Design Guidelines

The secondary oil containment system shall be designed as a passive system not requiring any instrumentation or control systems. The system shall consist of an impermeable liner anchored to an excavated earthen berm or affixed to a concrete wall, and a floor attached to the liner that consists of a needle-punched non-woven geotextile mat infused with oil immobilizer proprietary material. The liner shall be impermeable to liquid and the floor shall allow water to pass though but shall seal and block the flow of any liquid or oil in the event of an oil leak.

Manufacturer and designer of the oil containment system shall be a company that specializes in the manufacturing of needle-punched non-woven geotextile mats for secondary oil containment with a minimum of 9 years experience.

Albarrie Geocomposites Ltd.; 85 Morrow Road, Barrie, Ontario L4N 3V7
Phone: (705) 737-0551  Toll Free: 1-(866) 269-8275  Fax: (705) 737-4044
Website: www.sorbwebplus.com

Containment system shall be designed according to site specification and approved by a Professional Engineer experienced with construction of secondary oil containment systems.

Materials and products shall be fabricated under strict quality control and good manufacturing practices free from defects in material and workmanship.

Standards

Secondary oil containment system shall meet or exceed the requirements set out by the SPCC, 40 CFR 112.(7)(C) Secondary containment for electrical equipment. The system shall comply with the guidelines set out by IEEE. P980 Guide for Containment and Control of Oil Spills in Electrical Substations.
Materials

Oilmat

- Top layer
  - Black needle-punched non-woven geotextile
- Middle layer
  - Copoly-005
  - Woven polyethylene scrim
- Bottom layer
  - Black needle-punched non-woven geotextile
- Nominal mass – 3,265 g/m² ASTM D5993
- Nominal polymer loading – 2,800 g/m²
- Peel Strength – 0.7 kgf ASTM D6496
- Grab Tensile Strength – 80 kgf ASTM D4632
- Puncture Resistance – 60 kgf ASTM D6241
- CBR Puncture strength – 371.5 ±41.0 kgf ASTM D6241
- Compressive Strength – 137.3 ±13.5 kgf ASTM D6364
- Tear Strength MD – 51.3±4.1 kgf ASTM D4533
- Tear Strength CD – 83.0 ±13.5 kgf ASTM 4533
- Hydraulic Conductivity (@ 5 psi, 20°C) – 5.0x10⁻⁵ cm/s ASTM D5084
- UV Resistance 70% @ 500 hours ASTM D4355 (applies to non-woven components only)

Liner

- Reinforced Polyethylene constructed of pre-stressed high density polyethylene tapes woven into a stable network and coated in a thin film of linear low density polyethylene.
- Nominal thickness – 0.61mm ASTM D1777
- Coating thickness – 0.061mm ASTM D1777
- Nominal Weight – 340 g/m²
- Tensile Strength MD – 1,500 N ASTM D5034
- Tensile Strength CD – 1,500 N ASTM D5034
SorbWeb™ Plus/SorbWeb™ Plus with SAM

- Elongation – 15% ASTM D751
- Low temperature bend - 55°C ASTM D2136
- Burst Strength – 4,480 kPA ASTM D3786
- UV resistance - >90% after 2000 hours ASTM G151-00
- Heat bonded seam (manufacturer weld) strength 21.0 N/mm ASTM D7747 25.4mm strip
Performance

Oil detected below the system after a spill shall be within allowable quantities determined by national and/or province/state regulations following an oil spill. Needle-punched non-woven geotextile mat shall seal upon oil coming in contact with it. System shall have a UV resistance of 70% or greater.

Containment Construction

The installation of the secondary oil containment system shall be supervised by a qualified technician provided by the manufacturer of the system. The installation shall be monitored to ensure the design guidelines are met and the materials are installed correctly.
APPENDIX A: TYPICAL CONTAINMENT AREA

NOTES:
1. ALL DIMENSIONS ARE IN METRIC UNLESS OTHERWISE STATED.
2. CONTAINMENT BOUNDARY TO BE AN EXCAVATED EARTH-EN PERIMETER WITH A 1:1 SLOPE.
3. THE SOIL BELOW THE TRANSFORMER PAD SHOULD NOT BE LOOSENED OR DISTURBED DURING CONSTRUCTION OF SOIL WEB™.
4. CONTAINMENT PAD MUST BE LEVEL ABOVE THE DRAINAGE.
5. CONCRETE STRUCTURE MUST BE INSPECTED FOR ANY CRACKS OR OPENINGS THAT MUST BE SEALADO PRIOR TO SOIL WEB™ INSTALLATION.
6. DURING CONSTRUCTION THE PERIMETER BERM MUST AT ALL TIMES BE PROTECTED FROM RUTTING AND DAMAGE WHEN DRIVING VEHICLES AND EQUIPMENT OVER IT.
7. THE PRECAST BOX CONCRETE MUST BE A WASHED CRUSHED, 2% FRACTIONED, WELL GRANULATED BETWEEN 30mm-70mm, STONE CAN BE BASALT, CRANITE, LIMESTONE OR COMPOUND. THE VOID RATIO OF THE STONE MUST BE A MINIMUM OF 20%. STONE MUST HAVE A MINIMUM ELECTRICAL RESISTIVITY OF 3000 OHMS.
8. ALL MATERIALS REQUIRE A MINIMUM 300mm COVER. THE DESIGN DOES NOT INCLUDE THIS AMOUNT OR ANY OTHER SURFACE STONE.
9. SOILWEB CONTAINMENT SYSTEM IS DESIGNED TO PERFORM WITH LUMINOL, TRI AND VINILSE.
10. ONLY, ANY OTHER OIL SHOULD BE TESTED PRIOR TO INSTALLATION OF SOIL WEB™ SYSTEM.
11. SOILWEB PLUS SYSTEM IS DESIGNED TO CONTAIN 10% OIL VOLUME OF THE TRANSFORMER.
12. CONSTRUCTED EARTHEN BERM SHALL BE GRANULAR MATERIAL COMPACTED TO 100% SPACED AROUND THE CONTAINMENT AREA IN LIFTS NO GREATER THAN 100mm. CONCRETE MATERIALS SUITABLE FOR BERM CONSTRUCTION IN LIFFNO GREATER THAN 200mm, COMPACTED TO 80% SPACED.
13. BIAL, GEORIGIOR MUST BE TERRAFIX TB 300, LAYFIELD EBHD 300, OR EQUIVALENT, BIAL, GEORIGIOR MUST HAVE COVERSTONE PLACED IMMEDIATELY AFTER PLACEMENT.
14. DRAINAGE REQUIREMENTS INCLUDE A MINIMUM SLOPE OF 1%. REGULATORY GUIDANCE FOR DRAINAGE TO BE OBTAINED BY OTHERS, AS REQUIRED.
15. DRAINAGE TO BE PROTECTED FROM FROST AS PER THE GEOLOGICAL ENGINEERS RECOMMENDATION.
16. THE DRAINAGE OVER THE BERM MUST BE LIMITED TO 20,000 GPH PER TRENCH AXE AS PER REGULATIONS.

LEGEND
- CONTAINMENT AREA
- CONCRETE
- TRANSFORMER OUTLINE
- Wick Drain
- Solid PVC Pipe

PLAN VIEW

DESCRIPTION: TYPICAL SOILWEB™ PLUS WITH SAM CONTAINMENT AREA

PROJECT: ENGINEERING STANDARDS

DATE: Oct 13, 2023

NOT TO SCALE

AB12345A
APPENDIX B1: TYPICAL DRAINAGE DETAILS

TRENCH DETAIL
- 300mm Min.
- COMPACTED BACKFILL
- 100mm SOLID PVC
- SAND TO SPRING LINE
- 100mm BASE SAND LAYER

TRANSFER OUTLET DETAIL
- 100mm RIGID, NON-PERFORATED PVC PIPE
- 100mm TRANSFER OUTLET
- 150mm WICK DRAIN

WICK DRAIN DETAIL
- 25mm
- 150mm
- NON WOVEN GEOTEXTILE
- WEEPING HOLES
- WICK DRAIN

CONTAINMENT DETAIL
- SURFACE STONE
- FIRE QUENCHING STONE
- WOVEN GEOTEXTILE
- NON-WOVEN GEOTEXTILE
- 50mm SAND LAYER
- SAM LAYER
- GILMAT
- 50mm SAND LAYER
- 150mm WICK DRAIN

SEE APPENDIX A FOR NOTES

TYPICAL SORBWEB™ PLUS with SAM DRAINAGE DETAILS

PROJECT ENGINEERING STANDARDS

NAME: ALBARRIE GEOCOMPOSITES
SCALE: NOT TO SCALE

AB12345B1

DRAWN BY: K.D.
CHECKED BY: O.W.
APPROVED BY: C.W.