

# OPERATIONS PLAN for the Construction of the Amherst Island Wind Project

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Revision 9, 25 July 2017

### **Framework**

This Operations Plan for the construction of the Amherst Island Wind Project has been prepared by Windlectric Inc. in cooperation with its contractors and consultants. It reflects planning relative to Amherst Island Wind Project activities within the road allowances of the Corporation of Loyalist Township and is submitted to the Township in accordance with provisions of the Road Use Agreement made between Windlectric Inc. and the Corporation of Loyalist Township on January 26, 2016 (the “Road Use Agreement”).

This Road Use Agreement provides that the purpose of the Operations Plan “will be to demonstrate how prudent and reasonable practices will be utilized to minimize the level of disruption, disturbance and inconvenience to the Municipality’s residents, given the scope of the Project. The Operations Plan will also demonstrate how the continuing functioning of its roads and other municipal services and facilities will be maintained to the extent reasonable possible and how the Municipality’s residents’ access to emergency services will be maintained at all times.”

### **Revision History**

<b>Revision</b>	<b>Date</b>	<b>Description</b>
1	14 Oct '16	Initial issue
2	23 Dec '16	Revised draft reflecting comments received from Loyalist Township to earlier submittal
3	7 Feb '17	Revised draft reflecting comments received from Loyalist Township to earlier submittal
4	28 Mar '17	Revised draft reflecting comments received from Loyalist Township to earlier submittal
5	2 May '17	Revised draft reflecting comments received from Loyalist Township, town hall meeting on Amherst Island, Amherst Island residents, and during 25 Apr '17 meeting with Loyalist Township representatives
6	12 July '17	Revised draft reflecting comments received from Loyalist Township June 12, 2017, meetings with the Township, and continued Project evolution.
7	19 July '17	Revised draft reflecting removal of ‘trunk’ and ‘branch’ concept of public road modification, and the insertion of comprehensive road rebuild methodology.
8	21 Jul '17	Revised draft reflecting comments received from Loyalist Township in letters dated 19 May '17 and 20 May '17.
9	25 Jul '17	Revised to reflect final comments received from Loyalist Township’s counsel in email dated 25 Jul '17.

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## 1 Introduction

This Operations Plan for the Amherst Island Wind Project (the "Project") has been written by Windlectric Inc. ("Windlectric") and is provided to The Corporation of Loyalist Township (the "Municipality" or "Township") as prescribed by the Road Use Agreement<sup>1</sup> made between Windlectric and the Municipality on January 26, 2016, and commitments made by Windlectric in their Renewable Energy Approval application. The purpose of this Operations Plan is to demonstrate:

- a) how prudent and reasonable practices will be utilized to minimize the level of disruption, disturbance, and inconvenience to the Municipality's residents, given the scope of the Project;
- b) how the continuing function of roads and other municipal services and facilities will be maintained to the extent reasonably possible; and
- c) how the Municipality's residents' access to emergency services will be maintained at all times.<sup>2</sup>

This Operations Plan is comprised of: (i) a Traffic and Construction Management Plan, (ii) a Communications Plan, and (iii) a Public Safety Plan whose minimum contents are stipulated by section 40 of the Road Use Agreement. Multiple schedules, attached and incorporated herein, form an integral part of this Operations Plan. This Operations Plan is intended to be a living document that will be subject to updates and refinement throughout the Project.

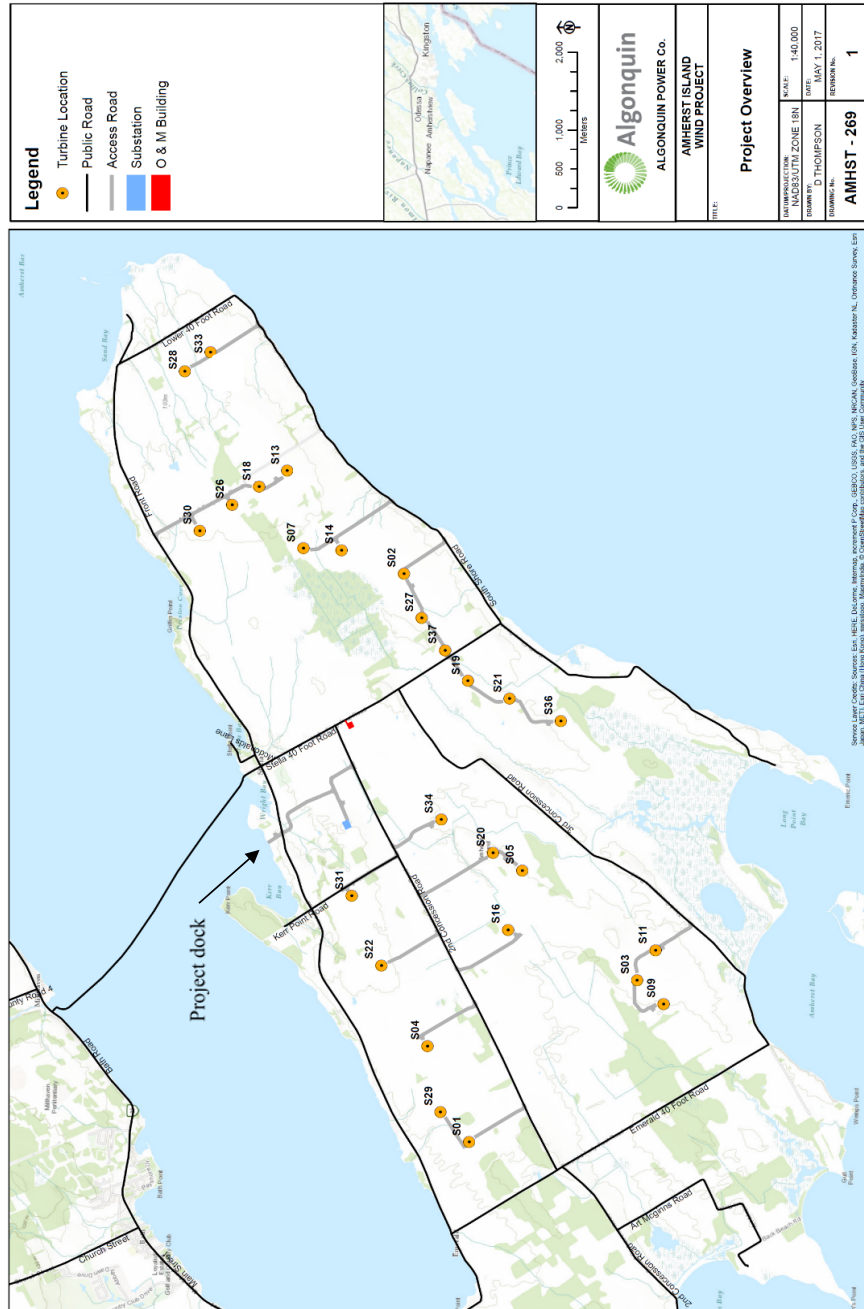
Project elements include without limitation docks on Amherst Island and the mainland, private access roads, turbine foundations, wind turbines, meteorological towers, an electrical collection system, an operations and maintenance building, a substation, overhead electrical transmission lines, underwater electrical transmission facilities, and a grid interconnection facility on the mainland. An overview of the Project infrastructure layout is provided on the following pages in **Figure 1 – Overview of Project Turbines and Surface Infrastructure** and **Figure 2 - Overview of Project Electrical Infrastructure**. These images are provided to orient the reader of this Operations Plan to the overall layout of the Project and to provide a frame of reference for subsequent discussions in this document as to specific turbines or locations.

Boundaries for the Township owned or controlled public rights of way, roads and streets, ditches, drainage ways, etc. collectively referred to as the "Road Allowances" in the Road Use Agreement were established by a licensed Ontario Land Surveyor in accordance with the Ministry of Transportation of Ontario Standard for boundary survey illustration. Project elements falling within the Road Allowances were designed to be fully contained within the minimum Road Allowance boundary dimensions established by survey. The tolerance for this survey data is within 0.3 metres. To ensure Project construction would not infringe Road

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<sup>1</sup> Road Use Agreement executed on January 26, 2016 between Windlectric Inc. and The Corporation of Loyalist Township available on the Loyalist Township's website ([www.loyalisttownship.ca](http://www.loyalisttownship.ca)).

<sup>2</sup> Road Use Agreement, Section 35.



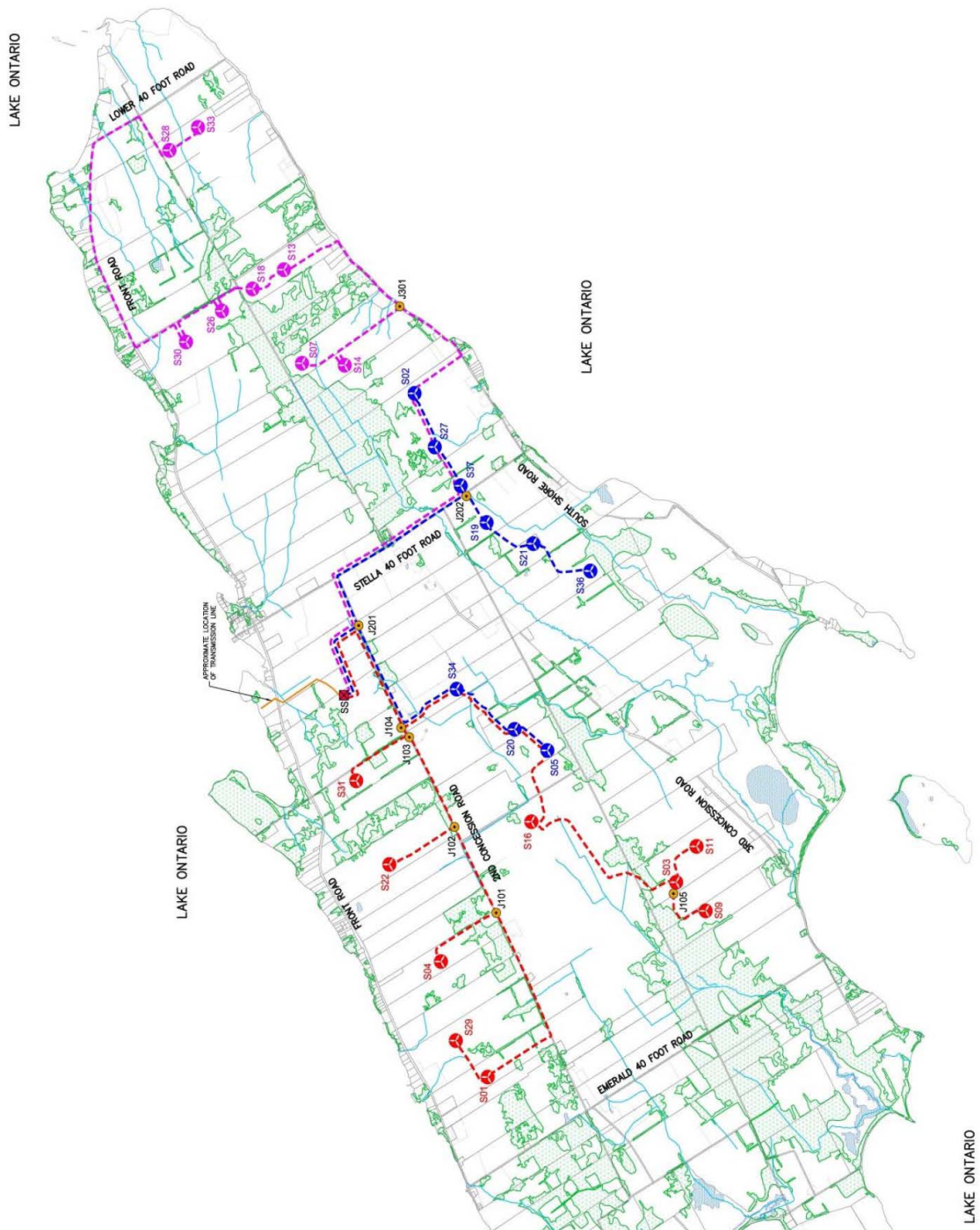


Figure 2 - Overview of Project Electrical Infrastructure

Allowances, Project elements (including road widening or culvert extension or ditch fore and back-slope modifications) have been kept at least 0.6 metres by design, from the surveyed boundaries (other than, for example, access roads, and electrical collection system, both of which cross over the Road Allowance boundary and onto private property subject to existing landowner lease agreements with Windlectric). In addition to the foregoing, in those areas where the road is fronting on properties owned by non-participating landowners and (i) the traveled gravel surface of the road is less than 6 metres or (ii) where work is proposed to be completed outside the 6 metre traveled gravel surface of the road, Windlectric will complete a legal survey of the road allowance. Such legal survey will be subject to the review and approval of an Ontario Lands Surveyor retained by the Township in accordance with a protocol agreed upon with the Township, a copy of which is attached hereto as Schedule 21. For the purposes of the operations plan the term “legal survey” will mean a survey having a tolerance of  $\pm 0.030\text{m}$ . In addition to the design criteria cited above, Windlectric commits that no field construction activity or road modifications will encroach beyond the boundary line for the Township’s road allowance/right-of-way on properties for which Windlectric does not have land use rights.

Consistent with its desire to minimize the level of disruption, disturbance, and inconvenience to the Municipality’s residents, Windlectric has made several significant changes to the configuration of the Project during the course of development, including:

- Reduced the number of turbine locations from 33 to 26,
- Eliminated the prior turbine location closest to the Amherst Island Public School,
- Constructed a Project road from the Project dock to Second Concession Road in order to minimize traffic on Front Road, near the Village of Stella, and the Amherst Island Public School.
- Relocated the electrical collector system path to avoid the village of Stella, and
- Committed to utilize directional boring for collector system installation in the vicinity of St. Paul’s Presbyterian church in order to protect the root structure of the trees in front of this Cultural Heritage Resource,

Significant construction sequencing and/or execution process adjustments have been made for the same purposes, including:

- Eliminating most Heavy Load deliveries in front of the Amherst Island Public School and through the village of Stella (all Heavy Loads other than four sets of Major Turbine Components<sup>3</sup>),
- Relocating the collector system ‘side of the road’ where necessary to limit tree removal due to collector system installation to a single tree,
- Ensuring that the collector system is located on the south ‘side of the road’ in the vicinity of the Pentland Cemetery in order to minimize any risk of harm to this Cultural Heritage Resource,
- Committing to the elimination of blasting as a construction technique within the public road allowances,
- Committing to zero overnight road closures,

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<sup>3</sup> Turbine blades, nacelles, rotor hubs, and tower sections (each a “Major Turbine Component”).

- Committing to minimize potential Project traffic interference with public ferry access,
- Committing to delay the start of all full Road Closures on any of the public school's bus routes until after the public school's buses have passed,
- Committing to utilize access road on private land from turbine S37 to South Road to reduce the impact to public roads from construction and deliveries,
- Committing to adjust the Project schedule to ensure minimal impact to community events, and
- Committing to a minimum 3m lane width for traffic during Single Lane Restrictions to ensure that emergency vehicles will always be able to pass by these work zones.

The following sections of this Operations Plan detail the Traffic and Construction Management Plan, Communications Plan, Public Safety Plan developed for the Project.

## 2 Traffic and Construction Management Plan

Additional details of the Traffic Management Plan are provided as Schedule 02 (“Traffic Management Plan”) to this Operations Plan. That Schedule, along with the other Schedules incorporated in this Operations Plan, should be read in conjunction with the balance of Section 2 below. The Schedules form an integral part of the overall Operations Plan for the Project. Project related Heavy Load and Major Turbine Component delivery traffic will only occur on those routes set forth on Schedules 03 and 19.

### 2.1 Haul Routes for Oversized and Heavy Loads

See Schedule 03 for graphical representation of the Heavy Load routes to be utilized by the Project and Schedule 19 for a graphical representation of the Major Turbine Component delivery routes.

All Project deliveries from the Project island dock (except Major Turbine Component deliveries for turbines S30, S26, S18 and S13) will cross Front Road onto a Project road that provides access to the Project laydown area and Second Concession Road. All Project deliveries from the Project laydown yard will exit the yard to Second Concession Road. This routing greatly reduces the number of deliveries that will need to travel through the village of Stella, or in front of Amherst Island Public School. Additional benefits of utilizing this access road include:

- a straight-through path at the intersection of Front Road and Stella Forty Foot Road for those deliveries, and
- elimination of any construction-related disruption that otherwise would have been necessary for increased traffic on Front Road or turning from Front Road onto Stella Forty Foot Road.

Using a Project road rather than the Stella Forty Foot Road between Front Road and Second Concession Road minimizes the level of disruption, disturbance and inconvenience to the Municipality’s residents related to traffic at the main intersection in the village of Stella and in particular resident’s access to the ferry due to delivery of material and equipment.

The Project access road off of Stella Forty Foot Road to turbines S37, S27 and S02 will also be used as a delivery bypass to eliminate all Major Turbine Component and Heavy Load traffic from the southernmost segment of Stella Forty Foot Road and a segment of South Shore Road immediately east of Stella Forty Foot Road. This routing also eliminates the need for construction activities related to upgrading the bypassed segments of public road, and the need to upgrade the intersection of Stella Forty Foot Road and South Shore Road.

#### 2.1.1 Major Turbine Component Delivery Routes:

The routes and the direction of travel for the delivery of Major Turbine Components are provided in Schedule 19 (“Delivery Routes for Turbines”). Minor turbine components (those turbine components other than the Major Turbine Components) will follow the Delivery Routes for Heavy Loads. The Major Turbine Components will follow the Delivery Routes for Turbines, described as follows:

- The Major Turbine Components for turbines S30, S26, S18, and S13 will arrive at the Project's island dock and turn left onto Front Road (eastbound) passing through the Village of Stella and onward to a Project access road to these particular turbines.
- The Major Turbine Components for turbines S31, S34, S20, S05, S22, S16, S04, S29, and S01 will arrive at the Project's island dock and cross Front Road onto the Project road that links to Second Concession Road. These components then turn right (westbound) on Second Concession Road to the appropriate Project access road.
- The Major Turbine Components for turbines S11, S03 and S09 will arrive at the Project's island dock and cross Front Road onto the Project road that links Second Concession Road. These component deliveries will then turn left (eastbound) on Second Concession Road, then turn right onto Stella Forty Foot Road (southbound), and then turn right onto Third Concession Road (westbound) until reaching the Project access road to these particular turbines.
- The remaining Major Turbine Components will arrive at the Project's island dock and cross Front Road onto the Project road that links to Second Concession Road. These component deliveries will then turn left (eastbound) on Second Concession Road, then turn right onto Stella Forty Foot Road (southbound) and then enter the appropriate private access road either on the west for turbines S19, S21, and S36 or east for turbines S37, S27, S02, S14, S07, S33, and S28. The Major Turbine Components for turbines S14, S07, S33 and S28 will continue southbound until turning left on South Shore Road (eastbound) before turning north onto the appropriate Project access road.

Windlectric evaluated alternatives for Major Turbine Component deliveries to S30, S26, S18 and S13 that would have further reduced the number of components travelling through the Village of Stella (the "Alternate Turbine Delivery Route").

One Alternative Turbine Delivery Route would have progressed to the eastern end of South Shore Road, turned northbound onto Lower Forty Foot Road, then turned westbound onto Front Road to approach the Project road for these turbines from the east. Unfortunately, Road Allowance geometry at the intersection of South Shore Road and Lower Forty Foot Road precludes use of the Alternative Turbine Delivery Route for Major Turbine Component Delivery to S30, S26, S18, and S13.

A second Alternative Turbine Delivery Route would have progressed down South Shore Road and turned north on the Marshall Forty Foot Road to make Major Turbine Component Deliveries to turbines S30, S26, S18, and S13. This route was not feasible due to existing bird habitat along Marshall Forty Foot Road that would have been negatively impacted by the roadway modifications necessary to make turbine delivery feasible along this route.

### **2.1.2 Heavy Load Delivery Routes:**

All Project vehicles not used for personnel transport are classified as "Heavy Load" trucks in the Traffic Plan. A subset of Heavy Loads, which are addressed separately in Section 2.1.1 above, are the vehicles carrying Major Turbine Components. Heavy Loads, exclusive of Major Turbine Components, include all material and equipment delivery trucks which do not carry turbine component deliveries (the "Heavy Loads"). Examples of these vehicles include (but are not limited to) rubber-tired cranes, aggregate (crushed rock) delivery trucks, concrete trucks, float trucks for delivering or relocating heavy



equipment such as excavators or directional boring drill rigs, water trucks, dry cement tankers, and trucks containing crane parts, tool containers, reinforcing steel bars, anchor bolts, medium-voltage pad-mount transformers, batch plant equipment, substation equipment, spools of electrical cable and minor turbine components (i.e. turbine components other than blades, tower sections, nacelles and hubs). The routes and the direction of travel for the delivery of Heavy Loads are identified in Schedule 03 (see drawing AMHST-207 “Delivery Routes for Heavy Loads”).

Spoils resulting from turbine foundation excavation will largely be replaced as ballast over the foundation and fill around it. Remaining spoils will be consumed in access road construction and/or distributed in the vicinity of their origination. Consequently, these materials will not be transported on Township roads and are not included in the Heavy Load assessment for the Project. Aggregate transportation (excavation spoils and fill) associated with electrical collection system installation are included in the Heavy Load assessment for the Project. Excavation of existing materials from public roads will be utilized as fill for private access roads. Transportation of this material, and aggregate handling associated with reconstruction of public roads, is not included in the Heavy Load count in Schedule 03.

Heavy Load deliveries for the Project, exclusive of Major Turbine Components, will originate from either the Project’s island dock or the central staging and laydown area located on a private land access road between Front Road and Second Concession Road. These Heavy Loads will follow the same routes as those described above for the Major Turbine Components with the exception of Heavy Loads to turbines S30, S26, S18 and S13. Heavy Loads other than Major Turbine Components for those four turbines will take the same route as for turbine S33 but will continue along South Shore Road to Lower Forty Foot Road, travel north to Front Road and then west to the Project access road for these turbines. Heavy Loads, with the exception of four sets of Major Turbine Components, will not pass in front of the school or through the Village of Stella.

Heavy Loads associated with municipal road work includes hauling of excavation spoils from existing road surfaces and new aggregate. The excavation spoils will originate along portions of the municipal roads that are rebuilt. The new aggregate will originate from the central staging area. Heavy Load traffic related to municipal road work will only utilize those municipal roads designated in Schedule 03 as Heavy Load delivery routes.

A table containing a breakdown of the different Heavy Load truck types by Municipal road segment is provided in Schedule 03 (“Heavy Load Traffic by Road”). Many of these trucks will be transported to the island by barge. It is currently planned that two barges will transport personnel, materials, and equipment for the Project throughout the construction period, and that each of the two barges will make five to six trips from the mainland each day. The actual number of daily barge trips will, however, vary depending on weather conditions, material delivery requirements, and any unplanned events or delays.

Some of the Heavy Load truck trips on the island will not originate from barge traffic because:

- Water trucks will be filled from Lake Ontario,
- Concrete delivery trucks will travel between the batch plant on the island and turbine foundations or other concrete placement locations, and

- Equipment utilized in road maintenance and other Project activities will overnight at either the laydown area established on the island or Project work areas that are not within the public rights of way.

### **2.1.3 Other Large Transports:**

In addition to the deliveries described above, residents may encounter transports moving larger equipment loaded on a trailer from one construction site to another. The width of the largest planned wide load is listed in Schedule 10 (“Largest Wide Load”). The drivers of the transport trucks moving over-width equipment will be instructed to give way to residents travelling on any narrow sections of public roads and will move to the side of the roadway in a convenient location to allow traffic to pass. Prior to movement of over-width deliveries, the construction site team will assess the planned route for the movement. If such route is too narrow to allow on-coming traffic to pass safely, the movement will be performed using flag-staff and will be treated as a Traffic Interruption as that term is defined in Section 2.3 below and in Section 3.2.3 of the Traffic Management Plan detailed in Schedule 02.

The main turbine erection crane will be one or more Liebherr LG-1750 or equivalent rubber-tired crane. General specifications for this crane are provided in Schedule 16 (“Main Erection Crane”). This crane type provides excellent maneuverability on narrow public roads. In order to minimize any traffic interruption related to the main erection crane movement, this crane will be moved from site to site in a road configuration (and, for further clarity, the crane will not be moved on public roads with the boom installed). When this crane must move within the Township Road Allowances, such movement will be handled as a Traffic Interruption under Section 2.3 below and Section 3.2.3 of the Traffic Management Plan detailed in Section 02.

Notice of Traffic Interruptions, for movement of Project equipment or other Project purposes, will be made in accordance with the provisions of Section 3.1 of this Operations Plan.

### **2.1.4 Management of Inoperable Equipment in the Public Right of Way:**

The planned Public Road Modifications will generally result in the travelled surface of the Township gravel roads on Amherst Island having a 6 metre width so that bi-directional traffic can take place (up to and including the Largest Wide Load described in Section 2.1.3). Further details regarding these planned modifications including those areas where road width will be less than 6 metres are described in Section 2.2. The two exceptions to the 6 metre gravel road width restoration will be along South Shore Road and Dump Road.

At every location along the municipal roads that will be subjected to construction traffic, including the narrow sections of South Shore Road, there is an alternate route available to emergency vehicles to every location on the island. Nevertheless, Windlectric will ensure that heavy vehicle towing capability is maintained on the island during construction of the Project to ensure that any vehicle that becomes inoperable or stuck in the Township right of way may be promptly removed. This heavy vehicle towing capability will be in the form of a rubber-tired loader with towing capacity sufficient for the movement of any other inoperable vehicle involved in the construction work.

The single remaining hypothetical situation that could result in a complete elimination of road access to any point on the island would be the stranding of a Major Turbine Component Delivery along Third Concession Road at a time during which Emerald Forty Foot Road is impassable. This condition would

cause properties to the west of the blockage to not be immediately accessible. To eliminate this risk, Windlectric will ensure that Major Turbine Component Deliveries along Third Concession Road only take place during times when Emerald Forty Foot Road is available as a detour route.

## **2.2 Public Road Modifications**

The planned public road modifications will be fully contained within the surveyed boundaries of the Loyalist Township road allowances as described above or will extend onto private lands for which Windlectric has completed land control agreements. The gravel surface public roads used by the Project will be comprehensively improved prior to the onset of Project Heavy Load traffic in accordance with the details provided below under the heading “Structural Reconstruction of Public Roads”. Some public road segments will also require temporary widening to accommodate over-dimensional Project traffic. Other existing municipal roadways will not be improved.

The public road improvements described below will be performed on a road segment prior to use of that road segment by the Project for Heavy Loads other than (i) as necessary to perform such work or (ii) for execution of electrical collection system work that will be within the road surface. The gravel roadways utilized by the Project will be subsequently maintained by Windlectric in accordance with Section 2.6 to the better of (i) the preconstruction condition of the road and (ii) the minimum requirements of Ontario Regulation 239/02, as amended.

### **Structural Reconstruction of Public Roads**

Road segments with aggregate surface will be sub-excavated to 200mm depth by removal of existing material. A woven geosynthetic (Terrafix Combigrid 40/40 or approved equal) will be placed over prepared subgrade to provide separation from the underlying finer grained soils and then 200mm of compacted crushed, quarried, granular A material will be placed to re-establish road base and the travel surface. Roadway crown will also be re-established on these road segments to facilitate drainage. Finished centerline of the rebuilt road will generally match the current vertical alignment of the road.

If field conditions are encountered during the pre-construction road improvements where road sub-base appears to be organic or similar materials, there may be a need to adjust the previously-noted road bed section. Under this scenario, Windlectric’s engineers would need to provide a solution to the satisfaction of the Township. Existing gravel surface roads (other than South Shore Road and Dump Road) that are used for aggregate and concrete delivery will be restored to minimum 6 metre width. Where such work extends beyond the current traveled width of the road, adjacent width along the sides of the current traveled way will be stripped of vegetative growth, excavated and infilled with 200mm of compacted crushed, quarried, Granular A material and the approved geosynthetic material. This work will be performed within the limits of the current roadway platform at virtually all locations and will not negatively impact adjacent drainage, nor will it extend beyond the surveyed Road Allowances.

Front Road will be utilized by the Project traffic in its current configuration but will be subject to continual monitoring, maintenance, and repair as necessary to ensure continual serviceability. For the segments of Stella Forty-Foot Road that currently have existing hard surfaces, Windlectric will remove the hard

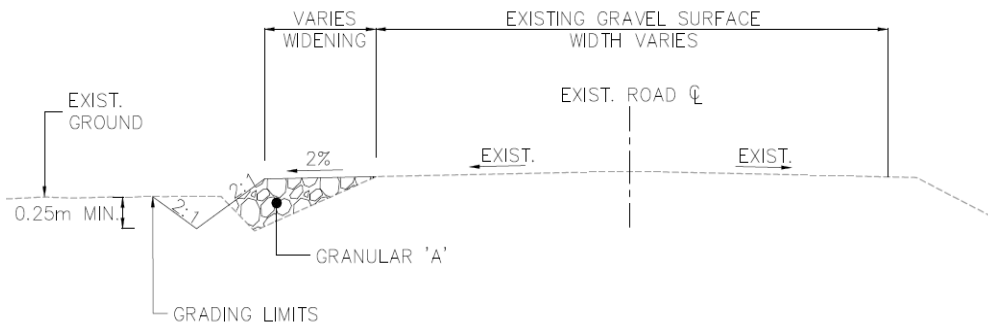
surface and prepare the road as per the proposed methodology for gravel roads as outlined above. Further surface treatment to be discussed with Township staff.

South Shore Road east of the access road for turbine S14 will be modified as above, but will not be subject to a minimum 6 metre width due to existing physical constraints along its length.

Front Road from the Project dock road to the access road for turbine S30 will be utilized for delivery of Major Turbine Components for four turbines. No improvements to this road segment is necessary prior to the use of this road given the limited nature of such use.

### **Temporary Road Widening**

In some areas, temporary road widening work within the Road Allowances, will be required to facilitate Major Turbine Equipment deliveries. This activity will take place on portions of South Shore Road, the “s-curve” on Third Concession Road, and the southern portions of Dump Road. This temporary widening work is illustrated in Figure 3. Work will include stripping of existing organic material where fill is to be added. Temporary widening work will be removed on the completion of Project construction.



**Figure 3 - Typical Temporary Road Widening (N.T.S.)**

### **Intersection Improvements and Bypasses**

In a limited number of areas, existing public road intersections will be temporarily modified to increase the turning radii in a direction of travel to accommodate Project traffic. These temporary turning radius enlargements are required to facilitate Major Turbine Component delivery. Work will either fall within the Road Allowances or private property under agreement with Windlectric. These temporary turning radius enlargements will be removed after all turbine components have been assembled and commissioned.

Existing Township guardrails will not be affected by Project modifications to public roadways.

Culvert extensions will be required in a limited number of areas where existing public road intersections will be temporarily modified, temporary intersection bypass routes will be installed, and where road restoration work or temporary widening occurs. These culvert extensions will be accomplished by the Project contractor, using the same type of culvert material and sizing as currently exists in each location.

### 2.3 Public Road Closures and Delays

Windlectric is committed to take every reasonable measure - consistent with prudent wind energy practice, prudent road construction practices, and applicable law - to minimize the occurrence and duration of traffic impacts related to: (i) Traffic Interruptions due to delivery of Major Turbine Components, movement of other wide equipment, and very short interruptions to allow construction equipment to reposition in working areas; (ii) Single Lane Restrictions; and (iii) full Road Closures as those terms are defined below and in Section 3.2 of the Traffic Management Plan included as Schedule 02.

Advance notice of construction activities that will affect usual traffic patterns, including notice of all Traffic Interruptions, Single Lane Restrictions, Road Closures and recommended detour routes will be provided as is more fully described in Section 03 (“Communications Plan”).

**Traffic Interruptions:** Very short term (less than 30 minute) closures of public road segment(s) will be required at various locations and times during construction of the Project. Traffic moving in the same direction as an over-width delivery will experience a much shorter ‘full stop’ interruption and will be allowed to proceed behind the over-width delivery. Traffic interruptions will be planned to start after ferry-bound traffic has passed through the Traffic Interruption road segment.<sup>4</sup>

Each Traffic Interruption will be staffed by a minimum of two traffic control flag persons at either end of the Traffic Interruption road segment. Flag persons will have knowledge of alternative routes available and the time that the Traffic Interruption is expected to conclude. The position of the flag staff will be selected to ensure traffic will not have to back-track in order to take advantage of the recommended alternative route.

Appropriate road signage, traffic marshals and flag-persons will be deployed during Temporary Interruptions. Advance coordination with the emergency services provider will be completed to minimize potential impact to services.

The primary Project activity anticipated to result in Traffic Interruptions will be delivery of oversize loads, including Major Turbine Components, main power transformer, erection crane components, and transmission poles. Approximate dimensions of the Major Turbine Components and their associated delivery vehicles are provided in Schedule 01 (“WTG Components Delivery Vehicle Dimensions”). Movement of some construction equipment within the Project site may also require Traffic Interruptions.

Characteristics and impact mitigations associated with these component and equipment movements include the following:

- Slow moving oversized load vehicles for the transportation of are expected to require rolling Traffic Interruptions affecting public roads ahead of the direction of travel of these vehicles for up to 20 minutes at a time (5 to 10 minutes will be more typical).

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<sup>4</sup> Project staff will not interrupt traffic flow in the direction of the ferry until 5 minutes after the time that a vehicle travelling from the point of interruption could safely reach the scheduled ferry departure from Stella (travelling at maximum permitted speed).

- Traffic will be allowed to follow these vehicles; however, traffic speeds will be reduced to less than 40 km/h until these delivery vehicles are able to turn off of the public roads onto the relevant Project access road.
- The Major Turbine Components are planned to be delivered Monday through Friday over an approximately seven-week period. Note there may be special conditions (e.g. weather interruptions causing a delivery to be rescheduled) which will require Major Turbine Component deliveries to occur on a Saturday.
- Plans related to such movements and any changes in schedule for such movements will be communicated in accordance with the Communications Plan.
- Oversized loads will move slowly through intersections and when entering or exiting a public road. A traffic spotter and/or flag person will be deployed for areas where sightlines are limited.
- The schedule for individual Major Turbine Component deliveries for turbines S13, S18, S26, and S30 that will travel through Stella will be coordinated with the ferry schedule. Transport vehicles will not enter Front Road to drive through the Village of Stella until shortly after the ferry has started its return trip to the mainland. Oversized load transport will be managed by a contractor site management representative designated as the traffic coordinator to ensure that vehicles adhere to the ferry-related restriction outlined above.
- Public traffic will be temporarily interrupted to allow the main erection crane and its primary components, as well as other construction equipment, to travel between successive Project access road entrances. Although the crane will be disassembled into its road configuration for these movements (i.e. the crane will not be transported with the boom up), traffic will need to be interrupted due to the width, speed, and turning radius of the crane and its component delivery vehicles.
- For safety purposes, the movement of oversized load vehicles must follow the prescribed routes. These vehicles will follow a pilot vehicle which may be an Ontario Provincial Police cruiser or other private escort vehicle depending upon transportation permit requirements and applicable law.
- Construction trucks carrying aggregate materials or concrete or other Heavy Loads will also reduce speeds as determined by road conditions and will, at all times, adhere to the posted speed limits on all Township roads.
- Performance of work under Single Lane Restrictions, as listed below, may involve periodic Traffic Interruptions as equipment or materials are relocated within a work area.

**Single Lane Restrictions:** Closures of public road segment(s) that will limit traffic flow to a single lane of traffic (a “Single Lane Restriction”) will be required at various locations and times during construction of the Project or municipal road reconstruction. Single Lane Restrictions will be most often associated with electrical collector installation and road work activities. Prior to implementing any Single Lane Restriction, Windlectric will proof-roll roadway areas that will remain open to traffic to ensure that such areas are structurally capable of supporting anticipated traffic. In the event that it is determined that a Single Lane Restriction is not feasible, Windlectric will either defer execution of the planned work or implement a Road Closure in accordance with the provisions of this Operations Plan governing Road Closures.

Every Single Lane Restriction will allow single lane traffic with a minimum lane width of 3m width. Traffic will be permitted in alternating directions as necessary to mitigate residential traffic delays. Flag persons will be aware of the MTO ferry schedule and will give priority to traffic bound for the public ferry dock. During Single Lane Restriction traffic control, flag persons will be used, in compliance with Ministry of Transportation (MTO) *Ontario Book 7* traffic safety requirements. When Single Lane Restrictions continue for more than thirty minutes after sunset, illumination will be provided in accordance with applicable regulations.

Activities which may result in partial constraints of a public roadway (i.e. a Single Lane Restriction or Traffic Interruption) include, without limitation:

- Trenching along the roadside for the electrical collection system which does not require full road closure.
- Laying material, grading and compacting gravel on public roads to improve their strength and bearing capacity will be generally performed while maintaining single lane use by local residential traffic and emergency services.
- Culvert installation at access road entrances and culvert extensions, if required, will require partial blockage of the public road way.
- Execution of the public road reconstruction.

For illustration purposes, examples of typical electrical collector system installation activity execution within a single traffic lane are provided in Figure 4 through Figure 7 below.



Figure 4 – Trenching Operations





Figure 5 - Cable Spool Trailer



Figure 6 - Trenching and Cable Placement





**Figure 7 - Roadside Plowing**

**Road Closures:** Full closures of public road segment(s) (each, a “Road Closure”) will be required at various instances during construction of the Project or municipal road reconstruction. Road Closures are planned to occur during normal working hours. If the duration of a Road Closure continues for more than thirty minutes after sunset, area illumination will be provided in accordance with applicable regulations. Road Closures will not be left in place overnight.

The closed road segment will typically be less than 50 metres in length at any one time, and will occur within a working area that will typically be limited to 500 metres in length. In the case of electrical collector line installation or public road reconstruction work described above, the closed segment will typically advance within the working area. Where a driveway will be temporarily cut-off within a working area, a steel plate or temporary ramps will be used to maintain access to the public road. The length of time that an individual resident’s driveway will be impacted will most often be limited to duration of a few hours. Affected driveways will be restored to original or better condition upon completion of the Project activities in the immediate area.

Each Road Closure will be planned with a detour route. Road closures will only be performed after the planned detour route has been inspected and confirmed to be available. Windlectric understands that Emerald Forty Foot is seasonally effected. Any detour using Emerald Forty Foot will occur only during times that the road is open for use by residents and emergency services.

Traffic Interruptions, Single Lane Restrictions, and Road Closures will not be executed on a detour route whose use is required by a concurrent Road Closure elsewhere.

Construction activities which will result in temporary Road Closures are planned to be limited to the following:

- Turning radius improvement to Third Concession Road at approximately 1.6 km west of Stella Forty Foot Road with an estimated duration of two working days,
- Electrical collector system installation and road improvements along South Shore Road from a point 1.3 km east of the intersection of Stella Forty Foot Road and South Shore Road to a point 2.4 km west of the intersection of South Shore Road and Lower Forty Foot Road with an estimated duration of fifteen individual working days,
- Road improvements to Dump Road for a 0.8 km segment north of Second Concession Road with an estimated duration of three working days, and
- Execution of the public road reconstruction.

#### **2.4 Waste Management and Hazardous Materials**

All waste will be promptly removed from the island in accordance with appropriate provincial legislation including Ontario Regulation 347, *General - Waste Management Regulation*.

Non-hazardous waste will be deposited in appropriately labeled and controlled receptacles located at the site laydown area, turbine locations, and substation. These waste receptacles will be provided and maintained by a licensed third party contractor who will also be responsible for transport (utilizing Project barges) and reuse, recycling and/or disposal at an approved Ministry of Environment and Climate Change (MOECC) off-site facility as required by applicable law. Sanitary waste generated during the construction phase will be collected via portable toilets and wash stations supplied and maintained by a licensed third party contractor who will be retained prior to the start of construction activities.

Hazardous materials utilized in construction of the Project will include those typical of a heavy civil construction project, including liquid fuels, lubricating oil, blasting materials, etc.; insulating oil for the main power transformer (non-PCB); and limited quantities of some chemicals utilized in fiberglass fabrication and painting (resin, solvents, etc.) Handling, transportation, storage, and use of any hazardous materials for the Project will be in accordance with applicable regulations. All contractor personnel and subcontractors working at the site will be properly trained on the Workplace Hazardous Materials Information System (WHMIS) prior to the commencement of the work.

A dedicated receptacle meeting appropriate regulations and standards will be maintained at the central staging and laydown area for any hazardous waste. Hazardous waste materials, if any, will be transported to the mainland regularly by a licensed third-party contractor for recycling or disposal at a licensed facility.

There will be no long-term storage of waste on site during the construction of the Project and final disposal of waste will be conducted by a third-party contractor at an MOECC-approved facility. No waste will be deposited at the Amherst Island waste disposal facility and all third-party contractors involved in waste management will be prohibited from using the public ferry for their activities related to the Project.

## 2.5 Navigable Waters

The primary Project-related factor that has the potential to affect marine navigation in the North Channel between Amherst Island and the mainland is increased vessel traffic (which includes the Project's transport barges, associated tug boats and personnel vessels):

- Vessel traffic is governed by the *Collision Regulations of chapter 1416 of the Canada Shipping Act*. All Project marine equipment, whether anchored, at a dock, or under way, will comply with these regulations. During emergency situations (e.g. a 911 call) all Project marine traffic will yield to the public ferry. Dedicated Project docks will be constructed and utilized on both the mainland (temporary) and the island (permanent) so there will be no Project impact to use of the existing MTO ferry docks.
- There will be continuous communication between the Project marine vessels and the Frontenac II ferry (or any temporary replacement) in accordance with marine protocol and Collision Regulations.
- It may be necessary to have the outer mooring dolphins of the Project docks lit at night; this determination will be made by Transport Canada.
- All Project marine vehicles and Project docks must adhere to Transport Canada requirements at all times.
- Additionally, all Project marine vehicles will also adhere to the Project's separate Marine Logistics Plan previously prepared pursuant to commitments made in the MEOCC Environmental Review Tribunal process.

## 2.6 Road Maintenance

- This section sets forth details regarding various aspects of the road maintenance activities that will be conducted during the construction of the Project. Despite the reference to those individuals responsible for such activities, all communications regarding the Project should be made in accordance with the Communications Plan set forth in Section 3.
- After the initial road reconstruction work described above, the Township roads with a gravel surface being utilized for Project activities will be maintained by the Project to at least the minimum standards set forth in Ontario Regulation 239/02, "*Minimum Maintenance Standards for Municipal Highways*", as amended.
- At the end of each day during construction of the Project, the contractor will inspect public roads that were utilized for Project Heavy Loads and/or Major Turbine Component deliveries during that day and prepare a Public Road Daily Inspection Report using the form provided as Schedule 18 ("Form of Daily Public Road Inspection Report") on the condition of the Heavy Load Routes and any Turbine Delivery Routes used that day. The Public Road Daily Inspection Reports will be made available to the Township's Public Works Manager upon request (including providing a daily email if requested).
- The Project contractor will inspect the condition of the public road at each site entrance being used at the end of the day and any excess mud, stone and debris will be cleared after the final vehicles have left the site road. Inspection sheets will be completed by contractor personnel to ensure that each entrance is clear before closing the site.

- In addition to the daily inspection above, Project construction personnel will monitor the condition of the roads throughout the day and report any issues for coordination of remedial work to the contractor's Roads Superintendent or designee.
- A dedicated road sweeper and dust control water truck will be maintained on-site and will sweep Front Road at the Project's island dock access road at least twice per day and will move around the island to clean roads at private access road entrances as necessary. The Project's mainland dock will be maintained in a similar manner.
- There will be a road maintenance crew with a grader deployed on roads being used for construction. The contractor will have equipment on site to maintain existing roads throughout Heavy Load and Major Turbine Component deliveries. The road maintenance crew will have their activities scheduled based on the daily traffic plan, but will also be dispatched to take care of reasonable road problem complaints.
- By-passes and temporary intersection improvements built for Project purposes will be blocked off with cones or barricades when not in use for Project traffic and will not be available for public use.
- All temporary intersection improvements, whether made available for use to non-construction traffic or not, will be signed in accordance with Ministry of Transportation (MTO) *Ontario Book 7* traffic safety requirements.
- Windlectric does not expect to impose any changes in intersection control for public traffic from current control measures in place. The contractor's Construction Superintendent will be in close communication with the Township's Public Works Manager (or other Township designated representative) allowing them to address any concerns directly.
- In addition to the Projects efforts as outlined above, the construction manager will respond to any reasonable request by Township's Public Works Manager to correct any section of the road in which the condition of the road has deteriorated, or been left, in a condition that might reasonably be considered unsafe to the public.
- Complaints from all sources will be addressed via the Complaint Resolution Protocol in accordance with the requirements of the REA and Section 3.2 of this Operations Plan.
- Potential Failure of Improved Roadbed: If, after the road has been improved as per Section 2.2, there is a subsequent road failure, Windlectric's engineers will propose a solution for the Township's review and acceptance, and undertake repairs as expediently as reasonably possible.

Project Closure Protocol - The project engineer of record will work with Township staff using generally accepted road maintenance measuring techniques to ensure the road integrity at the close of the Project replicates their pre-construction condition or better. In conjunction with the completion of Project construction activities, the Township may advise Windlectric of those improvements within the road allowances which it would like to retain following construction of the Project. To the extent Windlectric is able to honour such request and remain in compliance with all governmental approvals for the Project, it will do so.

### 2.6.1 Winter Conditions

Windlectric recognizes that the Township's regular winter road maintenance activities are planned and executed in accordance with Ontario Regulation 239/02, as amended, "*Minimum Maintenance Standards for Municipal Highways*". Windlectric will ask the Township to enter into a separate agreement for the provision of winter road maintenance activities that are in addition to the regular winter road maintenance activities.

Windlectric plans to use either large counter-weighted traffic cones or coloured and counter-weighted barrels as barricades to prevent public traffic use of newly-constructed intersection improvements and by-passes. Windlectric acknowledges that there may be a period of time from when the intersection improvements are constructed to when the intersection improvements are required for the delivery of turbine components. It is during this period of time that the barricades would be required to prevent public usage of the increased roadway surfaces or by-passes. It is also acknowledged that this period of barricaded and idle time may be at the same time as winter storms with snow accumulation. The proposed controls referenced herein will be sufficient for use during winter months.

The project laydown area will be made available during winter control snow ploughing of roads as a dump location as long as the volume of the snow does not exceed 50% of the volume of the storm-water retention pond at the laydown area, as determined by the Windlectric site manager. Windlectric will be responsible to obtain the necessary approvals from all agencies with respect to a snow dumping area prior to any snow being placed in this area.

### 2.6.2 Half-Load Conditions

Windlectric is aware of the reduced load restriction of 5 tonnes per axle that are effective on Township roads from 1 March through 30 April each year due to By-law 2003-12, "*A By-law to Designate Dates for a Reduced Load Period for commercial vehicles or trailers on Municipal Highways*". Project erection activities are expected to be complete prior to the inception date for load restrictions.

## 2.7 Impact Mitigation

The following section outlines further specific mitigation measures that will be utilized to minimize the level of disruption, disturbance and inconvenience to the Municipality's residents and to reduce the potential impacts from Project activities. The following section provides details of unique mitigation and communication plans with respect to specific stakeholders, such as the school, agricultural traffic, public parking, and community events. A very important component of the overall Project impact mitigation will be the implementation effectiveness of the Communication Plan (Section 3), including the handling and resolution of any stakeholder concerns or complaints, the process for which is specifically detailed in Section 3.2.

### 2.7.1 Bicycle Traffic

- Informational materials with maps identifying construction road traffic routes will be provided at various locations in the community including the post office, museum, ferry terminal and others as described in Section 3 (Communications Plan).
- All site personnel will be warned to pay particular attention to cyclists during their mandatory site safety orientation prior to commencing work and will be periodically

reminded at daily morning site meetings. Daily morning site meetings are mandatory and will be used to disseminate new information and to re-enforce existing site rules. Sample representative content of the mandatory site safety orientation meeting is provided in Schedule 04 (Site Safety Orientation).

- All construction traffic will be instructed to be courteous to cyclists and to provide them the right of way in accordance with the site construction rules. Interaction between Project-related traffic and pedestrian and cyclist activity on the public roads will be governed by specific Contractor safety policies that will include the following measures whenever construction vehicles encounter pedestrians or cyclists on the public roads: (i) a maximum vehicle speed of 20 km per hour within 50 metres of a cyclist or pedestrian; (ii) a minimum separation of 2 metres when passing a cyclist or pedestrian, and (iii) construction vehicles will remain behind cyclists or pedestrians until it is safe to pass. It will be a policy of the Project contractor that failure to comply with these safety rules will be grounds for driver dismissal from the Project.
- Areas of active construction activity on private land will be off-limits to bicycle traffic and will be clearly indicated as such. Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites.
- If any cyclist has a complaint they should follow the complaint protocol set forth in Section 3.2 of the Operations Plan. If such complaint involves a specific construction vehicle, if possible, the complainant should provide the reference number posted on the construction vehicle so that Windlectric can better investigate the specific complaint.

#### **2.7.2 School Functions**

- Prior to the start of major construction, a coordination meeting will be scheduled with the school principal to review traffic management and safety plans.
- Regular meetings will be organized with the school principal or other designated representative(s) to provide advance notice of traffic routing and schedules. These meetings will be scheduled by mutual agreement and will occur as frequently as requested by representatives of the school.
- Construction work will be planned in order to mitigate any impact on special school functions and these mitigation plans will be communicated to the site personnel via the daily morning meetings leading up to the school functions.
- The school representative will be invited to attend the Project daily coordination meeting to communicate directly with site staff if they wish. School staff will have access to the site construction planning map referred to in Section 3 (Communications Plan). As soon as practicably possible, the school principal and any other school representatives so designated, will be oriented to the Project's Communication Plan, specifically those sections that relate to the two-way access to multiple channels for providing the Project team with feedback including: the Complaint Response Protocol, the CLC, and the CWG, email to the Project team at [Windlectric@amherstislandwindproject.com](mailto:Windlectric@amherstislandwindproject.com), or calling the Project's toll-free number at 1-844-379-7740.
- A calendar of scheduled school functions including but not limited to bus times, professional development days, parent nights, and theatrical productions will be posted in

a location of high visibility at the site health and safety trailer and reviewed regularly. Site management will bring attention to special dates as required.

- In the event of an unplanned school event such as school closure due to mechanical/electrical problems at the school or snow day, the school will have the direct cell phone numbers of the senior site management team who will immediately review construction planning for the day and respond reasonably, in relation to traffic management and safety.
- During transportation of the Major Turbine Components in front of the school, a traffic safety monitor will be positioned near the school entrance to ensure traffic flow is maintained and safety is regulated at all times. This traffic safety monitor will be in constant contact with the site manager and transportation coordinators.

### **2.7.3 Student Transportation**

- Presently, public school bus services on the island are provided by two 30 passenger buses for senior students and one bus for the Amherst Island School.
  - The senior student bus operates in the morning from 6:30 am to 7:00 am, with one bus on each side of the island, and then utilizes the public ferry to take the senior students to their school on the mainland. In the afternoon, the senior student buses return to the island at 4:00 pm.
  - The Amherst Island Public School bus travels on the island in the morning from 7:20 am to 8:25 am. The Amherst Island Public School drops off students between 3:30 pm and 4:35 pm.
- The site team will coordinate with school officials to ensure appropriate safety precautions are set in place for any construction activities which may impact student transportation.
- The TriBoard Student Transportation Service, who is responsible for the public school's bus services on the island, was contacted as part of the development of this Operations Plan. The TriBoard has requested that they be notified of any Road Closures at least one week in advance so that their drivers may make route adjustments. Weekly notification of Road Closures will be provided to the TriBoard as part of the Communications Plan. The Project team will co-operate with the TriBoard if any reasonable change is requested to this notification plan.
- There will be no impact to school buses on their way to the ferry in the morning and from the ferry in the afternoon, as any Road Closure on a school bus route on school days will be delayed until both school buses have passed (a Single Lane Restriction may be in place to initiate work). Furthermore, deliveries of Major Turbine Components will be scheduled to ensure that school bus service to and from the ferry will not be interrupted.
- The Windlectric project team will work with the Tri-County bussing contractor to ensure that in the event of a Road Closure during the afternoon, the delivering bus would execute a turn-around manoeuvre, using a conventional 3-point turn, but within an existing driveway/entrance feature associated with the last student drop-off nearest the start of the 'road closure' feature. This existing driveway/entrance feature may be found at a residence, an agricultural field or farm entrance. There is no need or intention to construct any new turn-around features within the road allowance.



#### **2.7.4 Agricultural Traffic**

- This section sets forth details regarding various aspects of the interaction between agricultural traffic and construction traffic. Despite the reference to those individuals responsible for such activities, all communications regarding the Project should be made in accordance with the Communications Plan set forth in Section 3.
- Types of agricultural traffic expected are transporters with animals, herds or flocks on foot, and farming equipment. Seasonal agricultural traffic will be taken into consideration in the day-to-day construction planning for the Project.
- The site team will communicate closely with farmers as per the Communications Plan, and will request advice as to the agricultural traffic to be expected. This information will then be coordinated with the construction management team during daily meetings and with the general site personnel during mandatory daily morning meetings.
- Agricultural traffic awareness training will also be provided to each worker during their mandatory pre-work site orientation meeting. This training will include detailed communicated to workers regarding the timing, types, size, location, speed and extent of agricultural traffic to be expected.
- The site Safety Supervisor will coordinate with local farmers to understand their individual needs and work to mitigate the impact. This will include providing farmers with phone numbers to call in advance of particular equipment movements as well as regular meetings.
- If a large piece of agricultural equipment such as a tractor or combine does encounter a construction transport vehicle, the construction vehicle will pull over as far as possible onto the shoulder and come to a complete stop to allow the farm equipment to pass. If there is still not enough room the construction vehicle will summon a pilot vehicle or spotter and back up to a suitable location where the farmer can pass.

#### **2.7.5 Vehicular Traffic to and From the Public Ferry Docks**

- This section sets forth details regarding various aspects of how Windlectric will ensure that construction traffic does not impede ferry traffic. Despite the reference to those individuals responsible for such activities, all communications regarding the Project should be made in accordance with the Communications Plan set forth in Section 3.
- Mainland: A traffic coordinator will be located on the mainland at all times that the Project barges are active to ensure construction traffic does not impede commuter traffic to and from the MTO public ferry on Highway 33. The mainland traffic coordinator will marshal traffic between Project parking areas and the Project's mainland dock.
- Island: A traffic coordinator will be located at the intersection of Front Road and the entrance to the Project's island dock at all times to control the timing of Project traffic travelling towards the public ferry dock area to ensure that construction traffic does not impact either ferry-bound traffic at the intersection of Front Road and Stella Forty Foot Road, or access to the pre-boarding area.
- The traffic coordinators will ensure that Project drivers are aware of protocols and all public traffic and safety implications. Also, during periods of heavy construction traffic activity, (i.e. delivery of Major Turbine Components) a traffic coordinator will also be located in these locations on a full-time basis. During all other periods, various other construction



contractor supervisors will be trained and responsible to act as traffic coordinators in the event such coordination is required.

#### **2.7.6 Parking and Public Ferry**

- There will be sufficient parking areas at the Project's mainland dock and staging yard for construction traffic preparing to board the construction barge. This provision avoids traffic congestion on Highway 33.
- After construction of the Project's island dock, no construction vehicles will be permitted to use the MTO public ferry or to park at either the island or mainland MTO public ferry terminal parking area.
- Site construction personnel will park on the mainland and be bussed to/from the Project's mainland dock, transit to/from Amherst Island on Project barges, and to/from the Project's island dock to the laydown area. Crew trucks and vans will be used on the island for personnel carrying tools and other equipment.
- Windlectric and its subcontractors may use the MTO public ferry for non-construction traffic to and from Amherst Island including, without limitation, for project management, consultants, surveying, planning, engineering, and compliance monitoring personnel. This usage is expected to generate average usage on the order of 10 – 12 vehicle round trips per day.
- Work vehicles and equipment brought to the island for crew and equipment transport will be parked at the site trailer offices, the construction laydown areas, and at work areas during the construction period. Construction equipment will also be parked at turbine sites and on private access roads during the construction period.

#### **2.7.7 Community Events**

1. The Project team is aware of the community events listed in Schedule 12 ("Amherst Island Community Events").
2. No construction activities are permitted for any Sunday.
3. No construction activities will be conducted after 8:00 pm, unless permitted pursuant to a specific exemption from the Loyalist Township "Noise Bylaw". Exemptions from such by-law are expected to be limited in number, scope and duration and relating to activities at turbines (that are more than 550 metres from any residence) or substation (which is more than 400m from any residence).
4. Processions related to special church services (i.e. weddings and funerals) should be coordinated by contacting the Windlectric Site Manager at (613) 985-4466 or the Project's toll-free number at 1-844-379-7740. The Project team will take reasonable steps to minimize (the goal will be to eliminate) the impact of traffic disruptions on these processions if sufficient advance notice is received.
5. As Windlectric staff become aware of special church services, or other community events not listed on Schedule 12 and known as of the publication date of this Operations Plan, the Project team will take reasonable steps to minimize the Project impact on these events.
6. In all cases, and to the extent possible, Windlectric staff will respond to persons involved in public community events in order to fully understand the timing and

location implications of the event (i.e. parking, traffic routes, etc.), such that construction activities can be re-scheduled or otherwise planned to minimize the impact on these events to an extent that is reasonably possible.

7. A comparison of the current planned schedule for the Project Construction and known community events indicates the following overlaps that are mitigated as follows:
  - a. To ensure that there is no interference with the Fish Fry at St. Paul's Presbyterian Church on September 3, 2017, the Project will not use Stella Forty Foot Road on this date after 3:00 pm.
  - b. The Walling and Carving workshop on Saturday, October 21 is not located near any planned Project activities except Delivery of Major Turbine Components to S30, S26, S18 and S23. Delivery of Major Turbine Components along Front Road to these sites will not be performed on Saturday, October 21.
  - c. To ensure there is no interference with St. Paul's Christmas Bazaar on Saturday, November 18, 2017, the Project will not deliver Major Turbine Components along Front Road on this date.

#### 2.7.8 Wells

Shore wells and associated water lines occur along South Shore Road and a portion of Front Road. The Township has only limited information on service lines within the road allowances. Prior to the start of construction, Project staff will endeavor to locate any such facilities by consulting with homeowners along these routes and physical inspection.

When electrical collection line installation crosses such water lines, vacuum excavation techniques will be used to expose the water line. If a water line must be cut for Project installation, or in the event of accidental damage, Project will repair any damage to equal or better conditions. The Project will also have sources of potable water available to provide in the event of a service disruption.

No damage is expected to water lines from construction traffic. In the event of known water line burials that are extremely shallow, the Project will evaluate placement of steel plates on the roadway surface (with appropriate signage) or other mitigation measures for protection of the water lines. The Project recognizes that steel plates may not be used at the road surface in the direction of travel during winter control conditions.

Similarly, no damage is reasonably expected to existing dug or drilled wells from construction activities as a result of Project construction activities.

If a water line must be cut for Project installation, or in the event of accidental damage, Windlectric will repair any damage to equal or better conditions and will ensure that there are no buried joints under the travelled road surface. Note this obligation will require a Road Closure and/or a Single Lane Restriction for any line so cut or damaged. It is anticipated that shore wells will include a water line, an electrical heat tracing line, and power supply electrical cable. It is also anticipated that water supply interruptions will be minimized by advanced preparation prior to the approaching collection circuit trenching activity by (i) consultation with landowners to confirm line location, (ii) excavation of a trench in the vicinity of the shore well water line using hydro-vac, hand-digging or some other related

technique to avoid damage, transverse to the direction of the road and the collection circuit trench, (iii) preparation of a bypass line with splices outside of plan view bounds of the road surface, (iv) the shore well services cut, collection system placement and bedding, re-establishment of the new shore well services line(s), and finally (v) the back-filling of the trenches.

No material excavated using a hydro vac will be reused for backfill. Backfill will be by conventional methods only.

## **2.8 Enforcement of Speed Limits and Traffic Management Plan Training**

The Site Safety Supervisor will have the authority and responsibility to ensuring that all Project staff comply with public and Project-specific speed limits, and obey traffic rules in accordance with the Operations Plan. The Project's employee training procedures and enforcement policies are described in Section 4.4 ("Employee Training and Enforcement").

As noted in Section 3.3.12 of Schedule 02, a mobile radar-based speed tracking system (Traffic Logix SafePace Cruiser or equivalent) will be deployed in varying locations around the island during Project construction to increase awareness of travel speeds.

## **2.9 Hours of Operation**

Construction activity will take place within the time periods specified in the Municipality's noise bylaw 2011-6 (as amended by bylaw 2012-046). There are, however, limited circumstances when activities related to the Project may occur outside of these hours. Windlectric will seek an exemption from such by-law in the limited circumstances where it may be required.

## **2.10 Construction Noise Mitigation**

Sources of noise from typical wind farm construction activities include, but are not limited to:

- Foundation construction - excavators, loaders, steel transport on flatbed trucks, concrete trucks, concrete tele-belt or pump trucks, dewatering pumps, crane, compaction equipment, mechanical rock breakers, portable light plants, and blasting;
- Road construction - bulldozers, loaders, motor graders, gravel trucks, smooth drum and sheep's foot rollers, and portable light plants;
- Trench construction – excavation by trencher, excavator, or vacuum truck; trucks for cable delivery and placement; loader and compaction equipment for backfilling; directional boring machines and materials delivery, and portable light plants;
- Electrical installation – delivery trucks, hydraulic crimping equipment, generators, and portable light plants; and
- Wind turbine erection - multiple cranes, impact wrenches, hydraulic pumps for tower bolting equipment, electrical generators, and portable light plants.

Noise during construction will be unavoidable, but the contractor will take all reasonable measures consistent with prudent wind energy practice in order to mitigate noise impacts. Such efforts include:

optimizing work practice efficiency to reduce equipment run times, controlling the amount of re-work through the use of quality controls, ensuring all equipment is serviced and operating properly, and ensuring all regulatory compliance noise suppressing equipment is installed and functional by performing regular equipment inspections and audits.

Prior to electrical collector system trenching work along public roads near households, the trenching crew foreman will personally visit each residence in the day's work area to make sure occupants are aware of the pending activity, and to provide a description of the anticipated activities and their duration. This day-of-the-work courtesy notice will be in addition to notices provided in accordance with Section 3 (Communications Plan) of this Report.

The construction schedule will be set to ensure that construction noise does not interfere with the annual Emerald Island Music Festival. This Festival is located at 12675 Front Road and is generally scheduled for the first weekend following the August long weekend (next summer's festival is August 11 to 13, 2017). The location of the festival is 1,800 metres from the nearest potential construction activity. At this distance, the construction work will be barely audible but to reduce general disturbance the contractor will avoid particularly noisy activities at the nearest turbine (S01, S29 and S04) during these days.

### **2.11 Road Dust Control**

A water truck will be on-site full time once road construction begins until completion of construction activities. The water truck route and water spraying activity will be planned based on road conditions and the work planned for the day. The water truck will also be dispatched to locations where additional dust control is required. All water for construction purposes will be drawn from Lake Ontario at approved locations. The Project will consider the use of calcium chloride application for dust control as it may be applicable or effective in some cases.

The concrete batch plant will be equipped with Best Available Control Technology (BACT) to control fugitive dust from normal operations and meet all applicable law and permit requirements. Conveyors used for stockpiling aggregate materials will employ dust collection systems including discharge chutes to mitigate fugitive dust. Water will also be used at the batch plant and on stockpiles to suppress dust. The contractor will make routine inspections and prepare an audit including dust mitigation measures being employed on the Project. This audit of environmental controls will identify if a control measure is in place and functioning and if corrections identified from previous inspections have been completed. This audit will be included with the inspections of Erosion and Sediment Controls and shared with the Municipality's Engineer. The Township's Engineer will have the inspection schedule and may witness any and all inspections at his or her discretion.

### **2.12 Impact to Trees and Vegetation Within Municipal Road Allowances**

Trees in the public road allowances may be impacted by specific Project-related activities including: (i) installation of the electrical collector system, (ii) removal of trees located at turns in the road that will interfere with Major Turbine Component Deliveries, (iii) removal of trees located at entrances to new turbine access roads, and (iv) trimming of overhanging branches that are expected to interfere with Major

Turbine Component Deliveries. The revised arborist's report regarding tree removals, which is based on the updated alignment and configuration of the electrical collector system, is included as Schedule 13 (Tree Removal in Municipal Road Allowances) and illustrated in Figure 8 below. Any Emerald Ash Borer affected tree material will be removed in accordance with the applicable Canadian Food Inspection Agency guidelines.<sup>5</sup>

**Trees and the Electrical Collector System:** The trees along the electrical collector path in the public road allowance were reviewed by a professional arborist, and the location (particular side of the road) of the electrical collector system was adjusted in order to minimize damage to the roots of existing trees in the public right-of-way. Directional boring will be utilized in the area of St. Paul's Church in order to avoid detrimental impact to the trees on either side of Stella Forty Foot road. As a result of these electrical collection system design choices, only one tree must be removed to facilitate electrical collector system installation. The Project will obtain a tree permit for the tree to be removed if required by the Loyalist Township's Tree By-Law and tree replacements will be made in accordance with such tree removal permit.

Directional drilling at the St. Paul's Church hill location on Stella 40 Foot Road will be achieved via conventional directional boring machinery. The crew will first excavate entry and exit pits at each end of the bore. Two bores will be driven and HDPE sleeves will be pulled back to the drilling face side. Each of these two HDPE sleeves will be populated with 1250 MCM XLPE 34.5 kV 'collection system' cabling, a stranded copper grounding conductor and a fibre optic line. Each bore will be approximately 325 metres in length. Entry and exit pits created to facilitate the bore will be re-instated to as-found, pre-boring conditions.

The Project will obtain a Tree Permit from Loyalist Township for each tree greater than 15 cm diameter as measured at chest height that the arborist determines may experience 'Moderate' negative impact from electrical collector system installation if required by the Loyalist Township's Tree By-Law and will plant replacement trees in accordance with such permit(s).

**Tree Removal To Allow Major Turbine Component Deliveries and at Access Road Entrances:** A list of trees within the public road allowance that will be removed due to the Project's turbine delivery or access road construction activities is also provided in Schedule 13 (Tree Removal in Municipal Road Allowances). Most of these have a diameter of greater than 15 cm diameter at chest height, but some smaller trees are included in the report. These trees will be removed to allow either Major Turbine Component deliveries or construction of the private access roads to turbine sites. The Project will obtain a tree permit for each tree removed if required by the Loyalist Township's Tree By-Law and tree replacements will be made in accordance with such tree removal permits.

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<sup>5</sup> Available at [www.inspection.gc.ca/plants/plant-pests-invasive-species/insects/emerald-ash-borer/faq/eng/1337355937903/1337356019017](http://www.inspection.gc.ca/plants/plant-pests-invasive-species/insects/emerald-ash-borer/faq/eng/1337355937903/1337356019017)

Figure 8 - Tree Removal in Municipal Road Allowances

**Tree Trimming to Allow Delivery of Major Turbine Components:** The Major Turbine Component delivery trucks require a height of up to 5.7 metres and a width of 4.4 metres for zero clearance travel in a straight line as outlined in Schedule 01 (WTG Component Delivery Dimensions). A Certified Arborist shall review the travel routes and prune trees with branches that enter into the traveled roadway as necessary to achieve required horizontal and vertical clearances for the deliveries that will transit that route. If any tree requires removal due to pruning, that tree shall be identified prior to pruning to Windlectric and they will notify the Township.

The Project will obtain a Tree Permit from Loyalist Township for each tree that is greater than 15 cm diameter as measured at chest height that the arborist determines may experience 'Severe' or 'Moderate' negative impact due to trimming, if any. The Project will plant replacement trees in accordance with such permit(s).

The following locations have tree cover which will be measured for transport clearance to further assess the need for tree trimming:

- Front Road approximately:
  - 930 m west of Stella Forty Foot Road
  - 720 m west of Stella Forty Foot Road
  - 225 m east of Stella Forty Foot Road

- 290 m east of Stella Forty Foot Road
- 536 m east of Stella Forty Foot Road
- Foot of Preston Cove
- 700 m west of Lower Forty Foot Road
- Intersection with Lower Forty Foot Road
  
- South Shore Road approximately:
  - 230 m east of Stella Forty Foot Road
  - 450 m east of Stella Forty Foot Road
  - 550 m east of Stella Forty Foot Road
  - 700 m east of Stella Forty Foot Road
  - 1450 m east of Stella Forty Foot Road
  
- Third Concession Road approximately:
  - 600 m west of Stella Forty Foot Road
  - 840 m west of Stella Forty Foot Road
  - 3750 m west of Stella Forty Foot Road
  
- Second Concession Road approximately:
  - 850 m west of Stella Forty Foot Road
  - 1150 m west of Stella Forty Foot Road
  - 2400 m west of Stella Forty Foot Road
  - 2700 m west of Stella Forty Foot Road
  - 4540 m west of Stella Forty Foot Road
  - 5450 m west of Stella Forty Foot Road
  
- Stella Forty Foot Road approximately:
  - In the vicinity of St. Paul’s Presbyterian Church

### 2.13 Cultural Heritage Features

The mitigation measures related to Cultural Heritage Features described herein are based upon the recommendations of the Heritage Assessment Report (as modified by REA Amendment 4), the further recommendations of the Ministry of Tourism, Culture and Sport. The Heritage Assessment Report is available on the Project website<sup>6</sup>.

The Cultural Heritage Features exposed to Project activities are:

<u>Cultural</u>	<u>Heritage</u>	<u>Location</u>	<u>Item</u>
<u>Landscapes (CHL)</u>			
CHL 1		Village of Stella	Related structures
CHL 3		St. Paul’s Presbyterian Church	Related structures

<sup>6</sup> [www.amherstislandwindproject.com](http://www.amherstislandwindproject.com) (the Heritage Assessment Report can be accessed on the web site under the ‘Approvals’ drop-down, by selecting the ‘Final Renewable Energy Approval Technical Documents’ link).

<u>Built</u>	<u>Heritage</u>	
CHL 4	Ferry Landscape	Related structures, vista
<u>Resources (BHR)</u>		
BHR 1	1830 South Shore Road*	Structure
BHR 2	2090 South Shore Road*	Structure
BHR 3	2450 South Shore Road	Structure
BHR 4	3500 South Shore Road	Structure
BHR 5	4125 South Shore Road	Structure
BHR 6	2750 Front Road	Structure
BHR 7	3190 Front Road	Structure, stone fence
BHR 19	3475 Second Concession Road	Structure
BHR 20	4725 Second Concession Road	Structure
	5170 Front Road	Structure
	5555 Front Road	Structure

\*Mitigation not required for these features per the Heritage Assessment Report

Note that 5950 Second Concession Road is also noted in REA Condition M1 as a Built Heritage Resource, but is not located on a project haul route, for Project Heavy Load traffic, and therefore will not be monitored.

Dry stone walls include those at

- Intersection of Emerald Forty Foot Road and Second Concession Road
- 3190 Front Road
- 3850 South Shore Road
- 570 Front Road
- 2400 Front Road
- 2750 Front Road
- 12405 Front Road
- 12515 Front Road
- 12675 Front Road
- 13555 Front Road

The general preventative and mitigation efforts related to the Cultural Heritage Features within the Project study area are detailed in Section 2.13.1 (General Preventative and Mitigation Efforts) below. Specific preventative and mitigation measures with the monitoring program for each of the cultural heritage features that are expected to be exposed to Project activities will be performed in accordance with the Schedule 05 (“Renewable Energy Approval Condition M”) and Schedule 17 (“Cultural Heritage Feature Monitoring Program”), respectively.

The recommendations of the Ministry of Tourism, Culture and Sport to mitigate Project-related negative impacts to Cultural Heritage Features are summarized in the Heritage Assessment Report and provided below for reference:

*In order to lessen or avoid potential indirect negative impacts from construction vibrations on BHRs 4, 5, 6, 19, 20 and 21 and components of CHLs 1 and 3, the following recommendations have been made:*

- *Project activities should be avoided within 50 m of identified BHRs and any structures or buildings within identified CHLs.*



- *If Project activities within a 50 m buffer zone cannot be avoided, maximum acceptable vibration levels, or peak particle velocity (PPV) levels, should be determined by a qualified engineer with previous experience working with built heritage resources under similar circumstances.*
- *Project activities within the 50 m buffer zone should be monitored to ensure that PPV levels are not exceeded.*
- *Photographically record condition of burial vault and monitor its physical condition during construction process;*
- *All Project activities should cease immediately if levels are exceeded, or changes to resources occur, until a solution can be determined.*

*With respect to the dry stone walls associated with BHRs 7 and 18, the following recommendations have been made:*

- *It is recommended that Project activities be avoided within a 50 m buffer zone of any dry stone walls.*
- *In the event that Project activities cannot be avoided within 50 m of any dry stone wall, the wall should be documented prior to the commencement of said activities.*
- *The stone wall should be assessed periodically by a qualified individual during Project activities to ensure that no damage is occurring.*
- *Project activities should cease immediately if vibrations are found to be resulting in damage until the wall can be adequately reinforced or supported.*
- *The stone wall should be evaluated by a qualified mason or engineer following Project activities to ensure that no damage has occurred and any damage to the wall should be repaired immediately following Project activities.*

*Finally, prior to construction of shoreline Project infrastructure, views from the Ferry Landscape should be more thoroughly documented, particularly towards the proposed locations of new permanent and temporary infrastructure. This documentation should include, at the very least, a photographic record of existing conditions and views<sup>7</sup>.*

Additionally, the Project has committed in the Road Use Agreement to protect seven stone walls identified as 360 MacDonald's Lane, 6345 and 9000 Second Concession Road, 4000, 5675, 15095 Front Road, and 5830 Front Road. As with the other resources discussed above, details of the monitoring and protection program for these features is also provided in Schedule 17 ("Cultural Heritage Monitoring Program"). Mitigation details will follow those outlined in Schedule 05 ("Renewable Energy Approval Condition M"). Should Project activities cause damage to a stone wall, repairs will be carried out by a qualified and professional dry stone wall mason.

### **2.13.1 General Preventative and Mitigation Efforts**

The locations of the historically-significant sites identified in: (i) the Heritage Assessment Report, (ii) the Amherst Island Wind Energy Project Irish Stone Fence Detailed Review, and (iii) those specific locations identified in the Road Use Agreement<sup>8</sup>, will be indicated on the site map issued to all site

<sup>7</sup> The views from the Ferry Landscape have been photographed prior to the issuance date of this Operations Plan.

<sup>8</sup> Specifically, 360 MacDonald Lane, 6345 and 9000 Second Concession Road and 4000, 5675 and 15095 Front Road, and stone walls erected as part of the Stone Wall Festival at 5830 Front Road.

personnel and on the detailed construction drawings for the Project. Appropriate signage or warning flagging will be installed at any of these sites that would reasonably be expected to be impacted by Project activities in order to bring them to the attention of site personnel working in proximity to the site. The contractor's site quality representative will audit these flagged sites on a regular basis to ensure all required signage is in place.

All site construction personnel will receive training during site orientation on the specific Cultural Heritage Features and protected properties located on the island, the importance of protecting these features, and the mitigation procedures and systems put in place to protect them.

A qualified consultant will periodically give an informational presentation to all site personnel in order to provide context to the heritage features of concern and thereby deepen construction personnel's understanding of the cultural features.

In the cases where the Heritage Assessment Report has indicated that there are potential effect(s) from vibration related to Project activities that will occur within a 50 metre buffer zone around a Cultural Heritage Resource, the maximum acceptable vibration level at such Cultural Heritage Resource will be determined by a qualified engineer with appropriate professional designation and experience prior to the start of Project activities. Each of these potentially affected Cultural Heritage Resources will be photographically recorded prior to commencement of any work in the area.

Peak Particle Velocity (PPV) vibration levels will be monitored and logged around a Cultural Heritage Resource during Project activity within a 50 metre buffer zone around a Cultural Heritage Resource by a qualified vibration analyst to ensure established thresholds are not exceeded in accordance with Schedule 17 (Cultural Heritage Feature Monitoring Program). The contractor will cease construction activities if PPV levels are exceeded and will alter construction activities to ensure compliance with PPV levels. The contractor will also periodically visually monitor these structures during periods when Project activities are taking place within the related 50 metre buffer zone to ensure no damage is occurring. A qualified mason or engineer with appropriate expertise will visually evaluate the stone structures before and after Project activities to ensure that no damage has occurred; any damage will be recorded, reported and repaired by a qualified professional.

Baseline vibration studies will be performed at a location (or locations) away from any Cultural Heritage Feature to determine typical PPV vibration levels produced by: (i) electrical collector cable trenching activities, (ii) road work, and (iii) construction traffic. The studies will be carried out at location(s) representative of typical road and geotechnical structures to determine PPV vibration levels at different distances from the road. For the traffic-related PPV studies, expected vibration levels will be studied using loaded concrete and aggregate trucks at various speeds.

The Project will comply with the requirements of condition M of the REA issued for the Project attached as Schedule 05 (REA Condition M).

## 2.14 Drainage, Grading and Fencing

Windlectric has studied potential hydrologic impacts associated with the construction and operation of the Project. This work has reviewed the surface topology, cover permeability, and drainage infrastructure that will exist for affected drainage basins within the Project's extents during various stages of the Project's life cycle (conditions currently existing, during construction, and proposed). The studies conclude that the relative lack of change in impervious cover presented by the Project (both during construction and in its final form) and the resultant total drainage within local catchments will result in insignificant changes in or impacts to either the quality or the quantity of surface water runoff and/or groundwater discharge within the Project area.

Schedule 20 ("Stormwater Management Plan Report") provides full documentation for the studies conducted relative to the initial stages of the Project (Island dock, access road, and central staging area) and a technical memo from Stantec, Ltd. summarizing their draft study findings for the balance of the Project facilities located on Amherst Island.

The final study for the balance of the Project facilities is nearing completion and will be provided to the Township when it is finalized. Relevant portions of that study will form part of the Fill Permit application process for each private land access road. The technical memo summarizes review of thirty-two catchment areas delineated to encompass all Project infrastructure. Evaluation of those catchments for impervious fill conditions that are currently existing, will exist during construction, and will exist post-construction of the Project using the techniques employed for the initial two studies supports a conclusion that development of the Project will have negligible impact on the hydrology of the area and receiving stormwater systems.

The technical memo summarizes:

*"Owing to the dispersed characteristic of the proposed wind farm, with infrastructure distributed at very low density across a large area, it was concluded that both the relative lack of change in impervious coverage associated with the proposed development and the resultant total impervious coverage within the local drainage catchments are sufficiently limited as to not impact the pre-development hydrologic characteristics of the area during construction or longterm operation of the Project, including any impact to the drainage features associated with the existing public road network. There should be negligible change/impact on the quality and/or quantity of surface water runoff and/or groundwater recharge and, therefore, there is no requirement for the implementation of formal stormwater quality or quantity controls."*

During construction, best management practices will be utilized to control erosion and sediment runoff from Project work areas while maintaining drainage as per the Condition H of the REA (attached as Schedule 06 (REA Condition H)). Condition H of the REA imposes substantive requirements related to storm water management upon the Project. Windlectric will share any documents produced pursuant to Condition H of the REA with Loyalist Township. Typical erosion and sediment control details for the Project are attached in Schedule 07 (Erosion and Sediment Control Typical Details).

Windlectric will apply for a fill permit for each new access road and turbine location, and for other elements of the Project (e.g. Project laydown yard and the Project island substation), as required by Loyalist Township By-Law 2003-22 ("A bylaw to prohibit or regulate the placing or dumping of fill or the alteration

*of the grade of land in Loyalist Township*”) to ensure that impacts to drainage from alterations to grade are properly designed, and that Loyalist Township has the opportunity to review such designs prior to construction of the related Project work in order to be assured that impacts to both adjoining properties and to the the public drainage system have been reasonably minimized.

Windlectric will retain the services of a professional environmental monitor to ensure that the contractor has the required erosion and sediment controls put in place and ensure they are constructed per the contractor’s approved engineered plans. A weekly audit of all drainage, erosion and sediment controls will be conducted by Windlectric’s environmental monitor and the contractor to ensure these controls are installed per the plans and are maintained continuously. The Township’s Engineer may choose to witness these inspections and provide reasonable direction for improvements. The Township’s Engineer’s directions will be forwarded to the contractor’s engineers for review and approval. Once approved, the contractor will implement them.

Existing culverts may be bridged or reinforced prior to Project work. Drawings of any such reinforcement will be provided to the Township for review prior to execution.

Impacts from construction activities to private fencing and other private improvements (e.g. signage) located within the public road allowance will be avoided to the extent reasonably possible. Whenever impacts to fencing cannot be avoided, the fence line will be moved temporarily to the boundary of the road allowance to maintain continuity with yard fencing as needed to maintain equivalent security to the property it surrounds. Following construction activities, a fence with the same or superior quality will be installed on either the original fence line, or at the Road Allowance boundary at the discretion of the Township.

## **2.15 Village of Stella, the Ferry Landscape, St. Paul’s Presbyterian Church, and the Catholic Cemetery**

The specific efforts and preventative measures planned to mitigate impacts on the historic Village of Stella, the Ferry Landscape, St. Paul’s Presbyterian Church, and Catholic Cemetery are encompassed in the mitigation efforts described in Section 2.13.

Project design has eliminated any Project infrastructure within the Village of Stella and Project execution planning has eliminated all Heavy Load traffic passing through the Village of Stella other than for delivery of Major Turbine Components for four of the twenty-six individual wind turbines comprising the Project.

Ferry Landscape was documented in a report to the MOECC in November of 2015.

Potential impacts to St. Paul’s Presbyterian Church and its surrounding area have been further mitigated by a) Project’s commitment to use directional boring techniques for installation of the electrical collector system along Stella Forty Foot Road in front of the church and b) design of specialized transport equipment to eliminate the need for any adjustment to vertical grade of Stella Forty Foot Road in the vicinity of the church.

The Catholic Cemetery is located at Front Road Lot 5. The only permanent Project infrastructure in this area is the buried electrical collection system. As noted in the heritage assessment report, no negative impacts are expected at this location.

## 2.16 Ferry Operations

The Project's barge operators shall be required to manage the Project's water-based activities in such a way to ensure that operations of the public ferry are not delayed. Radio communication and coordination between the barge operator and the ferry captains will ensure that there is no impact to the ferry schedule. The contractor's barge operator will be required to meet with the public ferry's captain in order to review Project barge operational and communication procedures. The *Collision Regulations chapter 1416 of the Canada Transport Act* will govern the communication and sharing of the waterway between the various vessels.

Specific commitments made by the Project to minimize impact to resident's use of the MTO public ferry include:

- The Project's island dock construction contractor will ensure that its use of the public ferry will cause no delay of or restriction to the public use of the ferry, and will ensure that the public ferry is able to offload and reload without delay to its schedule caused by the contractor.
- After construction of the Project's island dock, no construction vehicles associated with the Project will be permitted to use the public ferry or to park at either the island or mainland public ferry terminal parking area.
- Site construction personnel will park on the mainland and be bussed to/from the Project's mainland dock, transit to/from Amherst Island on Project barges, and to/from the Project's island dock to the laydown area. Crew trucks and vans will be used on the island for personnel carrying tools and other equipment.

Note that Windlectric and its subcontractors may use the MTO public ferry for non-construction traffic to and from Amherst Island including, without limitation, for project management, consultants, surveying, planning, engineering, and compliance monitoring personnel. This usage is expected to generate average usage on the order of 10 – 12 vehicle round trips per day.

## 2.17 Electrical and Phone Interruptions

Reasonable efforts in accordance with prudent construction practice will be undertaken to ensure electrical and phone service interruptions are avoided wherever possible, and minimized where absolutely necessary. Affected residents will be notified at least three days in advance of any planned outage. Windlectric will work with HONI and Bell Canada in accordance with the protocols of those entities for necessary planned outages related to raising lines and other activities necessary to facilitate construction of the Project.

Windlectric will promptly notify the public of any unplanned outage using: (i) the Project's Twitter feed, (ii) the Project's Facebook site, and (iii) by notifying the local Amherst Island radio station. The Township will also be notified by phone or email of any such unplanned outage. Any unplanned outage will be repaired and returned to service as rapidly as is possible.



### 3 Communications Plan

Efficient and prompt communications will be a fundamental requirement for good relations and effective coordination between the various Project stakeholders on the Island and within the Township as a whole. This Communications Plan describes the means and methods that will be used by Windlectric to communicate Project activities to the public, and in particular communications as to any activities that may disrupt, disturb or inconvenience the Municipality's residents. The Communication Plan will use multiple channels including the internet, social media, radio, and weekly mail flyers to ensure that the Municipality's residents are able to access updates using various means that different residents find most convenient.

The Communications Plan will also ensure communication between the Project and the public is bidirectional. The public will be able to access multiple means of providing the Project team with feedback or advising them of concerns, including:

- the Complaint Response Protocol outlined below,
- access to the Community Liaison Committee (the CLC) and the Community Working Group (the CWG),
- email to the Project team at [Windlectric@amherstislandwindproject.com](mailto:Windlectric@amherstislandwindproject.com), or by
- calling the Project's toll-free number at 1-844-379-7740.

Elements of the overall Communications Plan are further detailed below.

#### 3.1 Municipality and Resident Notices

A construction activity map will be produced on a weekly basis to provide a simple visual description of which roads will be impacted by Project activity during the upcoming week. The map will identify trenching, aggregate deliveries, concrete deliveries and component deliveries with separate colours. The construction activity map will be updated weekly and will be made publicly available through the Project website ([http://amherstislandwindproject.com/site\\_main/](http://amherstislandwindproject.com/site_main/)), the Project Facebook page (<https://www.facebook.com/search/top/?q=amherst%20island%20wind%20project>), and Twitter (@Amherst\_WindP). The weekly construction activity map will also be mailed as a flyer to Amherst Island residents.

Daily reminders of expected Traffic Interruptions, Single Lane Restrictions, and Road Closures will be issued via the Project website, the Project Facebook page, and Twitter (including tweeting at YGKTraffic). The Project team will also ensure that the school, the TriBoard student transportation services, and EMS personnel have available the latest Project information and website updates. In addition to the social media feeds, the local radio station will also be provided with communication from the site construction management in order to relay it to listeners.

A general photographic information brochure on the nature of each type of construction activity will be produced and made available to the public on the Project website.

Windlectric has assembled a committee of representatives from the island and surrounding community to act as the Community Liaison Committee (the CLC). This committee will review the log of all complaints

and the resolution of these complaints. The CLC will convene at least 2 meetings per year that will be open to observation by the public. The CLC meetings will be augmented by a Community Working Group (the CWG) that will meet monthly in between the CLC meetings. The CWG meetings will not be open to the public so that members of the group will feel comfortable expressing their views frankly and openly. The CWG will be composed of the CLC members and will be joined by additional parties as the CWG may invite (e.g. the Project contractor, the Project's management team, emergency services, subject matter experts, etc.). The CLC and CWG can be accessed by sending an email to the Project website (such email will be forwarded to the members of these committees).

### **3.2 Complaint Response Protocol**

- Written complaints during construction will be accepted by the Project team via email at [Windlectric@amherstislandwindproject.com](mailto:Windlectric@amherstislandwindproject.com). Each complaint will be transferred to a Complaint Form by Project staff, and logged. A sample complaint form is provided as Schedule 15 ("Sample Complaint Form").
- All telephone complaints received by the Project team will be transferred to a Complaint Form and logged. Information will include complainant name, time, location and description of complaint. The Complaint Form will also record the Project Team's response to the complaint including what will be done, if appropriate, to mitigate the issue.
- The Project team will acknowledge each and every complaint within one business day of receipt, and will work to a service level response of five business days for either a full or initial response. Some complaints may not receive a fulsome answer within the five business days due to either the complexity of the required response, and/or the availability of subject matter experts.
- The construction team will make every reasonable effort to resolve all complaints in a timely manner.
- Complaints received, and the response provided, will be posted to the Project's website on a monthly basis. Individually identifiable information will be redacted in these postings.
- Complaints that require immediate action (e.g. a driveway inadvertently blocked by construction activities) can be directed to the Windlectric Site Manager by calling either (613) 985-4466 or the Project's toll-free number at 1-844-379-7740. Any such complaints will be addressed in an expedited manner.

### **3.3 On-site Staff**

- Windlectric will establish a physical office on Amherst Island when construction activities on the island resume.
- A dedicated site execution team comprised of construction contractor and Windlectric representatives will be on the island on a daily basis while Project work is underway.
- A two-person security detail will be present on the island Project site overnight, and during holidays and weekends, to ensure round-the-clock response to emergency situations. This security detail will be present during the following construction activities: i) road restoration, maintenance, and re-construction as necessary; ii) electrical collector line



construction; (iii) island electrical substation construction; (iv) turbine component delivery; (v) turbine erection; (vi) turbine mechanical completion; and (vii) turbine and wind farm commissioning.

- The site team will establish a regular time slot for meeting with the Township. This will be a scheduled meeting at the construction site office or another suitable location with at least two members of the construction management team in attendance. These meetings will be documented and minutes will be issued.
- Urgent or emergency issues will be received by the site construction management team at any time.

## 4 Public Safety Plan

### 4.1 Emergency Services

- Construction planning will ensure that Emergency Services (ES) will have access to all residences at all times during construction. Each Road Closure, and its related detour route, will be communicated to Emergency Services at least one week in advance. Road Closures will not be left in place overnight.
- All Single Lane Restrictions will ensure that a minimum 3 metres width<sup>9</sup> is maintained for public traffic in order to ensure that emergency service vehicles have room to pass; flag-staff at Traffic Interruptions will give priority to Emergency Services vehicles.
- If any emergency service vehicle is called to a particular location on the island, the ES team will be able to contact the contractor's site representative who, upon request, will
  - stop all contractor work or deliveries on Township roads throughout the Project,
  - ensure all trucks and other equipment except those in the immediate vicinity of a Road Closure are moved off the Township roads, and
  - offer to provide guidance to ES regarding any detour routing necessary to reach the site of the emergency.
- The contractor's safety supervisor will be available for weekly meetings with ES personnel to discuss any ongoing or upcoming activities and potential concerns. ES will be advised of the construction activities scheduled for the following week and ES will have the opportunity to propose revisions or additions to the Public Safety Plan, the contractor's Health and Safety Plan, and the Emergency Response Plan.
- ES will have access to the emergency radio frequency and radio equipment (if necessary) that will be used by the contractor and will have the authority to cut in at any time in order to direct traffic in an emergency situation.
- ES personnel will be invited to speak at the Plan of Day (POD) coordination meeting to ensure all Project personnel fully understand the emergency response plans and systems in place on the island. This information will also be presented to site personnel during their mandatory site orientation.
- All contractor vehicles will be equipped with fire extinguishers and all vehicle operators will be trained in the use of this equipment.
- All contractor vehicles will be equipped with first aid kits and contractor personnel will be trained in first aid application.
- The contractor's safety supervisor or their designee will be on site and available at all times that construction activities are ongoing. In the event of an emergency he/she will be able to communicate with all site personnel via a dedicated safety channel on radio communication. Each work site will be equipped with at least one radio.
- Access roads to primary Project facilities (turbines, substation, etc.) will be marked with signage for locating purposes. When civic addresses are assigned, they will be posted to site signage.

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<sup>9</sup> The largest emergency vehicle width on the island has been measured to have a width of 2.5m.

#### **4.2 Public Health and Safety Plan**

Safety will be the top priority every day, for all Project staff on site. Field personnel and work crews are trained to provide themselves with a safe workplace and to plan their work with safety as the top priority including public safety when worksites overlap with public spaces.

The contractor will be responsible for executing Project work activities in a safe manner and for implementing the Public Health and Safety Plan on a day-to-day basis in accordance with the applicable regulations. In addition, Windlectric will have full-time safety management personnel on-site when Project work is ongoing to monitor the performance of all contractors and stop any potentially unsafe work immediately. The municipal engineer engaged by Loyalist Township, if present on site, will also have the authority to direct work stoppages to address public safety concerns.

The public will not be permitted to access active construction areas either on private and municipal property. Public safety will be maintained through implementation and strict adherence to the Traffic Management Plan, the Emergency Response and Communications Plan, and the Public Health and Safety Plan.

The Project-specific Public Health and Safety Plan is attached as Schedule 08 (Public Health and Safety Plan). This Public Safety Plan is authored by the contractor and will govern the safety practices of all Project personnel at the site including staff of the contractor, their subcontractors, and Windlectric.

#### **4.3 Emergency Response and Communications Plan**

The Project's Emergency Response and Communication Plan is attached as Schedule 09 (Emergency Response Plan).

#### **4.4 Employee Training and Enforcement**

Every person who works at the site must attend a mandatory site orientation training session. These site orientation training sessions will be conducted in small groups and will be led by the contractor's site Safety Supervisor. These orientation sessions will include a presentation of the site environmental and traffic rules, site specific health and safety training including emergency response training, traffic management, accident/incident reporting processes, and training regarding the heritage and protected properties located on the island.

The training session will include a question and answer period to address any questions and to ensure complete understanding. At the end of each session there will be a test to confirm understanding of the material. If an individual is unsuccessful at the test, the Safety Supervisor will have the discretion to provide additional resources to assist the individual with the material, or remove the worker from the site.

On completion of the session, each trainee and the trainer will sign a certificate to confirm successful completion of the orientation and the commitment of the trainee to abide by all the site rules. A hard hat sticker will be issued to workers that have successfully completed site orientation. All personnel must have a valid and site-specific orientation sticker affixed to their hard hat in order to work on the site.

Orientation training will be supplemented by mandatory attendance at the daily morning safety meeting. The daily morning safety meetings will provide the Safety Supervisor and Project management staff the

opportunity to: convey any reports from the Township or public regarding traffic interruption or safety, introduce any new mitigation efforts, and to re-enforce orientation training.

Individuals in violation of any site safety or traffic rules will be subject to the contractor's progressive discipline policies, which will include consequences up to and including removal from site depending on severity of the infraction or a repetition of offence. By signing the orientation certificate, each worker will have agreed to such disciplinary measures. Each vehicle will have a site map with relevant information and reminders of specific site safety rules. Each worker will have available a copy of the site-specific safety rules and emergency contact number card at all times.

## **5 Operations Plan Approval, Evaluation, and Revision**

As outlined in the sections 36 – 49 of the Road Use Agreement, the formulation of this Operation Plan has been the subject of iterative review and revision by Windlectric, its contractor, Township staff, and Township residents. Upon approval by the Council of the Municipality, Windlectric shall implement and comply with the Operations Plan and the Municipal Engineer, or other Township designee, shall monitor Windlectric’s compliance with the Operations Plan.

The effectiveness of the planned Project management and impact mitigation measures included in the Operations Plan will be subject to ongoing evaluation and revision during Project construction. Project staff will rely on the measures detailed in the Communications Plan to receive and collect feedback from all stakeholders in the Project. Stakeholder feedback on actual impacts, and changes to planned Project activity, will be reviewed by the Project team to evaluate opportunities to further minimize the level of disruption, disturbance and inconvenience to the Municipality’s residents, or to improve public or worker safety.

Once the Project team has completed the evaluation of feedback, reasonable changes to mitigation measures outlined in the Operations Plan may be implemented. Staff from Loyalist Township and members of the Community Liaison Committee will be kept informed of feedback received in accordance with the Communications Plan (Section 3) and will be advised of any planned or implemented changes in Project mitigation efforts. Windlectric may elect to immediately implement changes to mitigation efforts that improve safety of the public or workers, or as required by applicable law; with subsequent notification to Loyalist Township and the Community Liaison Committee.

SCHEDULE 01 – WTG Component Delivery Vehicle Dimensons

SCHEDULE 01 - WTG Component Delivery Vehicle Dimensions



Oversized Turbine Components:	Number of items:	Component Length [m]:	Component Width [m]:	Component Height [m]:	Component Weight [lbs]:	Component Weight [MT]:	Truck Length [m]:	Truck Width [m]:	Truck Height [m]:	Total Weight [lbs]:	Total Weight [MT]:
Tower base	26	14.2	4.5	4.5	149,502	67.8	45.3	4.2	4.7	243,017	110.2
Tower mid 1	26	20.7	4.2	4.2	114,296	51.8	51.8	4.2	4.4	207,811	94.3
Tower mid 2	26	18.7	4.2	4.2	121,338	55.0	49.8	4.2	4.4	214,853	97.5
Tower mid 3	26	15.1	4.2	4.2	121,157	55.0	46.2	4.2	4.4	214,672	97.4
Tower top	26	29.0	3.8	3.8	123,150	55.9	39.3	4.2	4.1	186,450	84.6
Nacelle	26	7.6	4.2	4.2	174,790	79.3	29.7	4.2	5.6	327,140	148.4
Blades	78	55.0	4.1	3.0	27,858	12.6	62.2	4.2	4.4	85,545	38.8
Hub	26	4.4	4.4	3.9	75,700	34.3	22.9	4.4	4.4	123,460	56.0

SCHEDULE 02 – Traffic Management Plan



**Amherst Island Wind Energy Project  
TRAFFIC MANAGEMENT PLAN<sup>1</sup>**



Prepared for:  
Algonquin Power Services Canada

July 17, 2017

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<sup>1</sup> The information and plans set out in this document should be read together with the additional traffic-related planning details in the Operations Plan, which together constitute the project's traffic management plan.

## Sign-off Sheet

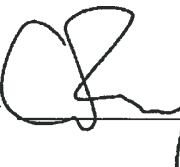
This document entitled Amherst Island Wind Energy Project, Traffic Management Plan was prepared by Stantec Consulting Ltd. for the account of Windlectric Inc. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Approved by

  
(signature)

**Gordon Murray, P.Eng., P.T.O.E.**  
**Principal, Transportation**

Prepared by

  
(signature)

**Clayton Rudy, P.Eng.**  
**Transportation Engineer**

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Markham, ON L3R 0B8



**AMHERST ISLAND WIND ENERGY PROJECT  
TRAFFIC MANAGEMENT PLAN**

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## AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN

### 1.0 Introduction & Background

A Wind Energy Project (the “Project”) located on Amherst Island located in Lake Ontario south of the Village of Bath has been proposed by Windlectric Inc. The Project was approved by the Ministry of the Environment and Climate Change through Renewable Energy Approval issued on August 24, 2015. The Project involves the construction and operation of 26 wind turbines (27 sites are permitted), which will be situated on Amherst Island as illustrated in **Figure 1** and to be illustrated in the **Pre-Construction Study**, which will also show the location of the proposed wind turbine sites, public road widenings, intersection improvements, and the permanent access roads that lead from the public road to the individual sites.

#### 1.1 OBJECTIVES & SCOPE

In order to create an environment that mitigates the level of disruption and inconvenience to the Municipality’s residents, it is important to limit the number of interactions of construction vehicles/equipment with local resident/tourist traffic and local wildlife, and also to establish reasonable controls to be used to safely manage such interactions when they cannot be avoided.

A Traffic Management Plan (TMP) will be implemented on Amherst Island during construction to address safety requirements of the Project. This report reflects the assessment conducted to define the TMP, as well as the details of the TMP itself including:

- A consideration of the existing traffic, pedestrian, and cycling activity on the island as well as the related road/intersection operations;
- Potential safety concerns related to the design of the existing roadways and/or intersections, given the addition of construction vehicles to the mix of traffic on Amherst Island;
- Determination of the routes from a safety perspective between the Island laydown areas, the Island dock, and proposed wind turbine sites;
- An articulation of the TMP to manage construction traffic in a manner that minimizes the potential impact on local wildlife; and
- The specific measures to be implemented during the construction phase of the Project, which incorporate the principles and guidelines of the *Ontario Traffic Manual (OTM) Book 7 Temporary Conditions*.

The TMP outlines specific measures that will be used during construction of the Project to manage the interaction between construction-related traffic and regular traffic, and between regular traffic and temporary construction-related road conditions. Some traffic and road conditions can change significantly over time; therefore the TMP must be revised, adapted, and field-fitted to the local conditions during the course of construction.



## **AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN**

### **1.1.1 Items Unrelated to the Scope of a Traffic Management Plan**

Items that do not substantially affect traffic safety and/or mobility do not fall within the scope of a TMP. Examples of out-of-scope items include construction methods, depths of granular material for widenings, buried or elevated utilities, ditch drainage, an existing conditions assessment of the road structure, etc.

## **1.2 LOCAL CONTEXT AND KEY TRANSPORTATION ISSUES**

Amherst Island is part of Loyalist Township within the County of Lennox and Addington. It has a population of approximately 400 people, which roughly doubles during the summer months. There are two hamlets on the island, Stella and Emerald, and rural residential development is generally located along the shoreline along Concession Road 3. There are many small businesses located on the island as well as farm lands that occupy most of its interior.

The Amherst Island Public School is located at 5955 Front Road. This school provides programs from junior kindergarten to grade 8 (approximately 30 pupils), and is served by a school bus operating on the island. Class times are from 8:35 a.m. to 2:50 p.m. The school also functions as a community centre, and so occasional small traffic spikes may occur related to community events. There are also several churches located on the island.

Transportation between the mainland (Millhaven) and the island (Stella) is provided by a ferry service for vehicles (maximum capacity of 30 cars) and passengers. The ferry runs on an hourly schedule between 6:00 a.m. and 1:30 a.m. and a one-way trip takes approximately 20 minutes. Ferry log information for 2014 indicates that, during an average month, approximately 11,000 cars and trucks are transported to and from the island. This translates into 370 average daily vehicle trips by ferry, and an average hourly volume of approximately 30 vehicles (15 vehicles to or from the island in an average hour). The seasonal variation of the ferry traffic was examined to determine how much the summer peak traffic would vary from the annual average traffic. It was found that the peak traffic for 2014 occurred in August with 13,576 car and truck trips. The seasonal peak trips were found to be approximately 23% greater than the annual average trips.

The key transportation considerations related to the context of the Amherst Island community and the planned construction of the Project are:

- The importance of the ferry to island residents as the single means for access (egress) to and from the mainland for traffic and in particular for emergency services support;
- Potential conflicts between construction-related traffic and the day-to-day activities associated with the local community, including local travel by car, school bus, bicycle, and on foot as well as the movement of farm machinery;
- The need to ensure that local residents are aware of the temporary conditions during construction that could affect traffic safety, or cause delay, on various parts of the island, depending on the location of the work sites; and

## **AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN**

- The need to ensure that local wildlife and its habitat are not adversely impacted by the construction traffic associated with the Project.

### **1.3 OBSERVED ROAD CHARACTERISTICS & TRAFFIC**

#### **1.3.1 Description of Roads**

The majority of the island roads can be characterized as having rural cross sections (i.e. gravel or grass shoulders and open drainage), relatively narrow travel widths (approximately 4 to 5m), and gravel surfaces. The exceptions include sections of Front Road along the north shore and Stella Forty Foot Road that have paved surfaces and travel widths of approximately 6 to 7m. The island roads are relatively flat (so sight lines are not limited) with the exception of the central section of Stella Forty Foot Road where there is a minor crest in the vicinity of the Glenwood Cemetery that limits north-south sight lines to some extent, along with a section of South Shore Road where it winds along the lakeshore. South Shore Road is a winding, narrow, gravel road that hugs the lake shore closely in some locations, allowing limited space for passing oncoming vehicles.

#### **1.3.2 Speed Limits**

There are some sections of Front Road with a posted speed limit of 50 km/h, while most of the other roads have no posted speed limits (statutory maximum speeds would apply, i.e. 50 km/h in urban settings and 80 km/h in rural settings). The physical characteristics and limitations of the island roads create a natural limit to vehicle speed.

#### **1.3.3 Intersection Control**

Most intersections lack stop or yield signs and are therefore “uncontrolled”, and approaching drivers are required to yield to a vehicle approaching from the right under the normal rules of the road. Several intersections have stop-controlled approaches such as Front Road/Stella Forty Foot Road (all-way stop) and Emerald Road/Second Concession (stop control on westbound approach), while several other intersections have yield signs on the minor street approach (e.g. Emerald Road/Front Road and Stella Forty Foot Road/South Shore Road).

## **AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN**

### **1.3.4 Traffic & Pedestrian Volumes**

Based on field observations and the limited capacity of the ferry, it is estimated that the hourly volumes on sections of the main roads such as Front Road and Stella Forty Foot Road would likely be in the order of 20 to 30 vehicles. The traffic on the remaining island roads is estimated to be 10 or less vehicle trips during a typical hour including movement of large farm machinery. Given these traffic volumes there are no road traffic capacity issues or significant operational issues, with the possible exception of short duration traffic activity during festivals or other special events.

Although cycling and pedestrian activity on the public roads is likely to be low in relative terms, out of an abundance of caution, construction will be managed on the assumption it will be present on a regular basis. Pedestrians and cyclists generally share the travelled section of the island roads since there are no separate facilities such as sidewalks or bike lanes provided for these modes of transportation.

### **1.3.5 Main Traffic Routes**

The most active routes with respect to local resident/ tourist traffic are:

1. Front Road, from Kerr Point Road to the east end of the island;
2. Stella 40 Foot Road, from the public ferry dock to South Shore Road with the busiest section being from the dock to Concession Road 3;
3. South Shore Road, from Stella 40 Foot Road to Lower 40 Foot Road; and
4. Concession Road 3.



**AMHERST ISLAND WIND ENERGY PROJECT  
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## **2.0 Overview of Construction Activities**

The following text outlines planned construction activities that affect the public roads and lists the principal steps that will be involved in the completion of each activity.

### **2.1 CONSTRUCTION ACTIVITIES IMPACTING THE PUBLIC RIGHT-OF-WAY**

#### **2.1.1 Access Road Construction on Private Lands**

Access road construction largely on private lands (with some tie-in work onto public roads) will include:

- Staking out the right-of-way construction limits and road centre line;
- Stripping and stockpiling of topsoil;
- Culvert and drainage work installation;
- Ditch and road construction with earthworks grading and geotextile as needed;
- Placement and compaction of sub-base road material and compaction testing;
- Placement of base-course road material and compaction testing; and
- Installation of gates (on private land) to restrict access.

Reclamation related to the access roads will occur once the Project is operational, and will reduce the size of the access road entrances required for maintenance vehicles to access the turbines. Reclamation will involve de-compaction, restoration of topsoil, site leveling, beauty ring installation around each turbine tower and any required seeding in accordance with the Renewable Energy Approval (REA) application supporting documents.

#### **2.1.2 Modifications to the Public Roads**

Public road modification construction for this purpose will include the following steps:

- Staking out the right-of-way;
- stockpiling of topsoil;
- Ditch construction with grading as necessary; and
- Placement and compaction of Granular A road material and testing.

## **AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN**

Any temporary road modifications will be reversed after construction is completed unless alternative direction is received from the Township.

### **2.1.3 Construction of Underground Collector System**

The underground collector system construction will include:

- Stake property lines and centre line;
- Install cable (plow, trench and bore as required);
- Backfill and compact trench;
- Install and connect splices and junction boxes;
- Install pad-mounted transformers at turbines;
- Terminate cable at substation and pad mounts; and
- Test collector system.

Reclamation work required as part of the collector line installation will occur once the line is fully installed and weather permits.

### **2.1.4 Major Turbine Component Deliveries**

Major Turbine Component delivery work includes the following steps:

- Typically two cranes (80 to 130 ton capacity) will be brought to a turbine site to offload turbine components;
- Escort vehicles will be used to guide turbine component delivery vehicles to each turbine site;
- Turbine components will be inspected and offloaded; and
- Cranes will be moved to the next delivery location.

## **AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN**

### **2.2 CONSTRUCTION ACTIVITIES NOT IMPACTING THE PUBLIC ROW**

#### **2.2.1 Turbine Foundations**

Foundation construction will include the following steps:

- Stripping and stockpiling of topsoil and vegetation/tree removal (if required, and in accordance with the Renewable Energy Approval documents) for each turbine foundation and erection laydown area;
- Staking of laydown area perimeter;
- Excavation of foundation;
- Pouring of concrete leveling mat;
- Installation of reinforcing bars and bolt cage;
- Pouring of concrete;
- Backfill foundation;
- Construction of crane pad; and
- Restoration of laydown area following turbine commissioning.

#### **2.2.2 Construction of Temporary Laydown Areas and Office Trailers**

Construction of the temporary laydown areas and the office trailer location will include the following steps:

- Stakeout of laydown area limits;
- Strip and stockpile topsoil;
- Site grading;
- Run services, electricity, communications cable;
- Place material and compact;
- Deliver construction trailers; and Install signage.

Upon completion of construction, temporary structures will be removed and the areas will be restored to pre-disturbance conditions.

## **AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN**

### **2.2.3 Construction of Transformer Station**

The Transformer Station construction will include the following steps:

- Stake constructible limits;
- Strip and stockpile topsoil;
- Begin earthwork grading and excavations for foundations;
- Install reinforcing bars for strip foundations and piers;
- Pour concrete for foundations;
- Install grounding grid;
- Backfill ground grid and install material;
- Begin steel erection including equipment, switch gear and bus work;
- Main transformer delivery;
- Pull cables, connect and commission transformer;
- Deliver and commission control building; and
- Testing.

## AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN

### 2.3 CONSTRUCTION SCHEDULE

Construction activities will take place within the periods outlined in Township noise bylaws. There are exceptional circumstances however when work could occur outside of these hours:

**Emergency circumstances:** As is recognized by the bylaw, certain health and welfare related incidences which require emergency equipment e.g. ambulance, fire trucks, helicopter ambulance.

**Bulk concrete pours:** The wind turbine foundations are poured in a continuous pour which cannot be interrupted. These pours will begin in the morning and are planned to be completed within the normal working day. However, in an exceptional circumstance of an interruption due to mechanical or weather related issues the pour may need to be continued after the normal working day. Concrete batch plant hours will observe 7am - 7pm restrictions as noted in the REA.

**Turbine Erection:** During the erection of the turbine there are certain specific erection milestones which have to be completed once the lift is begun. Daily lift work will be planned to allow completion by end of the normal daily working hours, but in the event of weather or mechanical delay, there is a possibility the work will need to proceed beyond normal working hours.

### 2.4 TYPES OF CONSTRUCTION VEHICLES

For the purposes of the TMP, there are three primary classes of construction-related vehicles:

1. Heavy Loads such as the delivery of bulk materials e.g. aggregate and concrete;
2. Oversize loads such as Major Turbine Components as well as large construction vehicles e.g. erection cranes and large excavators; and
3. General-purpose construction vehicles, typically pickup trucks and crew vans.

**AMHERST ISLAND WIND ENERGY PROJECT  
TRAFFIC MANAGEMENT PLAN**

### **3.0 Traffic Management Plan**

#### **3.1 MAINLAND ACCESS**

Access to the Project's temporary mainland dock will generally follow one of the two following routes from Highway 401: south along Lennox and Addington County Road 4, and east along Bath Road to the mainland construction dock and staging area; or south along County Road 6; west along Taylor Kidd Boulevard, south along County Road 4, to the mainland construction dock and staging area. For certain major turbine component deliveries, the route from Highway 401 would be either: south along Lennox and Addington County Road 4, east along Taylor Kidd Boulevard, and south via the Invista property (5275 Bath Road), with a crossing at Bath Road to the project dock; or south along County Road 6, west along Taylor Kidd Boulevard, south via the Invista property (5275 Bath Road), with a crossing at Bath road to the project dock.

A review of each route reveals no areas where there is a significantly elevated potential for collisions with local traffic. There are no sight distance restrictions or obstructions, terrain is relatively flat, and the few entrances along these routes are clearly visible on approach. The roundabout intersection at Regional Road 2 and County Road 4 provides an effective means of traffic/speed control, and will accommodate turbine delivery vehicles for all Major Turbine Components with some over-tracking on the central island; with the exception for turbine blade and the top tower section, which will be transported along County Road 6. Temporary construction signage should not be required, with the possible exception of "truck turning" signs on Bath Road, on the east and west approaches to the entrance to the staging area and dock. Escort vehicles will be employed to protect traffic during the transport of Major Turbine Components and the main power transformer. Vehicles arriving at the mainland construction site will either turn directly south into the dock access or may turn north to the Invista property to queue for the barge or for overnight staging as required. Traffic management requirements on the mainland are minimal due to the relatively low number of construction vehicles and adequate road widths. Oversize loads will follow normal piloting procedures per Applicable Law.

#### **3.2 CONSTRUCTION-RELATED TRAFFIC IMPACTS**

##### **3.2.1 Impacts to Ferry Traffic**

Construction-related movement of materials and people will be barges or bulk material transport vessels utilizing newly constructed, special-purpose docks on the mainland and on the island. Therefore, the construction-related transportation will not impact the existing ferry operation or public docks on the mainland and the island.

##### **3.2.2 General Impacts**

The delivery of wind turbine components, construction equipment and materials will be staged such that the volume of additional traffic created on the island will be relatively low during any given hour. For example, the expectation is that the Major Turbine Components for only one turbine would be delivered during any given day, which means 10 turbine component loads being transported in a single day. Transportation of these construction-related materials will be via routes that accommodate oversize and slow moving trucks (typically flatbed tractor-trailers).



## AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN

There will be a need during Major Turbine Component deliveries for oncoming vehicles to share the available roadway surface. This will require drivers to pull over or stop as they approach an escort vehicle until the delivery vehicle has passed. This procedure is standard practice and common throughout Ontario. Delays will be minimal due to the relatively small number of turbine component deliveries, and the relatively low traffic volumes on the island. The escort vehicle will be fitted with flashing lights and applicable and appropriate warning signage and will operate in accordance with applicable laws.

The Operations Plan provides a Communications Plan for delay scenarios and stipulates that transportation of oversized loads in front of the school, and through Stella, will not take place in a 30-minute period prior to, and following, the school day. In the event that a child is walking/riding to school at a non-standard time (i.e. running late or leaving early), the parents or the school may contact the Windlectric Site Manager directly, who will then take appropriate action by notifying delivery drivers to be aware of the child's presence.

The construction-related traffic associated with the more regular delivery of aggregate and other day-to-day construction equipment and materials, as well as daily worker traffic, will generate additional traffic. All construction-related traffic will arrive and leave by barge, which limits the ability for significant volumes of construction-related traffic to arrive at the same time. Based on the amount of materials to be delivered, and the capacity limitations of the two special-purpose barges, the peak traffic generated by the larger of the two barges (arriving at the island on a two hour cycle) will be limited to approximately 25 loaded aggregate trucks arriving and 25 trucks departing.

Given the low existing traffic volumes on any of the island roads, the increase in traffic due to construction activities can easily be accommodated from a capacity perspective, especially during off-peak hours (peak-hour traffic would only be expected for two to three hours a day, mostly during weekdays and summer weekends). Notwithstanding the adequate existing road capacity, there will be some relatively minor road and intersection improvements (i.e. road widening) required due to the physical limitations of the existing island road network as will be detailed in **Pre-Construction Study**.

### 3.2.3 Specific Types of Traffic Impacts

There are three types of traffic impacts expected for this Project:

1. **Traffic interruptions:** very short duration closures<sup>2</sup> that are limited to a single road segment at a time, usually for moving oversized loads such as turbine components, for a typical closure time of between approximately 5 to 30 minutes;
2. **Lane closures:** short duration and limited length (less than 500m) of closure of a single lane, leaving room for a single lane of traffic (only during normal construction hours and not remaining overnight), typically for construction of temporary road widenings, trenching of electrical collectors, etc. where there is adequate and reasonable amount of space for traffic to pass beside

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<sup>2</sup> Per Ontario Traffic Manual, Book 7 (Temporary Conditions) (Jan. 2014 edition): Very short duration work is 30 minutes or less, short duration work is 30 minutes to 24 hours, long duration work is over 24 hours.

## AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN

the work area. Lane closures may occur on one or the other and may alternate between sides as necessary for construction activities and traffic management; and

3. **Road closures:** short duration and limited length (less than 50m) closure of a road so that traffic is not possible in either direction. Road closures will only occur during normal construction hours and will not be left in place overnight. Road closures will be required for construction of temporary road widenings, trenching of electrical collectors, etc. where there is insufficient space for traffic to safely pass beside the work area.

These three types of traffic impacts are illustrated in **Drawing Number 2, 3, and 4.**

### 3.3 TRAFFIC MANAGEMENT STRATEGIES

#### 3.3.1 Construction-Related Traffic Routes

All Major Turbine Components and required construction equipment and materials are to be transported between mainland and island laydown areas by barge or bulk material transport vessel. The construction workforce will also be transported to and from the island by barge. Consequently, there will no need to use the public ferry for construction of the Project, except for the limited purpose of island dock construction. The existing road system on the island will be used for the transportation of construction materials and personnel between the Project's island dock and the wind turbine sites.

Construction vehicles (including gravel trucks and deliveries of turbine components) and equipment will reach the 26 turbine sites based on the *Delivery Routes for Heavy Loads* Drawing AMHST-207, and *Delivery Routes for Turbines* Drawings AMHST-206 (see **Operations Plan Schedule 19 "Delivery Routes for Turbines"** and **Operations Plan Schedule 3 "Heavy Load Traffic By Road"**, respectively). These drawings have been made available to the public for review and comment through a posting on the Loyalist Township website. Furthermore, larger construction vehicles will not use the intersection of Stella Forty Foot Road and South Shore Road due to geometric constraints. This report assumes that the truck routes outlined in these two schedules will not be changed. This report provides traffic management processes and procedures which will result in a level of public safety for the transport of materials and equipment that meets or exceeds prudent wind energy construction practices.

#### 3.3.2 Traffic-Related Schedule Management

Highly detailed construction traffic sequencing cannot be prescribed as an element of this report due to the scale of the construction and the unpredictability of external factors (e.g. weather, material suppliers, etc.). Detailed sequencing of construction activity for roadworks will be determined by the Constructor on a 'week-ahead' basis and will be subject to adjustment in real-time accounting for traffic, weather, and logistical considerations in order to minimize the level of disruption and inconvenience to the Municipality's residents related to use of the public roads. Closures will be implemented in consideration of construction requirements while ensuring traffic access, and in particular emergency services access, to all points of the island at all times. Detours for Road Closures have been summarized in **Appendix D**. Simultaneous road closures will not be permitted to ensure that planned detour routes remain effective.





## AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN

Deliveries of Major Turbine Components and road closures will be planned to avoid active road closure detour routes.

### 3.3.3 Illumination

Temporary illumination shall be provided at key points where it is deemed necessary to provide increased level of safety as per guidelines in *OTM Book 7*. Generally, deliveries and construction will occur during daylight hours.

### 3.3.4 Signage

All signage in this report is intended for temporary conditions. Pre-existing conditions such as tight horizontal curvature will be signed if the Constructor's traffic control personnel decide to implement such signage to ensure construction-related traffic operates safely.

"Keep Right" signs will be posted advising the public of approaching construction vehicles on both approaches to the sharp crest curve on Stella 40 Foot Road at the cemetery, in addition to the reduced posted speed (60km/h) in this section.

Project roads used to access turbines shall be marked clearly to allow orderly entrance and egress from the Project site, and also direct travel away from environmentally or socially sensitive areas, as determined in consultation with Windlectric. Signs will be legible, and of sufficient durability, to last for the duration of construction activities. Windlectric shall obtain permits or permission from the County and Township authorities for the temporary placement of signs within public rights-of-way.

Road signs shall clearly identify access points where construction vehicles will be entering and existing public roads. Signage will be placed to identify private access roads where public traffic is prohibited.

Each turbine site shall be identified by a sign located at the entrance points to access roads to be installed during road construction.

Stop signs will be provided at the end of all access roads where they intersect with public roads.

"Truck exiting" signs will be provided on the public roads in both directions each side of the construction site access points; see **Appendix A** for typical sign details and **Appendix B** for sign placement.

*OTM Book 7* traffic control measures (barriers, barrels, signage, etc.) will be used for working on the "shoulder" and for temporary lane closures. Where restriction to a single lane of traffic is required, single lane restrictions will be permitted during daylight hours only or lighting would be installed as per *OTM Book 7*. Traffic will be controlled by flag-persons in continual radio communication with each other.

Temporary signage will be required for construction of the minor road improvements. All temporary signage must conform to the specifications of shape, colour, reflectivity, message, and size, as specified by the Ontario Ministry of Transportation (MTO) in the *OTM*. Sign placement shall adhere to *OTM Book 7*,



## AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN

*Figure 14 – Typical Sign Placement*, provided in **Appendix A**. All signage shall be covered when not in use. All temporary lanes shall be clearly delineated and comply with the minimum lane width specified, per the typical layout (TL) drawings in *OTM Book 7*.

Typical signage and sign placement can be found **Appendix A**. These sign placements are based upon *OTM Book 7 – Temporary Conditions*. Typical sign placements for the following scenarios have been included:

- Providing warning of an approaching work zone and reducing the posted speed (*OTM Book 7 – TL3*);
- Typical signage for shoulder work (*OTM Book 7 – TL6*);
- Typical signage for on-road work requiring a lane closure (*OTM Book 7 – TL19 and TL20A*); and
- Typical signage for turbine construction site access, trucks approaching (*OTM Book 7 - TC31L and TC31R*).

When placing temporary signs, considerations must be made to accommodate and effectively manage traffic through the work zone. These considerations include:

- Ensuring the signs are clearly visible and not obstructed by equipment or vegetation;
- Signs are required in both direction of travel;
- Signage shall reflect the current condition of the work zone;
- Signs reducing speed shall be placed to give the users enough time to react and safely slow down; and
- Monitoring and maintaining effectiveness of signage.

Maintenance and monitoring will follow recommendations detailed in *OTM Book 7*.

### **3.3.5 Escort/Warning Vehicles for Oversize Loads**

As per the Highway Traffic Act, certain loads require an escort vehicle to accompany them during their transport. All necessary permits from MTO, the County, and the Township will be obtained in advance of these oversize load deliveries.

Escort vehicles and/or OPP escort, if required by Applicable Law, will accompany all Major Turbine Component deliveries.

## **AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN**

### **3.3.6 Flag Persons**

Where flagging is needed (for example, during a lane closure), appropriate Personal Protection Equipment (PPE) meeting the requirements of *CSA Z96-02 (High Visibility Safety Apparel)* is to be worn at all times. All flag persons shall be certified by an approved course. Certificates will be available on-site. Flag persons will be equipped with a Stop/Slow paddle as per *OTM Book 7 – Traffic Control Sign (Stop/Slow Paddle - TC22)* and two-way radios for continuous and uninterrupted communication between pairs of flag persons.

### **3.3.7 Parking and Moving Equipment/Vehicles on-site**

Vehicles working on the wind turbine construction shall park on the access roads to the turbines or at the wind turbine sites whenever possible. Vehicles shall be parked in a manner that does not impede traffic or interfere with visibility of signage.

### **3.3.8 Specialty Vehicles**

Specialty vehicles needing assistance through the work site may include emergency service vehicles, school buses, wide or long load vehicles, and farm vehicles. All emergency and school services will be advised of construction work one week prior to commencing. Maximum vehicle width of emergency equipment on the island has been measured to be 2.54m. Consequently, the minimum road width at single lane closures has been set at 3m in order to ensure that emergency services equipment can always pass through these work areas without delay.

### **3.3.9 Pedestrian and Cyclist Accommodation**

Pedestrian and cyclist traffic will be managed through work zones (road closures and single-lane restrictions) using the same traffic management procedures as those used to address vehicular traffic in such work zones. In order to further protect the safety of pedestrians and cyclists, the added accommodation of the provision of an escort will be offered to pedestrians and cyclists travelling through single lane closure work zones and through road closures if safe to do so.

Interaction between Project-related traffic and pedestrian and cyclist activity on the public roads will be governed by specific Contractor safety policies that will include the following measures whenever construction vehicles encounter pedestrians or cyclists on the public roads: (i) a maximum vehicle speed of 20 km/hour within 50m of a cyclist or pedestrian; (ii) a minimum separation of 2m when passing a cyclist or pedestrian, and (iii) construction vehicles will remain behind cyclists or pedestrians until it is safe to pass. It will be a policy of the Contractor that failure to comply with these Constructor safety rules will be grounds for driver dismissal from the Project.

Interaction between Project-related traffic and school-related pedestrian and cyclist activity near the school, and in the village of Stella, has been largely eliminated as there will be no deliveries of Heavy Loads in these areas at all. The 40 Major Turbine Component deliveries in front of the school and through Stella will not take place in the 30-minute period prior to the start of school, nor in the 30-minute period after the completion of the regular school day.

## AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN

In order to eliminate any delay to the island school bus on its way to the ferry, road closures will not start until the school bus has passed through the closure zone.

### 3.3.10 Public Information Strategy

In order to minimize impacts on island traffic, and to ensure the success of the Project, a traffic communication plan will be implemented. The traffic-specific components of the Communications Plan will include providing island residents with a week-ahead traffic impact forecast, and a day-ahead confirmation of traffic impacts. Road restriction notice signs will be placed near all work sites a minimum of one week prior to any lane or road closures (if installed much more than one week in advance, drivers may begin to be conditioned to ignore the signs). The traffic aspects of the Communication Plan will allow residents to effectively plan their routes, and mitigate the overall impact caused by the work and deliveries to the site. An activity forecast report shall be provided to Loyalist Township, outlining construction activity affecting the roads a minimum of one week prior to any work commencing. The road construction activity forecast will be updated weekly. A map of the island outlining the delivery routes to the sites for construction vehicles and deliveries will be kept up-to-date on the Project web site so that residents can plan to avoid those routes if desired. At this time, sources of aggregates, concrete, turbine components, and other materials have not been finalized, but it is assumed that County Road 4 and County Road 6 will be the primary delivery routes on the mainland.

The TriBoard Student Transportation Services that is responsible for the public school bus on the island will be notified of any road closures at least one week in advance of planned public road construction activity (as TriBoard has requested). There will be no impact to school buses on their way to the ferry in the morning as any road closure on a school bus route will be delayed until the school bus has passed.

A multi-media approach will be used to keep local residents and seasonal visitors advised of the designated construction routes so that they can avoid these routes if they wish to do so. Flyer delivery (weekly to residents' mailboxes), website postings, a Twitter feed, Facebook postings, and daily updates to the local radio station<sup>3</sup> will all be used to publicly communicate traffic impacts.

### 3.3.11 Wildlife Mitigation

Risk of wildlife collisions and disturbance from construction traffic will be addressed through a variety of mitigation measures detailed in **Appendix C** (Wildlife Mitigation). These measures incorporate design elements into this report (e.g. considering the potential for wildlife impacts during route selection), as well as a specific traffic control measures, including measures designed to influence driver behavior. Specific mitigation and avoidance measures include:

- Avoidance of roads in proximity to the wetland complex or through large woodland features to the degree practicable;

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<sup>3</sup> Staff at CJAI 92.1 have been contacted regarding this aspect of the communication plan. CJAI staff will determine in their sole discretion the frequency and content of traffic impact reports.

## AMHERST ISLAND WIND ENERGY PROJECT TRAFFIC MANAGEMENT PLAN

- To the extent possible, timing restrictions for construction traffic, specifically that large trucks and bulk material deliveries would be restricted to working hours;
- Reduced construction vehicle speed limits and signage near wildlife areas;
- Barrier fencing where appropriate; and
- Wildlife sensitivity and awareness training, with reinforcement designed to encourage a culture of respect for wildlife.

### 3.3.12 Construction Vehicle Driver Instructions & Supervision

All construction vehicle drivers shall be made aware of the potential for conflicts with island traffic on a route-specific basis and be advised of potential hazards such as locations with limited sight distance, areas with high entrance density, tight turns, and narrow roadway widths. Signage will be installed as per *OTM Book 7* as appropriate and where it can mitigate hazards related to construction activities, with care to avoid negative effects from over-signage.

A mobile radar-based speed tracking system (Traffic Logix SafePace Cruiser or equivalent) shall be deployed in varying locations during Project construction as a traffic calming measure. After deliveries to the Island commence, traffic patterns shall be monitored at key conflict points for any major changes to, or peaks in, construction traffic patterns in order to mitigate unanticipated traffic impacts. Monitoring of construction vehicle driving, traffic patterns and road improvements to facilitate Major Turbine Component delivery will be done by the EPC Contractor's site superintendent daily, with the help of lead hands and crew leads. Drivers will be reminded through regular daily meetings that a failure to comply with the requirements of the TMP will result in disciplinary action, which could include a range of consequences up to and including termination.

### 3.3.13 Oversight of Traffic Management Strategies

The first Major Turbine Component deliveries to the island shall be checked and monitored to ensure that the road improvements are working as intended. Regular oversight shall continue as outlined in *OTM Book 7* and performed by qualified traffic management personnel, which includes checking for hazards and maintaining signs and traffic control devices in a good condition. Monitoring of construction vehicle driving, traffic patterns and road improvements to facilitate Major Turbine Component delivery will be done by the EPC Contractor's site superintendent daily, with the help of lead hands and crew leads.

Traffic patterns will be monitored during construction at key conflict points to observe for collision potential. The major intersections, and particularly the intersection of the dock access road and Front Road, will be monitored. Adherence to all road regulatory and warning signage by construction vehicles will come under the responsibility of the contractor's site safety personnel who will regularly monitor and investigate traffic-related complaints. An Incident Reporting Form included as **Appendix E** will be used to record all pertinent details of any traffic incident observed/reported to the Contractor. Completed Incident Reports will be submitted, within 24 hours, to the Township with details of the incident and corrective actions taken.



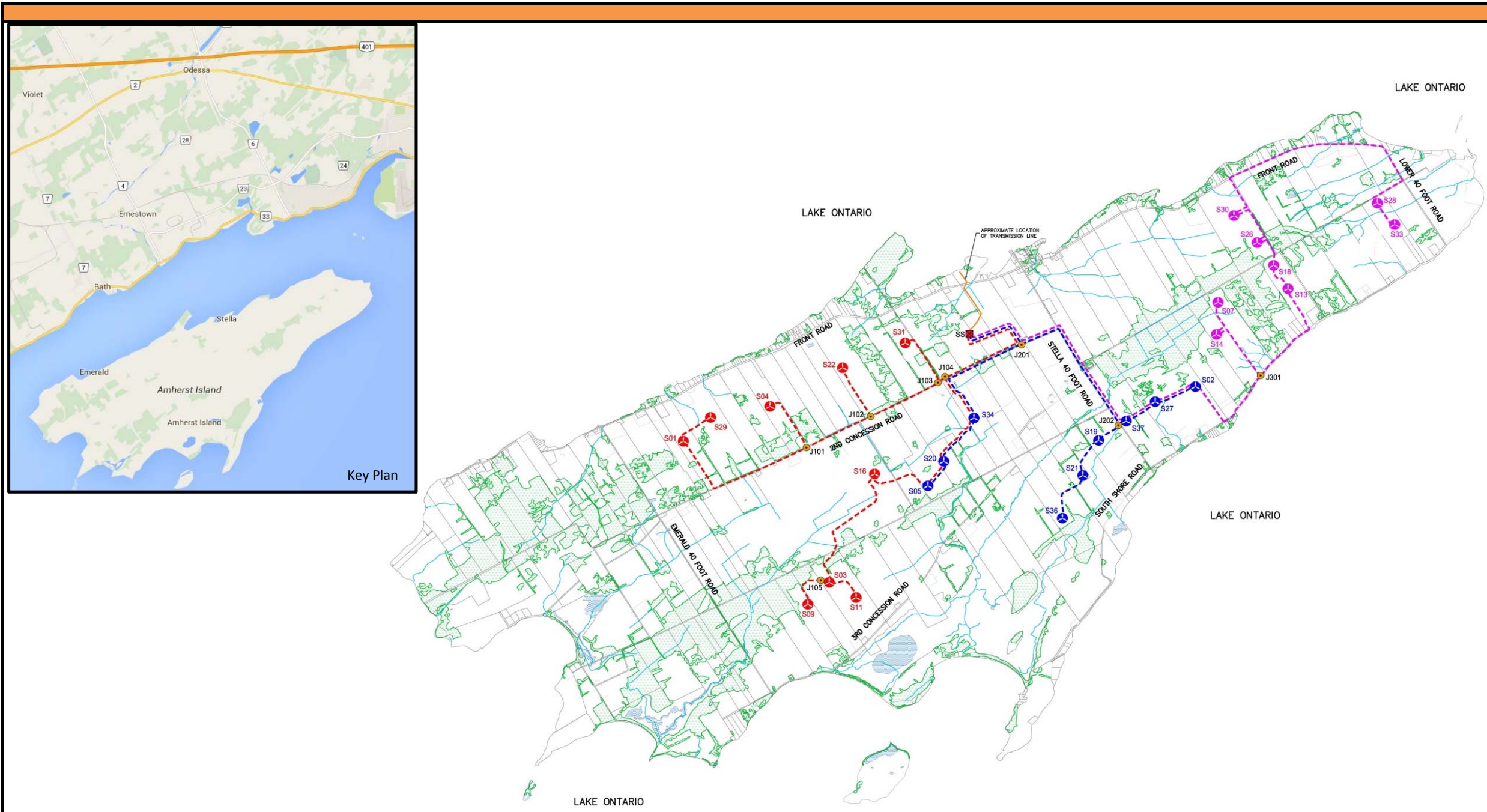
**AMHERST ISLAND WIND ENERGY PROJECT  
TRAFFIC MANAGEMENT PLAN**

**3.3.14 Dust Control and Snow Removal**

Water tankers and spreader trucks shall be used to suppress the emission of dust from the construction sites and haul routes.

Snow removal will be performed in accordance with the Operations Plan.





Not to Scale



Figure 1  
Site Location and  
Wind Turbine Plan

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Notes

Legend

- ROAD CLOSURE ZONE
- WORKING AREA

Revision	By	Appd.	YYMMDD

File Name:	Dwn.	Chkd.	Dgn.	YYMMDD

Permit-Seal

Client/Project



AMHERST ISLAND WIND PROJECT  
75MW WIND FARM  
Amherst Island, Loyalist Township, Ontario

Title

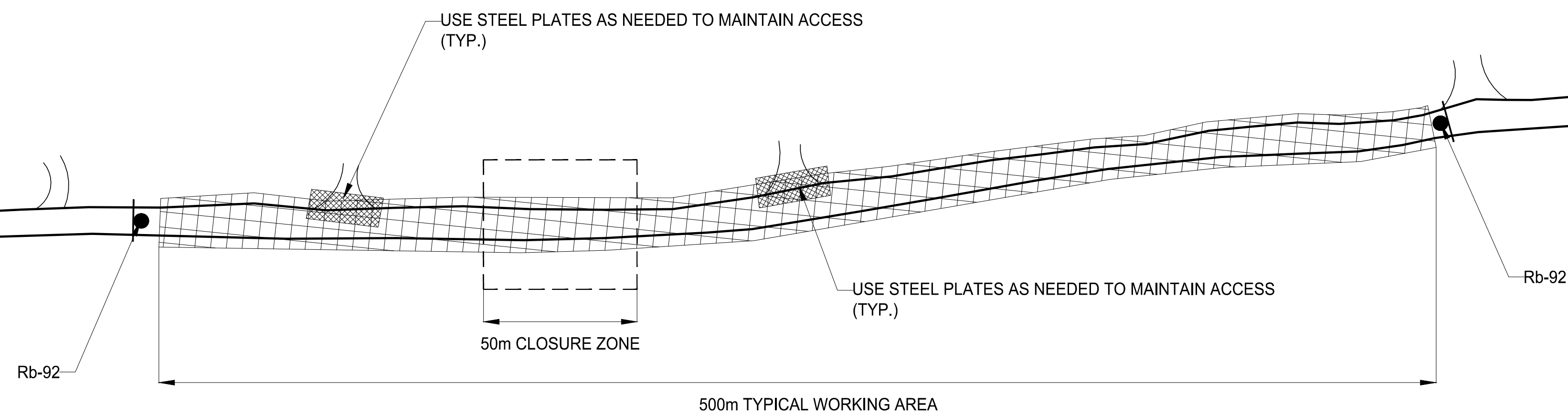
EXAMPLE FULL ROAD CLOSURE  
ON SOUTH SHORE ROAD

Project No.	Scale
133560101	

Figure No.	Sheet	Revision
2	1 of 1	

GENERAL NOTES

1. ALL TEMPORARY SIGNAGE AND ALL OTHER TRAFFIC MANAGEMENT SHALL BE IN ACCORDANCE WITH ONTARIO TRAFFIC MANUAL (OTM) BOOK 7.
2. CONSTRUCTION ZONE ADVISORY SIGNING TO BE PLACED IN ADVANCE OF THE BEGINNING OF CONSTRUCTION IN ACCORDANCE WITH OTM BOOK 7.
3. FLEXIBLE DRUM TC-54 SHALL BE USED TO DELINEATE A CLOSED LANE, SEPARATE OPPOSING LANES OF TRAFFIC, SEPARATE CONSTRUCTION WORK SITE AND FLOW OF TRAFFIC. SPECIFICATIONS AND PLACEMENT SHALL BE IN ACCORDANCE WITH OTM BOOK 7.
4. USE STEEL PLATES OR OTHER METHODS AS NECESSARY TO MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES.
5. THE ROAD CLOSURE WILL VARY IN LENGTH AND WILL PROGRESSIVELY MOVE DOWN THE ROAD.
6. UPSTREAM SIGNAGE WILL INDICATE THAT ROAD IS CLOSED AHEAD - LOCAL TRAFFIC ONLY.
7. TC-65 ROAD CLOSING NOTICE SIGN WILL BE INSTALLED WITH THE FOLLOWING TYPICAL MESSAGE: "ROAD CLOSURE ON SOUTH SHORE ROAD BETWEEN LOWER 40 FOOT ROAD AND STELLA 40 FOOT ROAD FROM [START DATE] TO [END DATE] BETWEEN 7AM AND 7PM - LOCAL TRAFFIC ONLY"
8. SIGNAGE PLACEMENT WILL BE COORDINATED WITH DRIVEWAY/ACCESSES AND OTHER EXISTING SIGNAGE.



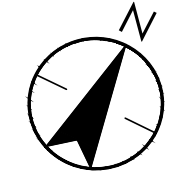
SOUTH SHORE ROAD



A B C D E F G H I J K L M N O P Q R S

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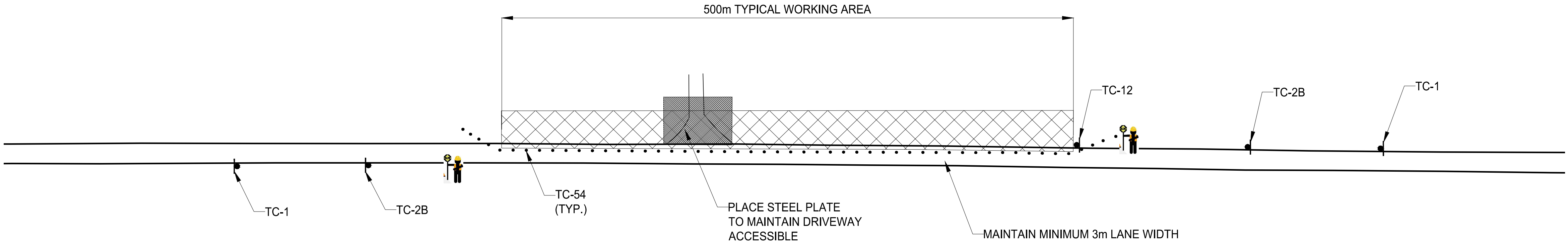
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**Notes**

**Legend**

-  SIGN
-  WORKING AREA
-  FLAG PERSON



**2ND CONCESSION ROAD**

Revision	By	Appd.	YY.MM.DD

File Name:	Dwn.	Chkd.	Dgn.	YY.MM.DD

Permit-Seal

Client/Project  
  
**AMHERST ISLAND WIND PROJECT**  
**75MW WIND FARM**  
 Amherst Island, Loyalist Township, Ontario

Title  
**EXAMPLE LANE CLOSURE ON 2ND CONCESSION ROAD**


Project No. 133560101	Scale
Figure No. 3	Sheet 1 of 1
Revision	

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### Notes

### Legend

 FLAG PERSON

 TURBINE COMPONENT DELIVERY PATH TO S27

Revision \_\_\_\_\_ By \_\_\_\_\_ Appd. \_\_\_\_\_ YY.MM.DD

File Name: \_\_\_\_\_ Dwn. \_\_\_\_\_ Chkd. \_\_\_\_\_ Dign. \_\_\_\_\_ YY.MM.DD

Permit-Seal \_\_\_\_\_

Client/Project \_\_\_\_\_

  
AMHERST ISLAND WIND PROJECT  
75MW WIND FARM  
Amherst Island, Loyalist Township, Ontario

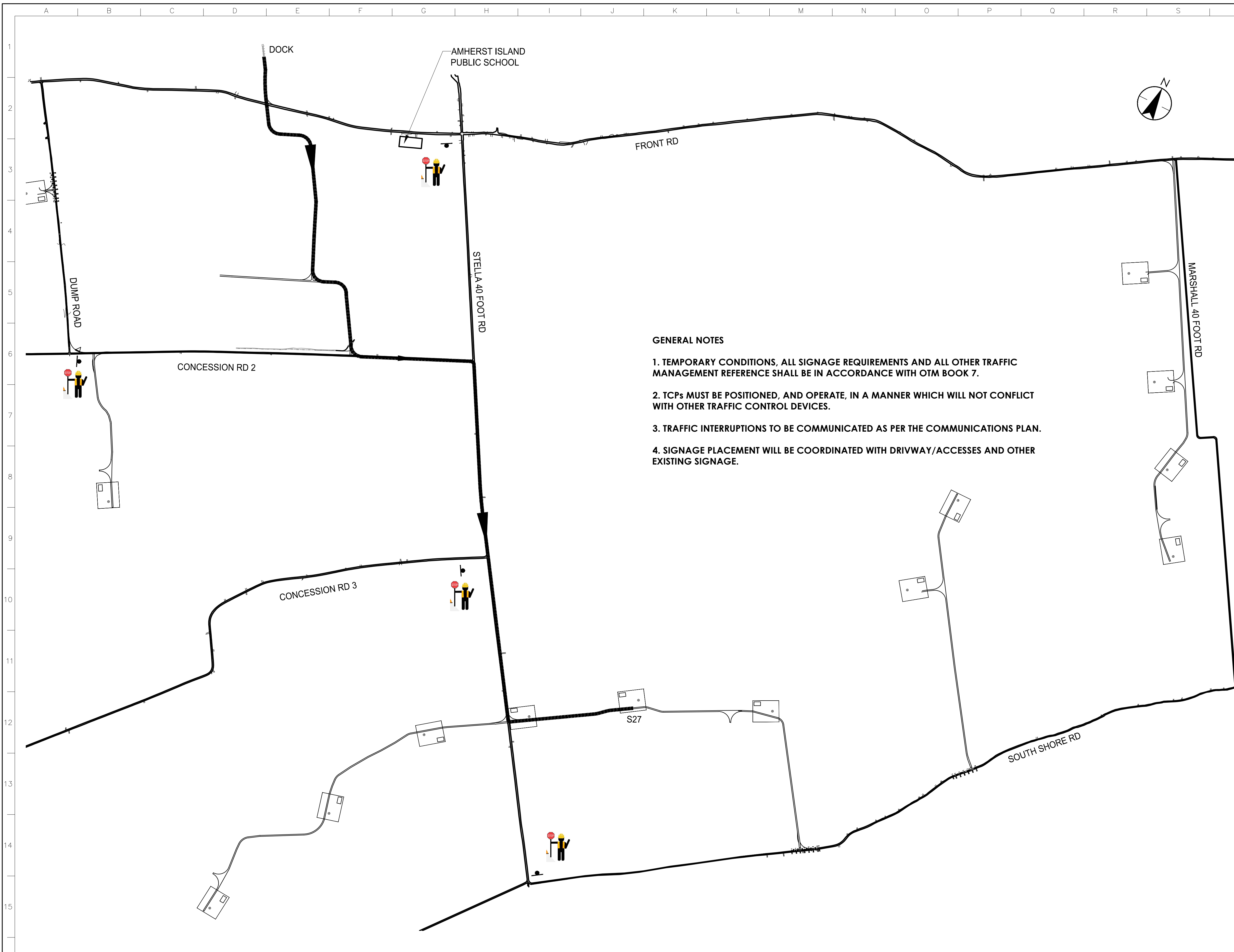
Title  
**EXAMPLE TRAFFIC INTERRUPTION  
FOR TURBINE DELIVERY TO S27**

Project No. 133560101 Scale \_\_\_\_\_

Figure No. \_\_\_\_\_ Sheet \_\_\_\_\_ Revision \_\_\_\_\_

4

1 of 1



- #### GENERAL NOTES
- 1. TEMPORARY CONDITIONS, ALL SIGNAGE REQUIREMENTS AND ALL OTHER TRAFFIC MANAGEMENT REFERENCE SHALL BE IN ACCORDANCE WITH OTM BOOK 7.
  - 2. TCPs MUST BE POSITIONED, AND OPERATE, IN A MANNER WHICH WILL NOT CONFLICT WITH OTHER TRAFFIC CONTROL DEVICES.
  - 3. TRAFFIC INTERRUPTIONS TO BE COMMUNICATED AS PER THE COMMUNICATIONS PLAN.
  - 4. SIGNAGE PLACEMENT WILL BE COORDINATED WITH DRIVEWAY/ACCESSES AND OTHER EXISTING SIGNAGE.

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20170717 4:01 PM By: [redacted] (133560101)

# **APPENDIX A – TYPICAL SIGNAGE**

**Figure TL-3 Reduced Speed Zone Signing**

Two-Lane

Multi-Lane

Undivided Non-freeway

Divided Non-freeway

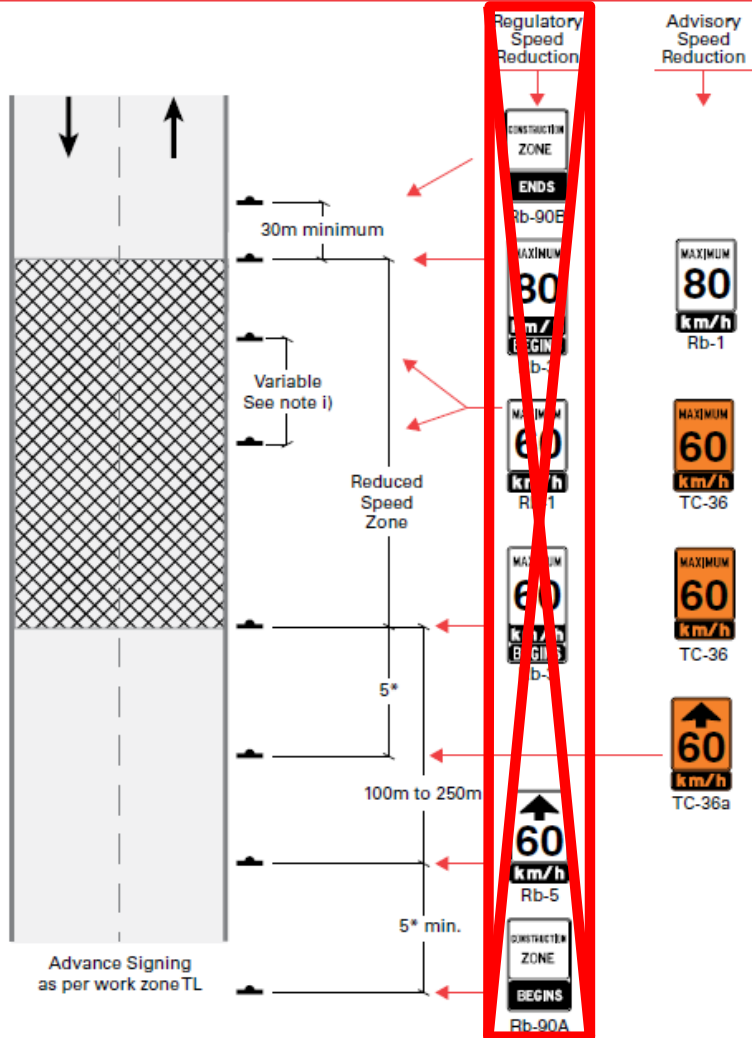
Freeway

Mobile Operations

Very Short Duration

Short Duration

Long Duration



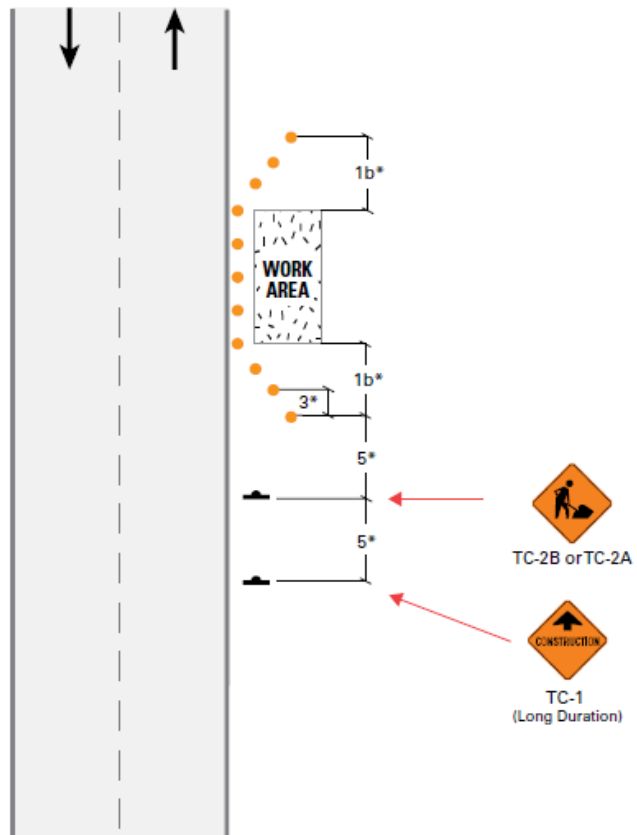
\* For Short Duration, see [Table A](#). For Long Duration, see [Table B](#).

**NOTES**

- i) Refer to Regulation 615 of the Highway Traffic Act and OTM Book 5 for distance between regulatory speed limit signs.
- ii) For regulatory speed reduction, a Designated Construction Zone must be established and signed as per TL-1.
- iii) The same signing is required in the opposite direction.

**Figure TL-6** Shoulder Work

<input checked="" type="checkbox"/> Two-Lane	<input checked="" type="checkbox"/> Undivided Non-freeway	<input type="checkbox"/> Mobile Operations
<input checked="" type="checkbox"/> Multi-Lane	<input checked="" type="checkbox"/> Divided Non-freeway	<input type="checkbox"/> Very Short Duration
<input type="checkbox"/> Freeway		<input checked="" type="checkbox"/> Short Duration
		<input checked="" type="checkbox"/> Long Duration



\* For Short Duration, see [Table A](#). For Long Duration, see [Table B](#). **NOTES**

- i) Work on the left shoulder mirror image for multi-lane divided road.
- ii) Termination taper optional.
- iii) Work area may or may not contain a work vehicle. See General Notes to Typical Layouts #4.
- iv) A work vehicle with a TC-12 may replace cones for Short Duration work.

**Figure TL-20A Lane Closed (Traffic Control Persons)**

**Two-Lane**

**Multi-Lane**

**Undivided Non-freeway**

**Divided Non-freeway**

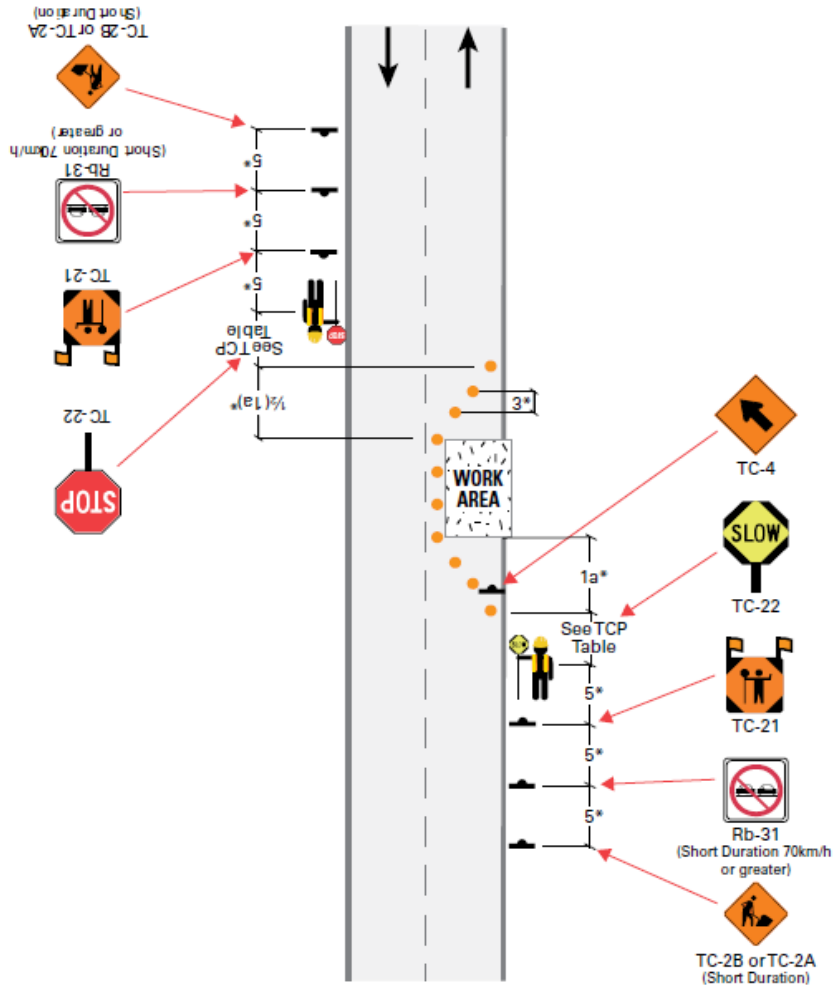
**Freeway**

**Mobile Operations**

**Very Short Duration**

**Short Duration**

**Long Duration**






\* See *Table A*.

**NOTES**

- i) For low-volume roads (< 3000 vehicles per day) and visibility more than 150m beyond the end taper, the TCP and TC-21 may be eliminated for the direction that is not closed.
- ii) For Very Short duration, work on low-volume roads with a normal posted speed less than 70km/h, the cones are not required.
- iii) On high speed (70 km/h or greater) or where lane keeping/compliance is an issue, consider using TL-20B.

### Truck Entrance Signs

TC-31L	TC-31A	TC-20At
TRUCK ENTRANCE	TRUCK ENTRANCE (with amber flashers)	WHEN FLASHING TAB
		
Minimum Background Reflectivity: Engineering Grade (Type I)		

**Purpose:**

The TRUCK ENTRANCE signs must be used when trucks are using an entrance from a work zone into a live lane (turn or crossing movement). The signs may also be used when the temporary condition limits the vision of an existing crossing that is heavily used by trucks (see OTM Book 6 – Warning Signs for sight distance criteria).

The TC-31 sign must be installed in advance of the crossing at the distance specified in the appropriate table (Table A, B, or C: 5\*).

The truck entrance sign illustrates the truck entering the roadway, not the work area. If the truck entrance is on the left, the TC-31L sign that is shown above must be used. The TC-31R sign which has the reverse symbol must be used when the truck entrance is on the right.



Table A Work Zone Component Dimensions: Very Short and Short Duration Work (Non-freeways)

	Dimension	Normal Posted Regulatory Speed Limit **				
		50 km/h or lower	60 km/h	70 km/h	80 km/h	90 km/h
1a*	Taper length for full lane closure (m)	10 – 15	20 – 30	30 – 40	50 – 60	70 – 80
1b*	Taper length for roadside work (m) ***	3 – 5	5 – 7	7 – 10	10 – 12	15 – 20
2*	Longitudinal buffer area (LBA) (m)****	(30)	(40)	50	60	75
3*	Maximum distance between markers (m)*****	4 – 6	4 – 6	8 – 10	8 – 10	10 – 12
	Minimum number of markers for taper	at least 4 markers	at least 5 markers	at least 5 markers	at least 7 markers	at least 8 markers
4*	Minimum tangent between tapers (m)	30	30	60	60	80
5*	Distance between construction signs (m) *****	20 – 30	20 – 30	50 – 60	50 – 60	70 – 80

\* Table A distances are based on good visibility, and should be increased if visibility is poor.

\*\* The regulatory maximum speed posted on a highway applies under normal conditions; that is, when no construction zone or work activity is present. Guideline provisions required in OTM Book 7 are based on normal posted regulatory speed, and not on temporarily reduced construction zone regulatory or advisory speeds.

\*\*\* Roadside work includes shoulder work and roadway edge work.

\*\*\*\* LBAs are optional at speeds of 60 km/h or lower, but should be used for closed lanes on multi-lane roads if space permits.

\*\*\*\*\* Markers are channelizing devices. Application guidelines are shown in Table F. Cones with reflective collars may be used for daytime or night-time operations on non-freeways.

\*\*\*\*\* 5\* also refers to the required distance for the placement of a TC Warning Sign ahead of the hazard where referenced in section 6.3.5 for the individual signs.



Table B Work Zone Component Dimensions: Long Duration Work (Non-freeways)

	Dimension	Normal Posted Regulatory Speed Limit**				
		50 km/h or lower	60 km/h	70 km/h	80 km/h	90 km/h
1a*	Taper length for full lane closure (m)	LV: 15 – 25 HV: 30 – 50	40 – 60	60 – 80	100 – 120	140 – 160
1b*	Taper length for roadside work (m)***	LV: 5 – 8 HV: 9 – 15	10 – 15	15 – 20	20 – 25	30 – 40
2*	Longitudinal buffer area (LBA) (m)****	(30)	(40)	50	60	75
3*	Maximum distance between markers (m)*****	6 – 8	8 – 10	8 – 10	10 – 12	12 – 14
	Minimum number of markers for taper	at least 5 markers	at least 7 markers	at least 9 markers	at least 11 markers	at least 13 markers
4*	Minimum tangent between tapers (m)	55	100	120	140	160
5*	Distance between construction signs (m) *****	40 – 50	90 – 100	110 – 120	130 – 140	150

\* Table B distances are based on good visibility, and should be increased if visibility is poor.

\*\* The regulatory maximum speed posted on a highway applies under normal conditions, that is, when no construction zone or work activity is present. Guideline provisions required in OTM Book 7 are based on normal posted regulatory speed, and not on temporarily reduced construction zone regulatory or advisory speeds.

\*\*\* Roadside work includes shoulder work and roadway edge work.

\*\*\*\* LBAs are not a requirement at speeds of 60 km/h or lower, but should be used for closed lanes on multi-lane roads if space permits.

\*\*\*\*\* Markers are channelizing devices. Application guidelines are shown in Table F. Cones with reflective collars may be used for daytime or night-time operations on non-freeways.

\*\*\*\*\* 5\* also refers to the required distance for the placement of a TC Warning Sign ahead of the hazard where referenced in section 6.3.5 for the individual signs.

LV = Low Volume

HV = High Volume

LV is defined as the average daily traffic volume with less than 3000 vehicles per day (combined traffic for both directions). This figure can be obtained from the local road authority or estimated by counting the number of vehicles that pass the work site in 3 minutes and multiplying this figure by 300. The count may be taken in off-peak or peak traffic periods, corresponding to the period during which the work operations will be carried out.

Example: 20 cars in 3 minutes x 300 = 6000 vehicles per day (this would be an HV road).

### KEEP RIGHT Sign



**Wb-6** 60 cm x 60 cm  
**Font** Highway Gothic D  
**Colour** Legend & Border – Black  
Background – Yellow Reflective  
**Minimum Sheeting** Type I

### Purpose and Background

The purpose of the KEEP RIGHT warning sign (Wb-6) is to warn motorists to keep to their own half of the roadway, on segments of two-lane road having the combined hazards of narrow pavement width and restricted sight distance.

### Sign Types

There is one type of KEEP RIGHT sign: (Wb-6).

### Guidelines for Use

The KEEP RIGHT warning sign must only be used on two-lane roads where the pavement width is narrow and the sight distance is restricted (e.g., due to horizontal or vertical curves, vegetation, etc.).

### Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

### Special Considerations

There is also a KEEP RIGHT regulatory sign (Rb-25), which is unrelated in application to the KEEP RIGHT warning sign. Information on the Rb-25 sign can be found in Book 5 (Regulatory Signs).

### RAMP METERED WHEN FLASHING Sign (With Amber Flashers)



**Wb-7** 75 cm x 75 cm  
**Font** Highway Gothic C  
**Colour** Legend & Border – Black  
Background – Yellow Reflective  
**Minimum Sheeting** Type I

**APPENDIX B – SIGNAGE  
PLACEMENT MAP**









**APPENDIX C – WILDLIFE  
MANAGEMENT PLAN**

**Amherst Island Wind Energy  
Project, Traffic Management  
Plan Appendix C  
WILDLIFE MITIGATION**



Prepared for:  
Windlectric Inc. (c/o Algonquin  
Power Co)

Prepared by:  
Stantec Consulting Ltd.

November 23, 2015



**AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C  
WILDLIFE MITIGATION**

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## **AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C WILDLIFE MITIGATION**

Introduction  
November 23, 2015

### **1.0 INTRODUCTION**

Windlectric Inc. (Windlectric) is proposing to develop, construct, and operate the 75 megawatt (MW) Amherst Island Wind Energy Project (the Project) within Loyalist Township (the Township) in the County of Lennox and Addington (the County) in eastern Ontario.

The basic Project components include the construction of 26 wind turbines with associated access roads, collector lines and temporary construction laydown areas. Natural heritage assessment and environmental impact studies were completed, which identified some natural heritage features in proximity to the Project, assessed the potential impacts to these features and provided required mitigation measures.

Project traffic will use existing public roads on Amherst Island. The use of public roads will include some relatively minor modifications to accommodate construction traffic, such as increasing turning radii at some intersections and tight corners. In accordance with the Renewable Energy Approval (REA – No. 7123-9W9NH2, Section P), a Traffic Management Plan was developed in connection with the use of the public roads. The purpose of this Appendix to the Traffic Management Plan is to provide the wildlife mitigation requirements that will form an integral part of the Traffic Management Plan.



**AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C  
WILDLIFE MITIGATION**

Local Context and Wildlife Habitats  
November 23, 2015

## **2.0 LOCAL CONTEXT AND WILDLIFE HABITATS**

The Amherst Island landscape is comprised mostly of agricultural fields, primarily hay and pasture. Scattered woodlands, shrubland habitats and some minor water features occur intermittently within the agricultural setting.

Woodlands on the island are typically dominated by ash, red cedar or maple. While smaller woodlands occur throughout the island, some larger woodland patches can be found in the western and central-eastern parts of the island. Portions of the woodland in the western part of the island were identified as old growth.

A large coastal wetland complex, comprised of open marsh and swamps, occurs in the southwestern portion of the island, outside of the Project area. This includes the Nut Island Duck Club Marsh (114 ha), Wemps Bay Marsh (43 ha) and the Long Point Marsh (315 ha). The wetland complex provides habitat for a variety of wildlife, including but not limited to amphibians, reptiles and breeding birds. Some ash swamp and wet meadows occur elsewhere on the island. However, these are reflective of poor drainage soils and typically do not hold standing water, making them ill-suited for use by wildlife species associated with wetlands.

The NHA/EIS identified certain types of significant wildlife habitat on the island. Breeding bird habitats that were identified as significant included grassland (mostly hay and pasture field), the wetland complex, shrubland / early successional habitat (fallow agricultural lands) and area sensitive woodland habitat. Other significant bird habitats on the island included landbird migratory stopover habitats (larger woodlands) and raptor wintering areas (open fields and woodlands).

**AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C  
WILDLIFE MITIGATION**

Wildlife Mitigation  
November 23, 2015

### **3.0 WILDLIFE MITIGATION**

#### **3.1 MITIGATION DURING MINOR ROADWAY MODIFICATIONS**

Construction of the Project will include minor modifications within the existing public road rights of way; specifically increasing turning radii at intersections, tight corners and other areas with space restrictions. These modifications will be strictly limited to the existing road right-of-way and will be temporary to the construction period.

During road work to construct these modifications, the mitigation measures described below will be taken, which go above and beyond normal construction mitigation best practices. These measures are consistent with mitigation in the NHA/EIS.

- In areas where the existing road footprint is expanded within the right of way, clearly delineate work area using silt fence to avoid accidental encroachment beyond work area and the right of way;
- The Project will implement a grading and stormwater management plan which will include a sedimentation and erosion control plan, and will be prepared by an erosion control design expert. The plan will include the following features:
  - minimizing the duration of soil exposure;
  - retaining or replace any existing vegetation in the right of way;
  - diverting runoff away from exposed soils, keeping runoff velocities low and trapping sediment as close to the source as possible;
  - exposed soil areas will be stabilized and re-vegetated, through the placement of seed and mulching or seed and an erosion control blanket, promptly upon completion of construction activities;
  - sediment and erosion controls should be monitored regularly and properly maintained, as required. Controls are to be removed only after the soils of the construction area have been stabilized and adequately protected until cover is re-established;
  - on site works inspected by a qualified inspector; and
  - post-construction inspection and monitoring (and if necessary further work) will occur to ensure that any necessary re-vegetation has been successful.



## **AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C WILDLIFE MITIGATION**

Wildlife Mitigation  
November 23, 2015

- In areas adjacent to water features (including water crossings, ponds and seasonally flooded areas), road construction and site preparation will occur between October 31<sup>st</sup> and May 1<sup>st</sup> to avoid sensitive periods for amphibians, fish and reptiles; and
- Any vegetation clearing required will take place outside of the period from April 1<sup>st</sup> to July 31<sup>st</sup> to eliminate the potential for wildlife disturbance during the breeding window.

Following construction, the temporary road modifications, such as turning radii, will be removed. During this period, all construction mitigation discussed above will apply. All disturbed areas will be re-seeded to be returned to pre-construction conditions.

### **3.2 TRAFFIC AND CONSTRUCTION TIMING MITIGATION**

During construction, Project related vehicles will use public roadways for delivery of construction equipment, materials, project components and aggregate, as well as daily worker traffic. The following sections outline mitigation steps that will be taken to minimize potential risk of wildlife collisions and disturbance from construction traffic. These measures have included incorporating design elements into the traffic management plan (e.g. considering the potential for wildlife impacts during route selection), traffic control mitigation and influencing driver behavior.

#### **3.2.1 Traffic Management Design and Construction Timing Restrictions**

The Ontario Ministry of Transportation provides a general approach to wildlife conflict assessment (MTO 2006). The process involves the identification and avoidance of priority wildlife areas. Where roads occur, MTO recommends that potential wildlife conflict zones be identified, the nature of the wildlife using these areas be assessed and appropriate wildlife mitigation measures be developed. During the development of the Traffic Management Plan and in selection of the trucking routes on public roads during construction of the Project this process was applied.

The wetland complex on the southern end of the island provides habitat for amphibian and breeding birds, as well as habitat for reptiles. Similarly, sections of existing public roads which pass through large wooded areas may have increased risk of wildlife collisions, in particular if the woodland provides a movement corridor function. Trucking routes were selected to avoid roads in proximity to the wetland complex or through large woodland features. Specifically, no construction related traffic will use Emerald 40 Foot Road, Art McGinns Road or South Shore Road to the west of Stella 40 Foot, which cross through woodlands, and are the only roads on Amherst Island that cross or run adjacent to the wetland complex. These roads will not be used at any time during the construction of the Project.



## **AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C WILDLIFE MITIGATION**

Wildlife Mitigation  
November 23, 2015

Avoidance mitigation will also include the following construction timing restrictions.

Risk of wildlife / vehicle collisions is typically increased during the evening at dusk when some wildlife species become more active. To reduce the potential risk of wildlife collision, use of any public roads by Project related vehicles during dusk and night hours will be limited to the extent possible. To accomplish this, delivery of Project components, equipment and materials, as well as aggregate delivery, will be scheduled outside of the dusk and nighttime hours.

Construction schedules will also avoid carrying out any construction activities between May 1<sup>st</sup> and October 31<sup>st</sup> in the areas that are in any proximity to the wetland complex, specifically access roads, turbine foundations and infrastructure associated with turbines S03, S09, S11 and S36, as well as construction traffic on 3<sup>rd</sup> Concession Road. Thus, no construction activities will be carried out at any of these locations, and there will be no construction traffic on 3<sup>rd</sup> Concession Road, during the main active season for various species of wildlife that may be using the wetland complex.

### **3.2.2 Traffic Control**

In general, increased awareness and vigilance with respect to wildlife, as well as reduced speeds, assist in the detection and avoidance of wildlife on roads. These measures can be particularly effective when implemented where roads intersect with any wildlife habitats.

During construction, the speed limits of Project traffic on existing public roads will be reduced to 30 km/hour in proximity to watercrossings, ponds or seasonally flooded areas. In these areas temporary signage will be installed during construction to remind vehicle drivers where speed restrictions apply and to increase driver vigilance with respect to wildlife. This mitigation will be in place from May 1<sup>st</sup> to October 31<sup>st</sup>.

The signage will be posted at the beginning of the designated wildlife zones, in both directions. The signs will in general be generic as to the type of wildlife presence and will not be species or group of species specific. If for some locations the on-site wildlife inspector feels it would be beneficial, species-specific signage will also be used. The signage will display wildlife crossing and speed limits to act as a reminder and to reinforce the awareness training.

During construction, trained field biologist wildlife inspectors will be on-duty full time to monitor the effectiveness of driver awareness and reduced speed limits, as well as the effectiveness of training and signage to influence driver behavior. As an example, the installed signs and fencing will be checked on a daily basis during construction and maintained or replaced as needed. If in the opinion of the wildlife inspector, additional measures or approaches should be implemented to increase or modify mitigation, or in order to ensure the effectiveness of the mitigation already in place, those measure or approaches will be put in place.



## AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C WILDLIFE MITIGATION

Wildlife Mitigation  
November 23, 2015

### 3.2.3 Driver Behavior

Driver behavior can influence the risk of wildlife / vehicle collisions (OREG 2010). The potential risk of vehicle / wildlife collisions can be reduced through the adoption of certain driver behaviors. Education and engagement of the construction team is a critical component of the traffic management mitigation (van der Ree et al., 2015, MNR 2014). As such, a training program and associated training materials to educate construction vehicle drivers about the risk to wildlife, mitigation measures and driver behavior requirements is important and has been included as part of this Plan.

All vehicle drivers will be required to complete wildlife awareness training before performing any work on the Project. Formal retraining will be required for any vehicle drivers that are away from the Project site for more than 120 business days. To reinforce training and engage drivers, wildlife sensitivity reminders into the daily Project tailgate sessions or morning workflow planning. Furthermore, pocket handouts will be provided to drivers, and wildlife mitigation materials will be posted around the job site to reinforce training.

The specific training materials will be developed by a qualified biologist with experience in construction environmental inspection. The initial wildlife awareness training will be provided in person by the construction environmental biologist; likely provided at the same time as the site orientation and the awareness training requirements under the Endangered Species Act permit.

Following this initial training, measures will be taken to reinforce wildlife awareness on the construction site. Materials such as posters and handouts will be posted in communal areas such as construction trailers or washrooms.

A record will be kept of all training including who provided and attended the training, the date of certification and the training materials that were covered. Hard hat certification stickers will be a requirement before work of any nature on site may begin.

The training session and associated materials will include, at a minimum:

- background information (designed to be engaging) on wildlife and wildlife habitat on Amherst Island;
- Identification of what wildlife drivers may encounter;
- where and when encounters are most likely to occur;
- the mitigation measures for wildlife that are being put in place;
- safety and responsible driving guidance (i.e. as recommended in MTO 2013), such as:



## AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C WILDLIFE MITIGATION

Wildlife Mitigation  
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- Watch - Scan the road ahead from shoulder to shoulder. If wildlife is spotted, slow down and pass carefully. Have extra vigilance and obey speed restrictions in signed areas;
  - Steer - Stay in control and adjust speeds to accommodate weather conditions. If driving at dusk or night occurs, reduce speeds. Look where you want to travel instead of fixation unduly on what you are trying to avoid;
  - Brake - firmly if wildlife is observed on or adjacent to the road. Do not assume the wildlife will move out of your way; and
  - Stop - as safely as possible if wildlife is crossing the road. If one animal crosses the road, others may follow.
- whom to speak to regarding any questions about the wildlife mitigation;
  - where on the construction site refresher materials on wildlife can be found; and
  - actions to take in the case of a wildlife encounter.

The onsite wildlife inspectors will encourage ongoing engagement and discussion with vehicle drivers throughout the construction period.

In addition to positive encouragement, and creating a culture of respect for wildlife, drivers will be reminded that compliance with this plan is a mandatory job requirement, and any failure to do so could result in disciplinary action, up to and including termination.

### 3.2.4 Wildlife Movements

To reduce the risk of any wildlife collisions during construction silt fencing or other appropriate barrier fencing will be used to inhibit movement of wildlife onto the public roadways. Such exclusory fencing will be placed strategically, where there appears to be the greatest possibility for any wildlife crossings to occur (MNR 2014). Within the Project site, such areas have been identified where public roads intersect or run adjacent to water crossings, ponds or seasonally flooded areas. The wildlife inspector will require fencing in additional areas as deemed beneficial based on the circumstances encountered during construction. The barrier fencing will in all cases be temporary, during the construction period.

Specifications for barrier fencing will follow best practices, including for example, Best Practices Technical Note – Reptile and Amphibian Exclusion Fencing (MNR 2013). Installation of barrier fencing will occur prior to commencement of construction. The fencing will extend 50m on either side of the feature and both sides of the road, with the ends of the fencing curved to direct wildlife away from the road. The wildlife inspector will be onsite during the installation of barrier fencing to minimize the potential disturbance or destruction of wildlife and/or their





**AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C  
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habitat during construction. As noted above, the fencing will also be monitored to ensure it remains in place and is working as planned.

**AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C  
WILDLIFE MITIGATION**

Closing  
November 23, 2015

## **4.0 CLOSING**

The Traffic Management Plan and this Wildlife Mitigation Appendix have been completed in accordance with REA No. 7123-9W9NH2. The application of these mitigation measures, including traffic management, driver behavior and wildlife movement mitigation are expected to address potential negative effects of construction traffic.

Stantec Consulting Ltd. prepared this Wildlife Mitigation Appendix to the Traffic Management Plan for Windlectric Inc. for the Amherst Island Wind Energy Project. Windlectric Inc. is committed to implementing the appropriate protection and mitigation measures as they apply to the construction of the proposed Project.

**AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C  
WILDLIFE MITIGATION**

Closing  
November 23, 2015

This document entitled Amherst Island Wind Energy Project, Traffic Management Plan Appendix C WILDLIFE MITIGATION was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Windlectric Inc. (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by Andrew Taylor  
(signature)

**Andrew Taylor, B.Sc.**  
Senior Terrestrial Ecologist

Reviewed by N. Kopysh  
(signature)

**Nicole Kopysh**  
Project Manager



**AMHERST ISLAND WIND ENERGY PROJECT, TRAFFIC MANAGEMENT PLAN APPENDIX C  
WILDLIFE MITIGATION**

References  
November 23, 2015

## **5.0 REFERENCES**

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Stantec Consulting Ltd. 2012. Amherst Island Wind Energy Project Natural Heritage Assessment & Environmental Impact Study.


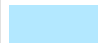

Van der Ree, R., D.J. Smith, and C. Grilo. 2015. Handbook of Road Ecology. John Wiley & Sons Ltd.

**APPENDIX D – DRAFT ROAD USE  
PACKAGE**

**APPENDIX E – INCIDENT  
REPORTING FORM**

Appendix D – Summary of Detour Routes

### Legend

-  Public Roads
-  Waterbodies
-  Detour Route



No.	Date	Description
1	6/29/15	Shapefile Update

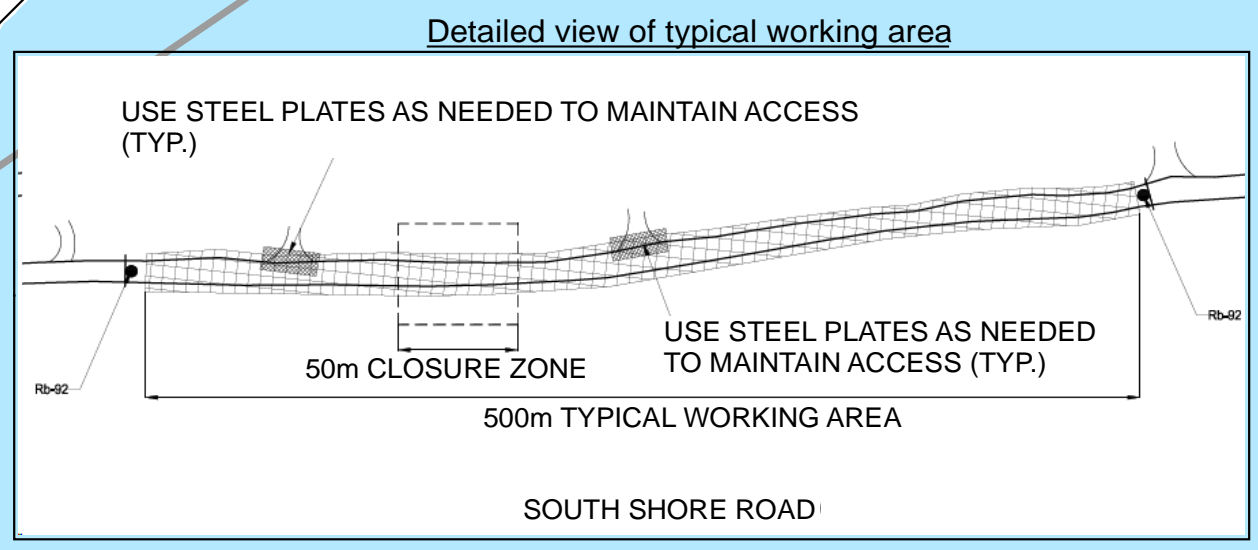
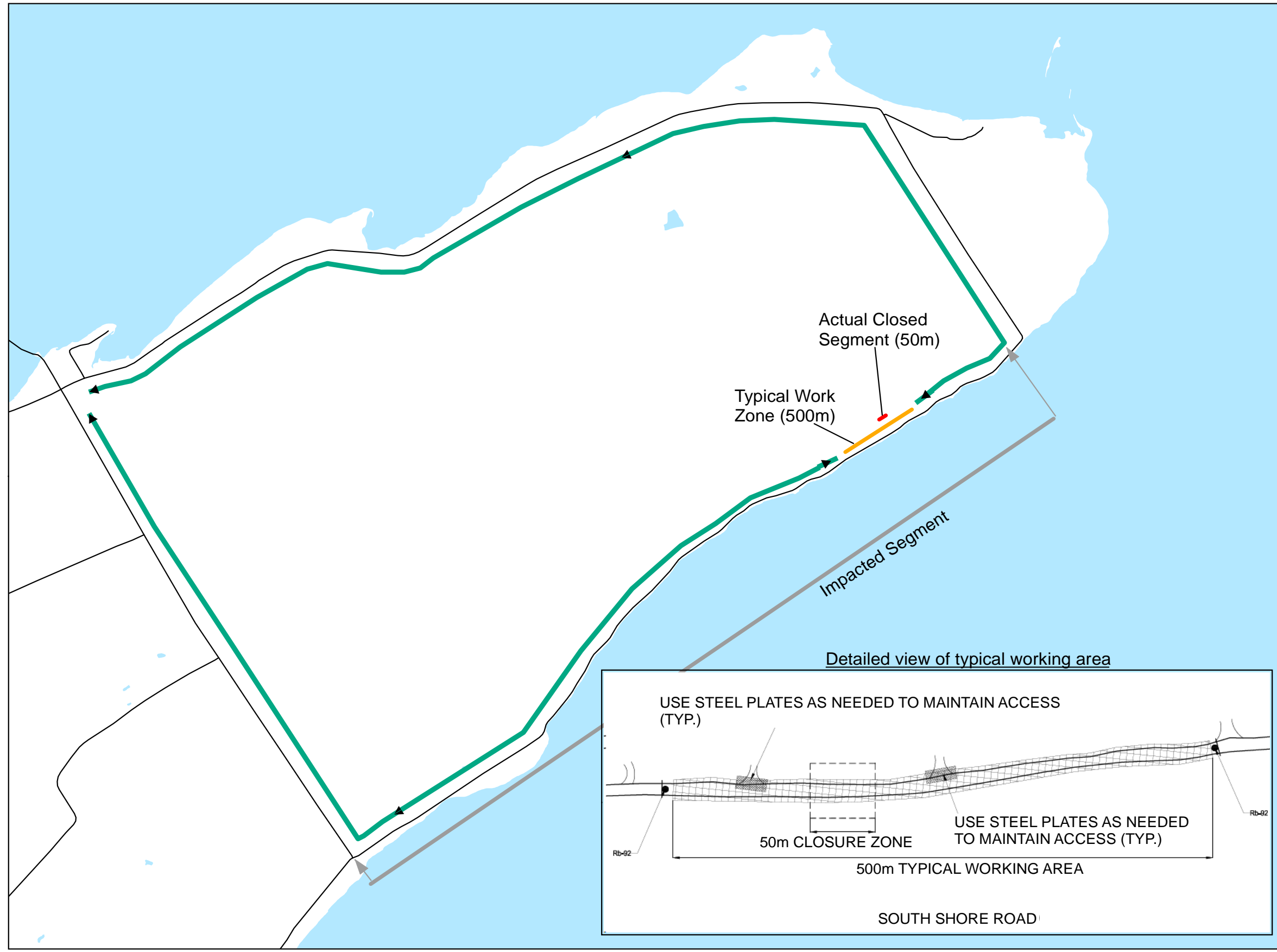
**REVISIONS**


**ALGONQUIN**  
 ALGONQUIN POWER Co.

**AMHERST ISLAND WIND PROJECT**

**TITLE:**  
**South Shore Rd  
 Road Closures &  
 Preferred Detour Routes**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:22,500
DRAWN BY: D THOMPSON	DATE: APR 18, 2017
DRAWING No. <b>AMHST - 240a</b>	REVISION No. <b>1</b>



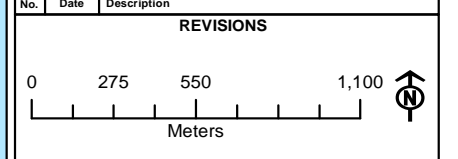


### Legend

- Public Road
- Waterbodies
- ↔ Detour Route



No.	Date	Description
REVISIONS		



### AMHERST ISLAND WIND PROJECT

### TITLE: Stella 40 Foot Rd Road Closures & Preferred Detour Routes

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:22,000
DRAWN BY: D THOMPSON	DATE: APR 28, 2017
DRAWING No. <b>AMHST - 240b</b>	REVISION No. <b>2</b>



Note: Emerald 40 Foot Road's availability will be confirmed prior to work taking place requiring use of this detour.



**Legend**

- Public Road
- Turbine Locations
- Waterbodies
- ↔ Detour Route



No.	Date	Description
REVISIONS		



**AMHERST ISLAND WIND PROJECT**

**TITLE: Dump Rd Road Closures & Preferred Detour Routes**

DATUM/PROJECTION: NAD83/UTM ZONE 18N		SCALE: 1:22,000	
DRAWN BY: D THOMPSON		DATE: DEC 23, 2016	
DRAWING No. <b>AMHST - 240c</b>		REVISION No. <b>0</b>	

**Legend**

- Public Road
- Waterbodies
- ↔ Detour Route



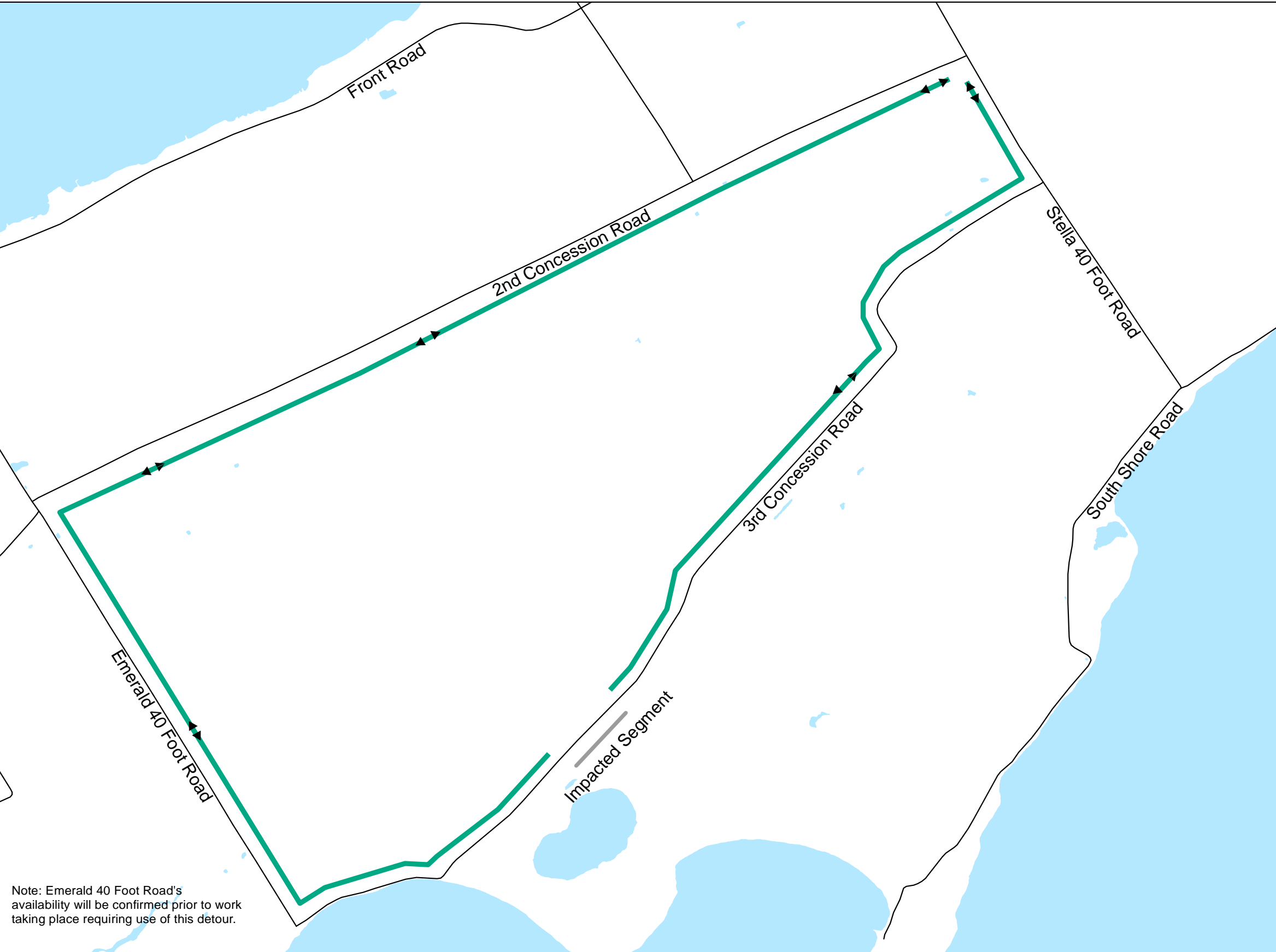
No.	Date	Description
REVISIONS		



**AMHERST ISLAND WIND PROJECT**

**TITLE:  
3rd Concession Rd Road Closures & Preferred Detour Routes**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:22,000
DRAWN BY: D THOMPSON	DATE: APR 28, 2017
DRAWING No. <b>AMHST - 240d</b>	REVISION No. <b>2</b>



Note: Emerald 40 Foot Road's availability will be confirmed prior to work taking place requiring use of this detour.

**Legend**

- Public Road
- Waterbodies
- ↔ Detour Route



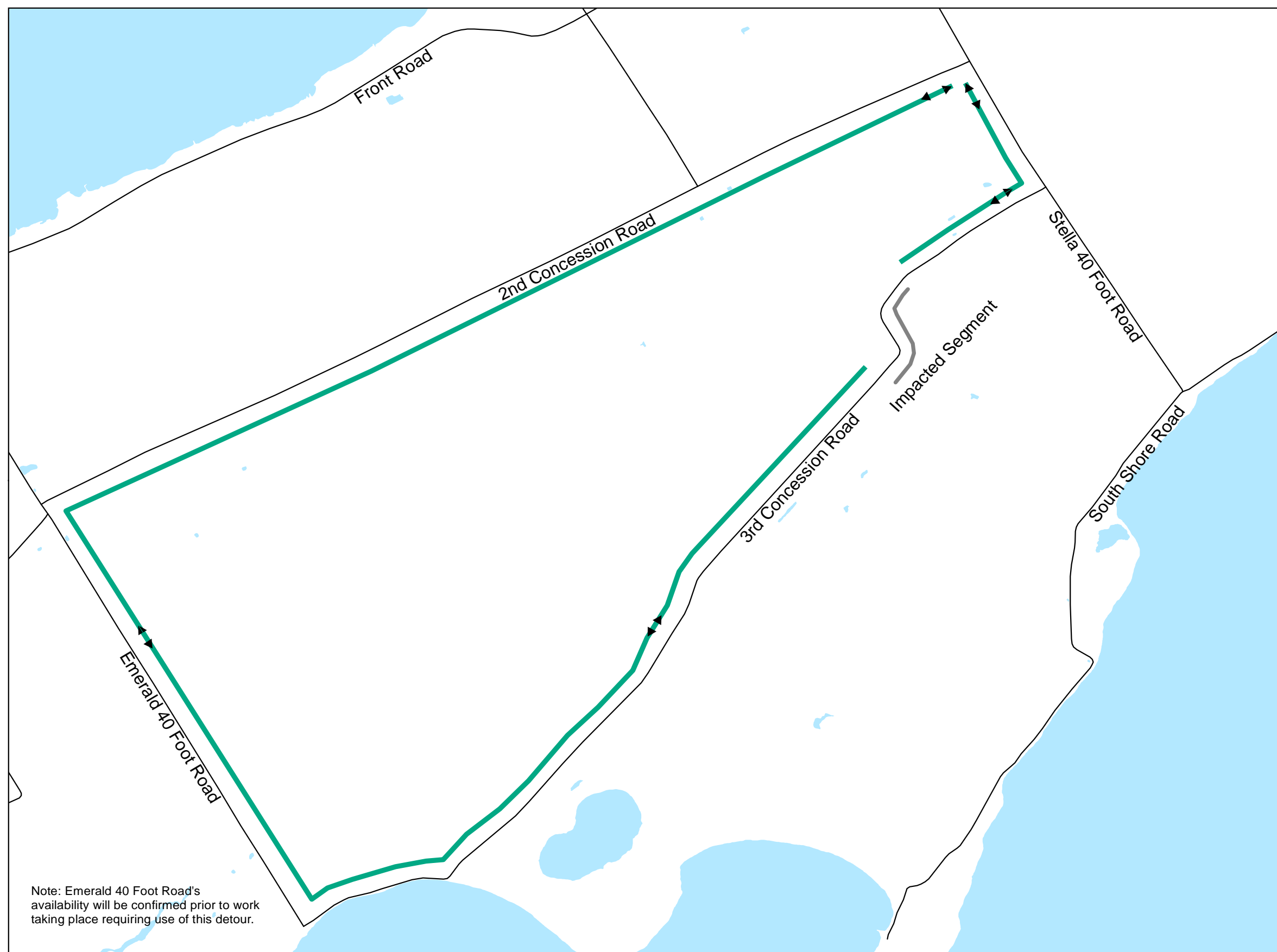
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REVISIONS		



**AMHERST ISLAND WIND PROJECT**

**TITLE:  
3rd Concession Rd Road Closures & Preferred Detour Routes**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:22,000
DRAWN BY: D THOMPSON	DATE: APR 28, 2017
DRAWING No. <b>AMHST - 240e</b>	REVISION No. <b>2</b>



Note: Emerald 40 Foot Road's availability will be confirmed prior to work taking place requiring use of this detour.

Appendix E – Incident Reporting Form



INCIDENT INVESTIGATION REPORT

Report No.

SECTION A

DATE OF INVESTIGATION: DATE & TIME OF INCIDENT:

Day Shift Night Shift

- INCIDENT TYPE: Personal Injury, Near Miss, Inhalation Exposure, Equipment Damage, Property Damage, Fire/Explosion, Security/Theft, Material Loss, Environmental, Chemical Exposure, Occupational Illness, Fuel Spill, Fatality, Report Only, Vehicle Incident, Other (Explain)

INDIVIDUAL REPORTING INCIDENT:

REPORTED TO WHOM? DIRECT FOREMAN:

CONTRACTOR: CONTRACT #:

PERSON(S) INVOLVED: OCCUPATION(S):

ANY WITNESSES? YES NO (If Yes, Please fill out Witness Statement Section B, Attachment B)

ARE PICTURES/DIAGRAMS ATTACHED? YES NO

WAS THERE ANY INJURIES: YES NO

Name of Injured Worker: Was First Aid Rendered? By Whom?

Injured Body Part /Nature of Injury:

Medivac/Medical Referral/Return to Work?

DESCRIPTION OF INCIDENT/ DESCRIBE HOW INCIDENT OCCURRED:

(Additional space is available in Section B)



INCIDENT INVESTIGATION REPORT

SECTION A

DESCRIBE ANY PROPERTY DAMAGE AND/OR TYPE OF EQUIPMENT DAMAGED: ESTIMATED COST: \$\_\_\_\_\_.00

\_\_\_\_\_

WAS EQUIPMENT TAKEN OUT OF SERVICE?  YES  NO DID EQUIPMENT RETURN TO WORK?  YES  NO
DESIGN (equipment failure, standards, utilized, guarding procedures, incompatibility with machinery, etc.)

ENVIRONMENT (dust, noise, hazard identification, etc.)

WEATHER CONDITIONS: \_\_\_\_\_ LIGHTING CONDITIONS: \_\_\_\_\_

WAS PROPER PPE BEING USED AT THE TIME?  YES  NO

HUMAN FACTORS (fatigue, competency, improvisation, drugs/alcohol, training, etc.)

INCIDENT ANALYSIS (direct causes/ indirect causes):

HAS OR WILL THIS INCIDENT BE REVIEWED WITH WORKERS?  YES  NO
HAS OR WILL THIS INCIDENT BE REVIEWED WITH SUPERVISION?  YES  NO
HAVE YOU ATTACHED MINUTES OF REVIEW MEETING(S)?  YES  NO IF NOT, FORWARD ASAP  YES  NO
HAS A HAZARD ANALYSIS BEEN CONDUCTED?  YES  NO

WHAT STEPS HAVE BEEN TAKEN TO ELIMINATE PROBABLE CAUSES? (BY WHOM? WHEN?)

\_\_\_\_\_

WHAT ADDITIONAL STEPS WILL BE TAKEN AT LATER DATE AND WHEN? \_\_\_\_\_

REVIEWED BY PENNECON LIMITED

Name: Position: Date:

FOLLOW UP REQUIRED  FILE COMPLETE

OH&S Committee Notified? Yes  No  WHSCC Notified? Yes  No

COMMENTS: COMPLETE SECTION-B REQUIRED Yes  No

\_\_\_\_\_

REVIEWED BY:

MANAGEMENT REPRESENTATIVE: Date:







INCIDENT INVESTIGATION REPORT

SECTION B (attachment A)  
EMPLOYEE'S STATEMENT OF FACTS:

Multiple horizontal lines for writing the employee's statement of facts.

EMPLOYEE'S SIGNATURE	DATE:
----------------------	-------

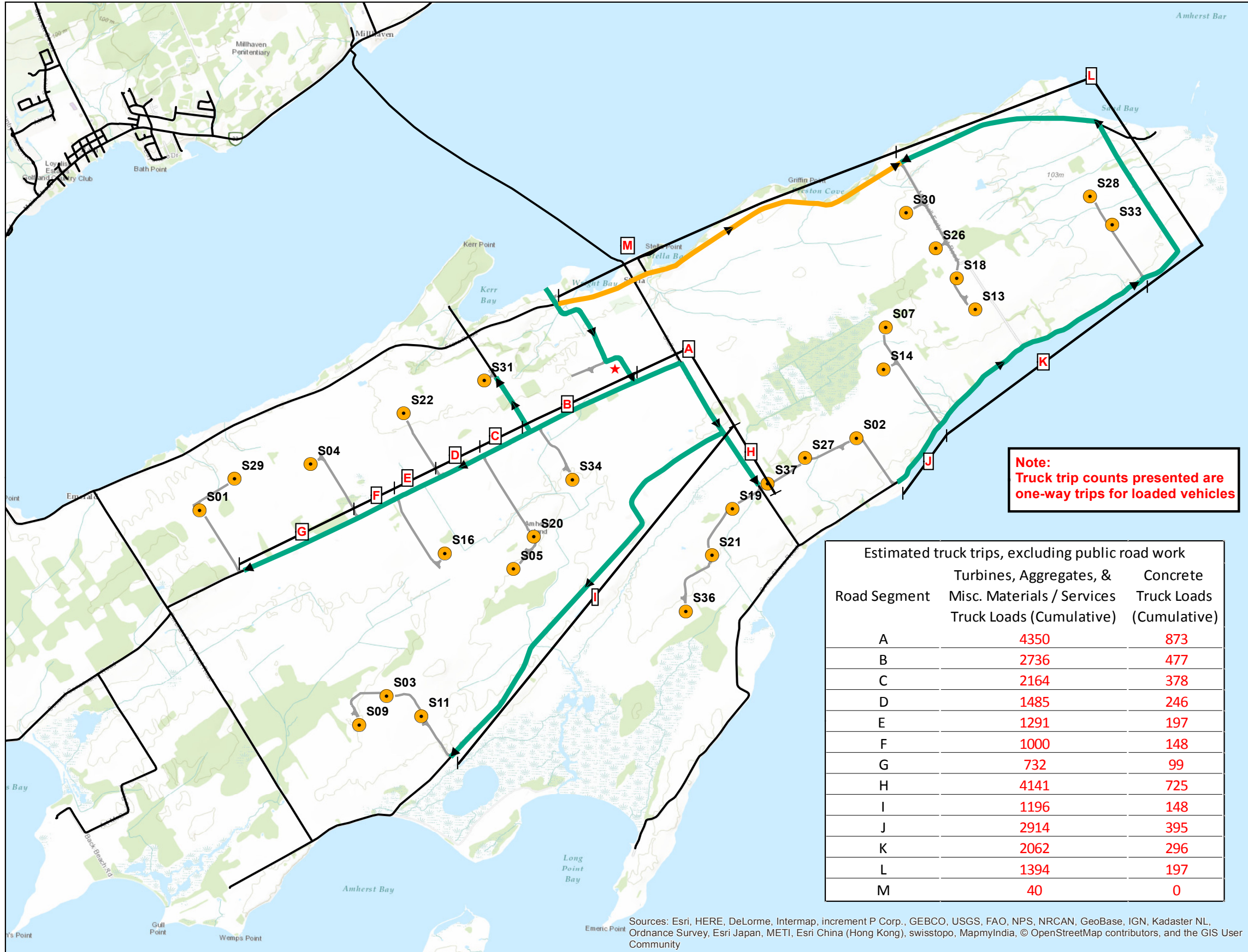
SF-051

Attachment "A"





SCHEDULE 03 – Heavy Load Traffic by Road



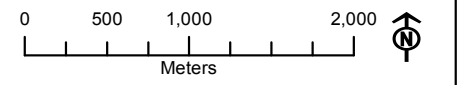
- Legend**
- Heavy Load Delivery Route
  - Turbine Component Delivery Route (S13, S18, S26, S30 ONLY)
  - Turbine Location
  - Access Road
  - Public Road
  - Island Laydown Yard
  - Road Segment

Note: Arrows indicate direction of travel of loaded trucks. Trucks will return on the same path, in the opposite direction

**Note:**  
Truck trip counts presented are one-way trips for loaded vehicles

Estimated truck trips, excluding public road work

Road Segment	Turbines, Aggregates, & Misc. Materials / Services Truck Loads (Cumulative)	Concrete Truck Loads (Cumulative)
A	4350	873
B	2736	477
C	2164	378
D	1485	246
E	1291	197
F	1000	148
G	732	99
H	4141	725
I	1196	148
J	2914	395
K	2062	296
L	1394	197
M	40	0



**AMHERST ISLAND WIND PROJECT**

TITLE:  
**Delivery Routes for Heavy Loads**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:40,000
DRAWN BY: D THOMPSON	DATE: JUL 19, 2017
DRAWING No. <b>AMHST - 207</b>	REVISION No. <b>7</b>

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

SCHEDULE 04 – Site Safety Orientation



# Welcome to Pennecon Heavy Civil Ltd. Amherst Island Wind Project





## While You Are Here In Orientation

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- Washroom location
- In case of an emergency
  - Muster area
- Breaks
- Please turn off cell phones





# Human Resources Employee Orientation



## Work Rules

The following behaviours are considered unacceptable and subject to disciplinary action:

- Destruction of Company/Contractor property.
- Removal of Company or Contractor property without permission.
- Refusal to accept work assignments. (except if unsafe).
- Falsifying records involving personnel, absence, sickness or termination.
- Insubordination.
- Reporting to work under the influence of narcotics, intoxicants or illegal medications or use of them on Company property.
- Verbally threatening bodily harm to any individual.
- Physically assaulting any individual.
- Harassment.
- Possession of firearms or other weapons or ammunition on Company property.



## Drug and Alcohol Policy Highlights

- Pennecon is committed to providing a safe, drug and alcohol-free workplace. The health and safety of our employees, as well as our clients expectations, are of utmost concern.
- Employees are prohibited from reporting to work under the influence of any non-prescribed drugs or alcohol. The use, possession, sale, manufacture or dispensation of illegal drugs is also prohibited.
- Employees who report to work under the influence or partake in illegal drug activity may be subject to disciplinary action, including termination of employment. In some cases, employees may need to be evaluated by an expert service provider to determine whether a substance abuse problem exists.
- If it is determined that the employee has a substance dependency, the employee will be required to successfully complete a rehabilitation treatment program before returning to work.

## Progressive Discipline

- Pennecon has adopted a policy of Progressive Discipline to ensure that employees have the opportunity to correct any performance or behavioural problems that may arise.
- The following methods of discipline will be applied when necessary:
  - Verbal discussion/warning
  - Written reprimand
  - Suspension
  - Termination of employment
- Investigations are conducted on case by case basis.
- The level of discipline depends on the severity of the infraction and mitigating factors.



## Respectful Workplace

- Pennecon is committed to building and preserving a positive working environment for all employees, one that is free from all forms of discrimination and/or harassment.
- The Company believes that all employees should be treated with dignity and respect.
- If it is determined that harassment or discrimination has occurred, appropriate action, up to and including termination of employment, will be taken against the respondent in accordance with Company policy.



## Workplace Violence Prevention

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- Pennecon Limited is committed to providing a workplace in which the respect and safety of the employees is paramount.
- Any work related threats or acts of violence against employees or their families, is unacceptable, and will not be tolerated.
- “Violence” includes any attempted or actual exercise by any person, including another worker, of any physical force so as to cause injury to a worker and includes any express threat of violence.

## Smoking

- The Company maintains a commitment to the health and safety of its employees.
- Smoking shall be prohibited on company premises, except in designated smoking areas as determined by management at each work site.
- Employees are responsible to ensure they know the designated smoking areas in their work site.





# Safety Overview







## Amherst Island Wind Project

- 75 MW wind project located on Amherst Island, located in Loyalist Township, in eastern Ontario.
- 26 Siemens wind turbines.
- Temp docks
- Temp Roads
- Switching Station
- Batch Plant
- Central Staging Area

## Site Specific Plans

- Amherst Island Wind Project Operation Plan
- Traffic and Construction Management Plan
- Communication Plan
- Public Safety Plan
- Site Specific Safety Plan
- Site Specific Environmental Protection Plan
- Species at Risk Training
- Renewable Energy Agreement



## Occupational Health & Safety Policy

- The Pennecon Heavy Civil Ltd. Management Team is committed to undertake its business in such a way as to minimize the risks of injury or ill health to people, and damage to property or the environment.
- We believe sound Health and Safety performance is fundamental to our successful business performance.
- It is our requirement and expectation that Management, Supervisors, Employees and Subcontractors will play their part in the implementation of our Health and Safety Management Strategy.

## Our Goals

The goals of the Pennecon Heavy Civil Ltd Health and Safety Management Strategy include:

- No personal injuries.
- No work related illness.
- No material damage or financial losses.
- Zero environmental impact.





## Our Commitment

- We will ensure the Health & Safety Policy is known and understood by all associated with PHCL.
- We will demonstrate that nothing has higher priority than Occupational Health and Safety and employee well-being.
- We will think, plan, observe and evaluate as we proceed.
- We will recognize those individuals who proactively contribute to Health and Safety improvement.
- Continual improvement is the objective.
- We comply with all relevant Ontario Health and Safety Act and Regulations, Statutes, Codes of Practice, Industry Standards and PHCL Corporate Policies as a minimum.
- Safe workplaces, practices and systems are established.
- Risks arising from our activities are properly identified, assessed and eliminated or reduced to an acceptable level.

## Our Commitment

- Full cooperation and participation is provided to The Occupational Health and Safety Committee, and/or Workplace Health and Safety Representative/designate.
- The corporate Health and Safety initiative is supported by the involvement of all employees, consultants, contractors and suppliers associated with Pennecon Heavy Civil Ltd in a culture of continuous improvement of Health and Safety performance.
- The immediate and root causes of incidents (actual and potential) are identified, addressed and communicated to prevent reoccurrence.

## Guiding Principles

Pennecon Heavy Civil Ltd Management Team's guiding principles for managing work are as follows:

- All incidents are preventable.
- Ownership by senior management and on-site supervision is mandatory through direct involvement and review of OHS programs and efforts.
- Pennecon Heavy Civil Ltd Management Team has an obligation to eliminate or control known hazards and to ensure workers are competent and are supervised by competent line management.
- Safety performance requires establishing procedures and programs, conducting training, contractor and employee involvement, routine self-evaluation, and continuous improvement.



## Employee Responsibilities

- Integrate Health & Safety diligence into all activities.
- Exercise all reasonable steps to protect Health & Safety of self and others.
- Immediately report all incidents, illnesses and near misses to supervision.
- Identify, assess and report hazards, as well as, take appropriate remedial steps prior to work commencing and/or continuing.
- Refuse work when faced with a situation presenting imminent danger.
- Maintain and use personal protective equipment.
- Communicate frequently with supervisor on Health & Safety issues.
- Working safely is a condition of employment.





## Employee Responsibilities

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Employees are expected to actively participate in:

- Job planning activities
- Safety meetings
- Inspections
- Incident and near miss investigations
- Company initiated training sessions
- Early and safe return to work programs



## Employee Rules & Conditions

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- Employees must conduct pre-use inspections of tools.
- Employees shall be governed by standard practices, standing instructions, directives, codes, etc. which are supplementary but do not contravene this safety management system.
- All work shall be carried out in accordance with appropriate safe work practices and supervisory direction.
- Every employee shall keep his or her work area neat, clean and orderly.
- All personnel who must operate a motor vehicle as part of their normal job must maintain a valid driver's license.
- Employees shall be subject to disciplinary action up to and including dismissal as a result of willful disregard for these rules.

## Employee Rights

### Right to Participate

- Pennecon Heavy Civil Ltd recognizes and supports employees' right to participate in the process of identifying and resolving workplace occupational health and safety issues.

### Right to Know

- Pennecon Heavy Civil Ltd recognizes and supports employees' right to know about issues that may affect their occupational health and safety in the workplace.
- All employees will be made aware of any known hazard they may encounter and of measures in place to reduce the risk associated with that hazard.

## Right to Refuse Unsafe Work

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- Any worker that believes that the work that they are asked to perform could put themselves and/or co-workers in imminent danger has the right to refuse.
- It is not just your right, but your obligation to refuse unsafe work.
- The Supervisor will take immediate action to develop a method of safe guarding to ensure that safety is the number one priority.
- If the employee still feel that the condition is unsafe then they are to talk with their OH&S Committee, WH&S Representative or Designate.
- If after corrections have been made and the worker(s) still believe the condition is unsafe, then OH&S will be contacted.

**NO WORKER WILL BE DISCIPLINED  
FOR USING THEIR RIGHT TO REFUSE**

## Toolbox/Safety Meetings

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- Safety meetings may include but are not limited to, regular weekly safety meetings, daily pre-shift toolbox talks, project specific meetings and special hazard meetings.
- A Supervisor or designated person will head the meeting.
- Topics, which are relevant to the work being performed, will be discussed.
- All accidents/incidents reported will be reviewed during the safety meetings.
- Concerns brought up by the workers will also be discussed and documented.
- Corrective actions taken from the concerns/issues that were brought forward from the previous meeting will be discussed.

## Incident Reporting

- It is Pennecon Heavy Civil Ltd.'s policy that all incidents and near misses are immediately reported to all appropriate company personnel and required Government Agencies.
- All incident investigations are to be completed in a timely manner as per site reporting requirements.
- Pennecon Heavy Civil Ltd will ensure that appropriate corrective actions are taken to reduce/eliminate the likelihood of reoccurrence.
- Employees are required to participate in the investigation proceedings as appropriate and required

## Incident Reporting

Incidents that must be investigated include but is not limited to:

- Personal Injury
- Property/Vehicle Damage
- Fires & Explosions
- Chemical & Pollutant Spills
- High Potential Near Misses



## Health & Safety Inspections

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- Pennecon Heavy Civil Ltd will ensure formal inspections will be carried out on a regular basis by a workplace team consisting of representatives from Management, Supervision, OHS Committee and the HSE Team.
- Informal workplace inspections take place on an ongoing basis to ensure compliance to company and legislative requirements.
- All deficiencies and hazards noted during inspections will be documented.
- All necessary corrective actions will be taken to mitigate any hazards identified as a result of the inspections.
- Responsible persons will date and sign off when issues have been completed.
- The issues noted during the inspections will be reviewed during the weekly safety meetings and daily toolbox talks.





## Hazard Recognition, Risk Evaluation & Control

- We expect employees to ensure that all work is performed in a safe manner through:
  - Planning the work to be completed.
  - Monitoring the area and work for hazards.
  - Monitor for any unsafe acts and conditions around the workplace.
  - Tools include JSA, FLRA & POST

## Job Safety Assessment

A JSA will be conducted or be reviewed:

- When a job is being undertaken for the first time and the risks are unknown.
- For non-routine jobs or new jobs where experience is limited.
- Any job that is deemed to be high risk.

## Field Level Risk Assessment

FLRA's help identify the hazards and determine the corrective actions that need to be taken.

The steps to performing a Field Level Risk Assessment is:

- Select the job to be analyzed
- Break the job down into steps
- Identify the hazards and potential accidents/incidents that may occur
- Develop ways to eliminate hazards and prevent potential accidents



# Field Level Risk Assessment

<b>PENNECON LIMITED</b>	<b>PENNECON LIMITED</b> OCCUPATIONAL HEALTH & SAFETY MANUAL
<b>FIELD LEVEL RISK ASSESSMENT</b>	

Supervisor: \_\_\_\_\_ Date: \_\_\_\_\_  
 Project/Location: \_\_\_\_\_ Task Location on Site: \_\_\_\_\_  
 Work Scope: \_\_\_\_\_

### PRE-JOB CHECKLIST

- |  |  |   |
|--|--|---|
| <p><b>Permits</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Permits required – issued/received (Safe work, hot work, confined space, energized electrical, critical lift, etc.)</li> </ul> <p><b>Working at Heights</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Trained in Fall Protection</li> <li><input type="checkbox"/> Harness required/Tie-off identified</li> <li><input type="checkbox"/> Others working above/below</li> <li><input type="checkbox"/> Falls from height</li> <li><input type="checkbox"/> Objects falling from work area</li> <li><input type="checkbox"/> Elevated work platform hazards</li> <li><input type="checkbox"/> Scaffold inspected and tagged</li> <li><input type="checkbox"/> Ladder tied off</li> <li><input type="checkbox"/> Personnel baskets inspected &amp; approved</li> <li><input type="checkbox"/> Hoisting tools (come-a-longs) inspected</li> <li><input type="checkbox"/> Hoisting tools sized for job</li> </ul> <p><b>Ergonomic Hazards</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Awkward body position</li> <li><input type="checkbox"/> Lift too awkward/heavy to lift</li> <li><input type="checkbox"/> Walk area not clear/level</li> <li><input type="checkbox"/> Prolonged twisting/bending position</li> <li><input type="checkbox"/> Parts of body in the line of fire</li> </ul> <p><b>Trenching/Excavation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Shoring adequate</li> <li><input type="checkbox"/> Sloping adequate</li> <li><input type="checkbox"/> Sewer/trench covers in place/labeled</li> <li><input type="checkbox"/> Barricades/tags</li> <li><input type="checkbox"/> Rock blasting operations</li> <li><input type="checkbox"/> Cave-in</li> </ul> | <p><b>Work Environment Hazards</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Slips or trips possible</li> <li><input type="checkbox"/> Limited access/egress</li> <li><input type="checkbox"/> Potential for foreign bodies to enter eyes</li> <li><input type="checkbox"/> Exposure to electrical hazards</li> <li><input type="checkbox"/> Lock-out procedure</li> <li><input type="checkbox"/> Lighting levels too low</li> <li><input type="checkbox"/> Position of hands – pinch points</li> <li><input type="checkbox"/> Exposure to heat/cold</li> <li><input type="checkbox"/> Exposure to steam</li> <li><input type="checkbox"/> Exposure to noise</li> <li><input type="checkbox"/> Exposure to chemicals</li> <li><input type="checkbox"/> Exposure to dust</li> <li><input type="checkbox"/> MSDS reviewed</li> </ul> <p><b>Rigging Hazards</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Slings in good condition / inspected</li> <li><input type="checkbox"/> Load weight identified</li> <li><input type="checkbox"/> Lifting overhead/live equipment</li> <li><input type="checkbox"/> Overhead power line</li> <li><input type="checkbox"/> Equipment inspected</li> <li><input type="checkbox"/> Barricades and signs in place</li> <li><input type="checkbox"/> Holes covered and identified</li> </ul> <p><b>Electrical Work</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> GFCI's</li> <li><input type="checkbox"/> Proper grounding in place</li> <li><input type="checkbox"/> Electrical shocks</li> <li><input type="checkbox"/> All energy isolations confirmed</li> <li><input type="checkbox"/> Test start/stop</li> </ul> <p><b>Confined Space</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Atmospheric testing complete</li> <li><input type="checkbox"/> Trained confined space personnel</li> </ul> <p><b>Emergency Plans/Equipment</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Emergency plans understood</li> <li><input type="checkbox"/> Emergency equipment available</li> <li><input type="checkbox"/> Evacuation routes identified</li> <li><input type="checkbox"/> Emergency meeting point identified</li> </ul> | <p><b>Personal Limitations</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Procedure not available for task</li> <li><input type="checkbox"/> No training for tools to be used</li> <li><input type="checkbox"/> First time performing this task</li> <li><input type="checkbox"/> Distractions in area</li> <li><input type="checkbox"/> Confusing instructions</li> </ul> <p><b>Equipment Hazards</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Operating power equipment</li> <li><input type="checkbox"/> Working with grinders</li> <li><input type="checkbox"/> Circular saws</li> <li><input type="checkbox"/> Chain saws</li> <li><input type="checkbox"/> Explosive actuated tools</li> <li><input type="checkbox"/> Cutting torches</li> <li><input type="checkbox"/> Hand tools (knives, saws)</li> <li><input type="checkbox"/> Power trowlers</li> </ul> <p><b>Hazards to the Environment</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Liquids that can be spilled</li> <li><input type="checkbox"/> Hazardous/special materials</li> <li><input type="checkbox"/> Work near water</li> <li><input type="checkbox"/> Erosion/sedimentation</li> <li><input type="checkbox"/> Wildlife in Area</li> </ul> <p><b>Welding/Grinding</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Welding Leads</li> <li><input type="checkbox"/> Trained fire watch</li> <li><input type="checkbox"/> Welding flash</li> <li><input type="checkbox"/> Arching</li> <li><input type="checkbox"/> Unsecured bottles</li> <li><input type="checkbox"/> Flash back arrestors</li> <li><input type="checkbox"/> Disks chipped or cracked</li> <li><input type="checkbox"/> Welding screens</li> <li><input type="checkbox"/> Welding hoods/lens used/available</li> </ul> <p><b>Personal Protective Equipment</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Hearing Protection</li> <li><input type="checkbox"/> Respiratory Protection</li> <li><input type="checkbox"/> Safety Glasses</li> <li><input type="checkbox"/> Hard Hat</li> <li><input type="checkbox"/> Steel Toe Boots</li> <li><input type="checkbox"/> Hand Protection(Gloves)</li> <li><input type="checkbox"/> Goggles/face shield</li> <li><input type="checkbox"/> Fall Protection</li> <li><input type="checkbox"/> Personal Floatation Device</li> </ul> |
|--|--|---|

PLEASE COMPLETE PRE-JOB TASK-HAZARD-CONTROLS TABLE ON BACK OF FORM

SUPERVISOR APPROVAL (Signature): \_\_\_\_\_

### JOB COMPLETION

- Permit signed off?  Yes  N/A All tools removed from location?  Yes  N/A  
 Task area cleaned up at end of job/shift?  Yes  N/A Flagging removed at end of job?  Yes  N/A

TASK GROUP MEMBER (Signature): \_\_\_\_\_

the printing place 726-2222

PL-HSF-02 Rev 02

JOB DESCRIPTION	Tasks (Define Tasks e.g. equipment, tools, etc.)	Hazards (Be specific to tasks & tools)	Plans to Eliminate/Control Risk (List all controls for each hazard)

All members of the task group must review and sign FLRA prior to commencing work at the task location:

Worker Name	Initial	Worker Name	Initial	Worker Name	Initial	Worker Name	Initial

PL-HSF-02 Rev 02

## Observation Cards

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- Employees wishing to report an unsafe or unhealthy working condition or a recommendation pertaining to safety or improving the health of the work environment may do so by:
  - Completing a POST Card
  - Reporting the issue to his/her Supervisor or Safety Representative
- Recommendations will be reviewed by the Safety Representative and/or Supervisors.
- The person(s) submitting the safety recommendation will be advised as to the action taken to remedy the condition.



# Performance Observation Safety Tracking



## Performance Observation Safety Tracking

### WHAT DID YOU OBSERVE?

- At-Risk Behavior       Unsafe Condition
- Positive Observation    Near Miss

### WHAT TYPE OF ACTIVITY DID YOU OBSERVE?

- Fall Protection       Line of Fire
- Lockout/Tagout       Tools
- Confined Space       Housekeeping
- Cranes/Rigging       Ergonomics
- HCTI                     Scaffolding
- Overhead Work       Access/Egress
- Manual Lifting         Environment
- PPE                      Permits
- Electrical               Mobile Equipment

Other: \_\_\_\_\_

Did a conversation take place?    Yes    No

Closed Out?                             Yes    No

Description:

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What did you do? (Conversation &/or Action)

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Company: \_\_\_\_\_

Location/Project : \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Choose your Trade/Craft:

- Carpenter       Scaffolder       Labourer
- Electrician       Pipefitter       Sheet Metal
- Millwright       Surveyor       Insulator
- Painter           Teamster       Hydraulic Tech.
- Welder           Ironworker     Mason
- Operating Engineer    MGMT/Office    Other

PL-HSF-14 Rev 02

## First Aid

- The appropriate number of site personnel will be trained in first aid.
- If there is a situation requiring immediate medical attention, notify Emergency Services and supervision and if qualified give first aid.
- If not qualified wait with the person until a qualified first aider/ambulance arrives at the location.
- A designated employee will wait a designated location to meet and direct the ambulance(if required) to the required location.



## Fire Prevention

Fires can cause serious injury, death, and property loss. Small fires can be put out with portable extinguishers.

To prevent fires:

- Ensure that all combustibles are kept in the appropriate areas
- Keep waste in designated containers
- Never assume a fire is out. The chance of re-ignition is always high – report it

In the event of a fire:

- Shout FIRE and assess the situation.
- If trained and it is safe to do so, try and extinguish the fire; if not, wait for help to arrive.



## Fire Prevention

When using a portable fire extinguisher, the following steps are to be taken:

- **P**ull the pin. Some models require you to remove a locking pin.
- **A**im low and direct the hose nozzle or cone at the base of the fire.
- **S**queeze the handle to release the contents of the extinguisher.
- **S**weep the extinguisher from side to side while moving forward.

- GHS: Globally Harmonized System
- Safety Data Sheets (SDS) are available in the workplace
- If a product is taken out of its original container then a workplace label must be put into place with the following information:
  - Product name
  - Safe handling instructions
  - Statement saying that SDS's are available

## GHS Pictograms

### GHS Pictograms

Carcinogen  
Respiratory  
Sensitizer  
Reproductive  
Toxicity  
Target Organ  
Toxicity  
Mutagenicity  
Aspiration Hazard



Acute  
Toxicity  
(severe)



Flammables  
Self-Reactives  
Pyrophorics  
Self-Heating  
Emits  
Flammable  
Gas



Environmental  
Toxicity



Irritant  
Derma/Skin  
Sensitizers  
Acute Toxicity  
(Harmful)  
Transient  
Target Organ  
Effects (narcotic  
or respiratory)



Oxidizers  
Organic  
Peroxides



Corrosives



Gases  
under  
Pressure



Explosive  
Self-Reactives  
Organic  
Peroxides





## Personal Protective Equipment

All Pennecon Heavy Civil Ltd employees, contractors, vendors, and visitors shall wear the following PPE as a minimum when in a field work environment, including shops and lay down areas:

- CSA approved:
  - hard hat.
  - Safety glasses.
  - Work boots (green triangle).
  - Reflective apparel.
- Gloves (appropriate to the task being performed)
- All clothing must be in good repair as not to create hazards in the workplace.
- Additional PPE if required will be available.

## Marine Safety

- The Construction Manager or Operations Manager, or designate, will take steps to reduce or eliminate any potential impacts to the marine environment.
- Safety is paramount during offloading procedures. All unloading personnel are required to wear approved safety equipment (steel-toed boots, high visibility vest) and life jackets (as per the appropriate regulation) must worn by waterside personnel.
- The dock will be equipped with safety equipment such as a ladder, life preserver rings (throw rings), lighting, and an emergency alarm.

## Marine Safety

- Equipment will be offloaded at low speed, by properly trained operators, and with the use of safety and directional “spotters”.
- In the event of strong tidal or wave motion, at the discretion of the Barge Operator, Construction Manager or Operations Manager, or designate, offloading operations will be halted if the unloading personnel is subjected to unsafe movement, or pitch, of the barge.
- Should a spill occur, the Construction Manager or Operations Manager, or designate, in consultation with the Site Manager, Barge Operator and authorities of jurisdiction, will direct the proper procedure for clean-up and reporting.

## Marine Safety

- Barge offloading activities, require strict procedures to ensure the health and safety of unloading personnel, while reducing or eliminating any potential impacts on the environment.
- The Barge Operator and Construction Manager or Operations Manager, or designate, will review weather conditions before offloading activities commence, to identify if severe weather may be expected using Environment Canada's web site or by calling Environment Canada's Marine Forecasting service. for contact information). This service provides the most up-to-date information, and also provides information beyond the 24-hour period.



## Housekeeping

- Work locations, vehicles and both the inside and outside of buildings are to be kept clean and orderly at all times.
- Combustible materials, such as oily rags, shall be kept in approved metal containers with metal lids.
- Floors, platforms, exits and walkways are to be kept clear of dangerous projections and obstructions.
- All spills are to be cleaned to prevent slipping hazards.
- Materials and tools are to be stored in an orderly manner.
- Keep lunchrooms and washrooms clean and clear of garbage.
- Ensure proper lighting is utilized; report broken/burnt out bulbs.
- Recycle and reuse wherever possible.



## Lifting Safety

It is important that proper lifting techniques are being utilized:

- Get a good footing.
- Place feet about shoulder width apart.
- Bend at the knees to grasp the weight.
- Keep your back reasonably straight and head up.
- Get a firm hold and lift gradually, without twisting, by straightening your legs.
- When putting the load down, reverse this procedure.
- Get help when needed.

**USE LIFTING EQUIPMENT OR GET ASSISTANCE, WHEN AVAILABLE, INSTEAD OF MANUALLY LIFTING**

## Confined Space Work

- Before entering into a confined space the workers must have the government approved confined space training certification.
- Employees must comply with Confined Spaces Regulation (O. Reg. 632/05)
- Gas monitors must be utilized to determine the oxygen, other gas levels and LEL (lower explosive limit) before entering the space as well as for continuous monitoring.
- An attendant **MUST** always be in place when employees enter a confined space.
- There must be a means of communication between the attendant and the personnel inside the confined space based on the requirements of the space.
- Signage must be posted at the entrance of all confined space.

## Fall Protection

- Fall protection is required for any work at heights as per site requirements.
- Employees must comply with Sections 26 to 26.9 of the Regulation for Construction Projects (O. Reg. 213/91).
- For work at heights, workers must have the government approved fall protection training certification as outlined in Occupational Health and Safety Awareness and Training (O. Reg. 297/13).
- Anchor points should be of sufficient height to limit free fall distance.
- Workers are responsible for inspecting their fall arrest gear prior to use.
- All lanyards must have shock absorbers in place.



## Lock Out Tag Out – Equipment Repair

Pennecon Heavy Civil Ltd expects:

- **ZERO ENERGY MAINTENANCE** for lock out/tag out
- Must always have both a lock and tag present

Basics to locking out equipment/machinery:

- Isolate equipment to be de-energized.
- Advise other workers of the lock out.
- Identify all energy sources
- Tag and lock the equipment/machinery
- Test to ensure that all energy has been removed.
- Hold onto the lock until the work is completed.

**1 WORKER, 1 LOCK, 1 KEY.**

**NEVER SHARE YOUR LOCK OR KEY WITH ANYONE**

## Machinery & Equipment

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- All machinery and equipment must comply with applicable codes, legislation and industry standards.
- No walking under loads, riding on forks, loader buckets, etc.
- Misuse of equipment will NOT be tolerated.
- Operators using equipment dangerously will be disciplined and removed from the equipment.
- Operators taking medications must first report to their Supervisor.

## Hand Tools

- Hand tools must be visually inspected prior to use.
- All electrical tools must have a ground plug or be double insulated; removal of grounding is NOT permitted.
- Trigger lock must be removed by qualified electrician.
- All extension cords must be in good repair.
- All tools/equipment designed with guards must have them in place; tools/equipment without guards are to be removed from service.
- All damaged and defective tools are to be tagged out and to be removed from service.
- Grinders are to be used with the correctly rated discs.
- Power tools are to be unplugged before being adjusted and/or repaired.

## Excavations & Trenches

- Remove debris and excavated soil near excavation site [s. 232]
- Arrange to protect workers from falling into excavation [s. 233(4)]
- Plan for removing water in excavation [s. 230]
- Identify and locate overhead power lines [s. 188) and underground services [s. 228]
- Know soil types [s. 226] and what sloping, shoring or pre-fabricated, hydraulic or engineer systems are required [s. 234 to 242]
- Notification requirements [s. 6 (a), (g) and (h)]
- Requirements for when support system must be engineered [s. 235(2) and s. 236]
- Prepare emergency plan [s. 17 and 18]
- Worker(s) shall not perform work in trench unless another worker is working above ground [s. 225]
- Obtain utility locations before digging [s. 228]



## Blasting Operations

- Ensure adequate notice is provided to the general public prior to blast
- Ensure all personnel on site are aware of blast time.
- Air Traffic Control is informed prior to blasting (30 minutes and 5 minutes before the blast).
- Access to blast to be guarded at time of blast, no unauthorized personnel
- Audible warning horn will be sounded
- “Danger Blasting” Signage at Security gate before start of shift outlining “Time Of Blast”
- Blaster to conduct visual inspection after the blast.



## Power Line Hazards

- Employees must comply with Section 188 of the Regulation for Construction Projects (O. Reg. 213/91).
- Never raise overhead lines to allow machinery or equipment to pass underneath.
- When operating equipment, post a signal person to ensure you maintain a safe working distance from overhead lines.



# Environmental Overview



### **Why do we have an Environmental Program?**

- Obey the law.
- Protect workers and the environment.
- Avoid financial losses, e.g.. fines and project shutdowns.
- Reduce liability though regulatory compliance.



## PHCL Environmental Policy

It is the primary and continuing objective of Pennecon Heavy Civil Limited that, in the conduct of its activities, it will endeavor to limit adverse effects on the physical environment through the respectful use of our natural resources.

As part of its commitment, PHCL will adhere to all applicable laws, regulations, and other requirements. PHCL will incorporate environmental considerations into project planning and operating practices and will promote sustainable development through pollution prevention, waste minimization, and recycling, wherever possible. PHCL believes that through heightened environmental awareness and action, these objectives can be accomplished.

PHCL believes that excellence and continuous improvement in environmental practices are in the best interests of all stakeholders.

This Environmental Policy reflects the commitment of PHCL's Senior Management to ensuring that environmental objectives, targets, and policies are communicated and adhered to by all employees, suppliers, and sub-contractors.

Some of the elements of the site EPP

- Erosion and sediment control
- Wildlife
- Wildlife Mitigations
- Petroleum Products and Hazardous Materials
- Spill Prevention
- Spill Response Protocol

## Erosion and Sediment Control

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- Sensitive areas: marine environment, wetlands,
- Typical measures:
  - Silt fencing and hay bales
  - Check-dams, dykes, gravel berms
  - Sediment control ponds or traps
- Your responsibility?
  - Prevention: appropriate mitigation measures in place BEFORE the work begins.
  - Mitigation measures maintained, inspected, changed, or upgraded regularly.

- General mitigation measures:
  - Several species of conservation concern in proximity to the site. A separate session will be provided to highlight wildlife sensitivities.
  - Notify the Environmental Manager of **any** wildlife sightings
  - Do not feed wild animals.
  - Hunting, trapping or fishing is not permitted on site.
  - Site and working areas will be kept clean of food scraps and garbage.
  - Wildlife-protected disposal containers will be used and will be regularly emptied and transferred to the local landfill.
  - No personal pets, domestic or wild, allowed on the site.
  - DO NOT disturb nests or burrows.
  - DO NOT chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot within the project site





## Petroleum Products and Hazardous Materials

- Fuel, hydraulic fluid, etc.
- The primary concern: uncontrolled or accidental release.
- Mitigations:
  - AST's: steel, double walled, and in a lined secondary containment (125%) basin.
  - Proper storage and disposal: oil buckets, hydraulic fluid containers, grease tubes, greasy/oily rags, contaminated soil, etc. stored in secondary containment.
  - Equipment Fueling: as per site plan. No fueling within 30 m of a watercourse, drainage ditch, area with a high water table, or exposed shallow bedrock.
  - Limited quantities stored on site. SDS sheets available.
  - Regular inspections of storage areas.
  - Fire extinguishers and spill kits strategically located.



## Spill Prevention

- **Every spill is a reportable spill (notify your supervisor or HSE Advisor)**
- Considerations?
  - Minimize danger to persons.
  - Minimize pollution of watercourses.
  - Minimize area affected by spill.
  - Minimize the degree of disturbance to the area and watercourses during cleanup.



## Spill Response Protocol

As per the Emergency Response and Communication Plan:

- Immediately upon a release or a spill, steps should be taken to implement procedures for containment, control and cleanup of the spill, as follows:
  - If it is safe to do so, stop the spill and remove all ignition sources.
  - Ensure the safety of all individuals in the area and evacuate the area as necessary.
  - Secure the area.
  - Contain the spill either by constructing containment dikes, by using spill absorption materials, or by other appropriate methods.
  - Immediately notify the Construction Manager or Operation Manager, or designate, who in turn will notify other regulatory authorities, as required.
  - If it is a reportable spill, call the Ministry of Environment Spills Action Center, as well as Loyalist Township.



## Spill Response Protocol

- If possible, identify the material released.
- If the material can be identified, use the Material Safety Data Sheet (MSDS) for detailed procedures.
- If the release is an airborne vapor spill, gas or a large uncontrollable spill of liquid, also call 9-1-1 to activate the Loyalist Township Emergency Services .
- Arrange for clean-up and proper disposal of all collected waste materials at an authorized regulated facility.
- In instances where remediation is required, call Quantum Murray or Dedicated Environmental Services Inc.
- Take all necessary precautions to ensure that the incident does not reoccur.
- The Operations Manager shall submit a written report to appropriate regulatory authorities as required by applicable legislation



## Roles and Responsibilities

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- ALL workers are expected to:
  - Become familiar with applicable elements of the EPP, SPRP, and WMP
  - Include environmental hazards in job planning/risk management
  - Identify potential environmental issues.
  - Minimize impacts
  - Inform the environmental team of observed or potential environmental impacts



## Quality Overview



**Pennecon Heavy Civil Ltd. is registered to the  
ISO 9001:2008 Quality System Standard**

- An effective QMS ensures that we are focused on meeting client requirements and that they are satisfied with the products and services that they receive.

**Goals:**

- Achieve quality by managing our processes with an emphasis on:
  - preventing problems by identifying risks;
  - improve operational performance that will cut errors;
  - Give the client confidence that products and services will consistently meet requirements.

- The result of all departments and personnel working together to achieve organizational goals and customer satisfaction for the products and services we provide.
- Quality is everyone's responsibility. All employees are expected to follow PHCL's QMS.
- Everyone on the job is responsible for completing their work in accordance with client requirements.
- Quality has to be built into the product, it cannot be inspected into it after the fact.





# Traffic Management Plan



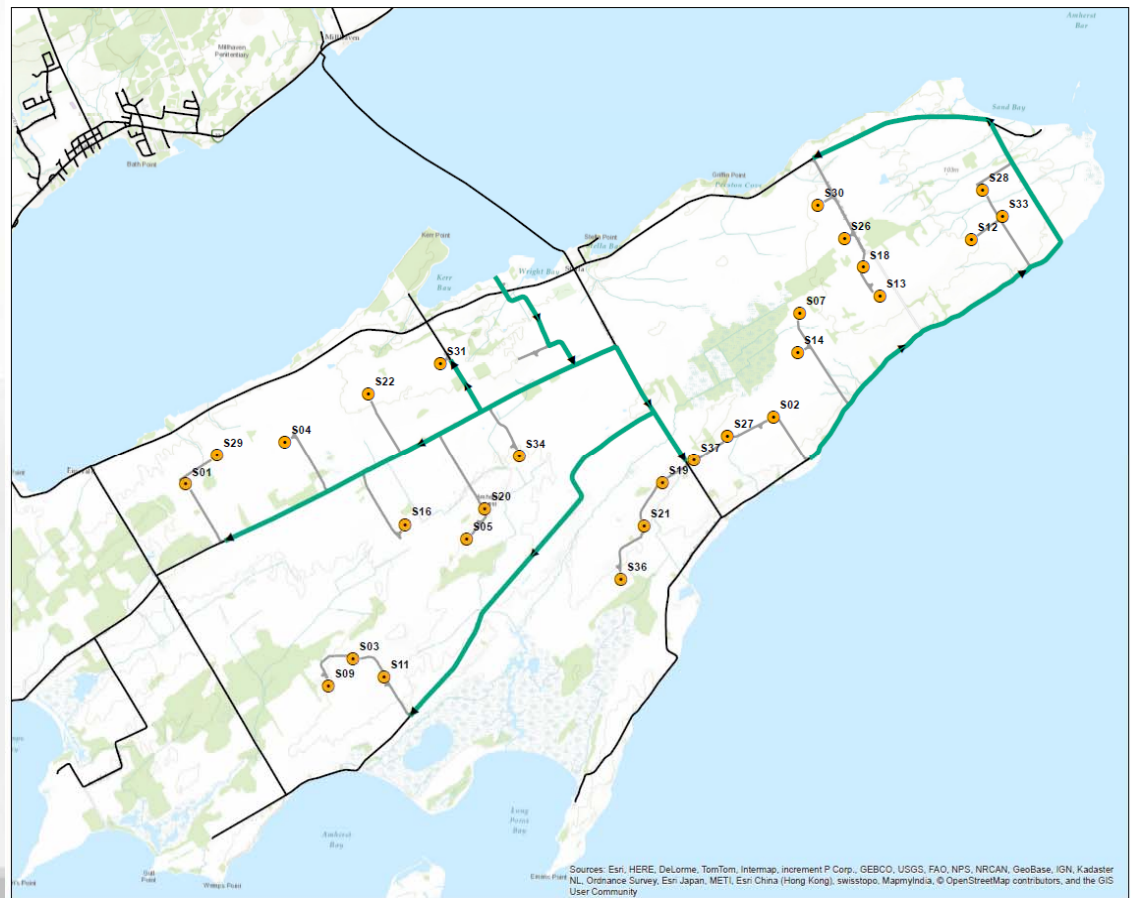


## Objectives & Scope





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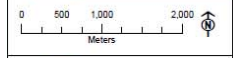

- The Traffic Management Plan (TMP) is intended to provide general guidance for the interaction between construction-related traffic and regular traffic, and between regular traffic and temporary construction-related road conditions.
- A consideration of the existing traffic, pedestrian, and cycling activity on the island as well as the related road/intersection operations;

# Traffic Routes



**Legend**

-  Turbine Location
-  Heavy Load Delivery Route
-  Access Road
-  Public Road

**ALGONQUIN POWER Co.**

**AMHERST ISLAND WIND PROJECT**

TITLE: **Delivery Routes for Heavy Loads**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:40,000
DRAWN BY: B WONG	DATE: JUNE 15, 2015
DRAWING No. <b>AMHST - 207</b>	REVISION No. <b>0</b>



## Traffic Management – Employee Responsibilities

- Follow all posted signage
- Speed limit is 30Km on public roads and 15Knm on access roads
- Yield for public vehicles (however follow posted signage, we can expand on this, but what I am trying to say is that if the public has a stop sign and you don't, than you proceed)
- Slow down when passing any pedestrians (walking or bicycle)
- Follow the designated haul route assigned for that task
- Check with your supervisor before deviating from any planned traffic route



## Construction Inside Public ROW

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- Access Road Construction
- Road Modifications to Accommodate Turbine Delivery
- Construction of Underground Collector System
- Turbine Component Deliveries



## Construction Outside The Public ROW

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- Turbine Foundations
- Construction of Temporary Laydown Areas and Office Trailers
- Construction of Transformer Station



## Types Of Construction Vehicles

- For the purposes of this Traffic Management Plan, there are three primary classes of construction-related vehicles:
  - Heavy loads: delivery of bulk materials such as aggregate and concrete;
  - Oversize loads: delivery of components larger than typical tractor-trailers such as wind turbine blades as well as large construction vehicles such as backhoes; and
  - General-purpose construction vehicles, typically pickup trucks.

## Mainland Access

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- Access to the newly constructed project dock will generally follow one of the two following routes:
  - From Highway 401; south along Lennox and Addington County Road 4, and east along Bath Road to the mainland construction dock and staging area.
  - From Highway 401; south along County Road 6; west along Taylor Kidd Boulevard; south along County Road 4, to the mainland construction dock and staging area.
- Traffic management requirements on the mainland are minimal due to the relatively low number of construction vehicles and that road widths are sufficient, however oversize loads will follow normal piloting procedures.





## Construction-related Traffic Impacts

### Specific Types of Traffic Impacts

- There are three types of traffic impacts expected for this project:
  - Traffic interruptions
  - Lane closures
  - Road closures





## Traffic Management Strategies

**Construction-related Traffic Routes** - Construction vehicles (including gravel trucks and deliveries of turbine components) and equipment will reach the 26 turbine sites (27 are permitted) based on the Delivery Routes for Heavy Loads Drawing AMHST-207 and Delivery Routes for Turbines Drawing AMHST-206, latest version of each.

**Traffic-related Schedule Management** - Sequencing of construction activity for roadworks is typically determined by the Constructor in consideration of the traffic, weather, and logistical considerations at the time therefore highly detailed sequencing cannot be prescribed for all scenarios at this time. Closures will be implemented in consideration of construction requirements and of maintaining traffic flow on the island.

## Traffic Management Strategies

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### Signage

- Ontario Traffic Manual Book 7 traffic control measures (barriers, barrels, signage, etc.) will be used for working on the “shoulder” and for temporary lane closures. See **Appendix A** for typical sign details and **Appendix B** for sign placement.

### Escort/Warning Vehicles for Oversize Loads

- As per the Highway Traffic Act, certain loads require an escort vehicle to accompany them during their transport. All permits from MTO, the County, and the Township will be submitted in advance of these oversize loads.

## Traffic Management Strategies

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### **Flagpersons**

- Flagging shall be provided as per *Ontario Traffic Manual Book 7 – Traffic Control Sign (Stop/Slow Paddle - TC-22)*

### **Parking and Moving Equipment/Vehicles on-site**

- Vehicles shall be parked in a manner that does not impede traffic, interfere with visibility of signage, or cause additional potential for collisions.

## Traffic Management Strategies

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### **Specialty Vehicles**

- Specialty vehicles needing assistance through the work site may include emergency service vehicles, school buses, wide or long load vehicles, and farm vehicles. These vehicles will be accommodated in a safe and timely manner.

### **Pedestrian and Cyclist Accommodation**

- Pedestrian and cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.



## Traffic Management Strategies

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### **Public Information Strategy**

- In order to minimize impacts on island traffic, and ensure the success of the project, a traffic Communication Plan is included in the Operation Plan
- An activity forecast report shall be provided to Loyalist Township, outlining construction activity a minimum of two weeks prior to any work commencing.
- Residents of the island shall be provided with a map of the island outlining the delivery routes to the sites for construction vehicles and deliveries of gravel, concrete, etc., so that they can plan to avoid those routes if desired.

## Traffic Management Strategies

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### **Wildlife Mitigation**

- As an integral component of the traffic management plan, potential risk of wildlife collisions and disturbance from construction traffic will be addressed through a variety of mitigation measures.
- The mitigation requirements are further detailed in **Appendix C**, Traffic Management Plan Wildlife Mitigation.



# Emergency Response Plan





## Definitions

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- **On-Site Construction Manager** – Third party general contractor involved in the construction of the Amherst Island Wind Project; referred to in the plan as “Construction Manager”.
- **ERCP** – Emergency Response and Communication Plan.
- **Facility** – Amherst Island Wind Project.
- **Loyalist Township Emergency Services** – Loyalist Township Emergency Services (including the Amherst Island Station).
- **Fire Safety Consultant** - Third party competent and qualified individual knowledgeable in fire safety and prevention.
- **Fire Watch** – Individual(s) assigned to observe metal grinding work activity to ensure no sparks cause a fire.



## Emergency Overview

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- This Emergency Response and Communication Plan (ERCP) is intended to advise on-site personnel, contractors and project landowners on the procedures they must follow and how to communicate in the event of an emergency situation related to the Amherst Island Wind Project (the “Facility”) during the construction and initial operations phase (pre-commissioning) of the Facility.
- This ERCP has been developed in consultation with Loyalist Township, the County of Lennox and Addington, and will be implemented prior to the start of construction and does not replace provincial regulations. During construction and operation the contractors and operator will adhere to provincial Ministry of Labour regulations.

## ERCP Stakeholders

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- This plan will be held both in the Construction Manager and Operation Manager Facility trailers.
- In addition:
  - A copy of the plan shall be sent to the Loyalist Township Emergency Services Office;
  - A copy of the plan will be placed in each contractor work truck; and
  - A copy of the plan will be placed in the on-site operations and maintenance building.



## Emergency Events and Response Protocols

- Emergency events impacting the Facility may include:
  - Fire / Explosion
  - Road Safety
  - Injury / Trauma
  - High Angle Rescue / Confined Space Rescue
  - Structural Damage Chemical - Environmental Spill
  - Severe Weather
  - Site Evacuation

## Emergency Preparedness

- Provide all workers and work vehicles with a copy of emergency numbers and emergency procedures to be carried and/or easily accessed within vehicles at all times.
- Provide all workers with location of muster point for emergency situations.
- Provide signage at each turbine location showing the turbine site ID number.
- Review training requirements for all personnel involved in the project,
- Review the contents of this plan with all personnel involved in the project to familiarize them with their duties and responsibilities.

## Emergency Preparedness

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- Ensure all workers are aware of the communication devices for emergencies, including emergency horns, cellular phones, two-way systems, etc.
- Ensure all workers know the location of the turbine they are working at.
- Conduct practice drills to train on-site personnel to carry out the correct response to an emergency condition.
- Ensure all adequate safety equipment is available on-site and all personnel are using the appropriate Personal Protective Equipment (PPE).
- Ensure all workers on site have GHS training.



## Emergency Preparedness Training

- It is the responsibility of each employee to become familiar with the Facility, learn the evacuation routes, muster and shelter areas, and to attend all safety training events.
- The Construction Manager and Operation Manager will make this ERCP and other health and safety related information available to all site employees.
- Mock Emergency Drills will be completed during the early stages of construction and again during the early stages of operations to review the effectiveness of the ERCP so that any deficiencies in the plan can be identified and corrected.

## Emergency Response

- The Construction Manager (construction phase) or Operations Manager (operation phase) is designated as the “Emergency Response Coordinator” during an emergency situation.
- Any visitor present at the site must report to the Construction Manager or Operations Manager.
- In the event of an emergency, contractors, project participating landowners and others who may be present at the site are responsible for immediately notifying the Construction Manager or Operations Manager who will then follow Emergency Response Protocol.

## Fire Hazard & Prevention

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- In order to minimize fire risk, the following measures will be implemented:
  - Personnel (contractor) training
  - No open fires
  - Hot Work
  - Fire-breaks
  - Portable Fire Extinguishers





## Emergency Response Protocol

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### **High Angle / Confined Space Rescue**

- Remove any hazards. Stop tools and machinery.
- Bring injured person to ground level or a safe area for evaluation.
  - Construction – contractor shall maintain competent and qualified representative(s) responsible for this action on site
  - Operation – service contractor(s) shall use competent and qualified technicians or call in competent Third Party High Angle Rescue contractors, prior to work commencing
- Treat any life threatening injuries.
- Call 9-1-1 and request Loyalist Township Emergency Services.



## Emergency Response Protocol – Severe Weather

### **Severe Thunderstorm & Lightning**

#### Wind Site

- Get out of a wind turbine.
- Stop all heavy construction equipment, especially when moving metal components, get out, and seek shelter. (Tractors and other implements having metal contact with the ground are often struck).
- Stop work actions and relocate to identified muster point.
- When there is no shelter, avoid the highest object in the area. If only isolated trees are nearby, your best protection is to crouch out in the open, while minimizing your contact with the ground (do not lie flat), and keeping twice as far away from isolated trees as the trees are high.
- Avoid hilltops, open spaces, wire fences, metal clothes lines, exposed sheds, and any other above ground electrically conductive objects.
- Inform Construction Manager or Operation Manager, and other applicable management personnel, and take census of personnel.



## Emergency Response Protocol

- All personnel remain at muster point until accounted for by Construction Manager or Operation Manager.
- Stay inside and do not venture outside until it is deemed safe to do so (i.e. No lightening with 48 KM of the Facility for at least 30 minutes).
- Do not approach a wind turbine until there has been no lightning within 48 KM of the Facility for at least 30 minutes. Do NOT approach if you hear a hissing or crackling sound coming from the blades. Assess the situation from inside the vehicle.

### On-site Office Buildings

- Stay away from open doors and windows, stoves, metal pipes, sinks, and plug-in electrical devices including corded phones.
- Shut down and unplug computers, modems, phones, and other valuable electronic equipment.



## Emergency Response Protocol

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### Person Struck By Lightning

- Persons struck by lightning receive a severe electrical shock and may be burned; however, they carry no electrical charge and can be handled safely.
- Prompt artificial respiration and/or CPR with an AED can often revive a person without vital signs after being struck by lightning.
- Call 9-1-1 and request Loyalist Township Emergency Services.
- Administer first aid.

## Emergency Response Protocol

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### **Tornado**

- Continue normal activities during the WATCH but be aware of the possibility of tornadoes.
- There is not always an official tornado warning.
- If you see or hear a tornado, or if you are told to evacuate the wind turbine because of a tornado, seek shelter immediately.
- Inform the Construction Manager or Operation Manager, and other applicable management personnel, and take census of personnel.

## Evacuation Protocol

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- Stop work actions and relocate to identified muster point.
- Construction Manager or Operation Manager takes census of personnel.
- All personnel and any visitors to the site remain at muster point until accounted for by Construction Manager or Operation Manager.
- Construction Manager or Operation Manager investigates any missing personnel and any visitors to the site.
- Call 9-1-1 to request Loyalist Township Emergency Services, if required.



## Post Emergency Actions and Reporting

- Accidents involving the general public, fatalities, or that are considered a threat to public or environmental health shall be reported to the appropriate authorities with jurisdiction, as applicable, including but not limited to:
  - Loyalist Township Emergency Services (Police, Fire, Paramedics);
  - Ministry of Labour;
  - Ministry of Environment.





# Operations Plan





## Introduction

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- The purpose of the Operations Plan is to “demonstrate how prudent and reasonable practices will be utilized to minimize the level of disruption, disturbance and inconvenience to the Municipality’s residents, given the scope of the Project.
- The Operations Plan will also demonstrate how the continuing function of its roads and other municipal services and facilities will be maintained to the extent reasonably possible and how the Municipalities residents’ access to emergency services will be maintained at all times.”

## Navigable Waters

- The primary Project-related factor that has the potential to affect marine navigation in the North Channel between Amherst Island and the mainland is increased vessel traffic (which includes the transport barges, associated tug boats and personnel vessels):
  - Vessel traffic is governed by the *Collision Regulations of chapter 1416 of the Canada Shipping Act*. All marine equipment, whether anchored, at a dock, or under way, will comply with these regulations. During emergency situations (e.g. a 911 call) all Project marine traffic will yield to the public ferry.
  - Dedicated Project docks will be constructed on the mainland (temporary) and the island (permanent) so there will be no impact to use of the existing MTO ferry docks.

## Navigable Waters

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- There will be continuous communication between the Project marine vessels and the Frontenac II ferry (or any temporary replacement) in accordance with marine protocol and Collision Regulations.
- It may be necessary to have the outer mooring dolphins of the Project docks lit at night; this determination will be made by Transport Canada.
- All Project marine vehicles and Project docks must adhere to Transport Canada requirements at all times.

## Road Maintenance

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- The contractor's Construction Superintendent will be in close communication with the Township's Transportation and Solid Waste Manager (or other Township designated representative) allowing them to address any concerns directly.
- The contractor will inspect the condition of the public road at each site entrance being used at the end of the day and any excess mud, stone and debris will be cleared after the final vehicles have left the site road.
- Inspection sheets will be completed by contractor personnel to ensure that each entrance is clear before closing the site.

## Road Maintenance

- A dedicated road sweeper and dust control water truck will be maintained on-site and will sweep Front Road at the barge dock access road twice per day and will move around the island.
- There will be a road maintenance crew with a grader deployed on roads being used for construction. The contractor will have a grader on site to maintain existing roads throughout Heavy Load deliveries.
- The grader will plan efforts based on the traffic plan but will also be dispatched to take care of reasonable road problem complaints.

## Impact Mitigations

### School Functions

- Prior to the start of civil construction, a coordination meeting will be scheduled with the school principal to review traffic management and safety plans.
- Regular meetings will be organized with the school principal or other designated representative(s) to provide advance notice of traffic routing and schedules.
- Construction work will be planned in order to mitigate the impact on special school functions and these mitigation plans will be communicated to the site personnel via the daily morning meetings leading up to the school functions.
- In the event of an unplanned school event such as school closure due to mechanical/electrical problems at the school or snow day, the school will have the direct cell phone numbers of the senior site management team who will immediately review construction planning for the day and respond reasonably, in relation to traffic management and safety.

## Impact Mitigation

- During transportation of the Major Turbine Components in front of the school, a traffic safety monitor will be situated near the school entrance to ensure traffic flow is maintained and safety is regulated at all times.
- Amherst Island Public School – 5955 Front Rd, Stella

### **Student Transportation**

- The TriBoard Student Transportation Service has been contacted as part of the development of this Operations Plan.
- The TriBoard has requested that they be notified of any road closures at least one week in advance so that its drivers can make route adjustments.
- The Project team will co-operate with the TriBoard if any reasonable change is requested to this notification plan.



## Impact Mitigations

### **Bicycle Traffic**

- Daily morning site meetings are mandatory and will be used to disseminate new information and to re-enforce existing site rules.
- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.
- All construction traffic will slow down when passing cyclists and will provide them with a wide berth.
- Areas of active construction activity on private land will be off-limits to bicycle traffic and will be clearly indicated as such.
- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites.



## Impact Mitigation

### **Agricultural Traffic**

- Types of agricultural traffic expected are transporters with animals, herds or flocks on foot, and farming equipment.
- Construction traffic will slow down, stop and, if necessary, back up for agricultural traffic

### **Vehicular Traffic to and From the Public Docks**

- Mainland: A traffic coordinator will be located on the mainland to ensure construction traffic does not impede commuter traffic to and from the MTO ferry on Highway 33.
- The mainland traffic coordinator will marshal traffic between Project parking areas and the construction barge dock.
- Island: A traffic coordinator at the intersection of Front Road and the entrance to the Project island dock will control the timing of Project traffic travelling towards the public dock area to ensure that construction traffic does not impact ferry traffic at the intersection of Front Road and Stella 40 Foot Road, or access to the pre-boarding area.

## Impact Mitigation

### Parking

- Site personnel will park on the mainland and be bussed to the crew ferry barge and from the island construction barge terminal to the laydown area.
- Crew trucks and vans will be used on the island for those carrying tools and other equipment.
- Management vehicles will travel on the barge on a daily basis as required.
- Work vehicles which are brought to the island for crew and equipment transport will be parked at the site trailer offices, the construction laydown areas and turbine work areas during the construction period.
- Construction equipment will also be parked at turbine sites and on private access roads during the construction period.

## Impact Mitigation

### Community Events

- No construction activities are planned for any Sunday.
- No construction activities are permitted after 8:00 pm (with the exception of those activities listed in Section 2.9 (Hours of Operation)).

### Enforcement of Speed Limits and Traffic Management Plan Training

- The Site Safety Supervisor will have the authority and responsibility to ensuring that all Project staff comply with public and Project-specific speed limits, and obey traffic rules in accordance with the Operations Plan.

## Construction Noise Mitigation

- Sources of noise from typical wind farm construction activities include, but are not limited to:
  - Foundation construction
  - Road construction
  - Trench construction; and
  - Wind turbine generator erection

## General Preventative and Mitigation Efforts

- All site construction personnel will receive training during site orientation on the specific Cultural Heritage Features and protected properties located on the island.
- In the cases in which the Heritage Assessment Report has indicated that there are potential effect(s) from vibration related to Project activities that will occur within a 50 metre buffer zone around a Cultural Heritage Resource
- Each of these potentially affected Cultural Heritage Resources will be photographically recorded prior to any work in the area.

## Cultural Heritage Features

- The Cultural Heritage Features exposed to Project activities are:

<u>Cultural Heritage Landscapes (CHL)</u>		
CHL 1	Village of Stella	Related structures
CHL 3	St. Paul's Presbyterian Church	Related structures
CHL 4	Ferry Landscape	Related structures, vista
<u>Built Heritage Resources (BHR)</u>		
BHR 1	1830 South Shore Road*	Structure
BHR 2	2090 South Shore Road*	Structure
BHR 3	2450 South Shore Road	Structure
BHR 4	3500 South Shore Road	Structure
BHR 5	4125 South Shore Road	Structure
BHR 6	2750 Front Road	Structure
BHR 7	3190 Front Road	Structure, stone fence
BHR 19	3475 Second Concession Road	Structure
BHR 20	4725 Second Concession Road	Structure
	5170 Front Road	Structure
	5555 Front Road	Structure

\*Mitigation not required for these features per the Heritage Assessment Report

## Drainage, Grading and Fencing

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- Best management practices will be utilized to control erosion and sediment runoff while maintaining drainage
- Impacts from construction activities to private fencing and other private improvements (e.g. signage) located within the public road allowance will be avoided to the extent reasonably possible.
- Whenever impacts to fencing cannot be avoided, the fence line will be moved temporarily to the boundary of the road allowance to maintain continuity with yard fencing as needed to maintain equivalent security to the property it surrounds.
- Following construction activities, a fence with the same or superior quality will be installed on either the original fence line, or at the property line at the discretion of the Township.



## Ferry Operations

- The Project will not use the public ferry for construction purposes with the exception of use of the public ferry for transport of personnel, equipment and materials required for the construction of the Project's island dock.
- The contractor's barge operator shall be required to manage the Project's water-based activities in such a way to ensure that operations of the public ferry are not delayed. Radio communication and coordination between the barge operator and the ferry captains will ensure that there is no impact to the ferry schedule.



## Communications Plan

- The Communication Plan will use multiple channels to ensure that the Municipality's residents are able to access updates using means that different residents find most convenient. The multiple channels will include the internet, social media, radio, and weekly mail.
- The Communications Plan will also ensure communication between the Project and the public is two-way.
- The public will be able to access multiple channels for providing the Project team with feedback including: a Complaint Response Protocol, through access to the Community Liaison Committee (the CLC), and the Community Working Group (the CWG), sending an email to the Project.



## Municipality and Resident Notice

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- A construction activity map will be produced on a weekly basis to provide a simple visual description of which roads will be impacted on a particular week. The map will identify trenching, aggregate deliveries, concrete deliveries and component deliveries with separate colours.
- Daily reminders of expected Traffic Interruptions, Single Lane Restrictions, and Road Closures will be issued via the Project website, Facebook, Twitter (including Tweeting at YGKTraffic).



## Complaint Response Protocol

- Written complaints during construction will be accepted by the Project team via email at [Windlectric@amherstislandwindproject.com](mailto:Windlectric@amherstislandwindproject.com).
- All telephone complaints received by the Project team will be transferred to a Complaint Form and logged.
- The contractor will respond to the complaint within a reasonable time period (but not longer than 2 business days).
- The construction team will make every reasonable effort to resolve all complaints in a timely manner.

## Public Safety Plan

### Emergency Services

- Construction planning will ensure that Emergency Services (ES) will have access to all residences at all times during construction.
- All Single Land Restrictions will have a minimum 3m width in order to ensure that emergency service vehicles have room to pass; flagstaff at single road closures will give priority to Emergency Services vehicles.
- If any emergency service vehicle is called to a particular location on the island, the ES team will be able to contact the contractor's On-site Safety Representative who will immediately stop all contractor work across the entire site, ensure all trucks and other equipment are moved off the roads along the route immediately

## Public Safety Plan

- The contractor's safety supervisor will be available for weekly meetings with ES personnel to discuss any ongoing activities or concerns.
- ES will have access to the emergency radio frequency and radio equipment (if necessary) that will be used by the contractor and will have the authority to cut in at any time in order to direct traffic in an emergency situation.
- The contractor will be responsible for planning activities in a safe manner and for implementing the Public Health and Safety Plan on a day-to-day basis in accordance with the applicable regulations.



Thank you.  
Questions?

SCHEDULE 05 – Renewable Energy Approval Condition M

SCHEDULE 05 – Renewable Energy Approval Condition M

**M - CULTURAL HERITAGE RESOURCES AND PROTECTED PROPERTIES**

**CONSTRUCTION ACTIVITIES**

Construction activities include the transport by heavy vehicles of equipment and component parts necessary for the construction and installation of the project infrastructure.

M1. The following cultural heritage resources have been identified:

**Built Heritage Resources:**

- (1) 5170 Front Road (Neilson's General Store)
- (2) 5555 Front Road (Trinity United Church)
- (3) 2750 Front Road

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- (4) 3190 Front Road - structural integrity of narrowly set back structures and features, including the structures and vulnerable fixtures of the residence, outbuildings, the 1820's brick bake oven and dry stone fencing throughout the property
- (5) 3500 South Shore Road
- (6) 4125 South Shore Road
- (7) 3475 South Shore Road
- (8) 4725 Second Concession Road
- (9) 5950 Second Concession Road

**Cultural Heritage Landscapes:**

- (1) Village of Stella
- (2) Ferry landscape
- (3) 1652 Front Road (Pentland Cemetery)
- (4) 1995 Stella 40 Foot Road (St. Paul's Presbyterian Church)

**Dry Stone Walls Located at:**

- (1) Emerald 40 Foot Road and Second Concession Road
- (2) 3190 Front Road
- (3) 3850 South Shore Road
- (4) 570 Front Road
- (5) 2400 Front Road
- (6) 2750 Front Road
- (7) 12405 Front Road
- (8) 12515 Front Road
- (9) 12675 Front Road
- (10) 13555 Front Road

- M2. The Company shall use best efforts to not construct within 50 metres (m) of the cultural heritage resources identified above.
- M3. If construction is within 50 m of the cultural heritage resources identified above, the Company shall ensure that peak particle velocity (PPV) levels are within the acceptable levels that were established prior to construction in accordance with Condition M4.
- M4. Acceptable vibration levels (peak particle velocity [PPV] levels) shall be determined for each cultural heritage resource prior to the commencement of construction within the 50 m buffer zone surrounding the cultural heritage resource by a Qualified Independent Structural Engineer with previous experience working with built heritage under similar circumstances.
- M5. Should, during ongoing monitoring by the Qualified Independent Structural Engineer, PPV levels be exceeded:
- (1) the Company shall cease construction activities within the 50 m buffer zone until an acceptable solution can be identified by the Qualified Independent Structural Engineer;
  - (2) the Qualified Independent Structural Engineer prepares and signs a report with recommendations regarding the solution; and
  - (3) the Company shall follow the recommendations and submit a copy of the Qualified Independent Structural Engineer's report to the District Manager.
- M6. With respect to the dry stone walls, the Company shall:
- (1) Prepare a detailed written and photographic documentation of their condition prior to construction;
  - (2) Conduct on-going monitoring of their condition during construction activity; and
  - (3) Assess and evaluate their condition after the completion of construction activity to ensure that negative impacts have not occurred.
- M7. If any damage does occur to the above listed cultural heritage resources or dry stone walls, the Company shall notify the District Manager and the Ministry of Tourism, Culture and Sport and follow any directions provided by the District Manager and/ or the Ministry of Tourism, Culture and Sport to rectify the damage.
- M8. The Company shall document, including photographically, the ferry landscape prior to any construction activity occurring and in advance of the installation of temporary and permanent project infrastructure in the vicinity of the ferry landscape.

- M9. The removal, destruction or damage of trees shall be avoided to the greatest extent practicable in all areas where construction activities take place including any roads/ transportation routes.
- M10. The removal of any extant cabins, log houses or built features encountered in wooded portions of the project location during construction of the project is prohibited without undertaking a Heritage Assessment prior to the removal of the resource. The heritage assessment report is to be submitted to the Ministry of Tourism, Culture and Sport for review.

**DECOMMISSIONING ACTIVITIES**

- M11. The Company shall permanently deposit a record of current conditions (reports documenting the pre-construction condition of the project location), including the *Amherst Island Wind Energy Project Protected Properties Assessment* report, dated April 1, 2013 and the addendum to this report dated April 17, 2015, prepared by Stantec Consulting Ltd., and the *Amherst Island Wind Energy Project Heritage Assessment* report, dated April 4, 2013 and addendum to this report dated December 1, 2014, at the local library within 3 months of the start of operation.
- M12. The Company shall, prior to decommissioning activities, review the heritage assessment reports mentioned above, and any pre-construction documentation, to ensure that decommissioning efforts return the project location lands as close to pre-construction conditions as possible.

SCHEDULE 06 – Renewable Energy Approval Condition H

## **SCHEDULE 06 – Renewable Energy Approval Condition H**

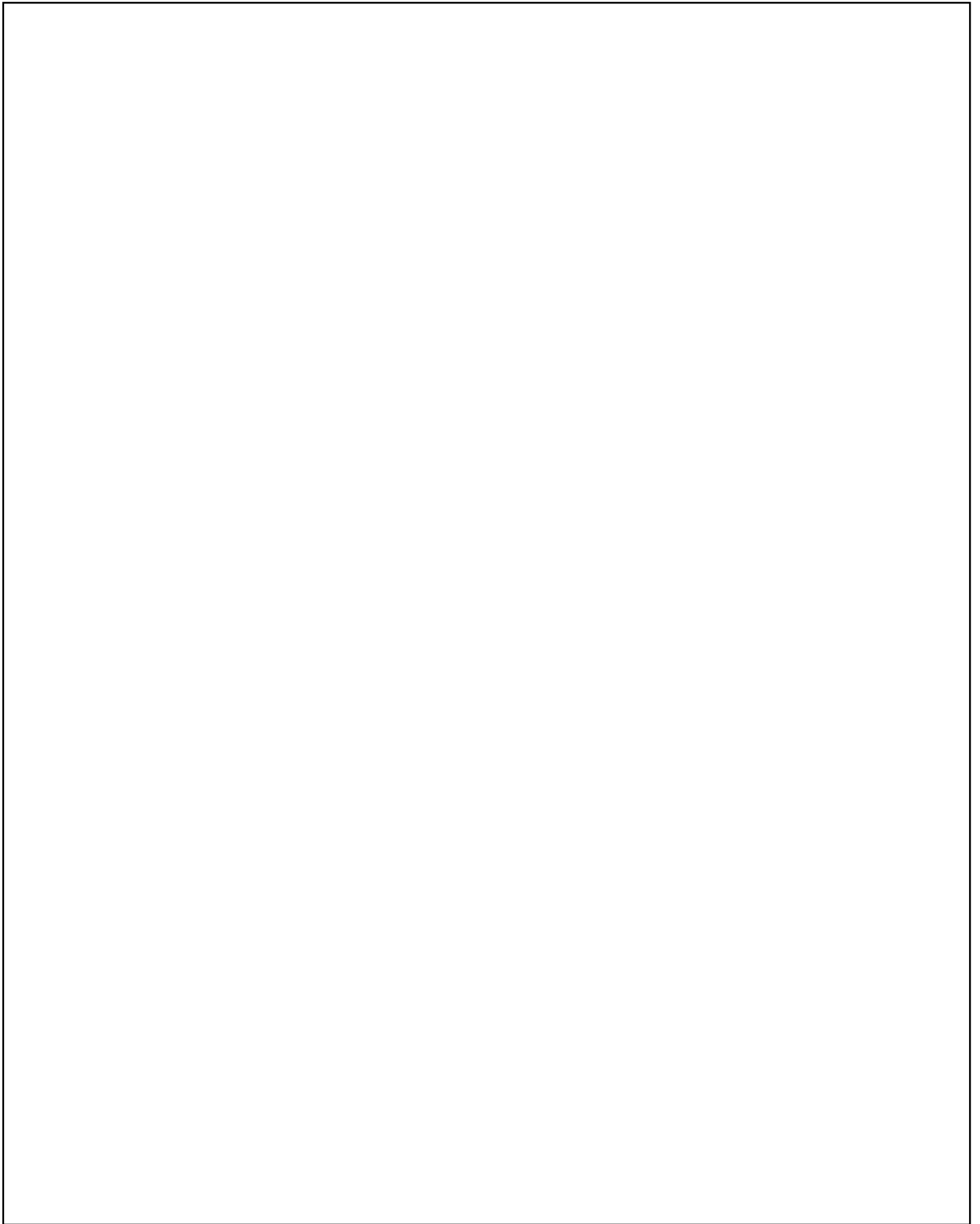
### **H - STORMWATER MANAGEMENT, EROSION AND SEDIMENT CONTROL AND SURFACE WATER MONITORING**

- H1. The Company shall prepare and submit using current best management practices, a site-specific stormwater management plan and erosion and sediment control plan for the construction, installation, use, operation, maintenance and retiring of the Facility and the Facility (Concrete Plant) to the Director and the District Manager at least one month prior to the commencement of construction of the Facility and the Facility (Concrete Plant).
- H2. The Company shall not commence construction of the Facility and the Facility (Concrete Plant) until the site-specific stormwater management plan and erosion and sediment control plan has been approved in writing by the Director. Any required installations will be in place prior to construction.
- H3. The site-specific stormwater management plan and erosion and sediment control plan shall:
- (1) Include details on erosion, sediment, stormwater management, spill control, and response plan for all construction-related activities for the Facility and the Facility (Concrete Plant);
  - (2) Be prepared by a Professional Engineer;
  - (3) Comply with the Ministry's Guideline B-6 "*Guidelines for Evaluating Construction Activities on Water Resources*", January 1995, "*Stormwater Management Planning and Design Manual*", March 2003, and "*Erosion and Sediment Control Guideline for Urban Construction, as Compiled by the Greater Golden Horseshoe Conservation Authority*", December 2006; and
  - (4) As a minimum requirement, require the installation of silt fencing prior to construction at the limits of construction around all staging areas, access roads, turbine foundations and laydown areas.
- H4. The Company shall take all measures necessary to prevent damages (or any related impacts) to neighbouring properties, buildings, bridges, structures, roads, railway lines and/or other infrastructure that may be impacted by the discharge/ drainage from the Facility and the Facility (Concrete Plant).
- H5. The Company shall install and maintain the stormwater management and erosion and sediment control measures as detailed in the plans required under Condition H1. No construction shall commence until the pre-construction measures outlined in the plans have been installed.
- H6. The Company shall employ a Qualified Inspector to inspect all erosion and sediment control and stormwater management measures, and perform all monitoring and measurements such as turbidity, as outlined in Conditions H8 and H15.

- H7. The erosion and sediment control and stormwater management measures shall be maintained and inspected daily during construction by the Company, and shall be inspected by a Qualified Inspector following precipitation events during the spring freshet and after any Significant Storm Event. These measures shall continue until such a time as the Qualified Inspector determines that the measures are no longer required or the Qualified Inspector deems that the risk of surface water/ environmental impacts from the construction activity is negligible.
- H8. For the duration of construction, the Company shall require the Qualified Inspector to monitor in-field turbidity levels for all project components/ construction which takes place within 30 m of the high water mark of a waterbody in accordance with the following:
- (1) Monitoring shall be conducted on a daily basis upstream of the construction activity, and downstream of the construction activity during Significant Storm Events and the spring freshet;
  - (2) If the average (arithmetic mean) daily turbidity level downstream of the In-Water Works and construction activity exceeds the Canadian Council of Ministers of the Environment Canadian Water Quality Guidelines (CCME-CWQG) for the Protection of Aquatic Life for a short-term or long-term exposure as defined in the Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, 1999, and as updated, the Company shall notify the Spills Action Centre (SAC) (1-800-268-6060 (toll-free, province-wide), or at 416-325-3000 (Toronto area), or 1-855-889-5775 (TTY)), within 24 hours and the Company shall implement the response plan to prevent further migration of turbid water into the watercourse(s).
- H9. When there is an overlap between regulatory requirements, the Company shall apply the more stringent and the more protective requirements for water bodies, natural heritage features and fish habitat.
- H10. The Company shall ensure that runoff/ stormwater does not contain a concentration of oil or petrochemicals that could be detected as a visible film, sheen or discoloration, be detected by odour, cause the tainting of any edible aquatic organism, form deposits on shorelines or bottom sediments, or that could be deleterious to aquatic organisms.
- H11. The Company shall ensure that water pumped from any excavations is not discharged at a rate or in a quantity which will cause downstream flooding, erosion, or an Adverse Effect and that appropriate sediment control measures such as sediment basin and filter strips will be employed as necessary at the discharge location.
- H12. The Company shall ensure that construction works and related activities are located a minimum of 30 m from the high water mark of water bodies, except as identified in the site-specific stormwater management plan and erosion and sediment control plan as per Condition H1.
- H13. The Company shall maintain records of all inspections, monitoring and sampling data, and maintenance carried out pursuant to Conditions H1 to H12 and H15 (for In-Water Works), which shall be made available for inspection by the Ministry, upon request. The records shall include the name of the Qualified Inspector, date and timing of inspections and all remedial actions taken.

#### **IN-WATER WORKS DURING CONSTRUCTION**

- H14. In-water Works shall be completed in a manner that protects fish habitat and other sensitive species/ habitats.
- H15. The Company shall monitor in-field turbidity levels for the duration of construction or until such a time as the Qualified Inspector determines that the erosion and sediment control measures are no longer required and/ or that the risk of surface water/ environmental impacts are negligible, in accordance with a sampling program prepared by the Company and submitted to the District Manager for approval prior to the commencement of construction including In-Water Works. The sampling program shall include the following:
- (1) Monitoring shall be initiated two weeks prior to the commencement of construction including In-Water Works and be conducted on a daily basis upstream and downstream of the In-Water Works within the waterbody(s), and downstream of the Facility and the Facility (Concrete Plant) within the waterbody(s);
  - (2) The Company shall notify the District Manager if the turbidity downstream of the erosion and control works is greater than 8 NTU (as per CCME-CWQG) from that measured upstream. The Company shall immediately implement additional erosion and sediment control measures to reduce or mitigate the sediment related impacts; and
  - (3) The Company shall collect water samples from a location immediately upstream of the In-water Works, and from a location immediately downstream of the In-water Works to be analyzed for Total Suspended Solids (TSS). The TSS sampling shall take place at least once daily during In-water Works related construction, unless otherwise directed by the Ministry.
- H16. The Company shall install all In-water Works in a manner which:
- (1) Prevents an Adverse Effect to the stream bed, substrates, stream bank, instream and near-shore habitat, and flow characteristics, absent of any authorizations such as timing restrictions and/ or mitigation requirements from partner Ministries and agencies; and
  - (2) Adheres to timing restrictions and/ or mitigation requirements of partner Ministries and agencies, including a restriction on In-Water Works related to dock construction from April 1 to June 30 annually.



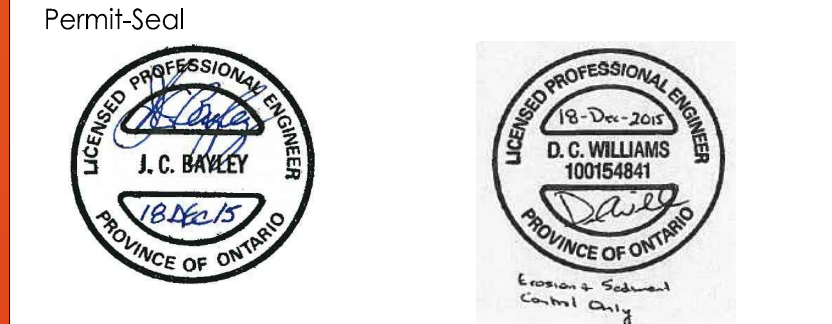


SCHEDULE 07 – Erosion and Sediment Control – Typical Details



****For PHCL and Windelectric Use Only****	
Review with no comments does not constitute approval of design details, calculations or methods. It is the responsibility of the consultant to ensure all information contained within the drawings are in full compliance with contractual obligations.	
<input type="checkbox"/> Reviewed - No comments	
<input type="checkbox"/> Reviewed - Incorporate comments and resubmit	
<input type="checkbox"/> Reviewed - Not accepted	
Reviewed By	Date [dd-mm-yyyy]
Project Manager - PHCL	Date [dd-mm-yyyy]
Project Manager - Windelectric	Date [dd-mm-yyyy]
Owner:	
Windelectric Inc.	

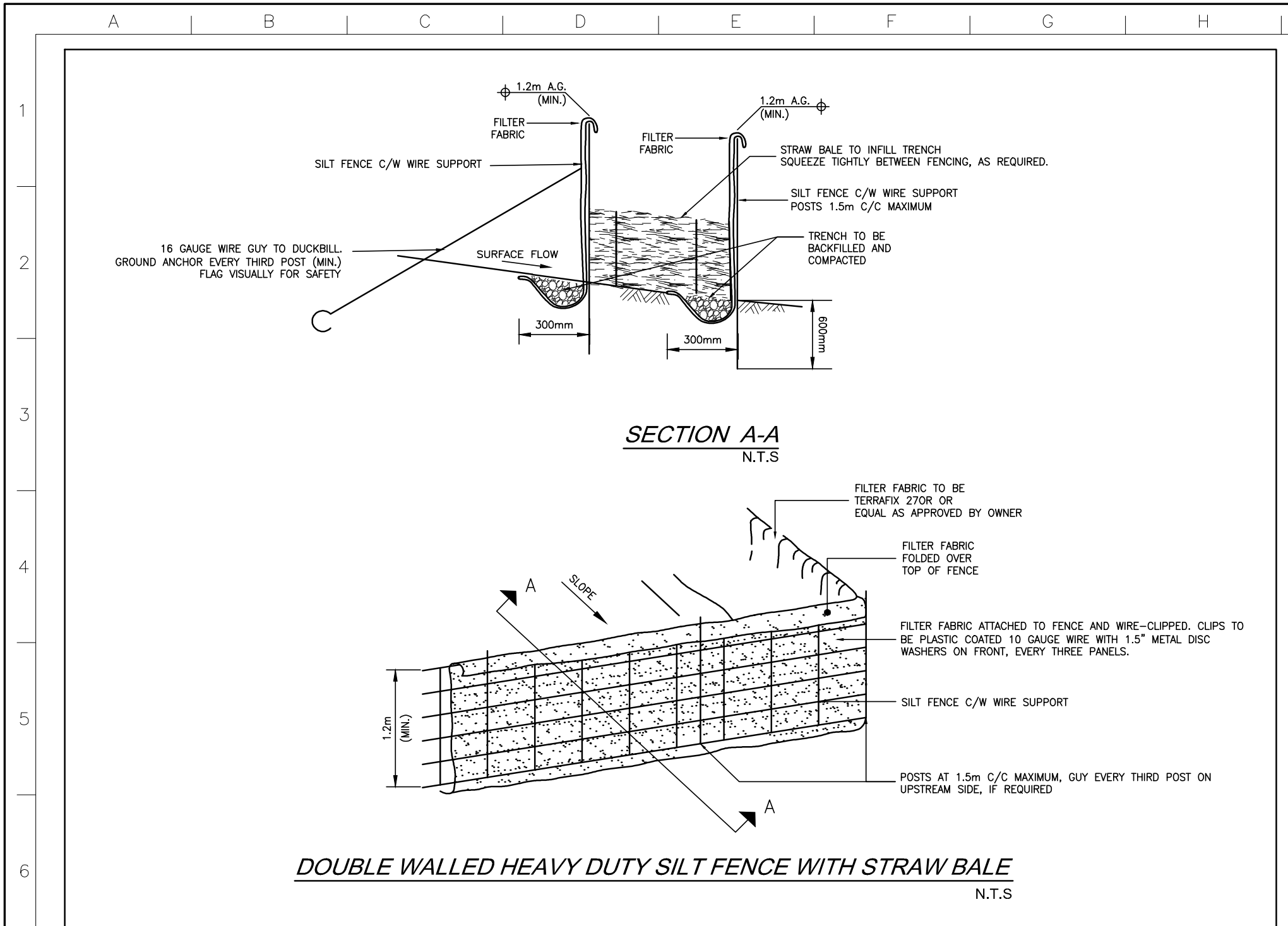
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Revision		By	Appd.	YY.MM.DD
File Name:	C:\300_133560100-Detail-DWG	RCL	DCW	DCW
		Dwn.	Chk.	Dgn.
				YY.MM.DD



Client/Project  
**PENNECON**  
HEAVY CIVIL  
AMHERST ISLAND WIND PROJECT  
75MW WIND FARM  
Amherst Island, Loyalist Township, Ontario

Title  
**CIVIL ACCESS ROAD  
DETAIL SHEET**

Project No.	Scale
133560100	N.T.S.
Drawing No.	Sheet
C300	Revision
	0



**DOUBLE WALLED HEAVY DUTY SILT FENCE WITH STRAW BALE**  
N.T.S.

**COIR MATTING**

- PROVIDE COIR FIBER MATTING TO MEET THE FOLLOWING SPECIFICATIONS:

Physical Specification (Roll)	
Material	100 percent coir twine woven into high strength mat (matting)
Thickness	7.6 mm
Tensile Strength	22.1 kN/m x 15.1 kN/m
Elongation	49% x 40%
Flexibility	4500 x 2950 mg/cm
Flow Velocity	Observed 11 ft/sec (3.4 m/s)
Weight	30 oz/SY (1.60 g/3H)
Size	2 m x 50 m (100 m <sup>2</sup> )
C Factor	0.022
Open Area (measured)	50%

- STAKES PROVIDED, ARE TO BE MADE OF WOOD OR OTHER BIODEGRADABLE MATERIAL, WITH A HOOK TO ANCHOR MATTING. STAKES TO BE INSTALLED, SHALL BE NO LESS THAN 0.60m IN LENGTH. ECOSTAKES (OR EQUIVALENT) AND STAPLES SHALL NOT BE USED UNLESS AS SUPPLEMENTAL TO WOOD STAKES.
- APPLY SEED MIX AND STRAW PRIOR TO INSTALLING MATTING.
- INSTALL THE COIR FIBER MATTING IMMEDIATELY UPON FINAL GRADING. PROVIDE A SMOOTH SOIL SURFACE THAT IS FREE FROM STONES, CLODS, OR OTHER EXTENDING DEBRIS THAT WILL PREVENT THE MATTING FROM CONTACTING THE SOIL.
- BEGIN INSTALLATION AT THE TOP OF THE SLOPE BY ANCHORING THE TOP OF THE MATTING IN A 0.15m DEEP x 0.60m WIDE TRENCH. STAKE MATTING IN PLACE, WITH EVENLY SPACED STAKES EVERY 0.60m. BACKFILL AND COMPACT THE TRENCH AFTER STAKING.
- THE EDGES OF THE PARALLEL MATTING MUST BE STAKED WITH APPROXIMATELY 0.15m OF OVERLAP SUCH THAT THE EDGE OF THE DOWNSTREAM MATTING IS UNDER THE ONE JUST UPSTREAM. WHEN MATTING MUST BE SPUNCE DOWN THE SLOPE, INSTALL MATTING END-OVER-END (SHINGLE STYLE) WITH APPROXIMATELY 0.15m OF OVERLAP.
- INSTALL STAKES APPROXIMATELY 0.60m APART ACROSS THE MATTING AND AT ENDS, JUNCTIONS, AND TRENCHES. INSTALL STAKES ALONG THE OUTER EDGES, DOWN THE CENTRE OF EACH STRIP OF MATTING AND ALONG ALL LAPPED EDGES APPROXIMATELY 0.60m APART. EXCESS MATTING SHALL BE TRIMMED, ANCHORED, AND TRENCHED AT THE END OF THE SLOPE.
- THE OWNER OR OWNER'S REPRESENTATIVE MAY REQUIRE ADJUSTMENTS IN THE TRENCHING OR STAKING REQUIREMENTS TO FIT INDIVIDUAL SITE CONDITIONS.

**GENERAL**

- EQUIPMENT AND CONSTRUCTION MATERIAL SHALL BE STORED AWAY FROM THE WATER IN A MANNER THAT PREVENTS ANY DELETERIOUS SUBSTANCE FROM ENTERING THE WATER. REFUELING OF MACHINERY AND GENERATORS SHALL NOT BE CONDUCTED WITHIN 100m OF A WATERBODY AND SHALL BE COMPLETED IN A CONTROLLED MANNER WITH ADEQUATE SPILL PROTECTION ON SITE.

**EROSION AND SEDIMENT CONTROL NOTES:**  
(SEE DETAILS THIS SHEET)

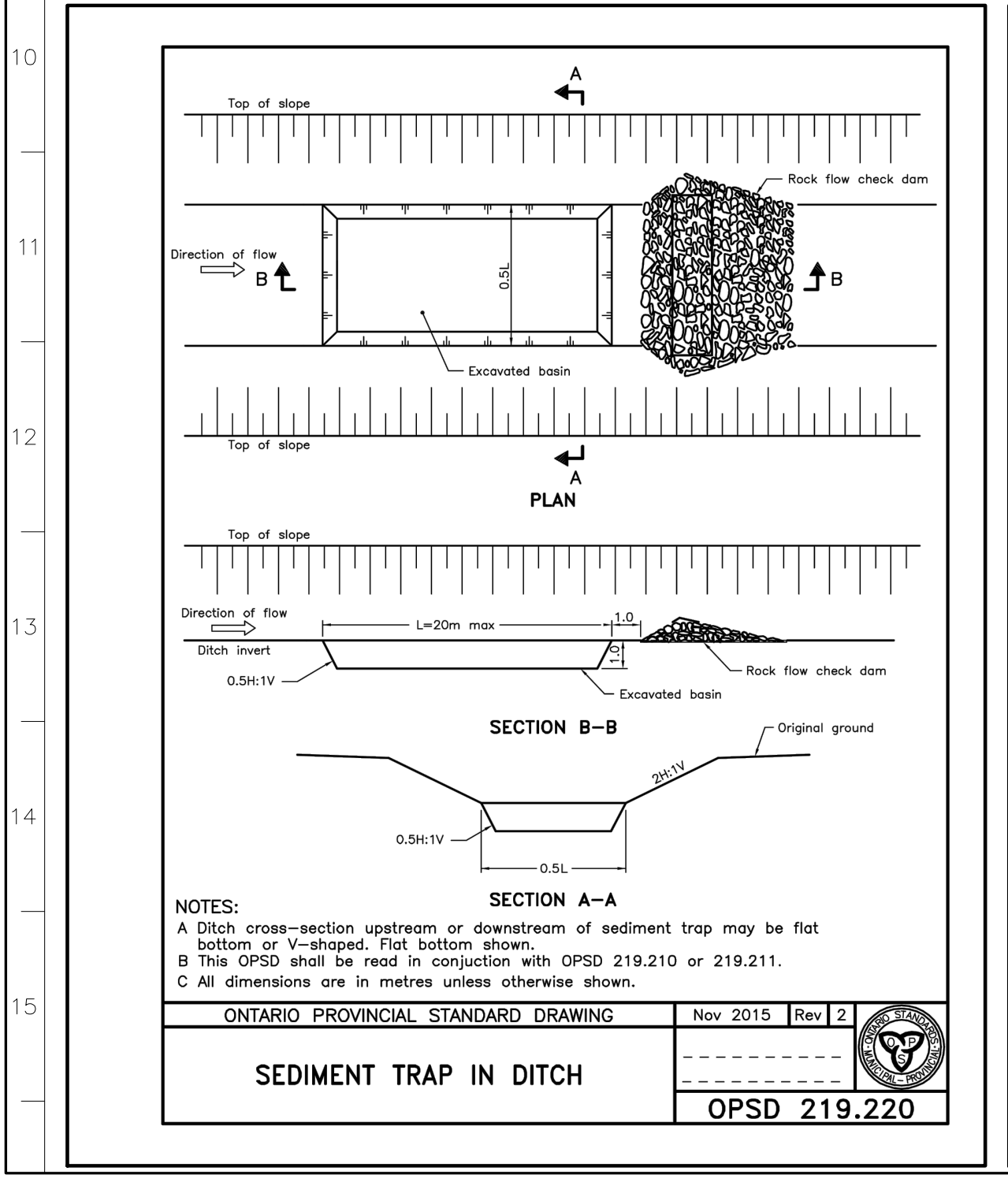
- THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM DURING CONSTRUCTION ACTIVITIES. THIS INCLUDES LIMITING THE AMOUNT AND DURATION OF EXPOSED SOIL AND INSTALLING SILT FENCES AND OTHER SEDIMENT TRAPS/FILTERS SIMILAR TO THOSE ILLUSTRATED HEREIN.
- EROSION AND SEDIMENT CONTROL WORKS SHALL BE INSTALLED AND IN WORKING CONDITION PRIOR TO COMMENCEMENT OF CONSTRUCTION RELATED ACTIVITIES.
- SEDIMENT CONTROL MEASURES ADJACENT TO CONSTRUCTION AREAS MAY REQUIRE REMOVAL / RELOCATION IN ORDER TO COMPLETE SPECIFIC CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE SEDIMENT CONTROL MEASURES ARE IN PLACE AT ALL TIMES.
- EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE MAINTAINED AND IMPROVED AS NECESSARY TO KEEP THEM EFFECTIVE AND MINIMIZE THE POTENTIAL FOR EROSION AND MIGRATION OF SEDIMENT TO THE DOWNSTREAM NATURAL ENVIRONMENT.
- AT THE DISCRETION OF THE OWNER OR OWNER'S CONSULTANT, ADDITIONAL SILT CONTROL DEVICES SHALL BE INSTALLED AT DESIGNATED LOCATIONS.
- SEDIMENT THAT IS ACCUMULATED BY THE TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED IN A MANNER THAT AVOIDS ESCAPE OF THE SEDIMENT TO THE DOWNSTREAM SIDE OF THE CONTROL MEASURE AND AVOIDS DAMAGE TO THE CONTROL MEASURE. ALL SEDIMENT SHALL BE REMOVED AND TOPSOIL WITH SEED TO BE ADDED IF NECESSARY.
- ACCUMULATED SEDIMENT IS TO BE REMOVED AND DISPOSED OF AS PER OPSD 180, PRIOR TO THE REMOVAL OF ANY CONTROL MEASURE. STOCKPILED MATERIAL IS TO BE STORED AWAY FROM POTENTIAL RECEIVERS (E.G. WATERCOURSES), AND BE SURROUNDED BY EROSION CONTROL MEASURES WHERE MATERIAL IS TO BE LEFT IN PLACE IN EXCESS OF 10 DAYS OR PRIOR TO A RAIN EVENT, WHICHEVER OCCURS SOONER.
- REMOVAL OF SEDIMENT CONTROL MEASURES AND COLLECTION OF ACCUMULATED SEDIMENT SHALL OCCUR FOLLOWING SUBSTANTIAL COMPLETION OF CONSTRUCTION (90%-100%) AND SITE STABILIZATION TO 90%.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN AND BOLSTER EROSION AND SEDIMENT CONTROL MEASURES AS NECESSARY TO KEEP THEM EFFECTIVE AND MINIMIZE THE POTENTIAL FOR EROSION.
- IN ADDITION TO BEING RESPONSIBLE FOR ENSURING THAT THE PRESCRIBED MEASURES ARE INSTALLED AND FUNCTIONING AS INTENDED, THE CONTRACTOR IS ALSO RESPONSIBLE FOR IMPLEMENTING ANY INTERIM OR EMERGENCY MEASURES AS NECESSARY, TO ENSURE THAT NO SEDIMENT IS DISCHARGED TO THE NATURAL ENVIRONMENT. THE FOLLOWING EXTRA EQUIPMENT/MATERIALS ARE TO BE KEPT ON SITE AS A CONTINGENCY, IN CASE THE PROPOSED CONTROL MEASURES ARE BREACHED.
  - SILT FENCE
  - FILTER CLOTH
  - PUMPS
  - CLEAN RIP-RAP (FREE OF FINES) FOR ROCK CHECK DAMS

**SLOPE PROTECTION NOTES**

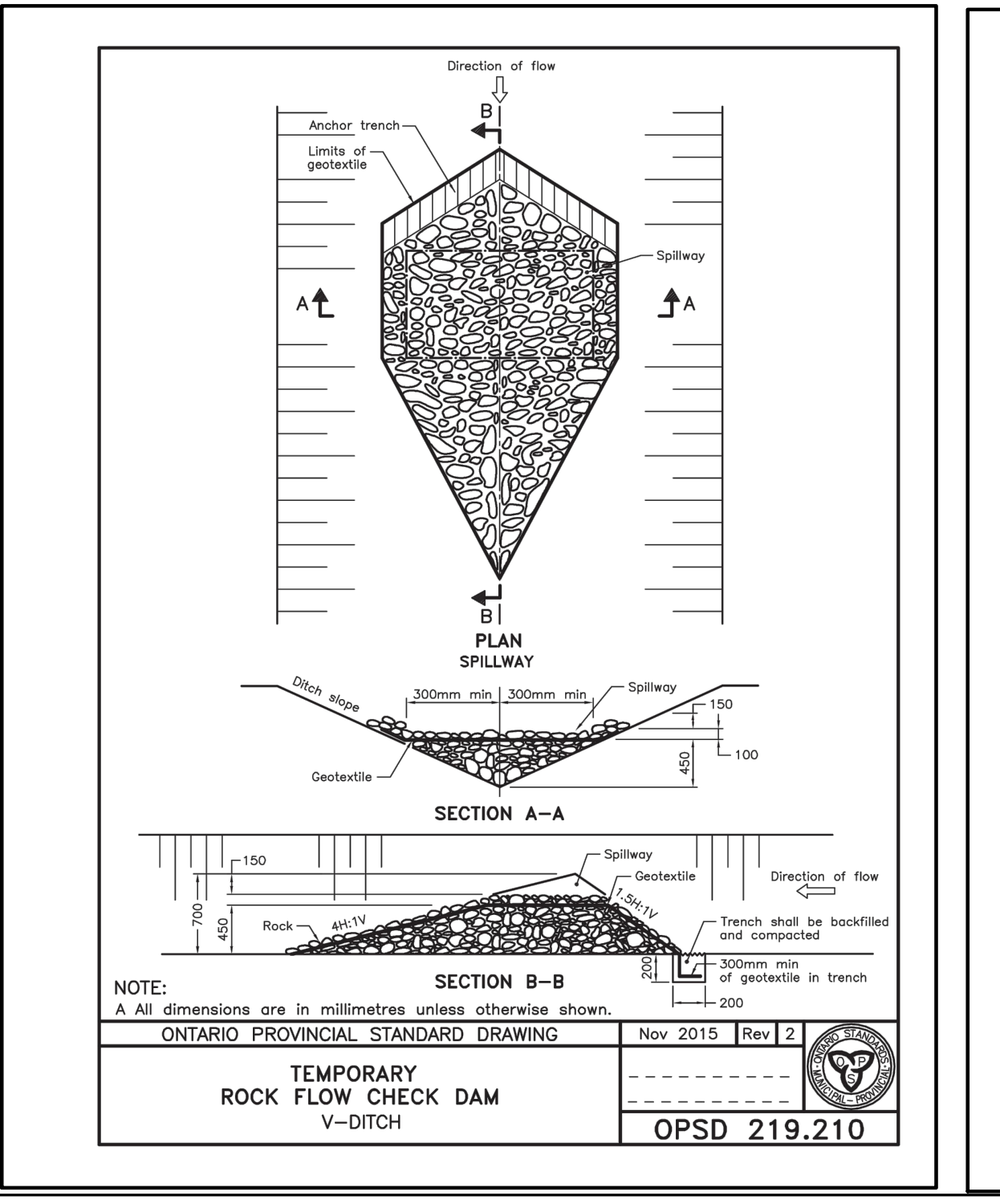
- ROLLED EROSION CONTROL PRODUCTS (RECP) ARE TO BE USED ON SLOPES GREATER THAN 3:1, UNLESS OTHERWISE NOTED.
- RECP PRODUCTS ARE TO BE BIODEGRADABLE.
- RECP PRODUCTS ARE TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS. INSTALLATION TO BE INSPECTED AND REPAIRED AS NEEDED.
- RECP ARE TO BE APPLIED AS SOON AS POSSIBLE FOLLOWING GRADING AND SEEDING OF SUBJECT AREAS.
- SURFACES ARE TO BE SMOOTH AND FREE OF STONES AND DEBRIS OR OTHER WEED CLUMPS PRIOR TO RECP PRODUCTS BEING INSTALLED.
- CONTRACTOR TO ENSURE THAT RILLING/GULLYING IS RECTIFIED PRIOR TO RECP INSTALLATION. CONTRACTOR TO MONITOR RUNOFF UNDER THE RECP FOLLOWING INSTALLATION.
- CONTRACTOR TO ENSURE THAT RECP IS SECURED AT THE TOP OF THE SLOPE IN A TRENCH AND OVERLAP (SIDE TO SIDE AND BOTTOM TO TOP).
- CONTRACTOR TO INSPECT THE SITE WEEKLY OR AFTER EVERY RAINFALL EVENT AND IDENTIFY AREAS OF EROSION OR POTENTIAL EROSION. BEST MANAGEMENT PRACTICES ARE TO BE USED TO CONTROL THE EROSION. METHODS OF CONTROL MAY INCLUDE THE USE OF EROSION CONTROL BLANKETS C/W SEEDING, HYDRAULIC MULCH, STRAW MULCH, OR SOIL BINDER. SOILS ARE TO BE STABILIZED AS SOON AS AREAS ARE IDENTIFIED TO PREVENT FURTHER EROSION.

**SILT FENCE NOTES (SEE DETAIL OPSD 219.110)**

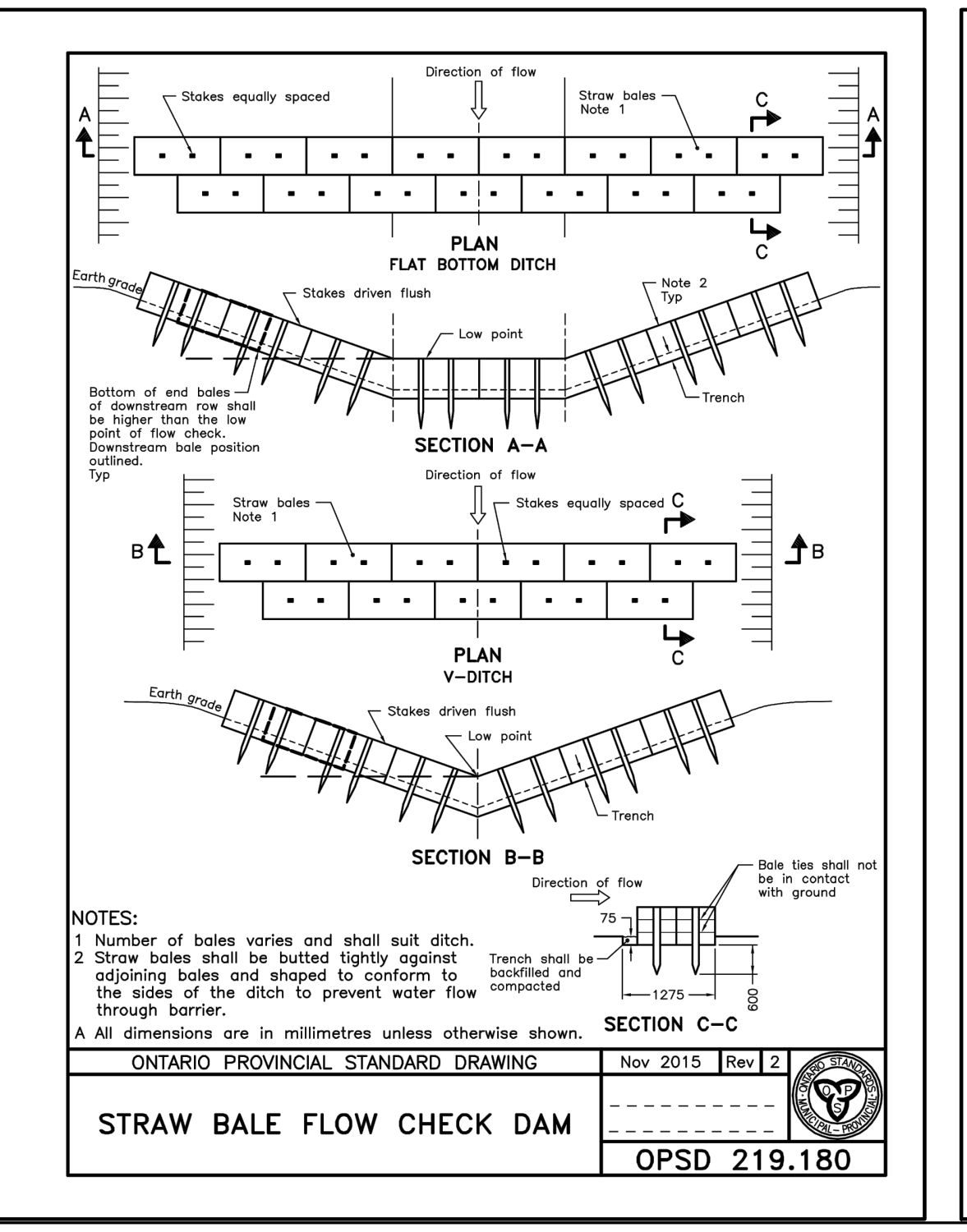
- STAKES ARE TO BE INSTALLED ON THE DOWNSTREAM SIDE OF THE BARRIER.
- CONTRACTOR TO MONITOR SILT FENCE FOR UV DEGRADATION.
- SILT FENCE IS TO BE CLEANED OUT ONCE SEDIMENT REACHES MAXIMUM 1/3 OF THE FENCE HEIGHT (MAX. 300mm DEPTH).



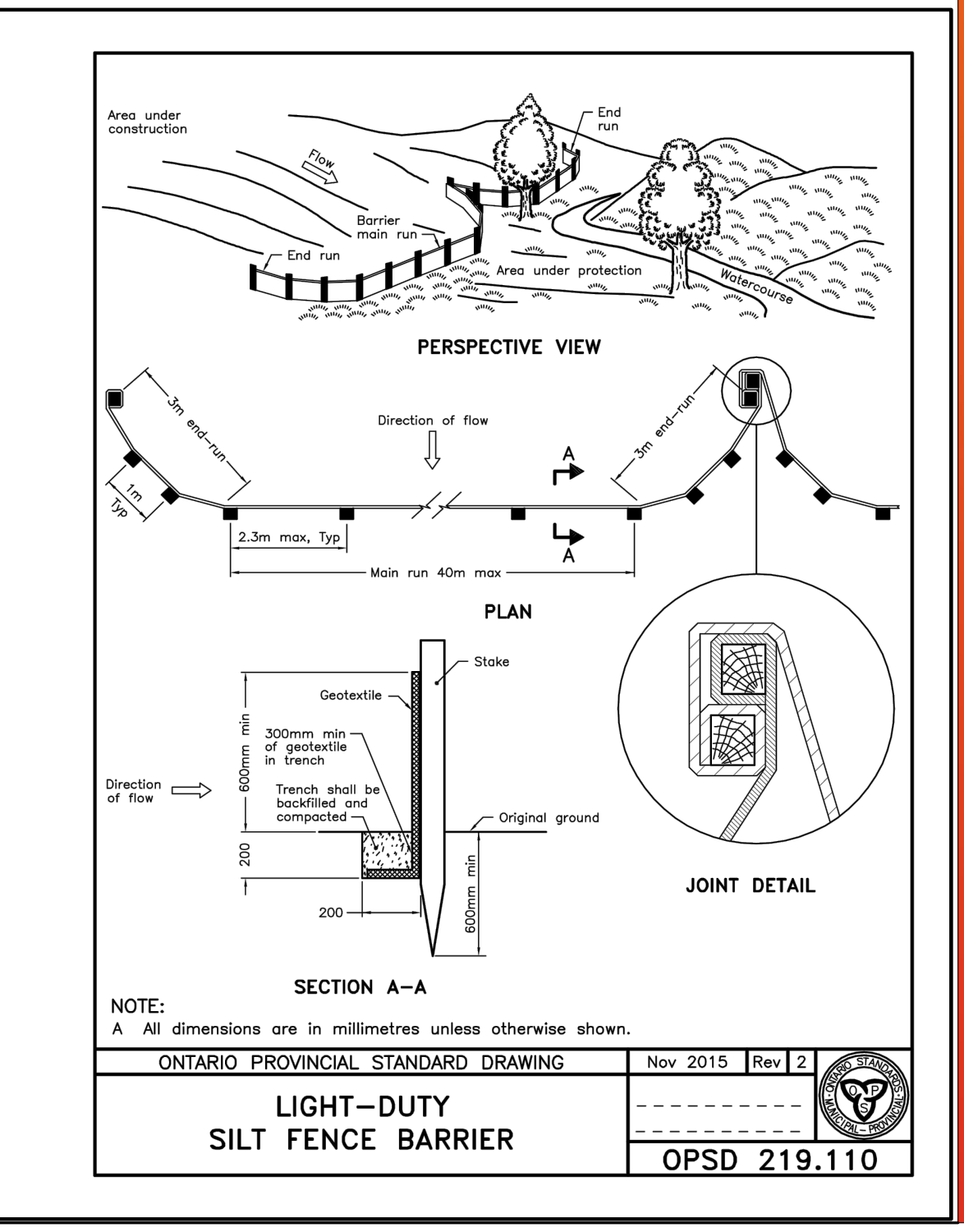
**SEDIMENT TRAP IN DITCH**  
OPSD 219.220



**TEMPORARY ROCK FLOW CHECK DAM V-DITCH**  
OPSD 219.210



**STRAW BALE FLOW CHECK DAM**  
OPSD 219.180



**LIGHT-DUTY SILT FENCE BARRIER**  
OPSD 219.110

133560100-Detail-DWG

ORIGINAL SHEET - ARCH-D



SCHEDULE 08 – Public Safety Plan



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**AMHERST ISLAND WIND FARM**

**CONTRACT-SPECIFIC PUBLIC SAFETY**

**PLAN**

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DRAFT

# Windlectric

May 2017

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DRAFT

## 1.0 INTRODUCTION

This document shall constitute the Pennecon Heavy Civil Limited (PHCL) Public Safety Plan for the Amherst Island Wind Farm Project. The content of this plan shall apply to all Pennecon Heavy Civil Limited employees, subcontractors and any visitors to the site. Copies of the Pennecon Heavy Civil Limited Public Safety Plan may be made available as required and will be available on the project site.

### 1.1 Objective

The objective of this Public Safety Management Plan (PSMP) is to describe the requirements for PHCL and its contractors in managing public safety. The PSMP applies to all work sites and all activities associated with construction of the Project.

Each contractor must:

- Conduct a public safety risk assessment as described below; and
- Implement appropriate mitigation measures.

Contractor Public Safety Management Plans will be provided to local authorities.

### 1.2 Responsibility

The Pennecon Heavy Civil Limited Management team, appointed to oversee the work, holds the primary responsibility for the development and execution of this plan. All employees and subcontractors are responsible for fulfilling the requirements of the Plan.

## 2.0 RISK ASSESSMENT

PHCL will provide its understanding of hazards to the public associated with Project construction, in particular hazards resulting from:

- Turbine Access Road Construction
- Post Construction Remediation
- Dock Access Road Construction
- Road Maintenance
- Collection system installation
- Turbine Offloading and Travel
- General Trucking Activities
- Batch Plant Operations

- General Construction
- Excavation activities
- Blasting activities
- Emergency Response
- Barge Activities
- Laydown Activities
- Crane Travel and erection
- Turbine Erection

Each contractor must consider the information provided by PHCL, and their own knowledge of the site and construction activities in conducting a risk assessment and in implementing appropriate mitigation measures.

The risk assessment will be based on the steps described below.

Appendix A provides the public safety risks and associated activities that PHCL has identified to date.

## **2.1 Risk Ranking**

Risk ranking consists of a combination of likelihood and consequence. Likelihood refers to the possibility that members of the public will suffer an injury from the activity. Consequence refers to the severity of injury as a result of the worst probable outcome. Because the likelihood of an incident resulting in a minor injury is higher than the likelihood of an incident resulting in a serious injury, as consequences rise, likelihood goes down. Because the final risk ranking is achieved by multiplying the likelihood score by the consequence score, reducing either likelihood or consequence will reduce the total risk score.



		Hazard Severity				
		1 Negligible injury, no absence from work. No damage to equipment or the environment.	2 Minor injury requiring first aid treatment. Minor damage to equipment or environment	3 Injury leading to a lost time incident. Equipment damage and environmental impact moderate.	4 Involving a single death or serious injury. Major damage to equipment. Severe impact on environment with significant restitution costs.	5 Multiple deaths. Production shutdown. Major pollution with long term implications and high restitution costs.
Likelihood of Occurrence	1 A freak combination of factors would be required for an incident to result. Not credible, i.e. the team have never heard of event occurring in industry.	1	2	3	4	5
	2 A rare combination of factors would be required for an incident to result. Conceivable, but would require multiple failures of systems and controls.	2	4	6	8	10
	3 Could happen when additional factors are present but otherwise unlikely to occur. Less than average, i.e. easy to put forward a scenario for incident but considered unlikely.	3	6	9	12	15
	4 Not certain to happen but an additional factor may result in an incident. More than average, i.e. the team do not have direct knowledge but suspect that event may have occurred and represents a credible scenario.	4	8	12	16	20
	5 Almost inevitable that an incident would result. Likely to occur and the team have knowledge of a similar event.	5	10	15	20	25

## 2.2 Risk Levels

Determining the risk level of each activity follows a three part process.

1. Incident Likelihood and Incident Consequence ratings are determined by examining the “as is” condition of each activity within a component area with respect to identifiable hazards with no risk reduction measures in place.
2. The overall risk level of the activity being examined is then determined by multiplying the Likelihood and Consequence ratings together.
3. New or modified risk reduction measures are then applied and Likelihood and consequence ratings are reassessed with the additional measures.

The above three steps are repeated for each activity within the component area until sufficient risk reduction measures are implemented to eliminate or to significantly reduce initial high risk levels to medium or low.

High		15 to 25
Medium		8 to 12

Low		1 to 6
-----	--	--------

### 2.3 Risk Mitigation

Each contractor must take into account the results of the risk assessment and identify the appropriate mitigation measures. The contractor will employ the following hierarchy (in order of priority) to identify and implement appropriate mitigation measures prior to the commencement of relevant construction activities:

1. Elimination of exposure: Exclude the public from dangerous areas through the use of effective means, such as fencing, gates and barricades
2. Substitution of different procedures: e.g., changes to construction procedures
3. Engineering: e.g., Innovative barricades, modification of equipment, lighting
4. Administration: e.g., Public education, effective signage
5. Protection of persons: e.g., security patrol, video surveillance

Selection of the appropriate risk reduction measure will depend upon the nature and degree of risk each safety hazard represents to the public. The practicability and effectiveness of implementation and the site-specific conditions must be taken into account in the choice of risk reduction measures used.

### 2.4 Public Notifications

Public Notification must be in accordance with the Construction Communications Plan.

Construction Activities	Public Activities/Concerns	Risk	Mitigation	Reference Document
Turbine Access Road Construction	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			<ul style="list-style-type: none"> <li>- construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

		in late arrival of school bus to ferry terminal.	- No construction activity that could impact bussing will take place prior to school bus route completion.	
Post Construction Remediation	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	- Interaction between bicyclist and construction equipment results in personal injury.	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			<p>particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</p> <ul style="list-style-type: none"> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

		to ferry terminal.	route completion.	
Dock Access Road Construction	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			<ul style="list-style-type: none"> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus to ferry terminal.</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus route completion.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
Road Maintenance	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> </ul>



		<ul style="list-style-type: none"> <li>- vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
Pedestrian Traffic		<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
Bicycle Traffic		<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			<ul style="list-style-type: none"> <li>- commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus to ferry terminal.</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus route completion.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
Collection	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management</li> </ul>

system installation		equipment and public vehicle traffic results in property damage - Interaction between equipment and public vehicle traffic results in personal injury - Interactions between construction workers and public vehicles results in personal injury	(e.g. traffic cones) will provide sufficient width for all road users to pass. - Informational materials with maps identifying construction road traffic routes will be provided - All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.	Plan - Operations Plan - Communications Plan
	Pedestrian Traffic	- Interactions between pedestrian traffic and construction equipment results in personal injury - Pedestrian walking uneven terrain results in personal injury	- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.	- Traffic Management Plan - Operations Plan - Communications Plan
	Bicycle Traffic	- Interaction between bicyclist and construction equipment results in personal injury.	- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites - All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules. - All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work. - Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as	- Traffic Management Plan - Operations Plan - Communications Plan

			long as it is safe to do so.	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus to ferry terminal.</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus route completion.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

Turbine Offloading and Travel	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			be accommodated through work zones as long as it is safe to do so.	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
General Trucking Activities	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> <li>- Debris coming off truck striking vehicles</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			inspected for debris between wheels before access on public roads.	
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> <li>- Debris coming off truck striking pedestrians</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> <li>- Debris coming off truck striking bicycles</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			access on public roads.	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> <li>- Debris coming off truck striking equine</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>



		<ul style="list-style-type: none"> <li>- to ferry terminal.</li> <li>- Debris coming off truck striking bus</li> </ul>	<ul style="list-style-type: none"> <li>- route completion.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	
Batch Plant Operations	Fugitive Dust Emissions	<ul style="list-style-type: none"> <li>- Traffic movement (raw material delivery trucks / tankers; ready mix-trucks; loaders)</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic speed on site is limited to a maximum of 20 km/hr;</li> <li>- Unpaved roads and areas are treated with a water truck or equivalent dust suppression measures as required.</li> </ul>	Best Management Practices Plan For The Control Of Fugitive Dust Emissions
		<ul style="list-style-type: none"> <li>- Accumulated dust from raw material delivery, storage and transfer</li> </ul>	<ul style="list-style-type: none"> <li>- Unpaved roads and areas are treated with a water truck or equivalent dust suppression measures as required.</li> <li>- The working face of each stockpile is to be minimized.</li> <li>- Aggregate is only to be handled on a very minimal basis, ideally 2 times, 1 for delivery and then for loading into plant hoppers.</li> <li>- The emissions are controlled by a dedicated Dust Collector, one for each of the in truss silos, and shared usage for delivery trucks filling on site auxiliary storage silo. Each Dust Collector contains polyester – siliconized bags and a pulse type cleaning mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
		<ul style="list-style-type: none"> <li>- Fines generated on unpaved areas; accumulated dust from raw material delivery, storage and transfer</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic speed on site is limited to a maximum of 20 km/hr.</li> <li>- Unpaved roads and areas are treated with a water truck or equivalent dust suppression measures as required.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
		<ul style="list-style-type: none"> <li>- Raw material drops outside</li> </ul>	<ul style="list-style-type: none"> <li>- The front-end loader working area and</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management</li> </ul>

		of a transfer point	<p>beneath the conveyor will be monitored (visual inspection) throughout the day, with particular attention to spillage</p> <ul style="list-style-type: none"> <li>- Spilled aggregate will be cleaned up promptly</li> </ul>	<p>Plan</p> <ul style="list-style-type: none"> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
		- Production	<ul style="list-style-type: none"> <li>- Finished product is delivered to Ready Mix trucks at the Loading Point. The Loading point is equipped with a loading sock, dust shroud and enclosures on 3 sides and top.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
		- Wind	<ul style="list-style-type: none"> <li>- Unpaved roads and areas are treated with a water truck or equivalent dust suppression measures as required.</li> <li>- The working face of each stockpile is to be minimized.</li> <li>- Aggregate is only to be handled on a very minimal basis, ideally 2 times, 1 for delivery and then for loading into plant hoppers.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
		- Material conveyance systems	<ul style="list-style-type: none"> <li>- The conveyor leading to the aggregate bins is constructed with 35 degree outside rollers creating a trough for material as it travels up to the bins. The flow (drop) of material onto the conveyor is controlled by the gates and opening in the bottom of the above ground hopper.</li> <li>- The flow of material is set to directly correlate to the length of the conveyor, width and speed of the conveyor belt, to avoid any material spillage from its sides and to keep material below the edge of the belt.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
		- Cement silo	<ul style="list-style-type: none"> <li>- Each silo is equipped with a bag house dust collector.</li> <li>- Bag house dust collectors are inspected on a monthly basis as per the Maintenance Log</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications</li> </ul>

			<ul style="list-style-type: none"> <li>- Book. Auxiliary storage silo utilize main silo dust collector systems or in truss systems.</li> </ul>	<ul style="list-style-type: none"> <li>- Plan Best Management Practices Plan For The Control Of Fugitive Dust Emissions</li> </ul>
	Excessive Noise	Regulated noise level are exceeded causing disruption to daily activities	Noise sampling will be performed to ensure we are in compliance to REA amendment #3	REA modification #3
General Construction	Excessive noise generated by construction activities	Regulated noise level are exceeded causing disruption to daily activities	<ul style="list-style-type: none"> <li>- Regular inspection of equipment to ensure exhaust systems are working to manufacturers specifications.</li> <li>- Contractor will perform noise monitoring at regular intervals to ensure compliance with Ontario regulations.</li> <li>- Construction activities will be performed as per</li> <li>- Signage will be posted as per Ontario noise regulations (where noise levels exceed 85dBa)</li> </ul>	<ul style="list-style-type: none"> <li>- Renewable Energy Approval</li> <li>- ONTARIO REGULATION 381/15</li> </ul>
	Lighting	Construction lighting causing interference with routine public activities	<ul style="list-style-type: none"> <li>- Where natural lighting is inadequate to ensure the safety of any worker, artificial lighting shall be provided and shadows and glare shall be reduced to a minimum.</li> <li>- Lighting placement will be focused primarily on the construction work area and will be placed to minimize glare to outside structures.</li> </ul>	Operations Plans
	Airborne Dust	Dust from construction traffic	<ul style="list-style-type: none"> <li>- A water truck will be on site full time once road construction begins until completion of</li> </ul>	Operations Plans

			major construction works. - Trucks will spray the road with water in advance of the transport vehicles in order to keep the dust down.	
	Hazardous material spills	Environmental contamination due to spills from construction activities	- All crew will have spill response training - Equipment will be equipped with spill response materials (spill kits) - 55 gallon site spill response containers will be distributed throughout the work site. - Third party spill response contractor to be established prior to start of construction and ready to responds to spill if required.	Operations Plan
	Site security	Unauthorized access to construction site results in injury	- Construction fencing and signage to ensure clear demarcation of construction zones. - All visitor are required to sign in/out. - All people entering the construction site must complete a site specific orientation prior to access.	HSE Execution Plan
Excavation activities	Contaminated materials	Exposure to contamination due to excavation activities	- Will be remediated as per Ontario Environmental Legislation. - Competent third party will be used for clean-up and removal. - Will be remediated as per Invista Canada CPU for north and south parcels.	- Environmental Protection Act, R.S.O. 1990, c. E.19 - Invista Canada CPU 6676-9CWHB7-2S south parcel - Invista Canada CPU 6676-9CWHB7-1N North Parcel
Blasting	Damage to	- Damage caused by fly rock	- Pre blast survey by competent consultant to	- R.R.O. 1990, Reg.

activities	structures resulting from blasting activities	<ul style="list-style-type: none"> <li>- Damage caused by ground vibration</li> </ul>	ensure pre and post blast condition of surrounding structures. <ul style="list-style-type: none"> <li>- Blasting mats will be used to control blast energy.</li> <li>- Blasting protocol to ensure all third party notifications are complied with</li> <li>- Clear communication with public regarding blast location and schedule</li> </ul>	854: MINES AND MINING PLANTS
Emergency Response	Emergency response times impacted by construction activities.	Lack of communication between emergency response and project management team results in decreased response time and possible ill effects to the public.	<ul style="list-style-type: none"> <li>- The contractor will work with the local ES to ensure any road can be opened up to emergency service within the time frame required by ES or to identify alternate routes. Any alternate routes will be inspected prior to commencing construction activity.</li> </ul>	Highway Traffic Act, R.S.O. 1990, c. H.8
Barge Activities	Barging of construction materials and equipment	<ul style="list-style-type: none"> <li>- Impediment of ferry schedule</li> <li>- Unplanned interaction between recreational boaters and barge/tug</li> </ul>	All vessels to obey maritime regulations	
Laydown Activities	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All loaded trucks will follow the load, haul</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

		<ul style="list-style-type: none"> <li>- personal injury</li> <li>- Debris coming off truck striking vehicles</li> </ul>	<ul style="list-style-type: none"> <li>- place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	
Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> <li>- Debris coming off truck striking pedestrians</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>	
Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> <li>- Debris coming off truck striking bicycles</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>	

			<p>travel inspections have been completed.</p> <ul style="list-style-type: none"> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	
Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> <li>- Debris coming off truck striking equine</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>	
Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>	

		<ul style="list-style-type: none"> <li>- Construction activity results in late arrival of school bus to ferry terminal.</li> <li>- Debris coming off truck striking bus</li> </ul>	<ul style="list-style-type: none"> <li>- area</li> <li>- No construction activity that could impact bussing will take place prior to school bus route completion.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	
Crane Travel and erection	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> <li>- Debris coming off truck striking vehicles</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>



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Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> <li>- Debris coming off truck striking equine</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>	

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Contact with overhead	<ul style="list-style-type: none"> <li>- Contact with overhead powerline causes power</li> </ul>	<ul style="list-style-type: none"> <li>- Powerline hazard awareness training for all personnel.</li> </ul>		

	powerlines	disruption to public buildings or homes.	<ul style="list-style-type: none"> <li>- Use spotters while Crane is traveling</li> <li>- Signage in high traffic areas when travelling under powerlines.</li> </ul>	
Turbine Erection	Site security	Unauthorized access to construction site results in injury	<ul style="list-style-type: none"> <li>- Construction fencing and signage to ensure clear demarcation of construction zones.</li> <li>- All visitor are required to sign in/out.</li> <li>- All people entering the construction site must complete a site specific orientation prior to access.</li> </ul>	HSE Execution Plan

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**AMHERST ISLAND WIND FARM**

**CONTRACT-SPECIFIC PUBLIC SAFETY**

**PLAN**

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# Windlectric

May 2017

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## 1.0 INTRODUCTION

This document shall constitute the Pennecon Heavy Civil Limited (PHCL) Public Safety Plan for the Amherst Island Wind Farm Project. The content of this plan shall apply to all Pennecon Heavy Civil Limited employees, subcontractors and any visitors to the site. Copies of the Pennecon Heavy Civil Limited Public Safety Plan may be made available as required and will be available on the project site.

### 1.1 Objective

The objective of this Public Safety Management Plan (PSMP) is to describe the requirements for PHCL and its contractors in managing public safety. The PSMP applies to all work sites and all activities associated with construction of the Project.

Each contractor must:

- Conduct a public safety risk assessment as described below; and
- Implement appropriate mitigation measures.

Contractor Public Safety Management Plans will be provided to local authorities.

### 1.2 Responsibility

The Pennecon Heavy Civil Limited Management team, appointed to oversee the work, holds the primary responsibility for the development and execution of this plan. All employees and subcontractors are responsible for fulfilling the requirements of the Plan.

## 2.0 RISK ASSESSMENT

PHCL will provide its understanding of hazards to the public associated with Project construction, in particular hazards resulting from:

- Turbine Access Road Construction
- Post Construction Remediation
- Dock Access Road Construction
- Road Maintenance
- Collection system installation
- Turbine Offloading and Travel
- General Trucking Activities
- Batch Plant Operations

- General Construction
- Excavation activities
- Blasting activities
- Emergency Response
- Barge Activities
- Laydown Activities
- Crane Travel and erection
- Turbine Erection

Each contractor must consider the information provided by PHCL, and their own knowledge of the site and construction activities in conducting a risk assessment and in implementing appropriate mitigation measures.

The risk assessment will be based on the steps described below.

Appendix A provides the public safety risks and associated activities that PHCL has identified to date.

## **2.1 Risk Ranking**

Risk ranking consists of a combination of likelihood and consequence. Likelihood refers to the possibility that members of the public will suffer an injury from the activity. Consequence refers to the severity of injury as a result of the worst probable outcome. Because the likelihood of an incident resulting in a minor injury is higher than the likelihood of an incident resulting in a serious injury, as consequences rise, likelihood goes down. Because the final risk ranking is achieved by multiplying the likelihood score by the consequence score, reducing either likelihood or consequence will reduce the total risk score.



		Hazard Severity				
		1 Negligible injury, no absence from work. No damage to equipment or the environment.	2 Minor injury requiring first aid treatment. Minor damage to equipment or environment	3 Injury leading to a lost time incident. Equipment damage and environmental impact moderate.	4 Involving a single death or serious injury. Major damage to equipment. Severe impact on environment with significant restitution costs.	5 Multiple deaths. Production shutdown. Major pollution with long term implications and high restitution costs.
Likelihood of Occurrence	1 A freak combination of factors would be required for an incident to result. Not credible, i.e. the team have never heard of event occurring in industry.	1	2	3	4	5
	2 A rare combination of factors would be required for an incident to result. Conceivable, but would require multiple failures of systems and controls.	2	4	6	8	10
	3 Could happen when additional factors are present but otherwise unlikely to occur. Less than average, i.e. easy to put forward a scenario for incident but considered unlikely.	3	6	9	12	15
	4 Not certain to happen but an additional factor may result in an incident. More than average, i.e. the team do not have direct knowledge but suspect that event may have occurred and represents a credible scenario.	4	8	12	16	20
	5 Almost inevitable that an incident would result. Likely to occur and the team have knowledge of a similar event.	5	10	15	20	25

## 2.2 Risk Levels

Determining the risk level of each activity follows a three part process.

1. Incident Likelihood and Incident Consequence ratings are determined by examining the “as is” condition of each activity within a component area with respect to identifiable hazards with no risk reduction measures in place.
2. The overall risk level of the activity being examined is then determined by multiplying the Likelihood and Consequence ratings together.
3. New or modified risk reduction measures are then applied and Likelihood and consequence ratings are reassessed with the additional measures.

The above three steps are repeated for each activity within the component area until sufficient risk reduction measures are implemented to eliminate or to significantly reduce initial high risk levels to medium or low.

High		15 to 25
Medium		8 to 12

Low		1 to 6
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### 2.3 Risk Mitigation

Each contractor must take into account the results of the risk assessment and identify the appropriate mitigation measures. The contractor will employ the following hierarchy (in order of priority) to identify and implement appropriate mitigation measures prior to the commencement of relevant construction activities:

1. Elimination of exposure: Exclude the public from dangerous areas through the use of effective means, such as fencing, gates and barricades
2. Substitution of different procedures: e.g., changes to construction procedures
3. Engineering: e.g., Innovative barricades, modification of equipment, lighting
4. Administration: e.g., Public education, effective signage
5. Protection of persons: e.g., security patrol, video surveillance

Selection of the appropriate risk reduction measure will depend upon the nature and degree of risk each safety hazard represents to the public. The practicability and effectiveness of implementation and the site-specific conditions must be taken into account in the choice of risk reduction measures used.

### 2.4 Public Notifications

Public Notification must be in accordance with the Construction Communications Plan.

Construction Activities	Public Activities/Concerns	Risk	Mitigation	Reference Document
Turbine Access Road Construction	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			<p>construction rules.</p> <ul style="list-style-type: none"> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

		in late arrival of school bus to ferry terminal.	- No construction activity that could impact bussing will take place prior to school bus route completion.	
Post Construction Remediation	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			<p>particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</p> <ul style="list-style-type: none"> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

		to ferry terminal.	route completion.	
Dock Access Road Construction	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			<ul style="list-style-type: none"> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus to ferry terminal.</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus route completion.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
Road Maintenance	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> </ul>



		<ul style="list-style-type: none"> <li>vehicle traffic results in property damage</li> <li>Interaction between equipment and public vehicle traffic results in personal injury</li> <li>Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>for all road users to pass.</li> <li>Informational materials with maps identifying construction road traffic routes will be provided</li> <li>All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>Operations Plan</li> <li>Communications Plan</li> </ul>
Pedestrian Traffic		<ul style="list-style-type: none"> <li>Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>Traffic Management Plan</li> <li>Operations Plan</li> <li>Communications Plan</li> </ul>
Bicycle Traffic		<ul style="list-style-type: none"> <li>Interaction between bicyclist and construction equipment results in personal injury.</li> </ul>	<ul style="list-style-type: none"> <li>Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to</li> </ul>	<ul style="list-style-type: none"> <li>Traffic Management Plan</li> <li>Operations Plan</li> <li>Communications Plan</li> </ul>

			<ul style="list-style-type: none"> <li>- commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus to ferry terminal.</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus route completion.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
Collection	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management</li> </ul>

system installation		<p>equipment and public vehicle traffic results in property damage</p> <ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<p>(e.g. traffic cones) will provide sufficient width for all road users to pass.</p> <ul style="list-style-type: none"> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<p>Plan</p> <ul style="list-style-type: none"> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			long as it is safe to do so.	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus to ferry terminal.</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus route completion.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

Turbine Offloading and Travel	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			be accommodated through work zones as long as it is safe to do so.	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
General Trucking Activities	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> <li>- Debris coming off truck striking vehicles</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			inspected for debris between wheels before access on public roads.	
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> <li>- Debris coming off truck striking pedestrians</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> <li>- Debris coming off truck striking bicycles</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			access on public roads.	
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> <li>- Debris coming off truck striking equine</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Public School Bussing	<ul style="list-style-type: none"> <li>- Interaction between school busses and construction equipment results in personal injury or property damage</li> <li>- Construction activity results in late arrival of school bus</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day.</li> <li>- Road closures will not take place prior to school bus route completion for that specific area</li> <li>- No construction activity that could impact bussing will take place prior to school bus</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>



		<ul style="list-style-type: none"> <li>- to ferry terminal.</li> <li>- Debris coming off truck striking bus</li> </ul>	<ul style="list-style-type: none"> <li>- route completion.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	
Batch Plant Operations	Fugitive Dust Emissions	<ul style="list-style-type: none"> <li>- Traffic movement (raw material delivery trucks / tankers; ready mix-trucks; loaders)</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic speed on site is limited to a maximum of 20 km/hr;</li> <li>- Unpaved roads and areas are treated with a water truck or equivalent dust suppression measures as required.</li> </ul>	Best Management Practices Plan For The Control Of Fugitive Dust Emissions
		<ul style="list-style-type: none"> <li>- Accumulated dust from raw material delivery, storage and transfer</li> </ul>	<ul style="list-style-type: none"> <li>- Unpaved roads and areas are treated with a water truck or equivalent dust suppression measures as required.</li> <li>- The working face of each stockpile is to be minimized.</li> <li>- Aggregate is only to be handled on a very minimal basis, ideally 2 times, 1 for delivery and then for loading into plant hoppers.</li> <li>- The emissions are controlled by a dedicated Dust Collector, one for each of the in truss silos, and shared usage for delivery trucks filling on site auxiliary storage silo. Each Dust Collector contains polyester – siliconized bags and a pulse type cleaning mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
		<ul style="list-style-type: none"> <li>- Fines generated on unpaved areas; accumulated dust from raw material delivery, storage and transfer</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic speed on site is limited to a maximum of 20 km/hr.</li> <li>- Unpaved roads and areas are treated with a water truck or equivalent dust suppression measures as required.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
		<ul style="list-style-type: none"> <li>- Raw material drops outside</li> </ul>	<ul style="list-style-type: none"> <li>- The front-end loader working area and</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management</li> </ul>

		of a transfer point	beneath the conveyor will be monitored (visual inspection) throughout the day, with particular attention to spillage - Spilled aggregate will be cleaned up promptly	Plan - Operations Plan - Communications Plan
		- Production	- Finished product is delivered to Ready Mix trucks at the Loading Point. The Loading point is equipped with a loading sock, dust shroud and enclosures on 3 sides and top.	- Traffic Management Plan - Operations Plan - Communications Plan
		- Wind	- Unpaved roads and areas are treated with a water truck or equivalent dust suppression measures as required. - The working face of each stockpile is to be minimized. - Aggregate is only to be handled on a very minimal basis, ideally 2 times, 1 for delivery and then for loading into plant hoppers.	- Traffic Management Plan - Operations Plan - Communications Plan
		- Material conveyance systems	- The conveyor leading to the aggregate bins is constructed with 35 degree outside rollers creating a trough for material as it travels up to the bins. The flow (drop) of material onto the conveyor is controlled by the gates and opening in the bottom of the above ground hopper. - The flow of material is set to directly correlate to the length of the conveyor, width and speed of the conveyor belt, to avoid any material spillage from its sides and to keep material below the edge of the belt.	- Traffic Management Plan - Operations Plan - Communications Plan
		- Cement silo	- Each silo is equipped with a bag house dust collector. - Bag house dust collectors are inspected on a monthly basis as per the Maintenance Log	- Traffic Management Plan - Operations Plan - Communications

			Book. - Auxiliary storage silo utilize main silo dust collector systems or in truss systems.	Plan - Best Management Practices Plan For The Control Of Fugitive Dust Emissions
	Excessive Noise	Regulated noise level are exceeded causing disruption to daily activities	Noise sampling will be performed to ensure we are in compliance to REA amendment #3	REA modification #3
General Construction	Excessive noise generated by construction activities	Regulated noise level are exceeded causing disruption to daily activities	<ul style="list-style-type: none"> <li>- Regular inspection of equipment to ensure exhaust systems are working to manufacturers specifications.</li> <li>- Contractor will perform noise monitoring at regular intervals to ensure compliance with Ontario regulations.</li> <li>- Construction activities will be performed as per</li> <li>- Signage will be posted as per Ontario noise regulations (where noise levels exceed 85dBa)</li> </ul>	<ul style="list-style-type: none"> <li>- Renewable Energy Approval</li> <li>- ONTARIO REGULATION 381/15</li> </ul>
	Lighting	Construction lighting causing interference with routine public activities	<ul style="list-style-type: none"> <li>- Where natural lighting is inadequate to ensure the safety of any worker, artificial lighting shall be provided and shadows and glare shall be reduced to a minimum.</li> <li>- Lighting placement will be focused primarily on the construction work area and will be placed to minimize glare to outside structures.</li> </ul>	Operations Plans
	Airborne Dust	Dust from construction traffic	- A water truck will be on site full time once road construction begins until completion of	Operations Plans

			major construction works. - Trucks will spray the road with water in advance of the transport vehicles in order to keep the dust down.	
	Hazardous material spills	Environmental contamination due to spills from construction activities	- All crew will have spill response training - Equipment will be equipped with spill response materials (spill kits) - 55 gallon site spill response containers will be distributed throughout the work site. - Third party spill response contractor to be established prior to start of construction and ready to responds to spill if required.	Operations Plan
	Site security	Unauthorized access to construction site results in injury	- Construction fencing and signage to ensure clear demarcation of construction zones. - All visitor are required to sign in/out. - All people entering the construction site must complete a site specific orientation prior to access.	HSE Execution Plan
Excavation activities	Contaminated materials	Exposure to contamination due to excavation activities	- Will be remediated as per Ontario Environmental Legislation. - Competent third party will be used for clean-up and removal. - Will be remediated as per Invista Canada CPU for north and south parcels.	- Environmental Protection Act, R.S.O. 1990, c. E.19 - Invista Canada CPU 6676-9CWHB7-2S south parcel - Invista Canada CPU 6676-9CWHB7-1N North Parcel
Blasting	Damage to	- Damage caused by fly rock	- Pre blast survey by competent consultant to	- R.R.O. 1990, Reg.

activities	structures resulting from blasting activities	<ul style="list-style-type: none"> <li>- Damage caused by ground vibration</li> </ul>	<p>ensure pre and post blast condition of surrounding structures.</p> <ul style="list-style-type: none"> <li>- Blasting mats will be used to control blast energy.</li> <li>- Blasting protocol to ensure all third party notifications are complied with</li> <li>- Clear communication with public regarding blast location and schedule</li> </ul>	854: MINES AND MINING PLANTS
Emergency Response	Emergency response times impacted by construction activities.	Lack of communication between emergency response and project management team results in decreased response time and possible ill effects to the public.	<ul style="list-style-type: none"> <li>- The contractor will work with the local ES to ensure any road can be opened up to emergency service within the time frame required by ES or to identify alternate routes. Any alternate routes will be inspected prior to commencing construction activity.</li> </ul>	Highway Traffic Act, R.S.O. 1990, c. H.8
Barge Activities	Barging of construction materials and equipment	<ul style="list-style-type: none"> <li>- Impediment of ferry schedule</li> <li>- Unplanned interaction between recreational boaters and barge/tug</li> </ul>	All vessels to obey maritime regulations	
Laydown Activities	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All loaded trucks will follow the load, haul</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

		<ul style="list-style-type: none"> <li>- personal injury</li> <li>- Debris coming off truck striking vehicles</li> </ul>	<ul style="list-style-type: none"> <li>- place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	
Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> <li>- Debris coming off truck striking pedestrians</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>	
Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> <li>- Debris coming off truck striking bicycles</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>	

			travel inspections have been completed. - All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.	
Equine Traffic	- Interaction between construction equipment and equine traffic results in personal/equine injury. - Debris coming off truck striking equine	- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites - All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules. - All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work. - Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so. - All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed. - All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.	- Traffic Management Plan - Operations Plan - Communications Plan	
Public School Bussing	- Interaction between school busses and construction equipment results in personal injury or property damage	- Transportation of oversized loads in front of the school and through Stella will not take place during the 30 minute periods at the start and end of the school day. - Road closures will not take place prior to school bus route completion for that specific	- Traffic Management Plan - Operations Plan - Communications Plan	

		<ul style="list-style-type: none"> <li>- Construction activity results in late arrival of school bus to ferry terminal.</li> <li>- Debris coming off truck striking bus</li> </ul>	<ul style="list-style-type: none"> <li>- area</li> <li>- No construction activity that could impact bussing will take place prior to school bus route completion.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	
Crane Travel and erection	Vehicle Traffic	<ul style="list-style-type: none"> <li>- Interaction between equipment and public vehicle traffic results in property damage</li> <li>- Interaction between equipment and public vehicle traffic results in personal injury</li> <li>- Interactions between construction workers and public vehicles results in personal injury</li> <li>- Debris coming off truck striking vehicles</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of temporary traffic control devices (e.g. traffic cones) will provide sufficient width for all road users to pass.</li> <li>- Informational materials with maps identifying construction road traffic routes will be provided</li> <li>- All construction traffic will be courteous to vehicle traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Pedestrian Traffic	<ul style="list-style-type: none"> <li>- Interactions between pedestrian traffic and construction equipment results in personal injury</li> <li>- Pedestrian walking uneven terrain results in personal injury</li> </ul>	<ul style="list-style-type: none"> <li>- Pedestrian accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>



		<ul style="list-style-type: none"> <li>- Debris coming off truck striking pedestrians</li> </ul>	<ul style="list-style-type: none"> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	
	Bicycle Traffic	<ul style="list-style-type: none"> <li>- Interaction between bicyclist and construction equipment results in personal injury.</li> <li>- Debris coming off truck striking bicycles</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to cyclists and will provide them the right of way as per highway traffic law and the site construction rules.</li> <li>- All site personnel will be warned to pay particular attention to cyclists during their mandatory safety site orientation prior to commencing work.</li> <li>- Cyclist accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>
	Equine Traffic	<ul style="list-style-type: none"> <li>- Interaction between construction equipment and equine traffic results in personal/equine injury.</li> <li>- Debris coming off truck striking equine</li> </ul>	<ul style="list-style-type: none"> <li>- Equine traffic on public roadways will be treated as vehicular traffic and directed accordingly through active construction sites</li> <li>- All construction traffic will be courteous to equine traffic and will provide them the right of way as per highway traffic law and the site construction rules.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic Management Plan</li> <li>- Operations Plan</li> <li>- Communications Plan</li> </ul>

			<ul style="list-style-type: none"> <li>- All site personnel will be warned to pay particular attention to equine traffic during their mandatory safety site orientation prior to commencing work.</li> <li>- Equine traffic accommodation will typically be on-road as this is the current condition, and will be accommodated through work zones as long as it is safe to do so.</li> <li>- All loaded trucks will follow the load, haul place JSA to ensure proper loading and pre travel inspections have been completed.</li> <li>- All trucks with dual rear wheels will be inspected for debris between wheels before access on public roads.</li> </ul>	
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Contact with overhead	<ul style="list-style-type: none"> <li>- Contact with overhead powerline causes power</li> </ul>	<ul style="list-style-type: none"> <li>- Powerline hazard awareness training for all personnel.</li> </ul>		

	powerlines	disruption to public buildings or homes.	<ul style="list-style-type: none"> <li>- Use spotters while Crane is traveling</li> <li>- Signage in high traffic areas when travelling under powerlines.</li> </ul>	
Turbine Erection	Site security	Unauthorized access to construction site results in injury	<ul style="list-style-type: none"> <li>- Construction fencing and signage to ensure clear demarcation of construction zones.</li> <li>- All visitor are required to sign in/out.</li> <li>- All people entering the construction site must complete a site specific orientation prior to access.</li> </ul>	HSE Execution Plan

DRAFT

SCHEDULE 09 – Emergency Response Plan

# Amherst Island Wind Project Emergency Response Plan

c/o Algonquin Power  
354 Davis Road, Oakville, ON, L6J 2X1

Latest Revision Date: July 21, 2017\*

- This Emergency Response Plan will be reviewed on a regular basis and updated as appropriate

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### Definitions

**On-Site Construction Manager** – Third party general contractor involved in the construction of the Amherst Island Wind Project; referred to in the plan as “Construction Manager”.

**ERP** – Emergency Response Plan.

**Facility** – Amherst Island Wind Project.

**Loyalist Township Emergency Services** – Loyalist Township Emergency Services (including the Amherst Island Station).

**Fire Safety Consultant** - Third party competent and qualified individual knowledgeable in fire safety and prevention.

**Fire Watch** – Individual(s) assigned to observe metal grinding work activity to ensure no sparks cause a fire.

**Hot Work** – Any process that can be a source of ignition when flammable material is present or can be a fire hazard regardless of the presence of flammable material in the workplace. Common **hot work** processes are welding, soldering, cutting and brazing.

**Operation Manager** – Management representative of the third party Operation and Maintenance Contractor; referred to in the plan at the “Operations Manager”.

**Operator(s)** – Representative(s) of a third party qualified Operation and Maintenance Contractor.

**Severe Thunderstorm** - A thunderstorm can be classified as severe when one or more of the following hazardous conditions occur:

- a. Winds of 26 m/s (78 kph +) or greater
- b. Hail ¾” or larger
- c. Lightning
- d. Tornados

**Severe Weather WATCH** - A WATCH is issued by Environment Canada for the area when weather conditions indicate that severe thunderstorm conditions are possible.





**Severe Weather WARNING** - A WARNING is issued by Environment Canada for the area when severe thunderstorm hazardous conditions are imminent or are occurring as reported by a reliable source, or detected by radar.

**Site Manager** – Algonquin Power Operation Management Representative(s).

**Site Safety Representative** – Employee hired to inspect safety work practices during work activities.

**Tornado WATCH** - A WATCH is issued by the Environment Canada when conditions that can produce tornadoes are expected to develop.

**Tornado WARNING** - A TORNADO WARNING is broadcast when an actual tornado has been detected. The warning will tell you the last known location of the tornado, and if possible, it's speed and direction of movement.

## **Introduction and Project Description**

The Amherst Island wind project (“Facility”) is a 75 MW wind project located on private agricultural land on Amherst Island, located in Loyalist Township in the County of Lennox and Addington, in eastern Ontario.

The work is comprised of construction of project infrastructure for 26 Siemens wind turbines.

The project includes a 34.5 kilovolt (kV) underground and/or overhead electrical power line collector system, fibre optic data lines from each turbine and/or wireless technology for the communication of data, a transmission line, truck turnaround areas, a submarine cable, an operations and maintenance building, permanent dock, a substation, a switching station, an un-serviced storage shed, one connection point to the existing electrical system, cable vault areas, meteorological tower(s) (met tower(s)), access road(s) to the met tower site(s), and turbine access roads with culvert installations, as required, at associated watercourse crossings.

Temporary components during construction may include staging areas for the turbines, access roads, met tower(s), collector lines and transmission line as well as crane paths, a temporary dock, site office(s), batch plant, central staging areas, and associated watercourse crossings. The electrical power line collector system will transport the electricity generated from each turbine to the substation, along the submarine cable to the mainland, and then to a switching station located near an existing Hydro One Networks Inc. (HONI) 115 kV transmission line.

## **Emergency Overview**

An emergency is defined as “A situation or an impending situation that constitutes a danger of major proportions that could result in serious harm to persons or substantial damage to property and that is caused by the forces of nature, a disease or other health risk, an accident or an act whether intentional or otherwise.”

This Emergency Response Plan (ERP) is intended to advise on-site personnel, contractors and project landowners on the procedures they must follow and how to communicate in the event of an emergency situation related to the Amherst Island Wind Project (the “Facility”) during the construction and initial operations phase (pre-commissioning) of the Facility. This ERP is to be used by the Construction Manager and Operations Manager, or designate, of the Amherst Island Wind Project, in coordination with Loyalist Township and the County of Lennox and Addington emergency services (i.e. Fire / Police / Paramedics) as a guideline for emergency response during the construction and operations phase of the Facility.

This ERP has been developed in consultation with Loyalist Township, the County of Lennox and Addington, and will be implemented prior to the start of construction and does not replace provincial regulations. During construction and operation the contractors and operator will adhere to provincial Ministry of Labour regulations (including safety, for example: complying with construction excavation safety requirements (if required - fencing)).

## **Facility Monitoring**

During the construction phase of the project, the Facility area will be monitored by security when work crews are not on site. Once turbines become operational, the SCADA (Supervisory Control and Data Acquisition) software will monitor all turbines for any variances in operation. All construction work areas will be restricted to authorized personnel only including installation of gates at all private access road entrances.

## **Emergency Communications**

If there is an emergency, first responders (Police, Fire, and Paramedics) will be contacted first via the 9-1-1 Operator or Loyalist Township Emergency Services can be contacted directly at 613-548-4001. Emergency responders will then be expected to respond following their established procedures and guidelines.

If a potentially unsafe situations arise, the person observing the situation must intervene and stop the activity and contact their direct Supervisor or designate.

**Emergency Response Plan Holders**

This plan will be held both in the Construction Manager and Operation Manager, or designate, Facility trailers. In addition:

- A copy of the plan shall be sent to the Loyalist Township Emergency Services Office;
- A copy of the plan will be placed in each contractor work truck; and
- A copy of the plan will be placed in the on-site operations and maintenance building.

**Signage**

Permanent emergency contact signs will be posted throughout the Facility, and emergency contact numbers (including turbine identification numbers) will be established as communicated to with Loyalist Township, the County of Lennox and Addington.

**Emergency Notification Procedure**

The following emergency procedures shall be followed in the event of an emergency or operational exceedance that occurs at the Facility during construction or pre-commissioning:

1. Stop work and “freeze” the scene
2. Notification of Direct Supervisor or Construction Manager or Operation Manager:
  - a. Immediately contact the nearest management representative and describe the situation, including:
  - b. The nature of the emergency such as a fatality, major illness (i.e. heart attack, not breathing, unconscious, etc.), or minor injury (i.e. twisted ankle, minor cuts, etc.);
  - c. Potential risks of injury to persons at or near the site;
    - i. Potential risks to the environment;
    - ii. Potential risks to property; and
    - iii. The need for personnel and other resources to respond to the emergency.

3. Identify the location of emergency by referring to the closest turbine, structure or road junction.
4. The Construction Manager or Operation Manager, or designate, will notify on-site personnel, including any visitors, of the emergency via an alarm system, by telephone, two-way radio or sirens, and then call 9-1-1 or Loyalist Township Emergency Services can be contacted directly at 613-548-4001. The Construction Manager or Operation Manager, or designate, will describe the emergency to the 9-1-1 Operator or Loyalist Township Emergency Services can be contacted directly at 613-548-4001. For non-urgent incidents the Construction Manager or Operation Manager, or designate will coordinate the transportation of the person to the hospital and notify the hospital of the incoming patient.
5. If the Construction Manager or Operation Manager, or designate cannot be immediately reached then employees will call 9-1-1 or Loyalist Township Emergency Services can be contacted directly at 613-548-4001.
6. The Construction Manager or Operation Manager, or designate, will notify the Algonquin Site Manager and the Algonquin Safety Representative.
7. If required, the Construction Manager or Operation Manager, or designate, will designate an employee to go to the nearest access point to meet the Loyalist Township Emergency Services and escort them to the location of the accident.
8. If required, to prevent further potential injury, the Construction Manager or Operation Manager, or designate, will evacuate the Facility area where the accident occurred.
9. The Construction Manager or Operation Manager, or designate will identify any need for security measures at the Facility during the emergency, and designate one person to coordinate these measures.
10. Any excessive delays or delay resulting from an unforeseen circumstances that blocks any roads must be relayed to the Loyalist Township Emergency Services department immediately.

In addition to the above noted emergency notification procedures, the Municipal and Provincial Officials noted below will be contacted by the Construction Manager or Operation Manager, or designate, via phone or in person within four hours or sooner of the occurrence of an emergency or operational exceedance. (See Appendix D and E for contact numbers).

An incident report on the emergency will be submitted to the same organizations within 24 hours of first notification and on an ongoing basis until the incident is resolved:

- The Ministry of Environment (including the Spills Action Centre, if applicable)
- Lennox and Addington County (Designated Representative)

- Loyalist Township (Designated Representative and Public Works Manager)

### **Emergency Preparedness**

The Construction Manager and Operation Manager, or designate, will ensure the following preparatory measures are undertaken during construction and pre-commissioning:

This Emergency Response Plan will be included in the construction contractor's orientation program.

Contractor will ensure that any open excavation are clearly identified and barricaded so the safety risk is minimized.

- Provide all workers and work vehicles with a copy of emergency numbers and emergency procedures to be carried and/or easily accessed within vehicles at all times.
- Provide all workers with location of muster point for emergency situations. (See Appendix G).
- Provide signage at each turbine location showing the turbine site ID number.
- Review training requirements for all personnel involved in the project, including contractors and subcontractors.
- Review the contents of this plan with all personnel involved in the project to familiarize them with their duties and responsibilities.
- Ensure all workers are aware of the communication devices for emergencies, including emergency horns, cellular phones, two-way systems, etc.
- Ensure all workers know the location of the turbine they are working at. (See Appendix H – Detailed Site Plan Map)
- Conduct practice drills to train on-site personnel to carry out the correct response to an emergency condition.
- Ensure all adequate safety equipment is available on-site and all personnel are using the appropriate Personal Protective Equipment (PPE).
- Ensure all workers on site have WHMIS training.

### **Emergency Preparedness Training**

Training is an integral part of the emergency preparedness and response program at this Facility, and it is the responsibility of the Construction Manager and Operation Manager, or designate, to ensure that all personnel (administrative or field, permanent or temporary) are properly trained on this ERP.

At this Facility, the ERP is initially presented to each employee during their site orientation and again if/when the plans or employees' responsibility changes. It is the responsibility of each employee to become familiar with the Facility, learn the evacuation routes, muster and shelter areas, and to attend all safety training events.

When required, and as a supplement to the training, the Construction Manager and Operation Manager, or designate, will conspicuously post pertinent information to ensure all employees and/or site visitors can safely respond during an emergency. The Construction Manager and Operation Manager, or designate, will make this ERP and other health and safety related information available to all site employees.

Training provides site employees with information and guidelines to assist them in recognizing, reporting and controlling hazards and risks. Employee training is provided at no cost to the employee and must be conducted during the employee's normal work week.

### **Emergency Drill Training**

Mock Emergency Drills will be completed during the early stages of construction and again during the early stages of operations to review the effectiveness of the ERP so that any deficiencies in the plan can be identified and corrected.

### **Emergency Response**

The Construction Manager (construction phase) or Operations Manager (operation phase), or designate, is designated as the "Emergency Response Coordinator" during an emergency situation and will be responsible for ensuring that all contractors, staff, on-site visitors and others adhere to the appropriate emergency response procedures as stated in this ERP.

Any visitor present at the site must report to the Construction Manager or Operations Manager, or designate.

In the event of an emergency, contractors, project participating landowners and others who may be present at the site are responsible for immediately notifying the Construction Manager or Operations Manager, or designate, who will then call 9-1-1 or Loyalist Township Emergency Services can be contacted directly at 613-548-4001. If the Construction Manager or Operations Manager, or designate, cannot immediately be reached call 9-1-1 or Loyalist Township Emergency Services can be contacted directly at 613-548-4001.

All personnel who work in or on the wind turbines during the construction or operation of the project will undergo training to ensure a high level of safety competency and an understanding of the protocols to be followed in the event of an emergency situation.

The Construction Manager or the Operation Manager, or designate, will designate competent and qualified personnel, or hire a third party competent and qualified contractor trained in High Angle and Confined Space Rescue procedures to assist coworkers who are injured or are in dangerous situations and are unable to utilize the self-rescue procedures. Such training will occur prior to the commencement of the construction and operation phases of the Facility.

### **Emergency Events and Response Protocols**

Emergency events impacting the Facility may include:

- Fire / Explosion
- Road Safety
- Injury / Trauma
- High Angle Rescue / Confined Space Rescue
- Structural Damage / Chemical - Environmental Spill
- Severe Weather
- Site Evacuation

### **Fire Hazard and Prevention**

Possible fire situations include grass fires due to lightning, failure of overhead lines, electrical situation in the turbine, and construction related accidents such as sparks from cutting operations and vehicular operation over dry vegetated areas. The most common Hot Work will be grinding, and will be overseen by a Fire Watch. Construction and contractor personnel shall follow all Hot Work procedures at all times. Personnel shall be made aware of other risks and rules upon site orientation, which is required prior to being allowed to work onsite.

In order to minimize fire risk, the following measures will be implemented:

- **Personnel (contractor) training** – All site personnel will be trained to make them aware of the dangers associated with fires, and how to respond in case of a fire.
  - Fire safety training, including the use of Fire Extinguishers, must be presented by either a competently trained Site Safety Representative or a Fire Safety Consultant.
  - Fire safety training must be documented using appropriate safety training attendance record forms, and filed in the Site Safety Records.



- **No open fires** – There are no exceptions to this rule.
- **Hot Work** – To be carried out in accordance with approved procedures and within graveled areas only. Each contractor shall ensure suitable fire extinguishing equipment is readily available where welding, cutting, burning or soldering is being performed.
- **Fire-breaks** – Each access road will be at a minimum 10 feet wide with no vegetation. Each turbine location shall have an area to allow the assembly of rotors and erection of the turbine without the need for vehicles to travel off-road. This area will be rolled flat with the majority of significant vegetation removed. The road shoulders will most likely be returned to farmland upon completion of the Facility construction. Each turbine and transformer shall be left with a minimum 5-foot wide gravel path surrounding them.

In order to suppress possible fires, the following measures will be implemented:

- **Portable Fire Extinguishers** – Must be held on site by individual sub-contractors. Each site vehicle shall have at least one (1) ten (10) pound ABC fire extinguisher. No foam fire suppressants or fire extinguishing equipment is currently planned for use during the construction period, nor will they be used unless prior approval has been obtained from the Loyalist Township Fire Chief. See section(s) to follow regarding use of foam during ongoing operation of the turbines.
- Containers used for flammable/ combustible material storage shall be of CSA Approved material and construction to ensure containment of the contents, and shall be properly labeled.
- All ignition sources are prohibited within 25 feet of fuel supplies.
- Smoking is prohibited while refueling equipment.
- **Off-Site Loyalist Township Emergency Services Support** – Any fire not immediately contained and/or suppressed will require a 9-1-1 call for Loyalist Township Emergency Services support or Loyalist Township Emergency Services can be contacted directly at 613-548-4001.

In order to suppress possible fires once the wind turbines are operational, the following measures may be implemented:

- The wind turbines are not supplied by the original equipment manufacturer with any type of factory-supplied fire suppression system; they are equipped with fire detection and notification instruments and systems other than appropriately rated and sized and manually-operated fire extinguishers.

- The wind turbine service technicians are trained in the proper use of the fire suppression and extinguishing hardware supplied with the turbine unit.
- As prescribed by the Ontario Fire Marshall, any fire in a turbine should be allowed to burn itself out while staff and fire personnel maintain a safe area around the turbine and protect against the potential for spot ground fires that might start due to sparks or falling material.
- Large quantities of flammable liquids will not be stored on site; either at the wind turbine nor at the project's Operation & Maintenance building.
- The turbine original equipment manufacturer will also act as the long-term service entity on-site for the wind turbines; they are contractually required to supply and maintain their wind turbines in compliance with the Ontario Fire Code, including Part 4. Foam banks or foam-based fire suppressing equipment is not planned for the project's wind turbines.

**Emergency Response Protocol – Fire/ Explosion**

- Evaluate further risks of explosion; evacuate area in case of doubt.
- If you are trained in fire safety, and the fire is small, locate extinguisher gear and attempt to extinguish the fire, if possible. Do NOT put yourself at risk.
- If safe extinguishing is not possible, then immediately evacuate the building or structure if inside and clear the area of all personnel, and if possible, vehicles and flammables.
- Immediately notify the Construction Manager or Operations Manager, or designate, who will then call 9-1-1 to activate the Loyalist Township Emergency Services Call or Loyalist Township Emergency Services can be contacted directly at 613-548-4001 and give location of fire. If the Construction Manager or Operations Manager, or designate, cannot immediately be reached call 9-1-1.
- Loyalist Township Emergency Services Inform other applicable management personnel.
- Secure the area and direct traffic, as applicable.
- Await the arrival of the Loyalist Township Emergency Services.

**Emergency Response Protocol – Road Safety**

- Construction staff or Algonquin personnel discover a road accident involving the public vehicle or construction vehicle(s):
  - Immediately contact Construction Manager or Operation Manger, or designate

- If the situation is an immediate threat to life and health call 9-1-1 or Loyalist Township Emergency Services can be contacted directly at 613-548-4001.
- Traffic management safety mitigation please see Traffic Management Plan section 5.3

11.

### **Emergency Response Protocol – Injury/ Trauma**

- Remove any hazards. Stop tools and machinery.
- Summon a First Aid Attendant.
- First aid supplies including AEDs will be in the Construction trailer and Operation and Maintenance building and a traveling first aid kit will be available in personnel vehicles
- Treat any life threatening injuries and care for other injuries.
- Immediately notify the Construction Manager or Operations Manager, or designate, who will then call 9-1-1 or Loyalist Township Emergency Services can be contacted directly at 613-548-4001 to activate Paramedics, if necessary. If the Construction Manager or Operations Manager cannot immediately be reached call 9-1-1 or Loyalist Township Emergency Services can be contacted directly at 613-548-4001.
- Inform other applicable management personnel

### **Emergency Response Protocol - High Angle / Confined Space Rescue**

- Remove any hazards. Stop tools and machinery.
- Bring injured person to ground level or a safe area for evaluation.
  - Construction – contractor shall maintain competent and qualified representative(s) responsible for this action on site
  - Operation – service contractor(s) shall use competent and qualified technicians or call in competent Third Party High Angle Rescue contractors, prior to work commencing(See Appendix D)
- Treat any life threatening injuries.
- Immediately notify the Construction Manager or Operations Manager, or designate, who will then call 9-1-1 or 613-548-4001 to activate the Loyalist Township Emergency Services and/ or Paramedics, if necessary. If the Construction Manager or Operations Manager cannot immediately be reached call 9-1-1.

- Inform other applicable management personnel

**Emergency Response Protocol – Structural Damage**

- Evaluate further risks; evacuate area in case of doubt.
- Remove any hazards (stop work).
- Immediately notify the Construction Manager or Operations Manager, or designate who will then call 9-1-1 to activate the Loyalist Township Emergency Services and/ or Paramedics, if necessary. If the Construction Manager or Operations Manager, or designate cannot immediately be reached call 9-1-1 or Loyalist Township Emergency Services can be contacted directly at 613-548-4001.
- Secure the area and direct traffic as applicable.

**Environmental Spill****Spills Response - Petroleum, Oil, Lubricants and Chemicals**

Federal and Provincial legislation place the responsibility for spill prevention and mitigation on the owner or controller of products or materials that can be spilled.

Spills are defined under these Acts, but not limited to:

- Environmental Protection Act
- Fisheries Act
- Gasoline Handling Act
- Ontario Pesticides Act
- Ontario Water Resources Act
- Transportation of Dangerous Goods Act.

Spills can include:

- Spills from containers including drums and tanks.
- A spill resulting from breaks in hydraulic or transfer hoses or piping.
- Spills resulting from traffic accidents and fire fighting.

Various lubricants, oils and fuels will be required during the Facility operations phase. Although unlikely, any leakage of oils from the turbines would be captured within the turbine itself and would be cleaned up using spill containment kit, this kit will contain

spill absorbent pads and/ or socks. The absorbed material will be disposed of at an appropriately regulated facility.

In accordance with the above noted Acts, the Operator has an obligation to:

- Prevent, eliminate or remediate an adverse affect resulting from a spill.
- Report the spill to the Ontario Ministry of the Environment - Spills Action Centre.

### **Material Safety Data Sheets**

Each contractor is required to maintain listings of all materials that they are using which may be flammable or hazardous to health. Therefore, refer to each contractor for the most comprehensive and up-to-date listing, together with the Material Safety Data Sheets for each one. The location of these within each contractor's trailer should be clearly indicated.

### **Spill Prevention**

The following preventative measures will be implemented at the Facility:

- The delivery, storage, use and disposal of these hazardous materials will be handled only by trained personnel in accordance with government laws and Regulations.
- To prevent accidental spills, liquid wastes will be labeled, handle and stored in secure areas to ensure containment in the event of a spill.
- To ensure proper storage and disposal of waste, and to prevent contamination, the Operator will be required to remove all waste materials during maintenance activities. There will be a systematic collection and separation of waste materials within on-site storage areas and in weather protected areas.
- Refueling and equipment maintenance would occur in designated areas and in compliance with TSSA regulations.
- Spill kits will be provided on-site during maintenance activities.
- The transport of fuel will be conducted in compliance with the Transportation of Dangerous Goods Act.
- Mobile fuelling trucks will be used to minimize the requirements for onsite storage of petroleum, oils and lubricants. Fuel drums will be stored upright on a deck with drip trays for the collection of spilled substances.
- On-site petroleum, oil and lubricant storage will be in a ventilated, lockable steel container, on level terrain, at least 30 m from any water body or wetland. The

container will be equipped with galvanized steel drip trays for the collection of spilled substances.

- Spill decks will be used for transferring products to smaller containers.
- Fire extinguishers and a spill kits will be located near petroleum, oil and lubricant storage areas.
- “No Smoking” signs will be displayed at all petroleum, oil and lubricant storage sites and refueling areas. Smoking will not be permitted within 50 metres of these areas.
- On-site signage will indicate the location of designated smoking areas.
- Equipment used will be mechanically sound with no oil or gas leaks. The Contractor or Operator shall undertake frequent inspection of equipment and repair leaks immediately.
- Fuelling, storage and servicing of vehicles and construction equipment is not allowed within 30 m of a watercourse, drainage ditch, areas with a high water table, or exposed and shallow bedrock.
- No equipment shall be washed within 30 m of a watercourse.
- All storage and distribution/dispensing areas will comply with the Ontario Fire Code (Fire Protection and Prevention Act)
- As described in the Construction Plan Report the above ground storage tanks would be at, a minimum, steel double walled for leak protection. The tank(s) will also be placed in a 20 mil blended linear polyethylene lined secondary containment basin which can hold a volume of 125% of the volume of the largest tank.
- All tanks shall be protected from collision damage by the use of snow fencing to alert operators, or by the placement of barriers to impede equipment movement near the tank.
- Handling and fuelling practices shall ensure that contamination of groundwater will not occur.
- Fuel storage areas and transfer lines shall be clearly marked or barricaded to prevent damage from vehicles.
- Drum storage areas shall be marked or fenced with temporary fence to avoid impacts.
- All stained soil resulting from the use of chemicals or fuels shall be cleaned-up and disposed of prior to leaving the work area.
- Waste oils and lubricants will be retained in a closed container, and disposed of in an environmentally acceptable manner.

- Only equipment that is not easily transported will be refueled on site. All other vehicles and equipment will be refueled at a central fuelling station.
- When refueling equipment, trained operators will:
- Use designated fuelling locations where practical
- Use drips trays
- Use leak free containers and reinforced rip and puncture proof hoses and nozzles
- Be in attendance for the duration of the procedure
- Seal all storage container outlets except the outlet currently in use.

**Emergency Response Protocol - Spills**

Immediately upon a release or a spill, steps should be taken to implement procedures for containment, control and cleanup of the spill, as follows:

- In the event of a spill, and only if it is safe to do so, stop the spill and remove all ignition sources.
- Immediately notify the Construction Manager or Operation Manager, or designate, who in turn will notify other regulatory authorities, as required.
- In instance of a reportable spill, call the Ministry of Environment Spills Action Center. (See Appendix D) as well as Loyalist Township.
- Ensure the safety of all individuals in the area and evacuate the area as necessary.
- Secure the area.
- Contain the spill either by constructing containment dikes, by using spill absorption materials, or by other appropriate methods.
- If possible, identify the material released.
- If the material can be identified, use the Material Safety Data Sheet (MSDS) for detailed procedures.
- If the release is an airborne vapor spill, gas or a large uncontrollable spill of liquid, call 9-1-1 to request Loyalist Township Emergency Services or Loyalist Township Emergency Services can be contacted directly at 613-548-4001.
- In most cases, clean-up procedures should start as soon as possible to prevent further spread of the substance into flowing water, ground water or sewer systems.

- For small spills or spills of vehicle fluids, follow the guidelines and procedures set forth in the Material Safety Data Sheets (MSDS) for proper clean up and disposal.
- Arrange for clean-up and proper disposal of all collected waste materials at an authorized regulated facility.
- In instances where remediation is required, call Quantum Murray or
- Dedicated Environmental Services Inc. (See Appendix D).
- Take all necessary precautions to ensure that the incident does not reoccur.
- The Operations Manager shall submit a written report to appropriate regulatory authorities as required by applicable legislation

### **Emergency Response to Scheduled Maintenance**

Scheduled maintenance occurs not less than every 6 months and includes visual inspection, grease maintenance, mechanical and electrical maintenance. The Operation Manager will provide the Loyalist Township Emergency Services with a detailed schedule of maintenance activities prior to commencing the operational phase of the Facility. The Township will be provided, as information only, with a regular maintenance schedule at the beginning of each calendar quarter. Unplanned maintenance could occur at any moment and the planned schedule may be altered because of weather conditions. The Operation Manager will work to keep the Township updated.

Any possible emergency events and subsequent response would be identical in nature to those identified in above response protocol sections.

### **Severe Weather**

A variety of severe weather conditions and/or natural disasters may affect the Facility, including:

- a. Severe thunderstorms, hail and heavy rains
- b. Lightning strikes
- c. Tornadoes

### **Thunderstorms**

During the spring and summer months (May through October) thunderstorms have the potential for producing damaging winds, hail, lightning and tornados.

The Construction Manager or Operation Manager, or their designated representatives, are responsible for monitoring area weather, and specifically Environment Canada



Severe Weather Watches and Warnings and related emergency broadcasts. The Construction Manager or Operation Manager, or their designated representatives, shall announce a temporary work interruption, site evacuation, or other emergency action, if deemed necessary.

### **Lightning**

Any thunderstorm can produce lightning. Lightning can strike people directly or it can start fires. Lightning will usually strike the highest object in the area of the discharge and it is particularly attracted to metal. The highest object might be a wind turbine, a met tower, a crane, or a grain silo. It can also be a person standing in an open field.

### **Lightning Weather Alert Service - Telvent**

Unlike most weather phenomena, specific lightning warnings are not issued by the National Weather Service. The Site Manager subscribes to a weather alert service called Telvent. Notification will be sent to site personnel to alert them to any dangerous weather within the site area (80 KM range). Telvent will also send an all clear message when no lightning has been detected in the last 30 minutes, which indicates it is now safe to go back to outside or up tower work. (See Appendix D).

### **Emergency Response Protocol - Severe Thunderstorm and Lightning**

#### Wind Site

- Get out of a wind turbine.
- Stop all heavy construction equipment, especially when moving metal components, get out, and seek shelter. (Tractors and other implements having metal contact with the ground are often struck).
- Stop work actions and relocate to the identified muster point. (See Appendix G)
- When there is no shelter, avoid the highest object in the area. If only isolated trees are nearby, your best protection is to crouch out in the open, while minimizing your contact with the ground (do not lie flat), and keeping twice as far away from isolated trees as the trees are high.
- Avoid hilltops, open spaces, wire fences, metal clothes lines, exposed sheds, and any other above ground electrically conductive objects.
- Inform Construction Manager or Operation Manager, and other applicable management personnel, and take census of personnel.
- All personnel remain at muster point until accounted for by Construction Manager or Operation Manager.
- Stay inside and do not venture outside until it is deemed safe to do so (i.e. No lightning with 48 KM of the Facility for at least 30 minutes).

- Do not approach a wind turbine until there has been no lightning within 48 KM of the Facility for at least 30 minutes. Do NOT approach if you hear a hissing or crackling sound coming from the blades. Assess the situation from inside the vehicle.
- Telvent will send the “All Clear” notification to site personnel phones.

#### On-site Office Buildings

- Stay away from open doors and windows, stoves, metal pipes, sinks, and plug-in electrical devices including corded phones.
- Shut down and unplug computers, modems, phones, and other valuable electronic equipment.

#### Person Struck By Lightning

- Persons struck by lightning receive a severe electrical shock and may be burned; however, they carry no electrical charge and can be handled safely.
- Prompt artificial respiration and/or CPR with an AED can often revive a person without vital signs after being struck by lightning.
- Call 9-1-1 to request Loyalist Township Emergency Services or Loyalist Township Emergency Services can be contacted directly at 613-548-4001.
- Administer first aid.

#### **Tornado**

A tornado, is a rotating column of air ranging in width from a few yards to more than a mile and whirling at destructively high speeds, usually accompanied by a funnel-shaped downward extension of a cumulonimbus cloud. Winds of 300-450 kph can occur with the most violent tornadoes.

#### **Emergency Response Protocol - Tornado**

- Continue normal activities during the WATCH but be aware of the possibility of tornadoes.
- There is not always an official tornado warning.
- If you see or hear a tornado, or if you are told to evacuate the wind turbine because of a tornado, seek shelter immediately. (See Appendix G for Designated Shelter Locations)
- Inform the Construction Manager or Operation Manager, or designate and other applicable management personnel, and take census of personnel.

- Temporary Office Buildings / Portable Office Trailers are particularly vulnerable to overturning and destruction during strong winds. Tie-downs will generally NOT protect the trailer from a tornado. Occupants should evacuate the office trailer immediately and proceed to the nearest shelter.
- (See Appendix G for Designated Shelter Locations)

**Evacuation Protocol**

- Stop work actions and relocate to the identified muster point.
- Construction Manager or Operation Manager, or designate, takes census of personnel.
- All personnel and any visitors to the site remain at muster point until accounted for by Construction Manager or Operation Manager, or designate.
- Construction Manager or Operation Manager, or designate, investigates any missing personnel and any visitors to the site.
- Call 9-1-1 to request Loyalist Township Emergency Services or Loyalist Township Emergency Services can be contacted directly at 613-548-4001.

**Post Emergency Actions and Reporting**

Any incident or accident will be reported to the Construction Manager or Operation Manager, or designate immediately.

The scene of the emergency must be preserved until approval to resume normal operations is obtained from the relevant authorities. These authorities may include local Loyalist Township Emergency Services and authorities with jurisdiction, including the Ministry of Labour. With all emergency events, the necessary paper work/incident forms shall be completed by the Construction Manager or Operation Manager, or designate, in conjunction with any other applicable on-site personnel. Sub-contractors may also wish to report all accidents or incidents with their own company, as required. The Construction Manager or Operation Manager, or designate, will subsequently investigate all reported events.

An accident investigation report shall be submitted to the applicable authorities, as required. Accidents involving the general public, fatalities, or that are considered a threat to public or environmental health shall be reported to the appropriate authorities with jurisdiction, as applicable, including but not limited to:

- Loyalist Township Emergency Services (Police, Fire, Paramedics);
- Ministry of Labour;
- Ministry of Environment.

## **Marine Safety**

### **Barge Activity and Dock Construction**

The contractor must comply with Transport Canada communication protocols when equipment and materials are being transported from the mainland to the island, and used in the waterway. In addition, similar to other marine vessels (recreational and commercial using the northern channel), the marine contracting company must communicate, as per Transport Canada regulations, with the Loyalist Township ferry personnel when approaching the ferry and to not interfere with the ferry's travel when transporting ambulance and fire services in emergency situations.

### **Barge Offload**

Equipment and supplies will be carried to and from the mainland to the Facility by barge.

A barge may be offloaded at the site from 7 am to 8 pm (Monday through Saturday), as dictated by weather and tidal conditions.

The Construction Manager or Operations Manager will schedule offloading personnel to meet the barge on arrival at the site.

The barge will be berthed and secured by trained (Barge Operator or Facility) personnel prior to unloading by trained (Barge Operator or Facility) personnel.

If adverse weather or safety conditions are encountered, such conditions will be reported to the Construction Manager or Operations Manager, or designate. Barge offloading will not commence or will be suspended in the event of severe weather.

To maintain a clean and safe work environment during the unloading of supplies, Facility personnel will follow strict environmental and safety procedures prior, during, and after unloading operations.

### **Barge Offloading - Environmental and Safety Procedures**

Barge offloading activities commence, require strict procedures to ensure the health and safety of unloading personnel, while reducing or eliminating any potential impacts on the environment.

The Barge Operator and Construction Manager or Operations Manager, or designate, will review weather conditions before offloading activities commence, to identify if severe weather may be expected using Environment Canada's web site or by calling

Environment Canada's Marine Forecasting service. (See Appendix D for contact information). This service provides the most up-to-date information, and also provides information beyond the 24-hour period.

The Construction Manager or Operations Manager, or designate, will take steps to reduce or eliminate any potential impacts to the marine environment.

Safety is paramount during offloading procedures. All unloading personnel are required to wear approved safety equipment (steel-toed boots, high visibility vest) and life jackets (as per the appropriate regulation) must worn by waterside personnel.

The dock will be equipped with safety equipment such as a ladder, life preserver rings (throw rings), lighting, and an emergency alarm.

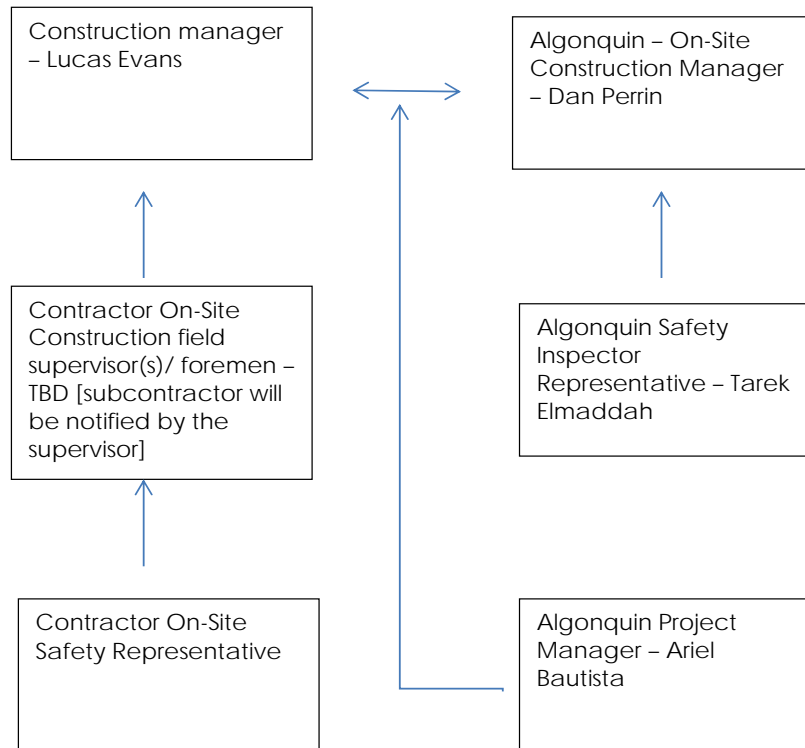
Equipment will be offloaded at low speed, by properly trained operators, and with the use of safety and directional "spotters".

In the event of strong tidal or wave motion, at the discretion of the Barge Operator, Construction Manager or Operations Manager, or designate, offloading operations will be halted if the unloading personnel is subjected to unsafe movement, or pitch, of the barge.

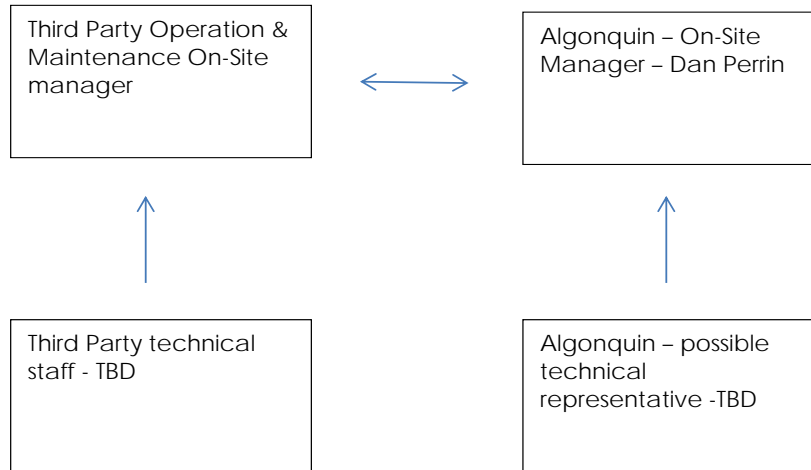
Should a spill occur, the Construction Manager or Operations Manager, or designate, in consultation with the Site Manager, Barge Operator and authorities of jurisdiction, will direct the proper procedure for clean-up and reporting.

**Appendix A: Amherst Island Wind Project - Organizational Charts**

Construction - Organization Chart



## Operation – Organizational Chart (Draft)



**Appendix B: Amherst Island Wind Project Contact Information**

This contact information will naturally change over the duration of the construction and operation phase of the Facility. This contact list will be actively managed and updated with all revisions forwarded to the Loyalist Township Loyalist Township Emergency Services.

Company	Name	Office	Cell
Algonquin	Ariel Bautista (Senior Project Manager)	905-465-6756	289-981-0171
Algonquin	On-Site Construction Manager	844-379-7740	613-985-4466
Algonquin	On-Site Safety Representative	647-232-9389	647-232-9389
Algonquin	Jim Stewart (Director, Project Management)	905-287-2054	416-523-1887
Algonquin	Sean Fairfield (Director, Project Planning and Permitting)	905-465-4518	905-466-1360
Pennecon	Lucas Evans (Project Manager)	Office #	Cell # 709-725-6749
Pennecon	Earl Dunphy (Site Superintendent)	Office #	Cell # 613-217-9227
Pennecon	Scott Miller (Safety Advisor)	Office #	Cell # 613-328-6592
Pennecon	Candace Hartley (Office Manager)	Office # 613-766-9360 (Kingston Office, will be updated when on site)	Cell # 613-328-9435



### Appendix C: Emergency Call Procedures, Contact Numbers and Service Locations

In an emergency, dial 9-1-1 to access fire, police or ambulance, and identify yourself as being on Amherst Island in Loyalist Township. Loyalist Township Emergency services can be contacted directly at 613-548-4001 - 0 for accident or spill reporting."

When calling the 9-1-1 Emergency Dispatcher, **remain calm, speak slowly and clearly.**

Include the following information in your communication:

- State the facility address or turbine coordinates;
- State the type of emergency (fire, medical, etc.);
- Stay on the phone until the responding agency releases you, answer all questions; and
- Advise the 9-1-1 Emergency Dispatcher if you need to evacuate the turbine and temporarily clear the area around the turbine

#### Non-Emergency Contact Numbers and Service Locations:

Loyalist Township Fire Stations	Odessa Station 51 Main Street, Odessa 613-386-3762	Amherst Island Station 955 Stella Forty-Foot Road, Stella	Amherstview Station 363 Amherst Drive, Amherstview	Bath Station 241 Church Street, Bath
Ontario Provincial Police	Non-Emergency Call 1-888-310-1122			
Lennox and Addington Ambulance Service	Loyalist Township Base (Bath Fire Station County Road No./ 7 Bath	Northbrook Base To be inserted - address and #)	Denbigh Base To be inserted -address and #)	

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### Appendix D: Service Provider Contact Numbers

Call Before You Dig (Ontario One Call)	1-800-400-2255
Environment Canada – Marine Forecasting	<a href="http://www.weatheroffice.ec.gc.ca">www.weatheroffice.ec.gc.ca</a> 1-900-565-6565.
Hazard Spills:	Toll Free: 1-800-268-6060
Spills Action Centre	Tel: 416-325-3000 Fax: 416-325-3011
High Angle Rescue Contractor(s)	– Siemens Canada Limited (905) 465-8000 Updated contact details will be provided once Siemens Canada Limited service personnel deployed at site in Q1, 2018. NOTE – high angle rescue of personnel located up-tower or in nacelle or hub or blades of fully-erected wind turbine generator is self-performed by the original equipment manufacturer who has been retained by Windlectric Inc. to also perform long-term service and maintenance, and will have full-time active technicians at site whenever any persons are up-tower.
Hydro-One Control Centre	1-800-664-9376
Spill Remediation	Quantum Murray – 1-800-251-7773



Services	Dedicated Environmental Services Inc. 1-613-888-0950
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**Appendix E: Municipal and Regulatory Contacts**

Loyalist Township	Bob Maddocks (CAO)	(613) 386-7351 ext 111
Loyalist Township	David Thompson (Director of Engineering)	(613) 386-7351 ext 118
Loyalist Township	David MacPherson (Public Works Manager)	(613) 386-7351 ext 117
Loyalist Township	Murray Beckel (Director of Planning and Development Services)	(613) 386-7351 ext 130
Loyalist Township	Gary Filson (Supervisor Amherst Island)	613-384-2579
Loyalist Township	Fire Chief	613-386-3762 ext 102
Ministry of Environment & Climate Change	Kingston District	613-549-4000
Ministry of Natural Resources & Forestry	Andy Baxter (Supervisor)	(705) 755-3304
Cataraqui Region Conservation Authority	Jason Messenger (Development Officer)	(613) 546-4228 ext 286

**Appendix F: Local Walk-In Clinics and Hospitals**

“Walk-In” clinics are available in Loyalist Township. These clinics can be used for non-emergency work related injuries or illnesses.

**Bayridge Plaza**

Phone: 613-546-5506

Address: 769 Bayridge Drive, Kingston

Hours: Monday-Friday 6pm–9pm, Saturday,  
Sunday and Holidays 9:30am–4:30pm

**Lakeview Medical, Family Medicine & Walk-In Clinic**

Dr. Shalini Jain

Phone: 613-634-9597,

Address: 6 Speers Blvd, Unit Q, Amherstview,

Hours: Monday-Thursday 8:30am - 5:30pm

Hospitals in the Loyalist Township area:

**Hotel Dieu Hospital**

Phone: 613-544-3310

Address: 166 Brock Street, Kingston

Website: <http://www.hoteldieu.com/>

**Kingston General Hospital**

Phone: 613-548-3232

Address: 76 Stuart Street, Kingston

Website: <http://www.kgh.on.ca/en/Pages/default.aspx>

**Lennox and Addington County General Hospital**

Phone: 613-354-3301

Address: 8 Richmond Park Drive, Napanee

Website: <http://www.lacgh.com/>



### **Appendix G : Designated Emergency Muster Point**

Muster point is at the laydown area – see project map.

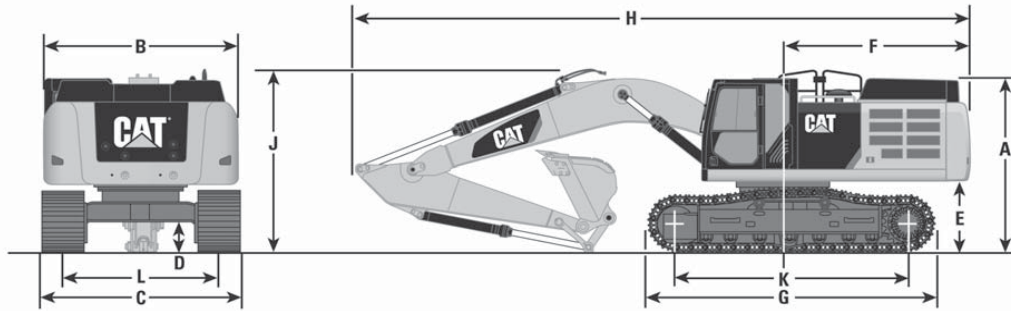
**Appendix H : Amherst Island Wind Project – Detailed Site Plan Map**



SCHEDULE 10 – Largest Wide Load

**Hydraulic  
Excavators**

**Shipping Dimensions**  
● 349E ● 349F L ● 349F L XE



Region Offerings	349E – FIX Reach**		349F L**		349F L – FIX***		349F L XE***	
	Japan		North America		North America		North America	
	mm	ft	mm	ft	mm	ft	mm	ft
A	3220	10'7"	3220	10'7"	3220	10'7"	3220	10'7"
B	2990	9'10"	2990	9'10"	3000	9'10"	2990	9'10"
C	3340	11'0"	3490	11'5"	3640	11'11"	3790	12'5"
D	510	1'8"	480	1'7"	510	1'8"	480	1'7"
E	1280	4'2"	1280	4'2"	1280	4'2"	1280	4'2"
F	3760	12'4"	3760	12'4"	3760	12'4"	3760	12'4"
G	5040	16'6"	5370	17'7"	5370	17'7"	5370	17'7"
H*	11 920	39'1"	11 920	39'1"	11 930	39'2"	11 930	39'2"
J*	3730	12'3"	3730	12'3"	3670	12'0"	3670	12'
K	4030	13'3"	4360	14'4"	4360	14'4"	4360	14'4"
L	2740	9'0"	2740	9'0"	2740	9'0"	2740	9'0"

\*Varies with stick length.  
\*\*R3.35 (11'0") stick and 600 mm (24") shoes.  
\*\*\*R3.9 (12'10") stick and 900 mm (35") shoes.

SCHEDULE 11 – Not Used

SCHEDULE 12 – Amherst Island Community Events

**Events on Amherst Island**

Month	Date	Event	Time	Location	Address
All year long	Second Saturday of the Month	Amherst Island Men's Society (AIMS) Meeting		St. Paul's Presbyterian Church	1955 Stella 40 Foot Stella, Ontario KOH 2SO
All year long	Third Wednesday of the Month	Amherst Island Women's Institute (WI) Meeting			
February	Second Wednesday of the month	Anglican Church Women (ACW)			
March	Second Wednesday of the month	Anglican Church Women (ACW)			
April	Second Wednesday of the month	Anglican Church Women (ACW)			
May	Second Wednesday of the month	Anglican Church Women (ACW)			
June	Second Wednesday of the month	Anglican Church Women (ACW)			
July	Second Wednesday of the month	Anglican Church Women (ACW)			
September	Second Wednesday of the month	Anglican Church Women (ACW)			
October	Second Wednesday of the month	Anglican Church Women (ACW)			
November	Second Wednesday of the month	Anglican Church Women (ACW)			
All year long	Monthly (Call for dates)	Island School Liaison Enthusiasts (ISLE)			
All year long	Second Tuesday of the month	Presbyterian Church Women (PCW)			
July	6 (Thursday), 2017	Waterside Summer Series - Charles Richard-Hamelin piano	7:15 PM	St. Paul's Presbyterian Church	1955 Stella 40 Foot Stella, Ontario KOH 2SO
July	15 (Saturday), 2017	Waterside Summer Series - Triple Forte Paino Trio	4:15 PM	St. Paul's Presbyterian Church	1955 Stella 40 Foot Stella, Ontario KOH 2SO
July	28 (Friday), 2017	Waterside Summer Series - Alcan String Quartet	7:15 PM	St. Paul's Presbyterian Church	1955 Stella 40 Foot Stella, Ontario KOH 2SO
August	12 (Saturday), 2017	Waterside Summer Series - Cheng Duo	4:15 PM	St. Paul's Presbyterian Church	1955 Stella 40 Foot Stella, Ontario KOH 2SO
August	17 (Thursday), 2017	Waterside Summer Series - Serouj Kradijian	7:15 PM	St. Paul's Presbyterian Church	1955 Stella 40 Foot Stella, Ontario KOH 2SO
August	11 (Friday), 2017	Emerald Music Festival	6:00 PM - 12:00 PM		12675 Front Road, Amherst Island, Ontario Canada
August	12 (Saturday), 2017	Emerald Music Festival	12:00 PM - 12:00 AM		12675 Front Road, Amherst Island, Ontario Canada
August	13 (Sunday), 2017	Emerald Music Festival	10:30 AM - 4:00 PM		12675 Front Road, Amherst Island, Ontario Canada
March	11 (Saturday), 2017	Dry Stone Canada Annual General Meeting	9:00 AM - 5:00 PM	The Lodge	The Lodge on Amherst Island 320 McDonalds Lane, Stella ON KOH 2So
March	12 (Sunday), 2017	Dry Stone Canada Annual General Meeting	9:00 AM - 5:00 PM	The Lodge	The Lodge on Amherst Island 320 McDonalds Lane, Stella ON KOH 2So
March	14 (Tuesday), 2017	Setting Sun Experience at the Dry Stone Legacy Site	6:00 PM	Across from the Amherst Island Public School on Front Road, Stella ON	
April	29 (Saturday), 2017	Walling and Carving Workshops	9:00 AM - 5:00 PM	The Lodge	The Lodge on Amherst Island 320 McDonalds Lane, Stella ON KOH 2So
April	30 (Sunday), 2017	Walling and Carving Workshops	9:00 AM - 5:00 PM	The Lodge	The Lodge on Amherst Island 320 McDonalds Lane, Stella ON KOH 2So
July	22 (Saturday), 2017	St. Paul's Garden Party	11:00 AM - 3:00 PM	St. Paul's Presbyterian Church	1955 Stella 40 Foot Stella, Ontario KOH 2SO
September	3 (Saturday), 2017	Fish Fry	5:30 PM - 7:00 PM	St. Paul's Presbyterian Church	1955 Stella 40 Foot Stella, Ontario KOH 2SO
September	27 (Tuesday), 2017	Setting Sun Experience at the Dry Stone Legacy Site	6:00 PM	Across from the Amherst Island Public School on Front Road, Stella ON	
October	21 (Saturday), 2017	Walling and Carving Workshops	9:00 AM - 5:00 PM	The Lodge	The Lodge on Amherst Island 320 McDonalds Lane, Stella ON KOH 2So
October	22 (Saturday), 2017	Walling and Carving Workshops	9:00 AM - 5:00 PM	The Lodge	The Lodge on Amherst Island 320 McDonalds Lane, Stella ON KOH 2So
November	18 (Saturday), 2017	St. Paul's Christmas Bazaar	10:00 AM - 1:30 PM	Amherst Island Community Centre	Front Rd, Stella, ON KOH 2SO
August	20 (Sunday), 2017	Wooly Bully Races 5k/10k	9:15 AM - 11:00 AM	Homestead of Dave Willard	600 South Shore Road
February	26 (Sunday), 2017	Amherst and Wolfe Island Ontario Field Ornithologists	8:00 AM	Whole Island (to be confirmed)	
October	15 (Sunday), 2017	Amherst Island Spring Ontario Field Ornithologists	7:50 AM	Whole Island (to be confirmed)	

SCHEDULE 13 – Tree Removal in Municipal Road Allowances

---

To:	Peter Bright Waterloo, ON	From:	Jennifer Koskinen Waterloo ON Office
File:	133560104	Date:	April 29, 2017

---

**Reference: Amherst Island Wind Project 75MW Wind Farm, Tree Removal Assessment, Amherst Island, Ontario**

### **1.0 Introduction**

Stantec Consulting Ltd. has been retained by Pennecon Heavy Civil Limited to complete a Tree Removal Assessment for the Amherst Island Wind Project, 75MW Wind Farm. The Tree Removal Assessment includes a review of trees located adjacent to the collector circuit that will be installed within the gravel shoulder adjacent to the road. The collector circuits will be distributed throughout the island on sections of the following public roads: 2<sup>nd</sup> Concession Road, Stella 40 Foot Road, South Shore Road, Front Road, Dump Road and Lower 40 Foot Road. Trees were reviewed along the section of these public roads where the collector circuit will be located.

### **2.0 Methodology**

The Project Arborist from Stantec, Ms. Jennifer Koskinen, HBESfcon, ISA, completed a site visit on September 28<sup>th</sup>, 2016, with the Project Electrical Technologist, Mr. Andrew Rees. The purpose of the visit was to review the circuit alignment along the road and to assess proposed impact to the trees located adjacent to the roads. The tree review included collecting general tree data through observation from the road. Tree data collected includes species identification, diameter class, condition, tree location in relation to the road, and impacts on the tree if the alignment was located on the adjacent gravel shoulder.

Additional trees have been identified by Algonquin Power as requiring removal. These include trees located on South Shore Road, 2<sup>nd</sup> Concession Road, and Dump Road, located on the attached Table 1. These removal trees were reviewed by Stantec and the data was verified in the field on April 20<sup>th</sup>, 2017. Tree removals in Table 1 include trees impacted by the collector system installation, road improvements, turbine component movement, and construction for access roads.

### **3.0 Observations**

Species distribution along all of the roads included in the study was similar. The tree species predominantly included Red Maple (*Acer rubrum*), Green Ash (*Fraxinus pennsylvanica*), Basswood (*Tilia americana*), and Elm sp. (*Ulmus sp.*). There were no rare or endangered species observed within the collector system area, or the areas where the additional tree removals were located. Trees were located anywhere from 2 meters to 5 meters off of the edge of the road with the average distance being 3 meters. The majority of trees were in good condition, with sporadic dead standing trees.

**Design with community in mind**

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**Reference:** Amherst Island Wind Project 75MW Wind Farm, Tree Removal Assessment, Amherst Island, Ontario

#### 4.1 Assessment

The collector circuit will be located adjacent to the existing road edge within the gravel shoulder for all the roads except for South Shore Road. South Shore Road will predominantly have the collector circuit located within the road, with some areas located adjacent to the road edge. The excavation required to install the collector circuit will be no more than 1 meter wide. This width was used to determine the construction impact and the required removal of trees for the collector system. Tree removals for road access, turbine delivery, and road improvements were identified by Algonquin. The species, DBH, condition, and GPS coordinates of these additional removals were verified by Stantec.

The following trees have been identified for removal based on the impacts identified in the field:

##### **Stella 40 Foot Road**

- Silver Maple, *Acer saccharinum*, 40 to 50 cm DBH, Poor

##### **South Shore Road**

- Basswood, *Tilia americana*, 45cm DBH, Poor
- Red Oak, *Quercus rubra*, 38cm DBH, Fair
- Cherry sp., *Prunus sp.*, 3 stems <10cm DBH, Good
- Basswood, *Tilia americana*, 2 stems at 18cm, 20cm, 23cm DBH, Good
- Basswood, *Tilia americana*, 2 stems 10cm and multiple <10cm DBH, Good

##### **2<sup>nd</sup> Concession Road**

- Bur Oak, *Quercus macrocarpa*, 65cm DBH, Good
- Ash sp., *Fraxinus sp.*, 2 trees at 10cm DBH, Good

##### **Dump Road**

- White Elm, *Ulmus americana*, 23cm DBH, Fair
- Green Ash, *Fraxinus pennsylvanica*, 22cm, 20cm, 18cm DBH, Poor
- Red Oak, *Quercus rubra*, 48cm DBH, Good
- Green Ash, *Fraxinus pennsylvanica*, 28cm, 35cm DBH, Poor
- White Elm, *Ulmus americana*, 10cm, 2 stems 18cm DBH, Good
- Basswood, *Tilia americana*, 10cm, 18cm DBH, Good
- Basswood, *Tilia americana*, 20cm, 15cm DBH, Good
- Basswood, *Tilia americana*, 10cm, 14cm DBH, Good
- Basswood, *Tilia americana*, <10cm, 10cm DBH, Good
- Basswood, *Tilia americana*, 18cm, <10cm DBH, Good
- White Elm, *Ulmus americana*, 18cm DBH, Dead
- Basswood, *Tilia americana*, 14cm DBH, Good
- Green Ash, *Fraxinus pennsylvanica*, 14cm DBH, Good

There will be twenty three, 23, trees removed to facilitate construction for the collector circuit, road access, turbine delivery, and road improvements. In total one, 1, tree will be removed for construction of the collector circuit; six, 6, trees will be removed for turbine delivery; and fifteen, 15, trees will be removed for access road construction.

**Design with community in mind**

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March 29, 2017

Peter Bright

Page 3 of 3

**STANTEC CONSULTING LTD.**

A handwritten signature in blue ink, appearing to read "Jennifer Koskinen".

Jennifer Koskinen, HBESfcon  
ISA Certified Arborist ON-1234A  
Phone: 519-585-7442  
jennifer.koskinen @stantec.com

Attachment: Table 1. General Tree Removal Inventory

c. Tim McCormick, Stantec

**Design with community in mind**

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**TABLE 1. General Tree Inventory, Amherst Island Wind Farm, Ontario**  
 Data collected : September 28th, 2016, and April 20th, 2017.

Approximate # of trees	Botanical Name	Common Name	DBH (cm)/Diameter Class	Condition	Comments	Tree Location	Impact Assessment	GPS Coordinates for Removals
<b>Stella 40 Foot Road</b>								
1	<i>Acer saccharinum</i>	Silver Maple	40 to 50	Poor	First large tree south of 2nd Concession, on the west side of Stalla 40.	Public	Remove - 1	X: 364716 Y: 4890896
<b>South Shore Road</b>								
1	<i>Tilia americana</i>	Basswood	45	Poor	Hile in mid trunk.	South Shore	Remove - 2	X: 367049.1 Y: 4889984.6
1	<i>Quercus rubra</i>	Red Oak	38	Fair		South Shore	Remove - 2	X: 367052.3 Y: 4889999.8
3	<i>Prunus sp.</i>	Cherry sp.	(3) <10	Good	Three stems.	South Shore	Remove - 3	X: 368721.3 Y: 4891591.0
1	<i>Tilia americana</i>	Basswood	(2)18,20,23	Good		South Shore	Remove - 2	X: 369580.5 Y: 4892111.5
1	<i>Tilia americana</i>	Basswood	(2)10, multiple <10	Good		South Shore	Remove - 2	X: 369672.5 Y: 4892175.9
<b>2nd Concession Road</b>								
1	<i>Quercus macrocarpa</i>	Bur Oak	65	Good		Concession 2	Remove - 3	X: 362360.0 Y: 4890196.2
Multiple	<i>Fraxinus sp.</i>	Ash sp.	(2) 10	Good	Within this removal area include multiple <10 Staghorn Sumac, and dogwood shrubs	Concession 2	Remove - 2	Area of X: 361408 Area of Y: 4889716
<b>Dump Road</b>								
1	<i>Ulmus americana</i>	White Elm	23	Fair		Dump Road	Remove - 3	X: 362813.5 Y: 4890507.0
1	<i>Fraxinus pennsylvanica</i>	Green Ash	23,20,18	Poor		Dump Road	Remove - 3	X: 362807.1 Y: 4890519.5
1	<i>Quercus rubra</i>	Red Oak	48	Good		Dump Road	Remove - 3	X: 362793.6 Y: 4890542.0
1	<i>Fraxinus pennsylvanica</i>	Green Ash	28,35	Poor		Dump Road	Remove - 3	X: 362789.5 Y: 4890546.6
1	<i>Ulmus americana</i>	White Elm	10,(2)18	Good		Dump Road	Remove - 3	X: 362784 Y: 4890556
1	<i>Tilia americana</i>	Basswood	10,18	Good		Dump Road	Remove - 3	X: 362770 Y: 4890580
1	<i>Tilia americana</i>	Basswood	20,15	Good		Dump Road	Remove - 3	X: 362755 Y: 4890611
1	<i>Tilia americana</i>	Basswood	10,14	Good		Dump Road	Remove - 3	X: 362752 Y: 4890612
1	<i>Tilia americana</i>	Basswood	<10,10	Good		Dump Road	Remove - 3	X: 362734 Y: 4890646
1	<i>Tilia americana</i>	Basswood	18,<10	Good		Dump Road	Remove - 3	X: 362734 Y: 4890646
1	<i>Ulmus americana</i>	White Elm	18	Dead		Dump Road	Remove - 3	X: 362720 Y: 4890622
1	<i>Tilia americana</i>	Basswood	14	Good		Dump Road	Remove - 3	X: 362720 Y: 4890622
1	<i>Fraxinus pennsylvanica</i>	Green Ash	14	Good		Dump Road	Remove - 3	X: 362650 Y: 4890785

Trees to Be Removed Which Are Over 15cm DBH      1    Trees to be Removed for Electrical Line      2    Trees to be Removed for Turbine Delivery      3    Trees to be Removed for Access Road Construction

SCHEDULE 14 – Road Closures and Recommended Detour Routes

**Legend**

- Public Roads
- Waterbodies
- ➔ Detour Route



No.	Date	Description
1	6/29/15	Shapefile Update

**REVISIONS**

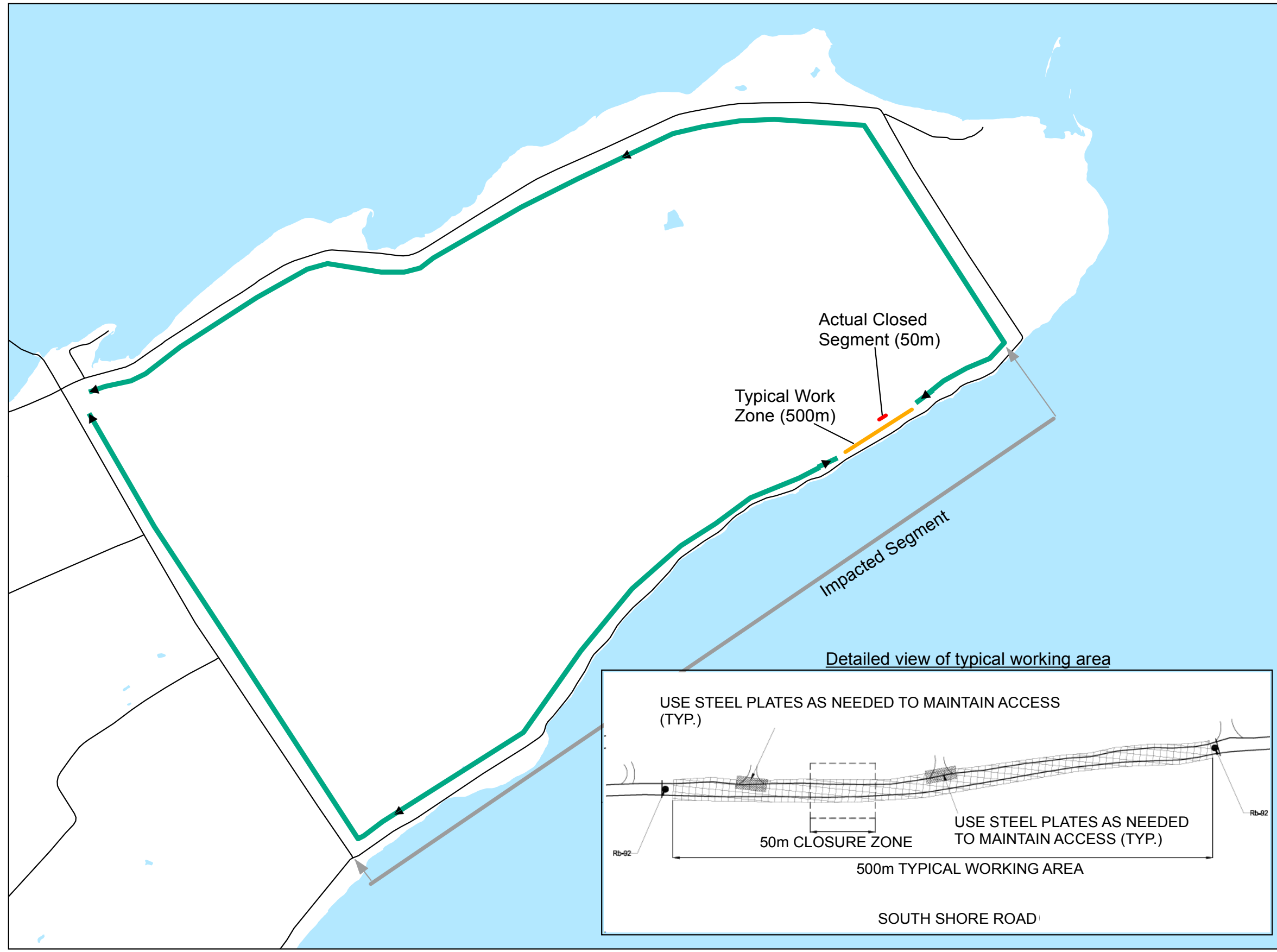
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Meters



**AMHERST ISLAND WIND PROJECT**

**TITLE: South Shore Rd Road Closures & Preferred Detour Routes**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:22,500
DRAWN BY: D THOMPSON	DATE: APR 18, 2017
DRAWING No. <b>AMHST - 240a</b>	REVISION No. <b>1</b>

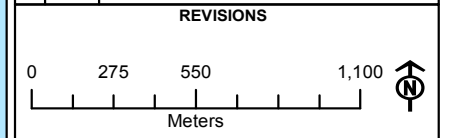


**Legend**

- Public Road
- Waterbodies
- ↔ Detour Route



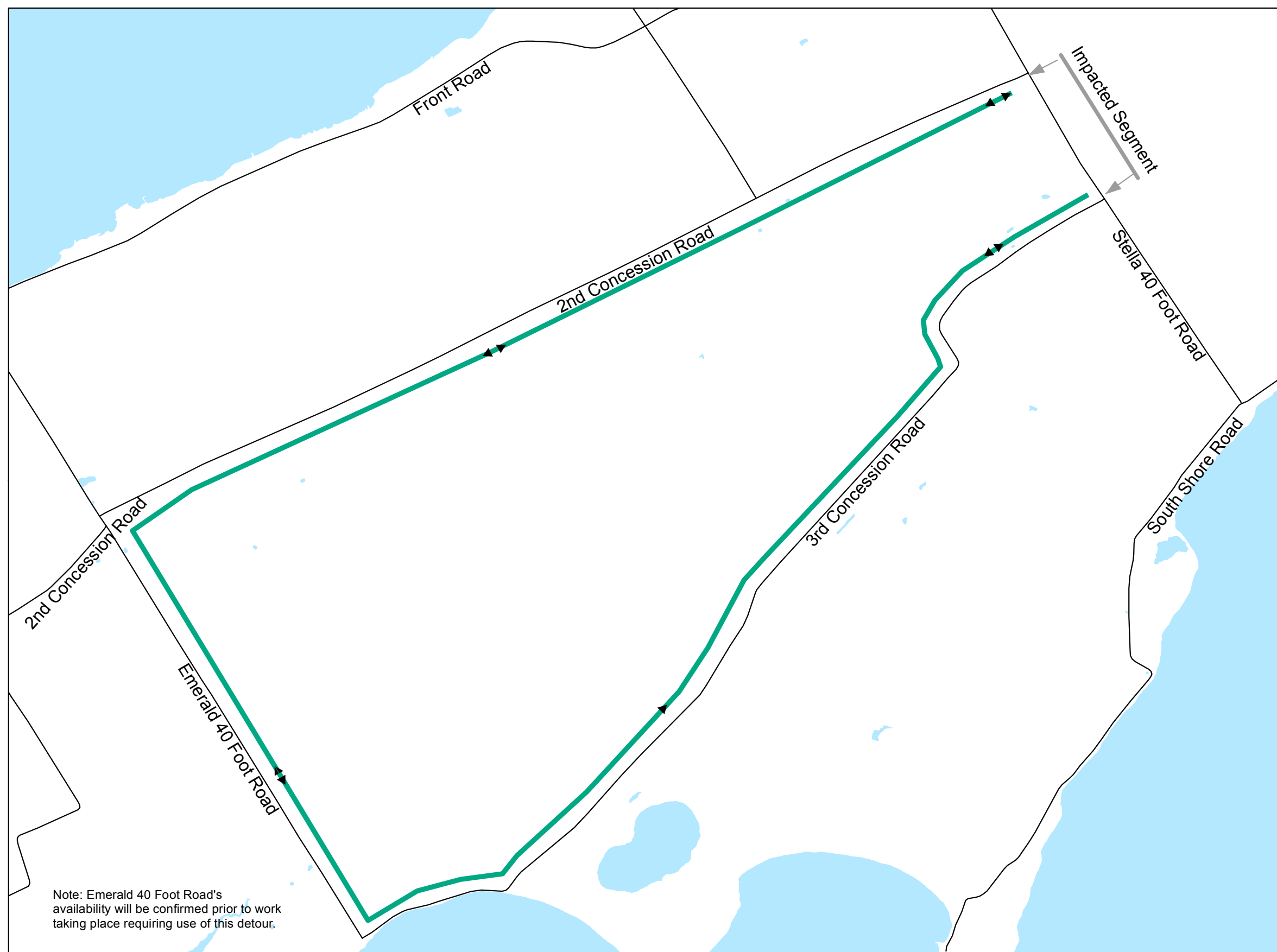
No.	Date	Description
REVISIONS		



**AMHERST ISLAND WIND PROJECT**

**TITLE:  
Stella 40 Foot Rd  
Road Closures &  
Preferred Detour Routes**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:22,000
DRAWN BY: D THOMPSON	DATE: APR 28, 2017
DRAWING No. <b>AMHST - 240b</b>	REVISION No. <b>2</b>



Note: Emerald 40 Foot Road's availability will be confirmed prior to work taking place requiring use of this detour.



**Legend**

- Public Road
- Turbine Locations
- Waterbodies
- ↔ Detour Route



No.	Date	Description

REVISIONS		
No.	Date	Description



**AMHERST ISLAND WIND PROJECT**

**Dump Rd Road Closures & Preferred Detour Routes**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:22,000
DRAWN BY: D THOMPSON	DATE: DEC 23, 2016
DRAWING No. <b>AMHST - 240c</b>	REVISION No. <b>0</b>

### Legend

- Public Road
- Waterbodies
- ↔ Detour Route



No.	Date	Description

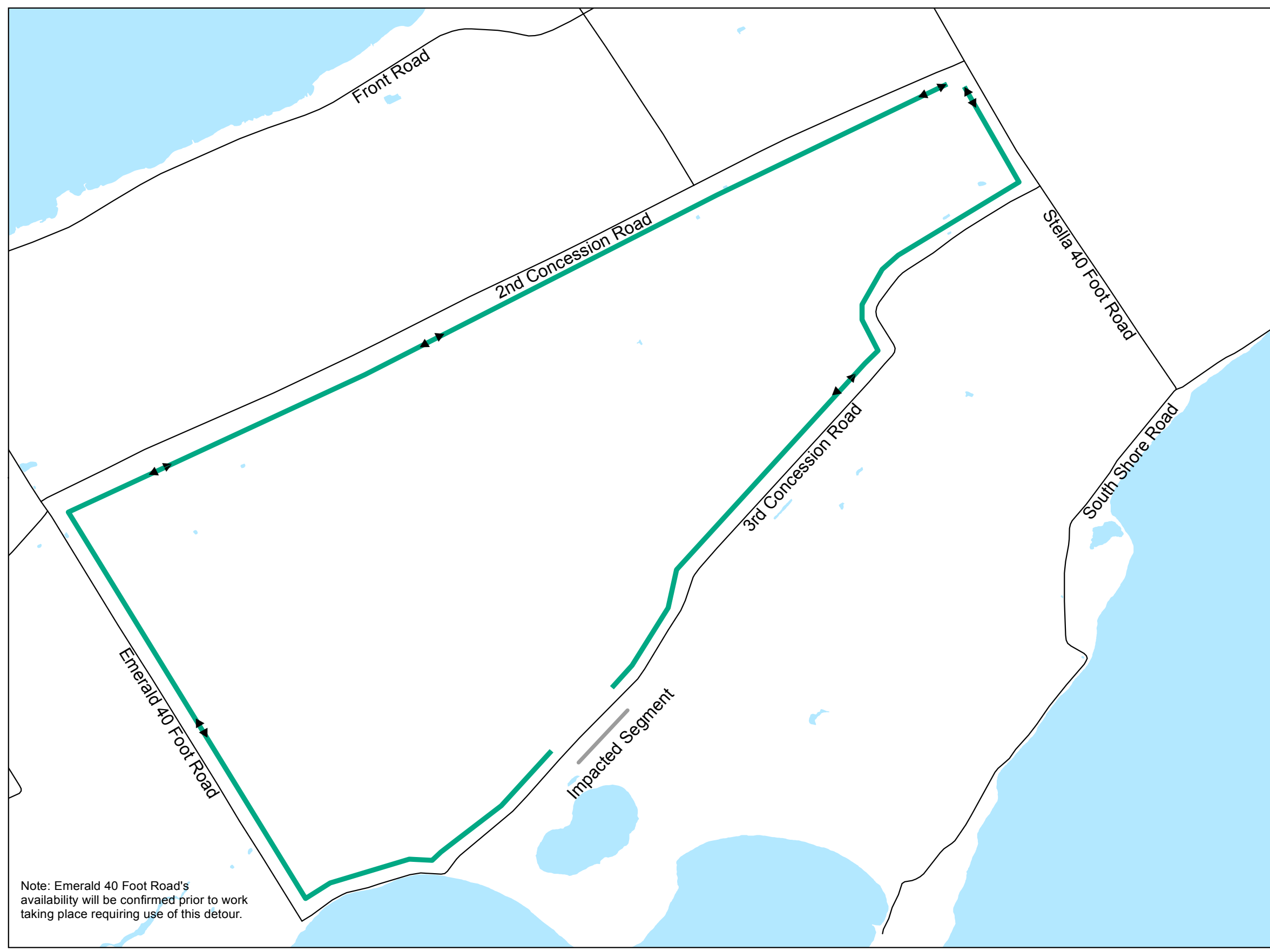
REVISIONS		
No.	Date	Description



**AMHERST ISLAND WIND PROJECT**

**TITLE:  
3rd Concession Rd Road Closures & Preferred Detour Routes**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:22,000
DRAWN BY: D THOMPSON	DATE: APR 28, 2017
DRAWING No. <b>AMHST - 240d</b>	REVISION No. <b>2</b>



Note: Emerald 40 Foot Road's availability will be confirmed prior to work taking place requiring use of this detour.

### Legend

- Public Road
- Waterbodies
- ↔ Detour Route



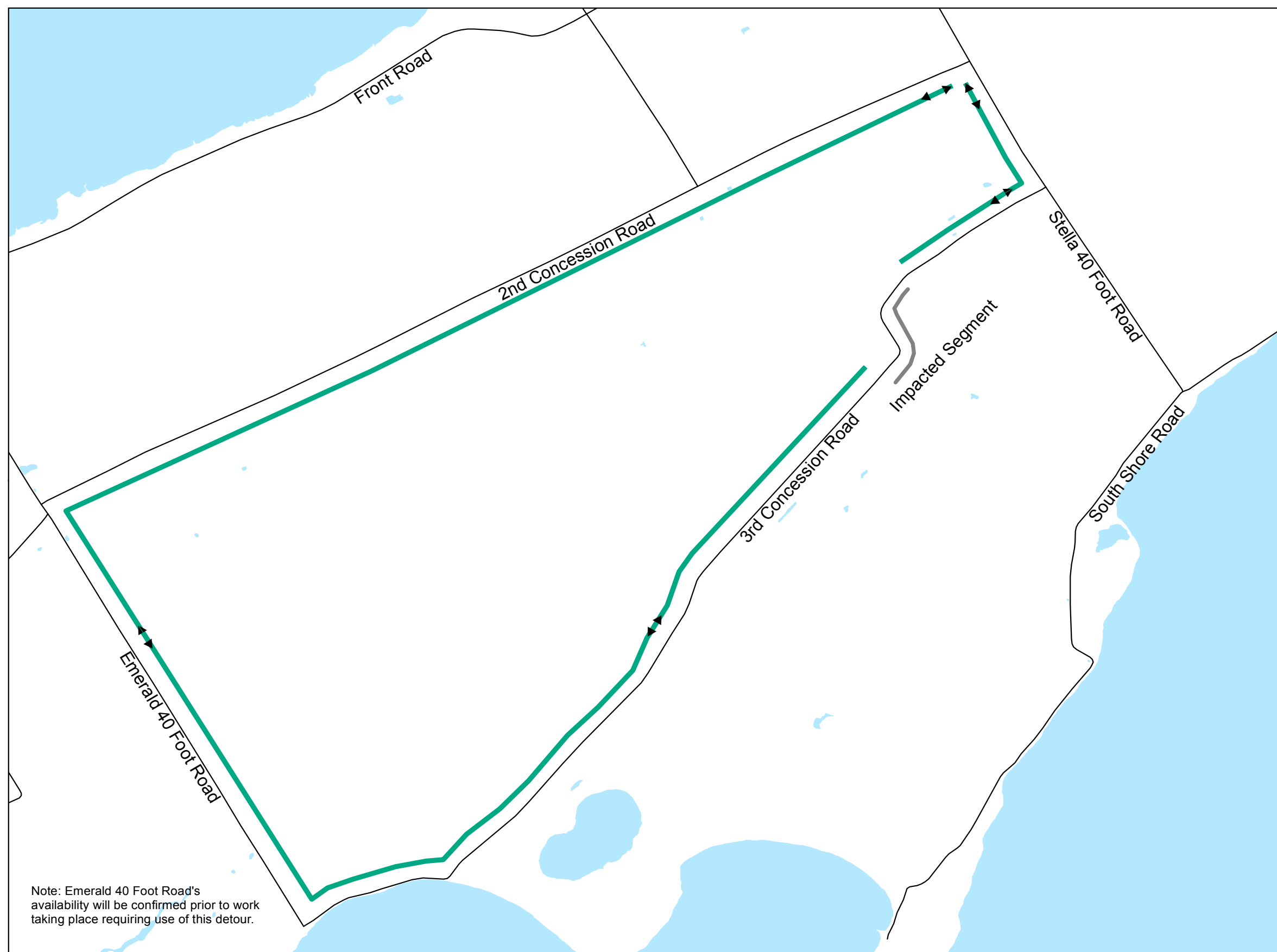
No.	Date	Description
REVISIONS		



**AMHERST ISLAND  
WIND PROJECT**

**TITLE:  
3rd Concession Rd  
Road Closures &  
Preferred Detour Routes**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:22,000
DRAWN BY: D THOMPSON	DATE: APR 28, 2017
DRAWING No. <b>AMHST - 240e</b>	REVISION No. <b>2</b>



Note: Emerald 40 Foot Road's availability will be confirmed prior to work taking place requiring use of this detour.



SCHEDULE 15 – Sample Complaint Response Form



345 DAVIS ROAD, OAKVILLE, ONTARIO L6H 7H7

<b>Amherst Island Wind Project</b>		Doc. #:	
Topic	<b>Complaint Form</b>	Revision #:	0
Prepared by	<b>BD team</b>	Date:	November 2016

**TO BE COMPLETED BY AMHERST ISLAND WIND STAFF:**

<b>Date of Receipt</b>				<b>Complaint No.</b>	
<b>Recorded By</b>				<b>Date</b>	
<b>Type of Complaint</b>	Substantial	General	Other	<b>Resolution Date</b>	

**Complainant Information**

<b>Name</b>	
<b>Address</b>	
<b>City / State / Zip</b>	
<b>Email</b>	
<b>Telephone</b>	
<b>Parcel Description / PID</b>	

**Nature of Complaint**

- Permit Matter     
  Other     
  Compliance Issue

<b>Description of Complaint</b>	
---------------------------------	--

**Action(s) Taken**

<b>Describe Action Taken to Resolve Issue</b>	
---	--

**Final Resolution**

<b>Describe Final Disposition</b>	
-----------------------------------	--

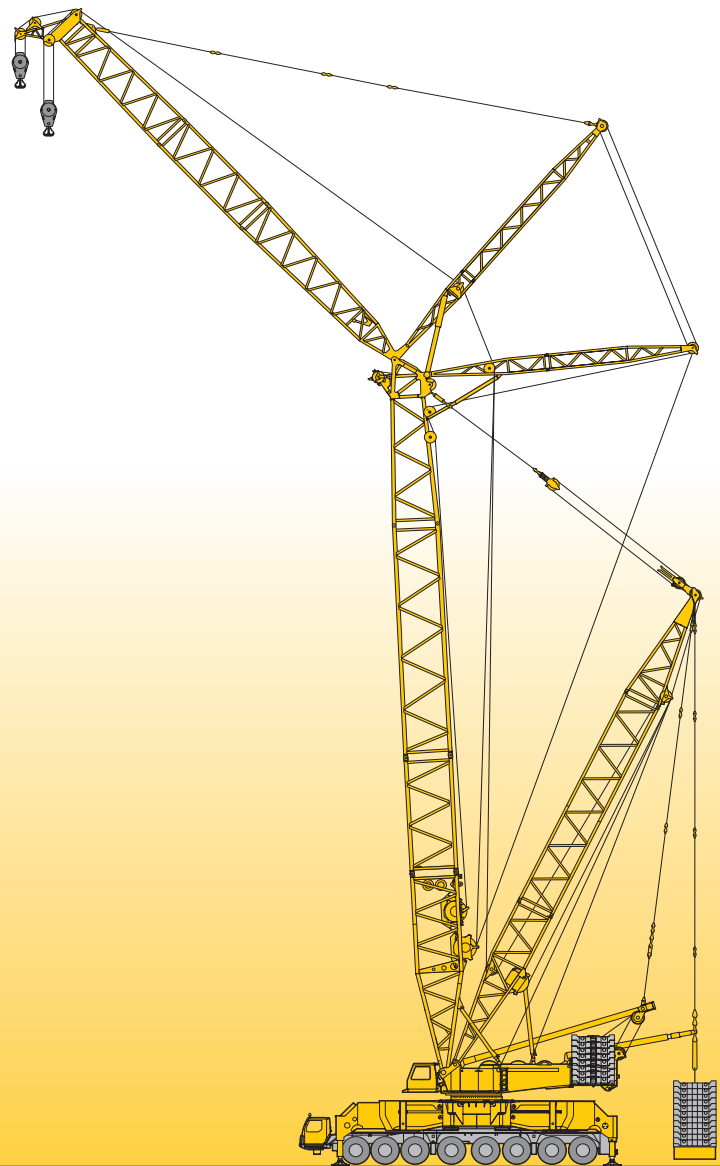
**Gittermast-Mobilkran**  
**Lattice boom mobile crane**

**LG 1750**

Grue à flèche en treillis • Autogrù tralicciata

Grúa móvil con pluma de celosía • Самоходный кран с решетчатой стрелой

**Technische Daten • Technical Data**  
**Caractéristiques techniques • Dati tecnici**  
**Datos técnicos • Технические данные**



**LIEBHERR**

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## Technische Beschreibung

### Technical description

Description techniques • Descrizione tecnica

Descripción técnica • Техническое описание

Max. Tragkraft	750 t bei 8 m Ausladung. S2DB – System mit S 35 m.
Max. Lastmoment	9.864 tm – 548 t bei 18 m Ausladung. S6D2B – System mit S 59 m und D 42 m.

## Kranfahrgestell

<b>Rahmen</b>	Eigengefertigte, verwindungssteife Stahlkonstruktion aus hochfestem Feinkorn-Baustahl.
<b>Abstützungen</b>	Vier hydraulisch ausklappbare Schwenkholme mit hydraulischen Abstützzy lindern.
<b>Motor</b>	8-Zylinder-Diesel, Fabrikat Liebherr, wassergekühlt, Leistung 505 kW (686 PS). Max. Drehmoment 3000 Nm. Abgasemissionen entsprechend Richtlinien 97/68/EG oder EPA/CARB. Kraftstoffbehälter: 600 l.
<b>Getriebe</b>	Automatisches Getriebesystem mit Wandler-schaltkupplung, Fabrikat ZF, Typ TC-TRONIC mit 12 Vorwärtsgängen und 2 Rückwärtsgängen, Verteilergetriebe mit sperrbarem Längsdifferential.
<b>Achsen</b>	Robuste Kranfahrzeugachsen. Alle Achsen gelenkt, Achsen 1, 2, 4 und 6 sind angetriebene Planetenachsen, Achse 4 mit Längsdifferential, Achsen 4 und 6 mit Querdifferential.
<b>Federung</b>	Alle Achsen sind hydropneumatisch gefedert mit automatischer Niveauregulierung. Achsdruckausgleich zwischen den Achspaa ren 1 + 2, 3 + 4, 5 + 6 und 7 + 8. Federung hydraulisch blockierbar.
<b>Bereifung</b>	16fach, alle Achsen einzeln bereift. Reifengröße: 505/95 R 25 (18.00 R 25).
<b>Lenkung</b>	ZF-Halbblock-Hydrolenkung, 2-Kreisanlage mit hydraulischer Servoeinrichtung und zusätzlicher Reservepumpe, von der Achse angetrieben, auf die mechanisch miteinander verbundenen Achsen 1 – 4 wirkend. Bei Straßenfahrt werden die Achsen 5 – 8 elektrohydraulisch gelenkt und ab 30 km/h werden die Achsen 5 + 6 auf Geradeausfahrt gestellt blockiert. Die Achsen 7 + 8 werden geschwindigkeitsabhängig bis 60 km/h in Abhängigkeit des Lenkeinschlages der Vorderachse "aktiv" gelenkt und über 60 km/h auf Geradeausfahrt gestellt wobei die 7. Achse zusätzlich blockiert wird.
<b>Bremsen</b>	Betriebsbremse: Allrad-Servo-Druckluftbremse, 2-Kreisanlage. Zusatzbremsen: Auspuffklappenbremse, Retarder, im TC-TRONIC-Getriebe, Telma-Wirbelstrombremse (Option). Handbremse: Federspeicher auf alle Räder der 3., 6. und 8. Achse wirkend.
<b>Fahrerhaus</b>	Großräumige Kabine in Stahlblech ausführung, gummielastisch aufgehängt. Sicherheitsverglasung.
<b>Elektr. Anlage</b>	Moderne Datenbus-Technik, 24 Volt Gleichstrom, 2 Batterien je 170 Ah.

## Kranoberwagen

<b>Drehbühnenrahmen</b>	Liebherr-Drehbühnenrahmen, bestehend aus Drehbühne mit Winde IV und abnehmbaren A-Bock, verbunden mit dem Raupenmittelteil über eine Rollendrehverbindung.
<b>Kranmotor mit Geräuschisolierung</b>	Liebherr 8-Zylinder-Diesel, wassergekühlt, Leistung 455 kW (618 PS), max. Drehmoment 2546 Nm. Kraftstoffbehälter: ca. 820 l. Abgasemissionen entsprechend Richtlinien 97/68/EG und EPA/CARB.

<b>Winde I</b>	Standard Hubwinde, hydraulisch angetrieben mit Axialkolben-Verstellpumpen mit integriertem Planetengetriebe.
<b>Winde IV</b>	Einziehwerk.
<b>Einscherwinde</b>	Hilfswinde zum Einscheren der Seile.
<b>Drehwerk</b>	1 Drehwerk, hydraulisch angetrieben durch Axialkolben-Verstellpumpen mit integriertem Planetengetriebe.
<b>Krankabine</b>	Klimatisierte Krankabine nach hinten neigbar mit Sicherheitsverglasung, wärmedämmendes Glas, Dachfenster mit Panzerglas, genormte Steuereinheiten ergonomisch angeordnet. Thermostatisch geregelte Warmwasser-Zusatzheizung.
<b>Kransteuerung</b>	Eingabe der Konfigurationsdaten durch einfache interaktive Funktionen. Alle Kranbewegungen werden durch zwei 4-Wege Meister-schalter sowie zwei 2-Wege Hand-/Fußhebel gesteuert. Alle Arbeitsbewegungen können unabhängig voneinander angesteuert werden.
<b>Sicherheitseinrichtungen</b>	Hubendschalter, Sicherheitsventile gegen Schlauch- und Rohrbruch. Seiltrommel-Endschaltung mit 3 Sicherheitswindungen. Windwarnanlage. Elektronische Neigungsanzeige. Flugwarnleuchte.
<b>Kamera-Überwachung</b>	2 Farbmonitore, 3 Kameras für Winden- und Heckbereich.
<b>Gegengewicht</b>	2 Konsolen mit je 10 t. Gesamtgegen-gewicht 245 t. 18 Ballastplatten à 12,5 t (Option).

## Auslegersysteme

<b>Hauptausleger S</b>	System 2826 mit Kopfstück für max. Tragkraft von 400 t (optional 600 t). Auslegerlänge S 21 m – 84 m. Auslegerlänge SDB 35 m – 140 m mit Derricksystem.
<b>Wippbare Gitterspitze W</b>	System 2421 mit Kopfstück für max. Tragkraft von 400 t. Wippspitzenlängen 28 m – 105 m. Für Wippspitzenbetrieb ist Winde V erforderlich.
<b>Feste Gitterspitze F</b>	System 1916 mit Kopfstück für max. Tragkraft von 150 t anbaubar unter 10°, 15° und 30°. Auslegerlänge F 12 m – F 21 m.
<b>Windkraftspitze HS</b>	Hilfsspitze 120 t / 6 m für Windkraftmontage. Anbau an verschiedenen SL-Auslegern.
<b>Derricksystem D</b>	System 2421 einschließlich Abspannstangen. Für Derrickbetrieb ist die Winde III erforderlich.
<b>Ballastpalette B</b>	Für max. Derrickballast von 400 t und stufenlos variable Radian von 13 m – 18 m bzw. 15 m – 20 m.
<b>Derrickballast</b>	Platten mit Gesamtgewicht von 400 t (Option).
<b>Schwerlastspitze WV</b>	Verwendung von vorhandenen Teilen der Wippspitze + zusätzlich WV-Adapter. Am S-Ausleger anbaubar zwischen 12° und 20°. Länge 14 m – 21 m.
<b>Winde II</b>	2. Hubwinde.
<b>Winde III</b>	Verstellung Hauptausleger/Derrickbetrieb.
<b>Winde V</b>	Verstellung wippbare Gitterspitze.
<b>Winde VI</b>	Hilfshubwerk.
<b>Mastnasen 60 t</b>	Zum Anbau am S oder SL, W, WV Kopf.

## Zusatzausrüstung

<b>Bolzenieheinrichtung</b>	Einschließlich mobilem Hydraulikaggregat. Für das Einschleiben und Herausziehen der Bolzen der S- und W-Zwischenstücke.
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Weitere Zusatzausrüstungen auf Anfrage.  
Serienausrüstung und Optionen entsprechend aktueller Preisliste.

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Max. capacity	750 t at 8 m radius S2DB – System with S 35 m.
Max. load moment	9.864 tm – 548 t at 18 m radius. S6D2B – System with S 59 m and D 42 m.

### Crane carrier

<b>Frame</b>	Self-manufactured, torsion-resistant box-type design of high-tensile grain refined structural steel.
<b>Outriggers</b>	Four hydraulically unfolding swing-out outriggers with hydraulic supporting rams.
<b>Engine</b>	8-cylinder diesel, make Liebherr, water cooled, power 505 kW (686 h.p.). Max. torque 3000 Nm. Exhaust emission according to guideline 97/68/EG or EPA/CARB. Fuel tank 600 l.
<b>Transmission</b>	Automatic transmission with converter control clutch, make ZF, type TC-TRONIC with 12 forward speeds and 2 reverse speeds, transfer case with lockable longitudinal differential.
<b>Axles</b>	Robust crane carrier axles. All axles steered, axles 1, 2, 4 and 6 are driven planetary axles, axle 4 with longitudinal differential, axles 4 and 6 with transverse differential.
<b>Suspension</b>	All axles with hydropneumatic suspension with automatic levelling control. Axle pressure equalization between the axle pairs 1 + 2, 3 + 4, 5 + 6 and 7 + 8. The suspension can be blocked hydraulically.
<b>Tyres</b>	16-fold, all axles equipped with single tyres. Tyre size: 505/95 R 25 (18.00 R 25).
<b>Steering</b>	ZF semi-integral power steering, 2-circuit system with hydraulic servo mechanism and additional axle-driven emergency pump acting on the mechanically interlinked axles 1 – 4. Axles 5 – 8 are steered electrohydraulically during road displacement and from 30 km/h, axles 5 + 6 are set to straight displacement and locked. Axles 7 + 8 are “actively” steered up to 60 km/h dependent on the cramp of the front axle and beyond 60 km/h, set to straight displacement and axle 7 is locked in addition.
<b>Brakes</b>	Service brake: All-wheel servo-air brake, 2-circuit system. Additional brakes: Exhaust pipe retarder, retarder in the TC-TRONIC transmission, TELMA-type eddy-current brake (optional). Hand brake: Spring-loaded brake, acting on all wheels of the 3 <sup>rd</sup> , 6 <sup>th</sup> and 8 <sup>th</sup> axle.
<b>Driver's cab</b>	Spacious cab of sheet steel, on rubber shock absorbers. Safety glass windows.
<b>Electrical system</b>	Modern data bus technology, 24 Volt DC, 2 batteries of 170 Ah each.

### Crane superstructure

<b>Superstructure frame</b>	Liebherr-slewing platform frame, consisting of slewing platform with winch IV and removable A-frame, connected to the centre section by a roller slewing bearing.
<b>Crane engine with sound insulation</b>	8-cylinder diesel engine, make Liebherr, water cooled, rated power 455 kW (618 h.p.), max torque 2546 Nm. Fuel tank approx. 820 l, exhaust emission according to directive 97/68/EG and EPA/CARB.
<b>Winch I</b>	Standard hoist drum, hydraulically driven by axial-piston swivel pumps with integrated planetary gear.
<b>Winch IV</b>	Boom hoist.

<b>Reeving winch</b>	Auxiliary winch for the reeving of ropes.
<b>Slewing gear</b>	1 slewing gear, hydraulically powered by axial-piston swivel pump, with integrated planetary gear.
<b>Crane cabin</b>	Air conditioned crane cabin tiltable to the rear with safety glazing, heat insulating glass, roof window with bullet proof glass, standardized control units ergonomically positioned. Additional thermostatically controlled hot water heating.
<b>Crane control</b>	Setting of configuration data by convenient interactive functions. All crane movements are initiated by means of two 4-way joystick hand levers and two 2-way hand/foot levers. All working movements are independently controllable.
<b>Safety devices</b>	Hoist limit switch. Safety valves against hose and pipe rupture. Drum switch limit at 3 rest layers. Wind speed gauge. Electronic inclination indicator. Aircraft warning control light.
<b>Camera observation</b>	2 colour-screens, 3 cameras for winches and rear area.
<b>Counterweight</b>	2 brackets 10 t each. Total counterweight at superstructure 245 t. 18 ballast plates 12.5 t each (option).

### Boom system

<b>Main boom S</b>	System 2826 with head section for max. 400 t (optional 600 t) load capacity. Boom length S 21 m – 84 m. Boom length SDB 35 m – 140 m with derrick system.
<b>Lattice type luffing fly jib W</b>	System 2421 with head section for max. 400 t load capacity. Luffing jib lengths 28 m – 105 m. Winch V is needed for all luffing jib operations.
<b>Fixed lattice fly jib F</b>	System 1916 with head section for max. capacity of 150 t, attachable at 10°, 15° and 30°, jib lengths F 12 m – F 21 m.
<b>Wind plant jib HS</b>	Auxiliary jib 120 t / 6 m for erection of wind power plants. Mounting to various SL-booms.
<b>Derrick system D</b>	System 2421 including guy rods. Winch III is needed for all derrick operations.
<b>Counterweight frame B</b>	For max. derrick counterweight of 400 t, for infinitely variable radius from 13 m – 18 m resp. 15 m – 20 m.
<b>Derrick-Counterweight</b>	Plates for a total of 400 t (option).
<b>Heavy duty jib WV</b>	Use of existing parts of the luffing jib + additional WV-adapter. Mountable on S-main boom; tiltable between 12° and 20°. Length 14 m – 21 m.
<b>Winch II</b>	Second hoist winch.
<b>Winch III</b>	Reeving main boom / Derrick operation.
<b>Winch V</b>	Luffing for W-jib configuration.
<b>Winch VI</b>	Auxiliary hoist gear.
<b>Boomnose 60 t</b>	For attaching to the S or SL, W, WV head.

### Additional equipment

<b>Pin pulling device</b>	Including mobile hydraulic aggregate. For assembly/disassembly of the pins at S and W intermediate sections.
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Other items of equipment available on request.  
 Standard equipment and options according to effective price list.



## Technische Beschreibung

### Technical description

Description techniques • Descrizione tecnica

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Capacité max.	750 t pour une portée de 8 m. Système S2DB avec S 35 m.
Couple de charge max.	9.864 tm – 548 t pour une portée de 18 m. Système S6D2B avec S 59 m et D 42 m.

## Châssis porteur

<b>Châssis</b>	Châssis avec fût central résistant à la torsion, de fabrication Liebherr, en acier à grains fins très résistant.
<b>Stabilisateurs</b>	Quatre poutres télescopiques à déploiement hydraulique, avec vérins de calage hydrauliques.
<b>Moteur</b>	Diesel Liebherr 8 cylindres, à refroidissement par eau, puissance : 505 kW (686 ch). Couple maxi : 3000 Nm. Emissions polluantes : conformes aux normes 97/68/EG ou EPA/CARB. Capacité du réservoir : 600 l.
<b>Réducteurs</b>	Système de réducteurs automatique avec convertisseur-embayage, marque ZF, de type TC-TRONIC avec 12 marches AV et 2 marches AR, boîte de transfert avec différentiel longitudinal auto-bloquant.
<b>Essieux</b>	Essieux robustes. Tous essieux directeurs, essieux 1, 2, 4 et 6 moteurs à planétaires, essieu 4 avec différentiel longitudinal, essieux 4 et 6 avec différentiel transversal.
<b>Suspension</b>	Tous les essieux sont suspendus hydropneumatiquement avec une régulation automatique de niveau. Compensation de charge entre les paires d'essieux 1 + 2, 3 + 4, 5 + 6 et 7 + 8. Suspension à blocage hydraulique.
<b>Pneumatiques</b>	16 fois, chaque essieu est équipé de pneus. Monte de pneumatiques : 505/95 R 25 (18.00 R 25).
<b>Direction</b>	Direction hydraulique semi-bloc ZF, 2 circuits avec servocommande hydraulique et pompe de secours supplémentaire, entraînée par l'essieu, action sur les essieux 1 – 4 liés mécaniquement. En mode de déplacement sur route, direction électro-hydraulique des essieux 5 – 8 et conduite en ligne droite activée pour les essieux 5 + 6 à partir de 30 km/h. En fonction de l'angle de braquage de l'essieu avant, direction «active» des essieux 7 + 8 en fonction de la vitesse jusqu'à 60 km/h, et au-delà de 60 km/h conduite en ligne droite activée et essieu 7 bloqué.
<b>Freins</b>	Frein de service : servo-frein pneumatique pour toutes les roues, 2 circuits. Freins supplémentaires : frein avec clapet sur échappement, ralentisseur, monté sur boîte de vitesses TC-TRONIC, frein Telma (en option). Frein à main : accumulateur à ressort, action sur toutes les roues des essieux 3, 6 et 8.
<b>Cabine porteur</b>	Cabine spacieuse en tôle électrozinguée, suspension par silent blocs. Vitres de sécurité.
<b>Circuit électrique</b>	Technologie de bus de données moderne, courant continu 24 Volts, 2 batteries de chacune 170 Ah.

## Partie tournante

<b>Cadre de la partie tournante</b>	Le cadre de la partie tournante Liebherr est composé de la partie tournante avec treuil IV et du chevalet démontable A, il est relié à la partie centrale du train de roulement par une couronne d'orientation à rouleaux.
<b>Moteur de la grue avec isolation phonique</b>	Diesel Liebherr 8 cylindres, refroidissement par eau, puissance 455 kW (618 ch), couple de rotation max. 2546 Nm. Réservoir de carburant : env. 820 l. Emissions polluantes conformes aux normes 97/68/EG et EPA/CARB.
<b>Treuil I</b>	Treuil de levage standard, il est entraîné hydrauliquement par des pompes à débit variable à pistons axiaux avec réducteur planétaire intégré.
<b>Treuil IV</b>	Mécanisme de relevage.
<b>Treuil de mouflage</b>	Treuil auxiliaire pour le mouflage des câbles.

<b>Mécanisme d'orientation</b>	1 mécanisme d'orientation, il est entraîné hydrauliquement par des pompes à débit variable à pistons axiaux avec réducteur planétaire intégré.
<b>Cabine du grutier</b>	La cabine du grutier est climatisée, inclinable vers l'arrière, possède un vitrage de sécurité, un vitrage isolant thermiquement, une fenêtre de toit en verre blindé, des unités de commande normalisées disposées de façon ergonomique. Chauffage d'appoint et chauffage de l'eau régulé thermostatiquement.
<b>Commande de la grue</b>	Entrée des données de configuration par des fonctions interactives simples. Tous les mouvements de la grue sont commandés par deux manipulateurs à 4 voies et deux pédales/levier à 2 voies. Tous les mouvements de travail peuvent être commandés indépendamment.
<b>Dispositifs de sécurité</b>	Interrupteur de fin de course. Clapets de sécurité contre les ruptures de tuyaux et de flexibles. Coupure de fin de course du tambour avec 3 enroulements de sécurité. Anémomètre de sécurité. Inclinomètre électronique. Balise aérienne.
<b>Contrôle vidéo</b>	2 écrans couleur, 3 caméras pour la zone de treuils et la partie arrière.
<b>Contrepoids</b>	2 consoles de 10 t chacune. Contrepoids total 245 t. 18 plaques de lest à 12,5 t (option).

## Système de flèche

<b>Flèche principale S</b>	Système 2826 avec élément de tête pour une capacité max. de 400 t (en option 600 t). Longueur de la flèche S 21 m – 84 m. Longueur de la flèche SDB 35 m – 140 m avec système derrick.
<b>Fléchette treillis à volée variable W</b>	Système 2421 avec élément de tête pour une capacité max. de 400 t. Longueurs de flèche treillis 28 m – 105 m. Le treuil V est nécessaire pour fonctionnement fléchette treillis.
<b>Fléchette treillis fixe F</b>	Système 1916 avec élément de tête pour une capacité max. de 150 t, montage possible sous 10°, 15° et 30°. Longueurs de flèche F 12 m – F 21 m.
<b>Fléchette éolien HS</b>	Fléchette auxiliaire 120 t / 6 m pour éolien. Montage de différentes flèches SL.
<b>Système derrick D</b>	Le système 2421 comprend des tirants. Le treuil III est nécessaire au mode derrick.
<b>Palette de lest B</b>	Pour un contrepoids derrick max. de 400 t et rayons vari-ables progressivement de 13 m – 18 m ou 15 m – 20 m.
<b>Contrepoids derrick</b>	Plaques de poids total de 400 t (option).
<b>Fléchette pour charge lourde WV</b>	Utilisation d'éléments existant de la fléchette à volée variable + adaptateur additionnel WV. Montage possible au niveau de la flèche S entre 12° et 20°. Longueur 14 m – 21 m.
<b>Treuil II</b>	2. treuil de levage.
<b>Treuil III</b>	Réglage flèche principale/mode derrick.
<b>Treuil V</b>	Réglage fléchette treillis à volée variable.
<b>Treuil VI</b>	Treuil de levage auxiliaire.
<b>Poulies en extrémité de mât 60 t</b>	Pour le montage sur la tête S ou SL, W, WV.

## Équipement additionnel

<b>Dispositif d'extraction des axes</b>	Il est constitué du composant hydraulique mobile. Il sert à l'insertion et l'extraction d'axes des éléments intermédiaires S et W.
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D'autres équipements additionnels sont disponibles sur demande. Les équipements de série et les options correspondent à la liste de prix actuelle.

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Capacità max.	750 t a 8 m di raggio di lavoro Sistema S2DB con S 35 m.
Momento di carico max.	9.864 tm – 548 t a 18 m di raggio di lavoro Sistema S6D2B con S 59 m e D 42 m.

### Autotelaio

<b>Telaio</b>	Di produzione Liebherr, struttura di tipo scatolato, in acciaio a grana fine ad alta rigidità torsionale.
<b>Stabilizzatori</b>	Quattro travi di stabilizzazione ad apertura idraulica con cilindri idraulici stabilizzatori.
<b>Motore</b>	8 cilindri diesel di produzione Liebherr, raffreddato ad acqua, potenza 505 kW (686 CV). Coppia massima 3000 Nm. Emissioni gas di scarico conformi alle normative 97/68/EG oppure EPA/CARB. Serbatoio carburante: 600 l.
<b>Cambio</b>	Cambio automatizzato ZF TC TRONIC con convertitore di coppia, 12 marce in avanti e 2 retromarce, riduttore ripartitore con differenziale longitudinale bloccabile.
<b>Assi</b>	Assi robusti, tutti gli assi sterzanti, assi 1, 2, 4 e 6 sono assi epicicloidali traenti, asse 4 con differenziale longitudinale, asse 4 e 6 con differenziale trasversale.
<b>Sospensioni</b>	Tutti gli assi con sospensione idropneumatica bloccabile idraulicamente ed un sistema di livellamento automatico. Il carico viene ripartito tra le coppie di assi.
<b>Pneumatici</b>	Tutti gli assi sono equipaggiati con pneumatico singolo. 16 gomme. Dimensione: 505/95 R 25 (18.00 R 25).
<b>Sterzo</b>	Sterzata idraulica ZF, 2 circuiti idraulici con sterzata idraulica servo-assistita e pompa di riserva addizionale, azionata dagli assi, funzionante con gli assi 1 – 4 collegati tra di loro meccanicamente. Durante guida su strada gli assi 5 – 8 sterzano elettroidraulicamente e a partire da 30 km/h gli assi 5 + 6 vengono bloccati su traiettoria dritta. Gli assi 7 + 8 vengono sterzati in base alla velocità a partire da 60 km/h in base all'angolo di sterzata dell'asse anteriore attivo e oltre 60 km/h posizionati in traiettoria dritta, in cui anche il 7° asse viene ulteriormente bloccato.
<b>Freni</b>	Freno di servizio: pneumatico, servoassistito, a doppio circuito. Freno addizionale: valvola agente su impianto di scarico, retarder, cambio TC TRONIC, freno elettromagnetico Telma (optional). Freno a mano: di tipo meccanico agente su assi 3, 6 e 8.
<b>Cabina guida</b>	Cabina spaziosa in lamiera d'acciaio zincato, montata su sospensione elastica, con vetratura di sicurezza.
<b>Impianto elettrico</b>	Moderna tecnica di trasmissione "data bus", corrente continua di 24 Volt, 2 batterie con ciascuna 170 Ah.

### Torretta

<b>Telaio ralla di rotazione</b>	Telaio ralla di rotazione Liebherr, costituito da ralla di rotazione con IV argano e cavalletto per montaggio del braccio asportabile. Collegato alla sezione centrale cingolata grazie a ralla di rotazione.
<b>Motore gru con isolamento acustico</b>	Motore diesel 8 cilindri Liebherr, raffreddamento ad acqua, 455 kW (618 CV), coppia max. 2546 Nm. Serbatoio carburante ca. 820 l. Emissioni gas di scarico in base alle direttive CE 97/68 e EPA/CARB.
<b>Argano 1</b>	Argano standard, azionamento idraulico con pompe a cilindrata variabile a pistoni assiali con riduttore epicicloidale integrato.

<b>Argano IV</b>	Argano per impennamento del braccio.
<b>Verricello per armare le funi</b>	Verricello ausiliario per armamento funi.
<b>Motore di rotazione</b>	1 motore di rotazione, azionamento idraulico con pompe a cilindrata variabile a pistoni assiali con riduttore epicicloidale integrato.
<b>Cabina gru</b>	Cabina gru climatizzata, reclinabile con vetratura di sicurezza, vetri a isolamento termico, tettuccio con vetro di sicurezza, unità comandi standard e ergonomiche. Riscaldamento addizionale ad acqua regolabile termostaticamente.
<b>Comandi gru</b>	Inserimento dei dati configurazione grazie a semplici funzioni interattive. Tutte le movimentazioni gru vengono comandate da due manipolatori principali a 4 movimenti e due pedali a 2 movimenti. Tutte le movimentazioni di lavoro possono essere eseguiti indipendentemente.
<b>Dispositivi di sicurezza</b>	Interruttore fine corsa. Valvola di sicurezza per evitare rottura dei tubi. 3 avvolgimenti di sicurezza della fune sui tamburi argani. Anemometro. Indicatori elettronici di inclinazione. Dispositivo segnalazione luci aeree.
<b>Telecamera controllo</b>	2 telecamere con monitor a colori. 3 telecamere per gli argani e per la parte posteriore.
<b>Contrappeso</b>	2 piastre da 10 t cadauna. Contrappeso totale 245 t. 18 piastre zavorra da 12,5 t cadauna (optional).

### Sistemi braccio

<b>Braccio principale S</b>	Sistema 2826 con testa braccio per portata max. 400 t (optional 600 t). Lunghezza braccio S 21 m – 84 m. Lunghezza braccio SDB 35 m – 140 m con sistema Derrick.
<b>Falcone variabile W</b>	Sistema 2421 con testa braccio per portata max. 400 t. Lunghezza braccio 28 m – 105 m. Per l'utilizzo del falcone variabile è necessario l'argano V.
<b>Falcone fisso F</b>	Sistema 1916 con testa braccio per portata max. 150 t regolabile a 10°, 15° e 30°. Lunghezza braccio F 12 m – 21 m.
<b>Falcone per montaggio turbina eolica HS</b>	Falcone ausiliario 120 t / 6 m per montaggio turbina eolica. Montaggio con vari sistemi di braccio SL.
<b>Sistema Derrick D</b>	Sistema 2421 inclusi gli stralli. Per l'utilizzo del braccio Derrick è necessario l'argano III.
<b>Telaio per contrappeso B</b>	Per max. 400 t di zavorra Derrick e raggi variabili da 13 m – 18 m o 15 m – 20 m.
<b>Zavorra Derrick</b>	Piastre con contrappeso totale di 400 t (optional).
<b>Falcone per carichi pesanti WV</b>	Utilizzo di elementi del falcone + adattatore WV addizionale. Montabile sul braccio S tra 12° e 20°. Lunghezza 14 m – 21 m.
<b>Argano II</b>	2. argano.
<b>Argano III</b>	Regolazione braccio principale/utilizzo Derrick.
<b>Argano V</b>	Regolazione falcone variabile.
<b>Argano VI</b>	Argano ausiliario.
<b>Runner 60 t</b>	Per montaggio su testa braccio S o SL, W, WV.

### Equipaggiamento addizionale

<b>Dispositivo per estrazione perni</b>	Inclusa centralina per inserimento e estrazione perni degli elementi intermedi del braccio S e W.
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Ulteriore equipaggiamento su richiesta.  
 Equipaggiamento di serie e optional conforme al listino prezzi attuale.

## Technische Beschreibung

### Technical description

Description techniques • Descrizione tecnica

Descripción técnica • Техническое описание

Máx. capacidad de carga	750 t para 8 m de radio de trabajo. Sistema S2DB – con 35 m de S.
Momento de carga máx.	9.864 tm – 548 t para 18 m de radio de trabajo. Sistema S6D2B – con 59 m de S y 42 m de D.

## Chasis

<b>Bastidor</b>	Fabricado por Liebherr en acero de grano fino de alta resistencia, resistente a la torsión.
<b>Estabilizadores</b>	Cuatro vigas hidráulicas de apoyo en cruz.
<b>Motor</b>	Diesel de 8 cilindros, marca Liebherr, refrigerado por agua, potencia 505 kW (686 CV), par de giro máximo 3000 Nm. Según norma 97/68/CEE y EPA/CARB. Depósito de combustible: 600 l.
<b>Caja de cambios</b>	Caja de cambio automática con convertidor, fabricación ZF, Tipo TC-TRONIC de 12 velocidades delanteras y 2 marcha atrás, caja transfer con diferencial de bloqueo longitudinal.
<b>Ejes</b>	Ejes de chasis de fabricación reforzada. Todos los ejes direccionales, Ejes 1, 2, 4 y 6 son ejes planetarios, eje 4 con diferencial longitudinal, ejes 4 y 6 con diferencial transversal.
<b>Suspensión</b>	Todos los ejes están provistos de suspensión hidroneumática con regulación automática de nivel. Compensación de presión entre los pares de ejes. Suspensión bloqueable por sistema hidráulico.
<b>Cubiertas</b>	16 cubiertas, montaje de rueda simple en todos los ejes. Tamaño de cubiertas: 505/95 R 25 (18.00 R 25).
<b>Dirección</b>	ZF-semibloque para dirección hidráulica. Doble circuito con sistema servo-hidráulico con bomba auxiliar adicional, accionados por eje, actuando sobre ejes 1 – 4 conectados mecánicamente. En conducción por carretera los ejes 5 – 8 se manejan electrohidráulicamente. A partir de 30 km/h los ejes 5 + 6 quedan centrados y fijados en línea recta. Los ejes 7 + 8 se manejan como „dirección activa“ en función de la velocidad hasta los 60 km/h dependiendo del giro del volante, y al sobrepasar los 60 km/h se fijan en línea recta, bloqueando además el séptimo eje.
<b>Frenos</b>	Freno de servicio: servofreno por aire comprimido accionando sobre todas las ruedas, doble circuito. Frenos adicionales: freno motor, retardador, integrado en caja de cambios, freno eléctrico Telma (opcional). Freno de mano: por acumuladores de muelle en todas las ruedas de la los ejes 3, 6 y 8.
<b>Cabina</b>	Cabina espaciosa fabricada totalmente en chapa de acero, montada sobre suspensión elástica, acristalamiento de seguridad.
<b>Sistema eléctrico</b>	Moderna tecnología de bus de datos, 24 voltios de corriente continua, 2 baterías con 170 Ah cada una.

## Superestructura

<b>Bastidor de superestructura</b>	Bastidor de superestructura Liebherr, compuesto por superestructura con cabrestante IV y caballete A desmontable, unida a la estructura central mediante una corona de giro de rodillos.
<b>Motor de grúa con aislamiento de ruidos</b>	Diesel de 8 cilindros, Fabricante Liebherr, refrigerado por agua, potencia 455 kW (618 CV), par de giro máx. 2546 Nm. Depósito de combustible alrededor 820 l. Según norma 97/68/CEE y EPA/CARB.
<b>Cabrestante I</b>	Cabrestante estándar, accionado hidráulicamente, con bombas variables con pistones axiales con caja de transferencia integrada.
<b>Cabrestante IV</b>	Sistema de elevación.
<b>Cabrestante de reenvíos</b>	Cabrestante auxiliar para reenvíos.

<b>Mecanismo de giro</b>	1 mecanismo de giro, accionados hidráulicamente con bomba variable de pistones axiales con caja de transferencia integrada.
<b>Cabina de grúa</b>	Cabina de grúa climatizada inclinable hacia atrás con acristalamiento de seguridad, cristal con sistema de reducción de calor, cristal antichoque en techo de grúa, sistema de mando normalizado y ergonómico. Calefacción adicional regulada con termostato.
<b>Pilotaje de grúa</b>	Los datos de configuración se introducen a través de funciones interactivas sencillas. Todos los movimientos se efectúan a través de dos joysticks de 4 movimientos así como también dos movimientos son accionables desde el mando o pedal. Todos los movimientos de trabajo son accionables de forma independiente.
<b>Dispositivos de seguridad</b>	Interruptor de fin de carrera de elevación, válvulas de seguridad contra rotura de tuberías y latiguillos. Final de carrera de cabrestante, con 3 vueltas de seguridad. Anemómetro. Dispositivo de inclinación electrónico. Baliza aérea.
<b>Supervisión por cámara</b>	2 monitores a color, 3 cámaras para zona de cabrestante y parte trasera.
<b>Contrapeso</b>	2 consolas con cada una de 10 t. Contrapeso total de 245 t. 18 placas de contrapeso a 12,5 t cada una (opción).

## Sistemas de pluma

<b>Pluma principal S</b>	Sistema 2826 con cabezal para máx. capacidad de carga de 400 t (opcional 600 t). Longitud de pluma S 21 m – 84 m. Longitud de la pluma SDB 35 m – 140 m con sistema Derrick.
<b>Plumín abatible W</b>	Sistema 2421 con cabezal para capacidad de carga máx. de 400 t. Longitud del plumín abatible 28 m – 105 m. Para servicio del plumín abatible se precisa cabrestante V.
<b>Plumín fijo F</b>	Sistema 1916 con cabezal para capacidad de carga máx. de 150 t, montable bajo 10°, 15° y 30°. Longitud de la pluma F 12 m – F 21 m.
<b>Plumín para energía eólica HS</b>	Plumín auxiliar 120 t / 6 m para montaje de aerogeneradores. Montaje en diferentes configuraciones de SL.
<b>Sistema Derrick D</b>	Sistema 2421 incluidos tirantes de sujeción. Para el servicio del sistema Derrick se precisa el cabrestante III.
<b>Bandeja de contrapeso B</b>	Para un contrapeso máx. Derrick de 400 t con radios variables radios escalonados de 13 m – 18 m o 15 m – 20 m.
<b>Contrapeso Derrick</b>	Placas con peso total de 400 t (opción).
<b>Cabezal de plumín WV</b>	Utilización de las piezas disponibles del plumín abatible + adaptador WV adicional. Montable en la pluma S entre 12° y 20°. Longitud de 14 m – 21 m.
<b>Cabrestante II</b>	Cabrestante II.
<b>Cabrestante III</b>	Abatimiento de la pluma principal / servicio Derrick.
<b>Cabrestante V</b>	Abatimiento del plumín abatible.
<b>Cabrestante VI</b>	Cabrestante auxiliar.
<b>Narices 60 t</b>	Para el montaje en cabezal S o SL, W, WV.

## Equipamiento adicional

<b>Dispositivo para embulonamiento</b>	Incluido dispositivo hidráulico con starter eléctrico. Para embulonar los bulones de los tramos de celosía S y W.
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Otro equipamiento adicional bajo sugerencia. Equipamiento de serie y opciones correspondientes al listado de precios actual.

**Technische Beschreibung**  
**Technical description**  
**Description techniques • Descrizione tecnica**  
**Descripción técnica • Техническое описание**

Макс. грузоподъемность	750 т при вылете 8 м. S2DB – система с S 35 м.
Макс. грузовой момент	9.864 тм – 548 т при вылете 18 м. S6D2B-система с S 59 м и D 42 м.

### Шасси

Рама шасси	Крутильно-жесткая конструкция собственного изготовления из высокопрочной мелкозернистой конструкционной стали.
Выносные опоры	Четыре гидравлически выводимые поворотные балки с гидравлическими опорными цилиндрами.
Двигатель	8-цилиндровый дизельный двигатель Либхерр, водяное охлаждение, мощность 505 кВт (686 л.с.). Максимальный крутящий момент 3000 Нм. Выброс ОГ в соответствии с директивами 97/68/EG или EPA/CARB. Топливный бак: 600 л.
Коробка передач	Автоматизированная коробка передач с блокируемым гидротрансформатором, производство ZF, тип TC-TRONIC, 12 передач переднего и 2 заднего хода, раздаточная коробка с блокируемым продольным дифференциалом.
Мосты	Прочные мосты шасси. Все мосты имеют рулевое управление; мосты 1, 2, 4 и 6 являются приводными планетарными мостами; мост 4 имеет продольный дифференциал, мосты 4 и 6 имеют поперечный дифференциал.
Подвеска	Все мосты имеют гидропневматическую подвеску с автоматическим выставлением уровня. Выравнивание нагрузки на оси между парами осей. Подвеска может быть гидравлически заблокирована.
Шины	16 односкатных шин размером 505/95 R25 (18.00 R25).
Рулевое управление	Полублочное рулевое гидроуправление ZF, 2-контурная система с гидравлическим сервооборудованием и дополнительным резервным насосом, с приводом от оси; действует на механически соединённые друг с другом мосты 1 – 4. При движении по дорогам общего пользования мосты 5 - 8 управляются электрогидравлически; со скорости 30 км/час мосты 5 и 6 выставляются на «движение прямо» и блокируются. Рулевое управление мостами 7 + 8 до скорости до 60 км/час «активно», в зависимости от скорости и угла поворота переднего моста; при скорости более 60 км/час мосты встают в положение движение прямо. 7 мост дополнительно блокируется.
Тормоза	Рабочий тормоз: двух контурная пневматическая система действующая на все колеса. Дополнительные тормоза: моторный тормоз, тормоз-замедлитель, установленный на коробке передач TC-TRONIC, тормоз на вихревых токах Teima (опция). Ручной тормоз: пружинные энергоаккумуляторы, действующий на колёса мостов 3, 6 и 8.
Кабина водителя	Просторная комфортабельная кабина из оцинкованного стального листа, с резиноэластичной подвеской, безопасным остеклением.
Электрооборудование	Цифровая передача данных. Постоянный ток 24 В, 2 аккумуляторные батареи по 170 А/час.

### Поворотная платформа крана

Рама поворотной платформы	Рама поворотной платформы Либхерр, состоящая из поворотной платформы с лебедкой IV и съёмной А-стойки, соединена с гусеничной тележкой через роликовое опорно-поворотное устройство.
Двигатель крана с шумоизоляцией	8-цилиндровый дизель, производство Либхерр, водяное охлаждение, мощность 455 кВт (618 л.с.), макс. крутящий момент 2546 нм. Топливный бак: прим. 820 л. Выброс ОГ в соответствии с директивами по 97/68/EG и EPA/CARB.

Лебедка I	Стандартная грузовая лебедка, гидравлический привод от аксиально-поршневых регулируемых насосов со встроенным планетарным редуктором.
Лебедка IV	Механизм натяжения.
Запасочная лебедка	Вспомогательная лебедка для запасовки канатов.
Механизм поворота	1 механизм поворота, гидравлический привод от аксиально-поршневых регулируемых насосов со встроенным планетарным редуктором.
Кабина крана	Кабина крана с климат-контролем; отклоняется назад; защитное остекление, детермальное стекло, потолочное окно с броневым стеклом, стандартные устройства управления с эргономичным размещением. Дополнительное отопление горячей водой с управлением от термостата.
Управление крана	Ввод данных конфигурации через простые интерактивные функции. Всеми движениями крана можно управлять при помощи двух 4-ходовых коммандо-контроллеров, а также двух 2-ходовых рычагов ручного или ногожного управления. Всеми движениями крана можно управлять независимо друг от друга.
Приборы безопасности	Концевой выключатель подъема, предохранительные клапаны против разрывов труб и шлангов. Отключение по конечному положению канатного барабана с 3-мя предохранительными витками. Предупредительная ветровая сигнализация. Электронная индикация наклона. Сигнальные маяки для самолетов.
Контроль через видеокамеру	2 цветных монитора, 3 камеры заднего вида и контроля лебедок.
Противовес	2 консоли по 10 т. Общий вес противовеса 245 т. 18 плит балласта по 12,5 т (опция).

### Стреловые системы

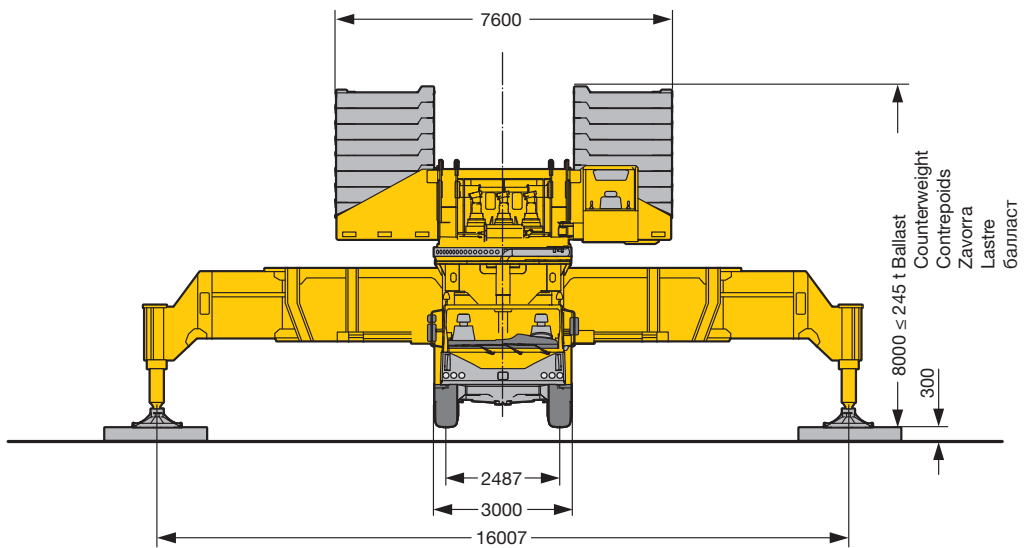
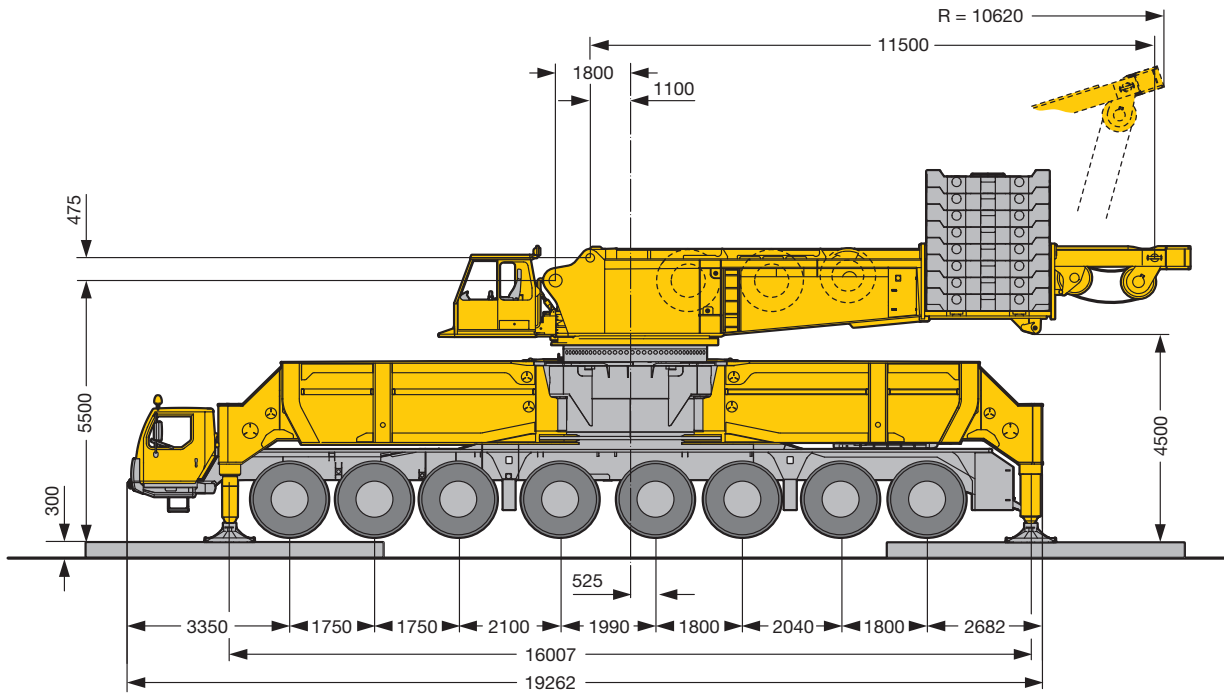
Основная стрела S	Система 2826 с головной секцией для макс. грузоподъемности 400 т (опционально 600 т). Длина стрелы S 21 м – 84 м. Длина стрелы SDB 35 м – 140 м с деррик-системой.
Качающийся решетчатый удлинитель W	Система 2421 с головной секцией для макс. грузоподъемности 400 т. Длина удлинителя с изменяемым вылетом 28 м – 105 м. Для работы удлинителя с изменяемым вылетом требуется лебедка V.
Жесткомонтируемый решетчатый удлинитель F	Система 1916 с головной секцией для макс. грузоподъемности 150 т, устанавливаемая под углами 10°, 15° и 30°. Длина стрелы F 12 м – F 21 м.
Удлинитель для монтажа ветровых генераторов HS	вспомогательный удлинитель 120 т / 6 м для монтажа ветровых генераторов. Монтаж возможен на всех стреловых комбинациях – SL.
Деррик-система D	Система 2421, включая штанги расчала. Для работы в режиме деррика требуется лебедка III.
Основание противовеса B	Для макс. балласта деррика 400 т и плавного изменения радиуса 13 м – 18 м или 15 м – 20 м.
Деррик-балласт	Плиты общим весом 400 т (опция).
Удлинитель большой грузоподъемности WV	Использование имеющихся частей управляемого удлинителя + дополнительный WV-адаптер. Может быть установлен на S-стреле под углом 12° – 20°. Длина 14 м – 21 м.
Лебедка II	2-я грузовая лебедка.
Лебедка III	Наклон главной стрелы / режим деррика.
Лебедка V	Наклон качающегося решетчатого удлинителя.
Лебедка VI	Вспомогательный механизм подъема.
Мачтовый наконечник 60 т	Для установки на оголовке S или SL, W, WV.

### Дополнительное оборудование

Устройство для вытягивания пальцев	Включая мобильный гидравлический агрегат с электростартером. Для установки и извлечения пальцев промежуточных S- и W-секций.
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Другое дополнительное оборудование – по запросу. Серийное оснащение и опции – в соответствии с текущим прайслистом.

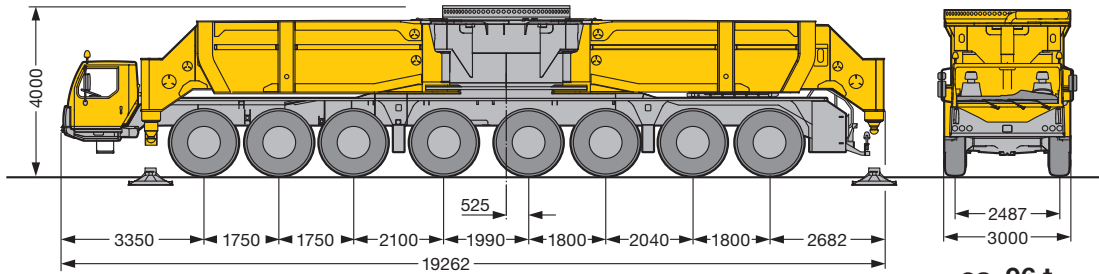
**Maße**  
**Dimensions**  
**Encombremet • Dimensioni**  
**Dimensiones • Габариты крана**



S1575.02



**Maße**  
**Dimensions**  
**Encombremet • Dimensioni**  
**Dimensiones • Габариты крана**

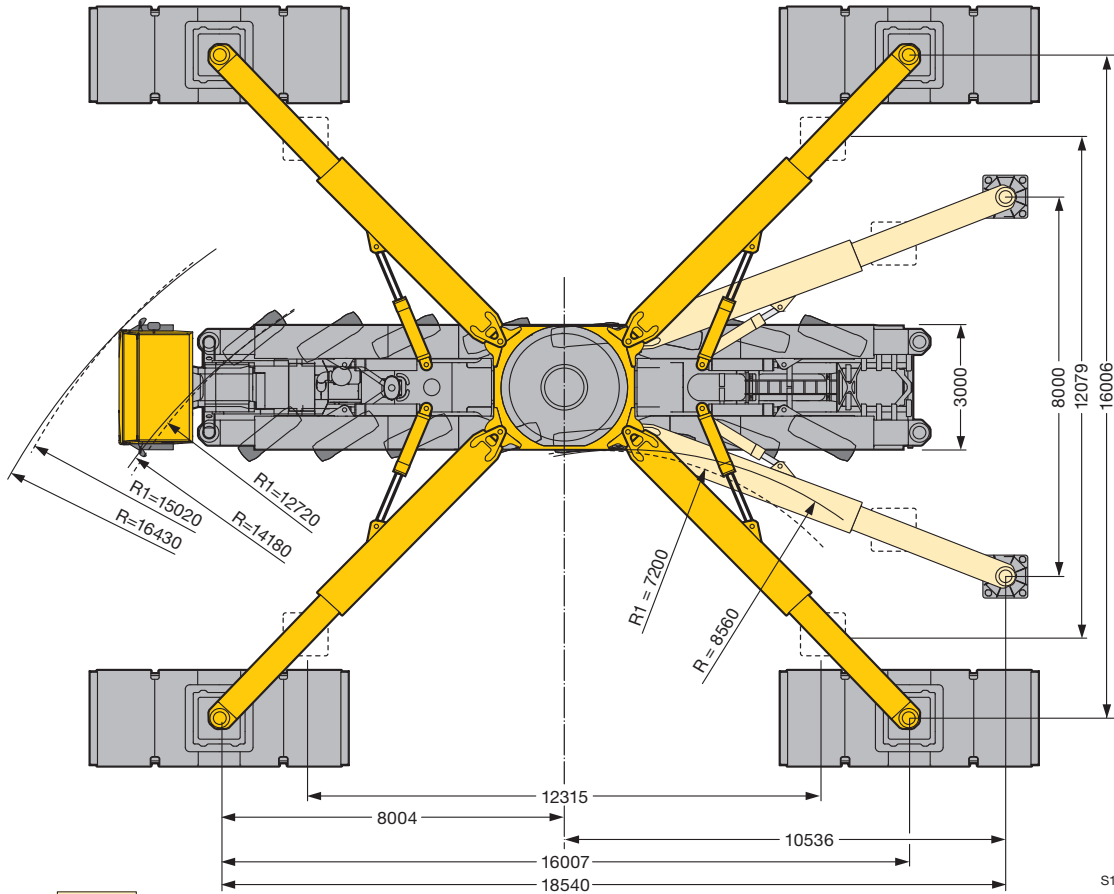


ca. 96 t

Bei Straßenfahrt hintere Klappholme 300 mm ausgefahren.  
 On-road travel rear outriggers 300 mm extended.  
 Pour déplacement sur route sortir les poutres de calage  
 arrière de 300 mm.

Durante la movimentazione su strada i travi stabilizzatori  
 posteriori arrivano fino a 300 mm.  
 Para circular en carretera los largueros de apoyo traseros deben  
 de estar extraídos 300 mm.

В транспортном положении задние опорные балки выдвинуты  
 на 300 мм.



S1325.02

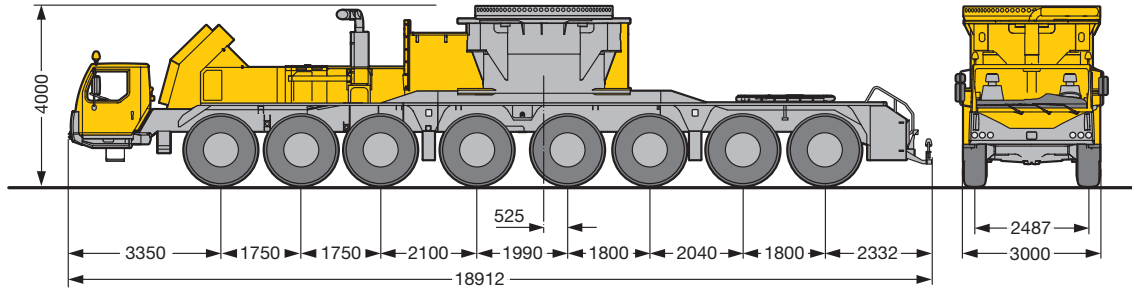
R<sub>1</sub> = Allradlenkung · All-wheel steering · Direction toutes roues · Tutti gli assi sterzanti · Dirección en todos los ejes · Поворот всеми колесами



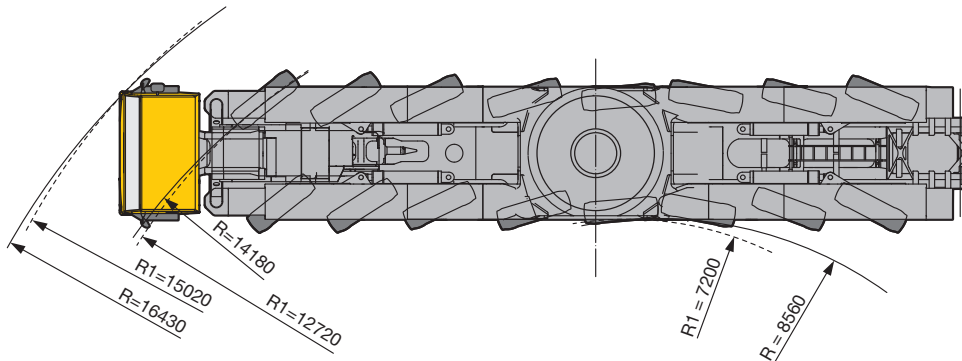
Achse · Axle  
 Essieu · Asse  
 Eje · мост  
 t

Achse · Axle Essieu · Asse Eje · мост t	1	2	3	4	5	6	7	8	Gesamtgewicht t · Total weight t Poids t · Peso totale t Peso t · Вес т
	12	12	12	12	12	12	12	12	96 t

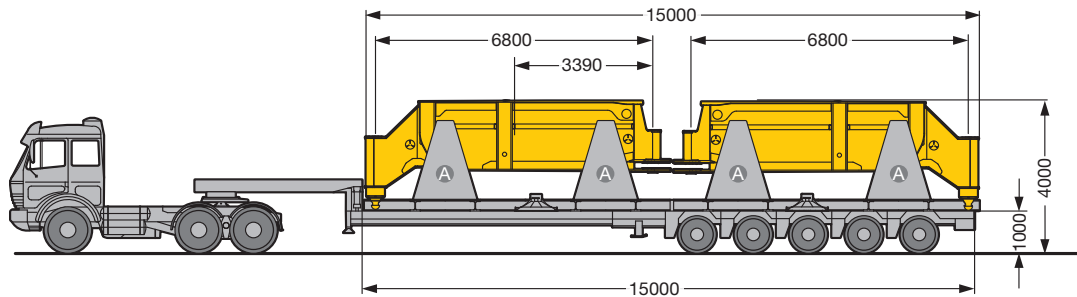
**Maße**  
**Dimensions**  
**Encombrement • Dimensioni**  
**Dimensiones • Габариты крана**



ca. 48 t

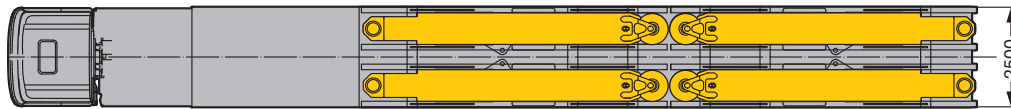


R<sub>1</sub> = Allradlenkung · All-wheel steering · Direction toutes roues · Tutti gli assi sterzanti · Dirección en todos los ejes · Поворот всеми колесами



Ⓐ = Nicht im Lieferumfang enthalten · not included in the scope of delivery · non compris dans le descriptif de livraison · non incluso nella fornitura  
 No incluido en volumen de entrega · не входит в объём поставки

4 x 12 t



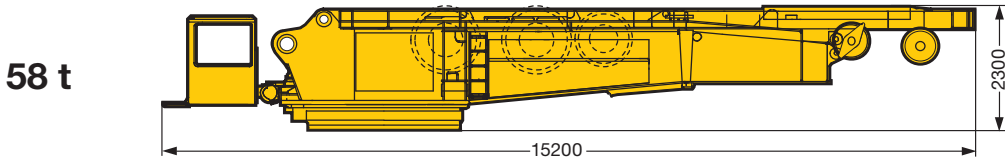
S1326.01



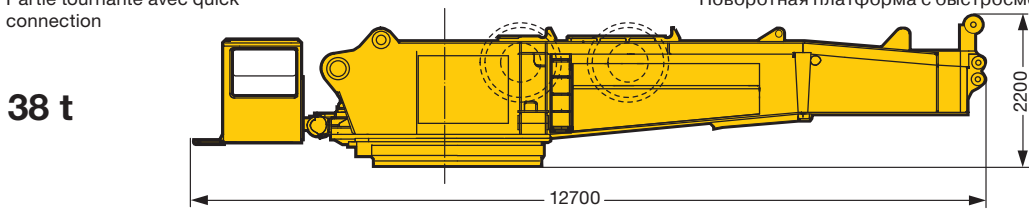
Achse · Axle Essieu · Asse Eje · мост t	1	2	3	4	5	6	7	8	Gesamtgewicht t · Total weight t Poids t · Peso totale t Peso t · Вес т
	6,5	6,5	6,5	6,5	5,5	5,5	5,5	5,5	48

**Transportplan**  
**Transportation plan**  
**Plan de transport · Piano di trasporto**  
**Esquema de transporte · Транспортная схема**

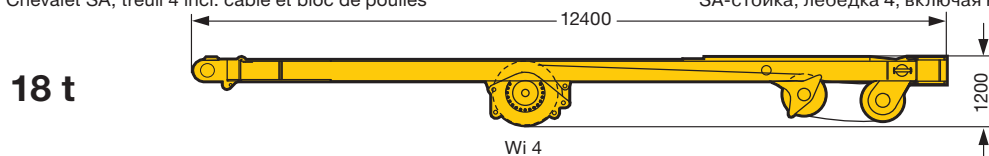
Drehbühne mit SA-Bock, Winde 4, Quick Connection, 2 Drehwerken  
 Superstructure with SA-frame, winch 4, quick connection, 2 slewing gears  
 Partie tournante avec chevalet SA, treuil 4, quick connection, 2 orientations  
 Piattaforma girevole con cavalletto SA, Argano 4, Connessione rapida, 2 gruppi rotazione  
 Superestructura con caballete SA, cabrestante 4, Quick Connection, 2 mecanismos de giro  
 Поворотная платформа с SA-порталом, лебёдкой 4, быстросъёмным поворотным кругом, 2 механизмами поворота



Drehbühne mit Quick Connection  
 Superstructure with quick connection  
 Partie tournante avec quick connection  
 Ralla di rotazione con connessione rapida  
 Superestructura con conexiones rápidas  
 Поворотная платформа с быстросъёмным соединением

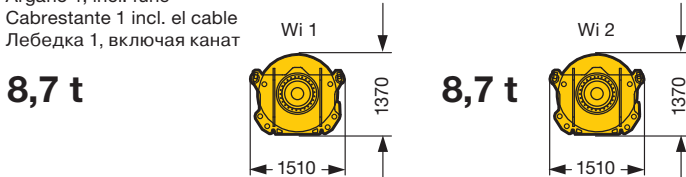


SA-Bock, Winde 4 inkl. Seil und Rollensatz  
 SA-frame, winch 4 incl. rope and pulley block  
 Chevalet SA, treuil 4 incl. câble et bloc de poulies  
 Cavalletto SA, argano 4. incl., fune e set pulegge  
 Caballete SA, cabrestante 4 incl. cable y juego de poleas  
 SA-стойка, лебедка 4, включая канат и канатный блок



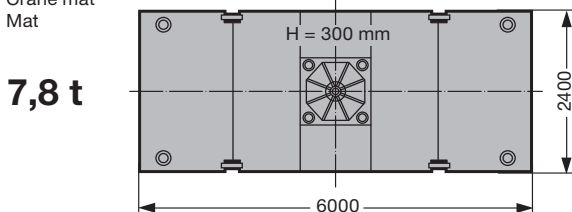
Winde 1 inkl. Seil  
 Winch 1 incl. rope  
 Treuil 1 incl. câble  
 Argano 1, incl. fune  
 Cabrestante 1 incl. el cable  
 Лебедка 1, включая канат

Winde 2 inkl. Seil  
 Winch 2 incl. rope  
 Treuil 2 incl. câble  
 Argano 2, incl. fune  
 Cabrestante 2 incl. el cable  
 Лебедка 2, включая канат



Matratze  
 Crane mat  
 Mat

Stuoia della gru  
 Placas de apoio  
 Опорная плита



S1334.01

Wi = Winde · winch · treuil · argano · cabrestante · лебедка

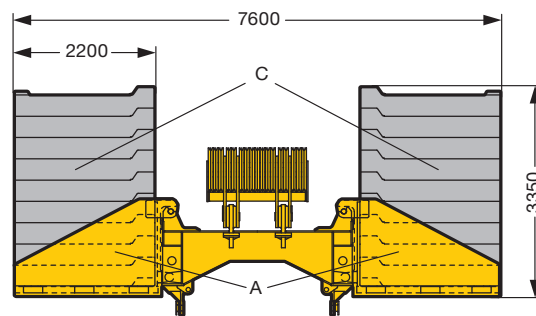


**Transportplan**  
**Transportation plan**  
**Plan de transport · Piano di trasporto**  
**Esquema de transporte · Транспортная схема**

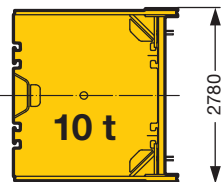
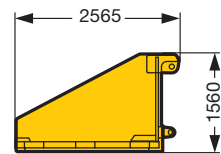
Ballastvarianten  
 Counterweight versions  
 Variantes de contrepoids

Varianti zavorra  
 Configuraciones de contrapeso  
 Варианты противовеса

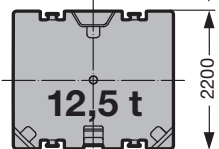
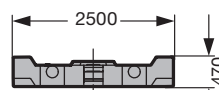
Drehbühnenballast      Zavorra piattaforma girevole  
 CWT at superstructure      Contrapeso superestructura  
 Contrepoids - tourelle      Противовес поворотной платформы



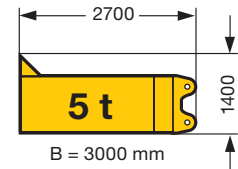
Teil A / Part A / Partie A / Parte A  
 / Pieza A / Часть A



Teil C / Part C / Partie C / Parte C  
 / Pieza C / Часть C



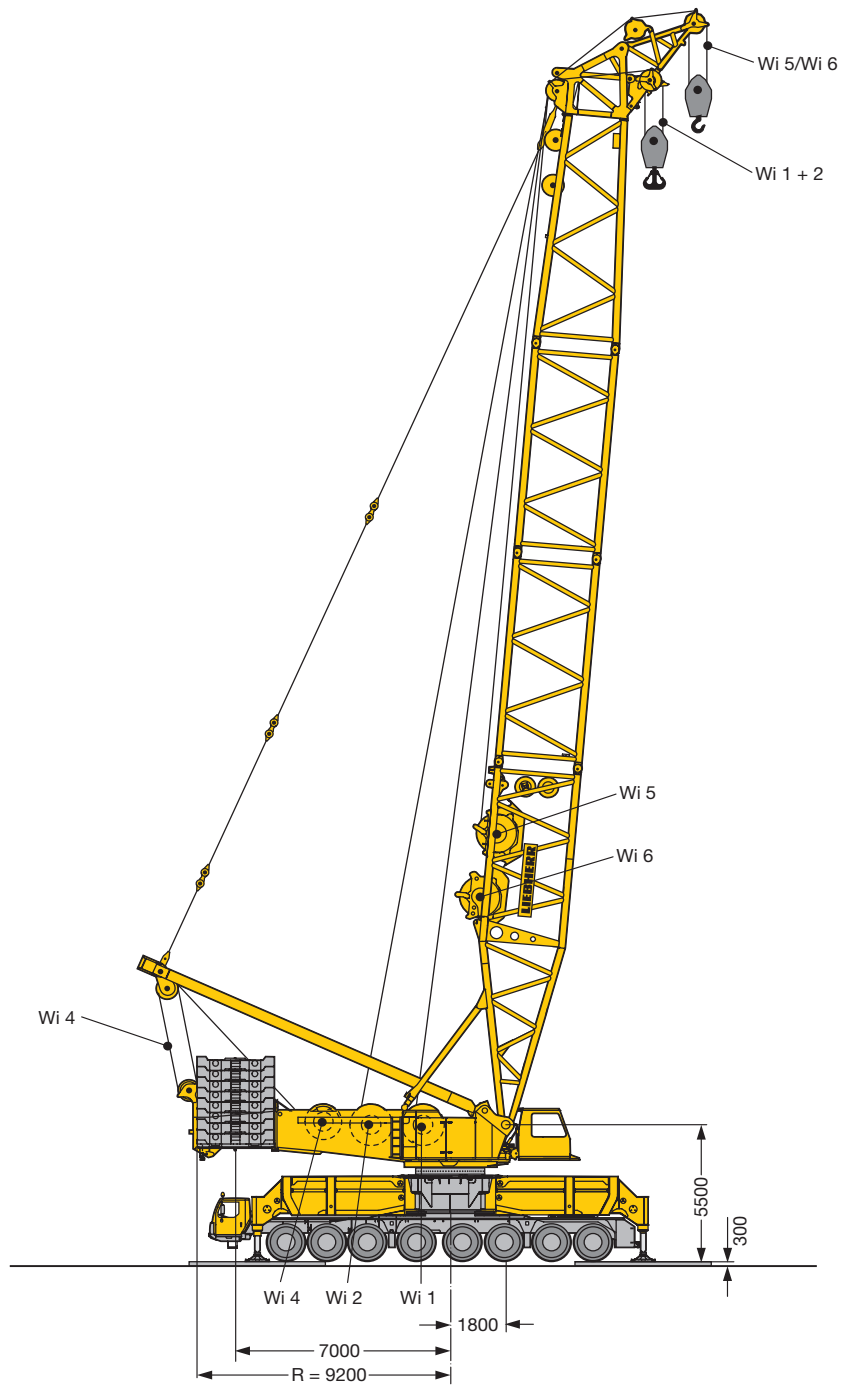
Mit Drehbühnenverlängerung  
 With extension of the  
 superstructure  
 Avec extension de la tourelle  
 Con allungamento piattaforma  
 girevole  
 Con prolongación de  
 superestructura  
 С удлинением поворотной  
 платформы



Mit Drehbühnenverlängerung With extension of the superstructure Avec extension de la tourelle Con allungamento piattaforma girevole Con prolongación de superestructura С удлинением поворотной платформы	Ohne Drehbühnenverlängerung Without extension of the superstructure Sans extension de la tourelle Senza allungamento piattaforma girevole Sin prolongación de superestructura Без удлинения поворотной платформы
-	20 t
50 t	45 t
75 t	70 t
100 t	95 t
125 t	120 t
150 t	145 t
175 t	170 t
200 t	195 t
225 t	220 t
250 t	245 t

S1333.01

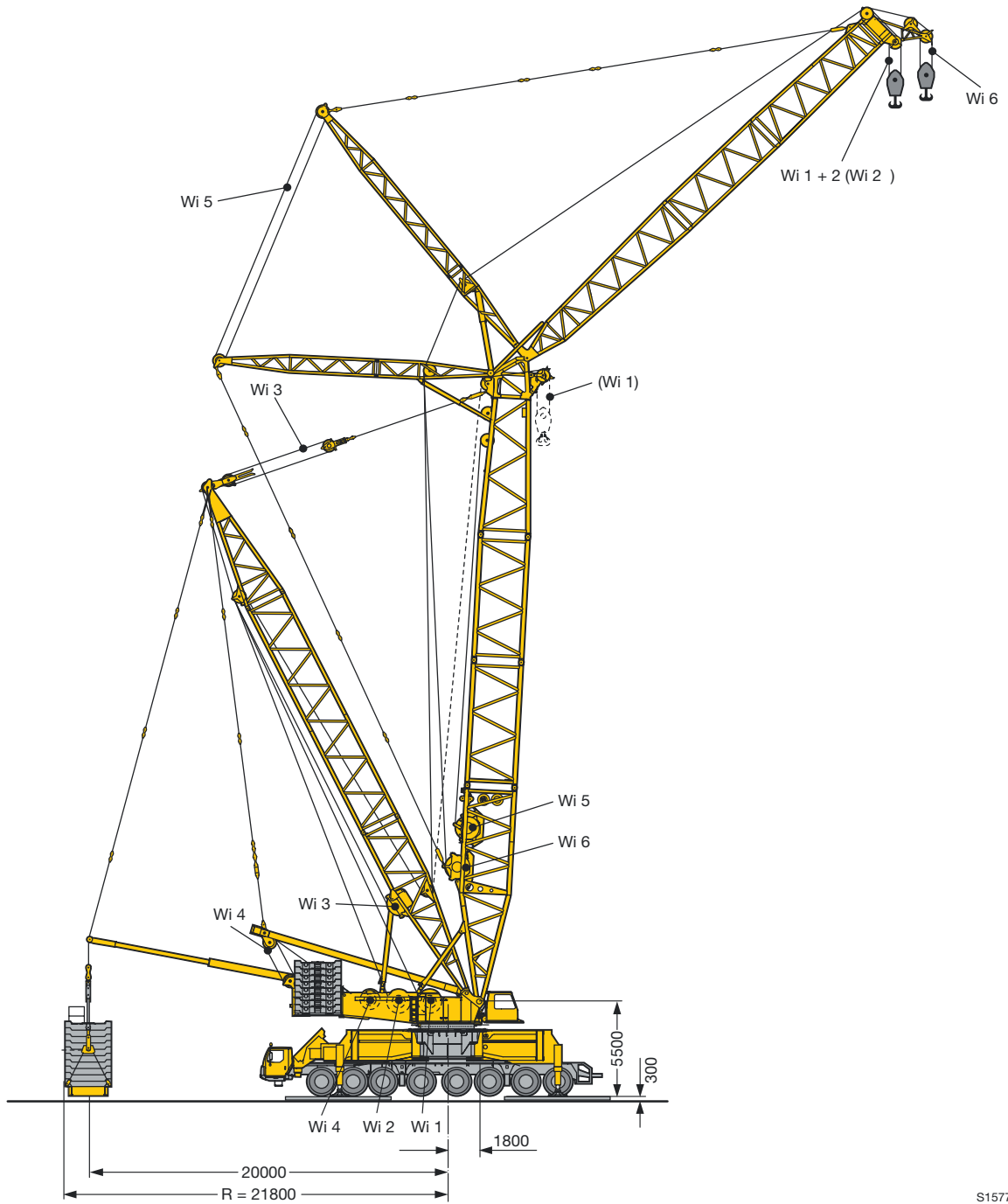
**Maße**  
**Dimensions**  
**Encombremet • Dimensioni**  
**Dimensiones • Габариты крана**



S1576

Wi = Winde · winch · treuil · argano · cabrestante · лебедка







**Maße**  
**Dimensions**  
**Encombremet • Dimensioni**  
**Dimensiones • Габариты крана**



S1577

Wi = Winde · winch · treuil · argano · cabrestante · лебедка

**Winden**  
**Winches**  
**Treuil · Argani**  
**Cabrestantes · Лебедки**



Antriebe · Drive Mécánismes · Meccanismi Accionamiento · Приводы	Geschwindigkeiten · Working speeds Vitesses · Velocità Velocidades · Скорости	Max. Seilzug · Max. single line pull Effort au brin maxi. · Mass. tiro diretto fune Tiro máx. en cable · Макс. тяговое усилие	Seil Ø / Seillänge · Rope diameter / length Diamètre / Longueur du câble · Diametro / lunghezza fune Diámetro / longitud cable · Диаметр / длина каната
	0 – 135 m/min	160 kN	28 mm / 1250 m
	0 – 135 m/min	160 kN	28 mm / 1250 m
	0 – 130 m/min	–	–
	0 – 2 x 75 m/min	–	–
	0 – 135 m/min	–	–
	0 – 135 m/min	160 kN	28 mm / 600 m

**Hakenflaschen · Hook blocks**  
**Moufles à crochet · Bozzello · Pastecas · Крюковые подвески**



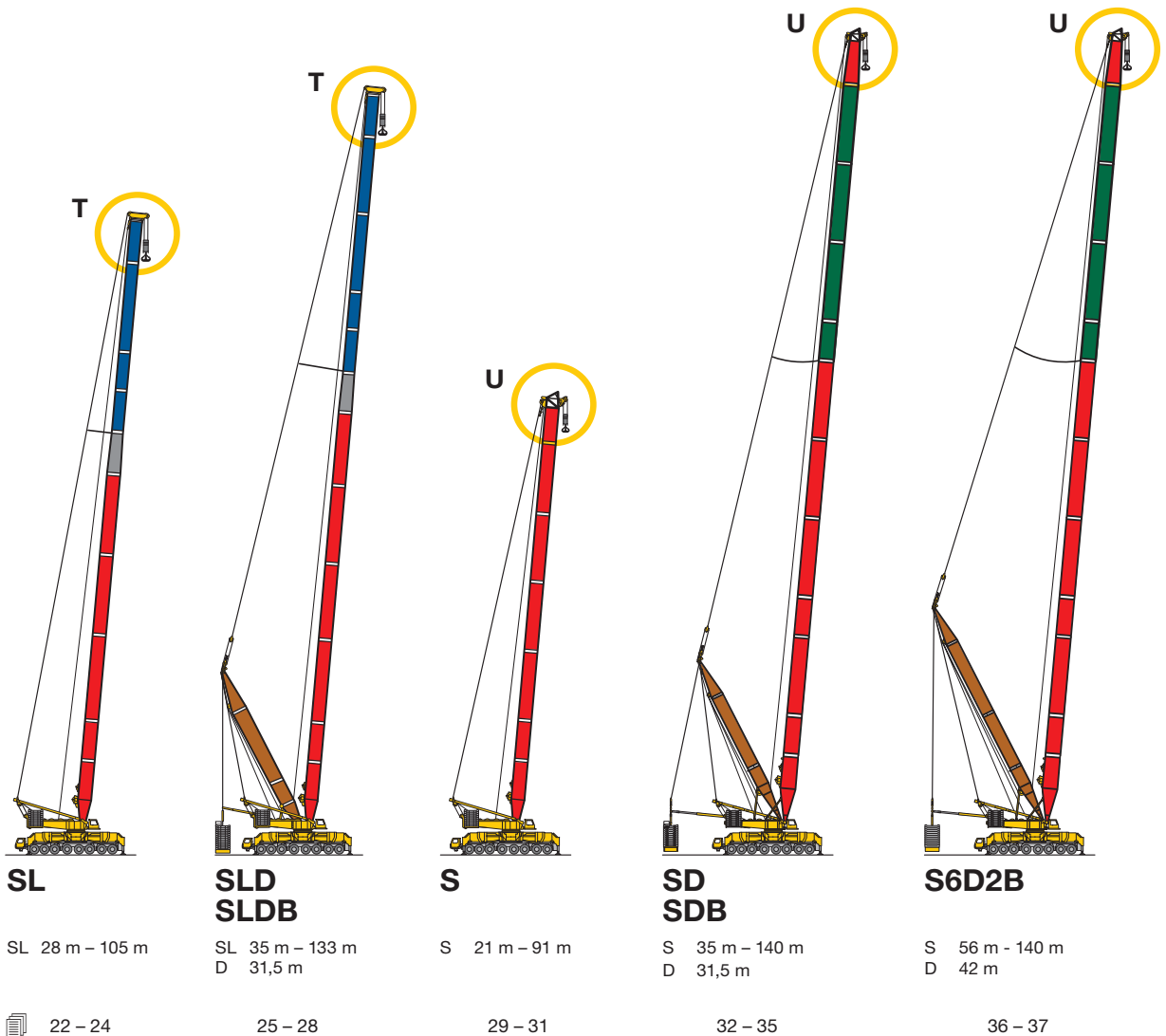
Traglast · Load t Forces de levage · Portata t Capacidad de carga · Грузоподъемность, т	Seil Ø · Rope diameter Diamètre du câble · Diametro fune Diámetro cable · Диаметр каната	Rollen · No. of sheaves Pouilles · Pulegge Ролеас · Канатных блоков	Stränge · No. of lines Brins · Tratti portanti Reenvíos · Запасовка	Gewicht · Weight t Poids · Peso t Peso · Собст. вес, т
600 / 312 t	28 mm	2 x 11	2 x 22	8,2 / 11 – 16 t
400 / 215 t	28 mm	2 x 7	2 x 14	5,5 – 7,5 / 7 – 15 t
320 / 160 t	28 mm	2 x 5	2 x 10	4 – 7 / 5 – 12 t
250 / 125 t	28 mm	2 x 3	2 x 6	3,5 – 11,5 / 2,35 – 6,35 t
200 t	28 mm	5	11	2 – 7 t
125 t	28 mm	3	7	1,5 – 5,5 t
50 t	28 mm	1	3	1 – 3 t
16 t	28 mm	–	1	1,1 t

**Einscherplan · Reeving chart**  
**Tableau de mouflage · Piano per armatura funi · Esquema de reenvíos · Схема запасовки**

Stränge · No. of lines Brins · Tratti portanti Reenvíos · Запасовка	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Max. Traglast · Max. capacity t Capacità maxi. · Max. portata t Cap. de carga máx. t макс. Грузоподъемность, т	16	32	47	62	78	92	107	121	135	149	162	176	189	202	215	228	240	253	265	277	289	300	312
	16 t																						
	47 t																						
	100 t																						
	107 t																						
	160 t																						
	215 t																						
	312 t																						
Stränge · No. of lines Brins · Tratti portanti Reenvíos · Запасовка	2 x 5	2 x 6	2 x 7	2 x 8	2 x 9	2 x 10	2 x 11	2 x 12	2 x 13	2 x 14	2 x 15	2 x 16	2 x 17	2 x 18	2 x 19	2 x 20	2 x 21	2 x 22					
Max. Traglast · Max. capacity t Capacità maxi. · Max. portata t Cap. de carga máx. t макс. Грузоподъемность, т	156	184	214	242	270	298	324	352	378	404	430	456	480	506	530	554	578	600					
	200 t																						
	320 t																						
	400 t																						
	600 t																						

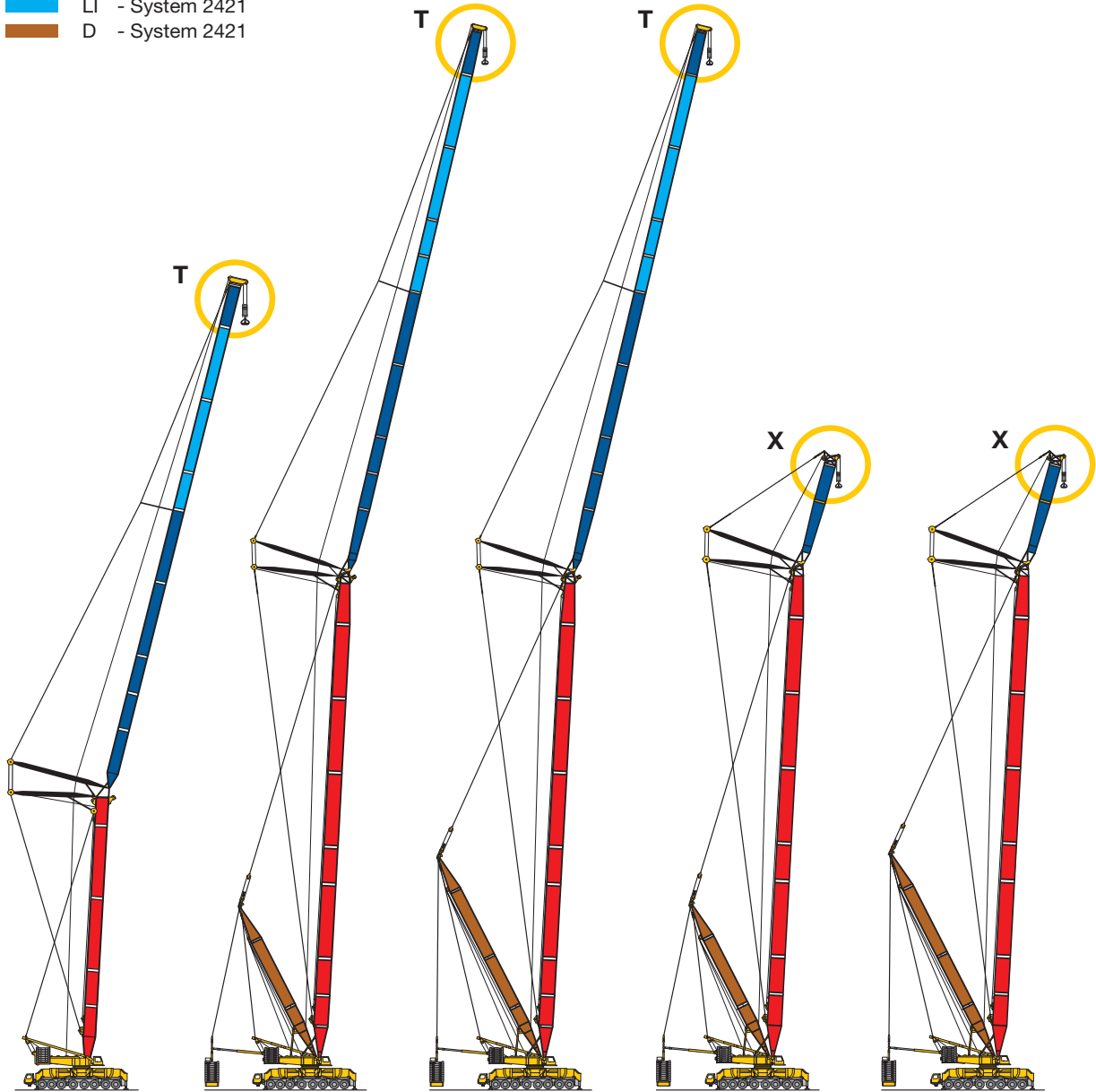
**Auslegersysteme**  
**Boom/jib combinations**  
**Configurations de flèche · Sistema braccio**  
**Sistemas de pluma · Стреловые системы**

- |  |  |   |  |
|--|--|---|--|
| <p><b>S</b> Hauptausleger, schwer<br/>Main boom, heavy<br/>Flèche principale, lourde<br/>Braccio principale, per carichi pesanti<br/>Pluma principal, pesada<br/>Основная стрела, тяжелая</p>  | <p><b>D</b> Derrickauser<br/>Derrick<br/>Flèche derrick<br/>Braccio Derrick<br/>Pluma Derrick<br/>Деррик-стрела</p>  | <p><b>B</b> Schwebeballast<br/>Suspended ballast<br/>Lest suspendu<br/>Zavorra sospesa<br/>Contrapeso flotante<br/>Подвесной противовес</p>   | <p><b>K</b> Knickausleger<br/>Articulated main boom<br/>Flèche à montage articulé<br/>Braccio principale articolato<br/>Pluma de montaje articulada<br/>Шарнирно-сочлененная стрела</p>  |
| <p><b>SL</b> Hauptausleger, schwer/leicht<br/>Main boom, heavy/light<br/>Flèche principale, lourde/légère<br/>Braccio principale, per carichi pesanti/leggeri<br/>Pluma principal, pesada/ligera<br/>Основная стрела, тяжелая/легкая</p> | <p><b>W</b> Wipbare Gitterspitze, schwer<br/>Luffing fly jib, heavy<br/>Fléchette, lourde<br/>Falcone tralicciato a volata variabile, per carichi pesanti<br/>Pluma abatible, pesada<br/>Качающийся решетчатый удлинитель, тяжелый</p> | <p><b>WV</b> Feste Gitterspitze, schwer<br/>Lattice fly jib, heavy<br/>Fléchette treillis fixe, lourde<br/>Falcone tralicciato fisso, pesante<br/>Plumín de celosía fijo, pesado<br/>Неподвижный решетчатый удлинитель, тяжелый</p> | <p><b>F</b> Feste Gitterspitze, leicht<br/>Lattice fly jib, light<br/>Fléchette treillis fixe, légère<br/>Falcone tralicciato fisso, leggeri<br/>Plumín de celosía fijo, ligera<br/>Неподвижный решетчатый удлинитель/легкая</p> |



**Auslegersysteme**  
**Boom/jib combinations**  
 Configurations de flèche · Sistema braccio  
 Sistemas de pluma · Стреловые системы

- S - System 2826
- F - System 2116
- LA - System 2826
- LI - System 2421
- LI - System 2421
- D - System 2421



**SW**

S 35 m - 63 m  
 W 28 m - 105 m

38 - 41

**SDW  
SDWB**

S 35 m - 91 m  
 W 28 m - 105 m  
 D 31,5 m

42 - 56

**S6D2WB**

S 56 m - 91 m  
 W 28 m - 105 m  
 D 42 m

57 - 65

**SDWVB**

S 35 m - 91 m  
 W 14 m - 21 m  
 D 31,5 m

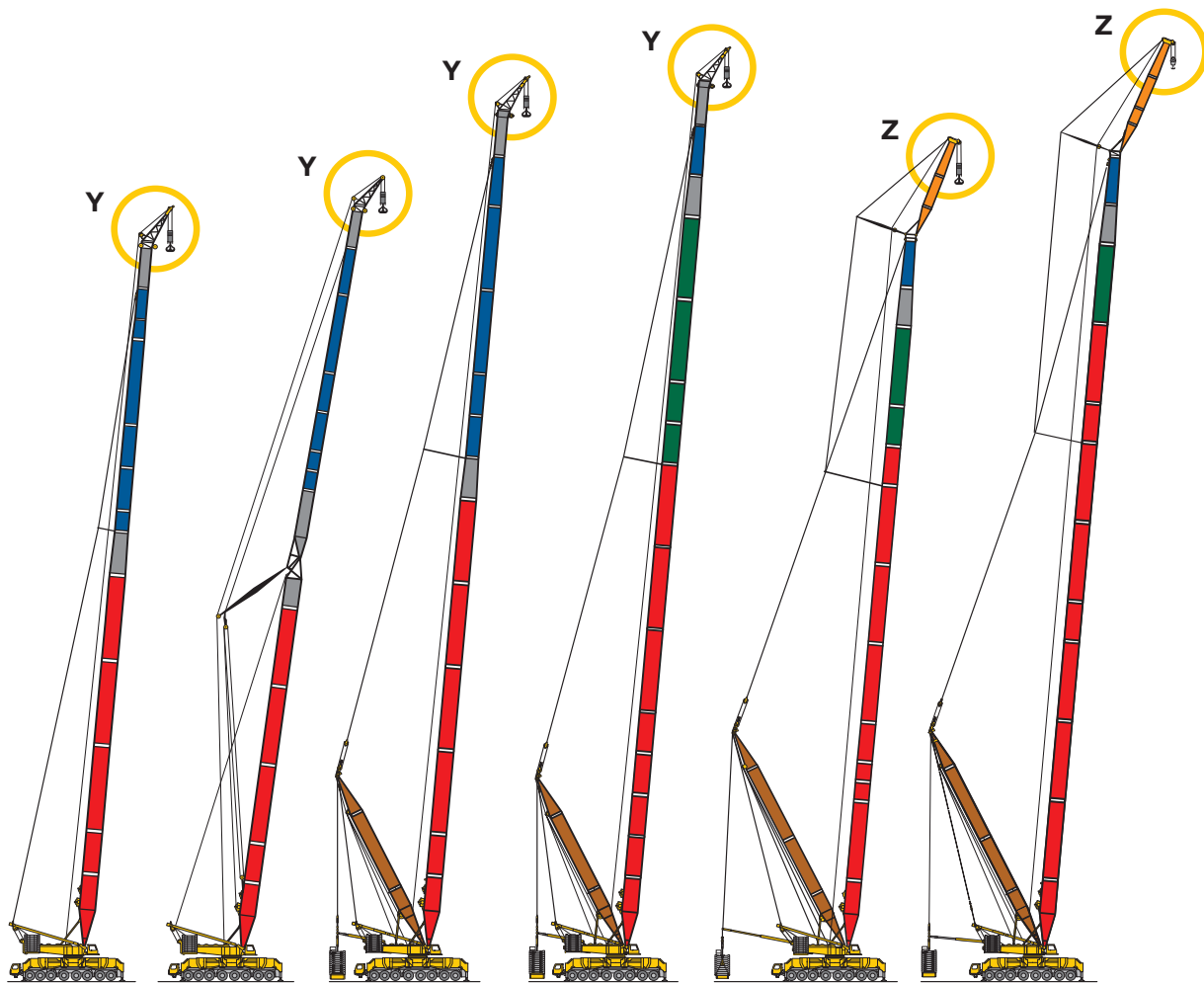
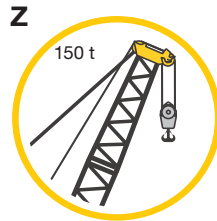
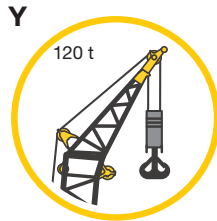
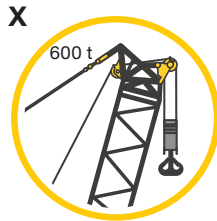
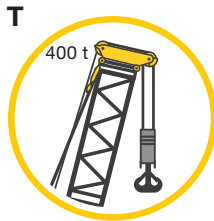
66 - 67

**S6D2WVB**

S 56 m - 91 m  
 W 14 m - 21 m  
 D 42 m

68 - 69

**Auslegersysteme**  
**Boom/jib combinations**  
 Configurations de flèche · Sistema braccio  
 Sistemas de pluma · Стреловые системы



**SL8HS**

**SLK**

**SL8DHS**

**SL7DHS**

**SL9D2FB**

**SL12D2FB**

SL 70 m - 115 m  
HS 6 m

SLK 108,5 m - 133 m

S 105 m - 140 m  
D 31,5 m  
HS 6 m

S 105 m - 147 m  
D 31,5 m  
HS 6 m

SL 119 m - 136 m  
F 12 m - 18 m  
D 42 m

SL 112 m - 140 m  
F 12 m - 21 m  
D 42 m

70 - 72

73 - 74

75 - 76

77 - 78

79 - 80

81 - 82

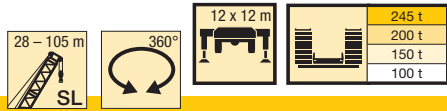
S1914.03



	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	
6	400												6
6,5	400												6,5
7	400	400											7
8	400	400	400	400									8
9	400	400	400	400	400	385							9
10	400	400	400	400	400	382	358	300					10
11	400	400	400	400	400	379	356	300	281				11
12	387	384	383	381	379	377	354	292	276	223	210		12
14	331	329	328	326	324	322	320	283	265	217	206	166	14
16	287	285	284	282	280	278	276	273	254	211	201	163	16
18	252	250	249	247	245	243	241	240	238	205	195	159	18
20	224	222	221	219	217	215	214	213	211	198	187	154	20
22	201	200	198	196	195	193	191	190	188	188	179	150	22
24	177	181	180	178	176	174	172	171	169	169	167	145	24
26	150	165	164	162	160	158	156	156	154	153	151	141	26
28		151	151	149	147	145	143	142	140	140	138	137	28
30		133	139	137	135	133	131	130	129	128	126	126	30
32		117	129	127	125	123	121	120	118	118	116	116	32
34			117	118	116	114	113	112	110	109	107	107	34
36			105	110	109	106	105	104	102	101	99	99	36
38			94	101	102	99	98	97	95	94	92	92	38
40			81	92	95	93	91	90	88	88	86	85	40
44				75	81	81	80	79	77	77	74	74	44
48					67	70	70	69	67	67	64	64	48
52					55	59	60	60	58	58	56	56	52
56						49	51	52	51	50	48	48	56
60							43	44,5	44	44	41,5	41,5	60
64							35	37,5	37,5	38	36	36	64
68								31	31,5	32,5	31	31,5	68
72								23,8	25,9	27,6	26,6	27,1	72
76									20,5	22,7	22,3	23,1	76
80										18,1	18,1	19,3	80
84											14,2	15,7	84
88											10,4	12,3	88
92												9	92
96												6	96

TAB 154106 / 154108 / 154110 / 154112





	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	
6	400												6
6,5	400												6,5
7	400	400											7
8	400	400	400	400									8
9	400	400	400	400	400	385							9
10	400	400	400	400	400	382	358	300					10
11	376	374	373	370	368	366	355	300	281				11
12	345	343	342	339	337	335	322	292	276	223	210		12
14	293	291	290	288	286	284	271	259	247	217	206	166	14
16	252	250	249	247	246	244	233	223	213	205	196	163	16
18	221	219	218	216	214	212	203	195	187	181	172	159	18
20	197	195	194	192	190	187	179	173	165	160	153	149	20
22	177	175	174	172	170	167	160	154	148	143	137	133	22
24	160	158	157	155	153	150	144	139	133	129	123	120	24
26	146	144	143	141	139	136	130	126	120	117	111	109	26
28		132	131	129	128	124	119	114	109	107	101	99	28
30		119	119	117	116	113	108	105	100	97	92	90	30
32		109	108	107	106	104	100	96	92	89	85	83	32
34			99	98	96	95	92	89	84	82	78	76	34
36			92	90	88	87	85	82	78	76	71	70	36
38			85	83	82	80	79	76	72	70	66	65	38
40			79	77	76	74	72	71	67	65	61	60	40
44				67	65	64	62	61	58	56	52	51	44
48					57	55	54	53	50	48,5	44,5	43,5	48
52					51	48,5	47	46	43,5	42	38,5	37,5	52
56						43	41,5	40,5	38,5	36,5	33	32,5	56
60							36,5	35,5	33	32	28,5	27,7	60
64							32,5	31	28,8	28,1	24,5	23,6	64
68								27,3	24,9	24,3	21	20,1	68
72								23,8	21,6	20,9	18	17	72
76									18,7	17,9	15,3	14,2	76
80										15,3	12,8	11,7	80
84											10,5	9,5	84
88											8,4	7,6	88
92												5,7	92
96												4	96

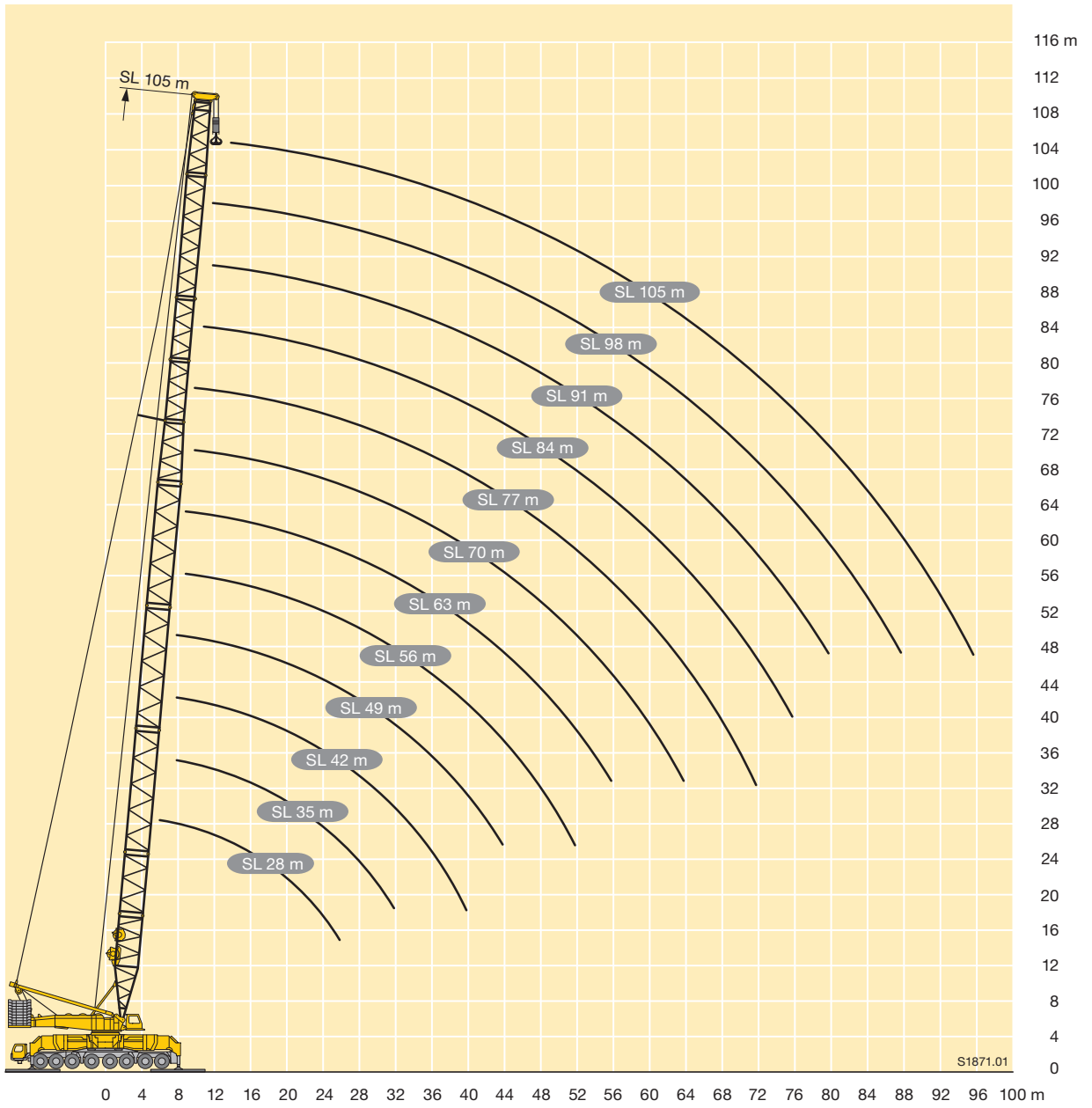
TAB 154077 / 154078 / 154079 / 154080

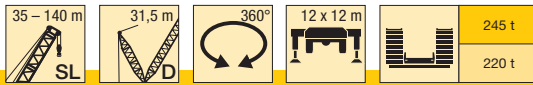
**Hubhöhen**

**Lifting heights**

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**SL**





	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	112 m	119 m	126 m	133 m	
7	400															7
8	400	400	400													8
9	400	400	400	400												9
10	400	400	397	382	393	371										10
11	371	360	357	348	336	330	328	301								11
12	338	318	321	316	307	296	304	294	253	225						12
14	279	262	256	260	256	251	246	247	238	222	182	165	134			14
16	227	221	220	214	211	211	211	206	204	201	180	163	132	120	100	16
18	195	192	189	187	183	178	179	171	174	175	166	162	131	119	100	18
20	174	170	165	163	159	156	154	152	151	153	148	142	130	118	100	20
22	155	151	147	143	141	137	137	134	134	132	131	126	123	117	100	22
24	137	133	131	128	125	123	121	118	119	114	116	112	110	106	100	24
26	123	121	120	116	114	110	109	105	106	103	102	99	98	95	93	26
28	115	110	109	107	105	100	98	95	95	92	91	87	87	85	83	28
30	107	100	100	99	97	93	89	86	86	82	83	79	77	75	74	30
32	99	94	91	91	90	86	83	77	78	76	75	71	70	67	65	32
34		89	83	83	83	79	77	72	72	70	67	64	63	61	58	34
36		83	78	76	76	73	71	67	67	65	61	57	57	55	53	36
38		78	73	69	70	68	66	62	61	60	56	52	52	49,5	48	38
40		73	69	64	64	62	61	58	57	55	51	47,5	46	44,5	43	40
44			62	58	53	52	52	49,5	47,5	45,5	43	39	38	35,5	34	44
48				52	47,5	43	44	41,5	38,5	37	37	33,5	30	27,7	25,2	48
52				46	42,5	38,5	36	34,5	32,5	28,9	30,5	28,1	24,6	20,6	19,5	52
56					38	34,5	32	27,3	27,3	24	25,1	23,4	20,4	17,4	14,7	56
60						30,5	28,2	23,4	22,3	19,4	19,8	19	16,5	14,7	10,1	60
64						26,8	24,9	20,6	19	15,1	14,8	14,8	12,8	12,1	6,4	64
68							21,8	17,9	16,6	12,3	11,5	10,9	9,4	9,8	5,4	68
72							18,8	15,4	14,4	10,6	9,9	7,1	6,2	7,5	4,4	72
76								13	12,3	9	8,4	4,3	4	5,4	3,5	76
80									10,2	7,5	7	3,6	3,4	3,4		80
84										6,1	5,7					84
88										4,7	4,4					88
92											3,2					92

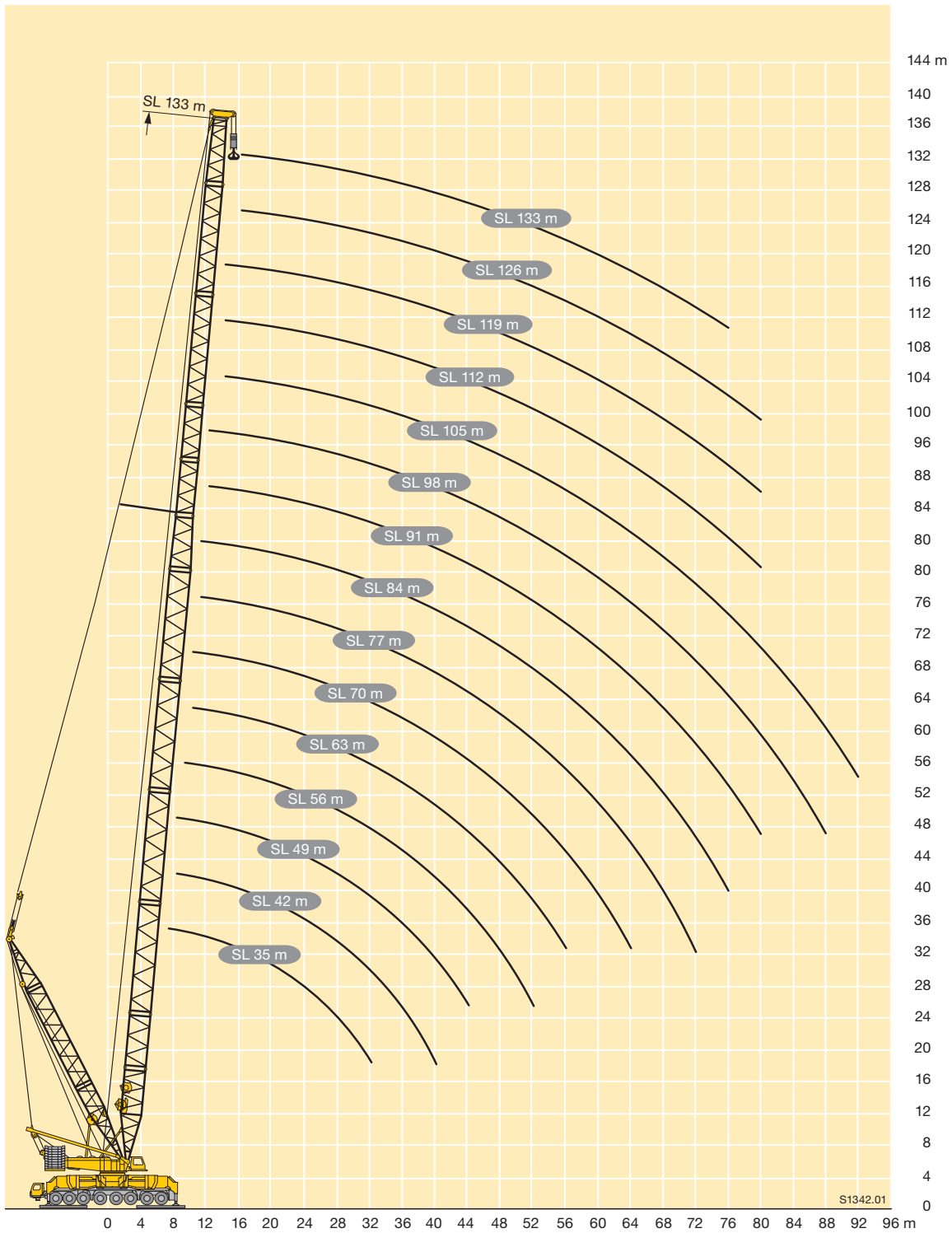
TAB 154173 / 154174









# Hubhöhen

## Lifting heights

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**SLD**



	 35 - 133 m	 31,5 m	 360°	 12 x 12 m	 170 t	 B	max. 400 t x 20 m										
 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	112 m	119 m	126 m	133 m	 m	
7	400															7	
8	400	400	400													8	
9	400	400	400	400												9	
10	400	400	400	400	393	371										10	
11	400	400	400	400	392	370	328	301								11	
12	400	400	400	400	391	370	328	301	246	223						12	
14	400	400	400	400	389	368	327	301	244	221	181	162	132			14	
16	400	400	400	400	398	387	367	326	300	243	218	179	161	131	119	100	16
18	400	400	400	396	385	366	326	299	242	217	178	160	130	118	100	100	18
20	400	400	400	394	384	365	325	290	239	215	176	159	130	117	100	100	20
22	395	400	395	381	373	361	322	281	231	213	175	158	129	116	100	100	22
24	357	375	371	357	348	339	313	272	224	210	174	157	128	116	100	100	24
26	321	346	345	337	328	322	300	264	218	205	172	157	128	115	99	99	26
28	286	321	320	319	312	306	290	257	212	201	170	156	127	114	99	28	28
30	254	293	300	299	297	291	280	249	206	197	165	154	127	114	98	30	30
32	225	267	281	280	279	278	268	237	201	191	161	150	126	113	97	32	32
34		242	263	264	263	262	255	230	191	186	157	146	126	112	95	34	34
36		219	242	250	249	248	242	222	186	181	153	143	123	112	93	36	36
38		198	224	230	236	235	225	213	181	176	149	140	120	111	90	38	38
40		177	207	214	220	225	212	204	176	171	145	137	118	109	88	40	40
44			174	190	189	197	190	187	167	162	137	129	113	105	84	44	44
48				165	172	168	169	170	159	155	130	124	108	101	81	48	48
52				141	152	153	151	152	149	143	124	119	104	98	78	52	52
56					134	139	138	135	134	132	118	113	99	93	75	56	56
60						124	128	123	120	120	113	109	95	90	71	60	60
64						110	116	114	109	107	108	104	91	86	68	64	64
68							104	105	101	97	98	97	87	83	65	68	68
72							93	95	94	90	89	88	83	80	63	72	72
76								86	86	84	83	79	79	77	60	76	76
80									78	78	77	74	73	71	58	80	80
84										71	72	69	68	66	55	84	84
88										65	66	64	63	61	53	88	88
92											60	59	59	57	51	92	92
96											55	54	54	53	49	96	96
100												49	49,5	48,5	45,5	100	100
104													45,5	44,5	41,5	104	104
108													41	40,5	38,5	108	108
112														36,5	35	112	112
116															30	116	116
120															26	120	120

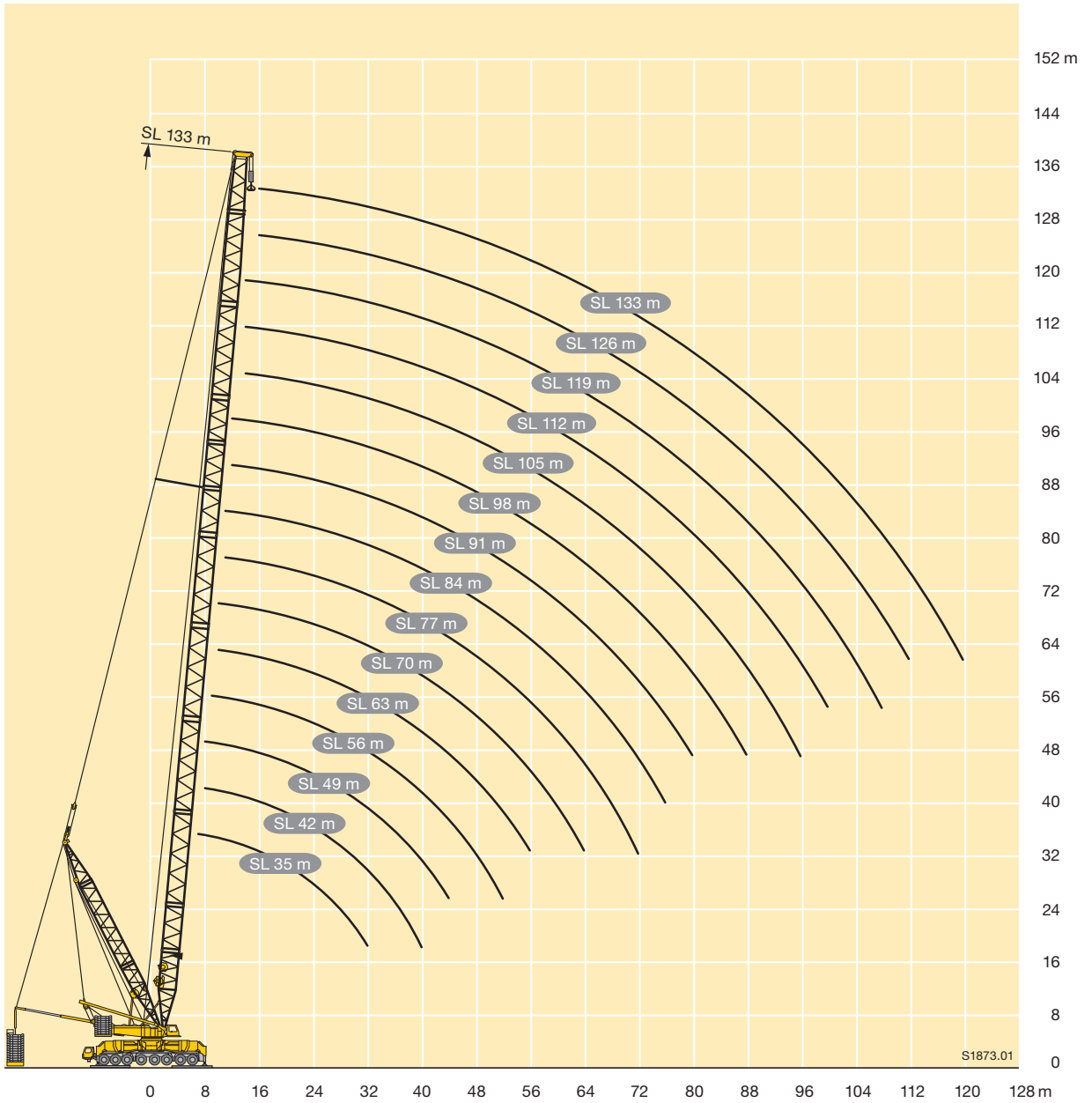
TAB 154349 / 154350 / 154351 / 154352

**Hubhöhen**

**Lifting heights**

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

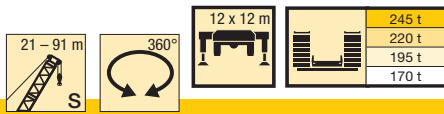
**SLDB**





	21 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	
6	596											6
6,5	571	573										6,5
7	547	550	546									7
8	506	508	504	501	497							8
9	475	472	468	465	461	458						9
10	443	440	436	433	430	427	424	411				10
11	416	412	409	406	402	399	397	394	347	295		11
12	383	381	378	376	373	371	369	368	343	291	250	12
14	328	326	323	321	318	316	314	313	308	284	244	14
16	283	281	279	277	274	272	271	269	268	260	237	16
18	240	246	244	242	239	237	235	234	233	230	221	18
20	186	218	216	214	211	209	208	206	205	204	198	20
22		196	193	191	189	187	185	183	182	181	178	22
24		171	175	173	170	168	166	165	163	162	160	24
26		144	159	157	154	152	150	149	148	146	145	26
28			144	144	141	139	137	135	134	133	131	28
30			126	132	129	127	125	124	122	121	120	30
32			110	121	119	117	115	114	112	111	109	32
34				109	111	108	107	105	103	102	100	34
36				97	101	101	99	97	96	94	90	36
38				86	92	93	91	90	88	87	83	38
40				74	83	85	84	83	82	80	77	40
44					66	71	71	70	68	67	65	44
48						58	60	59	58	56	55	48
52						45,5	49	49,5	49	47	45	52
56							39,5	41	41	40	37,5	56
60								32,5	33,5	33,5	31,5	60
64								25	26,5	27,1	26,3	64
68									20	21,3	21,2	68
72									13,5	15,8	16,4	72
76										10,6	11,9	76
80											7,6	80

TAB 154030 / 154031 / 154032 / 154033



	21 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	
6	*670											6
6,5	*621	*619										6,5
7	579	577	574									7
8	510	507	505	503	500							8
9	455	452	450	448	445	442						9
10	410	408	405	403	400	398	396	383				10
11	373	371	368	366	363	361	359	344	326	295		11
12	342	340	337	335	332	330	328	311	296	281	242	12
14	289	287	285	283	280	278	274	260	249	237	227	14
16	248	247	244	242	240	238	233	222	213	204	195	16
18	217	216	213	211	209	207	201	192	185	177	170	18
20	186	191	189	187	184	182	176	169	162	156	150	20
22		171	169	167	164	162	156	149	144	138	133	22
24		155	152	150	147	145	139	133	128	123	118	24
26		141	138	136	134	131	125	120	115	111	106	26
28			126	124	122	118	113	108	104	100	96	28
30			114	112	110	108	103	98	94	90	86	30
32			103	102	100	98	94	89	86	82	78	32
34				93	90	89	86	81	78	74	71	34
36				85	83	81	79	75	71	68	65	36
38				78	76	74	72	69	65	62	59	38
40				73	70	68	66	63	60	57	54	40
44					60	58	56	54	51	47,5	44,5	44
48						50	48	46	43	40	37	48
52						43,5	41,5	39,5	36,5	33,5	31	52
56							35,5	33,5	31	28,3	25,4	56
60								28,4	26,4	23,6	20,7	60
64								24,3	22	19,6	16,7	64
68									18,3	16,2	13,2	68
72									13,5	13	10,1	72
76										10,1	7,4	76
80											5,1	80

\* Traglasten > 600 t mit 750 t-Ausrüstung · Lifting capacities > 600 t with 750 t equipment  
 Forces de levage > 600 t avec équipement de 750 t · Portate > 600 t con 750 t equipaggiamento  
 Capacidades de carga > 600 t con equipamiento de 750 t · Грузоподъемность > 600 т только с 750 т оборудованием  
 TAB 154001 / 154002 / 154003 / 154004

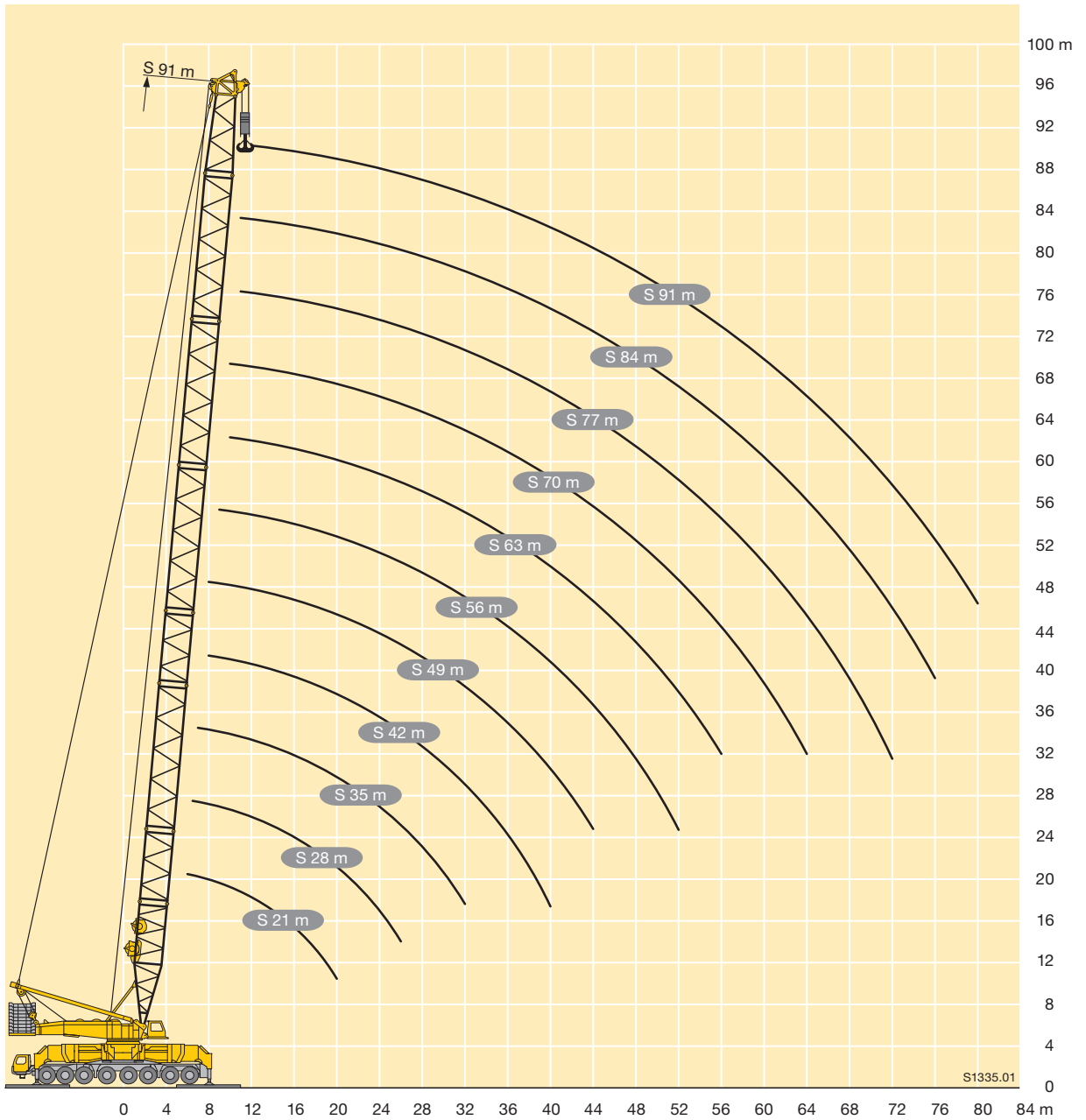


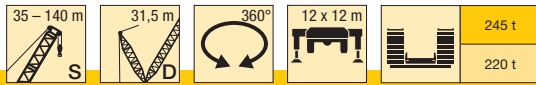
# Hubhöhen

## Lifting heights

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

S





7 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	112 m	119 m	126 m	133 m	140 m	7 m
7	581																7
8	511	508	505														8
9	455	453	450	448													9
10	410	407	404	403	401	399											10
11	373	370	367	365	363	361	340	321									11
12	341	339	336	334	332	327	309	292	278	258							12
14	286	283	281	278	276	273	260	247	236	225	217	192	167				14
16	241	238	235	233	229	227	223	212	203	194	188	181	167	144	124	105	16
18	209	206	202	199	195	194	192	184	177	170	164	159	153	143	123	105	18
20	182	180	177	174	169	167	167	162	156	150	145	140	135	130	123	104	20
22	160	157	155	152	149	146	144	142	138	133	129	125	120	116	111	104	22
24	143	140	137	134	131	128	127	125	123	119	115	112	108	103	100	97	24
26	129	127	124	122	116	116	112	110	108	107	104	100	97	93	89	87	26
28	119	115	113	111	106	106	100	98	95	95	92	91	87	84	81	78	28
30	110	103	102	101	97	98	90	88	85	84	82	81	79	75	73	70	30
32	102	96	93	92	89	89	82	79	76	75	73	72	70	68	65	64	32
34		89	83	84	81	82	74	71	69	67	65	64	62	61	59	57	34
36		84	77	76	74	75	66	63	61	60	57	56	55	54	53	50	36
38		78	72	68	67	68	59	57	54	54	51	50	48,5	47,5	46	43,5	38
40		73	68	61	60	62	53	52	48	48	46	44	42,5	41,5	40	37,5	40
44			60	54	48	49,5	44,5	43	40	38	36	34,5	32	31	29,2	26,4	44
48				48	42,5	38,5	36,5	35	32,5	31	26,8	25,6	23,2	23	21,2	17,6	48
52				42,5	37,5	33	29,2	27,7	25,9	25,1	21,2	18,1	16,5	16,3	14,8	10,3	52
56					32,5	28,5	24,5	20,8	19,7	19,5	16,5	14,6	13,4	10,1	8,8	8	56
60						24,5	21	16,5	13,8	14,2	12,2	11,3	10,5	7,1	5,1	6	60
64						20,8	17,7	13,9	9,8	9,3	8,2	8,3	7,9	5,6	3,9	4,2	64
68							14,6	11,4	7,8	5,6	4,4	5,4	5,3	4,2			68
72							11,7	9,1	6	4,6			3				72
76								6,9	4,2	3,6							76

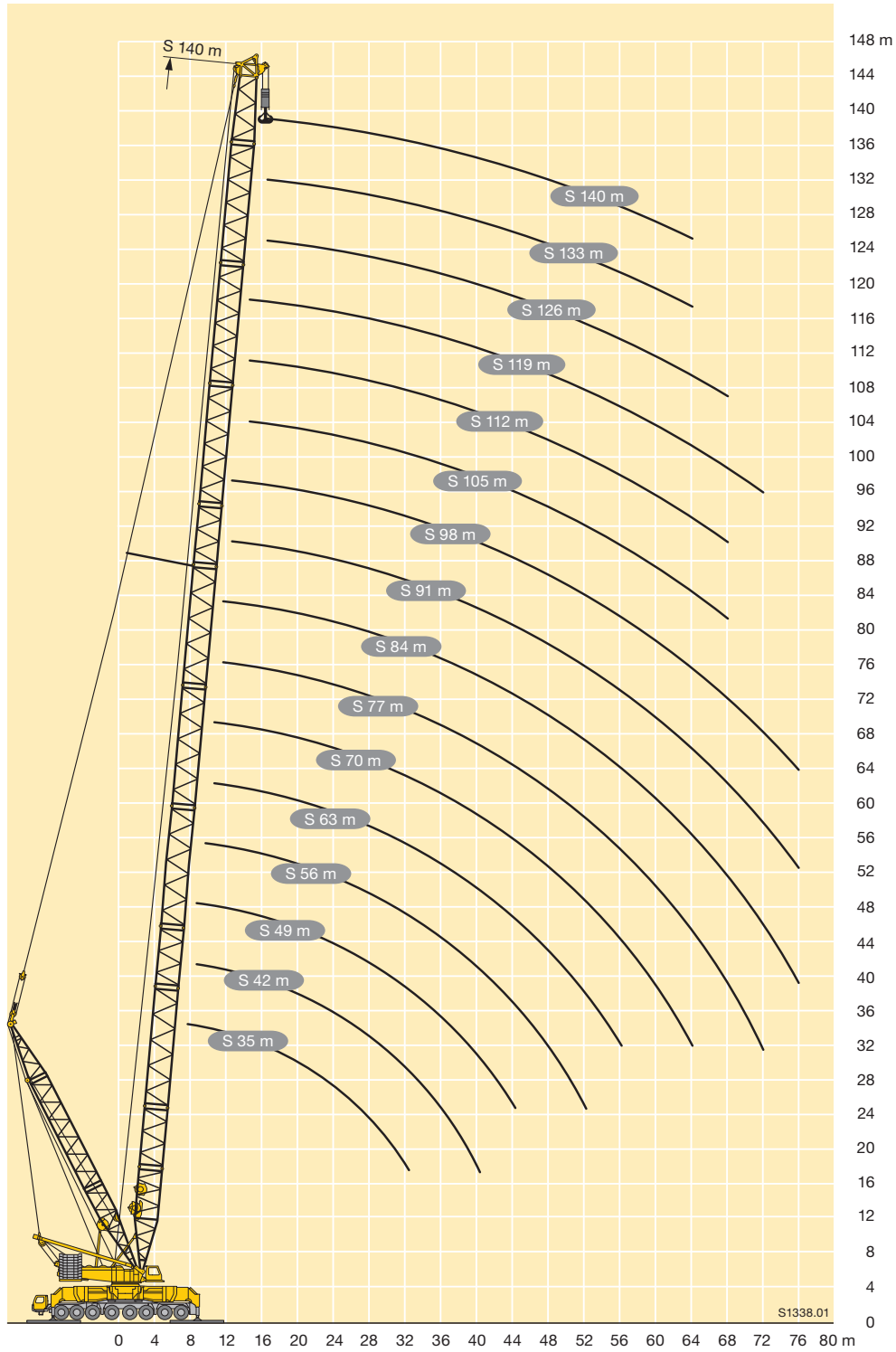
TAB 154153 / 154154

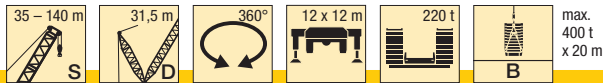
# Hubhöhen

## Lifting heights

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**SD**

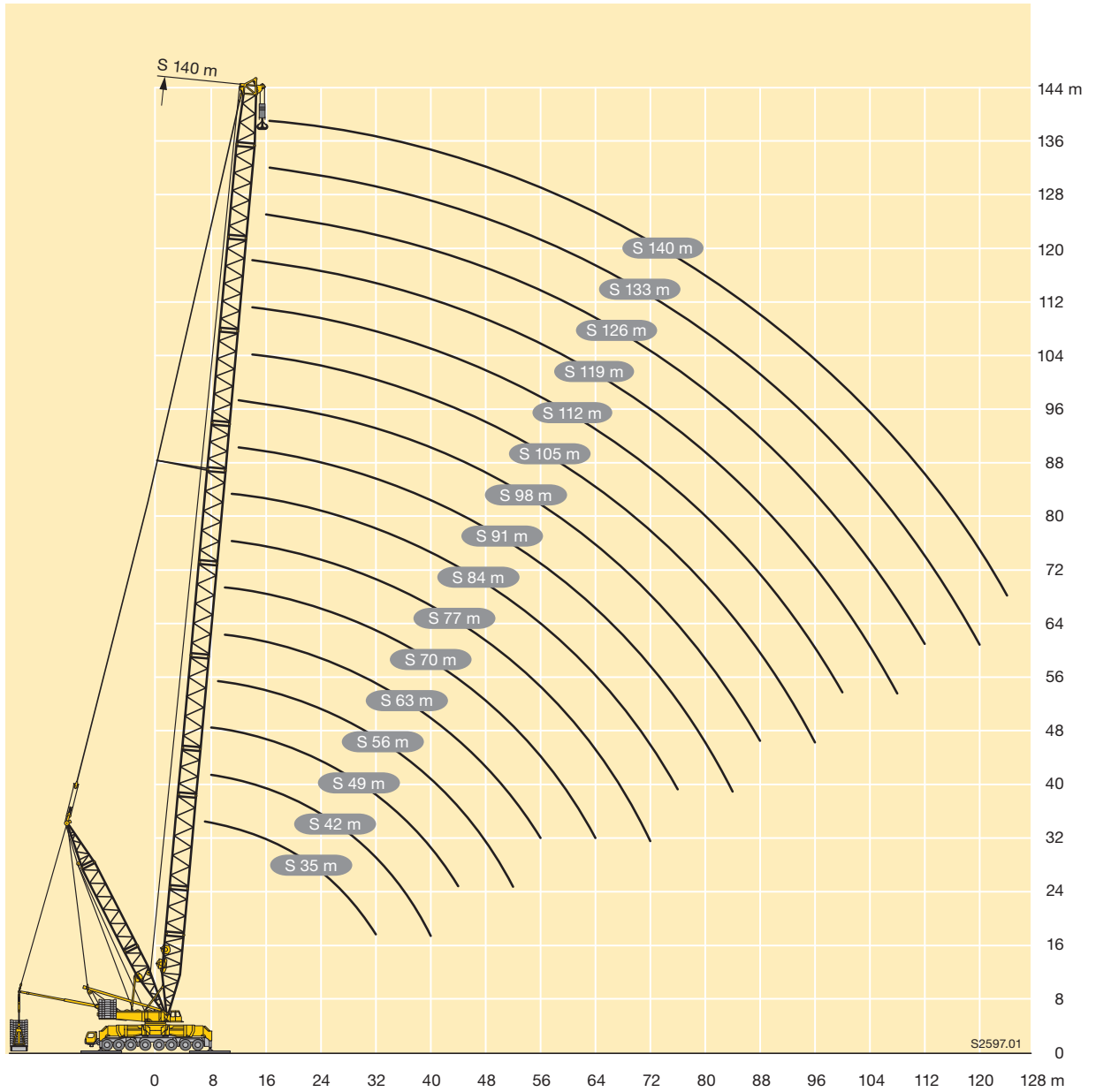




	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	112 m	119 m	126 m	133 m	140 m	
7	*600																7
8	*600	*600	*600														8
9	*600	*600	*600	*600													9
10	*600	*600	*600	*600	559	474											10
11	*600	*600	*600	*600	558	473	404	346									11
12	*600	*600	597	581	555	472	403	346	298	258							12
14	576	567	554	537	512	470	402	345	297	257	221	192	167				14
16	541	531	518	499	473	445	401	344	297	256	220	192	167	144	124	105	16
18	512	496	483	464	439	415	387	343	296	256	219	191	166	143	123	105	18
20	458	466	450	432	410	388	364	341	295	255	217	191	166	143	123	104	20
22	402	434	420	403	383	364	342	327	293	254	215	191	165	143	123	104	22
24	357	391	394	377	359	341	323	310	284	252	214	191	165	142	122	103	24
26	315	354	365	357	339	324	305	294	274	247	213	190	164	142	122	103	26
28	281	319	335	336	322	308	288	279	264	239	211	190	164	142	122	102	28
30	249	286	307	311	302	293	274	262	249	232	208	190	164	141	122	102	30
32	220	259	280	288	282	277	258	246	234	223	203	188	163	141	121	101	32
34		235	255	266	264	260	242	231	221	211	197	187	161	140	119	101	34
36		212	234	246	246	244	228	217	208	200	189	185	158	139	117	100	36
38		191	216	226	230	230	213	205	196	189	179	177	156	138	116	99	38
40		171	199	208	214	216	201	195	185	179	170	167	154	137	115	98	40
44			167	181	185	189	181	176	168	161	154	151	147	133	112	96	44
48				156	163	165	163	160	153	147	140	138	133	128	109	94	48
52				134	143	146	146	144	140	135	128	125	122	117	105	92	52
56					125	130	131	130	127	123	118	115	112	107	102	89	56
60						116	118	117	115	113	108	106	103	99	95	86	60
64						102	106	106	104	103	99	98	95	91	88	83	64
68							94	96	95	94	91	90	87	84	81	77	68
72							83	86	86	86	83	82	80	78	75	71	72
76								77	78	78	76	75	73	71	69	65	76
80									70	71	70	69	64	65	63	60	80
84									63	64	64	63	60	60	58	55	84
88										58	58	57	55	55	53	51	88
92											52	52	51	50	48,5	46,5	92
96											46,5	46,5	46	45	41,5	42	96
100												41,5	41	41	37,5	38	100
104													36,5	36,5	34	34	104
108													32	32,5	30,5	30,5	108
112														28,4	27	26,8	112
116															23,6	23,3	116
120															20	19,9	120
124																16,6	124

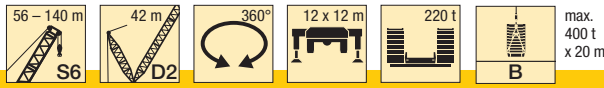
\* Traglasten > 600 t mit 750 t-Ausrüstung · Lifting capacities > 600 t with 750 t equipment  
 Forces de levage > 600 t avec équipement de 750 t · Portate > 600 t con 750 t equipaggiamento  
 Capacidades de carga > 600 t con equipamiento de 750 t · Грузоподъемность > 600 т только с 750 т оборудованием

TAB 154345 / 154346 / 154347 / 154348



# S6D2B

# S 56 - 140



m	42 m																			m		
	56 m	63 m	70 m	77 m	84 m	91 m	94 m	98 m	101 m	105 m	108 m	112 m	115 m	119 m	122 m	126 m	129 m	133 m	136 m		140 m	
9	600																				9	
10	600	600	567																			10
11	600	600	566	481	409																	11
12	600	600	565	480	409	351	323	301														12
14	600	600	562	479	408	351	323	300	275	259	239	225	205	192								14
16	600	599	558	476	407	350	322	299	275	258	238	224	205	191	174	165	151	142	129	122		16
18	540	542	522	473	405	349	321	299	274	258	236	223	204	190	175	164	151	141	128	123		18
20	479	487	481	447	400	346	319	299	273	257	235	222	202	188	171	163	150	141	127	119		20
22	425	433	436	416	385	342	318	297	273	256	234	220	201	187	169	163	150	141	126	119		22
24	377	390	395	384	362	328	309	292	271	255	233	219	198	187	166	162	150	140	126	118		24
26	339	351	355	352	340	316	298	285	265	251	230	218	196	185	163	162	149	140	125	118		26
28	309	317	322	323	315	302	287	274	258	245	225	214	194	181	161	161	148	139	124	117		28
30	279	286	293	297	297	283	274	264	249	237	221	209	190	178	157	161	147	138	124	117		30
32	252	260	268	271	274	269	259	252	239	229	215	203	186	176	153	160	145	137	123	116		32
34	228	237	249	252	251	249	246	239	229	222	208	198	184	172	150	158	143	137	123	116		34
36	206	221	231	234	234	236	229	227	220	212	202	192	180	168	146	155	142	135	122	115		36
38	194	205	214	214	218	218	218	215	206	203	194	186	175	165	143	152	140	133	121	115		38
40	175	190	198	200	204	207	201	201	197	193	186	179	169	160	139	150	137	130	120	113		40
44	153	165	170	175	179	181	182	181	179	174	170	166	159	151	131	142	132	125	116	109		44
48	133	142	149	152	156	161	158	160	162	158	156	148	144	140	123	135	124	120	112	105		48
52		120	131	136	140	143	142	145	146	143	141	136	134	131	115	126	117	114	106	101		52
56		108	114	121	125	124	126	130	127	128	128	126	123	116	107	114	110	107	99	96		56
60			97	107	111	111	114	116	114	117	110	111	112	108	100	106	101	101	93	90		60
64				91	95	98	102	100	102	105	102	102	101	100	92	99	92	92	87	85		64
68				80	84	89	91	92	93	94	94	95	93	92	85	92	84	84	82	80		68
72					73	79	82	84	83	86	87	81	83	84	79	80	78	77	76	75		72
76						69	75	71	73	77	77	75	75	76	73	74	72	71	70	69		76
80						63	67	66	67	68	69	69	69	69	67	69	66	64	63	63		80
84							60	58	60	62	63	63	63	63	60	64	60	58	57	57		84
88									54	57	55	57	56	58	55	57	55	52	52	52		88
92										51	47,5	52	49,5	53	49	51	49,5	48,5	48,5	48		92
96											44	46	45	48	43	45,5	45,5	45	45	45		96
100													41,5	43,5	37,5	42	42	42	42	41,5		100
104														39	32	39	39	38,5	39	38,5		104
108																35,5	36	34	34,5	34		108
112																	32,5	29,4	29,9	29,6		112
116																		24,8	25,3	24,9		116

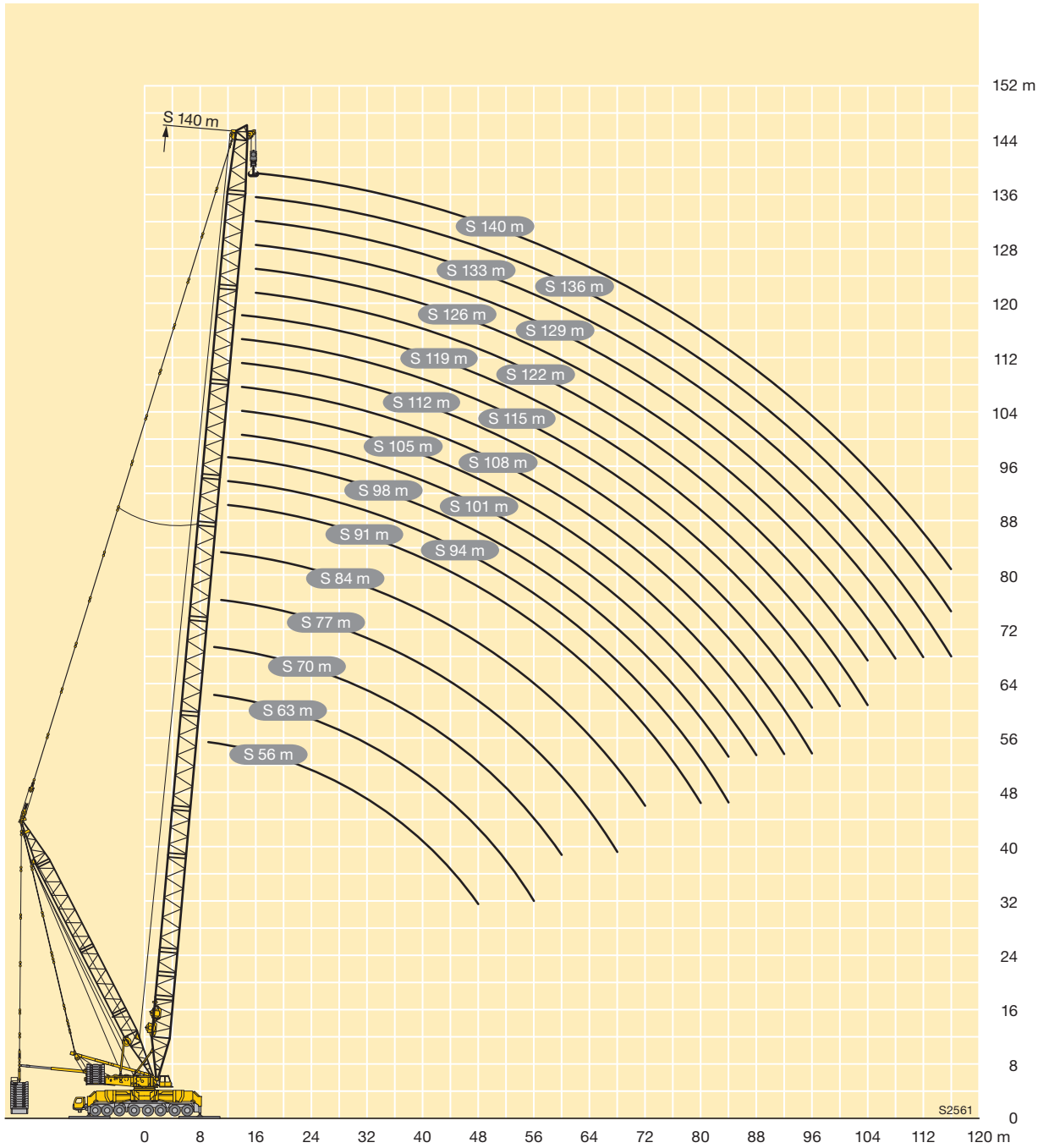
TAB 154512 / 154513

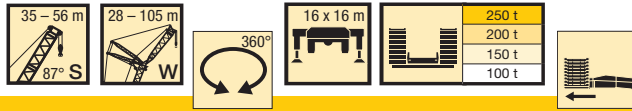
# Hubhöhen

## Lifting heights

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

# S6D2B





m	35 m										42 m										m				
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m	105 m
14	326												325												14
16	288	287	281										286	284											16
18	254	252	252	229									252	251	242	208									18
20	226	225	224	220	188								224	222	221	205									20
22	203	202	201	200	186	158							200	199	197	195	172	144							22
24	185	183	183	182	179	156	131	112					180	180	178	176	168	143	122						24
26	169	168	167	166	165	154	130	111	93				165	163	163	160	158	142	121	104	89				26
28	155	154	154	152	152	149	128	110	92	79			150	149	150	148	145	139	120	103	88	74			28
30	143	143	141	141	140	139	127	110	91	78	66		138	138	137	136	134	132	119	102	87	73	63		30
32		131	131	130	130	129	124	109	90	78	65	56		127	126	126	125	123	117	102	86	73	62	53	32
34		122	122	120	121	120	117	108	90	77	65	55		118	118	116	116	115	112	101	85	72	61	53	34
36		114	113	112	112	112	110	106	89	76	64	55		110	110	108	108	107	105	100	84	72	61	52	36
38		106	106	105	104	104	103	100	88	75	64	54		103	102	101	100	100	98	96	83	72	60	52	38
40			99	98	97	96	94	88	75	63	54			96	95	93	93	92	90	83	72	60	51	40	
44			88	87	86	85	84	83	84	73	62	53			85	83	83	81	81	80	79	72	59	51	44
48				77	76	75	73	73	74	69	61	52				75	73	72	71	70	70	67	58	50	48
52					68	67	66	65	69	63	60	51				66	64	63	62	62	60	56	48,5		52
56					62	60	59	58	61	57	56	50				59	58	57	56	55	53	53	47,5		56
60						55	53	53	51	50	50	47,5					52	51	50	49	47,5	47	45,5		60
64						49,5	48	47	47	45,5	44,5	43,5					47	46	45	44,5	43	42,5	41		64
68							43,5	43	42	41	40,5	39						42	40,5	40	39	38	36,5		68
72							39,5	39	38	37	36,5	35						38	37	36	35	34,5	33		72
76								35,5	34,5	33,5	33	31,5							33,5	32,5	31,5	31	29,5		76
80									31,5	30	29,4	28,4								29,6	28,2	27,5	26,4		80
84									28,5	27,4	26,5	25,3								26,7	25,6	24,7	23,5		84
88										24,8	24	22,6									23	22,2	20,8		88
92											22,2	21,6	20,2								20,6	19,9	18,5		92
96												19,3	18,1									17,7	16,4		96
100												17,1	16									15,6	14,4		100
104													14,1										12,5		104

TAB 154222 / 154224 / 154441 / 154443

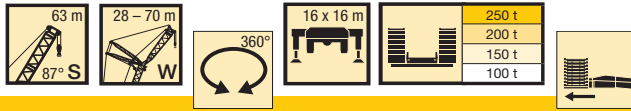
m	49 m										56 m										m					
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m	105 m	
14	316																								14	
16	282	263												266	237										16	
18	245	241	222											236	226	198									18	
20	216	214	211	185	158									209	206	193	166								20	
22	193	192	189	180	155	133								188	185	183	163	139	122						22	
24	174	174	171	170	152	131	111							169	169	166	159	137	120	104					24	
26	159	158	157	155	148	128	109	96						154	153	152	150	135	119	103	89				26	
28	146	144	144	142	140	126	108	95	80	72				141	140	140	137	132	117	101	88	74			28	
30	134	133	132	132	129	124	106	94	80	71	59			130	129	128	127	125	116	100	87	74	64	55	30	
32	124	123	122	122	121	117	105	94	79	70	58	49,5		120	120	118	118	116	114	99	86	73	64	54	32	
34		114	113	113	112	109	104	93	79	69	58	49			111	110	109	108	106	98	85	73	63	53	34	
36		106	106	104	104	102	100	92	78	68	57	48,5			103	103	101	101	100	97	84	72	63	53	36	
38		99	98	98	97	96	94	90	78	67	57	48			97	96	94	94	93	91	83	72	63	53	38	
40			92	92	90	89	88	87	77	66	56	47,5				90	89	87	87	85	83	71	62	52	40	
44			82	81	80	78	77	77	73	64	55	47				79	78	77	76	75	73	69	61	51	43,5	44
48				72	71	69	68	68	67	62	54	46					70	69	67	66	65	63	59	50	43	48
52					64	63	62	61	60	59	58	53	45,5				62	61	60	58	58	56	56	49,5	42,5	52
56						57	55	54	54	52	51	50	45				55	54	52	51	50	49,5	47,5	41,5		56
60							50	48,5	48,5	47	45,5	45	43					48,5	46,5	46,5	44,5	44	43	40		60
64							44	43,5	42	40,5	40	38,5						43,5	42	41,5	40	39,5	38	36,5		64
68								40	39	38	36,5	36	34,5							38	37,5	36	35,5	34	32,5	68
72								36	35,5	34	33	32,5	30,5							34,5	33,5	32	30,5	28,8		72
76									32	30,5	29,4	28,9	27,5								30,5	29	28,4	27,2	25,7	76
80									28,8	27,8	26,4	25,7	24,5								27,3	26,2	25,4	24,1	22,8	80
84										25	23,8	22,9	21,7									23,5	22,8	21,3	20	84
88											21,3	20,5	19,1									20,4	18,9	17,5		88
92											19	18,3	16,8										18,1	16,8	15,3	92
96												16,2	14,8										14,7	13,4		96
100												14,1	12,9										12,7	11,5		100
104													11											9,8		104
108													9,3											8,1		108

TAB 154222 / 154224 / 154441 / 154443



# SW

# S 63

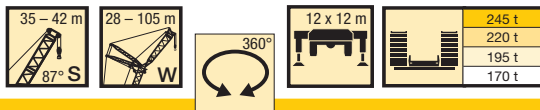


m	63 m							m
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	
16	240							16
18	226	204	177					18
20	203	197	172	148				20
22	182	179	167	146	128			22
24	165	163	160	144	126	109	95	24
26	150	149	147	142	124	107	93	26
28	138	136	135	133	122	106	92	28
30	127	125	125	123	120	104	91	30
32	118	116	115	114	113	103	90	32
34		108	107	106	105	101	89	34
36		101	100	98	98	96	88	36
38		94	93	92	91	90	87	38
40			87	86	85	84	83	40
44			77	76	75	73	73	44
48				68	67	65	64	48
52				60	60	58	57	52
56					53	51	51	56
60						46	45,5	60
64						41,5	40,5	64
68							37	68
72							33	72

TAB 154222 / 154224 / 154441 / 154443

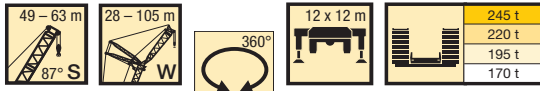
# SW

# S 35 - 42



m	35 m										42 m										m						
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m	105 m		
14	294												286												14		
16	255	250	240										248	238											16		
18	223	220	212	204									219	211	203	196									18		
20	199	196	190	183	177								196	189	182	176	170								20		
22	179	177	171	165	160	155							177	170	165	159	154	144							22		
24	162	161	156	150	146	141	131	112					161	155	151	145	140	135	122						24		
26	148	147	143	138	134	129	125	111	93				147	142	138	133	129	124	121	104	89				26		
28	136	135	132	127	124	119	115	110	92	79			135	131	127	123	119	115	112	103	88	74			28		
30	126	125	122	118	115	111	106	104	91	78	66		125	122	118	114	110	106	103	100	87	73	63		30		
32	116	114	109	107	103	99	96	90	78	65	56		114	110	106	103	99	96	93	86	73	62	53		32		
34		108	106	102	99	96	92	90	88	77	65	55		106	103	99	96	92	90	86	84	72	61	53	34		
36		101	99	96	93	90	86	84	82	76	64	55		100	97	93	90	86	84	81	79	72	61	52	36		
38		94	94	90	87	84	81	79	77	74	64	54		94	91	87	84	81	79	76	74	71	60	52	38		
40			88	85	82	79	76	74	72	69	63	54			86	82	79	76	74	71	69	67	60	51	40		
44				77	76	73	70	67	66	64	61	60	53			77	74	71	68	66	63	61	59	58	44		
48					67	66	63	60	58	57	55	53	51				67	64	61	59	56	55	52	49	48		
52						59	57	54	52	51	48,5	47,5	45,5					58	55	53	50	49	47	45,5	52		
56						53	52	49	47,5	46	43,5	42,5	40,5					53	50	48	45,5	44	42	41	39	56	
60							47	44,5	43	41,5	39,5	38	36,5						45,5	43,5	41	40	37,5	36,5	34,5	60	
64							42,5	40,5	39	37,5	35,5	34,5	32,5						42	39,5	37,5	36	34	33	31	64	
68								37	35,5	34	32	31	29,1							36,5	34	32,5	30,5	29,6	27,8	68	
72								34	32,5	31	29	27,9	26,1							33,5	31	29,6	27,7	26,7	24,8	72	
76									29,9	28,3	26,3	25,2	23,4								28,5	27	25	24	22,2	76	
80										25,9	23,9	22,7	21									24,6	22,7	21,6	19,8	80	
84											23,8	21,7	20,5	18,8								22,6	20,5	19,4	17,7	84	
88												19,8	18,5	16,7									18,7	17,5	15,7	88	
92													18,1	16,7	14,9								17	15,7	13,9	92	
96														15,1	13,3									14,1	12,3	96	
100															13,7	11,8									12,7	10,8	100
104																10,4										9,5	104

TAB 154454 / 154455 / 154456 / 154457



m	49 m														56 m														m
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m					
14	271																								271				
16	237	227																								237			
18	210	202	194																							210			
20	188	181	174	169	158																					188			
22	170	164	158	153	148	133																				170			
24	155	150	144	140	136	130	111																			155			
26	142	137	133	129	125	119	109	96																		142			
28	132	127	123	119	115	110	107	95	80	72																132			
30	122	118	114	111	107	102	99	94	80	71	59															122			
32	115	110	106	103	100	95	92	90	79	70	58	49,5														115			
34		103	99	96	93	89	86	84	79	69	58	49																	
36		97	93	90	87	83	81	79	76	68	57	48,5																	
38		91	88	85	82	78	76	74	71	67	57	48																	
40			83	80	77	73	71	69	67	64	56	47,5																	
44			74	72	69	65	63	62	59	57	55	47																	
48				65	62	59	57	55	53	50	49	46																	
52					59	56	53	51	49,5	47	45	44	41,5																
56						51	48	46	44,5	42,5	40	39	37																
60							43,5	41,5	40,5	38	36	35	33																
64							40	38	36,5	34,5	32,5	31,5	29,5																
68								35	33,5	31	29,2	28,2	26,3																
72								32	30,5	28,2	26,3	25,3	23,5																
76									27,8	25,7	23,7	22,7	20,9																
80									25,7	23,4	21,4	20,4	18,6																
84										21,4	19,3	18,3	16,5																
88											17,5	16,4	14,6																
92												15,9	14,7	12,9															
96													13,1	11,3															
100														11,8	9,9														
104															8,6														
108																7,5													

TAB 154454 / 154455 / 154456 / 154457

m	63 m							m
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	
16	216							216
18	192	185						192
20	173	166	177					173
22	157	151	146	148				157
24	144	139	134	141	128			144
26	133	128	123	129	116	109	95	133
28	123	118	114	119	107	107	92	123
30	114	110	106	103	100	95	91	114
32	107	103	99	96	93	88	86	107
34		96	93	90	87	83	80	
36		90	87	84	81	77	75	
38		85	82	79	77	73	71	
40			78	75	72	68	66	
44			70	67	64	61	59	
48				60	58	55	53	
52					55	49	47,5	
56						48	43	
60							39	
64								37
68								
72								29,6

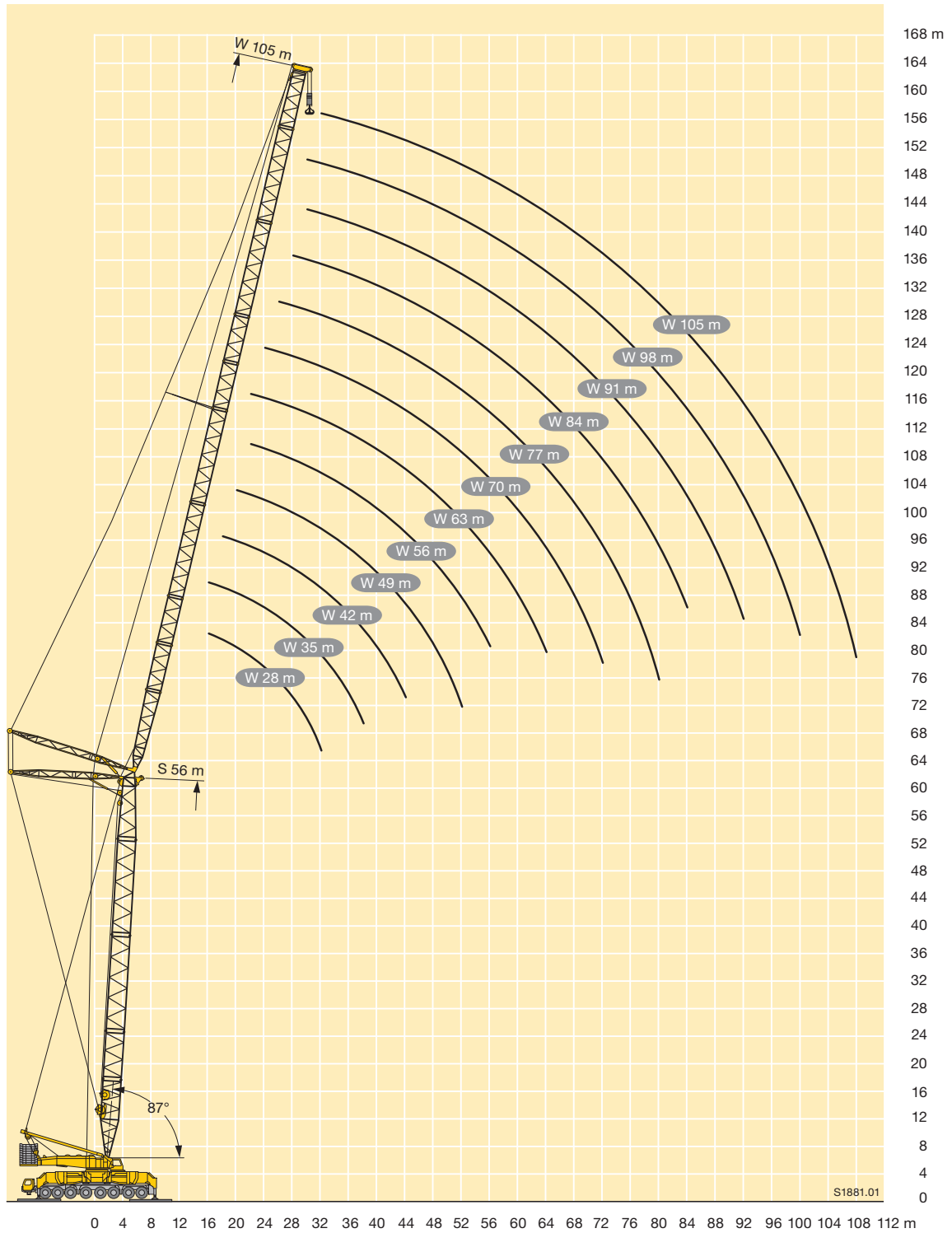
TAB 154454 / 154455 / 154456 / 154457

**Hubhöhen**

**Lifting heights**

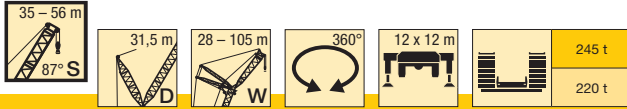
Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**SW**



# SDW

# S 35 - 56

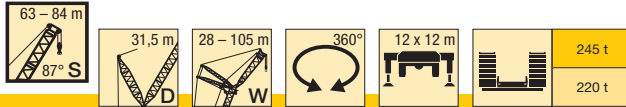


m	35 m										42 m										m			
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m
14	286											285												14
16	242	241										241	240											16
18	209	208	207									208	207	207										18
20	183	182	182	181	181							183	182	181	180									20
22	163	162	161	161	160	158						162	161	161	159	158	151							22
24	146	145	144	144	143	142	135					146	145	144	143	142	141	129						24
26	133	131	130	130	129	128	125	113				132	131	130	129	128	126	124	106					26
28	121	119	119	118	117	116	114	111	94			120	119	118	117	116	115	114	105	89				28
30		111	109	109	108	107	105	103	103	94	80	67												30
32			101	100	99	98	97	95	94	92	79	66	56											32
34			93	92	91	90	89	87	87	87	78	66	55											34
36			87	86	85	83	82	80	80	80	77	65	55											36
38				80	79	78	76	74	74	74	72	64	55											38
40				74	73	72	71	69	68	68	67	63	54											40
44				66	64	63	62	60	59	59	57	58	52											44
48					57	56	54	52	52	51	50	50	48,5											48
52						49,5	47,5	46	45,5	45	43,5	43	41,5											52
56						44	42,5	40,5	40	39	37,5	37,5	36											56
60							37,5	36	35	34,5	33	32,5	31											60
64							33,5	32	31	30,5	28,7	28,3	26,8											64
68								28,4	27,4	26,6	25,1	24,6	23											68
72									24,3	23,4	21,8	21,2	19,6											72
76									21,5	20,5	18,9	18,2	16,6											76
80										17,9	16,3	15,6	14,2											80
84											14,3	13,6	12,3											84
88											12,6	11,9	10,6											88
92												10,4	9,1											92
96												9	7,7											96
100													6,5											100

TAB 154414 / 154415

m	49 m										56 m										m			
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m
14	265												238											14
16	240	240											207	204	197									16
18	207	207	207										181	181	178	171								18
20	182	181	181	179									161	160	159	156	151							20
22	162	161	161	160	158								145	144	143	141	138	130						22
24	145	144	144	143	142	137							131	130	129	128	127	123	110					24
26	131	130	130	129	128	125	118	100					119	118	117	116	115	114	108	92	78			26
28	120	119	118	117	116	114	113	99	83				109	108	107	106	105	104	102	91	78	66		28
30		110	109	108	107	106	104	103	98	83	71													30
32			100	100	98	97	95	94	94	83	71	59												32
34			93	92	91	90	87	87	87	82	70	58	49,5											34
36			86	85	84	83	81	80	80	78	69	58	49											36
38			80	79	78	77	75	74	74	72	69	57	49											38
40				74	73	72	69	68	68	67	65	56	48,5											40
44				65	64	63	60	60	59	58	56	54	47											44
48					56	55	53	52	52	50	48,5	48,5	45											48
52						49	46,5	45,5	45	43,5	42	42	40,5											52
56						43,5	41	40	39,5	38	36,5	36,5	34,5											56
60							36,5	35,5	35	33	31,5	31,5	29,8											60
64							32,5	31,5	30,5	29,1	27,5	27,1	25,5											64
68								27,9	27,1	25,5	23,8	23,4	21,7											68
72									23,9	22,3	20,6	20	18,3											72
76									21,1	19,4	17,7	17	15,4											76
80										16,8	15,2	14,6	13,2											80
84										14,8	13,3	12,7	11,4											84
88											11,8	11,1	9,8											88
92												9,6	8,3											92
96												8,3	7											96
100													5,8											100
104													4,7											104

TAB 154414 / 154415



m	63 m										70 m										m				
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m	105 m
16	227												216											16	
18	203	196											194	187										18	
20	180	177	170	165									175	169	162									20	
22	160	160	155	150	140								159	154	148	143								22	
24	144	143	142	138	133	119							142	142	136	131	125	108						24	
26	130	129	128	127	123	117	100						129	129	125	121	118	106	91					26	
28	118	118	117	116	114	109	100	85					117	117	115	112	109	104	91	78				28	
30	108	108	107	106	105	101	99	84	72				108	107	105	104	102	97	90	78	66			30	
32	100	99	98	97	96	94	92	83	71	61	51		99	99	97	95	95	90	88	77	66	56		32	
34		92	91	89	89	86	86	82	71	61	51	42,5		91	89	88	87	85	82	77	66	56	46,5	34	
36		85	84	83	82	80	79	78	70	61	50	42,5		85	83	81	81	78	77	74	65	56	46,5	36	
38		79	78	77	76	74	73	72	69	60	50	42		79	77	76	75	72	70	64	55	46	39	38	
40			73	72	71	69	68	66	65	60	49,5	42			72	71	70	67	65	63	55	45,5	38,5	40	
44			64	63	62	60	59	58	56	56	49	41			63	62	61	59	58	56	57	53	45	38	44
48				55	54	52	52	50	48	48,5	46	40,5				54	53	51	50	49	49	47,5	43	37,5	48
52				49	48	46	45	43,5	42	42	40	38				48	47	45	44	42,5	42,5	40,5	39	35,5	52
56					42,5	40,5	39,5	38	36,5	36	34,5	33				41,5	39,5	38,5	37	37	35	33,5	31,5	56	
60						36	35	33,5	31,5	31,5	29,7	28					35	34	32,5	32	30,5	28,6	26,9	60	
64						32	31	29,2	27,5	27,2	25,5	23,7					31	29,9	28,3	27,9	26,2	24,4	22,6	64	
68							27,3	25,7	23,9	23,5	21,7	19,9						26,4	24,7	24,2	22,5	20,7	18,8	68	
72							24,2	22,5	20,7	20,2	18,4	16,5						23,3	21,6	21	19,2	17,3	15,5	72	
76							19,7	17,9	17,2	15,5	13,9								18,8	18,1	16,3	14,6	13,1	76	
80									15,4	14,8	13,3	12									15,6	14	12,6	11,2	80
84									13,6	13	11,6	10,2									13,7	12,3	10,9	9,5	84
88										11,4	10	8,7									10,8	9,4	8	88	
92											8,6	7,3										9,4	8	6,6	92
96												7,4	6										6,8	5,4	96
100													4,8											4,2	100
104													3,8											3,2	104

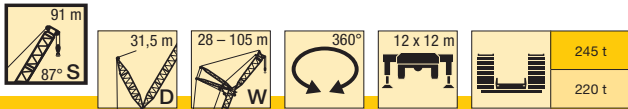
TAB 154414 / 154415

m	77 m										84 m										m			
	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m		105 m		
18	178																							18
20	161	154																						20
22	147	142	132																					22
24	135	131	126	112																				24
26	125	121	117	111	97																			26
28	115	112	109	104	96	83	71																	28
30	105	104	101	97	94	82	71	61																30
32	97	96	95	91	87	82	70	60	51															32
34	90	89	88	85	82	78	69	60	51	38														34
36	83	82	81	79	77	74	68	59	51	38	32													36
38	77	76	75	73	72	69	66	59	50	37,5	32	76	74	73	69	66	62	53	40,5	34,5	27,3		38	
40		71	70	68	67	65	62	58	50	37,5	32	71	69	68	65	62	60	52	40,5	34	27,1		40	
44			63	62	60	59	57	55	54	49	37	31,5	62	60	60	57	55	54	51	40	33,5	26,7	44	
48				54	52	51	49	47,5	47,5	46	36	31											48	
52				48	46	45	43	41	41	39,5	34	30,5											52	
56					40,5	39,5	37,5	36	35,5	34	28,9	28,8											56	
60						35	33	31	31	29,2	24,6	25,3											60	
64						31	28,9	27,2	26,8	25	20,9	21,3											64	
68							25,4	23,6	23,2	21,3	17,5	17,7											68	
72							22,3	20,5	19,9	18	14,5	14,5											72	
76								17,7	17	15,3	12,3	12,2											76	
80									14,7	13,2	10,6	10,4											80	
84									12,9	11,5	9,1	8,9											84	
88										10	7,8	7,5											88	
92										8,7	6,6	6,2											92	
96											5,5	5,1											96	
100												4											4	100
104												3,1											3,2	104

TAB 154414 / 154415

# SDW

# S 91



m	91 m									m
	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	
22	103									22
24	102	89								24
26	100	89	77							26
28	99	88	77	67						28
30	93	85	75	66	57					30
32	87	83	74	66	56	43,5				32
34	82	78	72	64	56	43	36,5	29,5		34
36	77	73	69	63	56	43	36,5	29,2	22,9	36
38	72	69	65	62	55	42,5	36	28,9	22,9	38
40	68	65	62	60	54	42	36	28,6	22,8	40
44	60	58	55	53	51	41	35,5	28,3	22,4	44
48	53	51	48	48	45,5	38,5	34,5	27,9	21,9	48
52	46,5	44,5	42	41,5	40	34,5	32,5	27,2	21,5	52
56		39	37	36,5	34,5	29,5	27,9	25,9	21,1	56
60		34,5	32,5	32	30	25,3	23,7	22,9	19,9	60
64			28,5	27,8	26	21,7	20	19,2	16,4	64
68				24,3	22,5	18,5	16,6	15,9	13,2	68
72				21,2	19,3	15,6	13,8	13,1	10,9	72
76					16,5	13,2	11,8	11,1	9,2	76
80					14,4	11,6	10,3	9,5	7,8	80
84						10,1	8,8	8,1	6,5	84
88							7,6	6,9	5,3	88
92							6,4	5,7	4,3	92
96								4,7	3,3	96
100									2,4	100

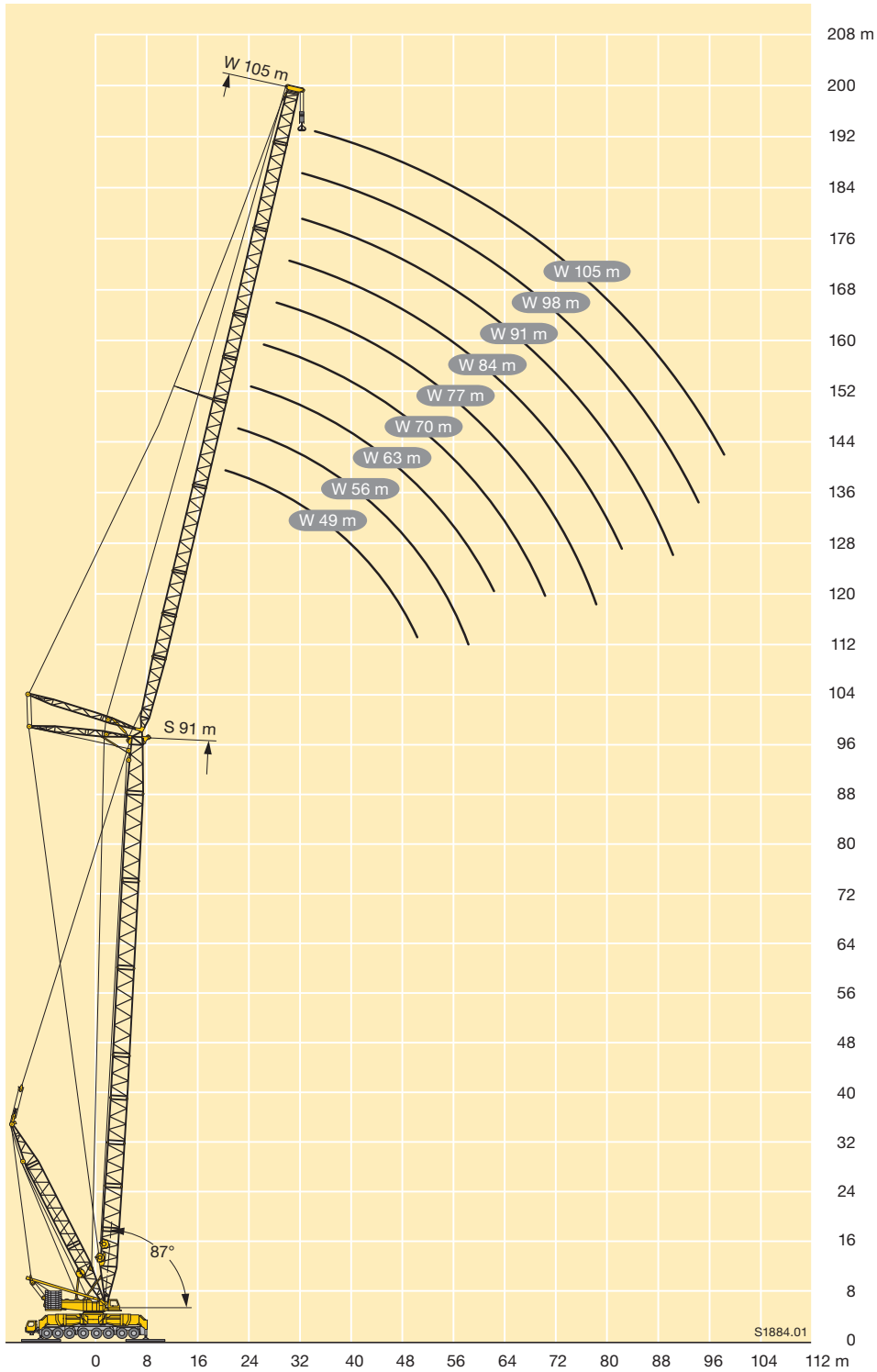
TAB 154414 / 154415

**Hubhöhen**

**Lifting heights**

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**SDW**



# SDWB

# S 35 - 56



max.  
400 t  
x 20 m

m	35 m										42 m										m			
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m
14	400											387												14
16	397	351										379	321											16
18	392	342	286									371	313	261										18
20	386	334	280	233	190							359	306	256	211									20
22	354	324	275	229	188	157						346	298	251	209	175	149							22
24	314	310	270	225	186	156	136					323	290	246	206	172	148	124						24
26	283	284	263	221	185	155	135	112				294	281	240	204	170	146	123	106					26
28	255	255	253	217	183	155	134	111	93			265	264	234	201	167	145	123	105	88				28
30	221	233	235	213	181	154	132	110	93	79	65	232	243	229	197	165	144	122	104	87	74			30
32		216	214	208	178	153	131	110	92	78	64	55	224	219	194	163	142	122	103	86	74	62		32
34		196	197	199	174	151	130	109	91	77	64	55	203	205	190	160	141	121	103	86	73	61	52	34
36		173	184	184	171	148	129	108	91	76	63	54	181	191	186	158	139	121	102	85	73	60	51	36
38			172	170	167	146	127	107	90	75	63	54	157	177	177	156	137	120	101	84	72	59	51	38
40			157	160	159	143	126	106	89	74	63	53		162	166	154	135	118	101	83	71	59	50	40
44			125	142	140	136	123	104	88	73	62	52		130	146	144	131	114	98	82	70	57	49,5	44
48				120	124	124	119	102	87	71	61	51			125	128	126	111	96	80	69	56	48,5	48
52					108	112	110	101	86	69	60	50				111	115	108	94	79	67	55	47,5	52
56					90	99	99	96	85	67	58	49				93	102	102	93	78	66	54	46,5	56
60						85	90	89	84	66	56	47,5				89	93	91	77	65	53	45,5	60	
64						71	80	82	80	65	55	46,5				74	82	85	76	64	52	44,5	64	
68							68	74	74	63	53	45,5					71	76	74	62	51	43,5	68	
72								65	68	62	53	44,5						67	69	61	51	42,5	72	
76								55	61	61	52	43,5						58	62	59	50	42	76	
80									53	56	52	42,5							54	57	50	41	80	
84										50	50	42							46	51	49	40,5	84	
88											43	46	41,5							44,5	47	40	88	
92												40	41									42,5	39,5	92
96												34	37,5									36	38	96
100													32										34	100

TAB 154393 / 154394 / 154395 / 154396

m	49 m										56 m										m				
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m	105 m
14	345												309											14	
16	345	289											302	253	211									16	
18	336	282	236										294	248	208	182								18	
20	326	276	231	196									285	243	205	177	148							20	
22	316	270	227	193	162								277	236	202	173	146	125						22	
24	306	263	223	190	160	137							267	230	198	169	145	125	104					24	
26	294	256	218	187	158	135	115	99					257	224	194	165	143	124	104	90	77			26	
28	273	249	213	184	156	133	114	98	82				241	218	190	162	142	124	105	89	76	64		28	
30	242	241	209	181	155	132	112	97	81	70			208	213	187	160	140	124	105	88	75	64	54	30	
32		229	205	177	153	130	111	96	80	69	58		205	183	157	138	123	105	88	74	64	54	45	32	
34		209	201	174	150	129	109	95	80	69	58	49	205	183	157	138	123	105	88	74	64	54	45	34	
36		188	194	171	148	128	108	94	79	68	57	48,5	189	179	155	135	122	105	87	74	64	53	44,5	36	
38		164	183	168	146	126	107	93	79	68	57	48	165	174	153	133	119	105	86	73	64	53	44,5	38	
40			167	165	144	125	106	93	78	67	56	47,5		166	150	131	117	103	86	73	64	52	44	40	
44			136	149	140	123	104	91	77	66	55	47		136	144	127	112	99	84	71	64	52	43	44	
48				128	130	120	103	89	76	65	54	46			127	123	108	95	83	70	63	51	42,5	48	
52					114	115	101	87	75	64	53	45,5				113	105	91	81	69	62	50	42	52	
56					97	104	98	86	73	62	52	44,5				95	101	88	80	68	60	49	41	56	
60						91	93	84	72	61	51	43,5					90	86	78	67	59	48	40,5	60	
64						76	84	82	71	60	50	42,5					75	81	76	66	57	47	39,5	64	
68							73	77	70	59	49	41,5						71	74	64	56	46	39	68	
72								69	69	58	48	41							67	63	55	45	38	72	
76									59	64	57	47,5	40						58	61	54	44,5	37,5	76	
80										56	56	47	39,5							55	53	43,5	37	80	
84											47,5	52	46	38,5						47	51	43	36,5	84	
88												45,5	45,5	38							44	42,5	36	88	
92													43	37,5									41	35,5	92
96														37,5									36,5	35,5	96
100															34,5									33,5	100
104																29,5								28,5	104

TAB 154393 / 154394 / 154395 / 154396



# SDWB

# S 63 - 84



max.  
400 t  
x 20 m

m	63 m										70 m										m					
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m	105 m	
16	274											236												16		
18	267	225										229	201											18		
20	260	221	190	160								223	195	169										20		
22	252	216	187	158	137							217	190	167	142									22		
24	244	211	184	155	134	115						211	184	164	141	122	106							24		
26	236	205	181	153	132	113	99					205	179	162	139	120	105	90						26		
28	228	199	177	151	130	112	98	83				199	174	158	138	119	104	88	76					28		
30	220	194	173	149	128	110	97	83	70			192	170	154	136	117	103	87	75	63				30		
32	212	190	169	147	126	108	96	82	69	60	50	187	165	150	133	116	102	87	75	63	55			32		
34		186	165	145	124	107	95	82	68	60	49,5	42,5	161	146	131	114	101	86	74	62	55	45,5		34		
36		182	162	143	123	106	94	81	68	59	49	42	157	142	128	112	100	85	73	62	54	45	39	36		
38		172	158	141	121	105	93	81	67	59	48,5	41,5	154	139	125	110	98	84	73	62	54	44,5	38,5	38		
40			155	139	120	104	92	81	67	58	48,5	41,5		135	122	108	97	83	72	61	54	44,5	38	40		
44			138	131	116	103	89	79	66	58	47,5	41		129	117	104	94	81	71	61	53	43,5	37,5	44		
48				126	112	101	87	77	65	57	47	40,5			111	100	92	79	69	59	52	43	37	48		
52				107	108	97	85	75	64	56	46	40			107	97	89	77	67	58	52	42	36	52		
56					98	93	83	73	64	55	45	39				93	85	76	66	56	51	41	35,5	56		
60						89	81	71	63	54	44	38,5					82	74	65	55	51	40	34,5	60		
64							78	80	70	62	53	43	38				79	72	63	54	50	39,5	34	64		
68								73	69	60	52	42	37					69	62	53	50	38,5	33,5	68		
72								62	67	58	51	41,5	36,5						64	61	53	48,5	38	32,5	72	
76									61	57	50	41	36							59	52	47	37	32	76	
80										55	49,5	40	35,5								51	45,5	36,5	31,5	80	
84											48,5	49	39,5	35								48,5	44,5	36	31	84
88												46	39	34									43,5	35,5	31	88
92													38,5	33,5									40,5	35	30,5	92
96														37	33									35	30,5	96
100															33										30,5	100
104																30,5									30	104

TAB 154393 / 154394 / 154395 / 154396

m	77 m										84 m										m				
	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m		105 m			
18	177																								18
20	172	151																							20
22	168	148	129																						22
24	164	145	127	110																					24
26	160	142	125	108	95																				26
28	155	139	123	107	94	80	71																		28
30	151	135	121	106	93	79	70	60																	30
32	147	131	119	104	92	79	69	59	51																32
34	144	128	116	103	91	78	68	58	51	38															34
36	142	125	114	101	90	77	67	58	51	37,5	32														36
38	139	122	111	99	89	77	66	57	51	37,5	31,5														38
40		120	109	97	87	76	65	57	51	37	31,5														40
44			115	104	93	84	74	64	56	50	36,5	31													44
48				100	90	81	72	62	55	50	36	30,5													48
52				96	86	78	70	61	54	48,5	35,5	30													52
56					83	75	68	60	53	47	34,5	29,5													56
60						72	65	58	52	45,5	34	28,8													60
64							63	56	50	44	33	28,1													64
68								61	54	49	43	32,5	27,5												68
72									60	53	47,5	41,5	31,5	26,8											72
76										51	46,5	40,5	31	26,3											76
80											45	39,5	30	25,9											80
84												44	38,5	29,5	25,4										84
88													37,5	28,9	25										88
92														37	28,4	24,6									92
96															28,3	24,3									96
100																23,9									100
104																	23,4								104

TAB 154393 / 154394 / 154395 / 154396

# SDWB

# S 91



max.  
400 t  
x 20 m

m	91 m									m
	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	
22	101									22
24	100	88								24
26	98	87	75							26
28	97	85	74	65						28
30	95	84	73	64	56					30
32	93	82	72	63	55	44,5				32
34	91	81	71	62	55	44	36	28,5		34
36	88	79	71	62	54	44	36	28,3	22	36
38	86	77	69	61	53	42	35,5	28	21,8	38
40	84	75	68	60	53	41	35	27,6	21,6	40
44	80	72	65	58	51	40	34,5	27,3	21,2	44
48	77	69	62	55	49,5	39	34	26,8	20,8	48
52	74	66	60	53	47,5	37,5	33	26,4	20,5	52
56		63	57	51	46	36	32	26,1	20,2	56
60		62	55	49	44,5	34,5	31	25,1	19,7	60
64			53	47,5	43	33,5	29,9	24,4	19,2	64
68				45,5	41,5	32,5	29	23,6	18,7	68
72				44	40	31,5	28	22,9	18	72
76					38,5	30	27	22,1	17,5	76
80					37,5	29,2	26,1	21,3	16,9	80
84						28,4	25,2	20,5	16,3	84
88							24,4	19,8	15,6	88
92							23,7	19,1	15,1	92
96								18,5	14,5	96
100									14	100
104									13,4	104

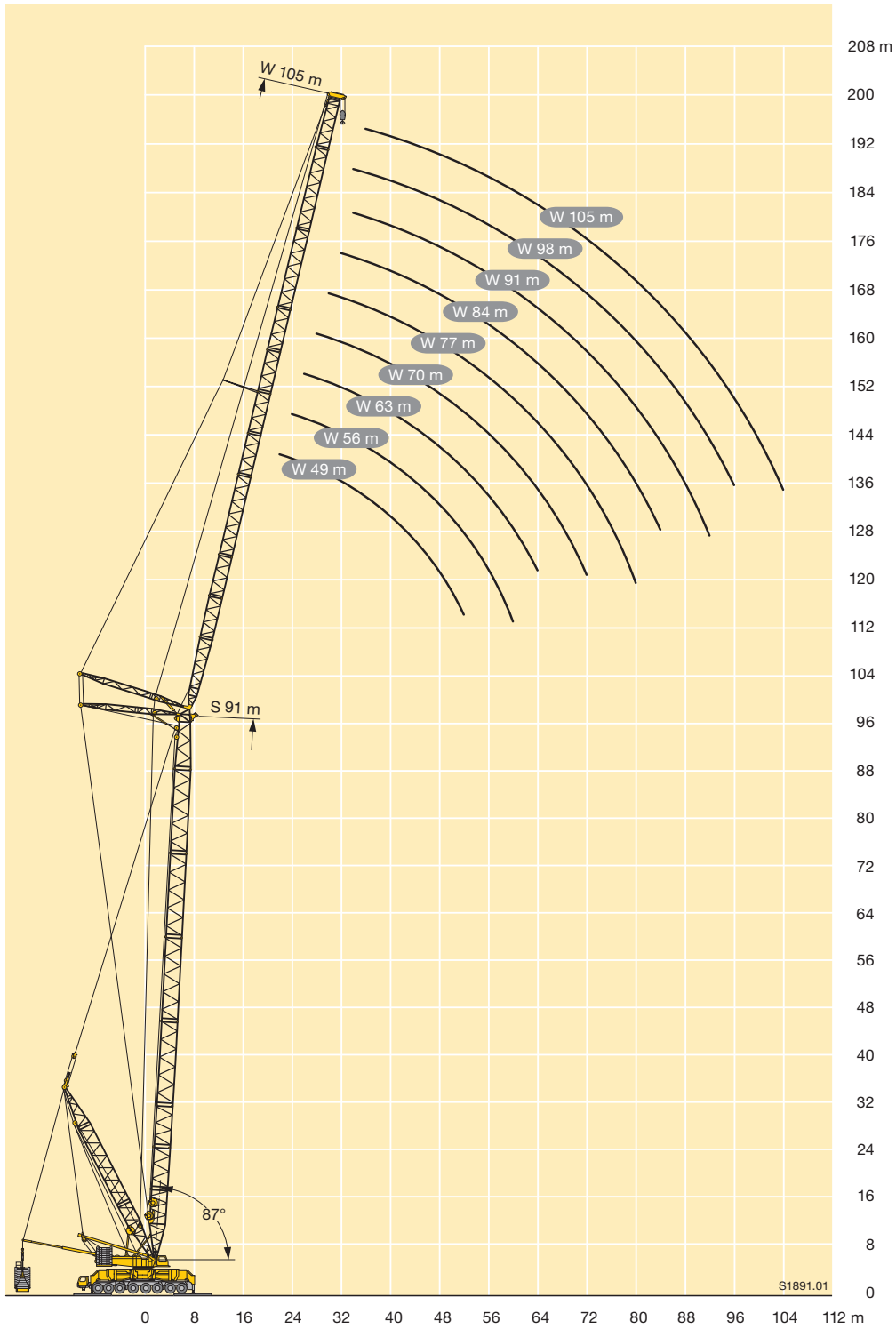
TAB 154393 / 154394 / 154395 / 154396

# Hubhöhen

## Lifting heights

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**SDWB**



# SDWB

# S 35 - 56



max.  
400 t  
x 20 m

m	35 m														42 m														m
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m					
24	334												307												24				
26	316												291												26				
28	300	290											278	268											28				
30	286	276	251										265	257	232										30				
32	273	264	249										254	246	230	189									32				
34	258	249	238	203									244	236	228	188									34				
36	238	236	226	201	164								232	226	220	187	156								36				
38		216	214	199	163	142							218	212	186	155	132								38				
40		202	201	193	163	141							186	186	182	153	131	108							40				
44			173	173	160	140	119	99						165	162	150	130	108	92						44				
48			153	150	151	137	119	99	81					136	144	143	128	108	92	76	63				48				
52				135	132	132	117	98	81	68					144	143	128	108	92	76	63	52			52				
56				118	120	118	116	98	80	67	55	46				129	127	125	108	92	76	63	52		56				
60					108	106	106	97	80	65	54	45,5					115	114	107	92	76	63	51	43	60				
64						97	95	94	80	64	54	45,5					99	104	102	92	75	62	51	43	64				
68						86	88	87	80	64	53	45						93	94	91	75	62	51	42,5	68				
72							80	80	76	63	53	44							85	84	75	61	50	42,5	72				
76							69	73	70	62	52	43,5							75	77	75	60	50	42	76				
80								66	65	61	52	43								71	70	60	49,5	41,5	80				
84									60	59	52	42,5								61	65	59	49,5	41	84				
88									54	55	52	42									58	58	49,5	40,5	88				
92										51	50	41,5										54	49,5	40,5	92				
96										43,5	46,5	41										47,5	49	40	96				
100											42	41											45	40	100				
104												38											39	40	104				
108												33,5												36	108				

TAB 154397 / 154398 / 154399 / 154400

m	49 m														56 m														m
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m					
28	282																								28				
30	269	260											260												30				
32	257	248											249	237											32				
34	246	238	213										238	230											34				
36	237	229	212	176									229	221	193										36				
38	227	220	210	175									216	213	192	159									38				
40	214	212	205	174	143								203	203	190	159									40				
44		190	189	171	142	123								181	180	157	133	113							44				
48			171	167	140	122	102	86						163	162	155	132	113	96						48				
52			151	153	137	122	102	86	71						148	146	130	113	96	81	66				52				
56				138	134	121	102	86	71	60	49					134	128	111	96	81	66	57			56				
60				116	122	119	101	86	71	60	48,5	40,5				123	121	110	95	81	66	57	45,5		60				
64					107	108	101	86	71	60	48,5	40,5					112	109	95	81	66	57	45,5	38	64				
68						98	97	85	71	59	48	40,5					94	101	94	81	66	57	45,5	38	68				
72						85	89	85	71	59	48	40,5					89	92	80	66	57	45	38		72				
76							80	80	71	58	47,5	40						83	80	66	57	44,5	37,5		76				
80								74	71	57	47	40							72	77	66	56	44,5	37,5	80				
84								66	67	57	46,5	39,5								69	66	56	44	37,5	84				
88									62	57	46,5	39								59	63	56	44	37,5	88				
92									54	56	46,5	39									56	55	44	37	92				
96										50	46,5	39										53	44	37	96				
100											46,5	38,5										45,5	44	37	100				
104											42	38,5											43	37	104				
108												38,5												37	108				
112												34												36	112				

TAB 154397 / 154398 / 154399 / 154400

# SDWB

# S 63 - 84



max.  
400 t  
x 20 m

m	63 m										70 m										m					
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m	105 m	
32	239												213											32		
34	229	212											206	183										34		
36	218	211											194	181	155									36		
38	204	203	176										182	176	154									38		
40	193	191	175	146									163	161	149	132	113							40		
44		170	170	146	122									145	143	128	112	96						44		
48			154	153	144	122	105	89							131	125	111	96	81					48		
52				139	137	120	105	89	74							120	117	108	95	81	68	57		52		
56				127	125	119	104	89	74	61							108	95	81	68	57			56		
60					115	113	103	88	74	61	52	42					108	105	94	81	68	57	48	60		
64						104	102	88	74	61	52	42	35,5				100	98	92	80	68	57	48	39,5	32	64
68						97	95	87	74	61	52	42	35,5				91	89	79	68	57	48	39,5	32	68	
72							88	86	74	61	52	41,5	35,5					82	78	68	57	48	39	32	72	
76							81	80	73	61	52	41,5	35,5				76	74	67	57	48	39	32	76		
80								75	73	61	52	41,5	35,5					69	67	57	48	38,5	32	80		
84									69	61	52	41	35,5					65	63	57	48	38,5	32	84		
88									63	61	52	41	35						59	57	48	38	32	88		
92										59	52	41	35							54	48	37,5	32	92		
96										51	52	41	35							51	48	37,5	31,5	96		
100											49	41	35									45,5	37,5	31,5	100	
104												41	35									43	37,5	31,5	104	
108												40	35										37,5	31,5	108	
112													35											31,5	112	
116														35										31,5	116	

TAB 154397 / 154398 / 154399 / 154400

m	77 m										84 m										m			
	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m		105 m		
38	157																							38
40	154	137																						40
44	147	132	117																					44
48	137	127	113	100																				48
52	124	122	109	98	86	73																		52
56		113	105	95	84	73	61																	56
60			101	92	82	72	61	52	44															60
64			93	89	80	71	61	52	44	32,5														64
68				84	77	69	60	52	44	32,5	26,3													68
72				78	75	68	59	52	44	32	26,3													72
76					70	66	58	52	44	32	26,3													76
80						64	57	51	44	31,5	26,3													80
84						60	56	50	43,5	31,5	26,3													84
88							54	49	42,5	31,5	26,3													88
92							50	48,5	42	31	26,2													92
96								46	41,5	31	26													96
100									41	31	26													100
104										38,5	31	26												104
108											31	26												108
112											29,4	26												112
116												25,4												116
120													25,4											120

TAB 154397 / 154398 / 154399 / 154400

# SDWB

# S 91



max.  
400 t  
x 20 m

m	91 m								m	
	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m		105 m
48	86									48
52	82	74	64							52
56	79	71	63	56						56
60	76	68	61	55	47,5					60
64	74	66	58	53	46,5	36	31			64
68	72	64	56	51	45	35,5	30,5	23,6		68
72		62	54	49,5	43,5	34	30	23,6	17,8	72
76		61	53	48	42	33	29,2	23,5	17,8	76
80			52	46,5	41	32	28,4	22,8	17,8	80
84				45	39,5	31	27,5	22,1	17,2	84
88				44	38,5	30	26,7	21,5	16,7	88
92					37,5	29,4	26	20,8	16,1	92
96						28,7	25,2	20,2	15,6	96
100						27,9	24,5	19,6	15,1	100
104							23,9	19,1	14,7	104
108							23,3	18,5	14,2	108
112								18	13,7	112
116									13,3	116
120									12,9	120

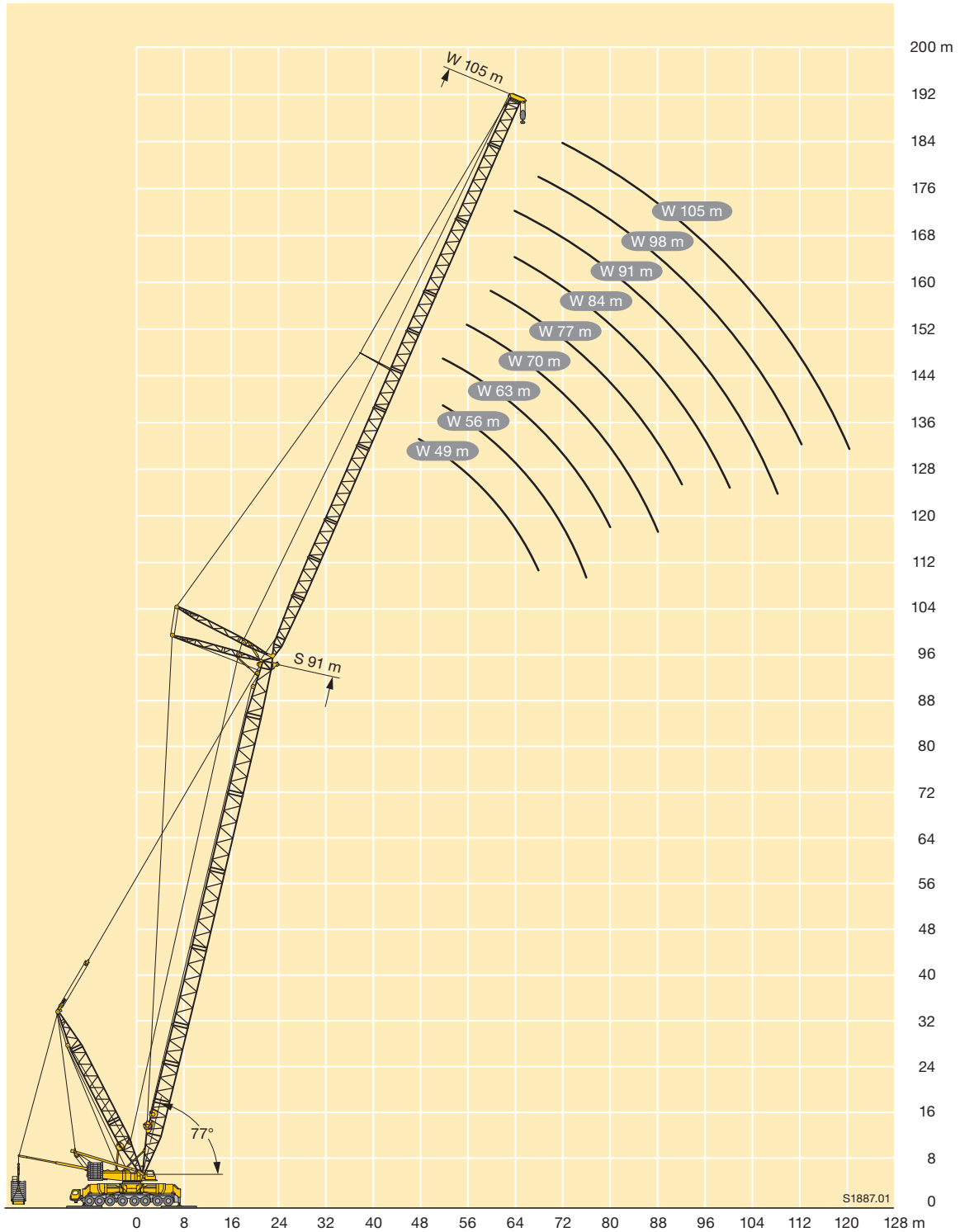
TAB 154397 / 154398 / 154399 / 154400

**Hubhöhen**

**Lifting heights**

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**SDWB**



# SDWB

# S 35 - 56



max.  
400 t  
x 20 m

m	35 m													42 m													m
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m			
34	233																								34		
36	219																									36	
38	208	203											224													38	
40	197	192											211													40	
44		175	169										189	187												44	
48		160	155	148									154	169	166											48	
52			143	136	134									152	146											52	
56			134	126	125	118								139	136	133										56	
60				119	117	111	106								126	124	116									60	
64					109	105	101	89							117	115	111	101								64	
68					101	100	94	88	72						106	104	100	82	67							68	
72					91	89	84	72	60						99	97	95	82	67	56						72	
76					83	82	81	72	60	47,5						90	89	82	67	56	44,5					76	
80						76	75	70	60	47,5	40						83	81	67	56	44,5	37				80	
84							69	66	60	47,5	40						76	74	67	56	44,5	37				84	
88							64	62	60	47,5	40							69	67	56	44,5	37				88	
92								58	56	47,5	40							62	62	56	44,5	37				92	
96									52	47,5	40								58	56	44,5	37				96	
100									48,5	47	40									53	44,5	37				100	
104										44	40									49	44,5	37				104	
108										40,5	39,5										44	37				108	
112											36,5											37				112	
116																							37			116	

TAB 154402 / 154403 / 154404 / 154405

m	49 m													56 m													m
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m			
40	210																									40	
44	188	186											182													44	
48	170	168	166										165	163												48	
52		152	151	148										148	146											52	
56			138	136	131									135	134	131										56	
60			127	125	123	114									123	121	118									60	
64				115	114	111	93								114	112	109	106								64	
68				107	105	103	93	77							103	101	99	87								68	
72					98	96	93	77	62							94	92	87	72							72	
76						89	88	77	62	53						88	85	84	72	60						76	
80						84	82	77	62	53	41,5						80	78	72	60	50					80	
84							77	76	62	53	41,5	35					75	73	72	60	50	39,5				84	
88							72	71	62	53	41,5	35						69	67	60	50	39,5	32,5			88	
92								67	62	53	41,5	35							63	60	50	39,5	32,5			92	
96									61	53	41,5	35							59	58	50	39,5	32,5			96	
100									57	53	41,5	35								55	50	39,5	32,5			100	
104										53	41,5	35								52	49,5	39,5	32,5			104	
108											41,5	35									47	39,5	32,5			108	
112											41,5	35										39,5	32,5			112	
116												35											39,5	32,5			116
120												35												32,5			120

TAB 154402 / 154403 / 154404 / 154405



# SDWB

# S 63 - 91



max.  
400 t  
x 20 m

m	63 m															70 m										m
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m		
48	158																								48	
52	144	141											137	134											52	
56		129	127										125	123	120										56	
60		119	117	114										113	110	108									60	
64			108	105	103									102	99	98									64	
68				98	96	94								94	92	90	87								68	
72				91	89	87	80							85	84	81	73								72	
76					83	81	78	67						80	78	75	73	61							76	
80					78	75	73	67	56						73	70	68	61	51						80	
84					70	68	67	55	46						65	64	61	51	42						84	
88						64	63	55	46	36					61	60	57	51	42	33					88	
92						60	58	55	46	36	29,7				56	54	51	42	33	27,2					92	
96							55	54	46	36	29,7					52	50	49	42	33	27,2				96	
100							52	50	46	36	29,7						47	46	42	33	27,2				100	
104								47,5	45,5	36	29,7							43	41	33	27,2				104	
108									42,5	36	29,7								40,5	38	33	27,2			108	
112									40	36	29,7									36	33	27,2			112	
116										36	29,7										33,5	32,5	27,2		116	
120											29,7											30,5	27,2		120	
124											29,7												26,3		124	
128											29,7												24,3		128	

TAB 154402 / 154403 / 154404 / 154405

m	77 m										84 m										m			
	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m		105 m		
56	116																							56
60	106	104																						60
64	98	96	94																					64
68		88	86	84																				68
72		82	80	77	75																			72
76			74	72	70	67																		76
80				67	65	62	57																	80
84				61	58	57	46																	84
88					56	54	53	46	39															88
92					53	50	49,5	46	39	27,4														92
96						47	46	44	39	27,4	22													96
100							43	41	39	27,4	22													100
104								40,5	38	37,5	27,4	22												104
108									35,5	34,5	27,4	22												108
112										33,5	32	27,1	22											112
116											30	25	22											116
120												23,3	21,2											120
124												21,6	19,4											124
128													17,8											128
132													16,2											132

TAB 154402 / 154403 / 154404 / 154405

m	91 m								m	
	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m		105 m
72	68									72
76	63	60								76
80	59	56		54						80
84	55	52		50	47	40,5				84
88		48,5		46,5	44	40	31			88
92				43	40,5	38	30,5	25,4		92
96				40	37,5	35,5	30,5	25,2	19,3	96
100					35	32,5	28,6	25	19,1	100
104					32,5	30	26,3	24	19	104
108						27,9	24,1	21,9	18,6	108
112							22,2	19,9	16,7	112
116							20,5	17,9	14,9	116
120								16,5	13,2	120
124								15,1	11,9	124
128									11,1	128
132										132
136										136

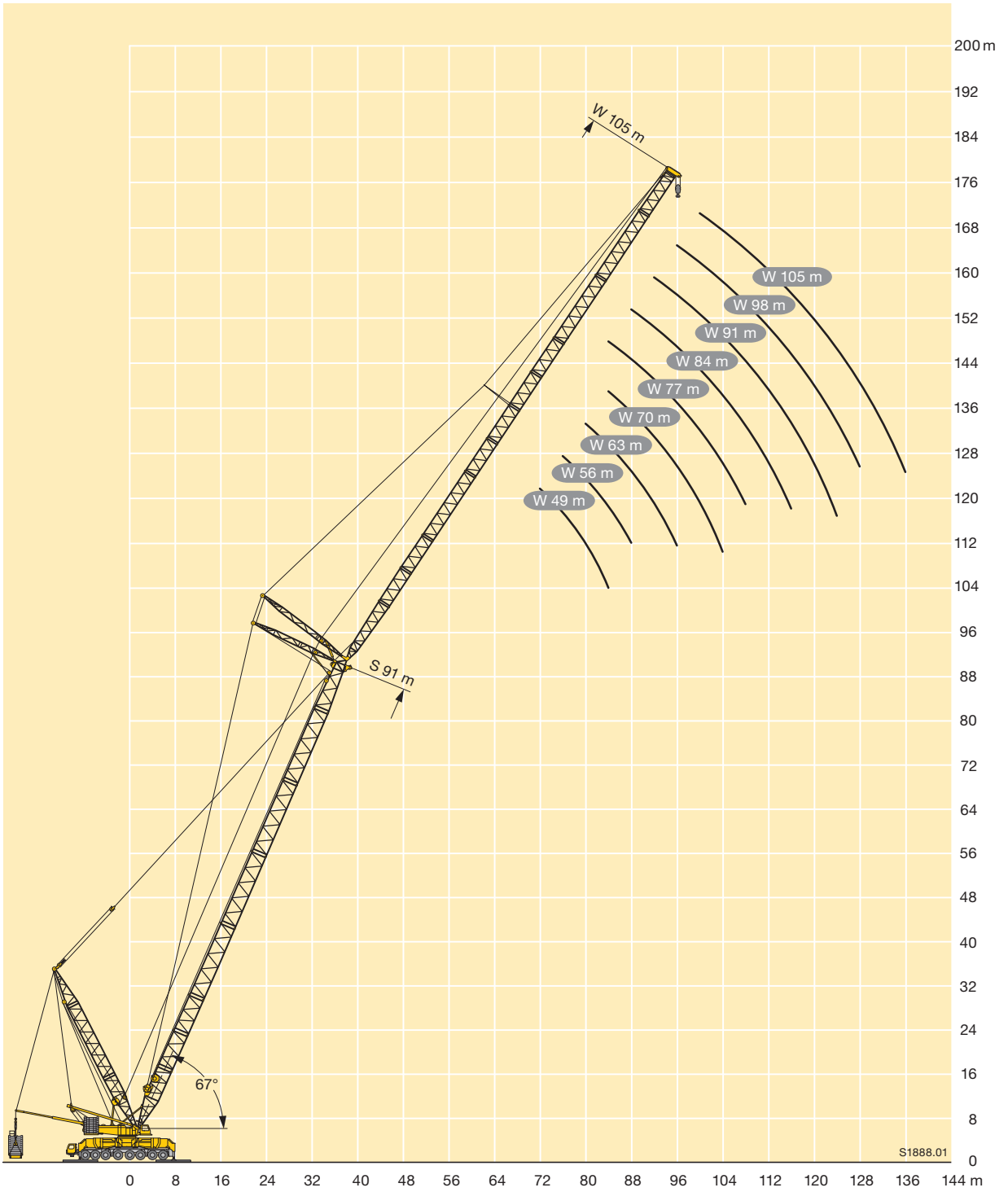
TAB 154402 / 154403 / 154404 / 154405

# Hubhöhen

## Lifting heights

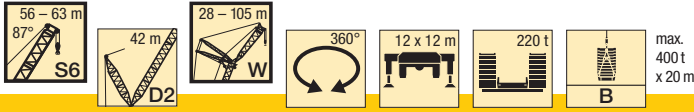
Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**SDWB**



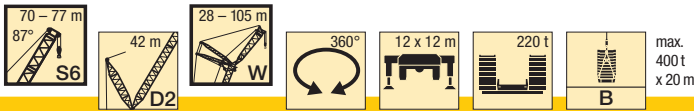
# S6D2WB

# S 56 - 77



m	56 m										63 m										m					
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m	105 m	
16	329												294												16	
18	320	270	228										286	243											18	
20	311	264	224	189									279	238	203	172									20	
22	301	258	220	186	158								270	233	199	170	145								22	
24	292	252	216	183	156	134							262	227	196	167	143	123							24	
26	279	245	212	181	154	133	113						252	221	192	165	142	122	104						26	
28	257	239	207	178	153	131	112	95	81				243	216	188	163	140	121	103	88					28	
30	234	232	202	175	151	130	111	94	80	69			234	213	184	160	138	120	102	87	74				30	
32		222	198	172	149	129	110	93	79	68	57			209	180	157	137	118	101	86	74	63	53		32	
34		207	194	169	147	128	109	93	79	68	56	48		204	176	154	135	117	101	86	73	63	53	44,5	34	
36		187	188	166	144	126	108	92	78	67	56	47,5		192	171	152	133	116	100	85	72	62	52	44,5	36	
38			179	163	142	125	107	91	77	67	55	47		167	167	149	131	114	99	84	72	62	52	44	38	
40			167	160	140	123	106	91	77	66	55	46,5			162	146	129	113	98	84	71	61	51	43,5	40	
44				147	135	120	104	89	76	66	54	46				139	124	110	95	82	70	61	50	43	44	
48				126	128	117	101	87	74	64	53	45				128	119	108	93	81	69	60	49,5	42	48	
52					115	113	99	86	73	63	52	44,5					114	107	91	79	68	59	48,5	41,5	52	
56					93	104	96	84	72	62	51	43,5				97	104	88	78	66	58	47,5	40,5	40,5	56	
60						89	93	82	70	60	49,5	42,5					93	85	77	65	57	46,5	40	40	60	
64						72	84	79	69	59	49	41,5					75	83	75	64	56	45,5	39	36	64	
68							71	76	68	58	48	41						72	74	63	55	45	38	36	68	
72								67	66	57	47	40							69	62	54	44	37,5	35	72	
76								56	62	57	46	39,5								58	61	53	43	36,5	76	
80									54	56	45,5	39									55	52	42,5	36	80	
84									44,5	51	45	38									46	50	41,5	35,5	84	
88										43	44,5	37,5										44	41	35,5	88	
92											41	37											40,5	35	92	
96												34,5											35,5	35	96	
100																								33	100	
104																									27,2	104

TAB 154549 / 154553



m	70 m										77 m										m				
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m		91 m	98 m	105 m	
16	258																								16
18	252	217																							18
20	245	213	183																						20
22	238	208	179	154																					22
24	231	204	176	151	130	113																			24
26	223	198	173	149	129	110	96																		26
28	216	193	170	147	127	110	95	81																	28
30	210	188	166	145	126	109	94	81	69																30
32		204	184	163	142	124	108	93	80	68	59														32
34			180	159	140	122	107	92	79	68	59	49													34
36			177	157	137	121	106	91	79	67	58	48,5	41												36
38			168	154	135	119	104	91	78	66	58	48	40,5												38
40				151	133	117	103	90	78	66	58	47,5	40												40
44				137	127	113	100	87	76	65	57	46,5	39,5												44
48					124	109	98	85	74	64	56	46	39												48
52						105	95	83	73	62	55	45	38,5												52
56						97	93	81	71	61	54	44	37,5												56
60							90	79	70	60	53	43	37												60
64								77	77	68	59	52	42,5	36											64
68									72	67	58	51	41,5	35											68
72									60	66	57	50	40,5	34,5											72
76										59	56	49,5	40	34											76
80											54	48,5	39	33,5											80
84											48	38,5	33												84
88												45	38	32,5											88
92												38	32												92
96													35,5	32											96
100														32											100
104															28										104

TAB 154549 / 154553

# S6D2WB

# S 56 - 91



max.  
400 t  
x 20 m

m	84 m										91 m										m
	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m		
20	147										111									20	
22	144	125									109	95								22	
24	141	123	107								107	94	83							24	
26	138	121	105	92							106	93	81	71						26	
28	135	119	104	91	79						104	91	80	70	61					28	
30	132	117	103	90	78	67	58				102	90	79	69	60	51				30	
32	129	115	101	89	77	66	57	49			100	89	78	68	60	51	43,5	36,5		32	
34	126	112	100	88	76	66	57	48,5	40,5		98	87	77	68	59	51	43	36	30,5	34	
36	123	110	98	87	76	65	56	48	40	33,5	96	85	76	67	59	50	43	35,5	30,5	36	
38	120	108	96	86	75	65	56	48	39,5	33,5	94	83	75	66	58	49,5	42,5	35,5	30	38	
40	118	105	94	85	74	64	55	47,5	39,5	33	90	80	72	64	57	49	42	34,5	29,7	40	
44	113	101	91	82	72	63	54	47	39	32,5	86	77	70	62	55	48	41,5	34	29,2	44	
48		97	87	80	70	61	53	46	38	32	84	74	67	60	54	46,5	40,5	33,5	28,8	48	
52			84	77	68	60	52	45	37,5	31,5	84	74	67	60	54	46,5	40,5	33,5	28,8	52	
56			82	74	66	58	51	44,5	36,5	31		72	65	58	52	45,5	39,5	33	28,3	56	
60				71	64	57	50	43,5	36	30,5			62	56	50	44,5	38,5	32	27,5	60	
64				70	62	55	48,5	42,5	35	29,7			61	54	49	43	37,5	31	26,8	64	
68					60	53	47,5	42	34	29				53	47,5	42	36,5	30,5	26,1	68	
72					59	52	46,5	41	33,5	28,4				52	46	40,5	35,5	29,7	25,5	72	
76						51	45,5	40	32,5	27,8					45	39,5	34,5	29	24,9	76	
80							44,5	39	32	27,2					44	38,5	33,5	28,3	24,3	80	
84							44	38	31,5	26,7						38	32,5	27,6	23,8	84	
88								37,5	30,5	26,2							32	27	23,3	88	
92								37,5	30,5	25,8							32	26,6	22,8	92	
96									30,5	25,5								26,4	22,4	96	
100										25,5									22,2	100	
104										25,5									21,9	104	

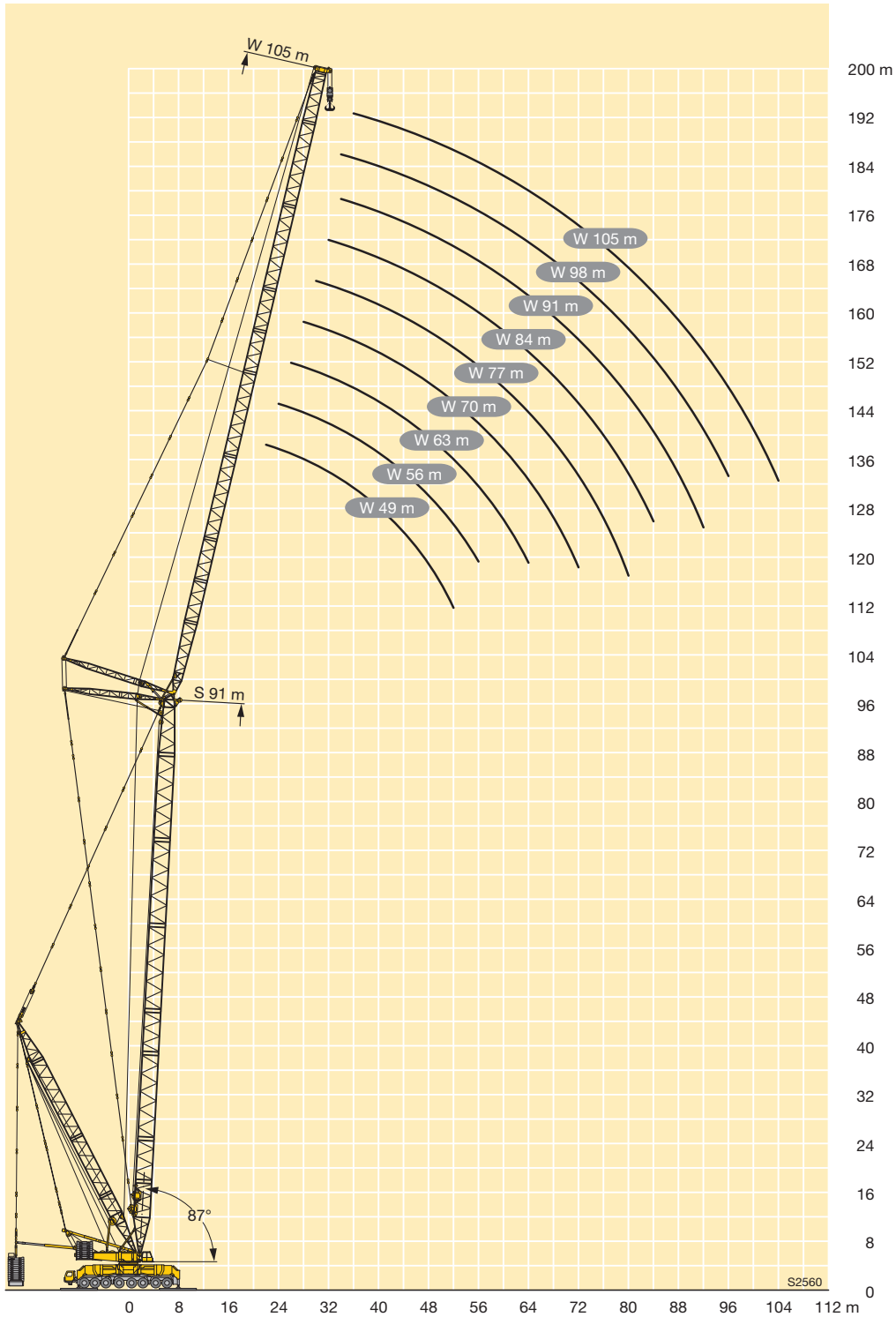
TAB 154549 / 154553

**Hubhöhen**

**Lifting heights**

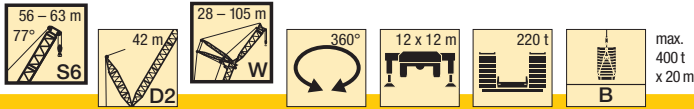
Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**S6D2WB**



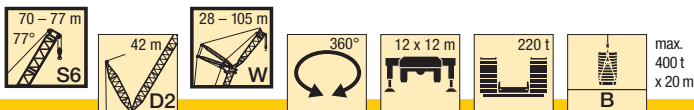
# S6D2WB

# S 56 - 77



m	56 m										63 m										m				
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m	105 m
30	266																							30	
32	252	241											248												32
34	239	230											235	222											34
36	228	221	204										224	214											36
38	218	212	197	179									214	207	188										38
40		203	190	175									206	199	183	165									40
44		188	177	165	148	127								185	172	158	137								44
48			165	156	143	127	105								162	150	135	117	98						48
52			154	146	137	125	105	88	73						152	142	131	117	98	82					52
56				137	130	120	105	88	73	61						135	125	114	98	82	68				56
60				121	122	115	104	88	73	61	49,5					128	119	109	98	82	68	57	46,5		60
64					111	109	100	88	73	61	49	41,5					114	105	97	82	68	57	46,5	38,5	64
68						100	97	88	73	61	49	41					101	94	82	68	57	46	38,5		68
72						88	91	86	73	61	48,5	41						94	81	68	57	46	38,5		72
76							83	82	73	60	48,5	40,5						86	79	68	57	45,5	38,5		76
80							71	76	72	60	48	40,5							77	77	68	57	45,5	38	80
84								68	70	59	48	40								72	68	56	45,5	38	84
88								56	64	59	48	40								62	66	56	45	37,5	88
92									55	57	48	39,5									60	56	45	37,5	92
96										52	47,5	39,5									50	54	45	37,5	96
100											44,5	47,5	39,5									48	45	37,5	100
104												43,5	39										44,5	37,5	104
108													38,5										39,5	37,5	108
112													34,5										36	36	112

TAB 154550 / 154554



m	70 m										77 m										m					
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m		91 m	98 m	105 m		
34	227																								34	
36	219	201																							36	
38	210	195	176										179												38	
40	202	190	172										175	157											40	
44		178	164	147	126								166	151	134										44	
48		168	156	142	125	107							157	145	130	114									48	
52			148	136	123	107	90							138	126	112	98	83							52	
56			141	130	119	107	90	76	63					132	121	109	97	83	69						56	
60				124	115	104	90	76	63	53					116	106	96	83	69	58	49				60	
64					110	101	90	76	63	53	43	36				112	102	93	82	69	58	49	40		64	
68						106	97	89	76	63	53	43	36				98	91	81	69	58	49	39,5	33	68	
72							94	86	76	63	53	43	35,5					88	79	69	58	49	39,5	33	72	
76							85	84	75	63	53	43	35,5					85	77	69	58	49	39,5	33	76	
80								80	74	63	53	42,5	35,5						75	68	58	49	39,5	33	80	
84								69	72	63	53	42,5	35,5						72	67	58	49	39,5	32,5	84	
88									66	63	53	42	35							65	58	49	39	32,5	88	
92										61	53	42	35							60	57	49	39	32,5	92	
96											54	53	42	35							55	49	39	32	96	
100												51	42	35								49	39	32	100	
104												44,5	42	35									46,5	39	32	104
108													41	35										39	32	108
112														35										37,5	32	112
116														33										32	32	116

TAB 154550 / 154554

# S6D2WB

# S 70 - 91



max.  
400 t  
x 20 m

m	84 m										91 m										m
	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m		
44	136																			44	
48	131	118	103								104									48	
52	126	114	102	88							101	89	78							52	
56	121	110	100	88	75	63					99	87	77	67						56	
60		107	97	86	75	63	53				96	85	75	66	57					60	
64		103	94	84	74	63	53	45			93	83	74	65	57	48	40			64	
68			91	82	73	63	53	45	36	29,6	90	81	72	64	56	48	40	32,5		68	
72			88	79	72	63	53	45	36	29,6		79	71	63	55	47,5	40	32,5	26,9	72	
76				77	70	62	53	45	36	29,6			69	61	54	47	40	32,5	26,9	76	
80				76	69	61	53	45	36	29,6			68	60	53	46,5	40	32,5	26,9	80	
84					67	60	53	45	36	29,6				59	52	45,5	39,5	32	26,9	84	
88						59	52	45	35,5	29,6				58	52	45	39	32	26,8	88	
92						59	51	45	35,5	29,4				51	44,5	38,5	31,5	26,6		92	
96							50	44,5	35,5	29,3					43,5	38	31,5	26,3		96	
100							50	44	35,5	29,2					43	37,5	31,5	26,1		100	
104								43,5	35,5	29,2						36,5	31	26,1		104	
108									35,5	29,2						36,5	31	26,1		108	
112									35,5	29,2							30,5	25,9		112	
116										29,2								25,6		116	
120										29,2								25,5		120	

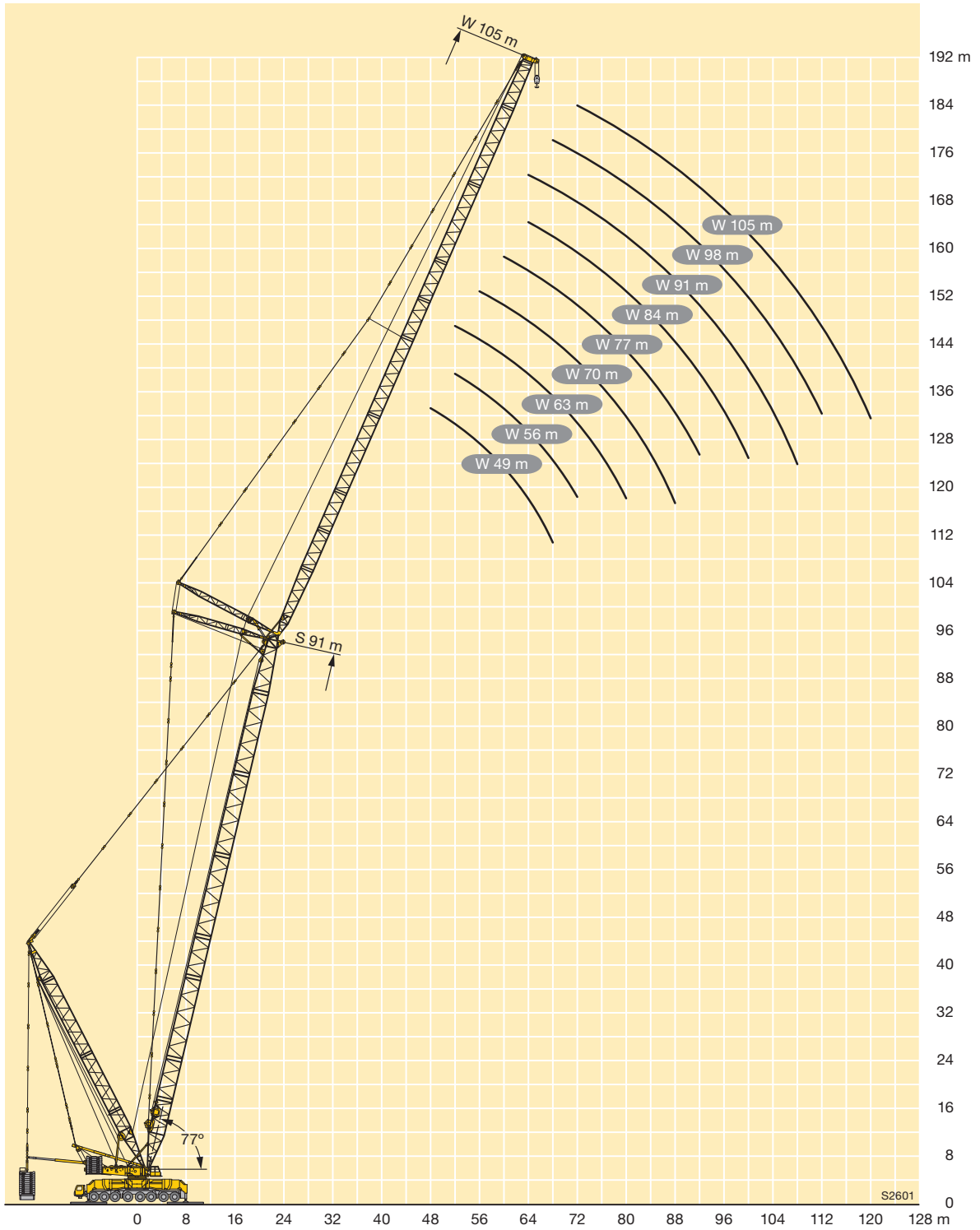
TAB 154550 / 154554

# Hubhöhen

## Lifting heights

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

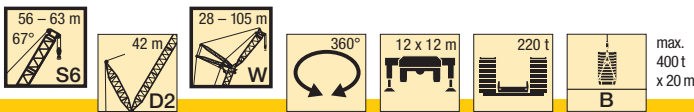
# S6D2WB





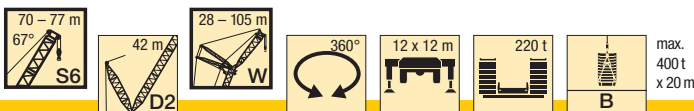
# S6D2WB

# S 56 - 77



m	56 m										63 m										m			
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m		84 m	91 m	98 m
44	177																							44
48	164	156										162												48
52		146	138										144											52
56			129	123									135	127										56
60			122	116	109									120	113									60
64				110	104	97								114	108	101								64
68				104	99	92	85								102	96	88							68
72					94	88	81	75							98	92	85	80						72
76					90	84	78	73	62							88	81	77	69					76
80						81	75	71	62	52							78	74	67	58				80
84							72	69	62	52	41,5						75	72	65	58	49			84
88							69	66	60	52	41,5	34						69	63	58	49	39		88
92								64	58	52	41,5	34						67	61	57	49	39	31,5	92
96								62	56	52	41,5	34							59	55	49	39	31,5	96
100									55	51	41,5	34						57	54	49	39	31,5	100	100
104									52	50	41,5	34								53	48,5	39	31,5	104
108										48	41,5	34									47,5	39	31,5	108
112											41,5	34									46,5	39	31,5	112
116											40	34										39	31,5	116
120												34											31,5	120
124													34										31,5	124

TAB 154551 / 154555



m	70 m										77 m										m			
	28 m	35 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	28 m	42 m	49 m	56 m	63 m	70 m	77 m	84 m		91 m	98 m	105 m
52	148	140																						52
56		132	125										127											56
60			125	118	111								120	112										60
64				112	105	98								107	99									64
68				107	101	94	85							102	95	87								68
72					96	90	82	76							91	84	78							72
76						86	79	74	65						87	81	76	67						76
80						83	76	72	64	54						78	73	66	59					80
84							74	70	62	54	45,5					75	71	64	58	49,5				84
88							71	67	61	54	45,5	36					68	62	57	49,5	42			88
92								65	59	54	45,5	36	29					60	56	49,5	42	33		92
96								63	57	53	45,5	36	29					58	54	49,5	42	33	26,4	96
100									56	52	45,5	36	29						53	48,5	42	33	26,4	100
104										51	44	36	29						52	47,5	41,5	33	26,4	104
108										49,5	43	36	29							47	40,5	33	26,4	108
112											42,5	36	29							45	40	33	26,4	112
116											41,5	36	29								39	33	26,4	116
120												36	29									33	26,4	120
124													29										26,4	124
128														29									26,4	128
132																							26,4	132

TAB 154551 / 154555

# S6D2WB

# S 56 - 91



max.  
400 t  
x 20 m

m	84 m										91 m										m
	42 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m	49 m	56 m	63 m	70 m	77 m	84 m	91 m	98 m	105 m		
64	100																			64	
68	96	90																		68	
72	92	87	79								79									72	
76		83	77	68							76	71								76	
80		81	74	66	61						73	69	61							80	
84			71	64	59	53						66	59	54	46,5					84	
88				62	58	52	45					64	58	53	45,5	40				88	
92				60	56	52	44,5	38					56	52	45	39,5	34			92	
96					55	51	44	38	29,9				55	50	44	39,5	34	26,6		96	
100					54	49,5	43	38	29,9	23,8				49	43	39	34	26,6	21,6	100	
104						48	42	38	29,9	23,8				47	42	38	34	26,6	21,6	104	
108						45,5	41	37,5	29,9	23,8				41	37	33,5	26,6	21,6	21,6	108	
112							40,5	36,5	29,9	23,8						36,5	32,5	26,6	21,6	112	
116								36	29,9	23,8						36	32	26,6	21,6	116	
120								35,5	29,9	23,8							31,5	26,6	21,6	120	
124									29,9	23,8							31	26,6	21,6	124	
128									29,9	23,8								26,6	21,3	128	
132										23,8								21	21	132	
136																			21	136	

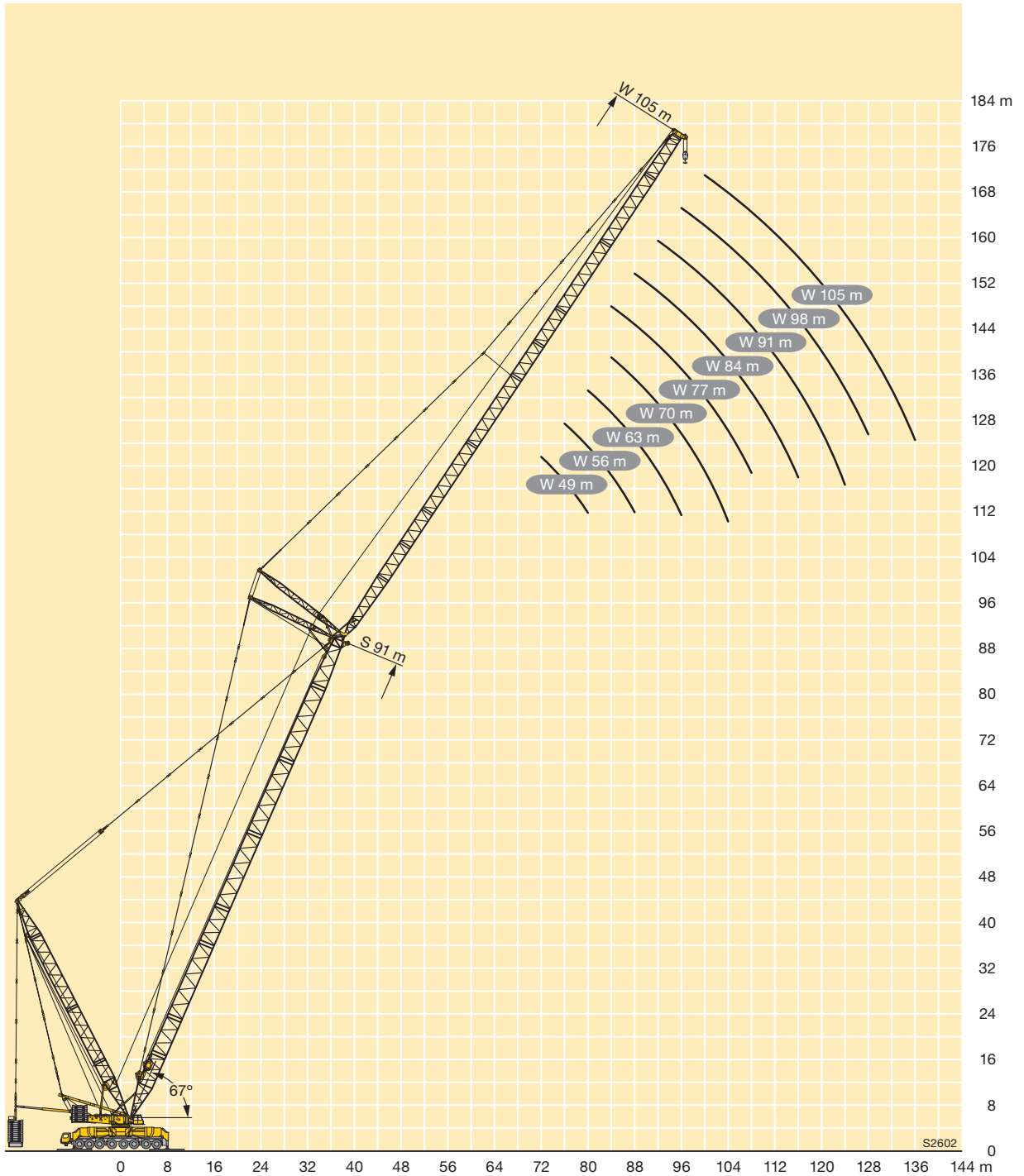
TAB 154551 / 154555

**Hubhöhen**

**Lifting heights**

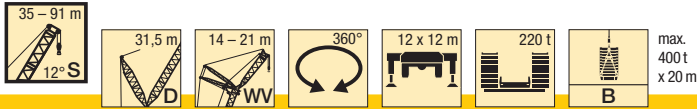
Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

**S6D2WB**



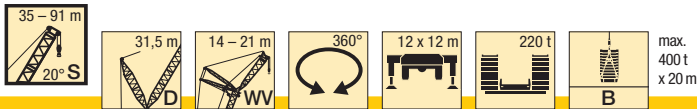
# SDWVB

# S 35 - 91



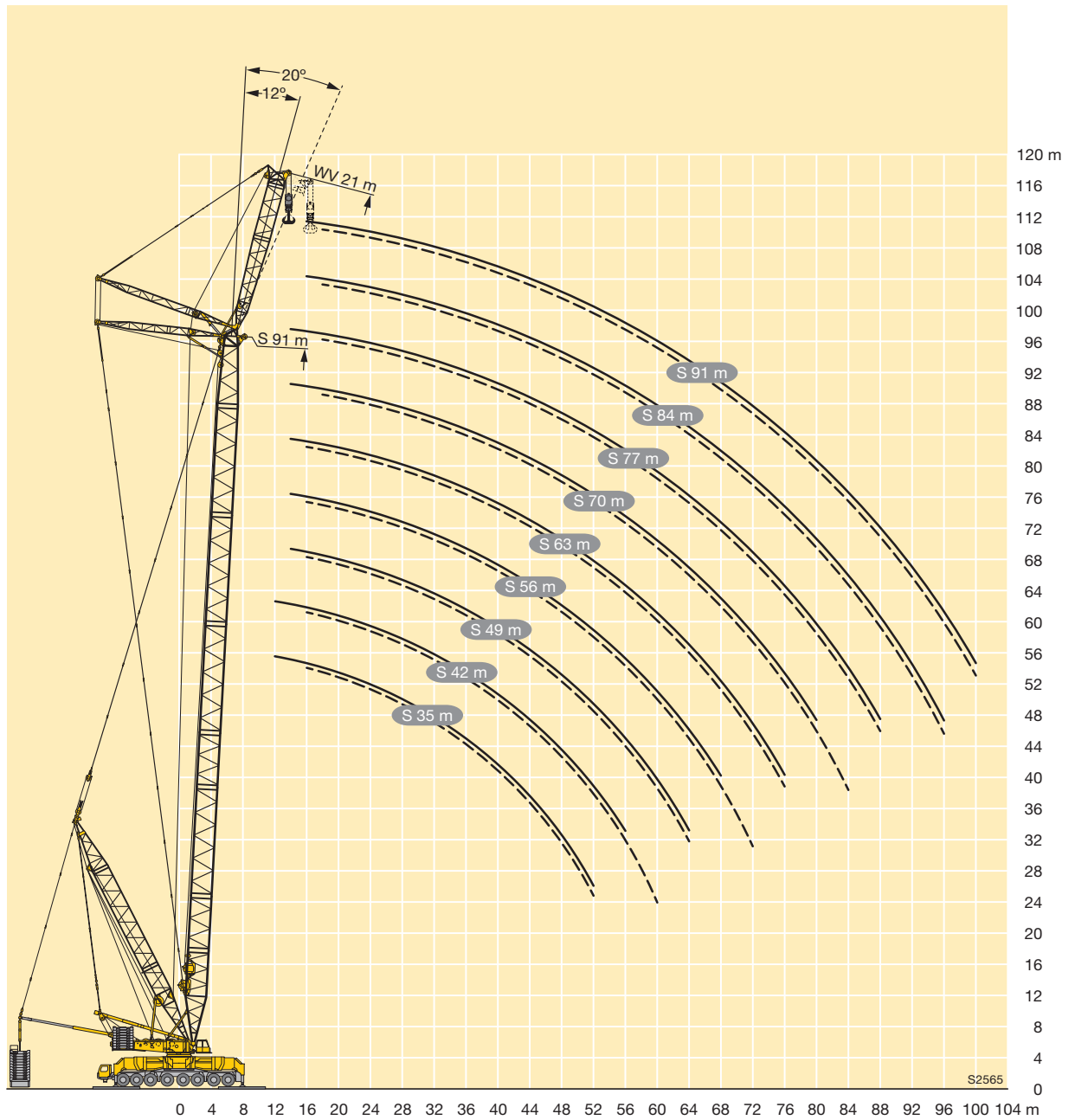
m	35 m		42 m		49 m		56 m		63 m		70 m		77 m	84 m	91 m	m	
	14 m	21 m	14 m	21 m	14 m	21 m	14 m	21 m	14 m	21 m	14 m	21 m	21 m	21 m	21 m		
10	600		595													10	
11	600		595		562		477		404							11	
12	596	552	590	502	562		477		404		344					12	
14	553	537	547	498	538	446	477	390	404	335	344	288	249			14	
16	514	505	508	496	500	445	477	390	404	335	343	288	248	214	185	16	
18	478	470	472	472	464	445	462	390	404	335	343	288	247	213	184	18	
20	445	435	439	431	432	419	426	390	400	335	342	287	246	212	182	20	
22	407	400	405	395	399	386	391	375	379	335	341	286	245	211	181	22	
24	374	366	369	363	366	357	361	349	351	332	334	286	244	210	180	24	
26	341	335	340	335	335	331	333	325	326	316	315	285	244	209	179	26	
28	310	311	318	308	310	307	307	303	302	295	292	280	242	208	178	28	
30	282	287	298	288	291	284	284	282	280	276	270	266	240	205	176	30	
32	254	264	276	272	274	266	268	262	259	259	250	248	233	202	174	32	
34	228	242	253	257	257	252	253	246	243	241	232	232	220	200	170	34	
36	205	222	231	240	239	239	237	233	228	225	217	216	206	195	168	36	
38	187	202	210	222	221	225	222	221	215	211	205	202	193	185	166	38	
40	170	184	191	205	204	211	207	208	202	200	194	190	180	174	162	40	
44	139	153	163	173	173	183	180	184	179	179	173	172	162	155	146	44	
48		126	133	148	149	158	155	162	157	160	155	155	147	140	132	48	
52		101	103	128	129	137	136	141	137	142	137	139	133	127	120	52	
56				106	106	113	119	124	121	125	121	124	120	115	109	56	
60							91	103	110	107	111	108	111	108	105	99	60
64							69	87	93	91	99	96	99	97	94	90	64
68									74	72	87	85	88	86	85	81	68
72											73	71	79	77	76	71	72
76											59	57	70	69	68	62	76
80													60	61	61	56	80
84														54	54	52	84
88														47	47,5	46	88
92															41	40,5	92
96															35	34,5	96
100																29,4	100

TAB 154536 / 154537 / 154538 / 154539



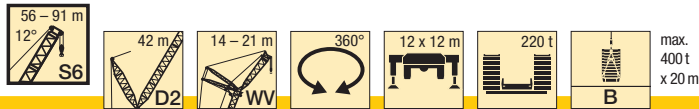
m	35 m		42 m		49 m		56 m		63 m		70 m		77 m	84 m	91 m	m
	14 m	21 m	14 m	21 m	14 m	21 m	14 m	21 m	14 m	21 m	14 m	21 m	21 m	21 m	21 m	
12	529		536		509		461		393		336					12
14	491		502		482		459	374	392	322	335					14
16	458	427	472	434	457	413	459	374	392	322	335	278	241	208	180	16
18	430	399	445	408	457	413	459	374	392	322	335	277	240	207	179	18
20	406	374	422	385	430	395	427	372	391	322	335	277	239	206	178	20
22	384	353	401	365	399	376	390	372	375	322	335	277	239	206	178	22
24	364	335	372	347	367	355	360	350	350	321	328	277	239	205	177	24
26	341	318	340	331	338	331	334	324	325	313	310	277	238	204	176	26
28	312	302	317	311	311	309	309	303	303	295	289	273	237	203	175	28
30	284	287	298	290	290	288	286	284	281	277	269	261	237	203	174	30
32	258	267	277	271	273	268	268	266	260	259	250	245	230	200	173	32
34	233	246	255	256	257	252	252	248	242	242	232	230	218	198	170	34
36	210	226	234	241	240	238	237	234	227	226	216	216	205	193	167	36
38	191	208	214	224	223	226	222	220	214	211	204	202	193	184	165	38
40	173	190	195	208	206	212	208	208	202	199	193	190	182	173	162	40
44	141	159	165	178	175	185	181	185	179	179	173	171	162	154	147	44
48		130	136	149	151	161	157	164	158	160	155	154	147	139	131	48
52		104	105	126	130	139	137	144	139	143	138	139	133	127	119	52
56				105	108	118	116	126	122	128	122	125	121	115	109	56
60				86		95	92	111	108	113	108	112	109	105	99	60
64						72	69	96	93	100	96	100	98	95	90	64
68								77	74	89	85	89	88	86	82	68
72								58		75	72	79	79	77	74	72
76										61	58	70	70	69	64	76
80												62	62	61	57	80
84												50	55	55	52	84
88													47,5	48	46,5	88
92														41,5	40,5	92
96														35,5	35	96
100															29,6	100

TAB 154540 / 154541 / 154542 / 154543



# S6D2WVB

# S 35 - 91



m	56 m		63 m		70 m		77 m	84 m	91 m	m
	14 m	21 m	14 m	21 m	14 m	21 m	21 m	21 m	21 m	
11	510		433							11
12	510		433		371					12
14	508	416	432	359	370	309	267			14
16	488	415	432	359	369	309	267	231	200	16
18	462	406	422	359	368	309	267	231	200	18
20	425	390	407	355	364	309	267	231	199	20
22	393	373	383	346	353	308	267	230	199	22
24	365	349	356	332	334	304	267	230	198	24
26	338	325	332	313	314	292	263	229	197	26
28	311	303	309	294	296	277	253	226	197	28
30	288	282	287	277	279	262	241	219	194	30
32	268	262	267	260	263	249	231	211	188	32
34	251	245	249	245	245	237	221	203	183	34
36	235	230	233	231	228	225	212	196	177	36
38	219	217	218	217	214	213	203	189	172	38
40	204	204	203	204	201	200	195	183	167	40
44	176	181	177	180	175	178	175	169	158	44
48	150	159	153	158	154	157	156	153	146	48
52	134	137	131	139	134	139	137	136	133	52
56	121	122	117	120	115	122	122	120	118	56
60	107	110	106	106	102	106	107	106	104	60
64	93	99	95	96	92	93	93	93	92	64
68		88	85	87	83	84	81	81	81	68
72				79	75	76	73	70	70	72
76				71	67	69	66	63	60	76
80						62	59	57	53	80
84							53	51	47,5	84
88							47	45	42	88
92								39,5	37	92
96								34	32	96
100									27,2	100

TAB 154563 / 154564

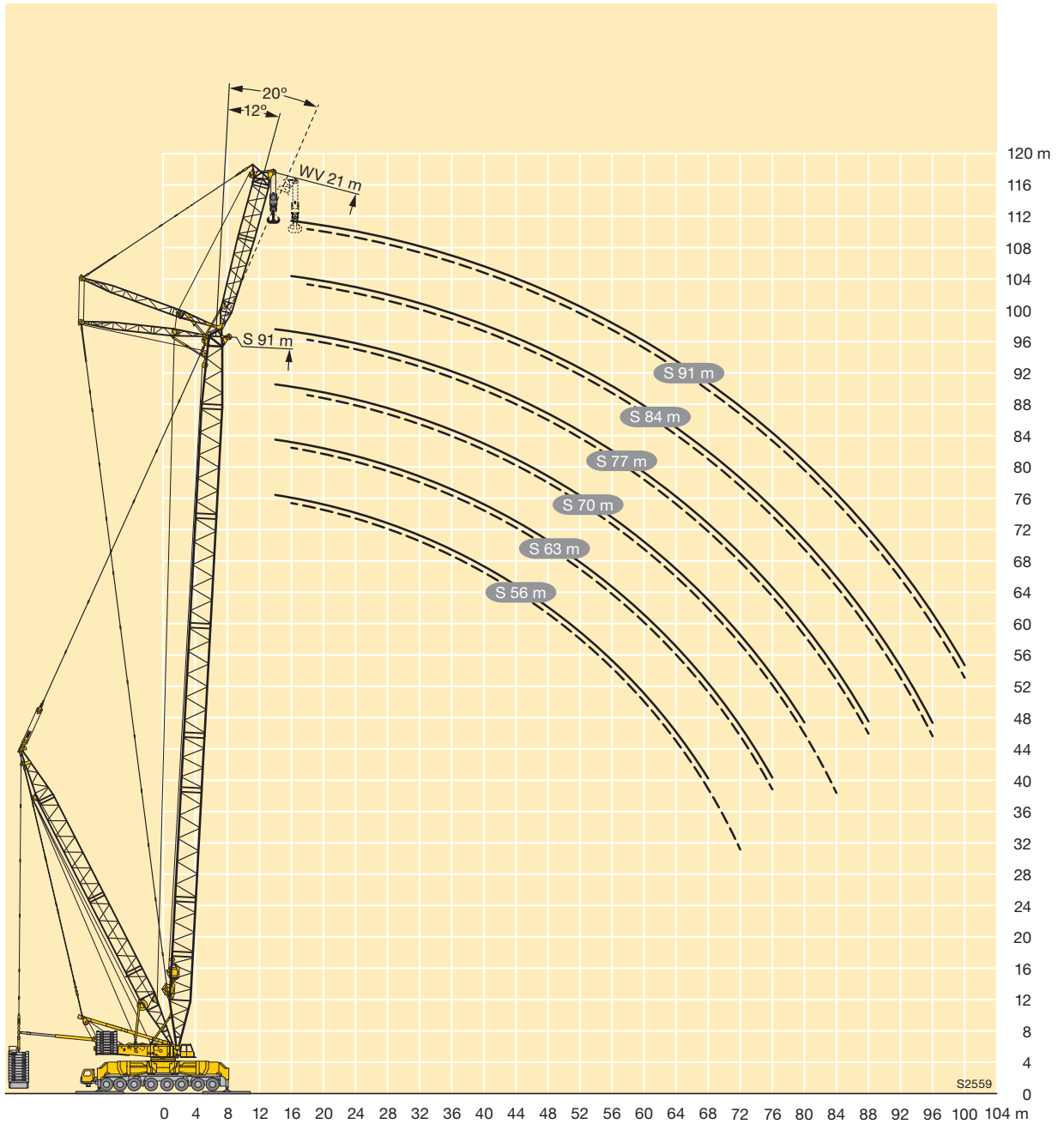


m	56 m		63 m		70 m		77 m	84 m	91 m	m
	14 m	21 m	14 m	21 m	14 m	21 m	21 m	21 m	21 m	
14	486		415		356					14
16	476	391	415	338	356					16
18	452	391	413	338	356	293	254	221	192	18
20	425	382	400	338	356	293	254	221	192	20
22	395	366	382	337	352	293	254	221	192	22
24	366	349	358	328	338	293	254	221	192	24
26	339	329	333	317	319	291	254	221	192	26
28	315	308	310	300	301	281	254	221	191	28
30	291	287	289	282	283	267	245	220	191	30
32	270	268	270	265	266	253	234	213	189	32
34	252	250	249	250	249	240	224	205	184	34
36	235	234	232	235	230	228	214	198	178	36
38	220	220	217	218	214	217	205	191	173	38
40	205	207	203	203	201	202	197	184	168	40
44	177	182	178	180	177	178	176	170	159	44
48	152	160	155	159	155	158	156	153	148	48
52	134	140	133	140	135	140	139	137	134	52
56	121	122	117	122	116	124	123	122	120	56
60	107	110	106	107	103	108	109	108	106	60
64	94	100	95	96	92	94	95	95	94	64
68		89	85	87	83	85	82	83	82	68
72		78		79	75	77	74	71	71	72
76				71	67	69	66	64	61	76
80						62	60	57	54	80
84							55	53	48	84
88								47	45	88
92									39,5	92
96									34,5	96
100										100

TAB 154565 / 154566

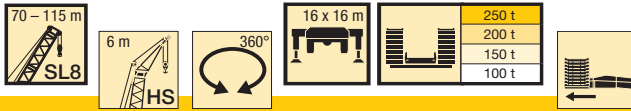
**Hubhöhen**  
**Lifting heights**  
 Hauteurs de levage • Altezze di sollevamento  
 Alturas de elevación • Высота подъема

**S6D2WVB**



# SL8HS

# SL8 70 - 115



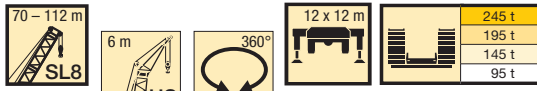
m	70 m	77 m	84 m	91 m	98 m	105 m	112 m	115 m	m
	6 m	6 m	6 m	6 m	6 m	6 m	6 m	6 m	
14	120	120	120						14
16	118	120	120	120	120	120			16
18	110	113	114	117	114	115	109	101	18
20	103	106	108	110	109	110	105	98	20
22	96	100	102	105	104	105	102	95	22
24	91	94	96	99	99	101	98	91	24
26	85	89	91	95	95	97	94	88	26
28	81	85	87	90	90	93	91	85	28
30	77	81	83	86	87	89	88	83	30
32	73	77	79	83	83	86	85	80	32
34	70	73	76	79	80	83	82	78	34
36	67	70	73	76	77	80	79	76	36
38	64	67	70	73	74	77	77	73	38
40	61	65	67	71	72	74	74	71	40
44	56	60	63	66	67	69	69	67	44
48	52	56	58	62	63	63	61	60	48
52	49	52	55	58	58	55	54	52	52
56	46	49	51	52	51	49	47,5	46,5	56
60	43,5	46	47	45,5	45	43,5	42	41	60
64	41	41,5	41,5	40,5	39,5	38	37	36	64
68	35,5	36	36,5	35	35	33,5	32	31,5	68
72		31	32	30,5	30,5	29,1	28	27,1	72
76			27,4	26,5	26,5	25,1	24,2	23,3	76
80			23,2	22,6	22,7	21,4	20,6	19,8	80
84				18,9	19,3	18,1	17,3	16,5	84
88					15,9	15,1	14,4	13,6	88
92					12,8	12,2	11,8	11,1	92
96						9,4	9,4	8,8	96
100							7	6,6	100
104							4,7	4,5	104
108								2,4	108

TAB 154374 / 154376 / 154378 / 154380



# SL8HS

# SL8 70 - 112



m	70 m	77 m	84 m	91 m	98 m	105 m	112 m	m
	6 m	6 m	6 m	6 m	6 m	6 m	6 m	
14	120	120	120					14
16	118	120	120	120	120	120		16
18	110	113	114	117	114	115	109	18
20	103	106	108	110	109	110	105	20
22	96	100	102	105	104	105	102	22
24	91	94	96	99	99	101	98	24
26	85	89	91	95	95	97	94	26
28	81	85	87	90	90	93	91	28
30	77	81	83	86	87	89	87	30
32	73	77	79	83	83	83	80	32
34	70	73	76	79	80	76	73	34
36	67	70	73	76	74	70	67	36
38	64	67	70	72	69	65	62	38
40	61	65	67	66	64	60	57	40
44	56	60	62	58	55	51	48,5	44
48	52	56	54	50	48	44,5	41,5	48
52	49	49	47,5	44	41,5	38	35,5	52
56	45	43,5	42	38,5	36	33	30,5	56
60	40	38,5	37	33,5	31,5	28,4	26	60
64	36	34	33	29,6	27,6	24,4	22,1	64
68	32,5	30,5	28,9	26,1	24,1	20,9	18,6	68
72		26,9	25,4	22,8	21	17,8	15,5	72
76			22,4	19,8	18,2	15	12,7	76
80			19,8	17,1	15,8	12,6	10,3	80
84				14,7	13,5	10,4	8,1	84
88					11,4	8,5	6,2	88
92					9,5	6,7	4,4	92
96						5,2	2,9	96

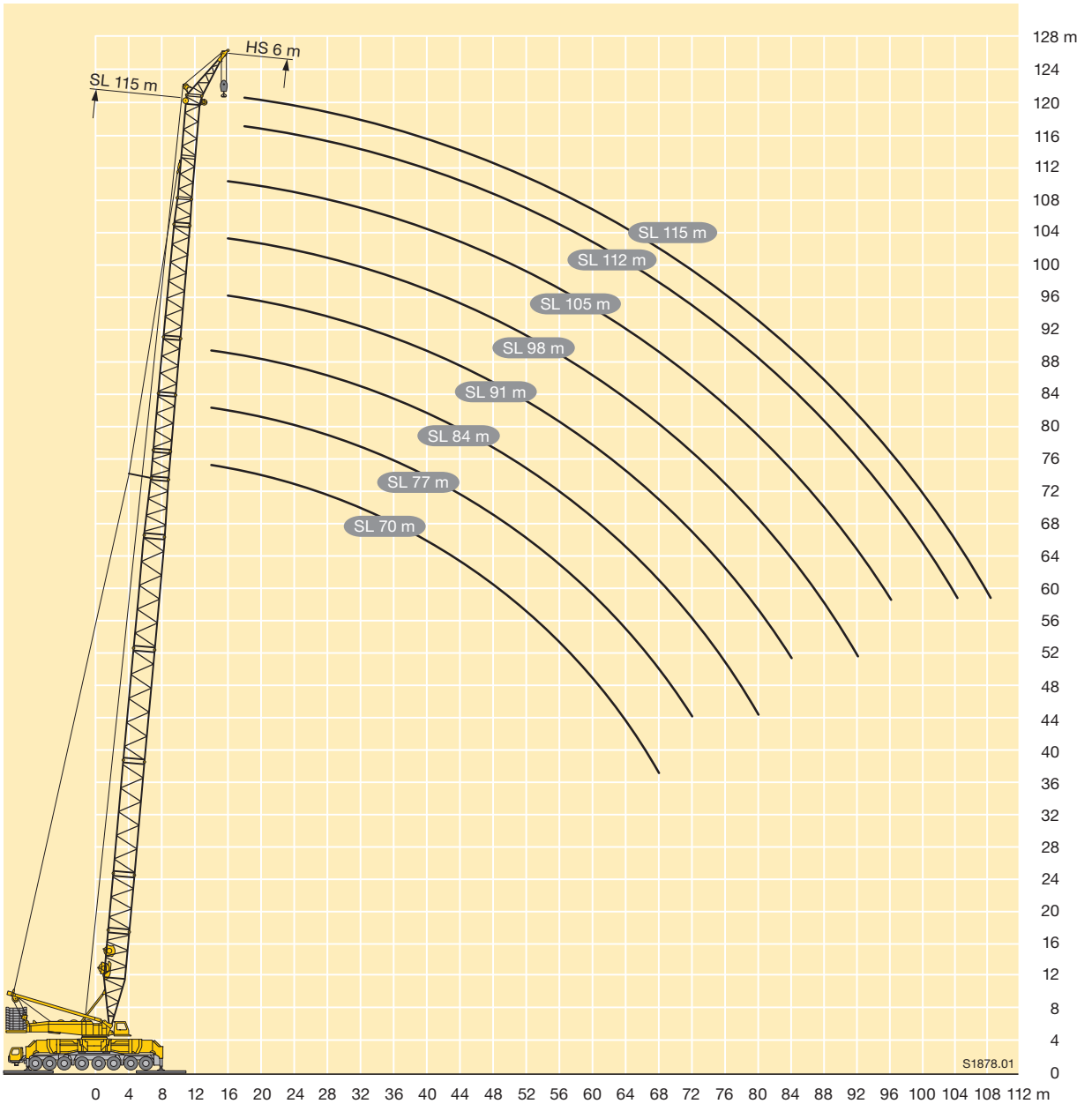
TAB 154354 / 154356 / 154358 / 154360

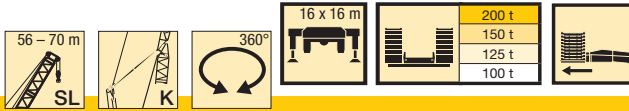
**Hubhöhen**

**Lifting heights**

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

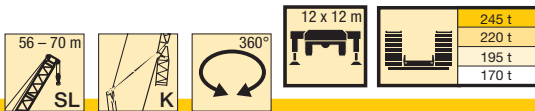
**SL8HS**





m	56 m		63 m		70 m			m
	52,5 m	59,5 m	52,5 m	59,5 m	52,5 m	59,5 m	63 m	
	6 m	6 m	6 m	6 m	6 m	6 m	6 m	
22	98		105		107			22
24	91	88	98	95	104	99		24
26	85	82	92	89	98	94	90	26
28	80	77	86	83	92	88	84	28
30	74	72	81	78	87	83	79	30
32	70	67	76	73	82	78	74	32
34	65	63	72	69	77	73	70	34
36	61	59	68	65	74	69	65	36
38	57	55	64	62	70	65	62	38
40	54	52	60	58	66	62	58	40
44	47,5	46	54	52	59	55	52	44
48	42,5	40,5	48	46,5	54	50	47	48
52	38	36	43	41	46	44,5	42,5	52
56		32	39	37	39,5	38	37	56
60				33,5	33	32	31,5	60
64						26,6	26,5	64
68							21,7	68

TAB 154383 / 154385 / 154386 / 154387



m	56 m		63 m		70 m			m
	52,5 m	59,5 m	52,5 m	59,5 m	52,5 m	59,5 m	63 m	
	6 m	6 m	6 m	6 m	6 m	6 m	6 m	
22	98		105		107			22
24	91	88	98	95	104	99		24
26	85	82	92	89	98	94	90	26
28	80	77	86	83	92	88	84	28
30	74	72	81	78	86	83	79	30
32	70	67	76	73	79	76	74	32
34	65	63	72	69	72	70	68	34
36	61	59	68	65	66	64	62	36
38	57	55	64	62	61	58	57	38
40	54	52	60	57	56	53	52	40
44	47,5	46	51	48,5	47	45	43,5	44
48	42,5	40,5	43,5	41,5	39,5	37,5	36,5	48
52	38	36	37	35	33,5	31,5	30,5	52
56		32	31,5	29,5	27,9	26,1	25	56
60				24,7	23,1	21,4	20,4	60
64						17,2	16,2	64
68							12,5	68

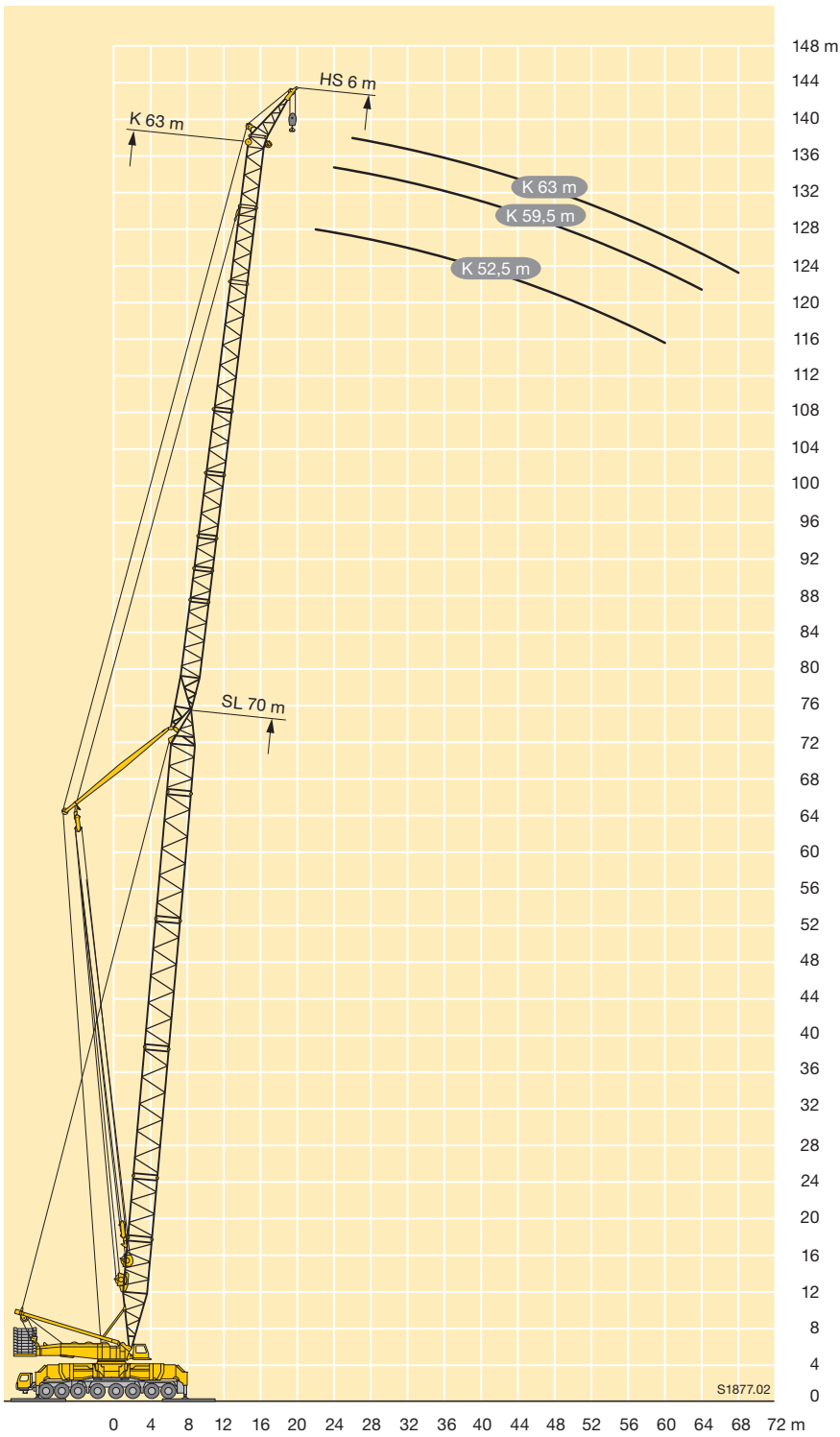
TAB 154434 / 154435 / 154436 / 154437

**Hubhöhen**

**Lifting heights**

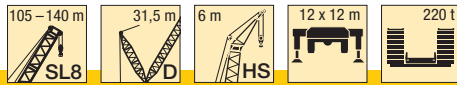
**Hauteurs de levage • Altezze di sollevamento**  
**Alturas de elevación • Высота подъема**

**SLK**



# SL8DHS

# SL8 105 - 140



m	SL8 105	SL8 112	SL8 119	SL8 126	SL8 133	SL8 140	m
	HS 6	HS 6	HS 6	HS 6	HS 6	HS 6	
16	120	116	113				16
18	115	111	110	102	92	83	18
20	109	107	106	100	91	81	20
22	104	102	102	97	91	80	22
24	99	98	99	94	91	79	24
26	95	94	95	90	88	77	26
28	91	90	88	85	81	75	28
30	86	84	81	77	74	72	30
32	81	77	74	71	67	66	32
34	74	71	68	65	62	60	34
36	68	66	63	60	57	55	36
38	63	60	58	55	52	50	38
40	57	55	53	51	48	46	40
44	49	47,5	45	42,5	40	39	44
48	41,5	39,5	37,5	36	33,5	32	48
52	35,5	33	31	29,6	27,6	26,6	52
56	29,8	27,9	25,5	23,9	21,7	21	56
60	24,7	23	20,8	19,2	17,3	15,7	60
64	20,2	18,5	16,4	15,1	13,8	11,5	64
68	16,6	14,5	12,3	11,2	10,7	7,7	68
72	13,4	11,8	8,9	7,6	7,7	4,7	72
76	10,4	9,4	6,7	4,8	4,9		76
80	7,9	7,2	4,9	3,2			80
84	6,2	5,2	3,2				84
88	4,6	3,7					88
92	3,3						92

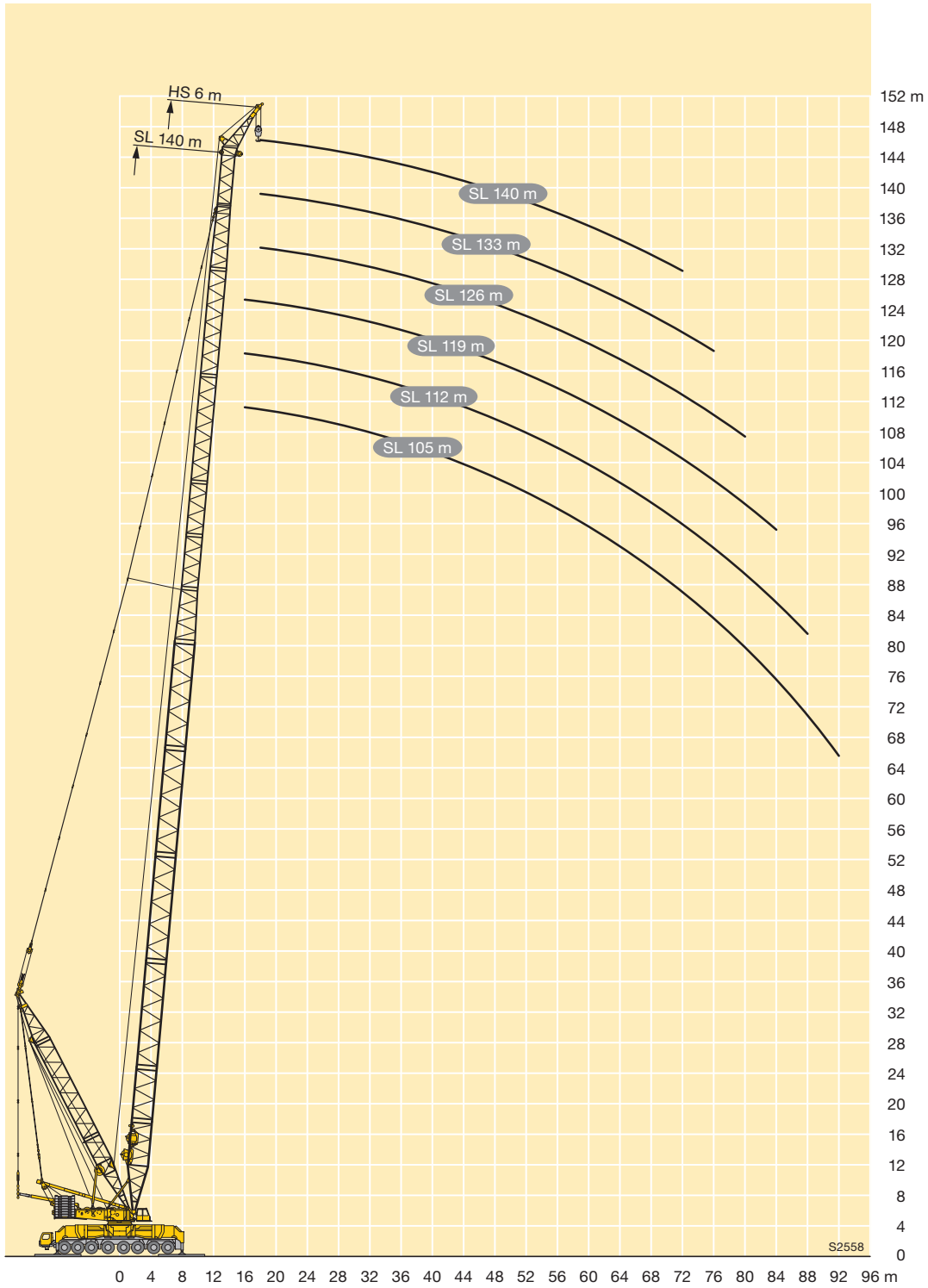
TAB 154523 / 154527

# Hubhöhen

## Lifting heights

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

# SL8DHS



# SL7DHS

# SL7 105 - 147



m	SL7 105	SL7 112	SL7 119	SL7 126	SL7 133	SL7 140	SL7 147	m
	HS 6	HS 6	HS 6	HS 6	HS 6	HS 6	HS 6	
16	120	120						16
18	118	118	116	111	105			18
20	113	113	111	107	102	95	86	20
22	107	107	107	103	99	93	85	22
24	102	103	102	99	96	91	84	24
26	98	98	98	96	93	89	83	26
28	93	94	92	88	85	81	78	28
30	89	87	83	80	77	73	71	30
32	84	80	76	73	70	67	64	32
34	77	73	69	66	64	61	58	34
36	70	67	63	60	58	55	53	36
38	63	62	58	55	53	50	48	38
40	58	56	53	50	48,5	45,5	43,5	40
44	48	46	44	42	40	37,5	35,5	44
48	40	38	36	34,5	33	31	28,8	48
52	33,5	31,5	28,8	27,4	26,2	24,2	23	52
56	28	25,7	23,2	21,6	20	18,1	16,9	56
60	22,8	20,6	18,4	17,1	15,4	12,6	11,3	60
64	18	15,9	13,9	13,1	12	8,8	7,1	64
68	14,3	11,8	9,7	9,4	8,8	5,7	4,6	68
72	11,1	9,1	6,3	5,9	5,9	3,2		72
76	8	6,7	4,4	3,2	3,1			76
80	5,6	4,5						80
84	4							84

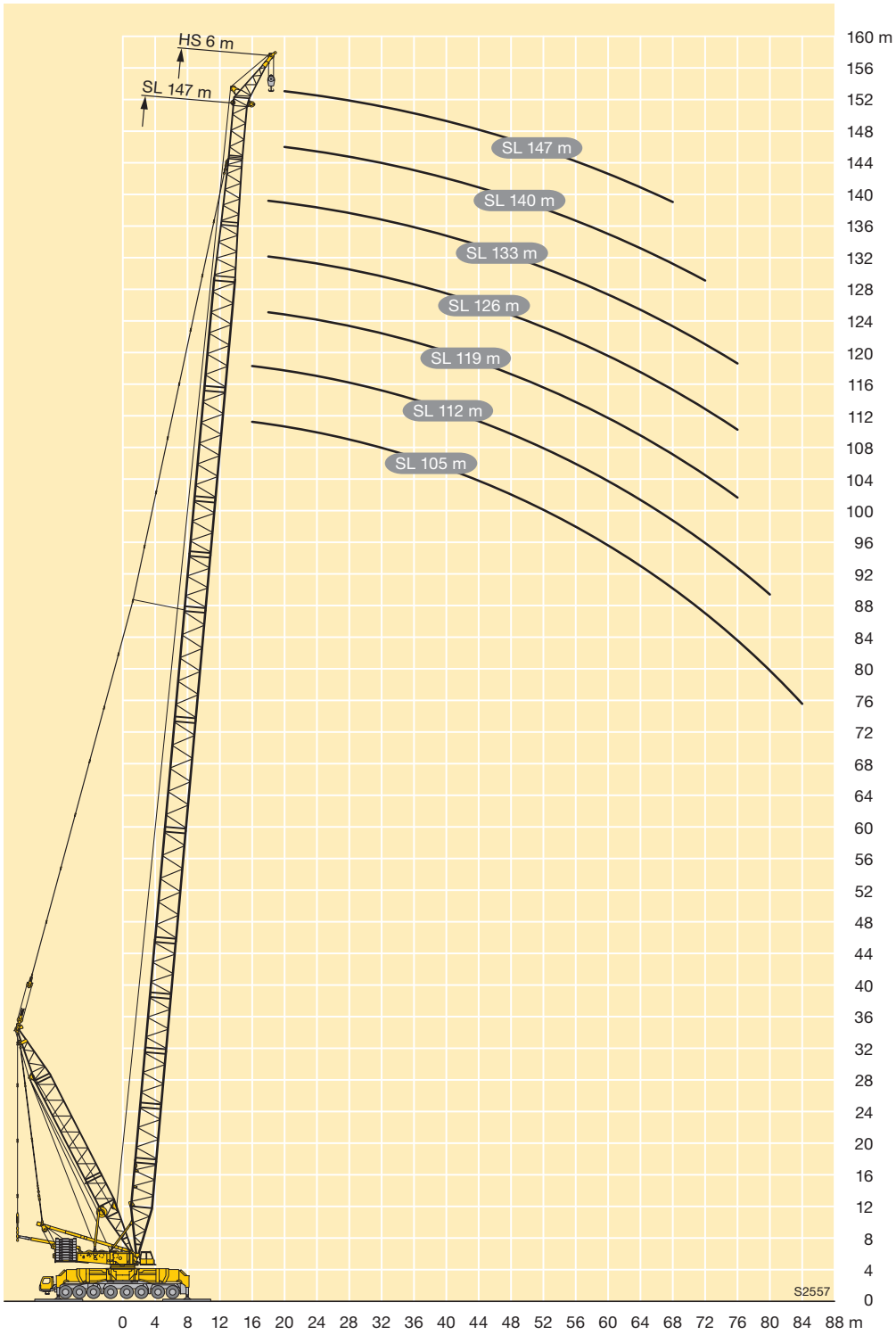
TAB 154516 / 154517

**Hubhöhen**

**Lifting heights**

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

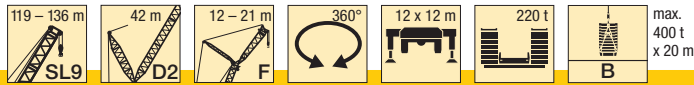
**SL7DHS**





# SL9D2FB

# SL 119 - 126



m	119 m		122 m		126 m		129 m	133 m	136 m		m
	F 12	F 18	F 12	F 18	F 12	F 18	F 18	F 18	F 18	F 21	
22	147		142		137						22
24	146		141		136						24
26	144	124	140	120	135	117	109	106			26
28	143	123	139	120	134	116	109	105	101		28
30	141	121	138	119	133	115	108	105	101	86	30
32	138	119	136	117	131	114	107	104	100	86	32
34	136	117	134	116	130	113	106	103	100	86	34
36	134	116	133	114	129	112	105	102	99	86	36
38	132	114	131	113	128	111	104	101	98	85	38
40	129	112	127	111	124	110	103	101	97	85	40
44	117	102	119	107	116	107	100	98	96	84	44
48	101	88	111	102	109	104	97	96	94	83	48
52	87	77	102	92	102	100	92	93	92	81	52
56	75	67	88	79	96	91	83	91	89	80	56
60	67	59	78	69	90	80	73	84	87	79	60
64	59	52	69	61	83	71	64	74	83	77	64
68	52	45,5	61	54	73	63	56	66	75	74	68
72	46,5	40,5	54	48	64	56	49,5	58	66	67	72
76	42	35,5	48,5	42,5	58	49,5	44	51	59	59	76
80	37,5	32	44	38	52	44	39	45,5	52	53	80
84	33,5	28,7	39,5	34,5	47,5	40	34,5	40,5	46,5	47	84
88	29,9	25,6	35,5	31	43	36	31	36	41,5	42	88
92	26,8	22,7	31,5	27,6	38,5	32,5	27,5	32,5	37,5	38	92
96	24,7	20,1	28,8	24,5	34,5	29,1	24,3	28,8	33,5	34	96
100	22,9	18,3	26,7	22,1	32	26	21,2	25,5	29,8	30,5	100
104	21,2	16,6	24,8	20,2	29,9	23,7	18,6	22,3	26,3	27,3	104
108	19,6	15	23	18,4	27,8	21,7	16,5	19,8	23,2	24,1	108
112	18,8	13,9	21,2	16,7	25,8	19,8	14,6	17,7	20,8	21,5	112
116	18,8	13,7	20,9	15,9	24,2	18	12,8	15,7	18,7	19,3	116
120		13,7	20,9	15,7	24,1	17,5	11,3	13,8	16,6	17,3	120
124				15,7		17,4	10,7	12,6	14,5	15,3	124
128						17,2	10,4	12	13,6	13,7	128
132							10	11,5	13	12,9	132
136									12,4	12,4	136
140									12,1	11,9	140

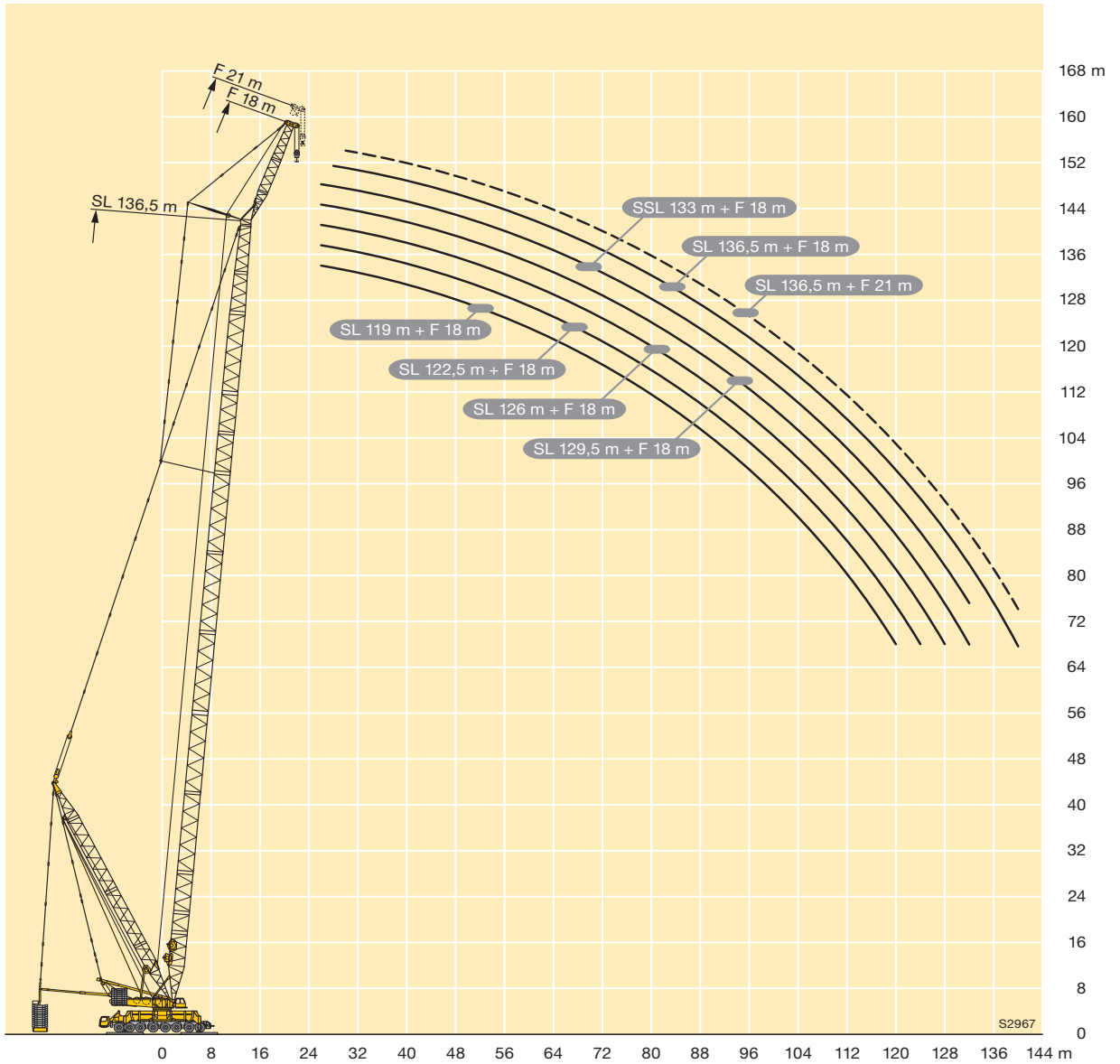
TAB 154389 / 154390 / 154533 / 154593

# Hubhöhen

## Lifting heights

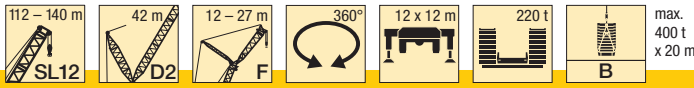
Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

# SL9D2FB



# SL12D2FB

# SL 112 - 140



m	112 m		115 m		119 m		122 m		126 m		129 m		133 m			136 m		140 m					m	
	F 12	F 18	F 12	F 18	F 12	F 18	F 12	F 18	F 12	F 18	F 12	F 18	F 12	F 15	F 18	F 15	F 18	F 15	F 18	F 21	F 24	F 27		
24	150																							24
26	147	141	148	142	149		150		150		147													26
28	143	129	145	140	146	139	147	137	148	134	147	129	141	133	122									28
30	131	118	142	136	143	137	144	135	145	133	144	128	138	133	122	119	113	109	104	97				30
32	120	109	139	126	140	136	141	134	142	132	141	127	135	130	121	117	112	107	103	97	90			32
34	110	100	129	116	137	132	138	133	139	131	138	126	133	127	119	114	110	104	101	96	89	79		34
36	102	92	118	107	135	125	136	130	137	130	135	125	130	125	117	112	108	102	99	95	89	77		36
38	94	86	109	99	128	115	134	128	135	129	132	123	127	123	115	110	106	100	97	93	88	76		38
40	87	79	102	92	119	108	131	124	132	126	130	120	125	120	113	106	102	99	95	92	87	74		40
44	75	68	87	79	102	93	119	108	128	121	125	114	120	116	109	91	88	95	92	88	83	71		44
48	65	59	76	69	89	80	103	93	121	108	109	98	116	112	105	78	75	84	81	77	73	65		48
52	56	51	66	60	77	70	90	81	106	95	95	86	111	104	96	66	64	71	69	66	63	57		52
56	49	44,5	58	52	68	61	79	71	92	83	82	75	96	91	84	57	56	62	60	57	54	49,5		56
60	42,5	38,5	50	46	60	54	69	63	82	73	73	66	84	80	73	48,5	48	53	52	49,5	47,5	43		60
64	37,5	33,5	44,5	40	52	47,5	61	56	72	65	64	58	74	70	65	42	41	45,5	44,5	42,5	41	37,5		64
68	33	29,5	39,5	35	46,5	42	54	49	64	57	56	51	65	62	58	36	35,5	39,5	38,5	37	35,5	32		68
72	28,5	25,7	34,5	31	41,5	37,5	48,5	44	57	51	50	45	58	55	51	30	29,8	33,5	33	31,5	30,5	27,7		72
76	25,1	22,1	30,5	27	36	33	43	39	51	46	44	40	52	48,5	45,5	25,5	25,2	28,3	27,8	26,8	25,9	23,7		76
80	22,2	19,4	27	23,6	32,5	28,9	38	34,5	45	41	38,5	35,5	45,5	43	40,5	21,2	21,1	24	23,7	22,7	21,8	19,8		80
84	19,3	16,9	23,8	20,9	29	25,9	34,5	30,5	41	36,5	34	31	40	38	35,5	17,1	17,2	19,8	19,8	19	18,3	16,4		84
88	17,1	14,5	20,8	18,3	25,7	23	30,5	27,4	37	33	30,5	27,2	35,5	33,5	31	13,4	13,5	15,9	16,1	15,5	15	13,4		88
92	15,3	12,6	18,9	15,8	23	20,3	27,2	24,4	33	29,6	26,7	24,1	32	29,8	27,8	11,1	10,9	13	12,7	12,2	11,9	10,7		92
96	13,7	11,3	17,1	14,1	21	17,9	24,8	21,6	29,8	26,5	23,2	21,1	28	26,3	24,7	8,8	8,9	10,6	10,6	9,8	8,9	8,4		96
100	12,1	10,1	15,3	12,6	19,1	16,2	22,7	19,5	27,4	23,6	20,5	18,2	24,5	23	21,6	6,7	7	8,3	8,5	8	7,3	6,3		100
104	12,1	8,9	14,1	11,1	17,2	14,6	20,6	17,7	25,2	21,7	18,2	15,9	22	20,3	18,7		5,1	6,2	6,6	6,3	5,9			104
108	12,1	8,5	14,1	9,7	16,5	13	18,7	15,9	23,1	19,8	16	14	19,5	18	16,7				4,7	4,6				108
112		8,5	14,1	9,7	16,5	12	18,5	14,3	21,5	18	13,9	12,2	17,2	15,8	14,7									112
116		8,5		9,7	16,5	12	18,5	13,7	21,4	16,2	12,8	10,4	15	13,7	12,8									116
120				9,7		12	18,5	13,6	21,4	16,1	12,4	9,2	14,3	12,1	10,9									120
124						12		13,6	21,3	16	12	9	13,7	11,6	10									124
128										15,9			8,7	13,2	11,1	9,6								128
132													8,5		10,6									132
136															8,9									136

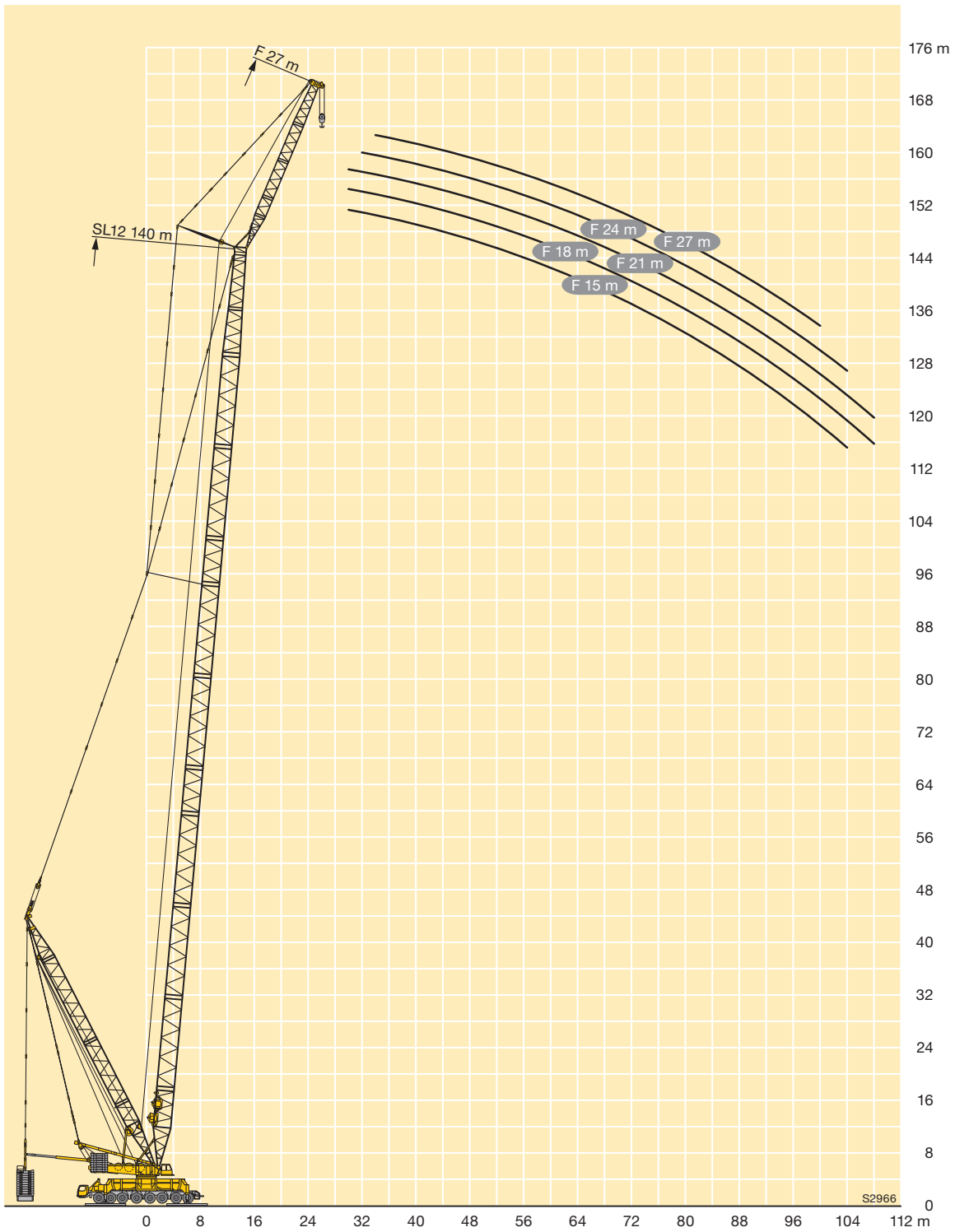
TAB 154576 / 154599 / 154602

# Hubhöhen

## Lifting heights

Hauteurs de levage • Altezze di sollevamento  
Alturas de elevación • Высота подъема

# SL12D2FB











## Symbolerklärung

### Description of symbols










Explication des symboles • Legenda simboli

Descripción de los símbolos • Объяснение символов

#### Allgemeine Symbole · General symbols Symboles généraux · Simboli generali Símbolos generales · Общие символы

	Abstützungen Outriggers Calage Stabilizzatori Estabilizadores Выносные опоры		Drehwerk / Arbeitsbereich 360° Slewing gear / Working area 360° Mécanisme d'orientation / Plage de travail 360° Rotazione / Raggio di lavoro 360° Mecanismo de giro / Área de trabajo 360° Механизм поворота / Рабочая область 360°
	Achse Axle Essieu Asse Eje Мосты		Seite Page Page Pagina Página Страница
	Ausladung Radius Portée Raggio di lavoro Radio de trabajo Вылет стрелы		Hakenflasche / Traglast Hookblock / Capacity Moufle à crochet / Capacité de charge Bozzello / Portata Pasteca / Capacidad de carga Крюковая подвеска / грузоподъемность
	Gegengewicht Counterweight Contrepoids Contrappeso Contrapeso Противовес		Hubwerk Hoist gear Treuil de levage Argano Cabrestante Механизм подъема

#### Kranspezifische Symbole · Crane specific symbols Symboles spécifiques à la grue · Simboli specifici relativi alla gru Símbolos específicos de grúa · Специфические для крана символы

	Hauptausleger S Main boom S Flèche principale S Braccio principale S Pluma principal S Основная стрела S		Windkraftspitze HS Wind plant jib HS Fléchette éolien HS Falcone per montaggio turbina eolica HS Plumín para energía eólica HS Удлинитель для монтажа ветровых генераторов HS
	Derricksystem D Derrick system D Système derrick D Sistema Derrick D Sistema Derrick D Деррик-система D		Knickausleger K Articulated main boom K Flèche articulée K Braccio principale articolato K Pluma de montaje articulada K Шарнирно-сочлененная стрела - K
	Wippbare Gitterspitze W Lattice type luffing fly jib W Fléchette treillis à volée variable W Falcone variabile W Plumín abatible W Качающийся решетчатый удлинитель W		Feste Gitterspitze F Fixed lattice fly jib F Fléchette treillis fixe F Falcone fisso F Plumín fijo F Жесткомонтируемый решетчатый удлинитель F
	Schwerlastspitze WV Heavy duty jib WV Fléchette pour charge lourde WV Falcone per carichi pesanti WV Cabezal de plumín WV Удлинитель большой грузоподъемности WV		Ballastpalette B Counterweight frame B Palette de lest B Telaio per contrappeso B Bandeja de contrapeso B Основа противовеса B
	Drehbühnenballastverlängerung Extension of slewing platform ballast Extension de lest de partie tournante Prolongamento zavorra piattaforma girevole Prolongación de contrapeso en superestructura Удлинение рамы балласта поворотной платформы		

## Anmerkungen zu den Traglasttabellen

1. Die Traglasttabellen sind berechnet nach EN 13000.
2. Bei der Berechnung der Traglasttabellen ist mindestens eine Windgeschwindigkeit von 9 m/s (33 km/h) und bezüglich der Last eine Windfläche von 1 m<sup>2</sup> pro Tonne Last und ein Windwiderstandsbeiwert der Last von 1,2 berücksichtigt. Beim Heben von Lasten mit großer Windangriffsfläche und/oder hohen Windwiderstandsbeiwerten muss die in den Traglasttabellen angegebene max. Windgeschwindigkeit reduziert werden.
3. Die Traglasten sind in Tonnen angegeben.
4. Das Gewicht des Lasthakens bzw. der Hakenflasche sowie der Anschlagmittel ist von den Traglasten abzuziehen.
5. Die Ausladungen sind von Mitte Drehkranz gemessen.
6. Die Aufstandsfläche muß eben und tragfähig sein.
7. Traglaständerungen vorbehalten.
8. Die Daten dieser Broschüre dienen zur allgemeinen Information. Sämtliche Angaben erfolgen ohne Gewähr. Anweisungen zur ordnungsgemäßen Inbetriebnahme des Krans entnehmen Sie bitte der Betriebsanleitung und dem Traglasttabellenbuch.

## Remarks referring to load charts

1. The load charts are calculated according to EN 13000.
2. For the calculation of the load charts at least a wind speed of 9 m/s (33 km/h) and regarding the load a sail area of 1 m<sup>2</sup> per ton load and a wind resistance coefficient of 1.2 on the load have been taken into account. For lifting of loads with large sail areas and/or high wind resistance coefficients the maximum wind speed as stated in the load charts has to be reduced.
3. Lifting capacities are given in metric tons.
4. The weight of the load hook and hook blocks as well as of the lifting tackle must be deducted from the lifting capacities.
5. The working radii are measured from the slewing centreline.
6. The subsoil must be even and of good bearing capacity.
7. Subject to modification of lifting capacities.
8. The data of this brochure serves only for general information. All information is provided without warranty. Instructions for the correct commissioning of the crane please take from the operation manual and the load chart book.

## Remarques relatives aux tableaux des charges

1. Les tableaux des charges sont calculés selon EN 13000.
2. Une vitesse de vent de 9 m/s (33 km/h) minimum, une surface de prise au vent de 1 m<sup>2</sup> par tonne ainsi qu'un coefficient de résistance au vent de la charge 1,2 sont pris en compte pour le calcul des tableaux de charge. Lorsque des charges ayant une surface de prise au vent et/ou un coefficient de résistance au vent plus élevé(e)(s) sont levées, la vitesse de vent maximale indiquée dans les tableaux de charge doit être réduite.
3. Les charges sont indiquées en tonnes.
4. Les poids du crochet ou du moufle ainsi que des élingues sont à déduire des charges indiquées.
5. Les portées sont prises à partir de l'axe de rotation de la partie tournante.
6. Le sol doit être plat et résistant.
7. Charges données sous réserve de modification.
8. Les données de cette brochure sont données à titre informatif. Ces renseignements sont sans garantie. Les consignes relatives à la bonne mise en service de la grue sont disponibles dans le manuel d'utilisation et le manuel de tableaux de charge.

## Note alle tabelle di portata

1. Le tabelle sono calcolate secondo la norma EN 13000.
2. Per il calcolo delle tabelle di portata bisogna considerare una velocità minima del vento di 9 m/s (33 km/h) e relativamente al carico, una superficie esposta al vento di 1 m<sup>2</sup> per tonnellata sollevata e un coefficiente di resistenza al vento di 1,2 sul carico. Durante il sollevamento del carico con superficie esposta al vento molto vasta e/o coefficienti di resistenza del vento molto alti, la velocità massima del vento indicata nelle tabelle di portata deve essere ridotta.
3. Le portate sono indicate in tonnellate.
4. Il peso del gancio del bozzello nonché di ulteriori accessori vanno sottratti dalle portate.
5. Gli sbracci sono misurati dal centro della ralla.
6. La superficie adibita al montaggio deve essere piana e in grado di sopportare il carico.
7. Con riserva di modifiche di portata.
8. I dati di questo prospetto sono utili come informazione generale. Tutte le indicazioni vengono fornite senza garanzia. Si prega di desumere le istruzioni per la messa in servizio della gru dal manuale di istruzioni per l'uso e dal manuale delle tabelle di carico.

## Observaciones con respecto a las tablas de carga

1. Las tablas de carga se calculan según EN 13000.
2. En el cálculo de las tablas de carga se ha tenido en cuenta una velocidad del viento mínima de 9 m/s (33 km/h) y con respecto a la carga una superficie expuesta al viento de 1 m<sup>2</sup> por tonelada de carga y un coeficiente de la resistencia del viento de la carga de 1,2. A la hora de elevar cargas con superficies grandes expuestas al viento y/o coeficientes altos de la resistencia al viento hay que reducir las velocidades máx. del viento indicadas en las tablas de cargas.
3. Las capacidades de carga se indican en toneladas.
4. El peso del gancho de carga o de la pasteca, así como de los accesorios de eslingado, se ha de restar de las capacidades de carga.
5. Los radios de trabajo se han medido desde el centro de la corona de giro.
6. La superficie de apoyo ha de ser llana y firme.
7. Las capacidades de carga están sujetas a modificaciones.
8. Los datos de este folleto sirven de información general y están sujetos a modificaciones. Rogamos consulten las instrucciones sobre el correcto funcionamiento de la grúa en el manual y el listado de tablas de carga.

## Примечания к таблицам грузоподъемности

1. Таблицы грузоподъемности рассчитаны согласно EN 13000.
2. При расчете таблиц грузоподъемности приняты минимальная скорость ветра 9 м/с (33 км/час), парусность (ветровая площадь) груза 1 кв. м на тонну поднимаемого груза и коэффициент воздушного сопротивления груза 1,2. При подъеме грузов с большей парусностью и/или с высоким коэффициентом воздушного сопротивления необходимо уменьшить указанное в таблицах грузоподъемности значение максимальной скорости ветра.
3. Грузоподъемности указаны в тоннах.
4. Вес грузового крюка или крюковой подвески, а также строповочных средств должен быть вычтен из значения грузоподъемности.
5. Вылет измеряется от середины опорно-поворотного круга.
6. Изменения значений грузоподъемности возможны.
7. Возможно изменение значений грузоподъемности.
8. Данная брошюра предназначена для общего информирования. Все без исключения данные приведены без обязательств по их соблюдению. Инструкции по надлежащему вводу крана в эксплуатацию находятся в руководстве по эксплуатации и в таблицах грузоподъемности.

Änderungen vorbehalten / Subject to modification / Sous réserve de modifications / Con riserva di modifiche / Salvo modificaciones / Возможны изменения

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SCHEDULE 17 – Cultural Heritage Monitoring Program



**Stantec Consulting Ltd.**  
300W-675 Cochrane Drive, Markham ON L3R 0B8

July 25, 2017  
File: 160960595

**Attention: Mr. Sean Fairfield, Algonquin Power**

Windlectric Inc.  
354 Davis Road, Suite 100  
Oakville, Ontario  
L6J 2X1

Dear Mr. Sean Fairfield,

**Reference: Construction Vibration Monitoring Program, Amherst Island Wind Energy Project  
Loyalist Township, County of Lennox and Addington, Ontario**

Further to Algonquin Power's (Algonquin) request for monitoring plan and fee proposal, Stantec Consulting Ltd (Stantec) is pleased to provide the following monitoring program for the above noted project. The program is based on our understanding of the requirements outlined in Renewable Energy Approval Number 7123-9W9NH2 dated August 24, 2015 (REA) and similar project experience.

**1 BACKGROUND**

The REA identifies three distinctly different types of structure as cultural heritage resources and protected properties (CHR and PP) that require consideration of vibration as outlined in section M of the REA. These structures are:

- a) **Built Heritage Resources** – there are nine built heritage resources identified that includes various types of structures including a general store, a church.
- b) **Cultural Heritage Landscape** – there are four cultural heritage landscape structures identified; there are generally conventional residential buildings.
- c) **Dry Stone Walls** (otherwise known as Irish stone fences) – there are 10 dry stone walls identified in the Loyalist Township Report and REA.

In addition to those listed above there are an additional seven dry stone walls identified in the Road Use Agreement and a residence identified by Loyalist Township through negotiation of the Operations Plan with Algonquin. While they are not identified in the REA they will be considered for vibration monitoring as part of this plan.

As required by the REA approval condition, monitoring will be required for the above type of structures that are within 50 metres (m) of the construction activity. The approval conditions further require such vibration be measured in peak particle velocity (PPV) and compared against criteria that were established prior to construction. Stantec's measurement program has been

*Design with community in mind*





July 25, 2017

Mr. Sean Fairfield, Algonquin Power

Page 2 of 8

**Reference: Construction Vibration Monitoring Program, Rev 5 - Amherst Island Wind Energy Project  
Loyalist Township, County of Lennox and Addington, Ontario**

developed to address these REA requirements. Our Qualified Independent Structural Engineer (QE) has been engaged in the preparation of this program.

## **2 MONITORING PLAN DEVELOPMENT**

This section provides details of the vibration monitoring plan for construction activities occurring within 50 m of the structures discussed in Section 1. The REA document also indicates that construction activities include the transport by heavy vehicles of equipment and component parts necessary for the construction and installation of the project infrastructure.

The structures that fall within 50 m of construction will be inspected and the conditions be documented prior to construction. This information will be used to determine the monitoring strategy such as location of monitors, number of vibration monitors, and vibration limits.

### **2.1 IDENTIFICATION OF POTENTIAL STRUCTURES FOR MONITORING**

As discussed in Section 1, the REA identifies three type of structures which are discussed in this Section.

#### **2.1.1 Built Heritage Resources (BHR)**

Under Section M of the REA there are nine (9) BHR identified as protected properties. The structures identified as BHR are:

1. 5170 Front Road (Neilson's General Store)
2. 5555 Front Road (Trinity United Church)
3. 2750 Front Road
4. 3190 Front Road
5. 3500 South Shore Road
6. 4125 South Shore Road
7. 3475 South Shore Road
8. 4725 Second Concession Road
9. 5950 Second Concession Road

As per the REA requirements, monitoring will be required for the BHR should construction activity be within the 50 m of BHR. If there are no construction activities within 50 m of BHR, then no monitoring will be required.

#### **2.1.2 Cultural Heritage Landscapes (CHL)**

The REA identifies four (4) CHL as follows:

1. Village of Stella

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July 25, 2017

Mr. Sean Fairfield, Algonquin Power

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**Reference: Construction Vibration Monitoring Program, Rev 5 - Amherst Island Wind Energy Project  
Loyalist Township, County of Lennox and Addington, Ontario**

2. Ferry Landscape
3. 1652 Front Road (Pentland Cemetery)
4. 1995 Stella 40 Foot Road (St. Paul's Presbyterian Church)

The REA requires that vibration be considered in terms of PPV. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is used in monitoring vibration since it is related to the stresses that are experienced by structures due to vibration.

Therefore, as a first step, structures (buildings and other structures) associated with the four (4) CHL groups that are within 50 m of construction will be identified and vibration limits will be established. For CHL #3 and #4, as per the REA requirements, monitoring will be required for the structures should construction activity be within 50 m of the structures. If there are no construction activities within the 50 m of the structures, then no monitoring will be required.

Among the identified structures in the CHL - #1 Village of Stella/CHL - #2 Ferry Landscape, the closest structure to the construction (including transport by heavy vehicles of equipment and components part) movement will be monitored. The vibration monitoring will be conducted for the period during which construction is within 50 m of the identified structure. Since vibration diminishes as it propagates away from the source, if the structure that is closest to construction complies with the limits, then the structures that are farthest will be deemed to be in compliance with the limits.

### **2.1.3 Dry Stone Walls (DSW)**

The REA identifies ten (10) DSW as follows:

1. Emerald 40 Foot Road and Second Concession Road
2. 3190 Front Road
3. 3850 South Shore Road
4. 570 Front Road
5. 2400 Front Road
6. 2750 Front Road
7. 12405 Front Road
8. 12515 Front Road
9. 12675 Front Road
10. 13555 Front Road

As per the REA requirements, monitoring will be required for the DSW should construction activity be within the 50 m of DSW. If there are no construction activities within 50 m of DSW, then no monitoring will be required. Windlectric will, however, go beyond the requirements of the REA conditions related to this matter, and commit to Loyalist Township to provide visual monitoring for the DSWs that reside outside of the 50 metre zone.

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**Reference: Construction Vibration Monitoring Program, Rev 5 - Amherst Island Wind Energy Project  
Loyalist Township, County of Lennox and Addington, Ontario**

Stantec reviewed these ten DSW and submitted a detailed report to the Ministry of the Environment on December 5, 2016. The information in that report along with the construction schedule will be used to determine the DSW structures that are within the 50 m construction area.

#### **2.1.4 DSW Recently Identified in Road Use Agreement**

In addition to those discussed above, the following seven (7) stone walls were identified in the Road Use Agreement under section 40 (a) (xii):

1. 360 MacDonald Lane
2. 6345 Second Concession Road
3. 9000 Second Concession Road
4. 4000 Front Road
5. 5675 Front Road
6. 15095 Front Road
7. 5830 Front Road (several fences – Stone Wall Festival)

#### **2.1.5 Additional Resource based on Township Request**

The residential dwelling located at 2450 South Shore Road will be added to the list as per the request by Loyalist Township.

While not required in the REA for items 2.1.4 and 2.1.5, a visual record of their respective present conditions will be obtained prior to any construction activity and monitoring for the DSW and the built heritage resource located at 2450 South Shore Road will be completed should construction activity be within the 50 m of the DSW and the built heritage resource. If there are no construction activities within 50 m, then no monitoring will be required. Windlectric will, however, go beyond the requirements of the REA conditions related to this matter, and commit to Loyalist Township to provide visual monitoring for the DSWs and built heritage resource listed in Section 2.1.4 and 2.1.5 that reside outside of the 50 metre zone.

#### **2.2 DETERMINATION OF PPV LIMITS**

The initial work will involve a review of the structure through visual inspection and determination appropriate limits for construction vibrations. The assessment will be based in general terms on the accepted standard DIN 4150: "*Structural vibration - Effects of vibration on structures*".

The German standard DIN 4150 Part 3 provides vibration limits in terms of PPV for construction vibration. A copy of Table 1 from this standard is provided below for reference. The limits provided are for buildings such as those used for residential, commercial or institutional purposes. For heritage buildings (i.e. listed buildings under preservation order), the limits are stringent and are provided in Table 2.

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**Reference: Construction Vibration Monitoring Program, Rev 5 - Amherst Island Wind Energy Project  
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**Table 1 - DIN 4150 Vibration Limits**

Type of structure	Guideline values for velocity in mm/s			
	Vibration at the foundation at a frequency of			Vibration at horizontal plane of highest floor at all frequencies
	1Hz to 10Hz	10 to 50Hz	50 to 100Hz (and above)	
Buildings for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15
Structures that because of their particular sensitivity to vibration, cannot be classified as above and are of great intrinsic value (e.g listed buildings under preservation order)	3	3 to 8	8 to 10	8

Stone fences are typically prone to adverse weather and forces of nature. Based on Stantec's experience, for dry stone fences a reasonable PPV is in the range of 100 mm/ sec for frequencies of 10 Hz or greater. For frequencies below 10 Hz, the values can be assumed to be 50 % (i.e. 50 mm). However, for the purpose of this monitoring program the limits for DSW are treated as similar to commercial buildings as listed in Table 1. The applicable limits for this project are summarized in Table 2.

**Table 2 - Applicable Limits**

Description	Vibration at foundation or ground level [PPV mm/s]		
	1 to 10 Hz	10 to 50 Hz	50 to 100 Hz
Heritage or listed buildings under preservation order this includes BHR and CHL	3	3 to 8	8 to 10
Protected structures such as DSW	20	20-40	40-50

### 2.3 INSTRUMENTATION

To monitor PPV Stantec proposes to use seismographs manufactured by InstanTel. An automated remote access monitoring system will be set up for monitoring. The monitoring system will be set up to provide automatic alerts to field staff and other key personnel. The monitoring system will be set

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**Reference: Construction Vibration Monitoring Program, Rev 5 - Amherst Island Wind Energy Project  
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up with battery power back-up for continuous functioning. A monthly network system access fee is included for the duration of the monitoring.

## **2.4 PROGRAM IMPLEMENTATION**

The vibration monitoring program will involve calibrating and setting up the instruments, a period of ongoing monitoring and reporting and demobilization or relocation of equipment as required. The initial set-up requires a visit to the site with a calibrated instrument and communications modem. A seismograph will be set up at a representative location of the closest BHR, CHL and DSW structure types. Trigger levels will be set and tested with the Client preferred communication protocol established.

A weekly monitoring fee and/or site visit cost has been provided should servicing or re-locating the units be required. We have committed up to six (6) seismograph units to this project.

The number of units can be increased or reduced as required based on the construction schedule.

At the end of the monitoring period a demobilization fee will be charged to remove and clean each unit. This will be based on a single trip to the site and for up to six (6) individual seismographs. Additional seismograph demobilization will be billed at an hourly rate.

## **2.5 REPORTING AND CONSULTATION**

The vibration monitoring program includes a weekly report of activity. Should professional consulting services be required to respond to Ministry of Environment or homeowner/stakeholder concerns our hourly rates would apply. As the level of effort in this area is not clearly defined we have provided unit rates and our estimate for this work is based on our experience on similar projects. Billing will be for actual hours applied.

## **3 TECHNICAL SUPPORT**

The effective and timely completion of a project is only as good as the project team. For this project, we have identified the following professionals with substantial experience in vibration monitoring, and visual inspection and condition documentation. In addition to those listed below, the project team has support from Acoustic Noise and Vibration (ANV) group and Building group.

**Kana Ganesh, M.A.Sc., PhD., P.Eng.**

**Project Responsibilities:** Kana will provide technical leadership and expert support for this project. Dr. Kana Ganesh is a Senior Engineer with over 16 years of consulting and research experience in acoustics, noise, and vibration(ANV) and will provide technical leadership to the project. Kana has previous experience working with Built Heritage and will be the "Qualified Independent Structural Engineer (QE)", as defined in the REA. Kana obtained a Doctorate from the *Institute of*

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**Reference: Construction Vibration Monitoring Program, Rev 5 - Amherst Island Wind Energy Project  
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*Sound and Vibration Research (ISVR), University of Southampton, UK* for his research work in active sound and vibration control. Kana has extensive experience in ANV monitoring and impact assessments. Kana has led several vibration assessment and measurement projects for construction and operations vibration that includes Niagara Wind farm, CN rail expansions in Ontario and Winnipeg, as well as others for TransCanada Pipelines Inc., Enbridge Gas and Union Gas.

**Christopher Woodcock, B.Sc.**

**Project Responsibilities:** Chris will lead the building condition documentation part of this project. Mr. Woodcock is an inspector, assessor, and designer with Stantec's Buildings Engineering group and will lead building condition documentation part of this project. Chris studied at Queen's University and obtained a B.Sc. in Civil Engineering. He will be the site vibration monitoring engineer. His building envelope work with Stantec includes inspection of new commercial construction, roof and exterior wall investigation, and facility assessments of heritage structures. Chris was actively involved in the West Block vibration monitoring for over 4 years.

**Prabu Surendran, B.Eng., EIT**

**Project Responsibilities:** Prabu will lead the field program.

Prabu Surendran B.Eng., EIT, completed his undergraduate degree in Mechanical Engineering in June, 2012. During his undergraduate career, Prabu has completed large data collection and analysis for the energy sector which resulted in peer reviewed publications. At Stantec he has developed a strong background in data collection and analysis. Prabu is a member of our ANV group, where he specializes in environmental assessments and vibration monitoring. As recently as the autumn of 2016, Prabu conducted vibration monitoring for an oil and gas sector pipeline horizontal directional drilling program involving a heritage barn structure in Ontario. He also looks after calibration and maintenance of our many precision acoustic testing and sound/vibration measurement instruments. Prabu is working toward achieving his Professional Engineer Certification.

**Leaman Chow P.Eng**

**Project Responsibilities:** Acoustical Engineer, technical leadership in Kana's absence

Leaman has a diverse range of experience in the area of environmental acoustic projects related to commercial, residential and industrial facilities involving the completion of detailed noise impact assessments. Further, Leaman has also conducted on-site noise source measurements, baseline monitoring, complaint based investigations and worked with regulatory bodies in support of obtaining environmental compliance approvals on behalf of clients. Leaman also specializes in the area of building acoustics related to commercial, residential and industrial facilities. Leaman is experienced in on-site field measurements, inspections as well as in-situ investigative and compliance testing in support of the acoustic assessments.

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**Reference: Construction Vibration Monitoring Program, Rev 5 - Amherst Island Wind Energy Project  
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#### **4 CLOSURE**

This proposal has been prepared based on our understanding of the project and Client needs. If we have not captured your requirements, please contact the undersigned directly. Thank you for this opportunity to submit this proposal. We look forward to working with you on this project.

Yours truly,

**STANTEC CONSULTING LTD.**

A handwritten signature in black ink, appearing to read "Rob Rowland".

Kana Ganesh, PhD, PEng  
Senior Acoustic, Noise and Vibration Engineer  
Phone: (905) 415-6332  
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Kana.Ganesh@stantec.com

Rob Rowland, BSc, MSc, PGeo  
Senior Project Manager  
Phone: (519) 780-8105  
Fax: (519) 836-2493  
Rob.Rowland@stantec.com

Attachment: None

c. Kerrie Skillen, Stantec

as \\cd1220-f02\work\_group\01609\active\60960595\pre\_construction\heritage monitoring\revised july  
16th\160960595\_aiwep\_vibration\_monitoring\_plan\_20170725\_word\_final2\_clean version.docx

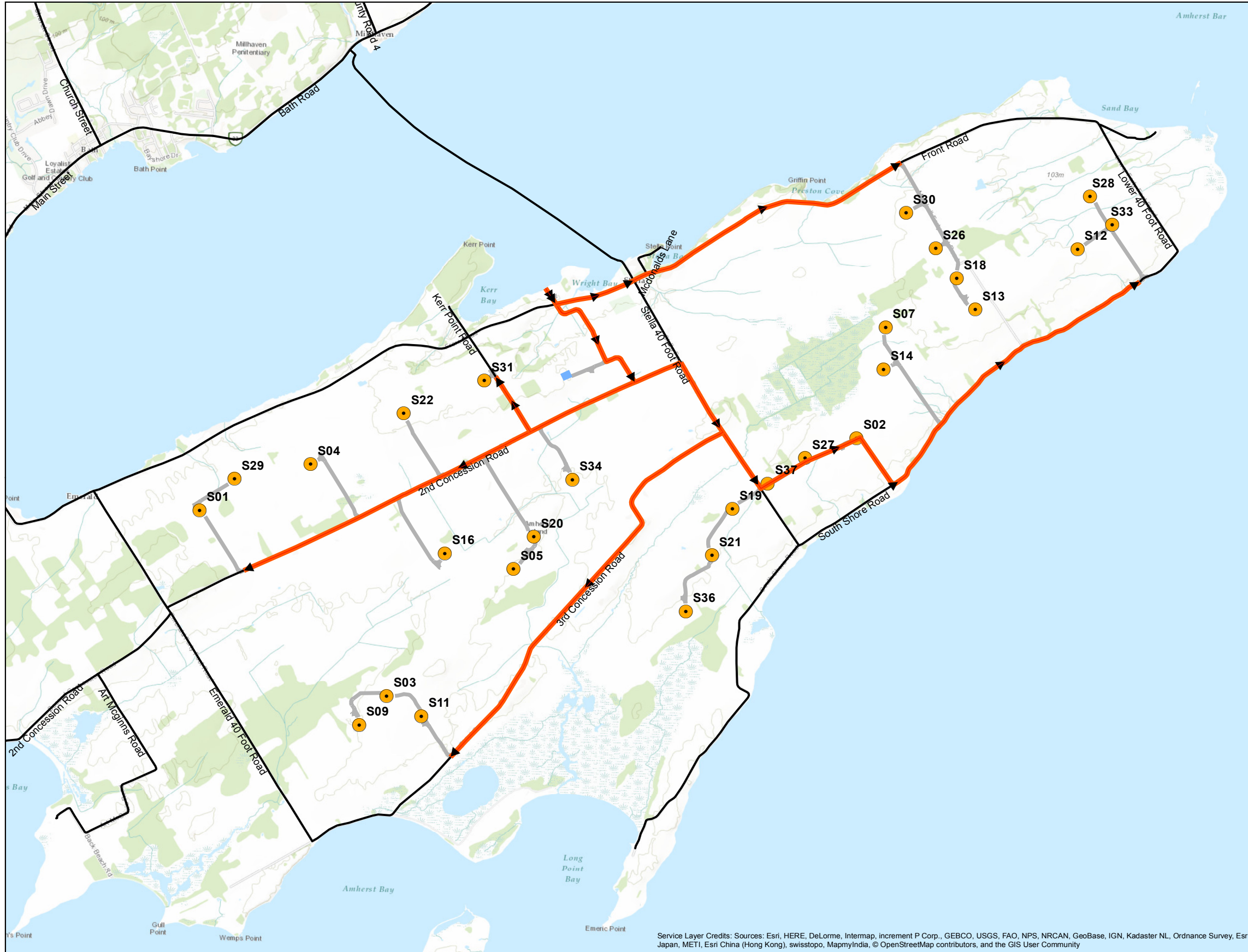
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SCHEDULE 18 – Form of Daily Public Road Inspection Report





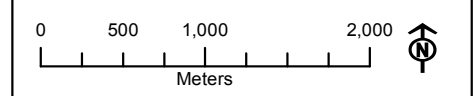
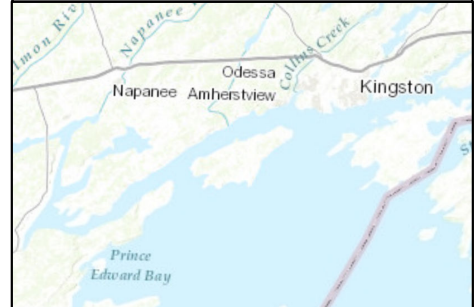
SCHEDULE 19 – Delivery Routes for Turbines



**Legend**

- Turbine Location
- ➔ Turbine Delivery Route
- Public Road
- Access Road
- Substation

Note: Arrows indicate direction of travel of loaded trucks. Trucks will return on the same path, in the opposite direction



**Algonquin**  
ALGONQUIN POWER Co.

**AMHERST ISLAND WIND PROJECT**

TITLE:  
**Delivery Routes for Turbines**

DATUM/PROJECTION: NAD83/UTM ZONE 18N	SCALE: 1:40,000
DRAWN BY: D THOMPSON	DATE: APR 28, 2017
DRAWING No. <b>AMHST - 206</b>	REVISION No. <b>7</b>

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## SCHEDULE 20 – Stormwater Management Plan Report

Note this Schedule includes three documents that collectively cover the extents of the Project area. The documents are as below:

1. Full Erosion and Sediment Control and Stormwater Management Plan Report for Phase 1 of the Project, which includes Island dock, access road from dock to Front Road, and access road south of Front Road
2. Full Erosion and Sediment Control and Stormwater Management Plan Report for Phase 2 – Central laydown area and substation
3. Technical memorandum summarizing draft Full Erosion and Sediment Control and Stormwater Management Plan Report for Phase 3 – Balance of Project area

Schedule 20, Part 1

Full Erosion and Sediment Control and Stormwater Management Plan Report for Phase 1 of the Project, which includes Island dock, access road from dock to Front Road, and access road south of Front Road

**Amherst Island Wind Energy  
Project,  
Erosion and Sediment Control  
and Stormwater Management  
Plan Report, Phase 1**



Prepared for:  
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Prepared by:  
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Waterloo, ON N2H 6M7

1609-60595  
October 17, 2016



## Sign-off Sheet

This document entitled Amherst Island Wind Energy Project, Erosion and Sediment Control and Stormwater Management Plan Report, Phase 1 was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Windlectric Inc. (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.



Prepared by \_\_\_\_\_  
(signature)

**Dave Williams, P.Eng.**  
**Water Resources Engineer**

Reviewed by \_\_\_\_\_  
(signature)

**Jayson Innes, P.Eng.**  
**Water Resources Engineer**



AMHERST ISLAND WIND ENERGY PROJECT,  
EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PLAN REPORT, PHASE 1

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## AMHERST ISLAND WIND ENERGY PROJECT, EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PLAN REPORT, PHASE 1

Introduction  
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### 1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by Windlectric Inc. (the Proponent) to assess and review the need for erosion and sediment control (ESC) and stormwater management (SWM) measures associated with the proposed development of the Amherst Island Wind Energy Project (herein referred to as the "Project"). This report is intended to address the requirements for SWM measures as described in Section H of the project's REA Approval (#7123-9W9NH2) and supplement the information included as part of the application for a Renewable Energy Approval (the REA Application).

Phase 1 of the Project includes the installation of a dock, on Lake Ontario, to provide access to Amherst Island for construction vehicles. In addition, an island dock access road will provide access for construction vehicles to a laydown area for temporary aggregate stockpiling adjacent to the Island Dock access road. Also included in Phase 1 is the construction of an access road south of Front Road, providing access to the future central laydown area and Island Substation which will be part of the Phase 2 Stormwater Management and Erosion and Sediment Control Plan. Previous SWM documentation for the construction of the Island and Mainland docks and associated access roads (*Amherst Island Wind Energy Project, Stormwater Management Design Brief*, Stantec, 2015) was submitted to the MOECC and subsequently approved.

This ESC/SWM Report summarizes the assessment of potential hydrologic impacts associated with the construction phase (i.e., ESC) and operational phase (i.e., SWM) of the Project. Potential hydrologic impacts assessed include changes to the quality and/or quantity discharged to the surface or sub-surface receiving systems. The objective of the report is to demonstrate that the Project design and proposed mitigation measures associated with the construction and operation phases of the Project, as described in the REA Application, detailed engineering design, and herein, are sufficient to minimize any potential impacts to environmental features within the Project area and, further, to provide details on the mitigation measures and control measures that will be implemented.

#### 1.1 STUDY APPROACH

The study approach involved the following components:

- A qualitative assessment of existing hydrologic conditions of the area and receiving systems.
- A review of the proposed Project activities as described in the REA Application with an emphasis on assessing potential for impacts associated with changes in hydrology.
- A semi-quantitative analysis of existing and proposed conditions to determine potential for short-term or long-term effects on receiving systems and mitigative approaches, if necessary.



**AMHERST ISLAND WIND ENERGY PROJECT,  
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- Development of an erosion and sediment control (ESC) strategy outlining the anticipated approach to minimize of impacts related to construction.

## **1.2 BACKGROUND INFORMATION**

A variety of sources have been referenced during the preparation of this ESC/SWM Report, including project-specific documentation, such as the various reports submitted in support of the REA application, and more general industry-standard design guidance documentation and/or literature references, as follows:

### General Guidance Documentation / Literature

- *Low Impact Development Stormwater Management Planning and Design Guide*, Credit Valley Conservation and Toronto and Region Conservation, 2011
- *Erosion and Sediment Control Guideline for Urban Construction (ESC Guidelines)*, Greater Golden Horseshoe Conservation Authorities, Dec. 2006
- *Stormwater Management Planning and Design Manual (SWMPD Manual)*, Ontario Ministry of the Environment, March 2003
- *Guidelines for Evaluating Construction Activities on Water Resources*, Ontario Ministry of the Environment, January 1995

Discussions and conclusions reached herein related to the relevance/significance of impervious coverage and its relative impact on the hydrology of receiving systems are based upon widely available literature, readily obtained in any Internet search for related terms such as "impervious coverage and aquatic systems". Two excellent examples include:

- *Impacts of Impervious Cover on Aquatic System, Watershed Protection Research Monograph No. 1*, Schueler, T., Center for Watershed Protection, March 2003
- *The Importance of Imperviousness*, from *Watershed Protection Techniques, Vol. 1, No.3 – Fall 1994*, Schueler, T., Centre for Watershed Protection, 1994

### Project-Specific Consultation / Documentation

- *Hydrogeological Investigation – Proposed Amherst Island Wind Farm*, Stantec Consulting Ltd., January 2016
- *Amherst Island Wind Energy Project: Dock Construction Stormwater Management Brief*, Stantec Consulting Ltd., December 2015
- *Amherst Island Wind Energy Project: Culvert Sizing Design Brief*, Stantec Consulting Ltd., October 2015
- *Supplementary Geotechnical Investigation – Proposed Amherst Island Wind Farm*, Stantec Consulting Ltd., September 2015



**AMHERST ISLAND WIND ENERGY PROJECT,  
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- *Amherst Island Wind Energy Project: Invista Dock – Drainage Assessment*, Stantec Consulting Ltd., August 2015
- *Geophysical Investigation to Map bedrock in Amherst Island, Ontario*, Geophysics GPR International Inc., June 2015
- *Amherst Island Wind Energy Project: Water Assessment and Waterbody Report (WA/WR)*, Stantec Consulting Ltd., April 2013
- *Amherst Island Wind Energy Project: Design and Operations Report (DOR)*, Stantec Consulting Ltd., December 2013
- *Amherst Island Wind Energy Project: Construction Plan Report*, Stantec Consulting Ltd., December 2013

**AMHERST ISLAND WIND ENERGY PROJECT,  
EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PLAN REPORT, PHASE 1**

Assessment of Potential Hydrologic Impacts and Mitigation – Operational Phase (SWM)  
October 17, 2016

## **2.0 ASSESSMENT OF POTENTIAL HYDROLOGIC IMPACTS AND MITIGATION – OPERATIONAL PHASE (SWM)**

### **2.1 EXISTING CONDITIONS**

As illustrated in the attached Figure 1, and summarized in Table 1, the proposed Project is situated on predominantly agricultural lands with very low existing impervious coverage. Runoff drains overland to local drainage draws, small watercourses, and/or wetland features, ultimately discharging to Lake Ontario. Drainage patterns are to be maintained through the use of limited grading, maintenance of surrounding land uses (e.g., agricultural operations, and the provision of conveyance infrastructure (e.g., culverts). As such, impervious coverage represents the primary parameter of potential impact to the hydrology of the Project area.

Catchment areas were delineated so as to encompass all proposed infrastructure and, therefore, any hydrologic impacts associated with proposed impervious coverage increases, allowing for a comparison between existing and proposed conditions. Owing to the dispersed characteristic of the proposed wind farm, with infrastructure distributed at very low density across a large area, deriving a reasonable comparison point at which to compare pre- and post-development conditions is somewhat subjective. For the purposes of the analysis described herein, comparison points have been set at the closest downstream road crossing of a given catchment within which development (i.e., the creation of new impervious surfaces) is proposed. These locations have been selected since, should a hydrologic impact occur as a result of development, this is the location at which it would be most noticeable and of most concern to the public. A summary of catchment IDs and areas and existing conditions impervious coverage statistics is provided in Table 1.

**Table 1: Existing Conditions Impervious Coverage**

Receivers / Catchment	Drainage Area (ha)	Impervious Coverage	
		(ha)	(%)
4	80.92	0.37	0.46
5	7.15	0.04	0.56
15	89.97	0.87	0.97

**AMHERST ISLAND WIND ENERGY PROJECT,  
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Assessment of Potential Hydrologic Impacts and Mitigation – Operational Phase (SWM)  
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**2.2 PROPOSED CONDITIONS**

*Access Roads*

As described in the *Construction Plan Report*, access roads will be approximately 6 m wide and will not require resizing for the operation phase, with the exception of the entrances off Township or County roads that require wider turning radii, of approximately 50 m, during construction. The access roads will be constructed of engineered compacted fill and/or soil stabilization material. The depth of the roadbed will be approximately 200 - 350 mm. Alternatively, soil stabilizer will be utilized with a reduced granular material depth. Typical construction details for the access road and temporary widenings can be found in Figure 1.

The construction of roads will include the excavation and removal of topsoil, placing of geotextile fabrics where necessary, placement of aggregate and gravel materials as a road base, and further grading and compaction as necessary. From a hydrologic impact perspective, the access roads are considered generally equivalent to a typical farm access (i.e., driveway). Photographs of a typical wind project access road construction have been appended for reference.

For the purposes of conservative analysis, all areas proposed for granular surface treatment (e.g., access roads) have been conservatively considered as 100% impervious within the current analysis. The drainage catchments previously delineated and described under the existing conditions analysis were subsequently analyzed for impervious coverage under proposed conditions, with the results as summarized in Table 2.

**Table 2: Proposed Conditions Impervious Coverage**

Receivers / Catchment	Drainage Area (ha)	Impervious Coverage	
		(ha)	(%)
4	80.92	0.96	1.19
5	7.15	0.19	2.66
15	89.97	2.81	3.12

*Island Dock Temporary Laydown Area*

The proposed 0.9 ha temporary laydown area (Drawing C-403, Attached) is located along the east side of the island dock access road connecting the future island dock and Front Road. Runoff from the northern 0.6 ha of the laydown area drains as overland flow towards Lake Ontario through a vegetated buffer immediately adjacent to the lake. The land to the south drains as overland sheet flow to a roadside ditch along Front Road, discharging to an unnamed tributary under a private laneway to Lake Ontario approximately 200 m east of the intersection of the proposed island dock access road and front road. Preparation of the laydown area



**AMHERST ISLAND WIND ENERGY PROJECT,  
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Assessment of Potential Hydrologic Impacts and Mitigation – Operational Phase (SWM)  
October 17, 2016

includes establishing all proposed erosion and sediment controls (Drawing C-401), excavation and removal of topsoil and proof-rolling the native subsoil prior to stockpile placement.

### **2.3 ASSESSMENT OF HYDROLOGIC IMPACTS AND NEED FOR STORMWATER CONTROLS**

Industry-standard approaches to assessing the potential for hydrologic impacts related to changes in the amount of urban impervious coverage, as supported by literature (see references in Section 1.2), generally conclude that watersheds typically maintain pre-development hydrology characteristics until they exceed 10-15% impervious coverage.

As illustrated in the calculations above, the impervious coverage in the three (3) catchments identified as part of this study remains below 3.12%. It is concluded, therefore, that the development of the Project will have negligible impact on the hydrology of the area and receiving systems.

Regarding the potential for flow re-direction or obstruction, the REA documents include commitments to minimizing grading and the implementation of drainage infrastructure (e.g., culverts or overland flow routes) as necessary to maintain drainage patterns per existing conditions. Care will be taken where construction is proposed in areas of known tile drainage systems to minimize damage to these systems and to repair any inadvertent damage that may occur, maintaining existing conditions drainage characteristics. On-going landowner liaison will occur as any impacts may only become noticeable at a later date.

Given the general maintenance of at-surface drainage conditions (i.e., no substantive grading or re-direction of surface water away from existing features) and vegetative conditions across the majority of the site, and the minimal introduction of impervious coverage, a formal stormwater management system for access roads is not proposed.

#### *Island Dock Temporary Laydown Area*

Aggregate stockpiles will not be compacted allowing rainfall to migrate through the stockpile where it will have the opportunity to infiltrate into the native subsoils. Any incidental increase in runoff as a result of temporary aggregate stockpiling will be attenuated and filtered through downstream vegetated conveyance systems in addition to the robust sediment and erosion controls described in Section 3 of this report. A formal Stormwater management system for the island dock temporary laydown area is not proposed.



**AMHERST ISLAND WIND ENERGY PROJECT,  
EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PLAN REPORT, PHASE 1**

Assessment of Potential Hydrologic Impacts and Mitigation (ESC)  
October 17, 2016

### **3.0 ASSESSMENT OF POTENTIAL HYDROLOGIC IMPACTS AND MITIGATION (ESC)**

#### **3.1 ASSESSMENT OF EROSION POTENTIAL**

An assessment of the erosion potential of the construction area was completed following the methodology outlined in the *ESC Guidelines* (GGHACA, 2006). The erosion potential is based on an assessment of three primary factors, namely slope gradient, slope length and soil texture (erodibility), with the resultant designation of either "low", "medium", or "high" erosion potential. The relative level of erosion potential dictates, to some extent, the comprehensiveness of the resultant ESC system design, monitoring, and maintenance program.

Beyond the three-parameter approach described by the Guidelines, it is often also appropriate to account for the relative sensitivity of the receiving systems as it relates to potential sediment transport offsite during construction. While never leading to a *reduction* in assessed erosion potential, such an assessment could result in a conclusion that diligence in excess of that already assessed is warranted. In this particular case, the receiving system is Lake Ontario which, should a spill occur, presents cleanup challenges if any sediment is to migrate into the Lake. It would be incumbent upon the proponent and contractor to elevate the level of attention paid to protecting the Lake against construction related impacts.

The existing and proposed (post-construction) condition gradients on the Project site can be classified as moderate (2 – 10% - Overland flow paths) to steep (>10% - Access road embankments), with predominantly long slopes (greater than 30 m). Site soils are comprised primarily of sand and silt tills, which are considered to represent a high erodibility potential (Table A1, ESC Guidelines). Therefore, based on this classification, the site has a "high" erosion potential.

The setbacks provided between the proposed project infrastructure and the surface water receiving features and the existing agricultural land uses surrounding the proposed infrastructure and the features, are such that the derivation of an ESC strategy in accordance with the "high" erosion potential assessment should satisfactorily address the potential impacts to the water features.

#### **3.2 DURING CONSTRUCTION DEWATERING**

As per the Construction Plan Report, it is not expected that the water table will be intercepted by any construction activities, though it is possible. Should dewatering be required, such would affect the local near-surface water table only for the period for construction (until concrete is hardened). Post-construction, the water table would return to pre-construction levels and the relatively small 'footprint' of the road base would not affect flow volumes or patterns, or the deep groundwater regime. Pumping rates are not anticipated to exceed 50,000 litres per day.





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Although culvert installation works are proposed to be completed in the dry, culvert installation may require minor dewatering during construction. The construction of watercourse crossings are understood to require approximately 1-3 days per crossing including the installation of minor water diversion infrastructure (if necessary), site excavation/preparation, culvert installation, backfilling, and removal of diversion measures. It is anticipated that the headwater features will be crossed using standard passive diversion or "dam and pump" dry crossing techniques. Prior to commencing crossing construction, weather forecasts will be reviewed to assess the potential for significant precipitation. In-stream activities will be delayed if foul weather is forecast and/or flows are elevated beyond available pump capacity or 50,000 litres per day.

Any required dewatering operations will be completed such that discharge rates will not cause any flooding and erosion concerns for the downstream natural areas. In order to prevent sediment migration to the downstream areas dewatering discharges may be treated with a variety of measures including but not limited to filter socks, sediment traps, and "frog's foot" dissipaters at the discretion of the contractor. Dewatering discharges will be directed through the sediment control measures to a gently sloped vegetated area greater than 30 m from any watercourse or wetland feature.

Detailed pumping records will be kept on site to ensure that maximum pumping rates are not exceeded.

### **3.3 EROSION AND SEDIMENTATION CONTROL PLAN**

As described in the *Construction Plan Report*, the various construction activities required to develop the site include topsoil removal, minor grading activities, infrastructure installation, creation of granular access roads, and general construction traffic. If left unmitigated, these activities will result in impacts ranging from disturbance of at-surface soils and exposure of the native sub-soils to potential erosion and sediment transport to offsite locations.

Erosion control will be achieved primarily through the excavation-and-backfill methods of construction and by limiting the duration of exposure of disturbed sub-soils inherent in the construction process. For example, access road construction includes the removal of topsoil and sub-soils as necessary to achieve a competent base, followed by the placement of granular material back to existing grade elevations (or marginally above); hence, the work areas are generally "self-contained" and protected from erosion and sediment transport by definition. Further, at any given location, these works will be completed in short order (1-2 days expected), providing little opportunity for sub-soils to be disturbed and entrained in storm runoff.





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In addition to limiting the potential for erosion, sediment control measures will be implemented prior to any grading or servicing works commencing as shown on the accompanying Plans, and include, but not necessarily be limited to, the following items:

- Sediment and erosion control measures should be implemented prior to construction and maintained during the construction phase to prevent entry of sediment into the water:
  - Erect silt fence (per OPSD 219.110) on the downstream sides of disturbed areas within 30 m of the buffers to environmental features and around entirety of temporarily stockpiled soils;
  - Temporarily stockpiled materials will be covered with rolled erosion control products when the material is expected to be left in place in excess of 10 days
  - Install temporary straw bale check dams (per OPSD 219.180) within 15 m downstream of new culvert construction
  - No equipment should be permitted to enter any natural areas beyond the silt fencing during construction;
  - Topsoil stockpiles should be sufficiently distant from watercourses to preclude sediment inputs due to erosion of stored soil materials;
  - If the sediment and erosion control measures are not functioning properly, no further work should occur until the sediment and/or erosion problem is addressed;
- Complete work in and around watercourses when the features are at their driest. All in-water work should be completed within MNR timing windows to protect local fish populations during their spawning and egg incubation periods. A typical construction timing window for warmwater streams in the Peterborough District is July 1<sup>st</sup> to March 31<sup>st</sup>.
- All materials and equipment used for the purpose of site preparation and Project construction should be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the water:
  - Any stockpiled materials should be stored and stabilized away from the water;
  - Refuelling and maintenance of construction equipment should occur in designated areas, a minimum of 100 m from a water body;
  - Spills should be reported to the MOE Spills Action Centre;
  - Any part of equipment entering the water should be free of fluid leaks and externally cleaned/degreased to prevent any deleterious substance from entering the water; and
  - Only clean material, free of fine particulate matter should be placed in the water.
- Revegetate all disturbed areas where construction is not expected for 30 days with a minimum 50 mm of topsoil and hydro-seeding or other stabilizing vegetation / erosion protection measures (per OPSS 804). If, given seasonal restriction or other revegetation



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limiting factors, the disturbed area should be stabilized against erosion impacts by non-vegetated means such as erosion control blankets.

The ESC measures shall be maintained in good repair during the entire construction period, and removed as contributing drainage areas are restored and stabilized. ESC measures shall not be removed until a qualified inspector determines that the measures are no longer required and the risk of surface water and environmental impacts from construction activities are negligible. In addition, the condition of erosion control works, their overall performance, and any repairs replacement or modifications to the installed item shall be noted in logbooks to be kept on-site.

### **3.4 EROSION AND SEDIMENTATION CONTROL MONITORING PLAN**

In order to ensure the effectiveness of the various erosion and sediment control measures, a routine program should be implemented which includes the inspection of the erosion and sediment controls daily and after each significant rainfall event (10 mm), and immediate repair of any deficiencies. This program will consist of the following activities:

- Visual inspection of the ESC measures to ensure discharged flows are generally free of sediment and turbidity
- Inspection of vegetation protection and silt fencing to ensure that they are maintained in good repair
- Removal of construction debris that may accumulate
- Implementation of remedial measures including erosion stabilization, repair of damaged fencing and any other remediation, where required.

If the monitoring program outlined above indicates a persistent problem then the following process should be undertaken to determine appropriate mitigative measures:

- Analysis of the monitoring information and field visits as required, determine the cause of the problem, and develop a mitigation plan to address the issue.
- Convene a meeting with the appropriate review agencies to discuss the problem.
- Develop a consensus on a proposed plan of action to resolve the problem in consultation with agency staff.
- Implement additional mitigation measures and monitor the results.



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October 17, 2016

### **3.5      LONG TERM EROSION AND SEDIMENT CONTROL**

Per the *Construction Plan Report*, upon the completion of backfilling and the subsequent disposition of excess soil elsewhere within the properties by the property owners, replanting with native vegetation will be undertaken in areas where active agricultural is not anticipated.

One year after construction a survey will be undertaken to ensure that long-term erosion control measures have been effective. This will include an inspection of drainage facilities associated with the Project construction (e.g., culverts) for structural integrity and any excessive amount of silt collection. Seeded or replanted areas will be inspected to ensure that revegetation measures were successful and reseeding or replanting will occur where necessary.

If erosion control measures are found to be less than fully effective during this survey, reseeding or replanting of problem areas will take place. Should there be residual effects noted during post-construction monitoring, advice on contingency measures will be sought out and applied.

**AMHERST ISLAND WIND ENERGY PROJECT,  
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Conclusions  
October 17, 2016

## **4.0 CONCLUSIONS**

It is concluded that both the relative lack of change in impervious coverage associated with the proposed development and the resultant total impervious coverage within the local drainage catchments are sufficiently limited as to not impact the pre-development hydrologic characteristics of the area during construction or long-term operation of the facility. There should be negligible change/impact on the quality and/or quantity of surface water runoff and/or groundwater recharge and, therefore, no requirement for the implementation of formal stormwater quality or quantity controls.

While the site assessment yields a "high" erosion potential classification, a number of factors combine to limit the potential for impact on the receiving systems. Specifically the relatively small area proposed to be disturbed, the short-term nature of the disturbance prior to stabilization whether through granular placement or re-vegetation, and the existing land use of the surrounding area as agricultural operations all combine to create a condition where a "standard" approach to erosion and sediment control will suffice to minimize potential for off-site impacts. The proposed erosion and sediment control plan accompanied by a monitoring and maintenance program will be implemented to prevent migration of sediment to downstream features during the construction phase of the Project.



# ATTACHMENTS













**Photo 1 Typical access road construction at a wind project**



**Photo 2 Typical access road construction at a wind project**



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Windlectric Inc.

SITE:  
Amherst Island Wind Energy Project  
Erosion and Sediment Control /  
Stormwater Management Plan

WILE  
Photograph

PAGE  
1 of 3

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**Photo 3 Typical access road construction at a wind project**



**Photo 4 Typical access road construction at a wind project**



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**Photo 5** Typical access road construction at a wind project



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Schedule 20, Part 2

Full Erosion and Sediment Control and Stormwater Management Plan Report for Phase 2 –  
Central laydown area and substation

**Amherst Island Wind Energy  
Project,  
Erosion and Sediment Control  
and Stormwater Management  
Plan Report, Phase 2**



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February 6, 2017

## Sign-off Sheet

This document entitled Amherst Island Wind Energy Project, Erosion and Sediment Control and Stormwater Management Plan Report, Phase 2 was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Windlectric Inc. (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.



Prepared by \_\_\_\_\_  
(signature)

**Adam Kristoferson, P.Eng.**

Reviewed by David Williams  
(signature)

**David Williams, P.Eng.**





**AMHERST ISLAND WIND ENERGY PROJECT,  
EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PLAN REPORT, PHASE 2**

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**AMHERST ISLAND WIND ENERGY PROJECT,  
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## **1.0 INTRODUCTION**

Stantec Consulting Ltd. (Stantec) was retained by Windlectric Inc. (the Proponent) to assess and review the need for erosion and sediment control (ESC) and stormwater management (SWM) measures associated with the proposed development of the Amherst Island Wind Energy Project (herein referred to as the "Project"). This report is intended to address the requirements for SWM measures as described in Section H of the project's REA Approval (#7123-9W9NH2) and supplement the information included as part of the application for a Renewable Energy Approval (the REA Application).

Phase 2 of the Project includes the installation of temporary laydown area, referred to herein as the Central Staging Area (CSA) for stockpiling wind project components and construction materials, along with a concrete batch plant and a SWM facility and a substation. Previous SWM documentation for the project includes:

***Amherst Island Wind Energy Project, Stormwater Management Design Brief, Stantec, 2015***

This brief includes SWM documentation for the construction of the Island and Mainland docks and associated access roads.

***Amherst Island Wind Energy Project, Erosion and Sediment Control and Stormwater Management Plan Report, Phase 1***

The Phase 1 report includes SWM documentation for the construction of the island dock laydown area for temporary aggregate stockpiling adjacent to the island dock access road, as well as the access road connecting the island dock access road which is north of Front Road, to the Central Staging Area south of Front Road.

This ESC/SWM Report summarizes the assessment of potential hydrologic impacts associated with the construction phase (i.e., ESC) and operational phase (i.e., SWM) of the Project. Potential hydrologic impacts assessed include changes to the quality and/or quantity discharged to the surface or sub-surface receiving systems. The objective of the report is to demonstrate that the Project design and proposed mitigation measures associated with the construction and operation phases of the Project, as described in the REA Application, detailed engineering design, and herein, are sufficient to minimize any potential impacts to environmental features within the Project area and, further, to provide details on the mitigation measures and control measures that will be implemented.

### **1.1 STUDY APPROACH**

The study approach involved the following components:

- A qualitative assessment of existing hydrologic conditions of the area and receiving systems.



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1.1

**AMHERST ISLAND WIND ENERGY PROJECT,  
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- A review of the proposed Project activities as described in the REA Application with an emphasis on assessing potential for impacts associated with changes in hydrology.
- Complete final design of SWM measures to control site runoff in a manner consistent with Ministry of Environment and Climate Change (MOECC) requirements
- Development of an erosion and sediment control (ESC) strategy outlining the anticipated approach to minimize of impacts related to construction.

## **1.2 BACKGROUND INFORMATION**

A variety of sources have been referenced during the preparation of this ESC/SWM Report, including project-specific documentation, such as the various reports submitted in support of the REA application, and more general industry-standard design guidance documentation and/or literature references, as follows:

### General Guidance Documentation / Literature

- *Low Impact Development Stormwater Management Planning and Design Guide*, Credit Valley Conservation and Toronto and Region Conservation, 2011
- *Erosion and Sediment Control Guideline for Urban Construction (ESC Guidelines)*, Greater Golden Horseshoe Conservation Authorities, Dec. 2006
- *Stormwater Management Planning and Design Manual (SWMPD Manual)*, Ontario Ministry of the Environment, March 2003
- *Guidelines for Evaluating Construction Activities on Water Resources*, Ontario Ministry of the Environment, January 1995

### Project-Specific Consultation / Documentation

- *Hydrogeological Investigation – Proposed Amherst Island Wind Farm*, Stantec Consulting Ltd., January 2016
- *Amherst Island Wind Energy Project: Dock Construction Stormwater Management Brief*, Stantec Consulting Ltd., December 2015
- *Amherst Island Wind Energy Project: Culvert Sizing Design Brief*, Stantec Consulting Ltd., October 2015
- *Supplementary Geotechnical Investigation – Proposed Amherst Island Wind Farm*, Stantec Consulting Ltd., September 2015
- *Amherst Island Wind Energy Project: Invista Dock – Drainage Assessment*, Stantec Consulting Ltd., August 2015
- *Geophysical Investigation to Map bedrock in Amherst Island, Ontario*, Geophysics GPR International Inc., June 2015
- *Amherst Island Wind Energy Project: Water Assessment and Waterbody Report (WA/WR)*, Stantec Consulting Ltd., April 2013



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- *Amherst Island Wind Energy Project: Design and Operations Report (DOR)*, Stantec Consulting Ltd., December 2013
- *Amherst Island Wind Energy Project: Construction Plan Report*, Stantec Consulting Ltd., December 2013



**AMHERST ISLAND WIND ENERGY PROJECT,  
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## **2.0 ASSESSMENT OF HYDROLOGIC IMPACTS AND MITIGATION – OPERATIONAL PHASE (SWM)**

### **2.1 EXISTING CONDITIONS**

Under existing conditions the location of the CSA and substation are currently used for agricultural purposes. As shown in Figure 1, surface runoff drains to a drainage channel along Second Concession to a culvert under Second Concession southwest of the site. Site topography can be characterized as moderately sloped with slopes ranging from 1 to 4% draining from north to south. Previous studies have characterized site soils as silt tills and clays with bedrock depths in the range of 0.15 to 0.6 m below ground surface.

Delineation of existing drainage catchments is provided on Figure 1, and is summarized as follows:

**Catchment 100** – 32 ha of agricultural land in the location of the proposed central staging area and substation

### **2.2 PROPOSED CONDITIONS**

As described in the Construction Plan Report, the 13 ha Central Staging Area is proposed to be stripped of topsoil, graded, proof rolled and then a gravel layer applied. The CSA is a temporary construction feature and is scheduled to be rehabilitated to existing conditions following the completion of the construction of the project. The CSA will drain by sheet flow to a SWM dry pond facility, along the CSA southern limits, to provide SWM controls prior to discharging to the Second Concession Drainage Ditch. A berm along the north-central portion of the SWM facility directs flows to the east and west limits of the pond to minimize the potential for flows short circuiting through the facility. Erosion control berms along the east and west edges prevent runoff from the CSA from bypassing the proposed SWM facility in addition to directing flows from the adjacent agricultural lands around the site.

The 0.5 ha substation is proposed to be stripped of topsoil, graded, proof rolled and resurfaced with a well-drained coarse granular layer underlying electrical infrastructure. Site access is restricted with fencing and a singular locked access gate. A drainage swale along the south edge of the substation site collects sheet flow runoff from the substation, preventing it from flowing uncontrolled over adjacent agricultural land to the south and west. Detailed grading design of the substation site has not been completed, however, the substation was considered in the design of the proposed SWM measures, as it lies within the same culvert catchment area as the CSA.



**AMHERST ISLAND WIND ENERGY PROJECT,  
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### **3.0 ASSESSMENT OF POTENTIAL HYDROLOGIC IMPACTS AND MITIGATION – DURING-CONSTRUCTION PHASE (ESC)**

An assessment of the erosion potential of the construction area was completed following the methodology outlined in the *ESC Guidelines* (GGHACA, 2006). The erosion potential is based on an assessment of three primary factors, namely slope gradient, slope length and soil texture (erodibility), with the resultant designation of either "low", "medium", or "high" erosion potential. The relative level of erosion potential dictates, to some extent, the comprehensiveness of the resultant ESC system design, monitoring, and maintenance program.

The existing and proposed (post-construction) condition gradients on the Project site can be classified as moderate (2 – 10% - Overland flow paths) to steep (>10% - Access road embankments), with predominantly long slopes (greater than 30 m). Site soils are comprised primarily of silt tills and clays, which are considered to represent a high erodibility potential (Table A1, *ESC Guidelines*). Therefore, based on this classification, the site has a "high" erosion potential.

The setbacks provided between the proposed project infrastructure and the surface water receiving features and the existing agricultural land uses surrounding the proposed infrastructure and the features, are such that the derivation of an ESC strategy in accordance with the "high" erosion potential assessment should satisfactorily address the potential impacts to the water features.

#### **3.1 DURING CONSTRUCTION DEWATERING**

As per the Construction Plan Report, it is not expected that the water table will be intercepted by any construction activities. Should dewatering be required, such would affect the local near-surface water table only for the period for construction (until concrete is hardened). Post-construction, the water table would return to pre-construction levels and the relatively small 'footprint' of the road base would not affect flow volumes or patterns, or the deep groundwater regime. Pumping rates are not anticipated to exceed 50,000 litres per day.

Any required dewatering operations will be completed such that discharge rates will not cause any flooding and erosion concerns for the downstream natural areas. In order to prevent sediment migration to the downstream areas dewatering discharges may be treated with a variety of measures including but not limited to filter socks, sediment traps, and "frog's foot" dissipaters at the discretion of the contractor. Dewatering discharges will be directed through the sediment control measures to a gently sloped vegetated area greater than 30 m from any watercourse or wetland feature.





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Legend

100 AREA NUMBER  
A=3172

BOUNDARY OF STUDY AREA (1:1)

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**WindElectric Inc.**  
AMHERST ISLAND WIND PROJECT  
75MW WIND FARM  
Amherst Island, Loyalist Township, Ontario

**File:** CENTRAL STAGING AREA  
STORM WATER CATCHMENT AREA PLAN  
EXISTING CONDITIONS

**Project No:** 1325-0100  
**Scale:** 1:3000  
**Drawn No:** 1

**AMHERST ISLAND WIND ENERGY PROJECT,  
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Delineation of proposed drainage catchments is provided on Figure 2, and is summarized as follows:

**Catchment 201** – 0.5 ha of substation area draining uncontrolled to the Second Concession drainage ditch

**Catchment 202** – 5.3 ha of agricultural land and access road draining overland towards the CSA

**Catchment 203** – 14 ha of graveled CSA draining by sheet flow to the proposed SWM facility at the south limits of the site

**Catchment 204** – 1.7 ha of agricultural land and Second Concession roadside ditch draining to the culvert under Second Concession southwest of the site

**Catchment 205** – 10.3 ha of agricultural land west of the central staging area draining uncontrolled to the Second Concession drainage ditch

## **2.3 HYDROLOGIC MODELING**

A hydrologic model was prepared to simulate drainage conditions for the subject development using the hydrologic modeling software package known as SWMHYMO (Stormwater Management Hydrologic Model). The models were used to predict flows for the existing and proposed development conditions and design SWM systems to ensure that proposed development peak flow rates at the second concession road culvert do not exceed existing flow rates. Storm event modeled included the 5-, 10- and 100-year SCS distribution storm events.

Soil Conservation Service (SCS) curve numbers (CNs) of 84 and 90 were used for crop covered and gravel covered areas respectively on silt tills / clays. Schematics of the SWMHYMO model and all input and output files are also attached.

## **2.4 STORMWATER MANAGEMENT STRATEGY**

Stormwater runoff from the proposed CSA, will be attenuated using a dry-pond facility along the southern limits of the site (Drawing C105). A dry facility was selected due to the shallow depths to bedrock on site. The dry facility is primarily designed to provide quantity control, but also serves a quality control purpose, allowing for some settlement of suspended solids. The facility will be drained by two (2) 525mm outlet pipes to the roadside ditch north of the 2nd Concession Road. Stage-storage discharge characteristics for the pond were calculated using spreadsheet analysis and incorporated into the hydrologic model and is attached with this letter. Tables highlighting the details regarding the parameters and results are found below.



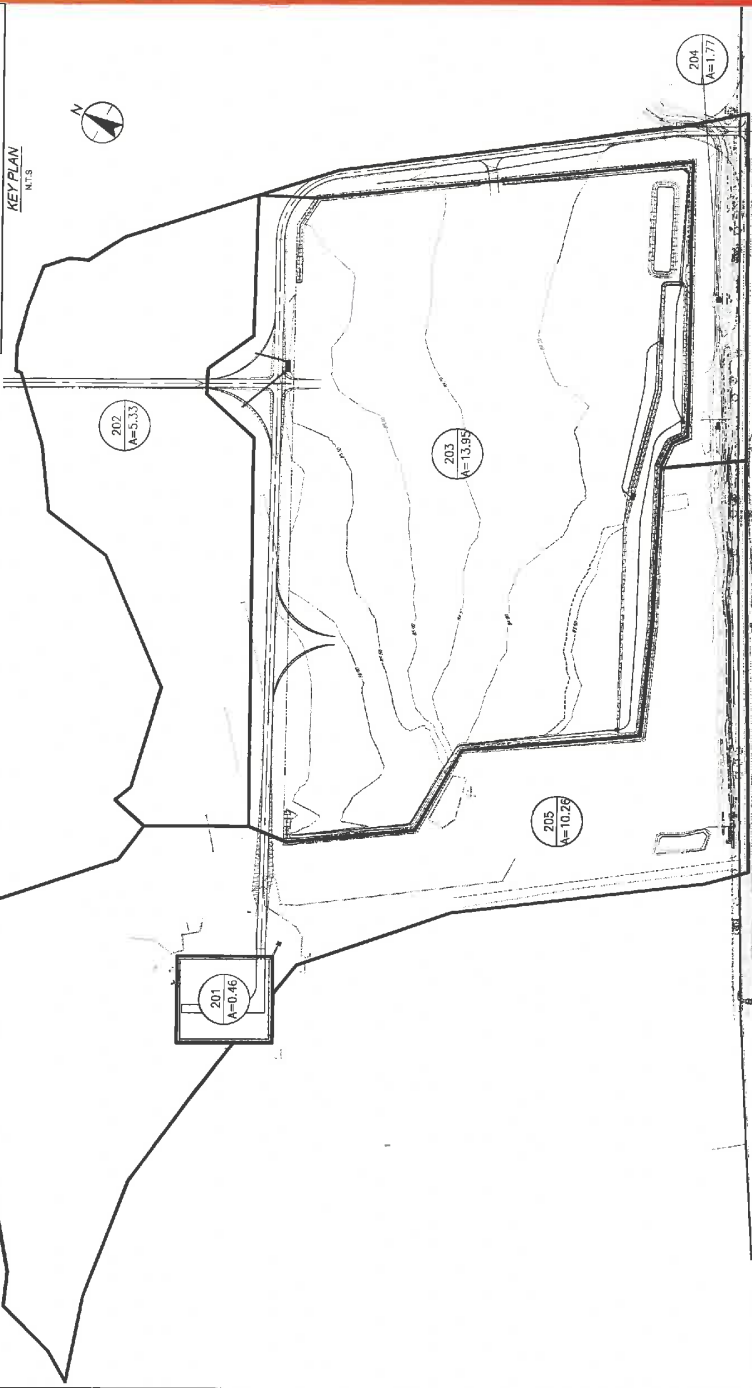
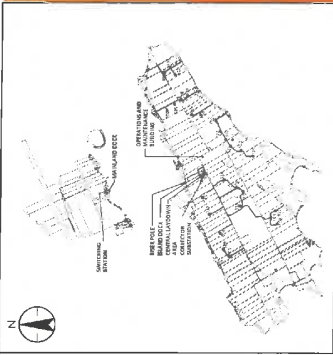




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Legend  
 100 MHA NUMBER  
 A=31.72 CONCENTRIC AREA (m<sup>2</sup>)  
 MAJOR OCEANIC FLOOD RIFLE  
 MINOR OCEANIC FLOOD RIFLE  
 LINE OF SETTLES, TYPICAL AREA



Client/Project  
 Windtecture Inc.  
 AMHERST ISLAND WIND PROJECT  
 75MW WIND FARM  
 Amherst Island, Lac Seul Township, Ontario

Title  
 CENTRAL STAGING AREA  
 STORM WATER DETENTION AREA PLAN  
 PROPOSED CONDITIONS

Project No.  
 1314-010

Scale  
 1:5000

Sheet No.  
 2

**AMHERST ISLAND WIND ENERGY PROJECT,  
EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PLAN REPORT, PHASE 2**

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**Table 1 - SWM Facility Design Characteristics**

<b>Total Contributing Area</b>	19.74 ha
<b>Total Area Modelled</b>	31.77 ha
<b>Pond Elevations (Bottom/Top)</b>	82.70 m / 83.75 m
<b>Twinned Outlet Pipe Elevation / Diameter</b>	82.65 m / 525 mm

**Table 2: Stormwater Management Facility Operating Characteristics**

<b>Storm Event</b>	<b>5-year</b>	<b>10-year</b>	<b>100-year</b>
<b>Existing Flows to Second Concession (m<sup>3</sup>/s)</b>	1.56	1.94	3.19
<b>Proposed Flows to Second Concession (m<sup>3</sup>/s)</b>	1.11	1.35	1.99
<b>Proposed Flows to SWM Facility (m<sup>3</sup>/s)</b>	1.31	1.60	2.54
<b>Proposed Flows from SWM Facility (m<sup>3</sup>/s)</b>	0.10	0.12	0.20
<b>Maximum Storage Used (m<sup>3</sup>)</b>	2899	3608	6320
<b>Maximum Ponding Depth (m)</b>	0.48	0.60	0.85
<b>Drawdown Time (hrs)</b>	4	4.5	5

As illustrated in Table 2, above, water quantity control targets have been met as the post-development peak flow rates are less than the target discharges established using existing conditions modeling.

### 2.4.1 Water Quality Control

Water quality benefits of the proposed perimeter grassed swales and vegetated dry pond facility are achieved as a result of the runoff / vegetation interaction which slows the velocity of runoff, as compared to a piped system, thereby promoting the sedimentation of particulate matter. The vegetation also provides nutrient uptake benefits to help reduce biological pollutants such as nitrogen and phosphorous. Due to the temporary nature of the CSA and the shallow depth to bedrock, the proposed dry pond facility will provide adequate water quality control for the proposed works.

Under proposed conditions, the substation is covered by washed crushed stone and electrical infrastructure. The crushed stone areas will not be subjected to vehicular traffic and therefore, will be less susceptible to compaction and sediment build-up / wash-off cycles. Runoff from this portion of the substation is considered "clean" and does not require additional water quality control. Site access is gated and will be restricted to routine inspection and maintenance operations, minimizing opportunity for sediment build-up and wash-off. Impacts to water quality are considered to be negligible, with associated control proposed to be provided through the use of a grassed swale at the south end of the substation site and the existing downstream vegetated conveyance system.



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**2.4.2 Design Considerations**

As the dry pond facility is proposed to be constructed in winter/spring 2017 additional measures have been included in the design of the CSA to minimize the potential for sediment to migrate offsite, prior to site vegetation becoming fully established. The perimeter berms around the CSA are to be covered by straw matting, while the swales on the interior side of the berm are to be covered by Anti-Wash Geojute to minimize erosion potential of designed features. The outlet of the dry pond facility will be protected by a double layer of light duty silt fencing. Light duty silt fencing was chosen for ease of installation and maintenance, as it can be manipulated without the assistance of machinery and limited access to the outlet structure.

The pond is proposed to be lined with an impervious liner to prevent migration of any deleterious substances into the subsurface soils bedrock below.

Due to the temporary nature of the CSA and to maximize the amount of working area, the dry pond facility has been sized to contain the 10-year rainfall event. Under larger storm events, ponding will occur onto the graveled area on the site. The 100-year ponding limit has been delineated on the attached drawings, and will be identified on site. Ponding depths on the graveled area of the site will not exceed 0.10 meters, which still allows for vehicle passage.



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Detailed pumping records will be kept on site to ensure that maximum pumping rates are not exceeded.

### **3.2 EROSION AND SEDIMENTATION CONTROL PLAN**

As described in the *Construction Plan Report*, the various construction activities required to develop the site include topsoil removal, minor grading activities, infrastructure installation, creation of granular access roads, and general construction traffic. If left unmitigated, these activities will result in impacts ranging from disturbance of at-surface soils and exposure of the native sub-soils to potential erosion and sediment transport to offsite locations.

Erosion control will be achieved primarily through the excavation-and-backfill methods of construction and by limiting the duration of exposure of disturbed sub-soils inherent in the construction process. For example, laydown area construction includes the removal of topsoil and sub-soils as necessary to achieve a competent base, followed by the placement of granular material back to proposed grade elevations (or marginally above); hence, the work areas are generally "self-contained" and protected from erosion and sediment transport by definition. Further, at any given location, these works will be completed in short order, providing little opportunity for sub-soils to be disturbed and entrained in storm runoff.

In addition to limiting the potential for erosion, sediment control measures will be implemented prior to any grading or servicing works commencing as shown on the accompanying plan (Drawing C105), and include, but not necessarily be limited to, the following items:

- Sediment and erosion control measures should be implemented prior to construction and maintained during the construction phase to prevent entry of sediment into the water:
  - Erect silt fence (per OPSD 219.110) on the downstream sides of disturbed areas within 30 m of the buffers to environmental features and around entirety of temporarily stockpiled soils;
  - Temporarily stockpiled materials will be covered with rolled erosion control products when the material is expected to be left in place in excess of 10 days
  - No equipment should be permitted to enter any natural areas beyond the silt fencing during construction;
  - Topsoil stockpiles should be sufficiently distant from watercourses to preclude sediment inputs due to erosion of stored soil materials;
  - Erosion control berms are to be stabilized with straw matting
  - Perimeter swales are to be stabilized with Antiwash Geojute
  - If the sediment and erosion control measures are not functioning properly, no further work should occur until the sediment and/or erosion problem is addressed;



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- Complete work in and around watercourses when the features are at their driest. All in-water work should be completed within MNR timing windows to protect local fish populations during their spawning and egg incubation periods. A typical construction timing window for warmwater streams in the Peterborough District is July 1<sup>st</sup> to March 31<sup>st</sup>.
- All materials and equipment used for the purpose of site preparation and Project construction should be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering nearby watercourses:
  - Any stockpiled materials should be stored and stabilized away from watercourses;
  - Refuelling and maintenance of construction equipment should occur in designated areas, a minimum of 100 m from a water body;
    - A refuelling zone has been designated on the attached sediment and erosion control plans
  - Spills should be reported to the MOE Spills Action Centre;
  - Any part of equipment entering water should be free of fluid leaks and externally cleaned/degreased to prevent any deleterious substance from entering the water; and
  - Only clean material, free of fine particulate matter should be placed in the water.
  - Two 525 mm PVC caps will be stored on-site to plug the upstream end of the SWM facility outlet pipes in the event of a spill
- Revegetate all disturbed areas where construction is not expected for 30 days with a minimum 50 mm of topsoil and hydro-seeding or other stabilizing vegetation / erosion protection measures (per OPSS 804). If, given seasonal restriction or other revegetation limiting factors, the disturbed area should be stabilized against erosion impacts by non-vegetated means such as erosion control blankets.

The ESC measures shall be maintained in good repair during the entire construction period, and removed as contributing drainage areas are restored and stabilized. ESC measures shall not be removed until a qualified inspector determines that the measures are no longer required and the risk of surface water and environmental impacts from construction activities are negligible. In addition, the condition of erosion control works, their overall performance, and any repairs replacement or modifications to the installed item shall be noted in logbooks to be kept on-site.

The proposed erosion and sediment control plan focuses on the CSA, however does not include details on the substation, as detailed design has not been completed for the substation site. Erosion and sediment control details for the substation site will be provided under separate cover.

### 3.3 EROSION AND SEDIMENTATION CONTROL MONITORING PLAN

In order to ensure the effectiveness of the various erosion and sediment control measures, a routine program should be implemented which includes the inspection of the erosion and



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sediment controls daily and after each significant rainfall event (10 mm), and immediate repair of any deficiencies. This program will consist of the following activities:

- Visual inspection of the ESC measures to ensure discharged flows are generally free of sediment and turbidity
- Inspection of vegetation protection and silt fencing to ensure that they are maintained in good repair
- Removal of construction debris that may accumulate
- Implementation of remedial measures including erosion stabilization, repair of damaged fencing and any other remediation, where required.

If the monitoring program outlined above indicates a persistent problem then the following process should be undertaken to determine appropriate mitigative measures:

- Analysis of the monitoring information and field visits as required, determine the cause of the problem, and develop a mitigation plan to address the issue.
- Convene a meeting with the appropriate review agencies to discuss the problem.
- Develop a consensus on a proposed plan of action to resolve the problem in consultation with agency staff.
- Implement additional mitigation measures and monitor the results.

### **3.4 LONG TERM EROSION AND SEDIMENT CONTROL**

Per the *Construction Plan Report*, upon the completion of backfilling and the subsequent disposition of excess soil elsewhere within the properties by the property owners, replanting with native vegetation will be undertaken in areas where active agricultural is not anticipated.

One year after construction a survey will be undertaken to ensure that long-term erosion control measures have been effective. This will include an inspection of drainage facilities associated with the Project construction (e.g., culverts) for structural integrity and any excessive amount of silt collection. Seeded or replanted areas will be inspected to ensure that revegetation measures were successful and reseeding or replanting will occur where necessary.

If erosion control measures are found to be less than fully effective during this survey, reseeding or replanting of problem areas will take place. Should there be residual effects noted during post-construction monitoring, advice on contingency measures will be sought out and applied.



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## **4.0 CONCLUSIONS AND RECOMMENDATIONS**

Based on the preceding design report the following conclusions can be drawn:

- Water quality and quantity control for the CSA is provided using a dry pond facility at the southern limits of the site.
- No formal water quality control is required for the substation. Water quantity control for the substation is provided through the overcontrol of peak runoff rates from the CSA

Based on the findings of this report, the following recommendations are provided:

- The proposed SWM and ESC measures be implemented for the subject site.
- The Monitoring and Maintenance Program be undertaken to ensure that the proposed measures function appropriately.



# ATTACHMENTS



Land Use	TABLE OF CURVE NUMBERS (CN's)										Source
	Hydrologic Soil Type										
	A	AB	B	BC	C	CD	D				
Meadow	30	44	58	65	71	75	78				MTO
Woodlot	36	48	60	67	73	76	79				MTO
Lawns	39	50	61	68	74	77	80				USDA
Pasture/Range	58	62	65	71	76	79	81				MTO
Crop	66	70	74	78	82	84	86				MTO
Gravel	76	81	85	87	89	90	91				MTO
Bare Soil (Fallow)	77	82	86	89	91	93	94				MTO
Impervious	98	98	98	98	98	98	98				MTO

MTO - Ministry of Transportation Ontario Drainage Manual (1997), Design Chart 1.09-Soil/Land Use Curve Numbers  
 USDA - United States Department of Agriculture (2004), National Engineering Handbook, Part 630 Hydrology,  
 Chapter 9 Hydrologic Soil Cover Complexes

### SWMHYMO Parameters

Job: Central Laydown SWM AIWEP  
 Job #: 1609-60595  
 Eng: AKK  
 Date: 2017-02-06

Catchment Number	SWMHYMO Command	Area (ha)	CN	Rise (m)	Length (m)	Catchment Slope (%)	Tc (hrs)	Tp (hrs)
<b>Existing Conditions</b>								
100	DESIGN NASHYD	31.72	84	4	405	0.99	0.77	0.46
<b>Proposed Conditions</b>								
201	DESIGN NASHYD	0.46	90	0.25	55	0.45	0.37	0.22
202	DESIGN NASHYD	5.33	84	1.5	150	1.00	0.47	0.28
203	DESIGN NASHYD	13.95	90	3	290	1.03	0.64	0.38
204	DESIGN NASHYD	1.77	84	3	290	1.03	0.64	0.38
205	DESIGN NASHYD	10.26	84	6.5	585	1.11	0.89	0.53
		31.77						

**Notes:**

Time of Concentration calculated using the Airport Method  
 (For areas less than 100 ha)

$$T_c = [3.26 (1.1 - C) L^{0.5}] / S^{0.33}$$

Where: C = Runoff Coefficient = 0.4 for undeveloped areas

L = Length of Overland Flow (m)

S = Slope (%)

$$T_p = 0.6T_c$$

Time to Peak

CN is a weighed average for CALIB NASHYD

**Stage-Storage-Discharge Calculations**

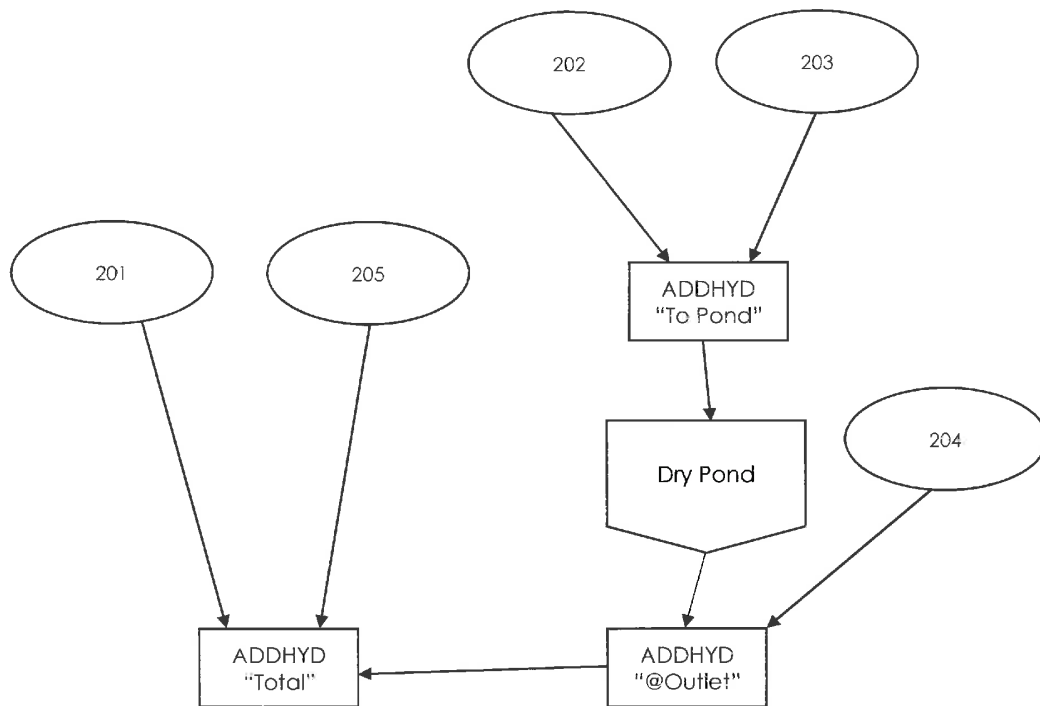
Job: Central Laydown SWM AIWEP  
 Job #: 1609-60595  
 Eng: AKK  
 Date: 2017-02-06

Office C: 0.6  
 Invert (m): 82.65  
 Diameter (mm): 525  
 Area (m²): 0.216  
 Q=CA(2gh)<sup>0.5</sup>

Overflow Outlet Elevation: 83.70 m  
 Weir Coefficient: 1.60  
 Weir Width: 10 m  
 Q=CLH<sup>1.5</sup>

Twin outlet orifice pipes										
	Elevation (m)	Orifice Head (m)	Area (m²)	Incremental Volume (m³)	Total Volume (m³)	Orifice Discharge (m³/s)	Overflow Weir Discharge (m³/s)	Total Discharge (m³/s)	Incremental Drawdown Time (sec)	Cumulative Drawdown Time (hrs)
Top of Storage Area	83.75	0.84	20244	961.9	9539.5	0.527	0.716	1.769	690	6.20
Bottom of Weir	83.70	0.79	18231	1621.8	8577.7	0.511	0.000	1.021	1642	6.01
100 Year Ponding Elevation (83.58)	83.60	0.69	14205	1283.1	6955.9	0.477		0.954	1398	5.55
	83.50	0.59	11457	1096.5	5672.8	0.441		0.882	1301	5.16
	83.40	0.49	10474	949.0	4576.2	0.402		0.803	1249	4.80
	83.30	0.39	8507	376.2	3627.2	0.358		0.716	543	4.46
	83.25	0.34	6540	324.1	3251.1	0.334		0.668	504	4.30
5 Year Ponding Elevation (83.21)	83.20	0.29	6426	631.1	2926.9	0.308		0.617	1132	4.16
	83.10	0.19	6197	608.3	2295.8	0.249		0.498	1451	3.85
	83.00	0.09	5968	585.4	1687.5	0.170		0.340	2010	3.45
	82.90		5739	562.5	1102.1	0.121		0.242	3008	2.89
Bottom of Storage	82.80		5511	539.6	539.6	0.066		0.132	7392	2.05
Outlet Invert	82.70		5282	0.0	0.0	0.007		0.014		
	82.65			0	0	0.000		0.000		

# Proposed Conditions SWMHYMO Schematic



```

00001> 2 Metric units
00002> *#-----
00003> *# Project Name: [AIWEP Central Staging SWM] Project Number: [1603-60595]
00004> *# Date : 02-06-2017
00005> *# Modeler : [AKK]
00006> *# Company : Stantec Consulting Ltd. (London)
00007> *# License # : 4730904
00008> *#-----
00009> *#
00010> *# This model represents the hydrologic characteristics of the Amherst Island
00011> *# Catchment in proposed conditions.
00012> *# Storm events modeled are:
00013> *# 5YR, 10YR and 100YR 24hr SCS STORMS (Amherst Island, ONT. IDF)
00014> *#
00015> *#-----
00016> START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[5]
00017> [*AISCS.24h*] <--storm filename, one per line for NSTORM time
00018> *#-----
00019> READ STORM STORM_FILENAME=["STORM.001"]
00020> *#-----
00021> *# Existing Conditions
00022> *#-----
00023> DESIGN NASHYD ID=[1], NHYD=["100"], DT=[1]min, AREA=[1.72] (ha),
00024> DWF=[0] (cms), CN/C=[84], TP=[0.46]hrs,
00025> RAINFALL=[ , , , ] (mm/hr), END=-1
00026> *#-----
00027> *# Proposed Conditions
00028> *#-----
00029> DESIGN NASHYD ID=[1], NHYD=["203"], DT=[1]min, AREA=[0.46] (ha),
00030> DWF=[0] (cms), CN/C=[90], TP=[0.22]hrs,
00031> RAINFALL=[ , , , ] (mm/hr), END=-1
00032> *#-----
00033> DESIGN NASHYD ID=[2], NHYD=["202"], DT=[1]min, AREA=[5.33] (ha),
00034> DWF=[0] (cms), CN/C=[84], TP=[0.28]hrs,
00035> RAINFALL=[ , , , ] (mm/hr), END=-1
00036> *#-----
00037> DESIGN NASHYD ID=[3], NHYD=["203"], DT=[1]min, AREA=[13.95] (ha),
00038> DWF=[0] (cms), CN/C=[90], TP=[0.38]hrs,
00039> RAINFALL=[ , , , ] (mm/hr), END=-1
00040> *#-----
00041> ADD HYD IDBUN=[4], NHYD=["To Pond"], IDa to add=[2+3]
00042> *#-----
00043> DESIGN NASHYD ID=[5], NHYD=["204"], DT=[1]min, AREA=[1.77] (ha),
00044> DWF=[0] (cms), CN/C=[84], TP=[0.30]hrs,
00045> RAINFALL=[ , , , ] (mm/hr), END=-1
00046> *#-----
00047> DESIGN NASHYD ID=[6], NHYD=["205"], DT=[1]min, AREA=[10.26] (ha),
00048> DWF=[0] (cms), CN/C=[84], TP=[0.53]hrs,
00049> RAINFALL=[ , , , ] (mm/hr), END=-1
00050> *#-----
00051> *# Twinned 525mm pipes outletting from the SWM
00052> ROUTE RESERVOIR IDout=[2], NHYD=["SWM-525*"], IDIn=[4],
00053> RDT=[2] (min),
00054> TABLE of ( OUTFLOW-STORAGE ) values
00055> (cms) - (ha-m)
00056> [ 0.0 , 0.0 ]
00057> [ 0.014 , 0.001 ]
00058> [ 0.132 , 0.054 ]
00059> [ 0.242 , 0.110 ]
00060> [ 0.340 , 0.169 ]
00061> [ 0.498 , 0.230 ]
00062> [ 0.619 , 0.293 ]
00063> [ 0.668 , 0.325 ]
00064> [ 0.716 , 0.363 ]
00065> [ 0.803 , 0.450 ]
00066> [ 0.882 , 0.567 ]
00067> [ 0.954 , 0.696 ]
00068> [ 1.021 , 0.858 ]
00069> [ 1.769 , 0.954 ]
00070> [ 1 , 1 ] (max twenty pts)
00071> IDout=[3], NHYDout=["OV-SWM"]
00072> *#-----
00073> ADD HYD IDBUN=[4], NHYD=["4Outlet"], IDa to add=[5+2+3]
00074> *#-----
00075> ADD HYD IDBUN=[2], NHYD=["Total"], IDa to add=[4+1+6]
00076> *#-----
00077> START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[10]
00078> [*AI10SCS.24h*] <--storm filename, one per line for NSTORM time
00079> *#-----
00080> START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[100]
00081> [*AI100SCS.24h*] <--storm filename, one per line for NSTORM ti
00082> *#-----
00083> FINISH
00084>
00085>
00086>
00087>
00088>
00089>
00090>
00091>
00092>
00093>

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00001
00022
00033
00044 S SSSSS W M H M H H H Y M M OOC 999 999
00055 SSSSS W M H M H H H Y M M O C H 9 9 9 9 9 Ver 4.03
00066 S M M M H H Y M M O C 9999 9999 Sept 2011
00077 SSSSS W M M M H H H Y M M OOC 9 9 9
00088 # 4739904
00099 Stormwater Management Hydrologic Model SDJ 999
00100
00111
00122 ***** SIMRA90 Ver/4.05 *****
00133 ***** A single event and continuous hydrologic simulation model *****
00144 ***** based on the principles of SWM and its successors *****
00155 ***** OTW/NO-81 and CTRHY90-89 *****
00166 *****
00177 ***** Distributed by: J.P. Stantec and Associates Inc. *****
00188 ***** Citrus, Ontario (613) 836-3884 *****
00199 ***** Steinfau Quebec (819) 243-6558 *****
00200 ***** E-Mail: stanep@stc.com *****
00211
00222 *****
00233 ***** licensed user: Stantec Consulting Ltd (Kitchener) *****
00244 ***** Kitchener SERIAL# 4739904 *****
00255 *****
00266 *****
00277 *****
00288 *****
00299 *****
00300 ***** PROGRAM ARRAY DIMENSIONS *****
00311 *****
00322 ***** Maximum value for ID numbers : 10 *****
00333 ***** Max. number of rainfall points: 10408 *****
00344 ***** Max. number of flow points : 10940 *****
00355 *****
00366 *****
00377 *****
00388 *****
00399 *****
00400 *****
00411 *****
00422 *****
00433 *****
00444 *****
00455 *****
00466 *****
00477 *****
00488 *****
00499 *****
00500 *****
00511 *****
00522 *****
00533 *****
00544 *****
00555 *****
00566 *****
00577 *****
00588 *****
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00644 *****
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00666 *****
00677 *****
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00755 *****
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00777 *****
00788 *****
00799 *****
00800 *****
00811 *****
00822 *****
00833 *****
00844 *****
00855 *****
00866 *****
00877 *****
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00899 *****
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00911 *****
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00933 *****
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00955 *****
00966 *****
00977 *****
00988 *****
00999 *****
01000 *****
01011 *****
01022 *****
01033 *****
01044 *****
01055 *****
01066 *****
01077 *****
01088 *****
01099 *****
01100 *****
01111 *****
01122 *****
01133 *****
01144 *****
01155 *****
01166 *****
01177 *****
01188 *****
01199 *****
01200 *****
01211 *****
01222 *****
01233 *****
01244 *****
01255 *****
01266 *****
01277 *****
01288 *****
01299 *****
01300 *****
01311 *****
01322 *****
01333 *****
01344 *****

```

```

01355 (Tps :30:DT: 1.00)
01366
01377 005:0007-----ID:HYD-----AREA-----CPEAK-TpeakDate_hh:mm-----R.V.-R.
01388 ADD HYD 02:202 5.33 .540 No_date 12:10 41.31 n
01399 005:0008-----ID:HYD-----AREA-----CPEAK-TpeakDate_hh:mm-----R.V.-R.
01400 DESIGN NASHVD 01:100 31.72 1.458 No_date 12:15 51.14 .6
01411 (CN= 84.0; N= 3.00)
01422 (Tps :28:DT: 1.00)
01433
01444
01455 005:0009-----ID:HYD-----AREA-----CPEAK-TpeakDate_hh:mm-----R.V.-R.
01466 DESIGN NASHVD 06:205 10.26 .543 No_date 12:16 41.31 .5
01477 (CN= 90.0; N= 3.00)
01488 (Tps :53:DT: 1.00)
01499
01500 # Twinned S25mm pipe outletting from the SWM
01511 ROUTE RESERVOIR -> C4 To Pond 19.28 1.562 No_date 12:13 47.45 n
01522 (RD7= 1.00) cuse= 22:SWM-525 19.28 .537 No_date 12:51 47.45 n
01533 overflow= 03:OV-SWM .00 .000 No_date 0:00 .00 n
01544 (NStoUsed= 30588; CC_TotOvVol= 00002+00; N-Ov= 0; TotOvOv= 0 hrs)
01555
01566 005:0010-----ID:HYD-----AREA-----CPEAK-TpeakDate_hh:mm-----R.V.-R.
01577 ADD HYD 03:204 1.77 .119 No_date 12:16 41.31 n
01588 (CN= 84.0; N= 3.00)
01599 (Tps :19:DT: 1.00)
01600
01611 005:0011-----ID:HYD-----AREA-----CPEAK-TpeakDate_hh:mm-----R.V.-R.
01622 ADD HYD 02:525 19.28 .537 No_date 12:51 47.45 n
01633 (CN= 84.0; N= 3.00)
01644 (Tps :19:DT: 1.00)
01655
01666 005:0012-----ID:HYD-----AREA-----CPEAK-TpeakDate_hh:mm-----R.V.-R.
01677 ADD HYD 04:001 21.05 .701 No_date 12:13 46.93 n
01688 (CN= 84.0; N= 3.00)
01699 (Tps :19:DT: 1.00)
01700
01711 005:0013-----ID:HYD-----AREA-----CPEAK-TpeakDate_hh:mm-----R.V.-R.
01722 ADD HYD 01:201 .46 .035 No_date 12:06 45.79 n
01733 (CN= 84.0; N= 3.00)
01744 (Tps :19:DT: 1.00)
01755
01766 005:0014-----ID:HYD-----AREA-----CPEAK-TpeakDate_hh:mm-----R.V.-R.
01777 ADD HYD 06:205 10.26 .543 No_date 12:16 41.31 n
01788 (CN= 90.0; N= 3.00)
01799 (Tps :30:DT: 1.00)
01800
01811 *****
01822 *****
01833 *****
01844 *****
01855 *****
01866 *****
01877 *****
01888 *****
01899 *****
01900 *****
01911 *****
01922 *****
01933 *****
01944 *****
01955 *****
01966 *****
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00269> # Project Name: [AIWP Central Staging SWM] Project Number: [1609-60595]
00270> # Date : 02-06-2017
00271> # Modeler : [ARK]
00272> # Company : Stantec Consulting Ltd. (London)
00273> # License # : 4730904
00274> #*****
00275> #
00276> # This model represents the hydrologic characteristics of the Amherst Island
00277> # Catchment 15 proposed conditions.
00278> # Storm events modeled are:
00279> # SVR, 10YR and 100YR 24hr SCS STORMS (Amherst Island, ONT. IDF)
00280> #
00281> #*****
00282> 100:0002-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00283> READ STORM
00284> Filename = STORM_001
00285> Comment =
00286> [DT=15:00] SUM= 24.00;PFOU= 119.80]
00287> # Existing Conditions
00288> 100:0003-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00289> DESIGN NASHVD 01:100 31.72 3.804 No_date 12:20 83.96 .7
00290> [CN= 84.0; M= 3.00]
00291> [Tp= .46;DT= 1.00]
00292> # Proposed Conditions
00293> #*****
00294> 100:0004-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00295> DESIGN NASHVD 01:201 .46 .102 No_date 12:06 95.51 .7
00296> [CN= 90.0; M= 3.00]
00297> [Tp= .22;DT= 1.00]
00298> #*****
00299> 100:0005-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00300> DESIGN NASHVD 02:202 5.33 .898 No_date 12:09 83.96 .7
00301> [CN= 84.0; M= 3.00]
00302> [Tp= .28;DT= 1.00]
00303> #*****
00304> 100:0006-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00305> DESIGN NASHVD 03:203 13.95 2.170 No_date 12:15 85.52 .7
00306> [CN= 90.0; M= 3.00]
00307> [Tp= .38;DT= 1.00]
00308> #*****
00309> 100:0007-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00310> ADD HYD 02:202 5.33 .898 No_date 12:09 83.96 n
00311> + 03:203 13.95 2.170 No_date 12:15 95.52 n
00312> [DT= 1.00] SUM= 04:70 Pond 19.28 3.032 No_date 12:13 92.32 n
00313> 100:0008-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00314> DESIGN NASHVD 05:204 1.77 .243 No_date 12:15 83.96 .7
00315> [CN= 84.0; M= 3.00]
00316> [Tp= .38;DT= 1.00]
00317> #*****
00318> 100:0009-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00319> DESIGN NASHVD 06:205 10.26 1.113 No_date 12:25 83.96 .7
00320> [CN= 84.0; M= 3.00]
00321> [Tp= .53;DT= 1.00]
00322> # Twinned 525m pipes outletting from the SWM
00323> 100:0010-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00324> ROUTE RESERVOIR -> 04:70 Pond 19.28 3.032 No_date 12:13 92.32 n
00325> [DT= 1.00] out< 04:SWM-525 19.28 .896 No_date 12:59 85.32 n
00326> overflow <= 03:OV-SWM .00 .000 No_date 0:00 .00 n
00327> [NsScsDwd= .6443E+00, TotCovVol= .0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs]
00328> #*****
00329> 100:0011-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00330> ADD HYD 05:204 1.77 .243 No_date 12:15 83.96 n
00331> + 02:SWM-525 19.28 .936 No_date 12:59 85.32 n
00332> + 03:OV-SWM .00 .000 No_date 0:00 .00 n
00333> [DT= 1.00] SUM= 04:46outlet 21.25 1.077 No_date 12:32 91.62 n
00334> 100:0012-----ID:MHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.
00335> ADD HYD 04:46outlet 21.25 1.077 No_date 12:32 91.62 n
00336> + 01:261 .46 .102 No_date 12:06 95.51 n
00337> + 06:205 10.26 1.113 No_date 12:25 83.96 n
00338> [DT= 1.00] SUM= 02:Total 31.77 2.223 No_date 12:26 89.20 n
00339> 100:0002-----FINISH
00340> #*****
00341> #*****
00342> #*****
00343> #*****
00344> #*****
00345> #*****
00346> #*****
00347> #*****
00348> #*****

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Schedule 20, Part 3

Technical memorandum summarizing draft Full Erosion and Sediment Control and Stormwater Management Plan Report for Phase 3 – Balance of Project area

Stantec Consulting Ltd. (Stantec) was retained by Windlectric Inc. (the Proponent or Windlectric) to assess the need for and, if necessary, provide a plan detailing erosion and sediment control (ESC) and stormwater management (SWM) measures associated with the proposed development of the Amherst Island Wind Energy Project (herein referred to as the "Project"). Stormwater management analyses and designs have been completed to address the requirements for SWM measures as described in Section H of the project's REA Approval (#7123-9W9NH2) and supplement the information included as part of the application for a Renewable Energy Approval (the REA Application). SWM Analyses have been completed in multiple-phases to accommodate project scheduling and construction requirements. The *Amherst Island Wind Energy Project, Erosion and Sediment Control and Stormwater Management Plan Report Phase 1* (Stantec, 2016) and *Amherst Island Wind Energy Project, Erosion and Sediment Control and Stormwater Management Plan Report Phase 2* (Stantec, 2017) were previously submitted to the Ministry of Environment and Climate Change (MOECC), Cataraqui Region Conservation Authority (CRCA) and Loyalist Township.<sup>1</sup> The Phase 1 report discussed the SWM and Erosion and Sediment Control (ESC) requirements for the Island Dock Access Road construction and the private land access road, south of Front Road, connecting the Island Dock Access Road to the future Central Staging Area. The Phase 2 report discussed the SWM and ESC requirements for the Central Staging Area (CSA) including a dry-pond SWM facility.

The Phase 3 report summarizes the assessment of potential hydrologic impacts associated with the construction phase (i.e., ESC) and operational phase (i.e., SWM) of the Project for all other proposed infrastructure on the Island (i.e., the turbine locations, crane pads and associated private land access roads). This 'technical memo' was prepared as a summary of that Phase 3 SWM, for the specific purpose of informing the Loyalist Township/Windlectric "Road Use Agreement" "Operations Plan" as there are negligible changes to the stormwater impact on the public road infrastructure on the Island.

Potential hydrologic impacts assessed include changes to the quality and/or quantity discharged to the surface or sub-surface receiving systems. The objective of the report is to demonstrate that the Project design and proposed mitigation measures associated with the construction and operation phases of the Project are sufficient to minimize any potential impacts to environmental features within the Project area and, further, to provide details on the mitigation measures and control measures that will be implemented.

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<sup>1</sup> The Phase 1 and Phase 2 reports have been approved by the MOECC and the CRCA through their Development Permit process. The Phase 1 report has been approved by Loyalist Township through a Fill Permit application while the Phase 2 report is currently under review by Loyalist Township.

### Study Approach

The Phase 3 study approach involved the following components (note: A detailed assessment report will be provided to the MOECC, CRCA and Loyalist Township in the near future, for approval):

- A qualitative assessment of existing hydrologic conditions of the area and receiving systems.
- A review of the proposed Project activities as described in the REA Application with an emphasis on assessing potential for impacts associated with changes in hydrology.
- A semi-quantitative analysis of existing and proposed conditions to determine potential for short-term or long-term effects on receiving systems and mitigative approaches, if necessary.
- Development of an erosion and sediment control (ESC) strategy outlining the anticipated approach to minimize of impacts related to construction.

### Study Results

The proposed Project is situated on predominantly agricultural lands with very low existing impervious coverage. Runoff drains overland to local drainage draws, small watercourses, and/or wetland features, ultimately discharging to Lake Ontario. Drainage patterns are to be maintained through the use of limited grading, maintenance of surrounding land uses (e.g., agricultural operations, and the provision of conveyance infrastructure (e.g., culverts)). As such, impervious coverage represents the primary parameter of potential impact to the hydrology of the Project area.

A series of 32 catchment areas were delineated which encompass all proposed Project infrastructure and, therefore, any hydrologic impacts associated with proposed impervious coverage increases, allowing for a comparison between existing and proposed conditions (Figure 1, attached). Owing to the dispersed characteristic of the proposed wind farm, with infrastructure distributed at very low density across a large area, deriving a reasonable comparison point at which to compare pre- and post-development conditions is somewhat subjective. For the purposes of the analysis, comparison points have been set at the closest downstream road crossing of a given catchment within which development (i.e., the creation of new impervious surfaces) is proposed. These locations have been selected since, should a hydrologic impact occur as a result of development, this is the location at which it would be most noticeable and of most interest to the public.

Industry-standard approaches to assessing the potential for hydrologic impacts related to changes in the amount of urban impervious coverage, as supported by literature<sup>2,3</sup>, generally conclude that watersheds typically maintain pre-development hydrology characteristics until

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<sup>2</sup> *Impacts of Impervious Cover on Aquatic Systems, Watershed Protection Research Monograph No. 1*, Schueler, T., Center for Watershed Protection, March 2003.

<sup>3</sup> *The Importance of Imperviousness*, from *Watershed Protection Techniques, Vol.1, No.3 – Fall 1994*, Schueler, T., Centre for Watershed Protection, 1994

they exceed 10-15% impervious coverage. As in the summary table below, the impervious coverage in 31 of the 32 catchments identified as part of this study remains below 11.28% under the during construction scenario and below 3.23% over the life of the Project. The impervious coverage in catchment 15 increases from the existing 0.78% to 23.87% during construction and then drops to 3.23% post construction. Stormwater management controls, for catchment 15, to be installed during the construction phase, are documented in *Amherst Island Wind Energy Project, Erosion and Sediment Control and Stormwater Management Plan Report Phase 2* (Stantec, 2017), which has been subsequently approved by the MOECC, CRCA and is currently under review by Loyalist Township. It is concluded, therefore, that the development of the Project will have negligible impact on the hydrology of the area and receiving systems.

**Table 1: Impervious Coverage Summary**

Receivers / Catchment	Drainage Area (ha)	Impervious Coverage (%)		
		Existing	During Construction	Post Construction
1	20.48	0.05	9.59	1.69
2	30.42	0.01	4.78	0.57
3	46.38	0.04	3.75	0.50
4	81.16	0.22	2.86	1.18
5	7.15	0.59	6.13	2.67
6	112.95	0.36	2.61	0.78
7	29.13	1.11	5.14	2.42
8	4.39	1.30	1.55	1.30
9	4.69	0.12	6.77	2.14
10	78.68	0.00	1.03	0.39
11	63.12	0.01	1.65	0.61
12	17.31	-	-	-
13	35.88	-	4.64	0.70
14	35.59	1.32	7.79	2.56
15	76.53	0.78	23.87	3.23
16	21.29	0.06	1.95	1.95
17	67.38	0.03	1.84	0.52
18	96.87	0.03	4.63	0.78
19	13.49	-	11.28	1.61
20	20.11	0.01	2.62	0.69
21	825.15	0.28	1.23	0.52
22	14.55	0.99	5.54	2.56
23	888.36	0.66	4.47	1.30
24	167.51	0.17	4.06	0.88
25	393.41	0.12	1.75	0.36
26	22.95	1.18	8.57	1.76
27	47.16	0.12	4.73	1.11
28	20.61	0.24	5.29	0.98
29	14.75	0.46	7.89	1.96
30	20.56	0.03	2.39	0.92

31	17.62	0.14	2.88	1.17
32	10.21	0.05	0.05	0.05
<b>Grand Totals</b>	<b>3303.63</b>	<b>0.35</b>	<b>3.46</b>	<b>0.88</b>

Note: Stormwater management controls for proposed infrastructure within Catchment 15 have been documented in *Amherst Island Wind Energy Project, Erosion and Sediment Control and Stormwater Management Plan Report Phase 2* (Stantec, 2017)

#### *Erosion and Sediment Control*

While a site assessment yields a “high” erosion potential classification, a number of factors combine to limit the potential for impact on the receiving systems. Specifically, the relatively small area proposed to be disturbed, the short-term nature of the disturbance prior to stabilization whether through granular placement or re-vegetation, and the existing land use of the surrounding area as agricultural operations all combine to create a condition where a “standard” approach to erosion and sediment control will suffice to minimize potential for off-site impacts. The ESC plan accompanied by a monitoring and maintenance program will be implemented to prevent migration of sediment to downstream features during the construction phase of the Project.

#### *Conclusion*

Owing to the dispersed characteristic of the proposed wind farm, with infrastructure distributed at very low density across a large area, it was concluded that both the relative lack of change in impervious coverage associated with the proposed development and the resultant total impervious coverage within the local drainage catchments are sufficiently limited as to not impact the pre-development hydrologic characteristics of the area during construction or long-term operation of the Project, including any impact to the drainage features associated with the existing public road network. There should be negligible change/impact on the quality and/or quantity of surface water runoff and/or groundwater recharge and, therefore, there is no requirement for the implementation of formal stormwater quality or quantity controls.

TECHNICAL MEMO  
AMHERST ISLAND WIND ENERGY PROJECT  
Stormwater Management Analysis Summary  
May 1, 2017



We trust that the preceding technical memo meets your requirements for summarizing the ESC/SWM analysis. Should you have any comments or questions, please do not hesitate to contact the undersigned at your convenience.

Sincerely,

**STANTEC CONSULTING LTD.**

A handwritten signature in blue ink that reads "D. Williams".

David Williams, P.Eng.  
Water Resources Engineer  
Tel: (519) 585-7320  
Fax: (519) 579-6733  
dave.williams@stantec.com

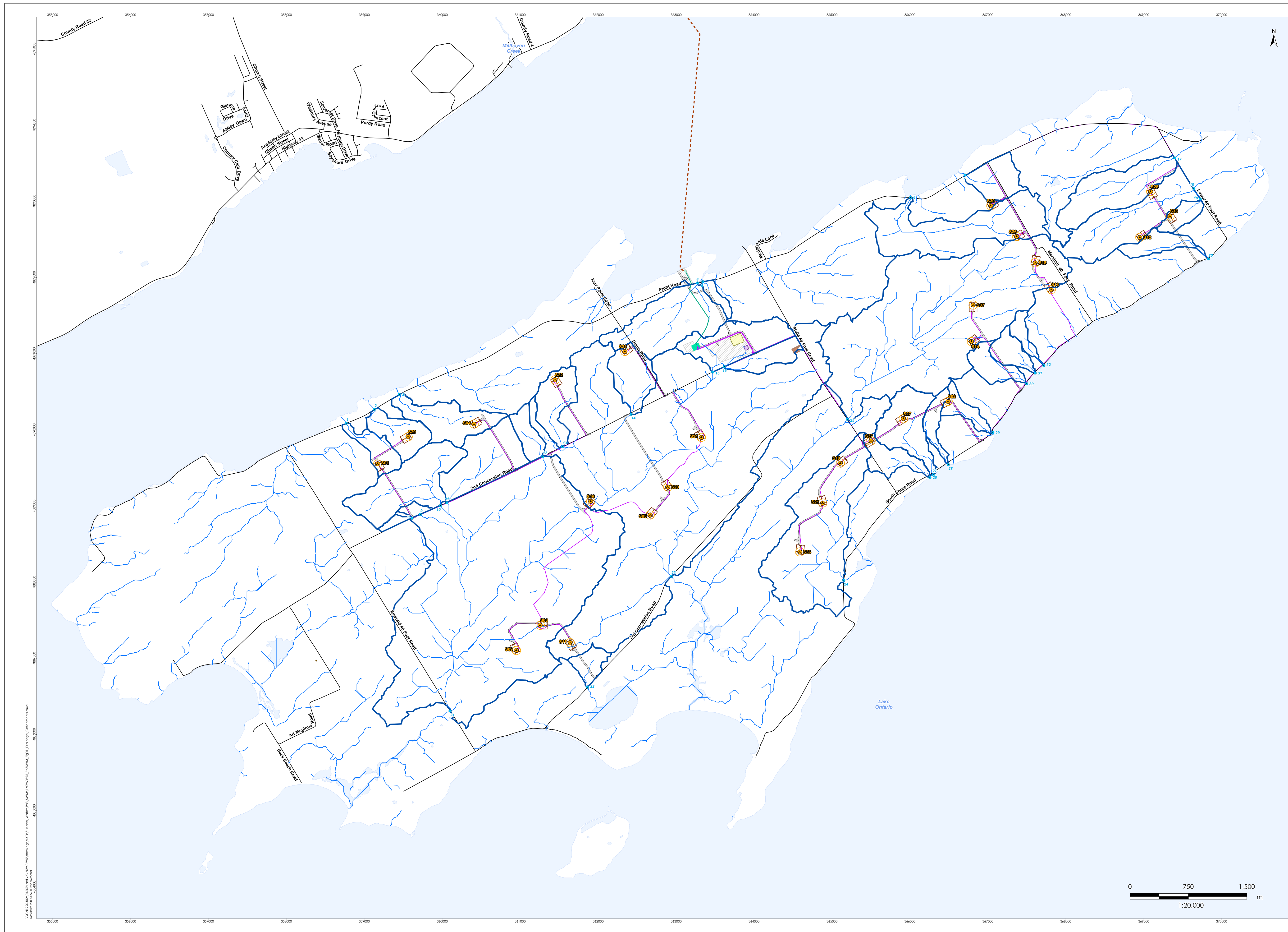
Attachments: Figure 1 – Results of GIS DEM Analysis and SWM Catchments

c. Mr. Sean Fairfield, Mr. Riley Griffin, Mr. Jim Stewart, Mr. Ariel Bautista and Mr. Homer Lensink,  
Algonquin Power Co.  
Ms. Kerrie Skillen and Mr. Rob Rowland, Stantec Consulting Ltd.

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# ATTACHMENTS





**Stantec**

**Legend**

- Point of Interest
- Flow Accumulation (minimum 4.5)
- Point of Interest Catchment
- Turbine
- Island Cable Vault
- Submarine Cable Path
- Island Transmission Line
- Laydown Area and Crane
- Collector Line
- Access Road
- Storage Shed
- Batch Plant (Potential)
- Site Office (Potential)
- Turbine Blade Tip
- Substation (Potential)
- Operation and Maintenance Building (Potential Location)
- Central Staging Area
- Road
- Waterbody

**Notes**

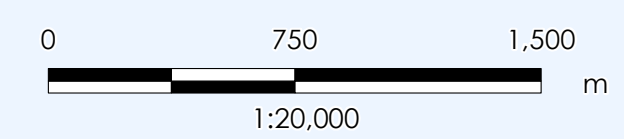
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.

May 2017  
160960595

Client/Project  
WindElectric Inc.  
Amherst Island Wind Energy Project

Figure No.  
1

Title  
**Results of GIS DEM Analysis and SWM Catchments**



I:\GIS\2017\GIS\Amherst Island Wind Energy Project\GIS\Map\Amherst Island Wind Energy Project - Results of GIS DEM Analysis and SWM Catchments.mxd  
 Project: 2017-05-16 10:00:00



SCHEDULE 21 – Survey Protocol

**Without Prejudice**

**Forced Road Boundary Identification and Pre-Construction Preparatory Work Protocol**

Windlectric Inc. recognizes that certain of the construction activities associated with the Amherst Island Wind Project ("AIWP") will occur in close proximity to the boundary of the Township road allowances and privately-owned properties. Windlectric understands that it must ensure that such activities do not cross any such boundary and onto the lands owned by a private landowner unless Windlectric has an agreement with such private landowner allowing construction on the landowner's property. Windlectric further understands that the nature of a forced road is such that a legal plan of survey can assist in confirming the limits of the road allowance. For purposes of the Operations Plan, a legal plan of survey is defined as a survey prepared by an Ontario Lands Surveyor having a maximum tolerance of +/- .03 m.

To ensure that no work is conducted outside the limits of the municipal road allowance without the applicable landowner's consent, Windlectric will undertake the following process in advance of permitting Collection System Work, Heavy Load deliveries, Project deliveries and Major Turbine Component deliveries to travel on any Township road allowance:

1. For all properties identified as requiring a legal survey, Windlectric shall provide a draft survey to the Township for its review and approval pursuant to this protocol.
  - a. in order to identify all properties where a survey is required, Windlectric shall prepare a map showing all proposed road allowances to be utilized for the Project with annotations listing the following:
    - i. sections of the road fronting properties owned by participating owners whose written permission has been given to do Project related work on their properties;
    - ii. sections of the road fronting properties owned by non-participating owners where the traveled (gravel surface) surface of the road is 6 m or greater and where all work shall be contained within the limits of the traveled (gravel surface) surface of the road; and
    - iii. sections of the road fronting properties owned by non-participating owners where the traveled (gravel surface) surface of the road is less than 6 m or where work is proposed outside the 6m traveled (gravel surface) surface of the road.

- b. Only those properties identified in s. 1(a)(iii) above shall require a legal survey;
2. The Township shall engage an Ontario Lands Surveyor to review the draft survey and undertake such necessary work to have prepared, in conjunction with the surveyor retained by Windlectric, a final legal survey. The Township's Ontario Lands Surveyor shall complete its review of the draft surveys that have been provided on or before July 12, 2017, by August 8, 2017, any draft surveys that are provided after July 12, 2017 shall be reviewed no later than August 18, 2017, provided that they are received at least ten business days prior to that date, and any draft surveys received on or after August 4, 2017 shall be reviewed within ten business days;
3. The final approved legal survey shall form the boundaries and limits of the road allowance for purposes of all Project related works;
4. Windlectric shall mark the boundaries of the road allowances as necessary to ensure all Project related work is confined within the limits of the road allowance;
5. Notwithstanding the foregoing, in the event that the Ontario Lands Surveyor retained by the Township disagrees with the road allowance boundary identified in the survey prepared by the Ontario Lands Surveyor retained by Windlectric then where either: (i) the disagreement relates to a situation where the Township's Ontario Lands Surveyor believes that the road allowance is wider than the road allowance identified by Windlectric's Ontario Lands Surveyor or (ii) the disagreement relates to a situation where the Township's Ontario Lands Surveyor believes that that the road allowance is narrower than the road allowance identified by Windlectric's Ontario Land Surveyor but all proposed work will be within the narrower road allowance, then in either such case Windlectric shall be permitted to commence its work;
6. In the event of a disagreement between the Ontario Lands Surveyors retained by Windlectric and the Township that they are unable to resolve within 3 business days of the receipt of the Township's surveyor's position, either Windlectric or the Township shall have the ability, upon providing written notice to the other, to retain a third Ontario Lands Surveyor to review the work of both parties and make a conclusive determination that will be binding on both parties. Such third surveyor shall be chosen from the following list; Hopkins Chitty Land Surveyors Inc., Jordan & Wiseman Surveying or J.D. Barnes Limited., with the parties working through the list in chronological order until they are able to identify a surveyor from such list that has the ability to review the matter and provide their decision within five business days of being retained. The third surveyor shall have the ability to set forth the process by which it reviews the matter and both the Township and

Algonquin/Windlelectric Comments – July 21, 2017

Windlelectric and the respective surveyors retained by each will provide such information and assistance as the third surveyor requires in order to complete its review and render its decision within the five business day period.

7. Windlectric shall prepare, as part of the Pre-construction Study, plan and profile drawings illustrating all Pre-construction Preparatory Work to be performed within the road allowances;
8. Windlectric may undertake Pre-construction Preparatory Work in a staged fashion to enable Collection System Work and deliveries to occur on those portions of the road allowance that have been upgraded by having Pre-construction Preparatory Work conducted. It is understood that no deliveries or Collection System Work shall occur until Pre-construction Preparatory Work has been completed on any portion of the road where such work is proposed;
9. Windlectric will provide to the Township a detailed staging schedule identifying how the staged Pre-construction Preparatory Work will be performed;
10. Notwithstanding the foregoing above, Windlectric may undertake Collection System Work within the road allowance in advance of undertaking Pre-construction Preparatory Work, provided that the traveled portion of the road adjacent to where Collection System Work is being performed can be used safely;
11. Where Windlectric elects to conduct Collection System Work in accordance with paragraph 8 above, Windlectric agrees that upon completion of the Collection System Work within the road allowance, the entire width of the road allowance must be upgraded in accordance with the Pre-construction Study prior to allowing any Project deliveries on that portion of the road allowance;
12. Where Windlectric elects to conduct Collection System Work in accordance with paragraph 8 above, that portion of the road allowance where work is conducted shall be restored to its preconstruction stage, or better, as soon as reasonably possible after the Collection System Work is completed and before the road is re-opened for use by the public;
13. Windlectric agrees that any breach of the foregoing conditions will be corrected forthwith to the reasonable satisfaction of the Township before continuation of Collection System Work, Pre-construction Preparatory Work or deliveries along the portion of the road allowance where these conditions are breached. All costs incurred by the Township to identify and/or correct the deficiency shall be the responsibility of Windlectric.