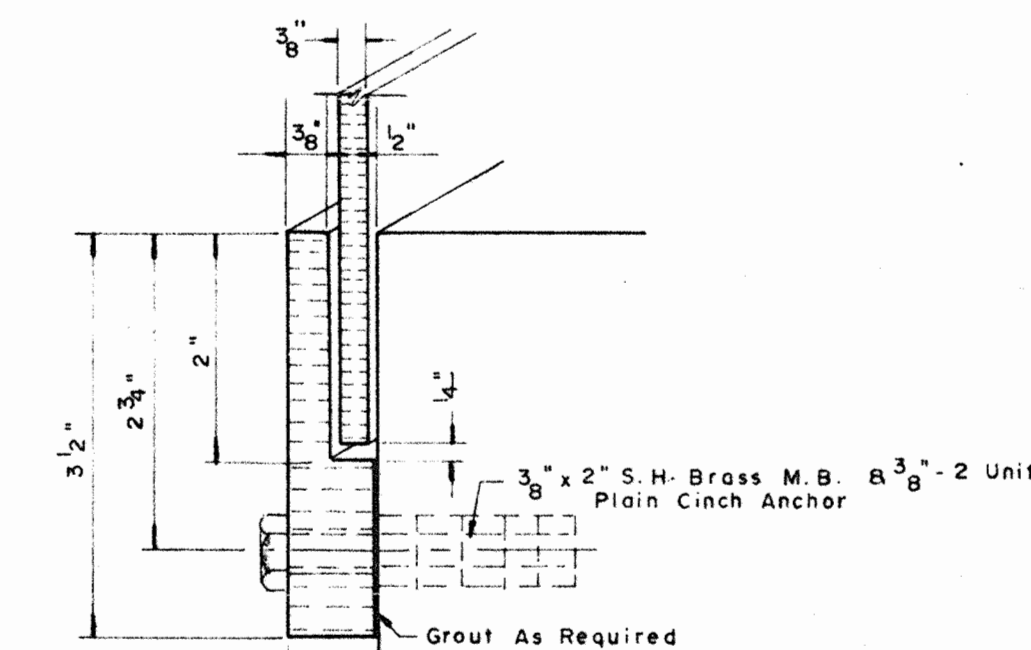


DETAIL OF BAR SCREEN

SCALE: NONE

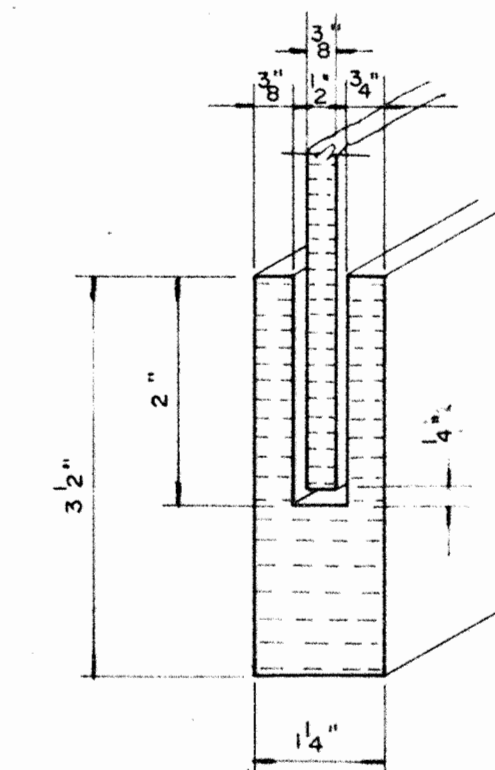


SECTION B-B

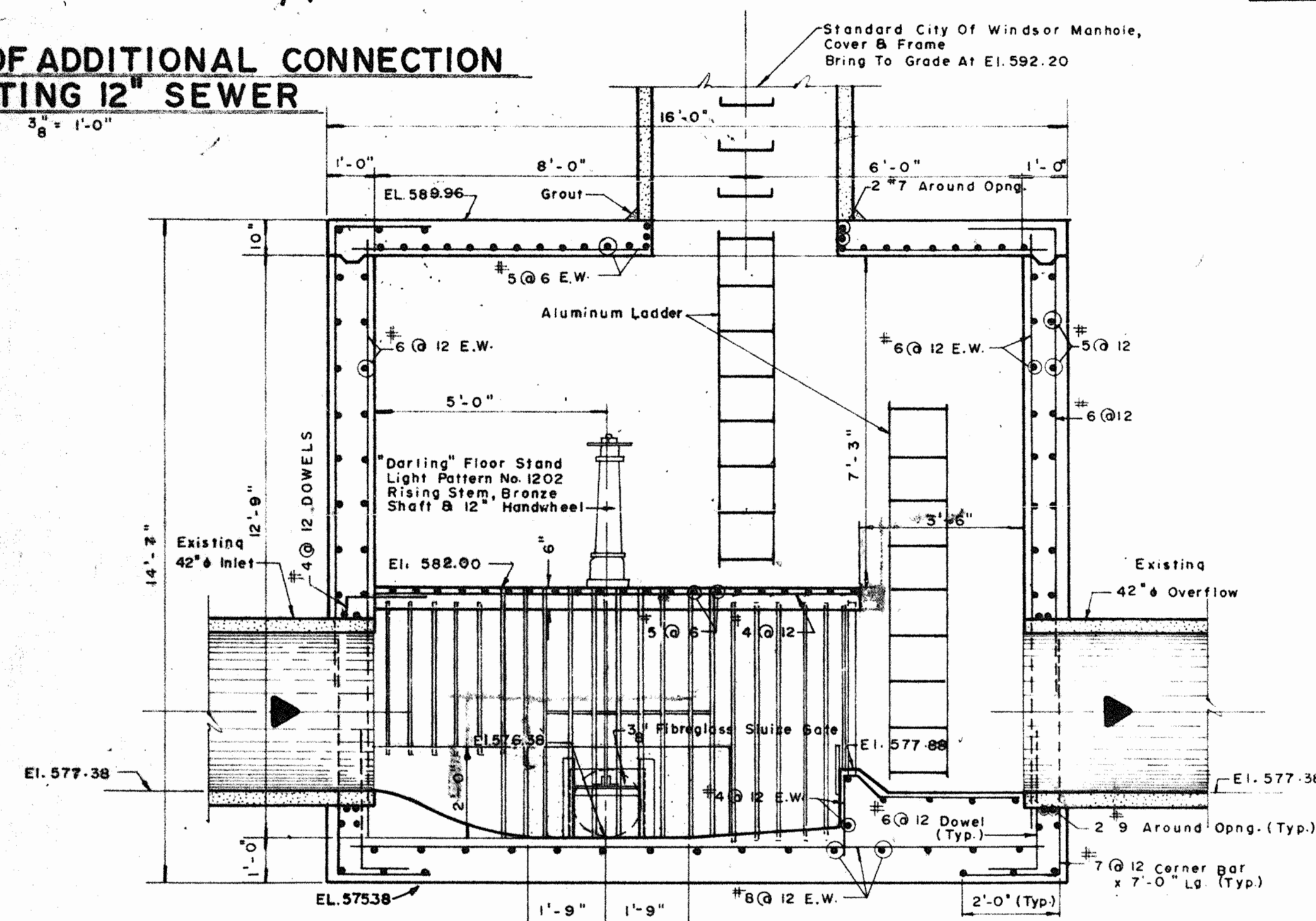


(CORNER) SLUICE GATE GUIDE DETAIL

SCALE: NONE



(WALL) WEIR PLATE GUIDE DETAIL



SECTION A-A

SCALE: $\frac{3}{8}'' = 1'-0''$

AS CONSTRUCTED

May 10, 1971

REV	BY	CHK'D	DESCRIPTION	DATE
B	M.B.		Changed Angle of Outlet Sewer	Mar 4, 1969
A	H.M.	AKB	*5 Corner Bars Are Changed To *8 Bars	Mar 11, 1969

CITY OF WINDSOR
RIVERFRONT INTERCEPTOR SEWER

R. T. Bailey

C. G. RUSSELL ARMSTRONG ASSOCIATES LTD.
CONSULTING ENGINEERS
WINDSOR - ONTARIO

PROJECT
CHAMBER "T"
ASSUMPTION
CHILVER RD. AT RIVERSIDE DR.
SHEET TITLE
PLAN, SECTIONS & DETAILS

DRAWN LR	APPROVED AKB	DATE JULY 5/68
CHECKED AKB	SCALE AS NOTED	FIELD BOOK
OFFICE FILE No. WD-128-67	CONTRACT No. 6B	
SHEET No. T-2	DRAWING No. 3F-596	



Appendix F

**Combined Sewer Service Area Map and
Table 3 – Combined Sewer Area – Population and Drainage Area**

Figure 2 - Combined Sewer

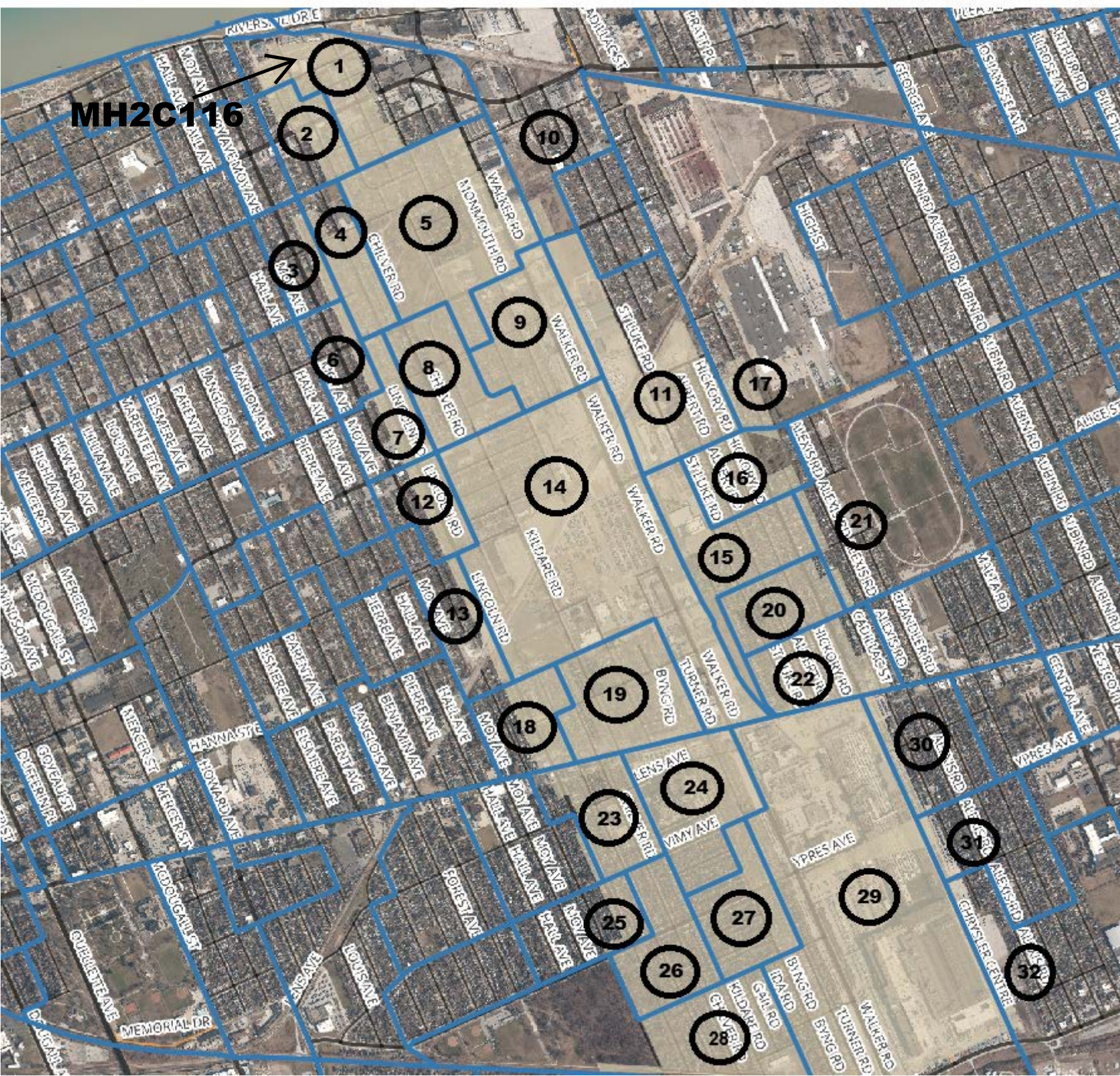




Table 3 - Combined Sewer Service Area - Population and Drainage Area

Grid Area No.	Grid Area (m ²)	Percentage of Grid Area within Drainage Area	Grid Area Within Drainage Area (ha)	Population in Grid Area	Percentage of Population in Drainage Area
1	273,743	45%	0.12	568	256
2	96,453	65%	0.06	446	290
3	79,833	20%	0.02	458	92
4	96,761	75%	0.07	465	349
5	370,317	90%	0.33	445	401
6	74,772	25%	0.02	385	96
7	97,607	60%	0.06	490	294
8	141,799	100%	0.14	489	489
9	186,121	100%	0.19	404	404
10	577,570	2%	0.01	429	9
11	319,251	70%	0.22	504	353
12	89,287	55%	0.05	449	247
13	117,981	20%	0.02	509	102
14	756,914	100%	0.76	569	569
15	183,983	100%	0.18	396	396
16	114,967	80%	0.09	397	318
17	871,888	4%	0.03	615	25
18	110,764	55%	0.06	491	270
19	191,980	100%	0.19	390	390
20	102,967	95%	0.10	429	408
21	426,113	2%	0.01	405	8
22	147,533	80%	0.12	538	430
23	131,761	90%	0.12	433	390
24	195,019	100%	0.20	322	322
25	120,547	30%	0.04	389	117
26	138,405	100%	0.14	437	437
27	129,337	100%	0.13	411	411
28	431,641	40%	0.17	505	202
29	971,529	95%	0.92	509	484
30	156,977	15%	0.02	417	63
31	178,020	10%	0.02	474	47
32	606,255	5%	0.03	481	24
Total			4.65	14649	8689



Appendix G

Proposed Servicing Plan (Figure 1)

