Lily Lake Storage Project — Preliminary Construction and Operations Plan

Location: 277 Lily Lake Rd, Selwyn, Ontario
Prepared by: Nexus Energy
Proponent: 16656048 Canada Inc.
Energy Capacity: 80 MWh AC
Technology: Battery Energy Storage Project

Disclaimer

This is a draft version submitted to support Municipal Support Resolution. The final version will be provided during the Development stage.

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1. Introduction

This document outlines the construction and commissioning plan for an 80MWh Battery Energy Storage System (BESS) utilizing 20 to 22 CALB 5MWh liquid-cooled container units. The plan is based on manufacturer specifications provided in the CALB User Manual and is formatted for municipal engineering review and approval.

2. Site Preparation and Foundation

The installation site must be dry, well-ventilated, and away from flammable or explosive areas. Soil compaction must meet a minimum of 98% relative compactness. Foundation design will be determined at the time of final design and may consist of slab on grade or pile type foundations depending on final equipment selection and geotechnical conditions. A sample design is provided below.

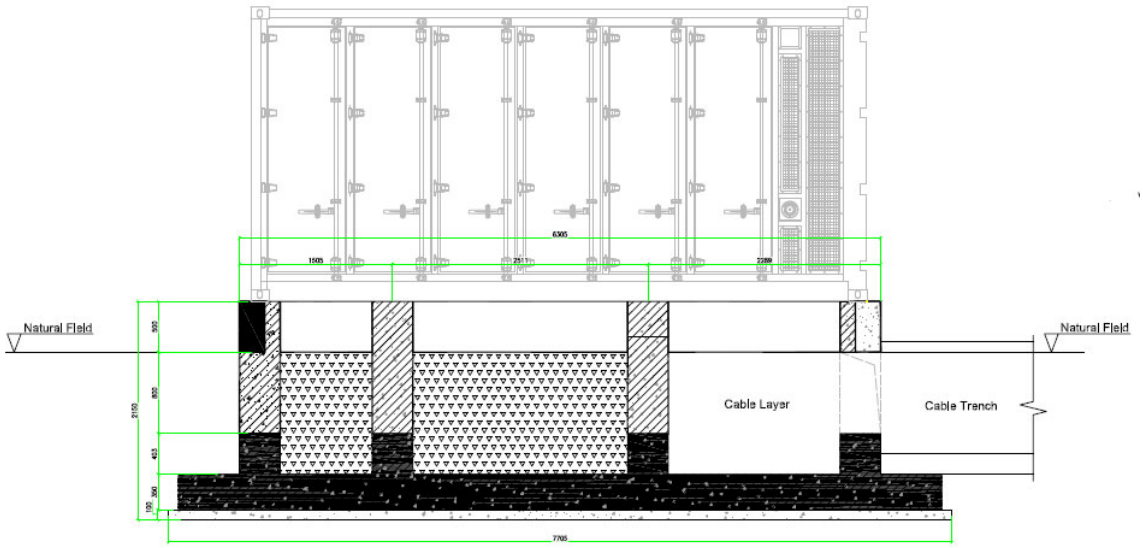


Figure 1 – Typical Container Foundation

3. Construction Scope

The construction of the 80MWh AC CALB Battery Energy Storage System (BESS) in Selwyn, Ontario encompasses a comprehensive set of civil, structural, electrical, and regulatory tasks. All work must comply, at a minimum, with the Township of Selwyn Building Permit requirements, Ontario Building Code, Electrical Safety Authority (ESA) standards, and Hydro One's Technical Interconnection Requirements for 44kV distribution systems.

3.1 Site Development and Permitting

The project begins with a detailed topographical survey and site clearing. Grading of the road and battery container area ensures a minimum slope away from equipment pads to prevent water accumulation. Soil compaction will meet or exceed 98% Standard Proctor Density (SPD) or as determined by the Geotechnical study. Drainage infrastructure, which may include swales and culverts, will be determined by the final Civil Design and installed to manage stormwater. Prior to construction, a building permit must be obtained from the Township of Selwyn , and ESA plan review and Hydro One interconnection approvals must be secured.

3.2 Foundations and Structural Works

Foundation design will be determined at the time of final design and may consist of slab on grade or pile type foundations depending on final equipment selection and geotechnical conditions. A typical reinforced concrete pad that would be constructed to support the 43-ton CALB containers would typically be a minimum of 300 mm thick with reinforced rebar grids. Cable trenches will be integrated into the foundation design to allow for safe routing of DC, AC, and communication cables. The foundation will be elevated to prevent water ingress and will include waterproofing and fireproofing measures. Over head poles may be required for Interconnection if required by Hydro One.

3.3 Access Roads and Laydown Area

A 6-meter-wide gravel or asphalt access road will be constructed to accommodate delivery trucks and cranes. The road will be designed to support a load-bearing capacity of at least 100 kN/m². A temporary laydown area will be prepared with compacted gravel for equipment staging and maintenance access.

3.4 Fencing and Security

The site will be enclosed with a galvanized chain-link fence with anti-climb features which meet local building and Ontario Electrical Safety Conde (OESC) requirements. Access gates will be lockable and compliant with Ontario Fire Code emergency access requirements. Security systems which may include CCTV, motion-activated LED lighting, and remote monitoring capabilities.

3.5 Electrical Infrastructure

Underground cabling typically will include 150 mm² copper DC cables and 25 mm² auxiliary power cables, routed through concrete trenches. Burial depths will be determined at the time of final electrical design and in accordance with the Ontario Electrical Safety Code. A grounding grid will be installed to ensure safety of the facility, staff and public.

3.6 Interconnection to Hydro One 44kV Line

The Point of Common Coupling (PCC) will be established at the Hydro One demarcation point and will include a visible break switch and metering cabinet. A transformer will be used to step down voltage. Protection systems will include anti-islanding, over/under voltage and frequency relays, and a transfer trip scheme. Real-time telemetry will be provided to Hydro One in accordance with their requirements.

3.7 Environmental Compliance

Environmental compliance measures include erosion and sediment control, spill containment, and noise mitigation. All construction activities will be monitored to ensure adherence to Ontario environmental regulation, Building Permit conditions and best practices.

4. Mechanical Installation

Each container arrives pre-assembled and must be lifted using a crane rated ≥200,000 kg. Lifting must be vertical and slow, with equal-length slings attached to corner pieces. Containers are welded to embedded steel plates and sealed with anti-corrosion treatment.

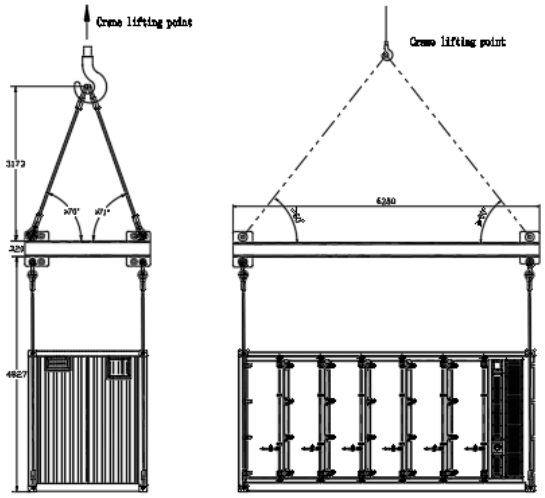


Figure 2 – Schematic Diagram of Crane Operation

5. Electrical Installation

Electrical connections include DC output, auxiliary power, and communication wiring. All wiring must follow EMC standards with layered routing and fireproof sealing. Grounding will be installed as per the final design and manufacturer requirements.

6. Commissioning Procedures

Commissioning follows CALB's Five Laws of Security: disconnect power, prevent re-energization, verify de-energization, ground equipment, and insulate adjacent parts. Pre-energization checks include insulation resistance, grounding verification, and communication tests. Energization is staged with functional verification and performance testing.

7. Operations

Once the building permit has been closed out and Permission to Operate has been received, the project will enter the Operational Phase.

7.1. Battery Operations

The BESS will be remote operated and monitored 24/7. If any faults or warnings are received, technicians will be dispatched to the site. Response time will vary in accordance with the severity of the issue and the protocols in the Emergency Response Plan.

The BESS system will operate in accordance with the contracted terms signed with the IESO. According to the draft terms, the BESS will only be required to be available to operate on business days, amounting to a maximum of 255 days per year. As the extra capacity will not likely be needed every day and the battery will only operate when it is economical, the total days of operation will be less. Charging will occur overnight between 11pm and 7 am and discharge will occur as needed between 7 am and 11 pm.

7.2. Site Maintenance Activities

A full list of maintenance activities will be submitted to the Township of Selwyn during the Development Stage, once project design and technical details are finalized. No chemicals will be stored in site (other than for fire suppression) and herbicides use is not anticipated. It is expected that site maintenance activities will include:

- Snow clearing during winter;
- Onsite vegetation management (mowing);
- Regular Inspections of fences, screening vegetation, stormwater control features;
- Test/Inspection of telecommunications equipment;
- Inspection of weather seals and detection of any water intrusion to equipment;
- Transformer and switch gear inspections and maintenance; and
- Inspection and repair of access roads

7.3 BESS Maintenance Program

BESS maintenance intervals are based on OEM manuals, Canadian codes/standards, and site conditions. The matrix below provides typical tasks/frequencies and will be tailored to the final equipment BOM.

Subsystem	Monthly	Quarterly	Semi-annual	Annual
Battery Containers (LFP)	Exterior visual; labels; check for leaks/damage; housekeeping	Safety function checks (E-Stop/Fast-Stop); verify ventilation clear	Cable/wiring inspection; torque checks as required; ground resistance ≤ 4 Ω	Deep clean; corrosion/paint touch-up; verify warning signage Notes: Follow OEM torque specs; keep deflagration/vent paths clear.
BMS/Controls	Alarm trend review; comms health	—	Parameter audit vs. approved set sheets	Firmware review with OEM; SOC calibration if required Notes: Maintain change control and version logs.
PCS/Inverters	Status/alarms; filter check	—	Safety shutdown test	Heat-sink & filter cleaning; cable terminations; insulation checks Notes: Coordinate with OEM warranty requirements.
HVAC/Liquid Cooling	Coolant level; pump/fan operation; clear obstructions	—	Pressure checks; replenish fluid as needed	Filter replacement; performance test Notes: Coolant replacement at 5–6 years or upon discoloration, per OEM.
Fire Detection & Suppression	Panel health; detector status; visual of aerosol/water piping	Detector functional tests; exhaust/vents test	—	Annual sprinkler/FDC flow (if applicable); gas detector calibration Notes: Coordinate with local Fire/AHJ.
MV Equipment (Switchgear/Transformers)	—	IR scan; relay self-tests (if applicable)	—	Protection testing; transformer oil tests (if mineral oil); SPCC checks
Site & Security	Fence/gates, signage, lighting; access roads; snow/vegetation	—	—	Security/camera audit Notes: Keep logs in CMMS/WMS.

7.4 Maintenance Schedule

A comprehensive maintenance Schedule will be submitted to the Township of Selwyn during the Development Stage, once project design and technical details are finalized.

7.5. Cybersecurity & Physical Security

Implement access control to cabinets and networks; MFA for remote access; patch/firmware governance; secure jump hosts for vendor access; and incident-response procedures aligned with corporate policies. Physical security includes perimeter fencing, locked enclosures, and cameras with privacy-by-design.

7.6. Fire & Life Safety Systems — Operations & Upkeep

Adopt a defensive firefighting philosophy: do not force entry to involved containers; allow self-cooling/consumption while protecting exposures; coordinate with integrated aerosol/water suppression and forced ventilation. Keep doors closed; maintain standoff from deflagration panels and exhaust paths. Perform inspection, testing, and maintenance (ITM) of detectors, suppression modules, exhaust fans/louvers, and FDC connections per NFPA and OEM.

7.7. Environmental & Spill Prevention

Maintain inventory of oils (e.g., transformer fluids), secondary containment provisions, dike drainage logs, inspection records, and reporting thresholds per provincial/federal requirements. Keep sorbents and spill kits on site. Coordinate notifications to the MECP Spills Action Centre as required and document corrective and preventive actions.

7.8. Documentation, Training & Drills

Maintain training records for O&M personnel and first responders. Conduct annual drills covering FRP/E-stop operation, apparatus positioning, water-shuttle operations (no onsite hydrants), air monitoring, and post-incident hazards. Keep PM records, outage logs, switching orders, and change logs audit-ready in the CMMS/WMS.

8. Appendix – Schematics and Diagrams

Figure: Preliminary Site Layout

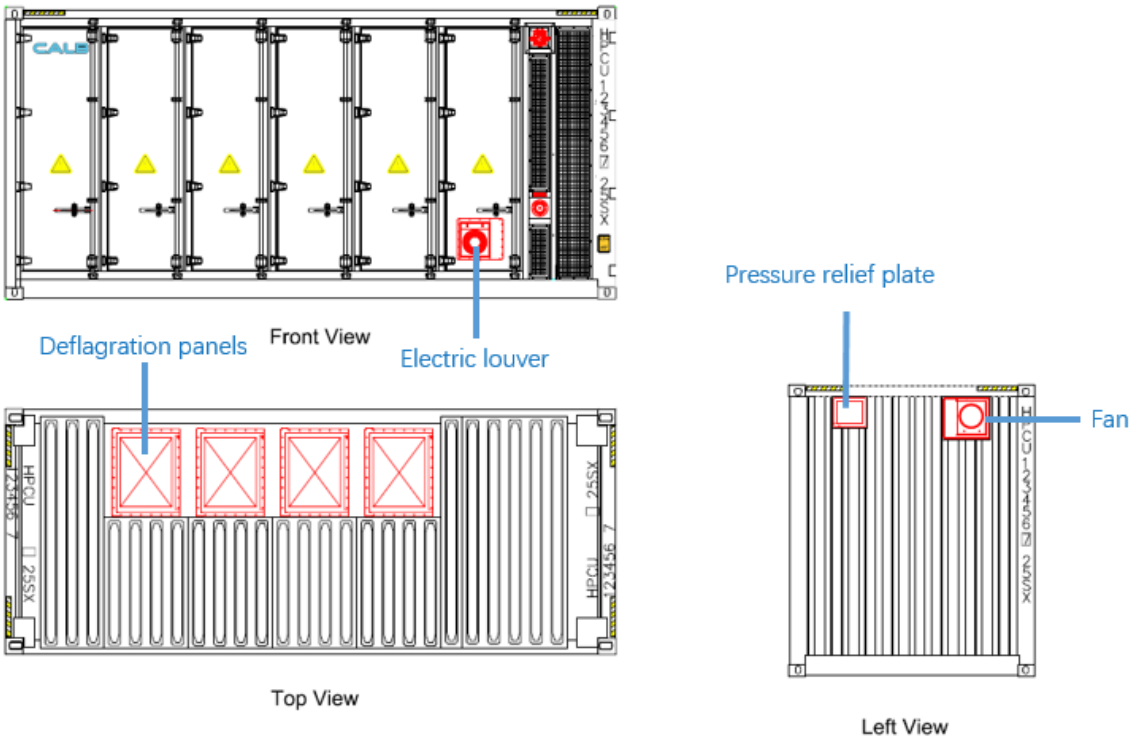


Figure: Product Appearance

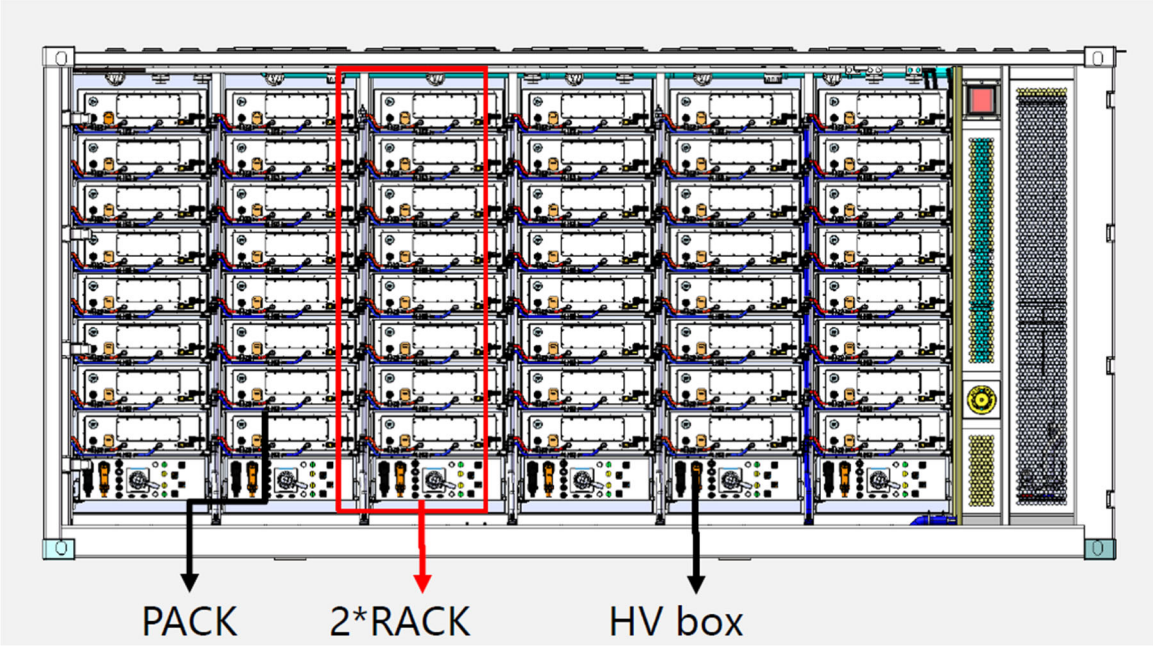
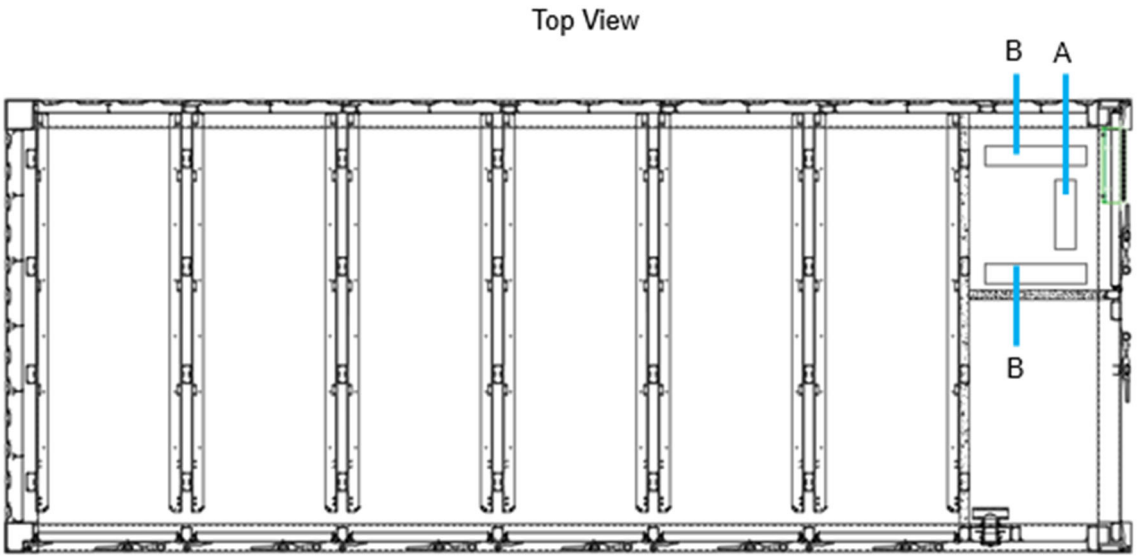


Figure: Internal equipment layout



No	Items
A	DC output inlet hole
B	Auxiliary power supply and communication inlet hole

Figure: Cable hole design