

D-4 Landfill Impact Assessment

Development in Southgate Township, Ontario

**Concession 2 Southwestern Part Lot 234,
Southgate Township, County of Grey**

Palmer Project #
2309101

Prepared For
Briarwood (Dundalk) Inc.

November 18, 2024

November 18, 2024

Enzo Di Giovanni
Briarwood (Dundalk) Inc.
14-636 Edward Ave,
Richmond Hill, ON
L4C 0V4

Dear Enzo Di Giovanni,

**Re: D-4 Landfill Impact Assessment, Development at Concession 2, SWTSR PT LOT 234,
Southgate Township, County of Grey, Ontario**

Project #: 2309101

Palmer, a part of SLR Consulting (Canada) Ltd. (Palmer) is pleased to provide Briarwood (Dundalk) Ltd. (the 'Client') the results of our D-4 Landfill Impact Assessment at Concession 2, Southwestern Part Lot 234, in Southgate Township, County of Grey ON (the "site"). Ministry of the Environment, Conservation and Parks (MECP) Guideline D-4 specifies restrictions and controls on land use within 500m of a landfill site. The focus of this assessment was to assess potential landfill-related impacts within the site. This was completed by identifying the presence of methane gas in the unsaturated and saturated portions of the on-site soils and testing for the presence of dissolved methane in groundwater.

As part of this assessment, two monitoring wells were drilled, and eight shallow boreholes were hand-augured and screened for soil vapour methane concentrations. Additionally, groundwater samples were tested for dissolved methane concentrations. The study revealed minimal methane concentrations in groundwater at the site, with soil vapour and well headspace methane concentrations matching atmospheric conditions.

We trust that this report will be satisfactory for your current needs. If you have any questions or require further information, please contact our office at your convenience.

Yours truly,



Nick Schmidt, B.Sc., P.Geo.
Senior Hydrogeologist

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Appendix C.	Borehole Logs (Palmer, February 2024)
Appendix D.	Laboratory Certificate of Analysis (ALS, February 2024)

1. Introduction

Palmer was retained by the Client to conduct a D-4 Landfill Impact Assessment to support the proposed residential development located southeast of Grey Road 9 & Ida Street intersection, Southgate, ON (the “site” or the “property”) (**Figure 1**). The site is identified as Roll Number (ARN) 420709000505800 and is legally described as CON 2 SWTSR PT LOT 234 (Range 2 West of Toronto and Sydenham Road, Proton). The property is located approximately 600m south of the Grey Rd. 9 & Ida St. intersection, with the property fronting on to Ida Street. The site is rectangular in shape and is generally flat and has an approximate site area of 51.3 acres (20.8 ha).

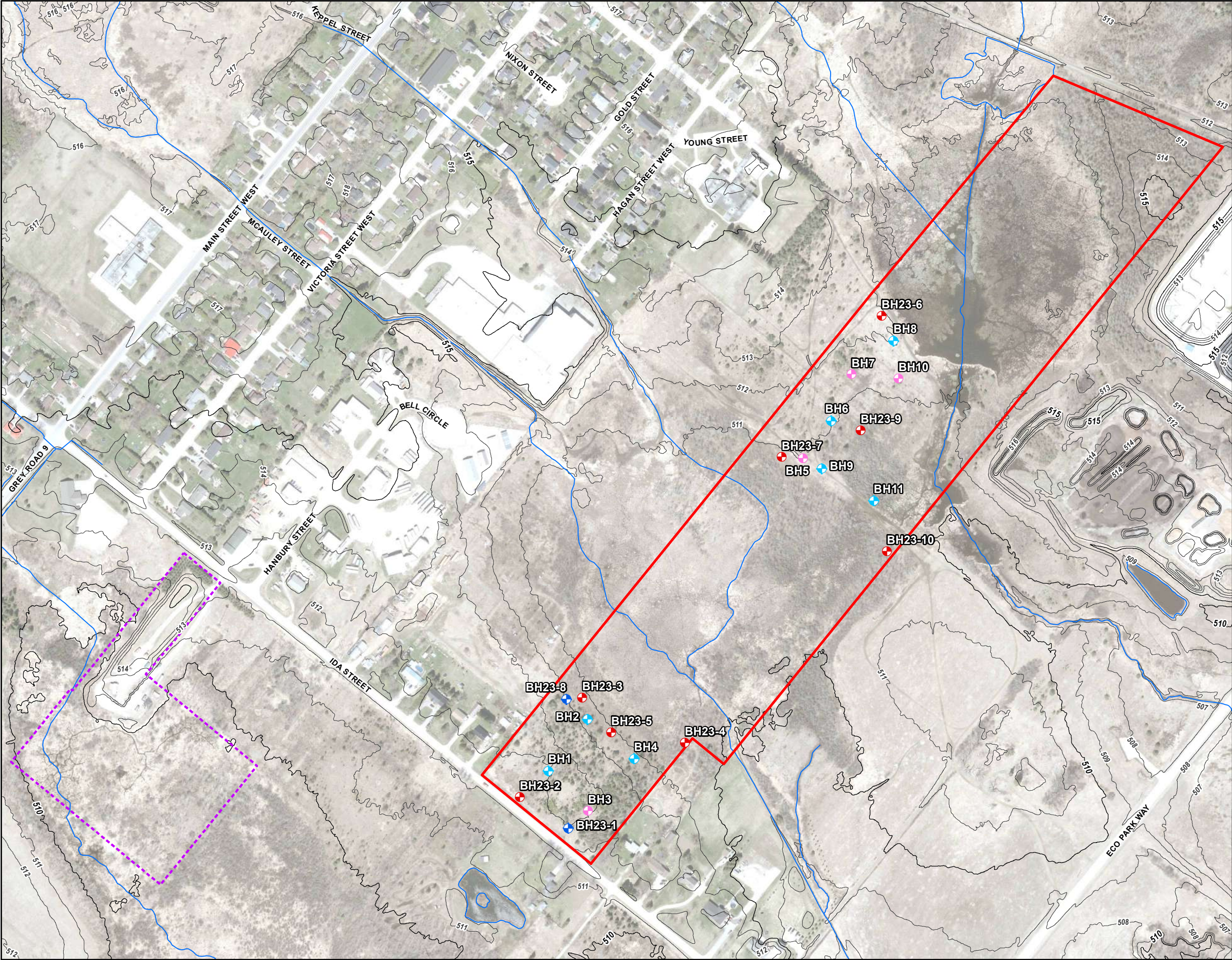
The objective of this assessment was to evaluate potential landfill-related impacts within the site. It aims to confirm our understanding of these potential impacts, including any constraints for construction related to methane concentrations in soil vapor, groundwater, as well as soil-related construction issues. This will be achieved by testing methane gas in both the unsaturated and saturated portions of the on-site soils, as well as testing for the presence of dissolved methane in groundwater.

The existing property is in a rural land use setting and is currently vacant. The concept site plan provided by S&C Architects Inc. proposes four (4) 3-storey apartment buildings with one (1) level of underground parking which will be provided with municipal servicing.

Palmer reviewed information contained in the following background documents to prepare this D4 Assessment for the proposed redevelopment at Concession 2, southwestern part lot 234, Southgate, ON:

- S&C Architects Inc – Dundalk Concept Site Plan, October 22, 2024.
- Soil Engineers – Geotechnical Investigation for Proposed Residential Development, Con 2 SWRTSR PT Lot 234, Southeast of Grey Road 9 and Ida Street – Briarwood (Dundalk) Ltd., January 2024.
- Ministry of the Environment, Conservation, and Parks – Amendment to Environmental Compliance Approval, Number A262302, Dundalk Transfer Station and Closed Landfill Site, Lot 232, Concession 3, Southgate Township, County of Grey.

The northwest boundary of the site lies within approximately 300 meters (m) of the current Dundalk Waste Transfer Station, and the Closed Landfill site located at 752178 Ida Street. Following the Ministry of the Environment Conservation and Parks (MECP Land Use Compatibility Guidelines, land development or land-use changes on or near (within 500m) operating or not operating landfills (as defined in O.Reg. 347) requires a Guideline D-4 Assessment be completed for the lands that could be potentially impacted by the waste disposal site.



KEY MAP

LEGEND

- Borehole (Palmer)
- Borehole (Soil Engineers)
- Borehole/Monitoring Well (Palmer)
- Borehole/Monitoring Well (Soil Engineers)
- Surface Elevation Contour (1m)
- Watercourse¹
- Subject Site
- Waste Transfer Station

1. LIO/MNRF

METRE SCALE

North American Datum 1983
Universal Transverse Mercator Projection Zone 17

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CLIENT	Briarwood (Dundalk) Ltd.	
PROJECT	D-4 Landfill Impact Assessment	
TITLE	Site Location Plan	
 PART OF 	REF. NO.	2309101-1-2
	Figure 1	

1.1 D-4 Study Guidelines

D-4 studies are required in order to:

- *“Protect the health, safety, convenience and welfare of residents near such facilities [Landfill Sites]” by restricting or controlling land use in their vicinity. The guideline stipulates that a D-4 study should consider “groundwater and surface water contamination by leachate, surface runoff, ground settlement, visual impacts, soil contamination and hazardous waste, and landfill generated gases. Particular attention shall be given to the production and migration of methane gas.”*

The D-4 guideline specifies restrictions and controls on land use that the MECP considers in the vicinity of landfills and dumps, in order to protect the health, safety, convenience and welfare of residents near such facilities. The application of the guideline extends to all proposals for land use on, or near, operating and non-operating landfills (as defined in O. Reg. 347), and dumps which contain municipal solid waste, industrial solid waste and/or sewage sludges. The guideline applies to all such facilities regardless of ownership. It does not apply to lands certified as organic soil conditioning sites under O. Reg. 347.

Section 4.2 of the Ministry's D-4 Guideline Summary states that for all non-operating waste disposal sites, *“Factors to be considered when land use is proposed on or near a non-operating site include: ground and surface water contamination by leachate, surface runoff, ground settlement, visual impact, soil contamination and hazardous waste, and landfill— generated gases (e.g., Methane)”*.

The environmental conditions of the landfill identified by Palmer staff would be categorized as a “non-operating” site under section 4.2 of O. Reg. 347.

1.2 Objectives and Scope of Work

The scope of this D-4 Landfill Impact Assessment report is to assess the likelihood of any adverse effects on the subject site, which involves the following tasks:

- Perform a Background Review to establish if potential environmental impacts are likely to be present on the site as a result of previous or current land use on or in the vicinity of the site.
- A field investigation including:
 - Hand auger eight (8) shallow boreholes to a depth of 1 m to 1.5 m below ground surface (mbgs), while logging and testing soils for the presence of landfill gasses
 - Install two (2) monitoring wells (BHMW23-1 and BH/MW23-8) to 6 meters below ground surface.
 - Using low-flow groundwater sampling techniques, collect groundwater samples from the two (2) newly installed monitoring wells. Groundwater samples will be submitted to a certified laboratory to analyze the dissolved methane in water.
- Prepare a D-4 technical report to determine the “Land Use Compatibility” of the site. The results will be summarized indicating if landfill related impacts have been detected as part of Palmer’s assessment.

2. Background Review

2.1 Proposed Development

The proposed concept site plan provided by S&C Architects includes four (4) residential 3-story apartment buildings with one (1) level of underground parking. The development will be provided with municipal services and paved roadways meeting the town's standards. The concept site plan has been included in **Appendix A**.

2.2 Dundalk Transfer Station and Closed Landfill

Palmer completed a search of available public (federal and provincial government) and private waste disposal site databases for records about the site and surrounding areas. It is noted that there was one record identified, the record was located offsite.

A closed landfill was identified at 752178 Ida Street and was located within a 500 m buffer area of the site boundary. This location is identified as the Dundalk Waste Transfer Station and Closed Landfill, which is currently operated by the Corporation of the Township of Southgate. The Amendment to Environmental Compliance Approval (ECA) Number A262302 for the Dundalk Transfer Station and Closed Landfill (MECP, 2016) has identified that an environmental monitoring plan is required to include groundwater monitoring, surface water monitoring, and gas monitoring. The ECA has been included as part of this report in **Appendix B**.

As per the amendment to the ECA (MECP, 2016), the Dundalk Waste Transfer Station and Closed landfills is monitored for the following parameters:

- groundwater parameters: arsenic, barium, boron, calcium, iron, magnesium, manganese, phosphorus, potassium, sodium, chloride, nitrate, nitrite, sulphate, alkalinity, conductivity, hardness, pH, ammonia, biological oxygen demand, total dissolved solids, total kjeldahl nitrogen, and volatile organic compounds.
- surface water parameters: barium, boron, iron, manganese, potassium, sodium, chloride, sulphate, alkalinity, conductivity, field temperature, hardness, pH, ammonia, chemical oxygen demand, dissolved organic carbon, total dissolved solids, total phosphorus, total suspended solids.
- gas is monitored for combustible gasses (methane).

2.3 Background

2.3.1 Site Setting and Surrounding Area

The proposed Briarwood residential subdivision lies on lands legally described as Parts of Lot 234, range 2 west of Toronto and Sydenham Road, Township of Proton, Township of Southgate, County of Grey. The site is bounded by Ida Street to the west, is approximately 650 m south of Grey Road 9, and is approximately 51.3 acres (20.8 ha). The lands are currently vacant, covered by grasslands and forest cover.

2.3.2 Topography and Surface Water

At a regional scale, the site and general area have relatively little change in topography with a gentle slope to the Southwest. Based on site survey from the Geotechnical boreholes installed by Soil Engineers Ltd., elevations range from 511 m to 513 m above sea level (masl).

The site is located within the upper Grand River watershed, which is regulated by the Grand River Conservation Area (GRCA). The drainage area of the watershed is approximately 7,000 km². Locally, the site is within the McNabb Drainage Works sub watershed.

There are four watercourses that flow through the northwestern site boundary, of the watercourses, two each converge such that only two watercourses flow through the southeastern site boundary. The watercourses are tributaries that feed into the Upper Grand River, ultimately discharging into Lake Bellwood, approximately 40 km south of the site. The watercourses on site, converge with a watercourse approximately 3 km downstream (south of the site) that flows through the Dundalk Waste Transfer Station and Closed Landfill.

2.3.3 Physiography and Geology

The site is located within the Dundalk Till Plain physiographic region of Southern Ontario (Chapman and Putnam, 1984). The Dundalk Till Plain is a gentle undulating, partially drumlinized, and fluted surface, where the long axis of the drumlins are oriented in a southeastward direction. The Dundalk Till Plain supports extensive wetland complexes due to the presence of poorly drained depressions.

Available surficial geology mapping by the Ontario Geological Survey (OGS, 2013) indicates that the native surficial geology is comprised of till (5b) and glaciofluvial deposits (7a). The Till is found to be stone-poor, sandy silt to silty sand textured till on Paleozoic terrain, where the glaciofluvial deposits are described to be river deposits and delta topset facies sandy deposits. The available quaternary geology mapping of the site (OGS, 1997) is described as Catfish Creek Till, comprised of sandy silt to silt matrix strongly calcareous, moderately stony to stony, deposited in the Pleistocene.

The overburden material is underlain by bedrock aquifer units comprised of the Guelph Formations (Armstrong and Dodge, 2007) and is found at depths of approximately 18 mbgs to 28 mbgs based on MECP water well records within a 500m radius of the site boundary.

2.3.4 Hydrogeology

Hydrostratigraphic units can be subdivided into distinct groups based on their ability to allow for groundwater movement: an aquifer and an aquitard. An aquifer is defined as a layer of soil that is permeable enough to permit a usable supply of water to be extracted. An aquitard is a layer of soil that inhibits groundwater movement due to its low permeability. The information provided in this section is derived from publicly available data from the Ontario Geological Society (OGS), Ministry of the Environment, Conservation and Parks (MECP), the Oak Ridges Moraine Groundwater Program

(ORMGP), and publicly available reports. The major regional hydrostratigraphic units that have been investigated at the site are described below:

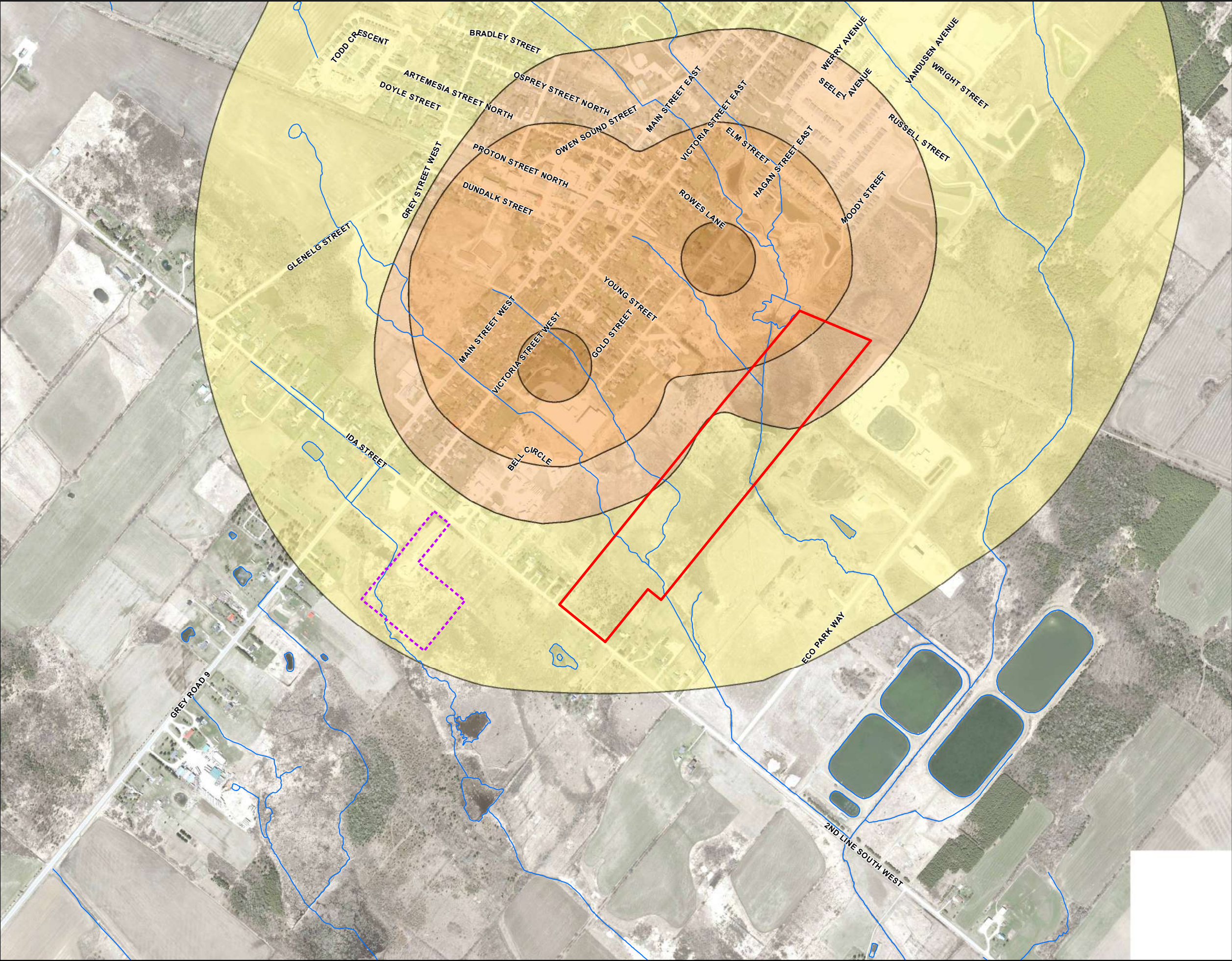
Catfish Creek Till forms a major regional aquitard within the study area, given its relatively lower hydraulic conductivity and consistent presence throughout the region. The properties of the till are consistent; the till is stoney with a silty to sandy matrix.

2.3.5 Source Water Protection

The site is located within the Grand River Source Protection area and is subject to the Grand River Source Water Protection Plan. The Grand River Source Water Protection (effective February 15, 2022) encompasses the township of Southgate, Aramanth, East Garfania, Town of Grand Valley, County of Wellington, City of Guelph, Region of Halton, Region of Waterloo, Township of Perth East, County of Oxford, City of Hamilton, County of Brant, City of Brantford, and County of Haldimand, and identifies four main regulatory factors under the *Clean Water Act (2006)* relating to local hydrogeology to consider for site development: Significant Groundwater Recharge Areas (SGRAs), Highly Vulnerable Aquifers (HVAs), Wellhead Protection Areas (WHPAs), and Intake Protection Zones (IPZs).

A Wellhead Protection Area (WHPA) is the area around the wellhead where land use activities have the potential to affect the quality or quantity of water that flows into the well. These areas are delineated into zones of vulnerability (A, B, C, and D) based on the time of travel of water into the well, and zones around a surface water body influencing Groundwater Under Direct Influence (GUDI) (E, F). Other zones (Q1, and Q2) are defined as the areas where new water takings or reduced recharge could impact the quantity of water available to municipal supply wells. IPZs are the area on the water and land surrounding a municipal surface water intake. HVAs are aquifers that are susceptible to contamination as a result of the soil structure/material or due to its location near the ground surface. Lastly, SGRAs are areas where recharge is important to maintain the water level in a community drinking water aquifer.

The site falls mainly within a WHPA D with a score of 2, however, the northeastern portion is with WHPA C with a score of 2 and the most northeasterly portion is within WHPA B with a score of 6 (**Figure 2a**). It is noted that the majority of the site is considered within an intake protection zone 3 (**Figure 2b**), and the site is considered within a Significant Groundwater Recharge Area with a score classified as n/a (**Figure 2c**)



LEGEND

Watercourse¹

Subject Site

Waste Transfer Station

Source Water Protection²

Wellhead Protection Area - A

Wellhead Protection Area - B

Wellhead Protection Area - C

Wellhead Protection Area - D

1. LIO/MNRF

2. GRCA and Source Protection Information Atlas, MECP 2024 ©King's Printer for Ontario

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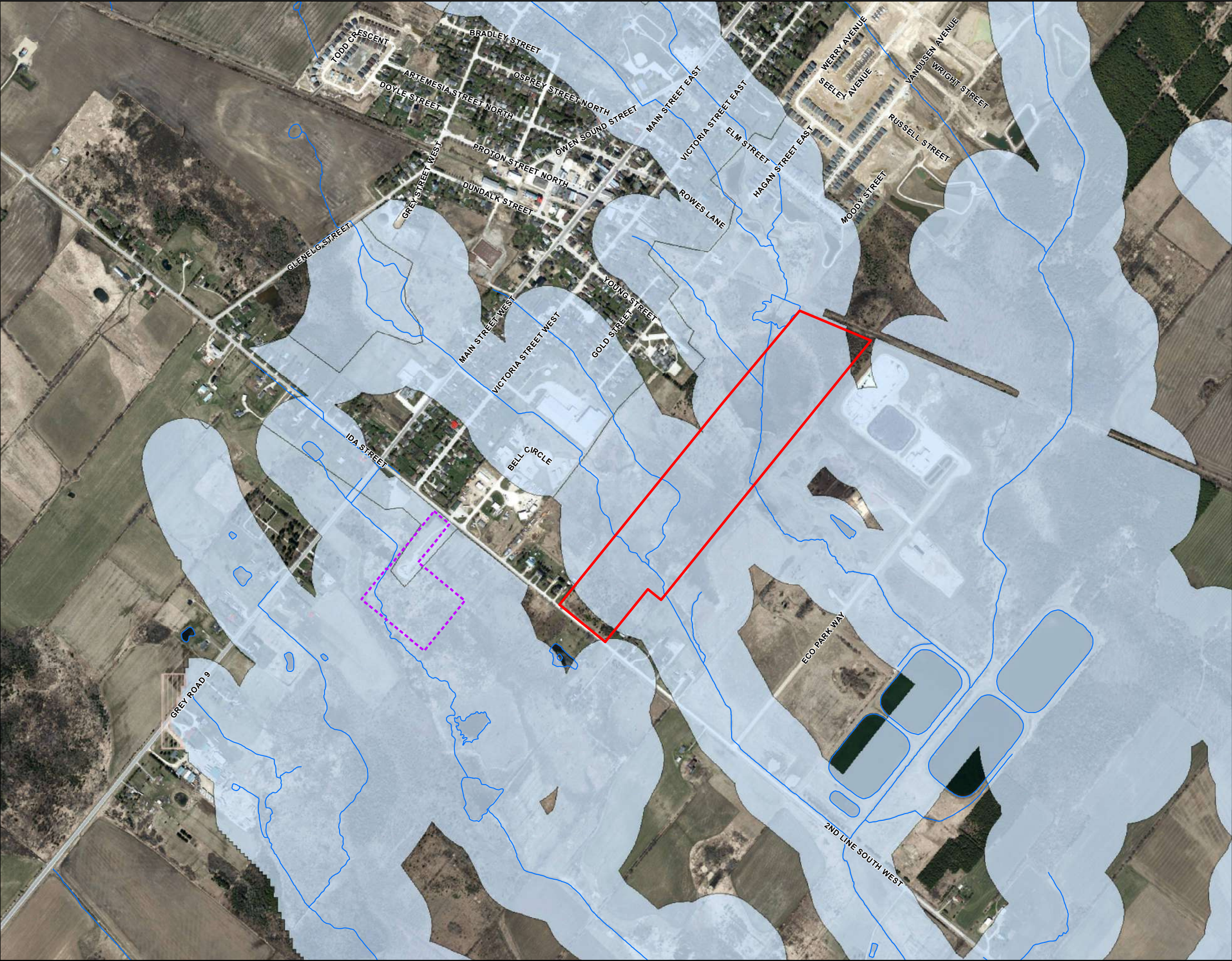
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NORTH

CLIENT	Briarwood (Dundalk) Ltd.	
PROJECT	D-4 Landfill Impact Assessment	
TITLE	Source Water Protection Areas	
	REF. NO.	2309101-2a-1
	Figure 2a	



LEGEND

 Watercourse¹

 Subject Site

 Waste Transfer Station

Source Water Protection²

 Highly Vulnerable Aquifer

 Intake Protection Zone 3

1. LIO/MNRF

2. GRCA and Source Protection Information Atlas, MECP 2024 ©King's Printer for Ontario

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METRE SCALE

North American Datum 1983

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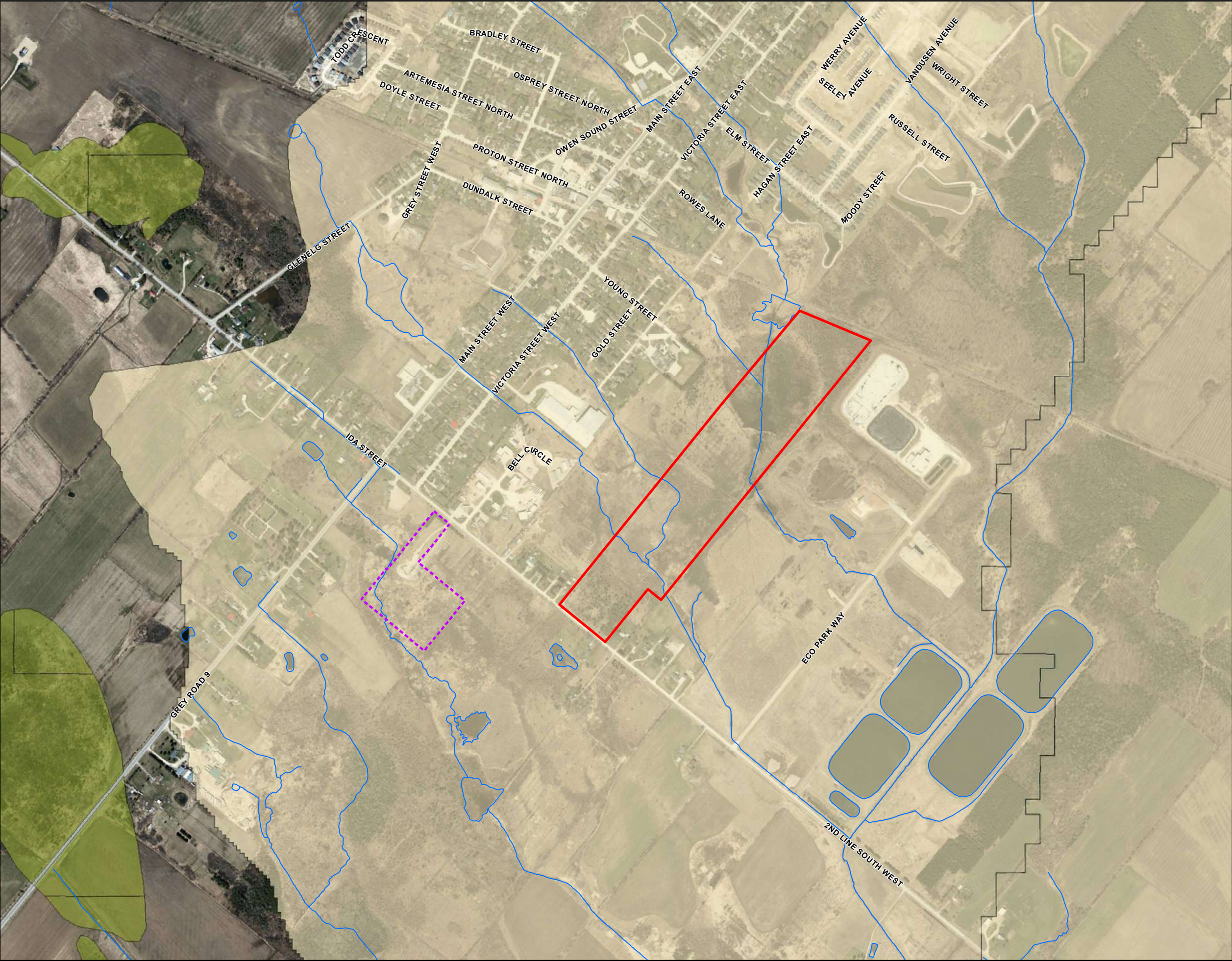
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NORTH

CLIENT	Briarwood (Dundalk) Ltd.	
PROJECT	D-4 Landfill Impact Assessment	
TITLE	Source Water Protection Areas	
Palmer PART OF SLR	REF. NO.	2309101-2b-1
	Figure 2b	

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LEGEND

Watercourse¹

Subject Site

Waste Transfer Station

Source Water Protection²

Significant Groundwater Recharge Area

Score N/A

Score 2

1. LIO/MNRF

2. GRCA and Source Protection Information Atlas, MECP 2024 ©King's Printer for Ontario

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North American Datum 1983

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NORTH

CLIENT	Briarwood (Dundalk) Ltd.	
PROJECT	D-4 Landfill Impact Assessment	
TITLE	Source Water Protection Areas	
	REF. NO.	2309101-2c-1
	Figure 2c	

3. Site Investigation

3.1 Site Investigation Methodology

Palmer prepared a site-specific health and safety hazard assessment and communicated it with the field staff prior to commencing the field activities. The field component of the D-4 assessment was completed on three separate days, January 25, 29, and 31, 2024. The borehole and well locations are shown on **Figure 1**.

The field activities carried out on January 24, 2024, entailed:

- Eight (8) shallow boreholes were advanced via hand auger to a depth of approximately 1 – 1.5m and a total of eight (8) soil samples were collected. Soil samples were examined in the field for lithology as well as for aesthetic evidence of impacts (i.e., staining and/or odours). Dedicated nitrile gloves (i.e., one pair per sample) were used during sample handling. A portion of the soil was placed into plastic bags and allowed to rest before a GEM 2000 calibrated to detect methane, was used to measure the headspace vapor of the eight (8) soil samples.

Additional investigations were carried out on January 29, 2024, including:

- The drilling of two (2) monitoring wells by ACE Environmental Drilling at BH/MW23-1 and BH/MW23-8. The wells were drilled to a depth of approximately 6.0 m and installed with a 3.1 m screen.
- Measurements of the two monitoring wells included water level, well stickup, and total depth of the well with a Solinst water level meter. Along with this, the headspace in the well was also measured for methane using the GEM 2000. The monitoring wells were developed by removing water and sediment from the wells until they were dry, with 2L of water being purged from BH23-1 and 2.5L purged from BH23-8.

Palmer staff returned to the site on January 31, 2024. Activities on this day included:

- Additional headspace readings for Methane using the GEM 2000 after removing the J-plug from the well.
- The collection of groundwater samples from the two monitoring wells for testing for dissolved methane in water.

3.2 Shallow Borehole Locations

Palmer completed hand auguring at eight (8) shallow boreholes to depths of 0.72 to 1.48 meters below ground surface (mbgs), throughout the property on January 24, and January 29, 2023. A summary of the location, depth, depth of groundwater, and soil lithology can be found below in **Table 1**. The shallow borehole locations can be seen in **Figure 1**.

Table 1. Shallow Borehole Details

Shallow Borehole ID	Latitude	Longitude	Total Depth (m)	Depth of Groundwater (mbgs)	Soils Encountered
BH23-2	44.158278	-80.39346	1.03	0.00 (surface)	Silty Clay, some sand, trace gravel, brown, wet, cohesive, stiff
BH23-3	44.159369	-80.3925285	0.72	Dry	Silty Sand, some clay, trace gravel, brown, wet, stiff
BH23-4	44.1588992	-80.3910264	1.13	0.30	Silty Clay, some gravel, light brown, wet, firm
BH23-5	44.1590103	-80.3921248	1.05	0.29	Silty Sand, some clay, some gravel, brown, wet, firm
BH23-6	44.16327	-80.38814	1.48	0.20	Silty Sand with Gravel, brown, wet
BH23-7	44.161811	-80.389669	1.19	0.10	Silty Sand, some clay, trace gravel, light brown, wet, firm
BH23-9	44.1620785	-80.3885524	0.91	0.27	Silty Clay, some sand, trace gravel, light brown, wet, firm
BH23-10	44.16074	-80.38775	1.43	0.31	Silty Sand, light brown, wet

3.3 Borehole and Monitoring Well Program

Palmer supervised the advancement of two boreholes with monitoring well installations by Ace Environmental Drilling Ltd., with borehole drilling and monitoring well installation taking place on January 29, 2024.

Boreholes were advanced using a Geoprobe 7822DT drill rig, using hollow stem augers. Soil samples were collected every 0.75m by split spoon sampler. Soil samples were analyzed using a Gem 2000, for landfill gasses after the soils were removed from the split spoon sampler. Both monitoring wells BH23-1 and BH23-8, were drilled to 6.0 mbgs with monitoring wells being installed at borehole termination depth. Ground surface elevations were estimated based on Client provided flood plain mapping completed by Valdor Engineering Inc (Jan. 2024).

Soil Engineers Ltd. (SEL) completed a separate Geotechnical Investigation, which consisted of advancing 11 boreholes (BH1-BH11) to depths of 6.3 to 6.6 mbgs and was completed between October 30 to November 2, 2023. Upon completion of the borehole drilling program, groundwater monitoring wells were installed in seven of the boreholes (BH1, BH2, BH4, BH6, BH8, BH9, and BH11). The locations of the boreholes, and monitoring wells installed by Soil Engineers can be found in **Figure 1**, and detailed borehole logs can be found in **Appendix C**.

Details regarding monitoring well information for all wells found on site can be found below in **Table 2**.

Table 2. Summary of Monitoring Wells installed on site

Borehole ID	Installed by	Estimated / Reported Ground Surface Elevation (masl)	Field Measured Monitoring Well Stickup (m)	Field Measured Monitoring Well Depth (mbgs)	Reported Screened Interval (mbgs)	Reported Soil Description of the Screened Interval
BH23-1	Palmer	512.2	1.05	6.05	3.05 – 6.10	Silty Sand to Silty Clay
BH23-8	Palmer	511.5	1.04	6.04	3.05 – 6.10	Silty Sand to Silt
BH1	SEL	513.0	0.98	6.15	3.1 – 6.10	Sandy Silt Till
BH2	SEL	512.3	0.93	6.24	3.1 – 6.10	Sandy Silt Till
BH3	SEL	513.5	-	-	-	-
BH4	SEL	511.7	0.94	6.28	3.1 – 6.10	Sandy Silt Till
BH5	SEL	511.0	-	-	-	-
BH6	SEL	511.4	0.83	6.10	3.1 – 6.10	Sandy Silt Till
BH7	SEL	511.6	-	-	-	-
BH8	SEL	512.0	1.04	6.24	3.1 – 6.10	Sandy Silt Till
BH9	SEL	510.9	0.93	6.16	3.1 – 6.10	Sandy Silt Till
BH10	SEL	511.4	-	-	-	-
BH11	SEL	510.4	0.83	6.10	3.1 – 6.10	Sandy Silt Till

3.4 Soil Description

The subsurface stratigraphy of the site encountered during the Palmer borehole drilling program is summarized below. Borehole logs are provided in **Appendix C**.

Topsoil: a layer of topsoil was encountered in both boreholes with a thickness of 0.1 to 0.3 m.

Upper Silt: silt was found below the topsoil at BH23-1. The layer consisted of dark brown to brown, moist and stiff, and was observed with a thickness of 0.3 m.

Upper Silty Clay: was observed underlying the topsoil in BH23-8. This unit was found to be 0.5 m in thickness with some sand, trace rootlets, moist, and soft.

Upper Silty Sand: containing some clay, some to trace gravel, light brown, moist to wet. This layer was observed in both boreholes, in borehole 23-1 this unit was underlying the upper silt, with a thickness of 0.8m, and in BH23-8, underlying an upper silty clay, this unit was observed to have a thickness of 3.8m.

Lower Silty Clay: a unit of silty clay was observed in BH23-1, which was found to be light brown, with some sand and trace gravel. This unit was observed below the upper silty sand unit, with a thickness of 0.7 m.

Lower Silty Sand: containing some clay, trace gravels, light brown, moist to wet, and very stiff to hard. This unit was found in BH23-1, underlying the lower silty clay unit, with an observed thickness of 1.6 m.

Silt and Gravel: containing some clay and, trace sand, was visibly light brown and was observed to be moist to wet. The unit was observed in BH23-1, below the lower silty sand, and extended to the borehole termination depth.

Lower Silt: containing some clay and, trace sand, was visibly light brown and was observed to be moist to wet. The unit was observed in BH23-8, below the upper silty sand, and extended to the borehole termination depth.

3.5 Groundwater Levels

Two (2) 50mm diameter monitoring wells were installed by Palmer, and five monitoring wells (installed by Soil Engineers Ltd.) were utilized as part of this investigation to monitor groundwater levels. The groundwater levels were measured on January 29th, 2024, following drilling at the Palmer wells BH23-1 and BH23-8, and on January 31st, 2024. The locations of the monitoring wells can be found in **Figure 1**. Groundwater levels were measured using a water level tape and recorded to the nearest centimeter. It is noted that groundwater levels were measured in BH23-1 and BH23-8 on January 29, 2024, following drilling and as such may not be at a static groundwater elevation. Groundwater levels are presented in **Table 3**. It should be noted that groundwater levels can vary and are subject to seasonal fluctuations in response to weather events.

Groundwater levels on January 31, 2024, ranged from 0.11 meters above ground surface to 1.12 mbgs corresponding to elevations of between 511.0 masl and 513.0 masl. The groundwater levels on site were found to be high, with BH-2 being under artesian conditions, where groundwater levels are observed above the ground surface. Shallow groundwater flow is presumed to be lateral, moving both north and south towards the two tributaries of the upper Grand River that cross the site. This directional separation of shallow groundwater flow follows local topography, where it likely discharges into the two tributaries of the Upper Grand River.

Table 3. Groundwater Level Measurements

Well Information					Groundwater Levels			
Monitoring Well ID	Ground Surface Elevation (masl)	Monitoring Well Depth (mbgs)	Stick up (m)	Screened Interval (mbgs)	29-Jan-24		31-Jan-24	
					mbgs	masl	mbgs	masl
BH23-1	513.0	6.05	1.05	3.0 - 6.1	4.75*	508.3*	1.12	511.9
BH23-8	513.0	6.07	1.04	3.0 - 6.1	3.69*	509.3*	0.01	513.0
BH1	513.0	6.15	0.98	3.0 - 6.1	0.34	512.7	0.41	512.6
BH2	512.3	6.24	0.93	3.0 - 6.1	-0.18*	512.5	-0.11*	512.4
BH4	511.7	6.28	0.94	3.0 - 6.1	0.31	511.4	0.34	511.4
BH6	511.4	6.10	0.83	3.0 - 6.1	-	-	0.37	511.0
BH8	512.0	6.24	0.93	3.0 - 6.1	-	-	0.23	511.8

Notes: mbgs indicates meters below ground surface, and masl indicates meters above sea level

* a negative value indicates that groundwater is above-ground surface

+ indicates a groundwater level measurement before well development.

3.6 Landfill Generated Gasses

Methane is naturally occurring and is caused by the decomposition of organic materials, this can occur in the environment naturally or as a result of human generated waste (i.e. landfill). Methane cannot cause an explosion unless it accumulates to a concentration above its lower explosive limit (LEL) in an enclosed space where it can be ignited. The lower explosive limit of methane is 5% by volume, and concentrations are equal to or greater than the LEL are considered to be hazardous.

As part of the landfill-generated gas monitoring component of this project, Palmer screened the soil samples for soil vapour that were collected during this field program and reported the concentrations of methane gas on site. During the January 2024 field activities, Palmer measured combustible gas levels in all retrieved unsaturated soil samples, using a Gem 2000 calibrated to detect methane. The results of the methane soil vapour measurements can be found in **Table 4**, below.

The locations of monitoring wells and shallow borehole locations are identified in **Figure 1**.

Table 4. Methane Vapour Concentrations Shallow Boreholes Soils

Matrix	Location	Sample ID	Date	Methane (%)
<u>Background</u> (atmospheric) Reading	-	-	29-January-24	0.3
<u>Soil</u>	BH23-1	SS1	29-January-24	0.3
		SS2	29-January-24	0.3
		SS3	29-January-24	0.3
		SS4	29-January-24	0.3
		SS5	29-January-24	0.3
		SS6	29-January-24	0.3
		SS7	29-January-24	0.3
		SS8	29-January-24	0.3
	BH23-2	SS1	25-January-24	0.3
	BH23-3	SS1	25-January-24	0.3
	BH23-4	SS1	25-January-24	0.3
	BH23-5	SS1	25-January-24	0.3
	BH23-6	SS1	29-January-24	0.3
	BH23-7	SS1	25-January-24	0.3
	BH23-8	SS1	29-January-24	0.3
		SS2	29-January-24	0.3
		SS3	29-January-24	0.3
		SS4	29-January-24	0.3
		SS5	29-January-24	0.3
		SS6	29-January-24	0.3

Matrix	Location	Sample ID	Date	Methane (%)
		SS7	29-January-24	0.3
		SS8	29-January-24	0.3
	BH23-9	SS1	29-January-24	0.3
	BH23-10	SS1	29-January-24	0.3

Methane readings were also collected on January 29, and 31, 2024, from the headspace in monitoring wells found on site. The wells were sealed (air tight) using J-plug and left for over 24 hours to allow for degassing of methane from groundwater. Gas readings were taken by removing the j-plug and immediately analyzing the off gas within the well headspace using the Gem 2000. The results of the well headspace readings can be found in **Table 5**.

Table 5. Methane Vapour Concentrations in Well Headspace

Matrix	Location	Date	Methane %
<u>Background (atmospheric)</u> <u>Readings</u>	-	29-January-24	0.3
		31-January-24	0.4
<u>Well Headspace</u>	BH23-1	29-January-24	0.3
	BH23-8	29-January-24	0.3
	BH23-1	31-January-24	0.4
	BH23-8	31-January-24	0.4
	BH1	31-January-24	0.4
	BH2	31-January-24	0.4
	BH2	31-January-24	0.4
	BH4	31-January-24	0.4
	BH6	31-January-24	0.4
	BH8	31-January-24	0.4

The results provided in **Table 5** and **Table 6** indicate that there were minimal methane gas concentrations found in the soil vapour and the well headspace found on site. All methane readings consistently matched the daily atmospheric methane percentage. Specifically, on January 29, 2024, the methane concentration was recorded at 0.3%, while on January 31, 2024, it increased slightly to 0.4%. Therefore, the samples taken during this study indicate that methane concentrations were found to be below the LEL for methane (5%).

3.7 Groundwater Analytical Results

Palmer collected two (2) groundwater samples, one (1) from each of the Palmer installed monitoring wells on January 31, 2024. Prior to collecting the samples, the monitoring wells were developed by purging three well volumes of groundwater. Following development, the groundwater was sampled using low-flow sampling techniques (using a peristaltic pump) and collected in laboratory-prepared and preserved sample vials. There was no evidence of free product (i.e. visible film or sheen) observed during Palmer's field program.

The groundwater samples were preserved placed on ice, and submitted to ALS Canada Inc. (ALS), a CALA-accredited laboratory, for analysis of Dissolved Methane.

Results for the groundwater testing are presented below in **Table 6**, and the laboratory certificate of analysis of the collected groundwater samples is included in **Appendix C**.

Table 6. Dissolved Methane Groundwater Analytical Results

Well	Lowest Detection Limit (ppmv)	Lowest Detection Limit (µg/L)	Dissolved Methane (ppmv)	Dissolved Methane (µg/L)
BH23-1	20.8	5.0	50.8	12.2
BH23-8			62.4	15.0

Based on the results from the groundwater samples collected, dissolved methane concentrations were found to be at a maximum concentration of dissolved methane of 15.0 µg/L or 62.4 parts per million by volume (ppmv) in BH23-8.

4. Potential Methane Gas Impacts

Based on the findings described in Chapter 3, methane concentrations were found to be minimal in nature with methane concentrations in soils from drilled and hand-augured boreholes having concentrations of 0.3 % methane. Concentrations of methane found in the vapours from the monitoring well headspace were found to be between 0.3% – 0.4%, and the dissolved methane of the groundwater found on site was found to be at the highest concentration in BH23-8 at 62.4 ppmv.

All vapour and groundwater testing were performed in the overburden soil, with wells installed within the overburden. The soils found on site are comprised of silt, silty clay, silty sand, silt and gravel, and contained minimal levels of methane gases. The minimal concentrations of methane on the site soils and groundwater do not pose an elevated risk for the proposed development.

It should be noted that the proposed concept site plan proposes a residential development with four (4) 3-story apartment buildings with one (1) level of underground parking.

Shallow groundwater flow on site is presumed to follow local topography where discharge occurs into tributaries of the upper Grand River. It is presumed based on local topography that the closed landfill is cross-gradient to the site. As such minimal impact is anticipated based on groundwater transport from the Dundalk Waste Transfer Station.

Based on the results of this D-4 Study, conducted in accordance with MECP Guideline D-4, the Dundalk Transfer Station and Closed Landfill do not adversely impact the Site. Landfill-generated gases are not likely to migrate from the closed landfill into the surrounding overburden due to the shallow saturated soils at the site.

5. Conclusions

The purpose of this study was to evaluate the potential for impacts to the proposed residential development at the site due to the presence of methane, in the context of the Ministry's D-4 guidelines. The following provides a summary of the findings of the D-4 Study for Briarwood (Dundalk) Ltd., located at Concession 2 SWTSR PT LOT 234, Township of Southgate (Dundalk), Ontario:

- Groundwater: impacts to groundwater under the site are not considered to be an issue of concern based on the following observations:
 - Groundwater flow is considered to be cross gradient from the site and the Dundalk Waster Transfer Station and Closed Landfill;
 - There is no known planned use of groundwater at the site. The site will be municipally served, and will be supplied by municipal water; and,
 - Dissolved methane concentrations in groundwater were observed to be minimal.
- Methane gases: Potential impacts to the proposed site development due to the presence of methane gases are not considered to be an issue of concern as all measured well headspace and soil gas methane concentrations were found to be similar to atmospheric readings;
- Other Issues of Potential Concern: No other issues of concern were identified, provided that the operational plans for the proposed development include appropriate measures to inspect and control adverse issues and that issues such as traffic, dust, etc., are addressed by other studies or agreements through the development application.

No further methane investigations are recommended relative to the application for the proposed development at the site.

6. Limitations of Report

The extent of this study was limited to the specific scope of work for which we were retained and that is described in this report. Palmer has assumed that the information provided by the client or any secondary sources of information are factual and accurate. Palmer accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or negligent acts from relied upon data. Judgment has been used by Palmer in the interpretation of the information provided but subsurface physical and chemical characteristics may differ from regional scale geology mapping and vary between or beyond well/borehole locations given the inherent variability in geological conditions.

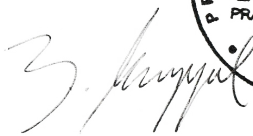
Palmer is not a guarantor of the geological or groundwater conditions at the subject site, but warrants only that its work was undertaken and its report prepared in a manner consistent with the level of skill and diligence normally exercised by competent geoscience professionals practicing in the Province of Ontario. Our findings, conclusions and recommendations should be evaluated in light of the limited scope of our work.

The information and opinions expressed in the Report are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT PALMER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS PALMER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belongs to Palmer. Any use which a third party makes of the Report is the sole responsibility of such third party. Palmer accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Palmer's express written permission. Should the project design change following issuance of the Report, Palmer must be provided the opportunity to review and revise the Report in light of such alteration or variation.

7. Certification

This report was prepared, reviewed and approved by the undersigned:

Prepared By:



Zach Kuszczak, B.Sc., P.Geo.
Hydrogeologist

**Reviewed and
Approved By:**



Nick Schmidt, B.Sc., P.Geo.
Senior Hydrogeologist

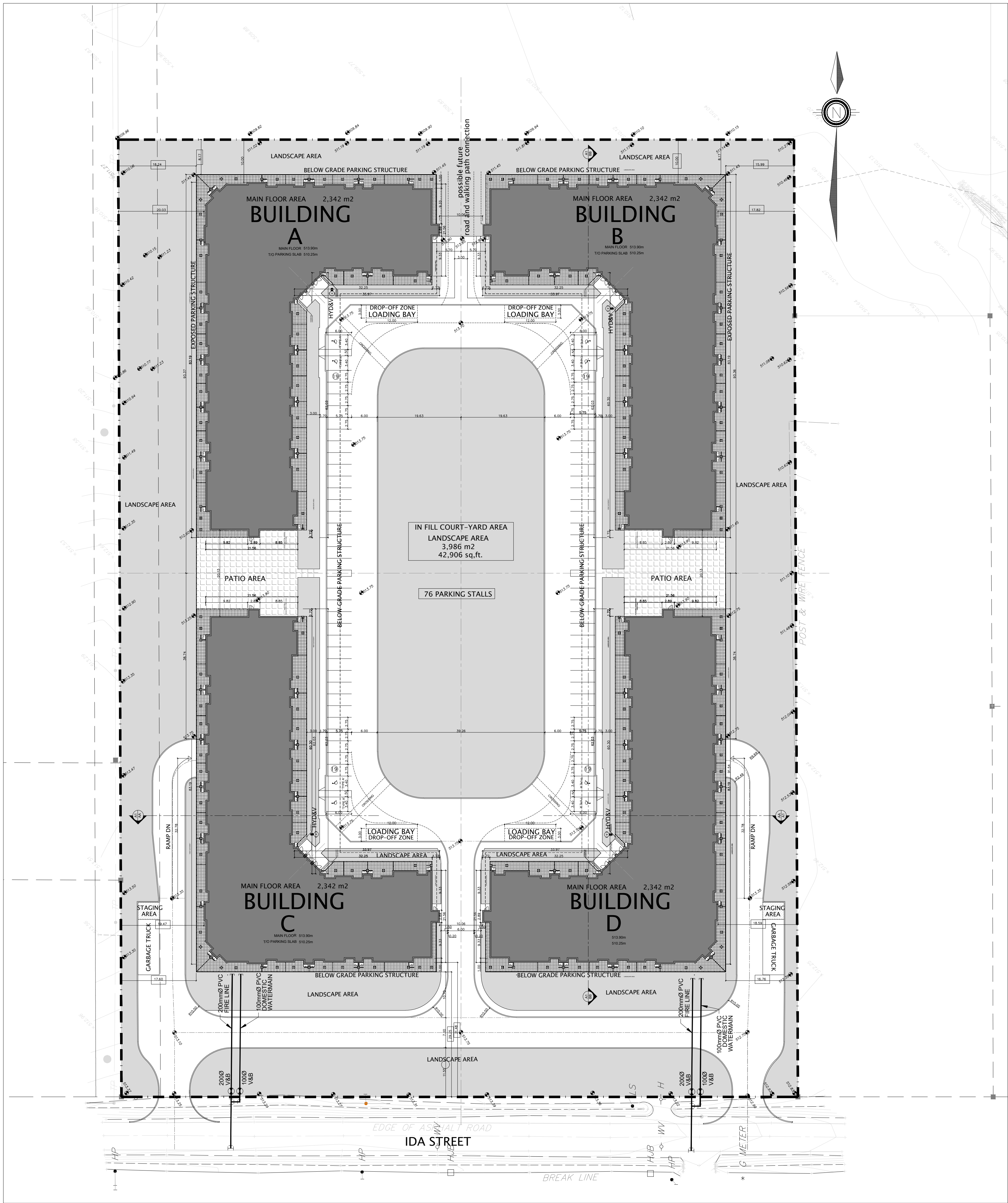
8. References

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- Ministry of the Environment, Conservation, and Parks – Amendment to Environmental Compliance Approval, Number A262302, Dundalk Transfer Station and Closed Landfill Site, Lot 232, Concession 3, Southgate Township, County of Grey.
- Soil Engineers – Geotechnical Investigation for Proposed Residential Development, Con 2 SWRTSR PT Lot 234, Southeast of Grey Road 9 and Ida Street – Briarwood (Dundalk) Ltd., January 2024.

Appendix A

Concept Site Plan

(S&C Architects Inc, October 2024)



OBC: 3.2.2.45 group C, up to 4 storeys, Sprinklered
(iii) 2400 m² if 3 storeys in building height.
SITE AREA 35,481.69 m²
381,921.7 sq.ft.
LOT COVERAGE 26%
OPEN AREA 74%
FRONT YARD SET BACK (SOUTH SIDE) 29.25m
SIDE YARD SET BACK (EAST SIDE) 15.99m
SIDE YARD SET BACK (WEST SIDE) 17.60m
REAR YARD SET BACK (NORTH SIDE) 10.00m

PARKING STRUCTURE BELOW GRADE
AREA EACH SIDE 7,540m²
TOTAL AREA 15,080 m²
TOTAL AREA 162,319.8 sq.ft.

PARKING STALLS 1.0 PER UNIT 376
PARKING STALLS VISITOR 0.2 PER UNITS 75
PARKING STALLS REQUIRED 451
1 BED accessible unit 15% of total 56 Units
(PARKING STALLS EACH SIDE PROVIDED 189)
TOTAL PARKING STALLS BELOW GRADE 1.0 PER UNIT 378
PARKING STALLS AT GRADE COURT YARD 0.2 PER UNITS 76
PARKING STALLS PROVIDED 454

BUILDING -A-
MAIN FLOOR AREA 2,342 m²
2ND FLOOR AREA 2,309 m²
3RD FLOOR AREA 2,309 m²
GFA-TOTAL AREA PER BUILDING 6,960 m²

BUILDING -B-
MAIN FLOOR AREA 2,342 m²
2ND FLOOR AREA 2,309 m²
3RD FLOOR AREA 2,309 m²
GFA-TOTAL AREA PER BUILDING 6,960 m²

BUILDING -C-
MAIN FLOOR AREA 2,342 m²
2ND FLOOR AREA 2,309 m²
3RD FLOOR AREA 2,309 m²
GFA-TOTAL AREA PER BUILDING 6,960 m²

BUILDING -D-
MAIN FLOOR AREA 2,342 m²
2ND FLOOR AREA 2,309 m²
3RD FLOOR AREA 2,309 m²
GFA-TOTAL AREA PER BUILDING 6,960 m²

GFA-GRAND TOTAL AREA X 4 27,840 m²
299,667.3 sq.ft.

(per building-4 buildings) DUNDALK DEVELOPMENT

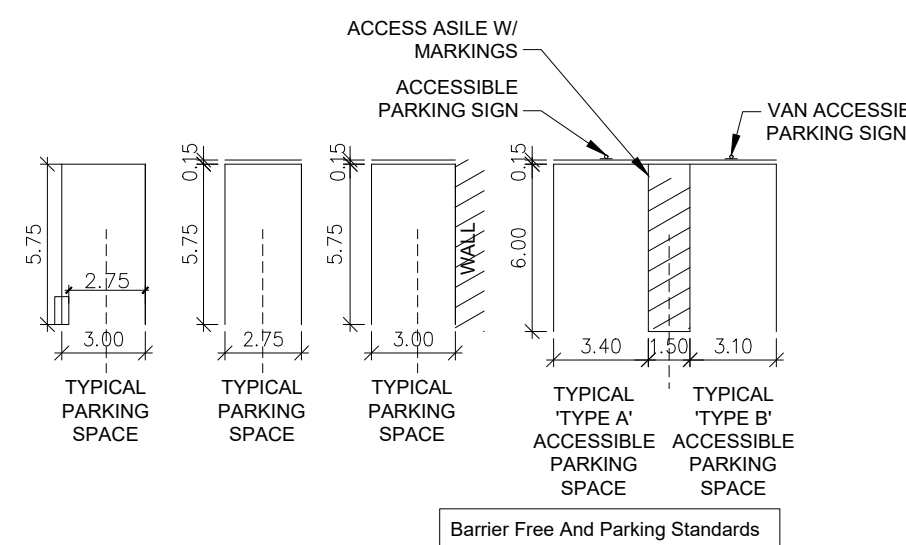
Item	Ontario Building Code Data Matrix Part 3	OBC Reference
1	Project Description	Part 3
2	Major Occupancy(s)	GROUP C - RESIDENTIAL / GROUP E MERCANTILE 3.1.2.1.(1)
3	Building Area (m²)	New 2342.00 Total 2342.00 1.1.3.2
4	Ground Area (m²)	New 6960.00 Total 6960.00 1.1.3.2
5	Number of Storeys	Above grade 3 Below grade 1 3.2.1.1.(1)&1.1.3.2
6	Height of Building	3 STOREY 3.2.2.45
7	Number of Streets Access Routes	1 3.2.2.10&3.2.5.5
8	Building Classification	GROUP C, 3 STOREYS, SPRINKLERED 3.2.2.45
9	Sprinkler System Proposed	entire building 3.2.2.45 in lieu of roof rating not required
10	Stand pipe required	Yes No 3.2.9
11	Fire Alarm required	Yes No 3.2.4
12	Water Service Supply is Adequate	Yes No 3.2.6
13	High Building	Yes No 3.2.2.45
14	Permitted Construction	Combustible Non-combustible 3.2.2.45
15	Actual Construction	Combustible Non-combustible 3.2.1.1.(8)-(8)
16	Occupant load based on	1st Floor 80 persons 3.1.17 2nd Floor 88 persons 3rd Floor 88 persons
17	Barrier-free Design	Yes No (Explain) 3.9
18	Hazardous Substances	Yes No 3.3.1.2.(1)&3.3.1.9(1)
19	Required Fire Resistance Rating (FRR)	Horizontal Assemblies FRR (Hours) Listed Design No. or Description (SB-2) 3.3.5.6.(1), 3.2.2.43A, 3.2.2.20-83&3.2.1.4 Floors 1 OBC SB-2 / ULC Floors 1 OBC SB-2 / ULC Roof 1 OBC SB-2 / ULC FRR of Supporting Members (Hours) Listed Design No. or Description (SB-2) Floors 1 OBC SB-2 / ULC Floors 1 OBC SB-2 / ULC Roof 1 OBC SB-2 / ULC
20	Spatial Separation-Construction of Exterior Walls	3.2.3
	Wall L.D. Area (m²) or H.L. Permitted Max. of Openings	Proposed FRR (Hours) Listed Design No. or Description (SB-2) Comb. Const. Non-Comb. Const. Non-Comb. Const.
	North 10.00 NA NA NA NA NA NA NA NA NA	
	South 31.48 NA NA NA NA NA NA NA NA NA	
	East 17.60 NA NA NA NA NA NA NA NA NA	
	West 15.99 NA NA NA NA NA NA NA NA NA	



SHEETS

- A-101 SITE PLAN
- A-102 PARKING PLAN
- A-103 PARKING PLAN LARGE SCALE -1
- A-104 PARKING PLAN LARGE SCALE -2
- A-105 MAIN AND TYPICAL FLOOR PLANS
- A-106 MAIN FLOOR PLAN LARGE SCALE
- A-107 2ND FLOOR PLAN LARGE SCALE
- A-108 3RD FLOOR PLAN LARGE SCALE
- A-109 ROOF PLAN
- A-110 UNIT PLANS
- A-111 A BUILDING ELEVATIONS
- A-112 B BUILDING ELEVATIONS
- A-113 C BUILDING ELEVATIONS
- A-114 D BUILDING ELEVATIONS
- A-115 SITE SECTIONS
- A-116 3D IMAGES

NOTE: ALL LANDSCAPING IMAGES ARE FOR REFERENCE ONLY. SEE LANDSCAPE ARCHITECTS DWGS.
ALL SITE GRADES PROPOSED ON THIS AND FOLLOWING DWGS ARE SUBJECT TO CIVIL DWGS.



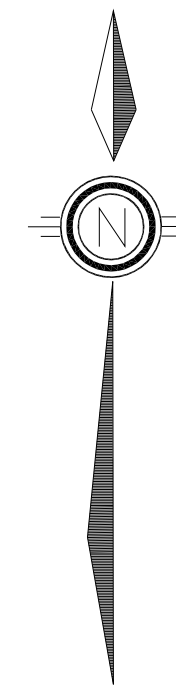
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CLIENT		
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	FLOOD PLAIN SITE PLAN	DATE: JUNE 27, 2024
PROJECT #	MARKETING NAME	
2024-25		S&C ARCHITECTS INC.
SCALE	MUNICIPALITY	1:500
		1: (416) 848-0991 F: (416) 860-6101 INFO@SCARCHITECTS.CA 60 RANDALL DRIVE, SUITE 10 AJAX, ONTARIO L1S 6L3

BUILDING
A

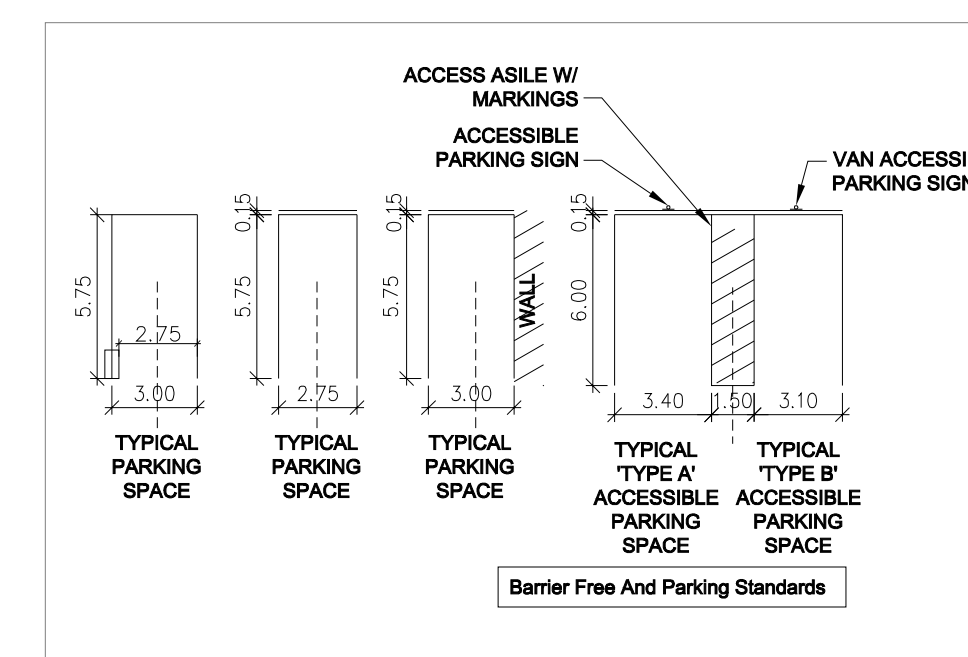
BUILDING
C

BUILDING
B

BUILDING
D

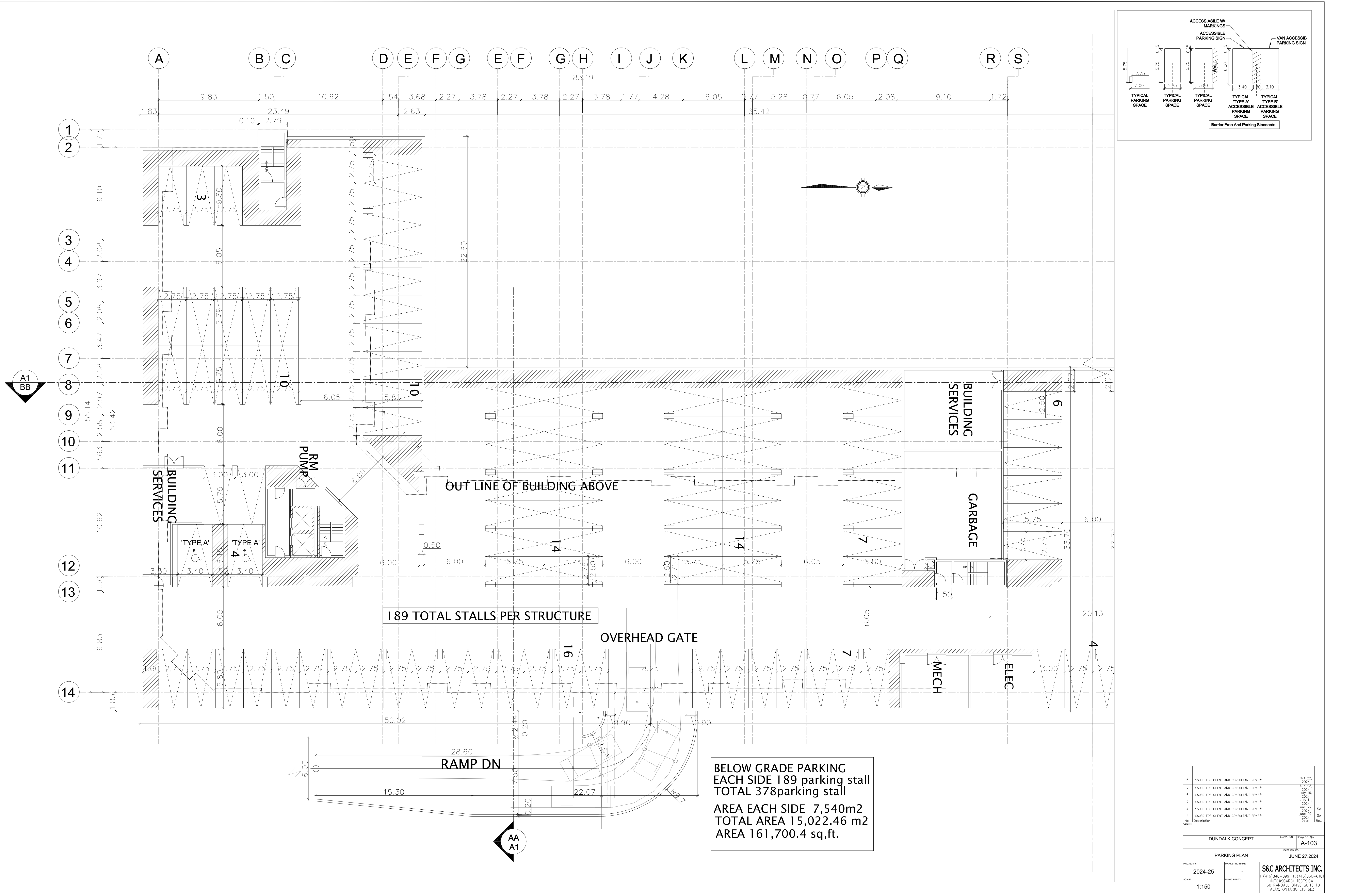


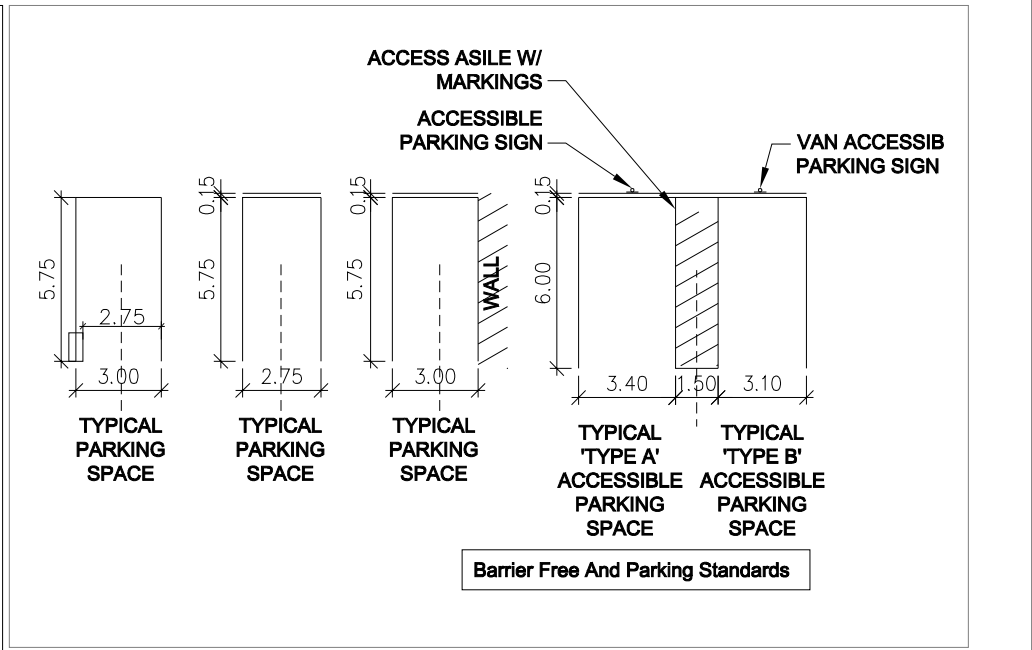
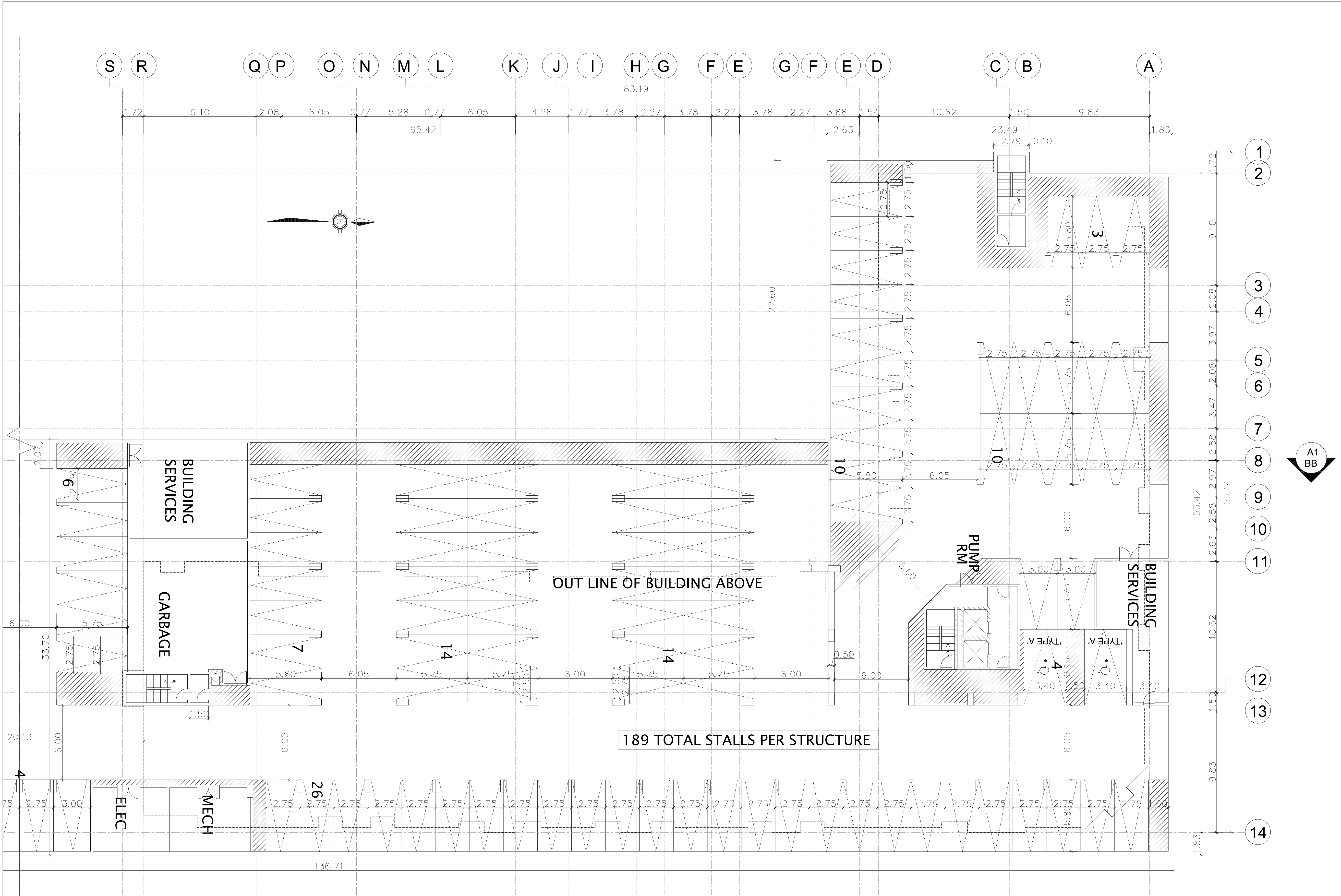
BELOW GRADE PARKING
EACH SIDE 189 parking stall
TOTAL 378 parking stall
AREA EACH SIDE 7,540m²
TOTAL AREA 15,022.46 m²
AREA 161,700.4 sq.ft.



6	ISSUED FOR CLIENT AND CONSULTANT REVIEW		
5	ISSUED FOR CLIENT AND CONSULTANT REVIEW		
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Oct 22, 2024	
3	ISSUED FOR CLIENT AND CONSULTANT REVIEW	AUG 08, 2024	
2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	MAY 16, 2024	
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		JUNE 27, 2024	SA
		JUNE 07, 2024	SA
Rev		0106	Rev

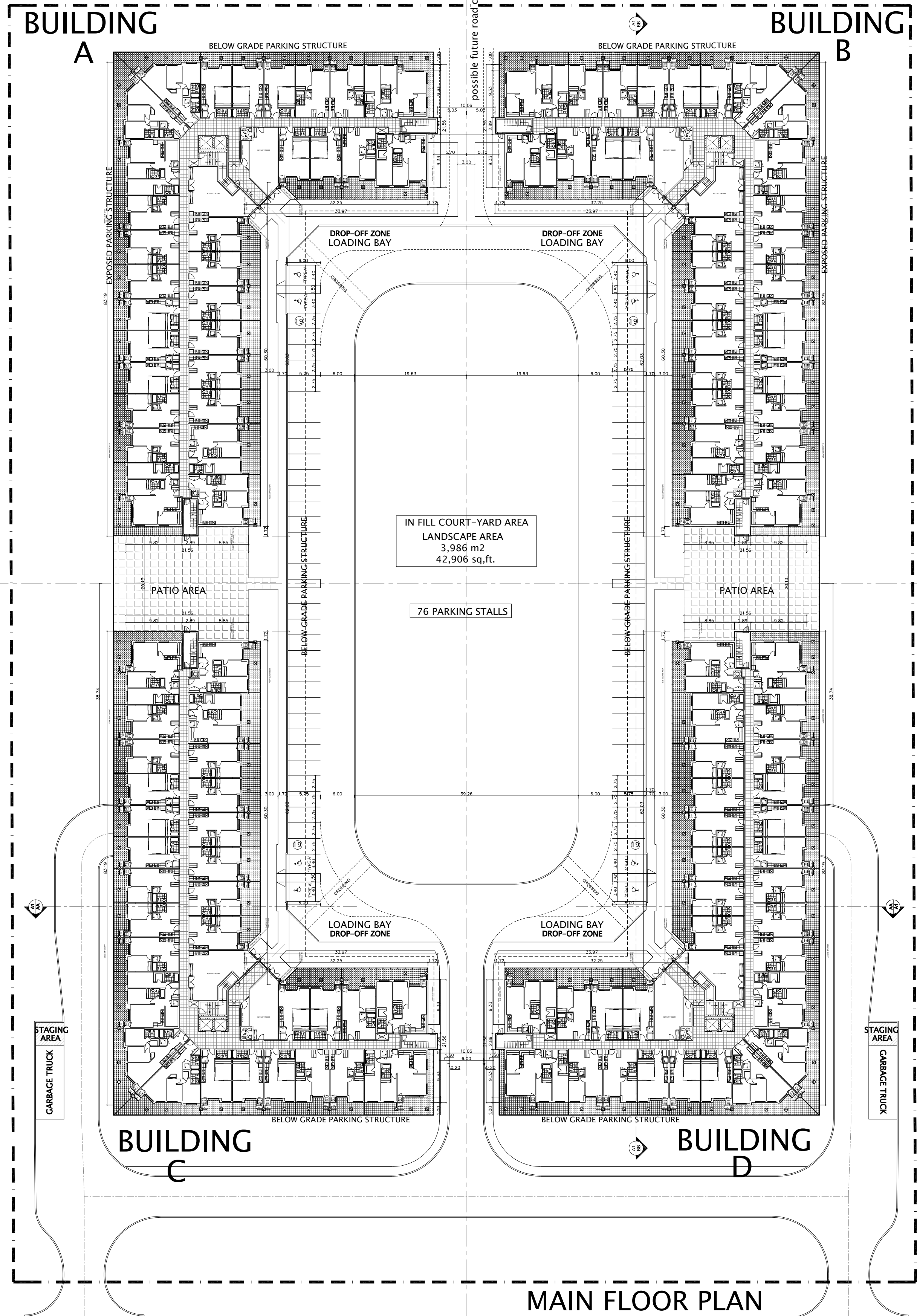
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PROJECT #		DATE REVISION	JUNE 27, 2024
MARKETING NAME			
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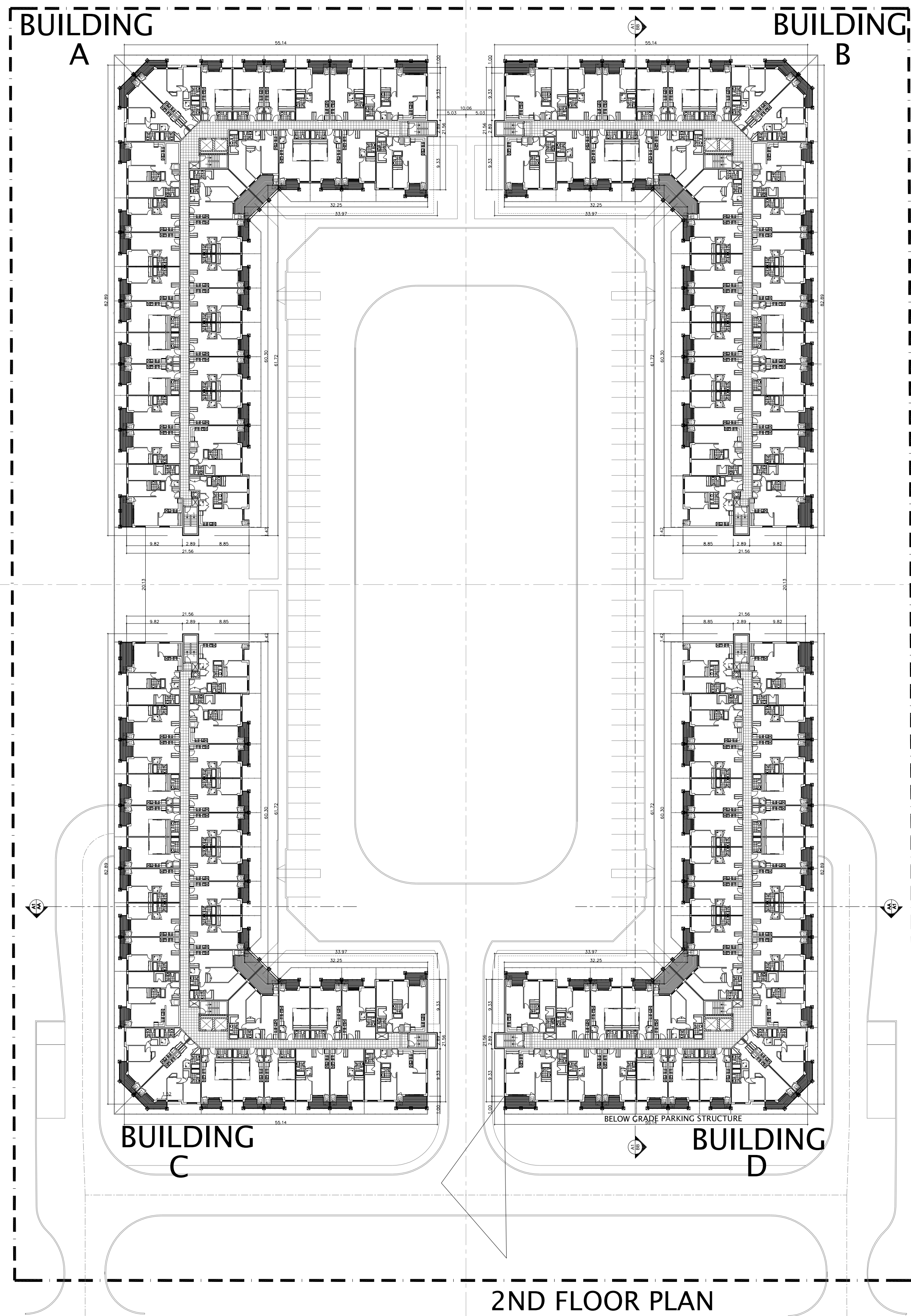


BELOW GRADE PARKING
EACH SIDE 189 parking stall
TOTAL 378 parking stall
AREA EACH SIDE 7,540m²
TOTAL AREA 15,022.46 m²
AREA 161,700.4 sq.ft.

5	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Oct 22, 2024	
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2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Aug 27, 2024	SA
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No.	Description	Date	Rev.
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PARKING PLAN		DATE REVISION	A-104
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		AJAX, ONTARIO L1S 6L3	

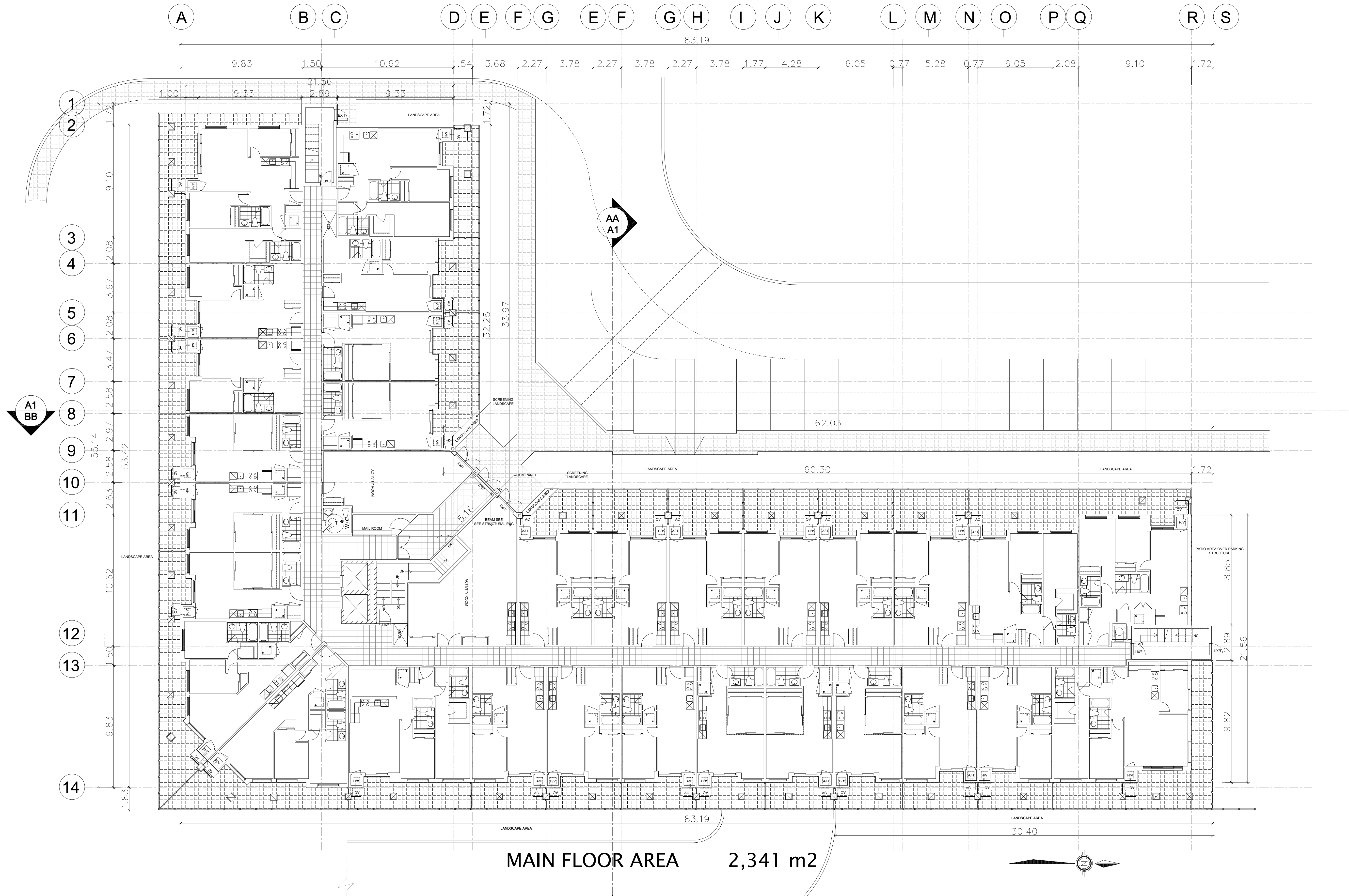


MAIN FLOOR PLAN

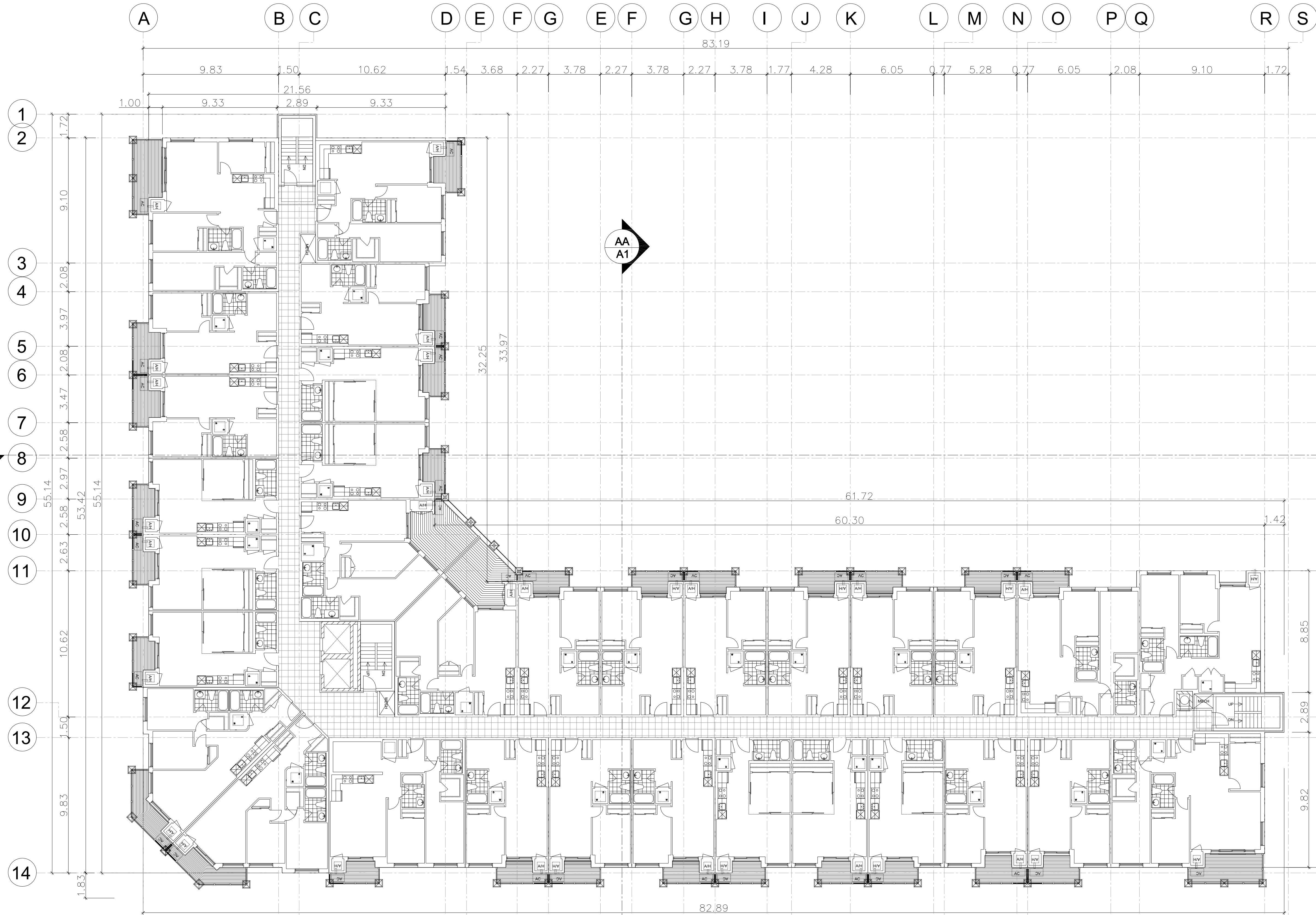


2ND FLOOR PLAN

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2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	June 21, 2024
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PROJECT #	2024-25	DATE
SCALE	1:500	DATE
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T: (416) 848-0991 F: (416) 860-6101		SA
INFO@S&CARCHITECTS.CA		SA
60 RANDALL DRIVE SUITE 10		SA
AJAX, ONTARIO L1S 6L3		SA



5	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Oct 22, 2024	
3	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Aug 08, 2024	
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	May 16, 2024	
3	ISSUED FOR CLIENT AND CONSULTANT REVIEW	July 11, 2024	
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Rev. Description		DATE	Rev.
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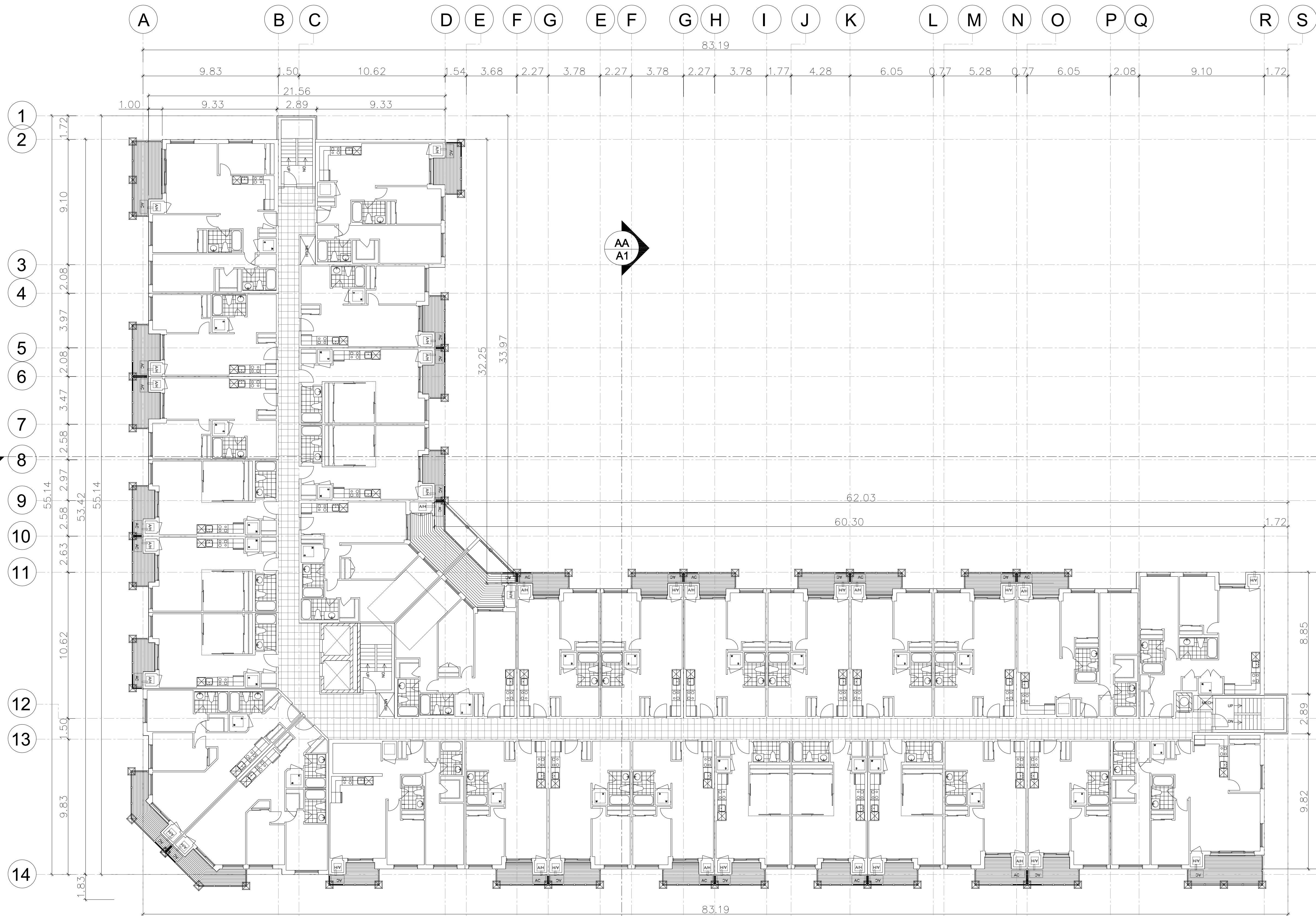


2ND FLOOR AREA 2,309 m2



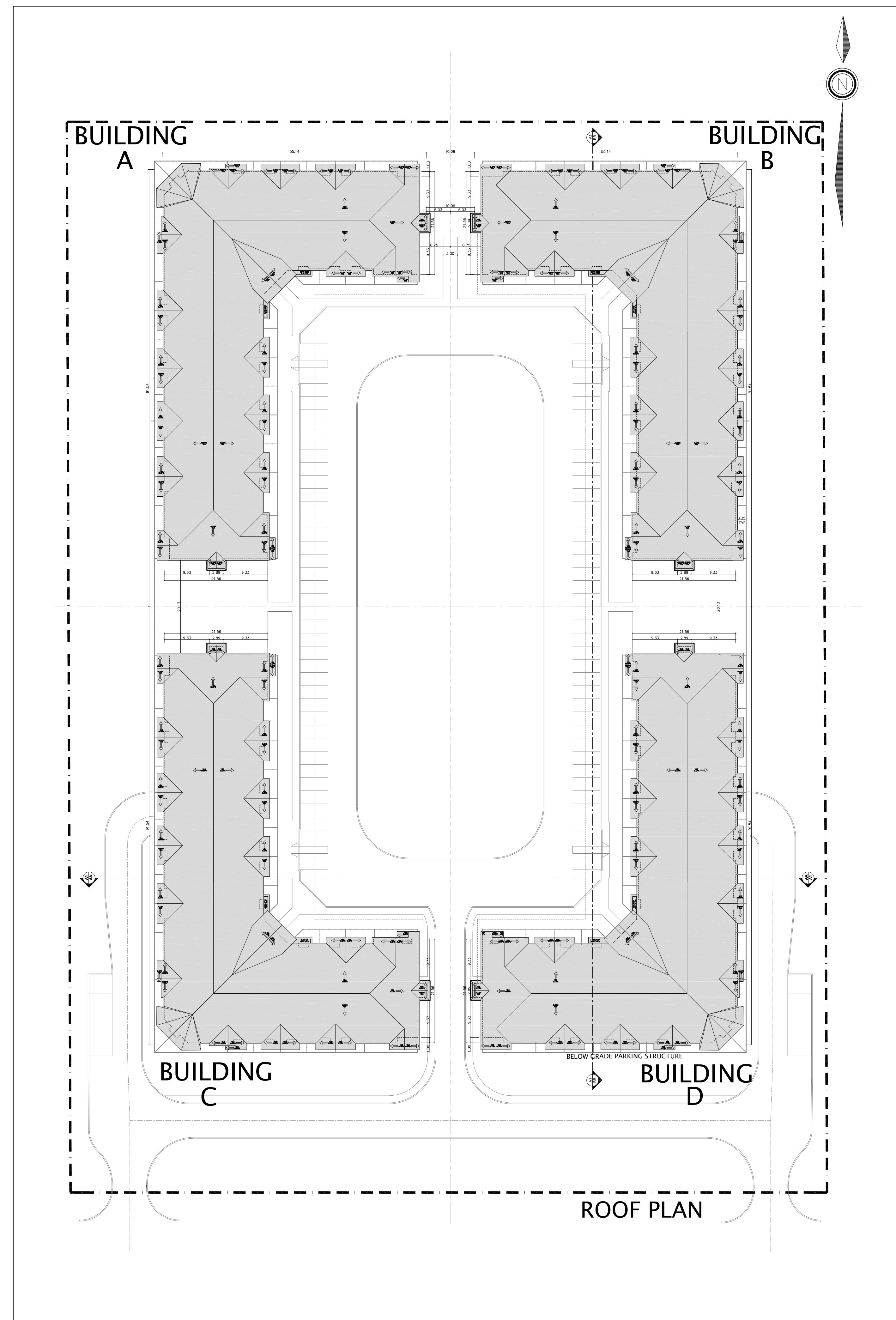
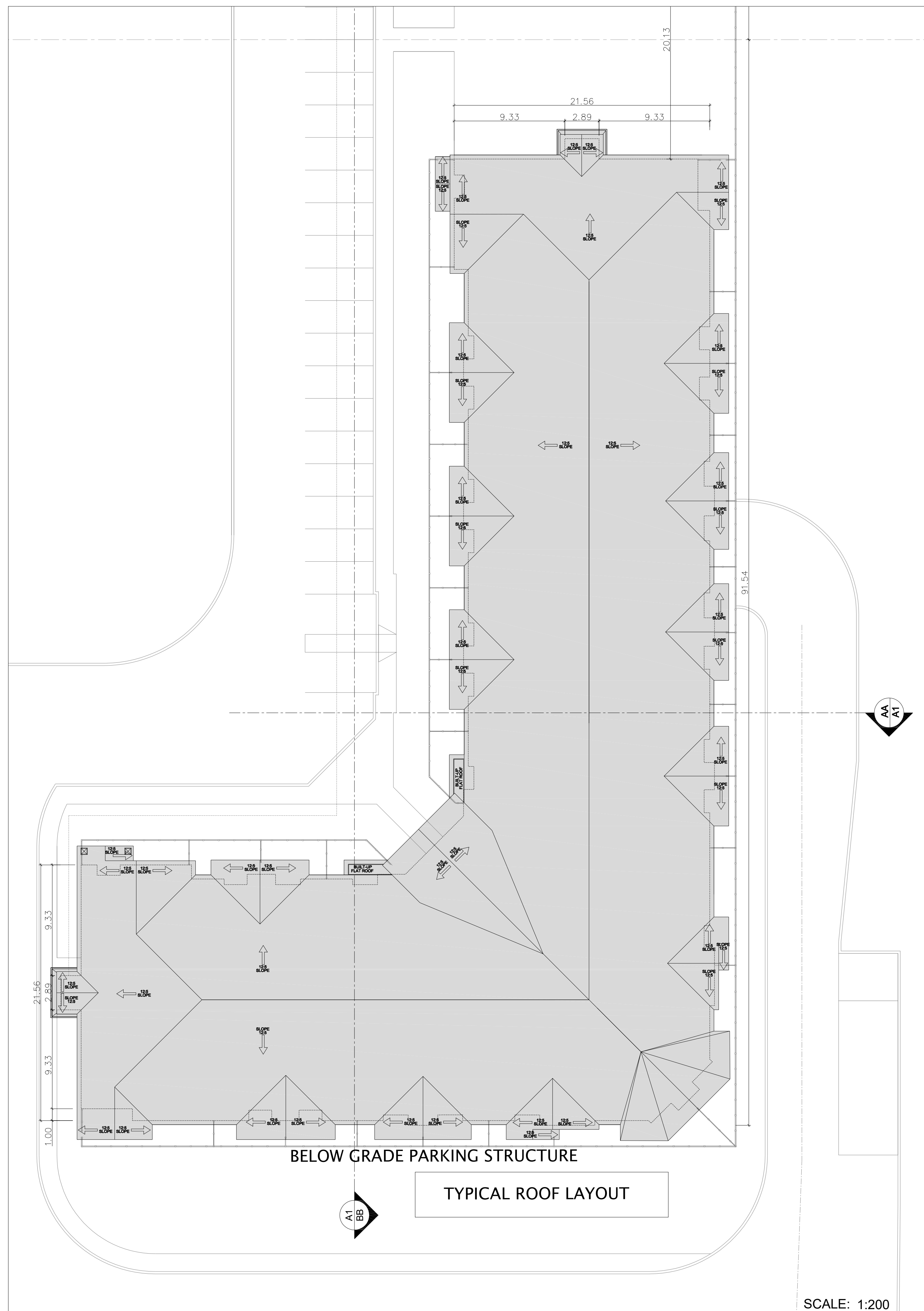
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5	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Aug 08, 2024	
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	May 16, 2024	
3	ISSUED FOR CLIENT AND CONSULTANT REVIEW	July 11, 2024	
2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	June 27, 2024	SA
1	ISSUED FOR CLIENT AND CONSULTANT REVIEW	June 07, 2024	SA
Rev.		DATE	Rev.

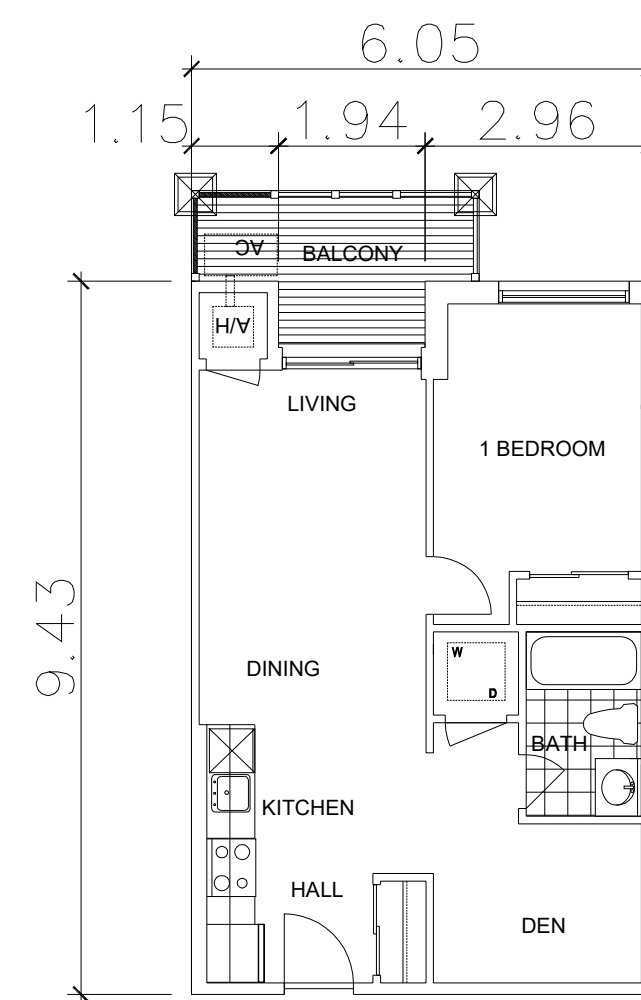
DUNDALK CONCEPT		ELEVATION	Drawing No.
2ND FLOOR PLAN		DATE REVISION	A-107
PROJECT #	MARKETING NAME	S&C ARCHITECTS INC.	
2024-25	-	1: (416) 848-0991 F: (416) 860-6101	
SCALE	MUNICIPALITY	INFO@S&CARCHITECTS.CA	
1:150		60 RANDALL DRIVE SUITE 10	
		AJAX, ONTARIO L1S 6L3	



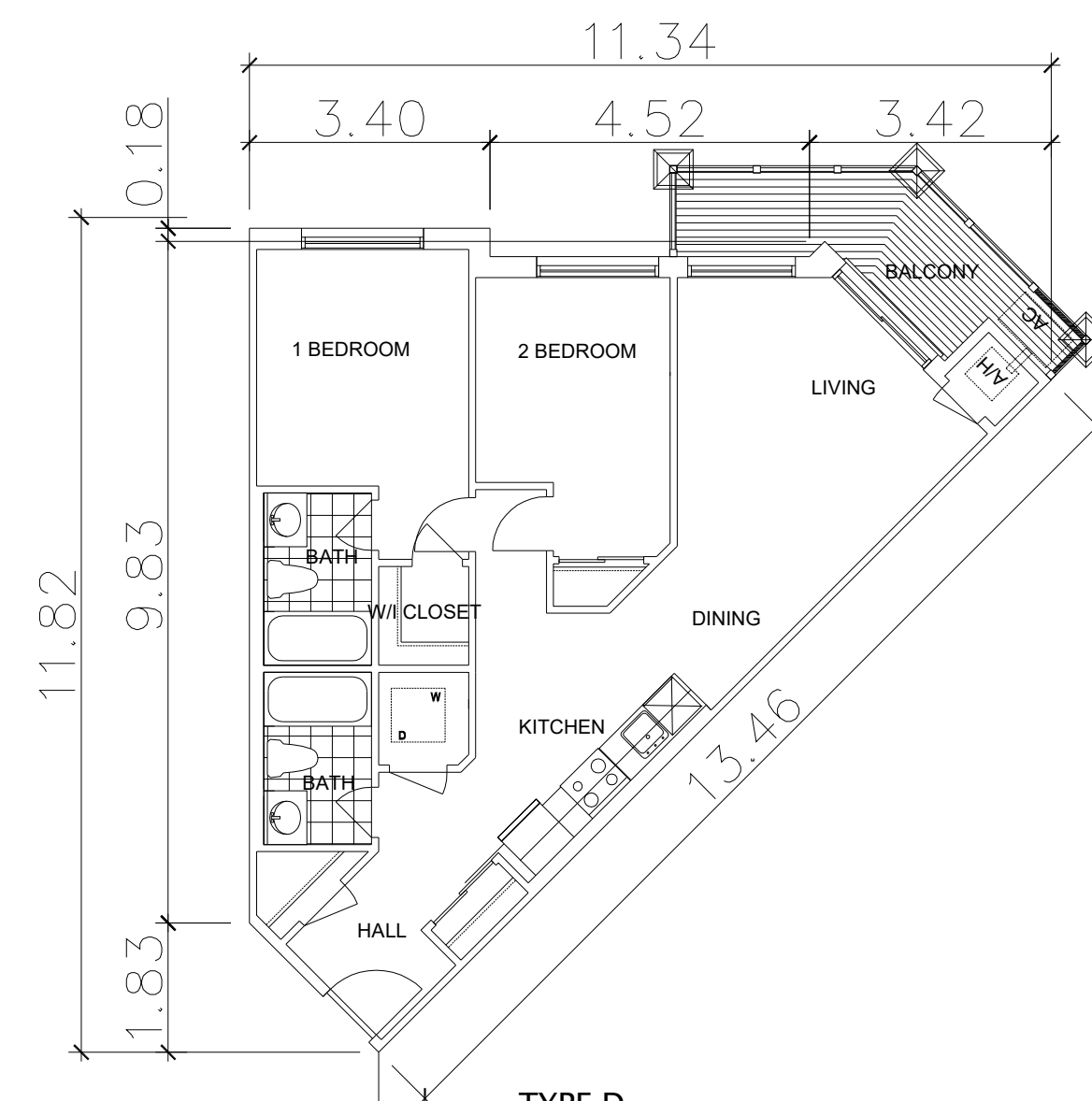
3RD FLOOR AREA 2,309 m2

6	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Oct 22, 2024	
5	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Aug 08, 2024	
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	May 16, 2024	
3	ISSUED FOR CLIENT AND CONSULTANT REVIEW	July 11, 2024	
2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	June 27, 2024	SA
1	ISSUED FOR CLIENT AND CONSULTANT REVIEW	June 07, 2024	SA
Rev. Description		Rev.	
DUNDALK CONCEPT		ELEVATION	Drawing No. A-108
3RD FLOOR PLAN		DATE ISSUED	JUNE 27, 2024
PROJECT #	MARKETING NAME	S&C ARCHITECTS INC.	
2024-25	-	T: (416) 848-0991 F: (416) 860-6101	
SCALE	MUNICIPALITY	INFO@S&CARCHITECTS.CA	
1:150		60 RANDALL DRIVE SUITE 10	
		AJAX, ONTARIO L1S 6L3	

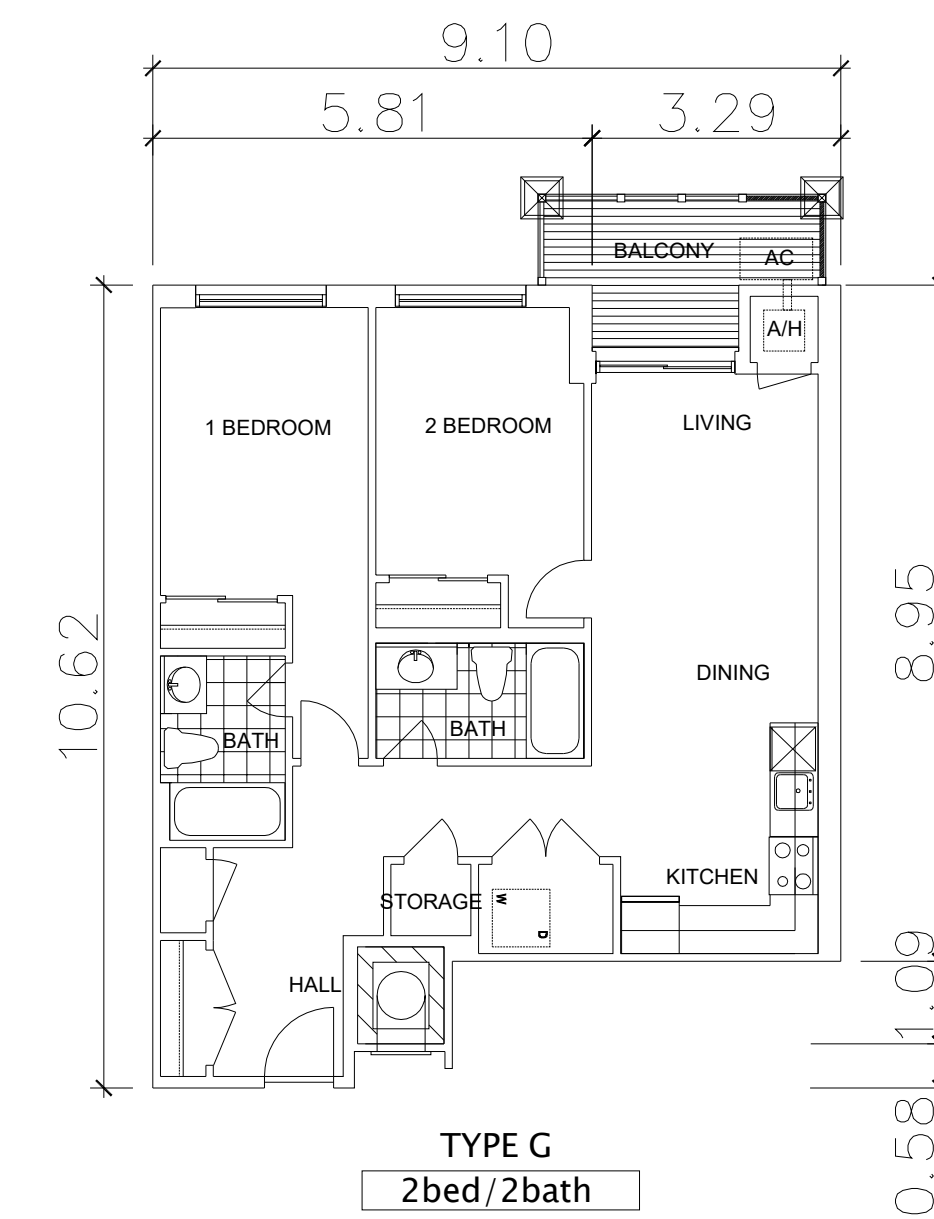




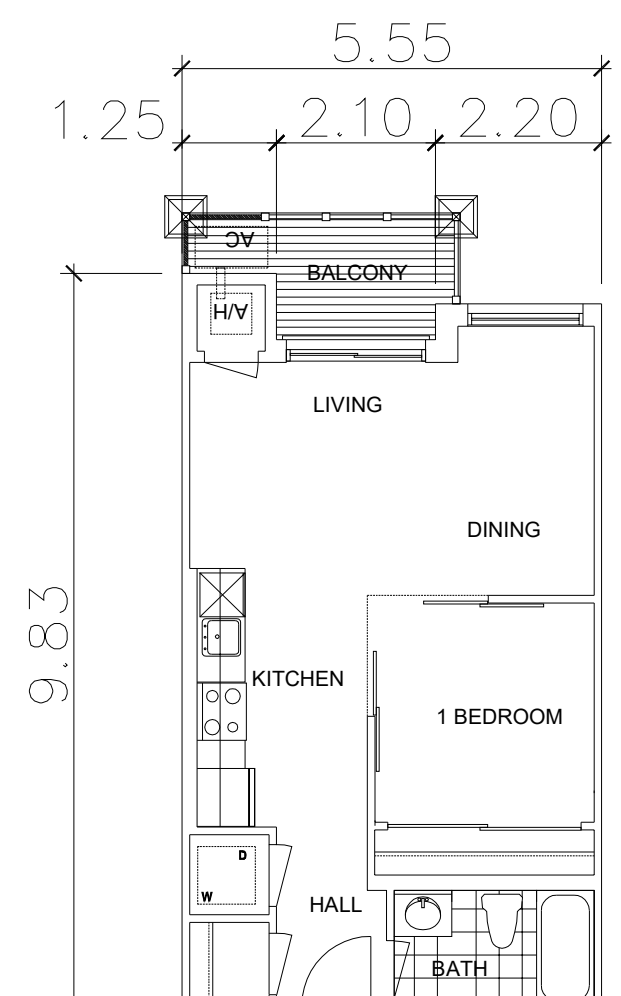
TYPE A
1 bed/den/1 bath
AREA
55m²
592sq.ft



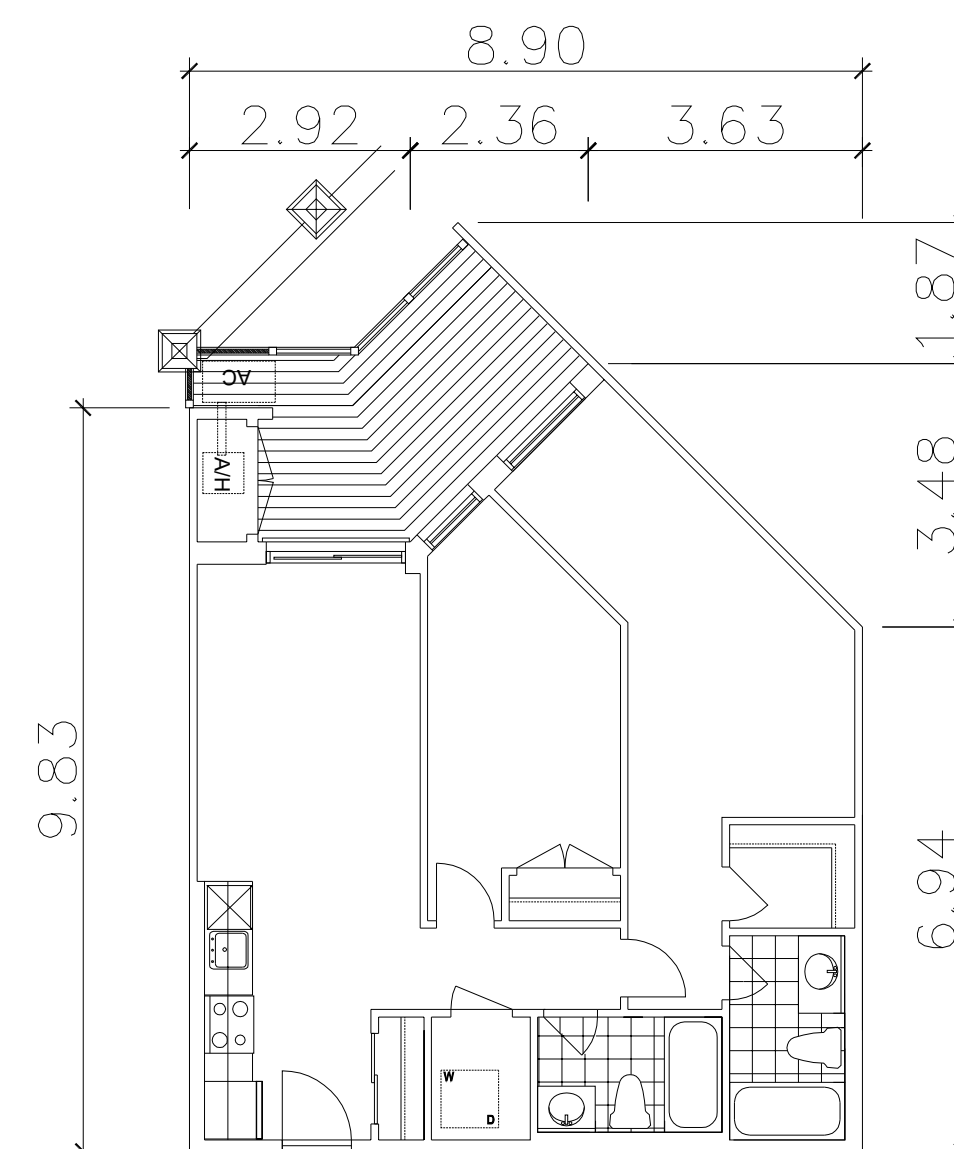
TYPE D
2bed/2bath
AREA
79m²
850sq.ft



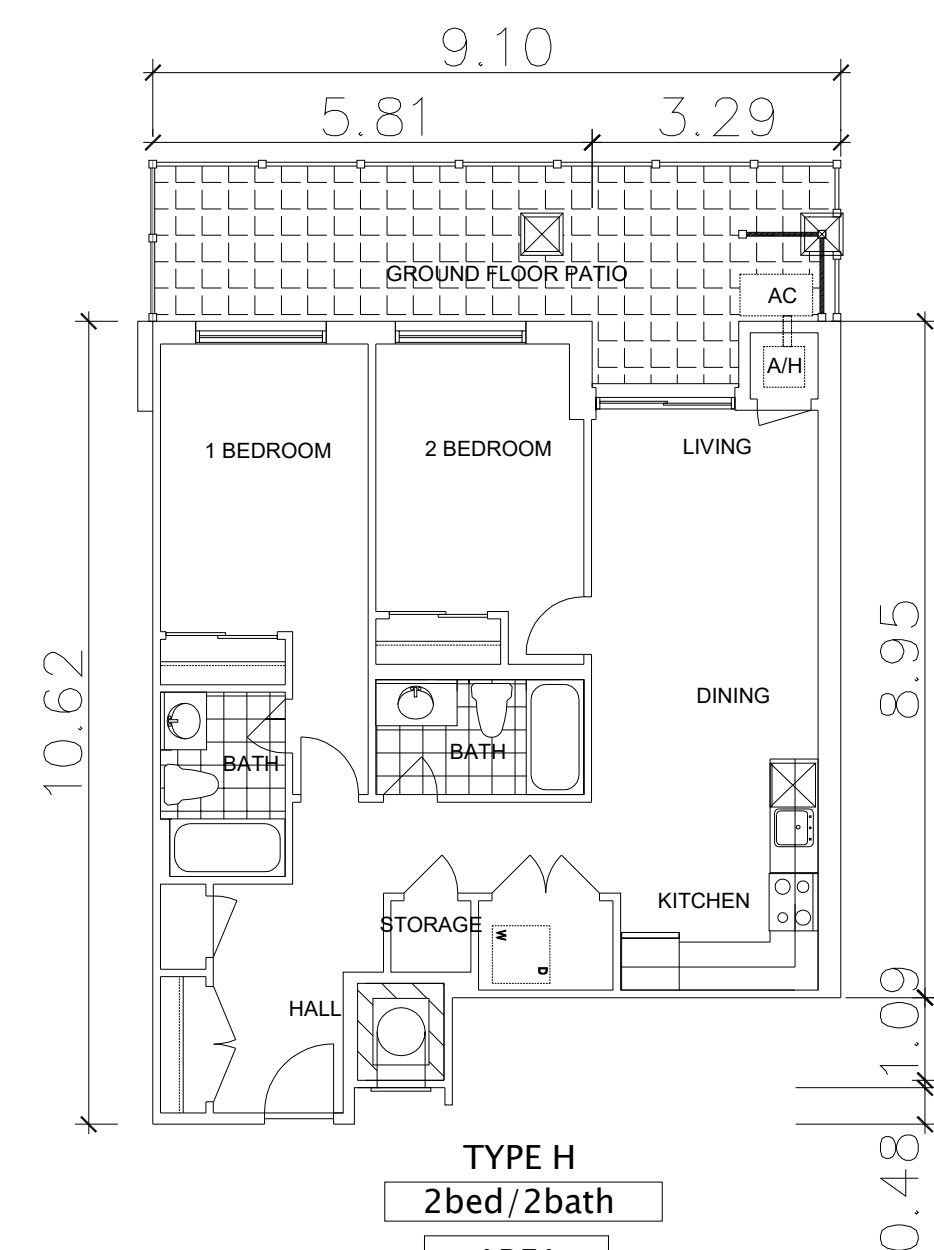
TYPE G
2bed/2bath
AREA
84m²
904 sq.ft



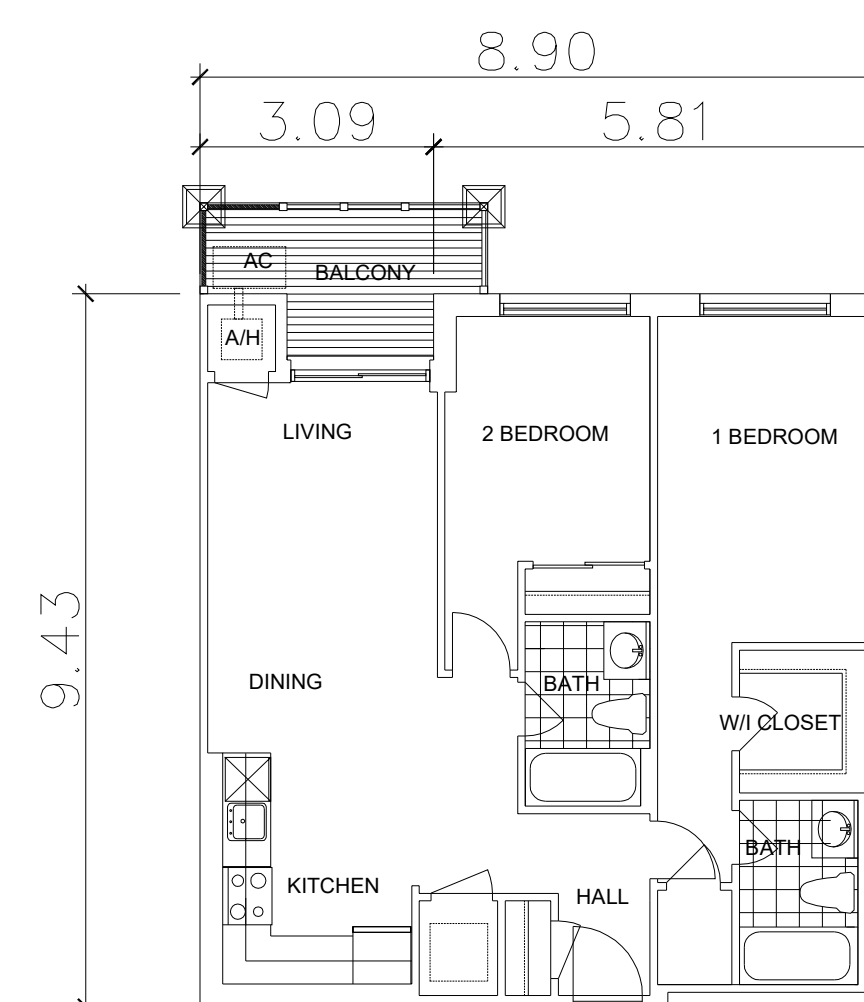
1 BED affordable unit 15% 56 Units
TYPE B
1bed/1bath
AREA
51m²
549sq.ft



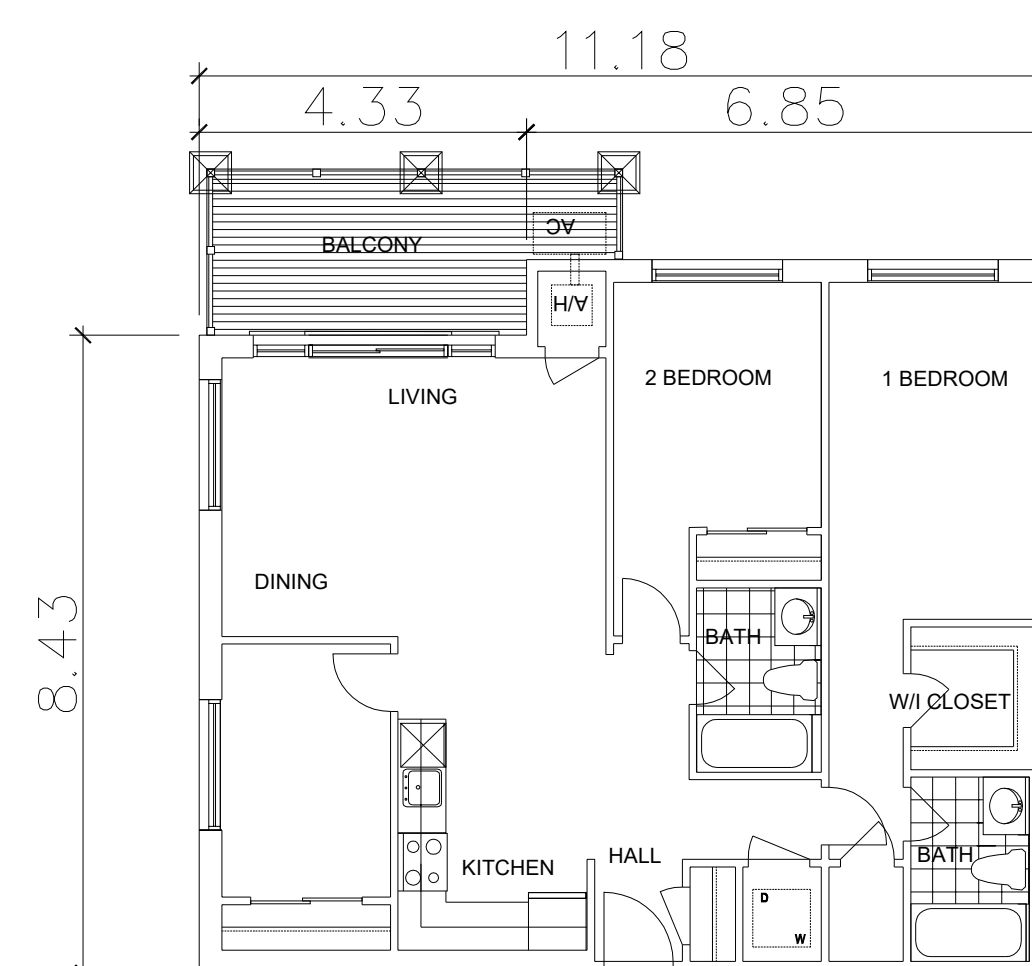
TYPE E
2bed/2bath
AREA
78m²
840sq.ft



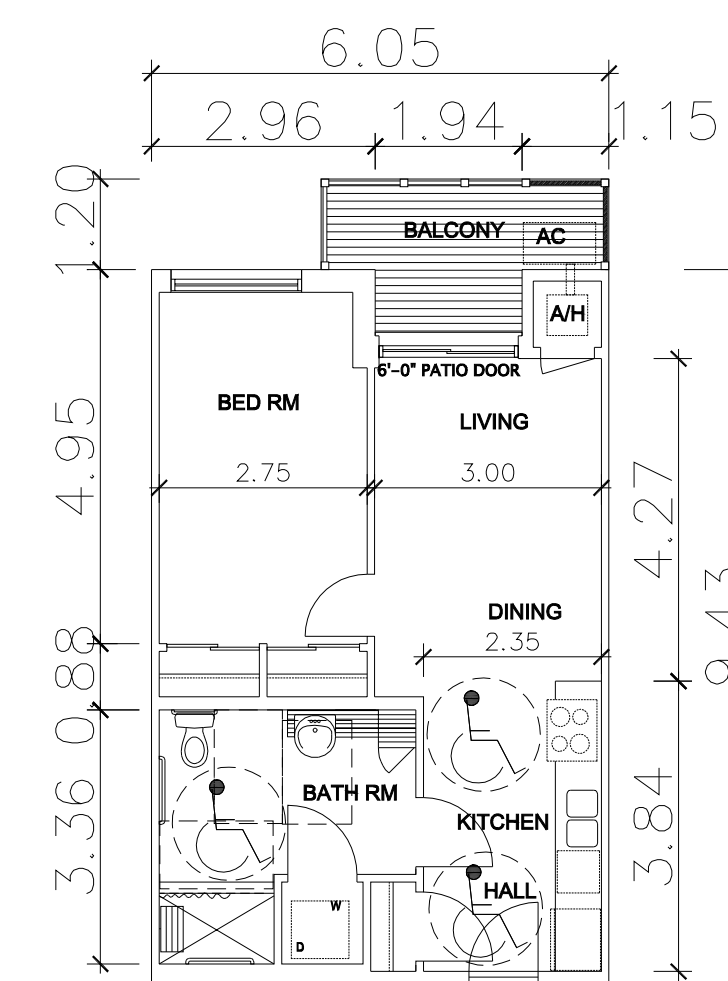
TYPE H
2bed/2bath
AREA
84m²
904 sq.ft



TYPE C
2bed/2bath
AREA
81m²
872sq.ft



TYPE F
3bed/2bath
AREA
100m²
1,076sq.ft



1 BED accessible unit 15% 56 Units

TYPE A1

1 bed/1 bath

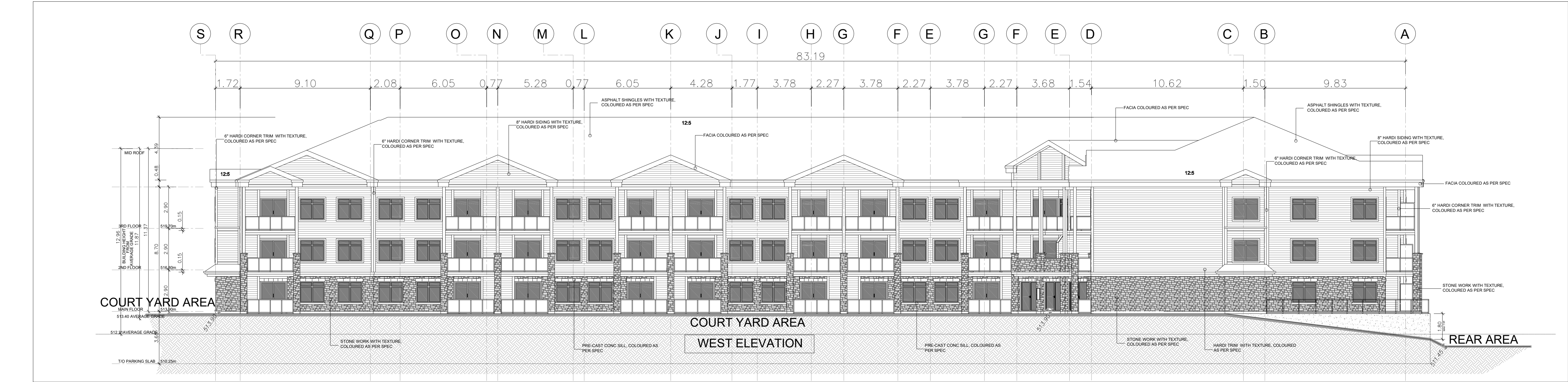
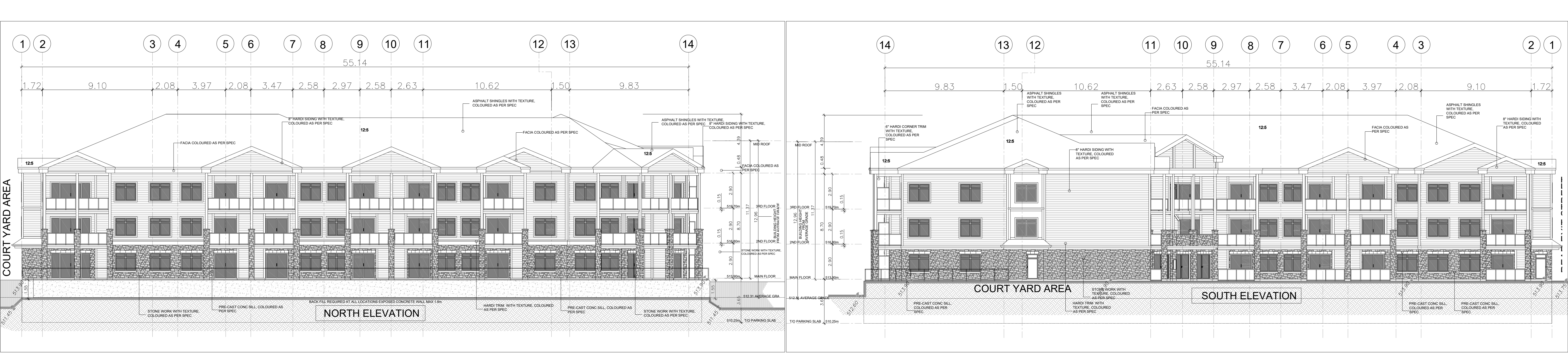
AREA
55m²
592sq.ft



UNIT FLOOR PLANS

6	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Oct 22, 2004	
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Aug 08, 2004	
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	July 16, 2004	
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	July 1, 2004	
2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	June 22, 2004	SA
1	ISSUED FOR CLIENT AND CONSULTANT REVIEW	June 02, 2004	SA
NO.	Description	Date	Rev.

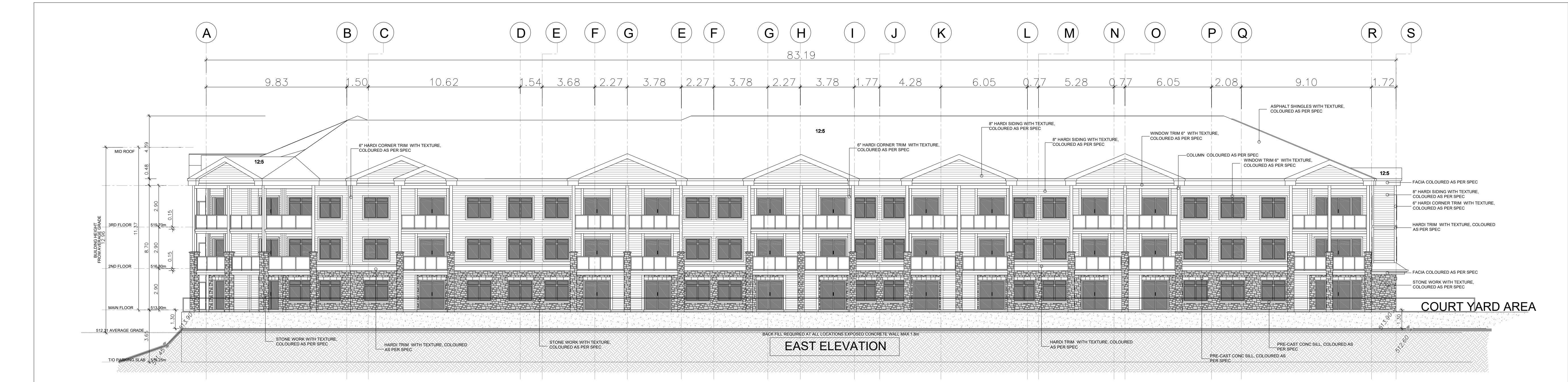
DUNDALD CONCEPT		ELEVATION	Drawing No.
			A-110
		DATE ISSUED:	JUNE 27, 2024
UNIT FLOOR PLANS			
PROJECT #	MARKETING NAME	S&C ARCHITECTS INC. 17-04848--0991 / 7-641860-010 INFO@SCARCHITECTS.COM 60 RANDALL DRIVE, SUITE 10 AJAX, ONTARIO L5R 6L5	
2024-25	-		
SCALE	MUNICIPALITY		
1:100			



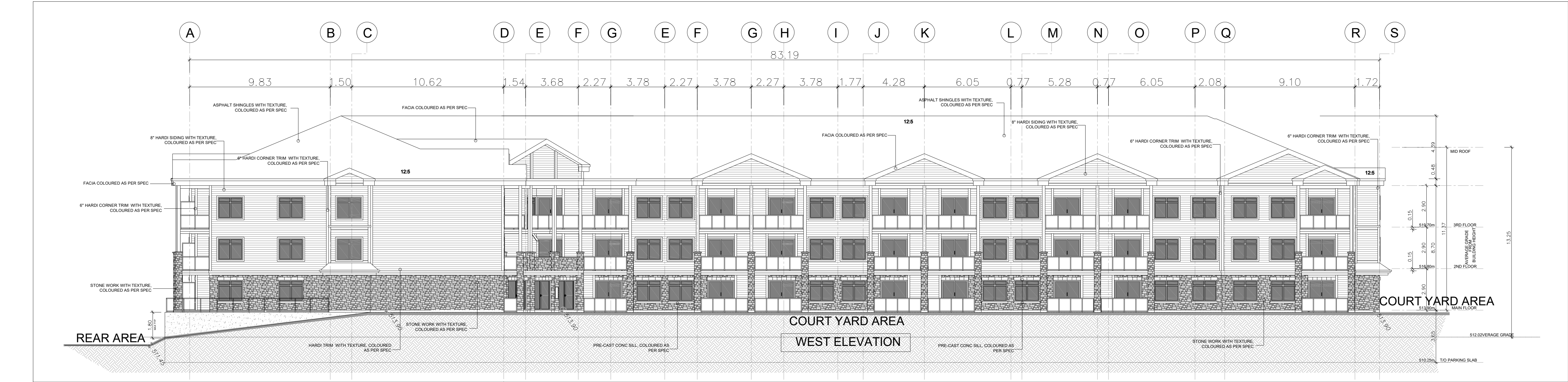
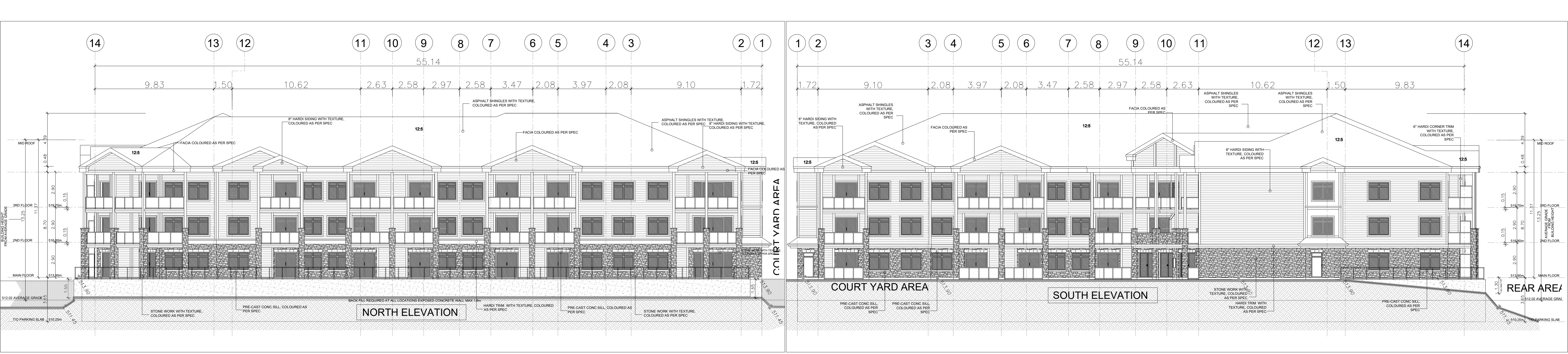
NOTE:
SEE SPEC FOR EACH BUILDINGS
ASSIGNED
COLOURS AND STONE WORK.
LOCATIONS OF MATERIALS WILL REMAIN
CONSTANT WITH EACH BUILDING.
ALL GLAZING TO BE CLEAR AT RAILINGS.

ALL GRADES ARE TO CONFORM TO CIVIL
ENG DWGS.

SEE COLOUR ELEVATIONS
A-110a



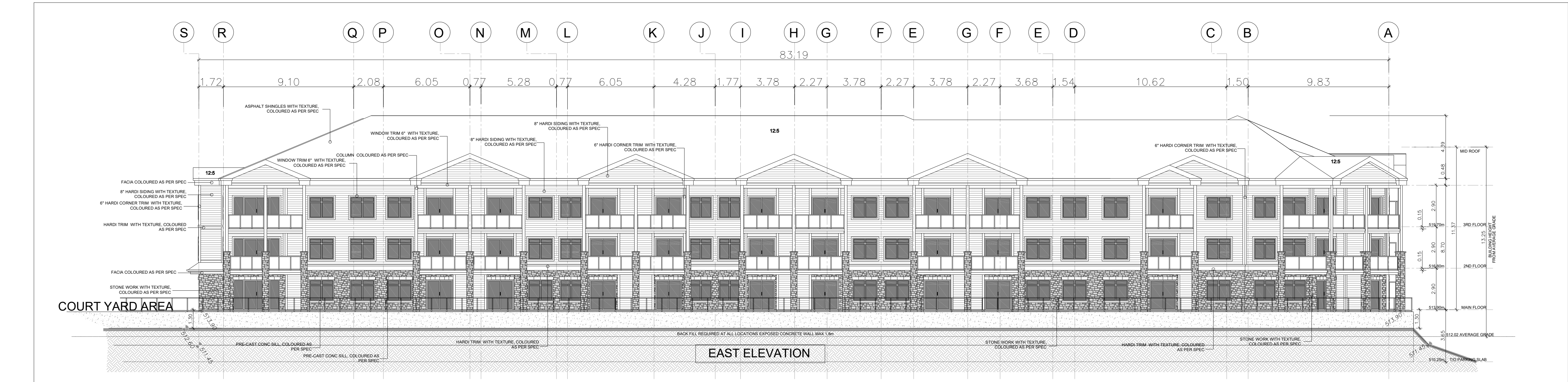
6	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Oct 22, 2024
5	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Aug 08, 2024
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jul 16, 2024
3	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jul 11, 2024
2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jun 27, 2024
1	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jun 07, 2024
No.	Description	Date
1	DISCUSSION	Rev.
DUNDALK CONCEPT		Elevation Drawing No. A-111
BUILDING "A" ELEVATIONS		DATE REVISION JUNE 27, 2024
PROJECT #	MARKETING NAME	S&C ARCHITECTS INC.
2024-25	-	1: (416) 848-0991 F: (416) 860-6101
SCALE	MUNICIPALITY	INFO@S&CARCHITECTS.CA
1:150		60 RANDALL DRIVE SUITE 10
		AJAX, ONTARIO L1S 6L3



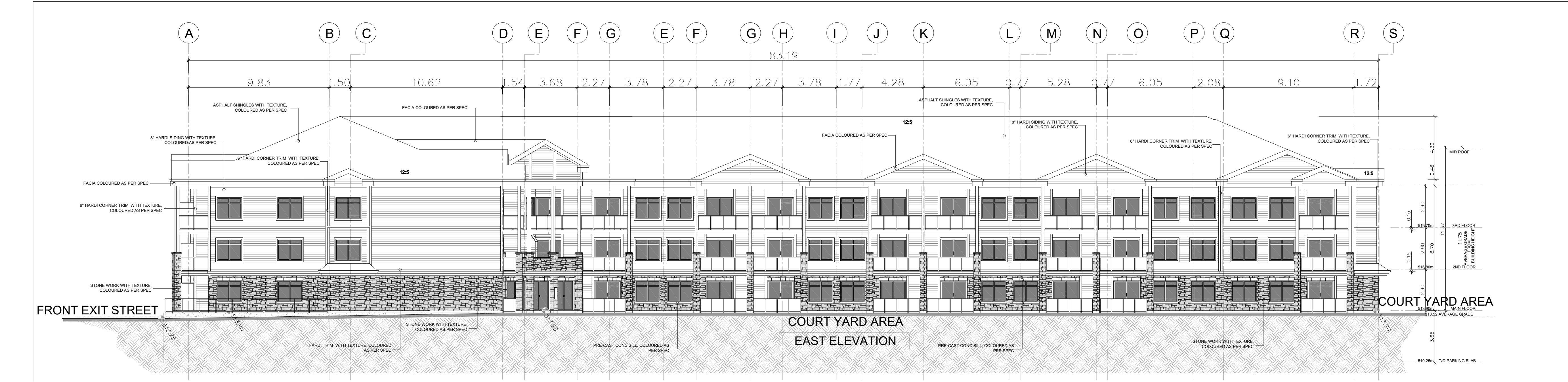
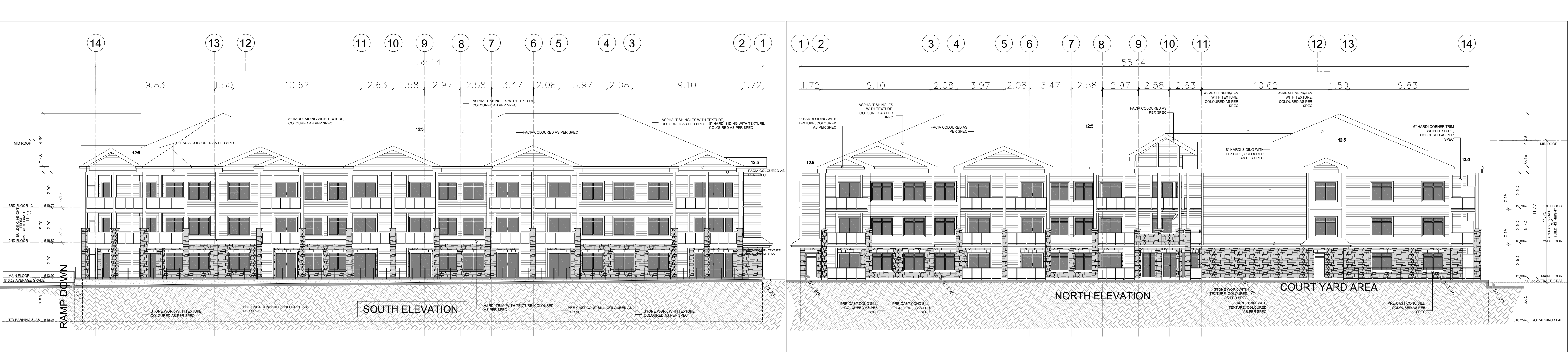
NOTE:
SEE SPEC FOR EACH BUILDINGS
ASSIGNED
COLOURS AND STONE WORK.
LOCATIONS OF MATERIALS WILL REMAIN
CONSTANT WITH EACH BUILDING.
ALL GLAZING TO BE CLEAR AT RAILINGS.

ALL GRADES ARE TO CONFORM TO CIVIL
ENG DWGS.

SEE COLOUR ELEVATIONS
A-111a



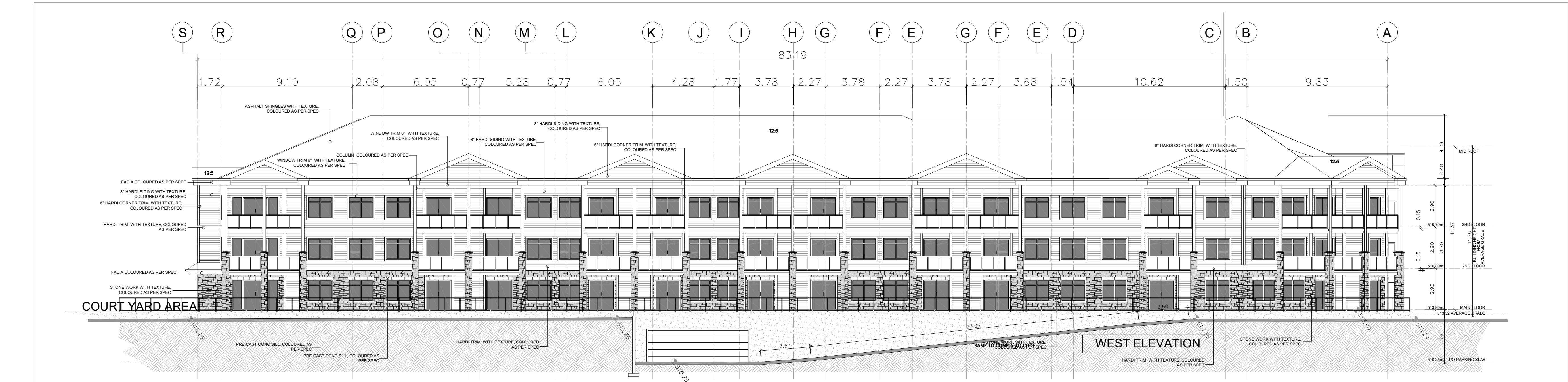
6	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Oct 22, 2024
5	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Aug 08, 2024
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jul 16, 2024
3	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jul 11, 2024
2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jun 27, 2024
1	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jun 07, 2024
No.	Description	Date
Rev.		
DUNDALK CONCEPT		ELEVATION Drawing No. A-112
BUILDING "B" ELEVATIONS		DATE REVISION JUNE 27, 2024
PROJECT #	MARKETING NAME	S&C ARCHITECTS INC.
2024-25	-	T: (416) 848-0991 F: (416) 860-6101
SCALE	MUNICIPALITY	INFO@S&CARCHITECTS.CA
1:150		60 RANDALL DRIVE SUITE 10
		AJAX, ONTARIO L1S 6L3



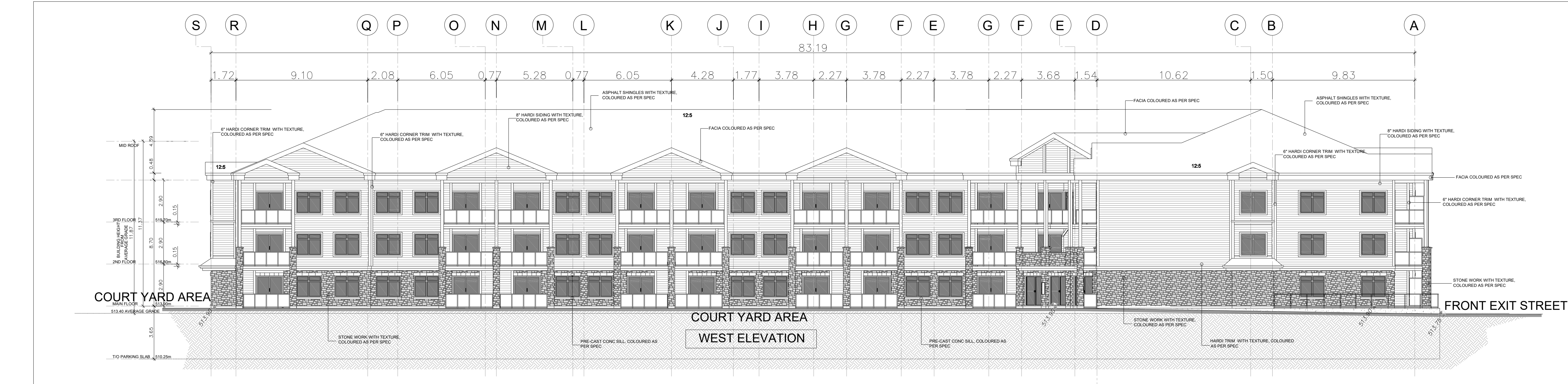
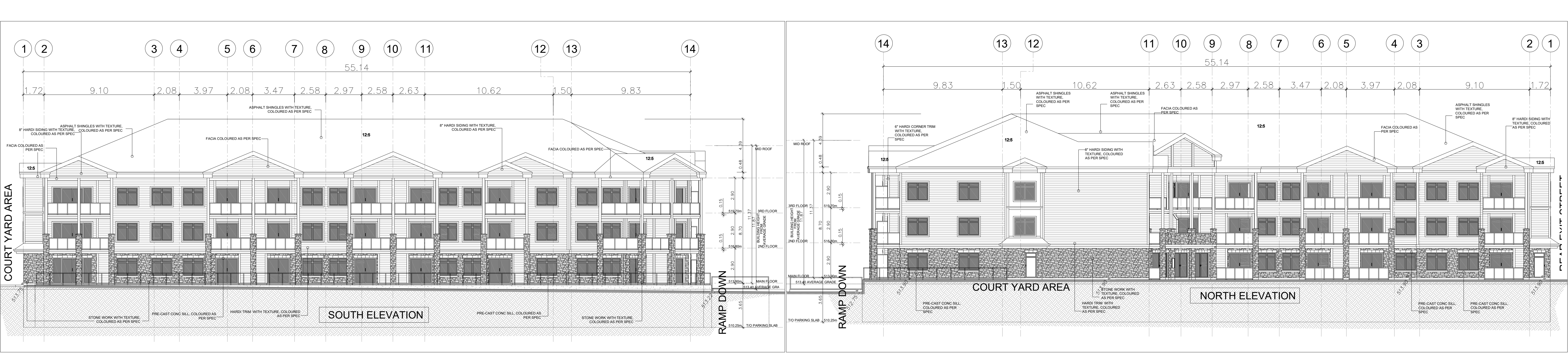
NOTE:
SEE SPEC FOR EACH BUILDINGS
ASSIGNED
COLOURS AND STONE WORK.
LOCATIONS OF MATERIALS WILL REMAIN
CONSTANT WITH EACH BUILDING.
ALL GLAZING TO BE CLEAR AT RAILINGS.

ALL GRADES ARE TO CONFORM TO CIVIL
ENG DWGS.

SEE COLOUR ELEVATIONS
A-112a



6	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Oct 22, 2024	
5	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Aug 28, 2024	
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jul 16, 2024	
3	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jul 11, 2024	
2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jun 27, 2024	SA
1	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jun 07, 2024	SA
UN. Description			
DATE			
DUNDALK CONCEPT		ELEVATION	Drawing No. A-113
BUILDING "C" ELEVATIONS		DATE REVIS	JUNE 27, 2024
PROJECT #	MARKETING NAME	S&C ARCHITECTS INC.	
2024-25	-	T: (416) 848-0991 F: (416) 860-6101	
SCALE	MUNICIPALITY	INFO@S&CARCHITECTS.CA	
1:150		60 RANDALL DRIVE SUITE 10	
		AURORA, ONTARIO L1T 6L3	



NOTE:
SEE SPEC FOR EACH BUILDINGS
ASSIGNED
COLOURS AND STONE WORK.
LOCATIONS OF MATERIALS WILL REMAIN
CONSTANT WITH EACH BUILDING.
ALL GLAZING TO BE CLEAR AT RAILINGS.

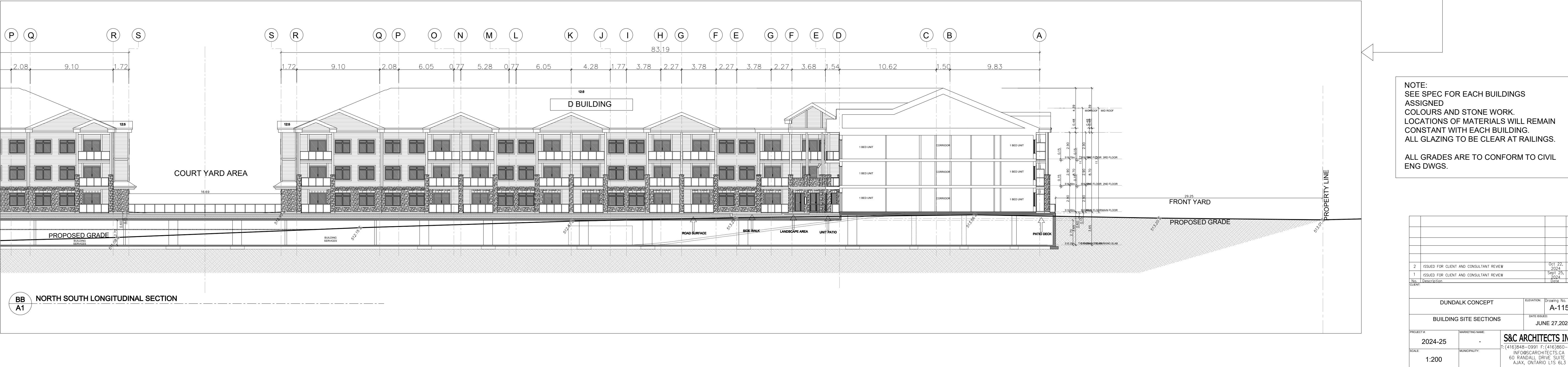
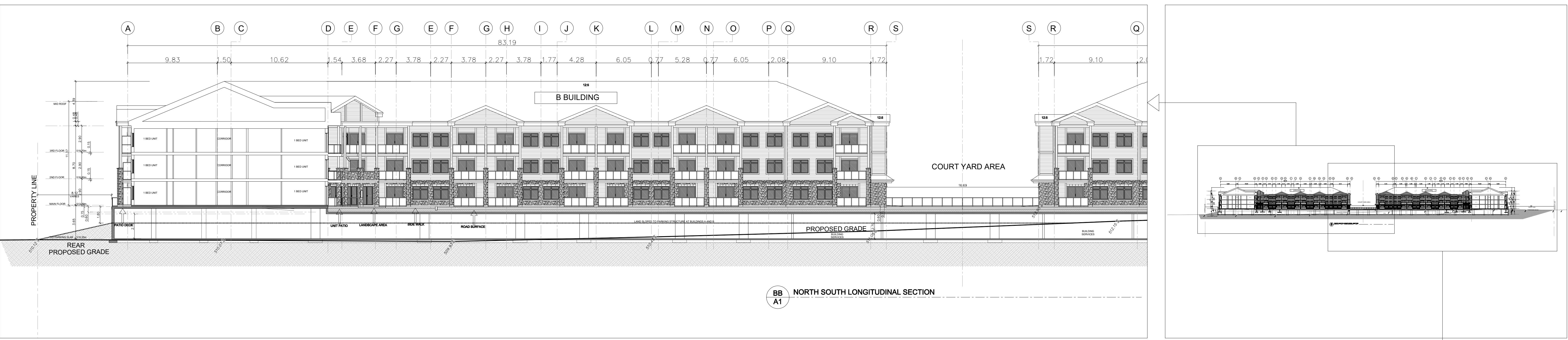
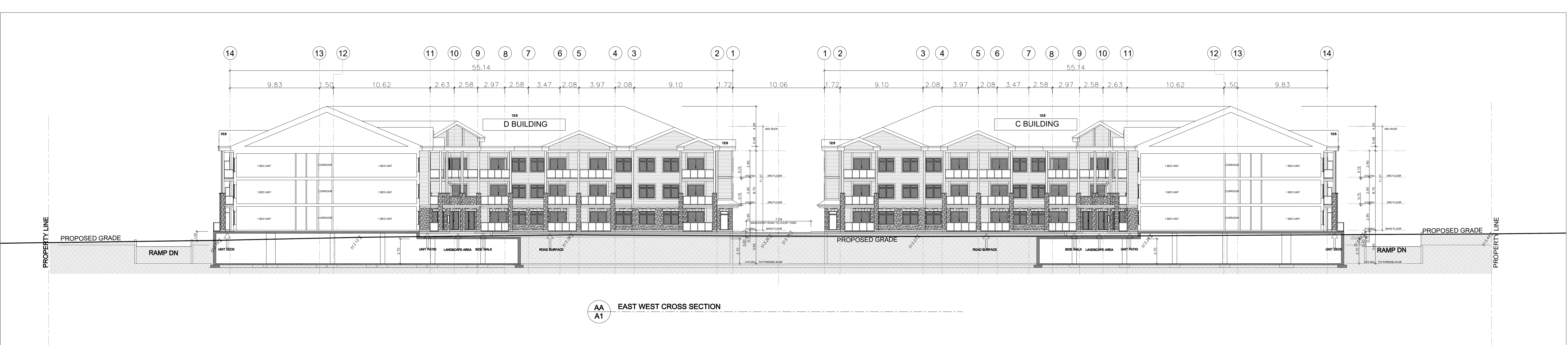
ALL GRADES ARE TO CONFORM TO CIVIL
ENG DWGS.

SEE COLOUR ELEVATIONS
A-113a



6	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Oct 22, 2024	Rev
5	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Aug 08, 2024	Rev
4	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jul 16, 2024	Rev
3	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jul 11, 2024	Rev
2	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jun 27, 2024	SA
1	ISSUED FOR CLIENT AND CONSULTANT REVIEW	Jun 07, 2024	SA
No.	Description	Date	Rev

DUNDALK CONCEPT		ELEVATION	Drawing No.
BUILDING "D" ELEVATIONS			A-114
PROJECT #	MARKETING NAME	DATE REVIS	JUNE 27, 2024
2024-25	-		
SCALE	MUNICIPALITY	S&C ARCHITECTS INC.	
1:150		1: (416) 848-0991 F: (416) 860-6101 INFO@S&CARCHITECTS.CA 60 RANDALL DRIVE, SUITE 10 AURORA, ONTARIO L1T 6L3	



Appendix B

ECA, Dundalk Waste Transfer Station and Closed Landfill

(MECP, 2016)



AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A262302

Notice No. 1

Issue Date: June 14, 2016

The Corporation of the Township of Southgate
185667 Grey County Road 9
Rural Route, No. 1
Dundalk, Ontario
N0C 1B0

Site Location: Dundalk Transfer Station and Closed Landfill Site
Lot 232, Concession 3
Southgate Township, County of Grey

You are hereby notified that I have amended Approval No. A262302 issued on July 12, 2011 for a 6.6 hectare Waste Disposal Site consisting of a closed landfill site on 0.8 hectares, a transfer site and a Municipal Hazardous and Special Waste depot , as follows:

I. For the purposes of this *Approval* , the following definitions are hereby amended:

"Approval" or "ECA" means this entire provisional Environmental Compliance Approval document, issued in accordance with Section 20.3 of the *EPA* , and includes any schedules to it, the application and the supporting documentation listed in Schedule "A";

"Director" means any *Ministry* employee pursuant to section 20.3 of Part II.1 of the *EPA* .

II. Condition 50 of this *Approval* is hereby amended as follows:

50. By March 31, 2017, and on a biennial basis thereafter, the *Owner* shall submit to the *District Manager* a "Biennial Report" which shall cover the 24 month period of the previous two years. Each report shall include, as a minimum, the following information:

- (a) a summary, in tabular form where possible, of the information required to be kept in Condition 49;
- (b) a statement as to compliance with all Conditions of this *Approval* and with the inspection and reporting requirements of the Conditions herein;
- (c) the results and analyses of all groundwater, surface water, leachate and landfill gas monitoring, as specified in Schedule "C" of this *Approval* ;
- (d) comparison of results to the appropriate Ministry standards and guidelines, including the *Ministry's* Reasonable Use Guideline and the Provincial Water Quality Objectives;
- (e) any recommendations to minimize environmental impacts from the operation of the *Site* and to

improve *Site* operations and monitoring programs in this regard; and

(f) provide a list of *competent persons* at the *Site*.

III. The following Condition is hereby added to this *Approval* :

52. (a) Ground water, surface water and gas monitoring at the *Site* shall be carried out in accordance with Schedule "C".

(b) In the event the *Owner* recommends any changes to the environmental monitoring plan in the Biennial Report, the *Owner* shall provide a cover letter with the submission of the biennial report that clearly indicates the report contains proposed changes to the environmental monitoring plan and request the District Office review the proposed changes. The cover letter shall be addressed to the *District Manager* .

(c) Within fourteen (14) days of receiving written correspondence from the District Office confirming that the District Office is in agreement with the proposed changes to the environmental monitoring program identified in Condition 52 (b), the *Owner* shall forward a letter identifying the proposed changes, copies of the correspondences from the *District Manager* and all other correspondences and responses related to Condition 52 (b), to the *Director* requesting the *Approval* be amended to approve the proposed changes to the environmental monitoring plan.

(d) In the event any other changes to the environmental monitoring program are proposed outside of the recommendation of the Biennial Report, the *Owner* shall follow current *Ministry* procedures for seeking approval for amending the *ECA* .

IV. The following items are hereby added to Schedule "A" of this *Approval* :

14. Letter from Ian Mitchell, District Engineer, Owen Sound Area Office, Ministry of the Environment, dated April 13, 2006 to Mr. David Milliner, Corporation of the Township of Southgate, regarding changing reporting frequency from annual to bi-annual.

15. Letter from A.W. Bringleston, GM BluePlan Engineering Limited, dated March 31, 2015 to the Ministry of the Environment, enclosing an ECA application for amending Condition 50 of Approval A262302, and other supporting information.

V. This Schedule "C" forms part of Environmental Compliance Approval No. A262302

SCHEDULE "C"

	Monitoring Location	Sampling Frequency	Parameters
Ground Water Monitoring	DL1S, DL1D	Once every four years (Fall)	Arsenic, Barium, Boron, Calcium, Iron, Magnesium, Manganese, Phosphorus, Potassium, Sodium, Chloride, Nitrate, Nitrite, Sulphate, Alkalinity, Conductivity, Hardness, pH, Ammonia, Biological Oxygen Demand,
	DL2, DL3S, DL3I, DL3D, DL4, DL5R-04, MW-1, MW-2, MW-3	Once every year (Fall)	

			Dissolved Organic Carbon, Chemical Oxygen Demand, Total Dissolved Solids, Total Kjeldahl Nitrogen
	DL4, DL5R-04	Once every four years (Fall)	Volatile Organic Compounds
Surface Water Monitoring	SW-2, SW-3, SW-4	Twice every year (Spring and Fall)	Barium, Boron, Iron, Manganese, Potassium, Sodium, Chloride, Sulphate, Alkalinity, Conductivity, Field Temperature, Hardness, pH, Ammonia, Chemical Oxygen Demand, Dissolved Organic Carbon, Total Dissolved Solids, Total Phosphorus, Total Suspended Solids
Gas Monitoring	GP-1, GP-2, GP-3, GP-4, GP-5, GP-6, DL5R-04	Once every year (Fall)	Combustible Gas (Methane)

VI. The reasons for this amendment to the *Approval* are as follows:

1. The reason for Condition 50 is to change the reporting frequency from annual to bi-annual, in accordance with items 14 and 15 of Schedule "A".
2. The reason for Condition 52 is to demonstrate that the impacts on the natural environment from the closed landfill site are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

This Notice shall constitute part of the approval issued under Approval No. A262302 dated July 12, 2011

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the
purposes of Part II.1 of the
Environmental Protection Act
Ministry of the Environment and
Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 14th day of June, 2016

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

MT/
c: District Manager, MOECC Owen Sound
Alen Bringleston, GM BluePlan Engineering Limited

Appendix C

Borehole Logs

(Palmer, February 2024)

PROJECT: D-4 Studies

CLIENT: Briarwood (Dundalk) Ltd.

PROJECT LOCATION: Dundalk, ON

DATUM: Geodetic

BH LOCATION: N 4889610.68 E 548550.78

Method: Split Spoon

Diameter: 150 mm

Date: Jan 29, 2024

REF. NO.: 2309101

ENCL NO.: 1

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	REMARKS	GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m				
0.0	Ground Surface								GR SA SI CL
0.0	TOPSOIL: contains organics, dark brown							Methane: 0.3%	
0.3	SILT: some rootlets, dark brown to brown, moist, stiff		1	SS	13				
0.6	SILTY SAND: some clay, trace gravel, light brown, moist, stiff		2	SS	9			Methane: 0.3%	
1.4	SILTY CLAY: some sand, trace gravel, light brown, moist, firm		3	SS	4			Methane: 0.3%	
2.1	SILTY SAND: some clay, trace gravel, light brown, moist to wet, very stiff to hard		4	SS	21			Methane: 0.3%	
3.7	SILT AND GRAVEL: some clay, trace sand, light brown, moist to wet, very stiff to hard		5	SS	43			Methane: 0.3%	
			6	SS	24			Methane: 0.3%	
			7	SS	23			Methane: 0.3%	
			8	SS	32			Methane: 0.3%	
6.1	END OF BOREHOLE 1. Upon completion of drilling, one (1) 50mm diameter monitoring well was installed in the borehole. 2. Water Level Readings: Date: January 31, 2024 W.L. Depth: 1.12 mbgs								

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH
NOTES

+ 3 , × 3 : Numbers refer to Sensitivity

○ ● = 3% Strain at Failure

PROJECT: D-4 Studies

CLIENT: Briarwood (Dundalk) Ltd.

PROJECT LOCATION: Dundalk, ON

DATUM: Geodetic

BH LOCATION: N 4889751 E 548555.26

Method: Split Spoon

Diameter: 150 mm

Date: Jan 29, 2024

REF. NO.: 2309101

ENCL NO.: 2

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	REMARKS	GRAIN SIZE DISTRIBUTION (%)			
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m				GR	SA	SI	CL
0.0	Ground Surface											
0.1	TOPSOIL: contains organics, dark brown SILTY CLAY: some sand, trace rootlets, dark brown, moist, soft		1	SS	2			W. L. 0.0 mBGL Jan 31, 2024				
0.6	SILTY SAND: some clay, some to trace gravel, light brown, moist to wet, firm to hard		2	SS	6			Bentonite				
			3	SS	30							
			4	SS	32							
			5	SS	34							
			6	SS	41			Sand				
4.4	SILT: some sand, some to trace clay, trace gravel, light brown, moist to wet, hard		7	SS	60			Screen				
			8	SS	50							
5.9	END OF BOREHOLE 1. Upon completion of drilling, one (1) 50mm diameter monitoring well was installed in the borehole. 2. Water Level Readings: Date: January 31, 2024 W.L. Depth: 0.01 mbgs											

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH
NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ ●=3% Strain at Failure

Appendix D

Laboratory Certificate of Analysis (ALS, 2024)

(ALS, February 2024)

CERTIFICATE OF ANALYSIS

Work Order	: WT2402336	Page	: 1 of 2
Client	: Palmer Environmental Consulting Group Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Derek Gilbert	Account Manager	: Andrew Martin
Address	: 74 Berkeley Street Toronto ON Canada M5V 1E3	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 2309101	Date Samples Received	: 01-Feb-2024 09:15
PO	: ----	Date Analysis Commenced	: 05-Feb-2024
C-O-C number	: 20-1048441	Issue Date	: 06-Feb-2024 12:26
Sampler	: DG		
Site	: ----		
Quote number	: 2024 SOA - Ontario		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
David Tremblett	VOC Section Supervisor	Air Quality, Waterloo, Ontario



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	Description
µg/L	micrograms per litre
ppmv	parts per million (volume/volume)

<: less than.
>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

					Client sample ID	BH23-1	BH23-8			
					Client sampling date / time	31-Jan-2024 00:00	31-Jan-2024 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2402336-001	WT2402336-002	-----	-----	-----
						Result	Result	----	----	----
Dissolved Gases										
Methane	74-82-8	EC614B/WT	5.0	µg/L		12.2	15.0	----	----	----
Methane	74-82-8	E614B/WT	20.8	ppmv		50.8	62.4	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2402336	Page	: 1 of 5
Client	: Palmer Environmental Consulting Group Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Derek Gilbert	Account Manager	: Andrew Martin
Address	: 74 Berkeley Street Toronto ON Canada M5V 1E3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 2309101	Date Samples Received	: 01-Feb-2024 09:15
PO	: ----	Issue Date	: 06-Feb-2024 12:25
C-O-C number	: 20-1048441		
Sampler	: DG		
Site	: ----		
Quote number	: 2024 SOA - Ontario		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Dissolved Gases : Methane, Ethane, & Ethene by Headspace GC-FID										
Glass vial (sodium bisulfate) BH23-1	E614B	31-Jan-2024	----	----	----		05-Feb-2024	14 days	5 days	✓
Dissolved Gases : Methane, Ethane, & Ethene by Headspace GC-FID										
Glass vial (sodium bisulfate) BH23-8	E614B	31-Jan-2024	----	----	----		05-Feb-2024	14 days	5 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Methane, Ethane, & Ethene by Headspace GC-FID	E614B	1322594	1	2	50.0	4.5	✓
Method Blanks (MB)							
Methane, Ethane, & Ethene by Headspace GC-FID	E614B	1322594	1	2	50.0	4.5	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Methane, Ethane, & Ethene by Headspace GC-FID	E614B ALS Environmental - Waterloo	Water	EPA REGION 1, NATATTEN.WPD, REV. 1	Volatile hydrocarbons are analyzed by static headspace GC/FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing the analyte(s) to partition between the aqueous phase and the headspace in accordance with Henry's law.
Methane, Ethane, & Ethene by Headspace GC-FID	EC614B ALS Environmental - Waterloo	Water	Unit Conversion	Convert ppmV to ug/L

QUALITY CONTROL REPORT

Work Order	: WT2402336	Page	: 1 of 3
Client	: Palmer Environmental Consulting Group Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Derek Gilbert	Account Manager	: Andrew Martin
Address	: 74 Berkeley Street Toronto ON Canada M5V 1E3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	:	Telephone	: +1 519 886 6910
Project	: 2309101	Date Samples Received	: 01-Feb-2024 09:15
PO	: ----	Date Analysis Commenced	: 05-Feb-2024
C-O-C number	: 20-1048441	Issue Date	: 06-Feb-2024 12:25
Sampler	: DG		
Site	: ----		
Quote number	: 2024 SOA - Ontario		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
David Tremblett	VOC Section Supervisor	Waterloo Air Quality, Waterloo, Ontario



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
 - CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
 - DQO = Data Quality Objective.
 - LOR = Limit of Reporting (detection limit).
 - RPD = Relative Percent Difference
 - # = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Gases (QC Lot: 1322594)											
WT2402336-001	BH23-1	Methane	74-82-8	E614B	20.8	ppmv	50.8	38.1	12.7	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water						
Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Gases (QC Lot: 1322594)						
Methane	74-82-8	E614B	20.77	ppmv	<20.8	----





COC Number: 20 - 1048441

Environmental Division
Waterloo

Work Order Reference
WT2402336



Telephone : +1 519 886 6910

[illegible]

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FROM

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white-report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.