Functional Site Servicing and Stormwater Management Design Brief

18-Unit Apartment Building

814 Scott Street

Fort Frances, Ontario

September 30, 2020

Prepared for:

Hillside Construction

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Revision	Description	Author		Quality Check		Independent Review	
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Luke Viljakainen, B.Eng.

Reviewed by **DRAFT** _____
(signature)

Tyler Rizzuto, BA, CPT

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1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by Hillside Construction Inc. (Owner) to complete civil engineering, geotechnical, and legal and topographical survey services to support the design of a new 18-unit apartment building in Fort Frances, Ontario.

Stantec understands the project is located within the municipality at 814 Scott Street. The existing building on the property will be demolished to accommodate the proposed development, which also includes # parking stalls, concrete sidewalks, and greenspace.

The property is approximately 0.2 ha and is currently zoned Commercial (C2). Due to the land use change from commercial to residential, a record of Site Condition (RSC) will be required in accordance with Ontario Regulation (O. Reg.) 153/04 made under the Environmental Protection Act.

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2.0 WATER SERVICING

2.1 EXISTING WATER SERVICING

Existing 250 mm and 150 mm watermains are located within Scott Street and Reid Avenue, respectively. The site is provided a 50 mm water service terminated at property line connecting to the Scott Street watermain. An existing fire hydrant is located at the corner of Scott Street and Reid Avenue.

2.2 PROPOSED WATER SERVICING

Based on the total fixtures proposed for the apartment building and Table 7.6.3.2.A of the OBC (2012), the total Fixture Unit (FU) count was estimated. Based on the FU count calculated and Figure 4-3 of the AWWA Sizing Water Service Lines and Meters, Third Edition (2014), the probable water demand is estimated to be 4.0 l/s.

The building will be provided a new 50 mm service connecting to the stubbed water service at property line.

2.3 FIRE PROTECTION

It is Stantec's understanding that the proposed apartment building will not be provided a sprinkler system for fire protection. In accordance with section 3.2.5.7 of the OBC (2012), any point of a building perimeter facing a street is to be within 90.0 m horizontally of the nearest fire hydrant. This distance requirement is achieved by the existing fire hydrant located at the corner of Scott Street and Reid Avenue.

A fire hydrant flow test is required to determine the available water supply at a residual pressure of 20 psi. The minimum water supply to control a major fire is based on the Fire Underwriters Survey (FUS); this assessment incudes stock details such as building size, type of construction, exposures, occupancy, and fire protection systems. The FUS assessment is pending the completion of the fire hydrant flow test.

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3.0 SANITARY SERVICING

3.1 EXISTING SANITARY SERVICING

Existing 300 mm sanitary sewers are located within Scott Street and Reid Avenue. The site is provided a 150 mm sanitary service terminated at property line connecting to the Reid Avenue sanitary sewer.

3.2 PROPOSED SANITARY SERVICING

The building will be provided a new 150 mm sanitary service extending from the stubbed sanitary service at property line. The sanitary service will target a 2.0% slope and during peak flows will not exceed 18.6% of its available capacity.

In accordance with section 7.4.7.2.(3) of the OBC (2012), the first manhole to which the sanitary service connects to shall not exceed 30 m. This distance requirement is achieved by a proposed manhole located 8.6 m from the southeast corner of the building; the location of the manhole also facilitates the change in direction and connection to stubbed sanitary service.

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4.0 STORMWATER MANAGEMENT

The proposed site will be provided a stormwater management plan (SWM) that addresses quality and quantity control considerations. Through consultation with the Town of Fort Frances and Provincial Best Management Practices (BMP's), the proposed plan will incorporate the following:

1. Control the post-development peak discharge rates for the 2-year through 50-year storm events exceeding the pre-development rates.
2. Quality control in accordance with the MOECC's basic level of protection, which requires the long-term average removal of 60% of total suspended solids.
3. Pre-development and post-development catchment areas are shown on **Figure 1** and **2**, respectively. Plan and profile drawings for the development can be found in **Appendix A.**

4.1 EXISTING CONDITIONS

Existing runoff for the subject site is conveyed east via sheet flow to an existing swale and culvert located at the southeast portion of the site. Flow is conveyed through the culvert and discharge into an existing catch basin and subsequent 300 mm storm sewer on Scott Street.

The pre-development catchment area is comprised of existing building, gravel parking lot and green space. The total impervious percentage (TIMP) is 33%.

4.2 PROPOSED SWM PLAN

The subject property is divided into two sub catchment areas: catchment 201 is 0.11 ha in size and is comprised of the proposed asphalt parking lot, concrete sidewalks, and green space, and catchment 201 is 0.10 ha in size and is comprised of the proposed apartment building, concrete sidewalks, and green space. The TIMP for catchment 201 and 202 is 78% and 48%, respectively.

The majority of catchment 201 will direct stormwater runoff towards Scott Street via sheet flow; the east portion of the site between Reid Street and the concrete sidewalk will be directed towards the existing culvert and subsequent storm sewer system.

Catchment 202 is will direct stormwater runoff towards the proposed SWM facility via sheet flow and is oversized to accommodate the uncontrolled runoff discharged from catchment 201. The following table summarizes the PCSWMM modeling results for the pre-development, post-development, and controlled development peak flows:

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Table 1 PCSWMM Model Peak Flows

Catchment	Pre-development (m3/s)	Post-development (m3/s)	Controlled-development (m3/s)
201	0.042	0.046	0.038
202	0.039	0.041	0.041
Total	0.081	0.087	0.079

Based on the PCSWMM controlled development simulation, a total storage of 19.30 m^3 is required for catchment 201 to obtain a peak flow of 0.038 m^3/s from 0.046 m^3/s. The storage facility provides a total of 40 m^3 of active storage and 10 m^3 of infiltration storage though a perforated pipe and clear stone system. Flow will be controlled via orifice located within a proposed catch basin. The catch basin will connect to an existing storm sewer system on Gillon Street.

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5.0 GRADING AND DRAINAGE PLAN

The lot grading and drainage plan will utilize existing drainage features as well as a proposed stormwater management facility to convey stormwater runoff safely and effectively.

A 2.0% apron is provided around the entire apartment building to ensure positive drainage. Steeper slopes are found along Scott Street, but do not exceed 5.0%. The parking lot targets a 1.2% slope towards the stormwater management facility. Drainage along Reid Street is similar to the existing site conditions, where runoff is directed towards an existing culvert at south east portion of the subject site.

The proposed apartment building will achieve a minimum 150 mm clearance from finish floor to landscape areas. The finish floor elevation will be matched at all entrances to the building providing accessible transitions. Sidewalk slopes do not exceed 5.0% with landings less than 10 m apart for accessibility. Ramps are located where barrier free parking stalls meet the parking lot surface. Adequate drainage is provided adjacent to sidewalks to avoid accumulation of water.

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Appendix A PLAN AND PROFILE DRAWINGS

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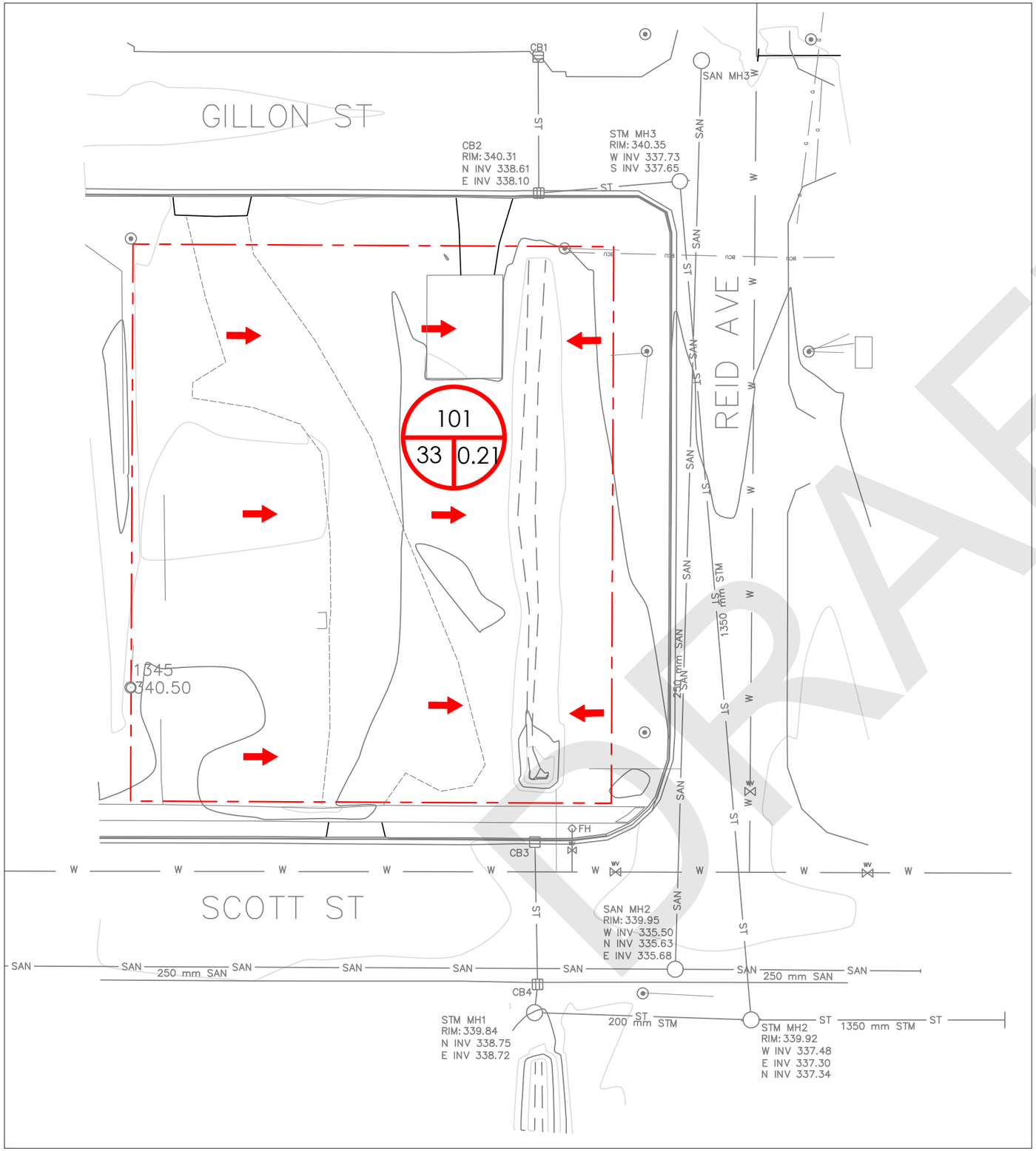
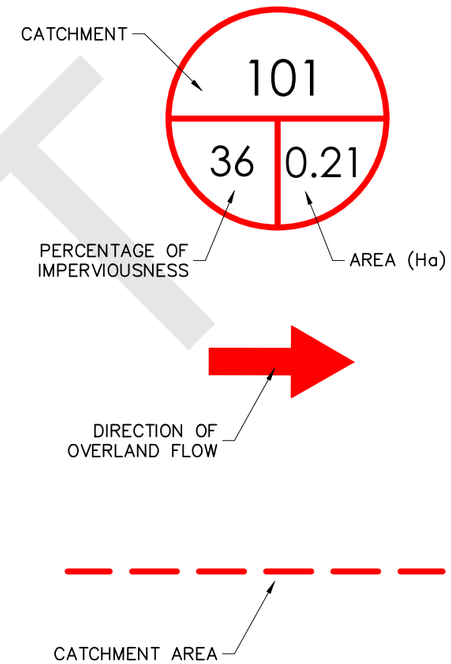


PRE DEVELOPMENT



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2. SITE PLAN PREPARED BY OTHERS
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Project

NEW 18 UNIT APARTMENT BUILDING
CIVIL FUNCTIONAL SITE SERVICING

814 SCOTT STREET, FORT FRANCES, ON

Title

PRE DEVELOPMENT CATCHMENT

Revision 00

Date 2020/09/29

Reference Sheet

Figure No. 01

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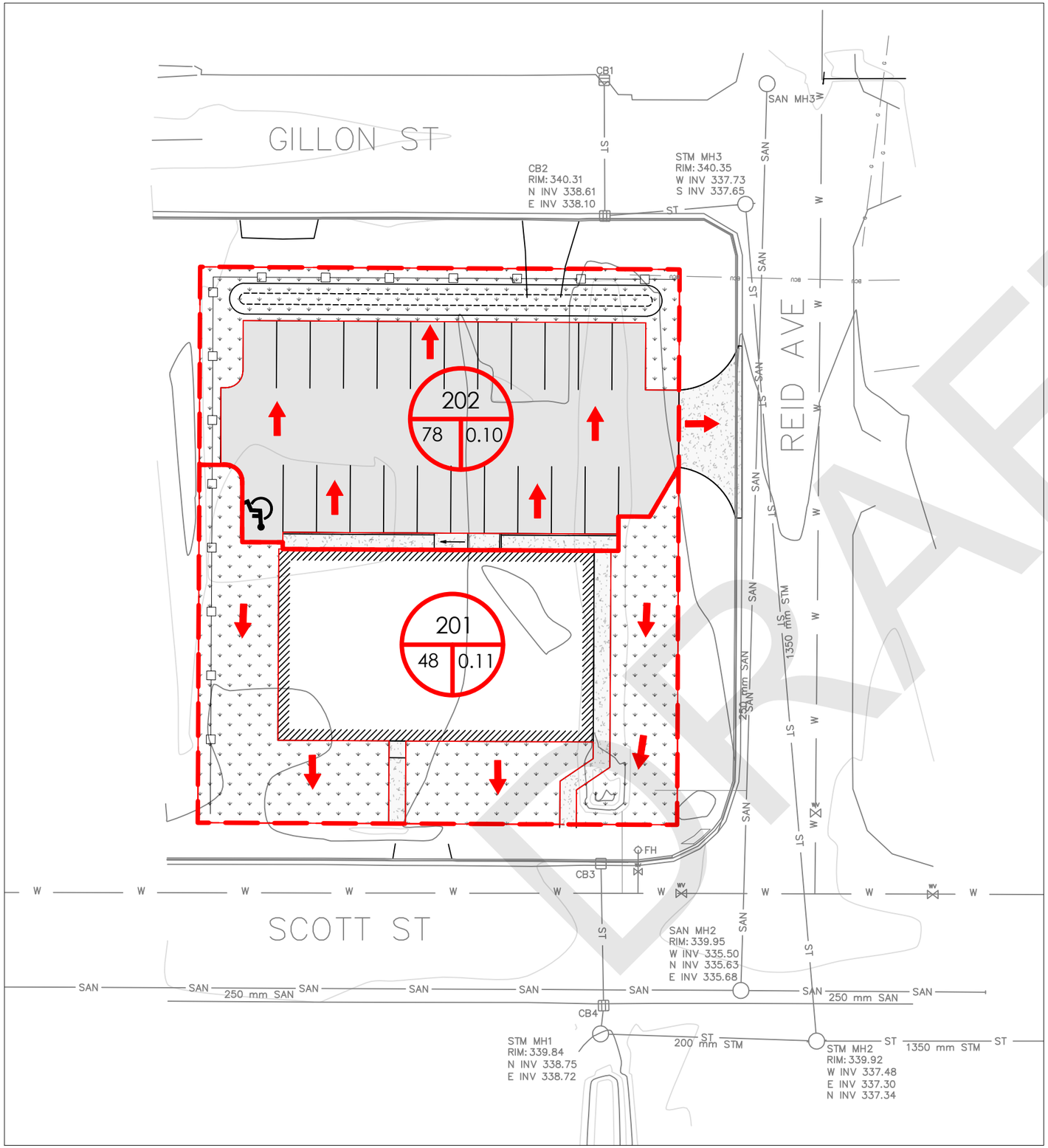

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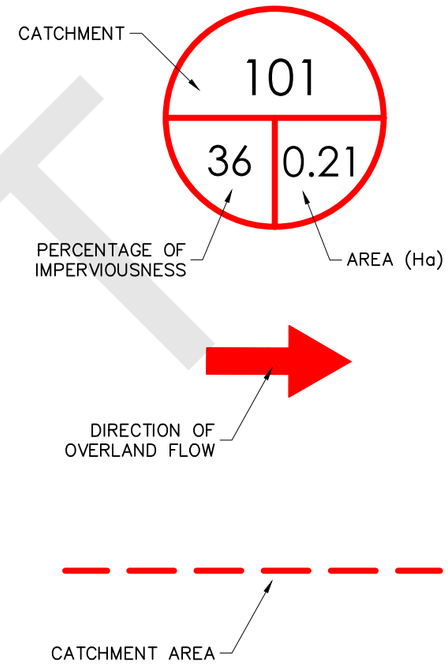

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NEW 18 UNIT APARTMENT BUILDING CIVIL FUNCTIONAL SITE SERVICING

814 SCOTT STREET, FORT FRANCES, ON

Title

POST DEVELOPMENT CATCHMENT

Revision	Date
00	2020/09/29

Reference Sheet

Figure No. 02

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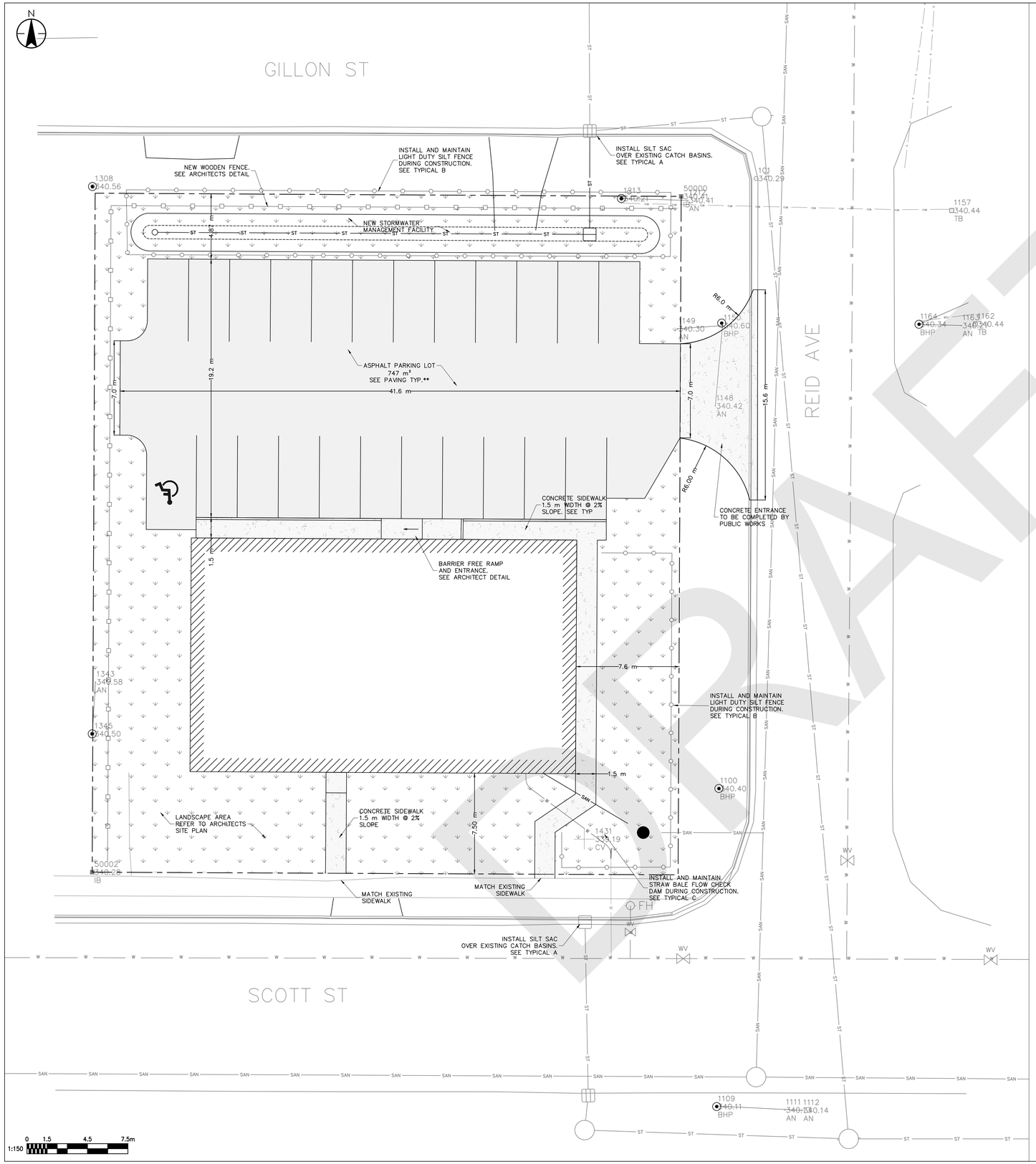

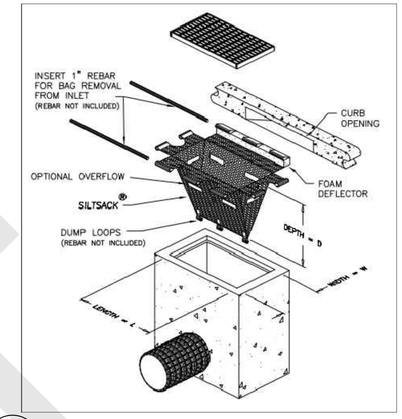

A c.01 CATCH BASIN SILT SACK

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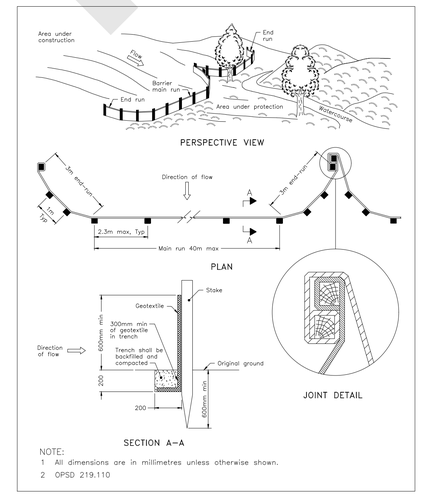

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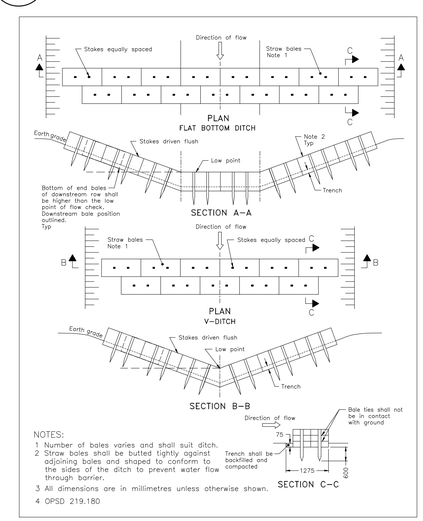

C c.01 STRAW BALE FLOW CHECK DAM

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New 18-unit Apartment Building

814 Scott Street, Fort Frances ON

Title
SITE PLAN AND EROSION SEDIMENT CONTROL PLAN

Project No. 129672065

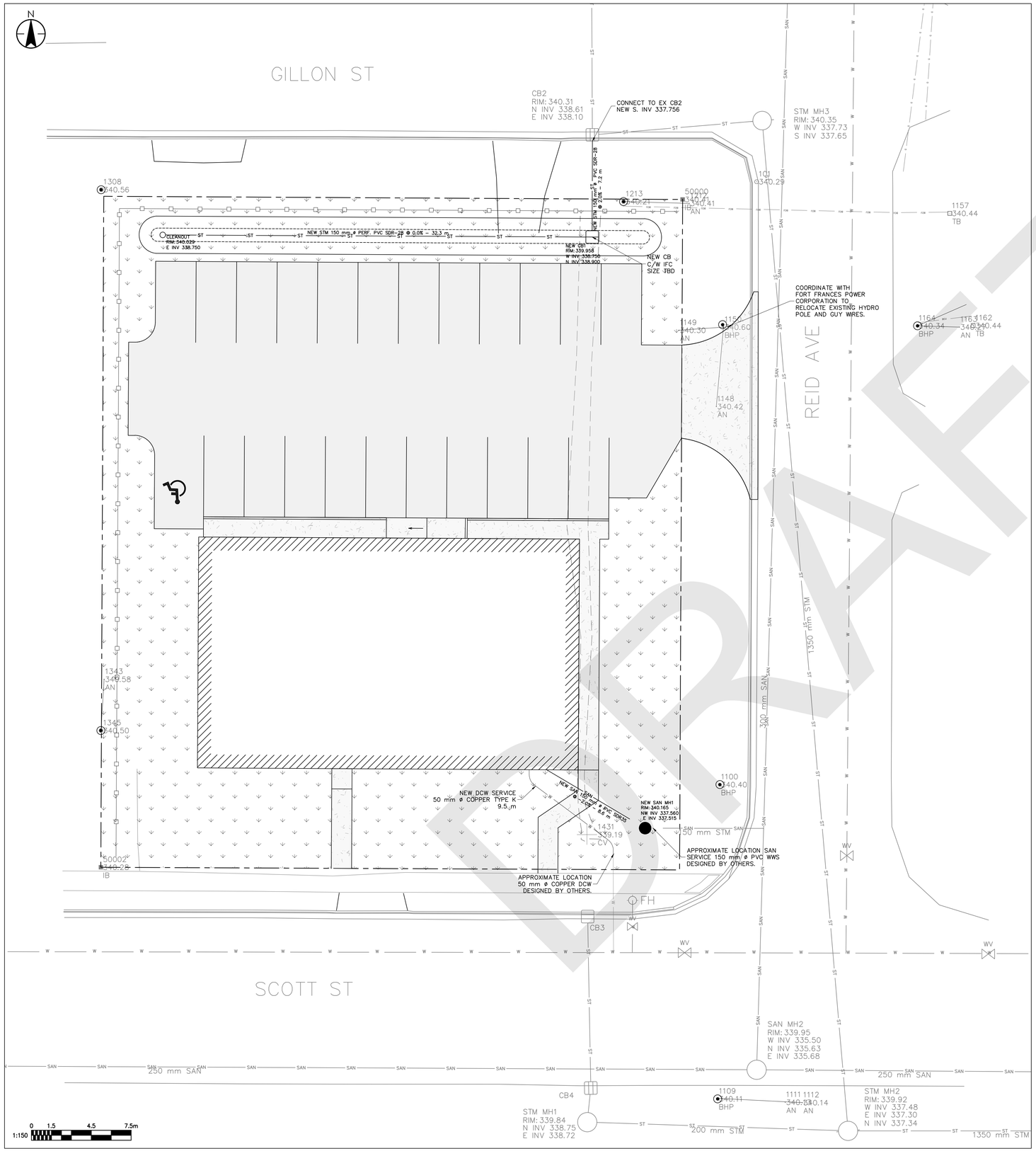
Scale

Revision 00

Sheet 01 of 03

Drawing No. C.01

ORIGINAL SHEET - ARCH D



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New 18-unit Apartment Building

814 Scott Street, Fort Frances ON

Title
NEW CIVIL SITE SERVICING PLAN

Project No.
129672065

Scale

Revision 00

Sheet 02 of 03

Drawing No.
C.02

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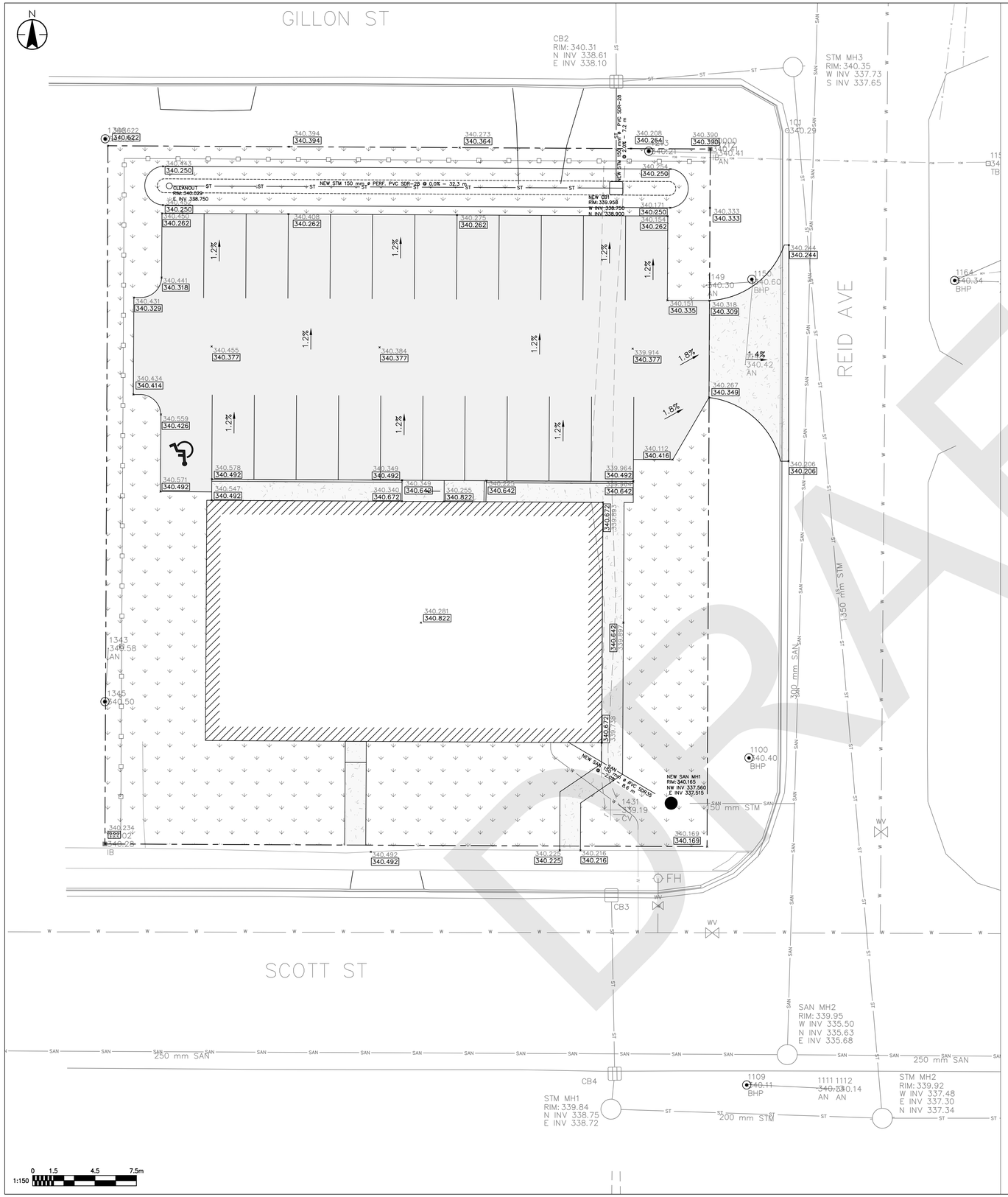

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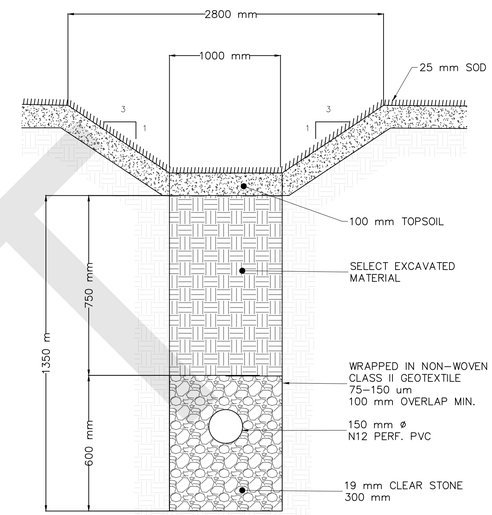

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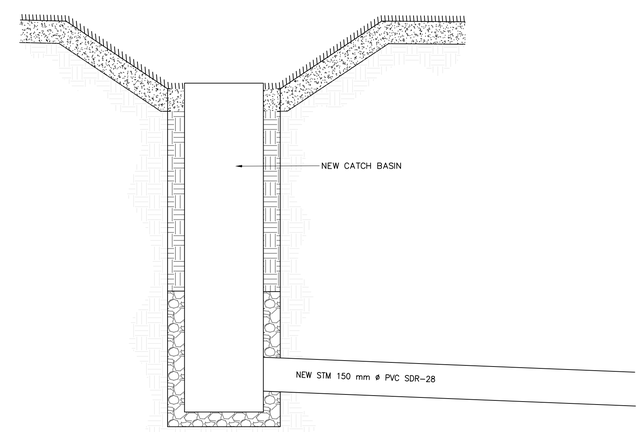

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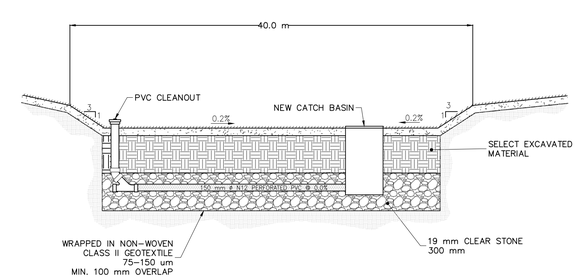

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New 18-unit Apartment Building

814 Scott Street, Fort Frances ON

Title
PRELIMINARY GRADING PLAN AND STORMWATER MANAGEMENT PLAN

Project No. 129672065
Scale
Revision 00
Sheet 03 of 03
Drawing No. C.03

ORIGINAL SHEET - ARCH D