Yorkton Rona – Commercial and Industrial development

Concept Plan and Serviceability Report

Prepared for:
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January 24, 2014

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1.0 Introduction

This report introduces a proposed subdivision to be located within the City of Yorkton. The concept plan and supporting documentation included herein provide the framework for the development of this property over the next several years. This report describes the physical site, the planning and design considerations behind the creation of the concept plan, the serviceability of the development and the proposed zoning to be implemented throughout the project.

1.1 LAND DESCRIPTION

This development consists of approximately 14.5 ha under the control of 101242326 Sask Ltd. The property is located at the south west corner of Highway 9 and Grain Millers Drive, as shown in Figure 1.0. The property is found within the following quarter section:

- NE 1/4-11-26-4-W2M

The area is bordered on the north by an existing utility right-of-way, to the east by the Highway 9 right-of-way and to the south and west by the proposed Potzus Industrial Subdivision lands. The preliminary site plan, which was prepared by Bob Morrison Construction Design Services, contains a total of 10 lots.

1.2 ZONING AND LAND USE

The City of Yorkton Municipal Development Plan designates all lands within city boundaries as a type of land use. As per Figure 2.0, the proposed development area is designated as a mixture of Industrial (MI) and Commercial (C) land.

The City of Yorkton also has a Zoning Bylaw which designates all lands within city boundaries as existing in a specified zoning district. As per Figure 3.0, the proposed development area is designated as a mixture of Heavy Industrial (MI-2) and Highway Commercial (C-3) land.

The purpose of the Heavy Industrial (MI-2) zoning district is to establish and preserve areas for industrial and manufacturing uses which, by the nature of their operations, may result in excessive noise, vibrations, odours or fumes which would be incompatible with adjacent land uses. Some examples of the permitted land uses are bulk fuel depots, fleet services, railway facilities, service stations, and truck sales/rental services. The discretionary uses are livestock sales facilities and planned unit developments. A complete list of permitted and discretionary uses can be found in the City of Yorkton Zoning Bylaw No.14/2003 Section 20.0 Heavy Industrial – MI-2.

The purpose of the Highway Commercial (C-3) zoning district is to provide for commercial development in areas along major access routes at entry points to the City. Some examples of the permitted land uses are car washes, equipment rentals, hotels/motels, professional services, restaurants, and a range of retail and shopping centres. Additionally, there are a number of discretionary land uses which are permitted. A

complete use list of permitted and discretionary uses can be found in the City of Yorkton Zoning Bylaw No.14/2003 Section 17.0 Highway Commercial – C-3.

1.3 EXISTING INFRASTRUCTURE

Existing underground infrastructure information was provided by the City of Yorkton Planning and Engineering Department.

It is understood that Grain Miller's Drive is currently part of the jurisdiction of the R.M. of Orkney. North access to the proposed development will need to be coordinated with the R.M. of Orkney. It is understood that a service road is planned on the east periphery of the development. Figure 4.0 shows the existing infrastructure surrounding the proposed development site and the intention is to tie into the existing infrastructure where ever possible.

1.4 EXISTING TOPOGRAPHY

Existing site topography has been provided in an AutoCAD file produced by Atlus Geomatics. The land elevation is generally grading from west to east over the entire site. Existing ground elevations found within the development site vary from 504.0 to 500.0 metres above sea level.

The existing contours within the development area can be seen in Figure 5.0.

2.0 Design Objectives

The proposed development has been laid out to generally conform to the regulations from the Zoning Bylaw No.14/2003 for Highway Commercial District (C-3) and the Heavy Industrial District (MI-2). The preliminary development design was prepared by Bob Morrison Construction Design Services.

2.1 DESIGN CONSIDERATIONS

The Preliminary layout provided by Bob Morrison Construction Design Services serves as the framework for our concept plan and is expected to remain unchanged for the detailed design. Topography information has been provided in the form of an AutoCAD file from Atlus Geomatics.

It is understood that a service road parallel Highway 9 is planned for future construction. This access road will service both the proposed subdivision as well as the future Potzus subdivision to the south. A second access is also proposed to the west off of Grain Miller's Drive. As this roadway falls within the RM of Orkney, discussion and final approval for these access points will have to be approved by the RM.

Lots 5-7 are proposed to be accessed by a shared road that will be used by both the proposed subdivision as well as the future Potzus subdivision.

It has been established that the City of Yorkton does not currently have design standards. It has been assumed that the final design will follow City of Saskatoon design standards.

3.0 Stormwater Management

Stormwater management is a critical component in the planning and development of any subdivision. The proposed strategy is surface or overland flow with a minimal pipes storm sewer system for minor rainfall events. The approach addresses drainage from within the community and considers the downstream impacts, discharging at a rate not to exceed pre-development conditions.

Due to the intended land use, it has been proposed that a ditch system be considered. For the purposes of the concept plan a piped system has been shown, however this is subject to change.

3.1 BACKGROUND INFORMATION

The conceptual stormwater management evaluations have been based on examination of the following information:

- Contour mapping based upon Atlus Geomatics surveys.
- Storm and rainfall data from Environment Canada.

3.2 STORMWATER MANAGEMENT CONCEPT

Geography and topography of the site and surrounding area have limited the available options for stormwater management. The major storm, or the 1:100 year design rainfall event, is to be retained on site to minimize the impacts of the development. The general overland flow paths are shown in Figure 6.0. Street grades will be designed to convey major storm flows to an existing culvert crossing Highway 9, approximately 75 m south of Grain Millers Drive. From here the storm flow will drain overland to the existing drainage ditch located approximately 600 m south of the culvert crossing.

The minor storm, or the 1:5 year rainfall event, will have a minimal pipe network designed to effectively catch water and transport it to the existing highway culvert. This will be done using overland drainage, catch basins, and an underground piping system to minimize the size of the infrastructure needed to effectively convey the minor storm water. The layout of the conceptual minor system is shown in Figure 7.0.

The stormwater management strategy has been developed with design standards intended to minimize erosion, meet public safety standards, and attenuate peak flows with storage, primarily in road right-of-ways and onsite detention sites, during periods of extreme rainfall events. The streets within the subdivision are proposed to be constructed using an urban cross-section with curbs and gutters on both sides. The curb and gutters will work with the major and minor storm systems to convey water overland to the catch basins of the minor pipe system. The target level of service is to provide protection for the 1:100 year design rainfall in accordance with current accepted practices. The primary elements of this strategy include:

- Overland Drainage to the existing Highway 9 culvert east of the proposed development.

- Storm events in excess of the 1:100 year event will be directed along the major storm overflow route defined in Figure 6.0 and will follow pre-development drainage patterns, thus mitigating effects on development.

- Grades of the development will be set above the 1:500 year flood plain. Confirmation that the development meets this requirement will be provided in part by the Water Security Agency of Saskatchewan.

The minor system will service a 1:5 year storm. If this scenario is exceeded, the storm sewer pipe system will continue to function at full capacity, however, the overland system will begin to displace the water to the existing highway culvert. The primary elements of this strategy include:

- Overland drainage to catch basins.

- Minimum 300 mm diameter pipes.

- A drainage structure may be required to convey directly into the drainage ditch. Further discussion regarding structure requirements can take place after detailed design which will determine the expected flow rates.

- Capacity of the existing Highway 9 culvert will have to be reviewed to ensure that it is capable of conveying the design flow rate.

4.0 Sanitary Sewer Serviceability

The conceptual design for sanitary sewer servicing is based upon the assumption that the most cost effective approach is to develop a gravity sewer main network with connection to the exiting 750 mm sanitary sewer trunk adjacent to Grain Millers Drive north of the proposed development. Flow travels east to the H.M. Bailey Water Pollution Control Plant, maintained by the City of Yorkton.

4.1 BACKGROUND INFROMATION

The conceptual engineering evaluations have been based upon an examination of the following information:

- Existing record plans and other information provided by the City of Yorkton.
- Contour mapping based upon Atlus Geomatics Surveys.
- Discussion with the City of Yorkton.

4.2 CONCEPTUAL DESIGN OF THE SANITARY SEWER MAIN NETWORK

From examination of the topography, it appears that servicing the site may be accomplished with a gravity system without the need for lift stations or forcemains. Flow from the development will be directed to an existing manhole located at the south west intersection of Grain Millers Drive and Highway 9.

If additional servicing is required for areas adjacent to the proposed development, extra capacity can be designed into the proposed sanitary sewer system to accommodate such flow.

The proposed gravity main sizing is based on the expected land uses. Based on recommended design guidelines, the following flow rates were assumed:

- Peak commercial flow = 28,100 Litres/ha/day
- Peak industrial flow = 44,900 Litres/ha/day
- Groundwater infiltration and manhole inflow (I&I) = 0.17 Litres/ha/day

Mitigation measures to minimize I&I will be reviewed during detailed design. Sanitary flows generated from within the subdivision will be directed to Yorkton's municipal treatment facility. It is estimated that at full build-out, the subdivision will generate a peak flow of 8.16 Litres/s.

These design flows will be used for conceptual purposes. Once in the detailed design phase, more defined flow rates will be able to be determined based on actual tenant requirements.

The sanitary sewer conceptual layout can be seen in Figure 8.0.

5.0 Water Distribution System

Potable water supply for the development is expected to be provided via connection to the existing water distribution piping network owned by the City of Yorkton. Water distribution piping exists to the east of the proposed subdivision along Highway 9 and a future 400 mm watermain to the north is to be installed by the City of Yorkton in 2014. For the purposes of this concept report, it has been assumed that the proposed development will be connected to the future 400 mm watermain.

The City of Yorkton has recently commissioned a new water treatment facility, the Queen Street Water Treatment Plant, which has consolidated all of their treatment needs. It is assumed for the purposes of this report that the WTP has adequate capacity to provide high quality potable water for the proposed subdivision.

A preliminary water distribution piping layout has been prepared for the development. Figure 9.0 shows the preliminary layout and estimated pipe sizing for the development area. The preliminary design proposes an interconnected, looped piping arrangement (no dead-ends) using both 250 mm and 200 mm piping.

A common industry standard minimum residual water pressure for fire protection is 150 kPa (Water Supply for Public Fire Protection – Fire Underwriters Survey 1999). Upon installation of the proposed 400 mm watermain, it is recommended that a hydrant flow test be completed adjacent to the proposed development to determine what flow would be available. In addition to these recommended design guidelines, the City of Yorkton typically defines fire flow requirements on a basis of flow rate, with 221 L/s as the minimum allowable. During the detailed design stage, it will have to be determined if the required minimum flow rate is achievable. In the event that this minimum cannot be achieved, the developer will review possible solutions in conjunction with the City of Yorkton to ensure adequate fire flows are available.

In addition to the connection to the north, it may be beneficial to connect to the proposed development to the south. This would add better redundancy to the water distribution system and may result in higher fire flows.

6.0 Earthwork and Grading

The grading design of a subdivision is an integral component of the land planning, design and development process. Grading is closely related to several factors, including, but not necessarily limited to, drainage and flood management, sanitary sewer serviceability, natural topography, landscaping and aesthetic features, berming for possible sound attenuation measures, and the general availability of fill if needed.

Typical grading procedures followed in most subdivisions that will be incorporated in the development include the following steps:

- Topsoil and other potential soft soils which are unsuitable for foundations or road structures will be stripped from the surface and salvaged for use in easement grading, sound attenuation berms and other suitable uses.
- An overall preliminary grading plan will be developed in order to ensure that grading will occur in a staged, efficient manner, such that material handling will be minimized.
- Street right-of-ways will be pre-graded in advance of underground utility installations to minimize trenching depths where this procedure is cost effective.
- The grading plan will include split lot drainage and back to front lot drainage schemes.

The basic objective of the overall subdivision grading plan is to produce an earth balance within the entire subdivision. In other words, the designated site will be designed such that as much earth on site as possible will be used on site, ant there will be minimal need to haul away excess material or import excessive amounts of earth to achieve successful grading.

A preliminary grading plan has been prepared for the proposed subdivision. During the detailed design portion of the project the grading will be finalized and an earth balance will be achieved. The preliminary grading plan prepared for the purpose of this concept plan is shown in Figure 10.0.

7.0 Transportation

The concept plan incorporates existing roadways within the City of Yorkton and the R.M. of Orkney. All properties within the concept plan will front the local roadways within the development, and rear lanes will not be incorporated into the design. A concept plan of the road alignments within the proposed subdivision is shown in Figure 11.0.

It is anticipated that the construction of the proposed subdivision will alter traffic patterns within the local area. In order to evaluate the effects of the proposed subdivision, what improvements would be required for the intersection of Highway 9 & Grain Millers Drive and what improvements would be required on Grain Millers Drive, the RM has requested that a transportation impact analysis be prepared. At this time Associated Engineering is in the process of finalizing a transportation impact analysis.

Upon completion of the transportation impact analysis, the validity of the proposed road alignments and entrances into/out of the site will be assessed. Finalized road alignments, intersection upgrades and road upgrades will be determined in the design stage based on input from the City, the RM and the owner.

8.0 Staging and Capital Work Strategy

The development is intended to be developed over a period of time, subject to market demand. The proposed development will create a need to initiate a number of capital projects in addition to the local servicing within the subdivision itself. A brief list of anticipated capital work affiliated with the development is as follows:

- Construction of a water distribution system.
- Construction of a sanitary sewer collection system.
- Construction of minor event storm sewer system.
- Construction of major event storm retention system.
- Site grading.
- Road construction.
- Curb and Sidewalk construction.
- Street lighting, power, gas, phone and other utility installation requirements.
- Municipal reserve space amounting to 5% of the total development (or monies in lieu as per City of Yorkton requirements).

Figure 12.0 outlines a preliminary phasing diagram. Lot numbers, sizes and phasing are subject to change as required by market demand.

9.0 Environmental

At this time, no environmental assessment of the proposed development site has been completed. In August of 2012, Stantec did complete a Phase 1 Environmental Site Assessment (ESA) for the adjacent proposed Potzus development to the south and west. From this report Stantec found that the adjacent land was previously cultivated for farm use, and that not site contaminants were found or suspected. It is anticipated that similar conditions would be found within the proposed development site, however, a new ESA may be completed for the proposed development site if required by the City of Yorkton.

Figures

PROPOSED DEVELOPMENT AREA (14.5 ha)

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Figure No.
Figure 1.0

Title
SITE PLAN LOCATION

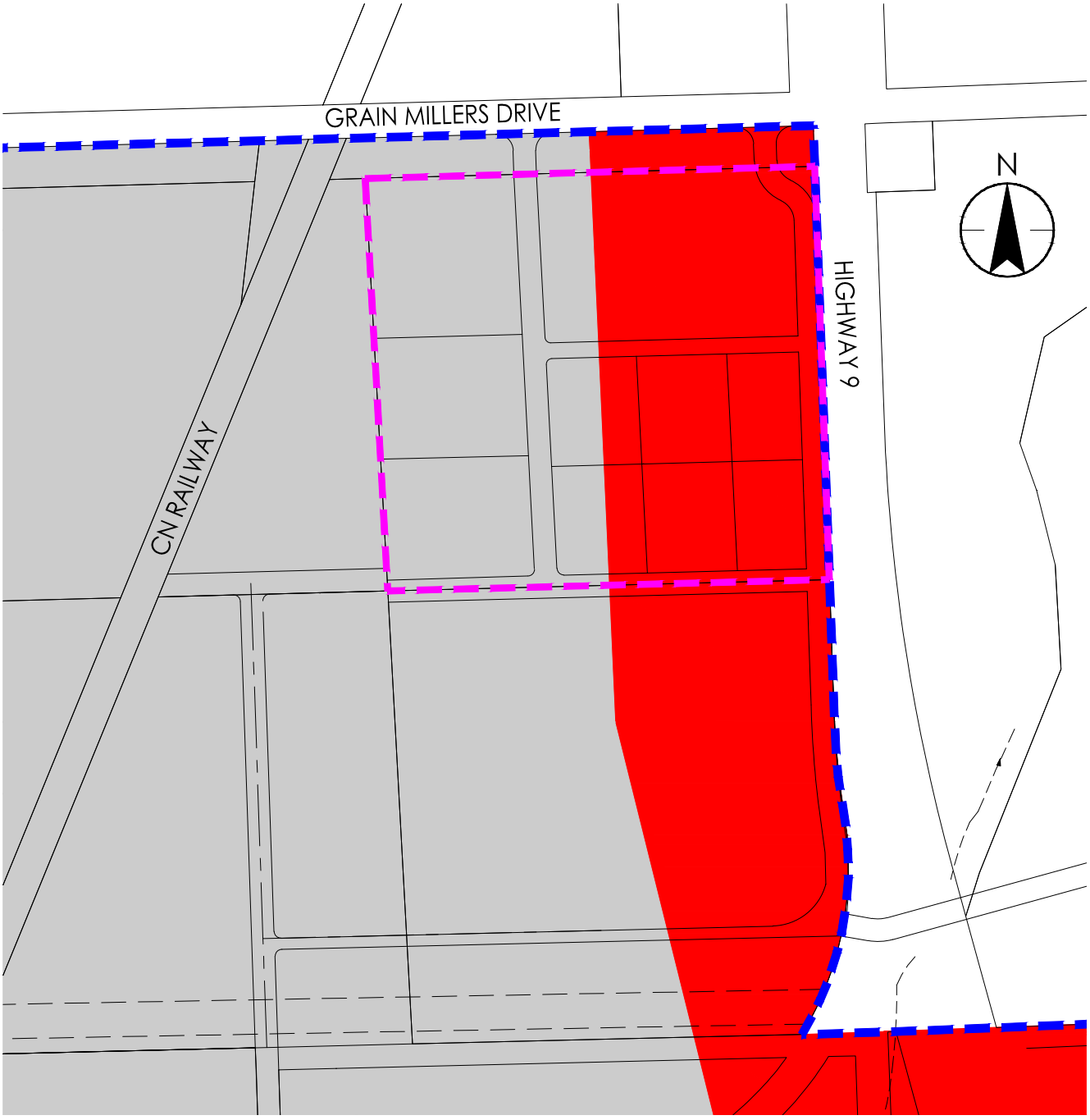

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Figure No.
Figure 2.0

Title
LAND USE MAP

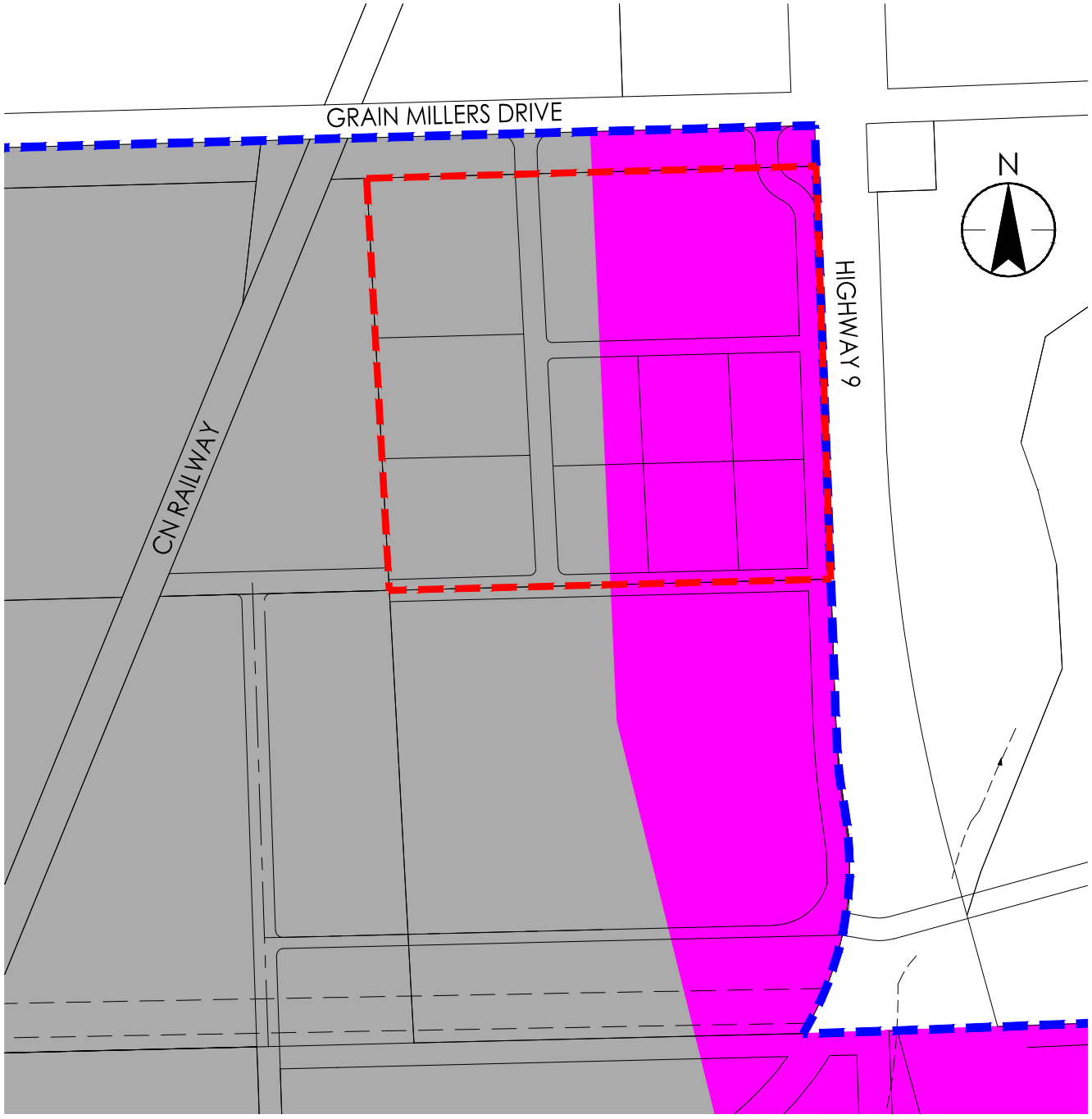

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Figure No.
Figure 3.0

Title
ZONING DISTRICT MAP

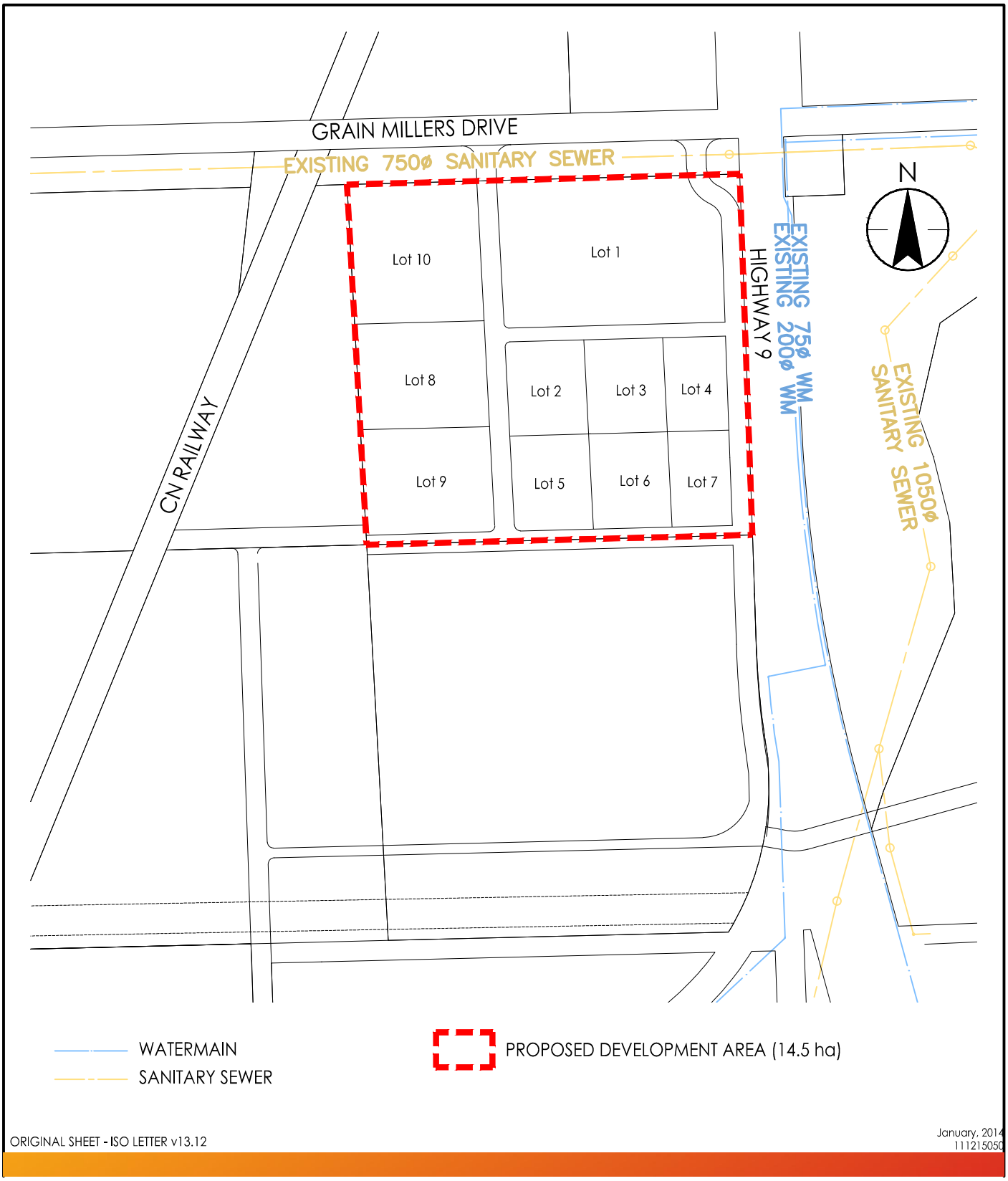

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Figure No.
Figure 4.0

Title
EXISTING INFRASTRUCTURE

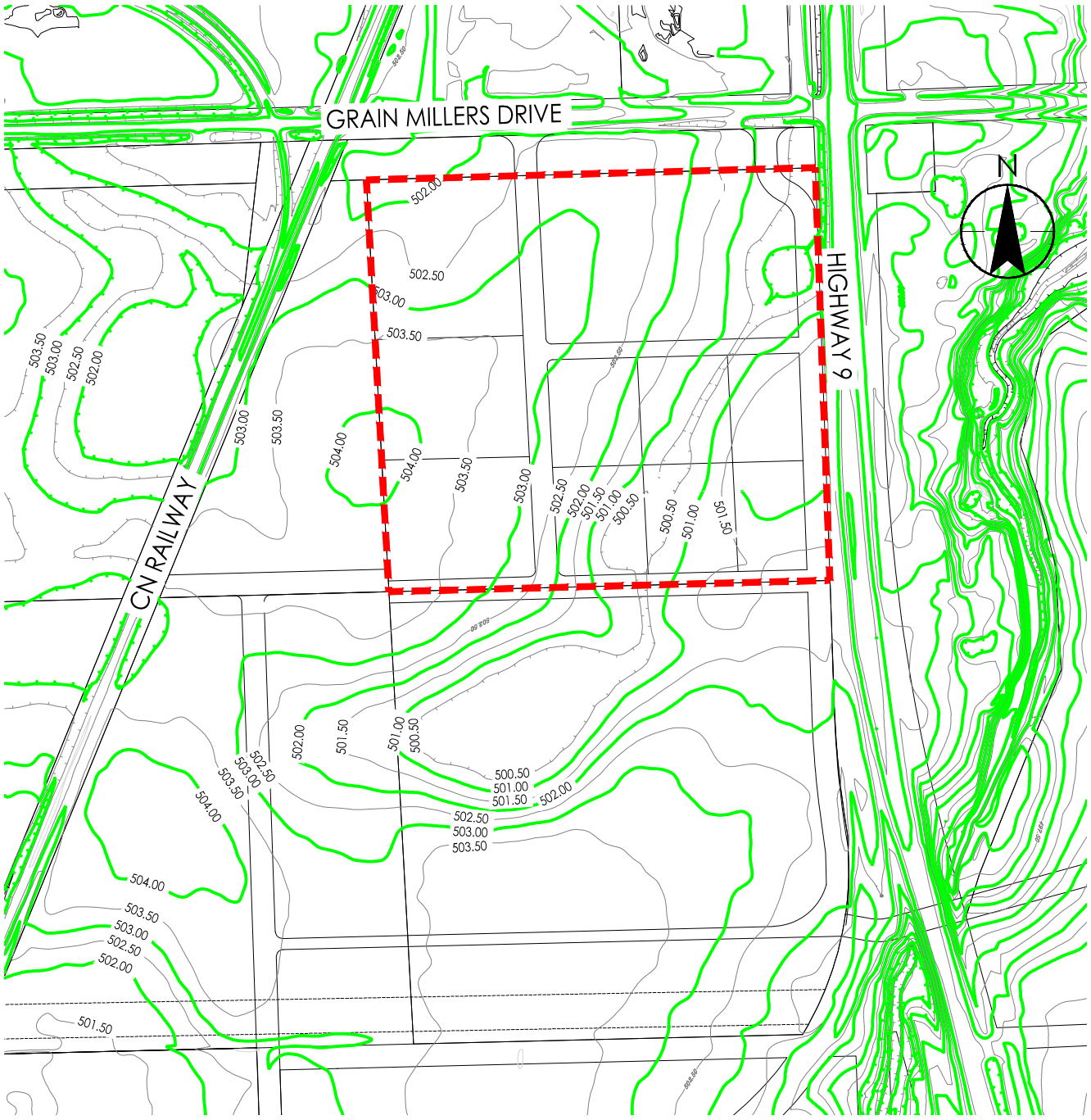

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Figure No.
Figure 5.0

Title
EXISTING TOPOGRAPHY PLAN

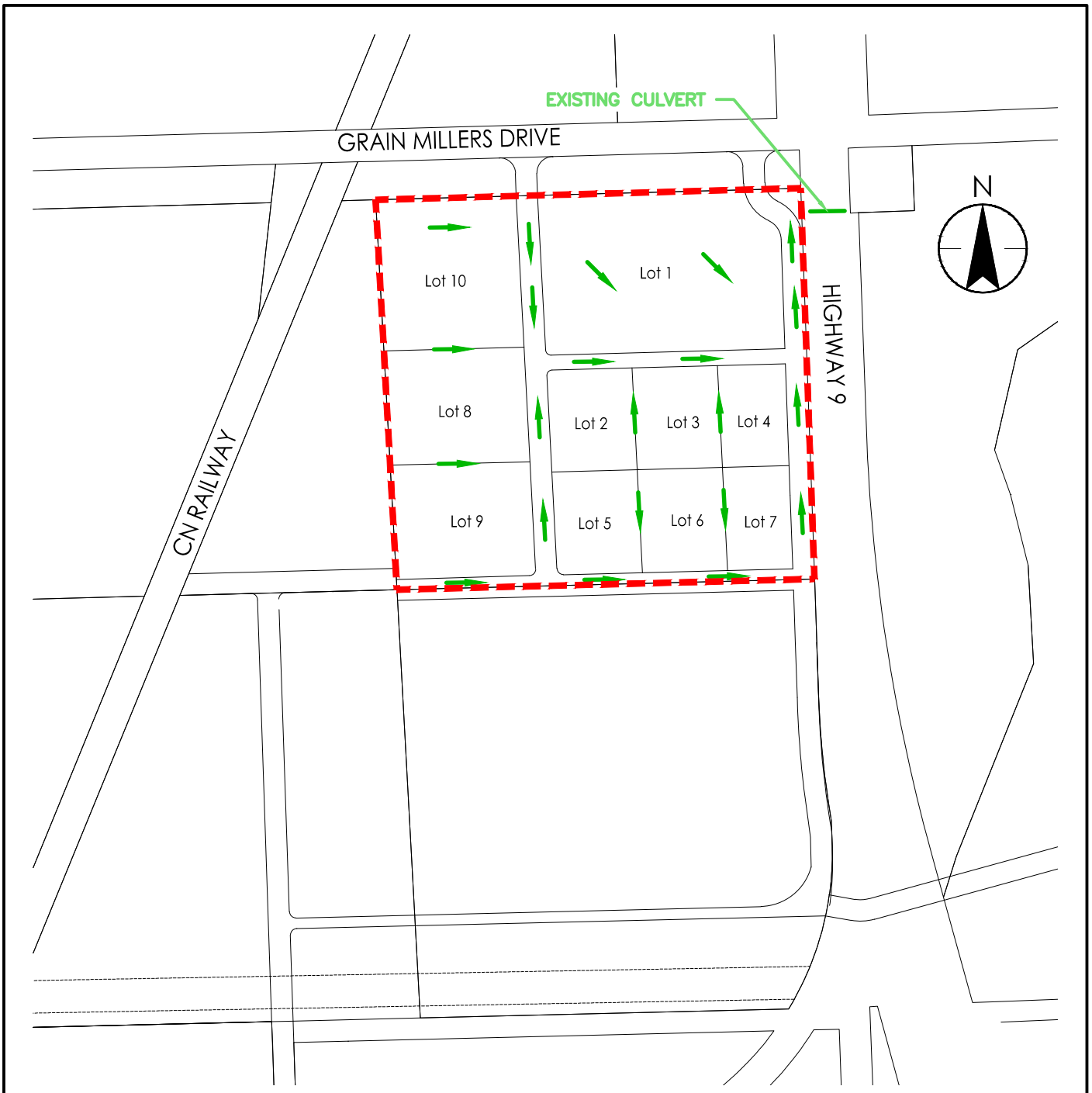

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Figure No.
Figure 6.0

Title
MAJOR STORM WATER CONCEPT PLAN

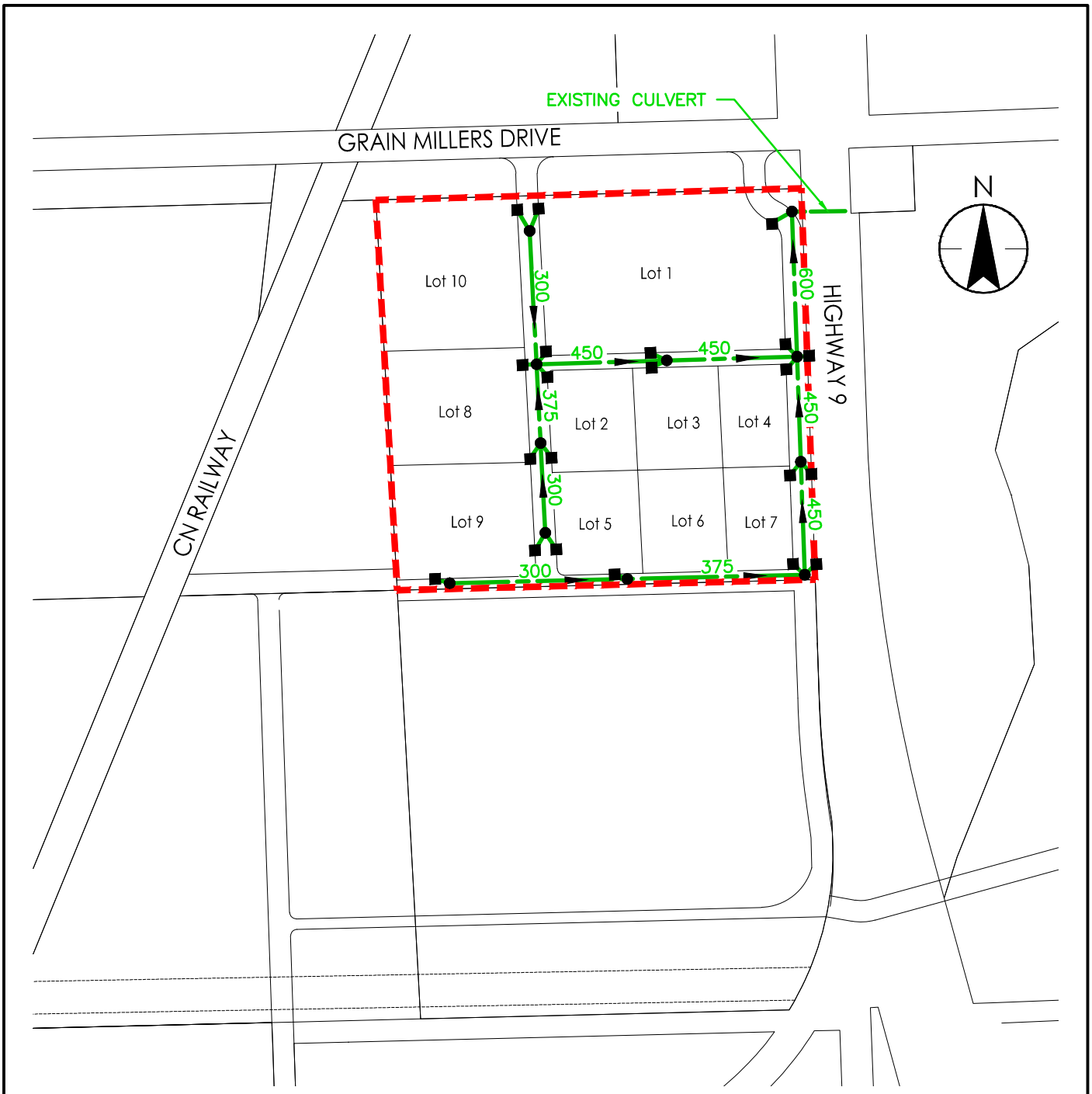

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Figure No.
Figure 7.0

Title
MINOR STORM WATER CONCEPT PLAN

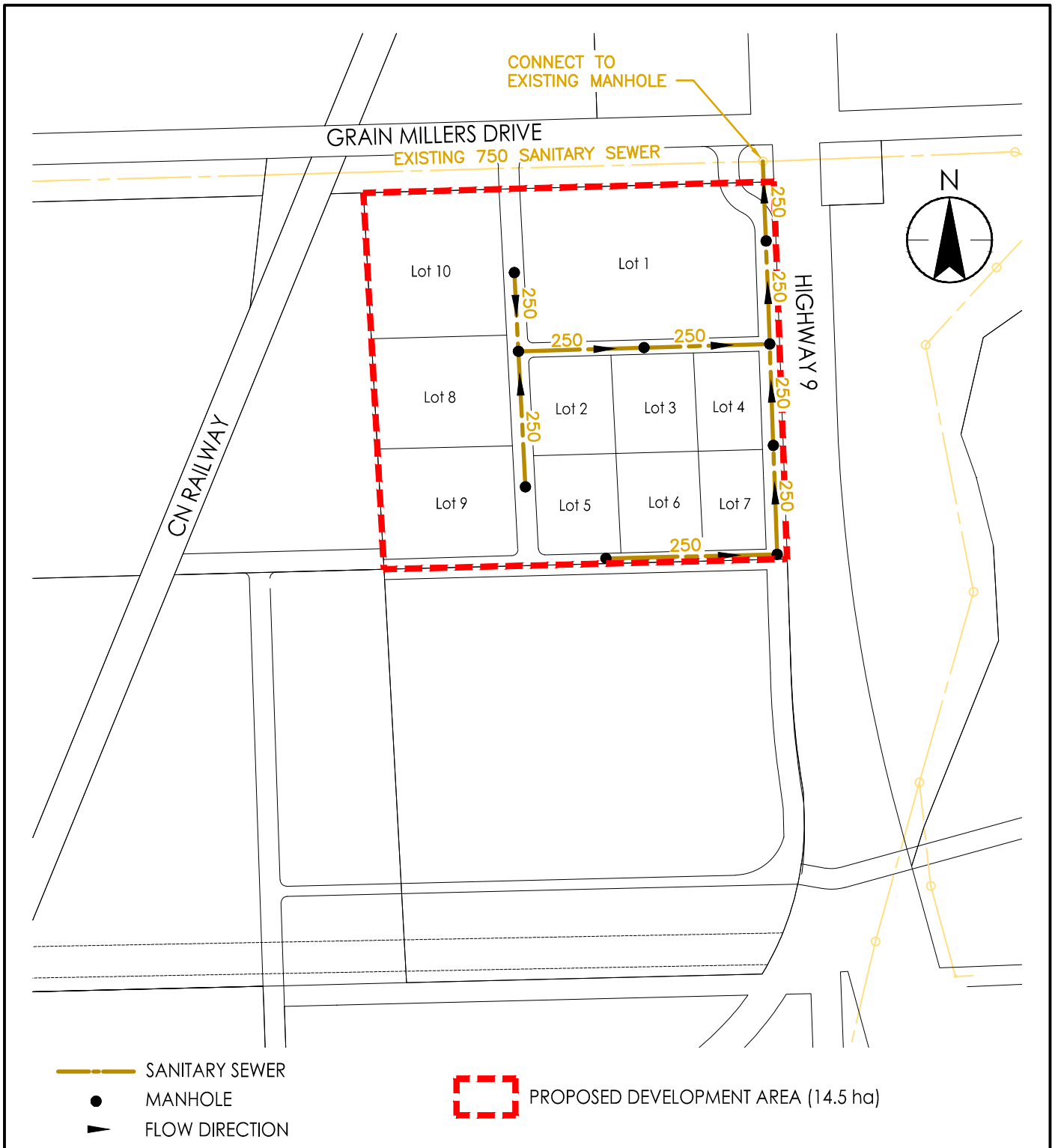

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Figure No.
Figure 8.0

Title
SANITARY SEWER
CONCEPT PLAN

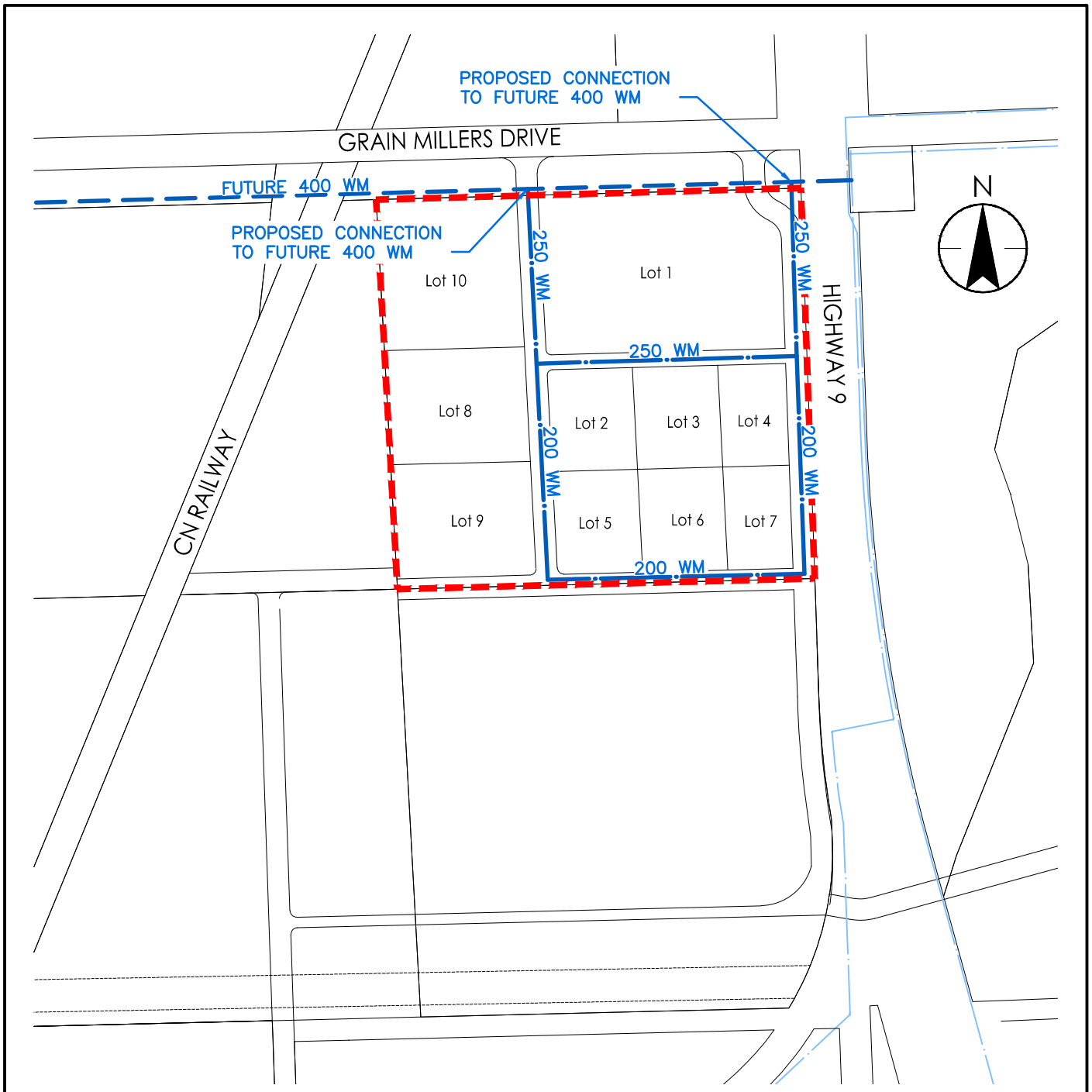

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Figure No.
Figure 9.0

Title
WATER DISTRIBUTION
CONCEPT PLAN

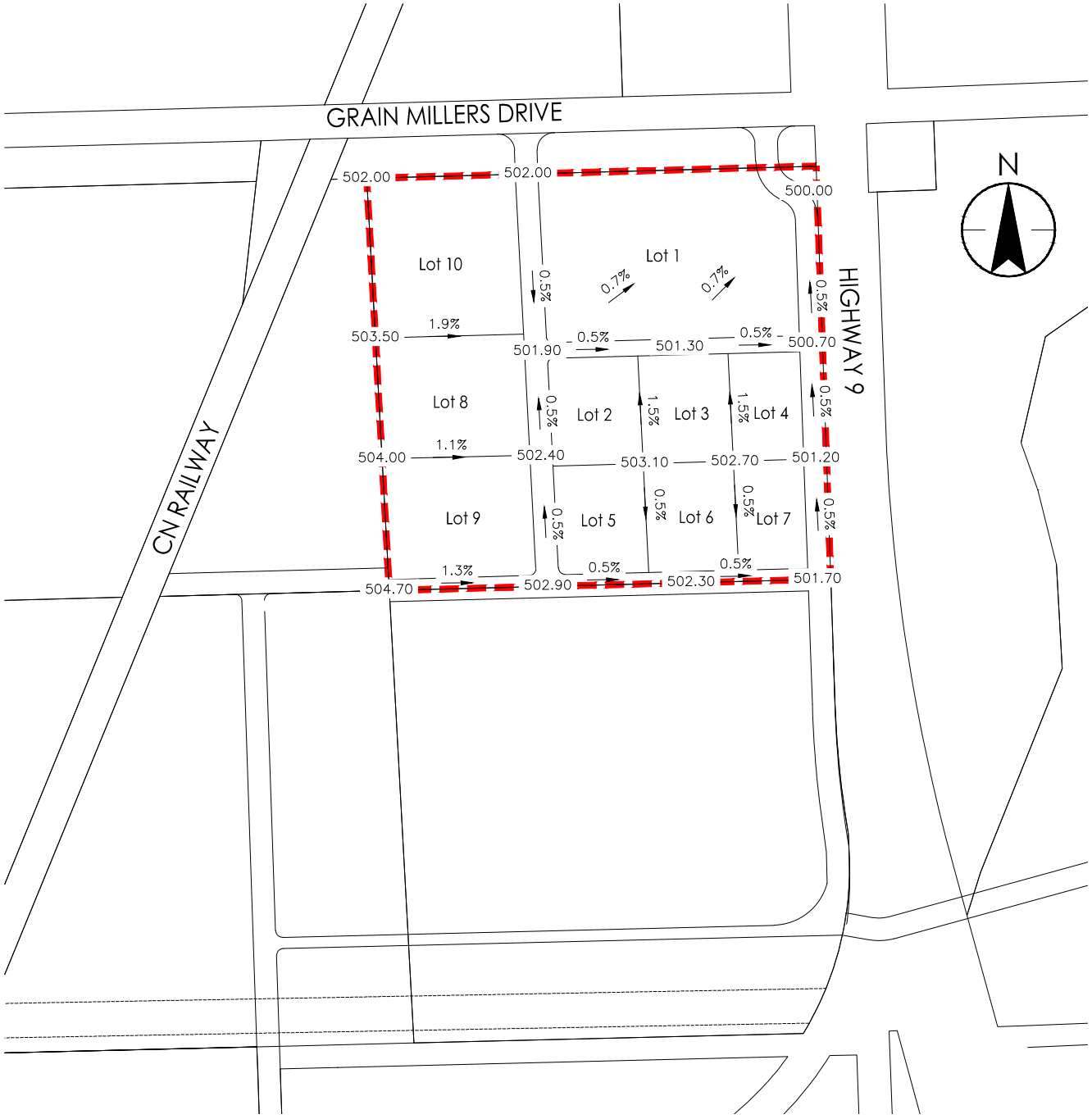

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Figure No.
Figure 10.0

Title
SITE GRADING
CONCEPT PLAN

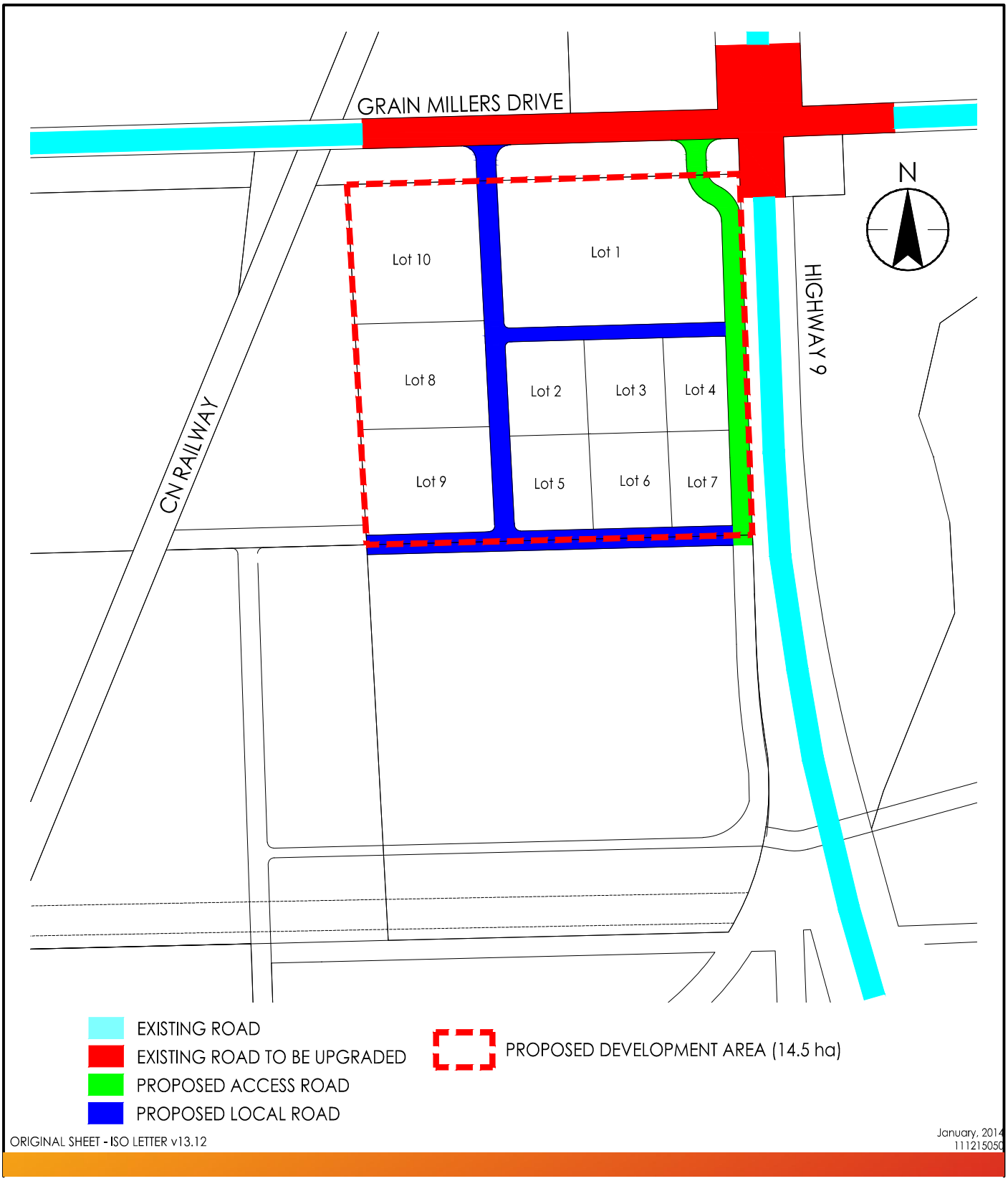

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Figure No.
Figure 11.0

Title
TRAFFIC
CONCEPT PLAN

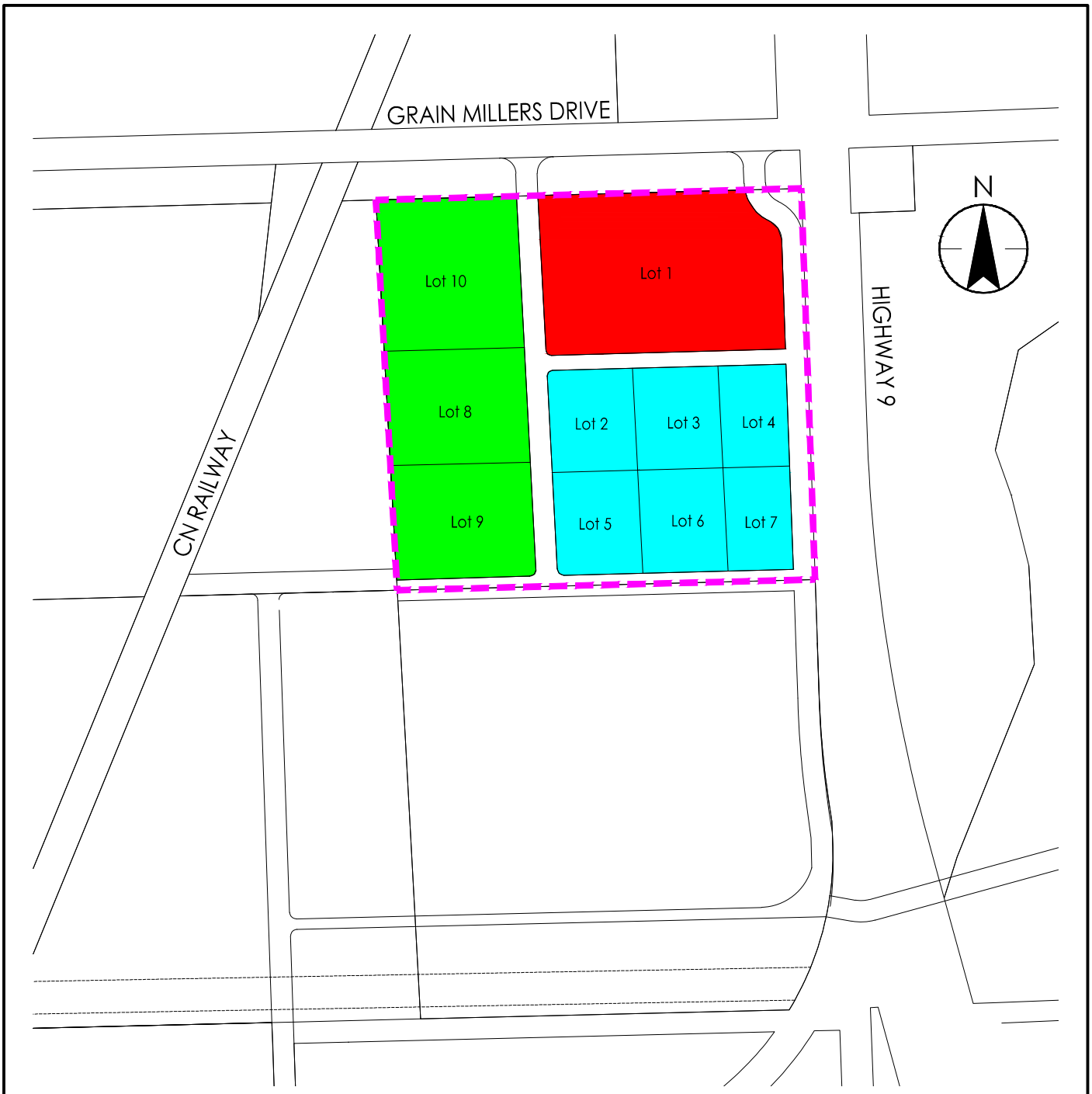

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Figure No.
Figure 12.0

Title
PHASING
CONCEPT PLAN