



**Stantec Consulting Ltd.**  
100-300 Hagey Boulevard, Waterloo ON N2L 0A4

April 6, 2017  
File: 160960595

**Attention: Mr. Sean Fairfield, Director Project Planning and Permitting**

Algonquin Power Co.  
2845 Bristol Circle  
Oakville, ON L6H 7H7

Dear Mr. Fairfield,

**Reference: Amherst Island Wind Energy Project  
Switching Station Stormwater Management (SWM) Brief**

In response to the Government of Ontario's recent promotion of renewable energy development, Algonquin Power Co. (Algonquin), on behalf of Windlectric Inc., is proposing to construct and operate the Amherst Island Wind Energy Project located in Loyalist Township, Ontario.

This technical memorandum ("Brief") focuses on the proposed switching station located on the grounds of the former Invista Polyethylene plant at 5275 Bath Road (Highway 33) in Millhaven, Ontario. The switching station will be located in the northwest corner of the former industrial site and is bounded by grassed area to the north, and existing access roads, rail lines, and paved area to the south, east, and west (Figure 1, attached).

Under existing conditions, the switching station site occupies a section of hard packed/disturbed ground on the former factory site and drains overland as sheet flow in a southwest direction. Flow from the site leaves from an existing swale south of the switching station that flows west towards an unnamed watercourse. From here, flow is conveyed south to Lake Ontario via a culvert under Highway 33 approximately 550 m from the switching station. The site is not located within a Cataraqui Region Conservation Authority (CRCA) regulated area.

The switching station (0.2 ha) is proposed to include a small electrical building (46 m<sup>2</sup>), overhead and underground wiring, a well-drained, coarse granular area underlying the electrical infrastructure, and an access road (Drawing C-102, attached). The majority of the ground within the fenced area is proposed to be surfaced with 150 mm diameter washed crushed stone underlain by a structural base (300 mm depth) composed of 100 mm granular 'A' and 200 mm granular 'B' material. The proposed access road covers approximately 0.3 ha and is constructed at grade with 100 mm of granular 'A' atop 200 mm granular 'B' material. A second access road (0.03 ha) is proposed external to the switching station yard for use by Hydro One Networks Inc. (HONI), providing maintenance access to the connections between the switching station and HONI infrastructure. All work must comply with the Certificate of Property Use (CPU)

Design with community in mind



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**Reference: Amherst Island Wind Energy Project  
Switching Station Stormwater Management (SWM) Brief**

(CPU# 6676-9CWHB7), including Soil and Groundwater Management Plan and Health and Safety plan, for the parcel.

The proposed grading design maintains drainage to the existing receiving systems via overland, sheet drainage to the southwest, mimicking existing conditions.

**Water Quality Control**

Under proposed conditions, the switching station site will be covered by washed crushed stone and the electrical building. The crushed stone areas will not be subject to vehicular traffic and, therefore, will be less susceptible to compaction and sediment buildup / wash-off cycles. Runoff from this portion of the sites is considered "clean" and does not require additional water quality control. Most of the access roads for the switching station are already constructed as part of the former industrial operations. Access roads that are to be constructed are proposed to be at grade. Site access is gated and will be restricted to routine inspection and maintenance operations, minimizing opportunity for sediment buildup and wash-off. Impacts to water quality are considered to be negligible, with associated control proposed to be provided through the use swales and downstream vegetated conveyance systems.

Water quality benefits of are achieved as a result of the runoff / vegetation interaction which slows the velocity of runoff, as compared to a piped system, thereby promoting sedimentation of particulate matter. The vegetation also provides nutrient uptake benefits to help reduce biological pollutants such as nitrogen and phosphorous. Given the general maintenance of drainage patterns and capacity of the existing adjacent lands to provide passive treatment that may be required to serve access roads, a formal stormwater management system to provide additional water quality control is not proposed.

**Water Quantity Control**

As previously described, the switching station site is proposed to be covered in primarily clean, crushed stone surfaces, representing a very minor, if any increase in flows relative to the existing cover configuration (compacted bare earth). As shown on Figure 1 and summarized in Table 1 below, the site comprises a negligible portion of the watershed to its respective discharge watercourse.



**Reference: Amherst Island Wind Energy Project  
Switching Station Stormwater Management (SWM) Brief**

**Table 1: Substation Site Watershed Coverage**

<b>Substation</b>	<b>Watershed</b>	<b>Watershed Size (ha)</b>	<b>Switching Station Watershed Size (ha)</b>	<b>Site Area (ha)</b>	<b>% Switching Station Watershed Coverage</b>
Mainland Switching Station	Highway 33 Culvert	411	28	0.2	0.7

Any potential increase in runoff as a result of substation construction, and increase in impervious coverage, will be attenuated and filtered through downstream vegetated conveyance systems. The gravel surface characteristic of the site will provide infiltration opportunities for runoff which will also help mitigate any increases in offsite surface water flows. A formal stormwater management system to provide additional water quantity control is not proposed.

**Disposal of Excavated Soils**

Excavation of site soils is required to construct the Switching Station yard. Excavated soils will be stockpiled on the Invista property per the *Soil/Groundwater Management Program and Health and Safety Plan – North Parcel* (Stantec 2016) as shown on Figures 2 and 3, attached. The stockpile will be stabilized with vegetation and surrounded by a vegetated topsoil berm (per the Soil Management Program). The stockpile may be covered with a 150-300 mm layer of topsoil to promote vegetation growth, if required.

Should the contractor elect off-site disposal, soil samples will be submitted to an analytical laboratory for off-site waste disposal chemical testing analysis in accordance with O. Reg. 347. and disposed of at an appropriate off-site waste disposal facility.

**During Construction SWM Considerations**

The various construction activities required to develop the substation sites include topsoil stripping, grading activities involving cutting or filling, infrastructure installation, and general construction traffic. These activities will result in the disturbance of at-surface soils and exposure of the underlying earth to potential erosion and sediment transport to offsite locations. An evaluation of the erosion potential for the sites yields a general conclusion of 'low', owing primarily to the 'low' erodibility of in-situ clay soils and gentle slopes.



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**Reference: Amherst Island Wind Energy Project  
Switching Station Stormwater Management (SWM) Brief**

The provision of erosion control will be achieved primarily through limiting the duration of exposure of disturbed sub-soils inherent in the construction process. Construction of access roads and substation yards, for example, include the stripping of topsoil and placement of granular material in very short order, providing little opportunity for sub-soils to be disturbed and entrained in storm runoff. In addition to limiting the potential for erosion through construction practices alone, a suite of erosion and sediment control (ESC) measures will be implemented prior to any grading or servicing works commencing including, but not necessarily limited to, the following items:

- In the event of inclement weather or unfavourable terrain for construction, construction best practices, such temporary rig-mats may be used to prevent disruption of surface soils and vegetative cover by construction vehicles and equipment. As these measures are within the constructible areas of the project, it is not anticipated that offsite flows will increase from proposed conditions.
- Erect silt fence before grading begins on the downstream sides of the area to be graded to protect the downstream lands from potential sediment transport caused by entrainment in overland flows
- Direct runoff via swales and erosion control berms (where necessary) to sediment control measures to ensure that no untreated runoff is discharged from the site
- Install temporary rock check dams, straw bale barriers and/or filter cloth barriers in swales where appropriate to help attenuate flows, reduce erosive velocities, and encourage sediment deposition
- Immediately stabilize all disturbed areas not subject to construction activities within 30 days, according to OPSS 804
- Following completion of construction and installation activities, and removal of temporary construction works and completion of site restoration, all erosion and sediment control measures and accumulated sediment are to be removed

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 after each significant rainfall event ( $\geq 10$  mm) or weekly, whichever is more frequent, and immediate repair of any deficiencies.



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Switching Station Stormwater Management (SWM) Brief**

Given the general maintenance of existing drainage patterns and capacity of the existing adjacent grassland lands on the property to provide passive treatment that may be required to serve the access road, a formal stormwater management system to provide additional water quality control is not proposed.

**Operational SWM Considerations**

The filtration provided by the passive, vegetated systems will provide water quality treatment benefits, such as the removal of sediment and other debris, and, by association, will require periodic inspections and maintenance to ensure on-going functionality. Vegetated conveyance systems represent a familiar, passive, and simple type of SWM practice, with operational and maintenance requirements to match. Generally speaking, the treatment benefits of vegetated filtration systems are the result of the contact between the flows being conveyed and the vegetation. Given this, inspection, operational, and maintenance activities can be generally limited to:

- Routine observations as to the presence of retained trash/debris that could be conveyed downstream and/or affect the conveyance capacity of the system and removal of same as needed
- For the first year following construction, a seasonal walking inspection (spring / summer) will be completed to identify areas of bare soil and/or the formation of erosive gullies (annually thereafter). Remediative efforts would typically involve re-grading the area and/or re-vegetating with sod or appropriate seed mix, with fertilizer and water applied as necessary to ensure germination and stabilization
- Concurrent with the walking inspections, a visual assessment of any areas of isolated ponding or sediment build-up should be identified. Minor areas of ponding can be resolved with re-grading / re-stabilization, if the magnitude of associated nuisance warrants such action. From a SWM perspective, there are no functional concerns associated with ponding and, therefore, remediation is not strictly required. Excessive sedimentation is an issue requiring attention if it remains in a non-vegetated condition and is, therefore, prone to re-suspension and transport downstream, if it creates an isolated ponding area as described above, or if it occurs to an extent that it impacts on the conveyance capacity of the swale. If any such condition occurs, the sediment should be removed, in compliance with the CPU, and the area re-stabilized



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Vegetation management in drainage swales is not a strict requirement in that excess growth will serve to improve water quality treatment benefits. If the density of vegetation reaches a level where conveyance capacity is impacted, a cutting operation should be undertaken. A minimum vegetation height of 0.15 m (6") should be maintained

**Conclusion**

Based on the information in this report, it is concluded that the lack of change in impervious coverage associated with the proposed substations is sufficiently limited as to not impact on the pre-development hydrologic characteristics of the area during construction, or operation of the facility. The construction of the switching station should result in negligible change/impact on the quality and quantity of surface water runoff.

While a site assessment yields a "low" erosion potential classification, a number of factors 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 grassland. These factors all combine to create a condition where a "standard" approach to erosion and sediment control will suffice to minimize potential for off-site impacts, combined with a monitoring and maintenance program during and following the proposed works to ensure that measures continues to function as designed.

We trust that this meets your needs at this time. Should you have any questions or comments please do not hesitate to contact the undersigned at your convenience.



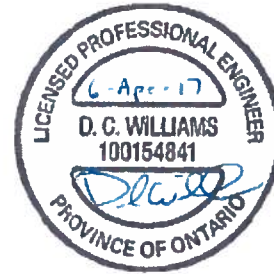
April 6, 2017  
Mr. Sean Fairfield, Director Project Planning and Permitting  
Page 7 of 7

**Reference: Amherst Island Wind Energy Project  
Switching Station Stormwater Management (SWM) Brief**

Regards,

**STANTEC CONSULTING LTD.**

Amber Garrett  
Water Resources Engineering Intern  
Phone: (519) 585-7416  
Fax: (519) 579-6733  
Amber.Garrett@stantec.com



Dave Williams  
Water Resources Engineer  
Phone: (519) 585-7320  
Fax: (519) 579-6733  
Dave.Williams@stantec.com

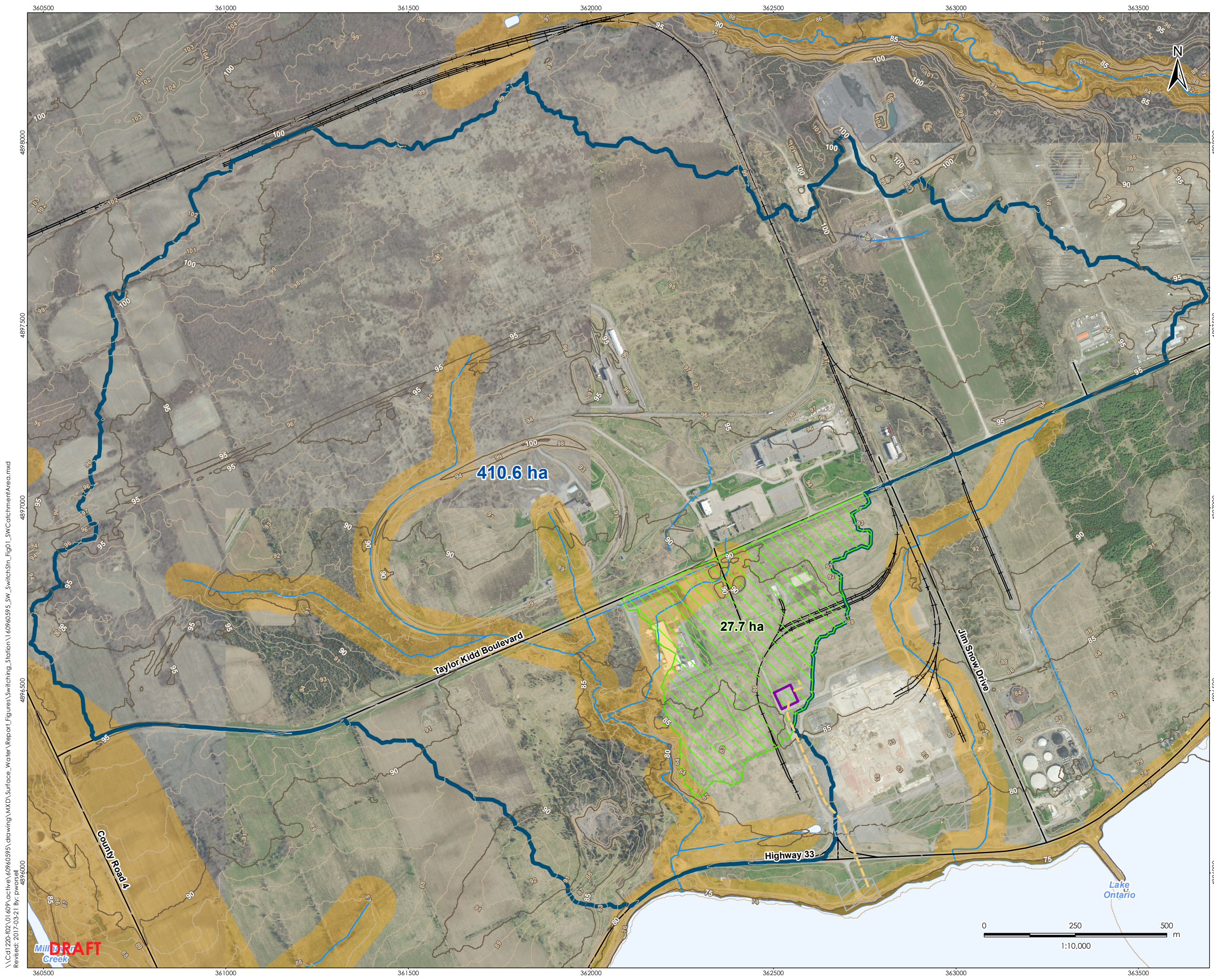
Attachment: Figure 1 – Switching Station Drainage Assessment  
Figure 2 – Switching Station Disposal Area  
Figure 3 – Location Plan – Disposal Area  
Drawing C-102 – Switching Station Grading and Sediment and Erosion Control Plan  
Drawing C-303 – Site Detail Sheet

c. Mr. Riley Griffin, Algonquin Power Co.  
Ms. Kerrie Skillen and Mr. Rob Rowland, Stantec Consulting Ltd.

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# ATTACHMENTS





- Legend**
- Mainland Transmission Line
  - Central Staging Area
  - Switching Station
  - Switching Station Drainage Catchment Area
  - Highway 33 Culvert Subwatershed
- Existing Features**
- Road
  - Railway
  - Ground Surface Contour (5 metre intervals - metres AMSL)
  - Ground Surface Contour (1 metre intervals - metres AMSL)
  - Watercourse
  - Regulation Limit (CRCA)

- 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; © Cataraqui Region Conservation Authority, 2017.
  3. Orthoimagery © Cataraqui Region Conservation Authority, 2017. Imagery taken in 2014.

Client/Project  
Windlectric Inc.  
Amherst Island Wind Energy Project

Figure No.  
**1**  
Title

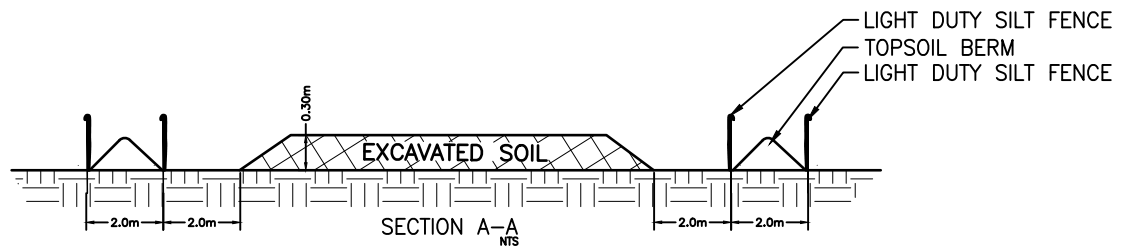
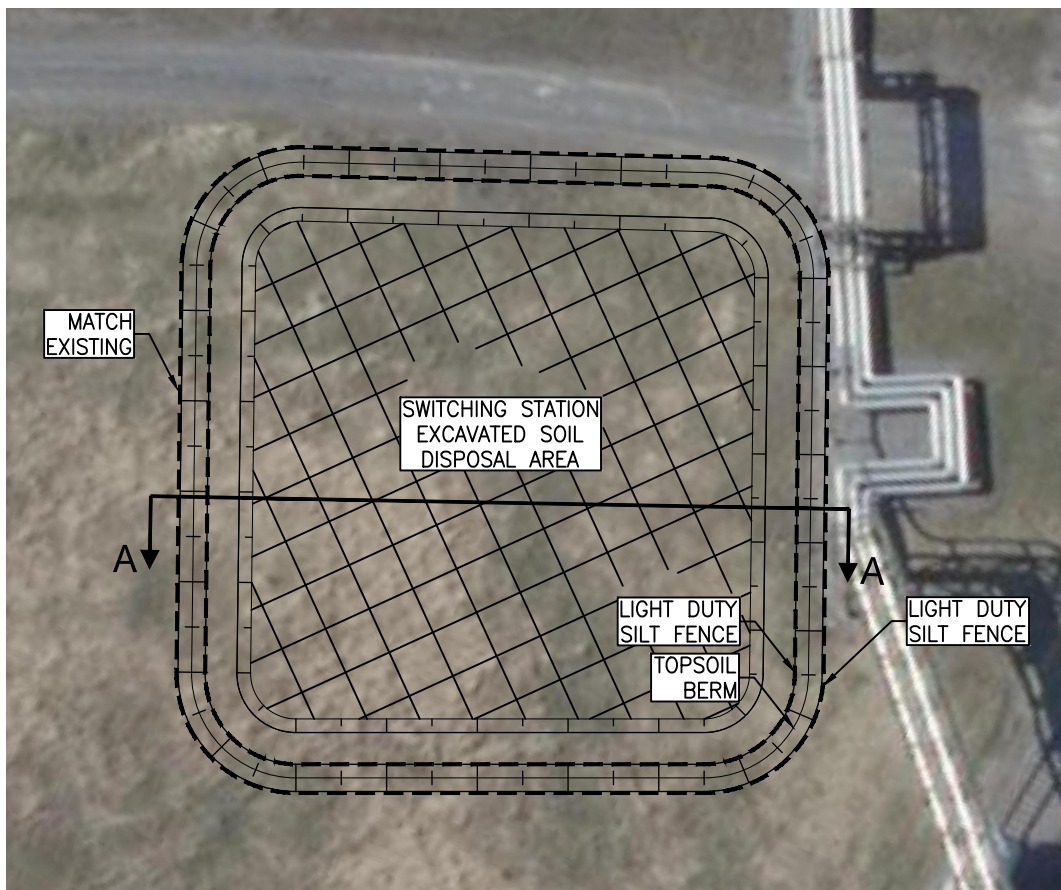
**Switching Station  
Drainage Assessment**

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 Revised: 2017-03-21 By: p.worsell  
 4896000



March 2017  
160960595

V:\01614\active\133560100\design\drawing\civil\sheet\_files\swm\133560100C-SWITCHING STATION DISPOSAL AREA.dwg  
 2017/04/06 12:52 PM By: Miller, Jonathan



- Notes**
1. REFER TO DRAWINGS C303 FOR EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS.
  2. DISPOSAL AREA AND BERM TO BE STABILIZED WITH OSC SEED MIX 8215.

ORIGINAL SHEET - ANSI A

April 2017  
 133560100



300 Hagey Blvd. Suite 100  
 Waterloo, ON, N2L 0A4  
 Tel. 519.579.4410  
 www.stantec.com

Client/Project  
 WINDLECTRIC INC.  
 AMHERST ISLAND WIND  
 ENERGY PROJECT

Figure No.

**2**

Title

SWITCHING STATION  
 DISPOSAL AREA

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2017/04/06 2:43 PM By: Miller, Jonathan



ORIGINAL SHEET - ANSI A

April 2017  
133560100



# Stantec

300 Hagey Blvd. Suite 100  
Waterloo, ON, N2L 0A4  
Tel. 519.579.4410  
www.stantec.com



Client/Project  
WINDLECTRIC INC.  
AMHERST ISLAND WIND  
ENERGY PROJECT

Figure No.  
**3**

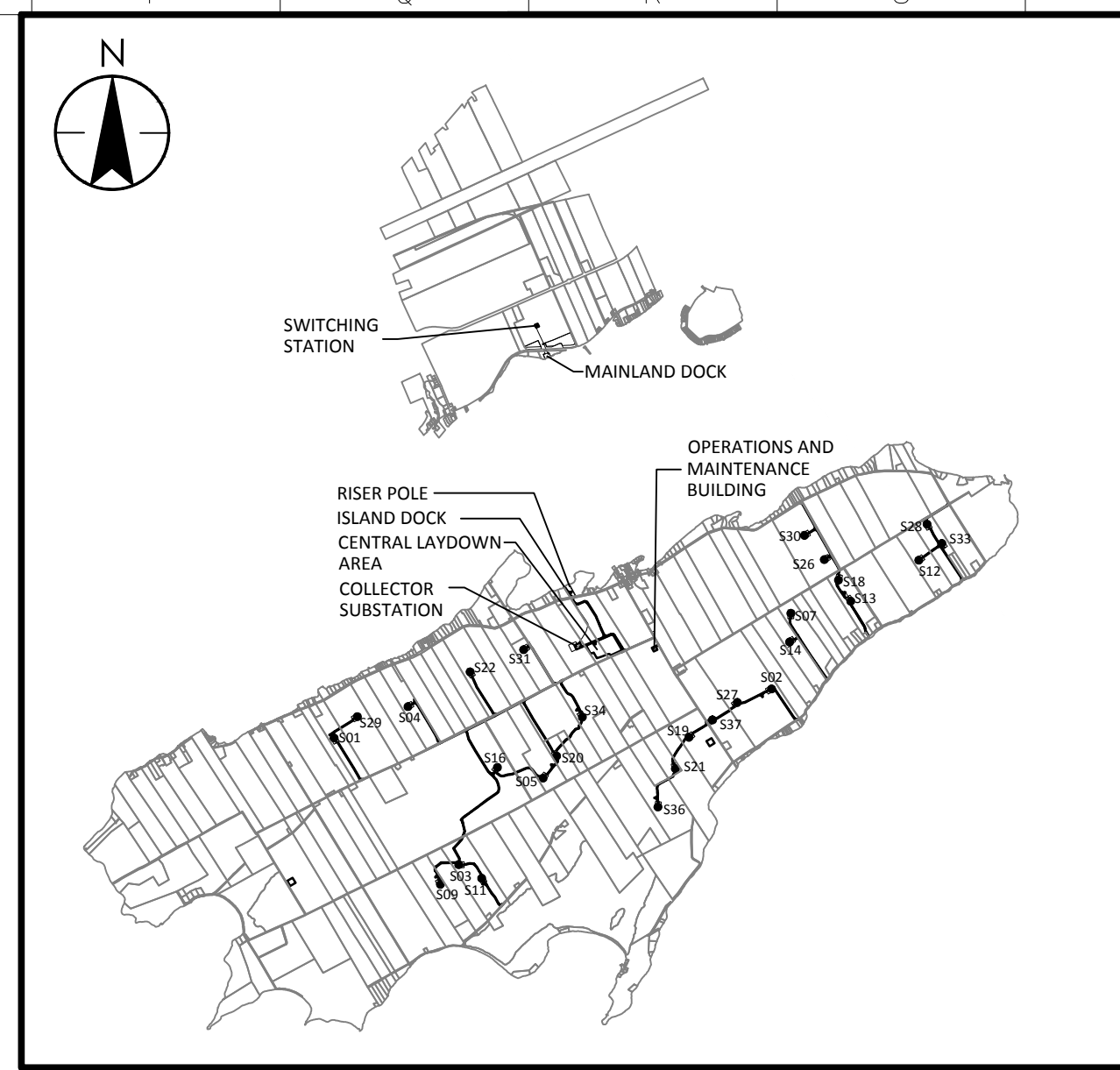
Title  
LOCATION PLAN

Copyright Reserved

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Notes

- TOPOGRAPHIC SURVEY COMPLETED BY McINTOSH PERRY CONSULTING ENGINEERS DATED 2015 (UTM ZONE 18 NAD83 (GRS) 1987.0). GEOTECHNICAL INFORMATION PROVIDED BY STANTEC MEMO, DATED JUNE 2015.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS IN THIS SET PREPARED BY STANTEC CONSULTING LTD.
- THE CONTRACTOR MUST CHECK AND VERIFY DIMENSIONS, OBTAIN ALL UTILITY LOCATES AND OBTAIN ALL REQUIRED PERMITS/LICENSES AND VERIFY ELEVATIONS OF EXISTING SERVICES BEFORE PROCEEDING WITH ANY WORK.
- ALL CONSTRUCTION WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS (LATEST EDITION).
- THE CONTRACTOR IS TO BE RESPONSIBLE FOR ALL DRAINAGE AND MEASURES TO CONTROL WATER. THE SITE IS TO BE FINE GRADED/LEVELED LEAVING THE SITE IN A NEAT APPEARANCE SUCH THAT POSITIVE DRAINAGE IS ACHIEVED.
- CONTRACTOR MUST COMPLY WITH HWSTA CPU REQUIREMENTS.
- ALL DISTURBED AREAS WITHIN THE PROPOSED WORKS ARE TO BE RE-VEGETATED USING NATIVE TOPSOIL AND SEED AS PER REA. MIX AND APPLICATION RATE/METHOD TO BE APPROVED PRIOR TO IMPLEMENTATION.
- CLEARING AND GRUBBING AND REMOVALS TO BE COMPLETED IN ACCORDANCE WITH OPSS 201. TEMPORARY EROSION CONTROL TO BE COMPLETED IN ACCORDANCE WITH OPSS 577.
- GRADING TO BE COMPLETED IN ACCORDANCE WITH OPSS 206.
- GRANULAR MATERIAL TO BE USED IN ACCORDANCE WITH OPSS 1010.
- ALL CULVERTS TO BE CONSTRUCTED IN ACCORDANCE WITH OPSS 421 AND AS PER OPSS 802.010.



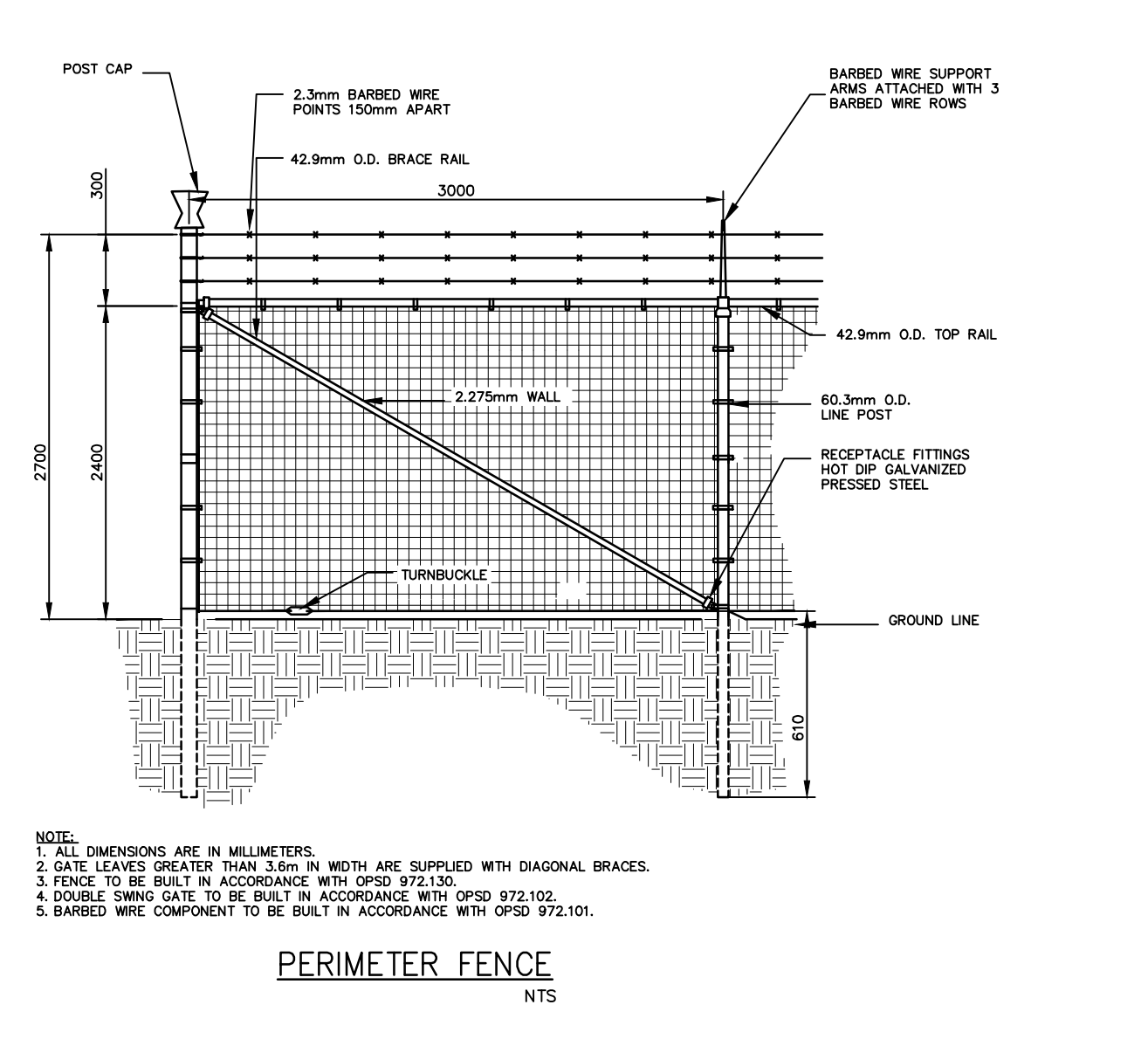
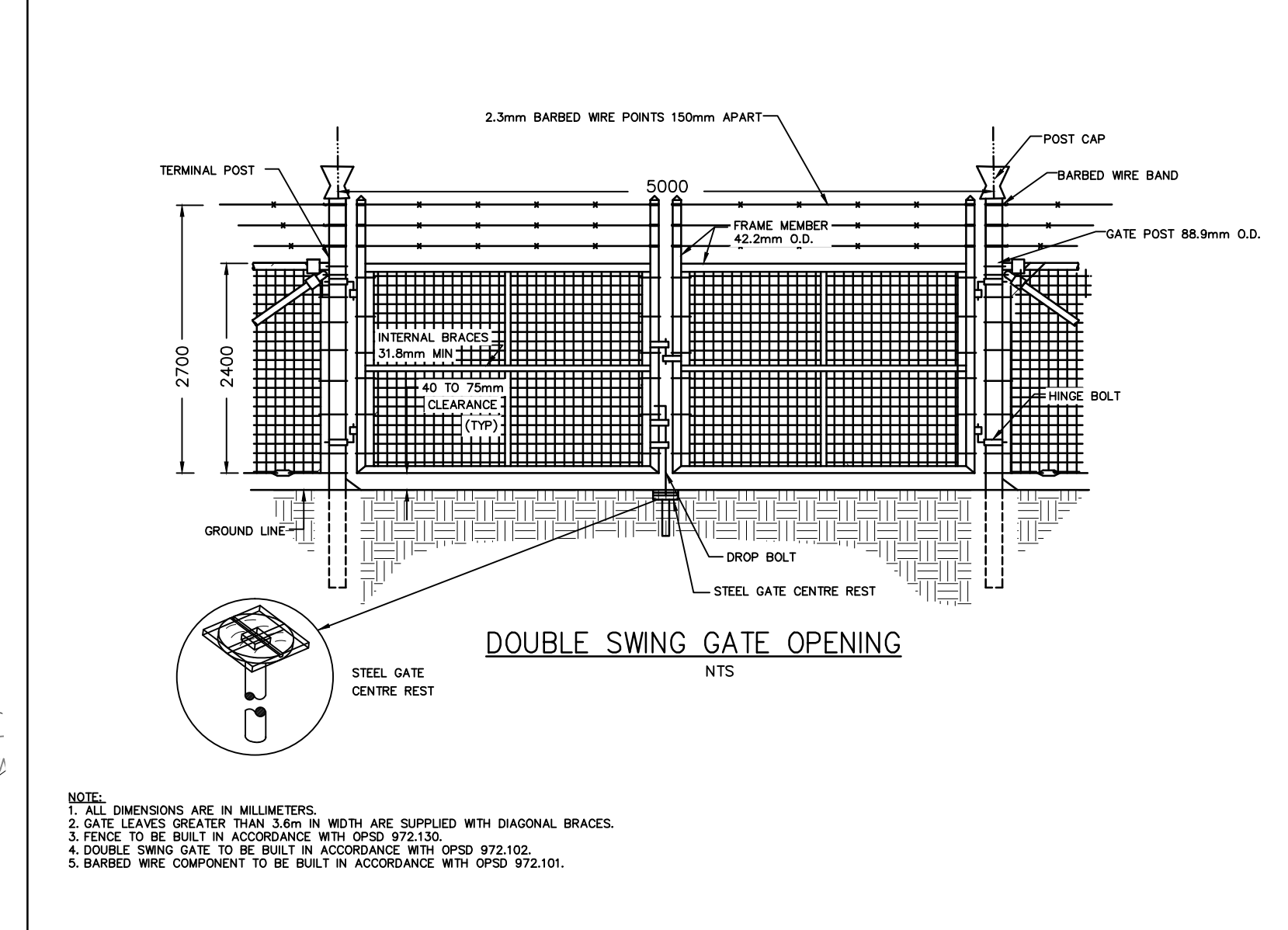
KEY PLAN

N.T.S.

NOTE: REFER TO DRAWING E-300 FOR ELECTRICAL DETAILS

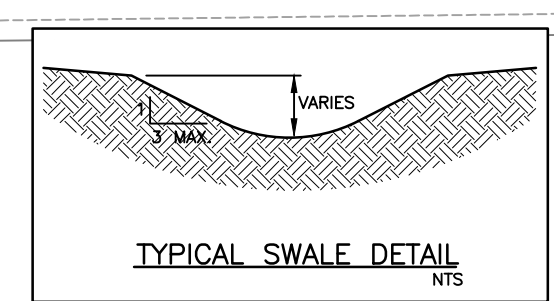
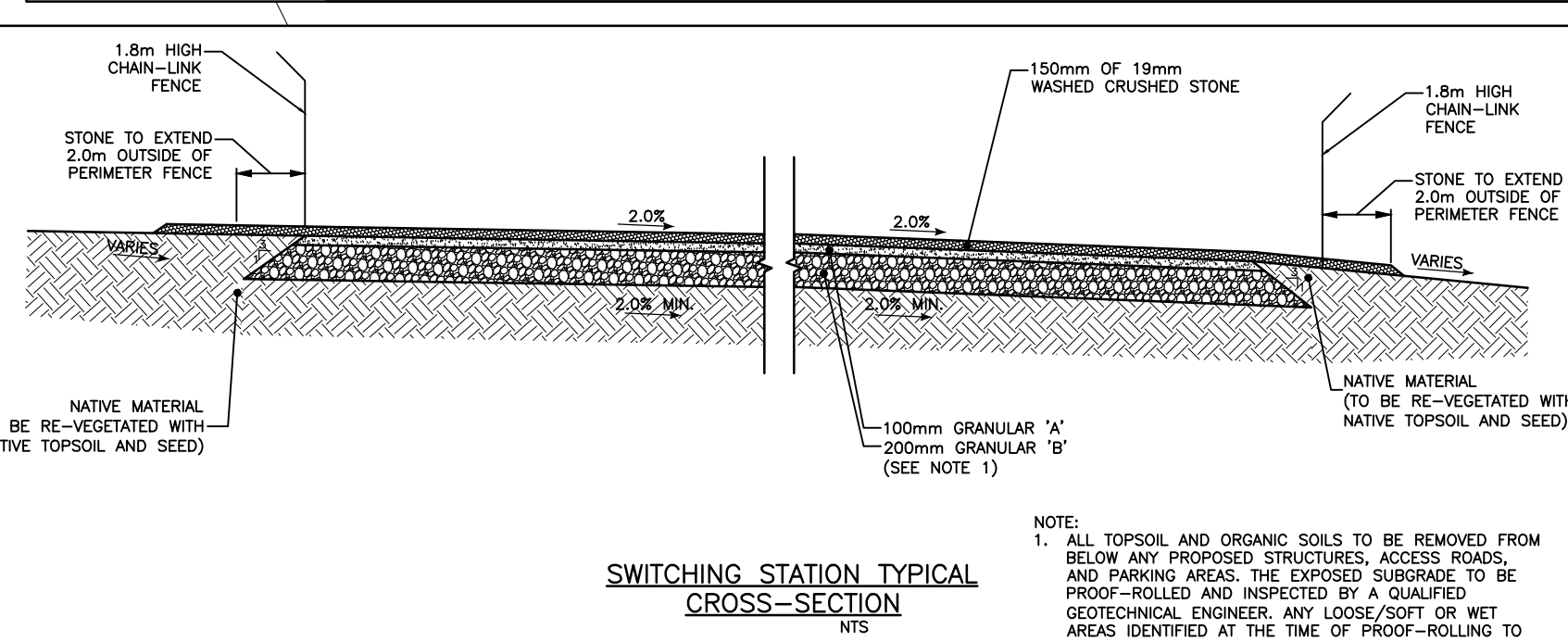
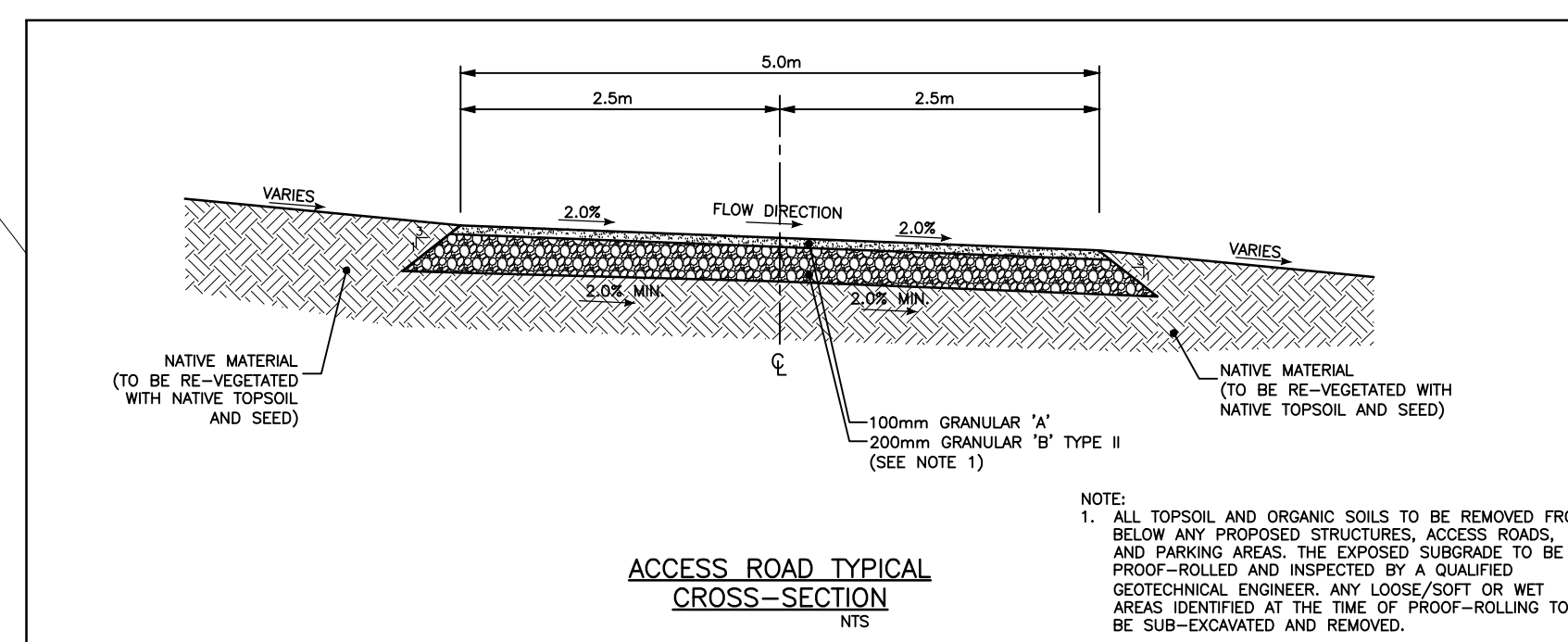
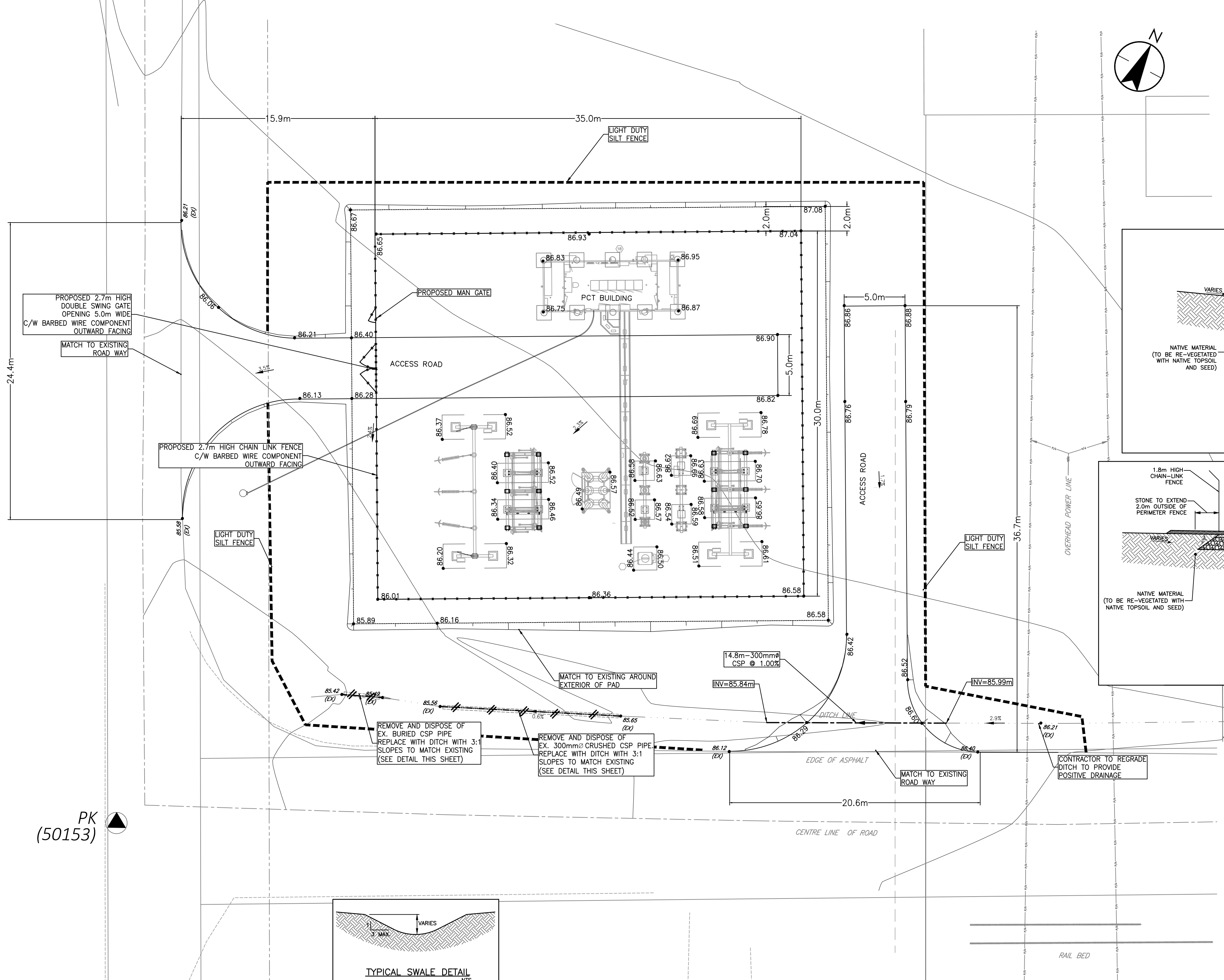
ALL CONSTRUCTION ACTIVITIES ARE TO ADHERE TO THE SOIL/GROUNDWATER MANAGEMENT PROGRAM AND HEALTH & SAFETY PLAN, PREPARED BY STANTEC CONSULTING LTD. THESE PLANS ARE TO BE USED AS A REFERENCE TO FINAL CONSTRUCTION REQUIREMENTS, HOWEVER THE SOIL/GROUNDWATER MANAGEMENT PROGRAM AND HEALTH & SAFETY PLAN DATED JANUARY 12, 2017 IS TO BE REVIEWED PRIOR TO BREAKING GROUND AND TO BE USED AS A REFERENCE FOR CONSTRUCTION ACTIVITIES AND PHASING.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING C303 FOR ADDITIONAL DETAILS AND NOTES



NOTE:  
1. ALL DIMENSIONS ARE IN MILLIMETERS.  
2. GATE LEAVES GREATER THAN 3.0m IN WIDTH ARE SUPPLIED WITH DIAGONAL BRACES.  
3. FENCE TO BE BUILT IN ACCORDANCE WITH OPSS 972.10.  
4. DOUBLE SWING GATE TO BE BUILT IN ACCORDANCE WITH OPSS 972.102.  
5. BARBED WIRE COMPONENT TO BE BUILT IN ACCORDANCE WITH OPSS 972.101.

TBM  
SCRATCH MARK (X) ON 1" DIAM. CP PIPE TRACK  
ELEVATION = 87.469



Legend

PROPOSED	EXISTING

Revision	By	Appd.	Y/M/AM/DD
D. RE-ISSUED FOR PERMIT	DMS	DKS	17.03.29
C. REVISED FENCING	DMS	DKS	17.03.24
B. ISSUED FOR PERMIT	DMS	DKS	17.03.24
A. FOR CLIENT REVIEW	JBM	DKS	17.03.15

File Name: 133560100-CGP.dwg DS DKS DS 16.01.20  
Dwn. Chkd. Dsgn. Y/M/AM/DD



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

Title  
**SWITCHING STATION GRADING AND SEDIMENT AND EROSION CONTROL PLAN**

Project No. 133560100  
Drawing No. Sheet Revision  
Scale 1:200  
0 2 6 10m

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1. TOPOGRAPHIC SURVEY COMPLETED BY McINTOSH PERRY CONSULTING ENGINEERS DATED 2015 (UTM ZONE 18 NAD83 (GRS1987.0)) FOR BENCHMARK LOCATIONS PLEASE CONTACT McINTOSH PERRY CONSULTING ENGINEERS.
2. GEOTECHNICAL INFORMATION PROVIDED BY STANTEC MEMO, DATED JUNE 2015. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS IN THIS SET PREPARED BY STANTEC CONSULTING LTD.
3. THE CONTRACTOR MUST CHECK AND VERIFY DIMENSIONS, OBTAIN ALL UTILITY LOCATES AND OBTAIN ALL REQUIRED PERMITS/LICENSES AND VERIFY ELEVATIONS OF EXISTING SERVICES BEFORE PROCEEDING WITH ANY WORK.
4. ALL CONSTRUCTION WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS (LATEST EDITION).
5. ENCROACHMENT ON NON-PARTICIPATING PROPERTIES IS STRICTLY PROHIBITED. THE CONTRACTOR AND/OR THEIR REPRESENTATIVES ARE TO BE AWARE OF ALL PARTICIPATING LAND OWNERS ON THE PROJECT AND THE PROJECTS CONSTRUCTIBLE LIMITS. ALL CONSTRUCTION ACTIVITY BEYOND THE CONSTRUCTIBLE LIMITS IS STRICTLY PROHIBITED.
6. THE CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ALL DAMAGED AND/OR DISTURBED PROPERTY WITHIN THE MUNICIPAL RIGHT-OF-WAY TO THE CURRENT MUNICIPAL STANDARDS AND SHALL CONFORM TO ROAD USE AGREEMENT.
7. THE CONTRACTOR IS TO BE RESPONSIBLE FOR ALL DRAINAGE AND MEASURES TO CONTROL WATER. THE SITE IS TO BE FINE GRADED/LEVELED LEAVING THE SITE IN A NEAT APPEARANCE SUCH THAT POSITIVE DRAINAGE IS ACHIEVED.
8. CONSTRUCTION TURNING RADIUS LIMITS IDENTIFY AREAS WHERE ADDITIONAL ROAD WIDTH IS REQUIRED TO ALLOW FOR ADEQUATE CLEARANCE FOR CONSTRUCTION VEHICLES.
9. ALL DISTURBED AREAS WITHIN THE PROPOSED WORKS ARE TO BE RE-VEGETATED USING NATIVE TOPSOIL AND SEED. MIX AND APPLICATION RATE/METHOD TO BE APPROVED BY OWNER PRIOR TO IMPLEMENTATION.
10. CLEARING AND GRUBBING AND REMOVALS TO BE COMPLETED IN ACCORDANCE WITH OPSS 201. TEMPORARY EROSION CONTROL TO BE COMPLETED IN ACCORDANCE WITH OPSS 577.
11. GRADING TO BE COMPLETED IN ACCORDANCE WITH OPSS 206.
12. GRANULAR MATERIAL TO BE USED IN ACCORDANCE WITH OPSS 1010.
13. ALL CULVERTS TO BE CONSTRUCTED IN ACCORDANCE WITH OPSS 421 AND AS PER OPSS 802.010.

Revision	By	Appd.	YY.MM.DD
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		Dwn.	Chkd.	Dgn.	YY.MM.DD

Permit-Seal



Client/Project



AMHERST ISLAND WIND PROJECT  
75MW WIND FARM

Amherst Island, Loyalist Township, Ontario

Title

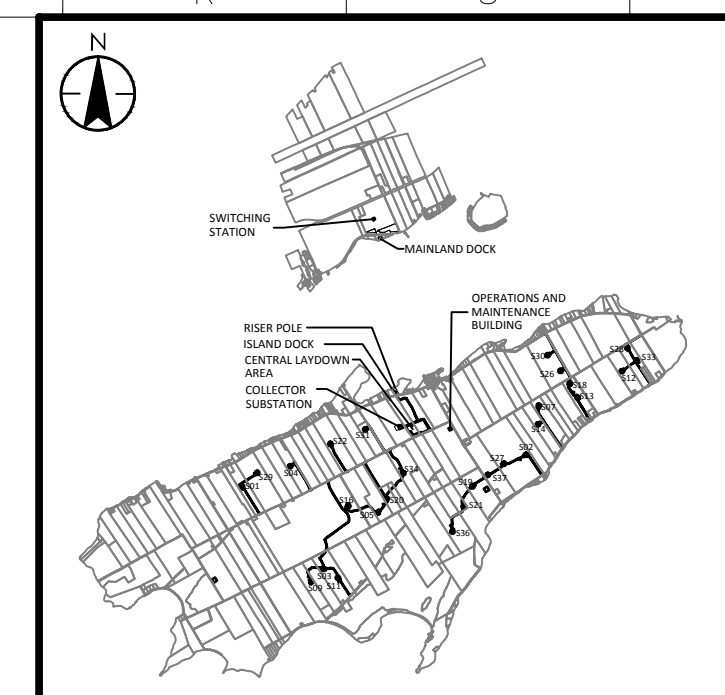
SITE DETAIL SHEET

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Drawing No.	Sheet
	Revision

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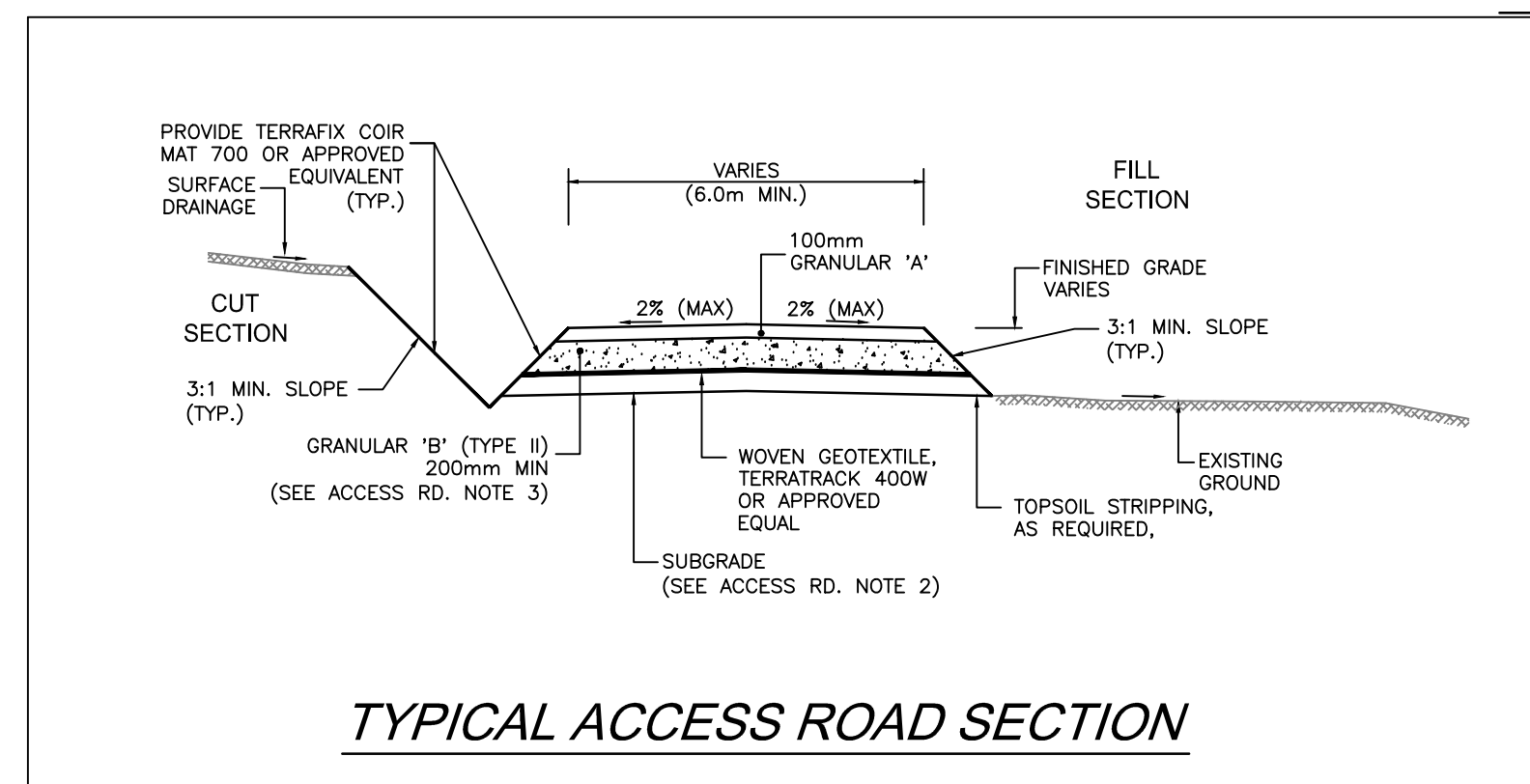
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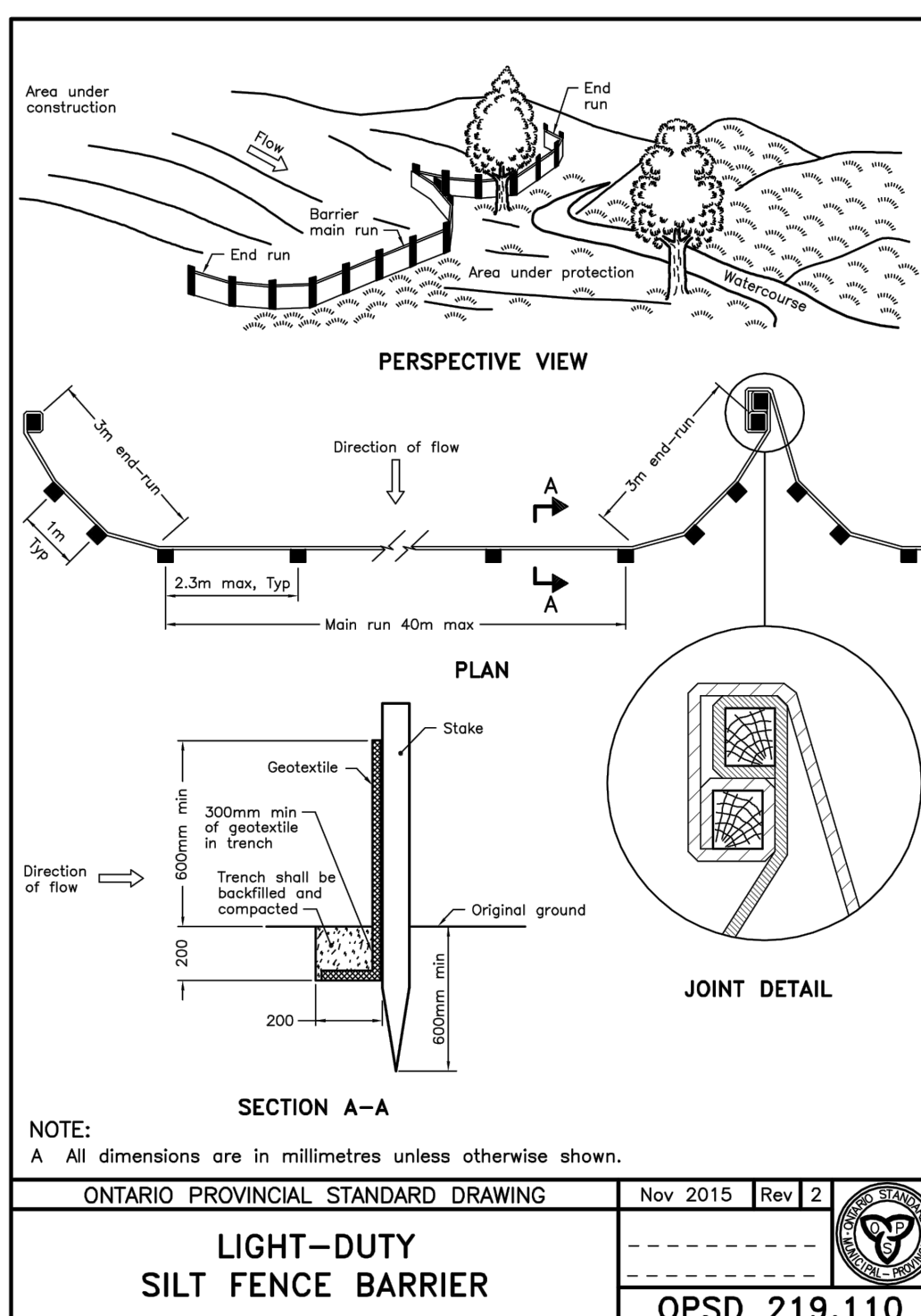


KEY PLAN

N.T.S



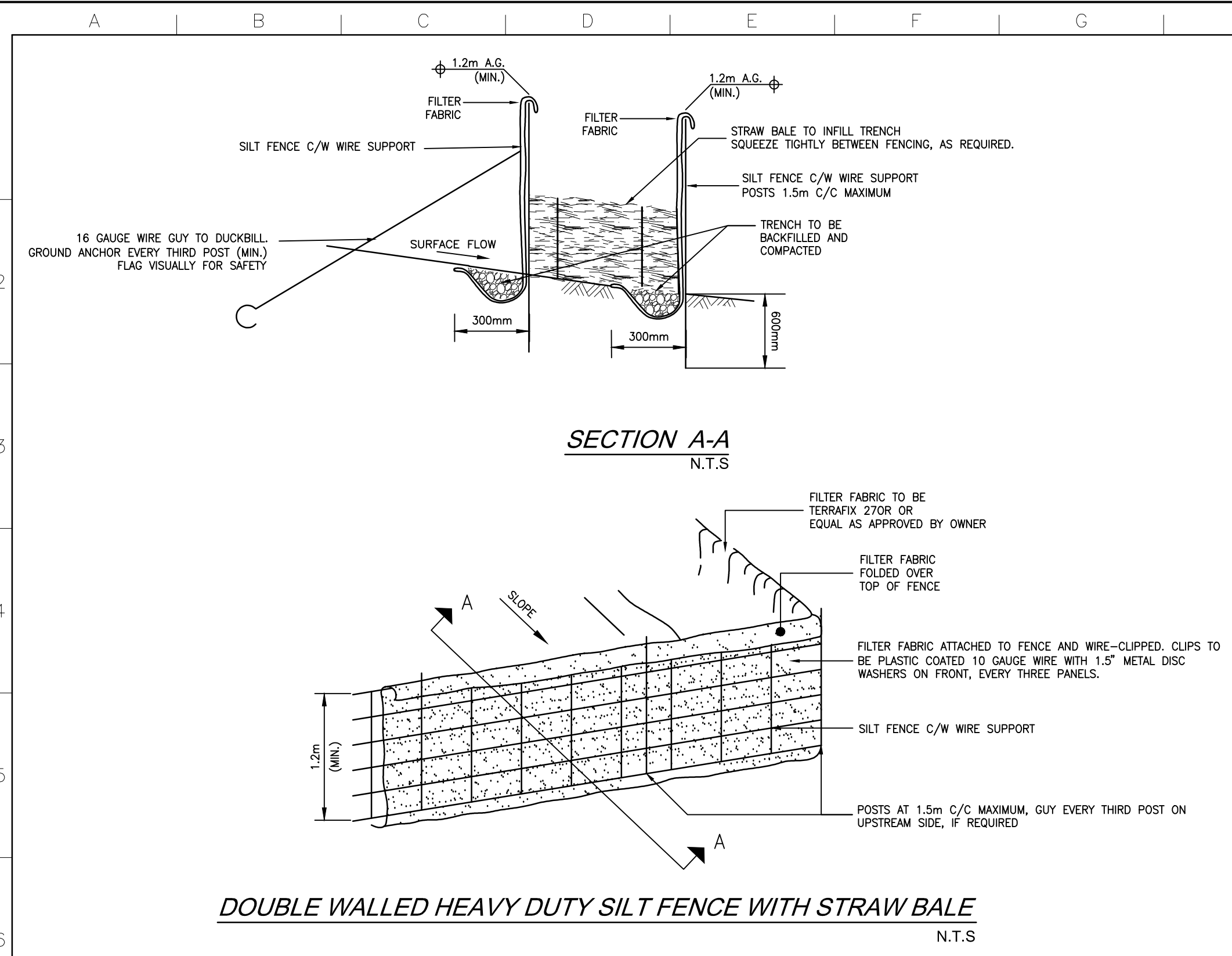
TYPICAL ACCESS ROAD SECTION



ONTARIO PROVINCIAL STANDARD DRAWING Nov 2015 Rev 2

LIGHT-DUTY  
SILT FENCE BARRIER

OPSD 219.110



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

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

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE 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.
2. EROSION AND SEDIMENT CONTROL WORKS SHALL BE INSTALLED AND IN WORKING CONDITION PRIOR TO COMMENCEMENT OF CONSTRUCTION RELATED ACTIVITIES.
3. 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.
4. 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.
5. AT THE DISCRETION OF THE OWNER OR OWNER'S CONSULTANT, ADDITIONAL SILT CONTROL DEVICES SHALL BE INSTALLED AT DESIGNATED LOCATIONS.
6. 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.
  - a) ACCUMULATED SEDIMENT IS TO BE REMOVED AND DISPOSED OF AS PER OPSS 180, PRIOR TO THE REMOVAL OF ANY CONTROL MEASURE.
7. SILT FENCE AND EROSION CONTROL STRUCTURES TO BE CHECKED DAILY AND AFTER EACH RAINFALL > 10mm FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES ONE THIRD OF THE WAY TO THE TOP OF THE BARRIER.
8. ALL AREAS WHERE ACTIVE CONSTRUCTION IS NOT EXPECTED FOR 2 WEEKS SHALL BE STABILIZED THROUGH SEEDING WITH NATIVE PLANT SPECIES AND APPLICATION OF HYDRAULIC MULCH.
9. STOCKPILED MATERIAL IS TO BE STORED AWAY FROM POTENTIAL RECEIVERS (E.G. WATERCOURSES), AND LOCATED AT LEAST 6m FROM THE BOUNDARY OF THE LAYDOWN AREA. WHERE STOCKPILED MATERIAL IS TO BE LEFT IN PLACE UNDISTURBED IN EXCESS OF 2 WEEKS OR PRIOR TO A RAIN EVENT (WHICHEVER OCCURS SOONER), THE STOCKPILE SHALL BE COVERED WITH A ROLLED EROSION CONTROL PRODUCT (RECP).
10. 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.
11. IN ADDITION TO BEING RESPONSIBLE FOR ENSURING THAT THE PRESCRIBED MEASURES ARE INSTITUTED 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
  - SAND BAGS
  - ANY ADDITIONAL MATERIAL DEEMED NECESSARY TO REPAIR/ CONSTRUCT PROPOSED MEASURES OR TO ADEQUATELY DEAL WITH UNEXPECTED HIGH FLOWS

CULVERT NOTES:

1. CULVERT SLOPE TO MATCH EXISTING DITCH GRADE UNLESS OTHERWISE NOTED.
2. CULVERT TO BE EMBEDDED 10% OF PIPE DIAMETER BELOW DITCH INVERT.
3. CULVERTS TO BE CORRUGATED STEEL PIPE (CSP). PIPE MATERIAL TO BE GALVANIZED STEEL AND HAVE A 68mm x 13mm CORRUGATION WITH 1.6mm METAL THICKNESS.
4. PIPE TO BE INSTALLED IN ACCORDANCE WITH OPSS 802.010.
5. CULVERT ELEVATIONS ARE APPROXIMATE AND ARE TO BE FINALIZED IN THE FIELD.

SILT FENCE NOTES (AS PER OPSD 219.110):

1. STAKES ARE TO BE INSTALLED ON THE DOWNSTREAM SIDE OF THE BARRIER.
2. CONTRACTOR TO MONITOR SILT FENCE FOR UV DEGRADATION.
3. SILT FENCE IS TO BE CLEANED OUT ONCE SEDIMENT REACHES MAXIMUM 1/3 OF THE FENCE HEIGHT.

HYDRAULIC MULCH NOTES:

1. COORDINATE/CONSULT WITH OWNER PRIOR TO UTILIZING ANY HYDRAULIC MULCH. TIMELINES AND SEEDING METHODS NEED TO BE CAREFULLY CONSIDERED PRIOR TO IMPLEMENTATION.
2. ENSURE THAT A TACKIFIER IS USED TO KEEP PRODUCT IN PLACE.
3. APPLY SEED MIX PRIOR TO MULCH WITH TACKIFIER.
4. HYDRAULIC MULCH IS TO BE APPLIED AS SOON AS GRADING AND SEEDING WORK IS COMPLETE TO ENSURE STABILIZATION OF SOILS.
5. RE-APPLY HYDRAULIC MULCH IF THE SUBJECT AREA IS DAMAGED OR ERODED BY WIND OR WATER. SURFACE COVERAGE MUST BE AT LEAST 80% AT ALL TIMES.

ROLLED EROSION CONTROL PRODUCT (RECP) NOTES:

1. RECP SHALL CONSIST OF STRAW, STRAW-COCOONUT, OR COCOONUT FIBER WHICH ARE HELD IN PLACE BY NETTING SEWN ON BOTH SIDES OF THE MATERIAL.
2. RECP MUST BE SECURED ON STOCK PILE BY STAPLING AT THE BOTTOM OF THE SLOPE AND UPRIIL TRENCHES ON THE STOCKPILE/SLOPED SURFACE.