
Servicing Strategy Brief

**20 Scott Street
Town of Grand Valley**

January 2018



1315 Bishop Street North, Suite 202
Cambridge, ON N1R 6Z2

t 519.623.1140
f 519.623.7334
www.meritech.ca

Project No.: 4584



January 5, 2018

Damadaro (Euclid) Inc.
1081 Bloor Street Suite 200
Toronto, ON M6H 1M5

Attention: Mr. Daniel Hrycyna

Dear Mr. Hrycyna,

**Re: Servicing Strategy Brief
20 Scott Street
Town of Grand Valley**

Please find our Servicing Strategy Brief for the above-noted project, in support of the Site Plan Application.

This document identifies constraints related to sanitary sewerage, water supply and storm drainage/stormwater management. It also considers grading constraints and utility availability. Where necessary, reasonable assumptions based on normal industry practices have been used and are described as such.

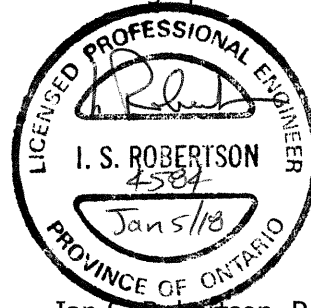
It is our opinion that adequate services exist to support this project. Recommendations from our report shall be incorporated into the detailed design phase of the project, following approval of this servicing strategy.

Yours very truly,

MERITECH ENGINEERING

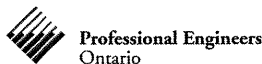
Michael Mosco, MASc, EIT
Engineering Designer

MJM/sb
Enclosures (0)



Ian S. Robertson, P.Eng.
Director of Engineering

WWW.MERITECH.CA



Executive Summary

The 1.18 hectare property is located at the corner of Crozier and Scott Street in the Town of Grand Valley, County of Dufferin. The majority of the subject site is presently a vacant field, with the exception of an existing dwelling and driveway on the property fronting Scott Street. The existing single family dwelling is proposed to be demolished as part of the proposed onsite works.

The proposed works are to include a residential development consisting of both townhouse and single detached dwellings serviced by a private road.

One service connection for water and sanitary sewer will be required to service the internal site, both connected from existing municipal infrastructure located in Scott Street. Each of the townhouse units are proposed to be serviced with individual connections to the internal private infrastructure. The four lots fronting Scott Street are proposed to be severed and will be serviced with individual connections. An internal hydrant provides adequate flow and pressure as per MOE and municipal guidelines for firefighting supply. Review of the sanitary and water services in the Town indicate there may be capacity issues; serviceability for the proposed development is unknown until the additional flows/demands are added to the existing municipal infrastructure model.

The internal storm sewer on the site is proposed to be sized for the 100-year storm event and will discharge to the proposed stormwater management facility. There are two proposed options for storm outlet from the facility that are to be considered. The first option is to infiltrate all of the stormwater from the site and the second option is to pump stormwater to an existing storm sewer on Crozier Street.

The stormwater management strategy consists of quality control provided by an oil/grit separator and a underground stormwater tank to attenuate various storm events up to the 100-year. Stormwater will either be infiltrated or pumped to the existing storm sewer on Crozier Street.

Review of the draft Geotechnical Report indicates that native soils are conducive to infiltration and that infiltration is recommended onsite to restore the pre-development water balance. A water balance can be provided through the use of soak away pits and/or an end of pipe infiltrating facility.

Agencies shall review and approve this brief as a suitable approach to proceed for detailed design for site plan approval.

Disclaimer

This Servicing Strategy Report was prepared by Meritech Engineering for Damadaro (Euclid) Inc. The comments, recommendations and materials presented in this report reflect our best judgement in light of the information available at the time of preparation. Except for approval and commenting municipalities and agencies in their review and approval of this project, any use which a third party makes of this report, or any reliance upon, or decisions as a result of, are the responsibility of such third parties. Meritech Engineering accepts no responsibility for damages suffered by any third party, other than an approval or commenting municipality or agency, as a result of decisions made or actions taken based on this report.

Use and Reproduction of This Document

No part of this report may be reproduced, stored in a retrieval system, or transcribed in any form, or by means including electronic, mechanical, photocopying, recording and scanning without the prior written approval of the author.

For Further Information

For further information regarding this report please contact the author at the following address:

Meritech Engineering

Attention: Mr. Ian S. Robertson, P.Eng.
Director of Engineering
1315 Bishop Street North, Suite 202
Cambridge, ON N1R 6Z2
t (519) 623-1140
f (519) 623-7334
email: ianr@meritech.ca

Table of Contents

Introduction	2
Background.....	3
Objectives and Criteria	4
Sanitary Servicing.....	4
Water Servicing.....	5
Storm Servicing.....	5
Stormwater Management.....	5
Water Budget and Infiltration	6
Grading and Drainage.....	6
Utilities	6
Discussion	6
Site Design	6
Sanitary Servicing.....	7
Water Servicing.....	7
Storm Servicing.....	8
Stormwater Management.....	9
Water Quantity	9
Water Quality	9
Water Balance, Infiltration, and Groundwater	9
Grading and Drainage.....	9
Site Erosion and Sediment Control.....	10
Utilities	10
Conclusions and Recommendations	11

List of Figures

Figure 1: Site Location	2
Figure 2: Existing Conditions via Scott Street.....	4

List of Tables

Table 1: Average Daily Flows.....	7
-----------------------------------	---

Appendices

- Appendix A: Conceptual Site Plan
- Appendix B: Conceptual Design Drawings
- Appendix C: Calculations
- Appendix D: Geotechnical Report

Introduction

The 1.18 hectare property is located at the corner of Crozier and Scott Street in the Town of Grand Valley, County of Dufferin. The majority of the subject site is presently a vacant field with the exception of an existing dwelling and driveway on the property fronting Scott Street. The existing single family dwelling is proposed to be demolished.

The surface condition of the subject site can be generally described as having steeply sloped topography with approximately 10 meters of fall between Crozier Street and Scott Street. Based on review of the GRCA contour mapping, the west part of the property slopes from Crozier Street towards an existing low point on Scott Street. The north part of the property slopes in a southerly direction towards Scott Street with a majority of the drainage outletting at the same location.

The subject site has been identified for urban residential settlement use by the Town of Grand Valley Official Plan, last consolidated in February 2014.

The site is proposed to be redeveloped to include a residential development consisting of townhouses serviced by a private road and single detached dwellings created through the severance process.

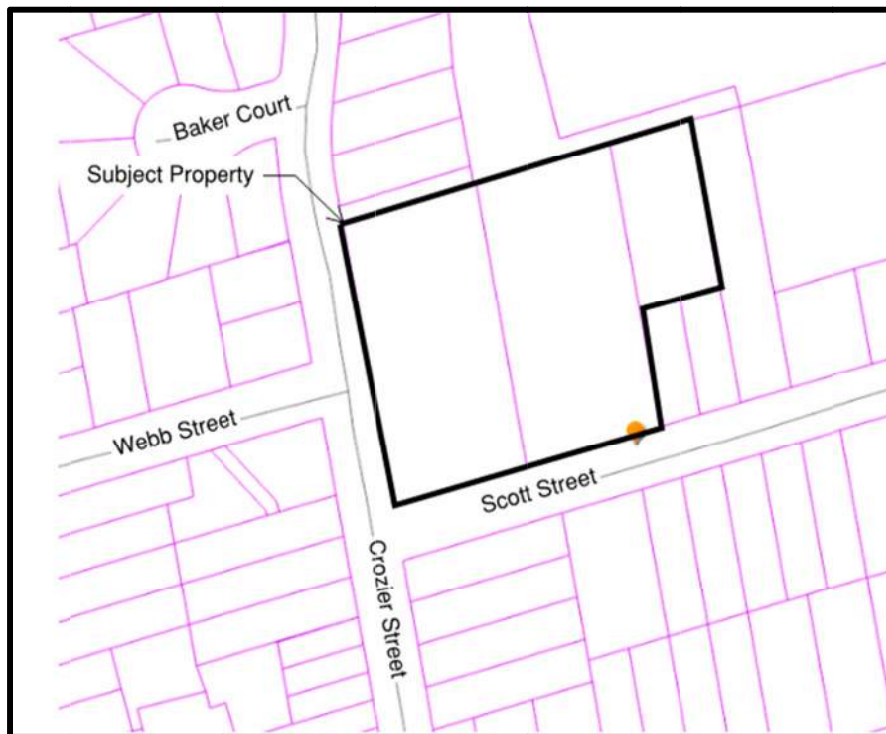


Figure 1: Site Location

Background

The following documents were reviewed and their conclusions and recommendations incorporated into the Functional design. These documents comprise the Design Criteria for the project.

Engineering Standards – Town of Grand Valley, 2016

This manual provides design guidelines for servicing and grading of developments.

Stormwater Management Planning and Design Manual, Ministry of the Environment, 2003

This manual provides guidelines on the planning and design of stormwater management facilities in Ontario.

Greater Golden Horseshoe Area Conservation Authority Erosion & Siltation Control Guideline for Urban Construction, December 2006

This document describes the methodology for determining the erosion potential of a site and the measures that should be undertaken to mitigate construction disturbance.

Preconsultation

Comments from the Town of Grand Valley have been incorporated into the following chapter 'Objectives and Criteria'.

Geotechnical

Chung and Vander Doelen Engineering have been retained to complete a geotechnical study for this site. Review of geotechnical investigation suggests that some areas of the site are suitable for infiltration. Select pages of the geotechnical report have been included in Appendix D.

Reconnaissance

A topographic survey of the property has not been completed at the time of this report.

Meritech staff have yet to visit the site in order to verify existing drainage patterns of the site and adjacent properties, to confirm existing infrastructure surrounding the site, and to make note of all aboveground features on neighbouring properties. Shown in Figure 2 are existing conditions as of date. This will be completed as part of our base plan walk once a topographic survey for the site is complete.



Figure 2: Existing Conditions via Scott Street

Objectives and Criteria

This section outlines the objectives and criteria for the wide variety of issues considered in this report; the following Discussion section will demonstrate how the objectives presented have been achieved and how the criteria are met.

Sanitary Servicing

The Town is currently serviced by the existing Grand Valley Wastewater Treatment Plant which was commissioned in July 2011. At that time, the treatment plan had an average daily flow rating of 1,244m³, designed for a population of 2,950.

R.J. Burnside prepared a Technical Memo to the Town in May 2014 providing an assessment of available capacity at the wastewater treatment plant. The update included details on the population demands, wastewater flows and the capability of the treatment plant to accommodate future planned developments. This Memo indicated that the existing plant will need to be upgraded to manage future flow and capacity requirements.

The subject property is within the existing town service boundary and an existing 200mm sanitary sewer is located on Scott Street which can service the site. The Memo indicates that future development areas will drain into the existing sanitary sewer network that services the subject property and future upgrades to the gravity sanitary sewer are proposed.

Water Servicing

There are two objectives regarding water servicing: provide domestic water supply as per Provincial, and municipal requirements, and ensure that an adequate fire-fighting water supply is available as per Ontario Building Code and other municipal requirements.

A Technical Memo retained by R.J. Burnside & Associates Limited completed in May 2014 reflects recent historical water demands and wastewater flows, incorporate amendments undertaken to the Town's Official Plan. The Memo outlines the existing water supply system consisting of 3 wells; Cooper Street Pumphouse wells (PW1 and PW2) which do not operate at the same time and the Melody Lane Pumphouse well (PW3). The well supply has a maximum capacity of 2,944m³/day and a firm capacity of 1,963 m³/day. A water tower with a storage capacity of 1,600m³ and high water level of 519.3m located off County Road 25, north of Fife Road functions as part of the distribution system water storage and supplements the well supply during high demand periods.

The existing and future water service demands were analysed by R.J. Burnside and it was determined that the existing infrastructure would not be able to meet the future demand and that additional water supply, treatment, and storage be implemented to meet the future requirements. The Memo recommends the construction of a new water tower, with similar capacity and storage to the existing tower, at the south end of the Town to accommodate the future demands of the Town.

The subject property is within the existing town service boundary and existing 150mm watermains are located on both Crozier and Scott Street which can service the site.

Storm Servicing

The primary objective with respect to storm servicing is that a storm sewer system servicing the site can be constructed as per MOECC and the Town of Grand Valley standards. The subject property currently drains to a localized low point on Scott Street where water is conveyed to an existing storm catchbasin. Plan/Profile information obtained from the Town does not show any storm sewer on Scott Street. Until such time this catchbasin on Scott Street can be confirmed by the Town as a suitable stormwater outlet it will not be proposed as an outlet for the development.

Stormwater Management

Stormwater techniques have evolved considerably in the past 20 years. Peak flow control is not necessarily the only component of a complete stormwater management solution. In accordance with Section 5.2.1 of the MOE manual, modern techniques include a 'treatment-train' approach of lot-level controls, water balance and infiltration, and water quality enhancement. The proposed SWM facility will be designed to provide the required level of control as per the requirements of the Ministry of the Environment (MOE), Grand River Conservation Authority (GRCA) and Town of Grand Valley.

The stormwater criteria has yet to be established for this development.

The site is proposed to be serviced by an internal storm sewer system discharging to a stormwater management facility to provide the required quality and quantity control. Two options for the ultimate outlet from the site will be presented in a later section.

Water Budget and Infiltration

It is anticipated that the GRCA will require water budget calculations to demonstrate that the annual average pre-development infiltration rate is maintained on the site.

A review of the geotechnical report suggests that some areas of the site are suitable for infiltration.

Grading and Drainage

The primary purpose of the grading on the site is to accommodate the proposed development, allowing surface flows to sufficiently drain away from proposed buildings and discharge via storm sewer or overland flow to a proposed stormwater management facility located at the lowest point.

Utilities

The following utility companies are required to confirm their ability to service the development:

- Orangeville Hydro
- Bell Canada
- Rogers Cable
- Union Gas

Discussion

Site Design

The proposed development consists of a mix of lots for townhomes and single detached dwellings. The lot frontages for the detached residential dwellings will range from 35 to 50 feet along a proposed private condo road connecting to Scott Street. The townhomes are proposed to have dual frontages, a roof top terrace facing Crozier Street and driveway entrance from the proposed internal road. An area located in the south east corner of the subject site has been proposed for a stormwater management facility to treat stormwater runoff.

The site configuration is shown in the Conceptual Site Plan in Appendix A. The conceptual servicing and grading plan shown in Appendix B provides a high level detail regarding the grading and servicing intents on the site.

Sanitary Servicing

An existing residential dwelling on the property is serviced by a municipal sanitary connection via Scott Street. A new sanitary service connection from the existing 200mm sewer will be located on Scott Street and will provide the required gravity sanitary sewer drainage for the internal site. The proposed lots fronting Scott Street are to be severed and will be serviced with individual connections.

Based on the unit counts provided by the Conceptual Site Plan, post-development peak flows were used by applying peaking factors to the average day demands shown in Table 1. The design criteria of the Town of Grand Valley and the Ministry of the Environment were used for the determination of sanitary flows leaving the site. The flows were calculated based on total development area and the proposed number of units which were combined to provide a total site peak flow discharge.

Unit Type	Flow	Area	Design Flow (L/s)	Peaking Factor	Peak Flow (L/s)
Residential - Singles	450L/cap/day	12 units x 4ppu	0.25	4.0	1.0
Residential - Towns	450L/cap/day	12 units x 4ppu	0.25	4.0	1.0
Infiltration	0.20L/s/ha	1.18	0.24	-	0.24
					Total: 2.24

Table 1: Average Daily Flows

The proposed development of 12 townhouses and 12 single detached units will generate peak flows of approximately 2.24 L/s. This peak flow rate is about 7% of the capacity of the 200mm diameter sewer servicing the site. Further details of this calculation are shown in Appendix C. The Conceptual Grading and Servicing Plan in Appendix B shows a layout that can adequately service the development.

Water Servicing

The site is proposed to be serviced by a single watermain connection from Scott Street. The proposed internal watermain is 150mm diameter which will be connected to an internal hydrant. Individual 25mm watermain service connections will supply each of the individual townhomes and single family homes. The proposed lots fronting Scott Street are proposed to be severed and will be serviced with individual connections. The Site Servicing Plan is included to show the proposed watermains for the development.

An internal hydrant is required, as the straight-line distance between the closest existing hydrant and the furthest main building entrance exceeds the Ontario Building Code (OBC) maximum of 90 metres.

Watermain junction modeling information or a flow test is required to determine the available water supply at the hydrant closest to the site. The site borders water noddle

junctions J-11, J-12, and J-13. A single watermain connection is proposed from Scott Street between J-11 and J-12. This information will be used to demonstrate that the water distribution system and proposed internal water system is able to provide domestic supply and fire protection.

Storm Servicing

The site is proposed to be serviced by an internal storm sewer system, designed for the 100-year storm event which will discharge to a stormwater management facility to provide the required quality and quantity control. The purpose of the oversized storm sewer is to collect runoff in all storm events from the internal road and re-direct flows to the stormwater management facility.

There are two options that can be further explored to outlet the stormwater from the proposed stormwater management facility.

Option 1

The infiltration of all stormwater onsite through the use of an underground infiltration gallery located within the stormwater management block. Stormwater that has entered the stormwater management facility will have been pre-treated by an oil-grit separator (OGS) and peak flows will be attenuated in the pond/tank. In order to reduce the impacts of local groundwater mounding it is proposed that discharge to the infiltration galleries be controlled to create a longer ponding drawdown time. This design will require close work with a hydrogeologist to determine the appropriate depth of the gallery.

Option 2

A viable storm sewer outlet is available on Crozier Street; however, there is a $\pm 5\text{m}$ grade change from the lowest point on the site. Similar to the previous option, stormwater that has entered the stormwater management facility will have been pre-treated by an OGS and peak flows will be attenuated in the pond/tank. A small pump and forcemain will be connected to the tank and discharge water to the existing storm sewer. The pumped discharge from the facility can be at a nominal rate to achieve a long drawdown time in order to ensure the existing sewers would have capacity for the additional flows. The storm forcemain is proposed to run along the rear of lots 19 and 18 and then directed along the proposed road eventually connecting to an existing storm structure along Crozier Street.

There is some concern with the function of this facility in the event of a power failure. In order to address these concerns, the onsite stormwater management facility is proposed to be sized for the 100-year storm event assuming no outflow from the facility. In a power failure during a large storm event, the facility would simply remain full until power can be restored.

Stormwater Management

The following sections detail the overall stormwater management strategy for the site. A final stormwater management plan will be detailed in a Stormwater Management Report submitted under separate cover.

Water Quantity

Runoff from the site and external lands are directed through the storm sewer system to the underground storage facility. Flows are then attenuated in all design storm events. The total volume required to attenuate the 100-year storm is provided in the system. Therefore the plan as presented is adequate to provide for the stormwater management requirements.

The stormwater management facility meets the water quantity targets by attenuating peak flows leaving the site for the requisite storm events. A Stormwater Management Report will describe this in more detail.

Water Quality

Although stormwater management criteria have yet to be established for the site it is anticipated that an Enhanced Level of quality treatment will be required. The site will be designed to meet this by implementing an OGS immediately before the proposed underground storage tank/pond. The use of an OGS unit dramatically reduces the total suspended solids (TSS) from the stormwater.

Water Balance, Infiltration, and Groundwater

Preliminary review of the geotechnical study indicates that shallow groundwater is present across the site. In order to ensure that basements are not impacted by high groundwater table, the areas of infiltration are set back from proposed building envelopes.

Preliminary review of the draft geotechnical report indicates that native soils in some areas of the site are conducive to infiltration. Infiltration rate in the more ideal infiltrating areas is 50mm/hr. Infiltration of stormwater is proposed in those areas.

A water balance can be provided through the use of lot level soak away pits and/or an end-of-pipe infiltrating facility. Lot level soak away pits located on the rear yards of walk-out lots collect surface flow stormwater discharge from those lots.

Grading and Drainage

The grading on the site is to accommodate the proposed development, allowing sufficient drainage away from proposed buildings and discharge via storm sewer or overland flow the proposed stormwater management facility located at the lowest point on the site along Scott Street. Proposed grading on the site will allow for the existing drainage patterns onsite to be maintained. Retaining walls and the use of rear yard grading designs will work

together to significantly reduce the existing grade changes on the site making it more feasible for the proposed type of development.

Grading within the municipal right of way along Crozier Street is not anticipated. Grading along Scott Street to accommodate the 4 single detached lots fronting Scott Street is anticipated.

In the geotechnical study completed for the site groundwater was noted in 4 of the 13 boreholes on site varying in elevation with the topography of the site ranging from 3.3 to 4.9m below existing grade. Along the northern property boundary there is proposed to be a retaining wall ± 6 m tall. Excavation for the installation of the retaining wall will likely breach the local water table and dewatering will be required. The design of the retaining wall and the extent of the dewatering activities will be evaluated in detailed design.

Site Erosion and Sediment Control

Construction activities can cause erosion of native soils and deposition of sediment on other properties or in receiving watercourses. To avoid these problems, siltation control measures are taken such as: silt fencing, a mud mat at the construction entrance, catchbasin protection, and construction staging.

The following will be included in the erosion/sedimentation plan:

- Disturbed areas should be kept to a minimum and re-vegetated in a reasonable timeframe in order to minimize dust.
- Maintenance of the installed erosion and sedimentation measures throughout the entire duration of construction, to ensure they are functioning as originally intended.

Utilities

The following utility companies have responded with their ability to service the development:

- Orangeville Hydro
 - The area is serviced by overhead conductors, no immediate concerns were identified.
- Bell Canada
 - Existing lines in the area are of sufficient size to service the development;
- Rogers Cable
 - There are existing cable lines along Scott Street, Fiber Optic is also available; no concerns were identified.
- Union Gas
 - No response at the time of this submission.

Conclusions and Recommendations

The 0.53 hectare property is located at the corner of Crozier and Scott Street in the town of Grand Valley, County of Dufferin. The majority of the subject site is presently a vacant field and a small area with the exception of the existing dwelling and driveway on the property front of Scott Street. The existing single family dwelling is proposed to be demolished as part of the proposed onsite works.

The proposed works are to include a residential development consisting of both townhouse and single detached dwellings serviced by a private condo road.

One service connection for water and sanitary sewer will be required to service the site, both connected from existing municipal infrastructure located off of Scott Street. The units are proposed to be serviced with individual service connections connected to the proposed 150mm watermain extended into the site. The proposed lots fronting Scott Street are proposed to be severed and will be serviced with individual connections. An internal hydrant provides adequate flow and pressure as per MOE and municipal guidelines for firefighting supply. Once water flow data becomes available for the junctions in the immediate vicinity of the site a detailed water distribution design should account for fire demand.

Review of the sanitary and water services in the Town indicate there may be capacity issues and serviceability for the proposed development is unknown until the additional flows/demands are added to the existing municipal infrastructure model.

The internal storm sewer on the site is proposed to be sized for the 5 year storm event and will discharge to the proposed stormwater management facility. There are two proposed options for storm outlet from the facility that are to be considered. The first option is to infiltrate all of the stormwater from the site and the second option is to pump stormwater to an existing storm sewer on Crozier Street.

Stormwater management quantity control is required on the site. Parking lot and paved surface runoff will be directed to an oil/grit separator to provide quality treatment prior to discharge to the culvert. Further detailed information is included in the Final Stormwater Management Report submitted under separate cover.

Post-development unattenuated flows exceed pre-development flows and, therefore, peak flow attenuation is required. The proposed stormwater management facility meets the design objectives for water quality and water quantity (flood) control. Various storm events up to the 100-year, 3-hour storm are attenuated to pre-development peak flow rates. The Town should confirm the stormwater management quality and quantity criteria for the subject property.

The Geotechnical Report indicates that native soils are conducive to infiltration. Infiltration is recommended onsite to restore the pre-development water balance. A water balance can be provided through the use of soak away pits and/or an end of pipe infiltrating facility. A

final stormwater management plan will be detailed in a Stormwater Management Report submitted under separate cover.

The locally high groundwater table will have impacts on the design and construction of the proposed retaining wall along the northern property boundary will be evaluated in the detailed design phase of the project.

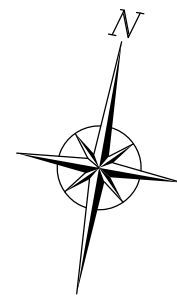
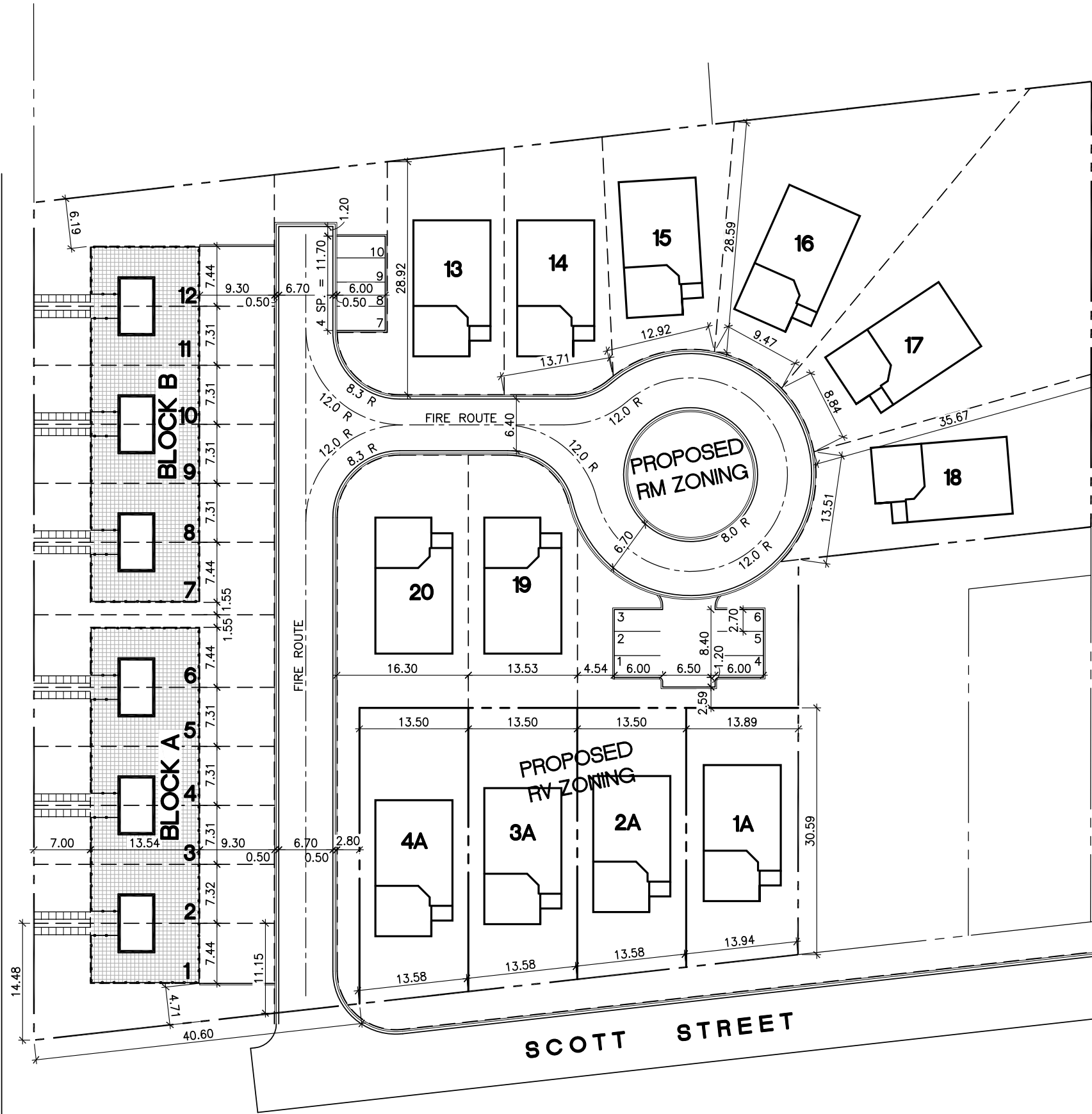
The detailed design should incorporate the conclusions and recommendations stemming from this preliminary design strategy.

Agencies shall review and approve this brief as a suitable approach to proceed for detailed design for zone change site plan approval.

Appendix A: Conceptual Site Plan



CROZIER STREET



SITE DATA - EXISTING RV ZONING
(DWELLING, SINGLE DETACHED) LOTS 1A, 2A, 3A AND 4A SCOTT STREET

REGULATION	REQUIRED	PROPOSED
LOT AREA (LOT 1A)	380 sq.m. (0.038 ha)	434.47 sq.m. (0.043 ha)
MIN. LOT FRONTAGE	11.0 m	13.58 m
MIN. FRONT YARD	7.00 m	7.00 m
MIN. INTERIOR SIDE YARD	1.20 m	1.20 m
MIN. REAR YARD	6.00 m	6.00 m
MAX. LOT COVERAGE	50%	50%
MAX. BUILDING HEIGHT	12.0 m	12.0 m

SITE DATA - PROPOSED RM ZONING (DWELLING, TOWNHOUSE)
CONDOMINIUM DEVELOPMENT LOTS 1 THROUGH 20

REGULATION	REQUIRED	PROPOSED
MIN. LOT AREA INTERIOR (LOT 2)	200 sq.m.	216.12 sq.m.
MIN. LOT AREA EXTERIOR (LOT 1)	400 sq.m.	381.74 sq.m.
MIN. LOT FRONTAGE (INTERIOR LOT 2)	6.0 m	7.32 m
MIN. LOT FRONTAGE (CORNER LOT 1)	15.0 m	14.48 m
MIN. FRONT YARD	7.00 m	40.60 m
MIN. INTERIOR SIDE YARD	1.20 m	1.20 m
MIN. EXTERIOR SIDE YARD	4.50 m	4.71 m
MIN. REAR YARD	6.00 m	6.19 m
MAX. NUMBER OF CONNECTED UNITS	6 UNITS	6 UNITS
MIN. DISTANCE BETWEEN 2 GROUPS OF UNITS	2.0 m	3.10 m
MIN. LANDSCAPE OPEN SPACE	20%	48.88%
MAX. DENSITY	50 Upha	20 Upha

PARKING
2 SPACES PER UNIT REQUIRED = 40 SPACES
PARKING PROVIDED = 20 GARAGE SPACES, 20 DRIVEWAY SPACES AND 10 VISITOR SPACES = 50 SPACES



ORCHARD
DESIGN STUDIO INC.
519-620-0414

I Keith Reganall, review and take responsibility for the design work on behalf of our firm Orchard Design Studio Incorporated registered under Division C, Part 3 (3.2.4) of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Firm BCIN: 28615 Individual BCIN: 21578

Signed: *Keith Reganall*

STATUS: ZONE CHANGE

PLOTTED: 22/12/2017 12:26pm

SCALE: 1:600

DWN BY: KSR

DATE: DECEMBER 2017

REV.

TOWNHOME / SINGLE FAMILY SITE

SCOTT STREET, GRAND VALLEY, ONTARIO

SITE PLAN

PROJECT SHEET No.

A1.1

Appendix B: Conceptual Design Drawings



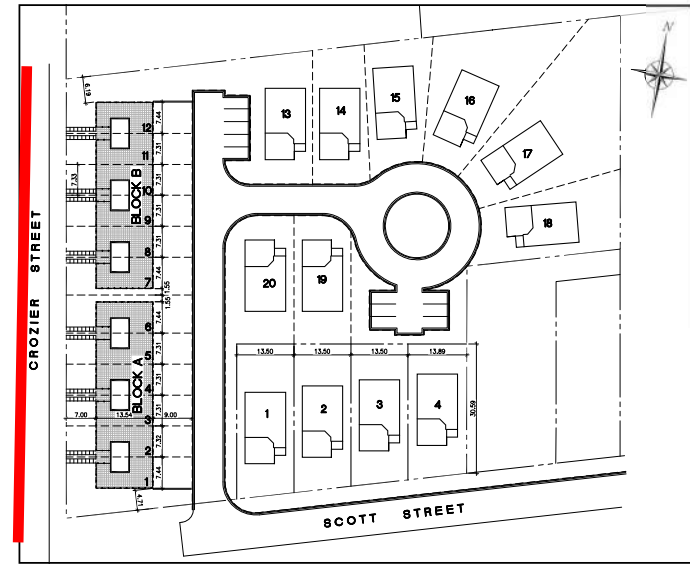
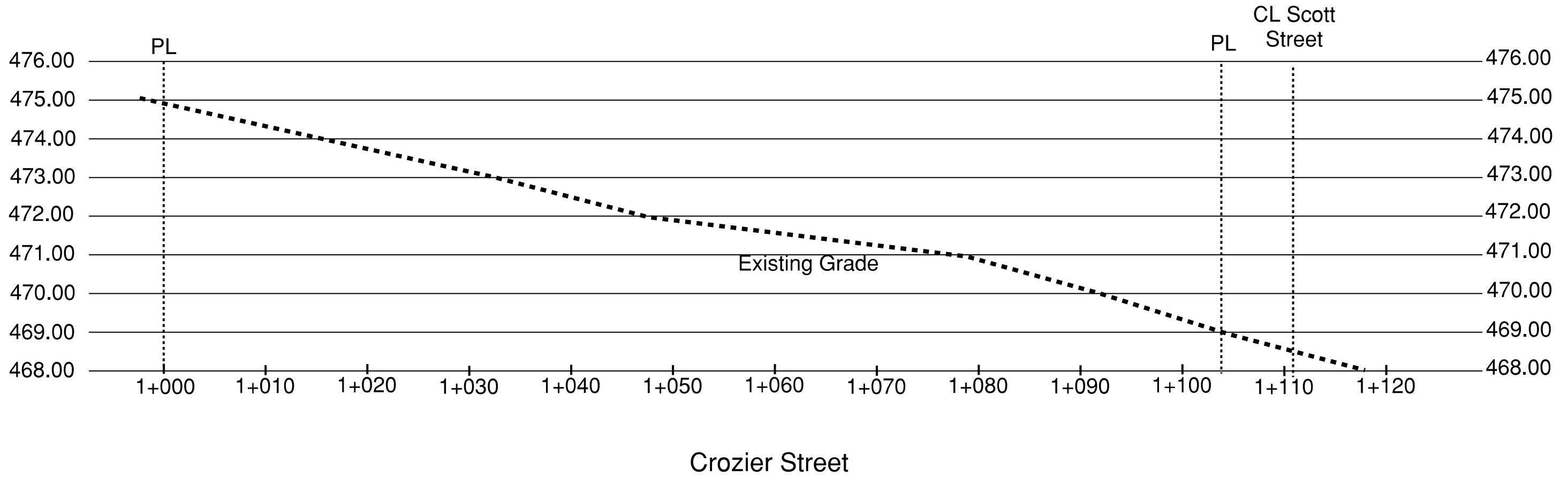


Legend

- Existing Sanitary Sewer
- Existing Storm Sewer
- Existing Watermain



		<small>1315 Bishop Street North, Suite 202 Cambridge T 519.623.1140 F 519.623.7294 www.meritech.ca</small>	
<small>Information shown on this plan is considered to be reliable, but is believed to be true and accurate. Meritech Engineering has determined to verify, where possible, all information. The Contractor is responsible for the accuracy of the information shown on this plan. Meritech Engineering is not responsible for any errors or omissions on this plan. Meritech Engineering is not responsible for any errors or omissions on this plan. Meritech Engineering is not responsible for any errors or omissions on this plan.</small>			
Existing Storm and Sanitary Sewer and Watermain Network		Damadaro (Euclid) Inc.	
DESIGNED BY: MJM	CHECKED BY: MJM	LOCATION: Grand Valley	PROJECT: 20 Scott Street
DRAWN BY: MJM	DATE: Dec. 12, 2017	CONTRACT: 4584	FILE NAME: 4584
DRAWING: NTS	SCALE: NTS	ISSUE	DATE
SHEET: 2 of 5	BY	No.	No.



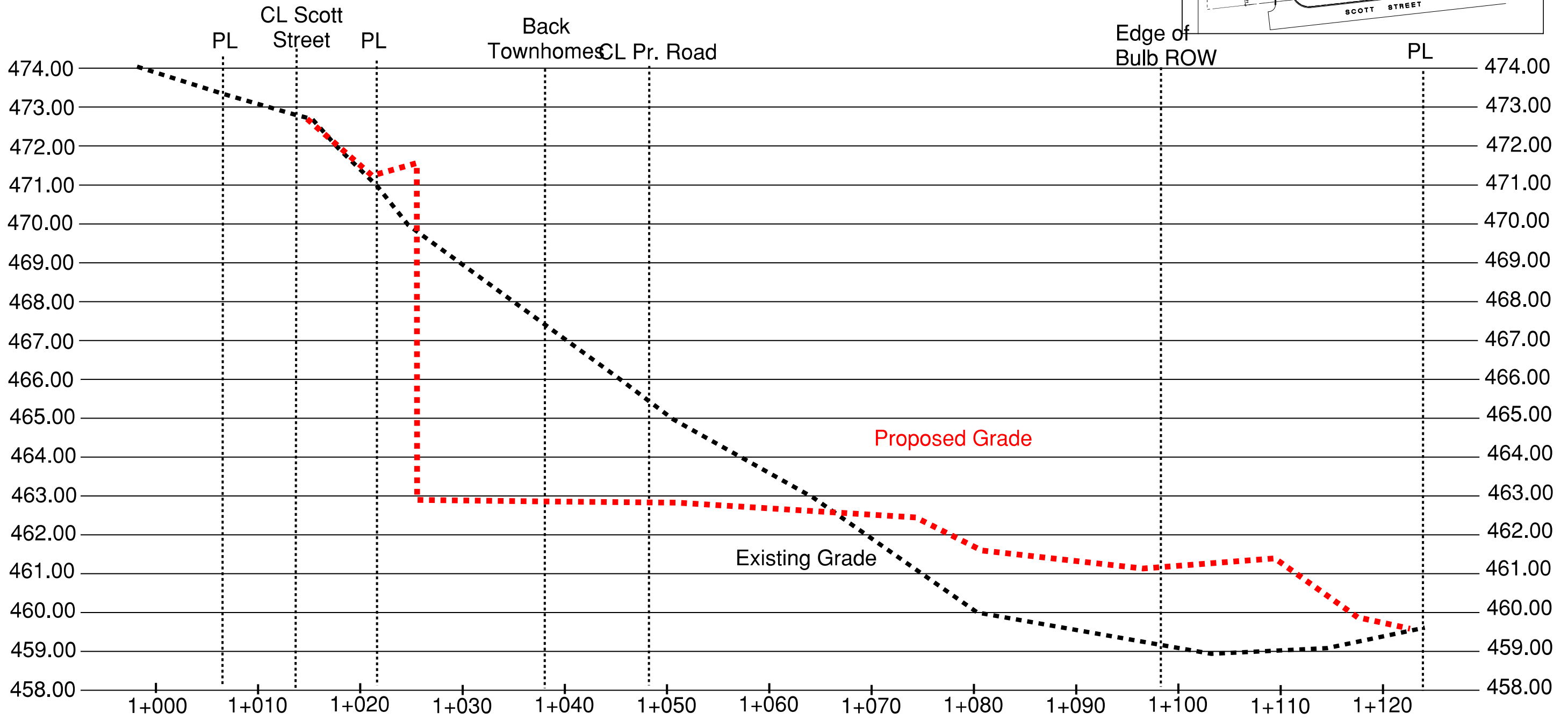
MERITECH engineering

1315 Bishop Street North, Suite 202 Cambridge
 T: 519.623.1140 F: 519.623.7234 www.meritech.ca

Information shown on this plan is compiled from various sources, and is believed to be true and accurate. Meritech Engineering has attempted to verify, where possible, all information. The Contractor is responsible for the accuracy of the information shown on this plan. Meritech Engineering is not responsible for any errors or omissions on this plan. Meritech Engineering Inc. All rights reserved. No part of this drawing may be reproduced or any form or by any means without the written permission of Meritech Engineering Inc.

OWNER:	Damadaro (Euclid) Inc.
LOCATION:	Grand Valley
PROJECT:	20 Scott Street
DRAWING:	Grade Profile North/South Via Crozier Street
DESIGNED BY:	MJM
CHECKED BY:	MJM
DATE:	Dec. 22, 2017
CONTRACT:	4584
FILE NAME:	
DRAWING:	NTS
SHEET:	3 of 6

No.	ISSUE	DATE	BY



MERITECH engineering
 1115 Belton Street, Suite 201, Columbus, OH 43260
 T 614.223.1140 F 614.223.7234 www.meritech.com

Information shown on this plan is compiled from various sources and is believed to be true and accurate. Meritech Engineering, Inc. and its staff do not warrant the accuracy or completeness of the information for verification of data and information related to this project, and neither Meritech Engineering, Inc. nor its staff shall be held responsible for any errors or omissions in the information shown on this plan. Meritech Engineering, Inc. is not a contractor.

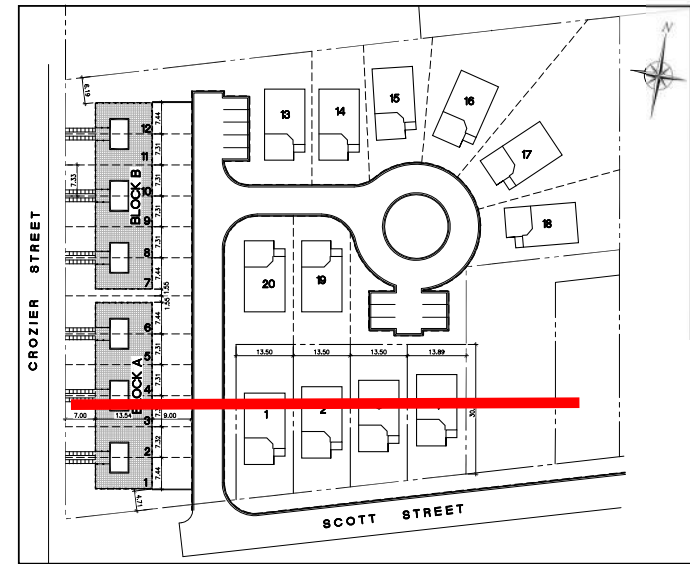
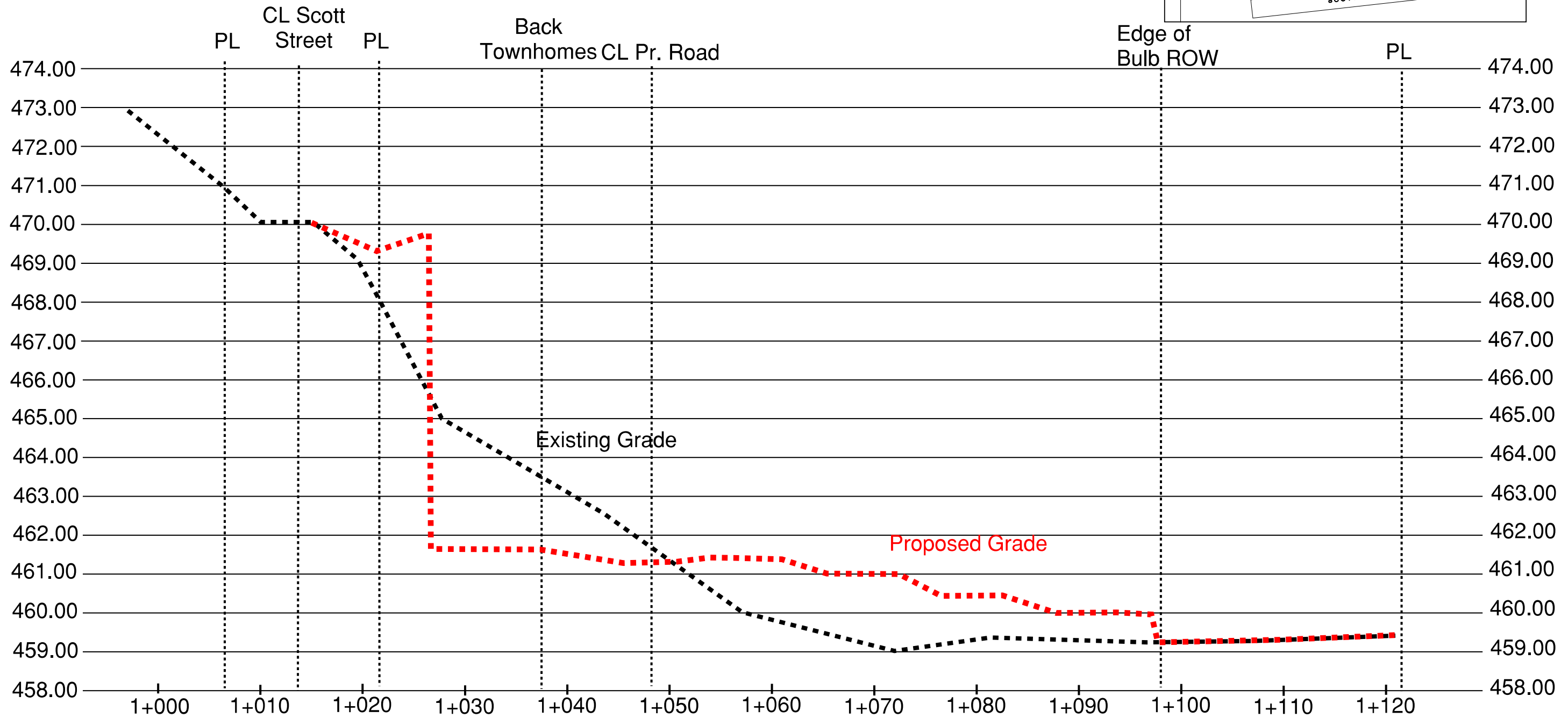
OWNER: Damadaro (Euclid) Inc.
 LOCATION: Grand Valley
 PROJECT: 20 Scott Street

DRAWING: MJM
 CHECKED BY: MJM
 DATE: Dec. 22, 2017
 CONTRACT: FILE NAME: 4584
 SCALE: NTS

NO. DATE BY

ISSUE

DRAWING: Grading Profile West to East through Site
 SHEET: 4 of 6



MERITECH engineering

1315 Babcock Street North, Suite 202 Cambridge
 T 516.623.1140 F 519.623.7234 www.meritech.ca

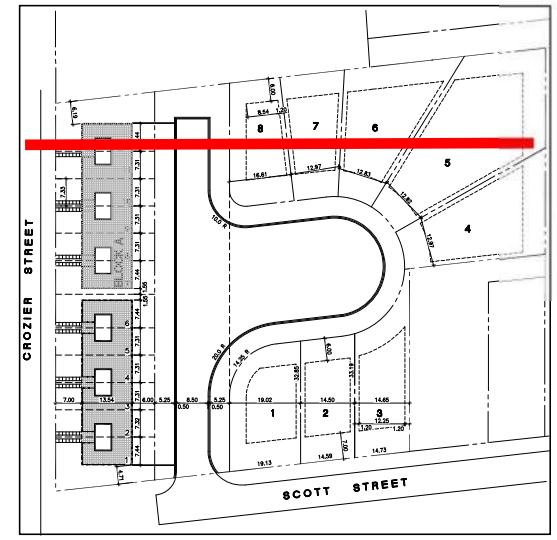
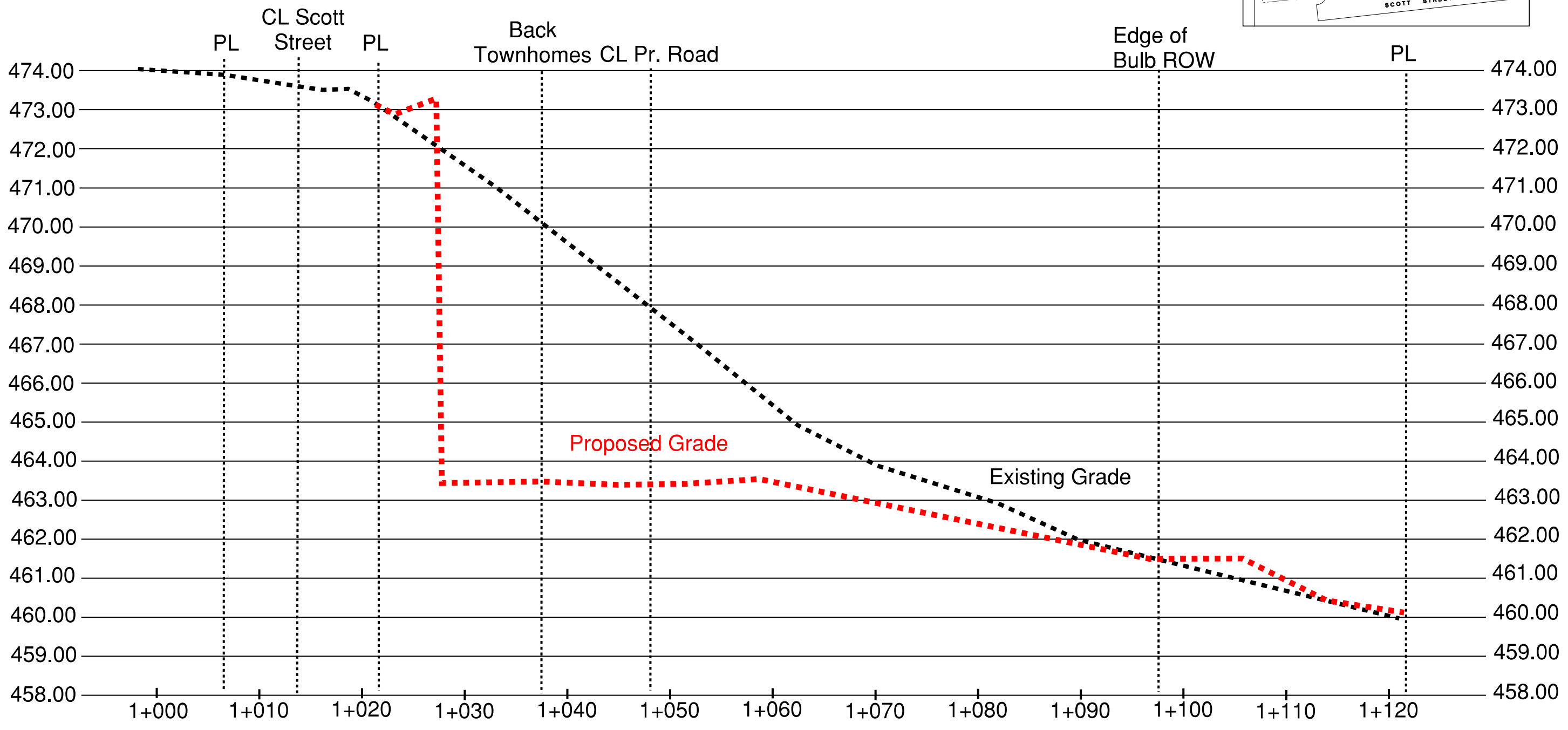
Information shown on this plan is compiled from various sources, and is believed to be true and accurate. Meritech Engineering has attempted to verify, where possible, all information. The Corporation is responsible for the construction of work. Meritech is not responsible for any discrepancies or omissions on the plan. Meritech is not responsible for any errors or omissions on the plan. Meritech is not responsible for any errors or omissions on the plan.

No.	ISSUE	DATE	BY

OWNER: Damadaro (Euclid) Inc.
 LOCATION: Grand Valley
 PROJECT: 20 Scott Street

DRAWING: MJM
 CHECKED BY: MJM
 DATE: Dec. 22, 2017
 CONTRACT: 4584
 FILE NAME: 4584
 SCALE: NTS

DRAWING SHEET: 3 of 6



MERITTECH
 engineering
 1315 Belmont Street North, Suite 202, Cambridge, MA 02142
 T 617.623.1140 F 617.623.7234 www.meritech.com

References shown in this plan to existing conditions, surveys, and other data are for information only. Meritech Engineering and its staff are not responsible for the accuracy of the data and information shown on this project, and we do not warrant the accuracy of the data and information shown on this project. The Contractor is responsible for verifying the accuracy of the data and information shown on this project. Meritech Engineering and its staff are not responsible for the accuracy of the data and information shown on this project. Meritech Engineering and its staff are not responsible for the accuracy of the data and information shown on this project. Meritech Engineering and its staff are not responsible for the accuracy of the data and information shown on this project.

No.	ISSUE	DATE	BY

OWNER: Damadaro (Euclid) Inc.
 LOCATION: Grand Valley
 PROJECT: 20 Scott Street

DESIGNED BY: MJM
 CHECKED BY: MJM
 DATE: Dec. 22, 2017
 CONTRACT: FILE NAME: 4584

DRAWING: SCALE: NTS
 SHEET: 8 of 8

Appendix C: Calculations



Sanitary Sewer Design Sheet

Project: 20 Scott Street
File: 4584

for
Town of Grand Valley

Pipe Velocities: 0.60 m/s min. (pipe full)
3.00 m/s max. (actual flow)
n= 0.013 all pipe material

Calc'd by: MJM
Date: 22-Dec-17

Ref# MOE ref num

Residential average daily flow (q): 450 L/cap/d Town of Grand Valley

Chk'd by: JEL
Date: 3-Jan-18

Unit extraneous flow (E): 0.2 L/s/ha Town of Grand Valley

q = average daily per capita flow (L/cap/d)
I = Unit of peak extraneous flow (L/s/ha)
Q(p) = peak population flow (L/s)
Q(I) = peak extraneous flow (L/s)
Q(d) = peak design flow (L/s)

Peaking Factor:
 $M = 1 + 14/(4 + (P/1000)^{0.5})$
 $Q(p) = (P/1000)qM/86.4$ (L/s)
 $Q(I) = IA$ (L/s); where A = Area in hectares
 $Q(d) = Q(p) + Q(I)$ (L/s)

Manning Equation:
 $Q_{cap.} = (D/1000)^{2.667} * (S/100)^{0.5} / (3.211 * n) * 1000$ (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coefficient

Location		Unit Count (ppu)		Zoning (p/ha)			Residential 0.0052 (L/s/cap)				Infiltration 0.2				Pipe									
From	To	4 Single	4 Town	Area ID	Zone	Density (pph)	Individual		Accumulative		Peak Factor M	Pop. Q(p) (L/s)	Total Area	Accum Total Area	Extran. Q(I) (L/s)	Design Q(d) (L/s)	Length L (m)	Size D (mm)	Pipe Mat'l	Slope S (%)	Capacity Qcap. (L/s)	Velocity V (m/s)	Q(d)/Qcap	Actual Velocity (m/s)
							P (person)	Area (ha)	P (person)	Area (ha)														
Site																								
Site	Scott St.	8	12				80	0.98	80	0.98	4.000	1.667	0.980	0.980	0.196	1.863	2.0	200		1.00%	34.221	1.055	5.4%	0.601
	Scott Street	4					16	0.20	16	0.20	4.000	0.333	0.200	0.200	0.040	0.373	1.0	200		1.00%	34.221	1.055	1.1%	0.380
Total Site Discharge									96	1.18	4.000	2.000	1.180	1.180	0.236	2.236	1.0	200		1.00%	34.221	1.055	6.5%	0.633

Appendix D: Geotechnical Report





CHUNG & VANDER DOELEN
ENGINEERING LTD.

**GEOTECHNICAL INVESTIGATION
PROPOSED TOWNHOUSE DEVELOPMENT
20 Scott Street
Grand Valley, Ontario**

SUBMITTED TO:
Daniel Hrycyna
1081 Bloor Street, Unit 200
Toronto, Ontario
M6H 1M5

FILE NO / G17440 / January 3, 2018

5.4 Silt Till

A deposit of brown silt till was encountered at Boreholes 1 to 5, 6 and 9 underlying the sand and silt deposit and at Boreholes 8 and 12 underlying the sand deposit. The silt till deposit extended to at least depths ranging between 4.70 and 7.90 m below ground surface, the maximum depths of exploration. The silt till contained cobbles, some sand, trace to some clay and traces of gravel.

The SPT "N"-values measured within the silt till deposit ranged from 7 blows per 300 mm to 50 blows per 75 mm of penetration, indicating a variable loose to very dense compactness condition. The measured water content of the samples collected from this deposit ranged between 4 and 18%, thus indicating a damp to saturated moisture condition.

5.5 Groundwater

Groundwater conditions were monitored during and following the completion of borehole sampling. Groundwater levels were measured on June 14, 2017 at 3.35 m, 4.48 m and 4.85 m in monitoring wells installed at Boreholes 2, 4 and 12, respectively, and this information is summarized below.

Borehole No.	Existing Ground Elevation (m)	Groundwater Depth (m)	Groundwater Elevation (m)
2	469.57	3.35	466.22
4	466.49	4.48	462.01
12	459.16	4.85	454.31

Saturated soil conditions were observed in Boreholes 2, 4, 12 and 13 at depths of 3.3± m to 4.9± m below existing grades, corresponding to elevations between 454.27 and 466.27m. From the above measured groundwater elevations, it is observed that the groundwater table follows the surficial topography across the site.

It is noted that the observed groundwater table will fluctuate seasonally and in response to major weather events.



6.9 On Site Infiltration

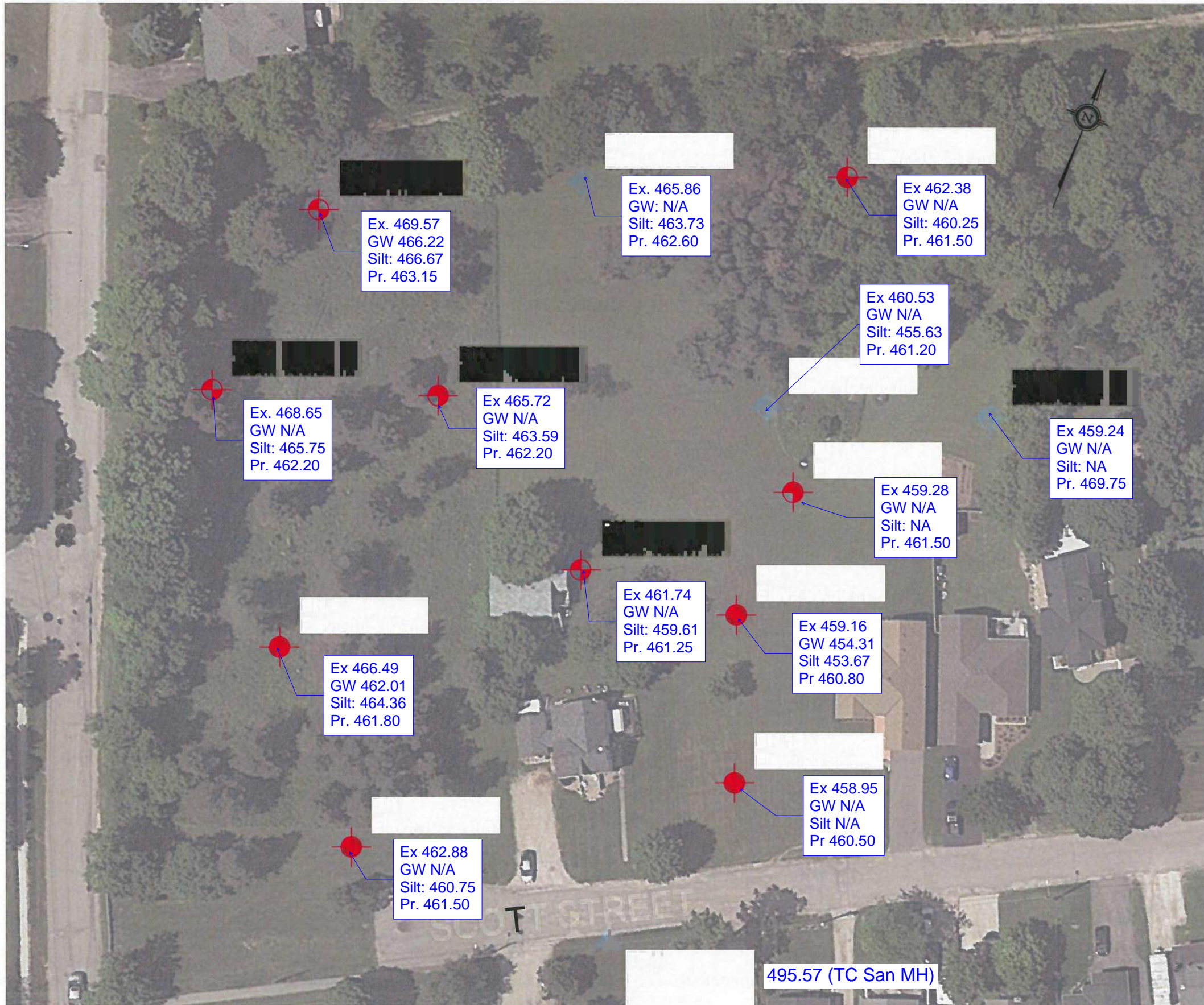
It is understood that the potential for at-source storm water infiltration features are to be considered at the site. It is noted that infiltration features should have the base located at least 1.0 m above the groundwater table and that a minimum infiltration rate of 15 mm/hr is required.

Based on the results of grain size analyses and our past experience, the hydraulic conductivity and infiltration rate of the native inorganic soil types encountered at the boreholes are estimated and provided in the following table and may be used for storm water management purposes:

MATERIAL	PERMEABILITY (K) (cm/sec)	INFILTRATION RATE (mm/hr)
Sand, trace gravel to gravelly, trace to some silt (Enclosures 15 and 16)	1×10^{-3}	50
Sand and Silt, trace to some clay, trace gravel (Enclosure 14)	1×10^{-5}	3
Silt Till, some sand, trace to some clay, trace gravel	1×10^{-6}	1

Considering the subsurface conditions encountered at the boreholes, at-source infiltration features may be considered within the native sand deposits.





Updated Elevations Below

Updated by Meritech Engineering
Updated on: January 5, 2018





Meritech Engineering 1315 Bishop Street North Suite 202 Cambridge ON N1R 6Z2 t 519.623.1140 f 519.623.7334