

File #: 2861
Date: November 7, 2025

Mr. Paal Helgesen
One The Esplanade
Pickering, Ontario, L1V 6K7

Dear Mr. Helgesen:

Re: | **Stormwater Management Design Brief
1794 Applevue Road, City of Pickering**

Introduction

SCS Consulting Group Ltd. has been retained by the owner of 1794 Applevue Road to prepare this Stormwater Management (SWM) Design Brief in support of the joint Zoning By-law Amendment (Rezoning) and Land Division (Severance) Applications for the three (3) newly created lots fronting Goldenridge Road, located in the City of Pickering.

Stormwater Management Analysis

Design Criteria

The following documents were used to develop the SWM design criteria:

- Concept Development Application Submission 3, 1794 Applevue Road Letter prepared by TRCA, dated July 25, 2025;
- City of Pickering Engineering Design Criteria for Lot Grading, dated January 2020;
- City of Pickering Engineering Design Criteria for Infill Lot Grading Plans and Individual Lot Grading Plan, dated January 2020;
- City of Pickering Stormwater Management Design Guidelines, dated July 2019;
- Stormwater Management Criteria – prepared by Toronto and Region Conservation Authority (TRCA), dated August 2012;
- TRCA/CVC Low Impact Development Stormwater Planning and Design Guide, dated November 2010; and
- Stormwater Management Planning and Design Manual – prepared by Ministry of Environment, dated March 2003.

Using the above documents, the stormwater runoff criteria and associated control methods for the stormwater runoff criteria are summarized in **Table 1** below.

Table 1 - Stormwater Runoff Control Criteria

Criteria	Control Measure
Quantity Control	Post-development peak flows to be controlled to pre-development peak flows for all storms up to and including the 100 year storm (i.e., 2, 5, 10, 25, 50, and 100 year storms)
Quality Control	No on-site control required
Erosion Control	Retention of the 5 mm rainfall to the extent possible
Water Balance	Retention of the 5 mm rainfall to the extent possible

Existing Conditions

Existing Drainage

As per the Storm Drainage Plan (Drawing 2), provided by the City of Pickering in **Appendix B**, the western portion of the subject site is anticipated to drain west towards Goldenridge Road (Catchment 101, 0.04ha, **Figure 3.1**). The remaining runoff from the subject site is conveyed eastwards into Dunbarton Creek (Catchment 102, 0.28ha, **Figure 3.1**).

The subject site is within the Frenchmans Bay watershed within the Toronto and Region Conservation Authority (TRCA) jurisdiction. The stormwater runoff from the subject site directly discharges into one of the main branches of Frenchmans Bay.

Existing Peak Flow

As required both by the City of Pickering and the TRCA, the target release rates for the proposed development are to be controlled to the pre-development peak flows for the 2 year through 100 year storm events. The rational method was used to determine the target release rates from the site based on the Intensity-Duration-Frequency (IDF) rainfall curves from the City of Pickering Design Standards. Supporting calculations are provided in **Appendix C. Table 2** summarizes the existing peak flows from the site for drainages to Goldenridge Road and Dunbarton Creek.

Table 2 – Summary of Existing Peak Flows

Return Period Storm	Goldenridge Road (L/s) ¹	Dunbarton Creek (L/s)
2 Year	3.9	18.6
5 Year	5.3	25.5
10 Year	6.3	30.2
25 Year	8.3	39.5
50 Year	10.1	47.7
100 Year	11.7	54.7

¹ Peak Flows to Goldenridge Road were calculated using a runoff coefficient of 0.45 as per Storm Drainage Plan provided by the City of Pickering as referenced in **Appendix B**.

Proposed Storm Drainage Conditions

Proposed Drainage and Stormwater Management Plan

In accordance with the Storm Drainage Plan provided by the City of Pickering (Drawing 2, **Appendix B**), the proposed three (3) subject lots were graded having a backsplit drainage configuration, as illustrated on the Grading and Servicing Plan (GR-1) in **Appendix D**.

Figure 4.1 demonstrates how the subject site was graded to maintain this backsplit drainage configuration. In accordance with the City of Pickering's Storm Drainage Plan, runoff from the western portion of the site is directed westwards towards Goldenridge Road (Catchment 201, $c = 0.45$). The remaining runoff from the eastern portion of the site is directed eastwards towards Dunbarton Creek (Catchment 202, $c = 0.40$).

Proposed Quantity Control

The post-development peak flows to Dunbarton Creek is summarized in **Table 3**. Please refer to **Appendix C** for detailed stormwater management calculations.

Table 3 – Summary of Proposed Peak Flows

Return Period Storm	Dunbarton Creek	
	Pre-Development Flows (L/s)	Post-Development Flows (L/s)
2 Year	18.6	18.6
5 Year	25.5	25.5
10 Year	30.2	30.2
25 Year	39.5	39.5
50 Year	47.7	47.7
100 Year	54.7	54.7

Proposed Quality Control

As described in **Table 1** of this report, on-site quality control is not required for the subject property. Additional quality control has been provided as part of the infiltration trench design. As outlined in Table 3.2 in the MOE Stormwater Management Planning and Design Manual, for an impervious level of 30%, a storage volume of 21.4 m³/ha (equivalent to 6.9 m³/0.32 ha) is required for infiltration measures to ensure enhanced 80% long-term suspended solids removal (**Appendix B**). As described in more detail in the following section, a total storage volume of 7 m³ is provided for the subject site (0.32 ha), which is greater than the required storage volume of 6.9 m³.

Proposed Erosion Control and Infiltration Measures

On-site retention of the runoff from the first 5 mm of every rainfall event can be provided through the following two Low Impact Development (LID) measures;

- Infiltration trenches (located a minimum of 5 m away from the basement foundation wall); and
- Downspout roof leader connection to infiltration trench (as the downspouts are directly connected to the infiltration trench, surface overflow and leaf separator are required).

Figure 4.1 and the attached Grading and Servicing Plan GR-1 in **Appendix D** shows the LID design for each of the proposed lots within the subject site. As shown, stormwater runoff is directed to each infiltration trench from the roof downspouts. Each roof downspout is directly connected underground through a roof leader to the subsurface stone infiltration trench. Please refer to **Appendix C** for supporting calculations and proposed details.

As shown in the figure and drawing mentioned above, for each lot, the entire roof drainage is to be collected by roof leaders and the downspout connections will be directly connected into their

respective infiltration trenches, which will capture and infiltrate the rear yard drainage. The six (6) infiltration trenches are proposed to be greater than 5 m away from the back of the house foundation and 1 m away from each of the property lines. They shall consist of 50 mm washed clear stone facilities that are 5.8 m long x 1.0 m wide x 0.5 m deep. Refer to **Appendix C** for supporting calculations.

Additionally, drawdown calculations were performed to verify performance of the proposed infiltration trenches. The infiltration rate for the site soil was based on the Ontario Soils Mapping information and MTO design guidelines, identifying Guelph Loam in the site area. Refer to **Appendix B** for supporting documentation. As this is a Type B soil with a range of infiltration rates of 13 – 200 mm/hr, an infiltration rate of 13 mm/hr has been used conservatively for the drawdown calculations. The drawdown time is 38 hours and thus meets maximum drawdown requirements as per the TRCA. Refer to **Appendix C** for supporting calculations.

The proposed infiltration trenches in Catchment 202 are designed to retain the first 5 mm of rainfall over any storm event as seen in **Appendix C**. This retention satisfies the requirements for erosion control and water balance as described in **Table 1** above.

Water Balance

Per the MECP's and Credit Valley Toronto and Region Central Lake Ontario (CTC) Source Protection Committee (SPC) source protection information, the subject site does not lie within a source protection area, therefore a water balance is not required beyond the retention of the first 5 mm of rainfall on-site.

Erosion and Sediment Control

Erosion and sediment control measures during future construction on the subject site may include:

- Double row silt fence with strawbales on the eastern border of the subject site;
- temporary filter cloth or sock protection of downstream catchbasins on Goldenridge Road;
- street cleaning of Goldenridge Road; and
- timely stabilization of the lot following construction.

A detailed Erosion and Sediment Control Plan will be prepared by the builder of the lot at the building permit stage.

Re: Stormwater Management Design Brief
1794 Applevue Road, City of Pickering

File #: 2861
November 7, 2025
Page 6 of 6

Grading and Servicing Plans

A preliminary Grading and Servicing Plan (GR-1) has been prepared and is included in **Appendix D**. The purpose of this plan is to demonstrate the proposed grading design and servicing connections.

As shown, all three (3) subject lots are proposed to have a back split drainage configuration, directing drainage up to the front building envelope towards Goldenridge Road, while the remaining drainage will be directed towards to rear yard, ultimately into Dunbarton Creek. Grades range between 2.0% to 6.0%, and the proposed grading techniques are all in accordance with the City of Pickering design standards, maintaining drainage within the lot boundaries.

Additionally, sanitary and watermain connections for each subject lot are proposed to be connected into the existing infrastructure on Goldenridge Road.

Please contact the undersigned if you have any questions or require any additional information.

Sincerely,

SCS Consulting Group Ltd.

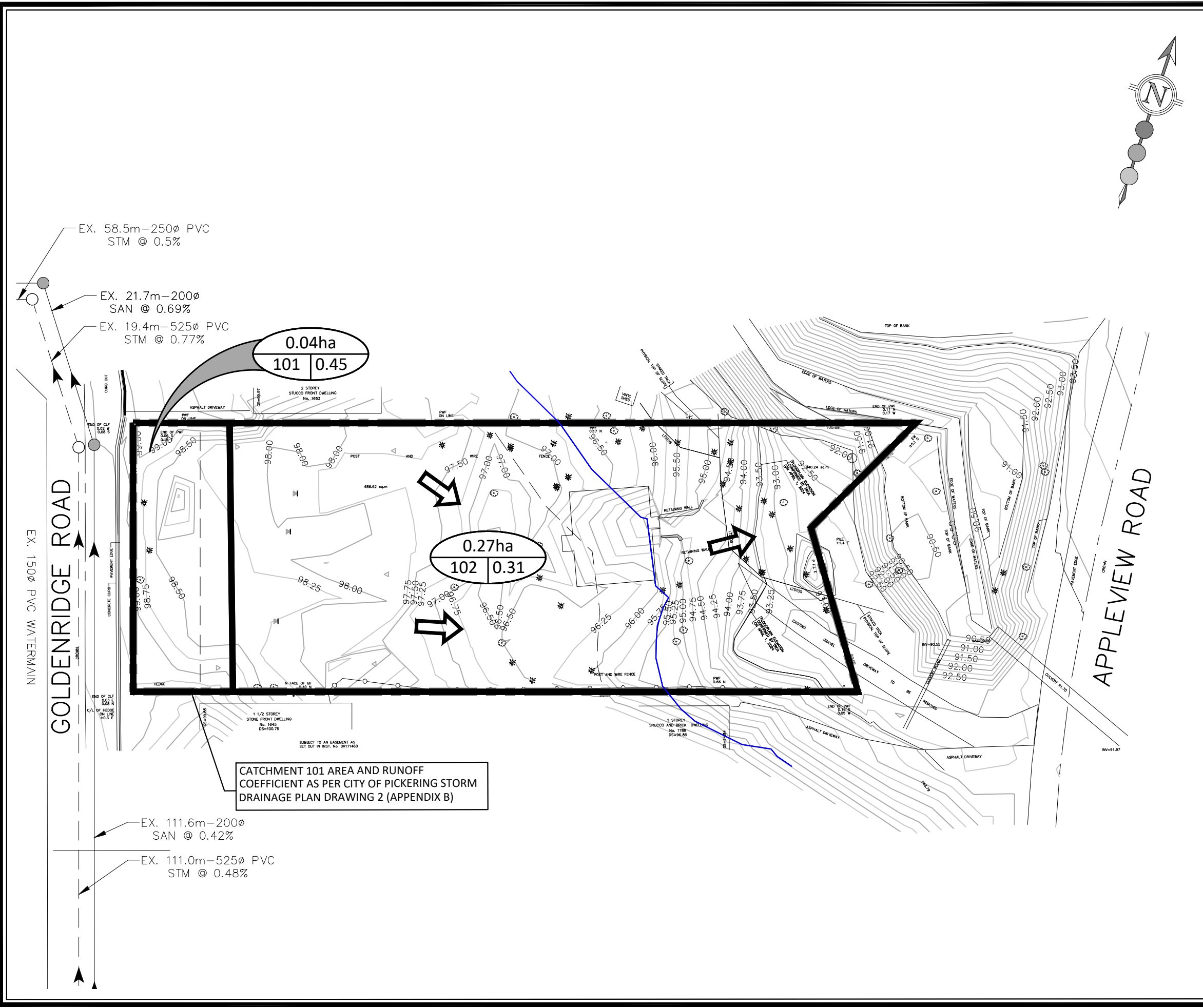


Alessia DeRose
aderose@scsconsultinggroup.com



Michael Ventresca, P.Eng.
mventresca@scsconsultinggroup.com

P:\2861 1794 Applevue Road, Pickering\Design\Reports\SWM\2861 - SWM Brief - 1794 Applevue Road.docx



LEGEND:

LIMIT OF PROPERTY

STORM DRAINAGE BOUNDARY

TRCA APPROVED FLOODLINE AND 10.0m OFFSET FROM LONG TERM STABLE TOP OF SLOPE

EXISTING CONTOUR AND ELEVATIONS

0.04ha
101 | 0.45

DRAINAGE AREA (HECTARES)

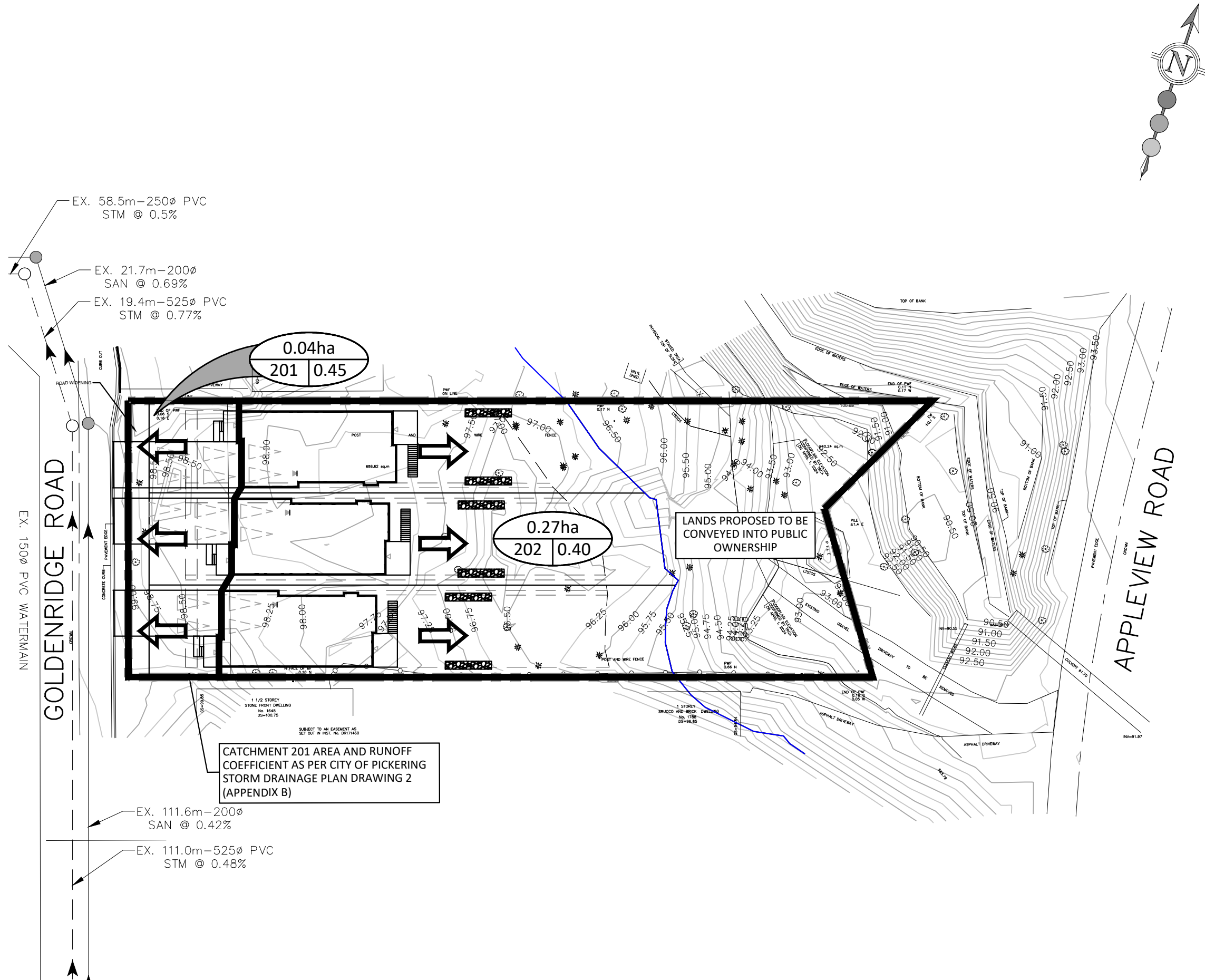
RUNOFF COEFFICIENT

CATCHMENT ID

MAJOR SYSTEM - OVERLAND FLOW

SCS consulting group ltd

30 CENTURIAN DRIVE, SUITE 100
MARKHAM, ONTARIO L3R 8B8
TEL: (905) 475-1900
FAX: (905) 475-8335



LEGEND:

- LIMIT OF PROPERTY
- STORM DRAINAGE BOUNDARY
- TRCA APPROVED FLOODLINE AND 10.0m OFFSET FROM LONG TERM STABLE TOP OF SLOPE
- EXISTING CONTOUR AND ELEVATIONS
- DRAINAGE AREA (HECTARES)
RUNOFF COEFFICIENT
CATCHMENT ID
- MAJOR SYSTEM - OVERLAND FLOW
- PROPOSED INFILTRATION TRENCH



30 CENTURIAN DRIVE, SUITE 100
MARKHAM, ONTARIO L3R 8B8
TEL: (905) 475-1900
FAX: (905) 475-8335

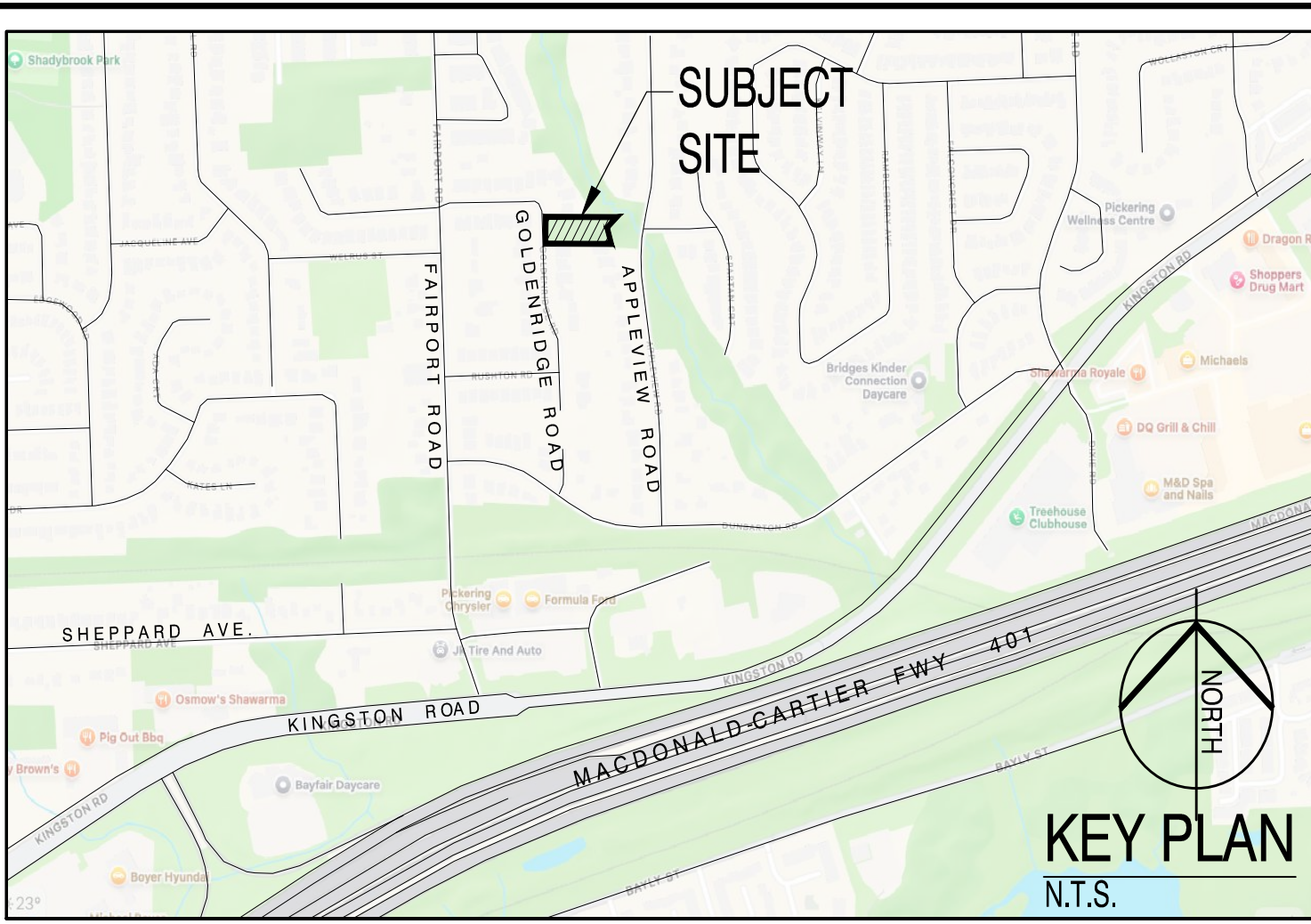
1794 APPLEVIEW ROAD

PROPOSED STORM
DRAINAGE PLAN

DESIGNED BY:	A.D.	CHECKED BY:	M.G.V.
SCALE:	1:500	DATE:	NOVEMBER 2025
PROJECT No:	2861	FIGURE No:	4.1

APPENDIX A

SITE PLAN AND SURVEY



OVERALL SITE STATISTICS									
ROAD WIDENING					90.10				
TRCA BUFFER AREA					940.24				
NET LOT AREA (MINUS ROAD WIDENING & TRCA BUFFER AREA)					2153.66				
TOTAL AREA :					3184.00m2				
RESIDENTIAL ZONE:					BASED ON "R1D ZONE"				
TOTAL UNITS					3 SINGLE DETACHED				
LOT No.	MODEL TYPE	LOT AREA (m²)	LOT FRONTAGE (m)	BUILDING HEIGHT (m) 12.0m MAX.	UNIT G.F.A. (m²)	COVERAGE W/ PORCH (m²) 38% MAX.	COVERAGE PERCENTAGE %	LANDSCAPE AREA (m²)	LANDSCAPE PERCENTAGE %
1	MODEL A EL-1	656.58	11.56	12.00	312.25	188.78	28.75	398.93	60.76
2	MODEL A EL-2	743.93	11.56	12.00	312.25	188.78	25.38	491.15	66.02
3	MODEL A EL-3	753.15	11.55	12.00	312.25	188.78	25.07	509.93	67.71
TOTAL:		2153.66 m2	34.67 m	6.00 m	936.75 m2	566.34 m2	13.2 m2	1400.01 m2	32.4 m2
PARKING						PROVIDED		REQUIRED	
3 LOTS WITH 2 SPACES IN GARAGE AND 4 SPACES IN DRIVEWAY						16 SPACES		6 SPACES	
TOTAL						16 SPACES		6 SPACES	
NOTE:									

PART 1
PLAN OF LOT 57
REGISTRAR'S COMPILED PLAN 1051
GEOGRAPHIC TOWN OF PICKERING
CITY OF PICKERING
REGIONAL MUNICIPALITY OF DURHAM

SCALE 1 : 250

METRES

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CITY OF PICKERING BENCHMARK NO. 1-087 HAVING AN ORTHOMETRIC ELEVATION OF 292.913 METRES. ELEVATIONS ARE REFERRED TO THE CANADIAN VERTICAL DATUM OF 1928, PRE-1978 ADJUSTMENT (CGVD-1928-1978ADJ).

BENCHMARK SET VERTICALLY IN A CHANCE ANCHOR, LOCATED 7.5 METRES WEST OF THE CENTRELINE OF APPLEVIEW ROAD AND 350 METRES NORTH OF DUNBARTON ROAD. CAP IS LOCATED 0.20 METRES BELOW GRADE.

NOTES:

LEGAL SURVEY INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A PLAN PREPARED BY R-PE SURVEYING LTD. WWW.R-PE.CA
643 CHRISLEA ROAD, SUITE 7, WOODBRIDGE, ONTARIO, L4L 8A3
TEL: (416) 635-5000 FAX: (416) 635-5001
TEL: (905) 264-0881 FAX: (905) 264-2099
DATED: MAY 16, 2024 WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED. THE FINAL REGISTERED PLAN OF SUBDIVISION SHALL BE REFERRED TO FOR CONFIRMATION OF THE DATA.

LEGEND	
---	STORM CONNECTION
---	SANITARY CONNECTION
---	WATER CONNECTION
---	HYDRO CONNECTION
□	DOUBLE CATCH BASIN
□	CATCH BASIN
●	STREET LIGHT
●	HYDRANT
⊠	TRANSFORMER
⊠	CABLE TV PEDESTAL
⊠	BELL PEDESTAL
⊠	ENTRANCE DOOR LOCATION
⊠	GARAGE DOOR LOCATION
⊠	COMMUNITY MAILBOX
⊠	ENGINEERED FILL LOT
⊠	VALVE AND CHAMBER
⊠	SANITARY MANHOLE
⊠	STORM MANHOLE
⊠	AIR-CONDITIONING UNIT
⊠	PROPOSED GRADE
⊠	EXISTING GRADE
⊠	PROPOSED SWALE GRADE
⊠	ESTABLISHED GRADE
⊠	DOWNSPOUT LOCATION
⊠	SUMP PUMP
⊠	PROPOSED BERM
⊠	SWALE DIRECTION
⊠	HYDRO METER
⊠	GAS METER
⊠	MUNICIPAL ADDRESS
⊠	FINISHED FLOOR ELEVATION
⊠	TOP OF FOUNDATION WALL
⊠	FIN. BASEMENT FLOOR SLAB
⊠	UNDERGRADE FOOTING ELEVATION
⊠	TPZ FENCE
⊠	PROPERTY BOUNDARY
⊠	PRECAST CONCRETE UNIT PAVERS
⊠	PRECAST CONCRETE PATIO SLABS
⊠	CHAINLINK FENCE
⊠	WOOD PRIVACY FENCE / SCREEN
⊠	SNOW STORAGE AREA

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

18		
17		
16		
15		
14		
13		
12		
11		
10		
9		
8		
7		
6		
5		
4		
3	SEPT. 17, 2025	ISSUED TO CLIENT FOR REVIEW.
2	AUG. 11, 2025	ISSUED TO CLIENT FOR REVIEW.
1	JULY 28, 2025	ISSUED TO CLIENT FOR REVIEW.
No. DATE:		WORK DESCRIPTION:

jardin
DESIGN GROUP INC
64 JARDIN DR. SUITE 3A
VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
EMAIL: info@jardindesign.ca

CONTEXT SITE PLAN (COLOUR)		
1794 APPLEVIEW ROAD (PICKERING)		
TYPE	SP	
SCALE:	1:250	
PROJ. No.	25-	No. A-01

**SURVEYOR'S REAL PROPERTY REPORT
AND TOPOGRAPHY**

**PART 1
PLAN OF LOT 57
REGISTRAR'S COMPILED PLAN 1051
GEOGRAPHIC TOWN OF PICKERING
CITY OF PICKERING
REGIONAL MUNICIPALITY OF DURHAM**

SCALE 1:200

10m 5m 0 10m 20metres

R-PE SURVEYING LTD., O.L.S.

METRIC

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

NOTES

- DENOTES MONUMENT FOUND
- DENOTES MONUMENT SET
- SIB DENOTES STANDARD IRON BAR
- IB DENOTES IRON BAR
- P.I.N. DENOTES PROPERTY IDENTIFIER NUMBER
- PL1 DENOTES PLAN OF SURVEY
- BY ISW SURVEYORS LTD., O.L.S. DATED MARCH 28, 2023
- PL2 DENOTES PLAN 40R-21831
- PL3 DENOTES PLAN 40R-9570
- PL4 DENOTES PLAN 40R-21830
- PL5 DENOTES PLAN 40M-2155
- DS DENOTES DOOR SILL ELEVATION
- GS DENOTES GARAGE SILL ELEVATION
- CLF DENOTES CHAIN LINK FENCE
- BF DENOTES BOARD FENCE
- PWF DENOTES POST AND WIRE FENCE
- EW DENOTES EDGE OF WATER
- S DENOTES STEPS
- N/S/E/W DENOTES NORTH/SOUTH/EAST/WEST
- DENOTES DECIDUOUS TREE
- ★ DENOTES CONIFEROUS TREE
- INV DENOTES INVERT ELEVATION
- WV DENOTES WATER VALVE
- CB DENOTES CATCH BASIN
- MHST DENOTES MANHOLE STORM
- MHSA DENOTES MANHOLE SANITARY
- MH DENOTES MANHOLE
- C/L DENOTES CENTRELINE
- (JOB) DENOTES J. D. BARNES LIMITED, O.L.S.
- (1056) DENOTES I. B. WALLACE, O.L.S.
- (729) DENOTES D. H. BLACK, O.L.S.
- SOP DENOTES SPECIFIED CONTROL POINT
- LTSTOS DENOTES LONG TERM STABLE TOP OF SLOPE
- ALL TIES TAKEN TO CONCRETE FOUNDATION.

INTEGRATION NOTE

BEARINGS ARE GRID, UTM ZONE 17, NAD83 (CSRS:CBN6:2010.0), DERIVED FROM:

POINT ID	NORTHING	EASTING
SCP 00820188081	4854258.020	652750.814
SCP 00820188082	4853730.482	651967.837

COORDINATES ARE UTM ZONE 17, NAD83 (CSRS:CBN6:2010.0), TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999670.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CITY OF PICKERING BENCHMARK No. 1-087 HAVING AN ORTHOMETRIC ELEVATION OF 292.813 METRES. ELEVATIONS ARE REFERRED TO THE CANADIAN VERTICAL DATUM OF 1928, PRE-1978 ADJUSTMENT (CGVD-1928:1978ADJ).

BENCHMARK SET VERTICALLY IN A CHANCE ANCHOR. LOCATED 7.5 METRES WEST OF THE CENTRELINE OF APPLEVIEW ROAD AND 350 METRES NORTH OF DUNBARTON ROAD. CAP IS LOCATED 0.20 METRES BELOW GRADE.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
- THE SURVEY WAS COMPLETED ON THE 16 DAY OF MAY, 2024

DATE _____, 2024

I. A. ABRAHAM
ONTARIO LAND SURVEYOR

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

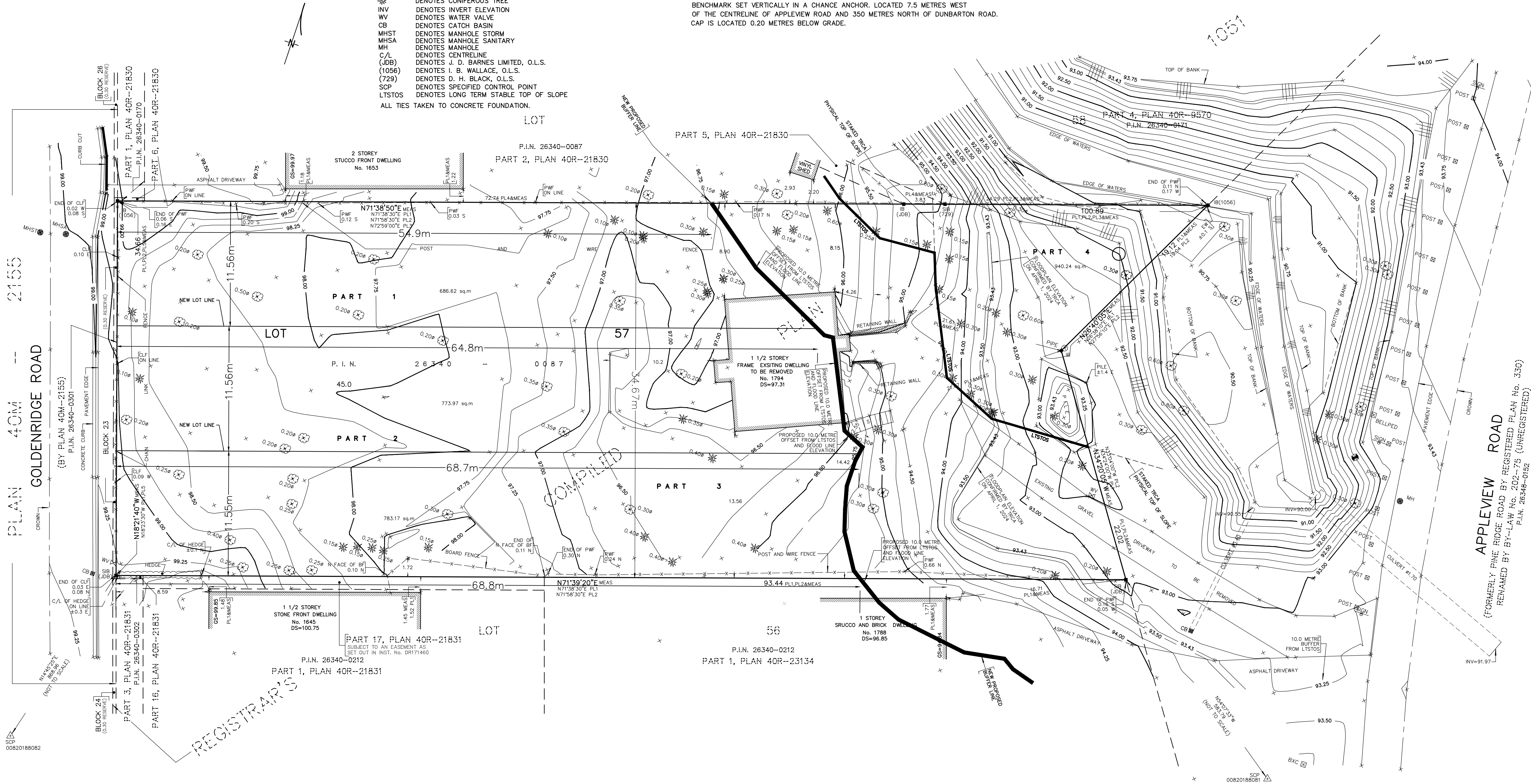
PART 2 (SURVEY REPORT)

REGISTERED EASEMENTS AND/OR RIGHT-OF-WAYS: LOT 36 IS SUBJECT TO AN EASEMENT FOR ENTRY AS SET OUT IN INST. No. H840784.

ADDITIONAL COMMENTS:

- NOTE THE LOCATIONS OF THE FENCES ALONG THE NORTH, SOUTH AND WEST LIMITS OF THE SUBJECT PROPERTY.
- NOTE THE LOCATION OF THE EDGE OF WATER ALONG A PORTION OF THE NORTH/EAST CORNER OF THE SUBJECT PROPERTY.

THIS PLAN DOES NOT CERTIFY COMPLIANCE WITH ZONING BY-LAWS.



THIS REPORT WAS PREPARED FOR
ALMONT HOMES
AND THE UNDERSIGNED ACCEPTS NO
RESPONSIBILITY FOR USE BY OTHER PARTIES.

© R-PE SURVEYING LTD., O.L.S. 2024.

rpe R-PE SURVEYING LTD.
ONTARIO LAND SURVEYORS
643 Christie Road, Suite 7, Woodbridge, Ontario, L4L 8A3
Tel. (416) 335-5000 Fax (416) 335-5001
Tel. (905) 264-0881 Fax (905) 264-2099
Website: www.r-pe.ca
DRAWN: V.K.
CAD FILE No. 24-133-SRPR+T-CONTOUR-E

CHECKED: I.A.A.
JOB No. 24-133

Jul 04, 2025 -- 14:29:20

APPENDIX B

BACKGROUND INFORMATION

July 25, 2025

CFN: 70383.04
Ex. Ref: 68381.15

BY E-MAIL ONLY (leo@almonthomes.ca)

Leo Perciasepe
Apcom Enterprises Inc.
15 Yorkton Boulevard
Markham, ON, L6C 0J9

Dear Leo Perciasepe,

Re: Concept Development Application – Submission 3
1794 Appleview Road
Lot 57, Plan 1051, Pickering
North of Dunbarton Road & West of Appleview Road
Applicant: Ashley Yearwood, Planning Peace of Mind Services Inc.
Owner: Leo Perciasepe, Apcom Enterprises Inc.

Toronto and Region Conservation Authority (TRCA) staff provide the following comments in response to the third submission of the referenced Concept Development Application. The list of materials reviewed by TRCA staff has been included in Appendix A.

Recommendation

Based on the review of revised plans, TRCA staff have no concerns with respect to the proposed development proceeding to the required Planning Act Applications at this time. Detailed comments are included in Appendix B of this letter. Please note some comments are deferred to the consent or permit review stage of the proposed development.

Should you have any questions or comments, please contact the undersigned.

Regards,

Terina Tam
Senior Planner
Development Planning and Permits | Development and Engineering Services
437-880-2421
terina.tam@trca.ca

TT/tt

cc: Ashley Yearwood, Planning Peace of Mind Services Inc.: ayearwood81@gmail.com

Liam Crawford, City of Pickering: lcrawford@pickering.ca

Appendix A: Materials Reviewed by TRCA

The following materials were received by TRCA:

- TRCA Comment Matrix, prepared by applicant, dated May 23, 2025, received by TRCA on May 23, 2025;
- Surveyor's Real Property Report and Topography, prepared by r-pe Surveying Ltd., dated July 4, 2025, received by TRCA on July 4, 2025;
- Slope Stability Assessment, prepared by Soil Engineers Ltd, dated June 11, 2025, received by TRCA on June 11, 2025.

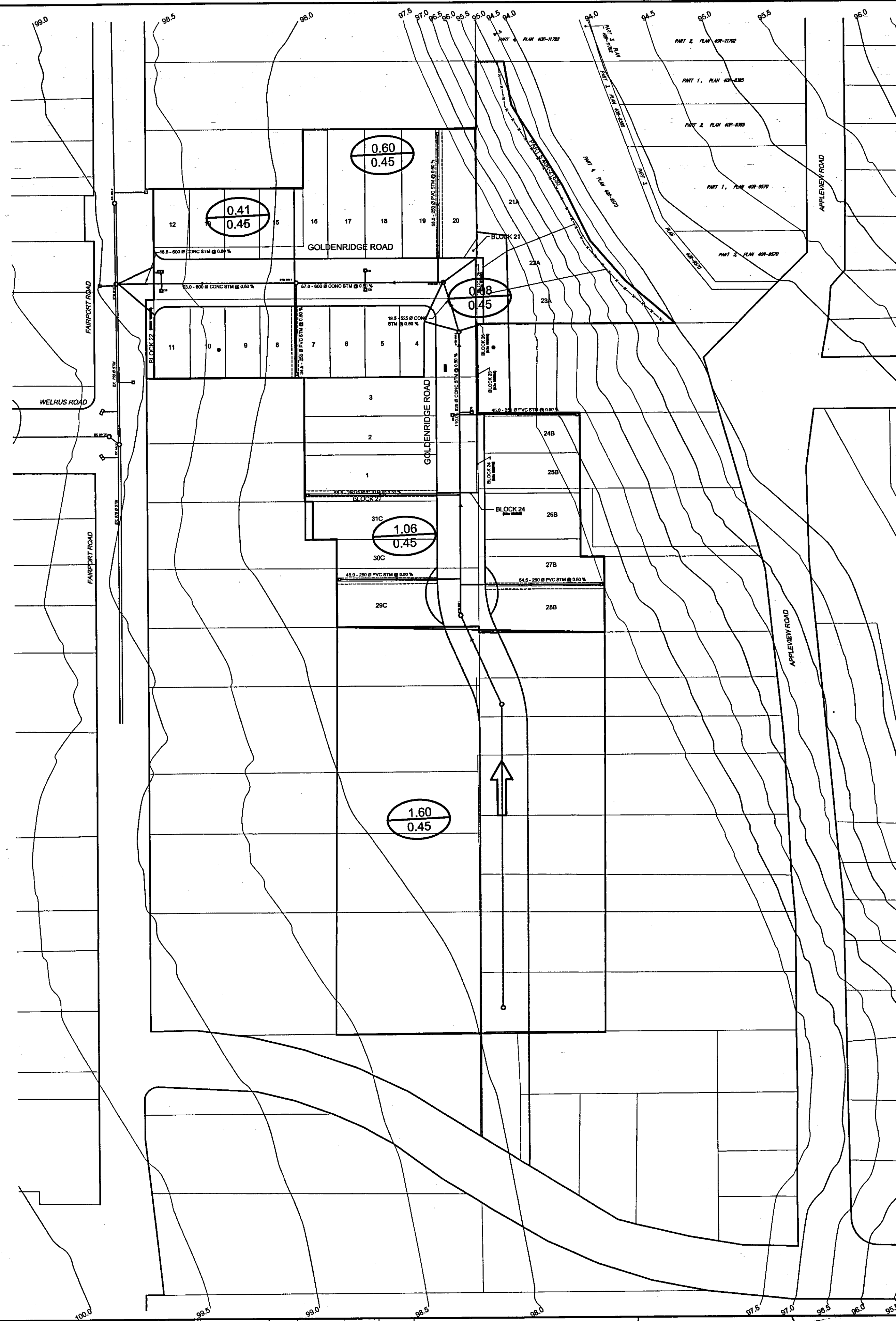
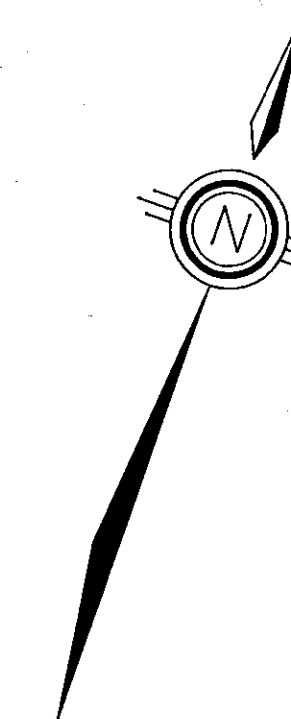
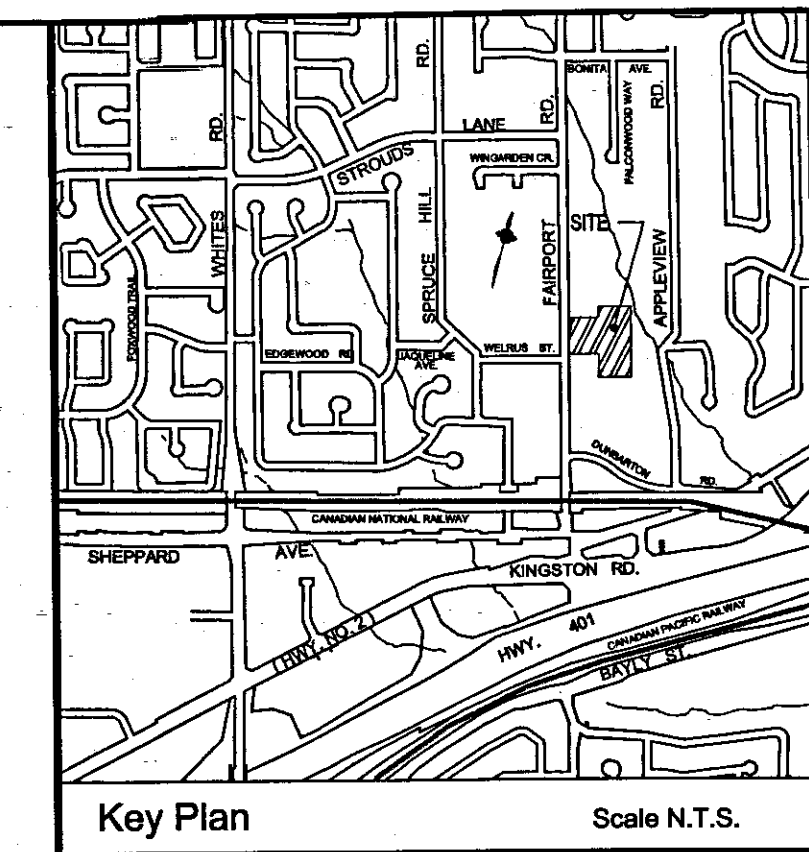
Appendix B: Detailed Comments

The following comments are based on a review of the materials noted in Appendix ‘A’ and pertain to regulations under the Conservation Authorities Act and TRCA’s Mandatory Programs and Services:

#	Description	TRCA Comment Submission #1	TRCA Comment Submission #2	Applicant Response Submission #2	TRCA Comment Submission #3
1	Long-Term Stable Top of Slope (LTSTOS)	<p>Please submit a stamped geotechnical report. The scope of work for the geotechnical study is as follows:</p> <ul style="list-style-type: none">a. A topographical survey is required to illustrate the slope features including existing top of slope, contours of the slope, toe of the slope, watercourse, etc.;b. Boreholes should be drilled to determine the native soil stratigraphy;c. In-situ and lab tests should be carried out, to identify the soil stratigraphy encountered throughout the entire slope, and to determine the soil strength parameters required for slope stability analysis;d. Piezometers should be installed in select boreholes to measure groundwater levels;e. The location of the long-term stable top of slope should be determined as follows:<ul style="list-style-type: none">- A sufficient number of cross-sections based on the topography (e.g. slope height and inclination) and slope features that represent the critical slope conditions should be analyzed;- Long-term stable slope allowances (setbacks) should be determined and correctly incorporated into each cross-section to delineate the long-term stable top of slope for each cross-section. The minimum acceptable safety factor is 1.50;- The Bishop, Spencer or Morgenstern-Price methods can be used for the slope stability analysis. The slope stability analysis should be performed by using either SLIDE or SLOPE/W;- Any stabilization effects of existing retaining structures on slopes should be ignored when delineating the long-term stable top of slope;f. The cross-sections, methodology, parameters, and test results should be presented in the report. The long-term stable top of slope should be shown on the site plan.	<p>Based on our review of Soil Engineer’s slope stability report, it is understood that the slope was analyzed along 3 cross-sections (namely cross-sections A-A, B-B and C-C).</p> <p>Cross sections A-A and B-B represent the northern portion of the slope whereas cross-section C-C captures the southern portion of the slope. Please note that the slope conditions of the northern portion differ greatly to that of the southern portion. The southern slope is a tiered slope. The northern portion of the slope, on the other hand, is not tiered.</p> <p>Please note that the LTSTOS line for cross-sections A-A and B-B is accurate; however, the LTSTOS for cross-section C-C is not accurate. It appears that Soil Engineers assessed the lower portion of the tiered slope for cross-section C-C. Therefore, the LTSTOS delineated for that cross-section is the stable top of bank of the lower slope and not the overall slope. The upper slope was not analyzed.</p> <p>Please reanalyze cross-section C-C and ensure the upper slope is assessed accordingly. Please revise the geotechnical report and update the LTSTOS and corresponding buffer on all applicable plans. Note, the LTSTOS should not be below the TRCA staked top of bank.</p>	<p>Cross-Section C-C was updated to include the lower and upper-tier slope and the location of the TRCA boundary.</p> <p>The resulting FOS of each slope section is above 1.5.</p> <p>The LTSTOS near Cross-section C-C was also revised accordingly and presented on Drawing No.1. of the revised Slope Stability Assessment, prepared by Soil Engineers Ltd. dated April 25, 2025</p>	Comment Addressed.

2	Feature Delineation	Please provide an updated topographic survey showing all natural feature limits detailed in the Background section of the letter. The limits staked by TRCA on September 18, 2023, should be revised from “TRCA Boundary” to the following: “ <u>Top of Slope Staked by TRCA on September 18, 2023</u> ” and “ <u>Dripline Staked by TRCA on September 18, 2023</u> ”. The TRCA Boundary line which is closer to the creek is the top of slope. Please also include the LTSTOS (as per geotechnical report) and the regulatory floodplain elevation (to be provided by TRCA staff at a later date).	<p>The TRCA’s staked top of bank is not shown on any of the plans. The top of bank should be clearly depicted and labelled on all applicable plans. Please revise the plans accordingly.</p> <p>TRCA staff note that dripline staking and EIS have been deferred to the municipality as a result of legislative changes.</p>	<p>The updated topographical survey illustrates the TRCA physical staked top of bank feature.</p> <p>GeoProcess (our Ecology firm) is preparing a terms of reference in consultation with the TRCA and the City of Pickering to review a Scoped Environmental Impact Study (EIS). The EIS will also consist of dripline staking, which will be peer reviewed by the City of Pickering.</p>	Comment Addressed.
3	Lot Configuration	TRCA policies do not support the creation of new lots within the Natural System, identified as being a 10-meter buffer from the greater of the long-term stable top of slope/bank, stable toe of slope, regulatory floodplain, meander belt, and any contiguous natural features or areas (dripline). Please delineate the 10-meter setback line from furthest inland natural feature and revise the proposed lot configuration accordingly to ensure the regulated feature and buffers are maintained on one lot.	<p>The regulated features and buffers should be maintained on one lot (Part 4). Please revise the lot configuration accordingly.</p> <p>TRCA staff note that the proposal shows Part 3 as a retained residential lot. Please note there is no access to Part 3 from a public road. The Natural System (features + buffers) will need to be conveyed into public ownership. Please revise the lot configuration to ensure all residential lots have access from a public road.</p>	<p>The updated conceptual plan illustrates that all residential lots are reconfigured to only accommodate frontages off Goldenridge Road. The remnant parcel off Appleview Road will have to be rezoned for Open Space Hazard Lands purposes with the City of Pickering and will be conveyed into public ownership.</p> <p>If feasible, following the findings of the dripline assessment, we would like to explore opportunities with TRCA and City of Pickering staff to straighten the rear lot lines of the Goldenridge parcels.</p>	Comment Addressed.
4	Conveyance	It is the policy of TRCA that development not be permitted within the Natural System and that it be conveyed into public ownership for long-term preservation.	It is understood that Part 4 is intended to be conveyed into public ownership. However, the current proposal only shows Part 4 as the regulated features, but do not include the associated 10-meter buffer. Please note the buffers are also part of the Natural System and should be conveyed and included in Part 4. Please also clearly label Part 4 on the plans as “Part 4 - Convey to Public Ownership”.	<p>Based on the results of the floodplain elevation and LTSTOS plus a 10-metre buffer inland from these features, TRCA has advised that safe access cannot be secured in accordance with their development policies.</p> <p>As such, the retained and severed lots will only accommodate frontages off Goldenridge Road, whereas lands on the subject property 10 metres from the LTSTOS and floodplain elevation will be conveyed into public ownership as a condition of consent with the City of Pickering.</p> <p>The conveyed lands will also include the Appleview Road frontage.</p>	<p>Comment Addressed.</p> <p>Please ensure the lands to be conveyed into public ownership are clearly labelled and delineated for the corresponding Planning Act Application.</p>

5	Restoration Plan	TRCA will require all existing structures, including the dwelling, retaining walls and stairs, within the Natural System be removed to facilitate the proposed severance and the future conveyance. Please submit a <u>Restoration Plan</u> showing how all disturbed areas will be stabilized and restored following the removals. Please include dense plantings of native trees/shrubs and an appropriate seed mix within the buffer to the feature. See CVC's Plant Selection Guide and TRCA's Seed Mix Guideline .	Comment not addressed.	<p>Due to the technical nature of this request, we are requesting to defer this requirement as a condition to future consent applications with the City of Pickering or to the TRCA permit stage.</p> <p>After discussing with Ms. Megan Cranfield on May 12, 2025, this request may be considered.</p>	Comment deferred to consent stage.
6	Erosion and Sediment Control Plan	At the permit stage for any development within the TRCA regulated area, please submit an <u>Erosion and Sediment Control Plan</u> fully isolating the works from the regulated feature (see TRCA's ESC Guideline). Please ensure appropriate details are included (e.g., non-woven silt fence, silt soxx, tree hoarding fencing, etc.), along with all applicable TRCA Standard Notes . Please also ensure that no staging or stockpiling is proposed within TRCA's regulated area.	Comment deferred to permit stage.	<p>Noted and thank you.</p> <p>Due to the technical nature of this request, this requirement can be addressed as a condition to a future consent application with the City of Pickering or to the TRCA permit stage.</p>	Comment deferred to permit stage.
7	Regulated Feature Assessment		Please provide an assessment of potential impacts to TRCA regulated features.	<p>It is our understanding that the revised conceptual residential lot layout will not require a regulated feature assessment. Based on the results of the floodplain elevation and long term stable top of slope (LTSTOS) plus the 10-metre buffer inland from these features, safe vehicular access cannot be granted off Appleview Road.</p> <p>This development has been amended to permit three residential lots for detached dwellings off Goldenridge Road. The proposed lots will maintain a 10-metre buffer from the most restrictive of either the LTSTOS, the floodplain elevation and the dripline in consultation with the City of Pickering.</p>	<p>Comment Addressed.</p> <p>All proposed residential lots have been revised to be located entirely outside of the regulated features/hazards and required TRCA buffers. As such, TRCA Ecology staff can confirm that a regulated feature assessment is no longer required.</p>



LEGEND:

1.50 - AREA IN HECTARES (ha)
0.45 - RUN-OFF COEFFICIENT

— DRAINAGE BOUNDARY



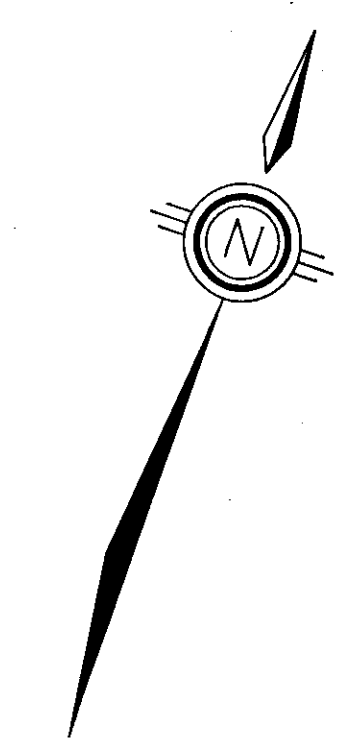
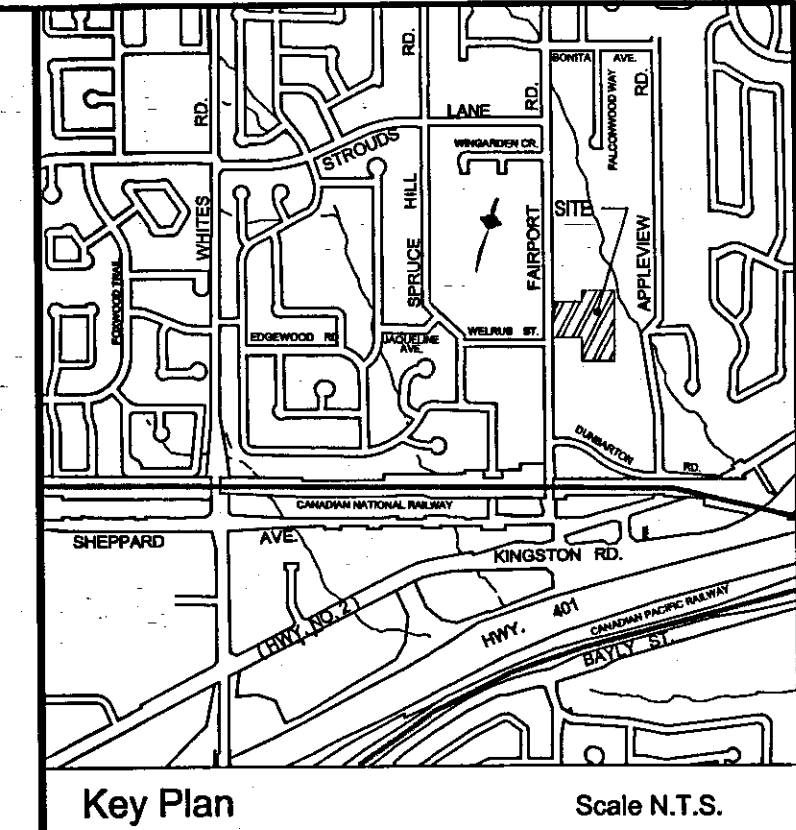
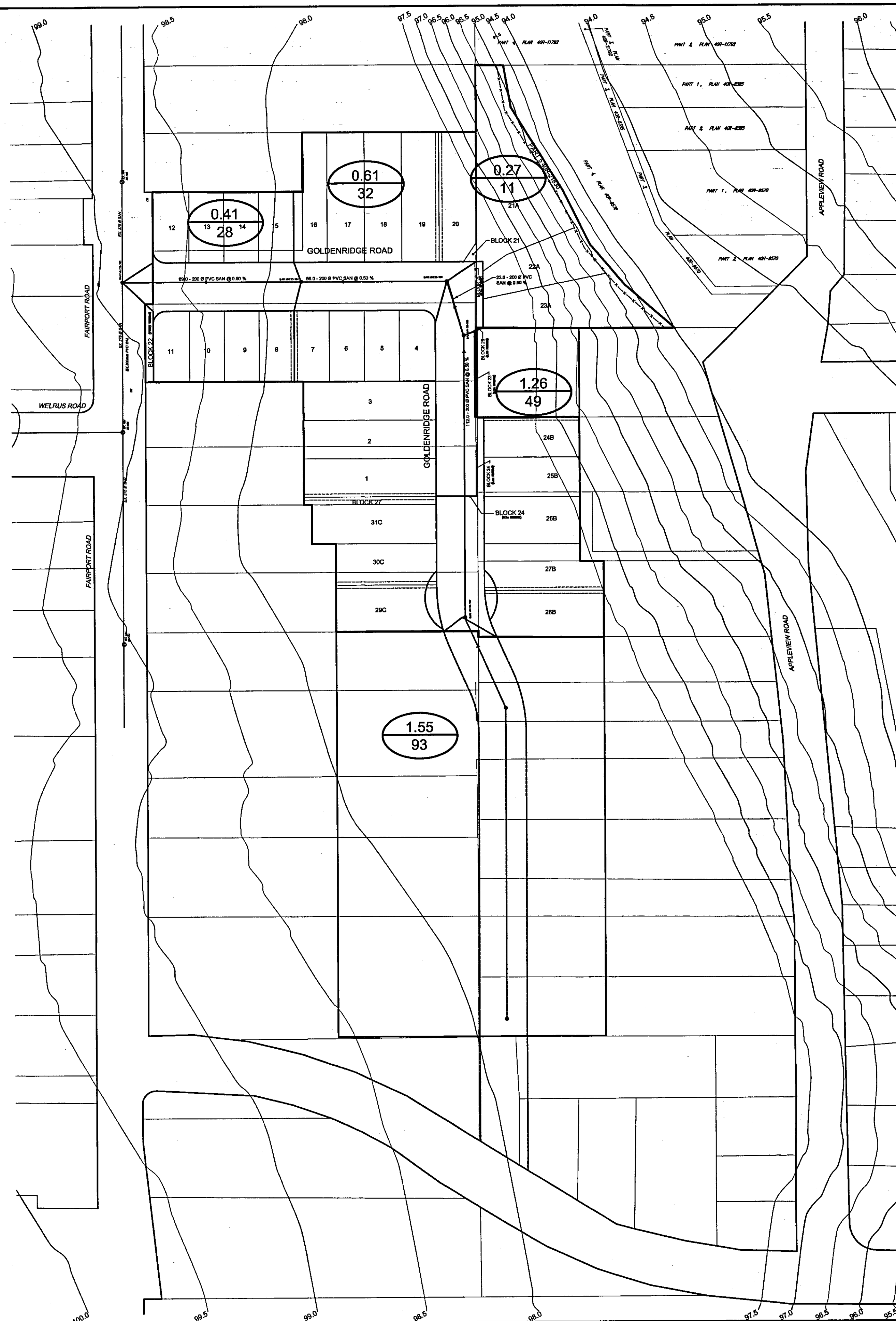
NO.	DATE	BY	APPD	REVISIONS
3	APR. 8/03			FINAL SUBMISSION / ISSUED FOR CONSTRUCTION
2	MAR. 12/03			2nd SUBMISSION
1	JAN. 30/03			1st SUBMISSION

APPROVED BY
CITY OF PICKERING
DATE APRIL 11 2003
APPROVAL TO WORKS REQUIRED BY THE CITY OF PICKERING
AND AS DEFINED IN THE SUBDIVISION AGREEMENT.
APPROVED BY
REGION OF DURHAM
DATE

CITY OF PICKERING
REGION OF DURHAM
Project **fairport**
DRAFT PLAN S-P-2002-1 R.P. 404
Description **STORM DRAINAGE PLAN**

Client **MARSHALL HOMES CORPORATION**
Design ICM
Checked ICM
Date JANUARY 2003
Scale HOR. 1:1000
Project No. **03-001**
Dwg. No. **2**

ICM ENGINEERING LTD.
CONSULTING ENGINEERS
Tel: (905) 500-6278 Fax: (905) 500-3615



LEGEND:

0.18
7

- AREA IN HECTARES (ha)
- POPULATION (3.5 PERSONS/UNIT)

— - DRAINAGE BOUNDARY

1.00 Ha
2.50 L/s

- AREA IN HECTARES (ha)
- SEWAGE FLOW CALCULATION BASED ON FOLLOWING:
RESIDENTIAL = 60 PERSONS/HECTARE
COMM./INDUST. = 180m³/DAY
INSTITUTIONAL = 112m³/DAY



NO.	DATE	BY	APPD	REVISIONS
3	APR. 8/03			FINAL SUBMISSION / ISSUED FOR CONSTRUCTION
2	MAR. 11/03			2nd SUBMISSION
1	JAN. 30/03			1st SUBMISSION

APPROVED BY
CITY OF PICKERING

DATE

APPROVAL TO WORKS REQUIRED BY THE CITY OF PICKERING
AND AS DEFINED IN THE SUBDIVISION AGREEMENT.

APPROVED BY
REGION OF DURHAM

DATE 03 04 11

CITY OF PICKERING
REGION OF DURHAM

fairport

DRAFT PLAN S-P-2002-1 R.P. 436

Sanitary Drainage
PLAN

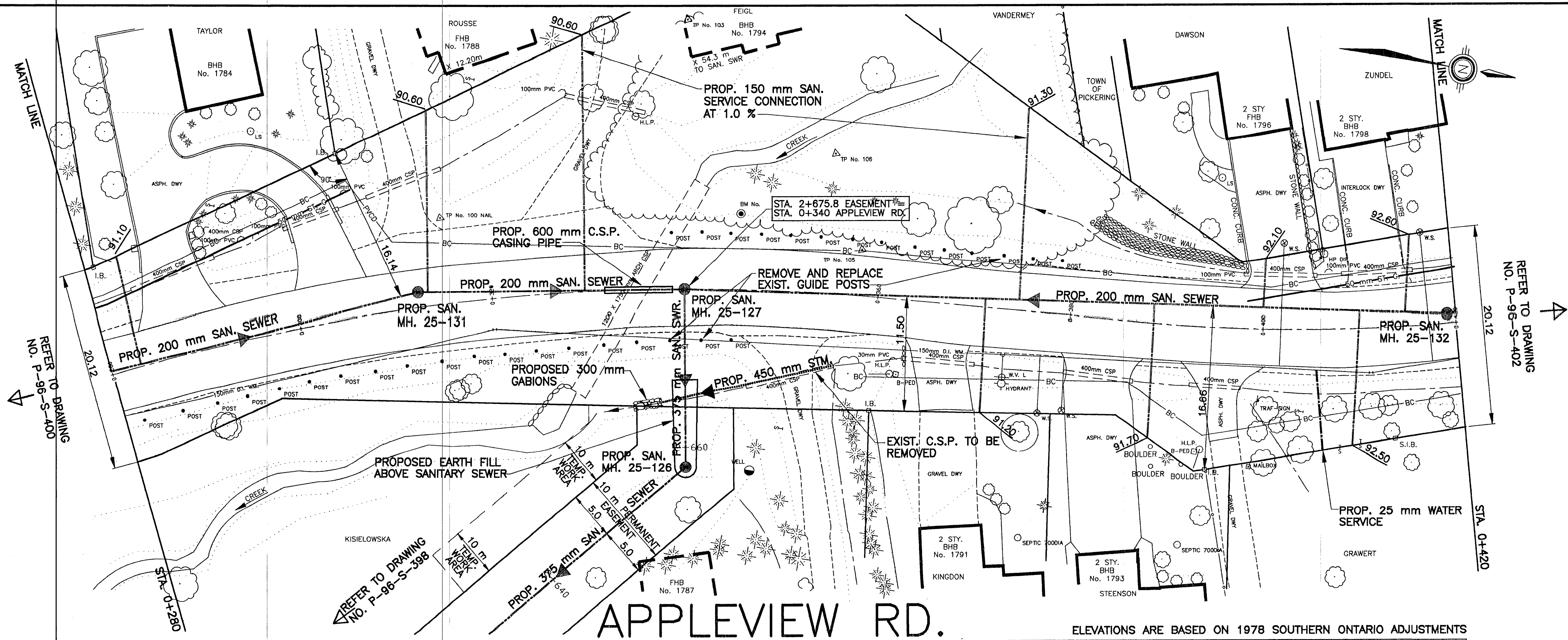
Client
MARSHALL HOMES
MARSHALL HOMES CORPORATION

ICM ENGINEERING LTD.
CONSULTING ENGINEERS
Tel. (905) 508-8278 Fax (905) 508-3615

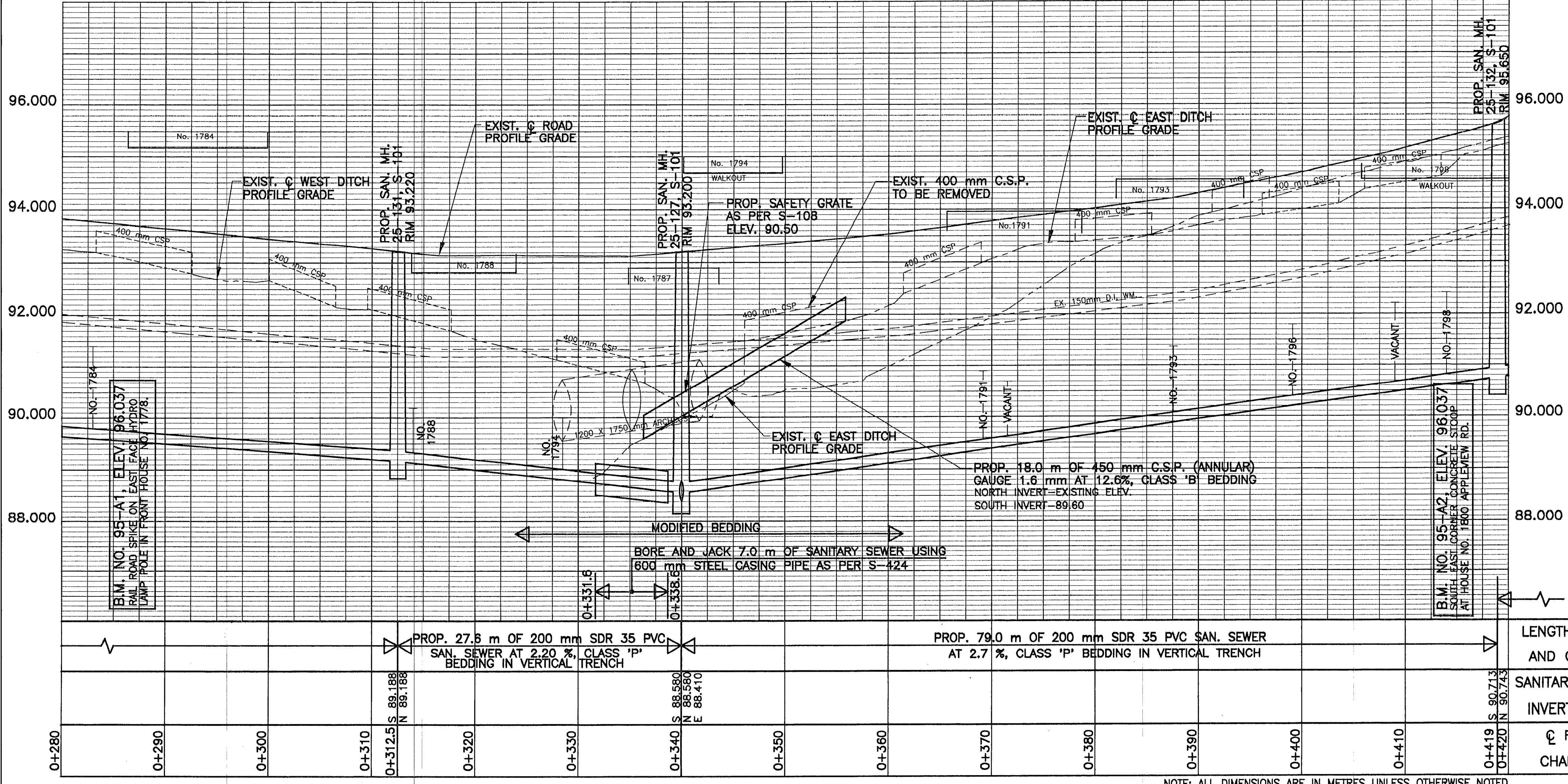
Drawn: CAD
Design: ICM
Checked: ICM
Date: JANUARY 2003
Scale: HOR. 1:1000

Project No.
03-001

Dwg. No.
3



- NOTES:
1. FOR SANITARY SEWER CONSTRUCTION NOTES REFER TO DRAWING NO. P-96-S-394.
 2. FOR WATER SERVICE CONSTRUCTION NOTES REFER TO DRAWING NO. P-96-S-400.



NO.	DATE	NAME	REVISIONS

UTILITIES VERIFIED

CABLE T.V.	1996 11 XX	HYDRO	1996 09 20
BELL CANADA	1996 09 27	TOWN OF PICKERING	1996 11 XX
CONSUMERS GAS	1996 10 29		

CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G & OVERHEAD UTILITIES. VARIOUS UTILITIES CONCERNED TO BE GIVEN REQUIRED ADVANCE NOTICE PRIOR TO ANY DIGGING, FOR STAKE OUT. THE REGION ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES AS INDICATED ON THIS DRAWING.

SURVEY DATA DATE

1995 12 14

SCALE

HORIZ. 1:250

VERT. 1:50

DRAWN: R. NICHOL / J. CAFARELLI

DESIGN: J. CAFARELLI

CHECKED: T. SCHULIGA

APPROVED: D.P. NUNDY

DATE: 1996 01

DATE: 1995 08

DATE: 1996 10

DATE: 1996 11

THE REGIONAL MUNICIPALITY OF DURHAM

WORKS DEPARTMENT

WHITBY

ONTARIO

APPLEVIEW RD.

FROM 280 m N. OF DUNBARTON RD. TO 420 m N. OF DUNBARTON RD.

CONCESSION

REG. RD. NO.

AREA MUNICIPALITY

PICKERING

DRAWING NUMBER

CONTRACT NUMBER

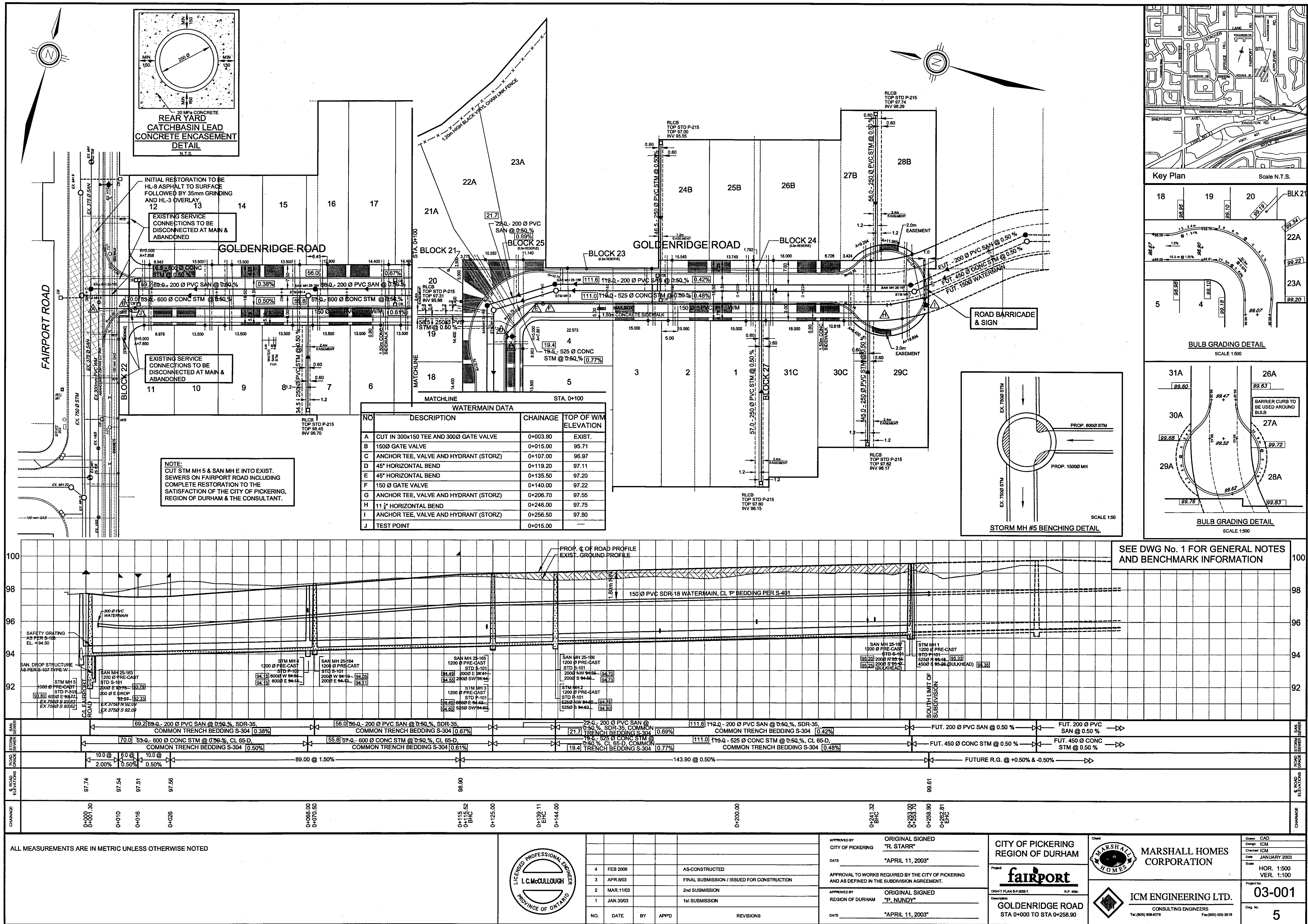
SHEET NUMBER

P-96-S-401

D96-10

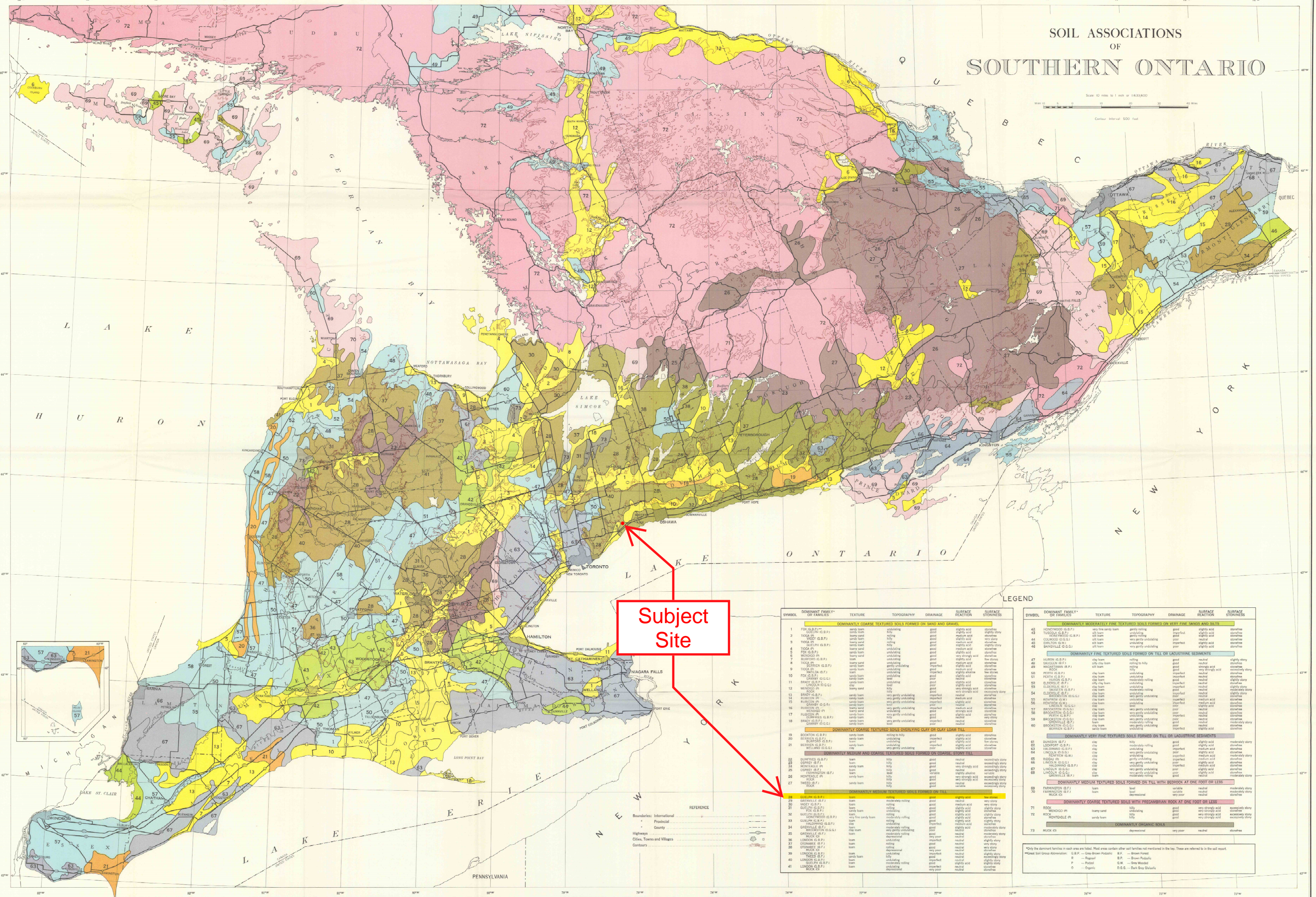
11 OF 13

NOTE: ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.



SOIL ASSOCIATIONS OF SOUTHERN ONTARIO

Scale: 10 miles to 1 inch or 1:633,600
Contour Interval: 500 feet



Subject
Site

SYMBOL	DOMINANT FAMILY* OR FAMILIES	TEXTURE	TOPOGRAPHY	DRAINAGE	SURFACE REACTION	SURFACE STONINESS
1	FOX (G.B.P.)	sandy loam	undulating	good	slightly acid	stonefree
2	TRICA (G.B.P.)	loamy sand	rolling	good	slightly acid	stonefree
3	TRICA (G.B.P.)	sandy loam	hilly	good	slightly acid	stonefree
4	TRICA (G.B.P.)	sandy loam	undulating	good	slightly acid	stonefree
5	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
6	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
7	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
8	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
9	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
10	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
11	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
12	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
13	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
14	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
15	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
16	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
17	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
18	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
19	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
20	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
21	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
22	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
23	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
24	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
25	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
26	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
27	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
28	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
29	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
30	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
31	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
32	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
33	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
34	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
35	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
36	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
37	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
38	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
39	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
40	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree
41	TRICA (G.B.P.)	loamy sand	undulating	good	slightly acid	stonefree

SYMBOL	DOMINANT FAMILY* OR FAMILIES	TEXTURE	TOPOGRAPHY	DRAINAGE	SURFACE REACTION	SURFACE STONINESS
42	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
43	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
44	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
45	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
46	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
47	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
48	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
49	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
50	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
51	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
52	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
53	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
54	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
55	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
56	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
57	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
58	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
59	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
60	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
61	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
62	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
63	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
64	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
65	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
66	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
67	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
68	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
69	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
70	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
71	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
72	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree
73	HONEYWOOD (G.B.P.)	very fine sandy loam	gently rolling	good	slightly acid	stonefree

*Only the dominant families in each area are listed. Most areas contain other soil families not mentioned in the key. These are referred to in the soil report.
*Soil Group Abbreviations: G.B.P. — Grey Brown Podzols; B.P. — Brown Podzols; P — Podzols; D.W. — Dark Wooded; D.G.G. — Dark Grey Shales.

Agencies with fisheries responsibilities may also require habitat compensation where stormwater management design impacts are determined to result in harmful alteration, disruption, or destruction of fish habitat as defined in the *Fisheries Act*. Habitat compensation typically involves the replacing of damaged habitat with newly created habitat or improving the productive capacity of other aquatic habitat at or near the area of impact.

The levels of protection are based on a general relationship between the long-term average suspended solids removal of the end-of-pipe stormwater management facilities and the lethal and chronic effects of suspended solids on aquatic life. The levels of protection correspond to the following 'long-term average suspended solids removals' which refer to the removal by the SWM facility of suspended solids from the site runoff for the entire range of rainfall events on that site for a long period of time, at least 10 years. The use of a long-term average is to account for the variability in characteristics of rainfall events.

- Enhanced protection corresponds to the end-of-pipe storage volumes required for the long-term average removal of 80% of suspended solids.
- Normal protection corresponds to the end-of-pipe storage volumes required for the long-term average removal of 70% of suspended solids.
- Basic protection corresponds to the end-of-pipe storage volumes required for the long-term average removal of 60% of suspended solids.

For SWMPs designed with a by-pass, the calculation of long-term suspended solids removal must be based on both suspended solids removal in the facility plus suspended solids by-passed around the facility.

3.3.2 Water quality sizing criteria

The volumetric water quality criteria are presented in Table 3.2. The values are based on a 24 hour drawdown time and a design which conforms to the guidance provided in this manual. Requirements differ with SWMP type to reflect differences in removal efficiencies. Of the specified storage volume for wet facilities, 40 m³/ha is extended detention, while the remainder represents the permanent pool.

Subject site, impervious level below 35%, interpolation required.

Table 3.2 Water Quality Storage Requirements based on Receiving Waters^{[1],[2]}

Protection Level	SWMP Type	Storage Volume (m ³ /ha) for Impervious Level: 35%	Storage Volume (m ³ /ha) for Impervious Level: 55%	Storage Volume (m ³ /ha) for Impervious Level: 70%	Storage Volume (m ³ /ha) for Impervious Level: 85%
Enhanced 80% long-term S.S. removal	Infiltration	25	30	35	40
Enhanced 80% long-term S.S. removal	Wetlands	80	105	120	140
Enhanced 80% long-term S.S. removal	Hybrid Wet Pond/Wetland	110	150	175	195
Enhanced 80% long-term S.S. removal	Wet Pond	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	25	30
Normal 70% long-term S.S. removal	Wetlands	60	70	80	90
Normal 70% long-term S.S. removal	Hybrid Wet Pond/Wetland	75	90	105	120

Protection Level	SWMP Type	Storage Volume (m ³ /ha) for Impervious Level: 35%	Storage Volume (m ³ /ha) for Impervious Level: 55%	Storage Volume (m ³ /ha) for Impervious Level: 70%	Storage Volume (m ³ /ha) for Impervious Level: 85%
Normal 70% long-term S.S. removal	Wet Pond	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20
Basic 60% long-term S.S. removal	Wetlands	60	60	60	60
Basic 60% long-term S.S. removal	Hybrid Wet Pond/Wetland	60	70	75	80
Basic 60% long-term S.S. removal	Wet Pond	60	70	85	95
Basic 60% long-term S.S. removal	Dry Pond (Continuous Flow)	90	150	200	240

For levels of imperviousness below 35%, required storage volumes may be obtained by extrapolating the values provided in Table 3.2. For levels of imperviousness between those included in Table 3.2, required storage volumes may be obtained by interpolation.

It should be noted that the total drainage area contributing to the facility should be included in sizing (lumped imperviousness or separate calculations for internal and external drainage areas is permissible) in most cases. The exception occurs when an external drainage area is itself controlled by a separate water quality facility (and erosion and quantity control are either not required or provided separately). Modelling studies (Marshall Macklin Monaghan Limited, 1997) indicate comparable combined long-term removal rates for ponds in series and separate parallel ponds. More frequent overflows will occur from the most downstream pond, but this can be compensated for by doubling the water quality active storage volume from 40 to 80 m³/ha.

The volumetric criteria specified in Table 3.2 address only water quality, not erosion, baseflow or flooding concerns. Furthermore, the criteria were developed based on the removal of suspended solids via settling, and therefore, may not adequately address contaminants which must be removed by other mechanisms.

3.3.3 Results of monitoring SWMP Performance

In the late 1990's a partnership of government agencies pooled their resources to undertake a series of monitoring studies aimed at assessing the water quality performance of selected SWMPs through the Stormwater Assessment and Monitoring Performance (SWAMP) Program (Meek and Liang, 1998). Most of the facilities monitored did not meet the design guidance provided in this or the previous version of the Manual as they were constructed before this guidance was available. Nevertheless, the results of the monitoring program are of use in assessing the performance of stormwater management facilities.

In addition to the efforts conducted under SWAMP, numerous studies of performance have been conducted both inside and outside of Ontario. Most performance studies in Ontario have been of wet pond or pond/wetland systems. Key results of performance studies, and their implications to SWMP design in Ontario, are summarized below.

- The results of performance studies indicate a fair consistency for most end-of-pipe SWMP types (typically 60-80% suspended solids (SS) removal and 40-50% total phosphorus (TP) removal);
- Extremes in performance are observed in all end-of-pipe SWMP types (from negative performance to 99% removal of SS and TP);

APPENDIX C

STORMWATER AND LID SIZING CALCULATIONS

Catchment 101

Outlets to: Goldenridge Road Sewer

	Runoff Coefficient	Area (ha)	Weighted Runoff Coefficient	Weighted Runoff Coefficient (100 Year)
Low-Rise Residential	0.45	0.04	0.45	0.56
TOTAL		0.04	0.45	0.56

Catchment 102

Outlets to: Dunbarton Creek

	Runoff Coefficient	Area (ha)	Weighted Runoff Coefficient	Weighted Runoff Coefficient (100 Year)
Rooftops	0.95	0.01	0.05	0.05
Gravel Driveway	0.70	0.02	0.04	0.05
Grass	0.25	0.25	0.22	0.28
TOTAL		0.28	0.31	0.38

Goldenridge Road Sewer Total

Catchment	Runoff Coefficient	Area	Weighted Runoff Coefficient
101	0.45	0.04	0.45
TOTAL		0.04	0.45

Dunbarton Creek Total

Catchment	Runoff Coefficient	Area	Weighted Runoff Coefficient
102	0.31	0.28	0.31
TOTAL		0.28	0.31

Overall Total

Catchment	Runoff Coefficient	Area	Weighted Runoff Coefficient
101	0.45	0.04	0.06
102	0.31	0.28	0.27
TOTAL		0.32	0.33

2 Year storm

IDF Parameters* {
 $a = 715.076$
 $t = 10$ min
 $b = 5.26$
 $c = 0.82$

Runoff Coefficient:
 $C1 = 0.45$
 $C2 = 0.31$

Allowable Release Rate Calculation				
Outlet	Area	time	Intensity	Flow
ID		t	$i=a/(t+b)^c$	$Q=CiA/360$
	ha	min	mm/hr	l/s
Goldenridge Road Sewer	0.040	10.00	77.57	3.9
Dunbarton Creek	0.278	10.00	77.57	18.6

* a,b,c's per City of Pickering

** As per Storm Drainage Plan provided by City of Pickering (**Appendix B**)

5 Year storm

IDF Parameters* {
 $a = 1082.901$
 $t = 10$ min
 $b = 6.007$
 $c = 0.837$

Runoff Coefficient:
 $C1 = 0.45$
 $C2 = 0.31$

Allowable Release Rate Calculation				
Outlet	Area	time	Intensity	Flow
ID		t	$i=a/(t+b)^c$	$Q=CiA/360$
	ha	min	mm/hr	l/s
Goldenridge Road Sewer	0.040	10.00	106.31	5.3
Dunbarton Creek	0.278	10.00	106.31	25.5

* a,b,c's per City of Pickering

** As per Storm Drainage Plan provided by City of Pickering (**Appendix B**)

10 Year storm

IDF Parameters* $\left\{ \begin{array}{l} a = 1313.979 \\ t = 10 \text{ min} \\ b = 6.026 \\ c = 0.845 \end{array} \right.$

Runoff Coefficient: $\begin{array}{l} C1 = 0.45 \\ C2 = 0.31 \end{array}$

Allowable Release Rate Calculation				
Outlet	Area	time	Intensity	Flow
ID		t	$i=a/(t+b)^c$	$Q=CiA/360$
	ha	min	mm/hr	l/s
Goldenridge Road Sewer	0.040	10.00	126.04	6.3
Dunbarton Creek	0.278	10.00	126.04	30.2

* a,b,c's per City of Pickering

** As per Storm Drainage Plan provided by City of Pickering (**Appendix B**)

25 Year storm

IDF Parameters* $\left\{ \begin{array}{l} a = 1581.718 \\ t = 10 \text{ min} \\ b = 6.007 \\ c = 0.848 \end{array} \right.$

Runoff Coefficient: $\begin{array}{l} C1 = 0.50 \\ C2 = 0.34 \end{array}$

Allowable Release Rate Calculation				
Outlet	Area	time	Intensity	Flow
ID		t	$i=a/(t+b)^c$	$Q=CiA/360$
	ha	min	mm/hr	l/s
Goldenridge Road Sewer	0.040	10.00	150.62	8.3
Dunbarton Creek	0.278	10.00	150.62	39.5

* a,b,c's per City of Pickering

** As per Storm Drainage Plan provided by City of Pickering (**Appendix B**)

50 Year storm

IDF Parameters* $\left\{ \begin{array}{l} a = 1828.009 \\ t = 10 \text{ min} \\ b = 6.193 \\ c = 0.856 \end{array} \right.$

Runoff Coefficient: $\begin{array}{l} C1 = 0.54 \\ C2 = 0.37 \end{array}$

Allowable Release Rate Calculation				
Outlet	Area	time	Intensity	Flow
ID		t	$i=a/(t+b)^c$	$Q=CiA/360$
	ha	min	mm/hr	l/s
Goldenridge Road Sewer	0.040	10.00	168.58	10.1
Dunbarton Creek	0.278	10.00	168.58	47.7

* a,b,c's per City of Pickering

** As per Storm Drainage Plan provided by City of Pickering (**Appendix B**)

100 Year storm

IDF Parameters* $\left\{ \begin{array}{l} a = 2096.425 \\ t = 10 \text{ min} \\ b = 6.49 \\ c = 0.86 \end{array} \right.$

Runoff Coefficient: $\begin{array}{l} C1 = 0.56 \\ C2 = 0.38 \end{array}$

Allowable Release Rate Calculation				
Outlet	Area	time	Intensity	Flow
ID		t	$i=a/(t+b)^c$	$Q=CiA/360$
	ha	min	mm/hr	l/s
Goldenridge Road Sewer	0.04	10.00	186.69	11.7
Dunbarton Creek	0.28	10.00	186.69	54.7

* a,b,c's per City of Pickering

** As per Storm Drainage Plan provided by City of Pickering (**Appendix B**)

Catchment 201

Outlets to: Goldenridge Road Sewer

	Runoff Coefficient	Area (ha)	Weighted Runoff Coefficient	Weighted Runoff Coefficient (100 Year)
Low-Rise Residential	0.45	0.04	0.45	0.56
TOTAL		0.04	0.45	0.56

Catchment 202

Outlets to: Dunbarton Creek

	Runoff Coefficient	Area (ha)	Weighted Runoff Coefficient	Weighted Runoff Coefficient (100 Year)
Rooftops	0.95	0.06	0.21	0.22
Grass	0.25	0.21	0.20	0.24
TOTAL		0.27	0.40	0.46

Goldenridge Road Sewer Total

Catchment	Runoff Coefficient	Area	Weighted Runoff Coefficient
201	0.45	0.04	0.45
TOTAL		0.04	0.45

Dunbarton Creek Total

Catchment	Runoff Coefficient	Area	Weighted Runoff Coefficient
202	0.40	0.27	0.40
TOTAL		0.27	0.40

Overall Total

Catchment	Runoff Coefficient	Area	Weighted Runoff Coefficient
201	0.45	0.04	0.06
202	0.40	0.27	0.35
TOTAL		0.32	0.41

Area ID: 202

Area = 0.274 ha
 "C" = 0.46
 AC= 0.1267
 Tc = 10.0 min
 Time Increment = 3.0 min
 Release Rate = 54.69 l/s
 Max.Storage = 6.6 m³

City of Pickering 100 Year
 a= 2096.425
 b= 6.485
 c= 0.863

Time (min)	Rainfall Intensity (mm/hr)	Storm Runoff (l/s)	Runoff Volume (m ³)	Released Volume (m ³)	Storage Volume (m ³)
10.0	186.7	65.73	39.4	32.8	6.6
13.0	161.6	56.90	44.4	37.7	6.6
16.0	142.8	50.29	48.3	42.7	5.6
19.0	128.2	45.14	51.5	47.6	3.9
22.0	116.5	41.00	54.1	52.5	1.6
25.0	106.8	37.61	56.4	57.4	-1.0
28.0	98.7	34.77	58.4	62.3	-3.9
31.0	91.9	32.35	60.2	67.3	-7.1
34.0	86.0	30.27	61.8	72.2	-10.4
37.0	80.8	28.46	63.2	77.1	-13.9
40.0	76.3	26.87	64.5	82.0	-17.6
43.0	72.3	25.46	65.7	87.0	-21.3
46.0	68.7	24.20	66.8	91.9	-25.1
49.0	65.5	23.06	67.8	96.8	-29.0
52.0	62.6	22.04	68.8	101.7	-33.0
55.0	59.9	21.11	69.7	106.6	-37.0
58.0	57.5	20.26	70.5	111.6	-41.1
61.0	55.3	19.48	71.3	116.5	-45.2
64.0	53.3	18.76	72.0	121.4	-49.4
67.0	51.4	18.10	72.8	126.3	-53.6
70.0	49.7	17.48	73.4	131.3	-57.8
73.0	48.0	16.91	74.1	136.2	-62.1
76.0	46.5	16.38	74.7	141.1	-66.4
79.0	45.1	15.88	75.3	146.0	-70.7

<<<<

Area ID: 202

Area = 0.274 ha
"C" = 0.45
AC= 0.1240
Tc = 10.0 min
Time Increment = 3.0 min
Release Rate = 47.66 l/s
Max.Storage = 6.3 m³

City of Pickering 50 Year
a= 1828.009
b= 6.193
c= 0.856

Time (min)	Rainfall Intensity (mm/hr)	Storm Runoff (l/s)	Runoff Volume (m ³)	Released Volume (m ³)	Storage Volume (m ³)
10.0	168.6	58.10	34.9	28.6	6.3
13.0	145.7	50.24	39.2	32.9	6.3
16.0	128.7	44.36	42.6	37.2	5.4
19.0	115.5	39.80	45.4	41.5	3.9
22.0	104.9	36.15	47.7	45.7	2.0
25.0	96.2	33.15	49.7	50.0	-0.3
28.0	88.9	30.64	51.5	54.3	-2.8
31.0	82.7	28.51	53.0	58.6	-5.6
34.0	77.4	26.68	54.4	62.9	-8.5
37.0	72.8	25.09	55.7	67.2	-11.5
40.0	68.7	23.69	56.8	71.5	-14.6
43.0	65.1	22.44	57.9	75.8	-17.9
46.0	61.9	21.34	58.9	80.1	-21.2
49.0	59.0	20.34	59.8	84.3	-24.6
52.0	56.4	19.44	60.6	88.6	-28.0
55.0	54.0	18.62	61.4	92.9	-31.5
58.0	51.9	17.87	62.2	97.2	-35.0
61.0	49.9	17.19	62.9	101.5	-38.6
64.0	48.0	16.56	63.6	105.8	-42.2
67.0	46.3	15.97	64.2	110.1	-45.9
70.0	44.8	15.43	64.8	114.4	-49.6
73.0	43.3	14.93	65.4	118.7	-53.3
76.0	42.0	14.46	66.0	123.0	-57.0
79.0	40.7	14.03	66.5	127.2	-60.8

<<<<

Area ID: 202

Area = 0.274 ha
 "C" = 0.43
 AC= 0.1186
 Tc = 10.0 min
 Time Increment = 3.0 min
 Release Rate = 39.49 l/s
 Max.Storage = 6.2 m³

City of Pickering 25 Year
 a= 1581.718
 b= 6.007
 c= 0.848

Time (min)	Rainfall Intensity (mm/hr)	Storm Runoff (l/s)	Runoff Volume (m ³)	Released Volume (m ³)	Storage Volume (m ³)
10.0	150.6	49.67	29.8	23.7	6.1
13.0	130.2	42.94	33.5	27.2	6.2
16.0	115.0	37.92	36.4	30.8	5.6
19.0	103.2	34.03	38.8	34.4	4.4
22.0	93.7	30.91	40.8	37.9	2.9
25.0	86.0	28.36	42.5	41.5	1.1
28.0	79.5	26.22	44.0	45.0	-1.0
31.0	74.0	24.41	45.4	48.6	-3.2
34.0	69.3	22.84	46.6	52.1	-5.5
37.0	65.1	21.49	47.7	55.7	-8.0
40.0	61.5	20.29	48.7	59.2	-10.5
43.0	58.3	19.23	49.6	62.8	-13.2
46.0	55.5	18.29	50.5	66.3	-15.9
49.0	52.9	17.44	51.3	69.9	-18.6
52.0	50.5	16.67	52.0	73.5	-21.4
55.0	48.4	15.97	52.7	77.0	-24.3
58.0	46.5	15.34	53.4	80.6	-27.2
61.0	44.7	14.75	54.0	84.1	-30.1
64.0	43.1	14.21	54.6	87.7	-33.1
67.0	41.6	13.72	55.1	91.2	-36.1
70.0	40.2	13.26	55.7	94.8	-39.1
73.0	38.9	12.83	56.2	98.3	-42.1
76.0	37.7	12.43	56.7	101.9	-45.2
79.0	36.6	12.06	57.1	105.4	-48.3

<<<<

Area ID: 202

Area = 0.274 ha
 "C" = 0.40
 AC= 0.1103
 Tc = 10.0 min
 Time Increment = 3.0 min
 Release Rate = 30.23 l/s
 Max.Storage = 5.2 m³

City of Pickering 10 Year
 a= 1313.979
 b= 6.026
 c= 0.845

Time (min)	Rainfall Intensity (mm/hr)	Storm Runoff (l/s)	Runoff Volume (m ³)	Released Volume (m ³)	Storage Volume (m ³)
10.0	126.0	38.65	23.2	18.1	5.0
13.0	109.0	33.43	26.1	20.9	5.2
16.0	96.3	29.54	28.4	23.6	4.8
19.0	86.5	26.52	30.2	26.3	3.9
22.0	78.6	24.10	31.8	29.0	2.8
25.0	72.1	22.12	33.2	31.7	1.4
28.0	66.7	20.46	34.4	34.5	-0.1
31.0	62.1	19.05	35.4	37.2	-1.8
34.0	58.2	17.83	36.4	39.9	-3.5
37.0	54.7	16.78	37.2	42.6	-5.4
40.0	51.7	15.85	38.0	45.3	-7.3
43.0	49.0	15.02	38.8	48.1	-9.3
46.0	46.6	14.29	39.4	50.8	-11.4
49.0	44.4	13.63	40.1	53.5	-13.4
52.0	42.5	13.03	40.7	56.2	-15.6
55.0	40.7	12.49	41.2	59.0	-17.7
58.0	39.1	11.99	41.7	61.7	-19.9
61.0	37.6	11.54	42.2	64.4	-22.2
64.0	36.3	11.12	42.7	67.1	-24.4
67.0	35.0	10.73	43.1	69.8	-26.7
70.0	33.8	10.37	43.6	72.6	-29.0
73.0	32.7	10.04	44.0	75.3	-31.3
76.0	31.7	9.73	44.3	78.0	-33.6
79.0	30.8	9.43	44.7	80.7	-36.0

<<<<

Area ID: 202

Area = 0.274 ha
 "C" = 0.40
 AC= 0.1103
 Tc = 10.0 min
 Time Increment = 3.0 min
 Release Rate = 25.50 l/s
 Max.Storage = 4.4 m³

City of Pickering 5 Year
 a= 1082.901
 b= 6.007
 c= 0.837

Time (min)	Rainfall Intensity (mm/hr)	Storm Runoff (l/s)	Runoff Volume (m ³)	Released Volume (m ³)	Storage Volume (m ³)
10.0	106.3	32.60	19.6	15.3	4.3
13.0	92.1	28.23	22.0	17.6	4.4
16.0	81.4	24.97	24.0	19.9	4.1
19.0	73.2	22.44	25.6	22.2	3.4
22.0	66.6	20.41	26.9	24.5	2.5
25.0	61.1	18.74	28.1	26.8	1.3
28.0	56.6	17.35	29.1	29.1	0.1
31.0	52.7	16.16	30.1	31.4	-1.3
34.0	49.4	15.14	30.9	33.7	-2.8
37.0	46.5	14.25	31.6	36.0	-4.3
40.0	43.9	13.47	32.3	38.2	-5.9
43.0	41.7	12.78	33.0	40.5	-7.6
46.0	39.7	12.16	33.6	42.8	-9.3
49.0	37.8	11.60	34.1	45.1	-11.0
52.0	36.2	11.10	34.6	47.4	-12.8
55.0	34.7	10.64	35.1	49.7	-14.6
58.0	33.3	10.22	35.6	52.0	-16.5
61.0	32.1	9.83	36.0	54.3	-18.3
64.0	30.9	9.48	36.4	56.6	-20.2
67.0	29.9	9.15	36.8	58.9	-22.1
70.0	28.9	8.85	37.2	61.2	-24.0
73.0	27.9	8.57	37.5	63.5	-26.0
76.0	27.1	8.30	37.9	65.8	-27.9
79.0	26.3	8.06	38.2	68.1	-29.9

<<<<

Area ID: 202

Area = 0.274 ha
"C" = 0.40
AC= 0.1103
Tc = 10.0 min
Time Increment = 3.0 min
Release Rate = 18.61 l/s
Max.Storage = 3.2 m³

City of Pickering 2 Year
a= 715.076
b= 5.262
c= 0.815

Time (min)	Rainfall Intensity (mm/hr)	Storm Runoff (l/s)	Runoff Volume (m ³)	Released Volume (m ³)	Storage Volume (m ³)
10.0	77.6	23.79	14.3	11.2	3.1
13.0	67.0	20.55	16.0	12.8	3.2
16.0	59.2	18.15	17.4	14.5	2.9
19.0	53.2	16.30	18.6	16.2	2.4
22.0	48.3	14.82	19.6	17.9	1.7
25.0	44.4	13.62	20.4	19.5	0.9
28.0	41.1	12.61	21.2	21.2	0.0
31.0	38.3	11.75	21.9	22.9	-1.0
34.0	35.9	11.01	22.5	24.6	-2.1
37.0	33.8	10.37	23.0	26.2	-3.2
40.0	32.0	9.81	23.5	27.9	-4.4
43.0	30.4	9.31	24.0	29.6	-5.6
46.0	28.9	8.86	24.5	31.3	-6.8
49.0	27.6	8.46	24.9	32.9	-8.1
52.0	26.4	8.10	25.3	34.6	-9.3
55.0	25.3	7.77	25.6	36.3	-10.7
58.0	24.3	7.47	26.0	38.0	-12.0
61.0	23.4	7.19	26.3	39.6	-13.3
64.0	22.6	6.93	26.6	41.3	-14.7
67.0	21.8	6.70	26.9	43.0	-16.1
70.0	21.1	6.48	27.2	44.7	-17.4
73.0	20.5	6.28	27.5	46.3	-18.8
76.0	19.9	6.09	27.8	48.0	-20.2
79.0	19.3	5.91	28.0	49.7	-21.7

<<<<

Infiltration Trench Sizing

	Units	Catchment 202
Total Area	m ²	3184.00
Total Impervious Area	m ²	1305.44
Min Required Volume	m ³	6.53
Equivalent rainfall to be retained	mm	5
V - Total Volume to be Retained	m³	7.00

Infiltration Trench Design - TRCA Criteria

	Units	Stone Trench - 202
I - Infiltration Rate*	mm/hr	13.0
Safety correction factor		2.5
ts- Time to drain	hr	48
Vr - Media Porosity		0.4
Dm - Max Allowable Depth	m	0.6
Am - Minimum footprint area	m ²	28.0

*Based on Guelph - Loam Soils, taken from the Soil Associations of Southern Ontario, Surveyed by the Department of Soils, Ontario Agricultural College, Guelph and the Research Branch, Canada Department of Agriculture, Ottawa (1960), (Appendix B).

$$Dm = \frac{I * ts}{Vr}$$

$$Am = \frac{V}{Vr}$$

$$Dr * Vr$$

Infiltration Trench Design - Provided

	Units	Stone Trench - 202
Dr - Depth	m	0.5
W - Width	m	1.0
L - Length	m	5.8
Af - Footprint Area	m ²	5.8
# Of Trenches		6.0
Storage Volume Per Trench	m ³	1.17
Total Storage Volume	m³	7.00

Drawdown Time

	Units	Stone Trench - 202
Depth of Trench	m	0.5
Media Porosity		0.4
Infiltration Rate	mm/hr	13
Safety correction factor		2.5
Design Infiltration Rate	mm/hr	5.2
Drawdown Time	hr	38

Design Chart 1.13: Infiltration ParametersHorton Equation - Typical Values

		Minimum Infiltration Rate (mm/hr)	Maximum* Infiltration Rate (mm/hr)
Soil Group	A	25	250
	B	13	200
	C	5	125
	D	5	75
Decay Parameter		2 hr ⁻¹	*Dry Soil Conditions

Green-Ampt Method - Typical Values

		IMD (mm/mm)	S _u (mm)	K _s (mm/hr)
Soil Group	A (sand)	0.34	100	25
	B (silt loam)	0.32	300	13
	C (sand clay loam)	0.26	250	5
	D (clay)	0.21	180	3

Source: M.L. Terstriep and J.B. Stall (1974)
U.S. EPA (1989)

ratio would be 2.5, the safety correction factor would be 3.5, and the design infiltration rate would be 8.6 mm/h. Where the soil horizon is continuous within 1.5 metres below the proposed bottom of the BMP, the mean infiltration rate measured at the bottom elevation of the BMP should be divided by a safety correction factor of 2.5 to calculate the design infiltration rate.

Table C 3: Safety correction factors for calculating design infiltration rates

Ratio of Mean Measured Infiltration Rates ¹	Safety Correction Factor ²
≤ 1	2.5
1.1 to 4.0	3.5
4.1 to 8.0	4.5
8.1 to 16.0	6.5
16.1 or greater	8.5

Source: Wisconsin Department of Natural Resources. 2004. Conservation Practice Standards. Site Evaluation for Stormwater Infiltration (1002). Madison, WI.

Notes:

1. Ratio is determined by dividing the geometric mean measured infiltration rate at the proposed bottom elevation of the BMP by the geometric mean measured infiltration rate of the least permeable soil horizon within 1.5 metres below the proposed bottom elevation of the BMP.
2. The design infiltration rate is calculated by dividing the geometric mean measured infiltration rate at the proposed bottom elevation of the BMP by the safety correction factor.

The design infiltration rate should be used to determine the maximum depth of the water storage component of the BMP, based on the desired drawdown period (typically 48 hours to fully drain the BMP). Based on the calculated design infiltration rate, assumptions regarding the bottom elevation of the BMP may need to be reconsidered and further infiltration testing may be warranted.

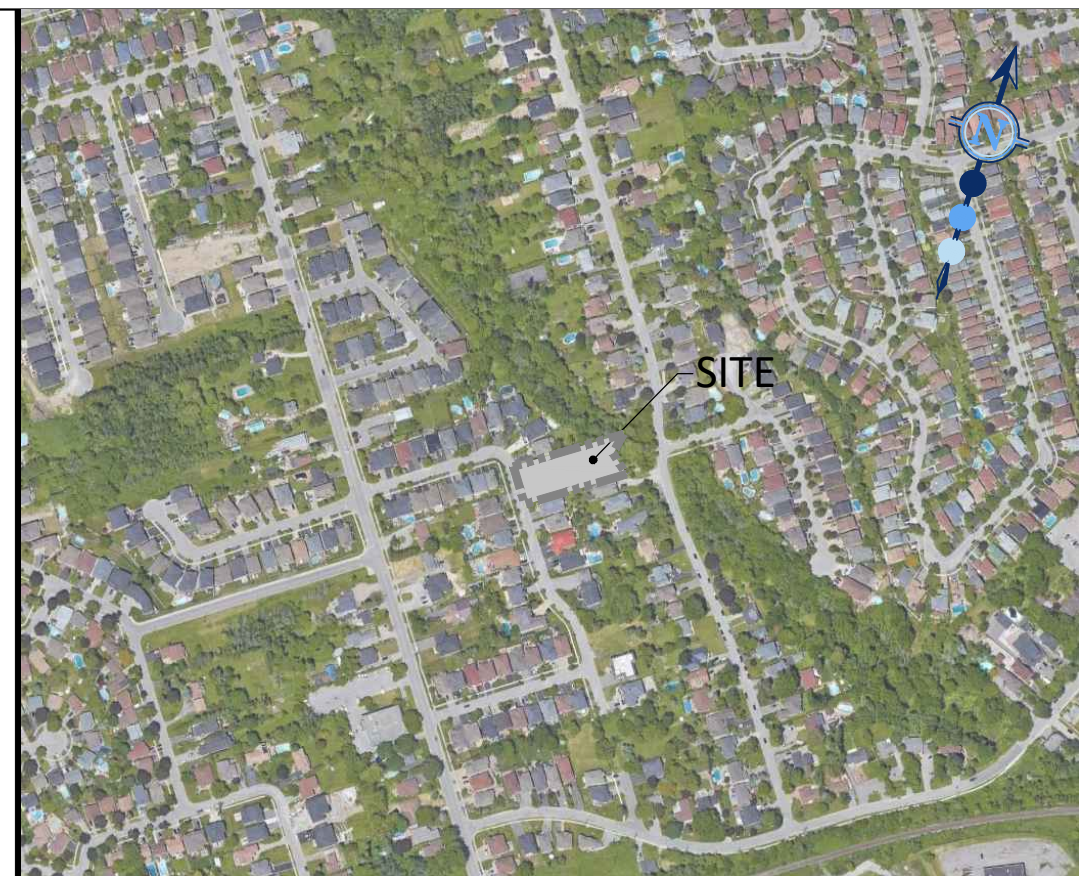
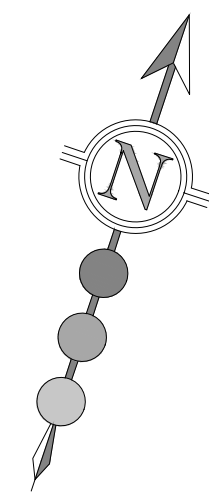
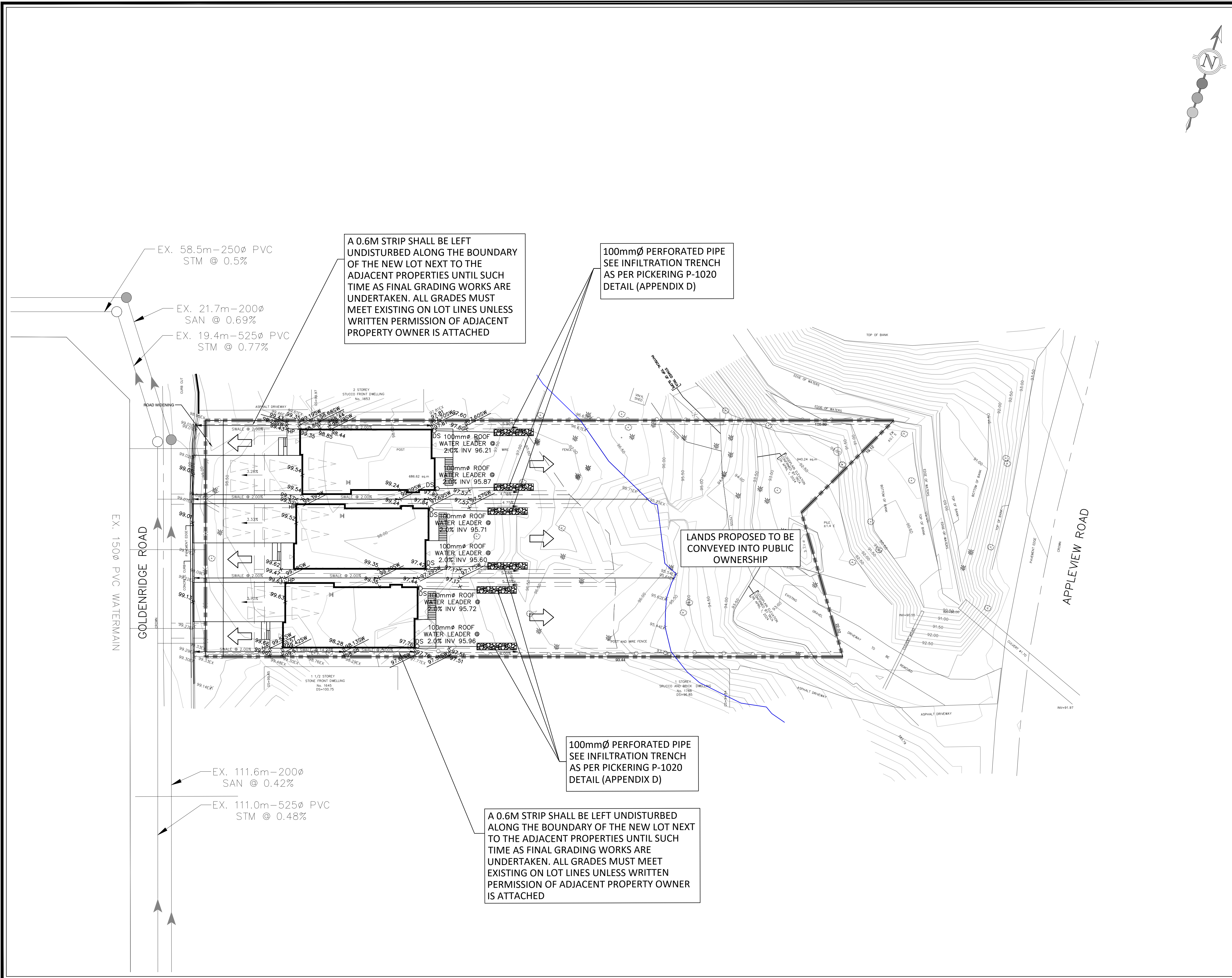
C3. Design Guidance for Infiltration Measures

The MOE Manual 2003 recommends applying lot level and conveyance controls to areas with infiltration rates of greater than 15 mm/hr (soils with hydraulic conductivity as low as 10^{-8} m/s). For the purposes of site suitability, where the tested soil infiltration rate is low (i.e. less than 15 mm/h), infiltration may still be feasible and therefore should still be considered for all soil types. The Sustainable Technologies Evaluation Program (www.sustainabletechnologies.ca) provides a number of site monitoring reports demonstrating infiltration on soils with low percolation rates. It is important to note that if infiltration measures are not sited, designed, and maintained properly, these practices may have the potential to contaminate groundwater, cause water to seep into the basements and crawlspaces of homes and other structures, and create favourable breeding habitat for mosquitoes.

The following steps are required to implement infiltration practices for water quality control:

APPENDIX D

ENGINEERING DRAWINGS AND FLOOR PLANS



BENCHMARK: 1-087 **ELEV. 292.813**
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CITY OF PICKERING BENCHMARK No. 1-087 HAVING AN ORTHOMETRIC ELEVATION OF 292.813 METRES. ELEVATIONS ARE REFERRED TO THE CANADIAN VERTICAL DATUM OF 1928, PRE-1978 ADJUSTMENT (CGVD-1928: 1978ADJ).

BENCHMARK SET VERTICALLY IN A CHANCE ANCHOR, LOCATED 7.5 METRES WEST OF THE CENTERLINE OF APPLEVIEW ROAD AND 350 METRES NORTH OF DUNBARTON ROAD. CAP IS LOCATED 0.20 METRES BELOW GRADE.

- LEGEND:**
- 120.00 LIMIT OF DEVELOPMENT
 - X 123.23 EXISTING CONTOUR AND ELEVATION
 - X 123.23 PROPOSED ELEVATION
 - X 123.23(G) PROPOSED GUTTER ELEVATION
 - X 259.25SW PROPOSED SWALE ELEVATION
 - SWALE @ 2.0% SWALE
 - OVERLAND FLOW
 - PROPOSED EMBANKMENT (MAX. 3:1 UNLESS OTHERWISE NOTED)
 - TRCA APPROVED FLOODLINE AND 10.0m OFFSET FROM LONG TERM STABLE TOP OF SLOPE
 - UNDISTURBED STRIP OF 0.6m
 - INFILTRATION TRENCH
 - SANITARY SERVICE CONNECTION
 - STORM SERVICE CONNECTION
 - WATERMAIN SERVICE CONNECTION

TOPOGRAPHIC SURVEY PROVIDED BY RPE SURVEYING LTD., JULY 2025

REVISIONS				
No.	DESCRIPTION	DATE	BY	APPROVED

30 CENTURIAN DRIVE, SUITE 100
MARKHAM, ONTARIO L3R 8B8
TEL: (905) 475-1900
FAX: (905) 475-8335

THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
PICKERING ONTARIO

1794 APPLEVIEW ROAD
CITY OF PICKERING

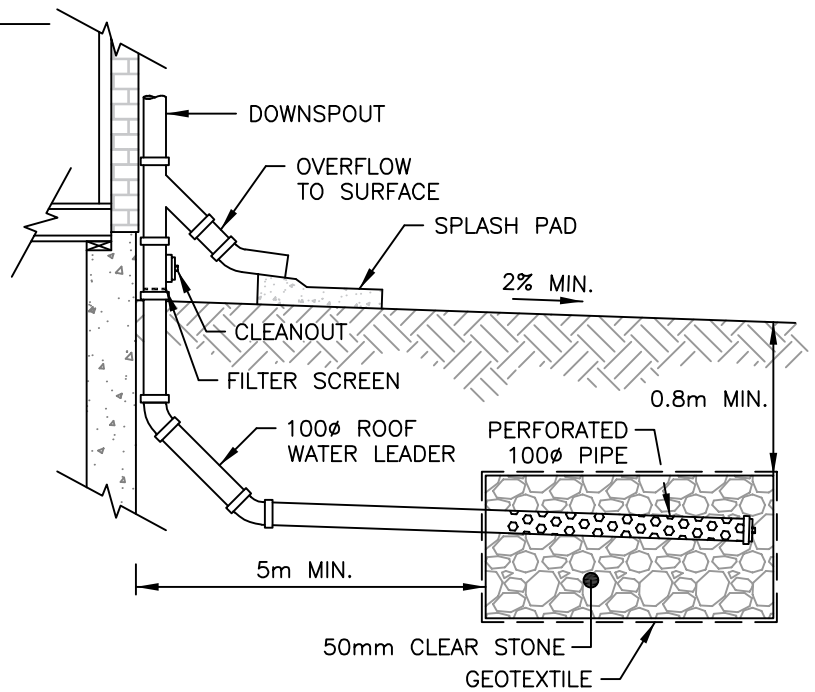
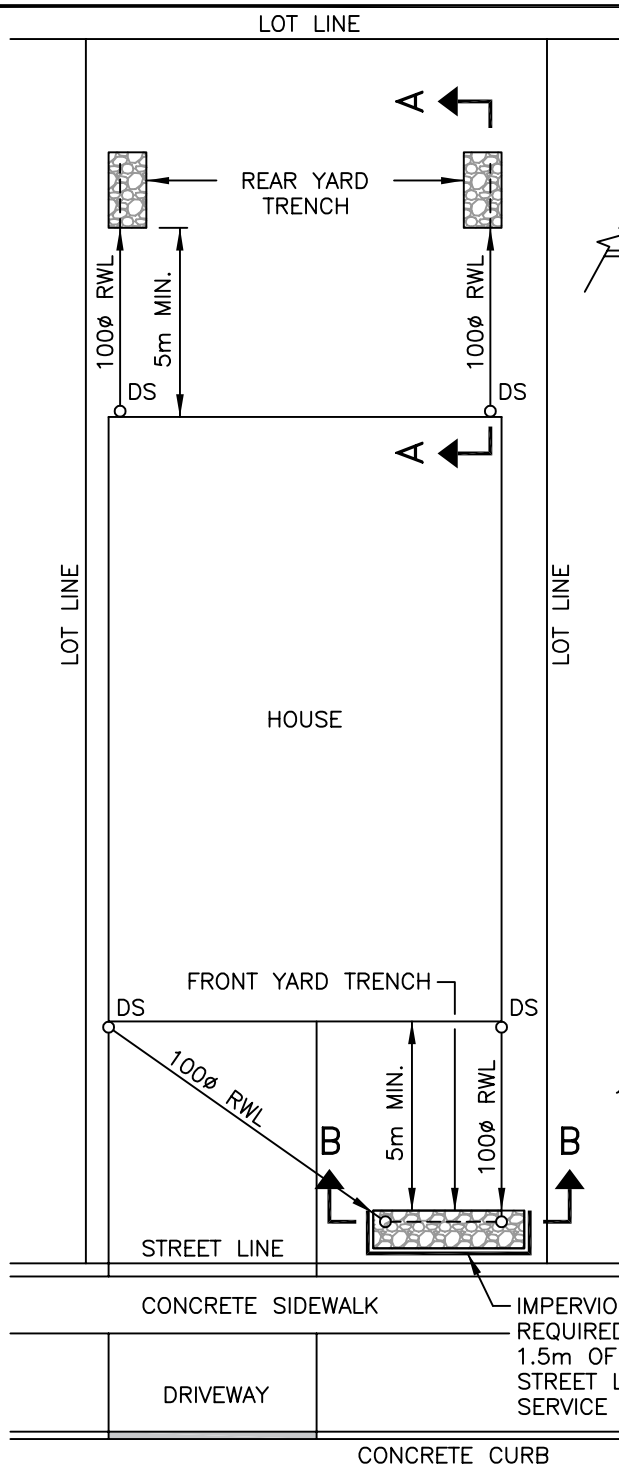
GRADING AND SERVICING PLAN

DATE: NOVEMBER 2025
SCALE: 1:250

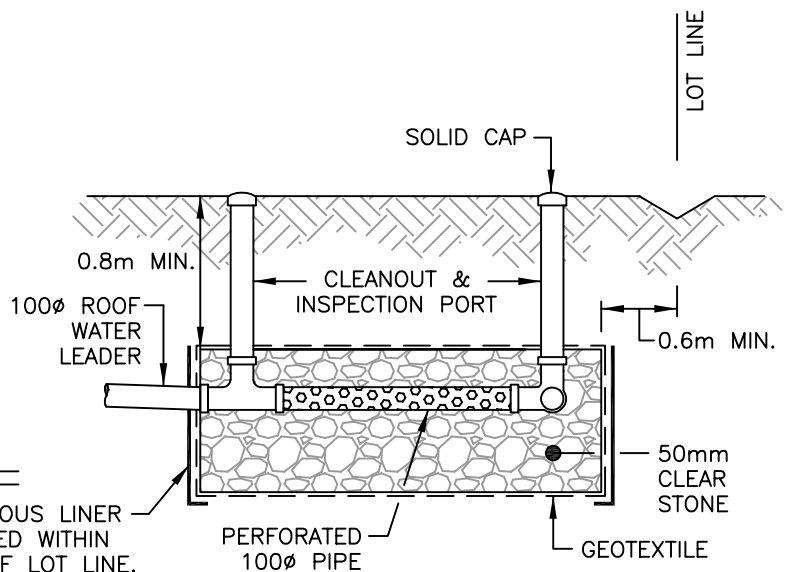
DESIGNED BY: A.D.
DRAWN BY: D.M.D.

CHECKED BY: M.G.V.
CHECKED BY: M.R.C.

PROJECT No: **2561**
DRAWING No: **GR-1**



SECTION A-A



SECTION B-B

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. TO BE READ IN CONJUNCTION WITH SECTION 5.3.1 OF THE SWM DESIGN GUIDELINES.
3. FOR SCHEMATIC PURPOSES ONLY. CONSULTING ENGINEER TO PROVIDE DESIGN DETAILS AND SPECIFICATIONS.
4. ALL DOWNSPOUTS SHALL BE EQUIPPED WITH OVERFLOW TO SURFACE AS SHOWN ON SECTION A-A.
5. GEOTEXTILE SHALL BE NON-WOVEN NEEDLE PUNCHED OR WOVEN MONOFILAMENT WITH 300mm MIN. OVERLAP.
6. 48HR NOTICE MUST BE PROVIDED TO ENGINEERING SERVICES TO INSPECT INSTALLATION PRIOR TO BACKFILLING.

City of Pickering

Engineering Services Department

DRAWN
B. TRAJCESKI

APPROVED
P. HELGESEN

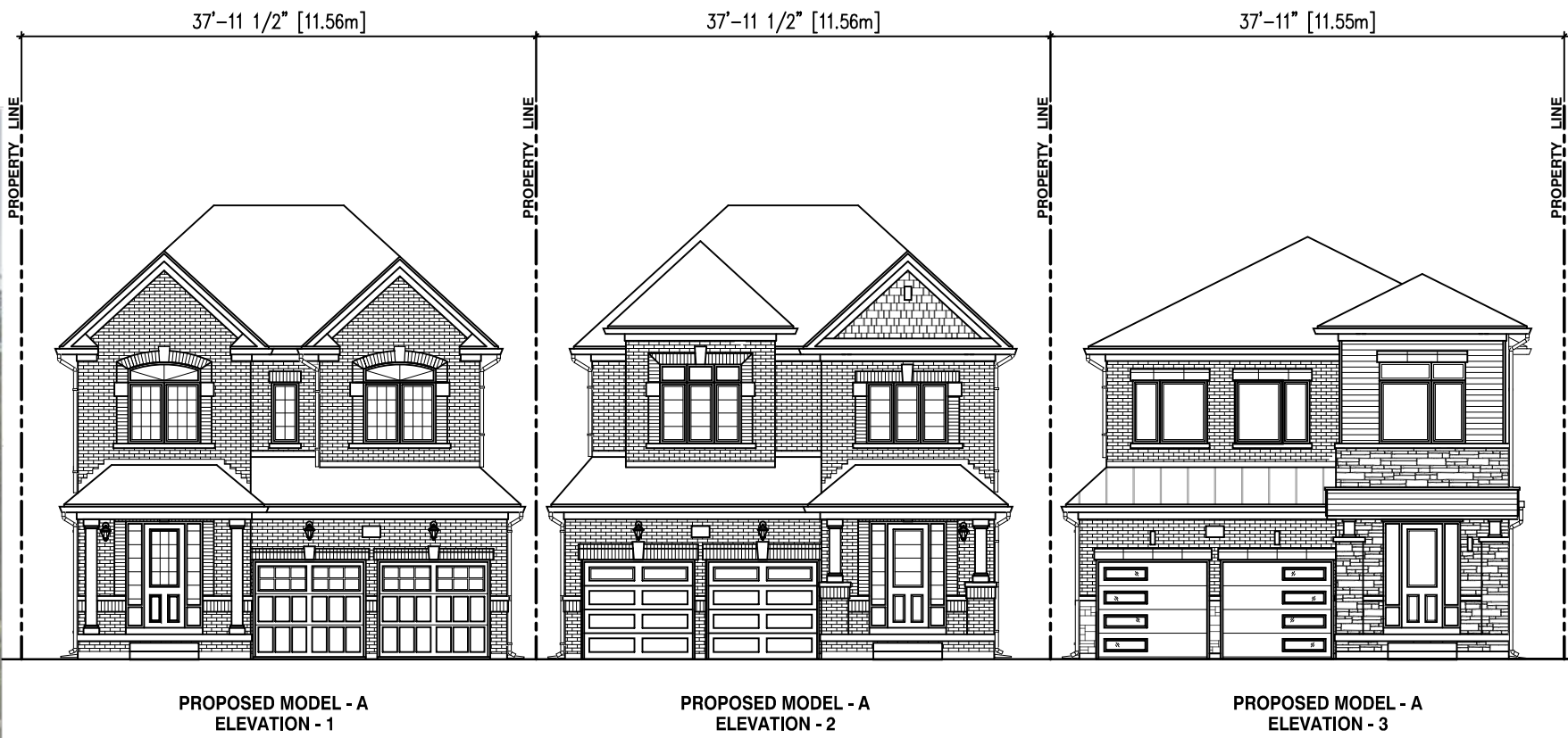
DATE
JUNE 2022

TYPICAL RESIDENTIAL ROOF WATER
INFILTRATION TRENCH

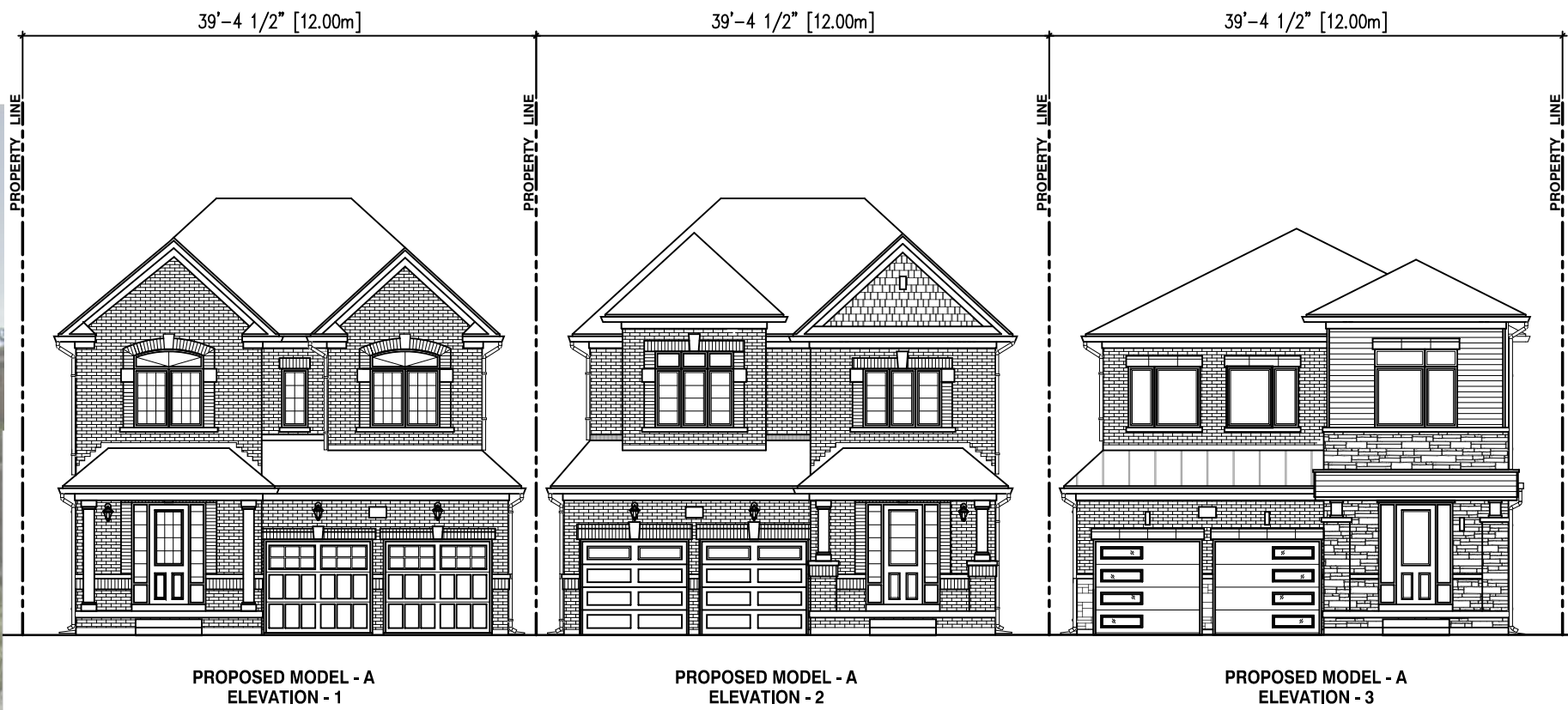
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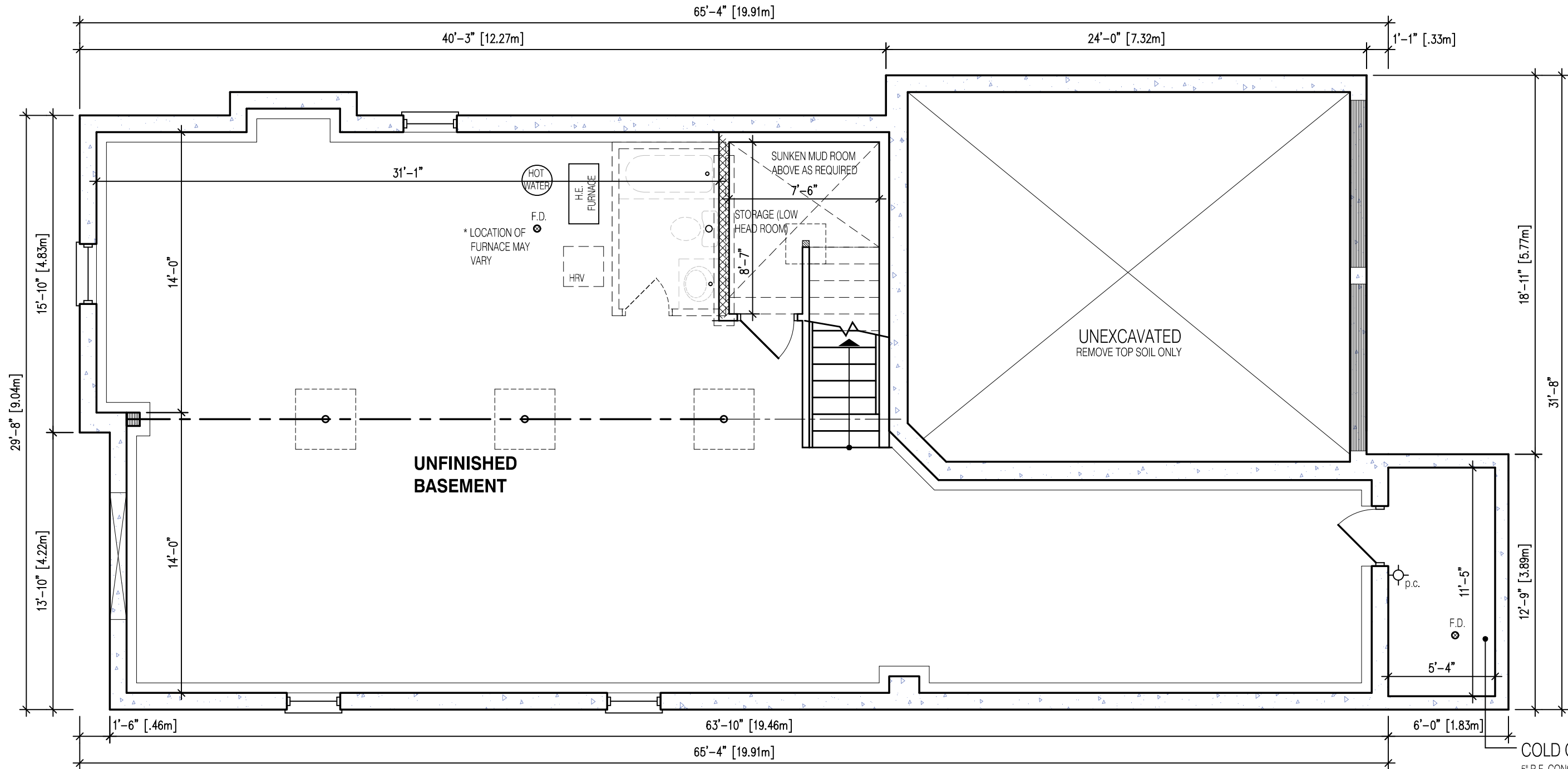
P-1020



GOLDENRIDGE ROAD



GOLDENRIDGE ROAD



COLD CELLAR
5" R.F. CONC. SLAB OVER
10M RODS @ 7 7/8" O.C.
IN EACH DIRECTION WITH MIN. 1 1/4"
COVER FROM BOTTOM OF SLAB
(SEE WALL SECTION DETAIL)
VENT TO OUTSIDE

BASEMENT PLAN

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS ON SITE BEFORE PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO JARDIN DESIGN GROUP INC. PRIOR TO COMMENCEMENT OF WORK.

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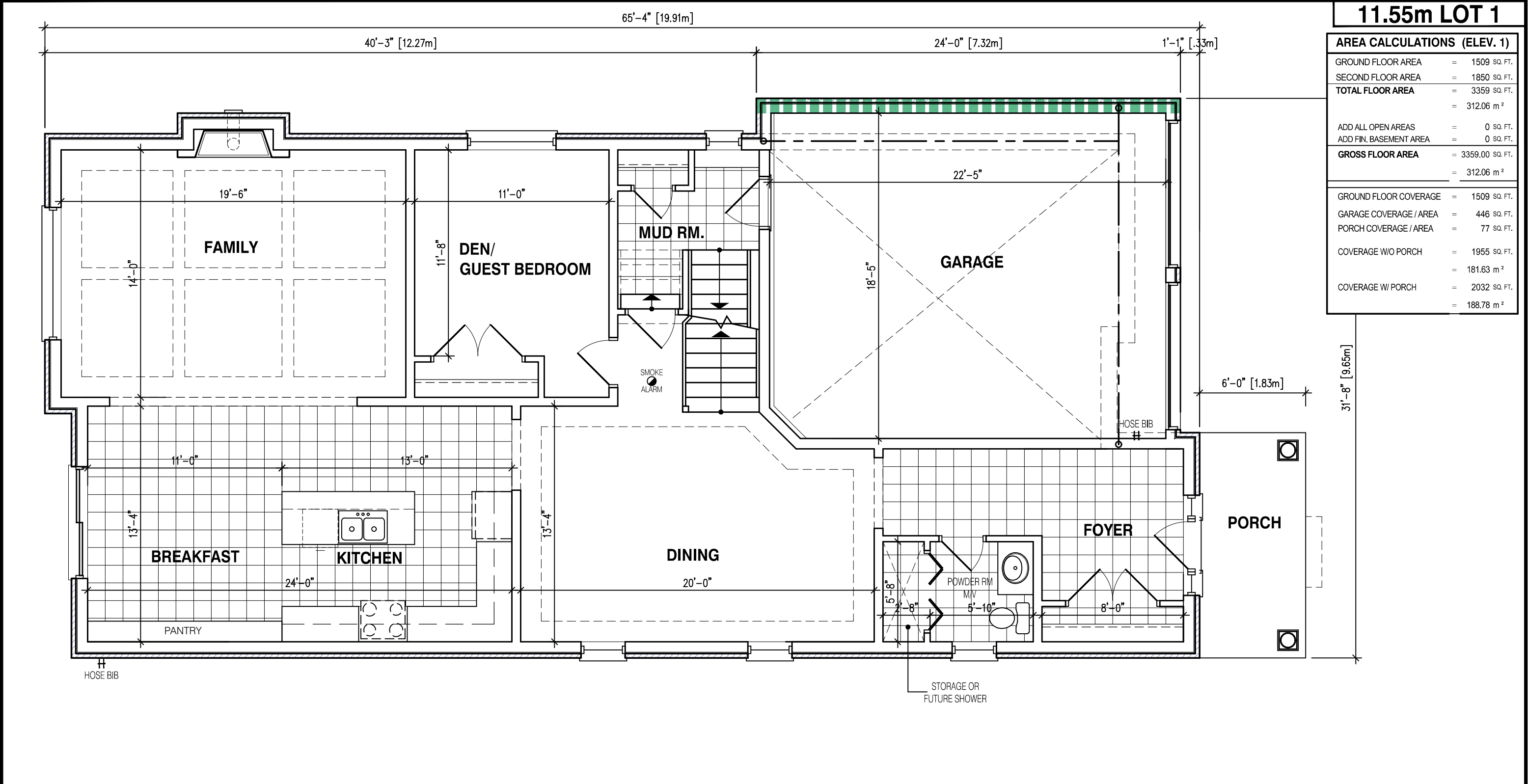
THIS DRAWING IS AN INSTRUMENT OF SERVICE, IS PROVIDED BY AND IS THE PROPERTY OF JARDIN DESIGN GROUP INC. THIS DRAWING IS NOT TO BE SCALED.

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No:		DATE:
		WORK DESCRIPTION:

PRELIMINARY

jardin
DESIGN GROUP INC
64 JARDIN DR. SUITE 3A
VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
EMAIL: info@jardindesign.ca

BASEMENT PLAN	
MARVEL HOMES 1794 APPLEVIEW ROAD (PICKERING)	
	MODEL SINGLE
	SCALE: 3/16"=1'-0"
	PROJ. No. DWG. No.
25-11	1



11.55m LOT 1	
AREA CALCULATIONS (ELEV. 1)	
GROUND FLOOR AREA	= 1509 SQ. FT.
SECOND FLOOR AREA	= 1850 SQ. FT.
TOTAL FLOOR AREA	= 3359 SQ. FT.
	= 312.06 m ²
ADD ALL OPEN AREAS	= 0 SQ. FT.
ADD FIN. BASEMENT AREA	= 0 SQ. FT.
GROSS FLOOR AREA	= 3359.00 SQ. FT.
	= 312.06 m ²
GROUND FLOOR COVERAGE	= 1509 SQ. FT.
GARAGE COVERAGE / AREA	= 446 SQ. FT.
PORCH COVERAGE / AREA	= 77 SQ. FT.
COVERAGE W/O PORCH	= 1955 SQ. FT.
	= 181.63 m ²
COVERAGE W/ PORCH	= 2032 SQ. FT.
	= 188.78 m ²

FIRST FLOOR PLAN

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FIRST FLOOR PLAN

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)

MODEL
SINGLE

SCALE:
3/16"=1'-0"

PROJ. No.
25-11

DWG. No.
2

11.55m LOT 2

AREA CALCULATIONS (ELEV. 2)

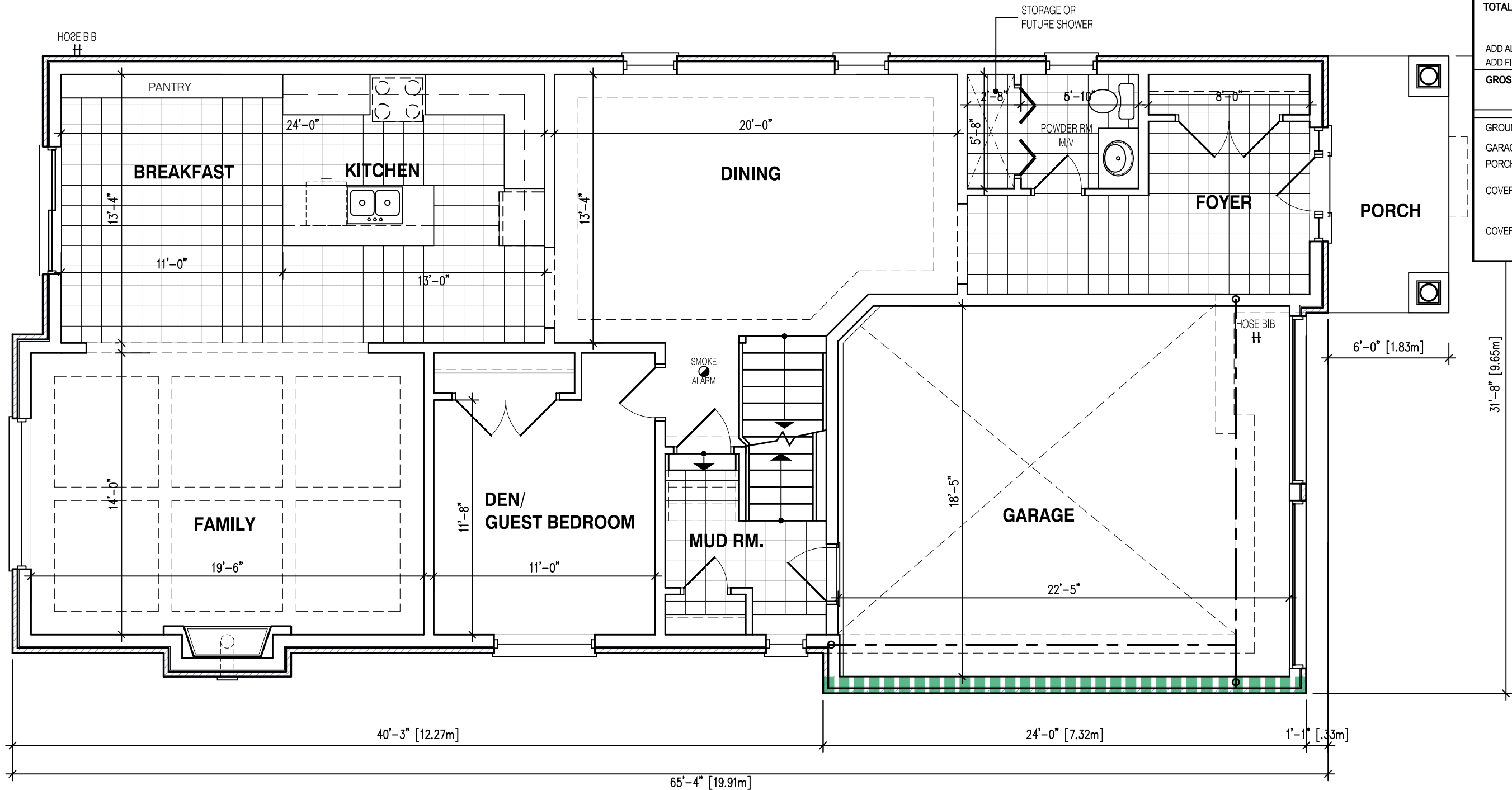
GROUND FLOOR AREA	=	1509 SQ. FT.
SECOND FLOOR AREA	=	1848 SQ. FT.
TOTAL FLOOR AREA	=	3357 SQ. FT.
	=	311.88 m ²
ADD ALL OPEN AREAS	=	0 SQ. FT.
ADD FIN. BASEMENT AREA	=	0 SQ. FT.

GROSS FLOOR AREA	=	3357.00 SQ. FT.
	=	311.88 m ²

GROUND FLOOR COVERAGE	=	1509 SQ. FT.
GARAGE COVERAGE / AREA	=	446 SQ. FT.
PORCH COVERAGE / AREA	=	77 SQ. FT.

COVERAGE W/O PORCH	=	1955 SQ. FT.
	=	181.63 m ²

COVERAGE W/ PORCH	=	2032 SQ. FT.
	=	188.78 m ²



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FIRST FLOOR PLAN

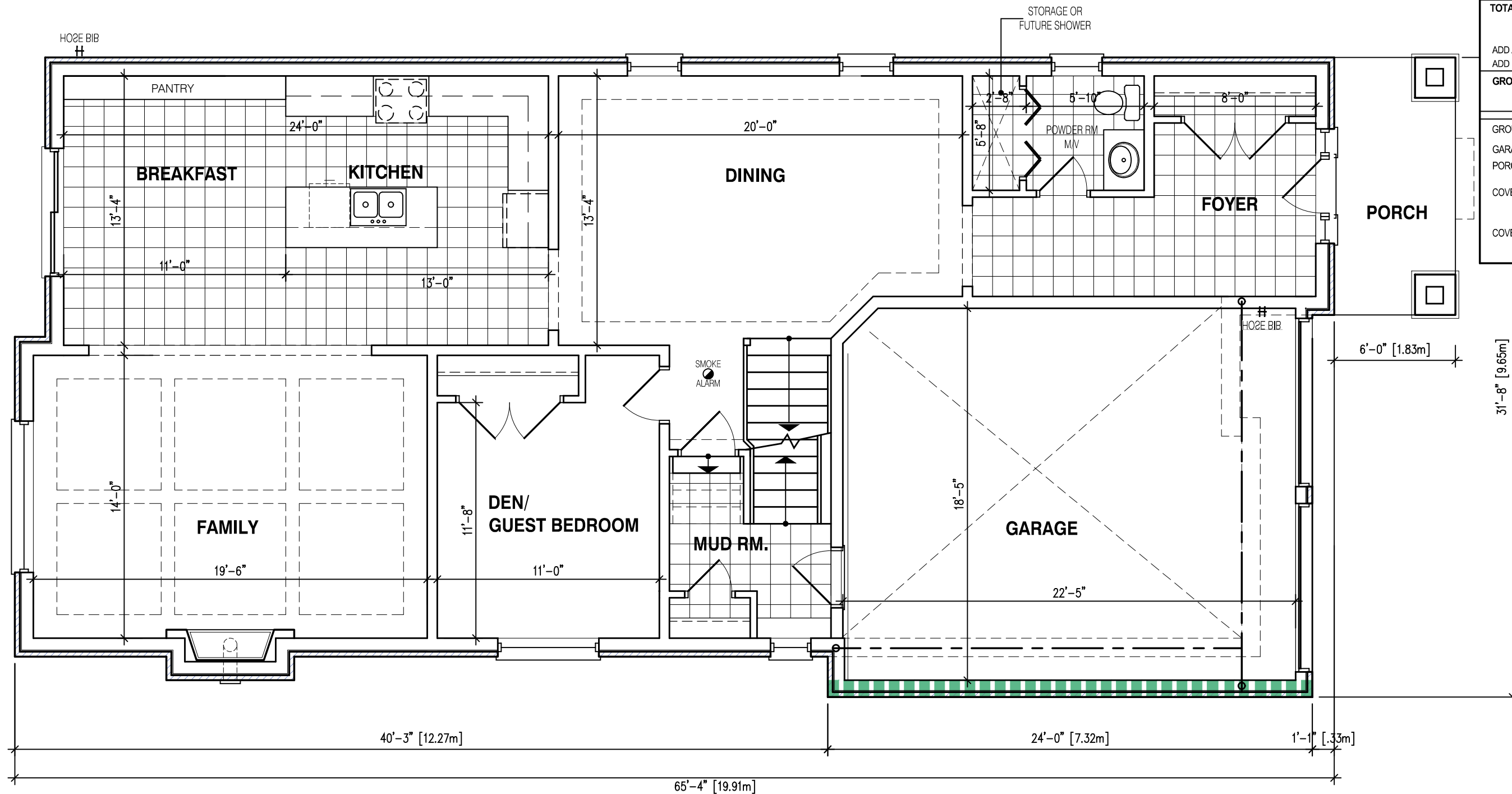
MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)



MODEL SINGLE
SCALE: 3/16"=1'-0"
PROJ. No. 25-11
DWG. No. 2A

11.55m LOT 3

AREA CALCULATIONS (ELEV. 3)	
GROUND FLOOR AREA	= 1509 SQ. FT.
SECOND FLOOR AREA	= 1855 SQ. FT.
TOTAL FLOOR AREA	= 3364 SQ. FT.
	= 312.53 m ²
ADD ALL OPEN AREAS	= 0 SQ. FT.
ADD FIN. BASEMENT AREA	= 0 SQ. FT.
GROSS FLOOR AREA	= 3364.00 SQ. FT.
	= 312.53 m ²
GROUND FLOOR COVERAGE	= 1509 SQ. FT.
GARAGE COVERAGE / AREA	= 446 SQ. FT.
PORCH COVERAGE / AREA	= 77 SQ. FT.
COVERAGE W/O PORCH	= 1955 SQ. FT.
	= 181.63 m ²
COVERAGE W/ PORCH	= 2032 SQ. FT.
	= 188.78 m ²



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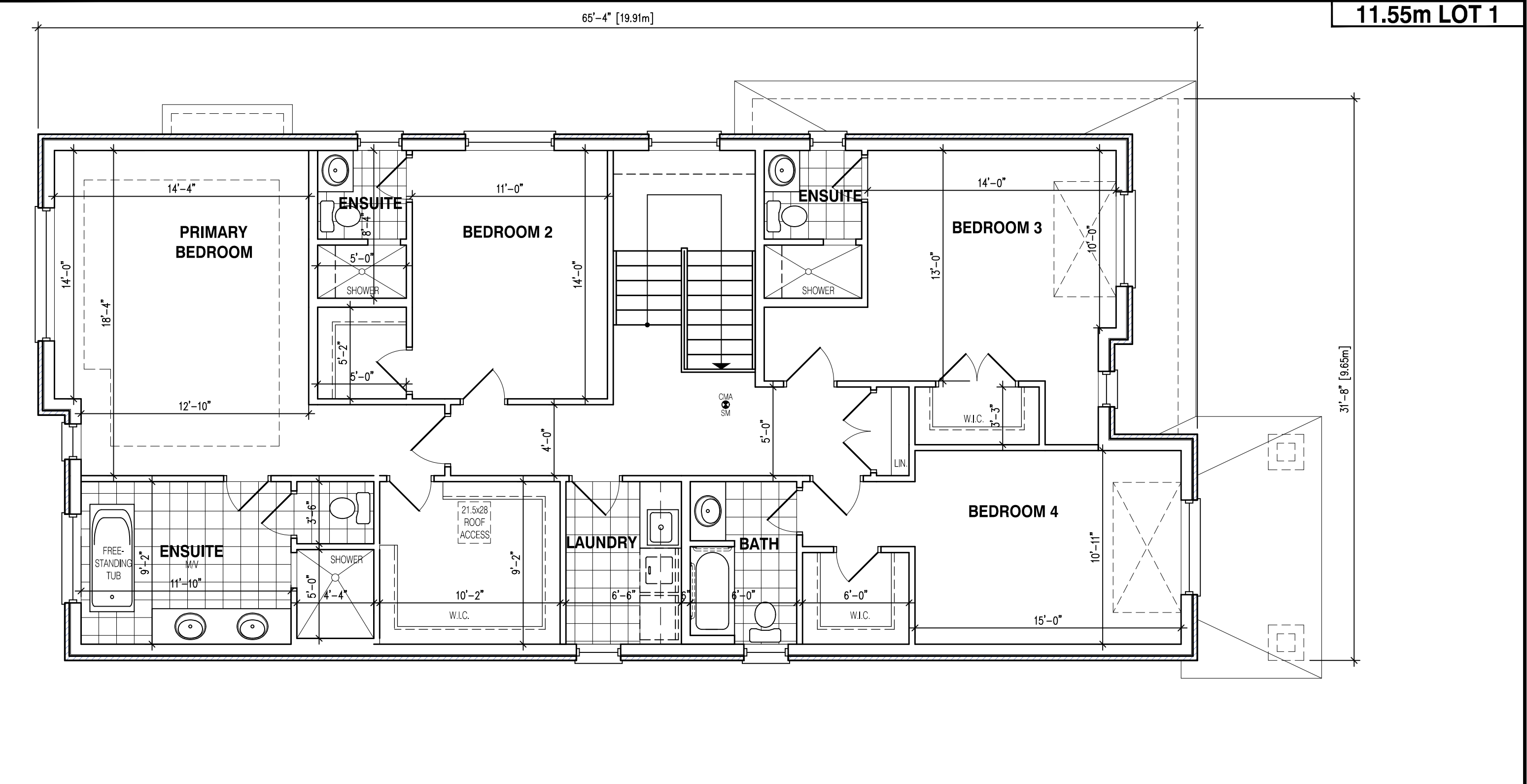
jardin
DESIGN GROUP INC
64 JARDIN DR. SUITE 3A
VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
EMAIL: info@jardindesign.ca

FIRST FLOOR PLAN

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)



MODEL SINGLE
SCALE: 3/16"=1'-0"
PROJ. No. 25-11
DWG. No. 2B



SECOND FLOOR PLAN

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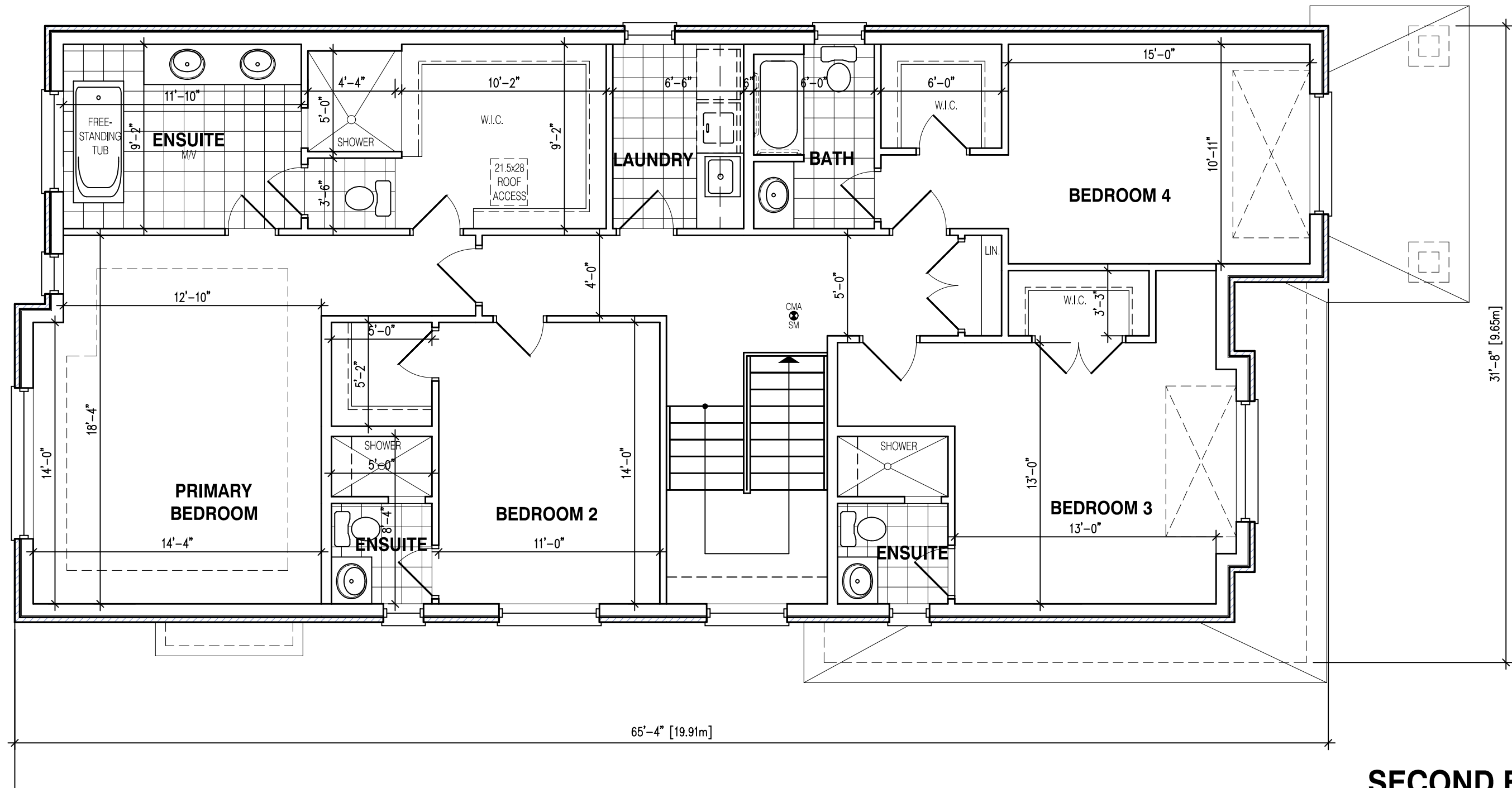
DESIGN GROUP INC

64 JARDIN DR. SUITE 3A
VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
EMAIL: info@jardindesign.ca

SECOND FLOOR PLAN

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)

MODEL
SINGLE
SCALE:
3/16"=1'-0"
PROJ. No.
25-11
DWG. No.
3



SECOND FLOOR PLAN

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DRAWING NAME: --

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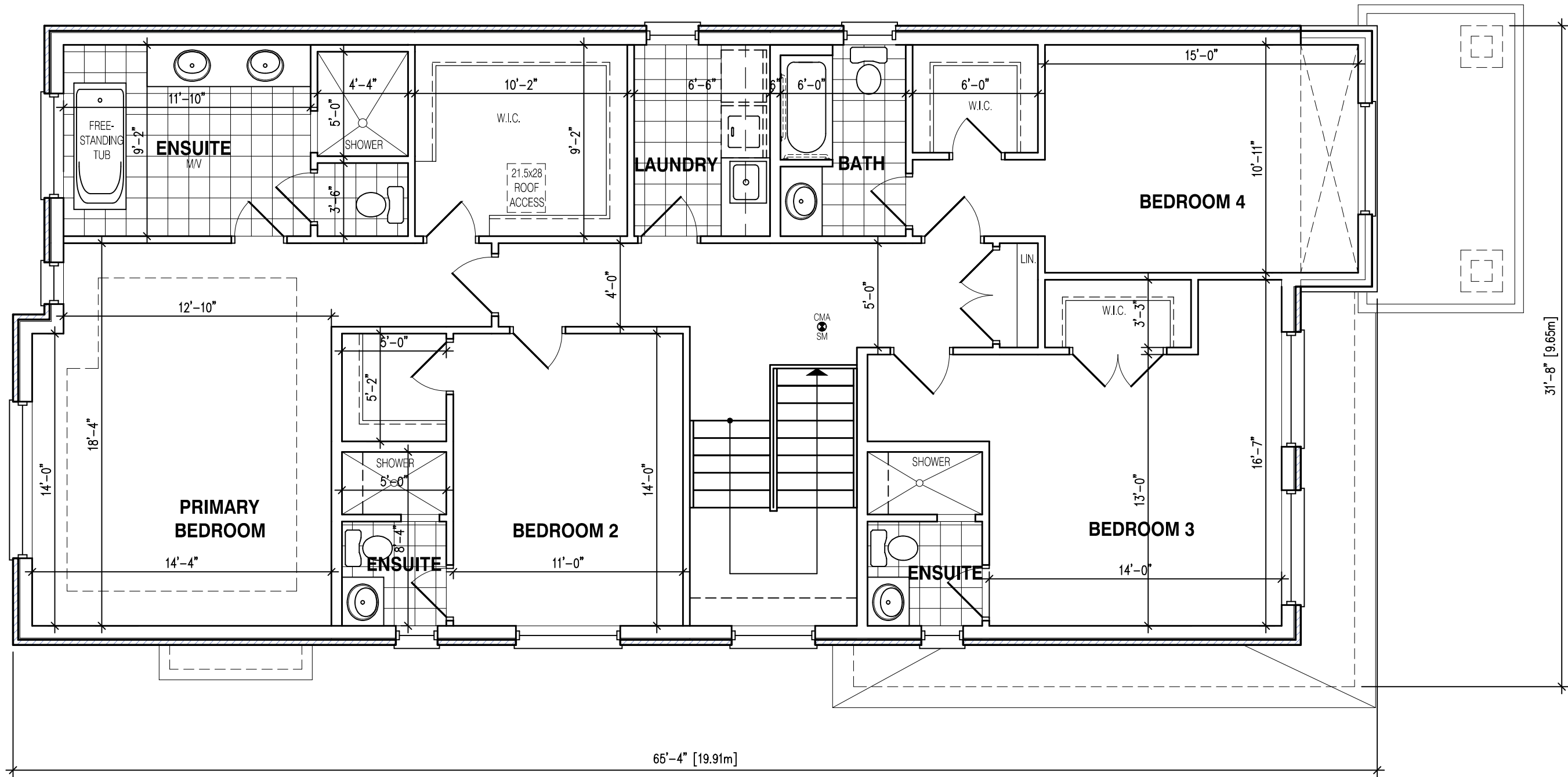
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SECOND FLOOR PLAN

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)



MODEL SINGLE
SCALE: 3/16" = 1'-0"
PROJ. No. 25-11
DWG. No. 3A



SECOND FLOOR PLAN

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No: DATE: WORK DESCRIPTION:

PRELIMINARY

jardin
DESIGN GROUP INC
64 JARDIN DR. SUITE 3A
VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
EMAIL: info@jardindesign.ca

SECOND FLOOR PLAN

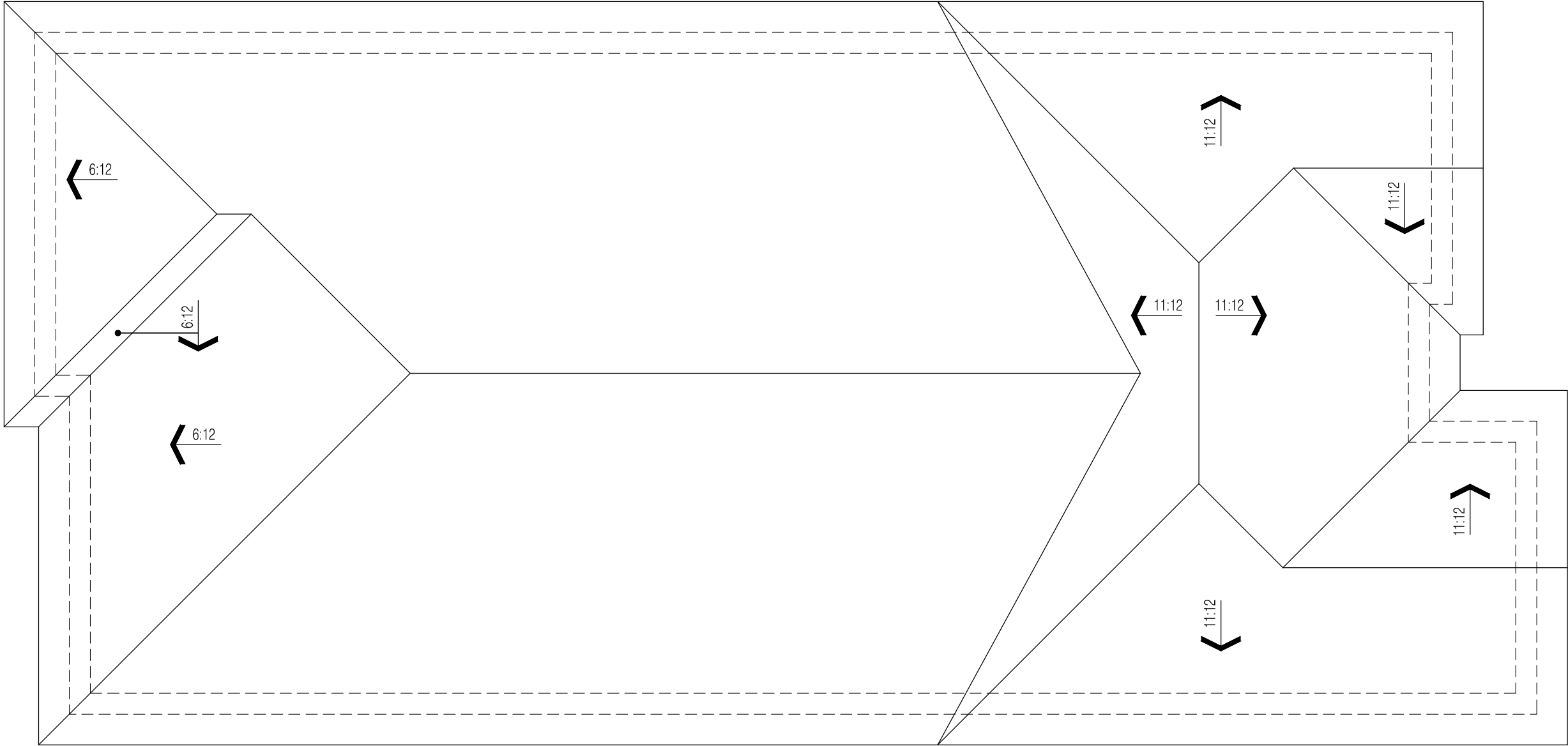
MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)

BILD

MODEL SINGLE
SCALE: 3/16"=1'-0"
PROJ. No. 25-11
DWG. No. 3B

11.55m LOT 1

NOTE:
THESE DRAWINGS ARE TO BE READ IN
CONJUNCTION WITH ENGINEER APPROVED
ROOF TRUSS LAYOUT BY MANUFACTURER



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PRELIMINARY

jardin
DESIGN GROUP INC
64 JARDIN DR. SUITE 3A
VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
EMAIL: info@jardindesign.ca

ROOF PLAN

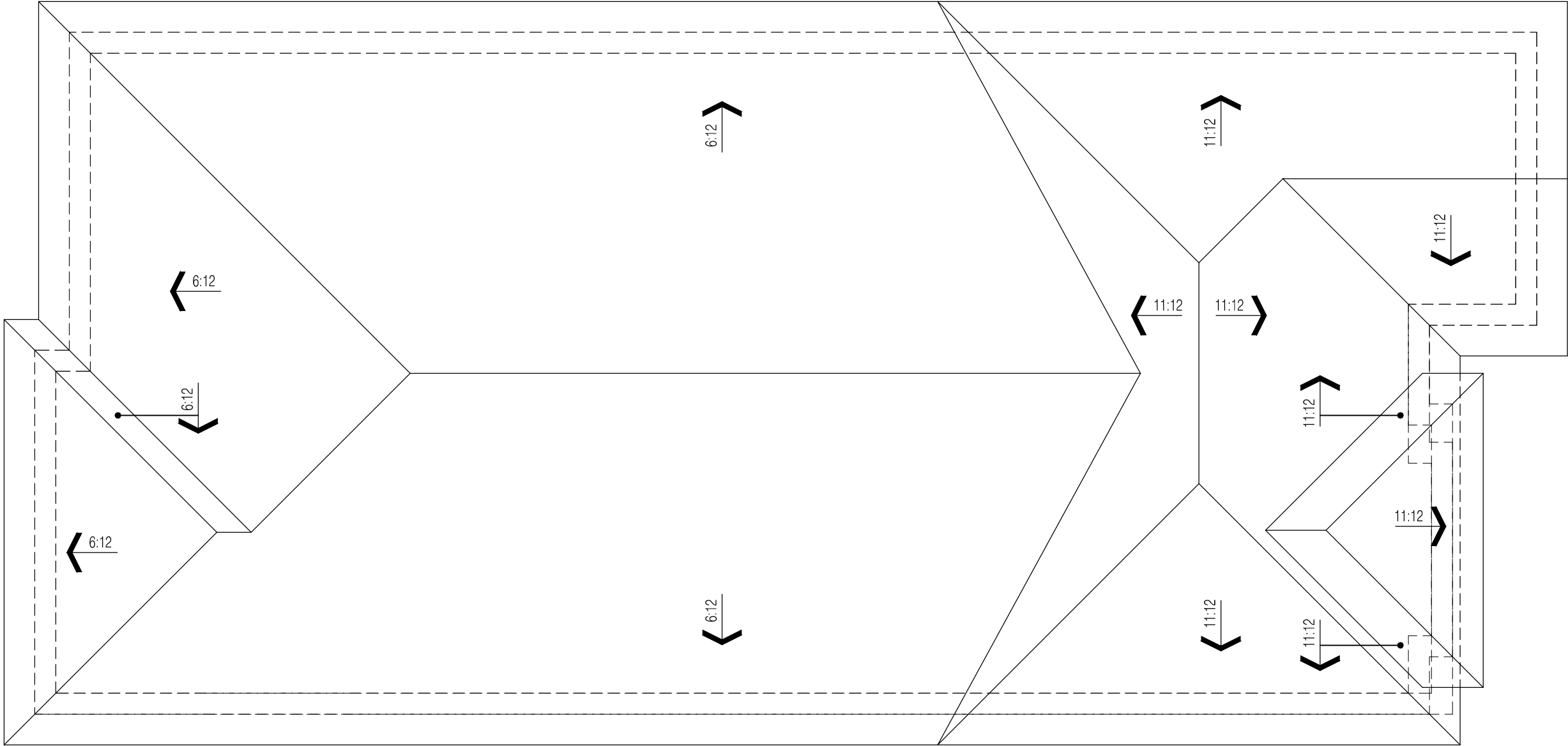
MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)

 **BILD**

MODEL SINGLE
SCALE: 3/16"=1'-0"
PROJ. No. 25-11
DWG. No. 4

11.55m LOT 2

NOTE:
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CONJUNCTION WITH ENGINEER APPROVED
ROOF TRUSS LAYOUT BY MANUFACTURER



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		WORK DESCRIPTION:

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EMAIL: info@jardindesign.ca

ROOF PLAN

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)



MODEL
SINGLE

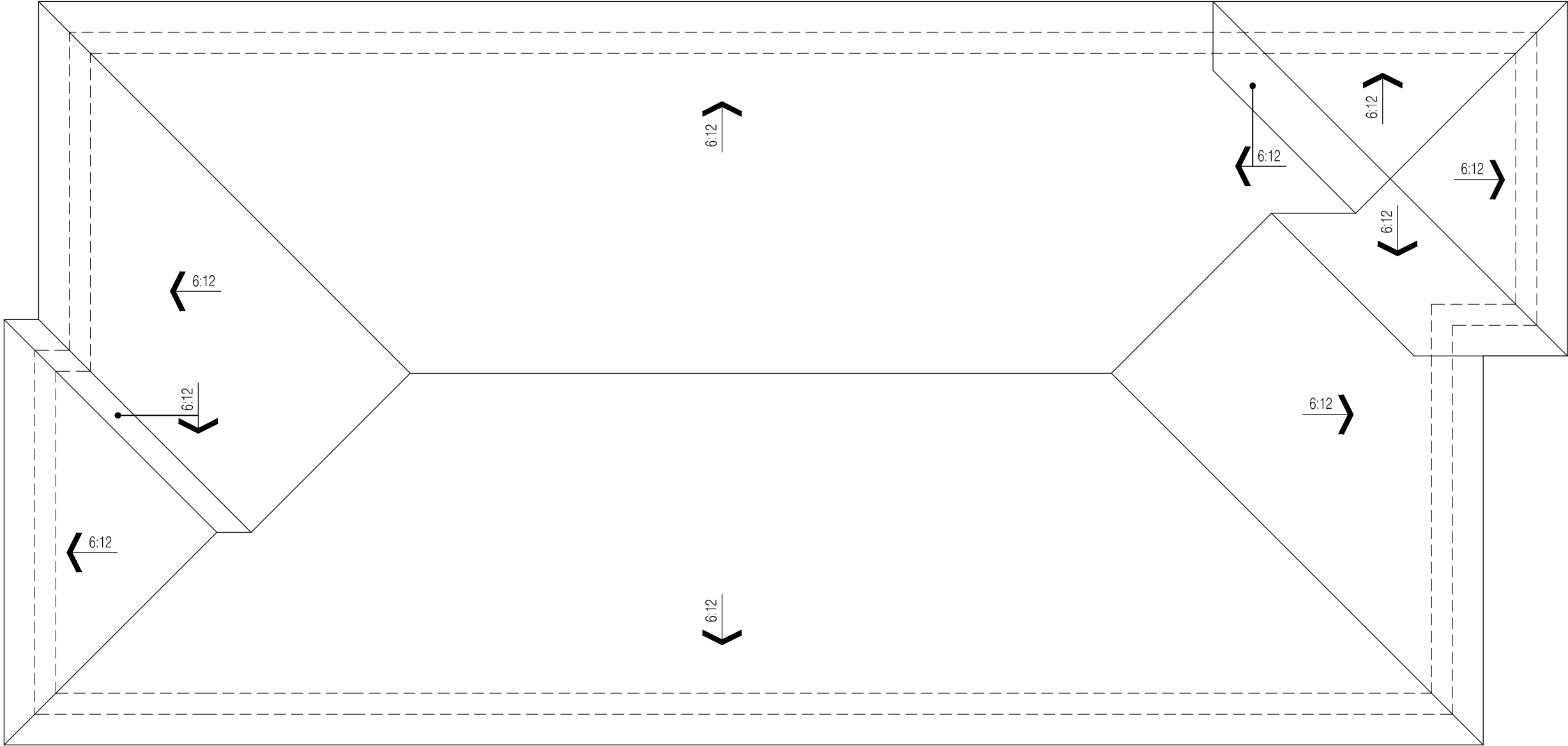
SCALE:
3/16"=1'-0"

PROJ. No.
25-11

DWG. No.
4A

11.55m LOT 3

NOTE:
THESE DRAWINGS ARE TO BE READ IN
CONJUNCTION WITH ENGINEER APPROVED
ROOF TRUSS LAYOUT BY MANUFACTURER



THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS ON SITE BEFORE PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO JARDIN DESIGN GROUP INC. PRIOR TO COMMENCEMENT OF WORK.

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No: DATE: WORK DESCRIPTION:		

PRELIMINARY

jardin
DESIGN GROUP INC
64 JARDIN DR. SUITE 3A
VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
EMAIL: info@jardindesign.ca

ROOF PLAN

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)



MODEL
SINGLE

SCALE:
3/16"=1'-0"

PROJ. No.
25-11

DWG. No.
4B



MODEL A -
FRONT ELEVATION 1

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PRELIMINARY

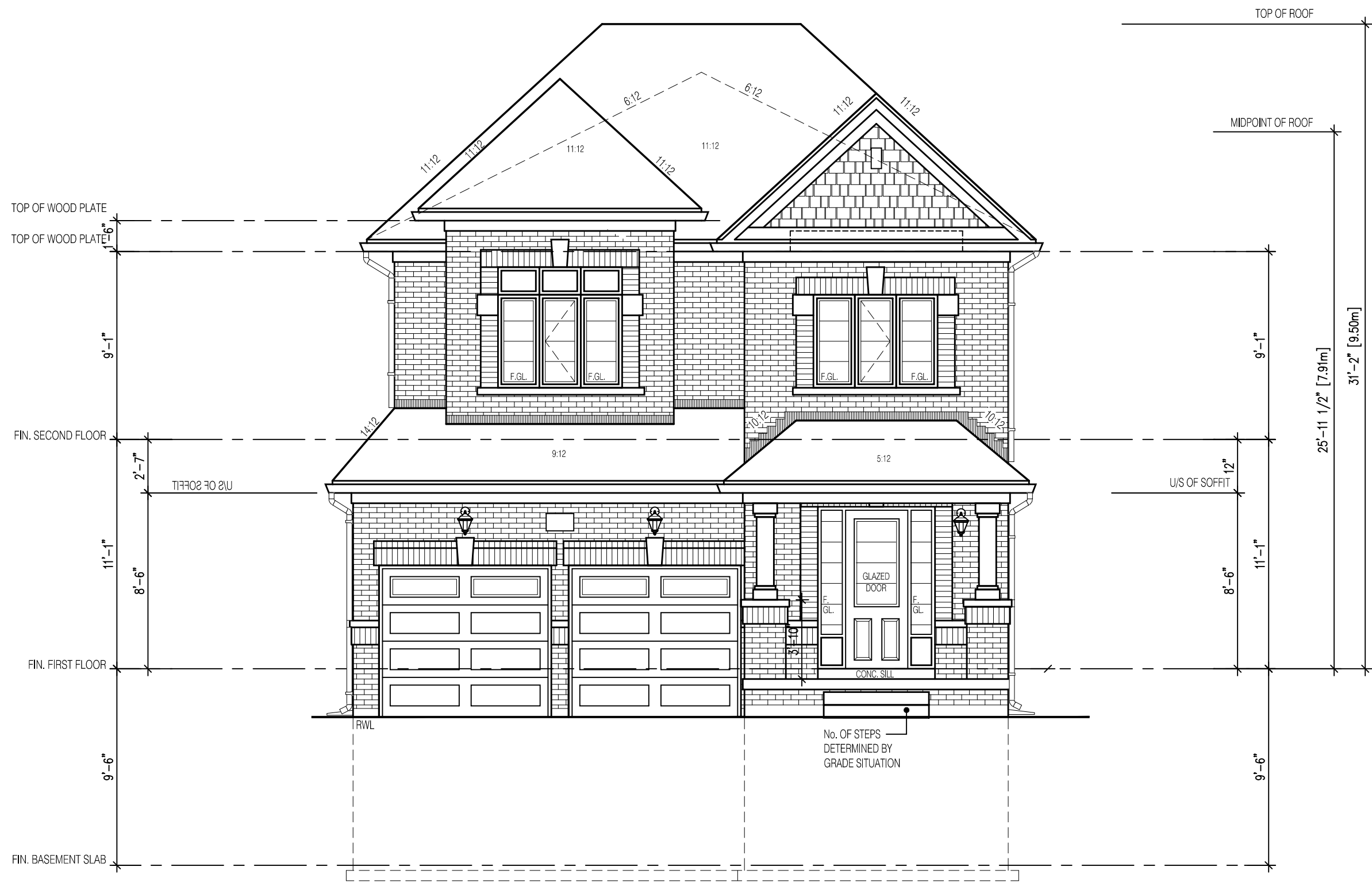
jardin
DESIGN GROUP INC
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VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
EMAIL: info@jardindesign.ca

FRONT ELEVATION

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)



MODEL SINGLE	
SCALE: 3/16"=1'-0"	
PROJ. No. 25-11	DWG. No. 5



MODEL A -
FRONT ELEVATION 2

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DRAWN BY: DRAWING NAME: ---

PRELIMINARY

jardin
DESIGN GROUP INC
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VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
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FRONT ELEVATION	
MARVEL HOMES 1794 APPLEVIEW ROAD (PICKERING)	
	MODEL SINGLE
	SCALE: 3/16" = 1'-0"
	PROJ. No. DWG. No. 25-11 5A



MODEL A -
FRONT ELEVATION 3

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FRONT ELEVATION

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)

BILD

MODEL SINGLE	DWG. No. 5B
SCALE: 3/16"=1'-0"	
PROJ. No. 25-11	



RIGHT SIDE ELEVATION 1

<div>THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS ON SITE BEFORE PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO JARDIN DESIGN GROUP INC. PRIOR TO COMMENCEMENT OF WORK.</div> <div>JARDIN DESIGN GROUP INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF SURVEY, STRUCTURAL OR ENGINEERING INFORMATION SHOWN ON THESE DRAWINGS OR FOR CONSTRUCTION STARTED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT. REFER TO THE APPROPRIATE ENGINEERING DRAWINGS BEFORE PROCEEDING WITH WORK.</div> <div>AS CONSTRUCTED INVERTS MUST BE VERIFIED PRIOR TO POURING FOOTINGS.</div> <div>JARDIN DESIGN GROUP INC. HAS NOT BEEN RETAINED TO CARRY OUT GENERAL REVIEW OF THE WORK AND ASSUMES NO RESPONSIBILITY FOR THE FAILURE OF THE CONTRACTOR OR SUB CONTRACTOR TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.</div> <div>THIS DRAWING IS AN INSTRUMENT OF SERVICE, IS PROVIDED BY AND IS THE PROPERTY OF JARDIN DESIGN GROUP INC. THIS DRAWING IS NOT TO BE SCALED.</div>	7		
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No. DATE: WORK DESCRIPTION:			

UNPROTECTED OPENINGS		
WALL AREA	1263.29	Φ
ALLOWABLE WINDOW AREA @ 7.0%(1.25m SIDEYARD)	88.43	Φ
ACTUAL GLAZED AREA	41.61	Φ

<div>jardin</div> <div>DESIGN GROUP INC</div> <div>64 JARDIN DR. SUITE 3A</div> <div>VAUGHAN ONT. L4K 3P3</div> <div>TEL: 905 660-3377 FAX: 905 660-3713</div> <div>EMAIL: info@jardindesign.ca</div>	
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RIGHT SIDE ELEVATION		
MARVEL HOMES		
1794 APPLEVIEW ROAD (PICKERING)		
<div><div></div><div>BILD®</div></div>	MODEL SINGLE	
	SCALE: 3/16"= 1'-0"	
	PROJ. No.	DWG. No.
	25-11	6



RIGHT SIDE ELEVATION 2

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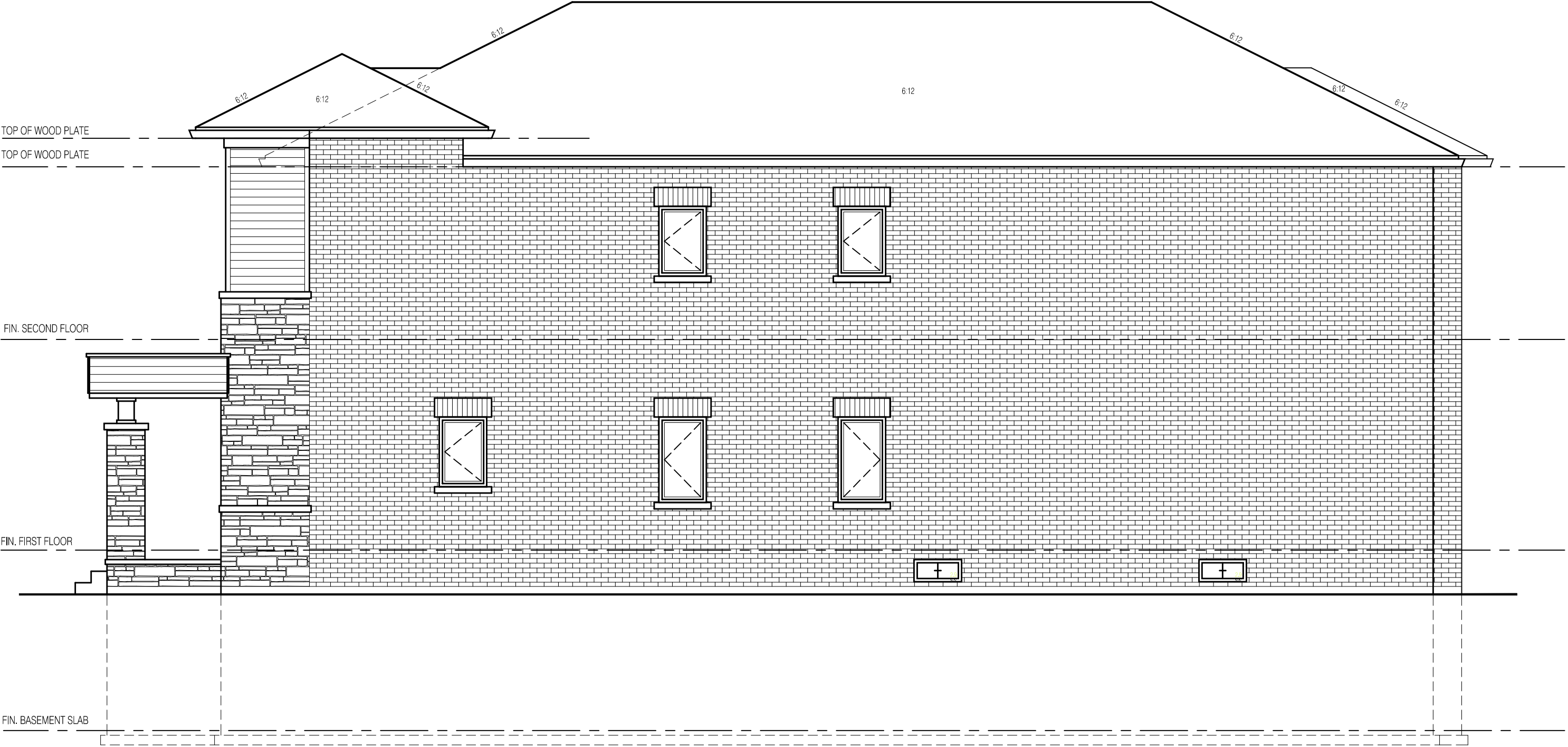
jardin
DESIGN GROUP INC
64 JARDIN DR. SUITE 3A
VAUGHAN ONT. L4K 3P3
TEL: 905 660-3377 FAX: 905 660-3713
EMAIL: info@jardindesign.ca

RIGHT SIDE ELEVATION

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)



MODEL SINGLE
SCALE: 3/16"=1'-0"
PROJ. No. 25-11
DWG. No. 6A



RIGHT SIDE ELEVATION 3

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TEL: 905 660-3377 FAX: 905 660-3713
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RIGHT SIDE ELEVATION

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)



MODEL SINGLE	
SCALE: 3/16"=1'-0"	
PROJ. No. 25-11	DWG. No. 6B



LEFT SIDE ELEVATION 1

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UNPROTECTED OPENINGS

WALL AREA1213.62

ALLOWABLE WINDOW AREA @ 7.0%(1.25m SIDEYARD)84.95

ACTUAL GLAZED AREA83.22


jardin

DESIGN GROUP INC

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LEFT SIDE ELEVATION

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)

BILD

MODEL
SINGLE

SCALE:
3/16"=1'-0"


PROJ. No.
25-11

DWG. No.
8

DRAWN BY: DRAWING NAME: ---



LEFT SIDE ELEVATION 2

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No. DATE: WORK DESCRIPTION:											



LEFT SIDE ELEVATION 3

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LEFT SIDE ELEVATION

MARVEL HOMES
1794 APPLEVIEW ROAD (PICKERING)



MODEL SINGLE
SCALE: 3/16"=1'-0"
PROJ. No. 25-11
DWG. No. 8B

SCS Consulting Group Ltd
30 Centurian Drive, Suite 100
Markham, ON, L3R 8B8
Phone 905 475 1900
Fax 905 475 8335