APPENDIX 3
STORM DRAINAGE DESIGN BRIEF

Mill Street (Mississauga Road to Creditview Road) Municipal Class Environmental Assessment

Storm Drainage Design Brief

Town of Caledon

RVA 205388

February 28, 2023

2.0 EXISTING SITE CONDITIONS CHARACTERIZATION

2.1 Overview

From Mississauga Road to approximately 160 m west of Creditview Road, Mill Street is a sinuous two-lane undivided rural road with granular shoulders in some sections and roadside ditches on both sides. The eastern most 160 m of Mill Street have an urban section with barrier curb and gutter, this section includes the Mill Street Bridge over the Credit River (structure ID# B20304037), which is being rehabilitated under a separate contract. The Caledon Trailway Path crosses Mill Street at approximately 230 m east of Mississauga Road.

In the rural section from Mississauga Road to 160m east of Creditview Road, drainage is conveyed via ditches to existing culvert outlets and to the Credit River, with no existing storm water management control for the road drainage. In the urban section from 160m east of Creditview Road to Creditview Road, road stormwater runoff is captured by catchbasins and drainage outlets on the bridge along the existing curb and gutter, and outlet to the Credit River. An additional catchbasin is found around Sta. 1+990 which collects roadway stormwater on the north side of the road in the absence of a ditch between 1328 Mill Street and 1382 Mill Street. The existing surrounding land use is primarily residential and agricultural, and drainage from these lands account for most flows at the culvert crossing locations.

2.2 Tributary and Natural Features

Mill Street is within two subwatersheds of the Credit River: 12 – Cheltenham to Glen Williams and 20 – Forks of the Credit to Cheltenham, both located in the middle section of the watershed. The Credit River in this zone flows through a steep-walled narrow valley. Numerous small spring-fed creeks drain over the escarpment plateau into the main branch of the Credit River (CVC, 2019).

2.3 Existing Culvert Crossings

Five small creeks, within regulated areas, cross Mill Street (southeastward) through separate culverts. At the east end of the project area, the Credit River crosses the road through an existing bridge, which is proposed to be rehabilitated as part of a different contract. The three westernmost tributaries cross Mill Street and continue their east path to discharge to the Credit River; the two other tributaries cross through culverts M3-4 and M3-6 and continue parallel to the road creating a regulated ditch that crosses under three

Mill Street (Mississauga Road to Creditview Road) MCEA
Storm Drainage Design Brief

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

R.V. Anderson Associates Limited has been retained by the Town of Caledon (the Town) to undertake a 'Schedule B' Class Environmental Assessment (EA) followed by detailed design for Mill Street, between Mississauga Road and Creditview Road, including the intersection with John Street and the Caledon Trailway crossing (Figure 1). The project involves identifying improvements to the road, intersections, and drainage, as well as enhancements to safety and connectivity for all road users.

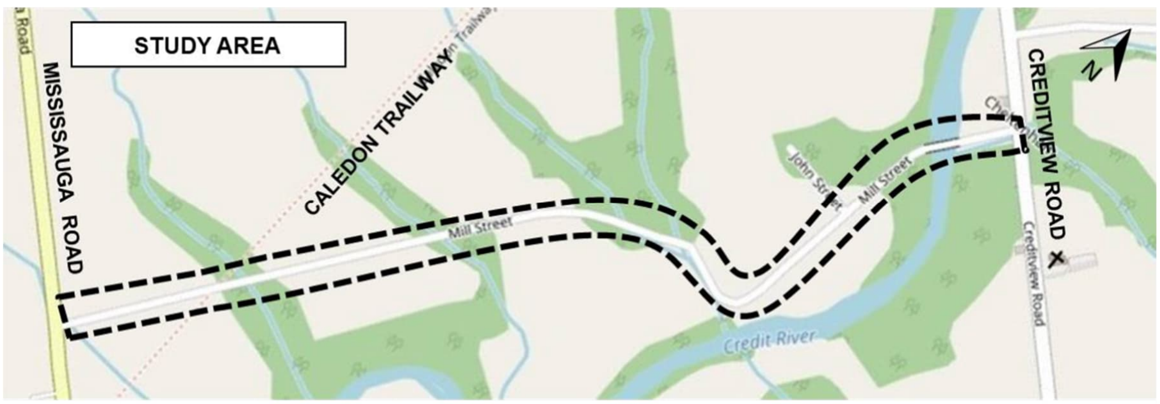

Figure 1 - Study Area

Mill Street is a two-lane rural road with discontinuous gravel shoulders. Drainage is managed through roadside ditches and culverts that convey storm water from the roadway and adjacent lands.

The project study area lies within Credit Valley Conservation Authority (CVC) and Niagara Escarpment Plan (NEP) jurisdiction, with most of the roadway being within the regulated area for the Credit River, its tributaries, and the 100-Year Floodplain.

1.2 Purpose

The purpose of this report is to detail the stormwater management (SWM) strategy and describe the impacts related to the proposed road works. This report will also address and incorporate concerns from stakeholders and regulatory agencies. As the proposed works will not result in a significant increase in impervious area, the SWM strategy is limited in scope.

The following reports and best practices were utilized as the basis for the stormwater management design:

Ministry of Transportation – Highway Drainage Design Standards - 2008

Low Impact Development Stormwater Management Planning and Design Guide – Credit Valley Conservation Authority – 2011

Stormwater Management Planning and Design Manual – Ontario Ministry of the Environment – 2003

Town of Caledon – Stormwater Management Master Plan – Final Study Report - 2016

Credit Valley Conservation – Watershed Characterization AR: Credit Valley Source Protection Area – Chapter 2 - 2019

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Five small creeks, within regulated areas, cross Mill Street (southeastward) through separate culverts. At the east end of the project area, the Credit River crosses the road through an existing bridge, which is proposed to be rehabilitated as part of a different contract. The three westernmost tributaries cross Mill Street and continue their east path to discharge to the Credit River; the two other tributaries cross through culverts M3-4 and M3-6 and continue parallel to the road creating a regulated ditch that crosses under three driveways (two of the crossings are within private property), therefore culverts M3-7, M3-8 and M3-9 are considered crossing culverts as opposed to driveway culverts. Culvert M3-5 conveys a small area north of the driveway of house number 1294. Culverts M3-10 to M3-14 are connected to catchbasins. Although M3-15 is a driveway culvert, it is included in the table as the ditch it is in is conveying a large drainage area through the 1.22 mx1.22 m culvert crossing under Creditview Road.

Table 1 below summarizes the existing road crossings along Mill Street. Based on CVC requirements only culverts with a drainage area larger than 120 ha require more detailed analysis via a HEC-RAS model, and no culverts would require geomorphology investigations regardless of drainage area size.

3.0 STORMWATER OBJECTIVES

3.1 Water Quantity and Flood Control

The objective of stormwater management for this project is to provide conveyance for the design storms. No specific quantity control targets have been set, since increases to impervious surface area are negligible. Conveyance and flood control criteria area are as follows:

- Ensure no increased risk of flooding to downstream and upstream properties and/or infrastructure.
- Design proposed ditches to convey runoff from a 50-year storm event.
- Road crossing culverts are to convey 50-year design storm.

3.2 Water Quality, Erosion, and Sediment Control

Water quality was generally not considered in the project as impervious area increases are negligible. It is generally not possible to provide water quality treatment due to limited right-of-way (ROW) space and high ground water levels and floodplain levels near the Credit River.

3.3 Water Balance

Water balance was not considered for this project.

Table 1. Existing Road Crossing Culverts

Existing Conditions Hydraulic Model Output Summary																
Culvert ID	Station	Size	Material	Length	Culvert Invert		Culvert Slope	Culvert Capacity	Road Surface Elevation	Drainage Area	Culvert Flow (m³/s)		Overtopping Flow (m³/s)		Water Elevation (m)	
		(mm)		(m)	U/S	D/S	(%)	(m³/s)	(m)	(ha)	50-year	100-year	50-year	100-year	50-year	100-year
M3-1	1+017	900	HDPE	15.84	276.696	275.817	5.55	1.44	277.85	28.18	0.904	1.056	0	0	277.49	277.64
	1+018	900	HDPE	15.74	276.854	275.954	5.72	1.46	277.85							
M3-2	1+276	1600	CSP	29.14	266.591	265.879	2.45	7.10	273.64	38.25	1.398	1.786	0	0	267.35	267.46
M3-3	1+556	800	HDPE	17.97	265.241	264.423	4.56	2.81	267.18	26.00	0.894	1.056	0	0	266.27	266.46
M3-4	1+812	700	CSP	14.63	260.546	259.845	4.80	1.09	262.25	23.93	0.629	0.804	0	0	260.93	260.99
M3-5	1+837	400	HDPE	12.23	260.174	258.796	11.27	0.69	260.89	2.35	0.015	0.017	0	0	260.26	260.27
M3-6	1+885	900	HDPE	15.08	257.582	257.371	1.4	2.13	259.12	105.51	1.43	1.836	0	0	258.04	258.12
	1+887	900	HDPE	15.17	257.574	257.278	1.96	2.52	259.06				0	0		
M3-7	1+914	900	CSP	6.03	256.764	256.61	2.56	1.56	258.02	129.70	2.05	2.626	0	0	257.26	257.35
		900	CSP	6.01	256.735	256.546	3.15	1.73	258.04				0	0		
M3-8	1+968	1300	CSP	4.65	254.904	254.868	0.78	2.30	256.84	129.74	2.11	2.642	0	0	255.83	255.94
M3-9	1+977	900	HDPE	9.12	255.13	254.932	2.18	2.66	256.84	129.74	2.08	2.644	0	0	255.77	255.86
		900	HDPE	9.15	255.176	254.856	3.50	3.37	256.76				0	0		
		900	HDPE	9.25	255.129	254.847	3.05	3.15	256.78				0	0		
M3-10	1+988	400	HDPE	12.36	255.141	255.078	0.51	0.15	256.78	1.10	0.18	0.216	0	0	255.81	255.91
M3-11	2+102	300	CP	9.42	257.167	257.166	0.02	0.01	257.89	2.14	0.115	0.116	0.104	0.205	257.91	257.91
M3-12	2+240	300	CP	9.73	256.883	256.762	1.25	0.11	257.67	2.52	0.164	0.199	0	0	257.34	257.47
M3-13	2+435	300	HDPE	6.26	256.928	256.789	2.23	0.14	258.34	0.08	0.034	0.039	0	0	257.68	257.70
M3-14	2+435	300	HDPE	3.13	256.931	256.93	0.04	0.02	258.34	0.11	0.186	0.347	0	0	257.68	257.76
M3-15	2+425	600	HDPE	6.1	256.748	256.577	2.78	1.02	258.11	0.15	0.205	0.368	0	0	257.67	257.73

3.4 Site Constraints

Most properties on both sides of the road from Sta. 1+880 to Creditview Road are located within the 100-Year and Regulatory Floodplains for the Credit River (Figure 2). Due to their proximity to the Credit River, flooding is anticipated at these properties during regular storms. Both property owners at 1347 Mill Street and 1499 Mill Street have notified RVA during public consultation that their properties is regularly flooded. Since the Credit River flood plain elevations is the predominant factor in controlling the water levels in this area, widening or deepening the existing ditches in front of these properties will not resolve the flooding issue. Therefore, only ditch cleanout is proposed for the ditches in front of both properties.

Based on the information gathered during the consultation process, the front yard of 1347 Mill Street gets flooded during most storms, and the regulated creek channel gets blocked frequently at culvert M3-9 and downstream. It was also observed during site visits that the gravel on top of the three barrels (M3-9) was falling into the barrels and washing downstream, cross sections of the driveways show that the HDPE barrels are shorter than required resulting in excessively steep side slopes between the driveway and bottom of the channel.

The owner at 1499 Mill Street have also noted the ditch in front of their property overflows during most storms and floods onto their property. The culvert underneath their driveways is the 1.22 mx1.22 m culvert crossing Creditview Road and culvert M3-15 which both convey a large drainage area east of Creditview Road. Widening the ditch in front of 1499 Mill Street or upsizing their culverts will not alleviate the flooding as the issue is due to the property being within Credit River's flood plain. In addition, the row of mature trees lining the front of their property will also restrict any grading work associated with ditch expansion.

During field review culvert M3-2, a road crossing culvert just east of the Caledon Trailway Path, was noted to have buckled and its south outlet detached and perched. Corrosion at both inlet and outlet of this CSP culvert and slope stability issues on the north inlet were also observed. During public consultation a resident notified the Town there were also erosion concerns on the embankment west of the Caledon Trailway Path, north side of Mill Street.

Culvert M3-2 collects stormwater runoff from the northside ditch along Mill Street as well as the culvert crossing the Caledon Trailway Path. Any regrading on the north embankment to smooth out the slope will result in filling in the ditch here and impacting the culvert under the Caledon Trailway Path. Alternatively, a headwall or retaining wall may be considered for the north inlet to minimize impact. Similarly on the south outlet, regrading the embankment or installing a new headwall/ retaining wall can be considered to rectify the slope stability issue. The Town is

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TOWN OF CALEDON

CALEDON GROWTH RELATED ROADS
MILL STREET
MISSISSAUGA RD TO CREDITVIEW RD

FIGURE 2. REGULATORY AND 100-YEAR FLOODING RISK MAP FOR THE CREDIT RIVER

LEGEND

Regulatory Flood Elevation

35.230 258.21 256.95

Cross Section

100-Year Flood Elevation

Regulatory Floodline

100-Year Floodline

M3–9 Culvert ID

FEBRUARY 2023

SOURCE: CVC, FLOOD RISK MAPPING CREDIT RIVER NORVAL TO ORANGEVILLE, SHEET No. 10.

currently undertaking a slope stability study in this area and recommendation for this culvert is pending on the study findings.

Due to limited Right-of-Way space, improved drainage LID measures such as enhanced swales, or bioswales are generally not feasible. Soak away pits are being considered around culverts M3-11 and M3-12, but their implementation will depend on the soils study report and the possibility of property acquisition at this location.

4.0 PROPOSED DRAINAGE CONDITIONS

4.1 Drainage Patterns

No changes are proposed to existing drainage patterns within the study area limits. The Drainage Area Map can be found in Figure 3.

4.2 Proposed Culvert Crossings

Table 2 below lists the proposed culverts characteristics and any additional measures required. Location of the culverts didn’t change dramatically for any of the units being replaced.

5.0 HYDROLOGIC AND HYDRAULIC MODELING

5.1 Design Storm

For modeling purposes, the IDF Curves from the Town of Caledon were used with a rainfall duration of 12 hours. The following storm depths were used:

- 2-year – 39.97 mm
- 5-year – 58.12mm
- 10-year – 66.80mm
- 25-year – 79.97mm
- 50-year – 88.43mm
- 100-year – 97.84mm

Table 2. Proposed Road Crossing Culverts

Proposed Conditions Road Crossing Culverts									
Culvert ID	Station	Size	Material	Length	Culvert Invert		Culvert Slope	Culvert Capacity	Notes
		(mm)		(m)	U/S	D/S	(%)	(m³/s)	
M3-1	1+017	900	HDPE	15.84	276.696	275.817	5.55	1.44	No replacement/extension. Culverts need to be cleaned up and the apron and ditch downstream of the culverts need to be reshaped.
	1+018	900	HDPE	15.74	276.854	275.954	5.72	1.46	
M3-2	1+276	1600	CSP	To be determined					Two alternatives: 1-DI and MH upstream + HW downstream; 2- HW both sides. Final recommendation will be provided after receiving the stability analysis from the Geotechnical Subconsultant; both will eliminate perching condition
M3-3	1+556	800	HDPE	19.34	265.265	264.385	4.56	2.81	Grade outlet area to eliminate the perching condition.
M3-4	1+812	750	HDPE	18.66	260.619	259.883	3.95	1.91	Realign culvert slightly to reduce impact on the existing ditch.
M3-5	1+837	400	HDPE	12.23	260.174	258.796	11.27	0.69	Side slope at the outlet is 1.2:1; guiderail and embankment protection are being added at this location.
M3-6	1+885	900	HDPE	15.90	257.593	257.371	1.4	2.13	0.7 m extensions upstream for the first culvert and downstream for the second culvert, resulting in no change to capacity and improvement of roadside slopes.
	1+887	900	HDPE	15.84	257.574	257.264	1.96	2.52	
M3-7	1+914	900	CSP	6.03	256.764	256.61	2.56	1.56	No changes for these culverts
		900	CSP	6.01	256.735	256.546	3.15	1.73	
M3-8	1+968	1300	CSP	4.65	254.904	254.868	0.78	2.30	No change for culvert M3-8. To review further during detailed design.
M3-9	1+977	2.4 mx1.2 m concrete box culvert		10.7	255.200	254.970	2.14	15.50	Culvert is proposed to be replaced to reduce risk of blockage. This will be confirmed during the detailed design phase.
M3-10	1+988	450	HDPE	13.65	255.610	255.460	1.10	0.30	Ex culvert doesn’t meet capacity. Replace pipe with 450 mm HDPE
M3-11	2+102	450	HDPE	12.90	256.970	256.850	0.93	0.29	Ex culvert doesn’t meet capacity. Replace with 450mm HDPE and 100 mm embedment. Relocate flower bed to reduce culvert blockage
M3-12	2+240	450	HDPE	9.73	256.850	256.680	1.25	0.11	Ex culvert doesn’t meet capacity. Replace with 450mm HDPE pipe and 100 mm embedment.
M3-13	2+435	300	HDPE	6.26	256.928	256.789	2.23	0.14	Clean out culverts and ditches. Culverts to remain as is since flooding is caused by the proximity to the Credit River.
M3-14	2+435	300	HDPE	3.13	256.931	256.93	0.04	0.02	
M3-15	2+425	600?	HDPE	6.1	256.748	256.577	2.78	1.02	

CALEDON GROWTH RELATED ROADS
MILL STREET
MISSISSAUGA RD TO CREDITVIEW RD

TOWN OF CALEDON

FIGURE 3. EXISTING DRAINAGE AREA PLAN - MAJOR EVENT

LEGEND

DRAINAGE AREA MINOR EVENT
DRAINAGE AREA MAJOR EVENT
CVC REGULATORY LIMIT
OVERLAND FLOW
WATER COURSE
M3-12 CULVERT ID

E 004 — AREA ID
0.21 ha — CATCHMENT AREA
25 — IMPERVIOUS %

SCALE
HORIZ. 0 20 40 80 100

NOTE:
CATCHMENT AREAS DELINEATION BASED ON 1m CONTOURS FROM TOWN OF CALEDON

FEBRUARY 2023

5.2 Modeling

PCSWMM software was used to complete the hydrology analysis for the study area. The tributary areas for the five small creeks crossing Mill Street and the road were delineated using GIS, contours provided by the Town, and aerial imagery. Only culverts M3-7, M3-8 and M3-9 have tributary areas larger than 120 ha. The catchment runoff from the road and external areas was calculated using the SWMM engine within PCSWMM.

Culvert modeling was performed using PCSWMM for all crossings, the results for the existing conditions are included in Table 1. Culverts M3-11 and M3-14 have a very low capacity (0.01 and 0.02 m^3/s), M3-11 overtops during all events (2-year and up) due to the downstream conditions. Culverts M3-7 to M3-9 have enough capacity to convey the flows up to the 100-year event, however the tributary regulated channel is constrained by the backwater effect of the Credit River.

No increase in tributary areas or runoff coefficient was considered for the proposed conditions since the increase in paved areas is anticipated to be negligible.

A HEC-RAS model was created for the regulated ditch, extracting the surface water elevations from the Credit River HEC-RAS model provided by CVC (River Sta. 35.5 and 35.23), to reflect the backwater effect of the Credit River. The results for the existing conditions show that culverts M3-8 (Channel Sta 65) and M3-9 (Channel Sta 50); can pass only up to the 10-year storm without overtopping. Four different alternatives were considered to improve conditions within the channel:

1. Do nothing – Leaving the road, culverts and ditches as is.
2. New road with culverts M3-8 and M3-9 as is and cleaning ditches.
3. New road, replacing culvert M3-9 only and cleaning ditches.
4. New road, replacing culverts M3-8 and M3-9 and cleaning ditches.

The HEC RAS and PCSWMM modeling and results will be discussed with CVC during the detailed design phase.

6.0 DRAINAGE PLAN AND DESIGN

6.1 Minor System Design

The minor drainage system consists of roadside ditches at similar locations as the existing. Paving of existing shoulders and minor road widening is proposed for traffic safety reasons and to accommodate proposed guiderail. No significant increase in runoff is anticipated from the proposed roadworks and no change in ditch capacity is required.

6.2 Major System Design

The major system consists mostly of interceptor ditches beyond the Town ROW limits. These ditches will capture the external drainage and convey it to the existing outlet points while maintaining existing drainage patterns. At some locations the existing side slopes are too steep and unstable, requiring the flattening of the slopes or the introduction of headwalls or other structures, such as manholes. This is the case is the case for culvert M3-2 which has current side slopes of 1:1 and is perched at both ends. Additionally, this culvert is in poor physical condition with extensive rust, dislodging plates and deformation at approximately the center line of the road. There is also an upstream culvert crossing under the Caledon Trailway Path with its outlet end very close to the existing inlet of culvert M3-2. Due to this second culvert any flattening of the slope will bury the Caledon Trailway Path culvert and will require a proposed maintenance hole catchbasin to connect the two culverts, requiring ditch realignment at this location with steep ditch side slopes.

6.3 Monitoring and Maintenance

The storm drainage systems of the site must be maintained at regular intervals by inspecting and cleaning the following:

- Catchbasin capture devices.
- Soak-away pits
- Ditches
- Culverts and storm sewer pipes

7.0 APROVAL AND REVIEW REQUIREMENTS

The drainage and stormwater management report is subject to review and approval from:

- Town of Caledon
- Credit Valley Conservation Authority (CVC)
- Public interest groups and stakeholders

8.0 CONCLUSION

This Preliminary Stormwater Management Plan has been prepared in support of the proposed road rehabilitation of Mill Street. The plan identifies existing drainage issues such as insufficient drainage capacity or culverts in poor physical conditions within the project limits, and possible alternatives to address these deficiencies. Flooding at 1347 Mill Street and 1499 Mill Street has also been identified but since most properties on Mill Street are within the Credit River floodplain, flooding at these properties is caused by their proximity to the river and backwater effects rather than insufficient ditch or culvert capacities. A larger area wide stormwater management study will be required to resolve the flooding issue on Mill Street which is outside the scope of this road rehabilitation project. The Town and RVA will continue to work with CVC during detailed design to provide overall stormwater drainage improvements wherever possible.

Report prepared by:

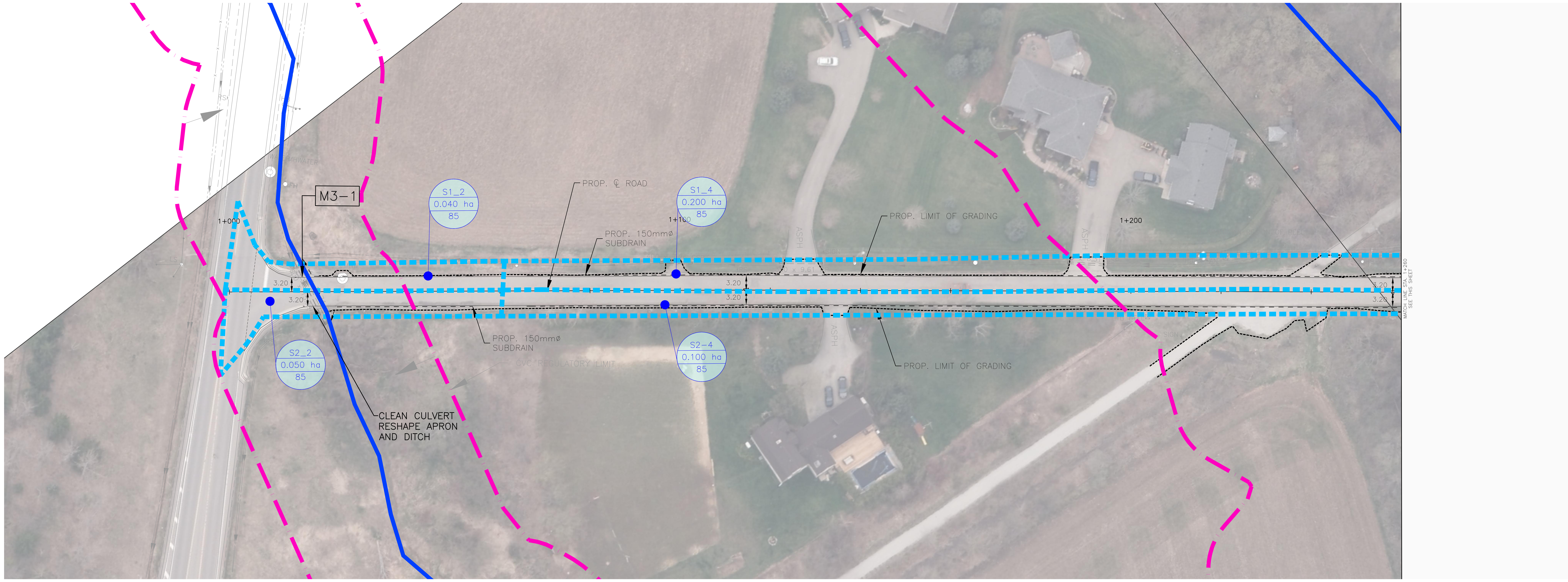
Mercedes Hincapie, P.Eng.

Report reviewed by:

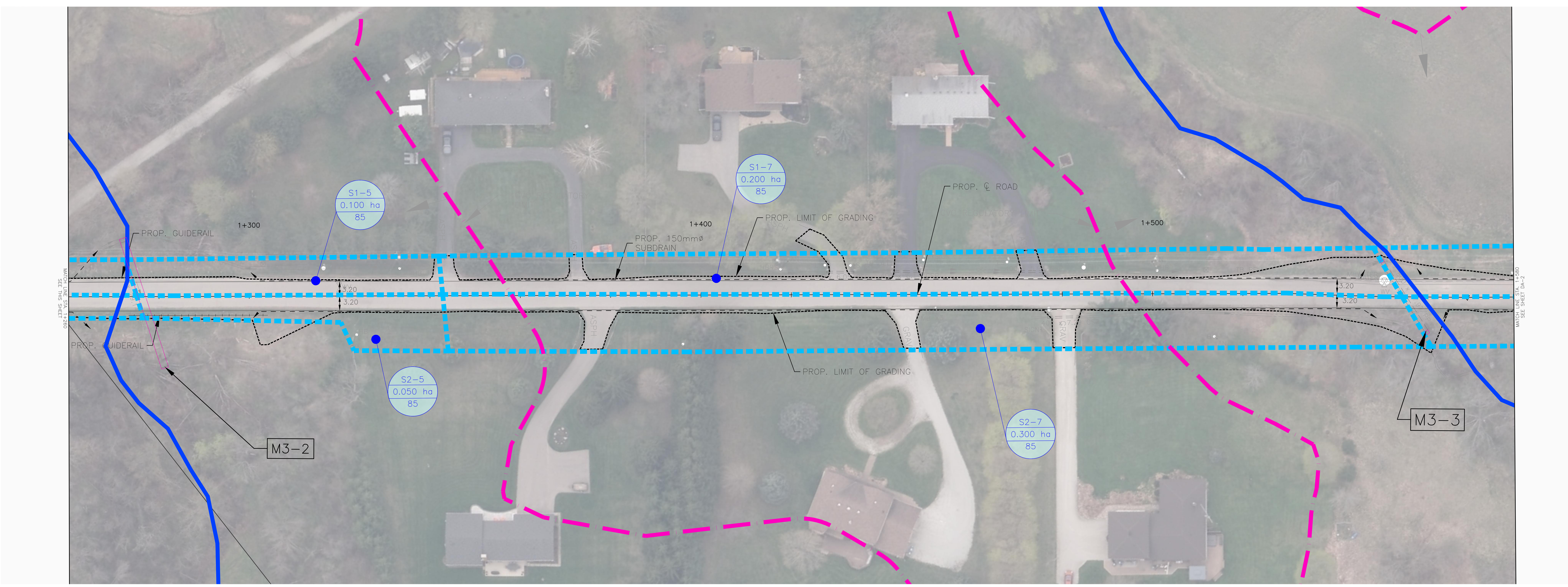
Matthew de Wit, P.Eng.

R.V. ANDERSON ASSOCIATES LIMITED

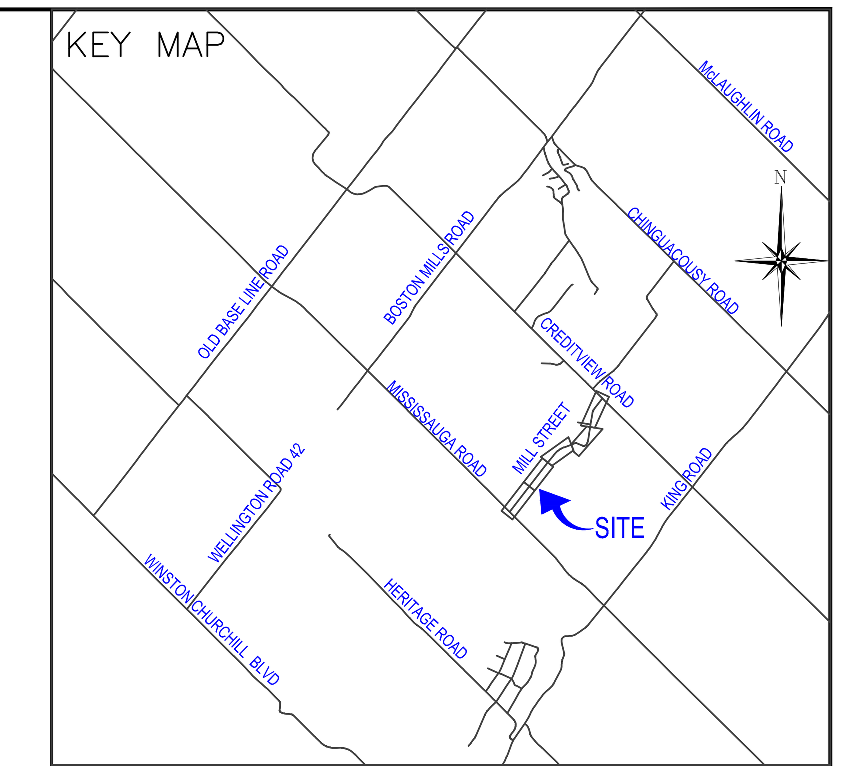
APPENDIX A
SWM DRAWINGS



MAIN STREET



KEY MAP



LEGEND

- DRAINAGE AREA MINOR EVENT
- CVC REGULATORY LIMIT
- E 004 — AREA ID
- 0.21 ha — CATCHMENT AREA
- 25 — IMPERVIOUS %
- OVERLAND FLOW
- WATER COURSE
- M3-12 — CULVERT ID
- EXISTING CULVERT
- PROPOSED CULVERT

NOTE:
CATCHMENT AREAS DELINEATION BASED ON 1m CONTOURS FROM TOWN OF CALEDON AND ROAD SURVEY

NO.	BY	DATE	REVISION	CONS. CHECKED	TOWN APPR'D
####	####	####	####	####	
####	####	####	####	####	
####	####	####	####	####	
####	####	####	####	####	

BENCH MARK:

CONSULTANT

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ENGINEER'S STAMP

APPROVED FOR CONSTRUCTION

RYAN GRODECKI,
MANAGER - ENGINEERING SERVICES
FINANCE AND INFRASTRUCTURE SERVICES

DATE

PROJECT NAME

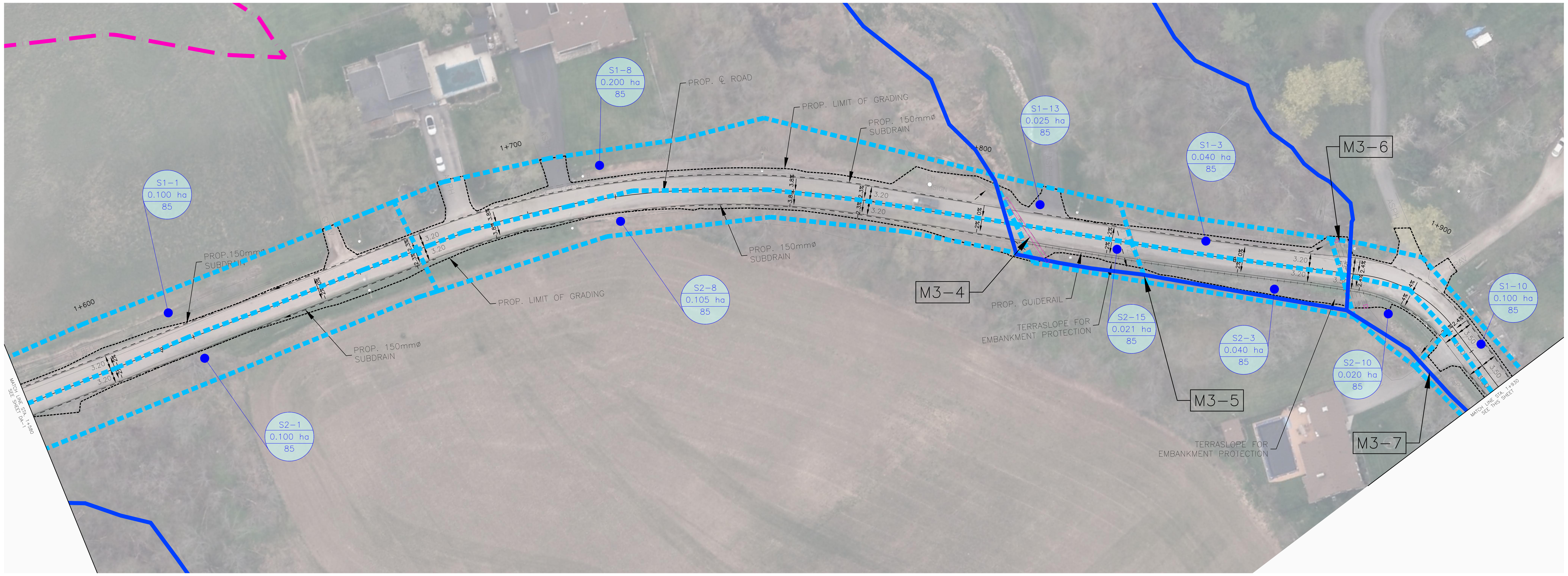
ROAD RECONSTRUCTION
MILL STREET
FROM MISSISSAUGA ROAD TO CREDITVIEW ROAD

FINANCE AND INFRASTRUCTURE SERVICES

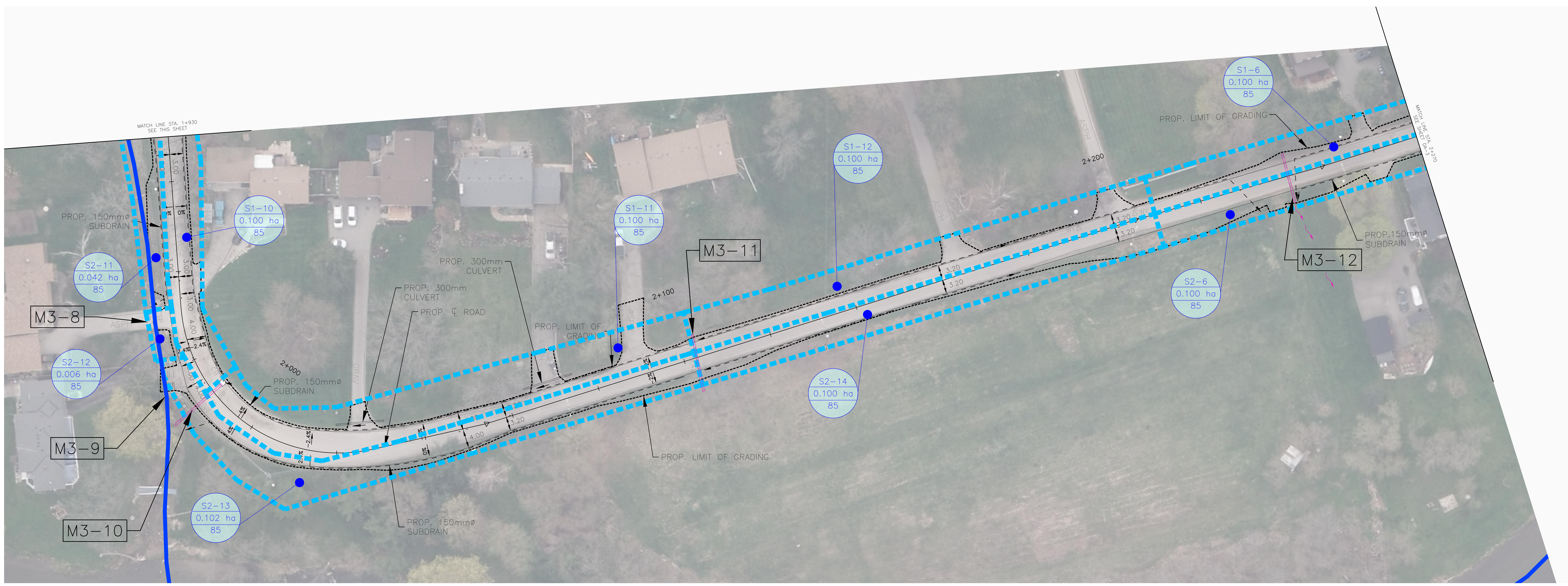
TOWN OF CALEDON

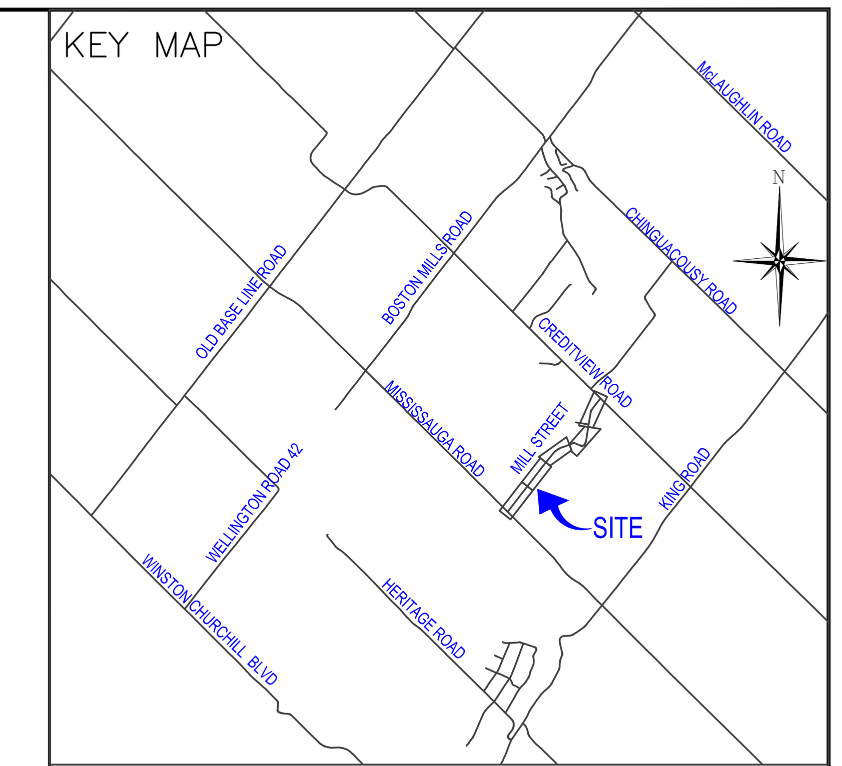
MILL STREET
SWM PLANS

SCALE: HORIZ. 1:500	VERT. 1:50	PROJECT No. FEB 23
DESIGNED BY: ####	DRAWN BY: ####	DRAWING No. DA-1
CHECKED BY: ####	DATE: ####	



MAIN STREET





LEGEND

DRAINAGE AREA MINOR EVENT

CVC REGULATORY LIMIT

E 004 — AREA ID

0.21 ha — CATCHMENT AREA

25 — IMPERVIOUS %

OVERLAND FLOW

WATER COURSE

M3-12 CULVERT ID

EXISTING CULVERT

PROPOSED CULVERT

NOTE:
CATCHMENT AREAS DELINEATION BASED ON 1m CONTOURS FROM TOWN OF CALEDON AND ROAD SURVEY

NO.	BY	DATE	REVISION	CONS. CHECKED	TOWN APPR'D
####	####	####	####	####	
####	####	####	####	####	
####	####	####	####	####	
####	####	####	####	####	

BENCH MARK:

CONSULTANT

RVA PEOPLE. PROJECTS. PLANET.
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ENGINEER'S STAMP

APPROVED FOR CONSTRUCTION

RYAN GRODECKI,
MANAGER - ENGINEERING SERVICES
FINANCE AND INFRASTRUCTURE SERVICES

DATE

PROJECT NAME

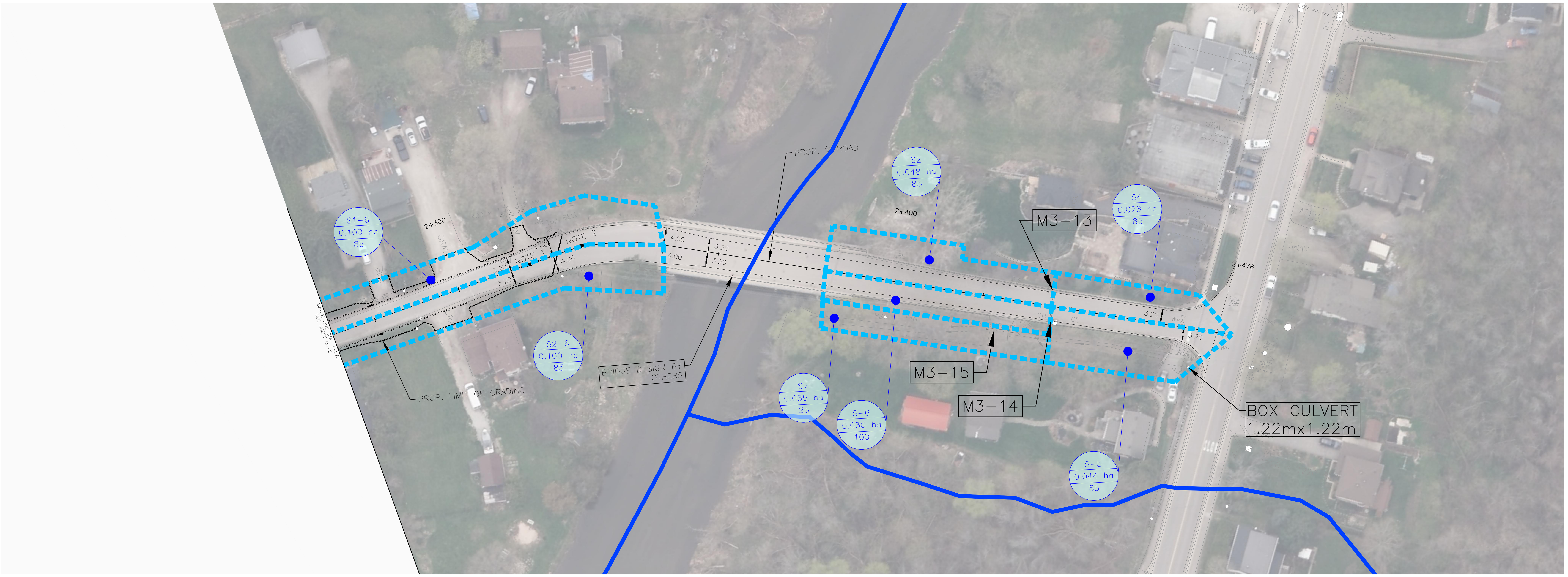
ROAD RECONSTRUCTION
MILL STREET
FROM MISSISSAUGA ROAD TO CREDITVIEW ROAD

FINANCE AND INFRASTRUCTURE SERVICES

TOWN OF CALEDON

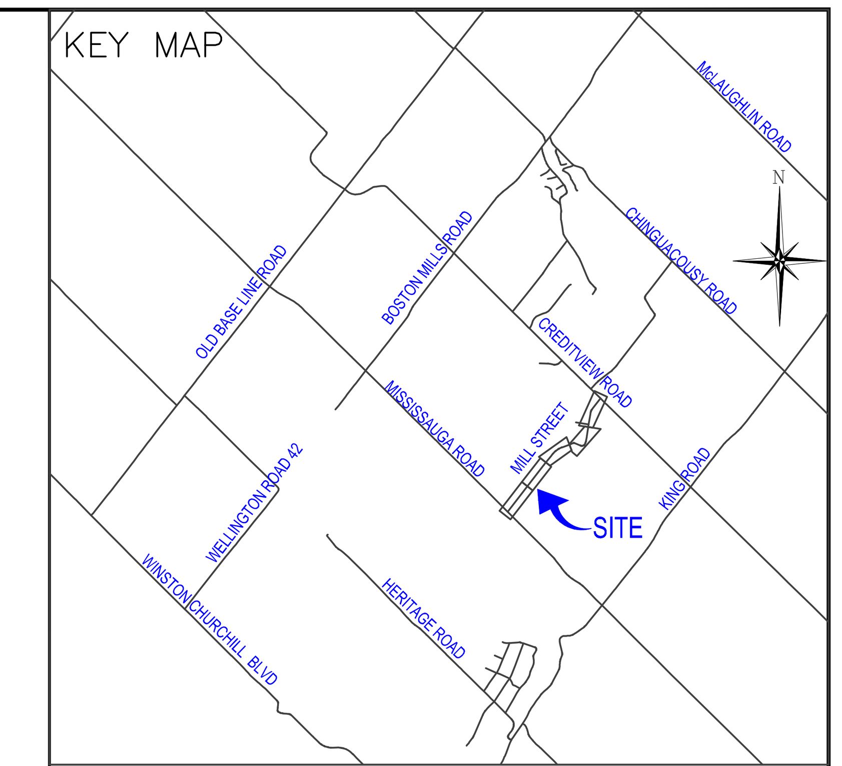
MILL STREET SWM PLANS

SCALE: HORIZ. 1:500	VERT. 1:50	PROJECT No. 205388
DESIGNED BY: ####	DRAWN BY: ####	DRAWING No. DA-2
CHECKED BY: ####	DATE: ####	



MAIN STREET

KEY MAP



LEGEND

DRAINAGE AREA MINOR EVENT

CVC REGULATORY LIMIT

E 004 — AREA ID

0.21 ha — CATCHMENT AREA

25 — IMPERVIOUS %

OVERLAND FLOW

WATER COURSE

M3-12 — CULVERT ID

EXISTING CULVERT

PROPOSED CULVERT

NOTE:
CATCHMENT AREAS DELINEATION BASED ON 1m CONTOURS FROM TOWN OF CALEDON AND ROAD SURVEY

NO.	BY	DATE	REVISION	CONS. CHECKED	TOWN APPR'D
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MANAGER - ENGINEERING SERVICES
FINANCE AND INFRASTRUCTURE SERVICES

DATE

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ROAD RECONSTRUCTION
MILL STREET
FROM MISSISSAUGA ROAD TO CREDITVIEW ROAD

FINANCE AND INFRASTRUCTURE SERVICES

TOWN OF CALEDON

MILL STREET
SWM PLANS

SCALE: HORIZ. 1:500	VERT. 1:50	PROJECT No. 205388
DESIGNED BY: ####	DRAWN BY: ####	DRAWING No. DA-3
CHECKED BY: ####	DATE: ####	