Evolugen

Trail Rd. BESS

Ottawa, ON

Technical Report

Traffic Assessment Study

BBA Document No.-Rev.: 7154024-100000-41-ERA-0002-R01

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FOR PERMITTING

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1. Introduction

The Evolugen Trail Road Battery Energy Storage System (BESS) project is proposed to be situated on a designated Rural Countryside property located at 4186 William McEwen Drive, Ottawa, ON. The subject area falls within the Rideau Valley Conservation Authority. The project contains the installation of 150 MW BESS. BBA has been mandated by the client to prepare civil plans for the proposed development, including a traffic assessment study. The BESS facility will be connected to William McEwen Drive through a new access road.

This report has been prepared to provide a high-level summary of the existing and proposed geometry/condition of roads leading to and within the BESS facility. The traffic study included checking the road alignments, width, and turning radii that would allow commuting the design vehicles into, within, and out of site during construction and the maintenance/operation phases of the project. Project design vehicles are limited to the following:

- Liebherr LR 1300.1 Crawler crane;
- Tridem drive tractor semitrailer delivery truck;
- A lowboy delivery truck;
- Fire/emergency vehicles.

1.1. Abbreviations and acronyms

The table below lists all abbreviations and acronyms used in this document along with their definition.

Table 1: Abbreviations and acronyms

Abbreviation or acronym	Definition
BESS	Battery Energy Storage System
MTO	Ministry of Transportation
OPS	Ontario Provincial Standards
PEO	Professional Engineers Ontario
TAC	Transportation Association of Canada

1.2. Units and symbols

All units of measurement must be in accordance with the International Systems of Units (SI). If exceptions need to be taken, SI shall be used as the primary dimensions, with the corresponding conversion to the other system if units in brackets. All units in this document are listed in the following table:

Table 2: Units and symbols

Unit / Symbol	Description
m	Meter
Ha	Hectares
MW	Megawatt
MWh	Megawatt-hour
Km/hr	Kilometre / hour

1.3. Codes, standards, regulations, and guidelines

Unless otherwise specified, the design will be based on applicable sections of the following codes, standards, regulations, guidelines, and other reference documents.

Table 3: Codes, standards, regulations, and guidelines

Document code/Author	Document Title / Reference
Liebherr	Liebherr Mobile Crane LTM 1500-8.1 Manual (2009)
Canadian Task Force on Vehicle Weights and Dimensions Policy	Heavy Truck Weight and Dimensions Limits for Interprovincial Operations in Canada (2014)
Transportation Association of Canada	Design Vehicle Dimensions for Use in Geometric Design (1997)
City of Ottawa	City of Ottawa general interactive map (GIS) – maps.ottawa.ca/geoottawa
Sungrow	Sungrow System Manual for Energy Storage System #ST5015UX-2H-US_ST5015UX-4H-US-SEN-Ver10-202311

2. Proposed on-site road conditions

The general layout and location for the proposed Trail Road BESS are shown in Figure 1.

Figure 1: Proposed location of the Trail Road BESS Project

The proposed developed area for the BESS and substation portion is approximately 3.0 Ha with a maximum width of 240 m (west-east) and a maximum length of 190 m (north-south). It will be connected to William McEwen Drive via an approximately 750 m long access road as shown in Figure 1.

Proposed on-site roads are shown in Figure 2. Apart from the last row having a width of 4.5 m, generally, on-site roads are designed with a minimum 8 m width. In addition, on-site roads were designed with a minimum turning radius of 14 m.

Figure 2: Proposed on-site roads geometric conditions

3. Proposed access road

The proposed Trail Road BESS facility will be connected to William McEwen Drive via a new 8-meter-wide access road. The geometry of the proposed access road is shown in Figure 3.

Figure 3: Proposed access road geometric conditions

The turning radius and turn width at the intersection of the proposed access road and William McEwen Drive are shown in the figure below.

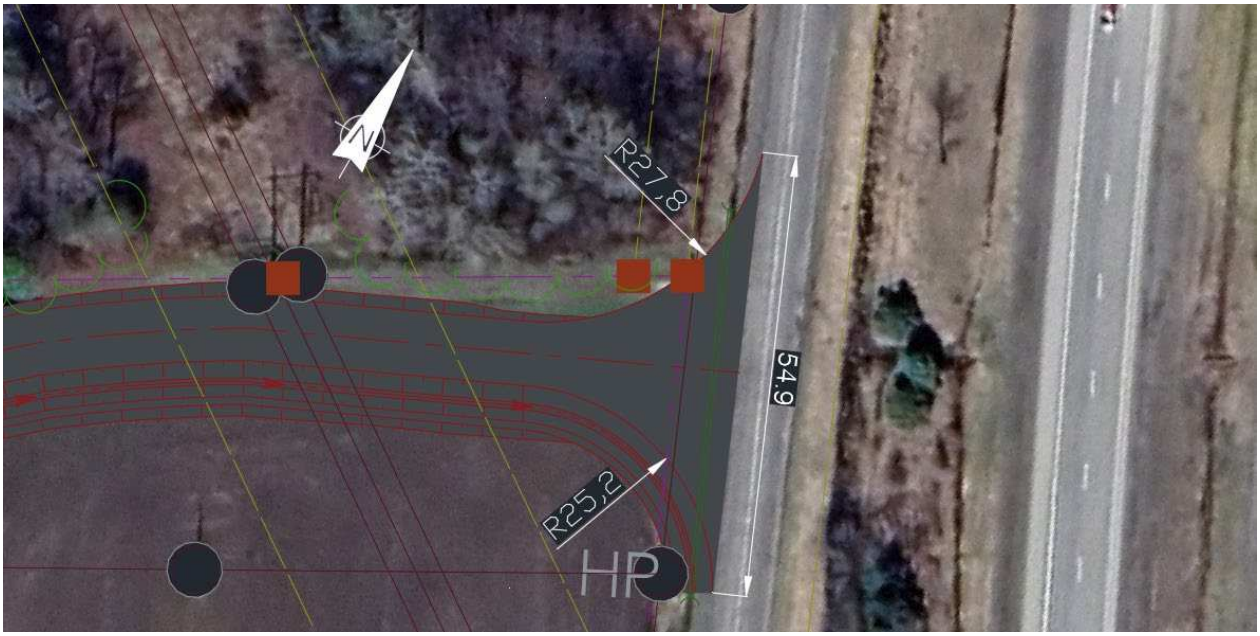

Figure 4: Geometric conditions intersection of William McEwen Drive and proposed site access road

4. Design vehicles

4.1. Liebherr LR 1300.1 SX Crawler Crane

The Liebherr LR 1300.1 SX is a high-performance crawler crane designed for heavy-duty lifting with a maximum lift capacity of 300 metric tons and offers reach capabilities with a main boom range of 20 to 110 m with a lattice job extension of 20 to 113m Dimensions (m) for the Lieber LTM 1500 crane are shown in Table 4 and Figure 3.

Table 4: Liebherr LR 1300.1 SX Crawler Crane dimensions (Liebherr LR.1 SX Manual)

Length (m)	Width (m)	Height (m)	Minimum Body-Ground Clearance (m)	Track Width (m)	Lock-to-lock Time (s)	Curb to Curb Turning Radius (m)
11.5	8	5.05	0.25 – 0.35	1.2	4 – 6	14.0
Note: the dimensions shown were used in the modelling portion of this study						

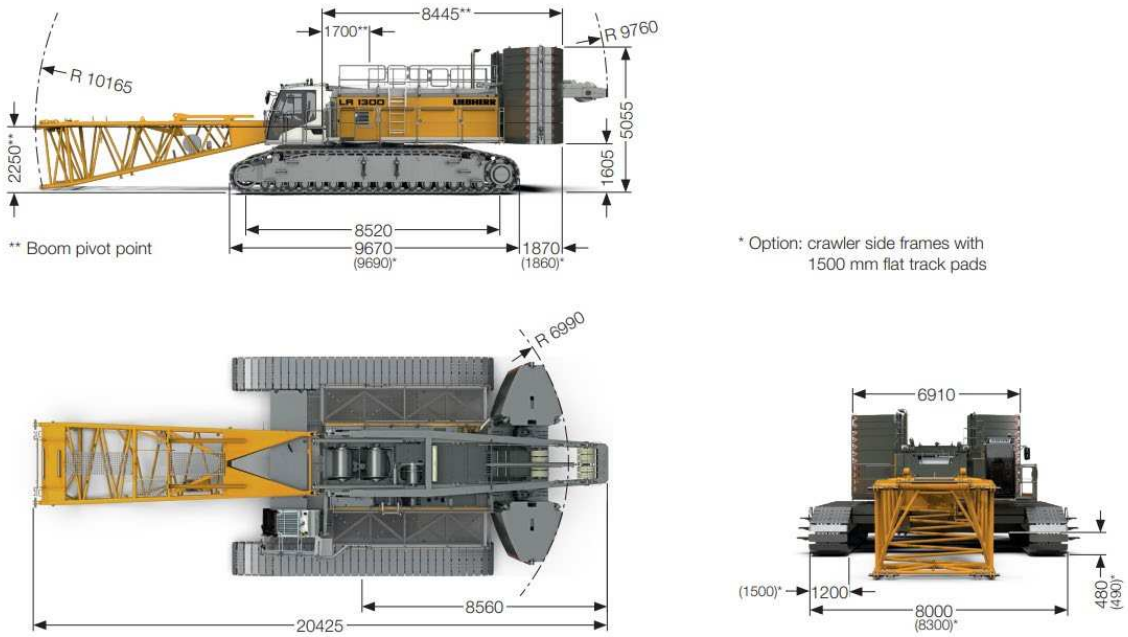

Figure 5: Liebherr LR 1300.1 SX Crawler Crane (Liebherr LR.1 SX Manual)

4.2. Tridem drive tractor semitrailer delivery truck (WB-20)

This is a heavy-duty truck with a tridem axle configuration. Axle spread requirements range from 2.4 to 2.8m. The vehicle's semitrailer typically has a maximum length of 16.2 m and a wheelbase ranging between 6.3 and 12.5 m. This vehicle was assumed to be the delivery truck for battery units having a maximum weight of 42 tons. Dimensions (m) for this truck are shown in Table 5 and Figure 6.

Table 5: Tridem Drive Tractor Semitrailer Delivery Truck dimensions
(Canadian Task Force on Vehicle Weights and Dimensions Policy, 2014)

Length (m)	Width (m)	Height (m)	Minimum body-ground clearance (m)	Track width (m)	Lock-to-lock time (s)	Curb to curb turning radius (m)
23.5	2.6	4.15	0.25 – 0.35	2.5 – 2.6	4 - 6	15
Note: the dimensions shown were used in the modelling portion of this study						

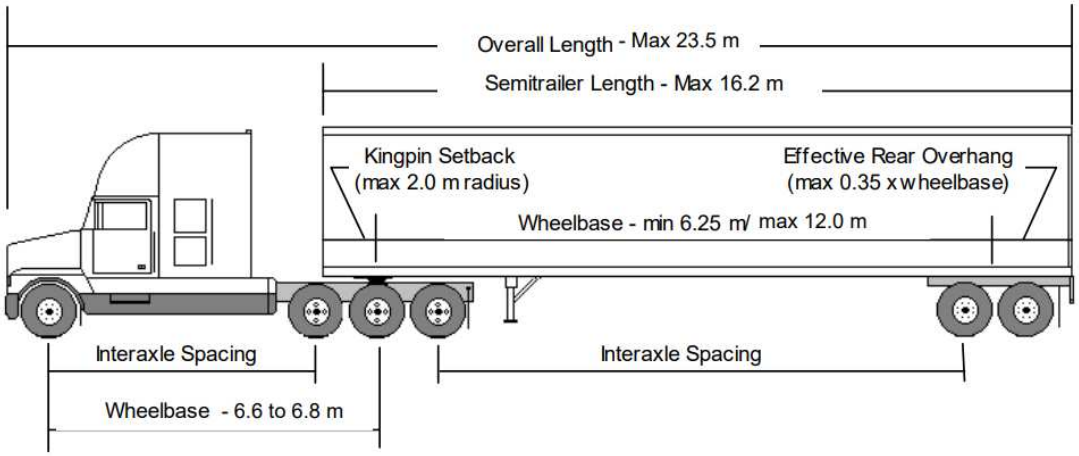

Figure 6: Tridem Drive Tractor Semitrailer Delivery Truck dimensions
(Canadian Task Force on Vehicle Weights and Dimensions Policy, 2014)

4.3. Lowboy delivery truck

This is a heavy-duty trailer designed for transporting oversized and heavy loads featuring a low deck height. With multiple axles to support heavy weights, lowboys can carry up to 50 tons or

more. This vehicle was assumed to be the delivery truck for the transformer units. Dimensions (m) for this truck are shown in Table 6 and Figure 7.

Table 6: Lowboy semitrailer truck dimensions

Length (m)	Width (m)	Height (m)	Minimum body-ground clearance (m)	Track width (m)	Lock-to-lock time (s)	Curb to curb turning radius (m)
37.9	3.0	3.6	0.127	3.0	6	14.0
Note: the dimensions shown were used in the modelling portion of this study						

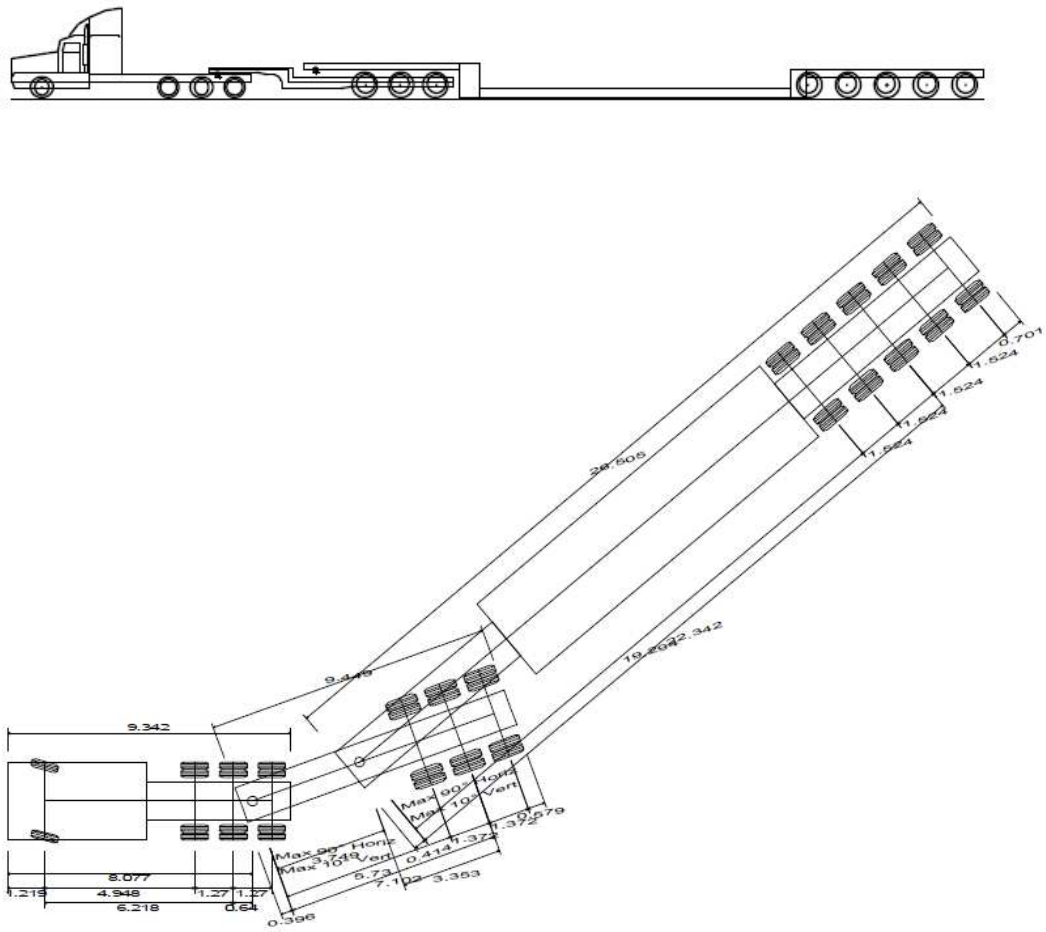

Figure 7: Lowboy semitrailer truck dimensions

4.4. Fire/emergency truck

This truck is being used as a control vehicle and is assumed to have access to all site areas including the substation area and battery unit area.

Dimensions for the pumper fire truck are based on the Civil 3D vehicles tracking modelling (see Table 7 and Figure 8):

Table 7: Pumper fire truck dimensions

Length (m)	Width (m)	Height (m)	Minimum body-ground clearance (m)	Track width (m)	Lock-to-lock time (s)	Max wheel angle
12.192	2.489	2.361	0.32	2.489	5.0	45°
Note: the dimensions shown were used in the modelling portion of this study						

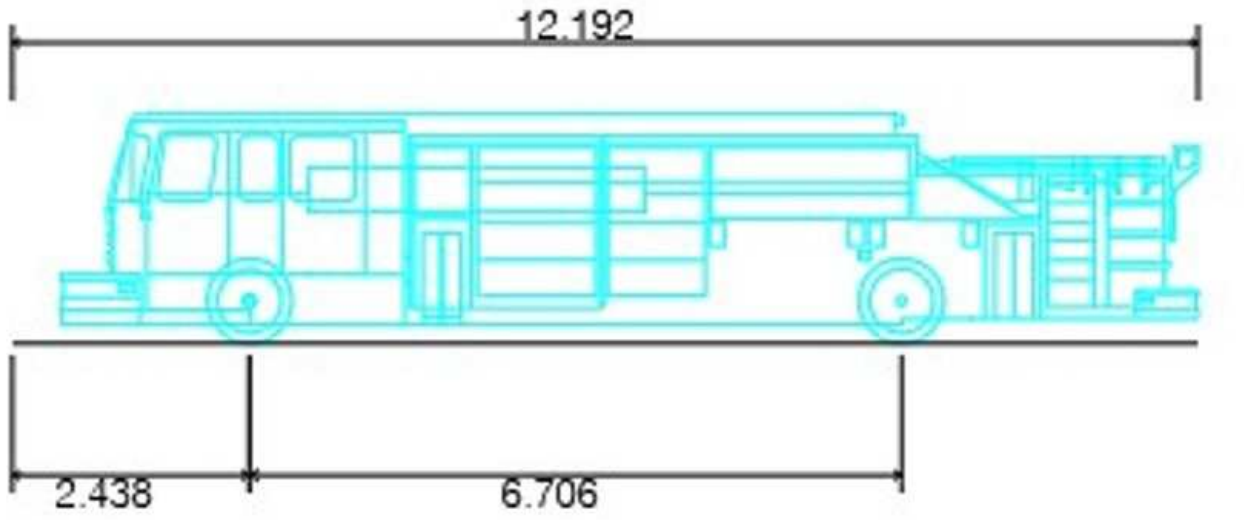

Figure 8: Pumper fire truck dimensions

5. Traffic modelling

5.1. General

Based on traffic modelling of the four design vehicles, the proposed maximum on-site speed for the lowboy semitrailer truck is limited to 5 km/hr. The tridem drive tractor semitrailer is limited to a maximum on-site speed of 10 km/hr. Other vehicles are limited to a maximum on-site speed of 25 km/hr.

The lowboy semitrailer truck is assumed to access the site only during the construction stage of the project. Construction staging may be required to accommodate movement of this vehicle and delivery of the transformer units. The tridem semitrailer and fire/emergency trucks will require access to the site at all phases of the project. A traffic sign for the maximum speed limit shall be installed at the beginning of the permanent access road.

All roads in this project have been designed to meet the minimum geometric requirements of selected design vehicles based on the latest information provided in this report. The study focused on modelling all design vehicles (except fire/emergency vehicles) within the site and to/from William McEwen Drive during the construction stage of this project assuming construction staging is followed. Fire/emergency vehicles will have access to the site during both construction and operational phases of the project.

Due to the limited width of on-site roads, design vehicles (except for fire/emergency vehicles) will need to be limited to a one-way direction to avoid conflict of vehicles.

5.2. Liebherr LR 1300.1 SX Crawler Crane

The Liebherr LR 1300.1 SX Crawler Crane route on-site and to/from William McEwen are shown through Figure 8 to Figure 10. Note that the 19 m and 12.5 m crane reach is based on a battery unit mass of 42 tons (obtained from the Sungrow System Manual) and transformer components of 106 tons (obtained from Siemens Energy DWG #E240499, date November 2024), respectively. Figure 8 shows the operation reach of the crane for both the battery and transformer during the installation of the battery and transformer units.

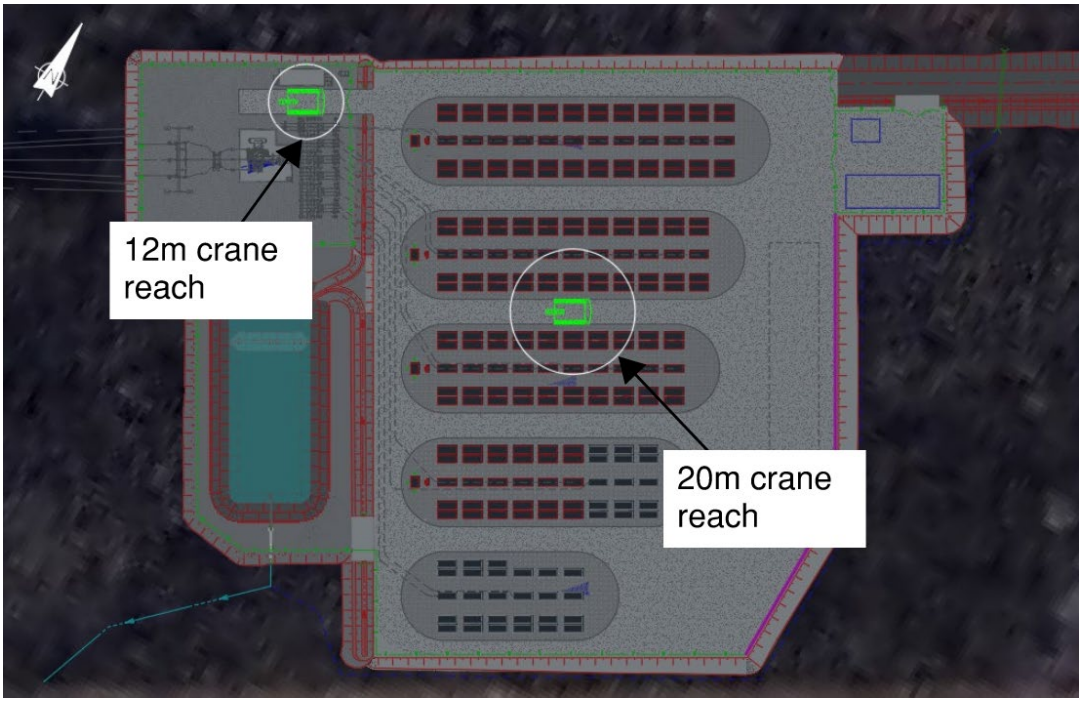

Figure 9: Liebherr LR 1300.1 SX Crawler Crane navigation and reach within site

Figure 10: Liebherr LR 1300.1 SX crane into/from William McEwen Drive

5.3. Tridem semi-trailer delivery truck

Tridem truck modelling on-site and to/from William McEwen Drive is shown in Figure 11 and Figure 12.

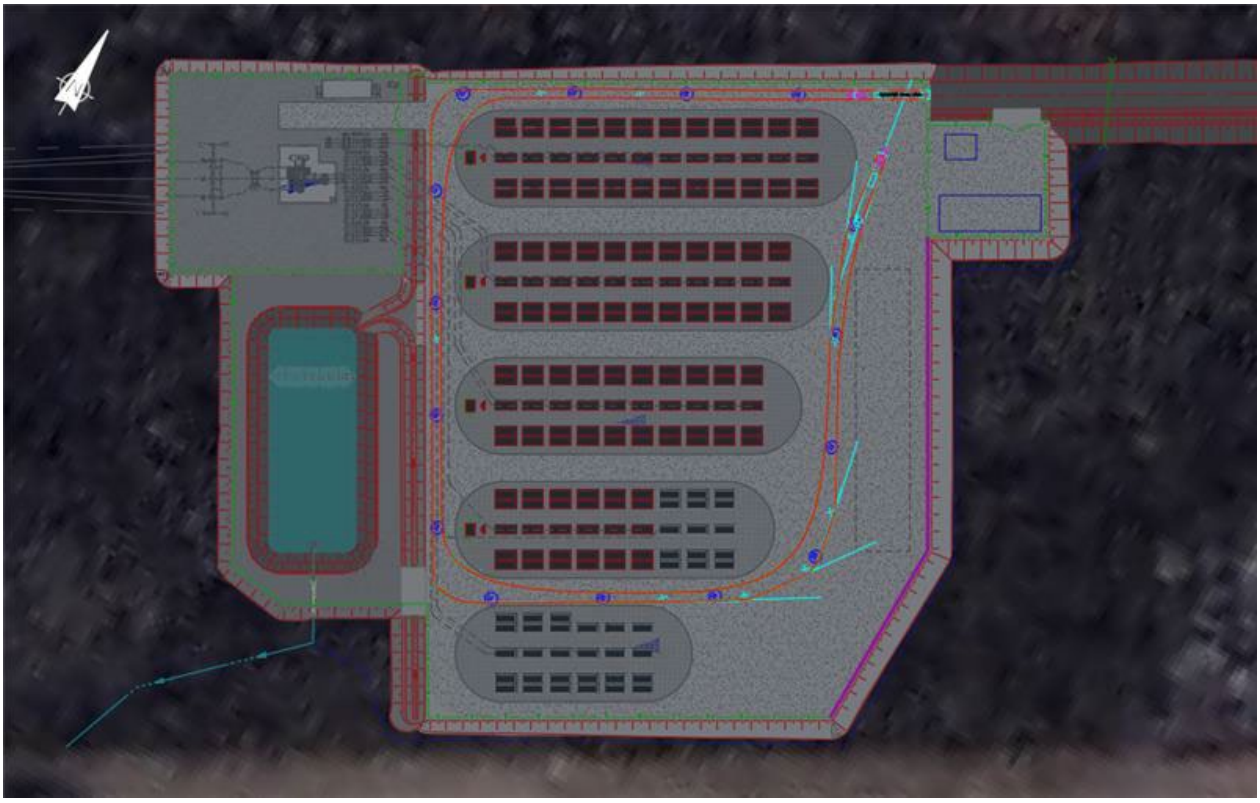

Figure 11: Navigation of the tridem semitrailer delivery truck on site

Figure 12: Navigation of the tridem semitrailer truck through the intersection of site access road and William McEwen Drive

5.4. Lowboy semi-trailer delivery truck

The lowboy semi-trailer delivery truck is assumed to deliver transformer units to the substation area only during construction. Further, it is assumed that substation equipment will be delivered to site after site grading and prior to any work occurring in the BESS area, providing additional space for truck navigation.

Modelling of the lowboy semi-trailer delivery truck on site and to/from William McEwen Drive is shown in Figure 13.

Figure 13: Navigation of the lowboy semitrailer delivery truck into the access road from William McEwen Drive

5.5. Fire/emergency truck

Modelling of a B-12R vehicle (i.e., fire/emergency truck) on site and to/from Dufferin Street is shown in Figure 14 and Figure 15.

Figure 14: Navigation of a fire/emergency truck within site

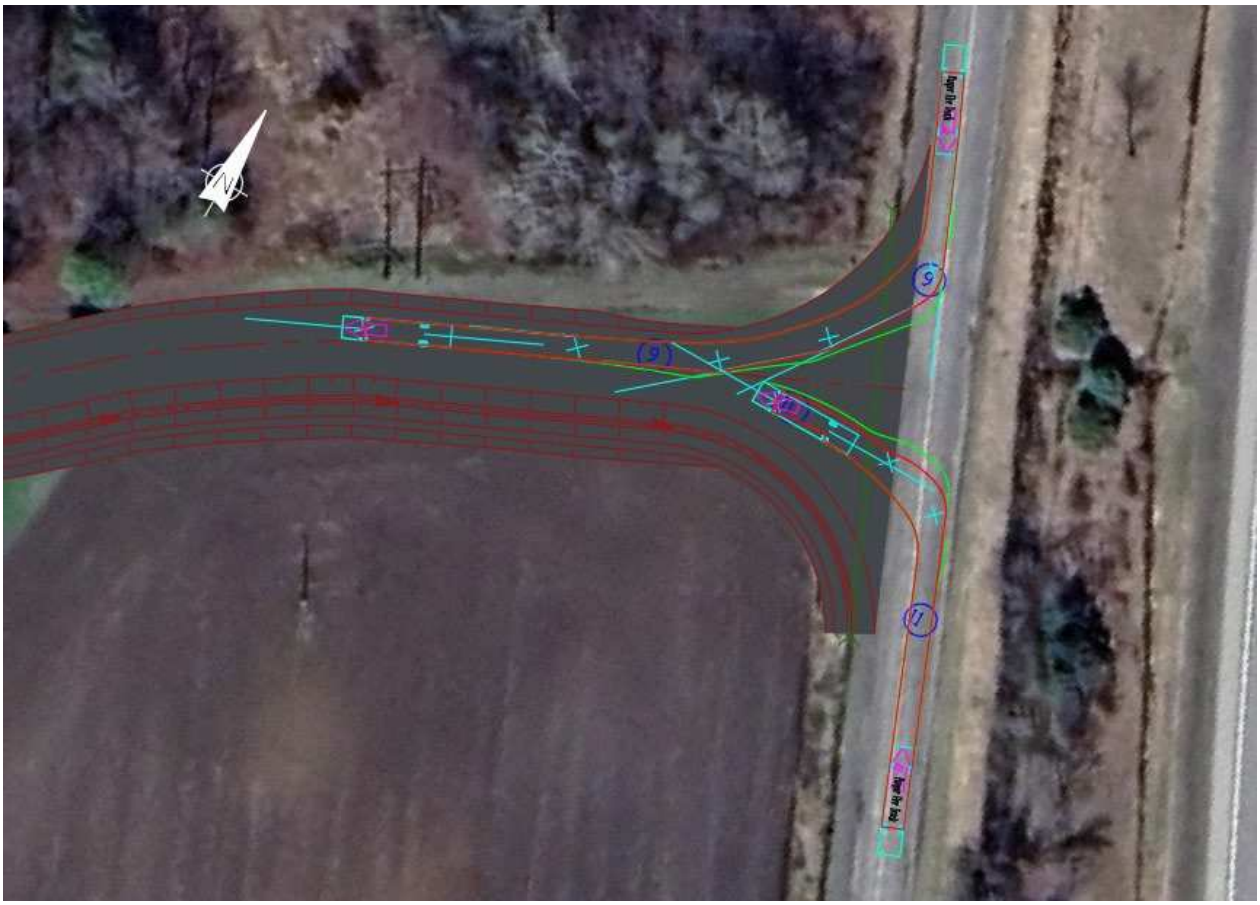

Figure 15: Navigation of fire/emergency truck into/from William McEwen Drive

6. Conclusion

Based on the modelling completed in section 5, generally, the proposed geometric conditions for the access road and on-site roads allow design vehicles to commute into and from William McEwen Drive without conflict or required modifications during installation and maintenance.

A construction sequence ensuring the substation equipment is delivered via the lowboy truck prior to any work in the BESS area is recommended to provide additional space for truck navigation within the site. The lowboy semitrailer truck is recommended to leave the site via the northbound lane of William McEwen Drive.