PROPOSED PLAN OF SUBDIVISION – 13030 LUNDY'S LANE

Preliminary

Functional Servicing Report

Project Location:
Highway 20 & Thorold Townline Road, Thorold, ON

Prepared for:
Rudanco Hospitality Corporation

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Engineers, Scientists, Surveyors.

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1.0 INTRODUCTION

1.1 Overview

MTE Consultants Inc. (MTE) has been retained by Rudanco Hospitality Corporation (Rudanco) to complete the Functional Servicing design in support of an application for Draft Approval of Plan of Subdivision for their 13030 Lundy's Lane (Highway 20) property in the City of Thorold. The property is referred to herein as the 'Subject Lands'.

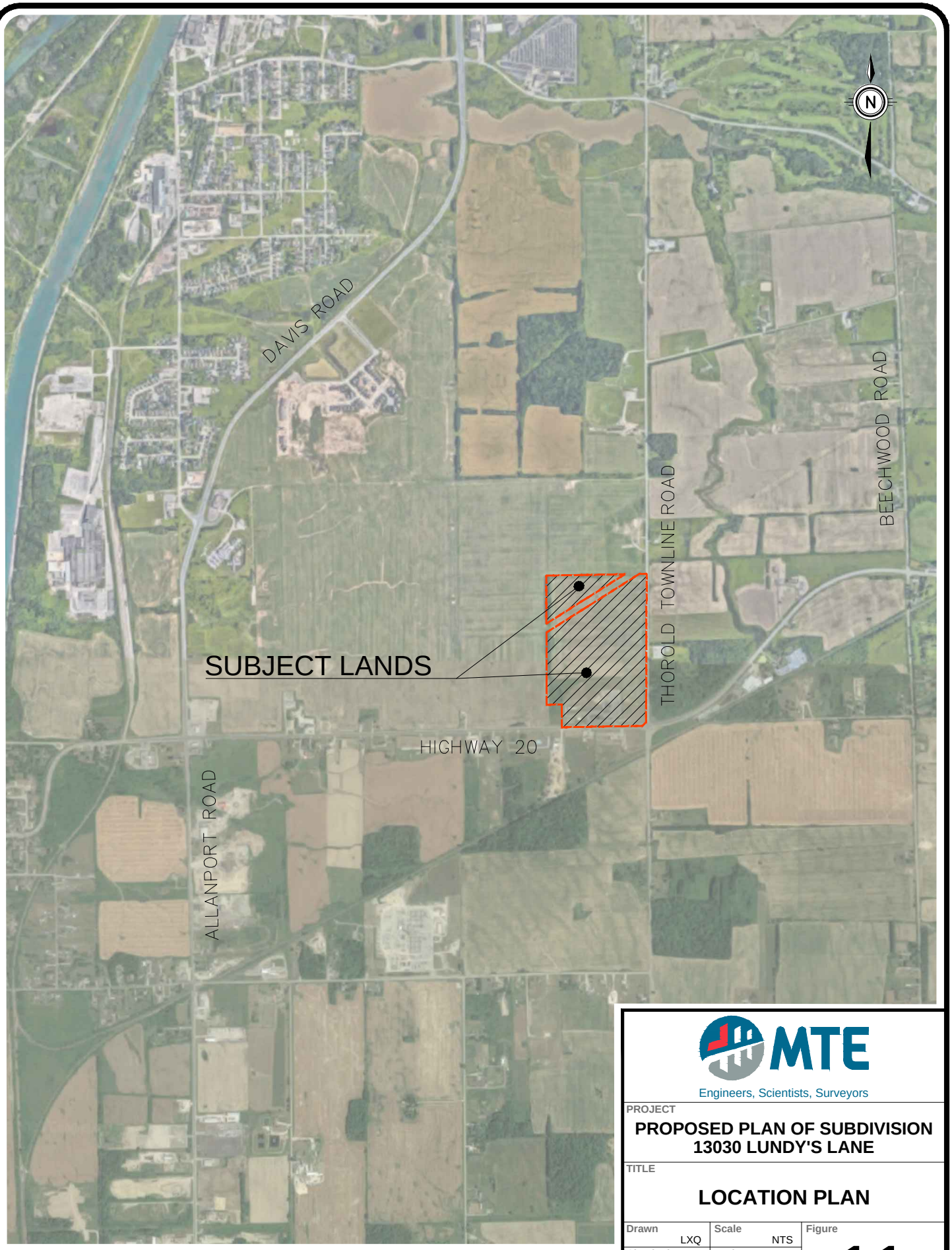
The Subject Lands comprise two parcels north of Lundy's Lane, west of Thorold Townline Road, immediately east of the Rolling Meadows Subdivision (including a small hold out lot, namely Part 1, Plan 59R-9206) and abutting the north and south sides of an existing Hydro Corridor. The Subject Lands are legally described as Parts 1 through 5 of Plan 59R-16622, City of Thorold and total 23.0 ha. The two parcels are separated by lands owned by Hydro One, dedicated to high voltage transmission towers, including a short north-south right-of-way across the hydro corridor (Part 5 of Plan 59R-16622). Urbanization of the Rolling Meadows Subdivision is occurring in different Phases and has begun, but the portion immediately adjacent to the Subject Lands has not yet been developed.

As illustrated in **Figure 1.1**, the Subject Lands are located at the northwest corner of Lundy's Lane and Thorold Townline Road. The Subject Lands extend from Thorold Townline Road at the east limits to Rolling Meadows Subdivision at the west and from Lundy's Lane at the south limits to north of the hydro easement where it is bound by agricultural lands. The majority of the site comprises vacant land with field crop vegetation. There is a closed motel and associated parking areas at the south end of the Subject Lands.

A Draft Plan of Subdivision has been prepared for the proposed development by Bousfields Inc. and forms the basis for the proposed servicing concepts. The Draft Plan of Subdivision includes single detached residential lots, townhouse residential blocks, mixed-use commercial, mixed-use residential, condominium townhouse blocks, park blocks, a stormwater management block, and municipal road allowances. The Draft Plan is enclosed in **Appendix A**, along with a preliminary Master Site Plan and Master Plan Statistics prepared for the Mixed-Use blocks by Giannone Petricone Associates.

The Draft Plan includes the following:

- Ten municipal roads (Streets A – J);
- Five Public Lanes (Lanes A – E);
- Single detached residential lots totaling 82 lots (Lots 1-39, 41-83);
- On-Street Townhouse blocks (Blocks 84-96), including an estimated 206 units;
- Rear Lane Townhouse blocks (Blocks 97-106), including an estimated 34 units;
- Condominium Townhouse block (Block 110), including an estimated 48 units;
- Mixed Use block (Block 109) including an estimated 167 residential apartment units and 7,309sm retail Gross Floor Area;
- Residential Apartment blocks (Blocks 107, 108) including an estimated 1,223 residential apartment units;
- Stormwater Management Pond block (Block 112);
- Park blocks (Block 113-114); and
- Road Widening block (Block 115).



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PROJECT
PROPOSED PLAN OF SUBDIVISION
13030 LUNDY'S LANE

TITLE
LOCATION PLAN

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This report is to be read in conjunction with the preliminary stormwater management report prepared for the Subject Lands (Ref. 14., below).

1.2 Purpose of Study

The purpose of this study is to demonstrate that development of the Subject Lands is technically feasible, with respect to road configuration as well as with respect to water, wastewater, and stormwater servicing, in order that Draft Approval of Plan of Subdivision for the project may be granted by the City of Thorold.

1.3 Background Documentation

A review of available documents was carried out prior to undertaking this Functional Servicing Report. Previous studies reviewed include the following reports:

- Ref. 1: *Preliminary Geotechnical Investigation Proposed Residential Development 13030 Lundy's Lane*, Allanburg, Ontario, Soil-Mat Engineers & Consultants Ltd. (July 23, 2021).
- Ref. 2: *Water Supply for Public Fire Protection*, Fire Underwriters Survey, 2020.
- Ref. 3: *Water-Wastewater Project Design Manual*, Niagara Region, August 2019.
- Ref. 4: *City Wide Water Service Master Plan*, City of Thorold, GM BluePlan (November 2019)
- Ref. 5: *Niagara Region 2016 Water and Wastewater Master Servicing Plan (MSP) Update*, Final Report, GM BluePlan (June, 2017).
- Ref. 6: *Official Plan of the City of Thorold*, City of Thorold (April 2016).
- Ref. 7: *City of St. Catharines Engineering Standards Manual*, City of St. Catharines, (June, 2015).
- Ref. 8: *Design Guidelines for Sewage Works*, Ministry of the Environment, 2008.
- Ref. 9: *Design Guidelines for Drinking-Water Systems*, Ministry of the Environment, 2008.
- Ref. 10: *MOE Stormwater Management Practices Planning and Design Manual*, Ministry of the Environment (March, 2003).
- Ref. 11: *Erosion and Sediment Control Guidelines for Urban Construction Greater Golden Horseshoe Conservation Authorities* (2006).
- Ref. 12: *Functional Servicing Report in Support of Zoning By-Law Amendment and Draft Plan Approval Upper's Grove Block Plan Residential Development*, Counterpoint Engineering, December 18, 2020.
- Ref. 13: *Erosion and Sediment Control Guide for Urban Construction*, Toronto and region Conservation Authority, 2019.
- Ref. 14: *13030 Lundy's Lane Proposed Plan of Subdivision Preliminary Stormwater Management Report*, MTE Consultants Inc., Revised November 2024.
- Ref. 15: *Preliminary Master Site Plan* and *Master Plan Statistics*, Giannone Petricone Associates, September 24, 2024.
- Ref. 16: *Ontario Building Code*, May 12, 2023.

- Ref. 17: *Thorold W and WW MSPU 13030 Lundy's Lane Development Review*, GEI Consultants, October 29, 2024.
- Ref. 18: *Thorold Special City Council Open Session Minutes CL 17-2024*, October 8, 2024.
- Ref. 19: *Minutes of Upper's Lane Construction Coordination Meeting #1, October 30, 2024*, City of Thorold Operations Department, including revisions requested by Rudanco and Parkbridge.
- Ref. 20: *Test Pit Study – Groundwater Considerations Proposed Residential Development 13030 Lundy's Lane Niagara Falls, Ontario*, Soil-Mat Engineers & Consultants Ltd. (November 21, 2024).

As directed by City of Thorold staff, the preliminary design included herein has been prepared in accordance with City of St. Catharines design criteria (Ref. 7).

2.0 SITE GRADING

2.1 Existing Topography

Suda & Maleszyk Surveying Inc. conducted a detailed topographical survey of the property which MTE received on August 08, 2021. Additional areas were surveyed to supplement the original drawing and were received on July 09, 2023. The existing topography of the Subject Lands is shown on MTE Drawing No**. 49428-100 P-ST1 Preliminary Pre-Development Storm Drainage Area Plan**, enclosed.

Much of the Subject Land is relatively flat with elevations ranging from 187.5 to 182.0m. The site mostly has an east-west drainage split which roughly coincides with the middle of the existing motel and extends north and west to a site high point just north of the Hydro Corridor. Approximately 3.2ha of the site near the north end including a portion of the Hydro Corridor drains towards the ditch within the west boulevard of Thorold Townline Road and into twinned existing 450mm culverts. Another large 14.7ha area of the site including a portion of the Hydro Corridor drains towards the ditch within the west boulevard of Thorold Townline Road and into an existing 600mm culvert. These culverts are labelled as Outlet #1 and #2 respectively. Outlet #1 crosses under Thorold Townline Road via two 450mm dia. culverts which discharge to a realigned, regular channel which flows through private lands to the north then east, eventually discharging into Beaverdams Creek. Outlet #2 crosses under Thorold Townline Road via a 600mm dia. culvert which discharges to a second realigned, regular channel which flows east and discharges to Beaverdams Creek approximately 450m east of the Subject Lands. There are six other existing outlets points which drain offsite to the west and north and are labelled as Outlets #4 through #9. Each of the drainage outlets is illustrated on enclosed MTE Drawing No. **49428-100 P-ST1 Preliminary Pre-Development Storm Drainage Area Plan**.

There is no minor or major storm drainage from Thorold Townline Road or Lundy's Lane conveyed through the Subject Lands. Thorold Townline Road drains to the north in the roadside ditches to the existing culverts as described above. Lundy's Lane also drains into roadside ditches and culverts, with an existing high point at the motel's entrance near mid-block. From this entrance, grades fall to the east on the east side into an existing 750mm culvert which passes under Thorold Townline Road and fall to the west on the west side.

2.2 Proposed Grading

Preliminary grading of the Subject Lands has been designed to meet the following goals:

- To direct stormwater runoff from within the Subject Lands towards the proposed stormwater management (SWM) facility within the development;
- To match to existing grades at the west limits of the Subject Lands;
- To ensure adequate cover is provided on proposed storm and sanitary sewers; and

To comply with City of Thorold lot grading and road criteria (using City of St. Catharines standards).The preliminary grading design for the Subject Lands generally mimics the shape of the existing topography where practical. The proposed design includes longitudinal slopes for the proposed municipal roads and rear lane ranging from 0.5% to 6.0%. Preliminary block grading includes a mixture of back-to-front and split drainage patterns. Proposed lot slopes vary from 2% - 5%. On low rise residential lots and blocks where split drainage is required, rear lot catchbasins have been provided to ensure drainage is captured within the development limits and not discharged onto neighbouring properties. Mixed-use, commercial and high-density residential blocks have been graded with 3:1 H:V transition slopes matching to existing grades at external road allowances. At the Site Plan stage for each of these blocks, grading design will be refined to suit each specific Site Plan, and it is anticipated that these transition slopes will be minimized through internal site grading design.

At this writing, proposed grading designs for adjacent phases of the Rolling Meadows Subdivision have not been received, so the grading design for the Subject Lands has endeavored to match to existing grades along the west limit. In areas where there is insufficient rear yard area to accommodate a transition slope, a precast concrete retaining wall is proposed at the rear lot in order that grading onto the neighbouring property is not necessary. Rear yard catchbasins are proposed at the back of split grading lots backing onto the west limits of the Subject Lands.

The geotechnical investigation report (Ref. 1) notes that in areas of the Subject Lands, the groundwater table is relatively high and readings taken to date conservatively indicate a groundwater level at 1.5 to 2 meters below the existing grade, at an elevation of roughly 183.5 to 186.5 metres. To gain a better understanding of groundwater levels throughout the Subject Lands, test pits were excavated in November 2024 to depths of 2.2m – 2.7m below existing ground, and no groundwater was contacted, as documented by Soil-Mat (Ref. 20). Based on this test pit data, groundwater is not expected at low rise building footing elevations. Nevertheless, it is recommended that the groundwater level be confirmed at the detailed design stage.

Preliminary grading design is illustrated on MTE Drawing No. **49428-100 P-AG1.1 Preliminary Area Grading Plan**, enclosed.

3.0 MUNICIPAL SERVICING

3.1 Water & Wastewater Servicing Background Information

On October 8, 2024, Thorold City Council resolved to direct staff to engage with stakeholders and report back to Council respecting options regarding the construction of Upper's Lane roadway (Ref. 18). On October 30, 2024, stakeholders including City staff, Rudanco and their consultants, Parkbridge and their consultant, and Upper Canada Consultants (Rolling Meadow's consultant) met for this purpose. Minutes of that meeting were prepared by City staff and

circulated to attendees for review. Parkbridge and Rudanco returned a requested revision to the minutes including their consolidated notes (Ref. 19, included in **Appendix F**).As documented in Ref. 19, City staff noted that the municipal water supply to the entirety of the Rolling Meadows Secondary Plan area (including both the built and future phases of Rolling Meadows, the Draft-approved lands held by Parkbridge, and the Subject Lands) is provided by a single watermain connection from Davis Road at Barker Parkway, and noted that looping of the system to Regional watermain south of the Secondary Plan area is required for security of supply, and to improve the fire flow capacity within the Secondary Plan. Possible solutions include (a) extension of watermain along Lundy's Lane from Davis Road to Thorold Townline Road, then south along Thorold Townline Road to connect to the existing watermain on Barron Road, and (b) extension of watermain along Upper's Lane from Barker Parkway to Thorold Townline Road, then south along Thorold Townline Road to connect to the existing watermain on Barron Road.

The Lundy's Lane alternative is constrained because Lundy's Lane (Highway 20) is a provincial road. MTO's onerous criteria for installation of infrastructure within provincial roads would require that such a watermain extension either be outside of, and set back at least 14m from, the Lundy's Lane road allowance. MTO may permit installation of the watermain extension within the road allowance if the watermain is encased in a steel carrier pipe, which would be cost prohibitive. Staff also noted that the City has had positive discussions with MTO about downloading this portion of Lundy's Lane to the City, but this process is anticipated to take several years to complete, if at all.

As part of the development review, the City's water and wastewater consultant, GEI Consultants, reviewed the first submission preliminary design information submitted in support of the Draft Plan application for the Subject Lands, and published a development review report (Ref. 17) in October 2024.

The GEI report assessed the ability of the City and Region's water and wastewater systems to accommodate the demands of the Subject Lands under a variety of servicing scenarios, made recommendations with respect to the servicing of the Subject Lands and identified required upgrades to external municipal infrastructure, all as described in the following subsections.

3.1.1 Water Servicing

Domestic and Fire demands of the Subject Lands can be met through implementation of the following servicing scenario, identified as Water Scenario 3 in the GEI report:

- Provide a watermain loop connection from the Subject Lands, south along Thorold Townline Road, to the existing 500mm diameter watermain on Barron Road;
- Provide a watermain loop connection from the Subject Lands, north along Thorold Townline Road then west along Upper's Lane, to the existing 300mm diameter watermain on Barker Parkway. Note that while the GEI report recommends a twin 250mm diameter watermain connection in this area (based on the then-current preliminary development design of the Subject Lands), City of Thorold Engineering staff have confirmed that a single 250mm diameter watermain is sufficient provided that the connection to Barron Road is also provided as described above;
- Upsizing of approximately 400m of 100mm diameter watermain to 250mm diameter, on Upper's Lane from Davis Road to the point at which the existing 200mm watermain starts; and
- New Regional watermain interconnection on Allanburg Road, south of Davis Road and Upper's Lane.

Figure 2-1 Pressure and Fire Flow Scenario Upgrades, excerpted from the GEI report, illustrates the above, and is included in **Appendix C**.

The GEI report does not provide information with respect to water allocation levels that will trigger each of the recommended upgrades.

3.1.2 Wastewater Servicing

The wastewater demand from the Subject Lands can be met through implementation of the following servicing scenario, identified as Wastewater Scenarios 1 and 2 in the GEI report:

- Discharge of up to 20L/s from the Subject Lands to the existing Lundy's Lane sanitary sewer;
- Extension of sanitary sewer from Upper's Lane to the Subject Lands via Upper's Lane and Thorold Townline Road; and
- Upsizing of approximately 250m of 675mm diameter sewer on Allanburg Road from Clara Drive to the Peel Street Sewage Pumping Station to 750mm diameter

At the October 30, 2024 Upper's Lane stakeholders meeting (Ref 19) it was agreed to design the extra capacity required to service the Subject Lands into the Upper's Lane sanitary sewer.

3.2 Sanitary Servicing

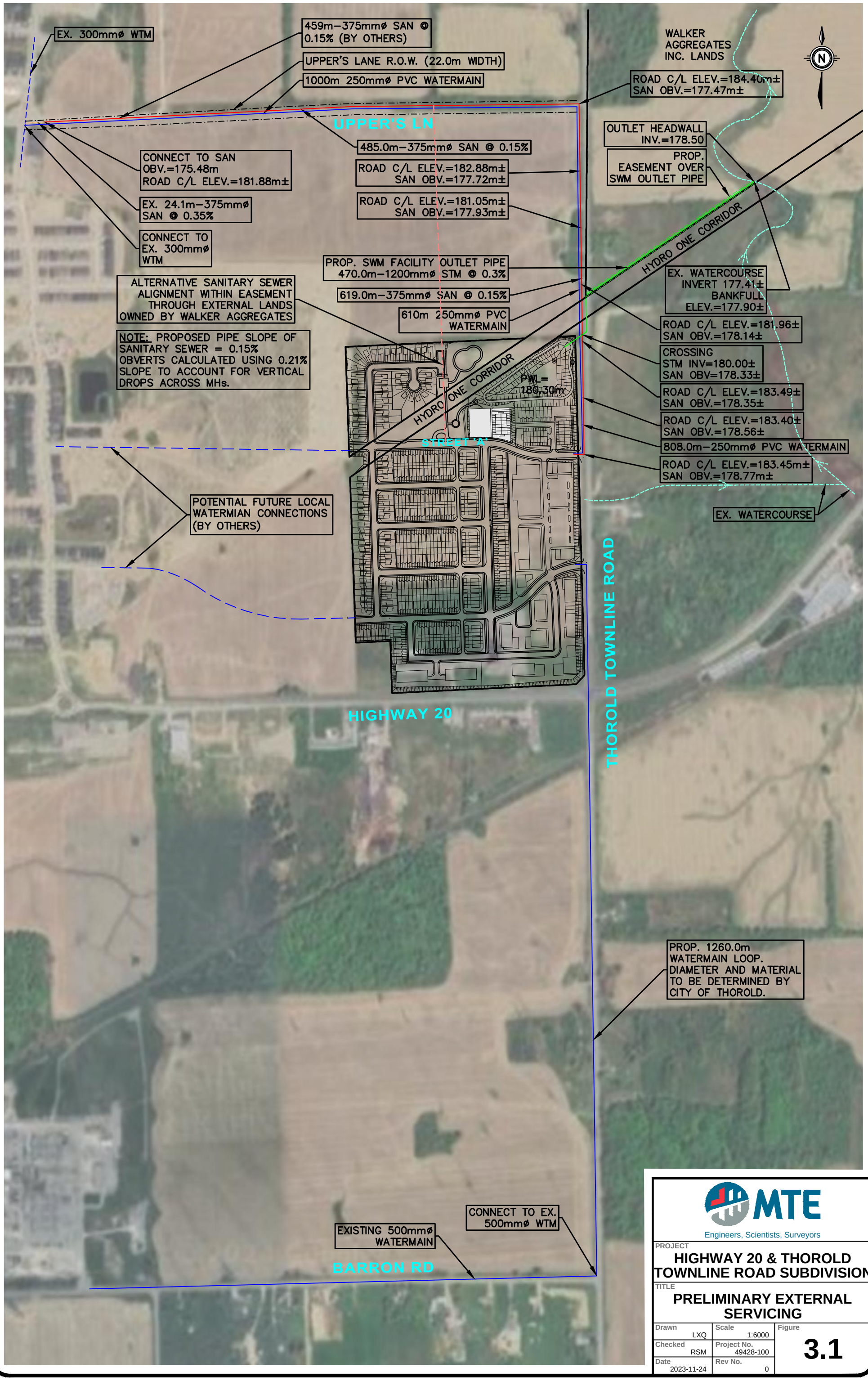
The proposed sanitary sewer network within the Subject Lands is shown on MTE Drawing No. **49428-100 P-GP1.1 Preliminary General Plan of Servicing** and the corresponding drainage area plan on MTE Drawing No. **49428-100 P-SA1.1 Preliminary Sanitary Drainage Area Plan**, both enclosed. Preliminary sewer design for the wastewater collection network has been carried out in accordance with City of Thorold design guidelines, using parameters from both the City of St. Catharines and Niagara Region standards. Generally, the depth of cover on sanitary sewers within the Subject Lands is on the order of 3m. To achieve this cover depth within the Subject Lands, the external sanitary sewer along Thorold Townline Road and Upper's Lane will be deeper, ranging from 4.5 to approximately 10m deep.

A preliminary sanitary sewer design sheet is included in **Appendix B**.

Extension of sanitary servicing to the Subject Lands will be provided by one connection to the 375mm dia. municipal sewer on Upper's Lane as illustrated on **Figure 3.1**, and one connection to the existing municipal sanitary sewer along the Lundy's Lane frontage of the Subject Lands, all as described in the following subsections.

3.2.1 Lundy's Lane

The existing Lundy's Lane sewer has an invert of 182.08m near the southwest corner of the Subject Lands. This sewer drains west towards the existing Blackhorse Sanitary Pump Station (SPS). Domestic wastewater generated from the southern portion (approximately 2.43 Ha) of the Subject Lands will be conveyed to this proposed connection with 200mm diameter gravity sewers. As set out by the GEI servicing study (Ref. 17), a flow of 20L/s from the Subject Lands can be directed to Lundy's Lane with no upgrade required. The peak flow from the Subject Lands proposed to be directed to the Lundy's Lane sewer is 17.81 L/s.



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PROJECT

HIGHWAY 20 & THOROLD TOWNLINE ROAD SUBDIVISION

TITLE

PRELIMINARY EXTERNAL SERVICING

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3.2.2 Upper's Lane

Sanitary flow from the balance of the Subject Lands will be conveyed to the intersection of Street A and Thorold Townline Road via 200-250mm gravity sewers, then to the intersection of Upper's Lane and Barker Parkway along Thorold Townline Road and the undeveloped Upper's Lane Road allowance via 375mm diameter gravity sewers.

In consultation with all stakeholders, the City of Thorold has begun the process of design and construction of the Upper's Lane extension to Thorold Townline Road. Through this process, it is agreed that the sanitary sewer will be extended along Upper's Lane to Thorold Townline Road at sufficient size and depth to accommodate development of the Subject Lands. From the intersection of Upper's Lane and Thorold Townline Road, Rudanco will extend the sanitary sewer along Thorold Townline Road to Street A.

As Thorold Townline Road is under the jurisdiction of the Region of Niagara, works proposed within Thorold Townline Road are subject to review and approval by the Region.

Alternatively, extension of the sanitary sewer from Upper's Lane to the Subject Lands via a contemplated easement through external lands owned by Walker Aggregates approximately 230m west of Thorold Townline Road is being explored by Rudanco. If acceptable to Walker and the City, this alignment would reduce the total length of sanitary sewer to be maintained by the City in the long term by 230m, and would reduce the depth of the external sanitary sewer by 1 - 1.5m. This is also illustrated on Figure 3.1. Rudanco is exploring this alternative with Walker, and if the alternative is to be pursued, additional information will be provided to the City for consideration.

3.3 Water Distribution

3.3.1 Within the Subject Lands

A network of 200-250mm diameter watermains is proposed within municipal road allowances. Fire protection will be provided by hydrants spaced in accordance with relevant design standards. The preliminary water distribution design within the Subject Lands is plan is shown on MTE Drawing No. **49428-100 P-GP1.1 – Preliminary General Plan of Servicing**. Domestic and Fire Demand calculations are included in **Appendix C**.

3.3.2 External Works

There are presently no municipal watermains adjacent to the Subject Lands. Discussion of proposed and potential extensions of municipal watermains to the Subject Lands are discussed in the following subsections.

3.3.2.1. Lundy's Lane

The existing watermain along Lundy's Lane ends some 600m west of the west limits of the Subject Lands. The City Wide Water Master Service Plan (Ref. 4) indicates that extension of this municipal watermain is necessary, from its current terminus along the Lundy's Lane to the east through the frontage of Rolling Meadows then the Subject Lands to Thorold Townline Road, then north along Thorold Townline Road past the frontage of the Subject Lands. Lundy's Lane is an MTO-owned road, and MTO requires that proposed infrastructure be set back 14m from the road allowance, meaning that a watermain extension to the Subject Lands must be installed within an easement on private property. As such, a section of the extension must pass through Rolling Meadows lands before reaching the Subject Lands. However, it is not apparent that this extension will be constructed through Rolling Meadows.

City staff have indicated that MTO may accept extension of the watermain within the Lundy's Lane road allowance if the watermain is encased within a steel carrier pipe. However, it is expected that the cost of this alternative would be prohibitive.

City staff have indicated that this portion of Lundy's Lane may be downloaded to the Region within a 3-5 year timeframe which could simplify such a watermain extension by allowing the extension to be made within the road allowance, without a steel casing. In order to ensure that development of the Subject Lands is not constrained by this uncertain timeline, the servicing strategy for the Subject Lands does not rely on extension of the Lundy's Lane watermain.

3.3.2.2. Rolling Meadows

Extension of watermains to the west limit of the Subject Lands along proposed ROWs within future phases of the Rolling Meadows development by the proponent of Rolling Meadows is anticipated, though the timing of this is uncertain. It is understood that, in the fullness of time, watermain connection(s) between the Subject Lands and Rolling Meadows will be made wherever feasible, and it is expected that the first development to proceed will provide stubs to which the second development to proceed will connect. Nevertheless, as the relative timing of the Rolling Meadows watermain extensions is uncertain, the water servicing design of the Subject Lands does not rely on the Rolling Meadows connections.

3.3.2.3. Watermain Loop from Upper's Lane and Barron Road

To allow development of the Subject Lands to move forward in advance of the potential downloading of Lundy's Lane and the development of future phases of Rolling Meadows, a looped watermain connection is proposed from Upper's Lane to Thorold Townline Road, and along Thorold Townline Road to Barron Road, past the Thorold Townline Road frontage of the Subject Lands. Based on discussion with City staff, it is understood that this watermain loop will benefit the City's overall water distribution system, and so will be funded by Development Charges. Connection of the Subject Lands to this City watermain loop is proposed at Street A and Street K. This watermain loop is shown on **Figure 3.1**.

3.3.3 Internal Water Distribution

3.3.3.1. System Demands

Based on the proposed unit count within the development including conceptual retail area within the Mixed-Use block, and using City of St. Catharines design criteria, domestic and fire water demands for the project are summarized in **Table 3.1**.

Table 3.1 – Domestic Water Demands

Land-use	Residential Units[A]	Pop. (pers.) [B]	Retail Gross Floor Area[A] (m^2)	Avg. Demand (L/s)[C, D]	Max Day Demand (L/s) [E]	Peak Hour Demand (L/s) [F]	Fire Flow Demand (L/s) [G]	Max. Day + Fire (L/s)
Single Detached	83	291		0.81	1.25	3.23	100	101.3
Street Townhomes	240	720		2.00	3.10	8.00	200	203.1
Retail (Block 109)			7,309	2.72	4.90	10.88	175	179.9
Condominium Apartments (Blocks 107-108)	1,448	2,896		8.04	12.47	32.18	200	212.5
Total		**3,907**	**7,309**	**13.57**	**21.72**	**54.29**	**200**	**221.7**

[A] Unit counts and Retail GFA based on Master Plan Statistics (Ref. 15).
[B] Population based on density of 3.5 persons per unit (PPU) for single detached homes, 3.0 PPU for street townhomes, 2.0 PPU for condo apartments.
[C] Residential Average demand based on 240 L/cap/day per Niagara Region MSPU
[D] Retail Avg Demand based on OBC, assuming 75% "Stores" and 25% "Restaurants (not open 24 hours)".
[E] Max Day demand based on peaking factor of 1.55 per Niagara Region MSPU except Retail which used 1.80 based on 2018 City MSP level of service objectives.
[F] Peak Hour demand based on peaking factor of 4 as per Niagara Region MSPU
[G] Fire Flow demand per Thorold MSP, except Multi-Residential which used 200L/s oer the anticipated MSPU (vs. 150L/s in the current MSP).

Complete domestic and fire flow demand calculations are included in **Appendix C**.

3.3.4 Modeling Results

Water distribution modeling was completed by GEI (Ref. 17) for a previous version of the Draft Plan for the Subject Lands which included approximately 22% more residential units and 38% less retail gross floor area than the current plan. The development scenario included in the current Draft Plan results in Average Day, Maximum Day, Peak Hour, Fire and Maximum Day + Fire Demands as listed in **Table 3.1**, all of which are at least 20% lower than those derived from the previous plan and modeled by GEI. Due to the lower demands in the current scenario, it is expected that such an update will produce improved results.

GEI's 'Scenario 3' modeling represents the proposed water servicing strategy for the Subject Lands. Under Scenario 3, GEI concludes that:

a) Under Average Day and Maximum Day Demands:

- resultant pressures within the Subject Lands meet the minimum pressure criteria of 40 psi.
- pressures within the larger study area do not experience any negative effects with the addition of the proposed development and are largely maintained in the preferred operating range of 50-100 psi.

b) Under Fire Flow Demand:

- There is one junction in the southeast corner of the proposed development (apartments) that does not meet the 200L/s multi-family residential fire flow target, however, it is within 5% of the target.
- Fire flows are expected to increase with additional looping (i.e. connections to future phases of Rolling Meadows).
- The larger study area experiences an increase in available fire flow.

It is recommended that the GEI modeling be updated to include additional modeling scenarios to a) reflect the latest development proposal of the Subject Lands; b) to ascertain the water allocation triggers associated with the various recommended upgrades to the existing municipal water distribution system, in order to inform decision making related to phasing of development of the Subject Lands; and c) to provide clarity with respect to which upgrades are required to service the Subject Lands alone and which upgrades will benefit other development lands and/or the larger municipal water distribution system, so that costs of the various upgrades can be shared appropriately among benefitting parties.

3.4 Storm Drainage

In general, the storm sewer system for the Subject Lands includes a storm sewer network designed to capture and convey runoff from the minor storm event (5-year storm event) and major overland flow routes along municipal roads to convey runoff from storms exceeding the capacity of the storm sewer towards the proposed stormwater management pond (Block 112), all in accordance with City of St. Catharines design guidelines.

Proposed pipe sizes vary from 300mm to 1350mm in diameter, with maximum slope of 0.7% and minimum slope of 0.47%. Minimum cover on the proposed storm sewers is 1.5m. Small transition areas around the perimeter of the site which cannot be directed to the SWM facility due to grading constraints are discharged uncontrolled and have been accounted for in the hydrologic modelling. The uncontrolled portions of Streets A and K will drain into the roadside ditch of Thorold Townline Road via curb spillways to be shown at the detailed design stage. In order to convey discharge from the SWM facility to Beaverdams Creek, a piped outlet from the SWM facility, across Thorold Townline Road and through external lands within an easement to Beaverdams Creek is proposed, as described in the Preliminary SWM report (Ref. 14).

A preliminary storm servicing plan and corresponding drainage area plan are shown on MTE Drawing No. **49428-100 P-GP1.1 Preliminary General Plan of Servicing** and the corresponding drainage area plans on **49428-100 P-ST1.1 Preliminary Storm Drainage Area Plan**, enclosed.

The storm sewer design sheet is included in **Appendix D**.

3.5 Stormwater Management

As described in the Preliminary SWM report for the project (Ref. 14), the SWM requirements for the project are as follow:

- “Enhanced” water quality treatment as defined by MOE 2003;
- Attenuation of the post-development peak flows for the 2- to 100-year storm events to the pre-development (existing) peak flows. Thorold Townline road and Lundy’s Lane shall not be negatively affected as a result of development; and

- Identify the feasible Low Impact Development/Green Infrastructure practices in order to mitigate impact on the downstream receiving creeks.

The SWM design for the Subject Lands includes construction of a wet pond SWM facility to provide the requisite Water Quality treatment and quantity control. As detailed in the preliminary SWM report for the project, all stormwater management targets for the project are met by the proposed SWM design.

4.0 ROAD NETWORK AND ROADWORKS

The road network through the Subject Lands has been prepared by Bousfields Inc. to best suit the physical boundary constraints while providing a logical layout with a mix of land uses.

Utilizing the proposed road layout, centreline road grades and associated lot grading have been designed to generally meet the following criteria:

- Match existing road grades at subdivision accesses;
- Match existing and proposed boundary grades around the perimeter of the site;
- Ensure adequate cover is provided over municipal services;
- Ensure “major” overland flow routes are directed to the downstream outlet, and;
- Comply with municipal standards for minimum and maximum road and lot grades.

Preliminary centreline road grades range from 0.5% to 6.0% along municipal roads and laneways, and generally slope from the site boundaries to the proposed downstream storm outlet at the northeast corner of the stormwater management pond (Block 112) as shown on MTE Drawing No. **45174-104 P-AG1.1 Preliminary Area Grading Plan**.

Municipal roadways will be constructed to a full urban cross-section including asphalt pavement, concrete curb and gutters, concrete sidewalks, roadway illumination and boulevard landscaping all in accordance with the City of Thorold standards. Sidewalk connections to the Street B Multi-Use Path, within the 24m wide portion of the Street B right-of-way will be shown at the detailed design stage.

Municipal right-of-way widths will be constructed to various widths as outlined in **Table 4.1**. Typical 18m, 20m and 24m ROW cross-sections have been prepared based on St. Catharines typical sections, modified to provide increased asphalt widths as required by the Official Plan of the City of Thorold, Section B.1.8.14.2. An additional 24m ROW section has been prepared for the portion of Street B from Street A to Street H, in which a 6m widening has been added to the west boulevard of the typical 18m ROW section to accommodate a trail corridor. Lastly, a typical 6.5m wide Rear Lane ROW section has been prepared for Lanes A-E.

A typical cross-section for each right-of-way width is included in **Appendix E**.

Table 4.1 – Proposed Right-of-Way Widths

Street Name	Width (m)
Streets A, K	20.0
Street B	24.0
Streets C – J	18.0
Lanes A - E	6.5

In accordance with the geotechnical investigation for the proposed development, the proposed pavement structure is summarized in **Table 4.2**.

Table 4.2 – Proposed Pavement Structure

Pavement Structure	Local Roads (mm)	Site Plan Blocks Light duty (mm)	Site Plan Blocks Heavy duty (mm)
Surface Course HL-3 Asphaltic Concrete	40	65	40
Binder Course HL-8 Asphaltic Concrete	65	-	80
Granular 'A' (or equivalent) Base	150	150	150
Granular 'B' Type II (or equivalent) Sub-base	300	300	450

5.0 EROSION & SEDIMENTATION CONTROL

The preliminary erosion and sedimentation control (ESC) design for the project includes the following aspects:

- siltation control fence along the portion of the site perimeter which drains off-site;
- temporary sediment basins (TSB);
- temporary swales to direct site runoff to the TSBs;
- rock check dams at 100m intervals along the temporary swales;
- a mud mat at the construction entrance to the project from Thorold Townline Road; and
- double row siltation control fence surrounding topsoil stockpile areas.

The preliminary ESC measures listed above are illustrated on MTE Drawings **45174-104 P-ES1.1 - Preliminary Erosion and Sediment Control Plan** and **45174-104 P-ES1.2** - **Preliminary Erosion and Sediment Control Plan Notes & Details**, enclosed.

6.0 UTILITY SERVICING

Utility servicing (electrical, natural gas, telephone, cable TV) will be provided through connection to and extension of existing services on Thorold Townline Road, Lundy's Lane and extension through the neighbouring future development of Rolling Meadows along municipal roads.

7.0 COST SHARING

Future development lands adjacent to the Upper's Lane corridor will benefit from the installation of the proposed watermain and sanitary sewer along Upper's Lane. It is anticipated that the proponent of the Subject Lands will share pro rata costs of this installation with benefitting third parties through developer-to-developer cost sharing agreements. It is recommended that the Subdivision / Site Plan Agreements for the Subject Lands and for other benefitting developments be written to include mechanisms for cost sharing.

Installation of the external watermain loop along Upper's Lane and Thorold Townline Road to Barron Road will benefit the overall City of Thorold water distribution system. It is understood that the Thorold Development Charges Bylaw and Background Study include funding for such projects, and it is therefore expected that this watermain loop will be funded by Development Charges. It is understood that the proponent of the Subject Lands may need to front end a portion of the funding for this infrastructure, to be recovered as DC collections or other City funding allows. It is recommended that such an arrangement be detailed in the Subdivision Agreement for the Subject Lands.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The analysis and discussion included in this report lead to the following conclusions with respect to the proposed 13030 Lundy's Lane development:

i. Proposed grading of the Subject Lands has been designed in accordance with City of Thorold standards to convey storm runoff to a SWM facility for treatment.

ii. Sanitary service to the south portion of the Subject Lands can be provided by connection to the existing gravity sanitary sewers on Lundy's Lane, without upgrade to existing infrastructure. The remainder of the Subject Lands can be serviced through the extension of existing gravity sanitary sewers along Upper's Lane and Thorold Townline Road to the limit of the Subject Lands then throughout the Subject Lands along proposed municipal roads. Upsizing of approximately 250m of 675mm diameter sewer to 750mm diameter will be required on Allanburg Road from Clara Drive to the Peel Street Sewage Pumping Station.

iii. Adequate domestic and fire water supply for the proposed development can be provided by a network of 200 – 250mm watermains throughout the Subject Lands.

iv. A new watermain loop from Upper's Lane to Thorold Townline Road connecting to the existing 500mm diameter watermain on Barron Road is required. Design and construction of this loop can be staged or not and can be undertaken by either the proponent of the Subject Lands or the City. This watermain loop benefits the larger City water distribution City and so is to be funded by Development Charges.

v. Future connection to proposed watermains within future phases of the Rolling Meadows development adjacent to the Subject Lands is expected to improve the Fire Flow through the area.

vi. Storm drainage will be collected and conveyed to a proposed wet pond stormwater management facility within the Subject Lands which will treat stormwater prior to discharging to Beaverdams Creek east of Thorold Townline Road. Under the 25-year and larger storm events, a portion of the major flow from the SWM facility will be discharged to the Thorold Townline Road west ditch. Under all design storm events, discharge to each location is controlled to less than the pre-development levels.

vii. All stormwater management criteria for the proposed development can be achieved through incorporation of SWM measures as described in the Preliminary SWM report for the project.

viii. Erosion & Sedimentation Controls can be implemented to ensure that site soils remain on site during grading and construction works.

ix. The proposed development can be adequately serviced through the extension of existing utilities including hydro, gas, cable TV and telephone.

x. Water and sanitary infrastructure proposed along the Upper's Lane corridor will benefit future development lands outside of the Subject Lands. Cost sharing of this infrastructure with benefitting third parties is recommended.

Based on the above conclusions, it is recommended that approval be granted to the Rudanco Hospitality Corporation application for Draft Approval of Plan of Subdivision, in order that the proposed development may proceed to the next design stage.

All of which is respectfully submitted,

MTE Consultants Inc.

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rmelick@mte85.com

:rsm

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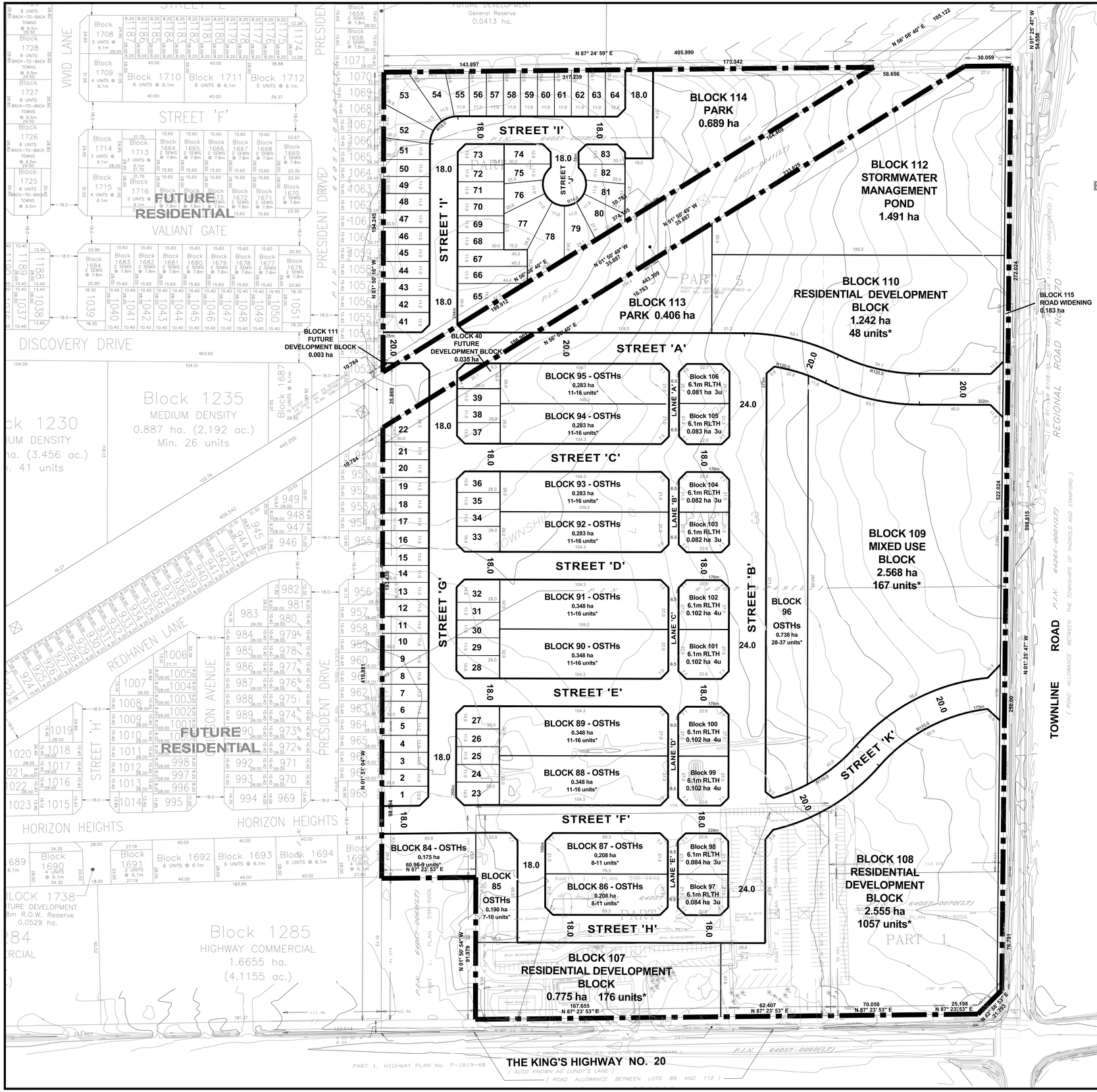
Appendix A

Draft Plan of Subdivision
Master Site Plan
Master Site Plan Statistics


STREET 'I'
STREET 'A'
STREET 'C'
STREET 'D'
STREET 'E'
STREET 'F'
STREET 'G'
STREET 'H'
STREET 'J'
STREET 'K'
BLOCK 114 PARK 0.689 ha
BLOCK 112 STORMWATER MANAGEMENT POND 1.491 ha
BLOCK 113 PARK 0.406 ha
BLOCK 110 RESIDENTIAL DEVELOPMENT BLOCK 1.242 ha 48 units*
BLOCK 115 ROAD WIDENING 0.183 ha
BLOCK 111 FUTURE DEVELOPMENT BLOCK 0.003 ha
BLOCK 40 FUTURE DEVELOPMENT BLOCK 0.035 ha
BLOCK 109 MIXED USE BLOCK 2.568 ha 167 units*
BLOCK 96 OSTHs 0.738 ha 28-37 units*
BLOCK 108 RESIDENTIAL DEVELOPMENT BLOCK 2.555 ha 1057 units*
BLOCK 107 RESIDENTIAL DEVELOPMENT BLOCK 0.775 ha 176 units*
BLOCK 85 OSTHs 0.190 ha 7-10 units*
BLOCK 84 - OSTHs 0.175 ha 60.96-9 units* N 87° 23' 53" E
BLOCK 95 - OSTHs 0.283 ha 11-16 units*
BLOCK 94 - OSTHs 0.283 ha 11-16 units*
BLOCK 93 - OSTHs 0.283 ha 11-16 units*
BLOCK 92 - OSTHs 0.283 ha 11-16 units*
BLOCK 91 - OSTHs 0.348 ha 11-16 units*
BLOCK 90 - OSTHs 0.348 ha 11-16 units*
BLOCK 89 - OSTHs 0.348 ha 11-16 units*
BLOCK 88 - OSTHs 0.348 ha 11-16 units*
BLOCK 87 - OSTHs 0.208 ha 8-11 units*
BLOCK 86 - OSTHs 0.208 ha 8-11 units*
Block 106 6.1m RLTH 0.081 ha 3u
Block 105 6.1m RLTH 0.083 ha 3u
Block 104 6.1m RLTH 0.082 ha 3u
Block 103 6.1m RLTH 0.082 ha 3u
Block 102 6.1m RLTH 0.102 ha 4u
Block 101 6.1m RLTH 0.102 ha 4u
Block 100 6.1m RLTH 0.102 ha 4u
Block 99 6.1m RLTH 0.102 ha 4u
Block 98 6.1m RLTH 0.084 ha 3u
Block 97 6.1m RLTH 0.084 ha 3u
LANE 'A'
LANE 'B'
LANE 'C'
LANE 'D'
LANE 'E'
LANE 'F'
FUTURE RESIDENTIAL
VALIANT GATE
DISCOVERY DRIVE
VIVID LANE
PRESIDENT DRIVE
REDHAVEN LANE
HORIZON HEIGHTS
HORIZON AVENUE
Block 1235 MEDIUM DENSITY 0.887 ha. (2.192 ac.) Min. 26 units
Block 1285 HIGHWAY COMMERCIAL 1.6655 ha. (4.1155 ac.)
Block 1738 FUTURE DEVELOPMENT 0.0529 ha.
EXISTING RURAL
EXISTING RURAL
REGIONAL ROAD NO. 70
TOWNLINE ROAD
THE KING'S HIGHWAY NO. 20
(ALSO KNOWN AS LUNDY'S LANE)
(ROAD ALLOWANCE BETWEEN LOTS 89 AND 112)
PART 1, HIGHWAY PLAN No. P-1819-48
PART 1
PART 2
PART 3
PART 4
PART 5
PART 6
PART 7
PART 8
PART 9
PART 10
PART 11
PART 12
PART 13
PART 14
PART 15
PART 16
PART 17
PART 18
PART 19
PART 20
PART

MASTER PLAN STATISTICS 2024-10-25

Hwy 20, Thorold

Gross Site	229,687 sm	22.969 ha	
Development Site (See Summary Below)	151,840 sm	15.184 ha	
Parkland (BLOCK 113, 114)	10,950 sm	1.095 ha	4.8%
SWM Pond (BLOCK 63)	14,910 sm	1.491 ha	
Unused Development Lot (BLOCK 111)	30 sm	0.003 ha	
Thorold TL Road Widening (BLOCK 115)	1,831 sm	0.183 ha	
Public ROW	50,126 sm	5.013 ha	

Summary	Block Area	Unit Count				GCA Retail		GCA Residential		GCA Total		GFA Retail		GFA Residential		GFA Total		FSI
		Towns	Detach	Apart	Total	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	
BLOCK 1-40	13,930	-	39	-	39	-	-	8,970	96,552	8,970	96,552	-	-	8,970	96,552	8,970	96,552	0.64
BLOCK 41-83	17,040	-	43	-	43	-	-	9,890	106,455	9,890	106,455	-	-	9,890	106,455	9,890	106,455	0.58
BLOCK 84-96	40,430	206	-	-	206	-	-	53,645	577,430	53,645	577,430	-	-	53,645	577,430	53,645	577,430	1.33
BLOCK 97-106	9,040	34	-	-	34	-	-	8,960	96,445	8,960	96,445	-	-	8,960	96,445	8,960	96,445	0.00
BLOCK 107	7,750	-	-	176	176	-	-	13,200	142,084	13,200	142,084	-	-	12,408	133,559	12,408	133,559	1.60
BLOCK 108	25,550	-	-	1,057	1,057	-	-	79,375	854,385	79,375	854,385	-	-	74,613	803,122	74,613	803,122	2.92
BLOCK 109	25,680	-	-	167	167	7,535	81,106	12,558	135,173	20,093	216,279	7,309	78,673	11,805	127,063	19,114	205,736	0.74
BLOCK 110	12,420	48	-	-	48	-	-	9,711	104,528	9,711	104,528	-	-	9,711	104,528	9,711	104,528	0.78
Development Site Total	**151,840**	**288**	**82**	**1,400**	**1,770**	**7,535**	**81,106**	**196,309**	**2,113,052**	**203,844**	**2,194,159**	**7,309**	**78,673**	**190,001**	**2,045,154**	**197,310**	**2,123,827**	**0.77**

BLOCK 1-40 13,930 sm 0.64 FSI

	Level	Unit Count				GCA Retail		GCA Residential		GCA Total		GFA Retail		GFA Residential		GFA Total	
		Towns	Detach	Apart	Total	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf
Block 1-22 Detached houses	1-2	-	22	-	22			5,060	54,465	5,060	54,465			5,060	54,465	5,060	54,465
Block 23-27 Detached houses	1-2	-	5	-	5			1,150	12,378	1,150	12,378			1,150	12,378	1,150	12,378
Block 28-32 Detached houses	1-2	-	5	-	5			1,150	12,378	1,150	12,378			1,150	12,378	1,150	12,378
Block 33-36 Detached houses	1-2	-	4	-	4			920	9,903	920	9,903			920	9,903	920	9,903
Block 37-39 Detached houses	1-2	-	3	-	3			690	7,427	690	7,427			690	7,427	690	7,427
Block 40 Future Development		-	-	-	-			0	0	0	0			0	0	0	0
Total		**-**	**39**	**-**	**39**	**-**	**-**	**8,970**	**96,552**	**8,970**	**96,552**			**8,970**	**96,552**	**8,970**	**96,552**

Detached House Units - 230 sm Avg

BLOCK 41-83 17,040 sm 0.58 FSI

	Level	Unit Count				GCA Retail		GCA Residential		GCA Total		GFA Retail		GFA Residential		GFA Total	
		Towns	Detach	Apart	Total	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf
Block 41-64 Detached Houses	1-2	-	24	-	24			5,520	59,417	5,520	59,417			5,520	59,417	5,520	59,417
Block 65-73 Detached Houses	1-2	-	9	-	9			2,070	22,281	2,070	22,281			2,070	22,281	2,070	22,281
Block 74-83 Detached Houses	1-2	-	10	-	10			2,300	24,757	2,300	24,757			2,300	24,757	2,300	24,757
Total		**-**	**43**	**-**	**43**	**-**	**-**	**9,890**	**106,455**	**9,890**	**106,455**	**-**	**-**	**9,890**	**106,455**	**9,890**	**106,455**

Detached House Units - 230 sm Avg

BLOCK 84-96 40,430 sm 1.33 FSI

	Level	Unit Count				GCA Retail		GCA Residential		GCA Total		GFA Retail		GFA Residential		GFA Total	
		Towns	Detach	Apart	Total	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf
Block 84	1-3	9	-	-	9			2,340	25,188	2,340	25,188			2,340	25,188	2,340	25,188
Block 85	1-3	10	-	-	10			2,600	27,986	2,600	27,986			2,600	27,986	2,600	27,986
Block 86	1-3	11	-	-	11			2,860	30,785	2,860	30,785			2,860	30,785	2,860	30,785
Block 87	1-3	11	-	-	11			2,860	30,785	2,860	30,785			2,860	30,785	2,860	30,785
Block 88	1-3	16	-	-	16			4,160	44,778	4,160	44,778			4,160	44,778	4,160	44,778
Block 89	1-3	16	-	-	16			4,160	44,778	4,160	44,778			4,160	44,778	4,160	44,778
Block 90	1-3	16	-	-	16			4,160	44,778	4,160	44,778			4,160	44,778	4,160	44,778
Block 91	1-3	16	-	-	16			4,160	44,778	4,160	44,778			4,160	44,778	4,160	44,778
Block 92	1-3	16	-	-	16			4,800	51,667	4,800	51,667			4,800	51,667	4,800	51,667
Block 93	1-3	16	-	-	16			4,160	44,778	4,160	44,778			4,160	44,778	4,160	44,778
Block 94	1-3	16	-	-	16			4,160	44,778	4,160	44,778			4,160	44,778	4,160	44,778
Block 95	1-3	16	-	-	16			4,160	44,778	4,160	44,778			4,160	44,778	4,160	44,778
Block 96	1-3	37	-	-	37			9,065	97,575	9,065	97,575			9,065	97,575	9,065	97,575
Total		**206**	**-**	**-**	**206**	**-**	**-**	**53,645**	**577,430**	**53,645**	**577,430**			**53,645**	**577,430**	**53,645**	**577,430**

BLOCK 97-106 9,040 sm 0.99 FSI

	Level	Unit Count				GCA Retail		GCA Residential		GCA Total		GFA Retail		GFA Residential		GFA Total	
		Towns	Detach	Apart	Total	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf
Block 97	1-3	3	-	-	3			780	8,396	780	8,396			780	8,396	780	8,396
Block 98	1-3	3	-	-	3			780	8,396	780	8,396			780	8,396	780	8,396
Block 99	1-3	4	-	-	4			1,040	11,194	1,040	11,194			1,040	11,194	1,040	11,194
Block 100	1-3	4	-	-	4			1,040	11,194	1,040	11,194			1,040	11,194	1,040	11,194
Block 101	1-3	4	-	-	4			1,040	11,194	1,040	11,194			1,040	11,194	1,040	11,194
Block 102	1-3	4	-	-	4			1,040	11,194	1,040	11,194			1,040	11,194	1,040	11,194
Block 103	1-3	3	-	-	3			780	8,396	780	8,396			780	8,396	780	8,396
Block 104	1-3	3	-	-	3			780	8,396	780	8,396			780	8,396	780	8,396
Block 105	1-3	3	-	-	3			900	9,688	900	9,688			900	9,688	900	9,688
Block 106	1-3	3	-	-	3			780	8,396	780	8,396			780	8,396	780	8,396
Total		**34**	**-**	**-**	**34**	**-**	**-**	**8,960**	**96,445**	**8,960**	**96,445**			**8,960**	**96,445**	**8,960**	**96,445**

BLOCK 107 7,750 sm 1.60 FSI

	Level	Unit Count				GCA Retail		GCA Residential		GCA Total		GFA Retail		GFA Residential		GFA Total	
		Towns	Detach	Apart	Total	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf
Midrise A- 6st	1	-	-	-	-			1,100	11,840	1,100	11,840			1,034	11,130	1,034	11,130
	2-6	-	-	-	-			5,500	59,202	5,500	59,202			5,170	55,649	5,170	55,649
Subtotal		-	-	88	88			6,600	71,042	6,600	71,042			6,204	66,779	6,204	66,779
Midrise B - 6st	1	-	-	-	-			1,100	11,840	1,100	11,840			1,034	11,130	1,034	11,130
	2-6	-	-	-	-			5,500	59,202	5,500	59,202			5,170	55,649	5,170	55,649
Subtotal		-	-	88	88			6,600	71,042	6,600	71,042			6,204	66,779	6,204	66,779
Total		**-**	**-**	**176**	**176**	**-**	**-**	**13,200**	**142,084**	**13,200**	**142,084**			**12,408**	**133,559**	**12,408**	**133,559**

Apart Units - 60 sm Avg

BLOCK 108 25,550 sm 2.92 FSI

	Level	Unit Count				GCA Retail		GCA Residential		GCA Total		GFA Retail		GFA Residential		GFA Total	
		Towns	Detach	Apart	Total	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf
Midrise A - 10st	1	-	-	-	-			1,250	13,455	1,250	13,455			1,175	12,648	1,175	12,648
	2-5	-	-	-	-			5,000	53,820	5,000	53,820			4,700	50,590	4,700	50,590
	6-10	-	-	-	-			4,000	43,056	4,000	43,056			3,760	40,472	3,760	40,472
Subtotal		-	-	136	136			10,250	110,330	10,250	110,330			9,635	103,710	9,635	103,710
Midrise B - 8st	1	-	-	-	-			1,285	13,832	1,285	13,832			1,208	13,002	1,208	13,002
	2-5	-	-	-	-			5,140	55,326	5,140	55,326			4,832	52,007	4,832	52,007
	6-8	-	-	-	-			2,400	25,833	2,400	25,833			2,256	24,283	2,256	24,283
Subtotal		-	-	118	118			8,825	94,992	8,825	94,992			8,296	89,292	8,296	89,292
Midrise C - 8st	1	-	-	-	-			990	10,656	990	10,656			931	10,017	931	10,017
	2-5	-	-	-	-			3,960	42,625	3,960	42,625			3,722	40,068	3,722	40,068
	6-8	-	-	-	-			2,100	22,604	2,100	22,604			1,974	21,248	1,974	21,248
Subtotal		-	-	94	94			7,050	75,886	7,050	75,886			6,627	71,332	6,627	71,332
Midrise D - 8st	1	-	-	-	-			1,230	13,240	1,230	13,240			1,156	12,445	1,156	12,445
	2-5	-	-	-	-			4,920	52,958	4,920	52,958			4,625	49,781	4,625	49,781
	6-8	-	-	-	-			2,400	25,833	2,400	25,833			2,256	24,283	2,256	24,283
Subtotal		-	-	114	114			8,550	92,031	8,550	92,031			8,037	86,510	8,037	86,510
Tower A - 18st	1	-	-	-	-			1,750	18,837	1,750	18,837			1,645	17,707	1,645	17,707
	2-5	-	-	-	-			7,000	75,347	7,000	75,347			6,580	70,827	6,580	70,827
	6-18	-	-	-	-			10,400	111,945	10,400	111,945			9,776	105,228	9,776	105,228
Subtotal		-	-	255	255			19,150	206,129	19,150	206,129			18,001	193,761	18,001	193,761
Tower B - 14st	1	-	-	-	-			1,300	13,993	1,300	13,993			1,222	13,153	1,222	13,153
	2-5	-	-	-	-			5,200	55,972	5,200	55,972			4,888	52,614	4,888	52,614
	6-14	-	-	-	-			7,200	77,500	7,200	77,500			6,768	72,850	6,768	72,850
Subtotal		-	-	182	182			13,700	147,466	13,700	147,466			12,878	138,618	12,878	138,618
Tower C - 12st	1	-	-	-	-			1,250	13,455	1,250	13,455			1,175	12,648	1,175	12,648
	2-5	-	-	-	-			5,000	53,820	5,000	53,820			4,700	50,590	4,700	50,590
	6-12	-	-	-	-			5,600	60,278	5,600	60,278			5,264	56,661	5,264	56,661
Subtotal		-	-	158	158			11,850	127,552	11,850	127,552			11,139	119,899	11,139	119,899
Total		**-**	**-**	**1,057**	**1,057**	**-**	**-**	**79,375**	**854,385**	**79,375**	**854,385**			**74,613**	**803,122**	**74,613**	**803,122**

Apart Units - 60 sm Avg

BLOCK 109 25,680 sm 0.74 FSI

	Level	Unit Count				GCA Retail		GCA Residential		GCA Total		GFA Retail		GFA Residential		GFA Total	
		Towns	Detach	Apart	Total	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf
Midrise A - 8st	1	-	-	-	-	2,260	24,326	1,200	12,917	3,460	37,243	2,034	21,894	1,128	12,142	3,162	34,035
	2-5	-	-	-	-			7,068	76,079	7,068	76,079			6,644	71,515	6,644	71,515
	6-8	-	-	-	-			4,290	46,177	4,290	46,177			4,033	43,407	4,033	43,407
Subtotal		-	-	167	167	2,260	24,326	12,558	135,173	14,818	159,500	2,034	21,894	11,805	127,063	13,839	148,957
Food Store	1	-	-	-	-	2,950	31,754			2,950	31,754	2,950	31,754			2,950	31,754
LCBO	1	-	-	-	-	1,080	11,625			1,080	11,625	1,080	11,625			1,080	11,625
Subtotal		-	-	-	-	4,030	43,379			4,030	43,379	4,030	43,379			4,030	43,379
Retail A	1	-	-	-	-	345	3,714			345	3,714	345	3,714			345	3,714
Retail B	1	-	-	-	-	450	4,844			450	4,844	450	4,844			450	4,844
Retail C	1	-	-	-	-	450	4,844			450	4,844	450	4,844			450	4,844
Total		**-**	**-**	**167**	**167**	**7,535**	**81,106**	**12,558**	**135,173**	**20,093**	**216,279**	**7,309**	**78,673**	**11,805**	**127,063**	**19,114**	**205,736**

Apart Units - 60 sm Avg

BLOCK 110 12,420 sm 0.78 FSI

	Level	Unit Count				GCA Retail		GCA Residential		GCA Total		GFA Retail		GFA Residential		GFA Total	
		Towns	Detach	Apart	Total	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf	sm	sf
Townhouse B2B A	1-4	14	-	-	14			2,520	27,125	2,520	27,125			2,520	27,125	2,520	27,125
Townhouse B2B B	1-4	14	-	-	14			2,520	27,125	2,520	27,125			2,520	27,125	2,520	27,125
Townhouse C	1-3	4	-	-	4			1,116	12,013	1,116	12,013			1,116	12,013	1,116	12,013
Townhouse D	1-3	4	-	-	4			1,395	15,016	1,395	15,016			1,395	15,016	1,395	15,016
Townhouse B2B E	1-4	12	-	-	12			2,160	23,250	2,160	23,250			2,160	23,250	2,160	23,250
Total		**48**	**-**	**-**	**48**	**-**	**-**	**9,711**	**104,528**	**9,711**	**104,528**			**9,711**	**104,528**	**9,711**	**104,528**

Notes :
- Residential and Commerical GCA to GFA efficiency assumed at 94% and 90%, GCA to NSA efficiency assumed at 80%.
- Building efficiencies and unit yields are preliminary estimations only, and are subject to change.
- Apartment unit is assumed at 60 sm average.
- Detached house GCA is assumed at 230 sm / house.

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Revision | Date

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ISSUED FOR OPA / ZBA 23-11-10

Revision | Date

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T 416.591.7788 F 416.591.1293 E mail@gpaia.com

13030 LUNDY'S LANE

THOROLD, ONTARIO

SHEET TITLE

PROJECT STATISTICS

DRAWN BY	Author
CHECKED BY	Checker
PROJECT START DATE	YY-MM-DD
PROJECT NUMBER	XXXXX
SHEET NUMBER	A0.02

PLOT DATE: 2024-10-25 10:58:40 AM

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13030 LUNDY'S LANE

THOROLD, ONTARIO

SHEET TITLE

MASTER PLAN

DRAWN BY	GPAIA
CHECKED BY	GPAIA
PROJECT START DATE	YY-MM-DD
PROJECT NUMBER	XXXXX
SHEET NUMBER	

A1.00

PLOT DATE: 2024-10-25 10:58:43 AM

BRIGHTON LANE
DISCOVERY DRIVE
VALIANT GATE
PEACH STREET
BARKER PARKWAY
PRESIDENT DRIVE
VIVID LANE
STREET 'E'
STREET 'F'
STREET 'G'
STREET 'I'
STREET 'J'
STREET 'H'
REDHAVEN LANE
CRIMSON AVENUE
HORIZON HEIGHTS
TEMPORARY EASEMENT 0.065 ha.
BLOCK 1236 MEDIUM DENSITY 0.1457 ha.
Block 1232 MEDIUM DENSITY 1.292 ha. Min. 47 units
BLOCK 1247 NEIGHBOURHOOD PARK 0.9757 ha.
BLOCK 1440 3.0m WALKWAY 0.008 ha.
BLOCK 1260 OPEN SPACE – GENERAL ~~0.0713 ha.~~ 0.4092 ha.
BLOCK 1273 SWM 1.1561 ha.
BLOCK 1241 MEDIUM DENSITY 0.0541 ha.
BLOCK 1233 MEDIUM DENSITY 0.6383 ha. Min. 23 units
BLOCK 1261 OPEN SPACE – GENERAL (EXISTING EASEMENT) ~~0.7104 ha.~~ 0.3576 ha.
BLOCK 1272 SWM 1.0720 ha.
BLOCK 1262 OPEN SPACE – GENERAL (EXISTING EASEMENT) ~~0.1570 ha.~~ 0.1242 ha.
BLOCK 1234 MEDIUM DENSITY 0.7174 ha. Min. 26 units
BLOCK 1266 OPEN SPACE – GENERAL 0.008 ha.
BLOCK 1283 HIGHWAY COMMERCIAL 1.4598 ha.
Block 1235 MEDIUM DENSITY 0.887 ha. (2.192 ac.) Min. 26 units
Block 1230 MEDIUM DENSITY 1.399 ha. (3.456 ac.) Min. 41 units
Block 1237 MEDIUM DENSITY 0.831 ha. (2.052 ac.) Min. 24 units
BLOCK 1738 FUTURE DEVELOPMENT 18m R.O.W. Reserve 0.0529 ha.
Block 1284 HIGHWAY COMMERCIAL 1.4584 ha. (3.6038 ac.)
Block 1285 HIGHWAY COMMERCIAL 1.6655 ha. (4.1155 ac.)
BLOCK 1307 0.3m Reserve 0.0006 ha.
BLOCK 1305 FUTURE DEVELOPMENT General Reserve 0.0413 ha.
BLOCKS 41-64 0.884 ha
BLOCK 65-73 0.364 ha
BLOCK 74-83 0.456 ha
BLOCK 1-22 0.762 ha
BLOCKS 23-27 0.177 ha
BLOCKS 28-32 0.177 ha
BLOCKS 33-36 0.148 ha
BLOCK 37-39 0.190 ha
BLOCK 40 0.035 ha
BLOCK 84 0.175 ha
BLOCK 85 0.190 ha
BLOCK 86 0.208 ha
BLOCK 87 0.208 ha
BLOCK 88 0.148 ha
BLOCK 89 0.148 ha
BLOCK 90 0.148 ha
BLOCK 91 0.148 ha
BLOCK 92 0.283 ha
BLOCK 93 0.283 ha
BLOCK 94 0.283 ha
BLOCK 95 0.283 ha
BLOCK 96 0.738 ha
BLOCK 97 0.084 ha
BLOCK 98 0.084 ha
BLOCK 99 0.102 ha
BLOCK 100 0.102 ha
BLOCK 101 0.102 ha
BLOCK 102 0.102 ha
BLOCK 103 0.082 ha
BLOCK 104 0.082 ha
BLOCK 105 0.083 ha
BLOCK 106 0.081 ha
BLOCK 107 0.775 ha
BLOCK 108 2.555 ha
BLOCK 109 2.568 ha
BLOCK 110 1.242 ha
BLOCK 111 0.003 ha
BLOCK 112 1.491 ha STORMWATER POND
BLOCK 113 0.406 ha PARK
BLOCK 114 0.689 ha PARK
BLOCK 115 0.183 ha ROAD WIDENING
FUTURE ROAD OR SERVICE CORRIDOR
HYDRO TOWER
EXISTING EASEMENT
HYDRO CORRIDOR
PRIVATE OPEN SPACE
PROPOSED ALL TURNS
PROPOSED SIGNALIZED INTERSECTION
EXISTING SIGNALIZED INTERSECTION
THOROLD TOWNLINE ROAD
PRIVATE STREET
LOADING
LCBO
FOOD STORE
RETAIL A
RETAIL B
RETAIL C
PATIO
MIDRISE A 8 ST
MIDRISE B 8 ST
MIDRISE C 8 ST
MIDRISE D 8 ST
MIDRISE A 6 ST
MIDRISE B 6 ST
MIDRISE A 10 ST
TOWER A 18 ST
TOWER B 14 ST
TOWER C 12 ST
POPS
14m MTO SETBACK
HIGHWAY 20 (LUNDY'S LANE)

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Revision	Date

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BLOCK 1307
0.3m Reserve
0.0006 ha.

BLOCK 1305
FUTURE DEVELOPMENT
General Reserve
0.0413 ha.

BLOCK 1236
MEDIUM DENSITY 0.1457 ha.

Block 1232
MEDIUM DENSITY
1.292 ha.
Min. 47 units

BLOCK 1247
NEIGHBOURHOOD PARK
0.9757 ha.

BLOCK 1440
3.0m WALKWAY
0.008 ha.

BLOCK 1260
OPEN SPACE – GENERAL
~~0.9713 ha.~~
0.4092 ha.

BLOCK 1273
SWM
1.1561 ha.

BLOCK 1241
MEDIUM DENSITY 0.0541 ha.

BLOCK 1233
MEDIUM DENSITY
0.6383 ha.
Min. 23 units

BLOCK 1261
OPEN SPACE – GENERAL
(EXISTING EASEMENT)
~~0.7104 ha.~~
0.3576 ha.

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SWM
1.0720 ha.

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~~0.1570 ha.~~
0.1242 ha.

BLOCK 1234
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Min. 26 units

BLOCK 1283
HIGHWAY COMMERCIAL
1.4598 ha.

Block 1230
MEDIUM DENSITY
1.399 ha. (3.456 ac.)
Min. 41 units

Block 1235
MEDIUM DENSITY
0.887 ha. (2.192 ac.)
Min. 26 units

Block 1237
MEDIUM DENSITY
0.831 ha.
(2.052 ac.)
Min. 24 units

BLOCK 1738
FUTURE DEVELOPMENT
18m R.O.W. Reserve
0.0529 ha.

Block 1284
HIGHWAY COMMERCIAL
1.4584 ha.
(3.6038 ac.)

Block 1285
HIGHWAY COMMERCIAL
1.6655 ha.
(4.1155 ac.)

TEMPORARY EASEMENT
0.065 ha.

BRIGHTON LANE
DISCOVERY DRIVE
VALIANT GATE
STREET 'E'
STREET 'F'
STREET 'G'
STREET 'H'
STREET 'I'
STREET 'J'
VIVID LANE
PRESIDENT DRIVE
BARKER PARKWAY
HORIZON HEIGHTS
REDHAVEN LANE
CRIMSON AVENUE
PEACH STREET

BLOCKS 41-64
0.884 ha

BLOCK 114
0.689 ha
PARK

BLOCK 112
1.491 ha
STORMWATER
POND

BLOCK 115
0.183 ha
ROAD
WIDENING

FUTURE ROAD OR
SERVICE CORRIDOR

HYDRO
TOWER

EXISTING
EASEMENT

BLOCK 74-83
0.456 ha

BLOCK 65-73
0.364 ha

HYDRO CORRIDOR

BLOCK 113
0.406 ha
PARK

PRIVATE
OPEN
SPACE

BLOCK 110
1.242 ha

PHASING LINE

BLOCK 111
0.003 ha

BLOCK 40
0.035 ha

BLOCK 39
0.009 ha

BLOCK 95
0.283 ha

BLOCK 94
0.283 ha

BLOCK 104
0.081 ha

BLOCK 105
0.083 ha

LANE 'A'

BLOCKS 1-22
0.752 ha

BLOCK 93
0.283 ha

BLOCK 92
0.283 ha

BLOCK 106
0.082 ha

BLOCK 107
0.082 ha

LANE 'B'

BLOCK 96
0.738 ha

BLOCK 91
0.446 ha

BLOCK 90
0.446 ha

BLOCK 102
0.102 ha

LANE 'C'

BLOCKS 24-27
0.177 ha

BLOCK 89
0.446 ha

BLOCK 88
0.446 ha

BLOCK 99
0.102 ha

LANE 'D'

BLOCK 84
0.775 ha

BLOCKS 85-87
0.190 ha

BLOCK 83
0.208 ha

BLOCK 82
0.208 ha

BLOCK 98
0.084 ha

BLOCK 97
0.084 ha

LANE 'E'

BLOCK 108
2.555 ha

BLOCK 109
2.568 ha

PROPOSED
ALL TURNS

PROPOSED
SIGNALIZED
INTERSECTION

EXISTING
SIGNALIZED
INTERSECTION

THOROLD TOWNLINE ROAD

LCBO

FOOD STORE

RETAIL C

RETAIL B

RETAIL A

PATIO

LOADING

PRIVATE STREET

1 ST

5 ST

MIDRISE A
8 ST

MIDRISE B
8 ST

MIDRISE C
8 ST

MIDRISE D
8 ST

MIDRISE A
6 ST

MIDRISE B
6 ST

MIDRISE A
10 ST

TOWER A
18 ST

TOWER B
14 ST

TOWER C
12 ST

POPS

14m MTO SETBACK

HIGHWAY 20 (LUNDY'S LANE)

ISSUED FOR ZBA	24-09-25
ISSUED FOR OPA / ZBA	23-11-10
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13030 LUNDY'S LANE

THOROLD, ONTARIO

SHEET TITLE

RENDERED MASTER PLAN
UPDATED

DRAWN BY	Author
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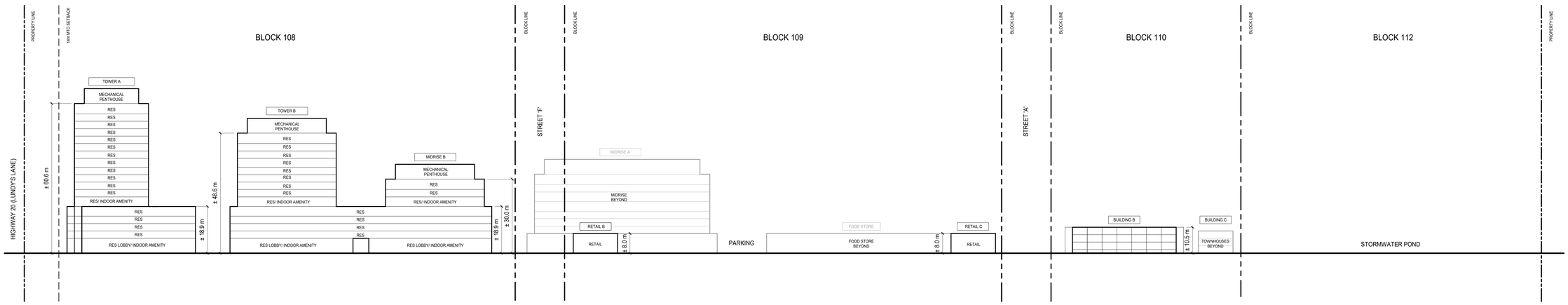
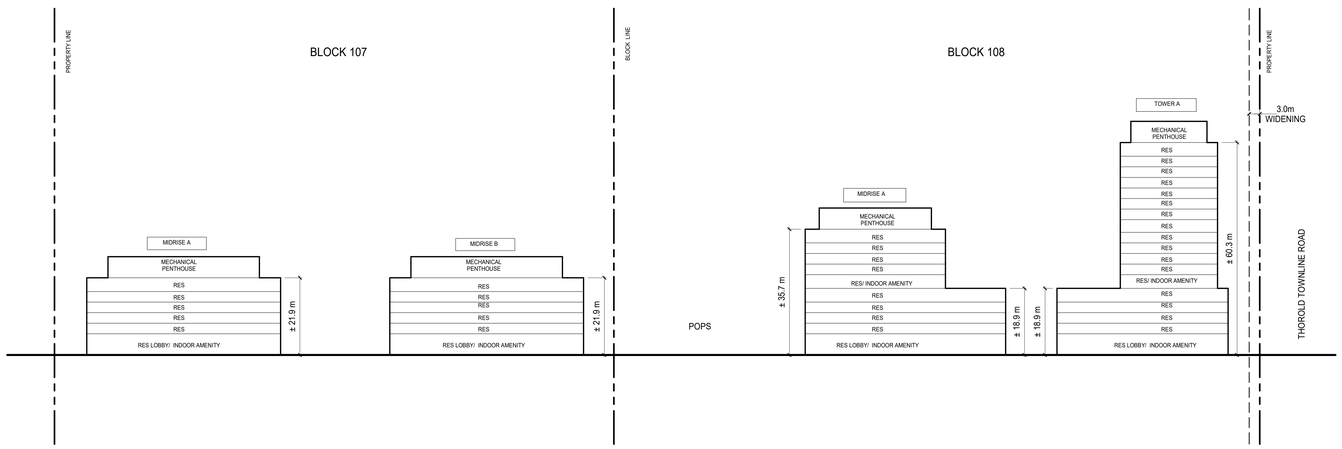
PROJECT NUMBER	XXXXX
SHEET NUMBER	

A1.05

PLOT DATE: 2024-10-25 10:58:46 AM



2 A2.00 THOROLD TOWNLINE ROAD ELEVATION
N.T.S.



1 A2.00 HIGHWAY 20 (LUNDY'S LANE) ELEVATION
N.T.S.

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13030 LUNDY'S LANE

THOROLD, ONTARIO

SHEET TITLE

SOUTH & EAST ELEVATION

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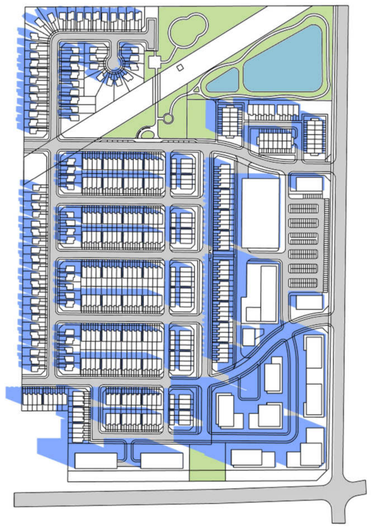
PROJECT START DATE	YY-MM-DD
PROJECT NUMBER	XXXXX
SHEET NUMBER	

A2.00

PLOT DATE: 2024.10.25 10:58:49 AM



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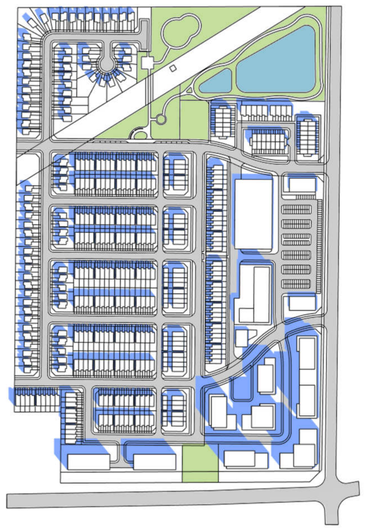
PROPOSED **10:18 AM**



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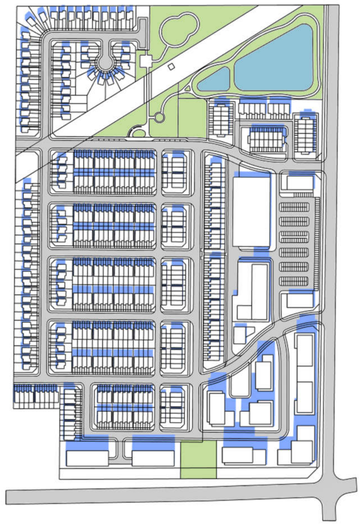

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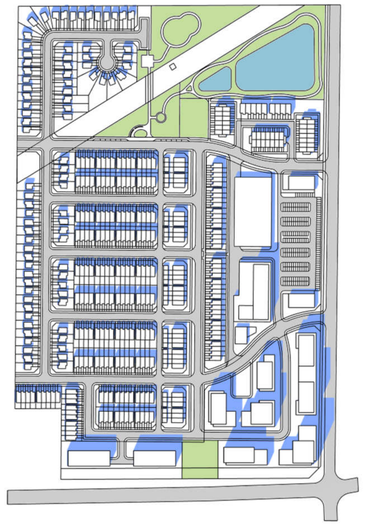

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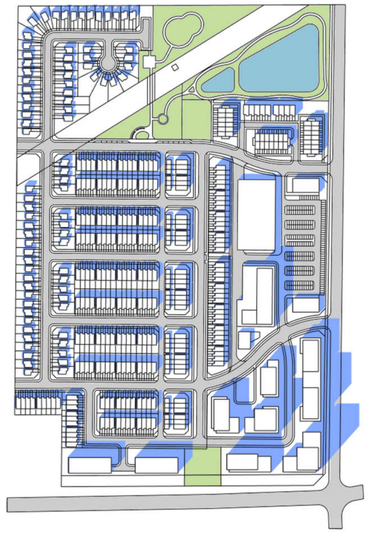

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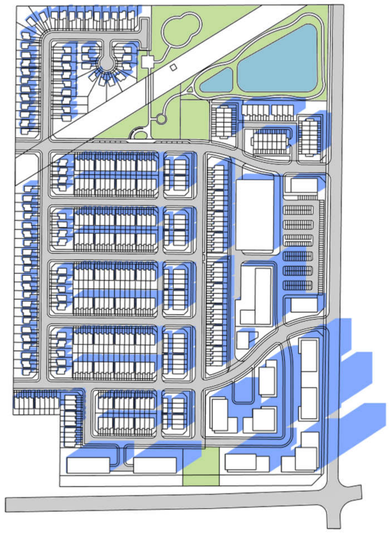

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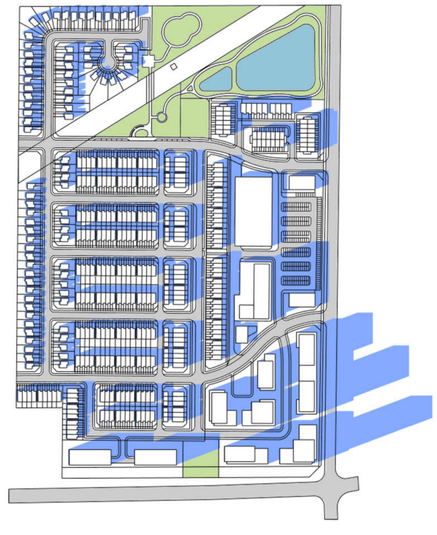

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SHADOW STUDY - MARCH/SEPTEMBER 21 (UTC-4)

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13030 LUNDY'S LANE

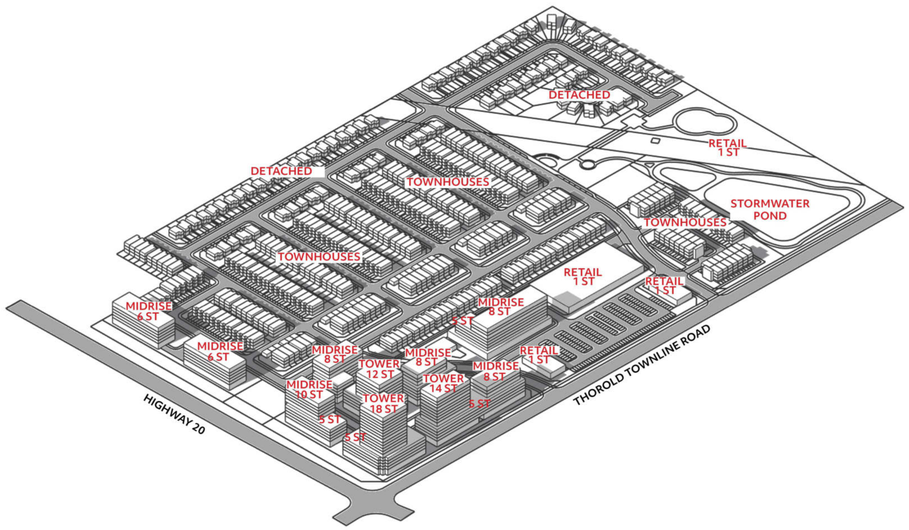
THOROLD, ONTARIO

SHEET TITLE

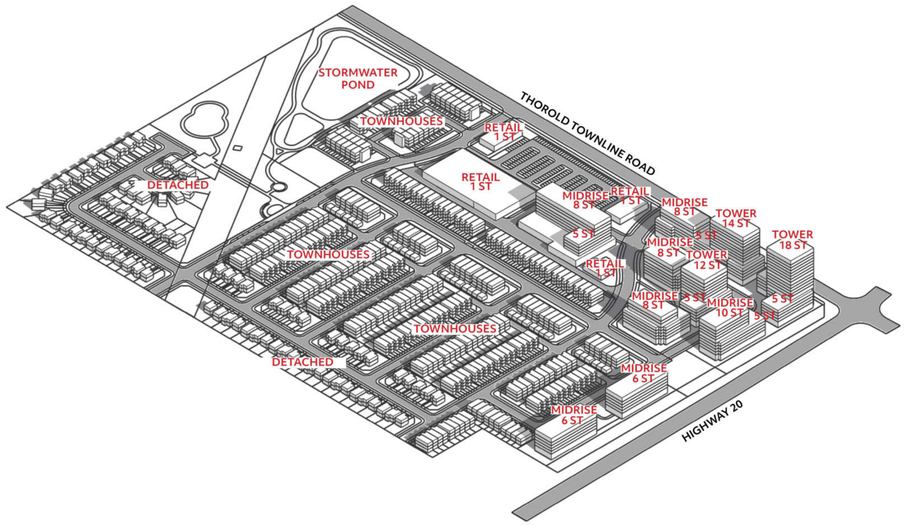
SHADOW STUDY

DRAWN BY	Author
CHECKED BY	Checker
PROJECT START DATE	YY-MM-DD
PROJECT NUMBER	XXXX
SHEET NUMBER	A4.00

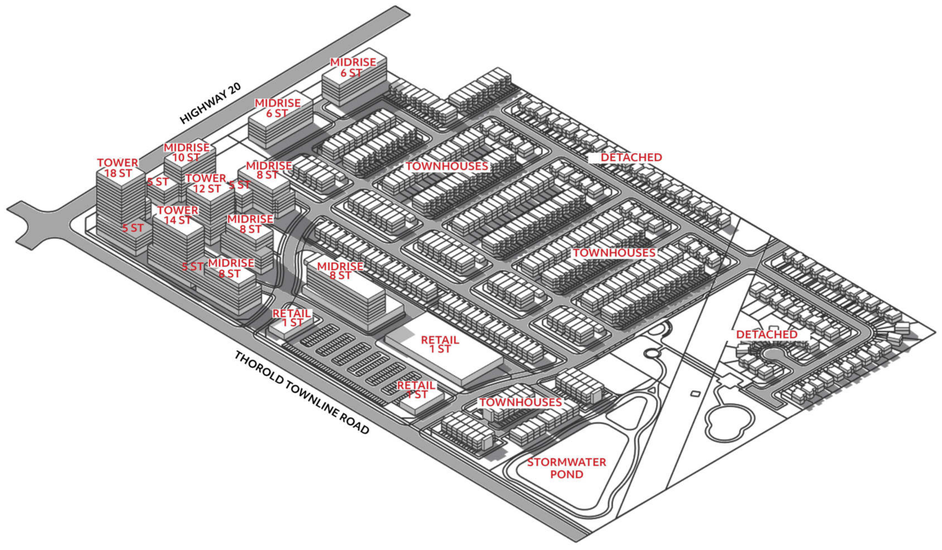
PLOT DATE: 2024-10-25 10:58:54 AM



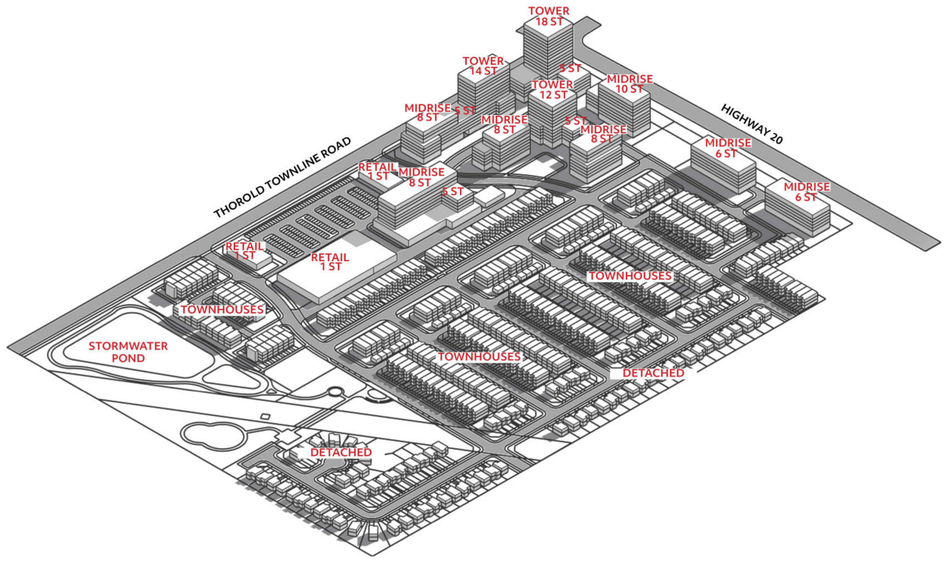
AERIAL VIEW FROM SOUTHEAST



AERIAL VIEW FROM SOUTHWEST



AERIAL VIEW FROM NORTHEAST



AERIAL VIEW FROM NORTHWEST

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Revision	Date

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13030 LUNDY'S LANE

THOROLD, ONTARIO

SHEET TITLE

3D MASSING

DRAWN BY	Author
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PROJECT START DATE	YY-MM-DD
PROJECT NUMBER	XXXXX
SHEET NUMBER	

A5.00

PLOT DATE: 2024.10.25 10:58:58 AM

Appendix B

Sanitary Sewer

Project No. 49428-100
Sheet No. 1
Checked by: RSM
Designed by: CKM
Date: October 22, 2024

City of Thorold
PRELIMINARY SANITARY SEWER DESIGN
Proposed Draft Plan of Subdivision - 13030 Lundy's Lane
Second Submission

DESIGN PARAMETERS

Design flow factor[1] = **255** L/capita/day, L/employee/day where P is in thousands
Peaking Factor M = $1 + \frac{14}{(4 + P^{0.5})}$ (Max = 4.0, Min = 2.0)
Infiltration Factor [1]: 0.286 L/s/ha

			Per/unit
Mannings n:	0.013	for all pipes	
Min Velocity:	0.6	m/s	**Singles** 3.5
Max Velocity:	3	m/s	**Street TH** 3.0
			Condo TH/Apt 2.0

						Retail				Residential										Proposed Sewer Design							
Area No.	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Retail GFA[3] [m²]	Retail Demand[2] [L/m²/d]	Incrmental Demand [L/s]	Cumulative Demand [L/s]	Number of Units[3]	Persons per Unit	Incremental Population [per]	Cumulative Population [per]	Average Flow [l/s]	Peaking Factor M	Peak Flow [L/s]	Peak Res Q + Retail Q [L/s]	Inflow/Infiltration [L/s]	Total Flow [L/s]	Diameter [mm]	Material n=0.013	Grade %	Capacity [L/s]	Velocity [m/s]	Actual Velocity [m/s]	% Pipe Full	Remarks
	NORTH, TO BARKER PARKWAY																										
11	Street F (Street TH)	MH129A/ MH162A	MH161A	0.279	0.279	-			0.00	9	3.0	27	27	0.08	4.00	0.32	0.32	0.08	0.40	200	PVC	1.00%	33.31	1.05	0.35	1.2%	
12	Street G (Singles)	MH161A	MH160A	0.524	0.803	-			0.00	11	3.5	39	66	0.19	4.00	0.78	0.78	0.23	1.01	200	PVC	0.50%	23.55	0.74	0.37	4.3%	
13	Street G (Singles)	MH160A	MH159A	0.591	1.394	-			0.00	13	3.5	46	112	0.33	4.00	1.32	1.32	0.40	1.72	200	PVC	0.50%	23.55	0.74	0.43	7.3%	
14	Street G (Singles)	MH159A	MH158A	0.473	1.867	-			0.00	10	3.5	35	147	0.43	4.00	1.74	1.74	0.53	2.27	200	PVC	0.50%	23.55	0.74	0.47	9.6%	
15	Street G (Singles)	MH158A	MH157A	0.355	2.222	-			0.00	6	3.5	21	168	0.50	4.00	1.98	1.98	0.64	2.62	200	PVC	0.50%	23.55	0.74	0.49	11.1%	
16	Street J (Singles)	MH152A	MH154A	0.555	0.555	-			0.00	10	3.5	35	35	0.10	4.00	0.41	0.41	0.16	0.57	200	PVC	1.00%	33.31	1.05	0.39	1.7%	
17	Street I (Singles)	MH153A	MH156A	0.726	1.281	-			0.00	13	3.5	46	81	0.24	4.00	0.96	0.96	0.37	1.32	200	PVC	0.50%	23.55	0.74	0.40	5.6%	
18	Street I (Singles)	MH156A	MH157A	0.967	2.248	-			0.00	20	3.5	70	151	0.45	4.00	1.78	1.78	0.64	2.43	200	PVC	0.50%	23.55	0.74	0.48	10.3%	
19	Street A (Street TH)	MH157A	MH107A	0.669	5.139	-			0.00	16	3.0	48	367	1.08	4.00	4.33	4.33	1.47	5.80	200	PVC	0.50%	23.55	0.74	0.61	24.6%	
31	Street H (Street TH)	MH127A	MH125A	0.468	0.468	-			0.00	11	3.0	33	33	0.10	4.00	0.39	0.39	0.13	0.52	200	PVC	1.00%	33.31	1.05	0.38	1.6%	
32	Street B (Street TH)	MH125A	MH117A	0.366	0.834	-			0.00	6	3.0	18	51	0.15	4.00	0.60	0.60	0.24	0.84	200	PVC	0.50%	23.55	0.74	0.35	3.6%	
36	Block 109/108 (Partial-Mixed-Use Residential)	MH122A	MH117A	2.316	2.316	3654.5	32.2	1.36	1.36	573	2.0	1146	1146	3.38	3.76	12.72	14.08	0.66	13.38	250	PVC	0.50%	42.71	0.86	0.76	31.3%	
33	Street H (Street TH)	MH127A	MH124A	0.308	0.308	-			0.00	10	3.0	30	30	0.09	4.00	0.35	0.35	0.09	0.44	200	PVC	1.00%	33.31	1.05	0.36	1.3%	
34	Street F (Street TH)	MH130A	MH124A	0.113	0.113	-			0.00	3	3.0	9	9	0.03	4.00	0.11	0.11	0.03	0.14	200	PVC	1.00%	33.31	1.05	0.25	0.4%	
35	Street F (Street TH)	MH124A	MH117A	0.743	1.164	-			0.00	24	3.0	72	111	0.33	4.00	1.31	1.31	0.33	1.64	200	PVC	0.50%	23.55	0.74	0.43	7.0%	
37	Street B (Street TH)	MH117A	MH114A	0.634	4.948	-			1.36	17	3.0	51	1359	4.01	3.71	14.88	16.24	1.42	16.30	250	PVC	0.50%	42.71	0.86	0.80	38.2%	
38	Street E (Street TH)	MH116A	MH114A	0.983	0.983	-			0.00	32	3.0	96	96	0.28	4.00	1.13	1.13	0.28	1.41	200	PVC	0.50%	23.55	0.74	0.41	6.0%	
39	Street B (Street TH)	MH114A	MH111A	0.667	6.598	-			1.36	19	3.0	57	1512	4.46	3.68	16.41	17.77	1.89	18.30	250	PVC	0.50%	42.71	0.86	0.83	42.8%	
40	Street D (Street TH)	MH113A	MH111A	0.918	0.918	-			0.00	32	3.0	96	96	0.28	4.00	1.13	1.13	0.26	1.40	200	PVC	0.50%	23.55	0.74	0.41	5.9%	
41	Street B (Street TH)	MH111A	MH108A	0.557	8.073	-			1.36	15	3.0	45	1653	4.88	3.65	17.80	19.16	2.31	20.11	250	PVC	0.50%	42.71	0.86	0.85	47.1%	
42	Street C (Street TH)	MH110A	MH108A	0.852	0.852	-			0.00	32	3.0	96	96	0.28	4.00	1.13	1.13	0.24	1.38	200	PVC	0.50%	23.55	0.74	0.40	5.8%	
43	Street B (Street TH)	MH108A	MH107A	0.538	9.463	-			1.36	14	3.0	42	1791	5.29	3.62	19.15	20.51	2.71	21.86	250	PVC	0.50%	42.71	0.86	0.86	51.2%	
44	Street A	MH107A	MH104A	0.203	14.805	-			1.36	0	0.0	0	2158	6.37	3.56	22.67	24.03	4.23	26.91	250	PVC	0.50%	42.71	0.86	0.91	63.0%	
45	Block 109 (Partial-Mixed-Use)	Stub	MH104A	1.317	1.317	3654.5	32.2	1.36	1.36	0	0.0	0	0	0.00	4.00	0.00	1.36	0.38	0.38	200	PVC	2.00%	47.10	1.48	0.44	0.8%	
46	Street A (Condo TH)	Stub	MH104A	1.049	1.049	-			0.00	48	2.0	96	96	0.28	4.00	1.13	1.13	0.30	1.43	200	PVC	2.00%	47.10	1.48	0.66	3.0%	
47	Street A	MH104A	MH101A	0.141	17.312	-			2.72	0	0.0	0	2254	6.65	3.54	23.58	26.30	4.95	28.53	250	PVC	0.50%	42.71	0.86	0.92	66.8%	
	Thorold Townline Road	MH101A	Uppers	0.960	18.272	-			2.72	-	-	0	2254	6.65	3.54	23.58	26.30	5.23	28.81	375	PVC	0.15%	63.84	0.61	0.59	45.1%	
	Upper's Lane	Uppers	BN	1.650	19.922	-			2.72	-	-	0	2254	6.65	3.54	23.58	26.30	5.70	29.28	375	PVC	0.15%	63.84	0.61	0.59	45.9%	
	SOUTH, TO LUNDY'S LANE VIA EASEMENT																										
1	Block 108 (Partial)	MH3A	MH1A	1.655	1.655	-			0.00	651	2.0	1302	1302	3.84	3.72	14.31	14.31	0.47	14.78	200	PVC	0.50%	23.55	0.74	0.78	62.8%	
External	Lundy's Lane (Highway No.20) [4]	EX15A	EX14A	0.000	1.655				0.00	-	-	0	1302	3.84	3.72	14.31	14.31	0.47	14.78	200	PVC	0.39%	20.80	0.65	0.71	71.1%	
2	Block 107	MH5A	MH4A	0.777	0.777	-			0.00	176	2.0	352	352	1.04	4.00	4.16	4.16	0.22	4.38	200	PVC	1.00%	33.31	1.05	0.73	13.1%	
External	Lundy's Lane (Highway No.20) [4]	EX14A	EX13A	0.000	2.432				0.00	-	-	0	1654	4.88	3.65	17.81	17.81	0.70	18.51	200	PVC	0.42%	21.59	0.68	0.76	85.7%	
External	Lundy's Lane (Highway No.20) [4]	EX13A	EX12A	0.000	2.432				0.00	-	-	0	1654	4.88	3.65	17.81	17.81	0.70	18.51	200	PVC	0.43%	21.84	0.69	0.77	84.7%	

NOTES: 1. Per Niagara Region Master Servicing Plan Update, 2021.
2. Retail Demand based on OBC 8.2.1.3.(2) Table 8.2.1.3.B, Line 20 "Stores" = 5 L/sm/d
3. Retail Gross Floor Area (GFA) and Residential Unit Counts on Blocks taken from Master Site Plan Statistics by Giannone Petricone Associates, September 19, 2024.
4. "13030 Lundy's Lane Development Review DRAFT" (GEI Consultants, July 22, 2024) allows a peak discharge of 20L/s from the development to Lundy's Lane.

Appendix C

Water Distribution

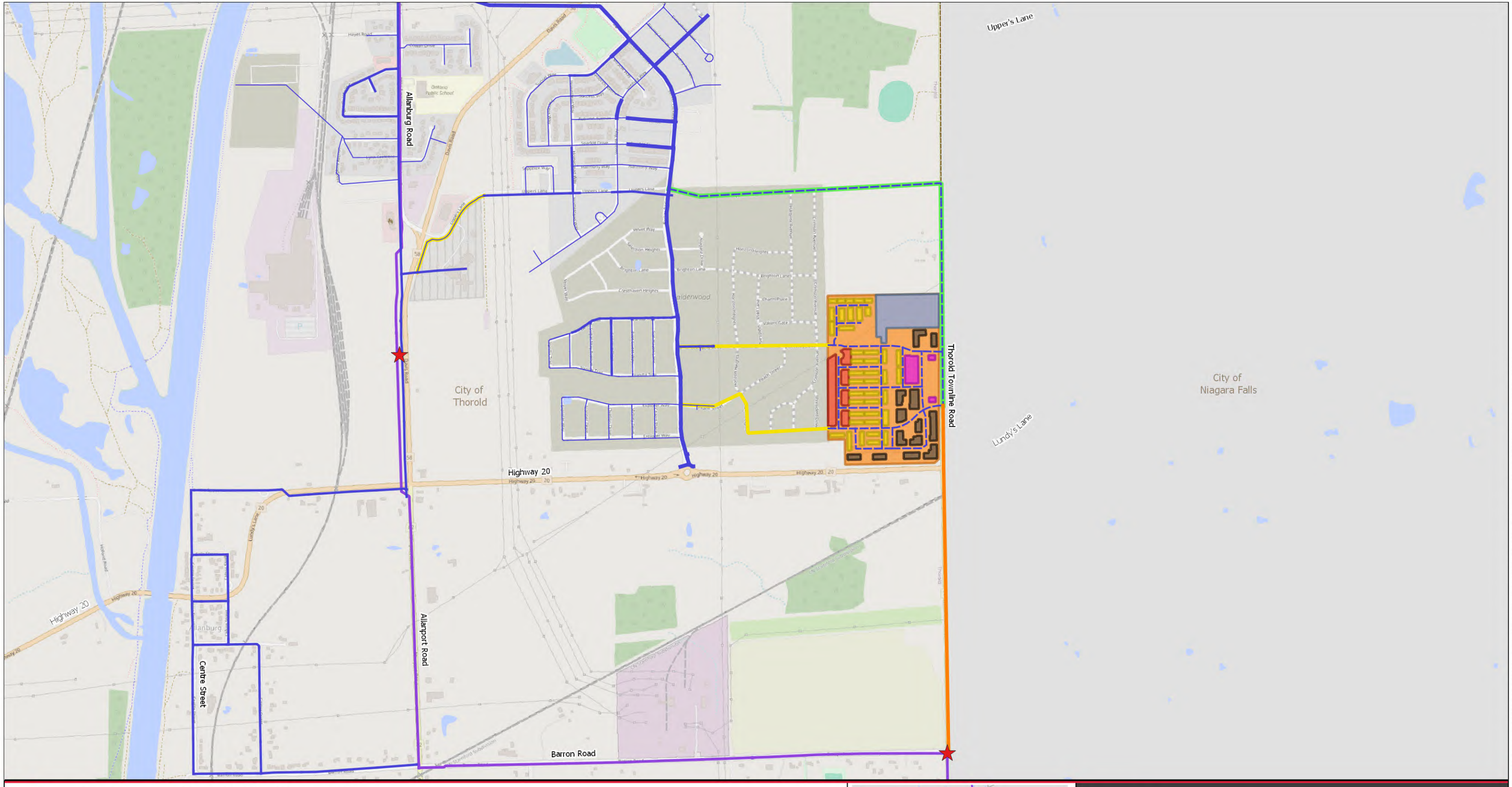


Figure 2-1
Pressure and Fire Flow Scenario Upgrades

Project Name:
13030 Lundy's Lane Development Review
Thorold W and WW MSP

Client Name:
City of Thorold
(Ontario, Canada)

GEI

Last Updated: October 2024
Document ID: 2402099

Document Path: B:\Working\THOROLD ON, CITY OF\2402099 - 623127 Thorold Water Service Master Plan Update\5 Work in Progress\GIS and Databases\1_Data\3 Working Maps\Water & WW 13030 Lundy's Lane.qgz

Proposed Draft Plan of Subdivision, 13030 Lundy's Lane

Preliminary Design - Domestic and Fire Flow

Thorold, Ontario

Project #: 49428-100
Date: October 30, 2024
Date Printed: November 5, 2024
By: RSM

Development Information[1,2,11]						Fire Flow — Fire Underwriters Survey[3]											
Description	# of Units	Population Density ppl/unit	Retail Gross Floor Area[12] sm	Population (or UNIT) Density per/ha	Population # of people	C	A[9,12] m^2	F L/min	F L/s	Occupancy Reduction %	Sprinkler Protection %	Building Exposure %	F[14] L/s	Average Day L/s	Max Day L/s	Peak Hour L/s	Max Day + Fire Flow L/s
Single Detached Res.	83	3.50			291	1.50	288	6,000	100	-15	0	75	100	0.81	1.25	3.23	101.3
Street Townhomes[9]	240	3.00			720	1.50	1,200	11,000	183	-15	0	45	200	2.00	3.10	8.00	203.1
Retail (Blk 109)[11, 13]			7309.0		0	1.00	2,673	11,000	183	-15	-30	20	175	2.72	4.90	10.88	179.9
Condo (Blk 107-108)[9]	1448	2.00			2896	1.50	1,200	11,000	183	-15	0	45	200	8.04	12.47	32.18	212.5
TOTALS FOR SITE [8]	**1771**				**3907**							**MAX FIRE FLOW=**	**200**	**13.57**	**21.72**	**54.29**	**212.5**
																Sum of Maximum Day Flows + Largest Fire Flow (L/s) =	**221.7**

Assumptions:

1 Development information based on Draft Plan prepared by Bousfields Inc.

2 Population densities conservatively estimated from common design standard values.

3 All buildings are classified as occupancy group C (Residential Occupancy). SDR and TH buildings are classified as Type V - Wood Frame Construction. Mixed-Use buildings are classified as Type III - Ordinary Construction.

4 Average Daily Demands referenced from Niagara Region MSPU, 2021:
Residential = 240 L/cap/day
Employment = per OBC (see note 13).

5 Max Day and Peak Hour factors referenced from Niagara Region MSPU, 2021:
Maximum Day (Residential) = 1.55
Maximum Day (Commerical) = 1.8 per 2018 City MSP level of service objectives.
Peak Hour = 4.0

6 Lot 38 used for Single Detached fire flow calculations. Assumed 2-storey building, wood construction with 1.5m side yard set back and 6m front & back yard setbacks.
Sample building for Townhouse fire flow calculations: Condo Townhouse units in Blk 72 assumed 3-storey building, ordinary construction with 3m side yard & 6m front/rear setbacks, and Street Townhouse units in Blk 51 assumed 3-storey building, ordinary construction with 1.5m side yard & 6m front/rear setbacks

7 Fire flow requirement for commericial block based on historically calculated values for similar developments

8 Slight variation in total population estimate compared to sanitary calculations due to rounding

9 Max TH floor area without a firewall assumed to be 600sm x 2 storeys = 1200sm. Mixed-Use Commercial worst-case = Block 76, Building 76A.

11 Residential Unit Count, Residential GFA and Retail GFA from Master Site Statistics, GPA, 2024/09/25.

12 Per FUS 2020, Total Effective Area of Blocks 74-76 Retail and Residential = Area of Largest Level + 25% of Area of 2 adjacent levels.

13 Retail demand: Assume Retail GFA comprises 75% Shopping Centre/Store and 25% Restaurant.
Shopping Centre/Store Demand: 5 L/sm/d (OBC 8.2.1.3.(2), Table 8.2.1.3.B Lines 20, 22.)
Restaurant Demand: 125 L/seat/d (OBC 8.2.1.3.(2), Table 8.2.1.3.B Line 12 a))
1.1 sm/seat (OBC 3.1.17.1, Table 3.1.17.1 Line 5)
113.6 L/sm/d
Therefore average Retail Demand = 5 L/sm/d x 75% + 113.6 L/sm/d x 25% 32.2 L/sm/d

14 Fire Demand per Thorold MSP, except Multi-Residential which used 200L/s per the anticipated MSP update (vs. 150L/s in the current MSP).

Appendix D

Storm Sewer

Proposed Plan of Subdivision
13030 Lundy's Lane
CITY OF THOROLD

Project Number: 49428-100
Date: November 20, 2024
Design By: CKM
Checked By: RSM
File: Q:\49428\100\STM\49428-100 Storm Sewer Design Sheet.xlsx

STORM SEWER DESIGN SHEET
PRELIMINARY SUBMISSION
ENGINEERING AND PUBLIC WORKS

Drainage Area Plan No: 49428-100-ST1.1

SECOND SUBMISSION

Design Parameters

5 YEAR STORM

Q=kAIC, k=0.00278
Intensity (I) = a/(tc+b)^{c}
a = 664.0
b = 4.700
c = 0.744

Manning's "n" 0.013
Min. Velocity 0.600 m/s
Max. Velocity 6.000 m/s

LOCATION				STORMWATER FLOW								DESIGN					
STREET	AREA NUMBER	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA (A)	RUNOFF COEFF. (C)	A x C	CUMUL. A x C	CONCENTRATION TIME TOTAL	CONCENTRATION TIME IN PIPE	RAIN INTENSITY (I)	FLOW (Q)	PIPE SIZE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	PIPE FULL
				ha		*ha*	*ha*	*min*	*min*	*mm/hr*	*L/s*	*mm*	*m*	*%*	*L/s*	*m/s*	*%*
Street F	1	MH9/MH92	MH8	0.283	0.70	0.1981	0.1981	10.00	0.55	89.9	49.5	300	34.7	0.50	68.4	0.97	72.4
Street G	2	MH8	MH7	0.546	0.45	0.2457	0.4438	10.55	1.07	87.5	107.9	450	82.4	0.50	201.6	1.27	53.5
Street G	3	MH7	MH6	0.643	0.45	0.2894	0.7332	11.61	0.96	83.2	169.5	450	82.0	0.50	201.6	1.27	84.1
Street G	4	MH6	MH5	0.527	0.45	0.2372	0.9703	12.58	0.77	79.7	215.0	525	70.0	0.50	304.1	1.40	70.7
Street G	5	MH5	MH4	0.432	0.45	0.1944	1.1647	13.34	0.79	77.2	249.9	525	74.0	0.50	304.1	1.40	82.2
Street J	7	MH15	MH12	0.539	0.45	0.2426	0.2426	10.00	0.59	89.9	60.6	375	39.2	0.50	124.0	1.12	48.9
Street I	8	MH13	MH10	0.769	0.45	0.3461	0.5886	10.59	1.45	87.3	142.9	450	119.7	0.50	201.6	1.27	70.9
Street I	9	MH10	MH4	0.995	0.45	0.4478	1.0364	12.04	1.43	81.6	235.1	525	132.7	0.50	304.1	1.40	77.3
Street A	10	MH4	MH2	1.199	0.55	0.6595	2.8605	14.13	1.43	74.8	594.5	750	168.1	0.50	787.2	1.78	75.5
Street H	37	Bk107	MH43	0.600	0.70	0.4200	0.4200	10.00	0.18	89.9	104.9	450	13.8	0.50	201.6	1.27	52.1
Street H	36	MH43	MH41	0.388	0.70	0.2716	0.6916	10.18	1.61	89.1	171.3	525	139.4	0.50	304.1	1.40	56.3
Street B	35	Bk108	MH41	1.261	0.70	0.8827	0.8827	10.00	0.19	89.9	220.6	600	17.7	0.50	434.2	1.54	50.8
Street B	34	MH41	MH35	0.249	0.70	0.1743	1.7486	11.79	0.67	82.5	401.2	675	71.8	0.50	594.4	1.66	67.5
Street K	33	Bk108	MH40	0.890	0.70	0.6230	0.6230	10.00	0.15	89.9	155.7	525	12.9	0.50	304.1	1.40	51.2
Street K	32	MH40	MH35	0.242	0.70	0.1694	0.7924	10.15	1.44	89.2	196.5	525	128.9	0.50	304.1	1.40	64.6
Street F	40	MH93	MH45	0.090	0.70	0.0630	0.0630	10.00	0.38	89.9	15.7	200	17.9	0.50	23.2	0.74	67.9
Street H	39	MH43	MH45	0.310	0.70	0.2170	0.2170	10.00	1.10	89.9	54.2	300	71.0	0.50	68.4	0.97	79.3
Street F	38	MH45	MH35	0.809	0.70	0.5663	0.8463	11.10	1.55	85.2	200.4	525	139.4	0.50	304.1	1.40	65.9
Street B	31	MH35	MH32	0.452	0.70	0.3164	3.7037	12.65	0.63	79.4	818.0	900	81.2	0.50	1280.1	2.01	63.9
Street E	30	MH34	MH32	1.119	0.70	0.7833	0.7833	10.00	1.79	89.9	195.7	525	160.5	0.50	304.1	1.40	64.4
Street B	29	MH32	MH29	0.523	0.70	0.3661	4.8531	13.29	0.60	77.4	1043.7	975	82.0	0.50	1584.7	2.12	65.9
Street D	28	MH31	MH29	1.079	0.70	0.7553	0.7553	10.00	1.81	89.9	188.7	525	160.3	0.50	304.1	1.40	62.1
Street B	27	MH29	MH26	0.429	0.70	0.3003	5.9087	13.89	0.49	75.5	1239.9	1050	70.0	0.50	1930.9	2.23	64.2

LOCATION				STORMWATER FLOW								DESIGN					
STREET	AREA NUMBER	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA (A)	RUNOFF COEFF. (C)	A x C	CUMUL. A x C	CONCENTRATION TIME TOTAL	CONCENTRATION TIME IN PIPE	RAIN INTENSITY (I)	FLOW (Q)	PIPE SIZE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	PIPE FULL
				ha		*ha*	*ha*	*min*	*min*	*mm/hr*	*L/s*	*mm*	*m*	*%*	*L/s*	*m/s*	*%*
Street C	26	MH28	MH26	0.961	0.70	0.6727	0.6727	10.00	1.85	89.9	168.1	525	159.8	0.50	304.1	1.40	55.3
Street B	25	MH26	MH21	0.413	0.70	0.2891	6.8705	14.38	0.51	74.0	1413.9	1050	74.0	0.50	1930.9	2.23	73.2
Street A	23A	Bk110	MH25	0.263	0.70	0.1841	0.1841	10.00	0.20	89.9	46.0	300	12.2	0.50	68.4	0.97	67.3
Street A	24	Bk109	MH24	2.362	0.90	2.1258	2.1258	10.00	0.14	89.9	531.2	675	17.3	0.60	651.1	1.82	81.6
Street A	22	MH25	MH58	0.143	0.70	0.1001	2.4100	10.20	0.62	89.0	596.3	750	72.3	0.50	787.2	1.78	75.7
Street A	23	MH58	MH21	0.811	0.70	0.5677	2.9777	10.81	0.37	86.4	714.9	750	52.1	0.70	931.4	2.11	76.8
Street A	21	MH21	MH2	0.245	0.70	0.1715	10.0197	14.89	0.20	72.6	2022.2	1200	31.8	0.50	2756.8	2.44	73.4
Street A		MH2	POND	0.000	0.25	0.0000	12.8802	15.56	0.71	70.8	2535.1	1350	117.6	0.47	3659.1	2.56	69.3
SWM Outlet (Note 1)		SWM Pond	HW								1317.00	1200	117.6	0.30	2135.4	1.89	61.7

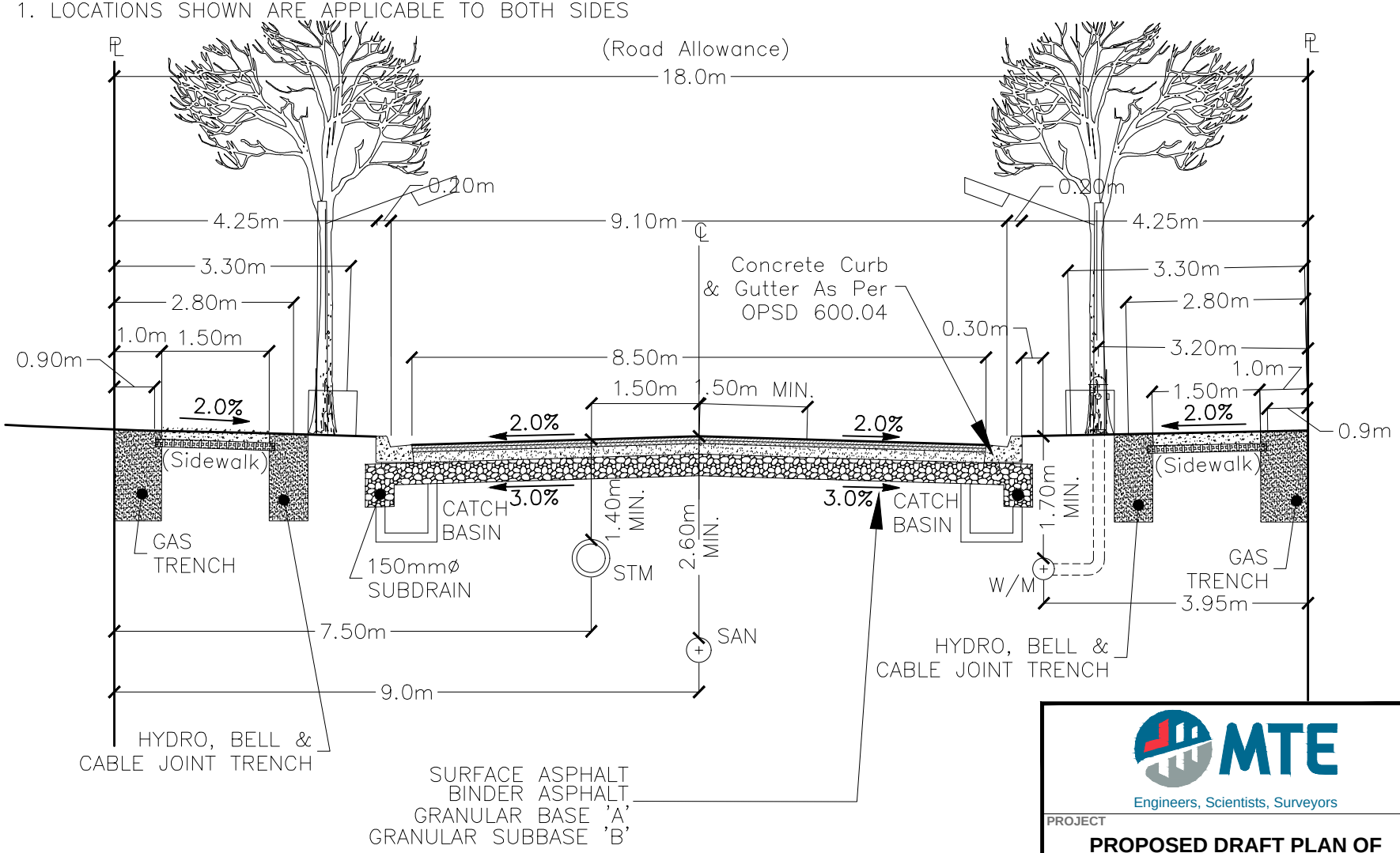
Notes:
1. Qp from SWM facilty = 100 year (24hr SCS storm) peak discharge from SWM facility 1.317cms (refer to Visual OTTHYMO output file).

Appendix E

Typical R.O.W. Cross-Sections

NOTE:

1. LOCATIONS SHOWN ARE APPLICABLE TO BOTH SIDES



TYPICAL 18m R.O.W URBAN CROSS-SECTION WITH SIDEWALKS AND 8.5m PAVEMENT WIDTH

N.T.S.

MTE

Engineers, Scientists, Surveyors

PROJECT

PROPOSED DRAFT PLAN OF SUBDIVISION-13030 LUNDY'S LANE

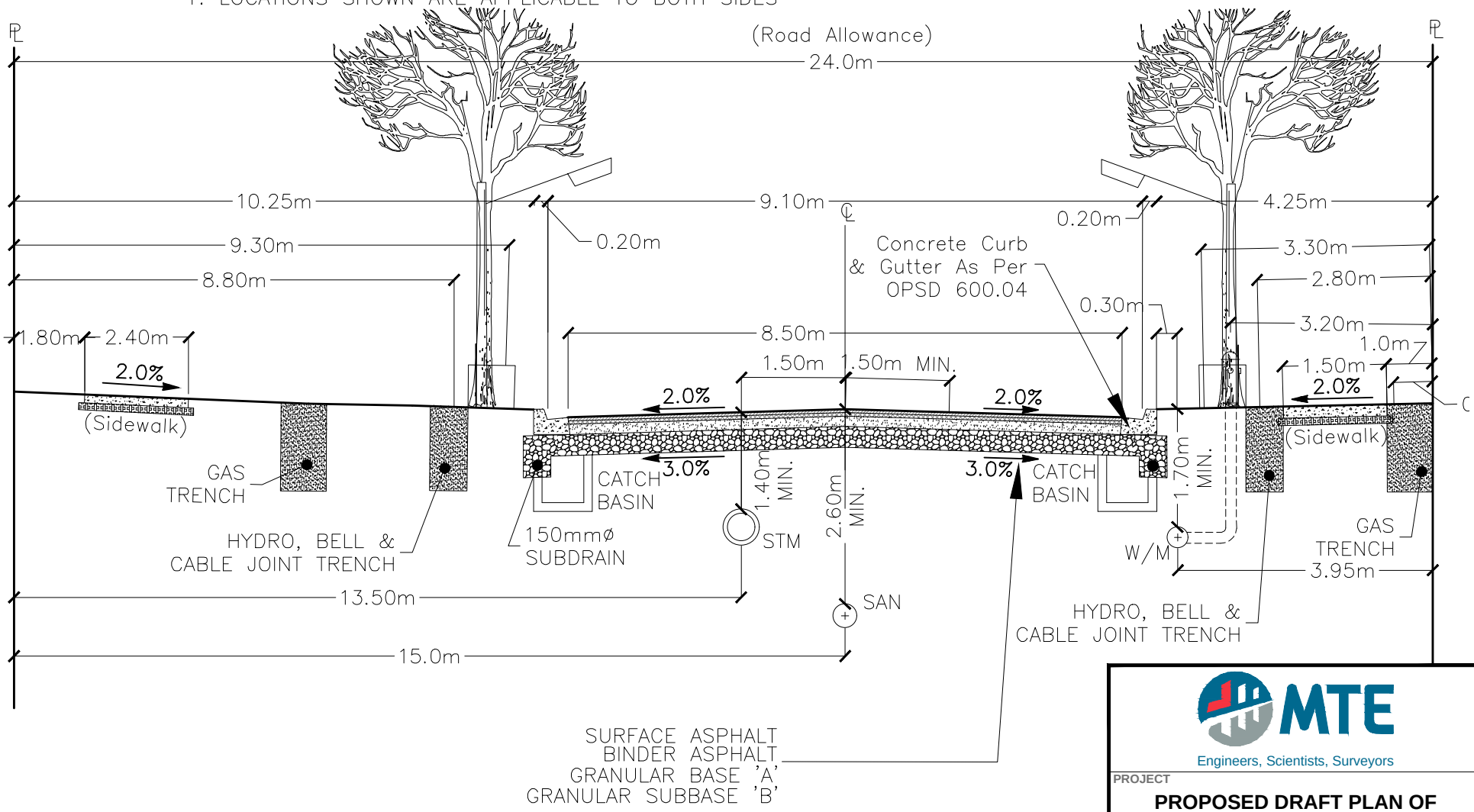
TITLE

PROPOSED 18m ROAD ALLOWANCE STREETS C, D, E, F, G, H, I, J

Drawn: RXJ	Scale: N.T.S.	Figure: **M1**
Checked: LXQ	Project No.: 49428-100	
Date: 2023-10-12	Rev No.: 0	

NOTE:

1. LOCATIONS SHOWN ARE APPLICABLE TO BOTH SIDES



TYPICAL 24m R.O.W URBAN CROSS-SECTION WITH SIDEWALKS AND 8.5m PAVEMENT WIDTH

N.T.S.

MTE

Engineers, Scientists, Surveyors

PROJECT

PROPOSED DRAFT PLAN OF SUBDIVISION-13030 LUNDY'S LANE

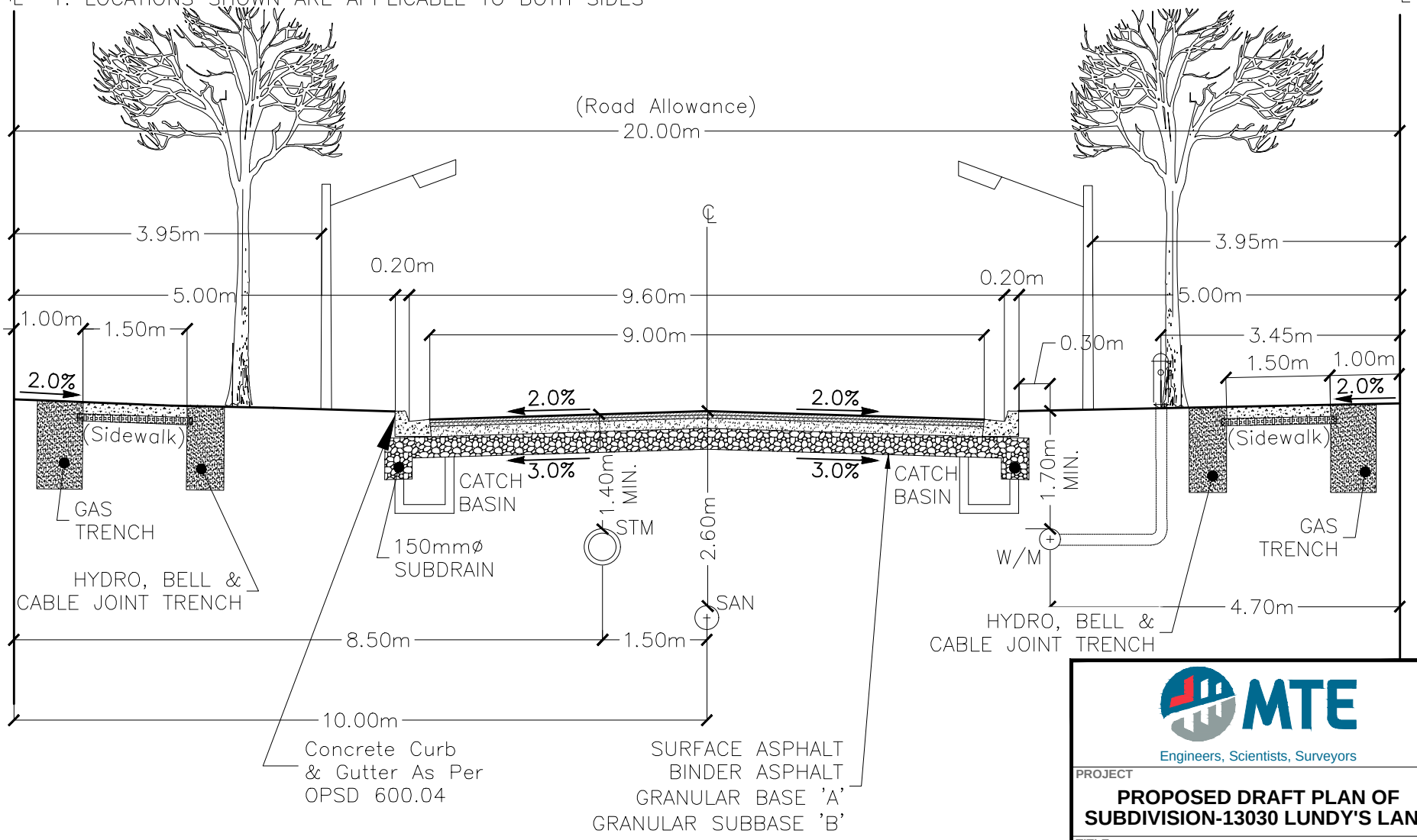
TITLE

PROPOSED 24m ROAD ALLOWANCE STREET B

Drawn: RXJ	Scale: N.T.S.	Figure: **M2**
Checked: LXQ	Project No.: 49428-100	
Date: 2023-10-12	Rev No.: 0	

NOTE:

1. LOCATIONS SHOWN ARE APPLICABLE TO BOTH SIDES



TYPICAL 20m R.O.W URBAN CROSS SECTION WITH SIDEWALKS AND 9.0m PAVEMENT WIDTH

N.T.S.

MTE

Engineers, Scientists, Surveyors

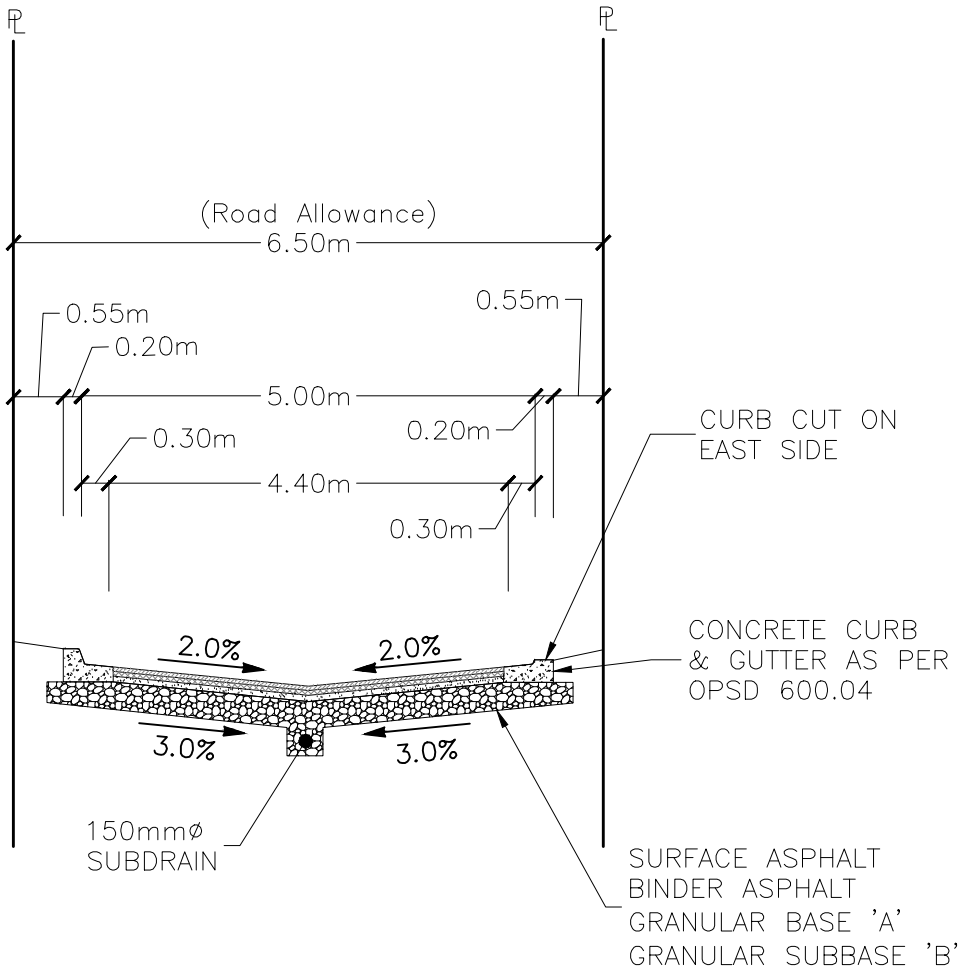
PROJECT

PROPOSED DRAFT PLAN OF SUBDIVISION-13030 LUNDY'S LANE

TITLE

PROPOSED 20m ROAD ALLOWANCE STREET A, K

Drawn: RXJ	Scale: N.T.S.	Figure: **M3**
Checked: LXQ	Project No.: 49428-100	
Date: 2023-10-12	Rev No.: 0	



TYPICAL 6.5m R.O.W URBAN CROSS SECTION
LANEWAY WITH 4.4m PAVEMENT WIDTH

N.T.S.

MTE
Engineers, Scientists, Surveyors

PROJECT
PROPOSED DRAFT PLAN OF SUBDIVISION-13030 LUNDY'S LANE

TITLE
PROPOSED 6.5m ROAD ALLOWANCE LANES A, B, C, D, E

Drawn: RXJ	Scale: N.T.S.	Figure: **M5**
Checked: LXQ	Project No.: 49428-100	
Date: 2023-10-12	Rev No.: 0	

Appendix F

Correspondence

City of Thorold Operations Department

Date of Meeting	October 30, 2024	Start Time	1:30 p.m.	End Time	3:40pm
Project Name	Uppers Lane Construction				
Location	Thorold Operation Centre				
Regarding	Coordination Meeting 1				
Attendees	Nathan Jamieson - Stantec Phil Busby – Parkbridge Peter Horn – Horn Design & Consulting Inc. Rob Melick – MTE Consultants Inc. Jeremia Rudan – Rudanco Martin Heikoop, UCC Consulting Geoff Holman, City of Thorold Sean Dunsmore, City of Thorold				
Distribution	All in attendance				
Prepared By	Sean Dunsmore				

PLEASE NOTE: If this report does not agree with your records of the meeting, or if there are any omissions, please advise, otherwise the contents are assumed to be accurate.

Item	Action By	Party Commenting / Proposing Revision
1. Sanitary a. The original plan to service the Rudanco property envisioned a connection to the Barker Parkway trunk sewer through Discovery Drive (a future phase of Rolling Meadows Secondary Plan). b. Rudanco would prefer to eliminate its reliance of the timing of future phase Rolling Meadows Subdivision for the connection to Barker Parkway and therefore requested a connection at Upper's Lane (via Thorold Townline Rd.) It was agreed that ~~this cost~~ **the additional cost to do this** would be at Rudanco's expense. c. It was agreed to design the extra capacity into the Uppers Lane sanitary sewer. d. Rudanco to submit updated functional servicing report to help	City, Rudanco	**Rudanco**

identify these needs. e. **UCC Consulting noted that the existing 300mm diameter sanitary sewer within Cristallina Drive (Rolling Meadows Subdivision) has sufficient capacity to convey waste-water flows from the entire Upper's Grove and Upper's Lane Residential Developments (Parkbridge lands).**		**Parkbridge**
2. Storm a. The proposed Stantec design and the proposed UCC design both include draining the Uppers Lane road allowance to the existing storm water management pond in Phase 14 of Rolling Meadows. b. Parkbridge will drain their development to the North to the temporary storm water management pond **with a very small portion of drainage from Streets 'A' and 'B' draining to Uppers Lane during major storm events (> 5-year design storm),** and Rolling Meadows development will drain to the south to the pond in phase 14. c. The road profile will need to be high enough to allow the storm to drain to the north to the **temporary** Parkbridge pond. The details of which will be reviewed during detailed design.	City, Parkbridge	**Parkbridge** **Parkbridge**
3. Water System a. City would like to see security of supply for all phases of the work and in the long term will ensure the proper looping is in place. b. Rudanco requested a twin main along uppers to create the security of supply for their development. The City would prefer not to complete this twining as it will become redundant when the final looping is in place. c. Rudanco identified that a new connection from Barron Road is required for full build out of their development. The City identified that this may fit into one of the DC eligible project and therefore could help to pay for this moving forward. **Stantec noted that if the new connection from Barron Road is DC eligible, then the extension of watermain along Thorold Townline Rd and Uppers Lane should be considered as DC eligible on the basis that it provides security of supply and looping for growth within the**	City, Rudanco	**Parkbridge** **Rudanco:** **For watermain, City discussed limitations within the existing distribution system including the lack of security of supply. This is a major risk to the City since the entire secondary plan is currently operating on a single connection to the Regional water supply. The City has started preliminary design on a new watermain loop from Allenport Road to**

Rolling Meadows Secondary Plan Area. The City will review. The City to follow up in its Master Plan model. d. Rudanco to submit the revised functional servicing plan and the City and Rudanco will review the construction of the main along Thorold Townline Road.		**Barker Parkway but this connection faces challenges since this is a MTO controlled highway. The City has been in discussions with the MTO to downgrade the road to the Region but this will likely take a number of years. The City indicated that an alternative is to extend a secondary connection along Townline Road from Barron Road to Uppers Lane, which could be complete now. The City indicated that this could be a DC funded project and would work with Rudanco to get this watermain constructed. The City was also open to the section along Uppers Lane to be part of this scope of work so that it ties into Barker Parkway. City was also open to staging the works so that a portion of the Rudanco lands could come online before the full extension to Barron Rd is required. City confirmed that this would allow Rudanco to function off a single feed and eliminate the need to twin the watermain along Uppers Lane and Thorold Townline. City also noted that the pipe diameter of**

		the watermain loop along Thorold Townline Road would likely be larger than would be needed to service only the Rudanco lands.
4. MOU a. The City will be taking the information from this meeting and revising the MOU to reflect the discussion. b. Some of the elements of the MOU which were requested to be changed but are; i. ~~Shallow utilities~~ **Upper Lane x-section will identify location of Utilities, but** the City will not be including any ~~of bell, cogeco, gas or hydro~~ **telecommunications and gas** in the initial design and will be the responsibility of the individual developer to coordinate with these supplier for the installation into their developments. **The City will design and construct primary hydro and street lights.** ii. ~~Timing, once the MOU has been agree to by all parties the timing can be established~~ **Tentative timing discussed is design and construction completed by July 2025 and July 2026, respectively. Schedule to be confirmed once MOU has been agreed to by all parties**. c. The City will be having a separate meeting with Walkers to coordinate and include their concerns in the road design. **d. City noted that 1st submission designs for a portion of Uppers Lane have been completed by UCC and Stantec. Rudanco and Parkbridge were agreeable to having UCC or Stantec complete the design and contract administration of Uppers Lane in lieu of the City completing an RFP process to retain a consultant, subject to the understanding that all parties equitably share the costs, work collaboratively, and to co-ordinate obligations associated with grading and servicing design of Uppers Lane relative to their respective developments.**	City	**Parkbridge** **Rudanco:** **In terms of project schedule, the City said that the project would happen a lot faster if one of the land owners undertook the project on behalf of everyone, especially if the road needs to be constructed in 2025. The City also stated that the deal with the school board should not be a deciding factor on whether the project moves forward since Uppers Lane needs to be built regardless of the school. If one of the land owners decided to lead, then it makes sense for either Upper Canada or Stantec to be retained given they have both advanced engineering designs for the road. In terms of the MOU, Parkbridge and Rudanco reiterated that the MOU needs to account for the technical design aspects (as noted**

		above) but also needs to allow for a transparent execution of the project including design review, tendering / procurement, step-in rights, cost sharing etc. There appeared to be a consensus that this is the best way to proceed. In terms of next steps, the City was going to prepare a revision to the draft MOU and recirculate to all stakeholders. City was targeting a council date in early December to present final recommendation with the understanding design would be complete by the spring 2025 and construction complete by fall 2025.
5. Cost Sharing a. The revised MOU will ~~spell out the cost sharing and require all parties to~~ **identify cost sharing principles with the understanding that all parties will** submit their share of the estimated cost sharing for the building of Uppers Lane. **Schedule of costs to be prepared as part of subsequent cost sharing agreement between City and all parties.** b. It is understood by Rudanco and Parkbridge that the cost sharing for Uppers Lane does not satisfy the condition of draft approval for the cost sharing for the services in Barker Pkwy.	Rudanco, Parkbridge, Rolling Meadows	**Parkbridge**
6. Uppers Lane Right-of-Way **a. City confirmed Uppers Lane will be a 22m wide right-of-way.** **b. City has acquired 20m wide right-of-way from Barker Parkway**		**Parkbridge**

	east to Thorold Townline Road. **c. Additional 2m road road widening required along south limit of Uppers Lane right-of-way from Rolling Meadows Subdivision and Walkers. City to approach Walkers to dedicate additional land required now. Should Walkers not dedicate land at this time, City can still proceed with detailed design and construction.** d. **City noted that they may not be able to provide construction access to Parkbridge lands during construction of the Uppers Lane sanitary sewer. Stantec requested that the City approve a temporary construction access via Cristalliana Drive to provide a secondary access should access via Uppers Lane be temporary cut off. City staff requested that Stantec submit a formal request to City staff for consideration.**		

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

401 Grays Road · Hamilton, ON · L8E 2Z3

www.soil-mat.ca info@soil-mat.ca 905.318.7440 905.318.7455

PROJECT NO.: SM 301708-G November 21, 2024

PLACEMAKER
4728 Dorchester Drive – Unit 11B
Niagara Falls, Ontario
L2E 7H9

Attention: Jeremia Rudan

TEST PIT STUDY – GROUNDWATER CONSIDERATIONS
PROPOSED RESIDENTIAL DEVELOPMENT
13030 LUNDY'S LANE
NIAGARA FALLS, ONTARIO

Dear Mr. Rudan,

Further to your authorisation, a representative of SOIL-MAT ENGINEERS visited the above noted site on November 14, 2024. The purpose of this site visit was to evaluate the subsurface soils in a series of test excavations, and to provide our comments and recommendations with respect to the design and construction of the foundations for the proposed residential dwelling, from a geotechnical point of view. This report should be read in conjunction with our initial geotechnical investigation for the project site, SM 301708-G dated July 23, 2021.

At the time of our site visit, our representative observed the advancement of seven [7] test pits advanced to depths of up to approximately 2.1 to 2.7 metres below the existing ground surface at the locations illustrated in the attached Drawing No. 1, Test Pit Location Plan. The excavations were examined and found to generally consist of approximately 0.3 metres of topsoil overlaying dry, brown to reddish brown clayey silt, consistent with the conditions described in the above noted geotechnical report. It is noted that at a deposit of fill comprised of clayey silt soil with occasional construction debris was noted at Test Pit No. 1, extending to a depth of approximately 1.4 metres.

The test pits were left open for the duration of the excavations, approximately between 2 to 5 hours. No signs of groundwater were observed during this time, and the test pits were backfilled with the excavated material. In fine grained to cohesive soils such as the clayey silt encountered, the static groundwater level generally coincides with the transition in colour from brown to grey. It is noted that our initial geotechnical report conservatively estimated groundwater at depths of approximately 1.5 to 2 metres however based on our observations during the advancement of test pits and experience in the area, the static groundwater level is estimated at depths of 2 to 2.5 metres or more below the existing ground surface.

The depths and elevations of the test pits and our observations have been summarised as follows:

Location	Ground Surface Elevation [m]	Termination Depth [m]	Termination Elevation [m] (dry)
TP1	185.24	2.2	183.0
TP2	185.17	2.2	183.0
TP3	185.46	2.2	183.2
TP4	186.58	2.2	184.4
TP5	185.44	2.4	183.0
TP6	187.59	2.4	185.2
TP7	183.56	2.7	180.8

We trust that this information is satisfactory for your purposes. Should you have any questions please do not hesitate to contact the undersigned.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Malcolm Green, B.Tech.
Junior Engineer

Kyle Richardson, P.Er
Project Engineer

Enclosures: Drawing No. 1, Test Pit Location Plan

Distribution: Placemaker [pdf]

LEGEND

Test Pit Location
TP#

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Geotechnical Report SM 301708-G.

2. Test pit and borehole locations are approximate.

SOIL-MAT
ENGINEERS & CONSULTANTS LTD.

Test Pit Study
Proposed Residential Development
13030 Lundy's Lane
Thorold, Ontario

Test Pit Location Plan

Project No. SM 301708-G

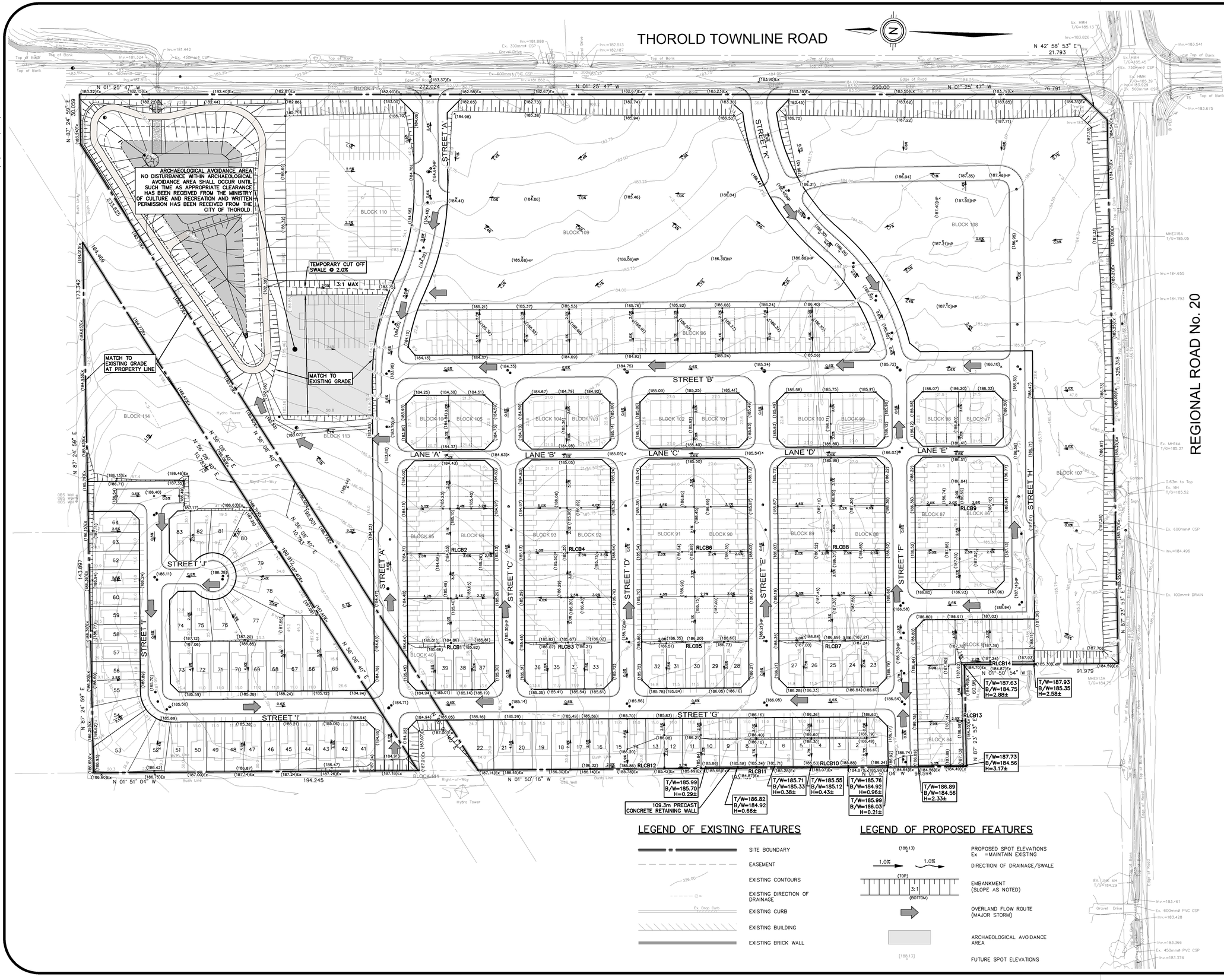
Date: November 2024

Drawn: KR

SM 301708-G Test Pit Location Plan

Drawing No. 1

Drawings

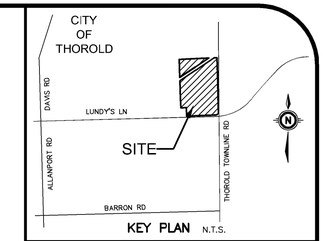


LEGEND OF EXISTING FEATURES

- SITE BOUNDARY
- EASEMENT
- EXISTING CONTOURS
- EXISTING DIRECTION OF DRAINAGE
- EXISTING CURB
- EXISTING BUILDING
- EXISTING BRICK WALL

LEGEND OF PROPOSED FEATURES

- PROPOSED SPOT ELEVATIONS Ex =MAINTAIN EXISTING
- DIRECTION OF DRAINAGE/SWALE
- EMBANKMENT (SLOPE AS NOTED)
- OVERLAND FLOW ROUTE (MAJOR STORM)
- ARCHAEOLOGICAL AVOIDANCE AREA
- FUTURE SPOT ELEVATIONS



GEODETIC BM ELEV. = NAm

SITE BENCHMARK ELEV. = NAm

NOTE TO CONTRACTOR :

DO NOT SCALE DRAWINGS.

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED OR REUSED WITHOUT THE ENGINEER'S WRITTEN PERMISSION.

THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.

No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
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3.			
2.	SECOND SUBMISSION FOR DRAFT PLAN APPROVAL	RSM	2024-11-26
1.	ISSUED FOR DRAFT PLAN APPROVAL	RSM	2023-12-13

MTE
Engineers, Scientists, Surveyors
905-639-2552

LICENSED PROFESSIONAL ENGINEER 2024-11-26 R. MELICK 49428-100 PROVINCE OF ONTARIO DIGITAL ORIGINAL

NOT FOR CONSTRUCTION

CLIENT

RUDANCO HOSPITALITY CORPORATION
4728 DORCHESTER RD NIAGARA FALLS, ON

PROJECT

PROPOSED PLAN OF SUBDIVISION
13030 LUNDY'S LANE
HIGHWAY 20 & THOROLD TOWNLINE RD THOROLD, ON

DRAWING

PRELIMINARY GRADING PLAN

Project Manager R.MELICK	Project No. 49428-100
Design By CKM	Checked By RSM
Drawn By CKM	Checked By RSM
Surveyed By OTHERS	Drawing No. P-AG1.1
Date Apr.26/23	
Scale 1:1000	Sheet of

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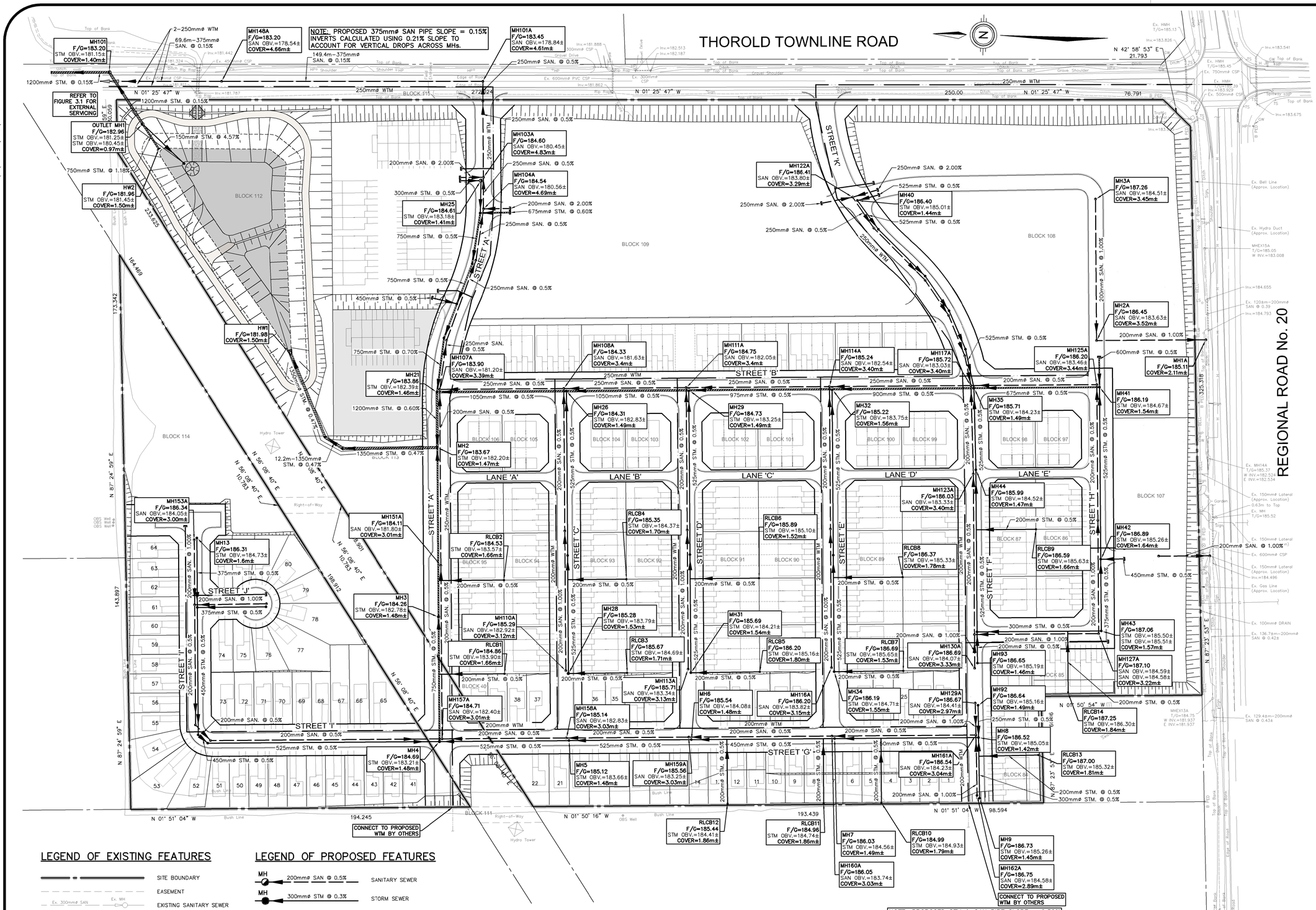


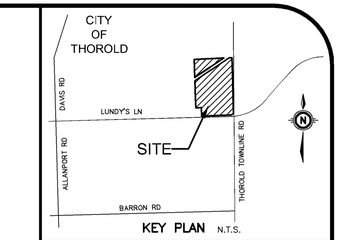
LEGEND OF EXISTING FEATURES

- SITE BOUNDARY
- EASEMENT
- EXISTING SANITARY SEWER (Ex. 300mmø SAN, Ex. MH)
- EXISTING CURB (Ex. Drop Curb)
- EXISTING BUILDING
- EXISTING BRICK WALL
- EXISTING HYDRO DUCT (H)
- EXISTING GAS LINE (G)
- EXISTING BELL LINE (BELL)

LEGEND OF PROPOSED FEATURES

- SANITARY SEWER (MH, 200mmø SAN @ 0.5%)
- STORM SEWER (MH, 300mmø STM @ 0.3%)
- WATERMAIN (200mmø WTM)

CITY OF THOROLD



KEY PLAN N.T.S.

GEODETIC BM ELEV. = NAm

SITE BENCHMARK ELEV. = NAm

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No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
4.			
3.			
2.	SECOND SUBMISSION FOR DRAFT PLAN APPROVAL	RSM	2024-11-26
1.	ISSUED FOR DRAFT PLAN APPROVAL	RSM	2023-12-13

MTE
Engineers, Scientists, Surveyors
905-639-2552

LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — 2024-11-26 — R. MELICK — 49428-100 — DIGITAL ORIGINAL

NOT FOR CONSTRUCTION

CLIENT

RUDANCO HOSPITALITY CORPORATION
4728 DORCHESTER RD NIAGARA FALLS, ON

PROJECT

PROPOSED PLAN OF SUBDIVISION
13030 LUNDY'S LANE
HIGHWAY 20 & THOROLD TOWNLINE RD THOROLD, ON

DRAWING

PRELIMINARY GENERAL PLAN OF SERVICING

Project Manager R.MELICK	Project No. 49428-100
Design By CKM	Checked By RSM
Drawn By CKM	Checked By RSM
Surveyed By OTHERS	Drawing No. P-GP1.1
Date Apr.18/23	
Scale 1:1000	Sheet of

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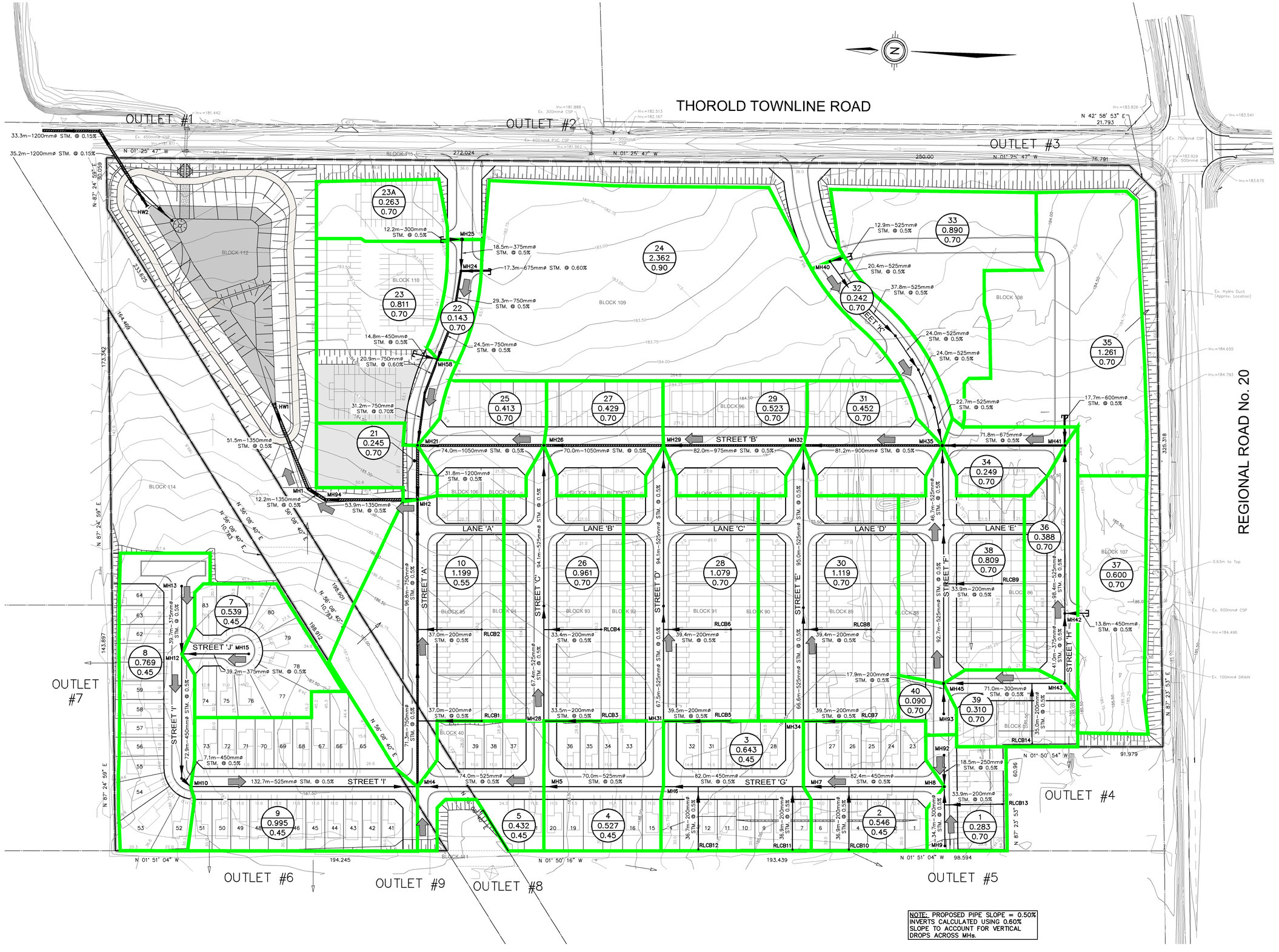

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SITE BENCHMARK ELEV. = NAm

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LEGEND

- SITE BOUNDARY
- DRAINAGE AREA
- F1 / 0.107 / 0.45 — ID No., AREA (Ha), RUNOFF COEFFICIENT
- EXISTING DIRECTION OF DRAINAGE
- PROPOSED DIRECTION OF DRAINAGE
- MH — STORM SEWER
- 326.00 — EXISTING CONTOURS
- OVERLAND FLOW ROU (MAJOR STORM)

No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
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4.			
3.			
2.	SECOND SUBMISSION FOR DRAFT PLAN APPROVAL	RSM	2024-11-26
1.	ISSUED FOR DRAFT PLAN APPROVAL	RSM	2023-12-13

MTE
Engineers, Scientists, Surveyors
905-639-2552

LICENSED PROFESSIONAL ENGINEER — 2024-11-26 — R. MELICK — 49428-100 — PROVINCE OF ONTARIO — DIGITAL ORIGINAL

NOT FOR CONSTRUCTION

CLIENT

RUDANCO HOSPITALITY CORPORATION
4728 DORCHESTER RD NIAGARA FALLS, ON

PROJECT

PROPOSED PLAN OF SUBDIVISION
13030 LUNDY'S LANE
HIGHWAY 20 & THOROLD TOWNLINE RD THOROLD, ON

DRAWING

PRELIMINARY STORM DRAINAGE AREA PLAN

Project Manager R.MELICK	Project No. 49428-100
Design By CKM	Checked By RSM
Drawn By CKM	Checked By RSM
Surveyed By OTHERS	Drawing No. P-ST1.1
Date Apr.27/23	
Scale 1:1000	Sheet of

REGIONAL ROAD No. 20

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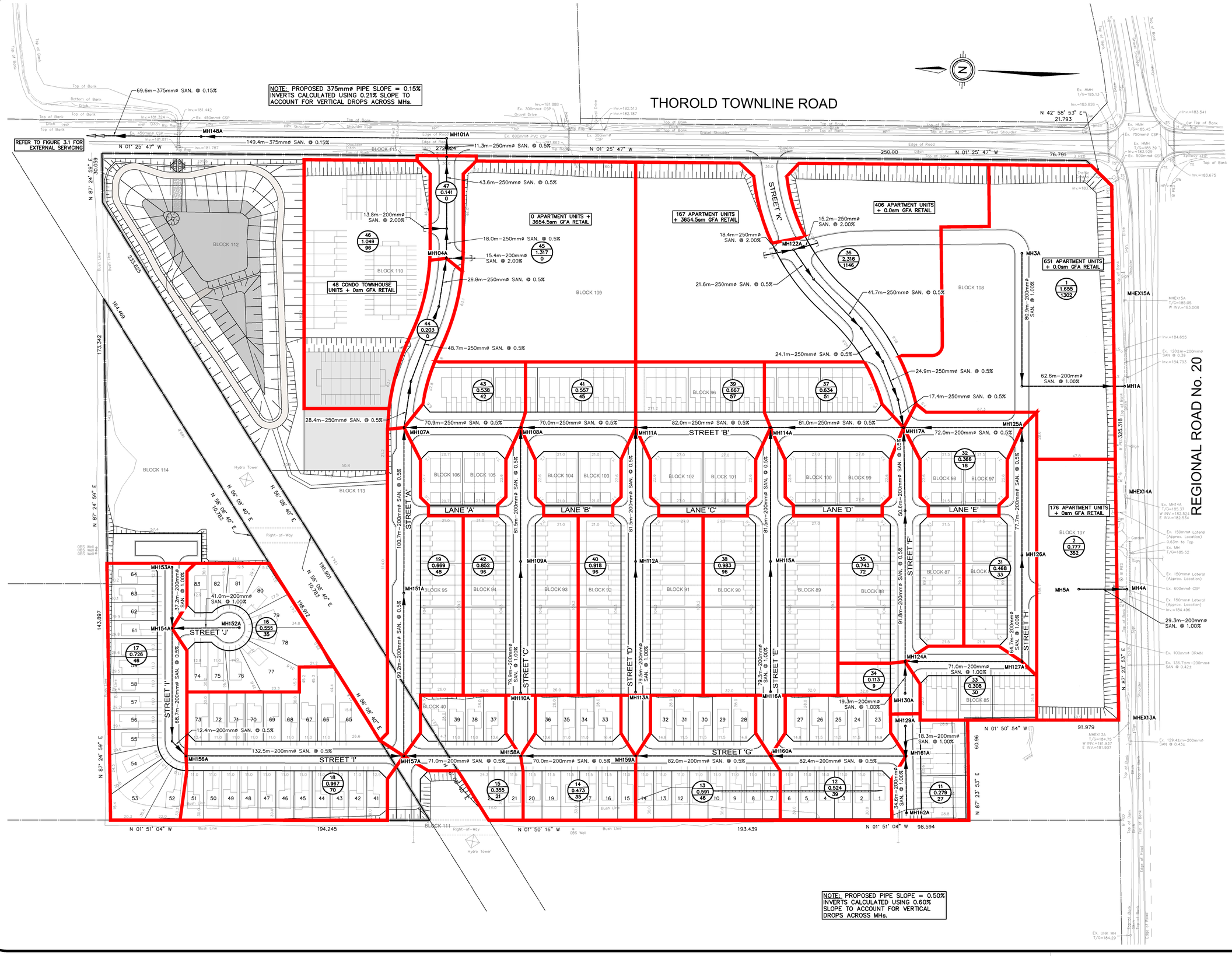

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SITE BENCHMARK ELEV. = NAm

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LEGEND

- SITE BOUNDARY
- EXISTING SANITARY SEWER (Ex. 300mmø SAN, Ex. MH)
- PROPOSED SANITARY SEWER (MH, 14.6m–200mmø SAN @ 1.5%)
- DRAINAGE AREA
- ID No. / AREA (Ha) / POPULATION (1 / 2.02 / 15)
- UNIT COUNTS PER MASTER SITE PLAN 2023/10/30 (1330 APARTMENT UNITS + 0sm GFA RETAIL)

No.	REVISION	BY	YYYY-MM-DD
1.	ISSUED FOR DRAFT PLAN APPROVAL	RSM	2023-12-13
2.	SECOND SUBMISSION FOR DRAFT PLAN APPROVAL	RSM	2024-11-26
3.			
4.			
5.			
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MTE
Engineers, Scientists, Surveyors
905-639-2552

LICENSED PROFESSIONAL ENGINEER — 2024-11-26 — R. MELICK — 49428-100 — PROVINCE OF ONTARIO — DIGITAL ORIGINAL

NOT FOR CONSTRUCTION

CLIENT

RUDANCO HOSPITALITY CORPORATION
4728 DORCHESTER RD NIAGARA FALLS, ON

PROJECT

PROPOSED PLAN OF SUBDIVISION
13030 LUNDY'S LANE
HIGHWAY 20 & THOROLD TOWNLINE RD THOROLD, ON

DRAWING

SANITARY DRAINAGE AREA PLAN

Project Manager: R.MELICK	Project No.: 49428-100
Design By: CKM	Checked By: RSM
Drawn By: CKM	Checked By: RSM
Surveyed By: OTHERS	Drawing No.: P-SA1.1
Date: Apr.27/23	
Scale: 1:1000	Sheet of

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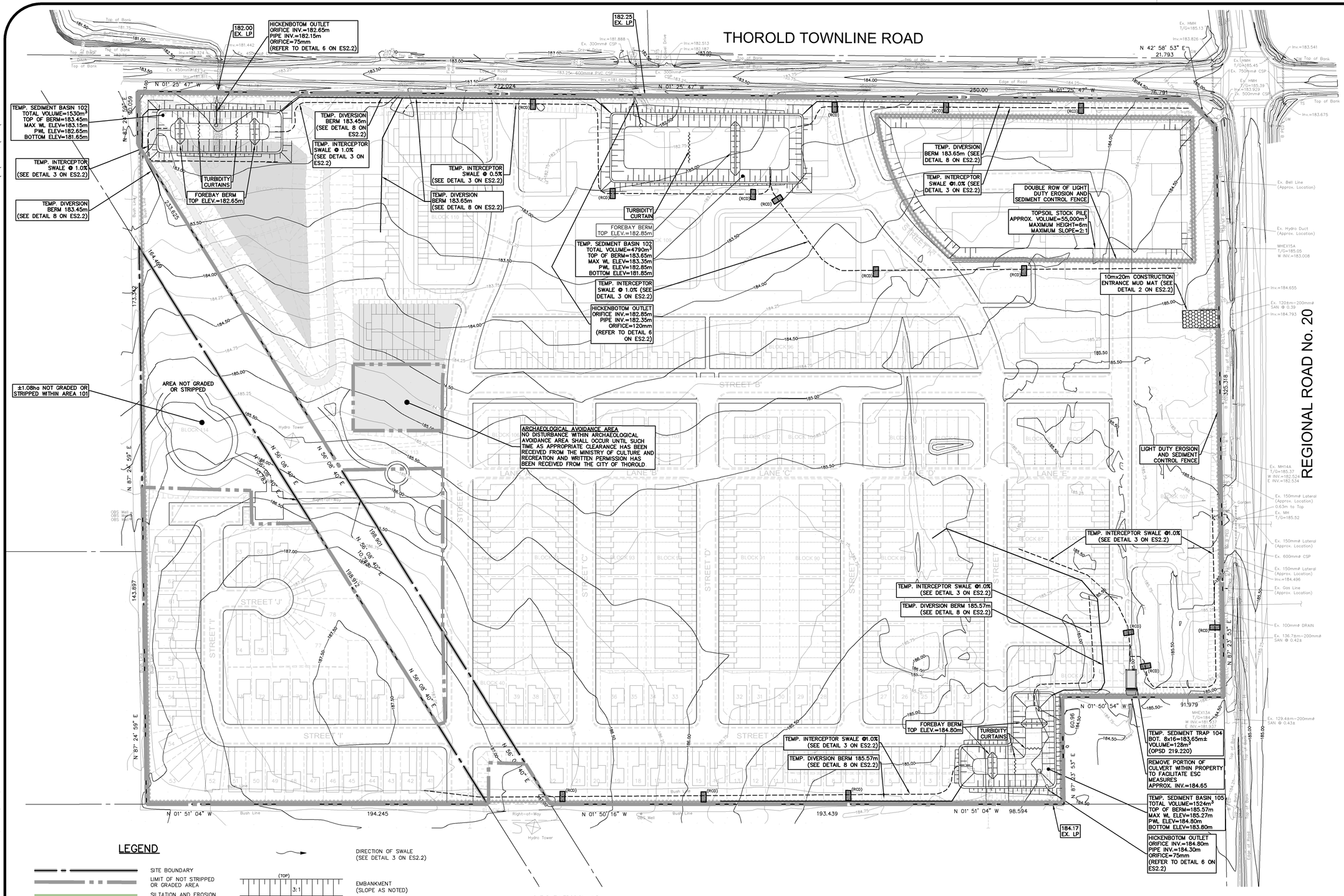
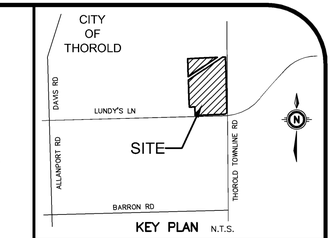
MTE FILE PATH:
November 26, 2024 - 1:28:09 PM - Plotted By: Chirag Maniya



LEGEND

- SITE BOUNDARY
- LIMIT OF NOT STRIPPED OR GRADED AREA
- SILTATION AND EROSION DRAINAGE AREA BOUNDARY
- PROPOSED ROW
- EXISTING DRIPLINE
- EASEMENT
- 326.00 EXISTING SURFACE CONTOURS
- PROPOSED DRAINAGE DIRECTION
- EXISTING DIRECTION OF DRAINAGE
- DIRECTION OF SWALE (SEE DETAIL 3 ON ES2.2)
- (TOP) 3:1 (BOTTOM) EMBANKMENT (SLOPE AS NOTED)
- OVERLAND FLOW DRAINAGE DIRECTION
- PROPOSED TOPSOIL STOCKPILE LOCATION
- LIGHT DUTY EROSION AND SEDIMENT CONTROL FENCE (SEE DETAIL 5 ON ES2.2)
- HEAVY DUTY EROSION AND SEDIMENT CONTROL FENCE (SEE DETAIL 4 ON ES2.2)
- LIGHT DUTY EROSION AND SEDIMENT CONTROL FENCE (SEE DETAIL 4 ON ES2.2)
- CONSTRUCTION MUD MAT (SEE DETAIL 2 ON ES2.2)
- (RCD) ROCK CHECK DAM (RCD)
- TEMPORARY DIVERSION BERM
- SEDIMENT TRAP (OPSD 219.220)



GEODETIC BM ELEV. = NAm

SITE BENCHMARK ELEV. = NAm

NOTE TO CONTRACTOR :

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2.	SECOND SUBMISSION FOR DRAFT PLAN APPROVAL	RSM	2024-11-26
1.	ISSUED FOR DRAFT PLAN APPROVAL	RSM	2023-12-13

MTE
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LICENSED PROFESSIONAL ENGINEER 2024-11-26 R. MELICK 49428-100 PROVINCE OF ONTARIO DIGITAL ORIGINAL

NOT FOR CONSTRUCTION

CLIENT

RUDANCO HOSPITALITY CORPORATION
4728 DORCHESTER RD NIAGARA FALLS, ON

PROJECT

PROPOSED PLAN OF SUBDIVISION
13030 LUNDY'S LANE
HIGHWAY 20 & THOROLD TOWNLINE RD THOROLD, ON

DRAWING

EROSION AND SEDIMENT CONTROL PLAN PRE-GRADING

Project Manager	R.MELICK	Project No.	49428-100
Design By	CNF	Checked By	RSM
Drawn By	CKM	Checked By	RSM
Surveyed By	OTHERS	Drawing No.	P-ES2.1
Date	Nov.03/23		
Scale	1:1000	Sheet	of

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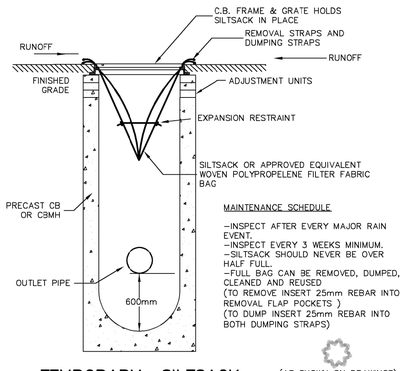


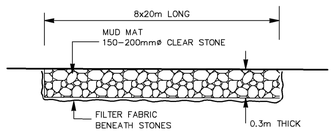
TEMPORARY SILTSACK SILTATION CONTROL IN CB

N.T.S.

(AS SHOWN ON DRAWINGS)

DETAIL 1

DESIGNATED ACCESS FOR ALL CONSTRUCTION TRAFFIC. INSTALL 'MUD MAT', AS PER DETAIL BELOW, PRIOR TO ANY OTHER CONSTRUCTION. MAT TO BE MAINTAINED IN GOOD WORKING ORDER UNTIL GRADING WORKS ARE COMPLETED AND GRANULAR "A" & "B" HAVE BEEN PLACED.

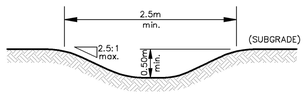


MUD MAT ENTRANCE DETAIL

N.T.S.

(AS SHOWN ON DRAWINGS)

DETAIL 2

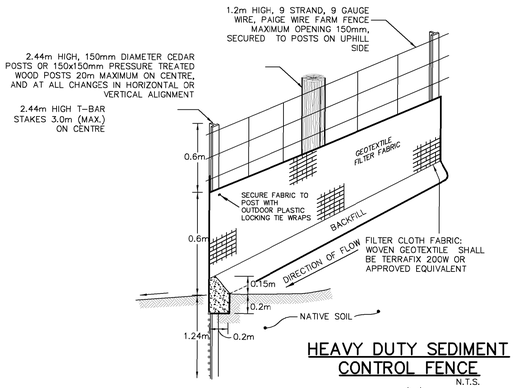


TEMPORARY INTERCEPTOR SWALE

N.T.S.

(AS SHOWN ON DRAWINGS)

DETAIL 3

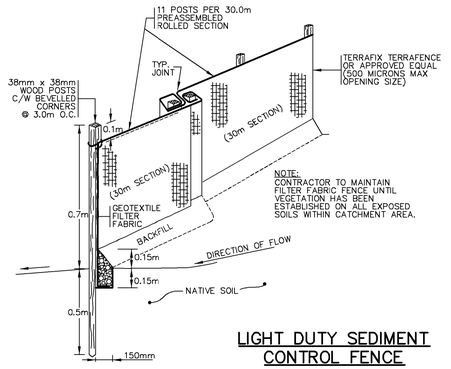


HEAVY DUTY SEDIMENT CONTROL FENCE

N.T.S.

(AS SHOWN ON DRAWINGS)

DETAIL 4

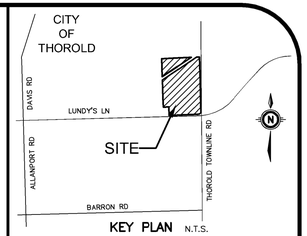


LIGHT DUTY SEDIMENT CONTROL FENCE

N.T.S.

(AS SHOWN ON DRAWINGS)

DETAIL 5



KEY PLAN N.T.S.

GEODETIC BM ELEV. = NAm

SITE BENCHMARK ELEV. = NAm

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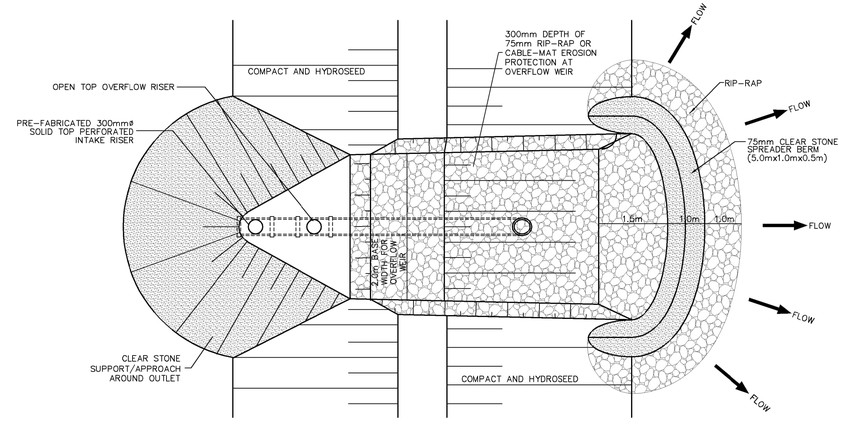
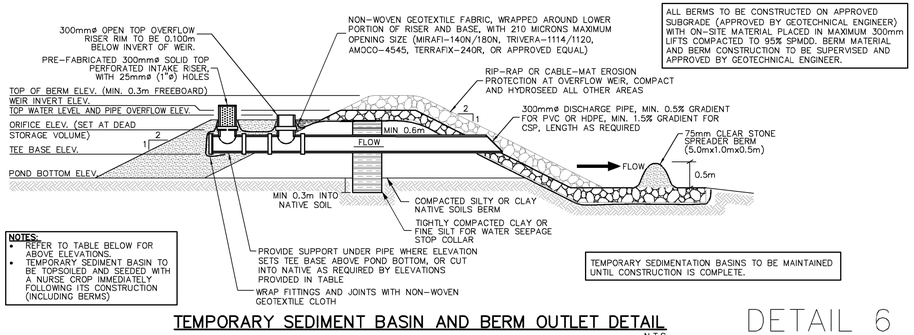




NOTES:
- REFER TO TABLE BELOW FOR ABOVE ELEVATIONS.
- TEMPORARY SEDIMENT BASIN TO BE TOPSOILED AND SEEDED WITH A NURSE CROP IMMEDIATELY FOLLOWING ITS CONSTRUCTION (INCLUDING BERMS)

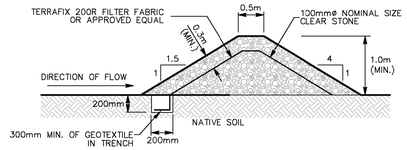
ALL BERMS TO BE CONSTRUCTED ON APPROVED SUBGRADE (APPROVED BY GEOTECHNICAL ENGINEER) WITH ON-SITE MATERIAL PLACED IN MAXIMUM 300mm LIFTS COMPACTED TO 95% SMDD. BERM MATERIAL AND BERM CONSTRUCTION TO BE SUPERVISED AND APPROVED BY GEOTECHNICAL ENGINEER.

TEMPORARY SEDIMENTATION BASINS TO BE MAINTAINED UNTIL CONSTRUCTION IS COMPLETE.

TEMPORARY SEDIMENT BASIN AND BERM OUTLET DETAIL

N.T.S.

DETAIL 6



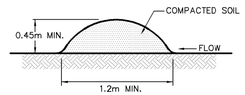
(PER OPSD 219.210)

(AS SHOWN ON DRAWINGS)

ROCK CHECK SILTATION DAM DETAIL

N.T.S.

DETAIL 7



NOTE:
- CONSTRUCT BARRIER FROM BOTTOM UP BY PLACING AND COMPACTING SUBSEQUENT LIFTS OF LOW PERMEABILITY SOILS.
- THE DEGREE OF COMPACTION WILL HAVE TO BE ASSESSED BY A GEOTECHNICAL ENGINEER.

TEMPORARY DIVERSION BERM

N.T.S.

(AS SHOWN ON DRAWINGS)

DETAIL 8

RIP-RAP SPECIFICATIONS

CLASS I

NOMINAL 300mmø OR 36kg WEIGHT GRADING SPECIFICATIONS:

	100%	SMALLER THAN 450mm OR 136kg
AT LEAST 20%	LARGER THAN 350mm OR	68kg
AT LEAST 50%	LARGER THAN 300mm OR	36kg
AT LEAST 80%	LARGER THAN 200mm OR	11kg

GENERAL NOTES :

1. EROSION AND SEDIMENTATION FACILITIES TO BE INSTALLED PRIOR TO ANY AREA GRADING OPERATIONS.
2. SITE INSPECTIONS OF THE EROSION CONTROL MEASURES BY THE DEVELOPER'S CONSULTANT ARE TO BE CONDUCTED WEEKLY OR AFTER ANY STORM EVENT GREATER THAN 15mm. INSPECTIONS MUST INCLUDE AN ASSESSMENT OF THE PROPOSED FACILITIES/CONTROLS AND RECOMMENDED CORRECTIVE MEASURES (IF REQUIRED). REPORTS ARE TO BE SUBMITTED MONTHLY TO THE NIAGARA PENINSULA CONSERVATION AUTHORITY AND CITY OF THOROLD.
3. ALL EROSION CONTROL MEASURES (INCLUDING SILT FENCE, TEMPORARY SEDIMENT BASINS, INTERCEPTOR SWALES AND STORM STRUCTURE CONTROL MEASURES) ARE TO BE MONITORED BY THE DEVELOPER'S CONSULTANT AND REPAIRS COMMISSIONED AS REQUIRED.
4. THE MEASURES AS PROPOSED MAY BE MODIFIED AT THE DISCRETION OF THE ENGINEER TO SUIT THE PROPOSED CONSTRUCTION PROGRAMS. THE GENERAL INTENT OF THE PROPOSED EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES.
5. UPON COMPLETION OF THE GRADING OPERATION ALL DISTURBED AREAS SHALL BE RESTORED WITH MULCH AND TREFOIL MIX SEED PER OPSS-804 UNLESS FINAL CONSTRUCTION IS SCHEDULED TO COMMENCE WITHIN 1 MONTH OF THE GRADING OPERATION.
6. CONTRACTOR AND DEVELOPER'S CONSULTANT TO REVIEW SITE PRIOR TO CONSTRUCTION TO DETERMINE THE NEED FOR MODIFICATIONS TO THIS SCHEDULE. CONTRACTOR IS NOT TO REMOVE ANY EROSION OR SEDIMENT CONTROL FACILITIES UNTIL DIRECTED TO DO SO BY THE ENGINEER.

SCHEDULE FOR CONSTRUCTION OF EROSION CONTROL MEASURES :

1. INSTALL SEDIMENT FENCE AS ILLUSTRATED. CONSTRUCT SEDIMENT BASINS c/w OUTLET STRUCTURES. INSTALL CONSTRUCTION ACCESS.
2. INSTALL "NO DUMPING OR REMOVAL OF TREES" SIGNS.
3. CONSTRUCT TEMPORARY INTERCEPTOR SWALES c/w ROCK CHECK DAMS WHERE GRADES PERMIT.
4. ROUGH GRADE SUBDIVISION AS FOLLOWS:
   - GRADE AREAS DIRECTING DRAINAGE TO TEMPORARY SEDIMENT BASIS 101, 102, AND 105, AND TO SEDIMENT TRAP 104..
   - SEDIMENT BASINS TO REMAIN IN PLACE UNTIL VEGETATIVE COVER IS ESTABLISHED.
5. ESTABLISH VEGETATIVE COVER TO ALL GRADED AREAS.
6. REMOVE/DECOMMISSION ALL EROSION CONTROL MEASURES ONCE VEGETATIVE COVERS IS ESTABLISHED. FINE GRADE AND ESTABLISH VEGETATIVE COVER ON REMAINING AFFECTED LOTS WHERE DISTURBED BY REMOVAL/DECOMMISSIONING OF SAID MEASURES.
7. AS SERVICING OF EACH PHASE IS COMPLETED, CATCHBASINS OR OTHER POTENTIAL INLET TO THE STORM SEWER SYSTEM SHALL BE PROTECTED WITH SILTSACKS, SILT FENCE, OR STRAW BALE FILTERS (OR COMBINATION THERE OF) AS DIRECTED BY THE ENGINEER TO PREVENT ENTRY OF SEDIMENT TO THE STORM SEWER SYSTEM

MAINTENANCE RECOMMENDATIONS :

1. EROSION CONTROL STRUCTURES TO BE MONITORED REGULARLY AND ANY DAMAGE REPAIRED IMMEDIATELY.
2. SEDIMENTS TO BE REMOVED WHEN ACCUMULATIONS REACH A MAXIMUM OF 1/3 THE HEIGHT OF THE FABRIC ON THE LIGHT DUTY TYPE FENCE AND 2/3 THE HEIGHT OF THE FABRIC ON THE HEAVY DUTY FENCE TYPE.
3. OWNER'S REPRESENTATIVE TO MONITOR EROSION CONTROL STRUCTURES TO ENSURE FENCING IS INSTALLED AND MAINTENANCE IS PERFORMED TO CITY OF THOROLD REQUIREMENTS.

EROSION AND SEDIMENT CONTROL STRATEGY :

1. ALL MATERIALS AND EQUIPMENT USED FOR THE PURPOSE OF SITE PREPARATION AND PROJECT COMPLETION SHOULD BE OPERATED AND STORED IN A MANNER THAT PREVENTS ANY DELETERIOUS SUBSTANCE (E.G. PETROLEUM PRODUCTS, SILT, DEBRIS, ETC) FROM REACHING GROUND SURFACE OR ENTERING GROUNDWATER.
2. ANY STOCKPILED MATERIALS SHOULD BE STORED AND STABILIZED AWAY FROM THE SEDIMENT BASINS.
3. VEHICLE AND EQUIPMENT REFUELLING AND MAINTENANCE SHOULD BE CONDUCTED AWAY FROM THE SEDIMENT BASINS.
4. ANY PART OF EQUIPMENT ENTERING OPEN WATER OR GROUNDWATER SHOULD BE FREE OF FLUID LEAKS AND EXTERNALLY CLEANED/DEGREASED TO PREVENT ANY DELETERIOUS SUBSTANCES FROM ENTERING THE WATER OR GROUNDWATER.

EROSION & SEDIMENT CONTROL
SEDIMENT BASIN SIZING & CONSTRUCTION INFORMATION

13030 Lundy's Lane
City of Thorold, Ontario

Date: November 01, 2023
Project Number: 49428-100
Design By: cnf, rsm

ID Tag	Basin Area	Sediment Basin Design Volume			Bottom Area	Bottom of Basin	Bottom Elevation	Tee Base Elevation	Orifice Plate		Top Water Level & Overflow Pipe		Weir Invert	Top Berm Elevation	Orifice Diameter	Maximum Orifice Flow	Live Storage Drawdown Time	Error Report	
		Dead	Live	Total					Elevation	Dead Volume	Elevation	Total Volume						Dead Volume	Total Volume
	ha	m^3	m^3	m^3	m^2	flat/sloped	m	m	m	m^3	m	m^3	m	m	mm	m^3/s	hrs		
101	2.07	383 (2)	259	642	570	flat	181.65	182.15	182.65	670	183.15	1,530	183.25	183.45	75	0.0087	48.4	OK	OK
102	14.73	2725 (2)	1,841	4,566	2423	flat	181.85	182.35	182.85	2926	183.35	4,790	183.45	183.65	120	0.0223	50.0	OK	OK
105	3.55	444 (1)	444	888	544	flat	183.80	184.30	184.80	869	185.27	1,524	185.37	185.57	75	0.0085	48.7	OK	OK

(1) Dead Storage is based upon minimum 125m^3 volume per ha drainage area; Live Storage is based upon minimum 125m^3 volume per ha drainage area.
(2) Dead Storage is based upon minimum 185m^3 volume per ha drainage area; Live Storage is based upon minimum 125m^3 volume per ha drainage area.

No.	REVISION	BY	YYYY-MM-DD
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2.	SECOND SUBMISSION FOR DRAFT PLAN APPROVAL	RSM	2024-11-26
1.	ISSUED FOR DRAFT PLAN APPROVAL	RSM	2023-12-13

MTE
Engineers, Scientists, Surveyors
905-639-2552

LICENSED PROFESSIONAL ENGINEER 2024-11-26 R. M. MELICK 49428-100 PROVINCE OF ONTARIO
DIGITAL ORIGINAL

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PROJECT
PROPOSED PLAN OF SUBDIVISION
13030 LUNDY'S LANE
HIGHWAY 20 & THOROLD TOWNLINE RD THOROLD, ON

DRAWING
EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS

Project Manager R.MELICK	Project No. 49428-100
Design By CNF	Checked By RSM
Drawn By CKM	Checked By RSM
Surveyed By OTHERS	Drawing No. P-ES2.2
Date Nov.03/23	
Scale N.T.S	Sheet of

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