NOVATECH
Engineers, Planners & Landscape Architects

M E M O R A N D U M

DATE: **DECEMBER 2, 2022**

TO: **NISHANT JHAMB (CITY OF OTTAWA)**

FROM: **MICHAEL PETEPIECE**
VAHID MEHDIPOUR

RE: **375 DESCHÂTELETS AVENUE - SITE PLAN CONTROL**
RUNOFF COEFFICIENT CALCULATION OF AREAS ABOVE UNDERGROUND PARKING ROOF SLAB
NOVATECH PROJECT #: 114025

CC: **STEVE ZORGEL**

BACKGROUND

This memo was originally submitted on November 24, 2022 and has been revised to include additional information and input from the geotechnical engineer in support of the assumptions and parameters used in the hydrologic analysis for Greystone Phase 3. This updated memo is provided in response to the following comment provided by the City's Storm Water Modelling team on September 29, 2022, regarding the runoff coefficient, model parameters and release rate calculations for the landscaped areas above the underground parking roof slab:

> *"Area A01, A02, A03, A04, A05, and A06 are above the underground parking roof slab. Storm water collected in this area during a major event will eventually drain to the City System. Runoff Coefficient and release rate calculations provided for this area are incorrect.*
>
> *The soil above the underground parking will act as storage layer above the impermeable Roof Slab with 100-year C value of 1. Please revise the calculations. Provide discussions on what will be the available storage volume and release rate from this layer. Please include discussions from geotechnical engineer about the available storage volume and release rates"*

The PCSWMM model currently represents these subcatchments as pervious areas using standard City of Ottawa runoff coefficients and infiltration parameters, in which a portion of the rainfall is infiltrated into the the soil above the parking garage roof slab, any excess storm runoff is conveyed overland to storm inlets to the storm sewer system in Scholastic Drive and Deschâtelets Avenue. Based on the proposed grading and architectural plans, there is a significant depth of soil above the top of the roof slabs. Water percolating through the soil column will eventually reach the roof slab where it will be collected by perforated pipes, or flow laterally to the outer edge of the slab where it will continue to perolcate downwards.

Upon further review of the hydrology for these catchments and discussions with the Geotechnical engineer for the project, we have determined that the modeling approach used is appropriate. This memo has been prepared in support of the hydrologic analysis and provides additional information on soil storage volumes and release rates.

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

DRAINAGE AREAS AND INFILTRATION MODELING (PCSWMM)

The storm drainage subcatchments within Phase III of Greystone Village are shown in the Storm Drainage Area Plan (**114025-STM(PH3))** attached to this memo. The post-development subcatchments of Phase III include two buildings (South Building and North Building) and areas A01-06 above the underground parking roof slab.

PCSWMM is used to model the proposed stormwater management for the Phase III site application. **Figure 1** illustrates the subcatchment areas used in the PCSWMM model. The hydrologic parameters for each subcatchment were developed based on the proposed land use and grading.

Figure 1. Phase III PCSWMM Model Subcatchments

Soil Type & Porosity

The soils on site generally consist of an upper layer of silty sand overtop of silty clay. The soils placed in the landscaped areas over the parking garage will either be the native silty sand, or imported soil suitable for landscaping. The porosity (space available for water storage) of this soil was reviewed with the geotechnical engineer and it was determined that 10% porosity is a reasonable value to use in the hydrologic analysis. The soil above the parking garage slab will be above the groundwater table, so the voids within the soil will be available for stormwater storage.

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Infiltration Rate

Infiltration has been modelled using Horton's equation, which defines the infiltration capacity of soil over the duration of a precipitation event using a decay function that ranges from an initial maximum infiltration rate to a minimum rate as the storm progresses. Through consultation with the geotechnical engineer, it was determined that the default Horton's infiltration values for the City of Ottawa are suitable for the soils that will be used in the landscaped areas.

Horton's Equation:
$f(t) = f_c + (f_o - f_c)e^{-k(t)}$

Initial infiltration rate: f_o = 76.2 mm/hr
Final infiltration rate: f_c = 13.2 mm/hr
Decay Coefficient: k = 4.14/hr

Over the course of a storm event, the soil will become saturated and the infiltration rate will decrease over time in accordance with the above-noted function. The water will percolate down towards the roof slab of the parking garage where it will be intercepted by a drainage layer. The drainage layer will either collect the water in perforated pipes or direct it laterally to the edges of the parking structure where it will continue to percolate downwards to the foundation drains. The drainage layer will have a much higher hydraulic conductivity than the overlying soil, so the overlying soil will always permit the vertical movement of water and will never become saturated to the point where it would act as an impermeable surface.

Back-to-Back Storms

In the event of back-to-back storms, the infiltration rate will not have recovered back to the initial rate (76.2 mm/hr). Depending on the inter-event time, the initial infiltration rate for the second storm will be somewhere between the minimum and maximum rates. This would be the same whether the soils are over the parking structure or not.

MODEL RESULTS

Table 1 shows the 100-year model results for peak runoff, runoff depth, infiltration depth, and infiltration volume for areas A01-06.

Table 1. Infiltration Depth, Runoff Depth and Peak Runoff for Areas A01-06

Subcatchment Parameters			Model Results (100yr-4hr Chicago Storm Event)			
Name	Area (ha)	% Impervious	Peak Runoff (L/s)	Runoff Depth (mm)	Infiltration Depth (mm)	Infiltration Volume (m^3)
A01	0.04	21	6.61	37.76	33.92	14
A02	0.12	31	25.63	41.81	29.87	36
A03*	0.09	53	29.14	151.07	63.96	58
A04*	0.04	43	12.70	100.68	42.69	17
A05	0.05	57	15.52	51.60	20.08	10
A06	0.09	28	21.27	42.69	28.99	26

* Sum of all sub-areas

Table *2* lists the elevation of the parking garage roof slab under each subcatchment, the average ground elevation, the average depth of soil above the roof slab, and the average available soil volume in each of areas A01-06. A detailed grading plan (**114025-GR(PH3)** and a plan showing the top of underground parking slab elevations (Slab Elevation Plan, 12272-001) are attached to this memo.

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Table 2. Average Finished Grading Top of Roof Slabs, Soil Volume and Water Capacity for Areas A01-06

Subcatchment Name	Average Finished Grade (m)	Elevation of Roof Slab (m)	Average Soil Depth (m)	Average Soil Volume[(1)] (m^3)	Water Holding Capacity[(2)] (m^3)	100yr Infiltration Volume[(3)] (m^3)
A01	61.89	61.21	0.68	272	27.2	14
A02	62.15	61.41	0.74	888	88.8	36
A03	63.20	61.95	1.25	1125	112.5	58
A04	63.56	61.87	1.69	676	67.6	17
A05	64.28	63.47	0.81	405	40.5	10
A06	63.29	62.28	1.01	909	90.9	26

(1) Is equal to [Finished Grading – Roof Slab Elevation] × Area

(2) Soil volume x 10% Void Ratio

(3) Volume of infiltrated water based on Horton's Equation - From Table 1

In comparing the 100-year infiltration volumes in **Table 1** to the water storage capacity in **Table 2**, this analysis demonstrates that the soils above the parking garage slab will have sufficient water storage capacity to accommodate the 100yr infiltration volume without becoming fully saturated. The available water storage capacity of the soils is between 2 and 4 times the 100yr infiltration volume.

CONCLUSION

Based on the above information, this analysis demonstrates that the soils above the parking garage slab will have the same infiltration characteristics as they would if the roof slab was not present. Even in the event of back-to-back storms and/or failure of the underlying drainage layer, the soil volume will have the sufficient water-holding capacity to accommodate the infiltrated surface water without becoming fully saturated and behaving like an impermeable surface. Therefore, there is no need to revise the PCSWMM modelling approach for these areas.

ATTACHMENTS

1) Email Correspondence with Geotechnical Engineer (November 30, 2022)
2) 114025-STM (PH3) Stormwater Management Plan (Rev 5, Nov. 24, 2022)
3) 114025-GR(PH3) Grading, Erosion & Sediment Control Plan (Rev 13, Nov. 24, 2022)
4) 12272-001 Slab Elevation Plan (Neuf Architects)

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

From: Scott Dennis <SDennis@patersongroup.ca>
Sent: Wednesday, November 30, 2022 4:35 PM
To: Mike Petepiece; Steve Zorgel
Cc: Evan Garfinkel; Vahid Mehdipour
Subject: RE: Infiltration Rate - Void Ratio Assumptions

Thanks Mike,

I have reviewed your assumptions and information provided below, and I am in agreement, from a geotechnical perspective. If you need more information from me on this, please let me know.

Regards,

PATERSON GROUP
SOLUTION ORIENTED ENGINEERING

SCOTT DENNIS, P.Eng., ing.
Senior Project Manager – Geotechnical
TEL: (613) 226-7381 ext. 332

9 AURIGA DRIVE
OTTAWA ON K2E 7T9
patersongroup.ca

From: Mike Petepiece <m.petepiece@novatech-eng.com>
Sent: November 30, 2022 3:35 PM
To: Steve Zorgel <s.zorgel@novatech-eng.com>; Scott Dennis <SDennis@patersongroup.ca>
Cc: Evan Garfinkel <egarfinkel@regionalgroup.com>; Vahid Mehdipour <v.mehdipour@novatech-eng.com>
Subject: RE: Infiltration Rate - Void Ratio Assumptions

Hi Scott,
Thank you for meeting with us this morning to review the stormwater modeling approach for the soils over the parking garage for Greystone Phase 3. As discussed, the City has indicated that our analysis requires input from a geotechnical engineer and we would appreciate your feedback on the following assumptions and information used in our stormwater management analysis as documented in the memo titled *"375 Deschatelets Avenue – Site Plan Control. Runoff Coefficient Calculation of Areas Above Underground Parking Garage Roof Slab"* (Novatech, November 24, 2022).

- The soils on site generally consist of an upper layer of silty sand overtop of silty clay. For the purposes of stormwater modeling, it is assumed that the soils that will be used for the landscaped areas over the parking garage will either be the native silty sand, or imported soil suitable for landscaping.
- The porosity (space available for water storage) of this soil is assumed to be approximately 10% of the total soil volume.

- The hydrologic parameters used to simulate infiltration in the stormwater model (Horton's Infiltration methodology) are the default values from the Ottawa Sewer Design Guidelines and are suitable for the soils that will be placed above the parking garage roof.

  Initial Infiltration Rate= 76.2 mm/hr
  Final Infiltration Rate= 13.2 mm/hr
  Decay Coefficient = 4.14 hr^{-1}

- As a storm progresses, the upper layers of the soil will become saturated and the infiltration rate will decrease over time in accordance with the above-noted function. The water will percolate down towards the roof slab of the parking garage where it will be intercepted by a drainage layer. The drainage layer will either collect the water in perforated pipes, or direct it laterally to the edges of the parking structure where it will continue to percolate downwards to the foundation drains. The drainage layer will have a much higher hydraulic conductivity than the overlying soil, so the surface infiltration rate will not be affected by any accumulation of water above the slab.
- In the event of back-to-back storms, the infiltration rate will not have recovered back to the initial rate (76.2mm/hr). Depending on the inter-event time, the initial infiltration rate for the second storm will be somewhere between the minimum and maximum rates. This would be the same whether the soils are over the parking structure or not.
- The soils will always have some vertical movement of water and will never become saturated to the point where the soils would act as an impermeable surface.
- Due to this, for the purposes of stormwater modeling, the soils above the parking structure will have essentially the same infiltration characteristics as if the parking structure was not there, even in back-to-back storms, and there is no required change to the modeling approach for these areas.

Please let us know if you agree with the assumptions and information provided above. Based on your reply, the memo and the stormwater management report will be updated to include the above noted information and any additional input you may have.

Thank you,

Michael Petepiece, P.Eng., Senior Project Manager | Water Resources
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 235 | Cell: 613.299.4677 | Fax: 613.254.5867

From: Steve Zorgel <s.zorgel@novatech-eng.com>
Sent: Tuesday, November 29, 2022 3:28 PM
To: Scott Dennis <SDennis@patersongroup.ca>
Cc: Mike Petepiece <m.petepiece@novatech-eng.com>; Evan Garfinkel <egarfinkel@regionalgroup.com>
Subject: Infiltration Rate - Void Ratio Assumptions

Hi Scott,

We recently submitted a package to the city for Greystone Phase 3 condo site. The City has provided the following comment and we provided a memo to address this comment:

2. *Area A01, A02, A03, A04, A05, A06 are above the underground parking roof slab. Storm water collected in this area during a major event will eventually drain to the City System. Runoff Coefficient and release rate calculations provided for this area are incorrect.*

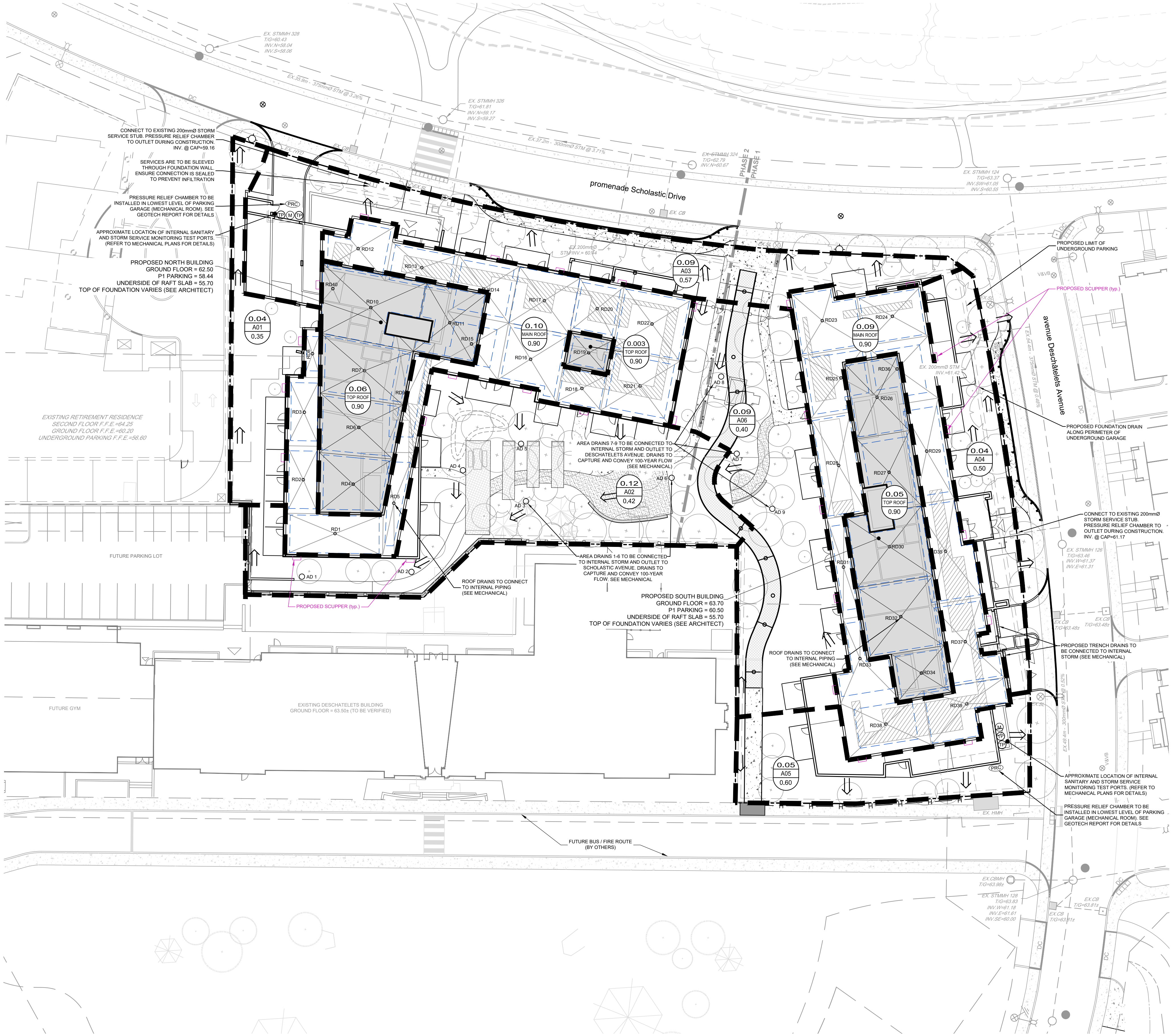
   The soil above the underground parking will act as storage layer above the impermeable Roof Slab with 100-year C value of 1. Please revise the calculations. Provide discussions on what will be the available storage volume and release rate from this layer. Please include discussions from geotechnical engineer about the available storage volume and release rates.

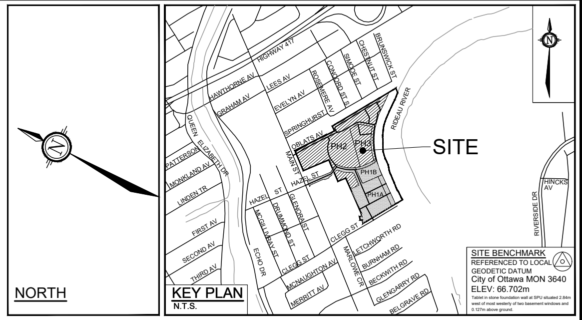
Novatech: Refer to Technical Memorandum, Runoff Coefficient Calculation of Areas Above Underground Parking Roof Slab, dated November 24, 2022.

We wanted to confirm the infiltration/exfiltration rate, void ratio was reasonable that was considered as part of the memo. The City is also concerned with back-to-back storms and we wouldn't mind a quick discussion on this.

Are you available for a quick meeting tomorrow to discuss?

Steve Zorgel, **P.Eng.,** Project Manager | Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x298 | Fax: 613.254.5867





LEGEND

- SITE BOUNDARY
- STORM DRAINAGE AREA
- MAJOR OVERLAND FLOW ROUTE
- DRAINAGE AREA (HECTARES) / DRAINAGE AREA I.D. / RUNOFF COEFFICIENT
- PROPOSED STORM SEWER AND DIRECTION OF FLOW
- PROPOSED AREA DRAIN
- PROPOSED ROOF DRAIN
- PROPOSED ROOF DRAIN WITH 100YR PONDING CONTOUR
- PROPOSED ROOF SCUPPER LOCATION
- PROPOSED LIMITS OF UNDERGROUND PARKING
- PROPOSED RETAINING WALL
- PROPOSED RETAINING WALL AND ACOUSTIC FENCE
- PROPOSED ACOUSTIC FENCE
- PROPOSED TREES / SHRUBS
- PROPOSED WATER METER LOCATION
- PROPOSED SANITARY / STORM MONITORING TEST PORT
- PROPOSED PRESSURE RELIEF CHAMBER
- EXISTING STORM MANHOLE AND SEWER
- EXISTING SANITARY MANHOLE
- EXISTING VALVE AND VALE BOX
- EXISTING FIRE HYDRANT
- EXISTING CATCHBASIN
- EXISTING TOP OF GRATE
- EXISTING UTILITY POLE C/W GUY WIRES
- EXISTING LIGHT STANDARD
- EXISTING LIMITS OF CONCRETE
- PROPOSED LIMITS OF CONCRETE
- PROPOSED LIMITS OF STONEDUST PAVING
- PROPOSED METAL GRATE / FOOTBRIDGE
- PROPOSED LIMITS OF GREEN ROOF

PHASE 3 CONDOS - ROOF DRAIN TABLE

AREA ID	ZURN SPECIFICATION	NOTCHES	POST DEVELOPMENT ZURN ROOFDRAIN CONTROL PARAMETERS					
			1:5 - YEAR EVENT			1:100 - YEAR EVENT		
			HEAD(m)	Q(l/s)	VOL(m³)	HEAD(m)	Q(l/s)	VOL(m³)
NORTH BUILDING								
RD1	ZCF121-1W-X4-Z-105-10-77	1	0.105	0.39	1.41	0.138	0.51	3.13
RD2	ZCF121-1W-X4-Z-105-10-77	1	0.095	0.36	0.57	0.127	0.47	1.35
RD3	ZCF121-1W-X4-Z-105-10-77	1	0.096	0.36	0.58	0.128	0.48	1.37
RD4	ZCF121-1W-X4-Z-105-10-77	1	0.107	0.40	1.53	0.139	0.52	3.39
RD5	ZCF121-1W-X4-Z-105-10-77	1	0.096	0.36	0.48	0.122	0.46	1.17
RD6	ZCF121-1W-X4-Z-105-10-77	1	0.107	0.40	1.76	0.139	0.52	3.87
RD7	ZCF121-1W-X4-Z-105-10-77	1	0.108	0.40	2.07	0.141	0.52	4.52
RD8	ZCF121-1W-X4-Z-105-10-77	1	0.077	0.29	0.10	0.108	0.40	0.27
RD9	ZCF121-1W-X4-Z-105-10-77	1	0.082	0.30	0.52	0.108	0.40	1.21
RD10	ZCF121-1W-X4-Z-105-10-77	1	0.115	0.43	3.06	0.149	0.56	6.60
RD11	ZCF121-1W-X4-Z-105-10-77	1	0.112	0.42	1.77	0.146	0.54	3.92
RD12	ZCF121-1W-X4-Z-105-10-77	1	0.101	0.38	0.87	0.133	0.50	2.00
RD13	ZCF121-1W-X4-Z-105-10-77	1	0.096	0.36	0.58	0.134	0.50	1.36
RD14	ZCF121-1W-X4-Z-105-10-77	1	0.096	0.36	0.81	0.127	0.47	1.87
RD15	ZCF121-1W-X4-Z-105-10-77	1	0.079	0.29	0.58	0.103	0.39	1.32
RD16	ZCF121-1W-X4-Z-105-10-77	1	0.104	0.39	1.34	0.135	0.51	2.99
RD17	ZCF121-1W-X4-Z-105-10-77	1	0.113	0.42	1.19	0.148	0.55	2.69
RD18	ZCF121-1W-X4-Z-105-10-77	1	0.103	0.39	0.34	0.140	0.52	0.85
RD19	ZCF121-1W-X4-Z-105-10-77	1	0.094	0.35	0.35	0.126	0.47	0.85
RD20	ZCF121-1W-X4-Z-105-10-77	2	0.096	0.71	0.41	0.131	0.97	1.05
RD21	ZCF121-1W-X4-Z-105-10-77	2	0.106	0.79	1.16	0.131	0.97	2.72
RD22	ZCF121-1W-X4-Z-105-10-77	2	0.104	0.78	1.16	0.141	1.05	2.74
RD40	ZCF121-1W-X4-Z-105-10-77	1	0.000	0.00	0.00	0.000	0.00	0.00
SUBTOTAL				9.31	22.65		12.29	51.25
SOUTH BUILDING								
RD23	ZCF121-1W-X4-Z-105-10-77	1	0.108	0.40	1.40	0.141	0.53	3.11
RD24	ZCF121-1W-X4-Z-105-10-77	1	0.107	0.40	1.09	0.140	0.52	2.47
RD25	ZCF121-1W-X4-Z-105-10-77	1	0.100	0.37	0.91	0.132	0.49	2.06
RD26	ZCF121-1W-X4-Z-105-10-77	1	0.108	0.40	1.63	0.141	0.52	3.62
RD27	ZCF121-1W-X4-Z-105-10-77	1	0.111	0.41	1.50	0.127	0.47	3.33
RD28	ZCF121-1W-X4-Z-105-10-77	1	0.108	0.40	1.51	0.141	0.53	3.35
RD29	ZCF121-1W-X4-Z-105-10-77	1	0.097	0.36	1.13	0.127	0.47	2.54
RD30	ZCF121-1W-X4-Z-105-10-77	1	0.114	0.42	2.34	0.148	0.55	5.09
RD31	ZCF121-1W-X4-Z-105-10-77	1	0.095	0.35	0.47	0.126	0.47	1.11
RD32	ZCF121-1W-X4-Z-105-10-77	1	0.110	0.41	2.31	0.143	0.53	5.06
RD33	ZCF121-1W-X4-Z-105-10-77	1	0.101	0.38	0.90	0.132	0.49	2.06
RD34	ZCF121-1W-X4-Z-105-10-77	1	0.101	0.38	0.83	0.133	0.50	1.89
RD35	ZCF121-1W-X4-Z-105-10-77	2	0.108	0.81	1.18	0.144	1.07	2.78
RD36	ZCF121-1W-X4-Z-105-10-77	1	0.085	0.32	0.77	0.112	0.42	1.75
RD37	ZCF121-1W-X4-Z-105-10-77	2	0.103	0.77	0.58	0.138	1.03	2.62
RD38	ZCF121-1W-X4-Z-105-10-77	2	0.114	0.85	1.19	0.108	0.80	1.00
RD39	ZCF121-1W-X4-Z-105-10-77	2	0.109	0.81	0.83	0.146	1.09	2.00
SUBTOTAL				8.25	20.58		10.49	45.85
	TOTAL			17.56	43.23		22.79	97.10

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

PRELIMINARY NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
5.	REVISED AS PER CITY OF OTTAWA COMMENTS	NOV 24/22	SAZ
4.	REVISED AS PER CITY OF OTTAWA COMMENTS	AUG 19/22	SAZ
3.	ISSUED FOR COORDINATION	AUG 10/22	SAZ
2.	REVISED AS PER CITY OF OTTAWA COMMENTS	JUN 3/22	SAZ
1.	ISSUED WITH SITE PLAN APPLICATION	JUL 22/21	JAG

SCALE 1:250

DESIGN SAZ
CHECKED MSP
DRAWN MTM
CHECKED SAZ
APPROVED MSP

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
S.A.N. ZORGEL
100191487
Nov. 24/22
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

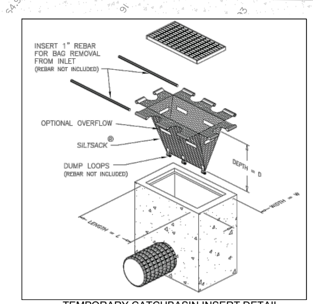
CITY OF OTTAWA
225 SCHOLASTIC DRIVE
GREYSTONE VILLAGE PHASE 3

DRAWING NAME
STORMWATER MANAGEMENT PLAN

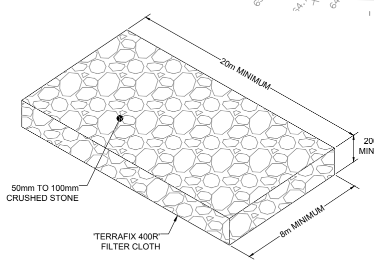
PROJECT No. 114025-PH3
REV: REV # 5
DRAWING No. 114025-STM(PH3)

D07-12-21-0111

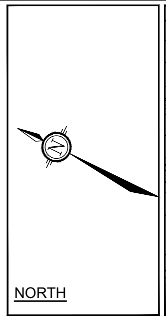
#17640

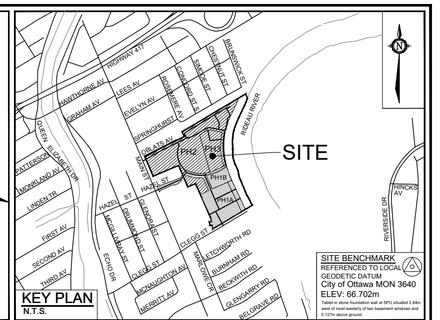


TEMPORARY CATCHBASIN INSERT DETAIL
- SILTSACK BY TERRAFIX
N.T.S.



MUD MAT DETAIL
NTS





KEY PLAN
N.T.S.

LEGEND

- SITE BOUNDARY
- PROPOSED ELEVATION / *EXISTING ELEVATION*
- PROPOSED TOP OF WALL ELEVATION / PROPOSED BOTTOM OF WALL ELEVATION
- PROPOSED TOP OF GRATE ELEVATION
- PROPOSED ELEVATED PATHWAY ELEVATION
- HOBIN ARCHITECT PROPOSED ELEVATION (CECCE SCHOOL)
- SUBDIVISION DESIGN ELEVATION
- AOV ORIGINAL TOPO ELEVATION
- PROPOSED GRADE AND DIRECTION
- PROPOSED TERRACING (MAX 3:1)
- PROPOSED SWALE WITH GRADE AND DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED BARRIER CURB
- PROPOSED DEPRESSED CURB
- PROPOSED DEPRESSED MOUNTABLE CURB (50mm)
- PROPOSED AREA DRAIN
- PROPOSED SIAMESE CONNECTION
- PROPOSED BUILDING ENTRANCE
- PROPOSED LIMITS OF UNDERGROUND PARKING
- PROPOSED RETAINING WALL
- PROPOSED RETAINING WALL AND ACOUSTIC FENCE
- PROPOSED TREES / SHRUBS
- PROPOSED SILT SACK IN EXISTING CATCHBASIN
- PROPOSED SILT FENCE (AS PER O.P.S.D. 219.110)
- *EXISTING VALVE AND VALE BOX*
- *EXISTING FIRE HYDRANT*
- *EXISTING CATCHBASIN*
- *EXISTING TOP OF GRATE*
- *EXISTING UTILITY POLE C/W GUY WIRES*
- *EXISTING STREETLIGHT*
- *EXISTING HYDRANT*
- *EXISTING DEPRESSED CURB*
- *EXISTING COMMUNITY MAILBOX*
- *EXISTING HYDRO MANHOLE*
- PROPOSED HYDRO MANHOLE
- *EXISTING LIMITS OF CONCRETE*
- PROPOSED LIMITS OF CONCRETE
- PROPOSED LIMITS OF STONEDUST PAVING
- PROPOSED METAL GRATE / FOOTBRIDGE

GENERAL NOTES:

1) COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2) DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3) OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4) BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5) RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6) REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7) ALL ELEVATIONS ARE GEODETIC.
8) REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
9) REFER TO SERVICING DESIGN BRIEF PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
10) SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
11) PROVIDE LINE/PARKING PAINTING.
12) CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING THE AS-BUILT ELEVATION OF EVERY DESIGN GRADE SHOWN ON THIS PLAN.
13) REFER TO GEOTECHNICAL REPORT PREPARED BY PATERSON GROUP FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
14) ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS. ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS WILL APPLY WHERE NO CITY STANDARDS ARE AVAILABLE.
15) ALL PRIVATE APPROACHES MUST BE CONSTRUCTED AS PER CITY SPECIFICATION SC13.

GRADING NOTES:

1) ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS.
2) EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL CONSULTANT.
3) ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS.
4) THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5) GRADE AND/OR FILL BEHIND PROPOSED CURB AND BETWEEN BUILDINGS AND CURBS, WHERE REQUIRED TO PROVIDE POSITIVE DRAINAGE.
6) MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
7) ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8) ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9) REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.

EROSION AND SEDIMENT CONTROL NOTES :

1) ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA. THEY ARE TO BE APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION. THESE PRACTICES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE MEASURES INDICATED ON THE PLAN.
2) TO PREVENT SURFACE EROSION FROM ENTERING THE DITCH OR STORM SYSTEM DURING CONSTRUCTION, CATCHBASIN INSERTS WILL BE PLACED UNDER GRATES OF CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED ALONG THE PROPERTY LINES. THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL VEGETATION HAS BEEN ESTABLISHED AND CONSTRUCTION IS COMPLETE.
3) THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
4) THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY DITCH OR STORM SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
5) THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
6) ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR MUNICIPALITY.
7) THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

PRELIMINARY
NOT FOR
CONSTRUCTION

No.	REVISION	DATE	BY
13.	REVISED AS PER CITY OF OTTAWA COMMENTS	NOV 24/22	SAZ
12.	REVISED AS PER CITY OF OTTAWA COMMENTS	AUG 19/22	SAZ
11.	ISSUED FOR COORDINATION	AUG 10/22	SAZ
10.	REVISED AS PER CITY OF OTTAWA COMMENTS	JUN 3/22	SAZ
9.	ISSUED FOR COORDINATION	MAY 24/22	SAZ
8.	ISSUED FOR COORDINATION	MAR 4/22	SAZ
7.	ISSUED FOR COORDINATION	MAR 2/22	MSP
6.	ISSUED FOR COORDINATION	FEB 23/22	MSP
5.	ISSUED WITH SITE PLAN APPLICATION	JUL 22/21	JAG
4.	ISSUED FOR INFORMATION	MAR 19/21	JAG
3.	RE-ISSUED FOR COORDINATION	FEB 17/21	JAG
2.	ISSUED FOR COORDINATION	DEC 4/20	JAG
1.	ISSUED FOR DISCUSSION PURPOSES	DEC 2/20	JAG

SCALE
1:250
1:250
0 2 4 6 8 10

DESIGN MTM
CHECKED SAZ
DRAWN MTM
CHECKED SAZ
APPROVED MSP

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
S.A.N. ZORGEL
100191487
Nov. 24/22
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
225 SCHOLASTIC DRIVE
GREYSTONE VILLAGE PHASE 3

DRAWING NAME
GRADING, EROSION & SEDIMENT CONTROL PLAN

PROJECT No. 114025-PH3
REV: REV # 13
DRAWING No. 114025-GR(PH3)

D07-12-21-0111

#17640

PARKING SLAB STUDY (1 001)
1 : 200

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P : (613) 254-9643

LANDSCAPE ARCHITECTURE
CSW Landscape Architects Limited
319 McRae Avenue, Suite 502
Ottawa, Ontario K1Z 0B9
P : (613-729-4536

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200-1550 Carling
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P : (613)-729-7242

ARCHITECTES Architect
NEUF architect(e)s SENCRL
630, boul. René-Lévesque O. 32e étages, Montréal QC H3B 1S6
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CLIENT Client
REGIONAL GROUP

OUVRAGE Project
GREYSTONE VILLAGE PHASE 3

EMPLACEMENT Location
OTTAWA

NO PROJET No.
12272

NO	RÉVISION	DATE (aa-mm-jj)

DESSINÉ PAR Drawn by
Author

VÉRIFIÉ PAR Checked
Checker

DATE (aa.mm.jj)
10/17/22

ÉCHELLE Scale
1 : 200

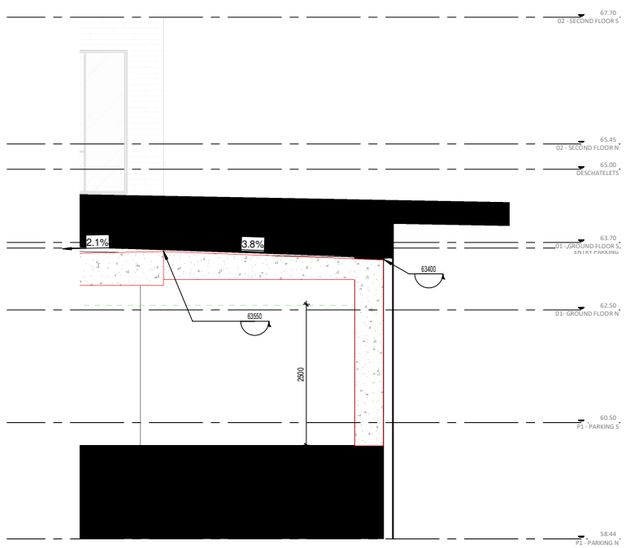
TITRE DU DESSIN Drawing Title
SLAB ELEVATION PLAN

RÉVISION Revision
001

NO. DESSIN Dwg Number
D07-12-21-0111

#17640

Autodesk Docs://12272_GREYSTONE/GV-PH3_12272_ARC_R22.rvt



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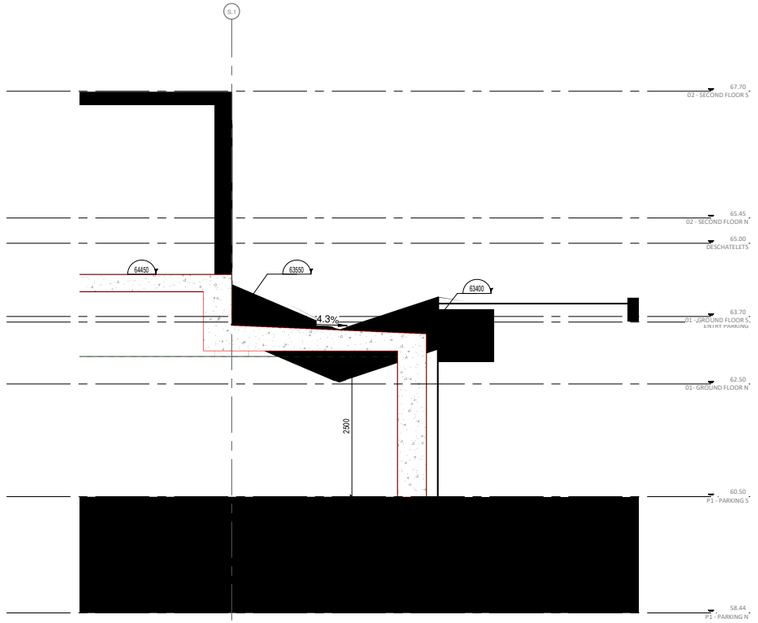

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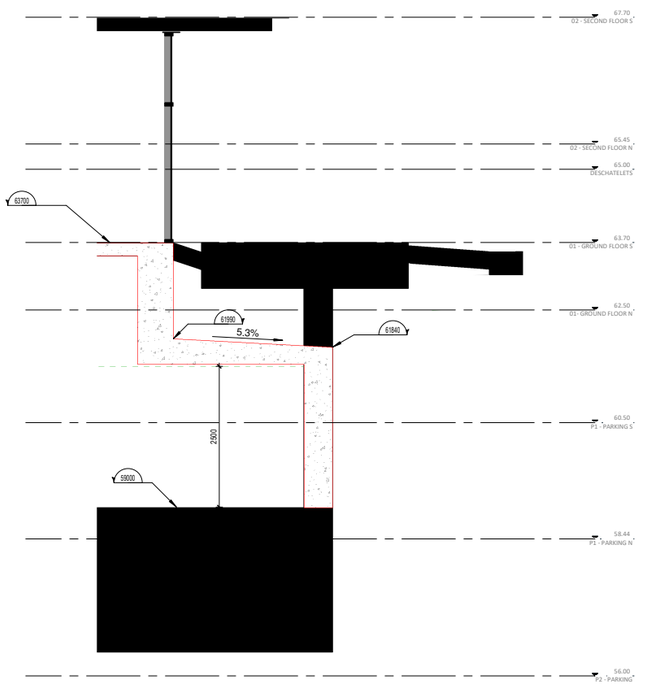

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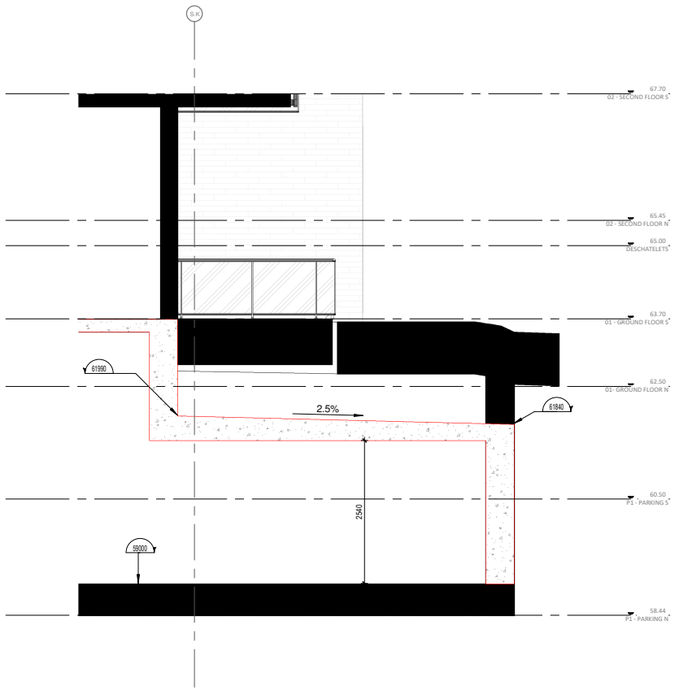

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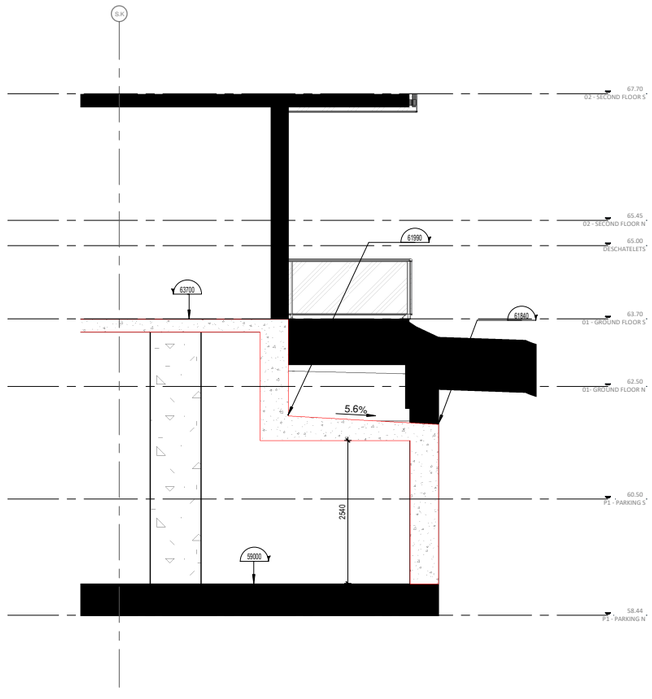

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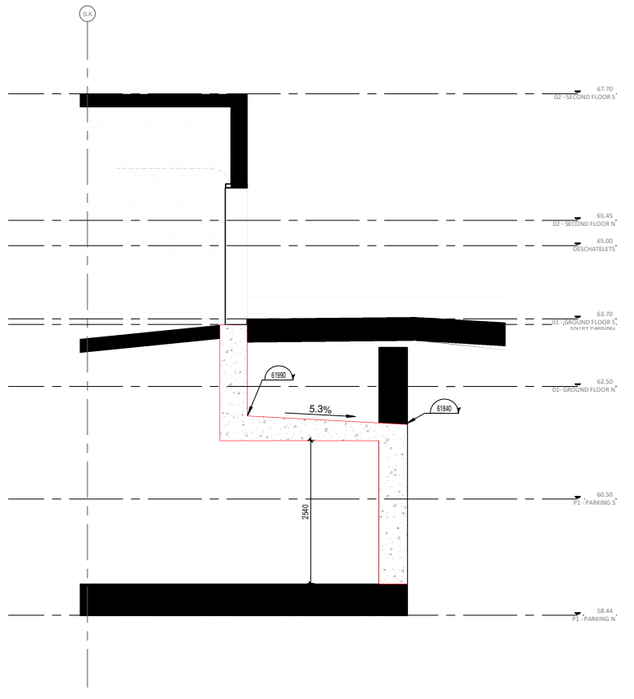

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6 / 005

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ARCHITECTES Architect
NEUF architect(e)s SENCRL
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REGIONAL GROUP

OUVRAGE Project
GREYSTONE VILLAGE PHASE 3

EMPLACEMENT Location
OTTAWA

NO PROJET No.
12272

NO	RÉVISION	DATE (aa-mm-jj)

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Author

VÉRIFIÉ PAR Checked
Checker

DATE (aa.mm.jj)
10/20/22

ÉCHELLE Scale
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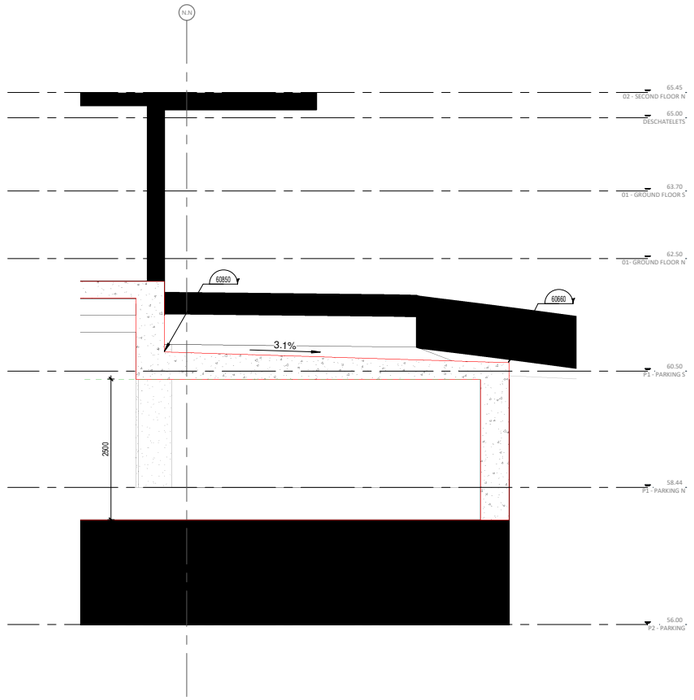
TITRE DU DESSIN Drawing Title
Unnamed

RÉVISION Revision

NO. DESSIN Dwg Number
005

D07-12-21-0111

#17640



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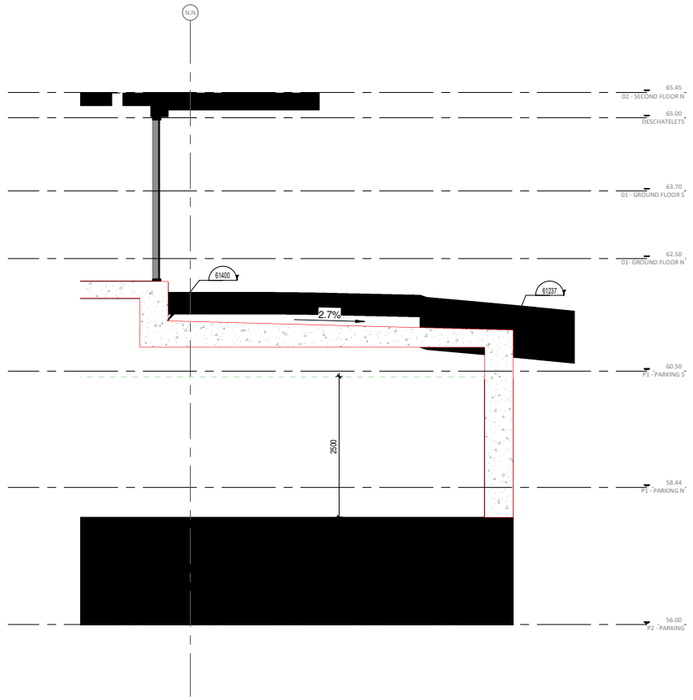

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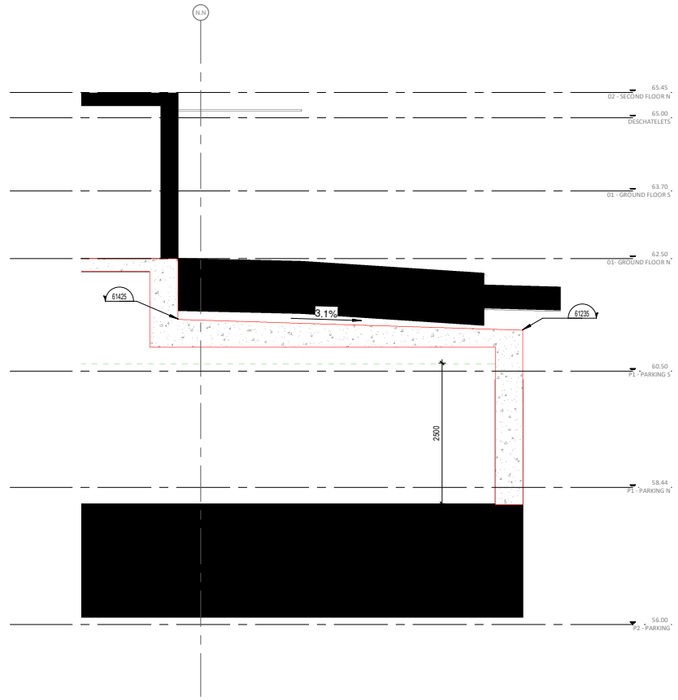

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EMPLACEMENT Location
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Author

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10/20/22

ÉCHELLE Scale
1 : 50

TITRE DU DESSIN Drawing Title
Unnamed

RÉVISION Revision

NO. DESSIN Dwg Number
006

#17640

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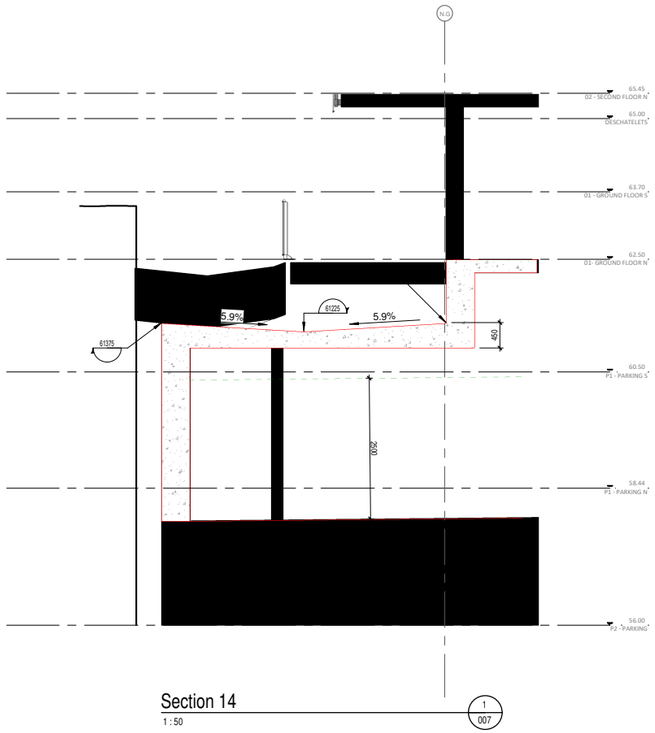

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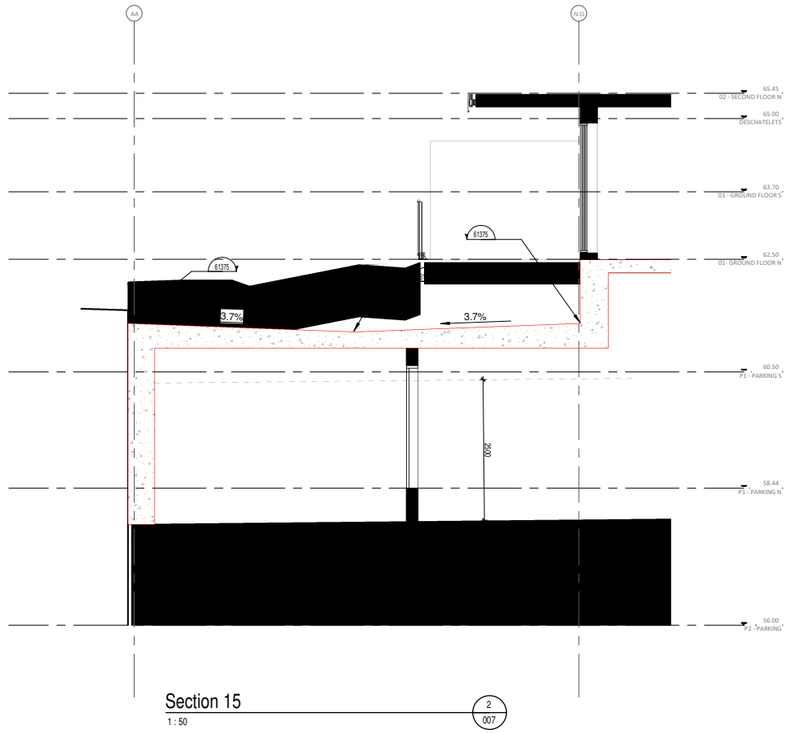

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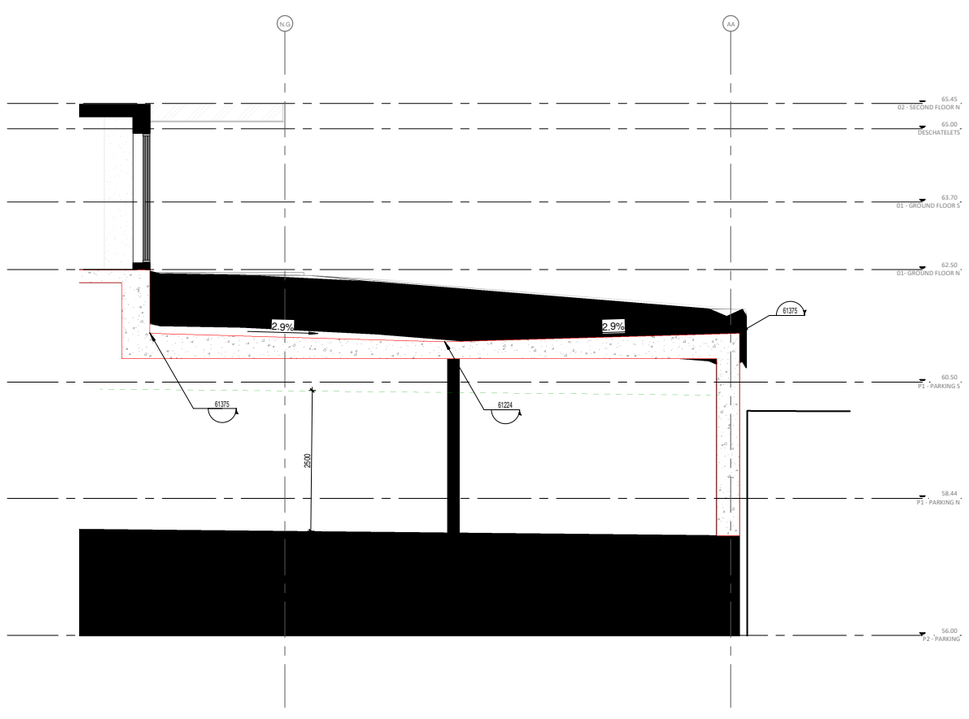

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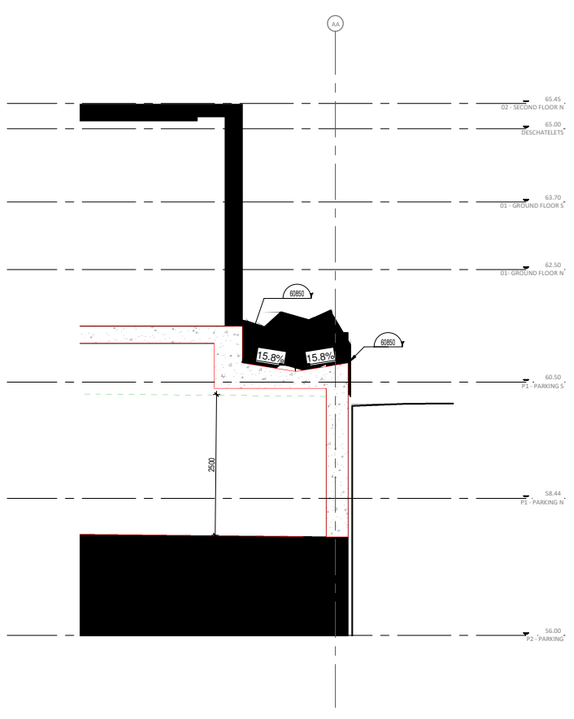

Section 17

1 : 50

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OUVRAGE Project
GREYSTONE VILLAGE PHASE 3

EMPLACEMENT Location
OTTAWA

NO PROJET No.
12272

NO	RÉVISION	DATE (aa-mm-jj)

DESSINÉ PAR Drawn by
Author

VÉRIFIÉ PAR Checked
Checker

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10/20/22

ÉCHELLE Scale
1 : 50

TITRE DU DESSIN Drawing Title
Unnamed

RÉVISION Revision

NO. DESSIN Dwg Number
007

D07-12-21-0111

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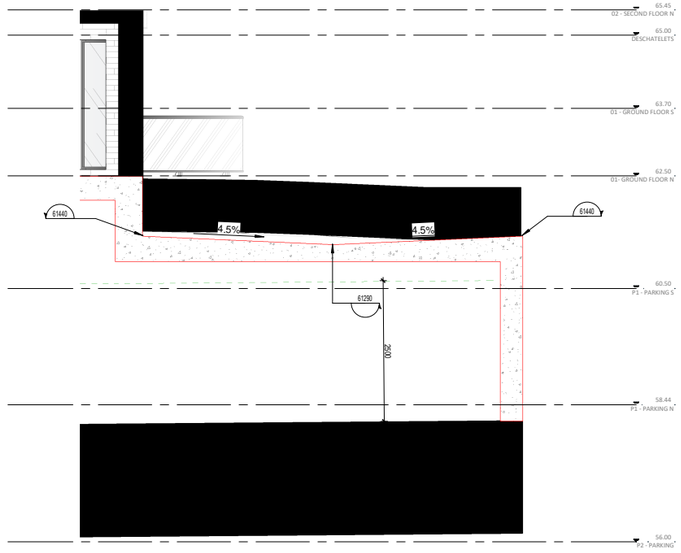

Section 27 — 1 / 008

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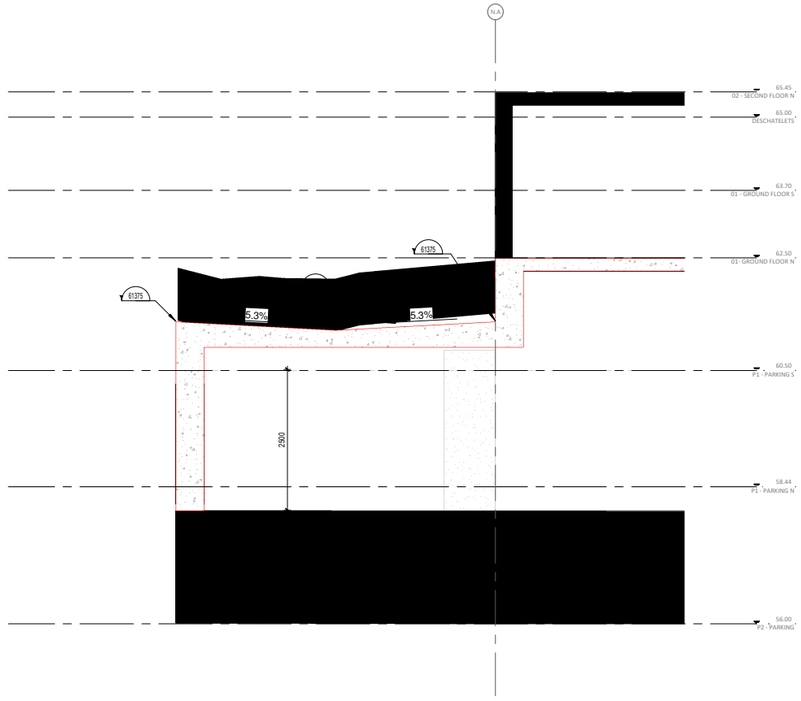

Section 13 — 2 / 008

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ARCHITECTES Architect
NEUF architect(e)s SENCRL
630, boul. René-Lévesque O. 32e étages, Montréal QC H3B 1S6
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CLIENT Client

REGIONAL GROUP

OUVRAGE Project

GREYSTONE VILLAGE PHASE 3

EMPLACEMENT Location
OTTAWA

NO PROJET No.
12272

NO	RÉVISION	DATE (aa-mm-jj)

DESSINÉ PAR Drawn by
Author

VÉRIFIÉ PAR Checked
Checker

DATE (aa.mm.jj)
10/20/22

ÉCHELLE Scale
1 : 50

TITRE DU DESSIN Drawing Title

Unnamed

RÉVISION Revision

NO. DESSIN Dwg Number
008

#17640

D07-12-21-0111

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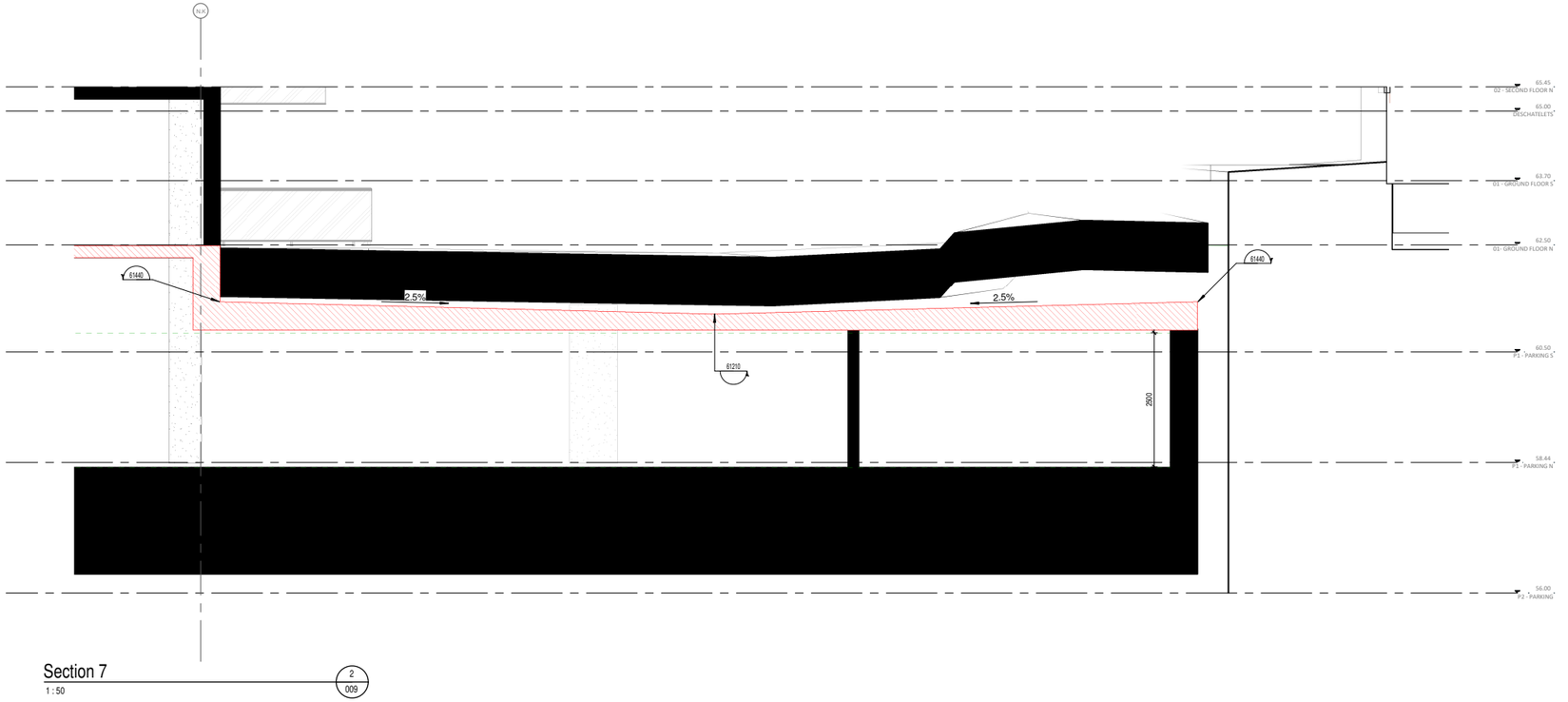

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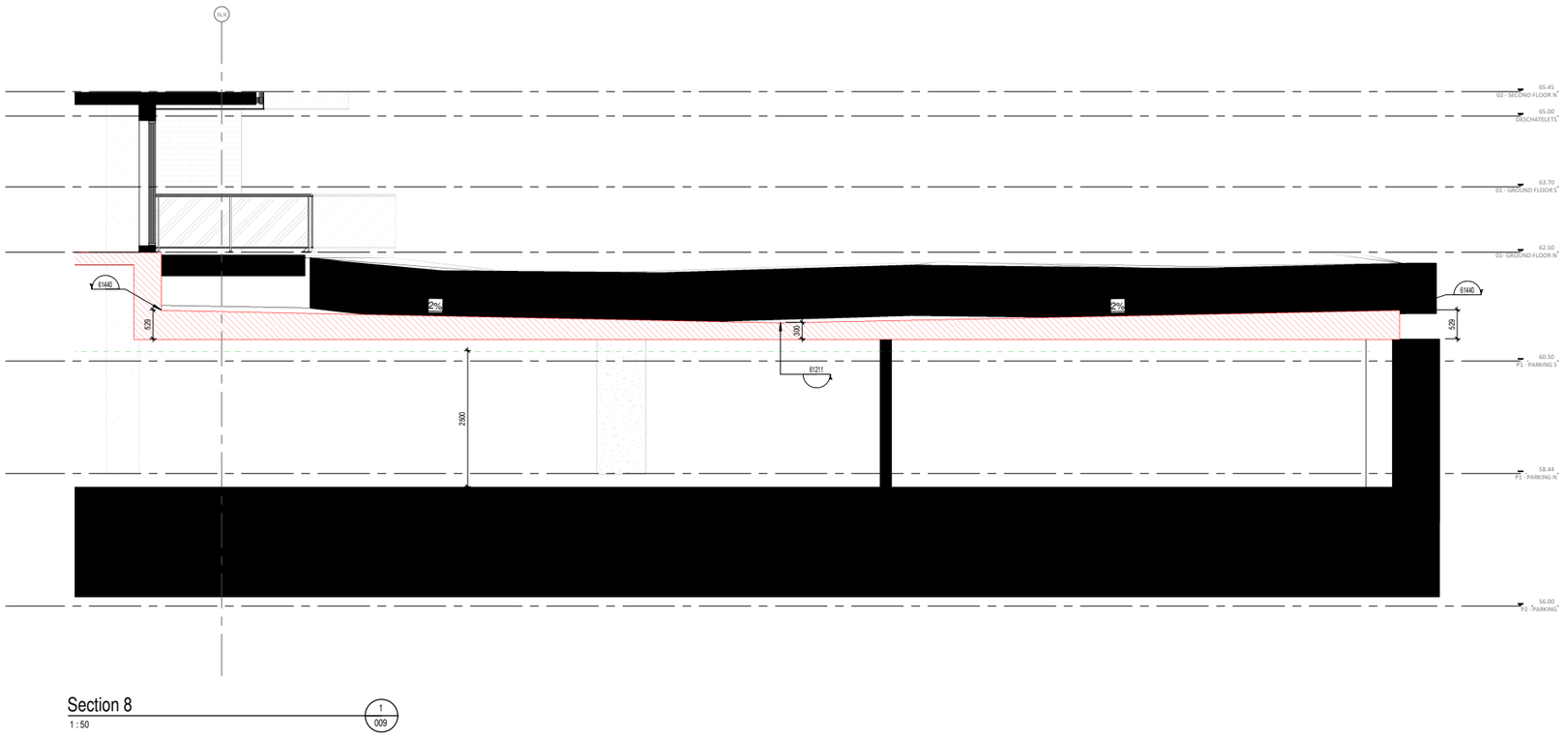

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319 McRae Avenue, Suite 502
Ottawa, Ontario K1Z 0B9
P : (613-729-4536

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ARCHITECTES Architect
NEUF architect(e)s SENCRL
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TITRE DU DESSIN Drawing Title
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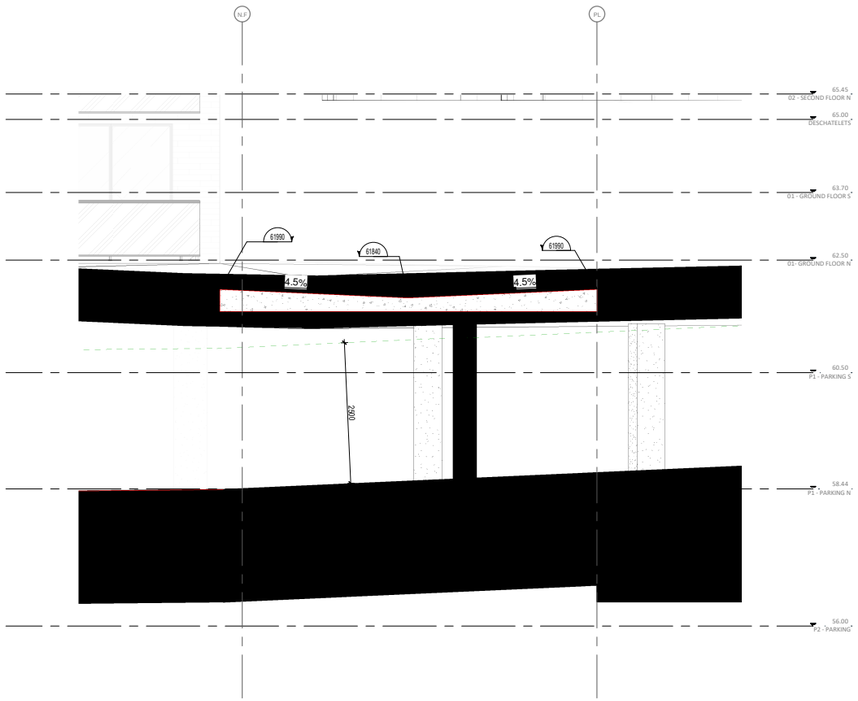

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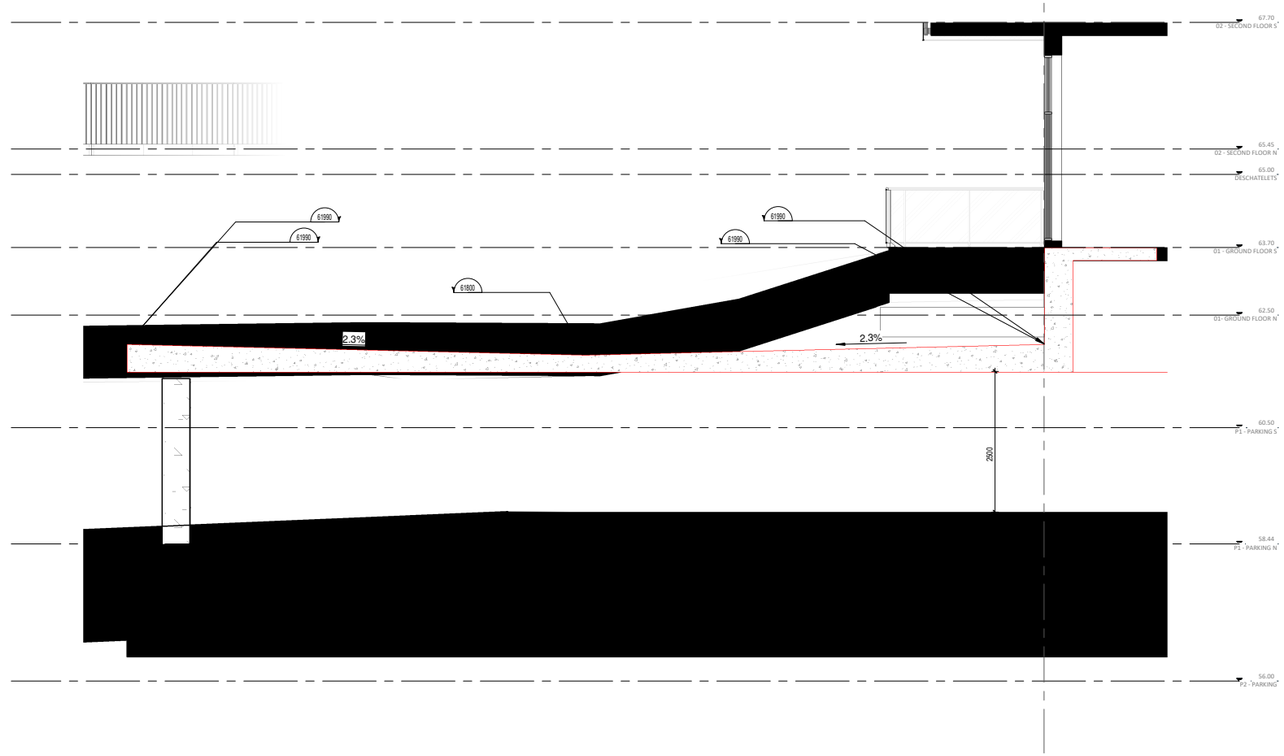

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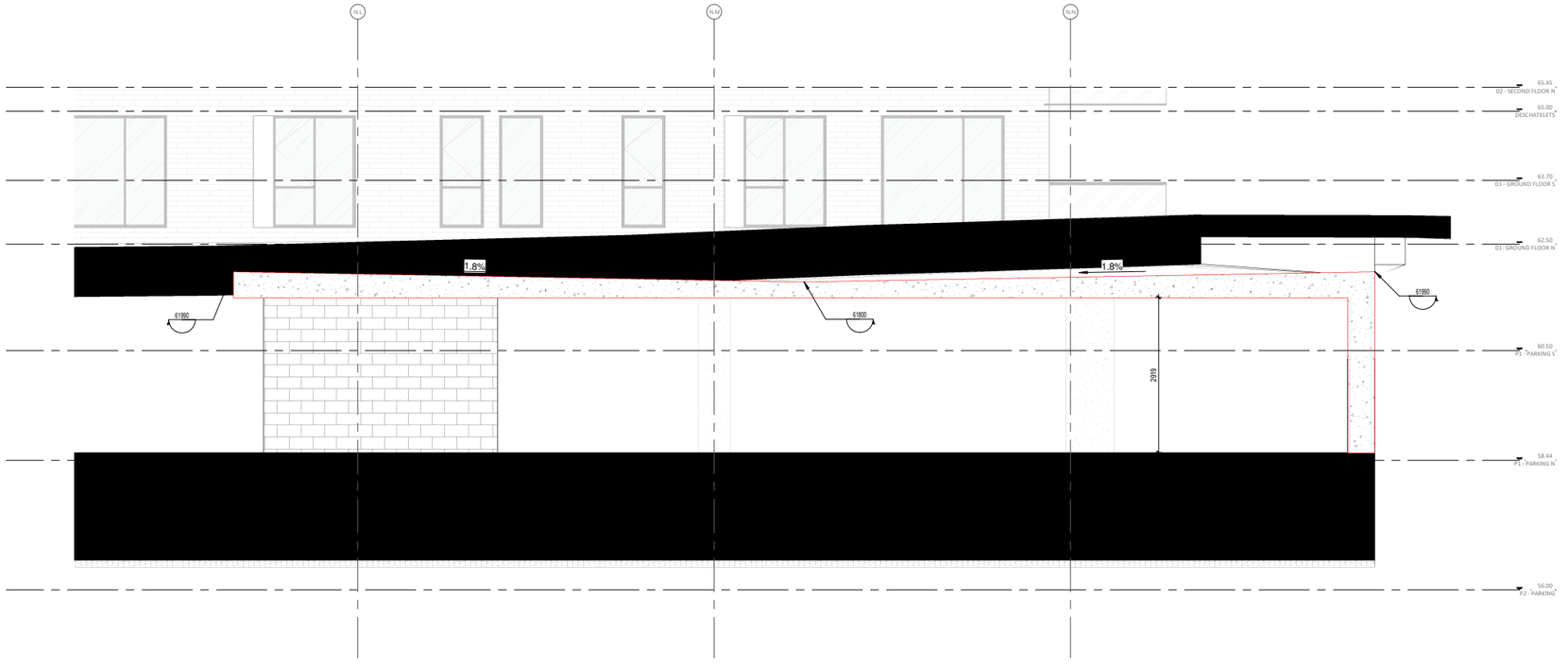

Section 22
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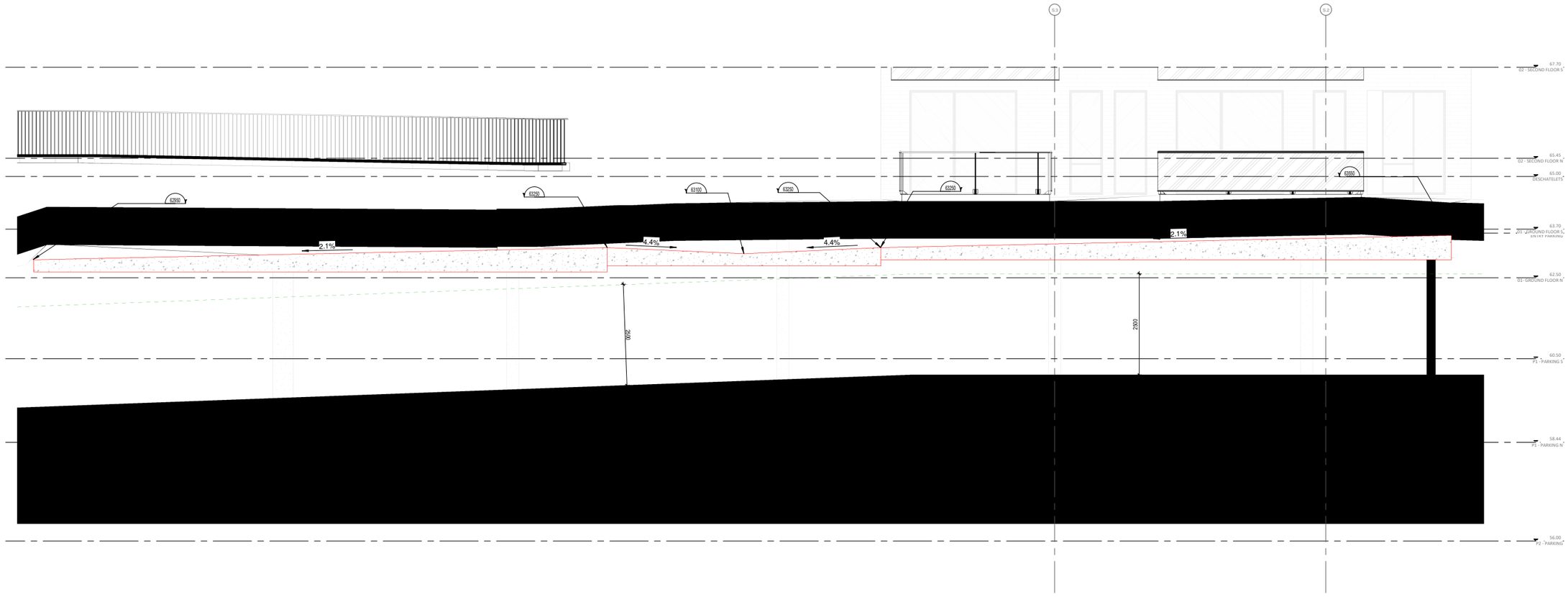

Section 25

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