

January 31, 2024

SBM-23-1518

Habitat for Humanity Guelph Wellington
Suite 100B – 104 Dawson Road
Guelph, ON, N1H 1A6

Attn: Brett Daw – Director, Build

**Re: Functional Servicing Report
Proposed Residential Development
303, 309 & 317 Speedvale Avenue East, Guelph, Ontario**

1. INTRODUCTION

This Functional Servicing Report (Report) has been prepared by Strik, Baldinelli, and Moniz Ltd. (SBM) to address the requirements of the City of Guelph (City) and of the Region of Waterloo and Area Municipalities for the OPA/ZBA submission for the proposed residential development located at 303, 309 & 317 Speedvale Avenue in the City of Guelph, Ontario.

The existing approximately 0.26 ha site is bordered by the Manhattan Court Right-of-Way (ROW) to the northeast, residential lands to the southeast and southwest, and the Speedvale Avenue East ROW to the northwest.

It is SBM's understanding that the proposed development is to consist of a 6-storey apartment building with a parking garage, containing 48 total residential units (11 one-bedroom units, 17 two-bedroom units, and 20 three-bedroom units). Please refer to the attached Speedvale Affordable Housing drawings by Newton Group Ltd for Habitat for Humanity Guelph Wellington, dated December 19, 2023, and the Site Plan by SBM, provided separately.

Design requirements have been based on the City of Guelph Development Engineering Manual (DEM) dated October 2023, the region of Waterloo and Area Municipalities Design Guidelines and Supplemental Specifications for Municipal Services (DGSSMS) dated February 2023, the Ministry of Environment Conservation and Parks, Design Guidelines for Drinking-Water Systems (DGDWS), 2022, the MECP Stormwater Management Planning and Design Manual (SWMPDM), and the current edition of the Ontario Building Code (OBC).

2. WATER SERVICING

Based on the City of Guelph As-Recorded Drawing No. M-737A, dated May 2008, provided in Appendix A, there is an existing municipal 150 mm watermain adjacent to the subject site located within the Manhattan Court ROW. It is proposed to service the subject site via a 150 mm service which is to be connected to the existing 150 mm watermain in the Manhattan Court ROW.

2.1 Domestic Water Supply

As per the Speedvale Affordable Housing drawings by Newton Group Ltd, provided in Appendix A, the proposed multi-residential building consists of 48 units with 105 total bedrooms. The occupancy was calculated for two cases; using 2 people per bedroom as per OBC 3.1.17.1(b) and using 1.86 people per unit as per the City of Guelph's DEM. The OBC occupancy was taken to be conservative, for a total estimated population of 210 people. Maximum hour

domestic demand (calculated as per MECP DGDWS) for the total occupancy load of 210 people is 148 L/min (2.46 L/s). Please refer to the Domestic Water Demand, Velocity, and Turnover calculations, attached in Appendix B.

2.2 Water Supply for Fire Protection

As per the Region's DGSSMS, Section B.2 requires the minimal residual pressure during Maximum Day plus Fire scenario to be not less than 140 kPa (20 psi) at any location in the water distribution system.

A fire hydrant flow test was performed at Speedvale Avenue East on December 8, 2023, with results included in Appendix B. The flow test results show that the static pressure of the water distribution system is 60 psi (413.69 kPa) and the residual pressures are 59 psi (406.79 kPa) and 58 psi (399.90 kPa) at the test flow rates of 4,402 L/min (1,163 USGPM) and 7,188 L/min (1,899 USGPM), respectively.

A sprinkler system is required for the proposed development, and therefore the fire-fighting demand is determined as per NFPA-13 (relevant information included in Appendix B). As the proposed building will have 'Light Hazard Occupancy' (for residential occupancy) and 'Ordinary Hazard Occupancy – Group 1' (for the parking structure), the proposed building is conservatively determined to have the 'Ordinary Hazard Occupancy – Group 1' (refer to Annex A - Section A.5.3.1 of the NFPA-13). Section B.2.3.4 of the Region's DGSSMS requires that the maximum velocity shall not exceed 5.0 m/s under all flow conditions. Under fire-flow + maximum day demand of 1,991 L/min with a 150 mm diameter water service, the anticipated velocity was calculated to be 1.88 m/s, which adheres to the design standards. Please refer to the Fire Flow (NFPA-13) calculations and pressure loss calculations, provided in Appendix B.

As per the NFPA-13 and the OBC Part 3 requirements, the fire hydrant(s) shall be located 45m from the building's Siamese connection. As there is an existing hydrant within 45 m from the 'Fire Department Connection' on Speedvale Avenue E, and the fire flow and pressure loss calculations show that the proposed water distribution system can provide the calculated minimum required water supply flow rate, adequate fire protection is available for the proposed development.

2.3 Capacity Review

As shown in the Fire Flow calculations provided in Appendix B, the water pressure in the Speedvale Ave ROW at the required flow of 1,991 L/min (fire flow + maximum day demand), including losses (refer to Hazen Williams Pressure Loss Calculations attached to this Study) will be approximately 431.88 kPa (62.64 psi). The final pressure in the sprinkler system will be calculated by the sprinkler system designer, upon sprinkler system layout completion (Mechanical scope of work). Additionally, the sprinkler system designer is to confirm if a 150 mm water service is sufficient to provide the required final pressure in the sprinkler system, upon sprinkler system layout completion.

The water pressure under the fire fighting condition is approximately 62.64 psi, which is larger than 20 psi and less than 80 psi, and therefore meets the requirements as per the DGSSMS.

The fire flow calculations demonstrate that the proposed water distribution system can provide the minimum required water supply flow rate under the fire flow plus maximum day demand scenario, therefore there is adequate water supply available for the proposed development. These calculations are to be confirmed at the time of detailed design.

3. SANITARY SERVICING

Based on the City of Guelph As-Recorded Drawing No. M-737A, dated May 2008, provided in Appendix A, there is an existing 300mm diameter municipal sanitary sewer at 3.5% located within the Speedvale Avenue E ROW. It is proposed that a new 200 mm sanitary service at 2.0% will convey sanitary flows from the proposed residential building to the existing 300mm sanitary sewer located on the Speedvale Avenue East ROW.

3.1 Design Flows per OBC

As per the attached Speedvale Affordable Housing drawings by Newton Group Ltd, the proposed multi-residential building consists of 48 units with 105 total bedrooms, for a total population of 210 people as calculated in section 2.1 of this report. This is multiplied by the average usage of 300 L/day/capita or 0.00347 L/s/capita and the Harmon

peaking factor “F” of 4.14. Adding the infiltration allowance of 0.06 L/sec yields a peak design flow for the building of 2.98 L/s, which can be conveyed by the proposed 200 mm pipe at 2.0% which has a capacity of 46.36 L/s, as shown in calculations provided in Appendix C. Therefore, the proposed sanitary connection has sufficient capacity to service the proposed development.

4. STORMWATER MANAGEMENT AND STORM SERVICING

4.1 Rainfall Intensity Duration Frequency (IDF) Storm Parameters

Rainfall intensity duration frequency (IDF) storm parameters for the City of Guelph were obtained from the City’s Development Engineering Manual (October 2023) from Table 5-2.

4.2 Pre-development Conditions

Pre-development conditions were obtained from the Plan of Survey Showing Topographic Features by J.D. Barnes Ltd., dated June 22, 2023. Under pre-development conditions, the approximately 0.26 ha site located at 303, 309 and 317 Speedvale Avenue E consists of one commercial property, two single-family dwellings, and a garage, with associated parking areas and landscaping. As per SWM calculations in Appendix D, the pre-development site has a calculated C-value of 0.64.

From the topographic survey, grading conveys flows on the subject site into the Speedvale ROW. A smaller portion of flows are directed south into the Manhattan Court ROW, where flows are ultimately directed back into the existing 1500mm storm sewer in the Speedvale ROW, as shown in City Drawing No. 2-A-50 (provided in Appendix A). As such, the subject site has been taken as a single pre-development catchment area that is ultimately tributary to the existing 1500 mm diameter storm sewer in the Speedvale ROW.

4.3 Post-development Conditions

Post-development conditions were obtained from the Site Plan by SBM, provided separately. Under post-development conditions, the entire site will be comprised of a 6-storey residential apartment building, and associated drive aisles, amenity space, and landscaping, for a post-development C-value for the entire site of 0.80. As per the City’s DEM, post-development flows are to be attenuated to pre-development levels.

4.4 Storm Servicing

Based on the City of Guelph As-Recorded Drawing No. M-737A, dated May 2008, provided in Appendix A, there is an existing 1500 mm diameter municipal storm sewer at 0.86% located within the Speedvale Avenue E ROW. The subject site is proposed to be serviced via a 250 mm service at 0.69%. Flows are to be restricted by flow-controlled roof drains on top of the building, and by a raised-outlet at CBMH2, which will allow flows to infiltrate via the proposed linear infiltration gallery, in order to meet City infiltration targets, as detailed in the sections below.

No additional surface flows are to be introduced into the City ROW, and as such, any excess storm flows produced by the subject site are to be stored on-site and released at pre-development levels, mimicking existing conditions.

4.5 Stormwater Management – Quantity Control

As shown in the attached stormwater management (SWM) calculations, due to the increase in impervious cover, increased stormwater runoff from the site is anticipated and formal SWM quantity controls are proposed to be implemented. These controls are to attenuate post-development flows of the 2 to 100-year to the pre-development levels and to allow infiltration for the runoff that is generated from 5 mm of rainfall, as per Guelph’s Development Engineering Manual. SWM quality controls will be implemented to provide Enhanced Level treatment levels as per the MECP SWM Planning and Design Manual. SWM quantity and quality controls demonstrating compliance with the SWM criteria and environmental targets identified will be addressed at the time of detailed design.

As per Guelph’s Stormwater Control Criteria Map, the subject site falls within the City-Wide Policy Area #13. The infiltration targets for this area require 5 mm to be infiltrated on site. Based on the total site area of 0.26 ha, the above requirement results in an infiltration volume of 13.01 m³. It is proposed to install a 48 m long linear infiltration trench between CBMH2 and CBMH3, which is sufficient to infiltrate the required volume, as shown in the SWM

calculations provided in Appendix D. The exact infiltration rate is to be confirmed prior to detailed design via a geotechnical engineer, and the proposed infiltration methodology is to be revised if required at the time of detailed design to ensure the City's infiltration targets are met.

The site has been designed for a C-value equal to 0.640. as per the pre-development conditions, which translates to a maximum allowable release rate of 67.46 L/s for the 2-year event and 141.21 L/s for the 100-year event.

Catchment U201 (484.67 m²) is comprised of the north side of the proposed development, which is mostly landscaped area. Flows from this small uncontrolled catchment area (7.55 L/s and 15.81 L/s for the 2-year and 100-year event respectively) are directed into the Speedvale Avenue E ROW, and these minimal uncontrolled flows are not anticipated to significantly impact the subject site nor the surrounding properties, as it matches the pre-existing site condition.

As shown in the attached SWM calculations in Appendix D, the resulting restricted post-development flow rates were calculated by subtracting the uncontrolled flows from the allowable flow rate. This results in maximum allowable restricted flow rates of 59.91 L/s and 125.40 L/s for the 2-year and 100-year events respectively.

Catchment A201 (853.84 m²) is comprised of the building rooftop, resulting in a C-value of 0.90. Flows within this catchment are to be restricted via 3 flow-controlled roof drains, which are to be coordinated with the mechanical design team. Each drain is proposed to release a peak flow of 1.5 L/s, for a total peak release of 4.5 L/s for the entire catchment. The rooftop storage volume was conservatively calculated by multiplying the area of the roof by the maximum water depth of 0.15 m and dividing by three. This results in an estimated storage volume of 42.69 m³, of which 12.70 m³ and 24.55 m³ are required to store the 2-year and 100-year storm events respectively. The restricted flows from this catchment are to be directed through the building and into area A202 underground via the proposed 250 mm connection from the building to the linear infiltration gallery.

Catchment A202 (1,263.31 m²) is comprised of the at-grade parking area. The small portion of landscaped area in this catchment has been conservatively ignored, and as such, the C-value was taken to be 0.90. The proposed parking lot is graded to direct flows into either CBMH2 or CBMH3, where flows will enter the proposed infiltration gallery. A raised outlet in CBMH2 is provided, as detailed on Engineering Drawing C3, to keep flows within the infiltration gallery until it is full. This allows for retention and infiltration onsite for 5 mm of rainfall, as per City of Guelph Development Engineering Manual (DEM) October 2023, Appendix G, while still allowing any overflow to drain towards the municipal sewer system. Based on the total site area of 0.26 ha, the above requirement results in an infiltration volume of 13.01 m³ that is to be stored and infiltrated on-site. The exact infiltration rate of the soil is unknown and was estimated using the borehole results of the Geotechnical Investigation by CMT Engineering, dated August 3, 2023, provided separately. Detailed calculations and design of the infiltration gallery is to be completed at the time of detailed design for site plan approval when the exact infiltration rate of the soil onsite is known.

As shown in the SWM calculations provided in Appendix D, the volume of infiltrated water exceeds the required 13.01 m³, and there is sufficient storage within the proposed on-site storm system to attenuate the flows to a peak flow rate of 47.70 L/s for the 2-year to 100-year storm events, which is below the allowable rates of 59.91 L/s and 125.40 L/s for the 2-year and 100-year events respectively.

4.6 Stormwater Management – Quality Control

SWM quality controls will be implemented to provide Enhanced Level treatment levels (80% removal) as per the MECP SWM Planning and Design Manual. SWM quantity and quality controls demonstrating compliance with the SWM criteria and environmental targets identified will be addressed at the time of detailed design for Site Plan Approval.

An oil-grit separator (OGS) is proposed for the subject site to meet the above targets. Therefore, an FD-4HC OGS unit (or approved equivalent) is proposed to provide 80% TSS removal for quality control for flows that exit the site via the overflow pipe, and is ETV certified as required per Guelph's DEM. Please see Appendix D for details.

Post-development stormwater flows will be restricted to the pre-development levels during the 2 to 100-year design storm events. Major Overland Flows from the 100-year storm event will be safely conveyed overland northeast to the Manhattan Court ROW, generally matching pre-development conditions. A Preliminary Grading Plan prepared by

SBM has been provided to demonstrate the grading feasibility and intent for the subject site. Detailed SWM calculations, infiltration design, and grading plans will be prepared at the time of detailed design for Site Plan Approval.

5. LIMITATIONS

This report was prepared by SBM for the City of Guelph and Habitat for Humanity Guelph Wellington. Use of this report by any third party, or any reliance upon its findings, is solely the responsibility of that party. SBM accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions undertaken as a result of this study. Third party use of this study, without the express written consent of the Consultant, denies any claims, whether in contract, tort, and/or any other cause of action in law, against the Consultant.

All findings and conclusions presented in this report are based on site conditions as they appeared during the period of the investigation. This report is not intended to be exhaustive in scope, or to imply a risk-free facility. It should be recognized that the passage of time may alter the opinions, conclusions, and recommendations provided herein.

The design was limited to the documents referenced herein and on the SBM drawings provided separately. SBM accepts no responsibility for the accuracy of the information provided by others. All designs and recommendations presented in this study are based on the information available at the time of the review.

This document is deemed to be the intellectual property of SBM in accordance with Canadian copyright law.

6. CLOSURE

We trust this report meets your satisfaction. Should you have any questions or require further information, please do not hesitate to contact us.

Respectfully submitted,

Strik, Baldinelli, Moniz Ltd.


Planning • Civil • Structural • Mechanical • Electrical



Hasan Ahmad, M. Eng., P. Eng.
Civil Eng III



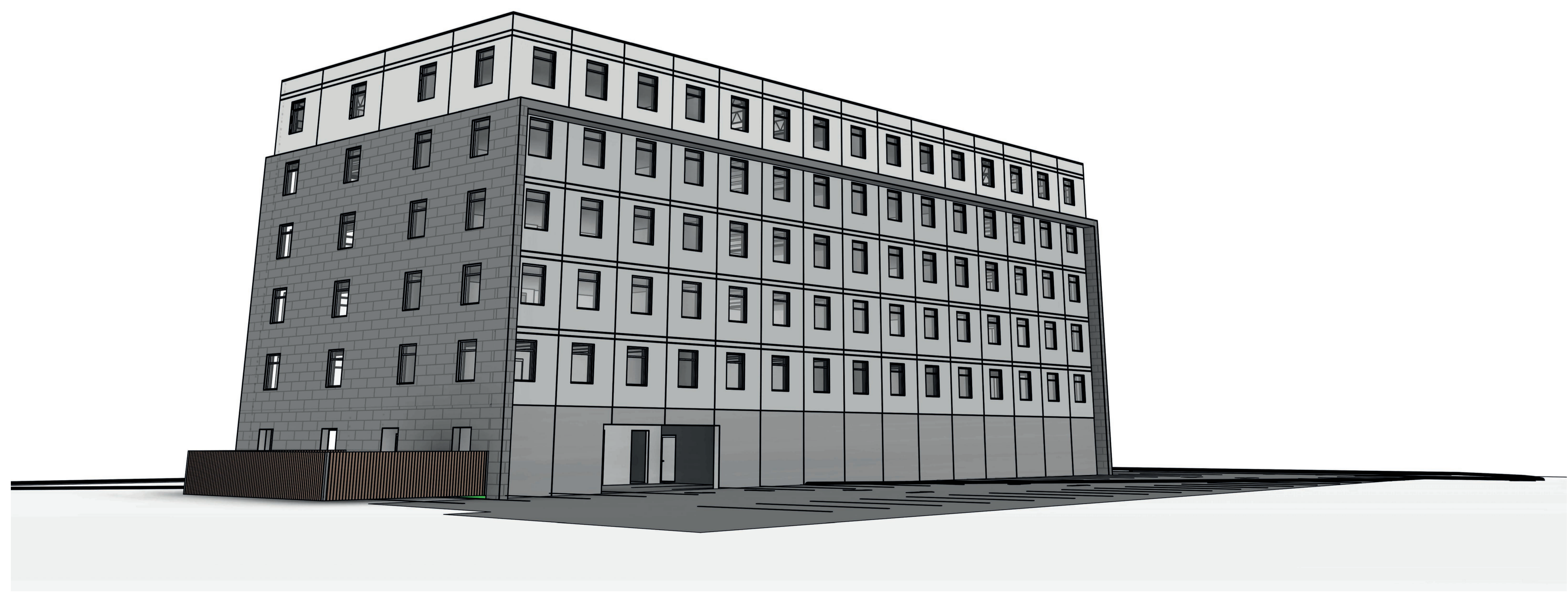
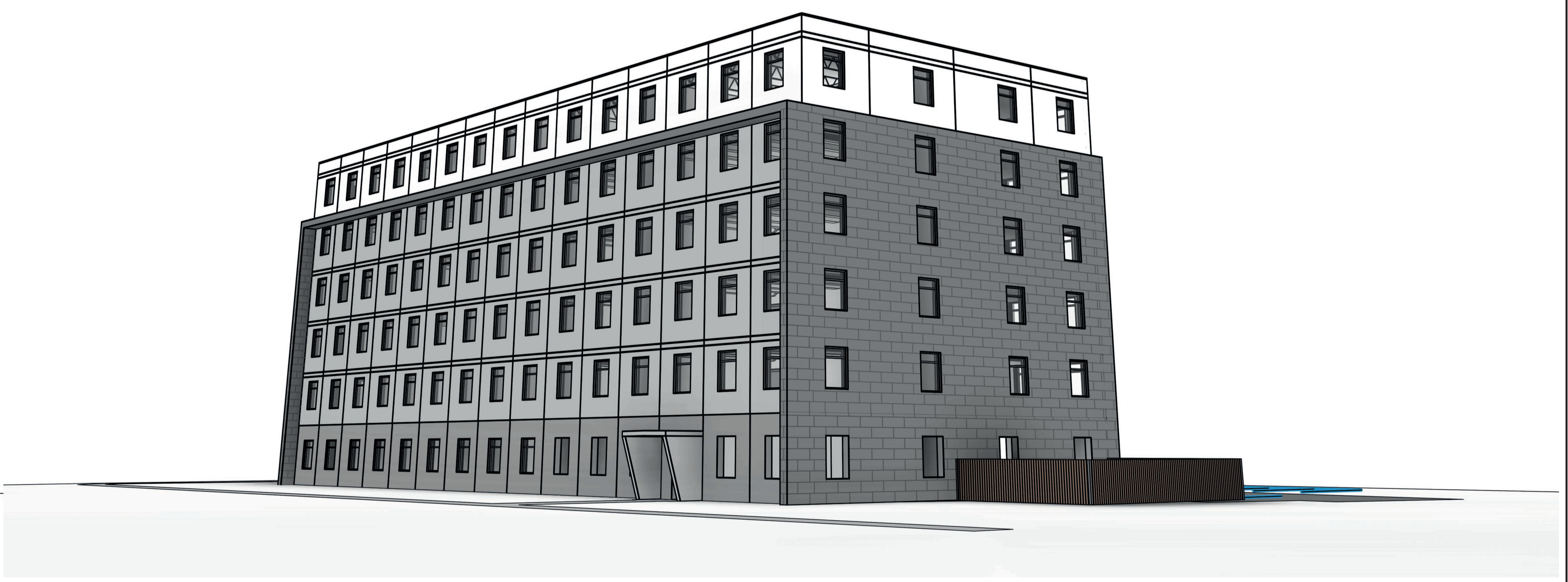
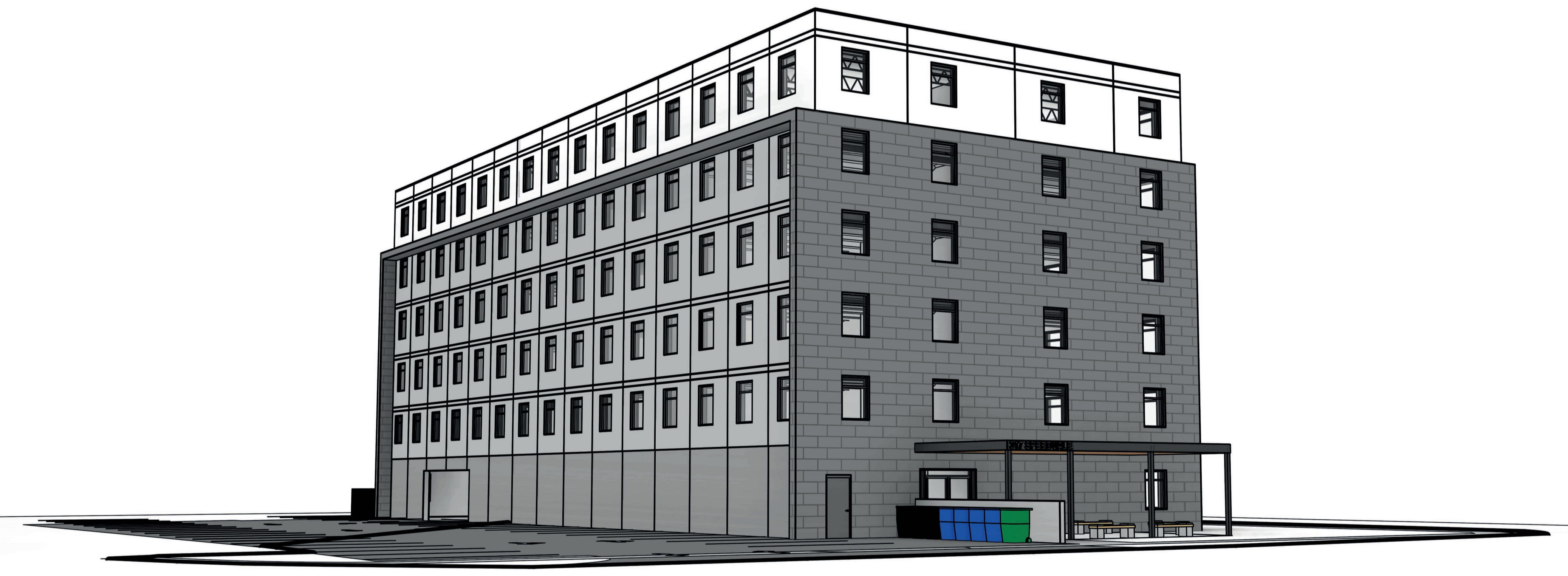
Tara Morton-Bernas
Civil Project Lead, Tech V



Lauren Andersen
Civil Engineering Trainee I

APPENDIX A

Speedvale Affordable Housing Drawings by Newton Group Ltd., dated December 19, 2023
Plan of Survey Showing Topographic Features by J.D. Barnes Ltd., dated June 22, 2023
City of Guelph As-Recorded Drawing No. M-737A, dated May 2008
City of Guelph Drawing No. 2-A-50



ARCHITECTURAL DRAWING SHEET LIST

SHEET NUMBER	SHEET NAME	SHEET ISSUED DATE	REV. #	REV. DATE
A1.00	SITE PLAN	23/08/25	B	23-12-19
A0.00	COVER PAGE	23/08/25	B	23-12-19
A2.01	BASEMENT MAIN LEVEL & LEVEL 1.0	23/08/25	B	23-12-19
A2.03	LEVEL 2.0 AND 3.0 FLOOR PLAN	23/08/25	B	23-12-19
A3.01	BUILDING SECTIONS	23/08/25	B	23-12-19
A4.01	BUILDING ELEVATIONS	23/08/25	B	23-12-19
A4.02	BUILDING ELEVATIONS	23/08/25	B	23-12-19
A2.04	LEVEL 4.0 AND 5.0 FLOOR PLAN	03/01/22	B	23-12-19
A2.05	ROOF LEVEL	23/08/25	B	23-12-19

#	23-12-19	ISSUED FOR SPA PRE-CONSULTATION	CVL
A	23-08-25	ISSUED FOR SPA PRE-CONSULTATION	CVL
#	DATE	DESCRIPTION	BY

PROJECT
SPEEDVALE AFFORDABLE HOUSING
 MANHATTAN COURT & SPEEDVALE AVE E
 GUELPH, ON
 POSTAL CODE (TBD)

DRAWING
COVER PAGE

PROJECT NO.: 23136
 PROJECT DATE: 2023-07-20
 DRAWN BY: CVL
 CHECKED BY: CU/PHI
 SCALE: AS NOTED

DRAWING NO. **A0.00**



SITE KEY PLAN
SCALE: 1 : 50

UNIT BREAKDOWN	
ROOM NAME	TOTAL UNITS
1 BEDROOM UNIT	5
1 BEDROOM-DEN UNIT	6
2 BEDROOM UNIT	17
3 BEDROOM UNIT	20
TOTAL UNITS:	48

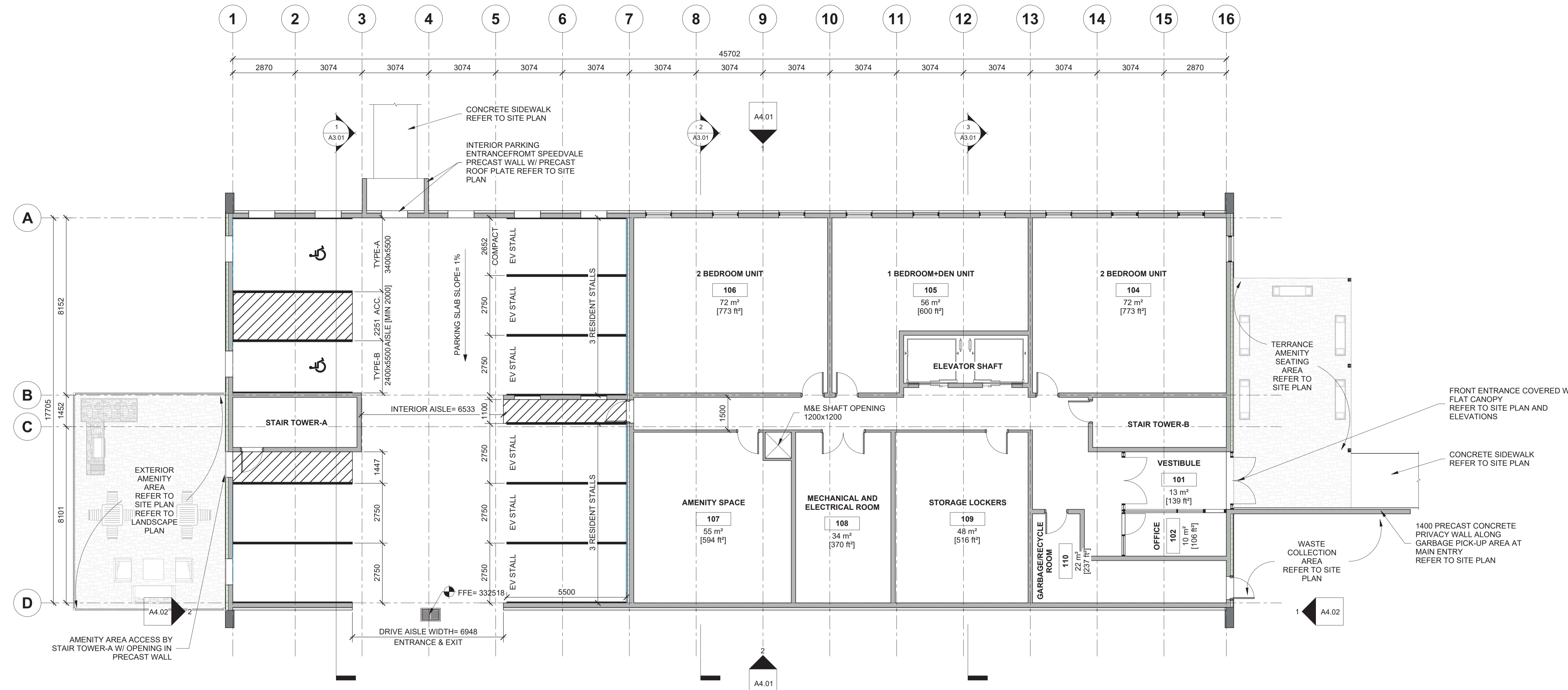
BUILDING UNIT / ROOM SCHEDULE								
ROOM NAME	ROOM #	OCCUPANCY TYPE	LEVEL REFERENCE	ROOM AREA	CEILING FINISH	BASE FINISH	WALL FINISH	COMMENTS
Not Placed								
MSE SHAFT	112		Not Placed	Not Placed				
MSE SHAFT	113		Not Placed	Not Placed				
Not Placed: 2				0 m ²				
BASEMENT								
VESTIBULE	101		BASEMENT	13 m ²				
OFFICE	102		BASEMENT	10 m ²				
2 BEDROOM UNIT	104		BASEMENT	72 m ²				
1 BEDROOM-DEN UNIT	105		BASEMENT	56 m ²				
2 BEDROOM UNIT	106		BASEMENT	72 m ²				
AMENITY SPACE	107		BASEMENT	55 m ²				
MECHANICAL AND ELECTRICAL ROOM	108		BASEMENT	34 m ²				
STORAGE LOCKERS	109		BASEMENT	48 m ²				
GARAGE/RECYCLE ROOM	110		BASEMENT	22 m ²				
COORDR	111		BASEMENT	51 m ²				
STAIR TOWER-B	314		BASEMENT	14 m ²				
TERRACE AMENITY AREA	N/A		BASEMENT	57 m ²				
DINING AMENITY AREA	N/A		BASEMENT	70 m ²				
STAIR TOWER-A	TBD		BASEMENT	13 m ²				
ELEVATOR SHAFT	TBD		BASEMENT	13 m ²				
BASEMENT: 15				600 m ²				
LEVEL 1.0								
2 BEDROOM UNIT	101		LEVEL 1.0	72 m ²				
3 BEDROOM UNIT	102		LEVEL 1.0	88 m ²				
1 BEDROOM-DEN UNIT	103		LEVEL 1.0	56 m ²				
2 BEDROOM UNIT	104		LEVEL 1.0	69 m ²				
1 BEDROOM UNIT	105		LEVEL 1.0	48 m ²				
3 BEDROOM UNIT	106		LEVEL 1.0	95 m ²				
2 BEDROOM UNIT	107		LEVEL 1.0	73 m ²				
3 BEDROOM UNIT	108		LEVEL 1.0	88 m ²				
3 BEDROOM UNIT	109		LEVEL 1.0	97 m ²				
LEVEL 1.0: 9				685 m ²				
LEVEL 2.0								
2 BEDROOM UNIT	201		LEVEL 2.0	72 m ²				
3 BEDROOM UNIT	202		LEVEL 2.0	88 m ²				
1 BEDROOM-DEN UNIT	203		LEVEL 2.0	56 m ²				
2 BEDROOM UNIT	204		LEVEL 2.0	69 m ²				
1 BEDROOM UNIT	205		LEVEL 2.0	48 m ²				
3 BEDROOM UNIT	206		LEVEL 2.0	95 m ²				
2 BEDROOM UNIT	207		LEVEL 2.0	73 m ²				
3 BEDROOM UNIT	208		LEVEL 2.0	88 m ²				
3 BEDROOM UNIT	209		LEVEL 2.0	97 m ²				
LEVEL 2.0: 9				685 m ²				
LEVEL 3.0								
2 BEDROOM UNIT	301		LEVEL 3.0	72 m ²				
3 BEDROOM UNIT	302		LEVEL 3.0	88 m ²				
1 BEDROOM-DEN UNIT	303		LEVEL 3.0	56 m ²				
2 BEDROOM UNIT	304		LEVEL 3.0	69 m ²				
1 BEDROOM UNIT	305		LEVEL 3.0	48 m ²				
3 BEDROOM UNIT	306		LEVEL 3.0	95 m ²				
2 BEDROOM UNIT	307		LEVEL 3.0	73 m ²				
3 BEDROOM UNIT	308		LEVEL 3.0	88 m ²				
3 BEDROOM UNIT	309		LEVEL 3.0	97 m ²				
LEVEL 3.0: 9				685 m ²				
LEVEL 4.0								
2 BEDROOM UNIT	401		LEVEL 4.0	72 m ²				
3 BEDROOM UNIT	402		LEVEL 4.0	88 m ²				
1 BEDROOM-DEN UNIT	403		LEVEL 4.0	56 m ²				
2 BEDROOM UNIT	404		LEVEL 4.0	69 m ²				
1 BEDROOM UNIT	405		LEVEL 4.0	48 m ²				
3 BEDROOM UNIT	406		LEVEL 4.0	95 m ²				
2 BEDROOM UNIT	407		LEVEL 4.0	73 m ²				
3 BEDROOM UNIT	408		LEVEL 4.0	88 m ²				
3 BEDROOM UNIT	409		LEVEL 4.0	97 m ²				
LEVEL 4.0: 9				685 m ²				
LEVEL 5.0								
2 BEDROOM UNIT	501		LEVEL 5.0	72 m ²				
3 BEDROOM UNIT	502		LEVEL 5.0	88 m ²				
1 BEDROOM-DEN UNIT	503		LEVEL 5.0	56 m ²				
2 BEDROOM UNIT	504		LEVEL 5.0	69 m ²				
1 BEDROOM UNIT	505		LEVEL 5.0	48 m ²				
3 BEDROOM UNIT	506		LEVEL 5.0	95 m ²				
2 BEDROOM UNIT	507		LEVEL 5.0	73 m ²				
3 BEDROOM UNIT	508		LEVEL 5.0	88 m ²				
3 BEDROOM UNIT	509		LEVEL 5.0	97 m ²				
LEVEL 5.0: 9				685 m ²				
TOTAL UNITS: 62				4022 m ²				

1 PROPOSED SITE PLAN
SCALE: 1 : 150

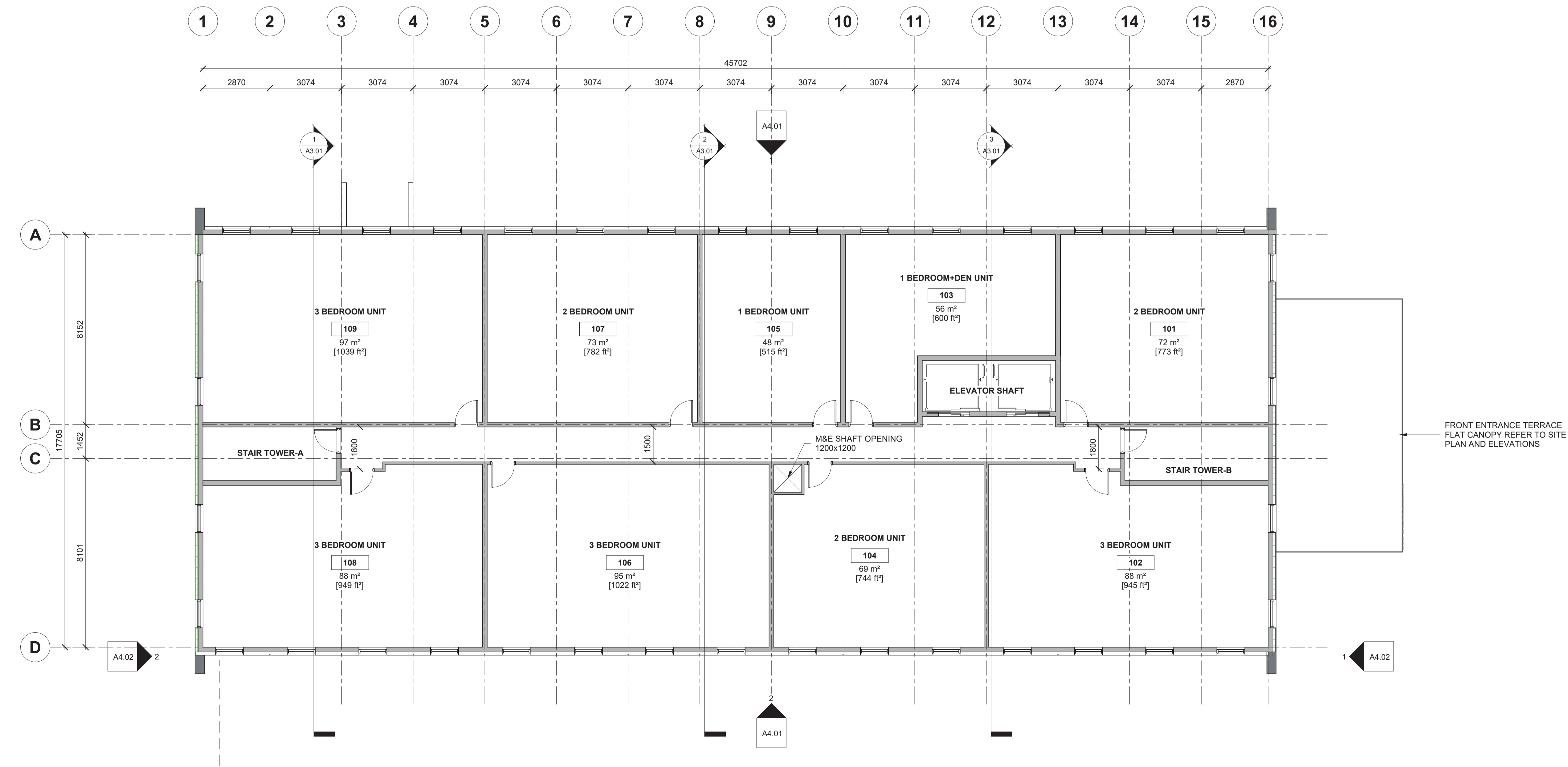
PV SOLAR PANEL SCHEDULE					
PANEL TYPE	Level	LEVEL COMMENTS	Count	PANEL ANGLE	COMMENTS
PV SOLAR PANEL 1000 x 2000 (ANGLED)	LUS OF DECK	APARTMENT ROOF	224	FLUSH MOUNT	BALLAST SYSTEM
			224		
TOTAL PANELS= 224					

PARKING SCHEDULE					
STALL TYPE	PARKING LEVEL REFERENCE	STALL QTY	COMMENTS		
TYP. STALL VISITORS CoG-2.75m x 5.5m	EXTERIOR PARKING	2	SPOTS NOT ACCESSIBLE DURING GARBAGE PICK-UP TIME		
TYP. ACC. STALL-A CoG-3.4m x 5.50m	INTERIOR PARKING	1			
TYP. ACC. STALL-B CoG-2.75m x 5.50m	INTERIOR PARKING	1			
TYP. STALL RESIDENT CoG-2.75m x 5.5m	INTERIOR PARKING	38			
COMPACT STALL CoG-2.69x5.5m	INTERIOR PARKING W/ EV	1			
TYP. STALL RESIDENT CoG-2.75m x 5.5m	INTERIOR PARKING W/ EV	3			
TYP. STALL RESIDENT EV CoG-2.75m x 5.5m	INTERIOR PARKING W/ EV	2			
TOTAL STALLS= 48					

AMENITY AREA SCHEDULE					
ROOM NAME	ROOM NUMBER	AREA (m ²)	AREA (ft ²)	LOCATION	
AMENITY SPACE	107	55 m ²	594 ft ²	INTERIOR	
DINING AMENITY AREA	N/A	70 m ²	753 ft ²	EXTERIOR	
TERRACE AMENITY AREA	N/A	57 m ²	614 ft ²	EXTERIOR	



1 BASEMENT LEVEL
SCALE: 1 : 100



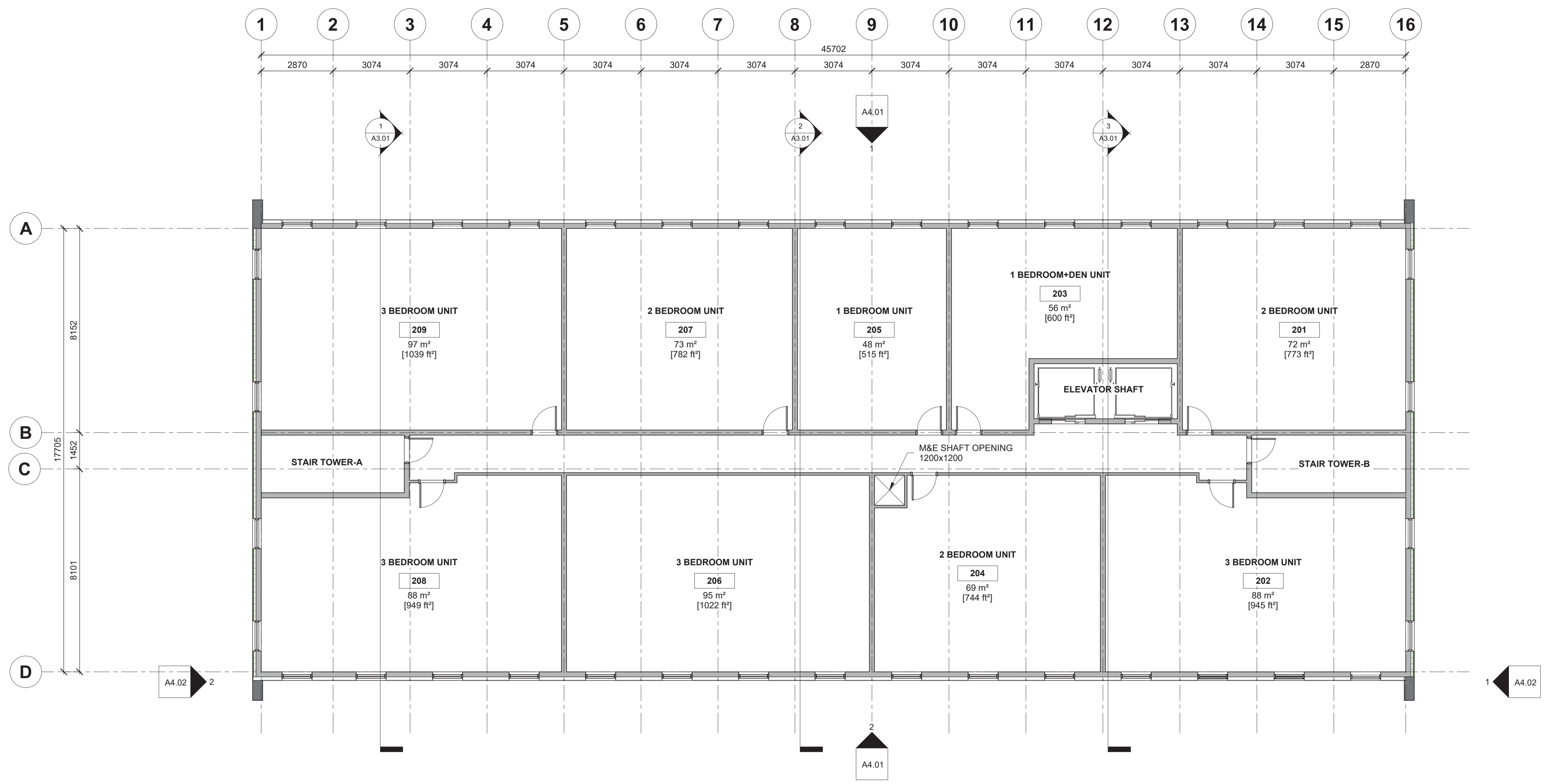
2 LEVEL 1.0
SCALE: 1 : 100

#	23-12-19	ISSUED FOR SPA PRE-CONSULTATION	CVL
A	23-08-25	ISSUED FOR SPA PRE-CONSULTATION	CVL
#		DATE	DESCRIPTION

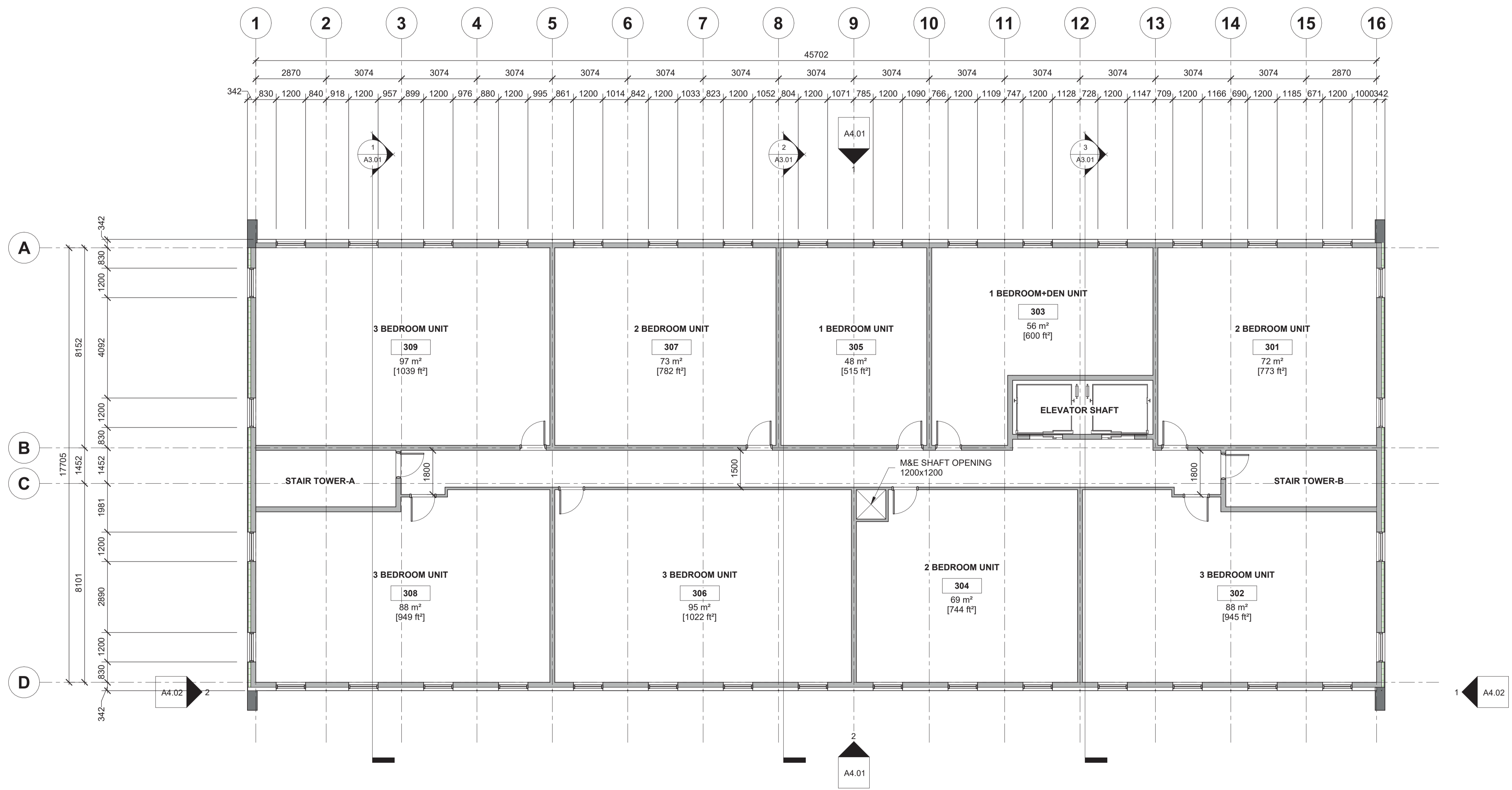
PROJECT
SPEEDVALE AFFORDABLE HOUSING
MANHATTAN COURT & SPEEDVALE AVE E
GUELPH, ON
POSTAL CODE (TBD)

DRAWING
BASEMENT MAIN LEVEL & LEVEL 1.0

PROJECT NO.:	23136
PROJECT DATE:	2023-07-20
DRAWN BY:	CVL
CHECKED BY:	CA
SCALE:	1 : 100



1 LEVEL 2.0
SCALE: 1 : 100



2 LEVEL 3.0
SCALE: 1 : 100

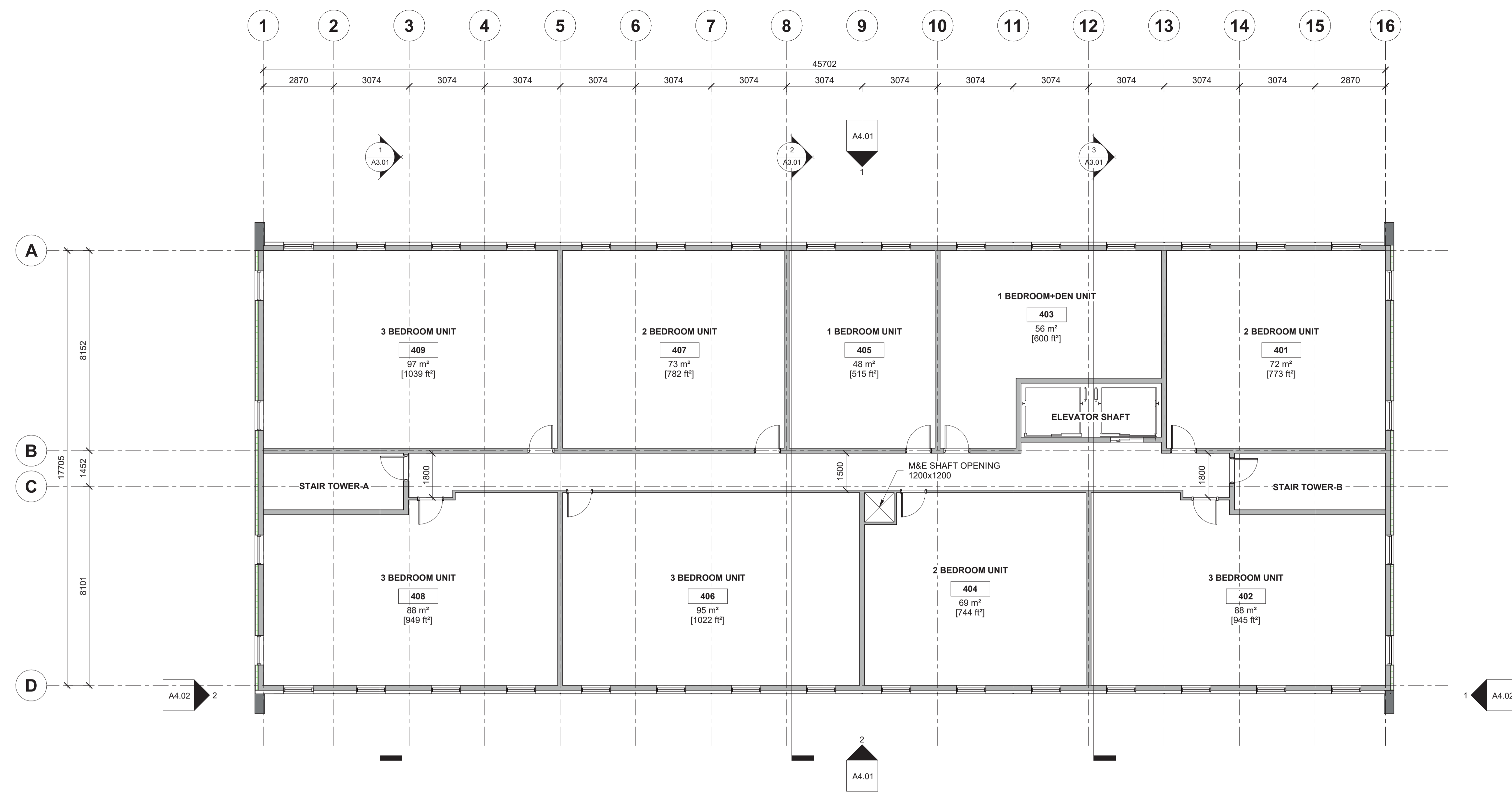
#	23-12-19	ISSUED FOR SPA PRE-CONSULTATION	CVL
#	23-08-25	ISSUED FOR SPA PRE-CONSULTATION	CVL
#		DATE	DESCRIPTION

PROJECT
SPEEDVALE AFFORDABLE HOUSING
MANHATTAN COURT & SPEEDVALE AVE E
GUELPH, ON
POSTAL CODE (TBD)

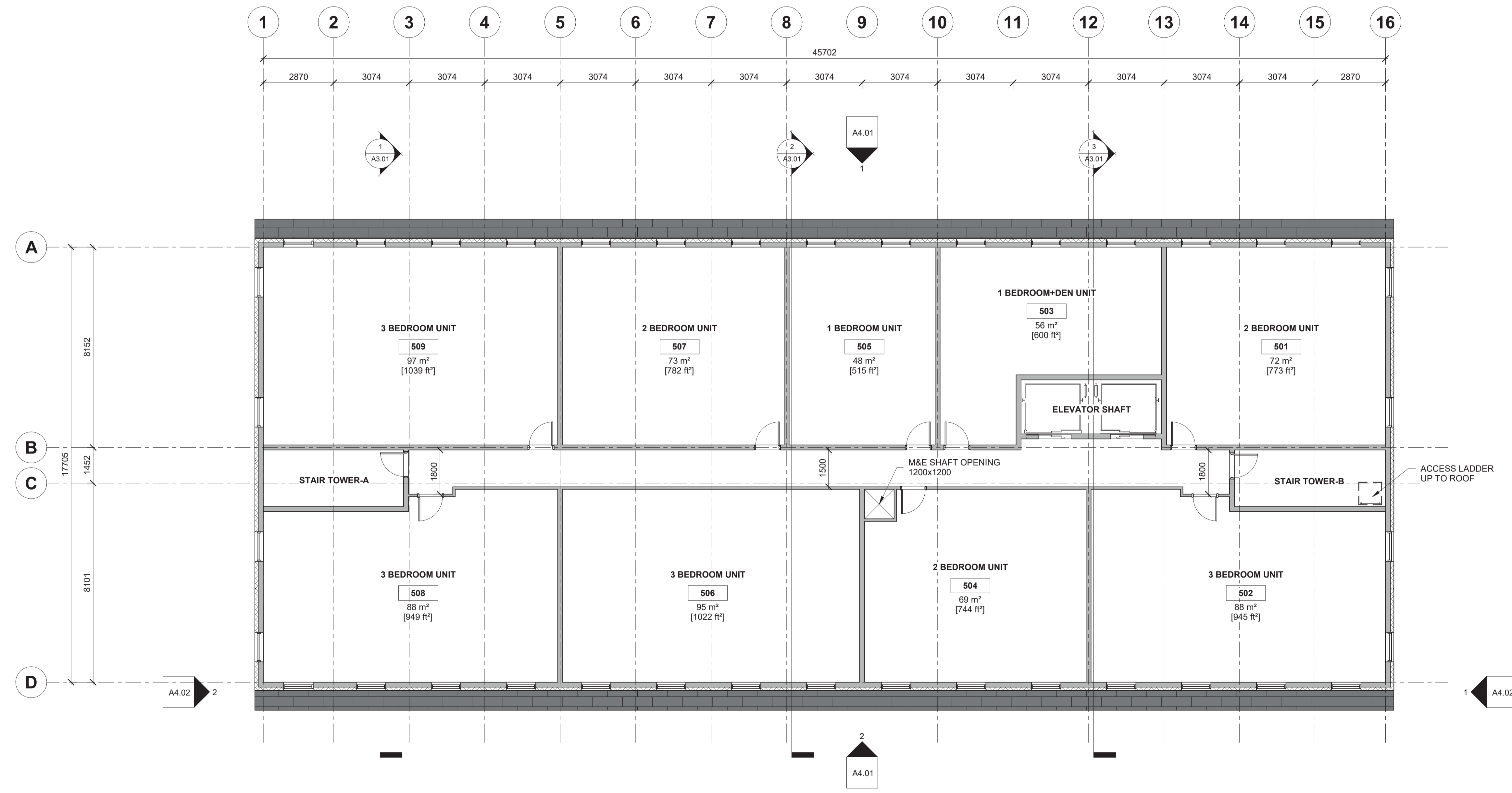
DRAWING
LEVEL 2.0 AND 3.0 FLOOR PLAN

PROJECT NO.:	23136
PROJECT DATE:	2023-07-20
DRAWN BY:	CVL
CHECKED BY:	CA
SCALE:	1 : 100

DRAWING NO. **A2.03**



1 LEVEL 4.0
SCALE: 1 : 100



2 LEVEL 5.0 (TOP FLOOR)
SCALE: 1 : 100

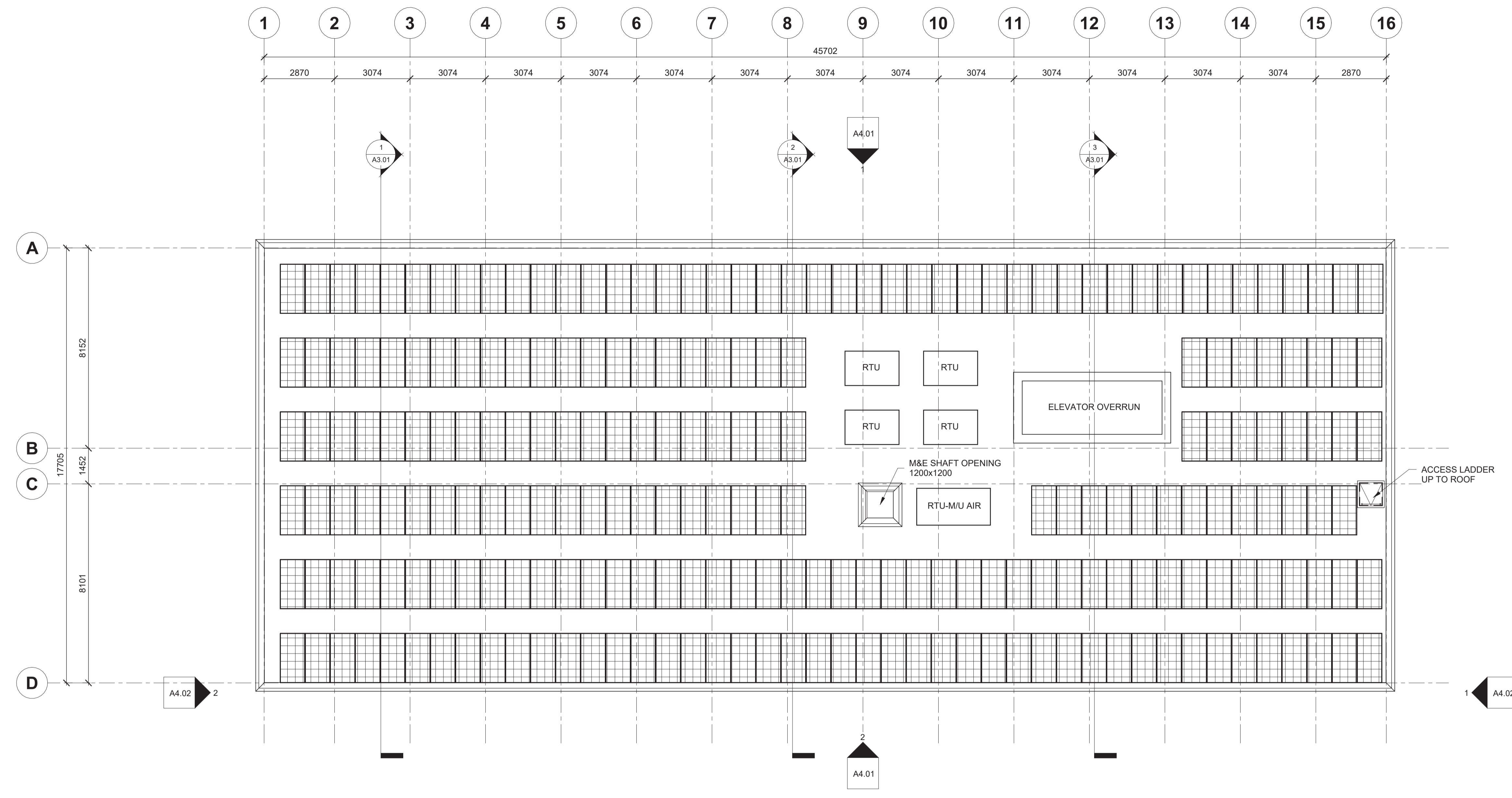
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#	23-08-25	ISSUED FOR SPA PRE-CONSULTATION	CVL
#		DATE	DESCRIPTION

PROJECT
SPEEDVALE AFFORDABLE HOUSING
MANHATTAN COURT & SPEEDVALE AVE E
GUELPH, ON
POSTAL CODE (TBD)

DRAWING
LEVEL 4.0 AND 5.0 FLOOR PLAN

PROJECT NO.:	23136
PROJECT DATE:	2023-07-20
DRAWN BY:	CVL
CHECKED BY:	CA
SCALE:	1 : 100

DRAWING NO. **A2.04**



1 U/S OF DECK
SCALE: 1 : 100

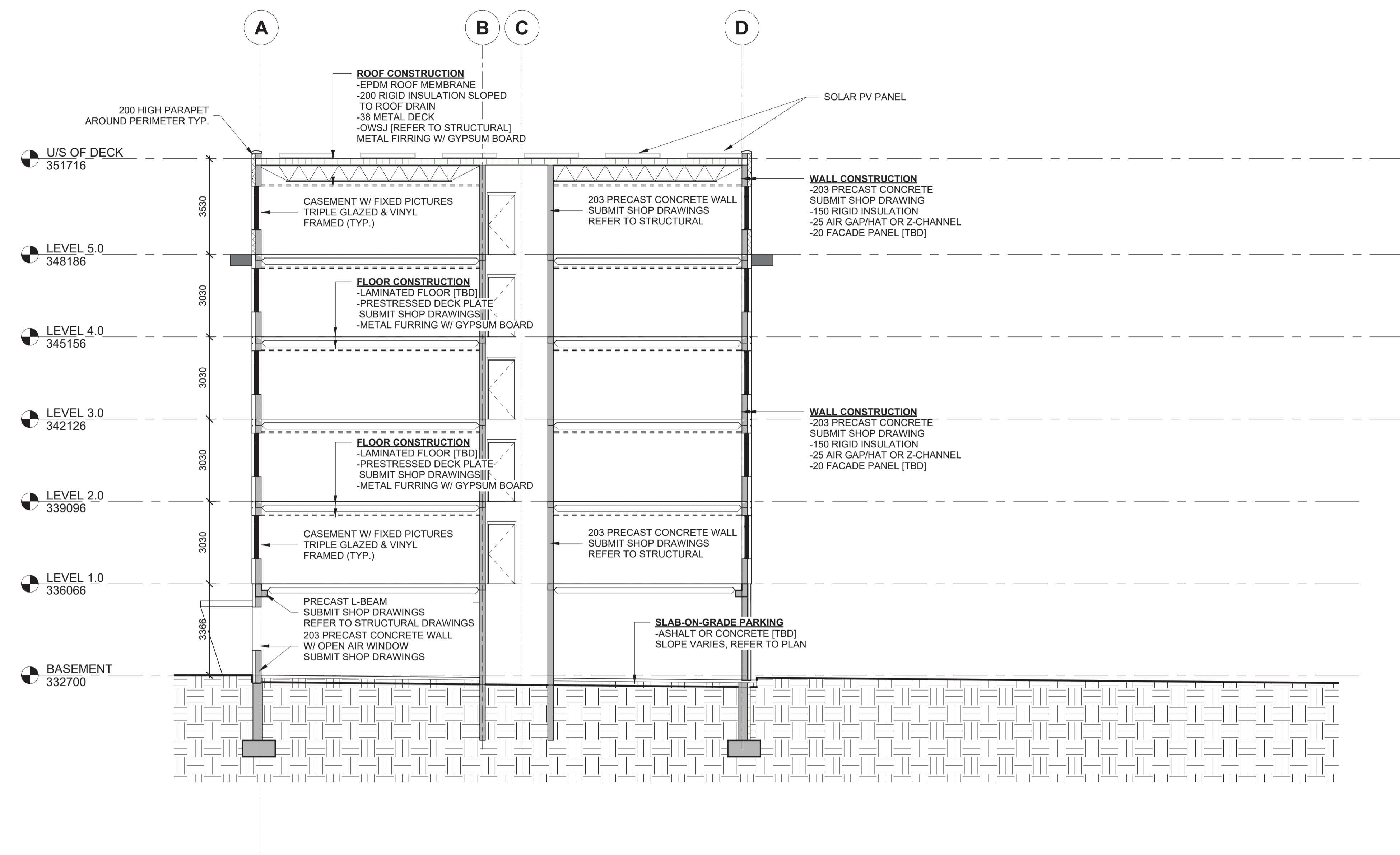
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A	23-08-25	ISSUED FOR SPA PRE-CONSULTATION	CVL
#	DATE	DESCRIPTION	BY

PROJECT
SPEEDVALE AFFORDABLE HOUSING
MANHATTAN COURT & SPEEDVALE AVE E
GUELPH, ON
POSTAL CODE [TBD]

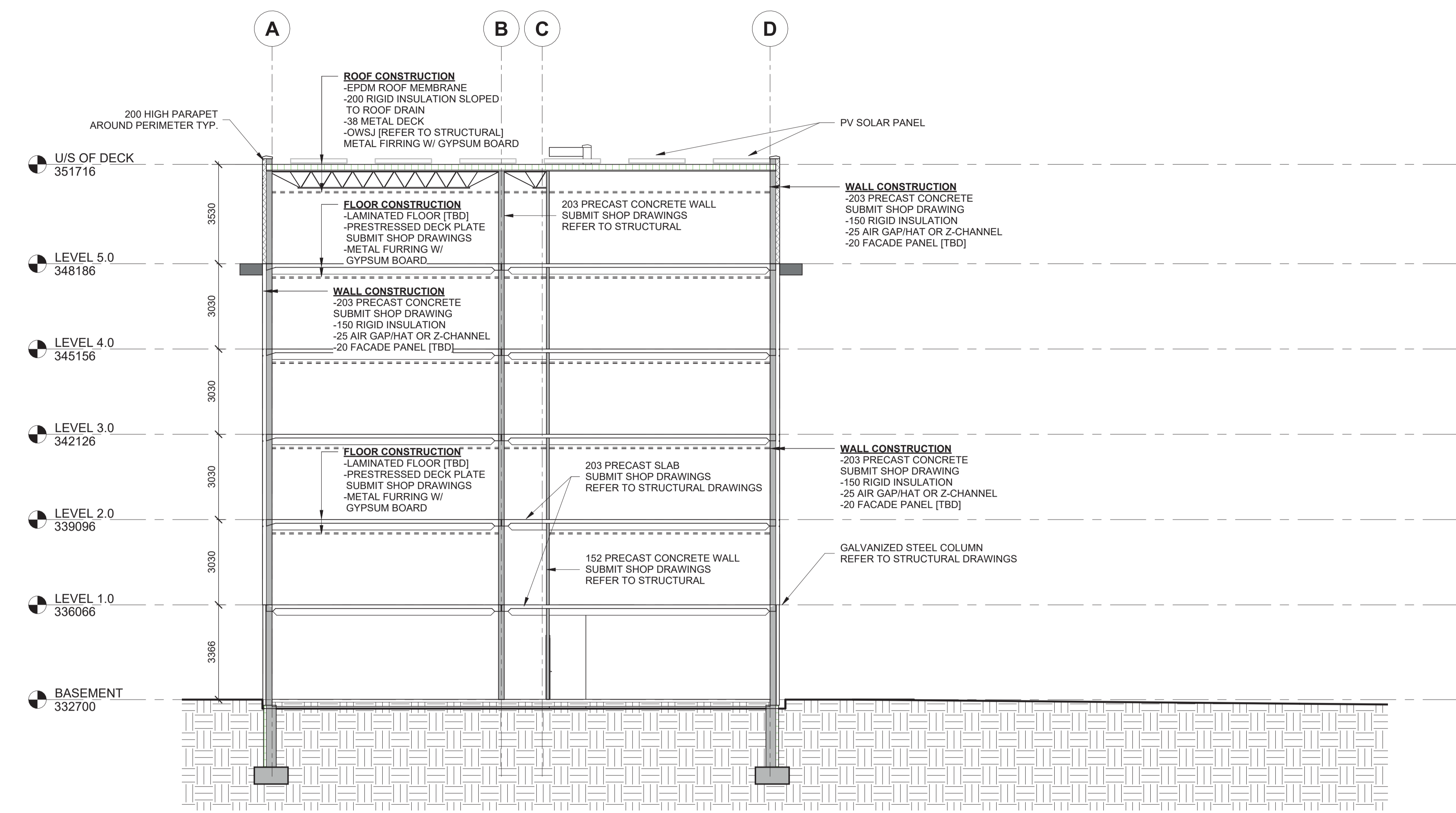
DRAWING
ROOF LEVEL

PROJECT NO.:	23136
PROJECT DATE:	2023-07-20
DRAWN BY:	CVL
CHECKED BY:	CA
SCALE:	1 : 100

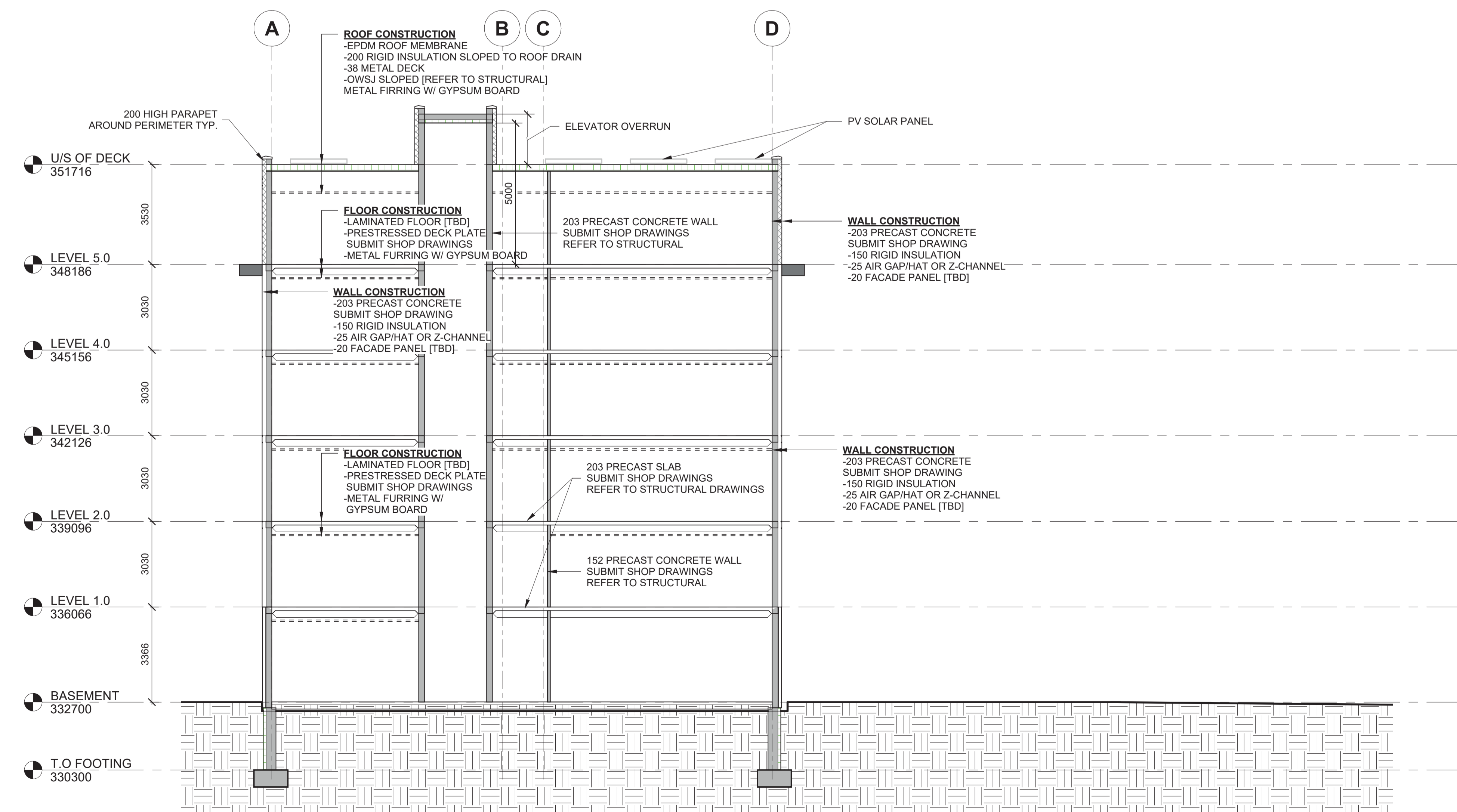
DRAWING NO. **A2.05**



1 BUILDING SECTION-1
SCALE: 1 : 100



2 BUILDING SECTION-2
SCALE: 1 : 100



3 BUILDING SECTION-3
SCALE: 1 : 100

#	23-12-19	ISSUED FOR SPA PRE-CONSULTATION	CVL
#	23-08-25	ISSUED FOR SPA PRE-CONSULTATION	CVL
#		DATE	DESCRIPTION

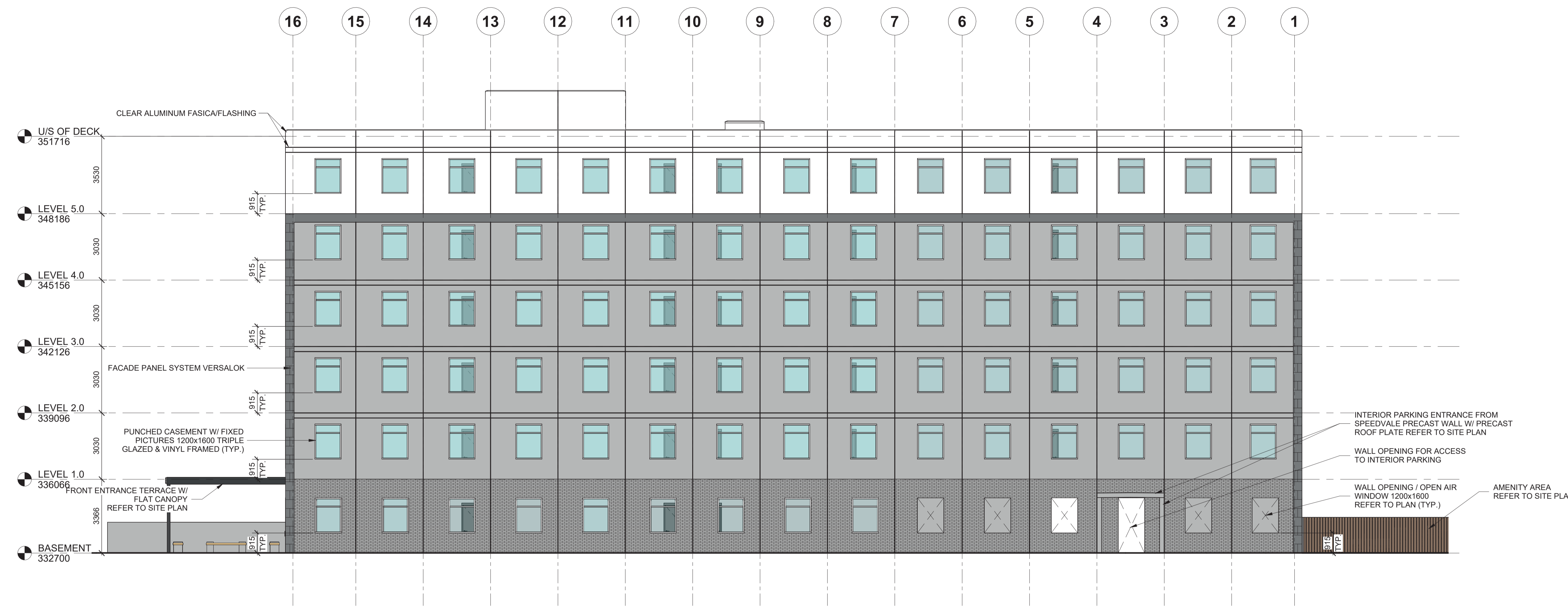
PROJECT
SPEEDVALE AFFORDABLE HOUSING
MANHATTAN COURT & SPEEDVALE AVE E
GUELPH, ON
POSTAL CODE (TBD)

DRAWING
BUILDING SECTIONS

PROJECT NO.:	23136
PROJECT DATE:	2023-07-20
DRAWN BY:	CVL
CHECKED BY:	CA
SCALE:	1 : 100

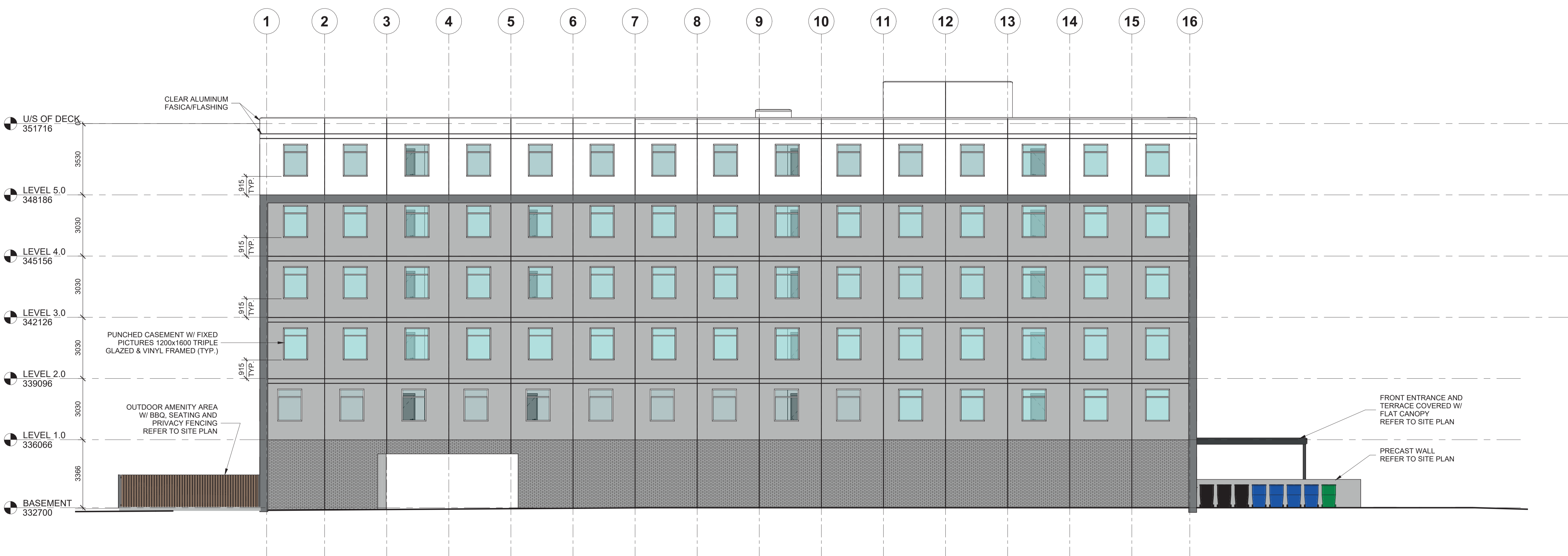
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2024.01.16.17.45.17 PM SHEET SIZE: 36 X 48



NORTH BUILDING ELEVATION

SCALE: 1 : 100



SOUTH BUILDING ELEVATION

SCALE: 1 : 100

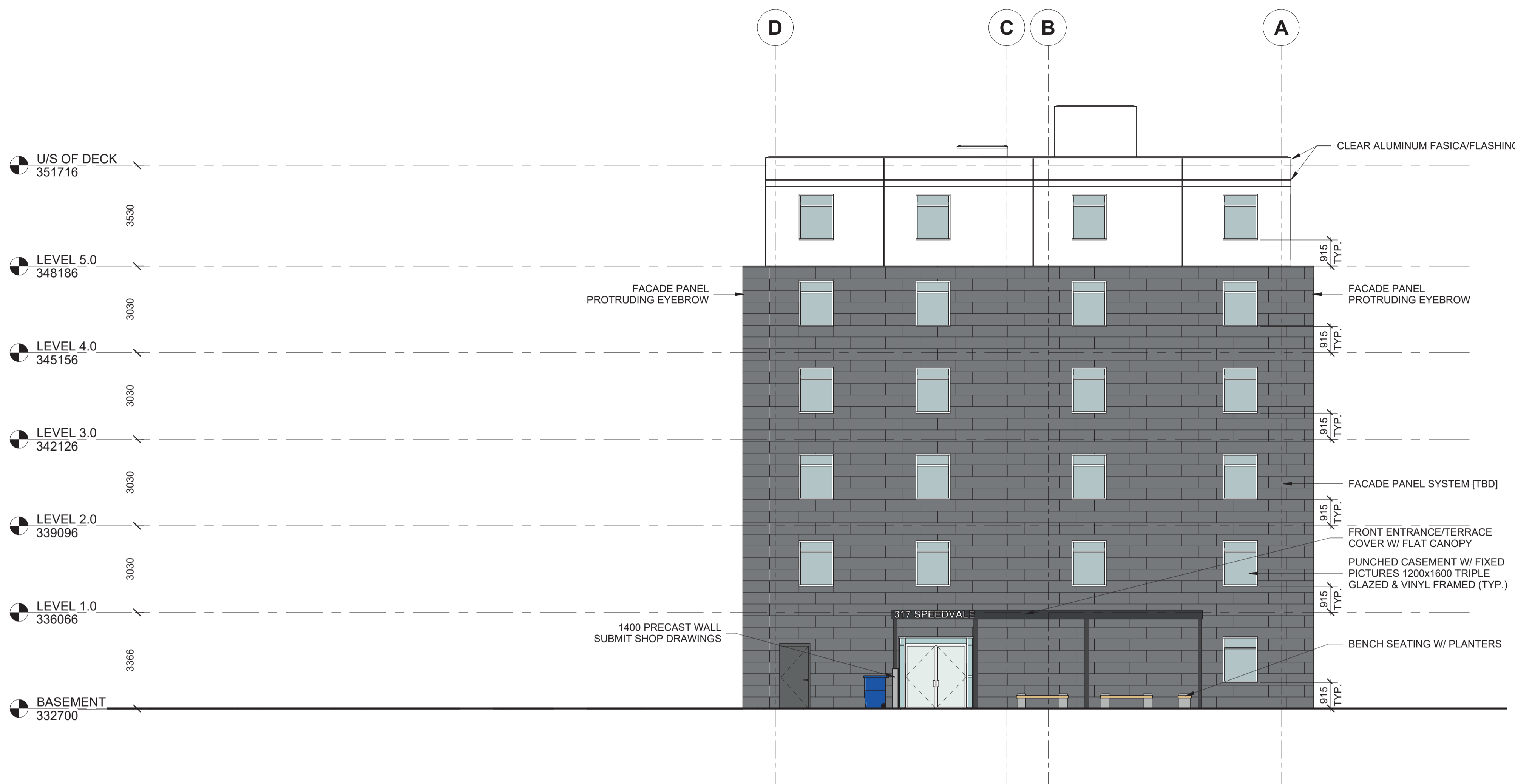
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#		DATE	DESCRIPTION

PROJECT
SPEEDVALE AFFORDABLE HOUSING
MANHATTAN COURT & SPEEDVALE AVE E
GUELPH, ON
POSTAL CODE [TBD]

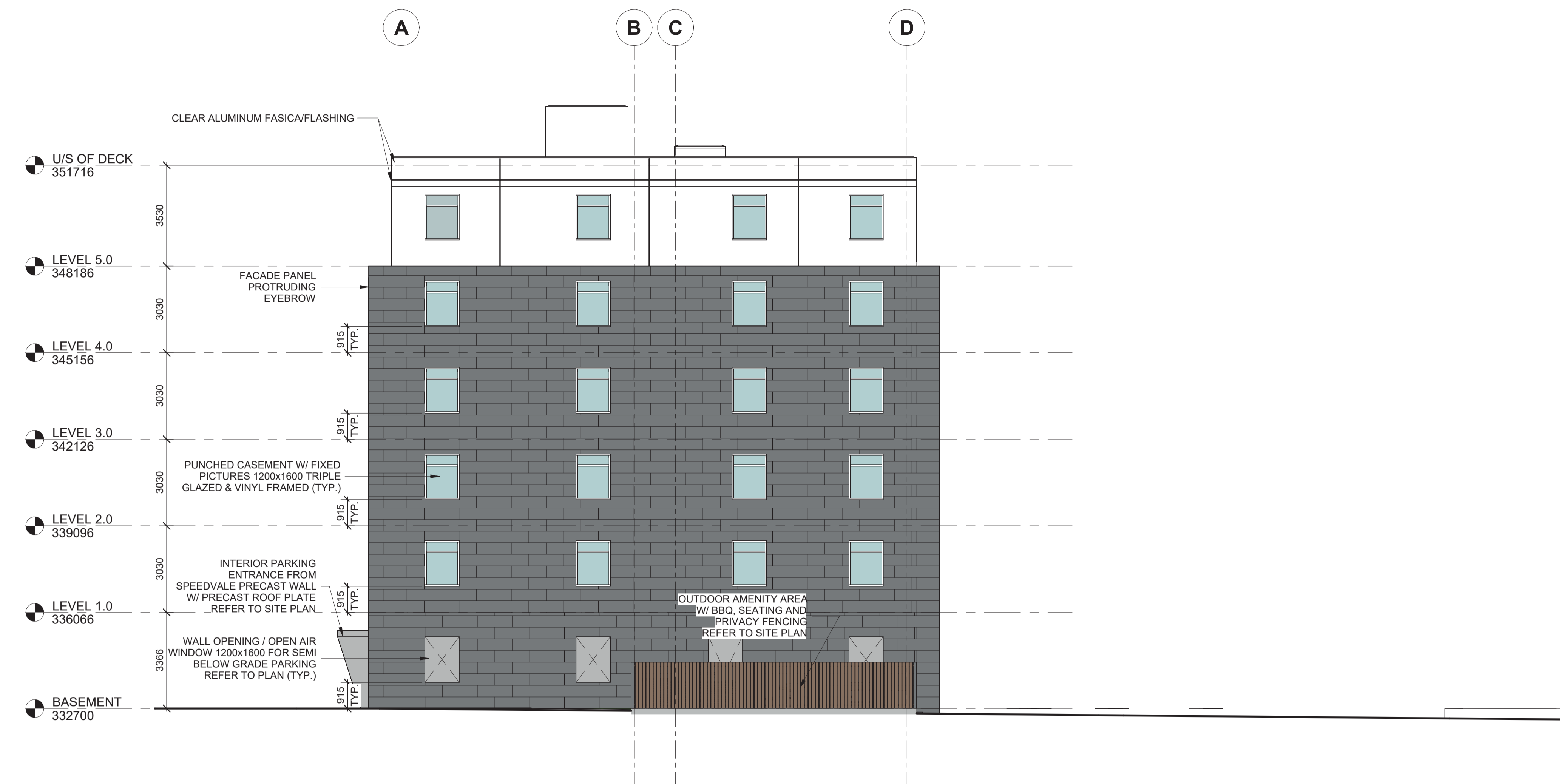
DRAWING
BUILDING ELEVATIONS

PROJECT NO.:	23136
PROJECT DATE:	2023-07-20
DRAWN BY:	CVL
CHECKED BY:	CA
SCALE:	1 : 100

DRAWING NO. **A4.01**



EAST BUILDING ELEVATION
SCALE: 1 : 100



WEST BUILDING ELEVATION
SCALE: 1 : 100

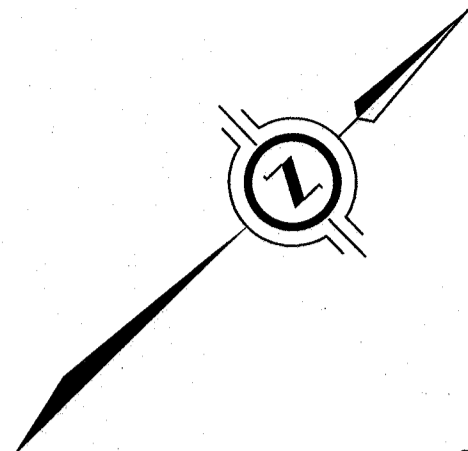
#	23-12-19	ISSUED FOR SPA PRE-CONSULTATION	CVL
A	23-08-25	ISSUED FOR SPA PRE-CONSULTATION	CVL
#	DATE	DESCRIPTION	BY

PROJECT
SPEEDVALE AFFORDABLE HOUSING
MANHATTAN COURT & SPEEDVALE AVE E
GUELPH, ON
POSTAL CODE [TBD]

DRAWING
BUILDING ELEVATIONS

PROJECT NO.:	23136
PROJECT DATE:	2023-07-20
DRAWN BY:	CVL
CHECKED BY:	CA
SCALE:	1 : 100

DRAWING NO. **A4.02**



SPEEDVALE AVENUE
PIN 71307-0002

PLAN OF SURVEY SHOWING
TOPOGRAPHIC FEATURES OF
**PART OF LOT 15
CONCESSION 2, DIVISION 'F'**
IN THE
CITY OF GUELPH
COUNTY OF WELLINGTON

SCALE 1 : 200
5 0 5 10 metres

J.D. BARNES LIMITED

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

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999598.

FOR BEARING COMPARISONS, A ROTATION OF 0°27'35" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS SHOWN ON P3 AND P4. A ROTATION OF 0°00'25" CLOCKWISE WAS APPLIED TO BEARINGS SHOWN ON P1.

ELEVATION NOTES

ELEVATIONS SHOWN HEREOA ARE GEODETIC (CGVD28-1978) AND ARE DERIVED FROM GNSS OBSERVATIONS USING NATURAL RESOURCES CANADA'S GEOD MODEL HTV2.0

INDEX CONTOURS ARE AT 1.00m INTERVALS.
INTERMEDIATE CONTOURS ARE AT 0.25m INTERVALS.

INTEGRATION DATA

OBSERVED REFERENCE POINTS (ORPs): UTM ZONE 17, NAD83 (CSRS) (2010.0).

COORDINATES TO URBAN ACCURACY PER SECTION 14 (2) OF O.REG 216/10.

POINT ID	EASTING	NORTHING
ORP (A)	559 786.55	4 823 768.89
ORP (B)	559 881.18	4 823 804.44

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

THE RESULTANT TIE BETWEEN ORP (A) AND ORP (B) IS 101.14 N69°24'35"E

LEGEND

- DENOTES SURVEY MONUMENT FOUND (VH UNLESS NOTED OTHERWISE)
- DENOTES SURVEY MONUMENT SET
- SIB DENOTES STANDARD IRON BAR
- SSIB DENOTES SHORT STANDARD IRON BAR
- IB DENOTES IRON BAR
- PB DENOTES PLASTIC BAR
- WIT DENOTES WITNESS
- MEAS DENOTES MEASURED
- BLS DENOTES BUILDING LOCATION SURVEY
- 375 DENOTES BLACK, SHOEMAKER, ROBINSON & DONALDSON LTD.
- VH DENOTES Van HARTEN SURVEYING INC.
- OU DENOTES ORIGIN UNKNOWN
- P1 DENOTES SRPR BY JDB, DATED: JAN 18, 2023 FILE: 22-14-857-00
- P2 DENOTES PLAN 61R-21047
- P3 DENOTES BLS BY 375 DATED: OCT 21, 1969 FILE: 69-1307
- P4 DENOTES REGISTERED PLAN 606
- P5 DENOTES PLAN BY VH DATED: OCT 16, 1973 FILE: MJ-622
- D1 DENOTES DEED AS IN INSTRUMENT No. ROS532100
- D2 DENOTES DEED AS IN INSTRUMENT No. ROS212691
- CT DENOTES CALCULATED FROM P4 & P2

- CB DENOTES DOUBLE CATCHBASIN
- CB DENOTES CATCHBASIN
- G METER DENOTES GAS METER
- MH DENOTES MANHOLE
- HP DENOTES HYDRO POLE
- CJB DENOTES CABLE TV JUNCTION BOX
- WV DENOTES WATER VALVE
- E DENOTES DENOTES OVERHEAD ELECTRICAL WIRE

ALL SET SSIB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF O.REG. 525/91.

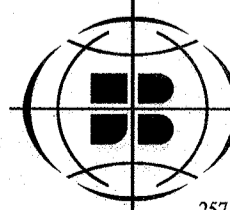
SURVEYOR'S CERTIFICATE

- 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.
 - THE SURVEY WAS COMPLETED ON JUNE 19, 2023

JUNE 22, 2023
DATE

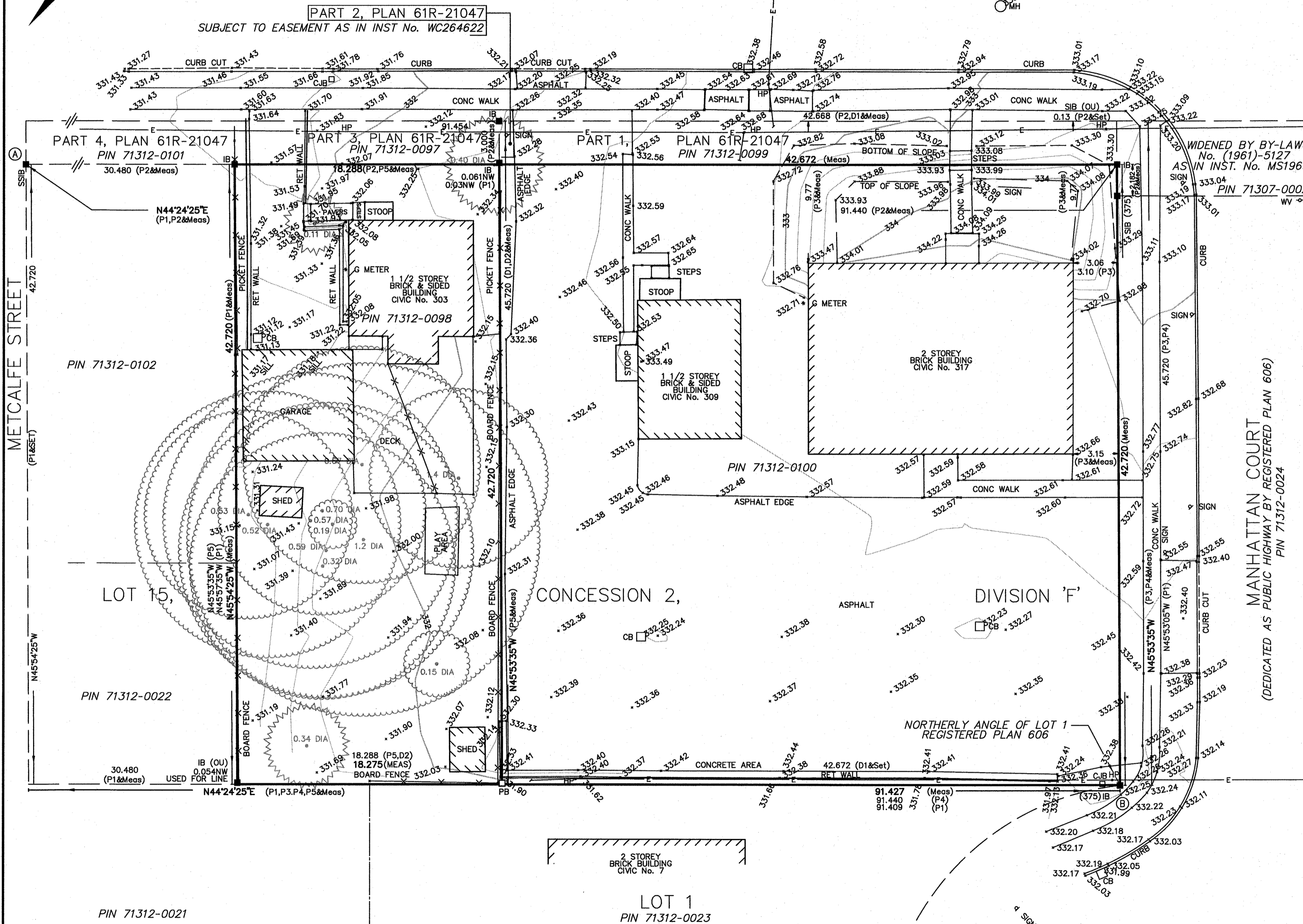
Raymond J. Sibthorp
RAYMOND J. SIBTHORP
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER V-46281



J.D. BARNES SURVEYING
LIMITED MAPPING
GIS
LAND INFORMATION SPECIALISTS
257 WOODLAWN ROAD WEST, UNIT 101, GUELPH, ON N1H 8J1
T: (519) 822-4031 F: (519) 822-1220 www.jdbarnes.com

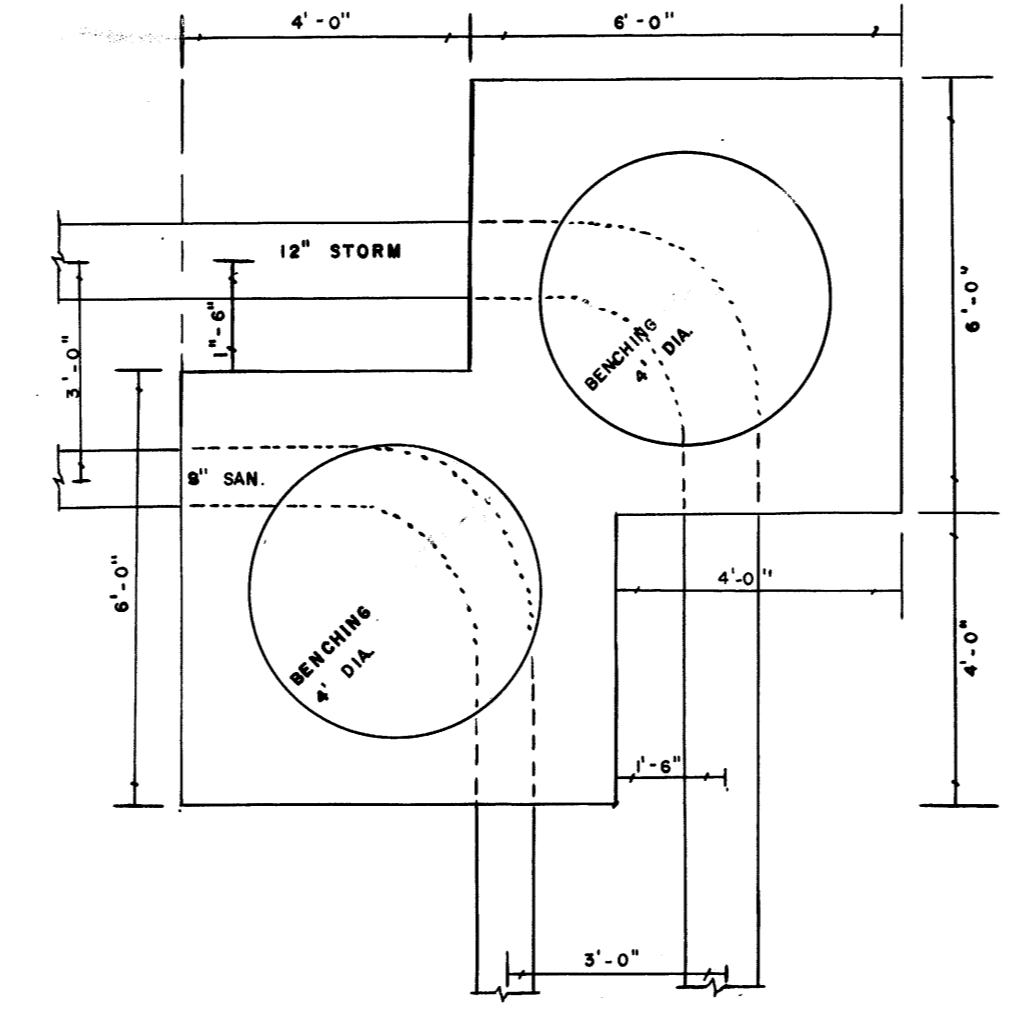
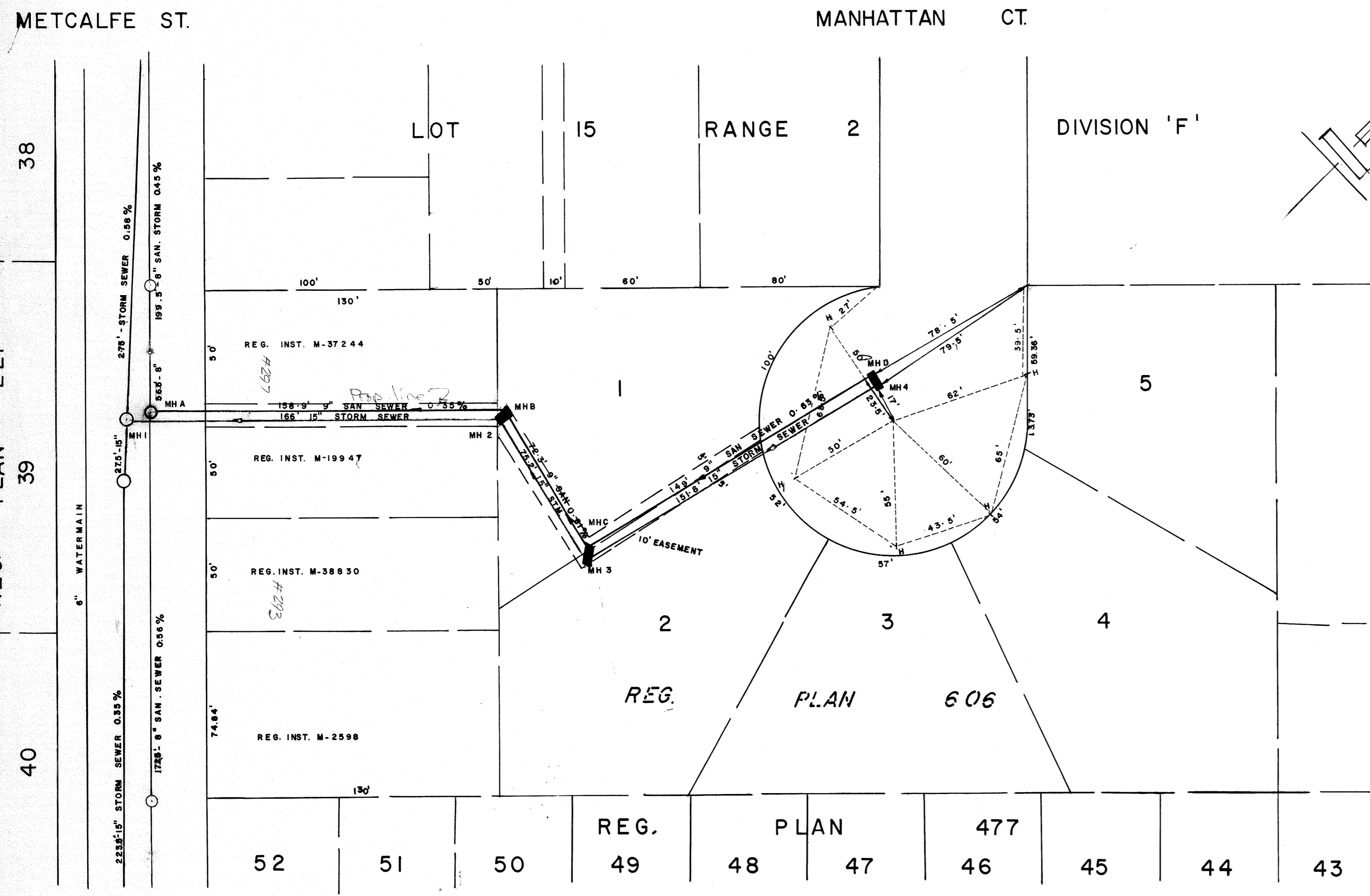
DRAWN BY: RPA	CHECKED BY: RJS	REFERENCE NO.: 23-14-947-00
PLOTTED: 6/22/2023	DATED: JUNE 22, 2023	



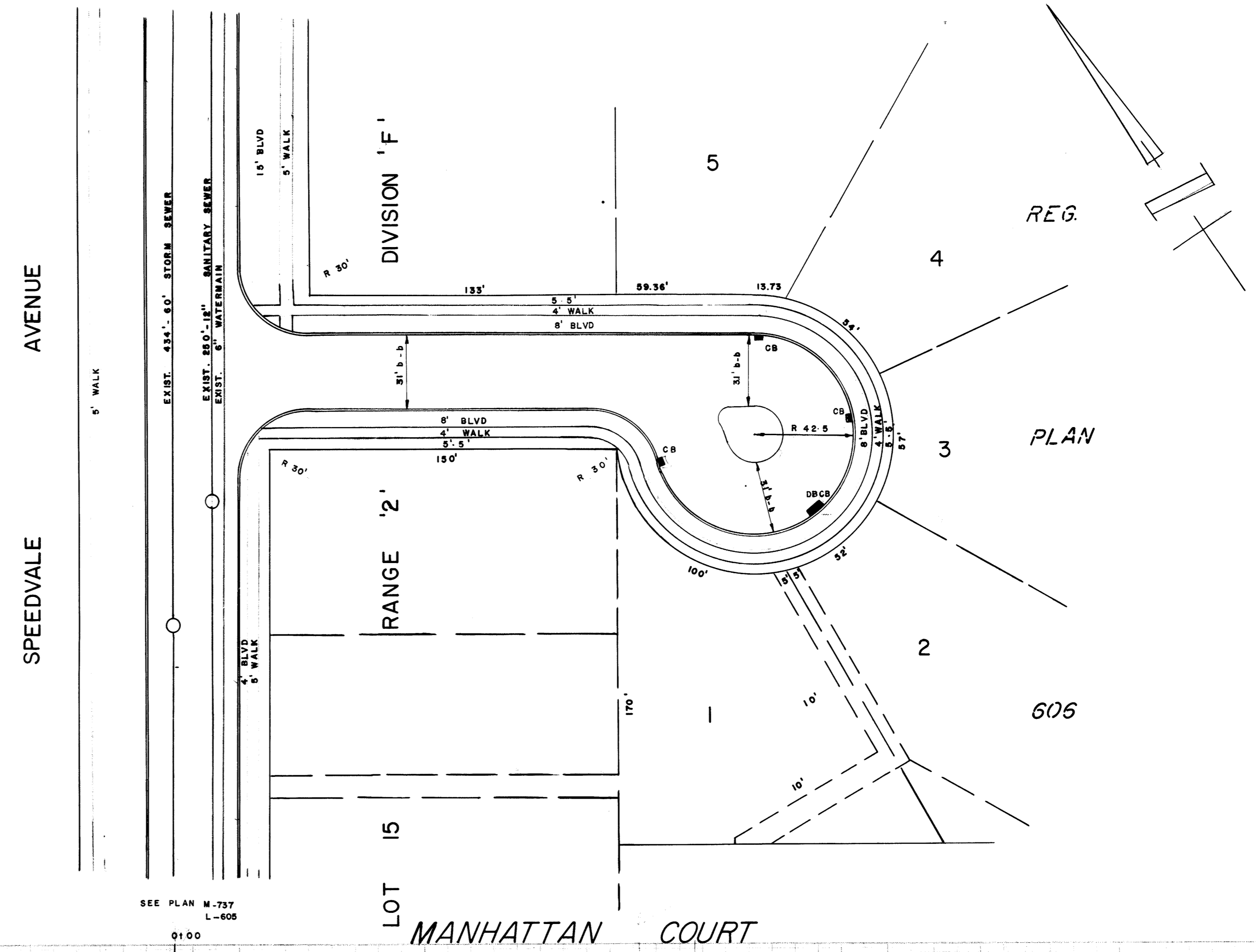
MANHATTAN COURT
(DEDICATED AS PUBLIC HIGHWAY BY REGISTERED PLAN 606)
PIN 71312-0024

METCALFE STREET
(P1&E1)
42.720

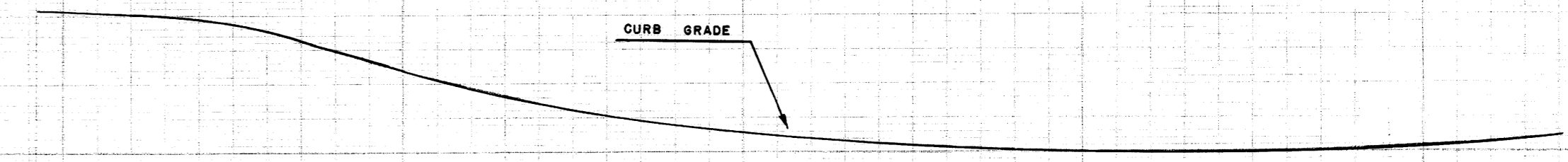
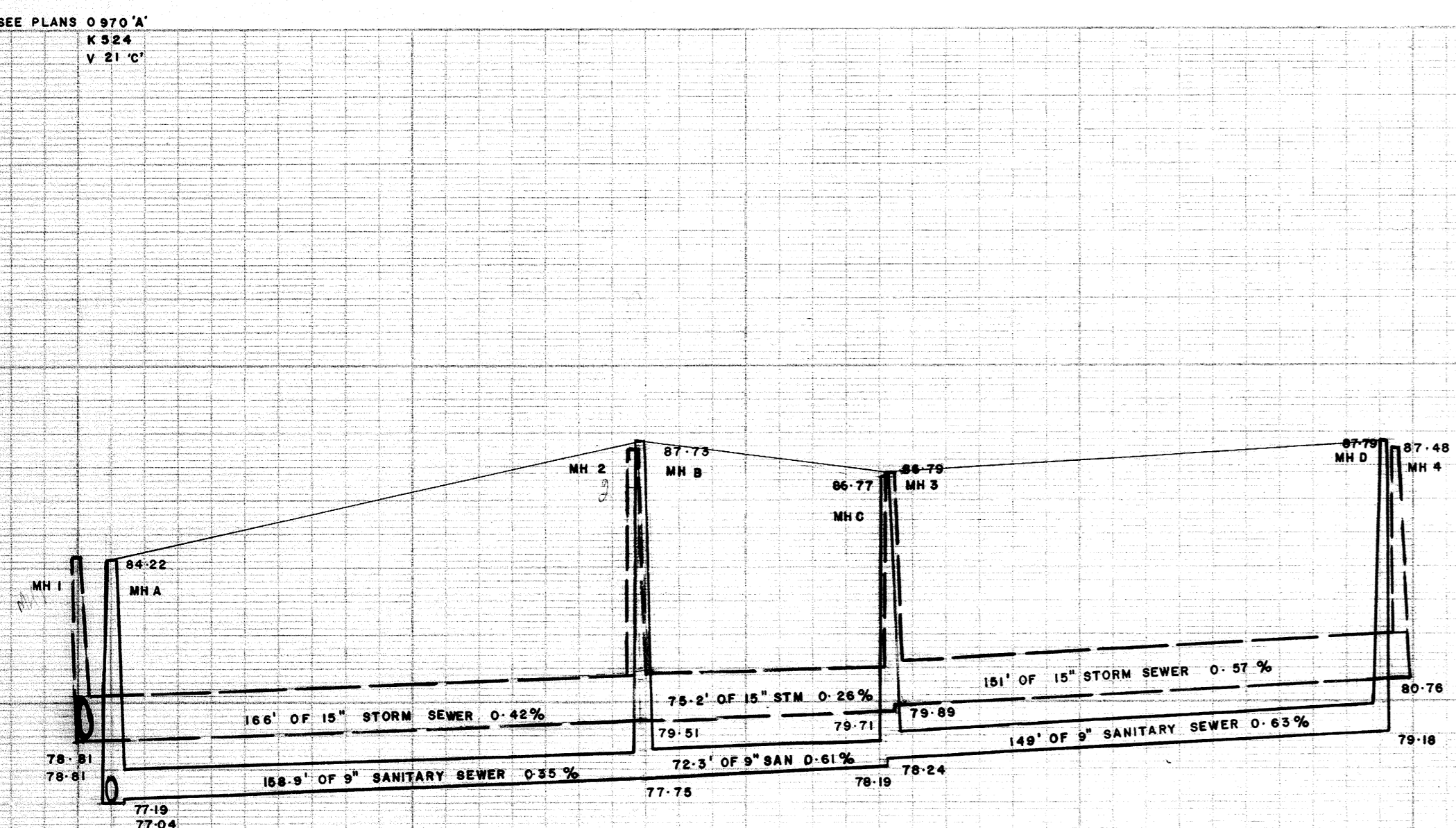
2A-50



PLAN OF TYPICAL DOUBLE MANHOLE CONSTRUCTION.
EX. MANHOLE NO. 2



CONTRACT NO. 87-51
CONSTRUCTION PLAN NO. 6700 82
CONTRACTOR CARERE, BOLES & TRIMBLE
S.M. CORNER OF SPEEDVALE & STEVENSON
HYDRO STATION NO. 35, ELEV. 96.91.
CONST. PLAN NO. 6700 82



CITY OF GUELPH ENGINEERING DEPARTMENT	
MANHATTAN COURT SERVICES:- SANITARY & STORM SEWERS, WATERMAIN, CURB & GUTTER, WALK.	
DATE: DEC. 1, 1987. VERT. 1" = 4' SCALE: HORZ. 1" = 40'	
DWN. BY R.C. MARSH DESIGN BY R.E.S. CHK'D BY B. RAYNER REVISIONS	
DEPUTY CITY ENGINEER	
2-A-50	

APPENDIX B

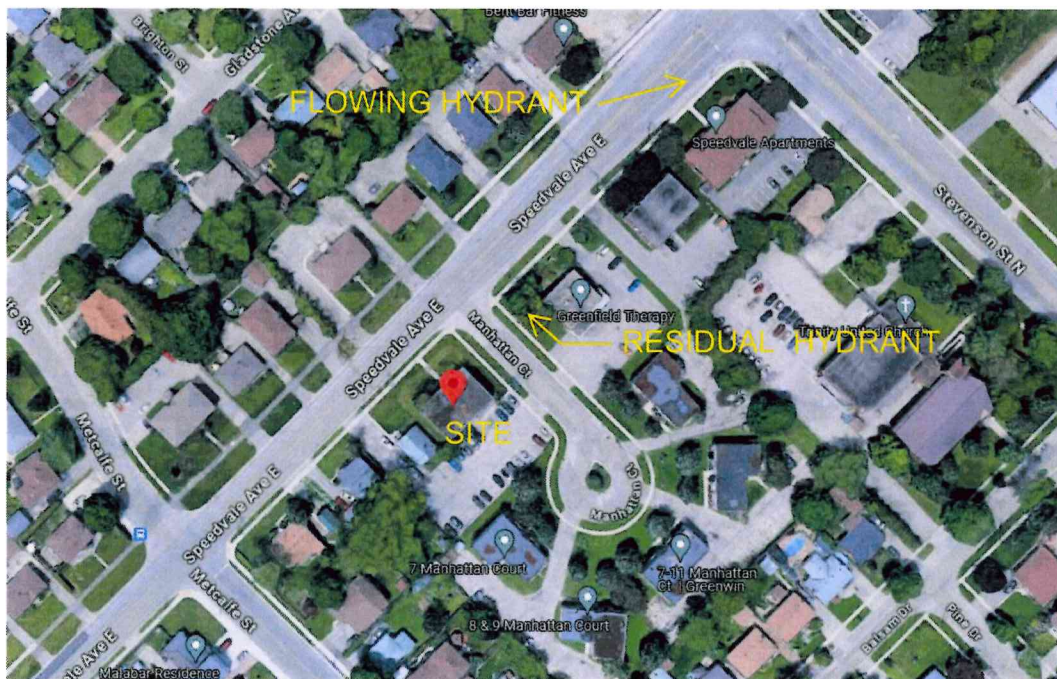
Flow Test Report, Project No. 2023-NSD-130, dated December 8, 2023
Domestic Water and Fire Water Calculations
Fire Flow Calculations
Hazen-Williams Pressure Loss Calculations
Relevant NFPA Information Sheets



PROJECT INFORMATION			
Project Name:	317 Speedvale Ave East Flow Test	Design Project #:	2023-NSD-130
Site Address:	317 Speedvale Ave East Guelph ON	Const. Project #:	NA
City Contact:	Josh Baker	Phone #:	519-826-1655
Flow Tester:	Rob Smith	Phone #:	226-376-3053
Technical Contact:	Andy Coghlin	Phone #:	519-476-0761

SITE INFORMATION

SITE MAP



Note: If the main is a dead end, the flowing hydrant shall be closest to the dead end

ITEMS TO LABEL ON MAP	HYDRANTS USED	MAIN SIZE
<input type="checkbox"/> Static / Residual & Flow Hydrants	<input type="checkbox"/> City Hydrant(s)	City:
<input type="checkbox"/> Flow Direction (if the main is dead end)	<input type="checkbox"/> Site Hydrant(s)	Site:

SITE NOTES



TEST INFORMATION			
Minimum Required Flow:	NA	Min Ports:	2
Personnel Present:	Robert Smith	Test Date:	2023-12-08
City / External Company:	City of Guelph	Test Time:	11:00am

TEST EQUIPMENT	
<input type="checkbox"/> Hose Monsters with built in Pitot	Hose length used:
<input type="checkbox"/> Hand held pitot gauge	<input type="checkbox"/> Pollard diffuser elbow with built in Pitot
<input type="checkbox"/> Other:	

TEST RESULTS						
Number of Ports	Outlet Size (IN)	Discharge Coefficient	Pitot Reading (PSI)		Total Flow (GPM)	Static / Residual Pressure (PSI)
0 Ports						60
1 Port	2.5	0.9	48		1,163	59
2 Ports	2.5	0.9	32	32	1,899	58
3 Ports	2.5	0.9			0	
4 Ports	2.5	0.9			0	
0 Ports	STATIC RE-CHECK					60

TEST NOTES

HYDRAULIC ADJUSTMENTS (FOR OFFICE USE ONLY)			
ADJUSTMENTS FOR HYDRAULIC GRADE LINE (HGL)			
Reservoir HGL (m):		Site Elevation (m):	
Theoretical Static Head (PSI):	0	PSI to subtract from test pressures:	0
OTHER HYDRAULIC ADJUSTMENTS			
Other adjustment as required by the City / AHJ:			

DOMESTIC WATER DEMAND, VELOCITY, AND TURNOVER CALCULATION

DATE: January 24, 2024
JOB NO.: SBM-23-1518

Client: Habitat for Humanity Guelph Wellington
Project: Proposed Residential Development
Location: 303, 309 & 317 Speedvale Avenue E, Guelph

DEMAND CALCULATION

Avg. Day Demand = 225 L/day/cap DGSSMS B.2.2.2
Avg. Day Demand = 0.002604167 L/s/cap
Max. Day Peaking Factor = 3 (Table 3-3)
Max. Hour Peaking Factor = 4.5 (Table 3-3)
Occupancy = 2 p/bedroom OBC 3.1.17.1 (b)

	No. Bedrooms	Population	Avg. Day (L/s)	Max. Hour (L/s)	Max. Day (L/s)
Occupancy Load - OBC 3.1.17.1 (b)	105	210	0.55	2.46	1.64
Total			0.55	2.46	1.64
				(148 L/min)	(98 L/min)

VELOCITY CALCULATION

Diameter (mm)	Demand (L/s)	Velocity (m/s)
150	2.46	0.139

Maximum allowable velocity of 5.0 m/s as per Section B.2.3.4 Maximum Velocity of the Region of Waterloo and Area Municipalities - Design Guidelines and Supplemental Specifications for Municipal Services (DGSSMS February 2023)

VOLUME CALCULATION

Diameter (mm)	Length from Municipal Watermain to Building (m)	Volume (Litres)
150	19.89	351.49
Total		351.49

TURNOVER CALCULATIONS

Average Day Demand (L/s)	Volume (L)	Hours	Days
0.55	351.49	0.18	0.01

Fire-Fighting Flow NFPA#13

	For data entry
	Calculated, not for data entry

Date:
Job No:

Client:
Project:
Location:

Table 1. NFPA#13 Flow Demand Requirements

Hazard	Sprinkler Flow (USGPM)	Hydrant Allowance (USGPM)	Total Flow (USGPM)
Light	175	100	275
Ordinary 1	250	250	500
Ordinary 2	350	250	600
Extra 1	750	500	1250
Extra 2	1000	500	1500

Required Supply Flow Rate, USGPM (Table 1) =
Required Supply Flow Rate, L/min =

Maximum Day Demand, L/min = L/s (Refer to attached Domestic Water Demand calculation)
 L/min

Required Supply Fire Flow + Maximum Day Demand, L/min =

Incorporate Hazen-Williams and Bernoulli's Principles: $P_{residual} = P_{static} - (Q_{required}/Q_{test})^{1.85} \times (P_{static} - P_{test})$

Provided Supply Flow Rate @	<input type="text" value="60.00"/>	*psi (413.69 kPa) =	<input type="text" value="0.00"/>	L/min (0 USGPM)
	<input type="text" value="59.00"/>	*psi (406.79 kPa) =	<input type="text" value="4402.00"/>	L/min (1163 USGPM)
	<input type="text" value="58.00"/>	*psi (399.9 kPa) =	<input type="text" value="7188.00"/>	L/min (1899 USGPM)
Residual pressure at hydrant =	<input type="text" value="59.52"/>	psi (410.38 kPa) =	<input type="text" value="1991.40"/>	L/min (526 USGPM)

* Refer to Hydrant Flow Test by Northern Sprinkler Design - 317 Speedvale Ave East, Guelph

Table 1. Water Velocity Calculation

Diameter (mm)	Demand (L/min)	Velocity (m/s)
150	1991	1.878

Maximum allowable velocity of 3.0 m/s as per Table 3-6 from the MOE Design Guidelines for Drinking-Water Systems

Approximate Elevation of Tested Hydrant = m
Approximate Elevation of Proposed Fire-Fighting Connection = m
Change in pressure due to elevation change = m head (3.98 psi, 27.45 kPa)
Change in pressure due to elevation change = psi

Water supply pressure at the proposed property under fire flow conditions (not accounting for losses) = psi (437.82 kPa)

Calculated Pressure Loss in Pipes = psi (Refer to attached Pressure Loss in Pipes calculation)

Water Pressure at Proposed Fire Fighting Connection Under Firefighting Conditions Including Losses = psi (431.89 kPa)

Therefore, water supply pressure at the proposed building under fire flow conditions accounting for losses = **62.64 psi (431.89 kPa)** which is greater than the 140 kPa (20 psi) required per the MOE Guidelines for Drinking Water Systems



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1599 Adelaide St. N., Unit 301
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P: 519-471-6667

www.sbmltd.ca

KITCHENER LOCATION

132 Queen St. S. Unit 4
Kitchener, ON N2G 1V9
P: 519-725-8093

sbm@sbmltd.ca

Pressure Loss in Pipes (Hazen-Williams) Calculations

DATE: January 28, 2024
JOB NO.: SBM-23-1518

Client: Habitat for Humanity Guelph Wellington
Project: Proposed Residential Development
Location: 303, 309 & 317 Speedvale Avenue E, Guelph

For data entry
Calculated, not for data entry

Pressure in Main

Starting Pressure Head at Building Connection without pressure loss 437.82 kPa

*Refer to attached fire hydrant flow test and Fire Flow Calculation

Pressure Loss in 150mm Service

Friction Losses Through Pipe Fitting in Terms of Equivalent Length of Pipe:

**Valve (2x4.56 ft)	2.78	m
**TEE (1x30.10 ft)	9.17	m
Length of pipe (m) [refer to drawing C3]	19.89	m
l = total length of pipe, including additional length due to loss in fittings	31.84	m
***c = Hazen-Williams roughness constant	150	
q = volume flow (L/s) [refer to fire-fighting demand calculations]	33.2	
d = inside or hydraulic diameter (mm) [refer to drawing C3]	150	

**Refer to NFPA 1142, Table I.1 (c)

**Refer to NFPA 1142, Table I.1 (d)

**** Refer to Fire-Fighting Flow NFPA#13 Calculation

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H ₂ O per 100 m pipe)	-1901.99
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	-18.66
Head loss (mm H ₂ O)	-605.59
Head loss (kPa)	-5.94

or -0.86 psi

Calculated Flow Velocity

v = flow velocity (m/s) 1.88

*****Less than 3.0 m/s as per MOE Design Guidelines for Drinking Water Systems

Final Pressure at the proposed building for sprinklers accounting for pressure loss (kPa) 431.88

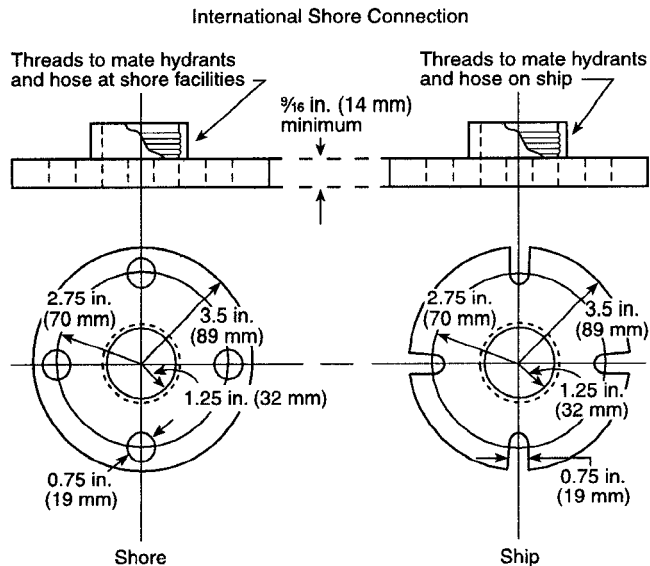
or 62.64 psi

NFPA # 13 FLOW DEMAND REQUIREMENTS

HAZARD	SPRINKLER FLOW	HYDRANT ALLOWANCE	TOTAL FLOW
Light	175 GPM	100 GPM	275 GPM
Ordinary 1	250 GPM	250 GPM	500 GPM
Ordinary 2	350 GPM	250 GPM	600 GPM
Extra 1	750 GPM	500 GPM	1250 GPM
Extra 2	1000 GPM	500 GPM	1500 GPM

Warehousing **Varies too much to come up with a generic water demand**

The pressures range on each of these flows and would be generally be 35 PSI - 80 PSI Requirements, but this information can't truly be given until final layouts and calculations are complete



Material: Any suitable for 150 psi (10.3 bar) service (shore)
 Flange surface: Flat face
 Gasket material: Any suitable for 150 psi (10.3 bar) service
 Bolts: Four 1/4 in. (16 mm) minimum diameter, 2 in. (51 mm) long, threaded to within 1 in. (25.4 mm) of bolt head
 Nuts: Four, to fit bolts
 Washers: Four, to fit bolts

Material: Brass or bronze suitable for 150 psi (10.3 bar) service (ship)

FIGURE A.3.10.7 International Shore Fire Connection.

A.5.1 Occupancy examples in the listings as shown in the various hazard classifications are intended to represent the norm for those occupancy types. Unusual or abnormal fuel loadings or combustible characteristics and susceptibility for changes in these characteristics, for a particular occupancy, are considerations that should be weighed in the selection and classification.

The light hazard classification is intended to encompass residential occupancies; however, this is not intended to preclude the use of listed residential sprinklers in residential occupancies or residential portions of other occupancies.

* A.5.2 Light hazard occupancies include occupancies having uses and conditions similar to the following:

- Animal shelters
- Churches
- Clubs
- Eaves and overhangs, if of combustible construction with no combustibles beneath
- Educational
- Hospitals, including animal hospitals and veterinary facilities
- Institutional
- Kennels
- Libraries, except large stack rooms
- Museums
- Nursing or convalescent homes
- Offices, including data processing
- Residential
- Restaurant seating areas

Theaters and auditoriums, excluding stages and prosceniums
 Unused attics

Note that it is not the committee's intent to automatically equate library bookshelves with ordinary hazard occupancies or with library stacks. Typical library bookshelves of approximately 8 ft (2.4 m) in height, containing books stored vertically on end, held in place in close association with each other, with aisles wider than 30 in. (762 mm) can be considered to be light hazard occupancies. Similarly, library stack areas, which are more akin to shelf storage or record storage, as defined in NFPA 232, *Standard for the Protection of Records*, should be considered to be ordinary hazard occupancies.

A.5.3 For purposes of these definitions, Class I, Class II, Class III, and Class IV commodities would be considered to have moderate rates of heat release, while Group A plastics would be considered to have high rates of heat release. Stockpiles are considered to include display merchandise (mercantile) and arrangements of combustibles ancillary to operations within the occupancy as opposed to dedicated storage areas where the fire loading is generally more severe.

* A.5.3.1 Ordinary hazard occupancies (Group 1) include occupancies having uses and conditions similar to the following:

- Automobile parking and showrooms
- Bakeries
- Beverage manufacturing
- Canneries
- Dairy products manufacturing and processing
- Electronic plants
- Glass and glass products manufacturing
- Laundries
- Restaurant service areas

* A.5.3.2 Ordinary hazard occupancies (Group 2) include occupancies having uses and conditions similar to the following:

- Agricultural facilities
- Barns and stables
- Cereal mills
- Chemical plants — ordinary
- Confectionery products
- Distilleries
- Dry cleaners
- Exterior loading docks

Note that exterior loading docks only used for loading and unloading of ordinary combustibles should be classified as OH2. For the handling of flammable and combustible liquids, hazardous materials, or where utilized for storage, exterior loading docks and all interior loading docks should be protected based upon the actual occupancy and the materials handled on the dock, as if the materials were actually stored in that configuration.

- Feed mills
- Horse stables
- Leather goods manufacturing
- Libraries — large stack room areas
- Machine shops
- Metal working
- Mercantile
- Paper and pulp mills
- Paper process plants
- Piers and wharves

APPENDIX C

Sanitary Design Sheet

303, 309 & 317 Speedvale Avenue E, Guelph				SANITARY SEWER DESIGN SHEET				Design Parameters										Harmon Peaking Factor Equation: Min. PF = 2 Max. PF = 4 $F = 1 + \frac{14}{4 + \sqrt{P}} (P = Population/1,000)$												
CITY OF GUELPH, ON								Average Daily Flow *Residential = 300 L/cap/day = 0.00347 L/cap/s Mannings "n" 0.0130 Min. Velocity 0.6 m/sec Max. Velocity 3.0 m/sec Residential Harmon Peaking Factor (F) Residential Areas Infiltration 0.25 L/s/ha																						
Project Number: SBM-23-1518 Date: January 28, 2024 Design By: H. Ahmad Checked By: File: S:\2023 Jobs\SBM-23-1518 Habitat-GW - 303-317 Speedvale Ave - Guelph\04 dDocs\03 Civil\Calculations\FSR\SAN\SBM-23-1518 HFH - 317 Speedvale Ave., Guelph - Sanitary Sewer Design Sheet - 2024-01-28.xlsx				Drainage Area Plan No: NA																										
LOCATION				RESIDENTIAL AREAS and POPULATION				SCHOOL, INSTITUTIONAL			COMMERCIAL			INDUSTRIAL			INFILTRATION			DESIGN										
STREET	AREA NO.	MANHOLE LOCATION		HECTARES OF EACH DENSITY				POPUL.	CUMUL POPUL.	PEAK FACTOR "F"	PEAK RES. FLOW	HECTARES AND FLOW OF EACH ZONING			TOTALS-C-I FLOW	AREA	CUMUL AREA	INFIL FLOW	TOTAL VOLUME FLOW	LENGTH	SLOPE	PIPE SIZE	CAPACITY	FULL FLOW VELOCITY	ACTUAL VELOCITY					
		FROM MH	TO MH	0	0	0	0					0	0	0												0	0	0	0	0
				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Design Flows Per OBC				Site	EX. SAN	0.26	*	0.210	0.210	4.14	2.92	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.26	0.00	0.0650	2.98	2.00	200	46.3604	1.476	0.828
Design Flows Per DEM 2023 (Apartments)				Site	EX. SAN	0.26	**	0.089	0.089	4.26	1.24	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.26	0.00	0.0650	1.31	2.00	200	46.3604	1.476	0.645

*The maximum building population of 210 people based on 105 bedrooms and an occupancy load of 2 people per bedroom as per the current Ontario Building Code (OBC).

**The maximum building population of 89 based on 48 units and a population of 1.86 people per unit per the City of Guelph's Development Engineering Manual (DEM)

APPENDIX D

SWM Calculations
ADS OGS Sizing Summary



LONDON LOCATION
1599 Adelaide St. N., Unit 301
London, ON N5X 4E8
P: 519-471-6667

KITCHENER LOCATION
132 Queen St. S. Unit 4
Kitchener, ON N2G 1V9
P: 519-725-8093

www.sbmltd.ca

sbm@sbmltd.ca

Stormwater Management (SWM) Calculations:

DATE: January 30, 2024
JOB NO.: SBM-23-1518

Client: Habitat for Humanity Guelph Wellington
Project: Proposed Residential Building
Location: 303, 309 & 317 Speedvale Avenue East, Guelph

***RAINFALL INTENSITY:**

Return Period	2-year	5-year	10-year	25-year	50-year	100-year
A	475.61	632.75	721.92	822.74	893.8	953.29
B	-0.738	-0.741	-0.736	-0.725	-0.719	-0.711

*Intensity, $i = A(tc)^3$

*Refer to Section 5.5.1.1 of the City of Guelph Development Engineering Manual (DEM) October 2023.

PRE-DEVELOPMENT CONDITIONS

PRE-DEVELOPMENT AREA OVERALL SITE:

	Area (m ²)	C	A*C
Total Site Area:	2,601.82		
Building Area:	401.50	0.9	361.35
Concrete/Asphalt:	1,245.50	0.9	1120.95
Gravel	0.00	0.7	0
Landscaped/Open:	954.82	0.2	190.964
Totals:	2,601.82		1673.264
$C_{eq} = \text{Sum}(A*C)/\text{Sum}(A) =$	0.64		

Time of Concentration of 5 min per Development Engineering Manual Section 5.5

2-Year Pre-Development Flows:

C = 0.64
Time of concentration $t_c = 5.0$ min
Intensity, $i (@ t_c) = 145.01$ mm/hr
Pre-Development Flow, $Q_p = 2.78 * C * i * A = 67.46$ l/s

100-Year Pre-Development Flows:

C = 0.64
Time of concentration $t_c = 5.0$ min
Intensity, $i (@ t_c) = 303.57$ mm/hr
Pre-Development Flow, $Q_p = 2.78 * C * i * A = 141.21$ l/s

POST-DEVELOPMENT CONDITIONS

POST-DEVELOPMENT OVERALL SITE:

	Area (m ²)	C	A°C
Total Site Area:	2,601.82		
Building Area:	853.84	0.9	768.456
Concrete/Asphalt:	1,392.39	0.9	1253.151
Gravel:	0.00	0.7	0
Landscaped/Open:	355.59	0.2	71.118
Totals:	2,601.82		2092.725
C _{eq} = Sum(A°C)/Sum(A) =	0.80		

POST-DEVELOPMENT CONTROLLED CATCHMENT (A201 - ROOFTOP):

	Area (m ²)	C	A°C
Total Site Area:	853.84		
Building Area:	853.84	0.9	768.456
Concrete/Asphalt:	0.00	0.9	0
Gravel:	0.00	0.7	0
Landscaped/Open:	0.00	0.2	0
Totals:	853.84		768.456
C _{eq} = Sum(A°C)/Sum(A) =	0.90		

POST-DEVELOPMENT CONTROLLED CATCHMENT (A202 - PARKING):

	Area (m ²)	C	A°C
Total Site Area:	1,263.31		
Building Area:	0.00	0.9	0
Concrete/Asphalt:	1,263.31	0.9	1136.979
Gravel:	0.00	0.7	0
Landscaped/Open:	0.00	0.2	0
Totals:	1,263.31		1136.979
C _{eq} = Sum(A°C)/Sum(A) =	0.90		

POST-DEVELOPMENT UNCONTROLLED CATCHMENT (U201):

	Area (m ²)	C	A°C
Total Site Area:	484.67		
Building Area:	0.00	0.9	0
Concrete/Asphalt:	129.08	0.9	116.172
Gravel:	0.00	0.7	0
Landscaped/Open:	355.59	0.2	71.118
Totals:	484.67		187.29
C _{eq} = Sum(A°C)/Sum(A) =	0.39		

2-Year Post-Development Flows (U201)

C =	0.39
Time of concentration t _c =	5.0 min
Intensity, i (@ t _c) =	145.01 mm/hr
Pre-Development Flow, Q _p = 2.78 * C * i * A =	7.55 l/s

100-Year Post-Development Flows (U201)

C =	0.39
Time of concentration t _c =	5.0 min
Intensity, i (@ t _c) =	303.57 mm/hr
Pre-Development Flow, Q _p = 2.78 * C * i * A =	15.81 l/s

RETURN PERIOD	ALLOWABLE PRE-DEVELOPMENT FLOWS [A101] (L/s)	UNCONTROLLED POST-DEVELOPMENT FLOWS [U201+U202] (L/s)	ALLOWABLE POST-DEVELOPMENT RELEASE FROM SITE (L/s)	ALLOWABLE SURFACE OUTFLOWS (L/s)
2-year	67.46	7.55	59.91	0
100-year	141.21	15.81	125.40	65.50

CATCHMENT A201 STORAGE CALCULATIONS - A201 (BUILDING ROOF)

FLOW RESTRICTION ROOF DRAINS:

Restricted Flow Rate = l/s

Note: Number and location of roof drains to be confirmed by roof designer and mechanical engineer

RAINFALL DATA:

Rainfall Data - Guelph Rainfall Intensity Duration

(3 roof drains at 1.5 L/s capacity per drain)

STORAGE CALCULATIONS:

2 Yr Strm Event		Inflow, Q _i 2.78°C*I*A (l/s)	Volume In (V _i) Q _i *t*60/1000 (m ³)	Orifice/Flow Restrictor Outflow Q _{orifice} (l/s)	Surface Outflow (Scuppers) Q _{surface} (l/s)	Total Outflow Q _{total} (l/s)	Volume Out (V _o) Q _o *t*60/1000 (m ³)	Difference/ Storage (m ³)
Duration (min.)	Intensity "I" (mm/hr)							
5	143.01	45.84	13.75	4.50	0.00	4.50	1.35	12.40
10	86.95	18.57	11.14	4.50	0.00	4.50	2.70	8.44
20	52.13	11.14	13.36	4.50	0.00	4.50	5.40	7.96
30	38.65	8.26	14.86	4.50	0.00	4.50	8.10	6.76
60	23.17	4.95	17.82	4.50	0.00	4.50	16.20	1.62
120	13.89	2.97	21.37	2.97	0.00	2.97	21.37	0.00
180	10.30	2.20	23.77	2.20	0.00	2.20	23.77	0.00
Max. Storage Volume (m³) =							12.40	
Drawdown Time (hr) =							0.77	

100 Yr Strm Event		Inflow, Q _i 2.78°C*I*A (l/s)	Volume In (V _i) Q _i *t*60/1000 (m ³)	Orifice/Flow Restrictor Outflow Q _{orifice} (l/s)	Surface Outflow (Scuppers) Q _{surface} (l/s)	Total Outflow Q _{total} (l/s)	Volume Out (V _o) Q _o *t*60/1000 (m ³)	Difference/ Storage (m ³)
Duration (min.)	Intensity "I" (mm/hr)							
5	303.57	64.85	19.46	4.50	0.00	4.50	1.35	18.11
10	185.45	39.62	23.77	4.50	0.00	4.50	2.70	21.07
20	113.29	24.20	29.04	4.50	0.00	4.50	5.40	23.64
30	84.92	18.14	32.65	4.50	0.00	4.50	8.10	24.55
60	51.88	11.08	39.90	4.50	0.00	4.50	16.20	23.70
120	31.69	6.77	48.74	4.50	0.00	4.50	32.40	16.34
180	23.75	5.07	54.80	4.50	0.00	4.50	48.60	6.20
Max. Storage Volume (m³) =							24.55	
Drawdown Time (hr) =							1.52	

AVAILABLE ROOFSTOP STORAGE:

Location	Area (m ²)	Depth (m)	Volume (m ³)
Proposed Bldg	853.84	0.15	42.69

(Refer to Site Grading Plan Sheet C4, provided separately)

Note: Available Roof Storage Volume conservatively calculated using V = AxD/3

Total Storage Available (m ³) =	42.69
Total Storage Required for 2-year (m ³) =	12.40
Total Storage Required for 100-year (m ³) =	24.55

Therefore, the rooftop storage of 42.69 m³ is sufficient to store 2-year through 100-year storm requirements on the roof of proposed building (A201).

CATCHMENT A202 STORAGE CALCULATIONS

Outflow Pipe Size (mm) =	200
Roughness (n)	0.013
Pipe Slope (%)	2
Velocity (m/s)	1.48
Flow Cap. (l/s)	46.38
Allowable Restricted Flow Rate, Q =	46.38 l/s

Refer to the maximum capacity of the outflow pipe at CBMH2

PROPOSED EXFILTRATION TRENCH PARAMETERS

Total Trench Depth from the Surface =	1.2	m
Depth to Permeable Strata (Below Pavement Composition) =	0.3	m
Stone Depth =	0.9	m
Stone Width =	3	m
50mm Crushed Stone Void Ratio =	0.4	
Infiltration Rate =	25	mm/hour
Infiltration Rates =	6.94E-06	m/s
Proposed Trench Length =	48.00	m
Pipe Length =	48.00	m
Pipe Storage =	3.39	m ³
Crushed Stone Storage =	50.48	m ³
Contact Area to Soil (Bottom and half of sides) =	189.90	m ²

Estimated as per Table 4.4 in the MECP based the infiltration rate of sandy loam

Soil type and infiltration rate estimated based on results found in the Geotechnical Investigation by CMT Engineering Inc., dated August 3, 2023. Exact infiltration rates are to be determined prior to detailed design.

INFILTRATION RATE CALCULATIONS

Total Contact Area Area to Soil =	189.90	m ² Contact Area to Soil
Infiltration Rate (I) =	25	mm/hr
Infiltration Rate (I) =	6.94E-06	m/s
Site Infiltration =	0.001319	m ³ /sec
Site Infiltration =	4.748	m ³ /hr
'A'*I =	0.00132	m ³ /s

VOLUME REQUIRED TO INFILTRATE 5mm OVER ENTIRE SITE

Site Area =	0.260182	ha
Site Area =	2601.82	m ²
Required Rainfall Depth to be stored over entire site =	0.005	m
Volume Required to be Infiltrated =	13.01	m ³

RAINFALL DATA:

Rainfall Data - Guelph Rainfall Intensity Duration
--

STORAGE CALCULATIONS:

2 Yr Strm Event		Inflow, Q ₁ 2.78°C**A	Inflow from Roof Drains [A201] (L/s)	Volume In (V ₀) Q**60/1000	Infiltration Rate	Infiltration Volume Out	Overflow Pipe Outflow Q _{overflow}	Surface Outflow Q _{surface}	Allowable Total Outflow Q _{total}	Volume Out (V ₀) Q ₀ **60/1000	Difference/ Storage
Duration (min.)	Intensity "I" (mm/hr)	(l/s)	(L/s)	(m ³)	(l/s)	(m ³)	(l/s)	(l/s)	(l/s)	(m ³)	(m ³)
5	145.01	45.84	4.50	15.10	1.32	0.40	46.38	0.00	47.70	14.31	0.79
10	86.95	27.48	4.50	19.19	1.32	0.79	30.66	0.00	31.98	19.19	0.00
20	52.13	16.48	4.50	25.17	1.32	1.58	19.66	0.00	20.98	25.17	0.00
30	38.65	12.22	4.50	30.09	1.32	2.37	15.40	0.00	16.72	30.09	0.00
60	23.17	7.32	4.50	42.57	1.32	4.75	10.51	0.00	11.82	42.57	0.00
120	13.89	4.39	4.50	64.02	1.32	9.50	7.57	0.00	8.89	64.02	0.00
180	10.30	3.26	2.97	67.22	1.32	14.24	4.91	0.00	6.22	67.22	0.00
										Max. Storage Volume (m³) =	0.79
										Drawdown Time (hr) =	0.17

100 Yr Strm Event		Inflow, Q ₁ 2.78°C**A	Inflow from Roof Drains [A201] (L/s)	Volume In (V ₀) Q**60/1000	Infiltration Volume	Infiltration Volume Out	Overflow Pipe Outflow Q _{overflow}	Surface Outflow Q _{surface}	Allowable Total Outflow Q _{total}	Volume Out (V ₀) Q ₀ **60/1000	Difference/ Storage
Duration (min.)	Intensity "I" (mm/hr)	(l/s)	(L/s)	(m ³)	(l/s)	(m ³)	(l/s)	(l/s)	(l/s)	(m ³)	(m ³)
5	303.57	95.95	4.50	30.14	1.32	0.40	46.38	0.00	47.70	14.31	15.82
10	185.45	58.62	4.50	37.87	1.32	0.79	46.38	0.00	47.70	28.62	9.25
20	113.29	35.81	4.50	48.37	1.32	1.58	38.99	0.00	40.31	48.37	0.00
30	84.92	26.84	4.50	56.41	1.32	2.37	30.02	0.00	31.34	56.41	0.00
60	51.88	16.40	4.50	75.23	1.32	4.75	19.58	0.00	20.90	75.23	0.00
120	31.69	10.02	4.50	104.52	1.32	9.50	13.20	0.00	14.52	104.52	0.00
180	23.75	7.51	4.50	129.69	1.32	14.24	10.69	0.00	12.01	129.69	0.00
										Max. Storage Volume (m³) =	15.82
										Drawdown Time (hr) =	3.33

CALCULATION FOR AVAILABLE STORAGE:

Available Storage in Structures:

Location	Area (m ²)	Depth (m)	Volume (m ³)
CBMH2	1.13	2.13	2.41
CBMH3	1.13	1.71	1.93
Total Structure Storage Available (m³) =			4.34

(Refer to Site Servicing Plan Sheet C3, provided separately)

Available Storage in Pipes:

Location	Dia. (m)	Length (m)	Volume (m ³)
CBMH2-CBMH3	0.3	48.00	3.39
Total Pipe Storage Available (m³) =			3.39

(Refer to Site Servicing Plan Sheet C3, provided separately)

Available Storage in Infiltration Gallery:

Location	Length (m ²)	Depth (m)	Volume (m ³)
Crushed Stone Storage	48.00	0.90	50.48
Total Pipe Storage Available (m³) =			50.48
Total Underground Storage Available (m³) =			58.21

Available Surface Storage:

Location	Area (m ²)	Depth (m)	Volume (m ³)
CBMH3		0.05	0.20
Total Surface Storage Available (m³) =			0.20

(Refer to Site Grading Plan Sheet C4, provided separately)
Obtained from Civil3D

Total Storage Available (m ³) =	58.41	Surface Storage Drawdown Time (minutes):	
Required 2 Year Storage (m ³) =	0.79	2-year:	0.00 min
Required 100 Year Storage (m ³) =	15.82	100-year:	0.00 min

0 m³ of surface ponding utilized under 2-year event
0 m³ of surface ponding utilized under 100-year event

Sufficient storage of 58.41 m³ is provided to store 2yr, and 100yr storm storage requirements.



ADS OGS Sizing Summary

Project Name:	317 Speedvale Ave	
Consulting Engineer:	SBM	
Location:	Guelph, ON	
Sizing Completed By:	C. Neath	Email: cody.neath@ads-pipe.com

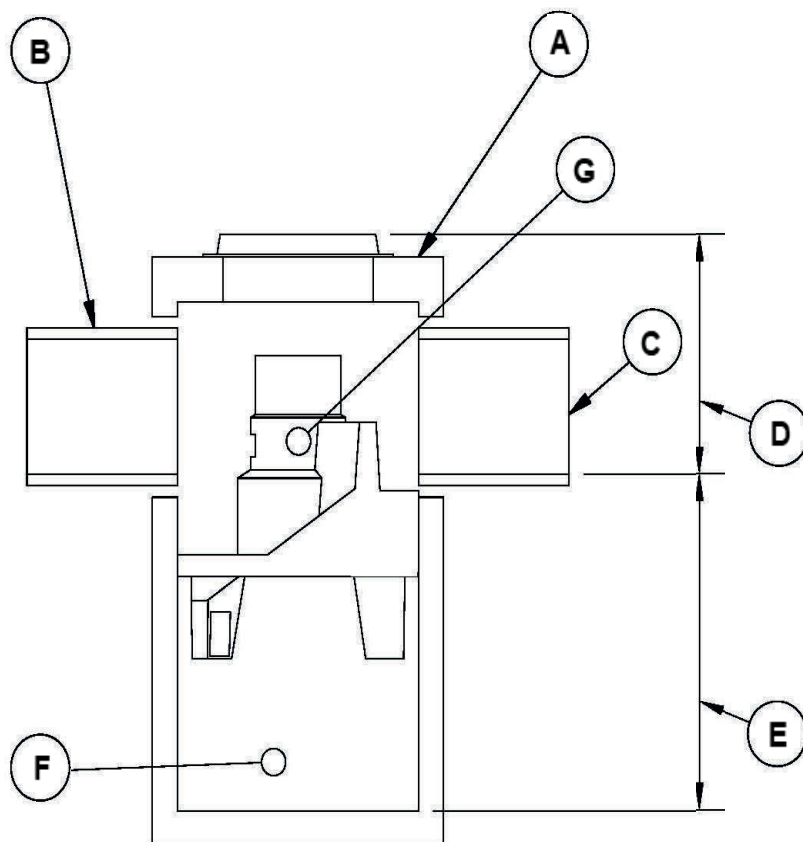
Treatment Requirements		
Treatment Goal:	Enhanced (MOE)	
Selected Parameters:	80% TSS	90% Volume
Selected Unit:	FD-4HC	

Summary of Results		
Model	TSS Removal	Volume Treated
FD-4HC	95.0%	>90%
FD-5HC	97.0%	>90%
FD-6HC	98.0%	>90%
FD-8HC	99.0%	>90%
FD-10HC	99.0%	>90%

FD-4HC Specification	
Unit Diameter (A):	1,200 mm
Inlet Pipe Diameter (B):	250 mm
Outlet Pipe Diameter (C):	250 mm
Height, T/G to Outlet Invert (D):	840 mm
Height, Outlet Invert to Sump (E):	1515 mm
Sediment Storage Capacity (F):	0.78 m ³
Oil Storage Capacity (G):	723 L
Recommended Sediment Depth for Maintenance:	440 mm
Max. Pipe Diameter:	600 mm
Peak Flow Capacity:	510 L/s

Site Elevations:	
Rim Elevation:	330.97
Inlet Pipe Elevation:	330.13
Outlet Pipe Elevation:	330.13

Site Details	
Site Area:	0.2117 ha
% Impervious:	---
Rational C:	0.90
Rainfall Station:	Waterloo_Wellington
Particle Size Distribution:	Fine
Peak Flowrate:	46.4 L/s



Notes:

Removal efficiencies are based on NJDEP Test Protocols and independently verified.

All units supplied by ADS have numerous local, provincial, and international certifications (copies of which can be provided upon request). The design engineer is responsible for ensuring compliance with applicable regulations.



Project Name: 317 Speedvale Ave
 Consulting Engineer: SBM
 Location: Guelph, ON

Net Annual Removal Efficiency Summary: FD-4HC

Rainfall Intensity ⁽¹⁾	Fraction of Rainfall ⁽¹⁾	FD-4HC Removal Efficiency ⁽²⁾	Weighted Net-Annual Removal Efficiency
mm/hr	%	%	%
0.50	0.3%	100.0%	0.3%
1.00	27.0%	100.0%	27.0%
1.50	3.2%	100.0%	3.2%
2.00	13.6%	100.0%	13.6%
2.50	7.2%	100.0%	7.2%
3.00	1.8%	99.6%	1.8%
3.50	6.7%	98.2%	6.6%
4.00	3.7%	97.0%	3.6%
4.50	1.5%	95.9%	1.4%
5.00	4.8%	95.0%	4.5%
6.00	3.3%	93.4%	3.1%
7.00	4.7%	92.1%	4.3%
8.00	2.8%	90.9%	2.5%
9.00	2.0%	89.9%	1.8%
10.00	2.5%	89.1%	2.2%
20.00	9.0%	83.5%	7.5%
30.00	3.1%	80.4%	2.5%
40.00	1.0%	78.3%	0.8%
50.00	0.8%	76.7%	0.6%
100.00	0.9%	71.9%	0.7%
150.00	0.1%	69.2%	0.1%
200.00	0.0%	0.0%	0.0%
Total Net Annual Removal Efficiency:			95.3%
Total Runoff Volume Treated:			>90%

Notes:

- (1) Rainfall Data: 1981:2007,HLY03 6149387, Waterloo/Wellington Airport, ON
- (2) Based on third party verified data and approximating the removal of a PSD similar to the STC Fine distribution
- (3) Rainfall adjusted to 5 min peak intensity based on hourly average.