CHARTER TOWNSHIP OF GUN PLAIN PLANNING COMMISSION

ALLEGAN COUNTY, STATE OF MICHIGAN

RESOLUTION NO. 2026-01

At a special meeting of the Gun Plain Charter Township Planning Commission, held on August 10, 2026, at 6:00 p.m.:

PRESENT: Robert Bennett, Diane Webber, Dana Albertson-Stowell, Kelly McHugh, Wayne Novick, Paul Sullivan, Bill Shannon

ABSENT: None.

WHEREAS, on or around February 15, 2026, the Charter Township of Gun Plain ("Township") received an application for Special Land Use and Site Plan review from Heron Energy Storage, LLC, ("Applicant" and the "Application"), for a 250 Megawatt (MW) Large Off-Site Battery Energy Storage System ("Project"), on unaddressed property upon the northeast side of Riverview Drive in Section 34 of the Township, also known as Parcel No. 03-08-034-021-20 ("Subject Property" and participating parcel). The Subject Property is located in the Township's "AG" Agricultural District Zoning Classification and is approximately 91.93 acres in size, with a proposed Project Area of approximately 23.9 acres. The Subject Property is legally described as ALL THAT PART OF NW 1/4 LYING N OF RIVER RD EX BEG AT INTERSECTION OF THE CENT LIN OF RIVER RD & N & S 1/4 LIN TH N 1323 TH W 660 TH S TO A PT 938 N OF CENT LIN OF SD RD TH W 375 TH S TO CENT LIN OF RD TH SELY ALG SD RD TO POB SEC 34 T1N T11W

WHEREAS, the Township Planning Commission held a duly noticed public hearing, in compliance with the Open Meetings Act, as amended, on April 15, 2026, to consider the Application and to receive input from the public, the Applicant, and other stakeholders. See Attached Exhibit 1; and,

WHEREAS, on April 15, 2026, the Planning Commission closed the public hearing and continued deliberations to consider the Application to May 20, 2026, for further discussions; and,

WHEREAS, on May 20, 2026, the Planning Commission continued deliberations of the Application to June 17, 2026, for further discussions.

WHEREAS, on June 17, 2026, the Planning Commission postponed deliberations until July 15, 2026, as it did not receive all of the requested additional information it deemed necessary, and,

WHEREAS, on July 15, 2026, the Planning Commission again postponed deliberations to August 10, 2026, to capture additional information, and,

WHEREAS, on August 10, 2026, the Planning Commission concluded deliberations of the Application and makes the following resolution:

NOW THEREFORE BE IT RESOLVED, that the Gun Plain Charter Township Planning Commission makes the following Findings of Facts:

1. Section 17.36 of the Township Zoning Ordinance, titled, "Energy Storage Systems Ordinance" ("ESS"), establishes Special Land Use permit standards for the siting, installation, operation, and repair of the Project, within the Township.

2. Section 22.02.E of the Township Zoning Ordinance, titled "Standards For Granting Special Use Approval" establishes standards that must be satisfied before the Planning Commission approves a Special Land Use permit request.

3. Chapter 20.05 of the Township Zoning Ordinance, titled, "Criteria for Granting Site Plan Approval," establishes standards required for Site Plan approval for certain uses that can be expected to impact natural resources and surrounding land uses.

4. To assist the Township in reviewing the application, the Township engaged Professional Code Inspections of Michigan, Inc. ("PCI") as the Township's professional Planning Consultant to perform Special Land Use and Site Plan review and to provide Staff Reports with its findings and recommendations as a supplement to the Zoning Administrator's review submitted by Mike Vandenberg, Township Supervisor/Zoning Administrator. Additionally, technical review assistance was provided by Prein and Newhof, as well as K&S Engineers, LLC.

5. PCI's Special Land Use Report, dated April 6, 2026, Mike Vandenberg's Site Plan Review report, and K&S Engineers, LLC's sound review report ("Reports") are incorporated by reference into this Resolution and Findings of Fact by the Planning Commission; and attached hereto as Exhibit 2.

6. During the public hearing(s), the Applicant presented the Application, which included a PowerPoint presentation to discuss the Project's Site Plan, construction plans; sound impact; operational and maintenance plans; environmental, safety and emergency response plans; landscaping design; and decommissioning plan.

7. During the public hearing, the Planning Commission accepted public comment in support of and in opposition to the Applicant's request for Special Land Use and Site Plan approval for a 250 MW BESS.

8. On April 15, 2026, the Planning Commission closed the public hearing and adjourned the meeting until May 20, 2026, at 6:00 p.m., at the Gun Plain Charter Township Hall, 381 8th Street, Plainwell, Michigan, 49080, to begin deliberations regarding the Special Land Use and Site Plan standards of review under the Township Zoning Ordinance. See attached Exhibit 3.

9. In addition to the Planning Commission's deliberations during the public hearing, the Planning Commission determined that the Application **SATISFIED** the provisions of the applicable Township BESS Zoning Ordinance and Site Plan Ordinance for the reasons contained in Applicant's narrative and supporting materials, coupled with the Reports prepared by Supervisor/Zoning Administrator and Planning Consultant PCI, which thoroughly analyzed the Applicant's application, the Planning Commission reviewed the Special Land Use standards contained in Section 22.01.E of the Township Zoning Ordinance and makes the following findings, subject to the attached conditions.

General Findings of Fact
Compliance with Miscellaneous Provisions of Energy Storage System Ordinance - Section 17.36 of the Township Zoning Ordinance

A. **Large Battery Energy Storage System.** The Project is 250MW and satisfies the definition of a Large Battery Energy Storage System under Section 17.36.I of the Township Zoning Ordinance.

Finding. The Planning Commission determines that the Project requests approval of a 250MW BESS, which exceeds the definitions requirement of 50MW for a Large Off-Site BESS under Section 17.36.I of the Township Zoning Ordinance.

B. **Site Selection**. The Subject Property is located in the Township's "AG" District Zoning Classification and does not reasonably diminish farming because the location of the BESS comprises approximately 30 acres of a larger farmed parcel in close proximity to an existing utility line and substation, upon land denoted as "Not Prime Farmland" per the 2022 USGS soils map.

Finding. The Planning Commission determines that the Project is entirely located within the Township's "AG" District Zoning Classification and is listed as a special land use, as confirmed by the Reports.

C. **Setbacks and Fencing**. The Application discussed all applicable setback and fencing standards as required under the Township Zoning Ordinance, as confirmed by the Reports and Site Plan.

Finding. PCI confirmed that all standards regarding setback standards and fencing standards are satisfied.

D. **Height**. The Application discussed all applicable height limitations as required under the Township Zoning Ordinance, as confirmed by the Reports.

Finding. The Planning Commission determines that PCI's staff report confirmed that the Project's height limitations comply with Township Zoning Ordinance standards.

E. **Light and Signage**. The Application provided a lighting and signage plan as required.

Finding: The Planning Commission determines that the Application provided studies and documentation which shall satisfy all applicable light and signage requirements under the Township Zoning Ordinance, as confirmed by the Reports.

F. Sound. A preliminary sound study was presented, however the Township finds it is not satisfactory based on Engineer reviews, and has notified the Applicant that an additional sound study shall be required both prior to and upon commencement to demonstrate compliance with all sound requirements of the Gun Plain Charter Township Zoning Ordinance.

Finding: The Planning Commission determines that more information is required to demonstrate compliance. Any approval must include protections for the Township regarding this matter.

G. **Screening**. The Application provided a site plan indicating that the project will be sufficiently screened from view from adjacent non-participating parcels and the Riverview Road Right Of Way.

Finding: The Planning Commission determines that the screening depicted on the site plan meets the requirement for screening.

Findings of Fact - Special Land Use Standards of Review

A. Section 22.02.E of the Township Zoning Ordinance provides, in part, that, when evaluating the Special Land Use application, the Planning Commission and Township Board shall refer to the site plan approval standards set forth in Section 20.02, as well as the following:

Standards for Granting Special Use Approval: Approval of a special land use permit shall be based on the determination that the proposed use will comply with

all requirements of this ordinance, including site plan review criteria set forth in Chapter 20. In addition, the following standards shall be met:

1. The location, scale, and intensity of the proposed use shall be compatible with adjacent uses and zoning of land.

   Finding: The Planning Commission finds that these standards are met as the parcel is zoned Agricultural and surrounded by agricultural and residential use, is located adjacent to an existing substation and large transmission lines.

2. The proposed use shall promote the use of land in a socially and economically desirable manner. The proposed use shall not adversely impact the social and economic well-being of those who will use the proposed land use or activity; residents, businesses, and landowners immediately adjacent; or the Township as a whole.

   Finding: The Planning Commission finds that this standard is generally met; while the proposed use is not one considered desirable by the Township residents as a whole, it is one that is protected by the State of Michigan. The Planning Commission finds that the relatively isolated location with additional buffering and other mitigation requirements to which the Applicant has agreed, but not necessarily required or guaranteed should the Project be sited through the Michigan Public Service Commission, provides for reasonable mitigation of potential adverse impacts noted within this standard.

3. The proposed special land use shall be compatible with and in accordance with the general principles and future land use configuration of the Gun Plain Charter Township Master Plan and shall promote the intent and purpose of this Ordinance.

   Finding: The Planning Commission determined the Township made the policy decision to adopt an Energy Storage Ordinance permitting Battery Energy Storage Systems within the Agricultural Zoning District, and finds that the Project's location meets this standard.

4. The Planning Commission shall find that a need for the proposed use exists in the community at the time the special land use application is considered.

   Finding: The Planning Commission recognizes that the State of Michigan has promoted the expansion of the power grid as the state and region become more dependent upon electricity use, and finds that this standard is satisfied.

5. The proposed use shall be designed, constructed, operated and maintained so as to assure long-term compatibility with surrounding land uses. Consideration shall be given to:
    a. The size, placement, and materials of construction of the proposed use in relation to surrounding uses.
    b. The location and screening of vehicular circulation and parking areas in relation to surrounding development.
    c. The location and height of buildings; the location, nature and height of walls and fences; and the nature and extent of landscaping.
    d. The location and screening of outdoor storage, outdoor activity or work areas, and mechanical equipment in relation to surrounding development.
    e. The hours of operation of the proposed use. Approval of a special land use may be conditioned upon operation within specified hours considered appropriate to ensure minimal impact on surrounding uses.

Finding: The Planning Commission reviewed the site plan and operational procedures in relation to these standards and discussed elsewhere within this resolution. The Planning Commission finds that the Applicant has provided evidence through the site plan that these standards either may be met as presented or with the conditions of approval included herein.

6. The location of the proposed special land use within the zoning district shall minimize the impact of the traffic generated by the proposed use. Consideration shall be given to the following:
    a. Proximity and access to major thoroughfares.
    b. Estimated traffic generated by the proposed use.
    c. Proximity and relation to intersections.
    d. Location of and access to off-street parking.
    e. Required vehicular turning movements.
    f. Provision for pedestrian traffic.

    Finding: The Planning Commission finds that these standards are largely inapplicable due to the nature of the proposed use; it shall not be regularly staffed and shall generate no regular customer or consumer traffic; the occasional maintenance and operations visits may be made by employees from time to time.

7. The proposed special land use shall be consistent with existing and future capabilities of public services and facilities affected by the proposed use.

    Finding: The Planning Commission finds that the proposed use is for the purpose of enhancing public services and facilities meeting this standard.

8. The proposed use shall not involve any activities, processes, materials, equipment, or conditions of operation, and shall not be located or designed so as to be detrimental to public health, safety, and welfare. Site layout shall be such that operations will not be objectionable to nearby dwellings by reason of noise, fumes, glare or flashing lights.

   Finding: The Planning Commission again recognizes the Applicant's option to apply for siting through the State of Michigan with its less stringent requirements than those herein. The Planning Commission is satisfied that the site plan as provided, along with the conditions attached to the approval, will provide relatively little detriment or objectionable activity in comparison to that which may be created from State approval.

9. The proposed use shall be compatible with the natural environment.

   Finding: The Planning Commission finds that this standard is satisfied because the Applicant has provided mitigation techniques and efforts to minimize any potentially adverse impact on the surrounding natural environment. Efforts include leaving all existing wood lines intact and planting additional trees, and including a sound wall where necessary. Additionally, any lighting shall be downward facing and kept to a minimum. The Applicant also has provided summary environmental studies that confirm no endangered or threatened flora or fauna, or historically significant physical characteristics are located within or directly adjacent to the proposed site.

B. The Michigan Zoning Enabling Act, being Public Act 110 of 2006, MCL 125.3101. *et seq.* requires that, "[a] request for approval of a land use or activity shall be approved if the request is in compliance with the standards stated in the Zoning Ordinance, the conditions imposed under the Zoning Ordinance, other applicable ordinances, and state and federal statutes." MCL 125.3504(3).

C. That in reliance upon the Applicant's representations, the Reports, the Planning Commission has reviewed the Application and the Project's Site Plan and found it to be **SATISFACTORY and COMPLIANT *with the*** applicable Zoning Ordinance standards for the reasons contained in these Findings that are based on the record, including the Reports, subject to certain reasonable conditions[1] stated in this Resolution that are necessary to protect the best interests of the Township and the surrounding property, and to achieve the objectives of the Zoning Ordinance.

The Planning Commission deliberations continued. Castello discussed PA 233 and its impact on townships. Castello said that the Township's BESS Ordinance is more restrictive than PA 233. She said that the Applicant could have proceeded to the MPSC but filed an application to process it locally under the Township's BESS Ordinance. The Planning Commission acknowledged that

[1] MCL 125.3502(4) authorizes the Planning Commission to impose additional reasonable conditions for the approval of the Project as conditions on a special use permit or Site Plan.

BESS is controversial, but the Township is trying to protect the Township the best it can by adopting a BESS Ordinance that is more restrictive than PA 233. The Planning Commission acknowledged hearing all concerns expressed by the public during public comment and during the public hearing. Castello discussed sound studies and said that two sound studies will be confirmed by the Township Engineer, before construction of the Project and after it becomes operational to confirm compliance with Township BESS standards. The Planning Commission agreed that a sound study must be done properly and confirmed by the Township Engineer, at cost to the Applicant before any permits or construction occurs on the site and then a sound study after the Project is operational to validate Zoning Ordinance compliance standards (i.e. no exceeding 55 DBA).

NOW, THEREFORE BE IT FURTHER RESOLVED, Bennett moved, supported by Albertson-Stowell, that the Gun Plain Charter Township Planning Commission, Allegan County, to **APPROVE** the special land use request of Heron Energy Storage, LLC, 200 South Wacker Drive, Suite 1600, Chicago, Illinois 60606, for a 250 mega-watt Large Energy Storage System on the Subject Property located within the Township, because the Zoning Ordinance standards of review **are** satisfied for the reasons contained in the Findings of Fact because the Findings satisfy all applicable provisions of the Township Zoning Ordinances contained therein, subject to the attached conditions.

Roll call vote:

Aye: Robert Bennett, Diane Webber, Kelly McHugh, Wayne Novick, Paul Sullivan

Nay: Dana Albertson-Stowell, Bill Shannon

Resolution passes 5-2.

Special Land Use Conditions of Approval

A. **Applicable Local, State, and Federal Permits.** The Applicant shall comply with all applicable local, state, and federal laws and regulations, and provide evidence of all necessary permits demonstrating compliance to the Zoning Administrator prior to performing any work requiring that permit. Within sixty (60) days of this approval, the Applicant shall provide the Township with a list of anticipated non-Township permits for the Project and estimated approval dates for those permits. Regardless of State of Michigan requirements, local municipality building and electrical permits shall be required to comply with the Gun Plain Charter Township Zoning Ordinance.

B. **Decommissioning.** Prior to construction, the Applicant and the Township Board of Trustees shall enter into a Development Agreement and Decommissioning Agreement that outlines the specific development of the Project and decommissioning requirements of the Project, including posting a financial instrument with the Township that provides for the

actual cost decommissioning of the entire Project. Salvage value shall not be considered and satisfy all applicable provisions of the Township Zoning Ordinance, including, but not limited to, Section 17.36, and shall maintain compliance with Section 17.36 for the life of the Project.

C. **Community Host Agreement.** The Applicant shall enter into a binding Community Host Agreement with the Gun Plain Charter Township Board prior to commencement of the operation.

D. **Drains**. Prior to construction, provide written confirmation by the Allegan County Drain Commissioner that the Applicant obtained all necessary approvals from the Allegan County Drain Commissioner.

E. **Construction**. Delivery, loading/unloading hours, shall be between 7:00 A.M. to 7:00 P.M., Monday through Friday. No Saturday work shall begin before 8:00 A.M. and shall conclude by 2:00 P.M. Work shall not be conducted on Sundays or recognized Federal holidays. Work conducted outside of the established dates and hours requires prior written approval from the Township Supervisor, or designee.

F. **Building Permit**. A building permit shall not be issued until compliance with Section 17.36 is confirmed in writing by the Township Supervisor, or designee.

G. **Community Outreach**. The Applicant shall provide written confirmation that good–faith efforts were made to negotiate good neighbor agreements with impacted property owners.

H. **Roads**. Prior to construction, if required, the Applicant shall obtain any permissions required by the Allegan County Road Commission and if requested, post a financial obligation in an amount agreeable to Gun Plain Charter Township to mitigate any impacts to county roads for which the Township is liable for repairs. The Applicant shall submit a copy of a driveway access permit and executed road agreement to the Township, if applicable.

I. **Cooperation with EGLE Award Application**. The Applicant shall cooperate with the Township in providing necessary information and completing necessary forms in order for the Township to apply for the Renewable Ready Communities Award administered by the Michigan Department of Environment, Great Lakes, and Energy.

J. **As-Builts**. Post-construction, the Applicant shall provide post-construction certification to the Township Supervisor and Township Clerk showing that the Project complies with

applicable codes and industry practices and as-built drawings of all the proposed facilities and Project components, such as access roads, fences, inverters, junction boxes, and underground collection system. The as-built drawings shall be provided within a reasonable time following completion of construction as determined by the Zoning Administrator.

K. **Start of Construction.** Special Land Use Permit shall be valid for three (3) years from the date of approval. The Site Plan approval shall be valid for one (1) year from the date satisfaction of all pre-construction conditions as documented by the Township Zoning Administrator. The above approval time frames shall apply unless construction commences prior to the date of expiration, subject to extension of permit or site plan execution periods of the approving body for good cause.

L. **Surety Bond**. The Applicant shall, at its cost, provide and update its surety bond every two (2) years under Section II of Section 17.36. of the Township Zoning Ordinance [BESS Ordinance] to address costs of inflation to the Township, at cost the Applicant, subject to confirmation of the Township's Planning Consultant or Designee. The surety bond shall be held by a creditworthy institution and remain valid and in effect throughout the life of the Project. For the purposes of this Agreement, "creditworthy" shall be defined as a commercial bank or trust company organized under the laws of the United States or a political subdivision thereof or the US branch of a foreign bank, who is not the account party or the account party's affiliate under the Letter of Credit with a "high grade" credit rating as defined by Moody's, Standard and Poor's, or Fitch Ratings, Inc. The Applicant agrees to not release or otherwise revoke its decommissioning surety bond until the new owner, operator and any other successors and assigns provide submits a valid surety bond for 110% of the actual cost of decommissioning the Project and written acceptance of the assigned of the Decommissioning Agreement; salvage value shall not be an acceptable reduction of decommissioning costs.

M. **Complaint Resolution.** The Applicant shall submit to the Township a comprehensive complaint resolution procedure consistent with the MPSC procedures, subject to the approval by the Township Board prior to commencement of construction.

N. **Applicability.** The Project's Special Land Use Permit, including all Conditions of Approval, all approved the Site Plan(s) and modifications, including any conditions of Site Plan approval(s); and, the Decommissioning Agreement, Emergency Response Agreement; and, a Development Agreement shall apply to and bind the Applicant, any successors, assigns, purchasers, transferees or subsequent owners. Any successor, assign, purchaser, transferee or subsequent owner and/or operator shall comply with all of the conditions of the Special Use Permit and Site Plan(s) approval. The Township may enforce any violation of the provisions of this Special Use Permit and/or Site Plan(s) against Applicant or any successors, assigns, purchasers, transferees or subsequent owners as

provided in the Township Zoning Ordinance or as otherwise provided by law. Any violation of these conditions is considered to be a violation of the *Township Zoning Ordinance or other applicable ordinances* shall be considered a nuisance per se and the Township may seek to enjoin such violation and/or otherwise enforce these conditions as provided by law. A memorandum of the Finding of Facts contained within this Resolution and Conditions of Approval and approved Decommissioning, Emergency Response Agreement; and, the Development Agreement shall be recorded in the Allegan County Register of Deeds Office on all participating parcels of the Project.

The Applicant shall notify the Township in writing within thirty (30) days of the time of any transfer of ownership, operator, or maintenance provider via certified mail to:

Gun Plain Charter Township
Attention: Township Supervisor and Township Clerk
381 8th Street
Plainwell, MI 49080

O. Hazard Mitigation Plan. The Applicant shall obtain written approval of the Fire Chief of a Fire Response Plan and an Emergency Response Plan and will provide training for the responding local emergency and fire department services, and all fire departments that provide mutual aid, prior to the start of Project operations. The Emergency Response Plan shall be updated from time-to-time upon the recommendation and approval of the Fire Chief. On-site emergency access and contacts, and equipment protocols shall be provided to local emergency services and fire departments in the event of a fire or other emergency. Local emergency service and fire department training will be held thereafter at the expense of the owner and/or operator, as requested by the emergency services and/or fire department(s) not less than once per calendar year.

P. The Applicant shall reasonably maintain the plant material installed as part of the vegetative buffer for the life of the Project. The Applicant shall replace any dead or diseased plant material by the end of the next growing season if possible, and if not, as soon as reasonably possible and as approved by the Zoning Administrator. The Subject Property shall be mowed twice a month or as needed to maintain ground cover vegetation at a height less than eight (8) inches within the project area.

Q. Sound Study. The Applicant shall provide two sound studies to be approved by the Township Engineer: The first shall be provided prior to construction to determine baseline environmental sound. The second shall be provided to the Township Engineer within 30 days of commencement of operations to verify the operational sound of the BESS complies

with ordinance standards. Failure of the operation to comply with noise levels shall require cessation of operations until such time as all required noise mitigation shall be completed, and a follow up study shall again be provided upon recommencement to verify compliance.

R. **Stacking of Batteries**. Stacking of battery cabinets is prohibited.

S. **Water Quality.** Baseline water quality and composition testing of ground water shall take place prior to construction. Testing shall include but not necessarily be limited to measurements of any contaminants, heavy metals or trace chemicals that could become a detriment to environmental or consumption health at any threshold. Applicant shall provide annual water testing results to the Township Engineer, and within 30 days of any incident which involves a rupture, damage or release of chemicals or toxins upon the premises. A lined catch basin with valve stops as approved by the Township Engineer shall be installed to contain any water runoff created from a thermal runaway event or other such incident which may potentially release contaminated water.

T. **Financial Responsibility.** An escrow of an amount deemed appropriate by the Gun Plain Charter Township shall be deposited with the Township Clerk to cover all costs of project reviews and inspections,and shall be replenished in full prior to construction commencement. The escrow fund shall again be replenished in full prior to any certificate of occupancy being issued or operation commencement.

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CERTIFICATION

STATE OF MICHIGAN)
) ss
COUNTY OF ALLEGAN)

I, the undersigned, the duly qualified and acting Secretary of the Gun Plain Charter Township Planning Commission, Allegan County, Michigan, DO HEREBY CERTIFY that the foregoing is a true and complete copy of certain proceedings taken by the Planning Commission of said Township at a special meeting held on August 10, 2026

Diane M. Webber

By: Diane M. Webber, Secretary
Gun Plain Charter Township Planning Commission

PROOF OF SERVICE

I certify that a copy of this Resolution and attached Exhibits 1-4 was served upon Dominic Evenson, Brian Gammon, and Jordan Lang of Kimley-Horn, representatives for the Applicant, and James Hingston of CIPTerra Technologies by electronic transfer on September 17, 2026.

Lori Castello, AICP
Planner, Gun Plain Charter Township

Findings of Fact - Site Plan Standards of Review

A. Chapter 22 of the Township Zoning Ordinance, titled "Special Land Uses" provides that that review procedure requires a prepared Site Plan reviewed under Chapter 20, "Site Plan Review," Section 20.05, "Criteria for Granting Site Plan Approval."

B. Under Section 20.05 of Site Plan Review the Planning Commission finds:

1. PCI's Report dated April 6, 2026, titled, "Staff Review - Heron Energy Storage LLC" and Supervisor Vandenberg's report attached hereto and contained in Exhibit 2 provides a Summary of Facts; background information; and a Site Plan Review analysis.

2. PCI and Supervisor Vandenberg's Reports indicate that all Site Plan Review standards contained in the BESS Zoning Ordinance [Section 17.36] are **SATISFIED** as outlined within PCI's Report.

3. The Michigan Zoning Enabling Act, being Public Act 110 of 2006, MCL 125.3101. *et seq.* requires that, "[a] Site Plan shall be approved if it contains the information required by the zoning ordinance and is in compliance with the conditions imposed under the zoning ordinance..." MCL 125.3501(5).

NOW THEREFORE BE IT FURTHER RESOLVED, Bennett moved, supported by Webber to **APPROVE** the Site Plan request of Heron Energy Storage, LLC, 200 South Wacker Drive, Suite 1600, Chicago, Illinois 60606, being Site Plan prepared by Kimley-Horn Engineering, dated May 1, 2026, for a 250 mega-watt Large Energy Storage System on the Subject Property located within the Township because the Reports confirmed Site Plan compliance with applicable standards contained in Chapter 20 of the Township Zoning Ordinance standards, conditioned upon site plans TP201, LP202, L101, and L100 be sealed/stamped by a professional engineer confirming its contents.

Roll call: Robert Bennett, Diane Webber, Dana Albertson-Stowell, Kelly McHugh, Wayne Novick, Paul Sullivan, Bill Shannon

Aye:

Nay: 0

Resolution passes: 7-0

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EXHIBIT 1

APPLICATION MATERIALS*

NOTE: Updated site plans have been attached as Exhibit 4 at the end of this document.

Zausmer

ZAUSMER, P.C.
32255 Northwestern Highway, Suite 225
Farmington Hills, MI 48334-1530
(248) 851-4111 · Fax (248) 851-0100

JOHN A. LEWSLEY
Shareholder
jlewsley@zausmer.com

March 18, 2026

UPDATED APPLICATION

VIA HAND-DELIVERY

Gun Plain Charter Township
ATTN: Township Zoning Administrator
381 8th Street
Plainwell, MI 49080

Re: Heron Energy Storage LLC's BESS Facility Special Land Use Permit and Site Plan Application ("Application")

To Whom It May Concern:

Our firm represents Heron Energy Storage LLC ("Applicant"), regarding the aforementioned Application for a battery energy storage system ("BESS") facility ("Project") located on a 23.90 acre portion of Tax Parcel No. 08-034-021-50 which is located on Riverview Drive (the "Property") in Gun Plain Charter Township ("Township"), in Allegan County. The Application requests the approval of a Special Land Use Permit and Site Plan Approval for the Project.

The Project consists of the construction and operation of a 250 MW / 1,000 MWh BESS, which will increase energy availability in Allegan County while also enhancing the resilience of the electric grid and advancing the state's renewable energy goals. Under Michigan law, the Legislature has set a statewide target of having 2,500 MW of energy storage in place by 2030. MCL 460.1101. Once it has been approved and connected to the grid, the Project will significantly advance the state's progress towards meeting that goal. The Project will also supply backup power to critical infrastructure during emergencies, enhancing energy security for this vital infrastructure.

The Project will be housed in enclosures containing racks with battery modules and string inverters, that will be monitored by an Emergency Management System ("EMS") and will be overseen by a control center that operates 24/7. The battery systems used in the Project will operate silently, and the noise produced by the Project will be limited to HVAC units that will be used for temperature regulation. As discussed in the supporting materials provided with the Application, the Project will be subject to safety and security measures, including an electronic security system, smoke detectors, an alarm system, and fire safety protocols. Additionally, the Property is well suited for the Project because of its location near existing electric grid infrastructure.

Under the Township's Zoning Ordinance ("Zoning Ordinance"), the Project meets the definition of a Large Off-Site BESS because it has a nameplate capacity of 50 MW or more and an energy discharge

of 200 MWh or more. The Project is designed to meet or exceed all requirements of the Zoning Ordinance, while mitigating any potential impacts on non-participating properties. The Property is zoned AG, and thus the Project may be approved via a Special Land Use Permit pursuant to the Zoning Ordinance. As detailed in the Application and the accompanying supporting materials, the Project meets all requirements for the issuance of a Special Land Use Permit and Site Plan approval.

The Applicant hereby submits 10 copies of the attached Application and supporting documents for consideration by the Township:

1. A copy of the Completed Signed Applications for Special Land Use and Site Plan Review executed by the Applicant and the Property's owner (**Exhibit 1**);

2. Site Plan Drawings for the Property which satisfy the requirements set forth in Section 17.36, Sections 20.01 to 20.06, and Sections 22.01 to 22.02 of the Zoning Ordinance as applicable to the Project (**Exhibit A to Exhibit 4**);

3. Proof of Payment of Application Fees (**Exhibit 2**);

4. Applicant's General Narrative Statement (**Exhibit 4**);

5. Applicant's Signed Statement Regarding Its Legal Financial Interest in the Property (**Exhibit I to Exhibit 4**);

6. Applicant's Emergency Response Guide (**Exhibit B to Exhibit 4**);

7. Applicant's Fire Response Plan (**Exhibit B to Exhibit 4**);

8. Applicant's Stormwater Report (**Exhibit 3**);

9. Applicant's Decommissioning Plan (**Exhibit H to Exhibit 4**);

10. Applicant's Landscape Plans (**Exhibit C to Exhibit 4**);

Based on our review of the Zoning Ordinance and the information provided below, the Applicant respectfully requests the review and approval of the Application by the Planning Commission. To that end, we request that the Application be reviewed and placed on the Planning Commission's agenda at the first available date. If possible, to expedite this request, we request that a special meeting be scheduled to expedite approval.

I. Site Plan Approval

The Applicant has submitted all materials required under Section 20.04 to Section 20.05 (see Signed Application attached as **Exhibit 1**, Site Plan Drawings attached as **Exhibit 2**, General Narrative Statement attached as **Exhibit 4**, and Signed Statement Regarding Its Legal Financial Interest in the Property attached as **Exhibit I** to **Exhibit 4**).

In addition, a narrative satisfying Section 20.04 and Section 20.05 is set forth below:

Section 20.04.B. Site Plan Information:

1. *Name of development and general location sketch.*

RESPONSE: This requirement is met. See the preceding portion of this letter as well as Exhibit A to Exhibit 4 (Site Plan Drawings).

2. *Name, address and phone number of owner(s), developer, engineer, architect and/or designer.*

RESPONSE: This requirement is met. See Exhibits 1 (Signed Applications) and 4 (Applicant's General Narrative Statement) and Exhibit A to Exhibit 4 (Site Plan Drawings).

3. *North arrow, scale, and date of original drawing and revisions.*

RESPONSE: This requirement is met. See Exhibit A to Exhibit 4 (Site Plan Drawings).

4. *The seal of one of the following professionals registered in the State of Michigan: Registered Architect, Registered Civil Engineer, Registered Landscape Architect, Registered Land Surveyor or Registered Professional Community Planner. The architectural plans of the buildings shall be prepared by and bear the seal of a Registered Architect. A site plan for an alteration or addition to an existing structure may be prepared by the builder or contractor.*

RESPONSE: This requirement is met. See Exhibit A to Exhibit 4 (Site Plan Drawings).

5. *A legal description and address of the property in question.*

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings) See Exhibit 2 (Site Plan Drawings).

6. *The area of the site in square feet and acres excluding all existing and proposed public rights-of-way.*

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

7. *The dimensions of all lots and subject properties, showing the relationship of the subject property to abutting properties, including lots across rights-of-way and easements. The boundaries of the subject property shall be clearly indicated on the site plan, differentiated from other contiguous property. If the parcel is a part of a larger parcel, boundaries of total land holding shall be indicated.*

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

8. *Existing topographic elevations at two foot intervals, including ground elevations of all existing buildings, drives and/or parking lots, and any adjacent unusual surface conditions. Indicate direction of drainage flow.*

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

9. *The location and elevations of existing water courses and water bodies, including county drains and man-made surface drainage ways, floodplains, and wetlands.*

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

10. *Location and type of existing vegetation, including location of all existing trees over five (5) inches in diameter.*

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

11. *Any significant site amenities and unique features.*

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement).

12. *Existing land uses and zoning classification of the subject parcels and adjacent parcels.*

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement).

13. *All required minimum setbacks from the existing or proposed right-of-way and from adjacent lots.*

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement).

14. The location and dimensions (length, width, height) of all existing and proposed structures on the subject property and all existing structures within 100 feet of the subject property.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

15. The location and width of all existing public roads, rights-of-way or private easements of record, abutting streets, alleys, and driveway locations to abutting streets.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

16. With residential proposals, a site summary indicating the number and location of one bedroom units, two bedroom units, etc., typical floor plans with the square feet on floor areas; density computation, recreation facilities, open spaces, street names, and lot coverage.

RESPONSE: N/A. The Project is not a residential proposal.

17. With non-residential proposals, the number of offices, number of employees, the number of floors and typical floor plans and cross sections.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (General Narrative Statement). To further clarify, the Project does not involve the construction of offices, and there will be no regular employees on the Property for day-to-day operations. Instead, the Project's employees will consist of maintenance and repair personnel who work on site as needed.

18. Proposed parking lots including layout and typical dimensions of parking spaces, number of spaces provided (including how computed per ordinance requirements) and type of surfacing.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

19. Location of and dimensions of proposed streets, drives, curb cuts, and access easements, as well as acceleration, deceleration and passing lanes (if any) serving the development.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

20. Proposed traffic and pedestrian circulation patterns, both within the site and on the public streets adjacent to the site and the proposed location and dimensions of any required pedestrian sidewalks. Designate loading and unloading areas, barrier free access, any fire lanes, and carports.

RESPONSE: This requirement is met to the extent applicable to the Project. See Exhibit 2 (Site Plan Drawings). The Project is a BESS facility to be sited entirely on one parcel with fencing and screening enclosing the facility such that no public ingress and/or egress shall be necessary. The

Project will be constructed so as to have minimal impact, if any, on the surrounding public roads and pedestrian areas.

21. Proposed finish grade of buildings, driveways, walkways, and parking lots.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

22. Proposed type of building materials, roof design, projections, canopies and overhangs, roof-located mechanical equipment, such as: air conditioning, heating units and transformers that will be visible from the exterior.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

23. Proposed water service including any proposed tap ins, main extensions or extensions for adequate fire hydrant spacing, and/or considerations for extensions to loop other public water mains.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

24. Proposed sanitary sewer facilities and the location of all existing utilities, easements and the general placement of lines, manholes, tap-ins, pump stations, and lift stations.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

25. Proposed storm water management plan including design of sewers, outlets (enclosed or open ditches), and retention or detention ponds. Sufficient data regarding site run-off estimates and off-site drainage patterns shall be provided to permit review of feasibility and permanency of drainage detention and/or retention as well as the impact on local surface and groundwater. The plan shall indicate location and status of any floor drains in structures on the site. The point of discharge for all drains and pipes should be specified on the site plan.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 3 (Stormwater Report).

26. Locations of existing and proposed fire hydrants with reasonable access thereto for fire fighting, police and other emergency equipment.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

27. Location of all other utilities on the site including but not limited to natural gas, electric, cable TV, telephone and steam.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

28. Soil erosion and sedimentation control measures.

RESPONSE: Not Applicable. Applicant will work with the EGLE Water Quality Division and Allegan County throughout the course of this Application's approval process to ensure all necessary measures are taken. Though not prepared at this stage, construction plans will describe the detailed plans for drainage and erosion control. The Applicant will maintain an open line of communication with the appropriate reviewing authorities to ensure compliance with all measures deemed necessary.

29. Detailed landscaping plan indicating location, types and sizes of material.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

30. All proposed screening and free standing architectural walls, including typical cross-sections and the height above ground on both sides.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

31. The dimensions and location of all signs, both wall signs and free-standing signs and of lighting structures and shielding.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings) and Exhibit E to Exhibit 4 (Photometric Plan). The Project will have lot lighting, and Applicant has prepared a Lighting Plan in compliance with exterior lighting standards, complete with detail insert for lighting fixture showing Kelvins and the method of shielding. Applicant does not anticipate any light impacts at the property lines.

32. Location, size and specifications for screening of all trash receptacles and other solid waste disposal facilities.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

33. Location and specifications for any existing or proposed outdoor or below ground storage facilities as well as any screening or containment structures or clear zones required by government authorities.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

34. Easements for proposed public rights-of-way, utilities, access, shared access, and drainage.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

35. Notation of any variances which have been or must be secured.

RESPONSE: N/A. No variances are anticipated for this Project.

36. Notation of performance guarantees to be provided including amounts, types, and terms.

RESPONSE: This requirement is met. See Exhibit 10 (Decommissioning Plan).

37. Statement that applicant will comply with state, local and federal laws, as applicable to the site or intended use.

RESPONSE: The Applicant will comply with state, local, and federal laws as applicable to the Project and Property.

38. Information and special data which may be critical to the adequate review of the proposed use and its impacts on the site or Township. Such data requirements may include traffic studies, market analysis, environmental assessments (including inventory and impact data on flora, fauna, natural resources, hazardous materials, erosion control and pollution), demands on public facilities and services, impact on historical or cultural resources, displacement of people or other uses as a result of the proposed development, alterations of the character of the surrounding area, effect on the Township's tax base and adjacent property values, or other data which the Township may reasonably deem necessary for adequate review.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (General Narrative Statement). Upon completion, the Project will consist of a BESS facility, fencing, and interconnection transmission line/collector substation. The BESS facility will consist of lithium iron phosphate batteries installed in racks; inverters; medium-voltage transformers; switchgear; a collector substation; and other associated equipment to interconnect into the point of interconnection. The batteries will be installed in purpose-built enclosures designed for aesthetic compatibility with the surrounding area. The enclosures will have battery storage racks with relay and communications systems for automated monitoring and managing of the batteries to ensure design performance. A battery management system will be provided to control the charging/discharging of the batteries along with temperature monitoring and control of the individual battery cell temperature with an integrated cooling system monitored 24/7. Batteries operate with direct current (DC) electricity that must be converted to alternating current (AC) for

compatibility with the existing electric grid. Power inverters to convert between AC and DC, along with transformers to step up the voltage, will be included.

To further clarify, no traffic impacts are expected due to the nature of the Project which will not require any day-to-day presence by a workforce after it is constructed and operation. Additionally, the Project is anticipated to result in an increase to the Township's tax base and have no impact on adjacent property values.

And no displacement or any impact to the character of the surrounding area is expected to occur for the same reason; the Project will be adequately screened and will be consistent with the character of the area, which is already the site of existing electric grid infrastructure.

39. The size, location and description of any proposed interior or exterior areas or structures for storing, using, loading or unloading of hazardous substances. A listing of types and quantities of hazardous substances which will be used or stored on-site in quantities greater than 100 kilograms or 25 gallons per month.

RESPONSE: N/A. The Project does not involve the storing, using, loading, or unloading of hazardous substances.

40. Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of the cleanup.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings). To further clarify, Applicant has conducted a preliminary environmental site assessment which did not reveal any recognized environmental conditions on the Property. The Applicant will also conduct all other appropriate environmental inquiries in connection with the Project.

41. Plans depicting existing and proposed building elevations.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

42. For developments that are of a scale to warrant phased development, the phasing of construction shall be indicated. A detailed site plan need be submitted only for that portion of the property for which a building permit will be applied for; a general site plan which clearly indicates the overall project intent may be submitted for the remainder of the site.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement). To further clarify, only a single construction phase is anticipated, as explained in Applicant's General Narrative Statement.

43. Building elevations of the proposed structure(s) from each direction shall be shown.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

Section 20.05 Criteria for Granting Site Plan Approval

Each site plan shall conform to all applicable provisions of this Ordinance. The following criteria shall be used by the Planning Commission as a basis upon which site plans will be reviewed and approved. The Township shall adhere to sound planning principles, yet may allow for design flexibility in the administration of the following standards:

A. All elements of the site shall be harmoniously and efficiently designed in relation to the topography, size, and type of land, and the character of the adjacent properties and the proposed use. The site shall be developed so as not to impede the reasonable and orderly development or improvement of surrounding properties for uses permitted on such property.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement). Additionally, the Project meets all screening and setback requirements under the Zoning Ordinance, and will be harmonious with the character of the adjacent non-participating properties which are already located near existing electric grid infrastructure. The Project site was specifically chosen due to the proximity to the point of interconnection and nearby electric grid infrastructure. As explained in the Application and supporting materials, the site will be developed in a way that will mitigate potential impacts on surrounding non-participating properties and will not impact the uses permitted on these properties.

B. The site plan shall comply with the zoning district requirements for minimum floor space, height of building, lot size, open space, density and all other requirements as set forth in this Ordinance.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

C. The existing natural landscape shall be preserved in its natural state as much as possible, by minimizing tree and soil removal and by topographic modifications that result in maximum harmony with adjacent properties.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

D. The site plan shall provide reasonable visual and sound privacy. Fences, walls, barriers, and landscaping shall be used, as appropriate, for the protection and enhancement of property and the safety and privacy of occupants and users. Where landscaping is provided, there must be provision for

maintaining all plantings through a regular program of fertilizing, irrigating, pruning, mowing and replacing all dead and diseased materials.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement), and Exhibit C to Exhibit 4 (Landscape Plans).

E. All buildings or groups of buildings shall be so arranged as to permit convenient and direct emergency vehicle access.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings).

F. There shall be a pedestrian circulation system that is insulated as completely as possible from the vehicular circulation system. In order to insure public safety, pedestrian underpasses or overpasses may be required in the vicinity of schools, playgrounds, local shopping facilities, and other uses that generate considerable amounts of pedestrian movement.

RESPONSE: This requirement is met as applicable to the Project. See Exhibit 2 (Site Plan Drawings) for circulation plans as applicable to the Project. To further clarify, pedestrian and public access to the Property is not contemplated as part of the Project, and there are no nearby schools, playgrounds, local shopping facilities, and other uses that generate considerable amounts of pedestrian movement.

G. All streets shall be developed in accordance with the Township Subdivision Regulations and the Allegan County Road Commission design specifications. The arrangement of public or common ways for vehicular and pedestrian circulation shall respect the pattern of existing or planned streets or pedestrian or bicycle pathways in the vicinity of the site. Streets and drives that are a part of an existing or planned street system serving adjacent developments shall be of an appropriate width to accommodate the volume of traffic they are planned to carry and shall have a dedicated right-of-way equal to that as specified by the Township. The applicant may be required to dedicate adequate land and improvements to the Township in order to achieve access which is safe and convenient.

RESPONSE: N/A. No developments of streets are proposed as part of the Project.

H. Special attention shall be given to proper site drainage. Appropriate measures shall be taken to insure that the removal of surface waters will not adversely affect adjacent lots or the capacity of the public or natural storm drainage system. Provisions shall be made for a feasible storm drainage system, the construction of storm-water facilities, and the prevention of erosion and dust. In addition, special attention shall be given to the installation of appropriate fencing and other safety measures adjacent to and surrounding stormwater retention and detention areas. Surface water on all paved areas shall be collected at intervals so that it will not obstruct the flow of vehicles or pedestrian traffic and will not create nuisance

ponding in paved areas. Where possible and practical, drainage design shall recognize existing natural drainage patterns. Final grades may be required to conform to existing or future grades of adjacent properties.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 3 (Stormwater Report).

I. All off-street parking, loading and unloading areas and outside storage areas, including areas for storage of trash, that face or are visible from adjacent residential districts or public thoroughfares, shall be screened by walls, fencing or landscaping of effective height as required within the landscape provisions of this Ordinance.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement), and Exhibit C to Exhibit 4 (Landscape Plans).

J. Exterior lighting shall be so arranged and limited in intensity and height so that it is deflected away from adjacent lots and so that it does not impede vision of drivers along adjacent streets. All exterior lighting shall be recessed within the fixture or structure in which it is attached.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement), and Exhibit E to Exhibit 4 (Photometric Plan). Applicant has submitted a Lighting Plan for lot lighting in compliance with all exterior lighting requirements in the Zoning Ordinance; and Applicant does not anticipate any light impacts at the property lines.

K. Adequate services and utilities including sanitary sewers, and improvements shall be available or provided, located and constructed with sufficient capacity and durability to properly serve the development.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement). The Project is not anticipated to have significant impacts and/or needs related to water, beyond the possibility of the relatively small needs related to maintenance of vegetation areas. All site development related to utilities shall be designed and constructed to support emergency response, such as fire suppression.

L. Any use permitted in any zoning district must comply with all applicable requirements of state, local, and federal statutes including health and pollution laws and regulations with respect to noise, smoke and particulate matter, vibration, noxious and odorous matter, glare and heat, fire and explosive hazards, gases, electromagnetic radiation and drifting and airborne matter, toxic and hazardous materials, erosion control, floodplains, wetlands, and requirements of the State Fire Marshal. Site plan approval may be conditioned on the applicant receiving necessary state and federal permits before final site plan approval or an occupancy permit is granted.

RESPONSE: This requirement is acknowledged, and Applicant will seek and comply with all necessary state and federal permits that are applicable to the Project.

M. An objective of site plan review shall be to protect and to promote public health, safety and general welfare by requiring the screening, buffering and landscaping of sites and parking lots which will serve to reduce wind and air turbulence, heat and noise, and the glare of automobile lights; to preserve underground water reservoirs and return precipitation to the ground water strata; to act as a natural drainage system and solve storm water drainage problems; to reduce the level of carbon dioxide and return oxygen to the atmosphere; to prevent soil erosion; to provide shade; to conserve and stabilize property values; to relieve the stark character of parking lots; to conserve energy, provide visual and sound privacy and to otherwise facilitate the preservation and creation of a healthful, convenient, attractive and harmonious community.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings), 4 (Applicant's General Narrative Statement), and 3 (Stormwater Report). Construction plans will include measures to prevent soil erosion and sedimentation and the Applicant will maintain an open line of communication with the appropriate reviewing authorities to ensure compliance with all measures deemed necessary. Applicant's contractors shall post OSHA signage where noise levels exceed reasonable decibel (dBA) levels for construction activities, which is estimated to be at 85 dBA at 3ft for near-field noise. All efforts will be made by Applicant and its contractors during construction to curtail the production of dust, noise, fumes, vibrations, smoke or lights. The Project is not anticipated to increase effluent discharge to the air. Additionally, the Project will be harmonious with the non-participating properties which are already adjacent to existing electric grid infrastructure, and the Project will support the surrounding area by enhancing the gird and ensuring energy security. Impacts from the Project on non-participating properties will be mitigated by meeting the screening and setback requirements established by the Zoning Ordinance, and there will be essentially no day-to-day activity on the Property after the Project is operational and placed into service.

N. It is an objective of site plan review to improve the quality of existing developments as they are expanded, contracted, redeveloped or changed in keeping with sound site development standards of the Township and with the Township Master Plan.

RESPONSE: This requirement is acknowledged. Additionally, the Project is consistent with the existing electric grid infrastructure which is already located near the Property.

O. A major objective shall be to retain, enhance and protect the quality, value and privacy of all residential land uses.

RESPONSE: This requirement is acknowledged. Additionally, the Project is consistent with the existing electric grid infrastructure which is already located near the Property. Impacts from the Project on non-participating properties will be mitigated by meeting the screening and setback

requirements established by the Zoning Ordinance, and there will be essentially no day-to-day activity on the Property after the Project is operational and placed into service. See Exhibit 4 (Applicant's General Narrative Statement) for additional information.

P. All development phases shall be designed in logical sequence to insure that each phase will independently function in a safe, convenient and efficient manner without being dependent upon improvements of a subsequent development potential of lands.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement).

Q. All sites shall be designed to comply with state and local barrier- free requirements and to reasonably accommodate the handicapped and elderly.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan Drawings). ADA parking stalls are provided.

II. Special Use Approval

The Applicant has submitted all materials required under Section 22.01 to Section 22.02 (see Site Plan Drawings attached as **Exhibit 2**, this Zoning Compliance Letter, and Applicant's General Narrative Statement attached as **Exhibit 4**).

In addition, a narrative satisfying Section 22.01 and Section 22.02 is set forth below:

Section 22.01.E Standards for Granting Special Use Approval.

Approval of a special land use permit shall be based on the determination that the proposed use will comply with all requirements of this ordinance, including site plan review criteria set forth in Chapter 20. In addition, the following standards shall be met:

1. *The location, scale, and intensity of the proposed use shall be compatible with adjacent uses and zoning of land.*

RESPONSE: **This requirement is met. Upon completion, the Project will consist of BESS facility that will be adequately screened from the adjacent non-participating properties. The Project site has been selected because of its proximity to nearby electric grid infrastructure, and thus this use is consistent with the existing uses in the immediate area. Due to the nature of BESS facilities, this will be a low intensity use because there will essentially be no day-to-day activity at the Project site following the completion of construction, and thus activity at the Project site will be limited to maintenance and repairs.**

2. *The proposed use shall promote the use of land in a socially and economically desirable manner. The proposed use shall not adversely impact the social and economic well-being of those who will use the proposed land use or activity; residents, businesses, and landowners immediately adjacent; or the Township as a whole.*

RESPONSE: Applicant does not anticipate any adverse effects or nonconformance with existing and potential development patterns. The Project site is an already cleared agricultural field. Applicant's development will not impede visibility or otherwise interfere with neighboring parcel's uses, and the Project will be sufficiently set back and screened from adjacent non-participating properties. Additionally, the Project is consistent with the existing electric grid infrastructure in the area, including a nearby substation and electric transmission line corridor.

3. *The proposed special land use shall be compatible with and in accordance with the general principles and future land use configuration of the Gun Plain Charter Township Master Plan and shall promote the intent and purpose of this Ordinance.*

RESPONSE: This requirement is met. Upon completion, the Project will consist of BESS facility that will be adequately screened from the adjacent non-participating properties. Further, the Township recently enacted a BESS Ordinance, which indicates that the Project is compatible with the general principles and land use configuration of the Township.

4. *The Planning Commission shall find that a need for the proposed use exists in the community at the time the special land use application is considered.*

RESPONSE: This requirement should be deemed met. The Project will increase energy availability in Allegan County while also enhancing the resilience of the electric grid and advancing the state's renewable energy goals. Under Michigan law, the Legislature has set a statewide target of having 2,500 MW of energy storage in place by 2030. MCL 460.1101. Once it has been approved and connected to the grid, the Project will significantly advance the state's progress towards meeting that goal. The Project will also supply backup power to critical infrastructure during emergencies, enhancing energy security for this vital infrastructure.

5. *The proposed use shall be designed, constructed, operated and maintained so as to assure long-term compatibility with surrounding land uses. Consideration shall be given to:*

   - The size, placement, and materials of construction of the proposed use in relation to surrounding uses.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (General Narrative Statement). Upon completion, the Project will consist of a BESS facility, fencing, and interconnection transmission line/collector substation. The BESS facility will consist of lithium iron phosphate batteries installed in racks; inverters; medium-voltage transformers; switchgear; a collector substation; and other associated equipment to interconnect into the point of interconnection. The batteries will be installed in purpose-built enclosures designed for aesthetic compatibility with the surrounding area. The enclosures will have battery storage racks with relay and communications systems for automated monitoring and managing of the batteries to ensure design performance. A battery management system will be provided to control the charging/discharging of the batteries along with temperature monitoring and control of the individual battery cell temperature with an integrated cooling system monitored 24/7. Batteries operate with direct current (DC) electricity that must be converted to alternating current (AC) for compatibility with the existing electric grid. Power inverters to convert between AC and DC, along with transformers to step up the voltage, will be included.

- The location and screening of vehicular circulation and parking areas in relation to surrounding development.

RESPONSE: This requirement is met to the extent applicable to the Project. See Exhibit 2 (Site Plan Drawings). The Project is a BESS facility to be sited entirely on one parcel with fencing and screening enclosing the facility such that no public ingress and/or egress shall be necessary. The Project will be constructed so as to have minimal impact, if any, on the surrounding public roads and pedestrian areas.

- The location and height of buildings; the location, nature and height of walls and fences; and the nature and extent of landscaping.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement), and Exhibit C to Exhibit 4 (Landscape Plans). The Project will be surrounded by fencing and landscaping as detailed on the Applicant's Site Plan and Landscape Plans.

- The location and screening of outdoor storage, outdoor activity or work areas, and mechanical equipment in relation to surrounding development.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan Drawings) and 4 (Applicant's General Narrative Statement), and Exhibit C to Exhibit 4 (Landscape Plans). The Project will be screened by fencing and landscaping as detailed on the Applicant's Site Plan and Landscape Plans.

- The hours of operation of the proposed use. Approval of a special land use may be conditioned upon operation within specified hours considered appropriate to ensure minimal impact on surrounding uses.

RESPONSE: This requirement is met. There will be no regular employees on the Property for day-to-day operations. Instead, the Project's employees will consist of maintenance and repair personnel who work on site as needed. Further, Battery systems operate silently, with noise limited to HVAC units required for temperature regulation. And the Project will be housed in enclosures containing racks with battery modules and string inverters, that will be monitored by an Emergency Management System ("EMS") and will be overseen by a control center that operates 24/7. The

6. *The location of the proposed special land use within the zoning district shall minimize the impact of the traffic generated by the proposed use. Consideration shall be given to the following:*

   - *Proximity and access to major thoroughfares.*
   - *Estimated traffic generated by the proposed use.*
   - *Proximity and relation to intersections.*
   - *Location of and access to off-street parking.*
   - *Required vehicular turning movements.*
   - *Provision for pedestrian traffic.*

RESPONSE: This requirement is met. No traffic impacts are expected due to the nature of the Project which will not require any day-to-day presence by a workforce after it is constructed and operation. The Project will be accessed by a gravel driveway as detailed on the Site Plan and will not require any off-street parking or provision for pedestrian traffic because it will not be made open and available to the public.

7. *The proposed special land use shall be consistent with existing and future capabilities of public services and facilities affected by the proposed use.*

RESPONSE: This requirement is met. The Project is not anticipated to have significant impacts and/or needs related to public services, beyond the possibility of the relatively small water needs related to maintenance of vegetation areas. All site development related to utilities shall be designed and constructed to support emergency response, such as fire suppression. See Exhibit 2 (Site Plan).

8. *The proposed use shall not involve any activities, processes, materials, equipment, or conditions of operation, and shall not be located or designed so as to be detrimental to public health, safety, and welfare. Site layout shall be such that operations will not be objectionable to nearby dwellings by reason of noise, fumes, glare or flashing lights.*

RESPONSE: This requirement is met. The Project is a BESS facility that will improve the public health, safety, and welfare by enhancing the electric grid and increasing energy security in Allegan County. The Project's site layout will not be objectionable to nearby dwellings as no fumes will be

emitted. The battery systems used in the Project will operate silently, and the noise produced by the Project will be limited to HVAC units that will be used for temperature regulation. The Project's minimal light and noise will be consistent with the descriptions provided in the Applicant's Noise Study and Lighting Plan, see Exhibits G (Noise Study) and E to Exhibit 4 (Photometric Plan). The Project will have lot lighting, and Applicant has prepared a Lighting Plan in compliance with exterior lighting standards, complete with detail insert for lighting fixture showing Kelvins and the method of shielding.

9. The proposed use shall be compatible with the natural environment.

RESPONSE: This requirement is met. The Project site is an already cleared agricultural field, and its development will be harmonious with the surrounding natural environment. The Project will be screened by fencing, landscaping, and setbacks, and will otherwise be consistent with the nearby electric grid infrastructure. Additionally, the Project's environmental benefits as a BESS facility include reduced greenhouse gas emissions and improving overall electric grid system efficiency.

III. BESS Ordinance Requirements

The Applicant has submitted all materials required under Section 17.36 (see Site Plan Drawings attached as **Exhibit 2**, this Zoning Compliance Letter, and Applicant's General Narrative Statement attached as **Exhibit 4**) to satisfy the requirements of the Township's BESS Ordinance.

In addition, a narrative satisfying Section 17.36 is set forth below:

Section 17.36.II.1

1. Site Selection. In the "AG" Agricultural District, this land use shall not unreasonably diminish farmland, including, but not limited to, prime farmland and, to the extent that evidence of such farmland is available in the evidentiary record, farmland dedicated to the cultivation of specialty crops.

RESPONSE: This requirement is met. See Exhibit K to Exhibit 4 (Farmland Classification). To further clarify, the Project will disturb a de minimis amount of prime farmland, and given that the Project as a whole is sited on a Property that is only around 25 acres, the Project will have no impact on the overwhelming majority of farmland acreage in the Township.

2. Energy Storage Systems, Small shall be allowed as a special land use in the following zoning districts:

A. AG Agricultural

B. I-1 Industrial

RESPONSE: N/A. The Project is an Energy Storage Systems, Large facility.

3. Energy Storage Systems, Large shall be allowed as a special land use in the following zoning districts:

A. AG Agricultural

B. I-1 Industrial

RESPONSE: This requirement is met. The Property is zoned AG.

4. The following minimum setbacks shall be required. Setbacks are measured from the nearest facility structure to the nearest point on the associated item:

A. 100 feet from any property line of a non-participating property

B. 300 feet from the nearest point on the outer wall of a dwelling on nonparticipating property.

C. 50 feet measured from the nearest edge of a public road right-of-way.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan).

5. Height. The height of energy storage system structures, except for electric distribution and transmission poles, shall not exceed a height of twenty (20) feet as measured from the natural grade of the property beneath the structure. Stacking of energy storage system components is prohibited.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan).

6. Fencing. The system shall be completely enclosed with fencing in compliance with the latest version of the National Electrical Safety Code or any applicable successor standard approved by the Michigan Public Service Commission.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan).

7. Sound. The system may not generate a maximum sound in excess of 55 average hourly decibels as measured at the property line of an adjacent non-participating property. Decibel modeling shall use the A- weighted scale designed by the American National Standards Institute. The Planning Commission shall require the applicant to provide a sounds study as part of the special land use review process.

RESPONSE: This requirement is met. See Exhibit G attached to Exhibit 4 (Noise Study). Additionally, the battery systems used in the Project will operate silently, and the noise produced by the Project will be limited to HVAC units that will be used for temperature regulation.

8. Lighting. The system must implement dark sky-friendly lighting solutions.

RESPONSE: This requirement is met. See Exhibit E to Exhibit 4 (Photometric Plan).

9. Impacts of Energy Storage System, Small and Large Energy Storage System.

A. The following requirements shall apply to the entire system, or to designated components of the system, as indicated:

1. Safety Signage. The system shall post signs in compliance with NFPA 70/70Eor any applicable successor code in place at the time of application for approval. Additionally, signage shall be provided per NFPA 855 7.4.4, or any applicable successor code in place at the time of application for approval, including information on the system type and technology, special hazards, fire suppression system and 24-hour emergency contact information, including reach-back phone number. A clearly visible warning sign concerning voltage shall be placed at the base of all pad-mounted transformers and substations.

2. Other Signage: Additional signage may be permitted or required by the Planning Commission as is necessary to ensure the safe operation of the system.

3. The facility shall comply with NFPA 855 "Standard for the Installation of Stationary Energy Storage Systems" or any applicable successor standard adopted by the Michigan Public Service Commission.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan) and 4 (Applicant's General Narrative Statement).

B. The Planning Commission shall require reasonable measures to minimize visual impacts by preserving existing natural vegetation, requiring new vegetative screening or other appropriate measures. The Planning Commission shall determine such visual screening measures as may be required on a site-specific basis pursuant to the standards for Special Land Use approval as specified in Section 17.36, the landscaping and screening standards of Chapter 21 Section 21.01-21.10, and/or the standards for site plan approval as specified in Chapter 20 Section 20.01-20.06 of the Zoning Ordinance of 2002 as Amended by Gun Plain Charter Township Board. In making this determination the Planning Commission is specifically authorized to consider whether additional visual screening measures are appropriate where a system is proposed to be located on property adjacent to a residential use and/or a residential district zoning classification. All screening/landscaping shall be properly maintained throughout the life of the project including replacement of any dead landscaping within six months.

RESPONSE: This requirement is acknowledged. The Applicant believes that the satisfaction of existing screening and landscaping requirements should be sufficient here given the location of the Project site as well as the nearby existing electric grid infrastructure. Moreover, the Project is sufficiently distant from existing residential uses such that additional screening is not warranted.

C. If the system includes an access drive(s) for maintenance purposes, the surface of the access drive(s) shall be permeable (unless on brownfield land or on an already paved surface at the time of application for approval, such as a parking lot or former building foundation.)

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan). The Project proposes the development of a gravel access drive.

D. Subject to approval of the Planning Commission, the area within which the system is located shall not be paved with asphalt/concrete or any other surface material that is impermeable to water other than for slab foundations for structures and equipment. This shall not apply to a system located on brownfield land or on an existing paved area such as a former building slab or in an unused parking area when adequate parking remains for all other uses on the site.

RESPONSE: This requirement is met. See Exhibit 2 (Site Plan).

E. All surface water runoff created by construction and operation of the project shall be effectively managed on-site.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan) and 4 (Applicant's General Narrative). On-site drainage areas have been delineated, and detention basins are proposed in each to provide the required storage to accommodate the runoff volume from the specified storm event. A specific drainage plan for the project which meets the requirements of Allegan County Drainage Commission can be found in the Site Plan Package attached to this application.

8. Installation and Operational Safety. The system shall comply with all of the following requirements:

A. The system shall be designed and constructed for interconnection to a Michigan Public Service Commission or Midcontinent Independent System Operator regulated utility electrical power grid and shall be operated with such interconnection.

B. The system and all foundation elements shall comply with all applicable building and electrical code requirements, and any applicable federal/state regulations. The manufacturer's engineer or another qualified engineer shall provide written certification that the design, installation (including foundations), and interconnection is compliant with the manufacturer and industry standards, all applicable local construction and electrical codes, and any applicable federal/state regulations.

C. Other than transmission or distribution lines for interconnection to the electric power grid, all electrical wiring shall be buried underground; except where the manufacturer's engineer or a qualified engineer employed by the utility that owns/operates the electrical power grid to which the system shall be interconnected certifies an underground wiring

installation is not permitted by an applicable code and/or applicable federal/state regulation, with attached complete documentation supporting any such certification.

D. The system shall be designed, located, and maintained so as to comply with all applicable codes and regulations.

RESPONSE: This requirement is met. See Exhibits 2 (Site Plan) and 4 (Applicant's General Narrative). The Project will interconnect the BESS system yard via multiple medium voltage underground feeders. The customer substation yard will house a Generator Step Up transformer that will step up the voltage from the BESS yard, up to the interconnection voltage of 120 kV. The proposed substation yard will include an electrical control house; an operational building used to control/monitor the substation. It houses ancillary equipment for systems necessary for the overall function of a substation. Such systems include control relays, server racks, telecommunications and technical security, fire alarm and protection, etc. It will occupy approximately 588 square feet within the customer substation yard.

A generator intertie will be interconnected at 120 kV from the customer substation to the point of interconnection at an existing electric utility substation 0.44 miles to the west. The exact gen-tie route will be determined by other entities as the project progresses. As shown on the Site Plan, the proposed substation will be enclosed by a 6-foot chain link fence, located within the designated building envelope.

9. Public Safety. The Emergency Response Plan and Fire Response Plan shall provide reasonable protection of the public health, welfare and safety including but not limited an internal fire suppression system, an emergency shutdown procedure in place and shall provide the local fire department site safety plans to include electrical, fire, smoke, and hazardous materials release, emergency response protocols and identification of typical hazards related to, electrical, fire, smoke and hazardous materials pertinent to the facility. Upon request, all systems shall provide first responder training at the site.

RESPONSE: This requirement is met. See Exhibit B (Fire Response Plan and Emergency Response Guide) to Exhibit 4. As stated in these documents, the Applicant will coordinate with the local fire department to provide a collaborative approach to emergency responses. The project applicant will also implement the following measures during project construction and operation:

- **All applicable Allegan County and Gun Plain Charter Township standards and requirements will be followed to ensure accessibility and ground clearance of emergency vehicles (e.g., fire engines)**
- **Smoking will be prohibited at the project site, except within designated areas.**

- **Work crews will be required to park vehicles away from flammable vegetation such as dry grass and brush. At the end of each workday, heavy equipment will be required to be parked over gravel, mineral soil, asphalt, or concrete where available to reduce the risk of fire.**

- **All heavy equipment will be required to include mechanisms for fire suppression, including spark arresters or turbocharging (which eliminates sparks in exhaust) and fire extinguishers.**

10. Repair and Augmentation. In addition to repairing or replacing facility components to maintain the system, the facility may at any time be augmented without the need to submit a new site plan so long as the augmentation is within the same footprint (e.g., same dedicated use building or on footings/foundations in the same location) as the original permit. If there is a change in the energy storage system chemistry, an updated Hazard Mitigation Analysis and Emergency Operation Plan shall be provided. When a facility is anticipated to be augmented over its lifetime by adding additional components, the applicant shall apply for the final/augmented site arrangement. A proposal to increase the size the project footprint may be considered a new application, subject to the ordinance standards at the time of the request.

RESPONSE: The Applicant acknowledges and will comply with this requirement.

11. Decommissioning and Removal. A decommissioning plan is required at the time of application.

A. The decommission plan shall include:

i. The anticipated manner in which the project will be decommissioned, including a description of which above-grade and below-grade improvements will be removed, retained (e.g., access drive, fencing), or restored for viable reuse of the property consistent with the zoning district. Pursuant to this requirement, the decommissioning plan shall be required to include that any structures up to forty-eight (48) inches below-grade shall be removed for disposal.

ii. The projected decommissioning costs shall reflect the estimated current cost and any future anticipated costs of the decommissioning project. Salvage value shall not be included in the cost to decommission the project.

iii. The method of ensuring that funds will be available for site decommissioning and stabilization (in the form of surety bond or cash deposit).

RESPONSE: This requirement is met. See Exhibit H (Decommissioning Plan) to Exhibit 4.

B. A review of the amount of the surety bond, based on inflation, and current removal costs shall be completed every 2 years, for the life of the project, and approved by the Planning Commission. A Energy Storage System owner may at any time:

i. Proceed with the decommissioning plan approved by the Planning Commission, and remove the system as indicated in the most recent approved plan; or

ii. Amend the decommissioning plan with Planning Commission approval and proceed according to the revised plan.

RESPONSE: The Applicant acknowledges and will comply with this requirement.

C. Decommissioning of an Energy Storage System must commence when the soil is dry to prevent soil compaction and must be complete within 12 months after abandonment. An Energy Storage System that has not operated for 12 consecutive months shall prompt an abandonment hearing.

i. Restoration shall include bringing soil and topography of the land to their pre-development composition unless the Planning Commission waives any part of this requirement to ensure permitted uses upon restoration. Soil tests shall be required as part of the decommissioning plan both before development and prior to the decommissioning.

RESPONSE: The Applicant acknowledges and will comply with this requirement.

12. Special Land Use Permit and Site Plan Application Requirements. Applications for Special Land Use permit approval shall comply with Chapter 22, Section 22.01-22.02 of the Zoning Ordinance of 2002 as Amended by Gun Plain Charter Township Board. A formal application for site plan approval for this land use shall comply with Chapter 20 Section 20.01-20.06 of the Zoning Ordinance of 2002 as Amended by Gun Plain Charter Township Board. An incomplete application will not be accepted by the Planning Commission. Each such application shall also be subject to the following additional submission requirements:

A. The complete name, address, and telephone number of the applicant.

RESPONSE: This requirement is met. See Exhibits 1 (Signed Applications), 2 (Site Plan Drawings), and 4 (Applicant's General Narrative Statement).

B. The planned date for the start of construction and the expected duration of construction.

RESPONSE: This requirement is met. See Exhibit 4 (Applicant's General Narrative Statement).

C. A description of the system, including a site plan as described in Section 224 of the Clean and Renewable Energy Waste Reduction Act, 2008 PA 295, MCL 460.1224. The following items must be shown on the site plan:

i. A map of all properties upon which any component of a facility or ancillary feature would be located, and all properties within one thousand (1,000) feet. This should indicate the location of all existing structures and shall identify such structures as occupied or vacant.

ii. Lot lines and required setbacks shown and dimensioned including horizontal and vertical elevation drawings that show the location and height of the Energy Storage System on the land and dimensions of the Energy Storage System.

iii. Size and location of existing and proposed water utilities, including any proposed connections to public, or private community sewer or water supply systems.

iv. A map of any existing overhead and underground major facilities for electric, gas, telecommunications transmission within the facility and surrounding area

v. The location and size of all surface water drainage facilities, including source, volume expected, route, and course to final destination.

vi. A map depicting the proposed facilities, adjacent properties, all structures within participating and adjacent properties, property lines, and the projected sound isolines along with the modeled sound isolines including the statutory limit.

RESPONSE: This requirement is met. See Exhibits 1 (Signed Applications), 2 (Site Plan Drawings), and 4 (Applicant's General Narrative Statement).

D. A description of the expected use of the system.

RESPONSE: This requirement is met. See Exhibit 4 (Applicant's General Narrative). The Project, as a BESS facility enhance grid stability, optimize energy utilization, and facilitate renewable energy integration. The BESS will provide essential services such as frequency regulation, voltage support, and additional capacity during peak demand periods, ensuring compliance with regulatory standards. By storing energy during off-peak hours and discharging during peak demand, the system will improve generation efficiency, reduce costs, and manage local peak loads, which will help defer expensive transmission and distribution upgrades.

E. Expected public benefits of the proposed system.

RESPONSE: This requirement is met. See Exhibit 4 (Applicant's General Narrative). And as stated above, the Project will increase energy availability in Allegan County while also enhancing the resilience of the electric grid and advancing the state's renewable energy goals. Under Michigan law, the Legislature has set a statewide target of having 2,500 MW of energy storage in place by 2030. MCL 460.1101. Once it has been approved and connected to the grid, the Project will significantly advance the state's progress towards meeting that goal. The Project will also

supply backup power to critical infrastructure during emergencies, enhancing energy security for this vital infrastructure.

F. Information on the effects of the proposed system on public health and safety.

RESPONSE: This requirement is met. See Exhibit 4 (Applicant's General Narrative). And as stated above, the Project will increase energy availability in Allegan County while also enhancing the resilience of the electric grid and advancing the state's renewable energy goals. The Project will also supply backup power to critical infrastructure during emergencies, enhancing energy security for this vital infrastructure.

G. A description of the portion of the community where the system will be located.

RESPONSE: This requirement is met. See Exhibit 4 (Applicant's General Narrative).

H. The expected direct impacts of the proposed system on the environment and natural resources and how the applicant intends to address and mitigate these impacts.

RESPONSE: No significant environmental or natural resources are expected because the Property is currently an already cleared agricultural property. The Applicant will comply with all applicable federal and state environmental laws to secure any required permits or other regulatory approvals.

I. A statement and reasonable evidence that the proposed system will not commence commercial operation until it complies with applicable state and federal environmental laws, including, but not limited to, the Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.

RESPONSE: This requirement is met. See above statements. Additionally, the Project will not commence commercial operation until it complies with applicable state and federal environmental laws and the Applicant will coordinate with all relevant authorities to secure any required permits or other regulatory approvals.

J. Evidence of consultation, before submission of the application, with the Department of Environment, Great Lakes, and Energy and other relevant state and federal agencies before submitting the application, including, but not limited to, the Department of Natural Resources and the Department of Agriculture and Rural Development.

RESPONSE: This requirement is met. To further clarify, the Applicant has undertaken consultation with relevant state and federal agencies through various channels, including engagement with planning resources, tools, and other items provided by these agencies to determine permitting and regulatory requirements. To reiterate the above, the Project will not commence commercial operation until it complies with applicable state and federal environmental

laws and the Applicant will coordinate with all relevant authorities to secure any required permits or other regulatory approvals.

K. The Soil and Economic Survey Report under Section 60303 of the Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.60303, for the county where the proposed system will be located.

RESPONSE: This requirement is met. See Exhibit L to Exhibit 4 (Soil Resource Report).

L. Interconnection queue information for the applicable regional transmission organization.

RESPONSE: This requirement is met. The Project is currently in the interconnection queue for the Midcontinent Independent System Operator, the applicable regional transmission organization. The Project's designation in the queue is J2100.

M. If the proposed site of the system is undeveloped land, a description of feasible alternative developed locations, including, but not limited to, vacant industrial property and brownfields, and an explanation of why they were not chosen. This requirement may be waived by the Planning Commission.

RESPONSE: The Applicant requests waiver of this requirement. The Project site is located 0.44 miles away from the existing electric utility substation that it will interconnect with. Thus, the Project site is particularly suited to be a location for a BESS facility because it will be able to utilize existing electric infrastructure and thus decease impacts to non-participating properties.

N. If the system is reasonably expected to have an impact on television signals, microwave signals, agricultural global position systems, military defense radar, radio reception, or weather and doppler radio, a plan to minimize and mitigate that impact. Information in the plan concerning military defense radar is exempt from disclosure under the Freedom of Information Act, 1976 PA 442, MCL 15.231 to 15.246, and shall not be disclosed by the commission or the electric provider or independent power producer except pursuant to court order.

RESPONSE: This requirement is met. See Exhibit 4 (Applicant's General Narrative Statement). To further clarify, the Project is not expected to have an impact on television signals, microwave signals, agricultural global position systems, military defense radar, radio reception, or weather and doppler radio.

O. A storm water assessment and a plan to mitigate, and repair any drainage impacts at the expense of the applicant. The applicant shall consult with the county drain commissioner before submitting the application and shall include evidence of those efforts in its application.

<u>RESPONSE:</u> This requirement is met. See Exhibit 2 (Site Plan). To further clarify, the Applicant has undertaken consultation with the county drain commissioner through various channels, including engagement with planning resources, tools, and other items provided by these agencies to determine permitting and regulatory requirements. Additionally, the Applicant anticipates the county drain commissioner to directly participate in further proceedings regarding the Application.

P. A fire response plan and an emergency response plan.

i. The fire response plan (FRP) shall include:

1. Will consult with the local fire department representatives and the local emergency manger to ensure that the FRP is in alignment with acceptable operating procedures, capabilities, resources, etc.

2. A description of all on-site equipment and systems to be provided to prevent or handle fire emergencies.

3. A description of all contingency plans to be implemented in response to the occurrence of a fire emergency.

4. A commitment to review and update the FRP with fire departments, first responders, and county emergency managers at least once every year.

5. An analysis of whether plans to be implemented in response to a fire emergency can be fulfilled by existing local emergency response capacity. The analysis should include identification of any specific equipment or training deficiencies in local emergency response capacity and recommendations for measures to mitigate deficiencies.

6. Other information the Fire Department finds relevant.

ii. The emergency response plan (ERP) shall include:

1. Will consult with local first responders and county emergency managers to ensure that the ERP is in alignment with acceptable operating procedures, capabilities, resources, etc.

2. An identification of contingencies that would constitute a safety or security emergency (fire emergencies are to be addressed in a separate fire response plan);

3. Emergency response measures by contingency;

4. Evacuation control measures by contingency;

5. Community notification procedures by contingency;

6. An identification of potential approach and departure routes to and from the facility site for police, fire, ambulance, and other emergency vehicles;

7. A commitment to review and update the ERP with fire departments, first responders, and county emergency managers at least once every year;

8. An analysis of whether plans to be implemented in response to an emergency can be fulfilled by existing local emergency response capacity, and identification of any specific equipment or training deficiencies in local emergency response capacity; and

9. Other information the Fire Department finds relevant.

RESPONSE: This requirement is met. See Exhibit B (Emergency Response Guide and Fire Response Plan) to Exhibit 4. Additionally, the Applicant acknowledges the requirement it must commit to review these plans with fire department, first responders, and county emergency managers at least once every year, and it will comply with these requirements. The Applicant also anticipates providing supplemental information regarding fire emergency needs, and it will provide this information to the Township as soon as possible.

Q. A report detailing the sound modeling results along with mitigation plans to ensure that sound emitted from the system will remain below the statutory limit throughout the operational life of the system.

RESPONSE: This requirement is met. See Exhibit G to Exhibit 4 (Noise Study).

R. Any other information regarding compliance with the requirements herein.

RESPONSE: This requirement is met. See all attached Exhibits and responses above.

13. Waiver. Because of the ever-changing technical capabilities of battery storage infrastructure and of new technology in general, the Township Planning Commission shall have the authority to review and consider alternatives in both the dimensional and physical requirements contained in this ordinance as part of the special land use review process, and other requirements annually.

RESPONSE: Applicant appreciates any waiver the Planning Commission and other reviewing authorities may grant in furtherance of the efficient and timely approval of this Application to the extent needed herein.

14. Building Permit. Prior to issuance of a Building Permit, the following information shall be provided.

A. Equipment specification sheets.

B. Identification and contact information for the installer(s) of the proposed system.

C. Augmentation Plan.

D. Approved Decommissioning Plan and Decommissioning Agreement in recordable form and acceptable to the Township Attorney.

E. Life expectancy of the system components including the anticipated schedule for battery replacement to maintain megawatts over the system's lifetime.

F. Hazard Mitigation Analysis.

G. Operation and Maintenance Manual.

H. Identification and contact information for the installer of the system.

I. Electrical schematic plan for the system, including disconnect devices.

J. An approved FRP and ERP.

K. An executed Community Host Agreement in the amount of $2,000 per megawatt.

L. Proof of financial guarantee for decommissioning.

RESPONSE: The Applicant acknowledges and will comply with this requirement. These materials will be provided prior to the issuance of a Building Permit.

15. Transfers. No transfer in ownership of the Energy Storage System shall occur prior to providing 60 days' notice to the Township and upon Township approval verifying that the new owner agrees to carry out the terms of the special land use and site plan approval.

RESPONSE: The Applicant acknowledges and will comply with this requirement.

IV. Applicable Law

Under Michigan law, when a site plan contains the information required by the zoning ordinance and is in compliance with the zoning ordinance, it is to be approved. *See* MCL 125.3501(5); *Hessee realty, Inc. v Ann Arbor*, 61 Mich App 319 (1975); *Keating Int'l Corp v Orion*, 51 Mich App 122 (1974), *aff'd*, 395 Mich 539 (1975). As Applicant has met all criteria under the Zoning Ordinance, the Application should be approved.

V. Conclusion

In conclusion, the Applicant respectfully requests that the foregoing materials be considered by the Township and that the Application be approved. On behalf of the Applicant, we thank you in advance for your timely attention to this matter and look forward to working with the Township throughout the zoning approval process.

Sincerely,

ZAUSMER, P.C.

John A. Lewsley

JAL
Enclosures
cc: Client

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GUN PLAIN CHARTER TOWNSHIP

Note: Applications must be received (30) days before the meeting to be considered for possible review or action in that month.

Application For:

_____ Private Road ($180.00)
___X___ Special Land Use($425.00)

_____Variance (Board of Appeals)($350.00)

----------Construction Board of Appeals ($350.00)

_____Rezoning ($425.00)

_____Planned Unit Development($600.00)

_____Site Plan Review 1/10th of 1% of Project Cost . Minimum of ($468.00) Max ($5,000.00) Project Cost $_____ **plus any legal and engineering fees incurred by the Township.**

_____Contract Zoning ($625.00) **plus any legal and engineering fees incurred by the Township.**

All Township Engineering or Legal Review that is Applicable will be paid for by Applicant

Applicant Information

Name: Heron Energy Storage LLC
Address: 412 West 15th Street,15th Floor
City: New York State: New York Zip: 10011
Phone: 415-596-9537 Fax: _____ E-Mail: japv@cip-tt.com

Owner Information (if different from applicant)

Name: Thomas Chapman
Address: 237 8TH AVE
City: Plainwell State: MI Zip: 49080
Phone: 269-985-6200 Fax: _____ E-mail: _____

Property Information

Address/Location Riverview Drive 49080
Parcel Number 03-08- 08-034-021-50
Current Zoning Agricultural Property Size 23.9 Acres

Description of proposed use/request/zoning (use additional pages as needed)

The proposed use of the property is a battery energy storage facility. See attached narrative for more details.

I hereby attest that the information on this application is, to the best of my knowledge, true and accurate.

Signed by: Jon Pavegy — February 15, 2026

Signature of applicant if other than owner — Date

Signature of owner

_____ Date _____

Optional: I hereby grant permission for members of the Gun Plain Township Planning and Zoning Commission to enter the above described property for the purpose of gathering information related to this application.
Note to applicant: This permission is optional and failure to grant permission will not effect any decision regarding your application.

Official Use Only

Date Received:_____ Fee Paid:_____
Materials Received Site Plan_____
Parcel ID _____
Application Accepted by_____

Notice: All fees paid are non-refundable, with exception of a majority vote of the Planning Commission and reason given by the Planning Commission. No fees shall be refunded without written notice to the Township office in the form of the Planning Commission minutes. The Planning Commission may request to the Zoning of Officer/Administrator additional fees from the Applicant if the applicant did not meet the criteria of the Ordinance Section 19:01 through 19.07, this will delay action by the Planning Commission. Adopted 10/5/1995. **The applicant shall be responsible for any or all engineering or legal review fees.**

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I hereby attest that the information on this application is, to the best of my knowledge, true and accurate.

Signature of applicant -if other than owner Date

Signature of owner Thomas H Chapman Date Feb 17/26

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I hereby attest that the information on this application is, to the best of my knowledge, true and accurate.

Signed by: February 15, 2026

Signature of applicant -if other than owner Date

Signature of owner

_____ Date _____

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GUN PLAIN CHARTER TOWNSHIP

Note: Applications must be received 30 days before the meeting to be considered for possible review or action in that month.

Application For:

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____ Special Land Use ($425.00)

____ Variance (Board of Appeals ($350.00)

____ Planned Unit Development ($600.00)

X Site Plan Review 1.00% of 1% of Project Cost - Minimum of ($468.00) Max ($5,000.00) Project Cost $ 5,000 **plus any legal and engineering fees incurred by the Township.**

____ Construction Board of Appeals ($350.00)

____ Rezoning ($425.00)

____ Contract Zoning ($625.00) **plus any legal and engineering fees incurred by the Township.**

All Township Engineering or Legal Review that is Applicable will be paid for by Applicant

Applicant Information

Name: Heron Energy Storage LLC

Address: 437 West 15th Street 15th Floor

City: New York State: New York Zip: 10011

Phone: 415-599-9537 Fax: ____ E-Mail: ajp@cop-ll.com

Owner Information (if different from applicant)

Name: Thomas Chapman

Address: 250 8TH AVE

City: Plainwell State: MI Zip: 49080

Phone: 269-685-6200 Fax: ____ E-mail: ____

Property Information

Address/Location: Riverview Drive 49080

Parcel Number 03-08-08-034-021-55

Current Zoning: Agricultural Property Size: 22.00 Acres

Description of proposed use/request/zoning (use additional pages as needed)

The proposed use of the property is a battery energy storage facility. See attached narrative for more details.

I hereby attest that the information on this application is, to the best of my knowledge, true and accurate.

Signature of applicant -if other than owner Date

Signature of owner Thomas J Chapman Date Feb 17/26

Optional: I hereby grant permission for members of the Gun Plain Township Planning and Zoning Commission to enter the above described property for the purpose of gathering information related to this application.

Note to applicant: This permission is optional and failure to grant permission will not effect any decision regarding your application

Official Use Only

Date Received: ____ Fee Paid: ____

Materials Received Site Plan ____

Parcel ID ____

Application Accepted by ____

Notice: All fees paid are non-refundable, with exception of a majority vote of the Planning Commission and reason given by the Planning Commission. No fees shall be refunded without written notice to the Township office in the form of the Planning Commission minutes. The Planning Commission may request to the Zoning of Officer/Administrator additional fees from the Applicant if the applicant did not meet the criteria of the Ordinance Section 19.01 through 19.07, this will delay action by the Planning Commission. Adopted 10.5.1995. **The applicant shall be responsible for any or all [illegible]**

ZAUSMER, P.C.
CASH OPERATING - HUNTINGTON

9860 Gun Plain Charter Township Check Date: 02/12/2026 Check Number:117236

Date	INV #	Client	Matter	Description	Amount
02/12/26	OPER-HTJ	2182	00002	Site Plan Review	5,000.00

Check Amount: $5,000.00

ZAUSMER, P.C.
CASH OPERATING - HUNTINGTON
32255 NORTHWESTERN HIGHWAY, SUITE 225
FARMINGTON HILLS, MICHIGAN 48334-1574

CHEMICAL BANK

117236
74-1001/724

Memo:

FIVE THOUSAND AND 00/100 DOLLARS

DATE February 12, 2026

AMOUNT **********$5,000.00

PAY TO THE ORDER OF Gun Plain Charter Township

AUTHORIZED SIGNATURE

ZAUSMER, P.C.
CASH OPERATING - HUNTINGTON

9860 Gun Plain Charter Township Check Date: 02/12/2026 Check Number:117235

Date	INV #	Client	Matter	Description	Amount
02/12/26	OPER-HTJ	2182	00002	Special Land Use Application	425.00

Check Amount: $425.00

ZAUSMER, P.C.
CASH OPERATING - HUNTINGTON
32255 NORTHWESTERN HIGHWAY, SUITE 225
FARMINGTON HILLS, MICHIGAN 48334-1574

CHEMICAL BANK

117235
74-1001/724

Memo:

FOUR HUNDRED TWENTY FIVE AND 00/100 DOLLARS

DATE
February 12, 2026

AMOUNT
**********$425.00

PAY TO THE ORDER OF Gun Plain Charter Township

AUTHORIZED SIGNATURE

STORMWATER REPORT

Heron Energy Storage LLC

Riverview Dr

Gun Plain Charter Township, Allegan County, MI

Prepared by:
Kimley-Horn of Michigan, Inc.
3000 Town Center, Suite 2600
Southfield, MI 48075
Contact: Brian Gammon, P.E.

Prepared on: January 14, 2026

Kimley»Horn
of Michigan, Inc.

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1. PROJECT DESCRIPTION

The proposed project consists of the development of a Battery Energy Storage System (BESS) facility located along Riverview Drive in Gun Plain Charter Township, Allegan County, Michigan. The project site is approximately 33.6 acres and will include battery enclosures, Power Conversion System (PCS), access roads, and stormwater management features. This report summarizes the stormwater management approach for the BESS project, including compliance with all applicable local, watershed, and state requirements.

Kimley-Horn has evaluated the existing and proposed drainage conditions of the site. This report provides computations for all applicable stormwater requirements of Gunship Charter Township and Allegan County. The existing and proposed drainage systems were analyzed using HydroCAD, Version 10.20-5c, a computer aided design system for modeling stormwater runoff hydrology. The calculations are based on the Soil Conservation Service (SCS/NRCS) techniques. The HydroCAD modeling utilizes TR-55 Curve Number methodology analysis and is based on the regulatory standards and best management practices for BESS facilities.

1.1. Pre-development Conditions

The existing site is currently characterized as agricultural and forested land. Surface drainage generally flows south toward Kalamazoo River. A small section of the northern portion of the site flows north towards a transmission line and residential areas surrounded by forests. The topography is varied and has slopes ranging from 0%-12% within agricultural land and 12% to 18% within the forested land. The site soils are classified as Oshtemo-Chelsea complex and are modeled with hydrologic soil type B. See **Appendix 3** for the NRCS Report. There are currently no on-site stormwater management or water quality treatment practices in place. See **Exhibit 1** for the Existing Drainage Map.

A summary of the pervious and impervious coverage for existing conditions is included below:

- *Total project area = 33.6 acres*
  - *Existing Pervious Area = 33.6 acres (100.0%)*
  - *Existing Impervious Area = 0.0 acres (0.0%)*
  - *Weighted Curve Number (CN) = 75*

1.2. Post-development Conditions

The proposed BESS facility will include battery enclosures, PCS skids, a project substation set on gravel pads, and stormwater management infrastructure. The BESS equipment will be surrounded by gravel pads and interior access roads, with an access driveway along Riverview Drive. The proposed access roads, BESS pads, and the substation are modeled as impervious (CN=98) to allow flexibility in the final placement and material selection of the BESS pads and access roads. Stormwater runoff from the proposed improvements will be routed to an on-site wet detention basin. See **Exhibit 2** for the Proposed Drainage Map.

The wet detention basin will provide treatment for the existing drainage area along with the net increase in runoff volume for the project area. Stormwater from the proposed site will first be captured

and conveyed via surface drainage to the basin. Once stormwater enters the wets detention basin, rate attenuation and settlement occurs. The basin utilizes an outlet control structure to regulate discharge in accordance with site-specific release rate requirements. After detention and settlement, mitigated flows are conveyed from the outlet control structure through an outlet pipe to the forested area south of the project.

A summary of the pervious and impervious coverage for proposed conditions is included below.

- *Total project area = 33.6 acres*
- *Disturbed area = 26.3 acres*
    - *Proposed Pervious Area = 10.56 acres (40.2%)*
    - *Proposed Impervious Area =15.74 acres (59.8%)*
    - *Weighted Curve Number (CN) = 78*

2. STORMWATER SUMMARY

2.1. Channel Protection Summary

Stormwater rate and volume control is required by Allegan County to ensure that post-development peak runoff rate and volume do not exceed pre-development rate or volume for the 2-year, 24-hour storm (2.57"). Retention of the volume increase is required. The volume increase to be retained is **23,950 CF.** The proposed stormwater management system is designed to meet or exceed these requirements by providing adequate detention and controlled discharge.

The proposed development achieves this requirement as outlined in the table below.

Table 1: Channel Protection Summary

	Pre-Development	*Post-Development*
2-year, 24-hour Rate (CFS)	18.28	1.21
2-year, 24-hour Volume (CF)	78,408	102,366

2.2. Flood Control Summary

Volume control for the BESS project will be achieved primarily through detention to offset increases in runoff volume from development. Volume control is determined by Allegan County which states the runoff from 100-year, 24-hour storms (6.03") be stored and released with a maximum release rate of 0.13 cfs/acre. The required flood volume is **439,085 CF** and the provided flood volume is **469,421 CF.**

A summary of the wet detention basin sizing is provided in Table 2 below.

Table 2: Flood Control Summary

	Basin #1
Contributing Drainage Area (AC)	*33.6*
Proposed New Impervious Area (AC)	*10.1*
Treatment Depth Required (inch)	*1*
Required 100-year, 24-hour Release Rate (CFS)	*4.39*
Provided 100-year, 24-hour Release Rate (CFS)	***4.09***
Required Flood Volume (CF)	*439,085*
Provided Flood Volume (CF)	***469,421***

2.3. Water Quality Summary

Water quality treatment is provided to meet or exceed regulatory requirements for removal of total suspended solids (TSS) and total phosphorus (TP). The required water quality volume is calculated as 1 inch over project site, per Allegan County. The wet detention basin stores the water quality volume in the permanent pool, an allowable treatment best management practice. The permanent pool is sized to be 2.5 times the water quality volume. The required permanent pool volume is **306,735 CF** and the volume provided is **312,185 CF**

3. CONCLUSION

The proposed stormwater management system has been designed in accordance with the Allegan County Drain Commissioner's Site Development Rules for channel protection, flood control, and water quality control of the proposed development. Therefore, the proposed stormwater management system meets the requirements set forth by Allegan County.

Exhibit 1 – Water Resources Delineation Report by SWCA Environmental Consultants

Water Resources Delineation Report for the Heron Battery Energy Storage System (BESS) Project, Allegan County, Michigan

NOVEMBER 2025

PREPARED FOR

Swift Energy Storage, LLC

PREPARED BY

SWCA Environmental Consultants

WATER RESOURCES DELINEATION REPORT FOR THE HERON BATTERY ENERGY STORAGE SYSTEM (BESS) PROJECT, ALLEGAN COUNTY, MICHIGAN

Prepared for

Swift Energy Storage, LLC
412 West 15th Street, 15th Floor
New York, New York 10011

Prepared by

SWCA Environmental Consultants
200 West 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 599-3022
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SWCA Project No. 101035

November 2025

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1 INTRODUCTION

On behalf of Swift Energy Storage, LLC (Swift), SWCA Environmental Consultants (SWCA) has prepared this water resources delineation report for the Heron Battery Energy Storage System (BESS) Project (project) located on approximately 73 acres of privately owned agricultural and forested land in Allegan County, Michigan (see Figures A-1 and A-2 in Appendix A).

The objectives of this survey were to identify and evaluate jurisdictional wetlands and other waters within the project area that may be subject to U.S. Army Corps of Engineers (USACE) jurisdiction under Section 404 of the Clean Water Act (CWA) and Michigan Department of Environment, Great Lakes, and Energy (EGLE) jurisdiction under Section 404 of the CWA and Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 Public Act (PA) 451, as amended (NREPA), which includes Part 301, Inland Lakes and Streams, and Part 31, Water Resources Protection Act. This report provides the methods, results, and conclusions of a water resources delineation that SWCA conducted on November 13, 2025. Fieldwork was performed by SWCA biologists, who are trained, practicing delineators with experience in the USACE's Northcentral and Northeast Region.

2 METHODOLOGY

In accordance with USACE methodology outlined in the *Corps of Engineers Wetlands Delineation Manual* (Manual) (USACE 1987), *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Northcentral and Northeast Region* (Regional Supplement) (USACE 2010), and *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams* (David et al. 2025), wetlands and other jurisdictional waters were identified and approximated through the combined use of existing publicly available baseline data and field investigations.

2.1 Desktop Analysis

The following publicly available data sources were used to complete a desktop analysis of the project area to assess the likelihood of wetlands and other jurisdictional waters to be present within the project area.

- Current and historical aerial imagery (Google Earth 2025)
- Federal Emergency Management Agency (FEMA) National Flood Hazard Layer mapping (FEMA 2025)
- Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2025)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (USFWS 2025)
- U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) (USGS 2025)
- EGLE Wetlands Map Viewer (EGLE 2025a), which depicts areas where EGLE believes wetlands may be present
- National Land Cover Database (NLCD) (Multi-Resolution Land Characteristics Consortium 2021)

The results of the desktop analysis were used to identify the likely locations of wetlands and surface waters for the field investigation described below.

2.2 Field Investigation

SWCA conducted a field evaluation to assess the general site characteristics, investigate and ground-truth any potential features identified during the desktop analysis, assess the likelihood of wetland presence in areas mapped as hydric soils, and delineate the boundaries of all wetlands and other jurisdictional waters in accordance with guidance and information available from the following sources:

- Manual (USACE 1987)
- Regional Supplement (USACE 2010)
- *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979)
- Geomare-Anderson Wetlands Protection Act (1979 PA 203), which is now Part 303, Wetlands Protection, and Part 301, Stream Protection, of the NREPA
- *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 9.0* (NRCS 2024)
- Revised Definition of "Waters of the United States;" Conforming (*Federal Register* 88:61964)
- *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams* (David et al. 2025)

2.2.1 Wetlands

In accordance with Section 404 of the CWA, wetlands are defined as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE 1987). To be classified as a wetland under the federal definition, an area must meet the following three criteria under normal circumstances: 1) have a predominance of hydrophytic vegetation, 2) contain soils that are characteristic of frequent saturation (i.e., hydric soils), and 3) have the presence of hydrology indicating regular inundation or saturation. Wetlands may be considered jurisdictional or non-jurisdictional based on the current regulatory regime mandated by USACE and the U.S. Environmental Protection Agency. Generally, in Michigan, wetlands with a continuous surface connection to a relatively permanent water are considered jurisdictional, in accordance with the "Revised Definition of 'Waters of the United States;' Conforming" (*Federal Register* 88:61964) and a supplemental memorandum issued in March 2025, which provides additional guidance on the implementation of "continuous surface connection" when determining the jurisdictional status of surface waters and adjacent wetlands (USACE and U.S. Environmental Protection Agency 2025).

In addition to the federal definition of jurisdictional wetlands, in 1979, the Michigan legislature passed the Geomare-Anderson Wetlands Protection Act (1979 PA 203), which is now Part 303, Wetlands Protection, of the NREPA. EGLE has adopted administrative rules that provide clarification and guidance on interpreting Part 303. In accordance with Part 303, wetlands are regulated at the state level if they meet any of the following criteria (EGLE 2025b):

- Connected to one of the Great Lakes or Lake St. Clair
- Located within 1,000 feet of one of the Great Lakes or Lake St. Clair
- Connected to an inland lake, pond, river, or stream
- Located within 500 feet of an inland lake, pond, river, or stream

- Not connected to one of the Great Lakes or Lake St. Clair, or an inland lake, pond, stream, or river, but are more than 5 acres in size
- Not connected to one of the Great Lakes or Lake St. Clair, or an inland lake, pond, stream, or river, and less than 5 acres in size, but EGLE has determined that these wetlands are essential to the preservation of the State's natural resources and has notified the property owner

During the field delineation, wetlands were identified by positive indicators of hydrology, hydrophytic vegetation, and hydric soils at specified data points. Data collected at each data point were used to approximate the wetland boundary and were recorded on USACE Northcentral and Northeast wetland determination data forms. Wetlands were then classified according to the Cowardin system, as described in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). This is a hierarchical system based on the topographic position and vegetation type of a wetland, which aids resource managers and others by providing uniformity of concepts and terms used to define wetlands according to hydrologic, geomorphologic, chemical, and biological factors. Wetland boundaries were recorded using Esri's Field Maps software and a Juniper Geode GNSS receiver capable of submeter accuracy; wetland and water body boundaries and paths were not marked with flagging during the field evaluation.

2.2.1.1 HYDROLOGY

Wetland hydrology was primarily determined in the field by considering the frequency and duration of inundation, visual observation of saturation in the upper 16 inches of the soil profile, and the presence of primary wetland hydrologic indicators (such as oxidized rhizospheres on living roots, water-stained leaves, water marks, sediment deposits, or algal matting). Secondary indicators used to determine wetland hydrology include, but are not limited to, surface soil cracks, crayfish burrows, geomorphic position, and drainage patterns. Evidence of these secondary indicators is present even during dry periods, and therefore, they are useful indicators of a wetland. If the area sampled displayed one or more primary hydrologic indicators or two or more secondary hydrologic indicators as listed in the Manual/Regional Supplement, the area was determined to meet the wetland hydrology criterion.

Rainfall has a substantial influence on maintaining wetland hydrology. Therefore, it is important to accurately evaluate the normality of rainfall with respect to its influence on wetland hydrology. This was done by employing the Antecedent Precipitation Tool (APT). Developed by the USACE, the APT uses rainfall data from National Oceanic and Atmospheric Administration weather stations within a 30-mile radius from a point of interest. Rainfall data is compared to a rolling 30-year record and a weighting factor to determine dry season, drought conditions, and antecedent precipitation relative to the previous rainfall data. The APT assesses normal rainfall conditions for the previous 3 months and classifies the site at the time of delineation as drier than normal, normal, or wetter than normal (USACE 2025).

2.2.1.2 VEGETATION

Hydrophytic vegetation is defined as a plant community with over 50% of the dominant plant species having a wetland indicator status of obligate wetland (OBL), facultative wetland (FACW), or facultative (FAC), as recorded in the National Wetland Plant List (USACE 2022). The presence of hydrophytic vegetation was determined using identified plant species, percent cover, and indicator status within prescribed data plots surrounding each data point. At each data point, SWCA recorded the scientific name of each plant species within a prescribed plot area in accordance with the Regional Supplement (i.e., 2-meter radius for herbaceous vegetation, 5-meter radius for shrub/vine strata, 15-meter radius for tree stratum) (USACE 2010). The absolute cover of each species was visually estimated, and then the absolute percent cover was calculated (e.g., each species may be rated up to 100% and the total can be over 100% cover). Then, either the rapid test (i.e., all dominant species across all strata are OBL or FACW), the

dominance test (i.e., 50/20 test; >50% of the total cover represented by plant species combined and including any species >20% of cover by itself, across all strata rated OBL, FACW, or FAC), or the prevalence index (i.e., average value of wetland indicator statuses [OBL = 1…Upland = 5] of all species in the plot, weighted by percent cover ≤3.0) was used to determine the presence or absence of hydrophytic vegetation.

2.2.1.3 SOILS

For each data point recorded, SWCA ecologists extracted a soil profile to a depth sufficient to document the presence or absence of applicable hydric soil indicators to determine the presence or absence of hydric conditions. As defined by the National Technical Committee of Hydric Soils, a hydric soil is a "soil that formed under the conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (NRCS 2024). Common indicators for these soils, according to the Manual and Regional Supplement (USACE 1987, 2010), include the presence of organic soils, histic epipedon, hydrogen sulfide odor, reduced soil conditions, gleyed soils, or listing on the hydric soils lists. Hydric soil determinations were made according to criteria listed in the Regional Supplement and *Field Indicators of Hydric Soils in the United States* (NRCS 2024). If the soil profile displayed at least one hydric soil indicator, the soil was determined to meet the hydric soil criterion.

2.2.2 Streams

At the federal level, non-wetland surface waters with a continuous surface connection to a relatively permanent water are generally considered jurisdictional, in accordance with the "Revised Definition of 'Waters of the United States;' Conforming" (*Federal Register* 88:61964). The ordinary high water mark (OHWM) is a defining element for identifying the lateral limits of jurisdictional, non-wetland waters and typically represents the outer limits of potential USACE jurisdiction. The OHWM is defined in 33 CFR 328.3(c)(4) as "…that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."

EGLE has authority over inland streams in Michigan pursuant to Part 301, Inland Lakes and Streams, of the NREPA. Under Part 301, an inland stream is defined as "a river, stream, or creek which may or may not be serving as a drain as defined by the drain code of 1956, 1956 PA 40, [Michigan Compiled Laws] 280.1 to 280.630; or any other body of water that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water, including the St. Marys, St. Clair, and Detroit Rivers" (Michigan Compiled Laws 324.30101).

Streams (e.g., creeks, rivers, human-made ditches) were identified using the following parameters in accordance with Part 301 of the NREPA. SWCA biologists recorded the presence of bed, bank, evidence of flow, and OHWM of water bodies encountered during the delineation using GPS units capable of submeter accuracy. The OHWM was determined in accordance with the *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams* (David et al. 2025). Streams were further classified as perennial, intermittent, or ephemeral based on field observations.

3 RESULTS

SWCA conducted a desktop analysis and performed a delineation of potentially jurisdictional waters located within the project area on November 13, 2025. The following sections summarize the landscape

setting, land cover, soils, rainfall, desktop-mapped wetlands and surface waters, and the results of the field identification of wetlands and surface waters within the project area.

3.1 Desktop Analysis

3.1.1 Landscape Setting

Elevations near the project area are generally higher in the north and slope south toward the Kalamazoo River, which is approximately 1 mile to the south. The proposed BESS area in the northeast portion of the project area is at a maximum elevation of 878 feet above mean sea level. To the southwest, the topography sharply slopes down to a flat area with a minimum elevation of 734 feet above mean sea level. The project area is situated primarily among fields used for commercial agriculture with patches of deciduous forest to the northeast and southwest. According to digital FEMA National Flood Hazard Layer data (FEMA 2025), no mapped flood hazard zones (Zone A) are present within the project area.

3.1.2 Land Cover

According to the NLCD (Multi-Resolution Land Characteristics Consortium 2021), the project area is dominated by cultivated crops (91.1%). Additional land uses within the project area include pasture/hay (2.9%), deciduous forest (2.7%), and developed open space (1.6%). All other land cover types each constitute less than 1.0% of the project area. NLCD data within the project area was field verified and determined to be accurate.

3.1.3 Soils

According to the NRCS Web Soil Survey (NRCS 2025), six soil types are present within the project area (Table 1, Figure A-4). None of these soil types are considered hydric.

Table 1. Soil Map Units within the Project Area

Map Unit Symbol	Soil Name	Hydric	Acres within Project Area	Percentage of Project Area
19A	Brady sandy loam, 0 to 3 percent slopes	No	25.6	35.1%
11C	Oshtemo-Chelsea complex, 6 to 12 percent slopes	No	18.4	25.2%
11B	Oshtemo-Chelsea complex, 0 to 6 percent slopes	No	11.7	16.1%
16B	Capac loam, Lake Michigan lobe, 0 to 4 percent slopes	No	10.1	13.9%
11D	Oshtemo-Chelsea complex, 12 to 18 percent slopes	No	7.1	9.7%
12B	Ockley loam, 1 to 6 percent slopes	No	0.1	0.1%
Total			**72.9**	**100.0%**

Source: NRCS (2025)

Note: Totals may not match expected totals because of rounding.

3.1.4 Rainfall

The APT generated a score of 12, indicating that the prevailing rainfall conditions for November 13, 2025, within the project area were normal (Figure 1) (USACE 2025).

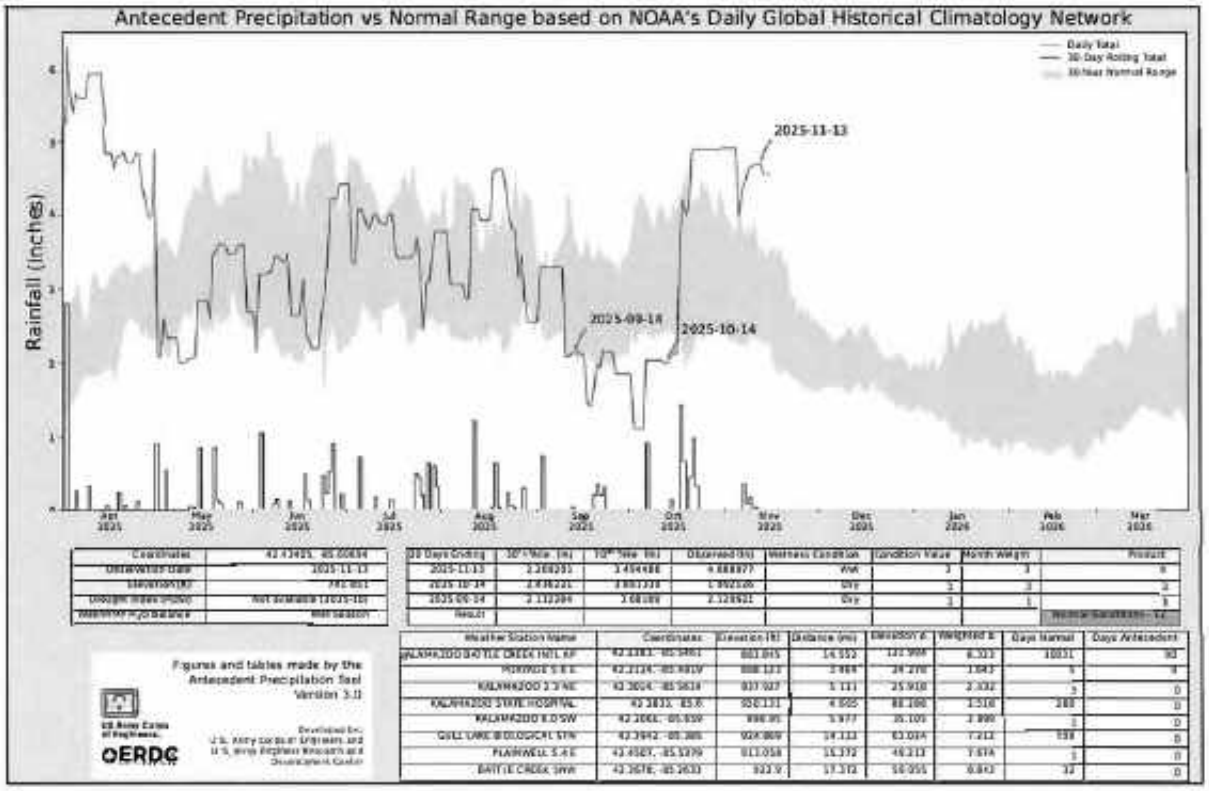

Figure 1. APT results for the project area, November 13, 2025.

3.1.5 Michigan EGLE Wetlands Map Viewer

Based on SWCA's review of the EGLE (2025a) Wetlands Map Viewer, less than 0.2 acre of NWI-mapped emergent wetland (PEM1C) is within the project area (see Figure A-3).

3.1.6 National Wetlands Inventory

Based on SWCA's review of USFWS (2025) NWI mapping data, less than 0.2 acre of NWI-mapped emergent wetland (PEM1C) is within the project area (see Figure A-3).

3.1.7 National Hydrography Dataset

Based on SWCA's review of USGS (2025) NHD mapping, the project area is within 8-digit Hydrologic Unit Code 04050003. No named or unnamed NHD-mapped waterways or water bodies are within the project area (see Figure A-3).

3.2 Field Investigation

SWCA conducted the field investigation on November 13, 2025. Wetland determination data forms are provided in Appendix B. Photographs of delineated aquatic features are provided in Appendix C.

3.2.1 Wetlands

Within the project area, SWCA delineated four distinct wetland areas totaling 1.57 acres (Table 2, Figure A-5). SWCA's opinion of the potential jurisdictional status for each delineated feature is detailed below. Photographs of each wetland data point and each associated upland data point are provided in Appendix C.

Table 2. Wetlands Delineated within the Project Area

Feature ID	Classification	Date Delineated	Anticipated Jurisdiction*	Acreage within Project Area
WA001	PEM	11/13/2025	EGLE	0.212
WA002	PEM	11/13/2025	EGLE	0.568
WA003	PEM	11/13/2025	EGLE	0.100
WA004	PFO	11/13/2025	EGLE	0.691
Total				**1.570**

Note: PEM = palustrine emergent, PFO = palustrine forested

* This determination is SWCA's professional opinion of USACE and EGLE jurisdictional status based on the current regulatory definitions.

3.2.2 Streams

SWCA delineated two ephemeral streams within the project area, totaling approximately 781 linear feet (Table 3; see Figure A-5). SWCA's opinion of the potential jurisdictional status for each delineated feature is detailed below.

Table 3. Streams Delineated within the Project Area

Feature ID	Classification	Date Delineated	Anticipated Jurisdiction*	Linear Feet within Project Area
SA001	Ephemeral	11/13/2025	EGLE	355.90
SA002	Ephemeral	11/13/2025	EGLE	425.08
Total				**780.98**

* This determination is SWCA's professional opinion of USACE and EGLE jurisdiction based on the current regulatory definitions.

4 CONCLUSIONS

SWCA conducted a field investigation of the project area on November 13, 2025. SWCA biologists identified four wetlands and two streams in the project area. All delineated features within the project area are potentially EGLE jurisdictional.

The conclusions provided in this report represent SWCA's professional opinion based on SWCA's knowledge and experience with EGLE and USACE, including regulatory guidance documents and manuals. The EGLE and USACE have final authority in determining the status and presence of jurisdictional waters and the extent of their boundaries.

5 LITERATURE CITED

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APPENDIX A

Figures

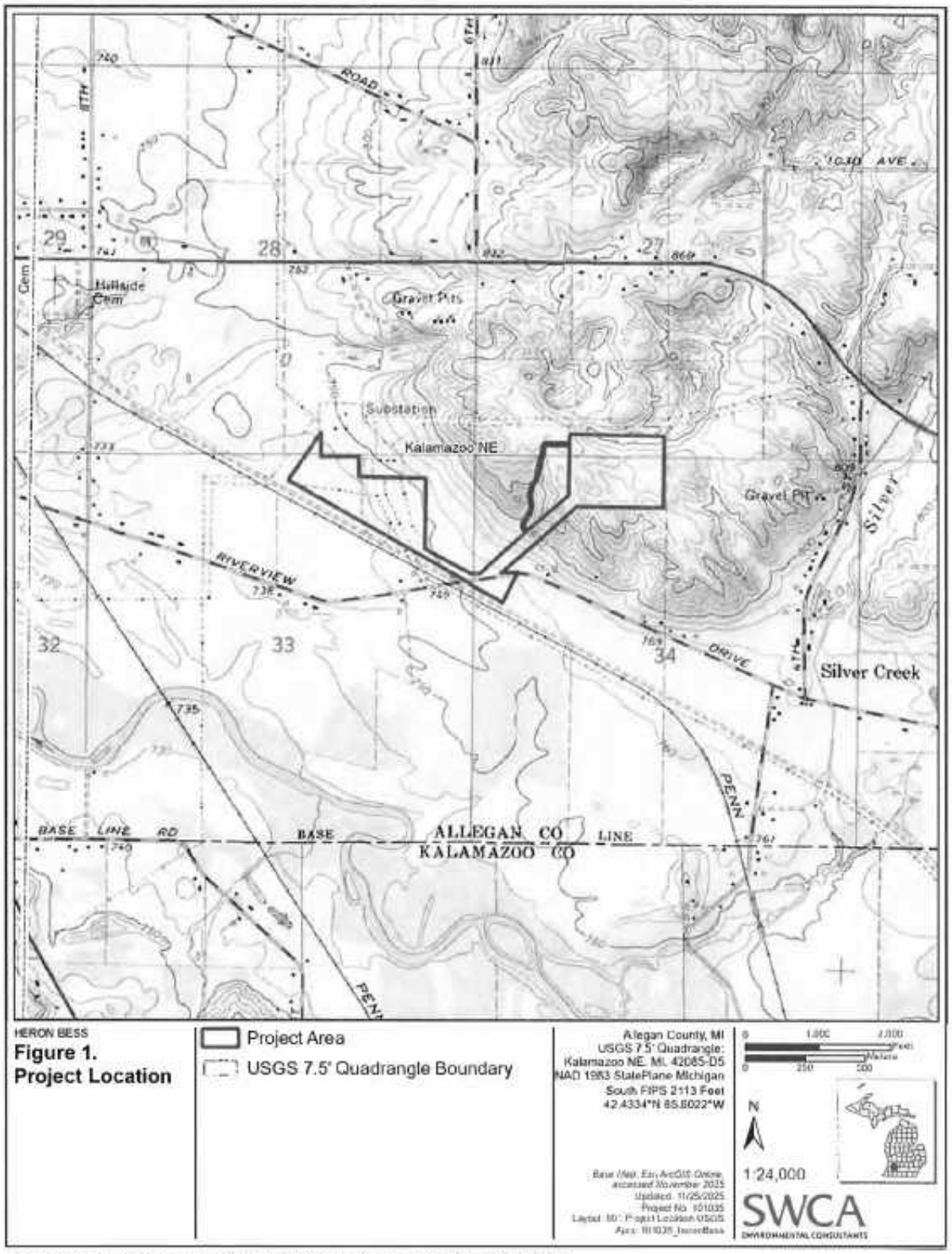

Figure A-1. Project location on USGS topographic mapping.

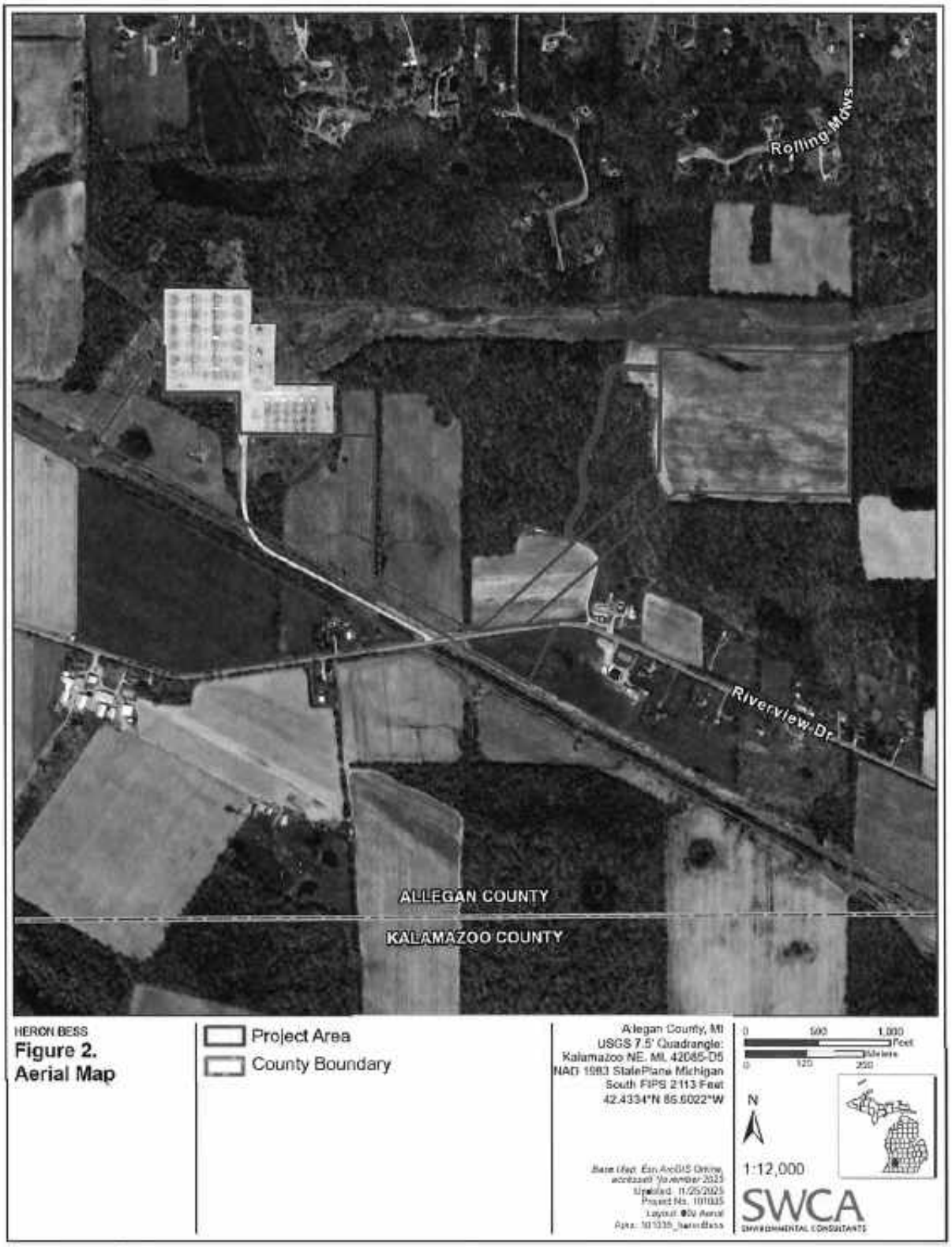

Figure A-2. Overview of the project area on aerial imagery.

Figure A-3. Aquatic resources identified within the project area during desktop review.

Figure A-4. Soil map units within the project area (NRCS 2025).

Figure A-5. Delineated wetlands and streams within the project area.

APPENDIX B

U.S. Army Corps of Engineers
Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025

Applicant/Owner: State: MI Sampling Point: UA001

Investigator(s): L.Jones Section, Township, Range: Sec. 33 T1N R11W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): <5%

Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4335 Long: -85.6085 Datum: NAD83

Soil Map Unit Name: 16B - Capac loam, Lake Michigan lobe, 0 to 4 percent slopes NWI classification: No

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: ___	No: X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes: X	No: ___		
Wetland Hydrology Present?	Yes: ___	No: X	If yes, optional Wetland Site ID:	___

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: UA001

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	30	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1. *Elaeagnus umbellata*	15	Y	UPL
2. *Quercus alba*	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
	25	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Daucus carota*	25	Y	UPL
2. *Setaria faberi*	15	Y	FACU
3. *Rosa multiflora*	15	Y	FACU
4. *Bromus inermis*	10	N	UPL
5. *Geum canadense*	10	N	FAC
6. *Zea mays*	10	N	UPL
7.			
8.			
9.			
10.			
11.			
12.			
	85	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 17 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	40	x 3 =	120	
FACU species	40	x 4 =	160	
UPL species	60	x 5 =	300	
Column Totals:	140	(A)	580	(B)

Prevalence Index = B/A= 4.14

Hydrophytic Vegetation Indicators:

___ 1 - Rapid test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UA001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
0-4	10YR 4/2	100		0			Clay Loam	
4-20	10YR 4/2	95	7.5YR 5/6	5	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025
Applicant/Owner: State: MI Sampling Point: UA002
Investigator(s): L.Jones Section, Township, Range: Sec. 27 T1N R11W
Landform (hillslope, terrace, etc.): Low Hill Local relief (concave, convex, none): Convex Slope (%): <5%
Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4363 Long: -85.5956 Datum: NAD83
Soil Map Unit Name: 11D - Oshtemo-Chelsea complex, 12 to 18 percent slopes NWI classification: No
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: ___	No: X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes: ___	No: X		
Wetland Hydrology Present?	Yes: ___	No: X	If yes, optional Wetland Site ID:	___

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: UA002

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus serotina*	50	Y	FACU
2. *Carya glabra*	25	Y	FACU
3.			
4.			
5.			
6.			
7.			
	75	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1. *Morus nigra*	15	Y	UPL
2. *Carya glabra*	10	Y	FACU
3. *Elaeagnus umbellata*	10	Y	UPL
4.			
5.			
6.			
7.			
	35	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Bromus inermis*	20	Y	UPL
2. *Glycine max*	15	Y	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	35	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	85	x 4 =	340	
UPL species	60	x 5 =	300	
Column Totals:	145	(A)	640	(B)

Prevalence Index = B/A= 4.41

Hydrophytic Vegetation Indicators:

____ 1 - Rapid test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UA 0 0 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0-20	10YR 4/4	100		0			Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025

Applicant/Owner: State: MI Sampling Point: UA003

Investigator(s): L.Jones Section, Township, Range: Sec. 34 T1N R11W

Landform (hillslope, terrace, etc.): Low Hill Local relief (concave, convex, none): Convex Slope (%): <5%

Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4335 Long: -85.5986 Datum: NAD83

Soil Map Unit Name: 11D - Oshtemo-Chelsea complex, 12 to 18 percent slopes NWI classification: No

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: ____	No: X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes: ____	No: X		
Wetland Hydrology Present?	Yes: ____	No: X	If yes, optional Wetland Site ID:	____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: UA003

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fagus grandifolia*	40	Y	FACU
2. *Quercus rubra*	40	Y	FACU
3. *Quercus alba*	40	Y	FACU
4.			
5.			
6.			
7.			
	120	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	

Herb Stratum: (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	120	x 4 =	480
UPL species	0	x 5 =	0
Column Totals:	120 (A)		480 (B)

Prevalence Index = B/A= 4.00

Hydrophytic Vegetation Indicators:

____ 1 - Rapid test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UA003

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0-20	10YR 4/6	100		0			Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025

Applicant/Owner: State: MI Sampling Point: WA001 PEM

Investigator(s): L.Jones Section, Township, Range: Sec 33T 1 NR 11W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): <5%

Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4346 Long: -85.6092 Datum: NAD83

Soil Map Unit Name: 16B - Capac loam, Lake Michigan lobe, 0 to 4 percent slopes NWI classification: No

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: X	No:	**Is the Sampled Area within a Wetland?**	**Yes X No ___**
Hydric Soil Present?	Yes: X	No:		
Wetland Hydrology Present?	Yes: X	No:	If yes, optional Wetland Site ID:	WA001

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes X No ___**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: WA001_PEM

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Setaria faberi*	3	N	FACU
2. *Allium stellatum*	1	N	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	4	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	3	x 4 =	12
UPL species	1	x 5 =	5
Column Totals:	4 (A)		17 (B)

Prevalence Index = B/A= 4.25

Hydrophytic Vegetation Indicators:

____ 1 - Rapid test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WA001_PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks: Can not dig under power line

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025

Applicant/Owner: State: MI Sampling Point: WA001_UPL

Investigator(s): L.Jones Section, Township, Range: Sec. 33 T1N R11W

Landform (hillslope, terrace, etc.): Flatwoods Local relief (concave, convex, none): Concave Slope (%): <5%

Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4353 Long: -85.6091 Datum: NAD83

Soil Map Unit Name: 16B - Capac loam, Lake Michigan lobe, 0 to 4 percent slopes NWI classification: No

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: X	No:	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes:	No: X		
Wetland Hydrology Present?	Yes:	No: X	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: WA001 UPL

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	30	Y	FAC
2. *Juniperus virginiana*	15	Y	FACU
3. *Ulmus americana*	15	Y	FACW
4.			
5.			
6.			
7.			
	60	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1. *Lonicera maackii*	20	Y	UPL
2. *Acer rubrum*	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
	40	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Geum canadense*	45	Y	FAC
2. *Rubus idaeus*	10	N	FACU
3. *Solidago altissima*	10	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	95	x 3 =	285
FACU species	35	x 4 =	140
UPL species	20	x 5 =	100
Column Totals:	165 (A)		555 (B)

Prevalence Index = B/A= 3.36

Hydrophytic Vegetation Indicators:

___ 1 - Rapid test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025
Applicant/Owner: State: MI Sampling Point: WA002_PEM
Investigator(s): L.Jones Section, Township, Range: Sec. 33 T1N R11W
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): <5%
Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4348 Long: -85.6109 Datum: NAD83
Soil Map Unit Name: 16B - Capac loam, Lake Michigan lobe, 0 to 4 percent slopes NWI classification: No
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: X	No:	**Is the Sampled Area within a Wetland?**	**Yes X No ___**
Hydric Soil Present?	Yes: X	No:		
Wetland Hydrology Present?	Yes: X	No:	If yes, optional Wetland Site ID:	WA002

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes X No ___**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: WA002 PEM

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Panicum virgatum*	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	5	x 3 =	15	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	5	(A)	15	(B)
Prevalence Index = B/A=			3.00	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025
Applicant/Owner: State: MI Sampling Point: WA002_UPL
Investigator(s): L.Jones Section, Township, Range: Sec. 33 T1N R11W
Landform (hillslope, terrace, etc.): Low Hill Local relief (concave, convex, none): Convex Slope (%): <5%
Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4347 Long: -85.6104 Datum: NAD83
Soil Map Unit Name: 16B - Capac loam, Lake Michigan lobe, 0 to 4 percent slopes NWI classification: No
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: ___	No: X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes: ___	No: X		
Wetland Hydrology Present?	Yes: ___	No: X	If yes, optional Wetland Site ID:	___

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: WA002_UPL

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Zea mays*	50	Y	UPL
2. *Stellaria media*	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	30	x 4 =	120
UPL species	50	x 5 =	250
Column Totals:	80 (A)		370 (B)

Prevalence Index = B/A= 4.63

Hydrophytic Vegetation Indicators:

____ 1 - Rapid test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WA002_UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks: Can not dig under power line

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025

Applicant/Owner: State: MI Sampling Point: WA003_PEM

Investigator(s): L Jones Section, Township, Range: Sec. 28 T1N R11W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): <5%

Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.436 Long: -85.6107 Datum: NAD83

Soil Map Unit Name: 19A - Brady sandy loam, 0 to 3 percent slopes NWI classification: No

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: X	No:	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes: X	No:		
Wetland Hydrology Present?	Yes: X	No:	If yes, optional Wetland Site ID:	WA003

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes X No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: WA003_PEM

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Phalaris arundinacea*	35	Y	FACW
2. *Scirpus atrovirens*	35	Y	OBL
3. *Eleocharis rostellata*	20	Y	OBL
4. *Andropogon virginicus*	15	N	FACU
5. *Solidago altissima*	15	N	FACU
6. *Carex frankii*	15	N	OBL
7. *Scirpus cyperinus*	10	N	OBL
8.			
9.			
10.			
11.			
12.			
	145	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:	
OBL species	80	x 1 =	80	
FACW species	35	x 2 =	70	
FAC species	0	x 3 =	0	
FACU species	30	x 4 =	120	
UPL species	0	x 5 =	0	
Column Totals:	145	(A)	270	(B)
Prevalence Index = B/A=			1.86	

Hydrophytic Vegetation Indicators:

___ 1 - Rapid test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WA003_PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks: Can not dig utility ROW

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025

Applicant/Owner: State: M Sampling Point: WA003_UPL

Investigator(s): L.Jones Section, Township, Range: Sec. 33 T1N R11W

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): <5%

Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4357 Long: -85.6106 Datum: NAD83

Soil Map Unit Name: 16B - Capac loam, Lake Michigan lobe, 0 to 4 percent slopes NWI classification: No

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: ___	No: X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes: ___	No: X		
Wetland Hydrology Present?	Yes: ___	No: X	If yes, optional Wetland Site ID:	___

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: WA003_UPL

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	20	Y	FACU
2. *Carya texana*	20	Y	UPL
3.			
4.			
5.			
6.			
7.			
	40	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1. *Elaeagnus umbellata*	20	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Sorghastrum nutans*	30	Y	FACU
2. *Geum canadense*	25	Y	FAC
3. *Daucus carota*	10	N	UPL
4. *Rosa multiflora*	10	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	25	x 3 =	75	
FACU species	60	x 4 =	240	
UPL species	50	x 5 =	250	
Column Totals:	135	(A)	565	(B)

Prevalence Index = B/A= 4.19

Hydrophytic Vegetation Indicators:

___ 1 - Rapid test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WA003_UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0-16	10YR 4/3	100		0			Clay	
16-24	10YR 4/6	70	7.5YR 6/2	30	D	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Heron BESS City/County: Allegan County Sampling Date: 11/13/2025

Applicant/Owner: State: MI Sampling Point: WA004 PFO

Investigator(s): L.Jones Section, Township, Range: Sec. 33 T1N R11W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): <5%

Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4338 Long: -85.6077 Datum: NAD83

Soil Map Unit Name: 19A - Brady sandy loam, 0 to 3 percent slopes NWI classification: No

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: X	No: ___	**Is the Sampled Area within a Wetland?**	**Yes X No ___**
Hydric Soil Present?	Yes: X	No: ___		
Wetland Hydrology Present?	Yes: X	No: ___	If yes, optional Wetland Site ID:	___

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes X No ___**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: WA004 PFO

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	35	Y	FAC
2. *Ulmus americana*	35	Y	FACW
3. *Populus deltoides*	1 0	N	FAC
4.			
5.			
6.			
7.			
	80	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1. *Acer negundo*	10	Y	FAC
2. *Elaeagnus umbellata*	5	Y	UPL
3.			
4.			
5.			
6.			
7.			
	1 5	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Phalaris arundinacea*	10	Y	FACW
2. *Lechea mucronata*	5	Y	UPL
3. *Carex hirtifolia*	5	Y	UPL
4. *Elymus virginicus*	5	Y	FACW
5.			
6.			
7.			
8.			
9.			
1 0.			
11.			
1 2.			
	25	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1 .			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 63 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	50	x 2 =	1 00
FAC species	55	x 3 =	1 65
FACU species	0	x 4 =	0
UPL species	1 5	x 5 =	75
Column Totals:	1 20	(A)	340 (B)

Prevalence Index = B/A= 2.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree –Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WA004_PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
0-5	10YR 3/1	100		0			Clay Loam	
5-20	10YR 3/1	95	7.5YR 5/6	5	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) (**LRR R, MLRA 149B**)
___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
___ Loamy Mucky Mineral (F1) (**LRR K, L**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
X Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
___ Coast Prairie Redox (A16) (**LRR K, L, R**)
___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
___ Dark Surface (S7) (**LRR K, L**)
___ Polyvalue Below Surface (S8) (**LRR K, L**)
___ Thin Dark Surface (S9) (**LRR K, L**)
___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM — Northcentral and Northeast Region

Project/Site: Hero nBESS City/County: Allegan County Sampling Date: 11/13/2025
Applicant/Owner: State: MI Sampling Point: WA004 UPL
Investigator(s): L.Jones Section, Township, Range: Sec. 33 T1N R11W
Landform (hillslope, terrace, etc.): Flatwoods Local relief (concave, convex, none): None Slope (%): <5%
Subregion (LRR or MLRA): MLRA 98 , LRR L Lat: 42.4338 Long: -85.6072 Datum: NAD83
Soil Map Unit Name: 19A - Brady sandy loam, 0 to 3 percent slopes NWI classification: No
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes: ___	No: X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes: ___	No: X		
Wetland Hydrology Present?	Yes: ___	No: X	If yes, optional Wetland Site ID:	___

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: WA004 UPL

Tree Stratum: (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	35	Y	FAC
2. *Carya glabra*	20	Y	FACU
3. *Fagus grandifolia*	15	Y	FACU
4.			
5.			
6.			
7.			
	70	=Total Cover	

Sapling/Shrub Stratum: (Plot size: 15)			
1. *Elaeagnus umbellata*	25	Y	UPL
2. *Fagus grandifolia*	10	Y	FACU
3. *Carya glabra*	10	Y	FACU
4.			
5.			
6.			
7.			
	45	=Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Geum canadense*	20	Y	FAC
2. *Solidago altissima*	10	Y	FACU
3. *Smilax illinoensis*	10	Y	UPL
4. *Elymus virginicus*	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	45	=Total Cover	

Woody Vine Stratum: (Plot size: 30)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Domant Species That Are OBL, FACW, or FAC: 22 (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	55	x 3 =	165
FACU species	65	x 4 =	260
UPL species	35	x 5 =	175
Column Totals:	160	(A)	610 (B)

Prevalence Index = B/A= 3.81

Hydrophytic Vegetation Indicators:

____ 1 - Rapid test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Profice supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WA004 UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
0-12	10YR 4/3	100		0			Clay Loam	
12-20	10YR 3/2	75	10YR 4/4	25	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

APPENDIX C

Photograph Log

Photograph 1. WA001_PEM, facing south. Taken on 11/13/2025 3:46:33 PM.

Photograph 2. WA001_UPL, facing east. Taken on 11/13/2025 2:41:24 PM.

Photograph 3. WA002_PEM, facing east. Taken on 11/13/2025 3:28:38 PM.

Photograph 4. WA002_UPL, facing west. Taken on 11/13/2025 3:38:35 PM.

Photograph 5. WA003_PEM, facing north. Taken on 11/13/2025 3:07:22 PM.

Photograph 6. WA003_UPL, facing south. Taken on 11/13/2025 3:19:06 PM.

Photograph 7. WA004_PFO, facing east. Taken on 11/13/2025 5:11:21 PM.

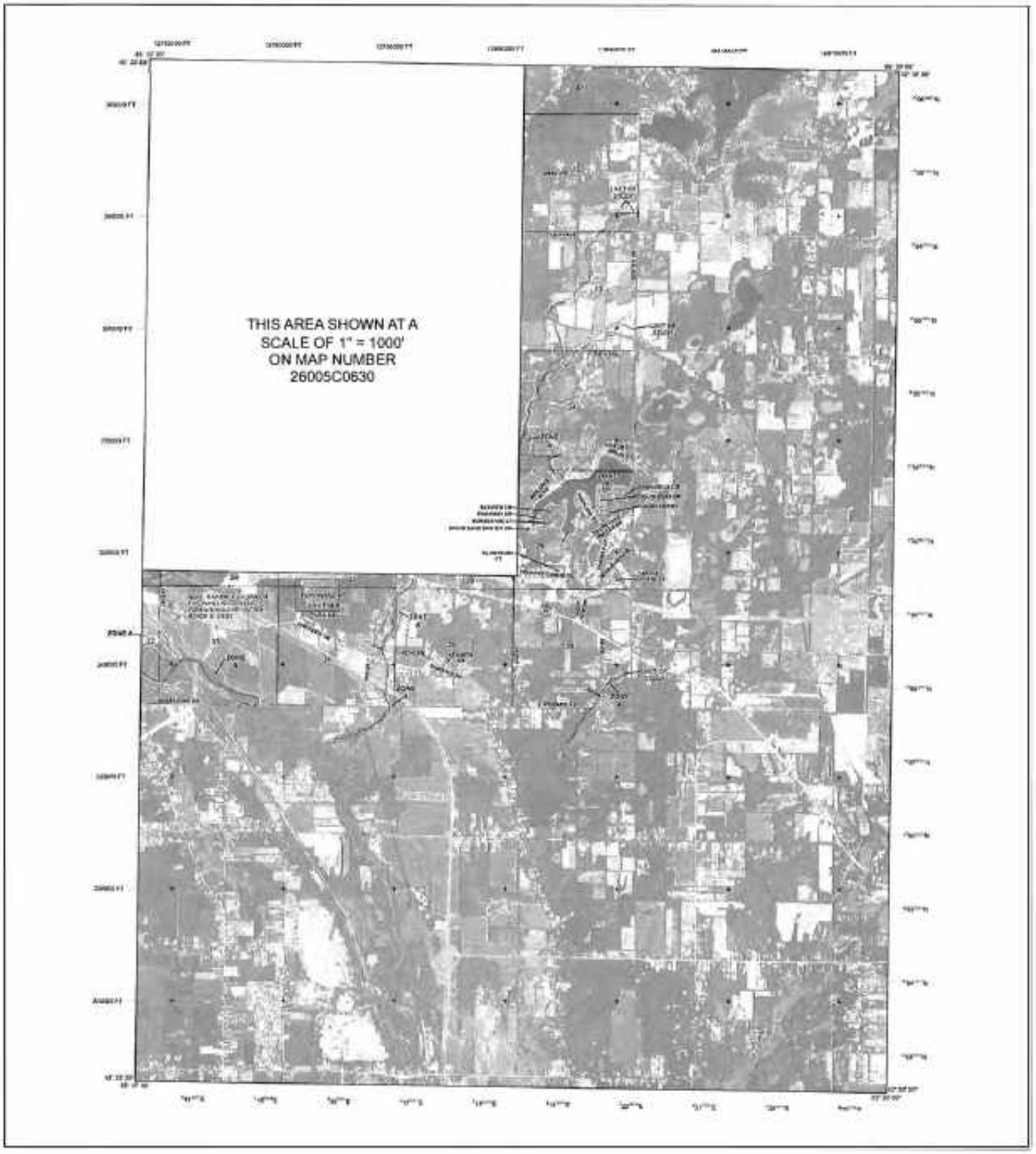
Photograph 8. WA004_UPL, facing south. Taken on 11/13/2025 5:29:32 PM.

Photograph 9. SA001, facing upstream. Taken on 11/13/2025 2:51:11 PM.

Photograph 10. SA002, facing downstream. Taken on 11/13/2025 5:02:57 PM.

Photograph 13. UA003, facing east. Taken on 11/13/2025 7:12:10 PM.

Exhibit 2 – FEMA Firm Map



FLOOD HAZARD INFORMATION

NOTES TO USERS

SCALE

PANEL LOCATOR

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

ALLEGAN COUNTY, MICHIGAN

panel 650 of 650

2.4.3.0

20005C0650

JUNE 21, 2023

Exhibit 3 – USGS Map

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

US Topo

KALAMAZOO NE QUADRANGLE
MICHIGAN
7.5-MINUTE SERIES

Produced by the United States Geological Survey

SCALE 1:24 000

KALAMAZOO NE, MI
2013

Exhibit 4 – NRCS Soil Report

Hydrologic Soil Group—Allegan County, Michigan
(Heron BESS)

Map Scale: 1:7,060 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 100 200 400 600

Feet: 0 300 600 1200 1800

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Allegan County, Michigan
Survey Area Data: Version 23, Sep 2, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 4, 2022—Nov 7, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
11B	Oshtemo-Chelsea complex, 0 to 6 percent slopes	A	59.4	28.5%
11C	Oshtemo-Chelsea complex, 6 to 12 percent slopes	A	35.1	16.8%
11D	Oshtemo-Chelsea complex, 12 to 18 percent slopes	A	90.4	43.4%
11E	Oshtemo-Chelsea complex, 18 to 35 percent slopes	A	1.4	0.7%
19A	Brady sandy loam, 0 to 3 percent slopes	B	21.9	10.5%
Totals for Area of Interest			**208.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

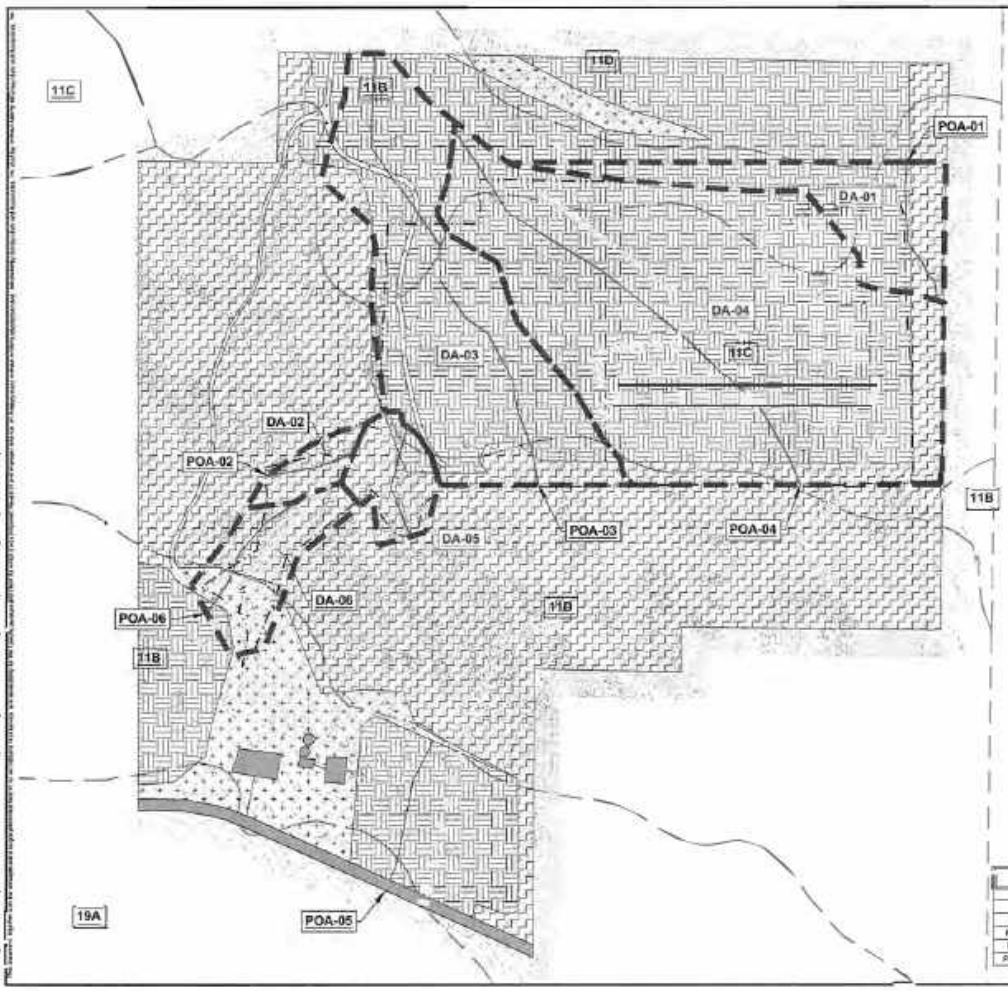
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Exhibit 5 – Pre-Development Drainage Area Map



LEGEND

SOILS LEGEND

CONTEND-CHELSEA COMPLEX 0 TO 8 PERCENT SLOPES	11B
CONTEND-CHELSEA COMPLEX 8 TO 12 PERCENT SLOPES	11C
CONTEND-CHELSEA COMPLEX 12 TO 18 PERCENT SLOPES	11D
CONTEND-CHELSEA COMPLEX 18 TO 25 PERCENT SLOPES	11E
WHITE SANDY LOAM 0 TO 3 PERCENT SLOPES	19A

DRAINAGE AREA SUMMARY

PROPERTY AREA	84.00 AC
DISTURBED AREA	30.30 AC
PRE-DEVELOPMENT PERVIOUS AREA	82.95 AC
PRE-DEVELOPMENT IMPERVIOUS AREA	1.05 AC
POST-DEVELOPMENT PERVIOUS AREA	67.24 AC
POST-DEVELOPMENT IMPERVIOUS AREA	16.76 AC

NORTH

GRAPHIC SCALE IN FEET

MISS DIG 811

PRELIMINARY - NOT FOR CONSTRUCTION

Kimley»Horn

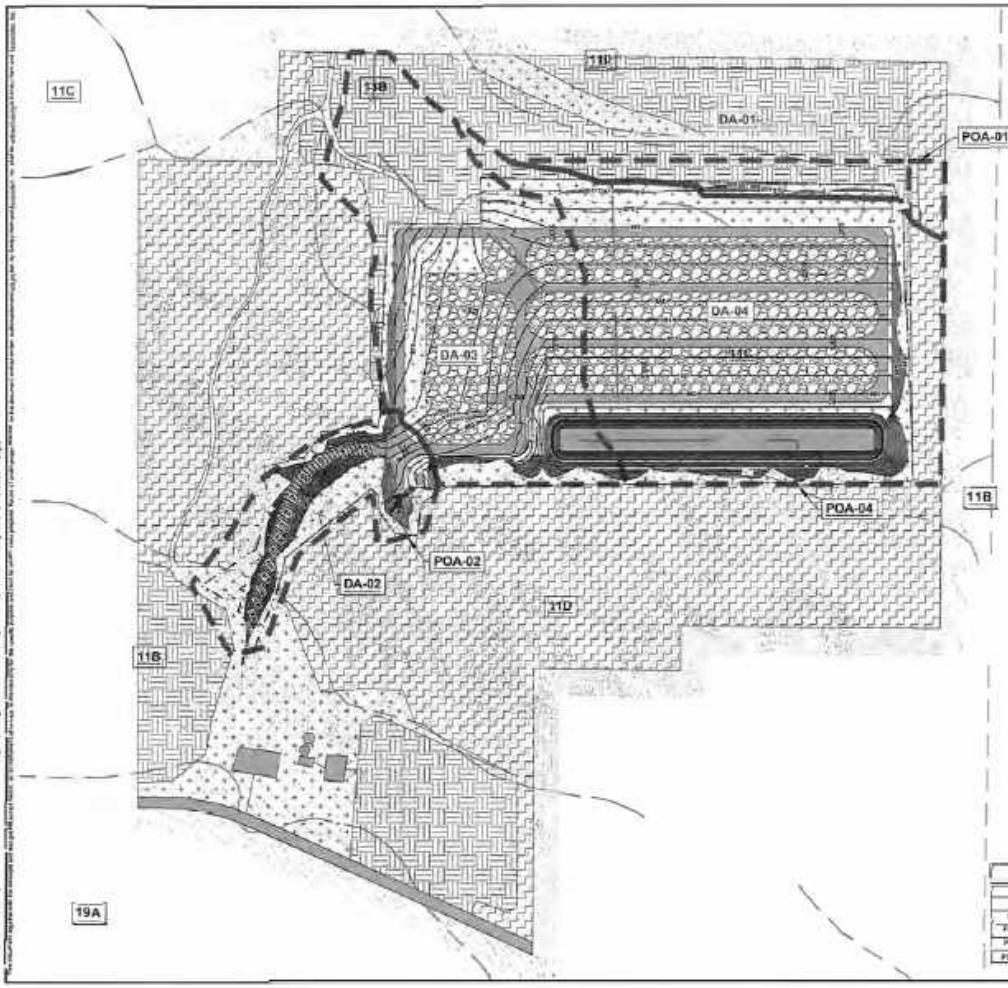
Cir

PRE-DEVELOPMENT DRAINAGE AREA MAP

HERON SOLAR
PREPARED FOR
COPENHAGEN INFRASTRUCTURE PARTNERS
PLAINWELL, MICHIGAN

SHEET NUMBER
EX-1

Exhibit 6 – Post-Development Drainage Area Map



LEGEND

SOILS LEGEND	
CONTONI-CHELSEA COMPLEX 0 TO 6 PERCENT SLOPES	11B
CONTONI-CHELSEA COMPLEX 6 TO 12 PERCENT SLOPES	11C
CONTONI-CHELSEA COMPLEX 12 TO 18 PERCENT SLOPES	11D
CONTONI-CHELSEA COMPLEX 18 TO 25 PERCENT SLOPES	11E
GRAYLY SANDY LOAM 0 TO 3 PERCENT SLOPES	19A

DRAINAGE AREA SUMMARY	
PROPERTY AREA	84.03 AC
DISTURBED AREA	26.30 AC
PRE-DEVELOPMENT PERVIOUS AREA	82.96 AC
PRE-DEVELOPMENT IMPERVIOUS AREA	1.06 AC
POST-DEVELOPMENT PERVIOUS AREA	67.24 AC
POST-DEVELOPMENT IMPERVIOUS AREA	16.79 AC

NORTH

GRAPHIC SCALE IN FEET
0 60 120 240

MISS DIG 811

PRELIMINARY - NOT FOR CONSTRUCTION

Kimley»Horn

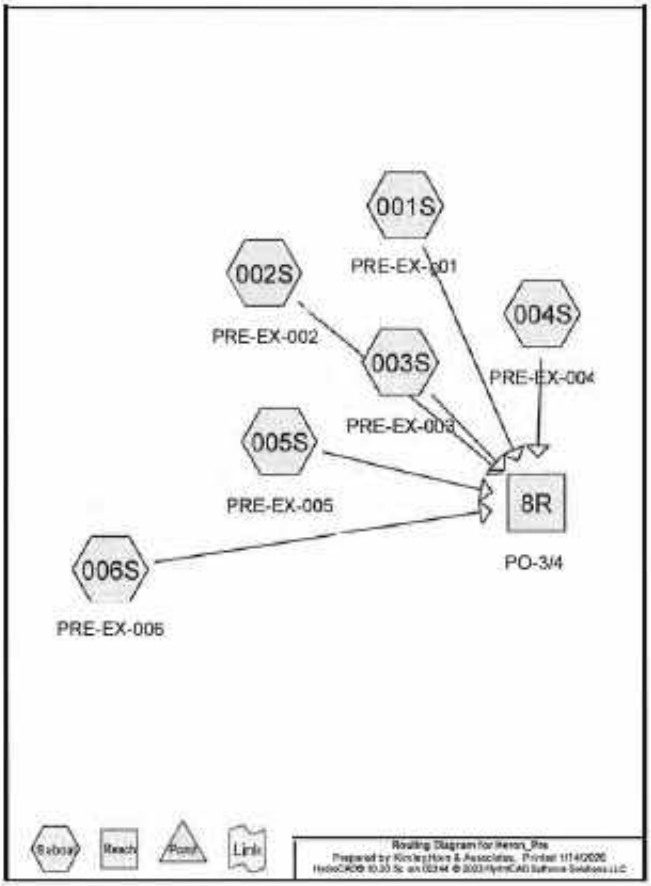
Cip

POST DEVELOPMENT DRAINAGE AREA MAP

HERON SOLAR
PREPARED FOR
COPENHAGEN INFRASTRUCTURE PARTNERS

SHEET NUMBER
EX-2

Exhibit 7 – Pre-Development HydroCAD Model



Project Notes

Copied 6 events from MI-Plainwell 24-hr S1 storm

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	MI-Plainwell 24-hr S1	2-yr	Default	24.00	1	2.57	2
2	10-yr	MI-Plainwell 24-hr S1	10-yr	Default	24.00	1	3.66	2
3	100-yr	MI-Plainwell 24-hr S1	100-yr	Default	24.00	1	6.03	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.985	69	GRASSLAND TYPE B, HSG B (003S, 006S)
26.249	79	ROW CROPS TYPE B, HSG B (001S, 002S, 004S, 005S, 006S)
6.383	60	WOODS TYPE B, HSG B (001S, 002S, 003S, 004S, 005S, 006S)
33.617	75	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
33.617	HSG B	001S, 002S, 003S, 004S, 005S, 006S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
33.617		TOTAL AREA

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.985	0.000	0.000	0.000	0.985	GRASSLAND TYPE B	003S, 006S
0.000	26.249	0.000	0.000	0.000	26.249	ROW CROPS TYPE B	001S, 003S, 004S, 005S, 006S
0.000	6.383	0.000	0.000	0.000	6.383	WOODS TYPE B	001S, 002S, 003S, 004S, 005S, 006S
0.000	33.617	0.000	0.000	0.000	33.617	TOTAL AREA	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 001S: PRE-EX-001 — Runoff Area=3.120 ac 0.00% Impervious Runoff Depth>0.62"
Flow Length=384' Tc=20.7 min CN=75 Runoff=1.81 cfs 0.161 af

Subcatchment 002S: PRE-EX-002 — Runoff Area=0.058 ac 0.00% Impervious Runoff Depth>0.16"
Flow Length=230' Tc=4.7 min CN=60 Runoff=0.06 cfs 0.000 af

Subcatchment 003S: PRE-EX-003 — Runoff Area=8.808 ac 0.00% Impervious Runoff Depth>0.70"
Flow Length=1,251' Tc=25.4 min CN=77 Runoff=5.34 cfs 0.517 af

Subcatchment 004S: PRE-EX-004 — Runoff Area=17.752 ac 0.00% Impervious Runoff Depth>0.70"
Flow Length=1,311' Tc=26.7 min CN=77 Runoff=10.69 cfs 1.043 af

Subcatchment 005S: PRE-EX-005 — Runoff Area=1.274 ac 0.00% Impervious Runoff Depth>0.25"
Flow Length=300' Tc=5.6 min CN=64 Runoff=0.27 cfs 0.027 af

Subcatchment 006S: PRE-EX-006 — Runoff Area=1.975 ac 0.00% Impervious Runoff Depth>0.25"
Flow Length=372' Tc=10.0 min CN=64 Runoff=0.37 cfs 0.042 af

Reach 8R: PO-3/4 — Inflow=18.28 cfs 1.798 af
Outflow=18.28 cfs 1.798 af

Total Runoff Area = 33.617 ac Runoff Volume = 1.798 af Average Runoff Depth = 0.64"
100.00% Pervious = 33.617 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 001S: PRE-EX-001

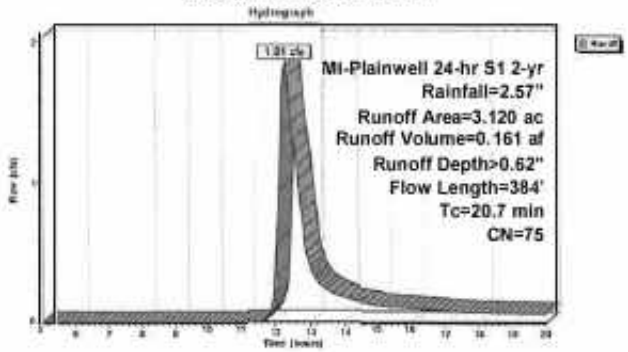
Runoff = 1.81 cfs @ 12.27 hrs, Volume= 0.161 af, Depth> 0.62"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

Area (ac)	CN	Description
* 2.392	79	ROW CROPS TYPE B, HSG B
* 0.728	60	WOODS TYPE B, HSG B
* 0.000	69	GRASSLAND TYPE B, HSG B
3.120	75	Weighted Average
3.120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	100	0.0522	0.11		Sheet Flow, WOODLAND Woods: Light underbrush n= 0.400 P2= 3.22"
3.0	57	0.0039	0.31		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
3.1	227	0.0311	1.23		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
20.7	384	Total			

Subcatchment 001S: PRE-EX-001



Summary for Subcatchment 002S: PRE-EX-002

[49] Hint: Tc<2dt may require smaller dt

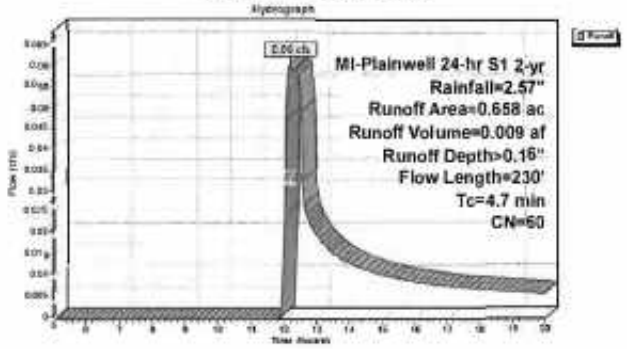
Runoff = 0.06 cfs @ 12.25 hrs, Volume= 0.009 af, Depth> 0.16"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

Area (ac)	CN	Description
* 0.658	60	WOODS TYPE B, HSG B
0.658		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.1868	0.45		Sheet Flow, WOODLAND Range n= 0.130 P2= 3.22"
1.0	130	0.1805	2.12		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
4.7	230	Total			

Subcatchment 002S: PRE-EX-002



Summary for Subcatchment 003S: PRE-EX-003

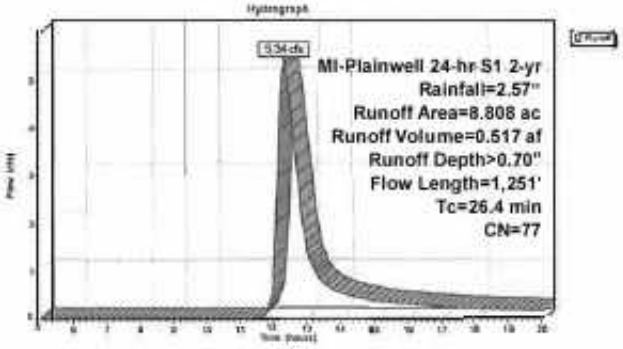
Runoff = 5.34 cfs @ 12.36 hrs, Volume= 0.517 af, Depth> 0.70"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

Area (ac)	CN	Description
* 7.569	79	ROW CROPS TYPE B, HSG B
* 0.947	60	WOODS TYPE B, HSG B
* 0.292	69	GRASSLAND TYPE B, HSG B
8.808	77	Weighted Average
8.808		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0151	0.20		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
16.7	1,073	0.0233	1.07		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
1.2	78	0.0483	1.10		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
26.4	1,251	Total			

Subcatchment 003S: PRE-EX-003



Summary for Subcatchment 004S: PRE-EX-004

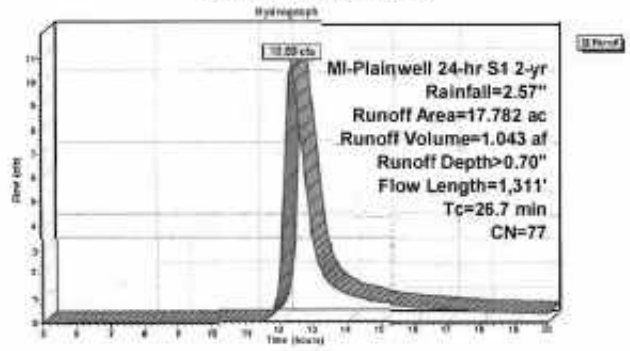
Runoff = 10.69 cfs @ 12.36 hrs, Volume= 1.043 af, Depth> 0.70"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

Area (ac)	CN	Description
* 15.932	79	ROW CROPS TYPE B, HSG B
* 1.850	60	WOODS TYPE B, HSG B
17.782	77	Weighted Average
17.782		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0252	0.24		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
19.0	1,151	0.0207	1.01		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
0.9	60	0.0510	1.13		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
28.7	1,311	Total			

Subcatchment 004S: PRE-EX-004



Summary for Subcatchment 005S: PRE-EX-005

[49] Hint: Tc<2dt may require smaller dt

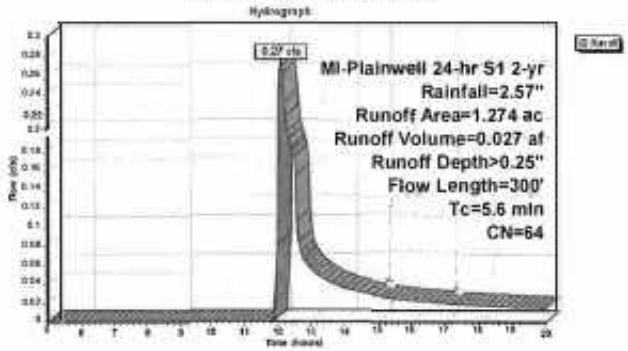
Runoff = 0.27 cfs @ 12.11 hrs, Volume= 0.027 af, Depth> 0.25"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

Area (ac)	CN	Description
* 0.239	79	ROW CROPS TYPE B, HSG B
* 1.035	60	WOODS TYPE B, HSG B
1.274	64	Weighted Average
1.274		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.1200	0.45		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
1.9	200	0.1295	1.80		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
5.6	300	Total			

Subcatchment 005S: PRE-EX-005



Summary for Subcatchment 006S: PRE-EX-006

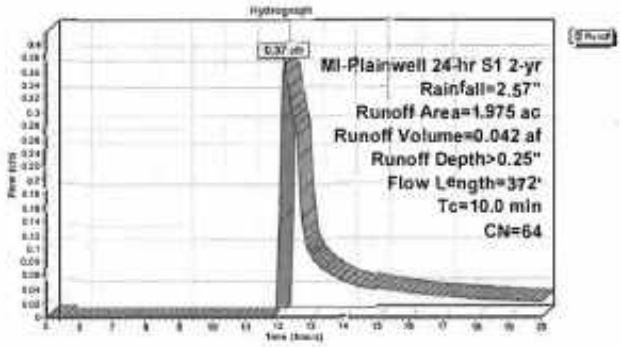
Runoff = 0.37 cfs @ 12.20 hrs, Volume= 0.042 af, Depth> 0.25"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

	Area (ac)	CN	Description
*	1.165	60	WOODS TYPE B, HSG B
*	0.117	79	ROW CROPS TYPE B, HSG B
*	0.693	69	GRASSLAND TYPE B, HSG B
	1.975	64	Weighted Average
	1.975		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.2255	0.21		Sheet Flow, WOODLAND Woods: Light underbrush n= 0.400 P2= 3.22"
1.0	143	0.2078	2.28		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
0.7	98	0.1187	2.41		Shallow Concentrated Flow, MEADOW/PASTURE Short Grass Pasture Kv= 7.0 fps
0.2	31	0.0852	2.53		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 9.0 fps
10.0	372	Total			

Subcatchment 006S: PRE-EX-006



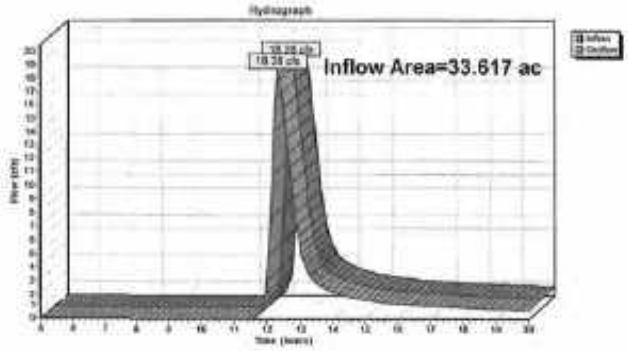
Summary for Reach 8R: PO-3/4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 33.617 ac, 0.00% Impervious, Inflow Depth > 0.64" for 2-yr event
Inflow = 18.28 cfs @ 12.35 hrs, Volume= 1.798 af
Outflow = 18.28 cfs @ 12.35 hrs, Volume= 1.798 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 8R: PO-3/4



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 001S: PRE-EX-001 — Runoff Area=3.120 ac 0.00% Impervious Runoff Depth>1.30"
Flow Length=384' Tc=20.7 min CN=75 Runoff=4.24 cfs 0.338 af

Subcatchment 002S: PRE-EX-002 — Runoff Area=0.598 ac 0.00% Impervious Runoff Depth>0.53"
Flow Length=230' Tc=4.7 min CN=60 Runoff=0.46 cfs 0.026 af

Subcatchment 003S: PRE-EX-003 — Runoff Area=8.808 ac 0.00% Impervious Runoff Depth>1.43"
Flow Length=1,251' Tc=26.4 min CN=77 Runoff=11.78 cfs 1.046 af

Subcatchment 004S: PRE-EX-004 — Runoff Area=17.782 ac 0.00% Impervious Runoff Depth>1.42"
Flow Length=1,311' Tc=26.7 min CN=77 Runoff=23.60 cfs 2.111 af

Subcatchment 005S: PRE-EX-005 — Runoff Area=1.274 ac 0.00% Impervious Runoff Depth>0.71"
Flow Length=300' Tc=5.6 min CN=64 Runoff=1.34 cfs 0.075 af

Subcatchment 006S: PRE-EX-006 — Runoff Area=1.975 ac 0.00% Impervious Runoff Depth>0.71"
Flow Length=372' Tc=10.0 min CN=64 Runoff=1.70 cfs 0.116 af

Reach 8R: PO-3/4 — Inflow=41.13 cfs 3.716 af
Outflow=41.13 cfs 3.716 af

Total Runoff Area = 33.617 ac Runoff Volume = 3.716 af Average Runoff Depth = 1.33"
100.00% Pervious = 33.617 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 001S: PRE-EX-001

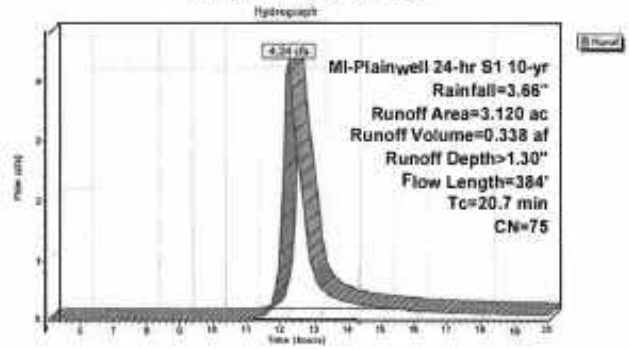
Runoff = 4.24 cfs @ 12.28 hrs, Volume= 0.338 af, Depth> 1.30"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

	Area (ac)	CN	Description
*	2.392	79	ROW CROPS TYPE B, HSG B
*	0.728	60	WOODS TYPE B, HSG B
*	0.000	69	GRASSLAND TYPE B, HSG B
	3.120	75	Weighted Average
	3.120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	100	0.0522	0.11		Sheet Flow, WOODLAND Woods: Light underbrush n= 0.400 P2= 3.22"
3.0	57	0.0039	0.31		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
3.1	227	0.0311	1.23		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
20.7	384	Total			

Subcatchment 001S: PRE-EX-001



Summary for Subcatchment 002S: PRE-EX-002

[49] Hint: Tc<2dt may require smaller dt

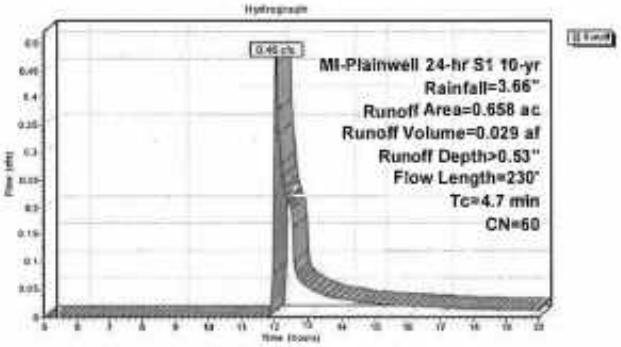
Runoff = 0.46 cfs @ 12.06 hrs, Volume= 0.029 af, Depth> 0.53"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

Area (ac)	CN	Description
* 0.658	60	WOODS TYPE B, HSG B
0.658		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.1666	0.45		Sheet Flow, WOODLAND Range n= 0.130 P2= 3.22"
1.0	130	0.1806	2.12		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
4.7	230	Total			

Subcatchment 002S: PRE-EX-002



Summary for Subcatchment 003S: PRE-EX-003

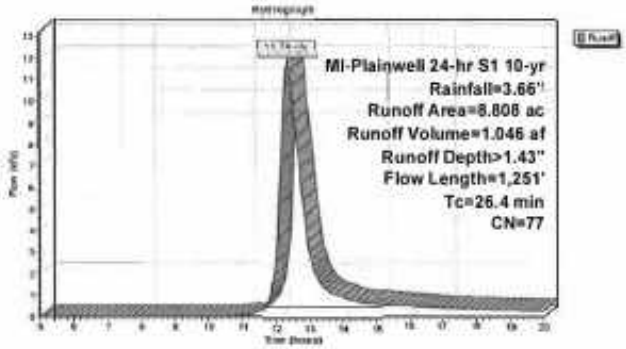
Runoff = 11.78 cfs @ 12.34 hrs, Volume= 1.046 af, Depth> 1.43"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

Area (ac)	CN	Description
* 7.569	79	ROW CROPS TYPE B, HSG B
* 0.947	60	WOODS TYPE B, HSG B
* 0.292	69	GRASSLAND TYPE B, HSG B
8.808	77	Weighted Average
8.808		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0151	0.20		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
16.7	1,073	0.0233	1.07		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
1.2	78	0.0483	1.10		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
26.4	1,251	Total			

Subcatchment 003S: PRE-EX-003



Summary for Subcatchment 004S: PRE-EX-004

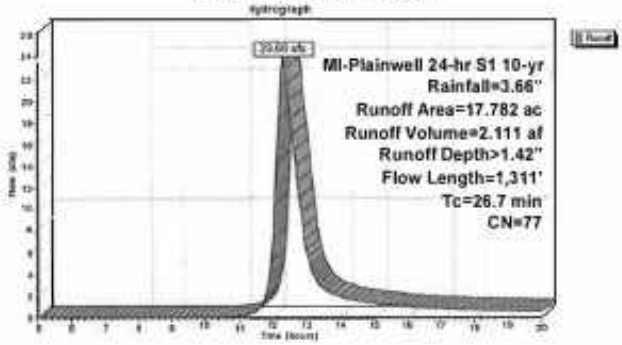
Runoff = 23.60 cfs @ 12.35 hrs, Volume= 2.111 af, Depth> 1.42"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

Area (ac)	CN	Description
* 15.932	79	ROW CROPS TYPE B, HSG B
* 1.850	60	WOODS TYPE B, HSG B
17.782	77	Weighted Average
17.782		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.0262	0.24		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
19.0	1,151	0.0207	1.01		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
0.9	60	0.0510	1.13		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
26.7	1,311	Total			

Subcatchment 004S: PRE-EX-004



Summary for Subcatchment 005S: PRE-EX-005

[49] Hint: Tc<2dt may require smaller dt

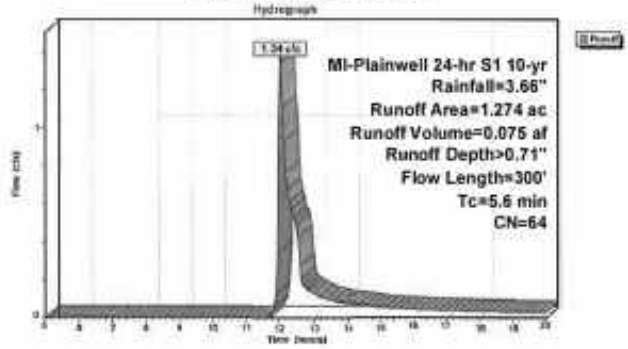
Runoff = 1.34 cfs @ 12.06 hrs, Volume= 0.075 af, Depth> 0.71"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

Area (ac)	CN	Description
* 0.239	79	ROW CROPS TYPE B, HSG B
* 1.035	60	WOODS TYPE B, HSG B
1.274	64	Weighted Average
1.274		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.1200	0.45		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
1.9	200	0.1295	1.80		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
5.6	300	Total			

Subcatchment 005S: PRE-EX-005



Summary for Subcatchment 006S: PRE-EX-006

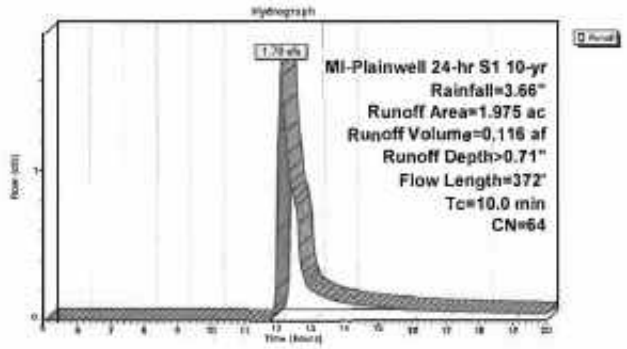
Runoff = 1.70 cfs @ 12.12 hrs, Volume= 0.116 af, Depth> 0.71"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

	Area (ac)	CN	Description
*	1.165	60	WOODS TYPE B, HSG B
*	0.117	79	ROW CROPS TYPE B, HSG B
*	0.693	69	GRASSLAND TYPE B, HSG B
	1.975	64	Weighted Average
	1.975		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0255	0.21		Sheet Flow, WOODLAND Woods: Light underbrush n= 0.400 P2= 3.22"
1.0	143	0.0378	2.28		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
0.7	98	0.1187	2.41		Shallow Concentrated Flow, MEADOW/PASTURE Short Grass Pasture Kv= 7.0 fps
0.2	31	0.0852	2.63		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 9.0 fps
10.0	372	Total			

Subcatchment 006S: PRE-EX-006



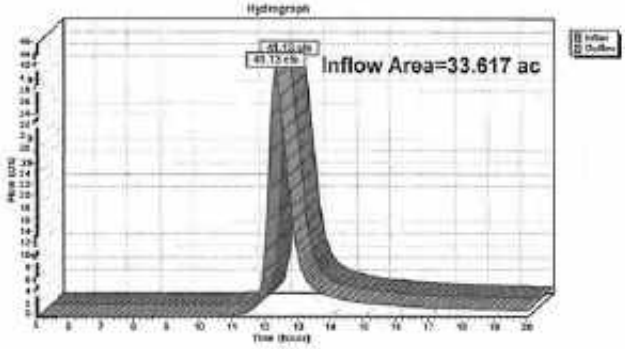
Summary for Reach 8R: PO-3/4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 33.617 ac, 0.00% Impervious, Inflow Depth > 1.33" for 10-yr event
Inflow = 41.13 cfs @ 12.33 hrs, Volume= 3.716 af
Outflow = 41.13 cfs @ 12.33 hrs, Volume= 3.716 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 8R: PO-3/4



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 001S: PRE-EX-001 — Runoff Area=3.120 ac 0.00% Impervious Runoff Depth>3.08"
Flow Length=384' Tc=20.7 min CN=75 Runoff=10.00 cfs 0.800 af

Subcatchment 002S: PRE-EX-002 — Runoff Area=0.858 ac 0.00% Impervious Runoff Depth>1.78"
Flow Length=232' Tc=4.7 min CN=60 Runoff=1.91 cfs 0.057 af

Subcatchment 003S: PRE-EX-003 — Runoff Area=8.868 ac 0.00% Impervious Runoff Depth>3.26"
Flow Length=1,251' Tc=26.4 min CN=77 Runoff=26.65 cfs 2.394 af

Subcatchment 004S: PRE-EX-004 — Runoff Area=17.782 ac 0.00% Impervious Runoff Depth>3.26"
Flow Length=1,311' Tc=26.7 min CN=77 Runoff=53.40 cfs 4.833 af

Subcatchment 005S: PRE-EX-005 — Runoff Area=1.274 ac 0.00% Impervious Runoff Depth>2.10"
Flow Length=300' Tc=5.8 min CN=64 Runoff=4.42 cfs 0.223 af

Subcatchment 006S: PRE-EX-006 — Runoff Area=1.975 ac 0.00% Impervious Runoff Depth>2.10"
Flow Length=372' Tc=10.0 min CN=64 Runoff=5.71 cfs 0.346 af

Reach 8R: PO-3/4 — Inflow=94.75 cfs 8.694 af
Outflow=94.75 cfs 8.694 af

Total Runoff Area = 33.617 ac Runoff Volume = 8.694 af Average Runoff Depth = 3.10"
100.00% Pervious = 33.617 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 001S: PRE-EX-001

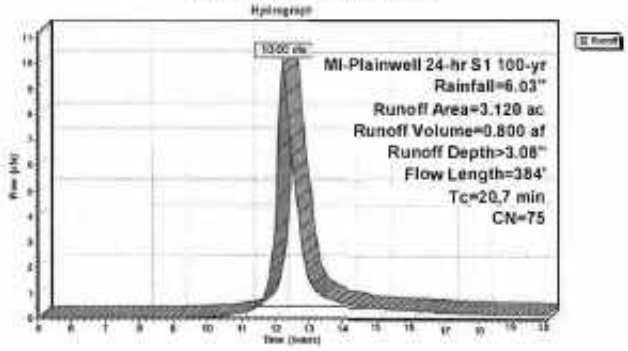
Runoff = 10.00 cfs @ 12.25 hrs, Volume= 0.800 af, Depth> 3.08"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

	Area (ac)	CN	Description
*	2.392	79	ROW CROPS TYPE B, HSG B
*	0.728	60	WOODS TYPE B, HSG B
*	0.000	69	GRASSLAND TYPE B, HSG B
	3.120	75	Weighted Average
	3.120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	100	0.0522	0.11		Sheet Flow, WOODLAND Woods: Light underbrush n= 0.400 P2= 3.22"
3.0	57	0.0039	0.31		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
3.1	227	0.0311	1.23		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
20.7	384	Total			

Subcatchment 001S: PRE-EX-001



Summary for Subcatchment 002S: PRE-EX-002

[49] Hint: Tc<2dt may require smaller dt

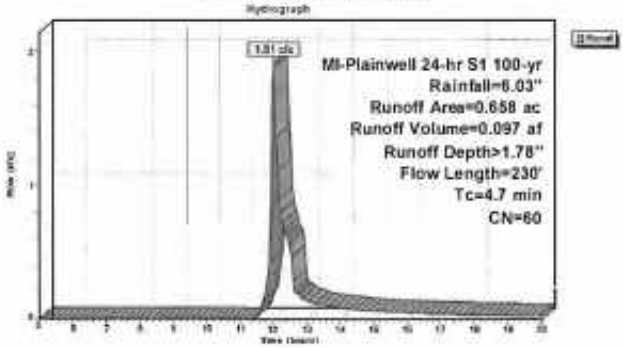
Runoff = 1.91 cfs @ 12.04 hrs, Volume= 0.097 af, Depth> 1.78"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

Area (ac)	CN	Description
* 0.658	60	WOODS TYPE B, HSG B
0.658		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.1666	0.45		Sheet Flow, WOODLAND Range n= 0.130 P2= 3.22"
1.0	130	0.1806	2.12		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
4.7	230	Total			

Subcatchment 002S: PRE-EX-002



Summary for Subcatchment 003S: PRE-EX-003

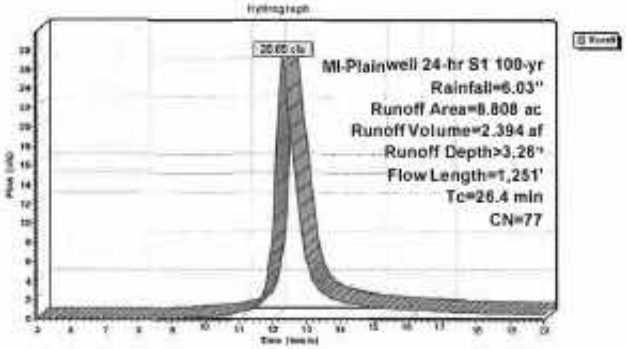
Runoff = 26.65 cfs @ 12.33 hrs, Volume= 2.394 af, Depth> 3.26"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

Area (ac)	CN	Description
* 7.569	79	ROW CROPS TYPE B, HSG B
* 0.947	60	WOODS TYPE B, HSG B
* 0.292	69	GRASSLAND TYPE B, HSG B
8.808	77	Weighted Average
8.808		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0151	0.20		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
16.7	1,073	0.0233	1.07		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
1.2	78	0.0483	1.10		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
26.4	1,251	Total			

Subcatchment 003S: PRE-EX-003



Summary for Subcatchment 004S: PRE-EX-004

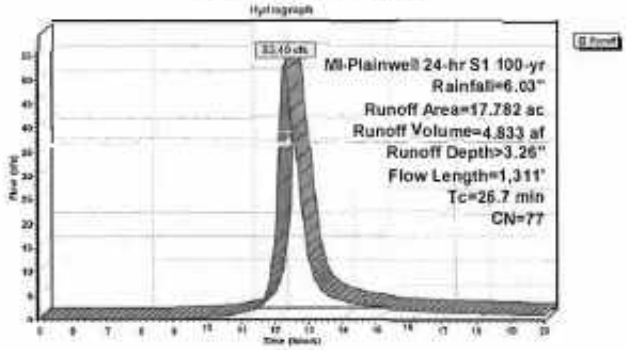
Runoff = 53.40 cfs @ 12.33 hrs, Volume= 4.833 af, Depth> 3.26"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

Area (ac)	CN	Description
* 15.932	79	ROW CROPS TYPE B, HSG B
* 1.850	60	WOODS TYPE B, HSG B
17.782	77	Weighted Average
17.782		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0252	0.24		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
19.0	1,151	0.0207	1.01		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
0.9	60	0.0510	1.13		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
26.7	1,311	Total			

Subcatchment 004S: PRE-EX-004



Summary for Subcatchment 005S: PRE-EX-005

[49] Hint: Tc<2dt may require smaller dt

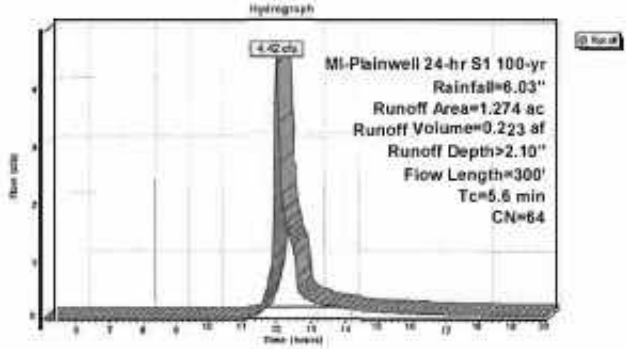
Runoff = 4.42 cfs @ 12.05 hrs, Volume= 0.223 af, Depth> 2.10"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

Area (ac)	CN	Description
* 0.239	79	ROW CROPS TYPE B, HSG B
* 1.035	60	WOODS TYPE B, HSG B
1.274	64	Weighted Average
1.274		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.1200	0.45		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
1.9	200	0.1295	1.80		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
5.6	300	Total			

Subcatchment 005S: PRE-EX-005



Summary for Subcatchment 006S: PRE-EX-006

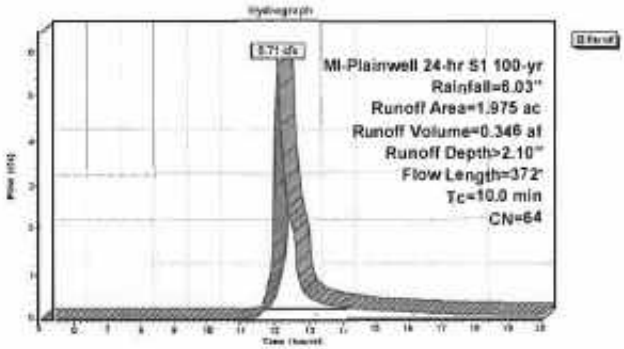
Runoff = 5.71 cfs @ 12.11 hrs, Volume= 0.346 af, Depth> 2.10"
Routed to Reach 8R : PO-3/4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

	Area (ac)	CN	Description
*	1.165	60	WOODS TYPE B, HSG B
*	0.117	79	ROW CROPS TYPE B, HSG B
*	0.693	69	GRASSLAND TYPE B, HSG B
	1.975	64	Weighted Average
	1.975		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.2255	0.21		**Sheet Flow, WOODLAND** Woods: Light underbrush n= 0.400 P2= 3.22"
1.0	143	0.2078	2.28		**Shallow Concentrated Flow, WOODLAND** Woodland Kv= 5.0 fps
0.7	98	0.1187	2.41		**Shallow Concentrated Flow, MEADOW/PASTURE** Short Grass Pasture Kv= 7.0 fps
0.2	31	0.0852	2.63		**Shallow Concentrated Flow, CROPLAND** Cultivated Straight Rows Kv= 9.0 fps
10.0	372	Total			

Subcatchment 006S: PRE-EX-006



Summary for Reach 8R: PO-3/4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 33.617 ac, 0.00% Impervious, Inflow Depth > 3.10" for 100-yr event
Inflow = 94.75 cfs @ 12.31 hrs, Volume= 8.694 af
Outflow = 94.75 cfs @ 12.31 hrs, Volume= 8.694 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 8R: PO-3/4

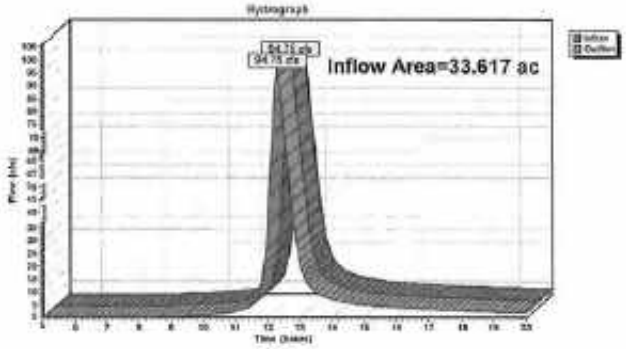
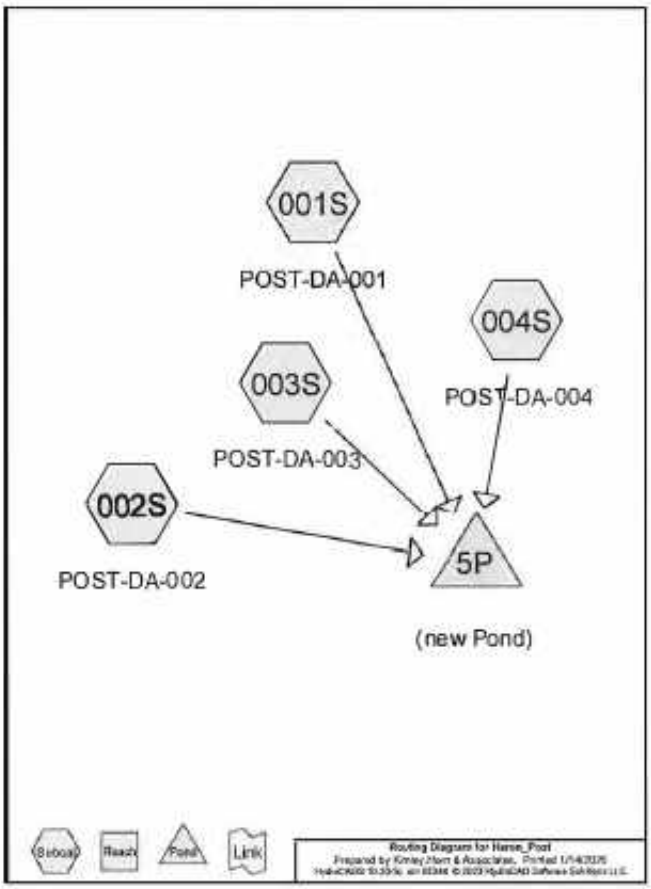


Exhibit 8 – Post-Development HydroCAD Model



Project Notes

Copied 6 events from MI-Rainwall 24-hr S1 storm

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	MI-Rainwall 24-hr S1	2-yr	Default	24.00	1	2.57	2
2	10-yr	MI-Rainwall 24-hr S1	10-yr	Default	24.00	1	3.88	2
3	100-yr	MI-Rainwall 24-hr S1	100-yr	Default	24.00	1	6.03	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.004	69	GRASSLAND TYPE B, HSG B (0025, 0035, 0045)
0.700	85	GRAVEL TYPE B, HSG B (0035, 0045)
4.136	98	IMPERVIOUS TYPE B, HSG B (0025, 0035, 0045)
8.347	78	ROW CROPS TYPE B, HSG B (0015, 0025, 0035, 0045)
5.431	60	WOODS TYPE B, HSG B (0015, 0025, 0035, 0045)
33.658	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
33.658	HSG B	001S, 002S, 003S, 004S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
33.658		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	6.064	0.000	0.000	0.000	6.064	GRASSLAND TYPE B	002S, 003S, 004S
0.000	9.700	0.000	0.000	0.000	9.700	GRAVEL TYPE B	003S, 004S
0.000	4.116	0.000	0.000	0.000	4.116	IMPERVIOUS TYPE B	002S, 003S, 004S
0.000	8.347	0.000	0.000	0.000	8.347	ROW CROPS TYPE B	001S, 002S, 003S, 004S
0.000	5.431	0.000	0.000	0.000	5.431	WOODS TYPE B	001S, 002S, 003S, 004S
0.000	**33.658**	**0.000**	**0.000**	**0.000**	**33.658**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	5P	653.50	653.00	36.0	0.0132	0.025	0.0	12.0	0.0	(n n

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 001S: POST-DA-001 Runoff Area=2.000 ac 0.00% Impervious Runoff Depth=0.69"
Flow Length=208' Tc=18.8 min CN=75 Runoff=1.21 cfs 0.115 af

Subcatchment 002S: POST-DA-002 Runoff Area=3.903 ac 15.55% Impervious Runoff Depth=0.42"
Flow Length=356' Tc=2.8 min CN=66 Runoff=2.01 cfs 0.136 af

Subcatchment 003S: POST-DA-003 Runoff Area=11.455 ac 13.02% Impervious Runoff Depth=0.94"
Flow Length=1,018' Tc=20.8 min CN=80 Runoff=9.73 cfs 0.895 af

Subcatchment 004S: POST-DA-004 Runoff Area=16.300 ac 12.38% Impervious Runoff Depth=0.88"
Flow Length=492' Tc=12.0 min CN=79 Runoff=16.52 cfs 1.202 af

Pond 5P: (new Pond) Peak Elev=654.24' Storage=376,982 cf Inflow=26.33 cfs 2.348 af
Primary=1.21 cfs 2.057 af Secondary=0.00 cfs 0.000 af Outflow=1.21 cfs 2.057 af

Total Runoff Area = 33.658 ac Runoff Volume = 2.348 af Average Runoff Depth = 0.84"
87.77% Pervious = 29.542 ac 12.23% Impervious = 4.116 ac

Summary for Subcatchment 001S: POST-DA-001

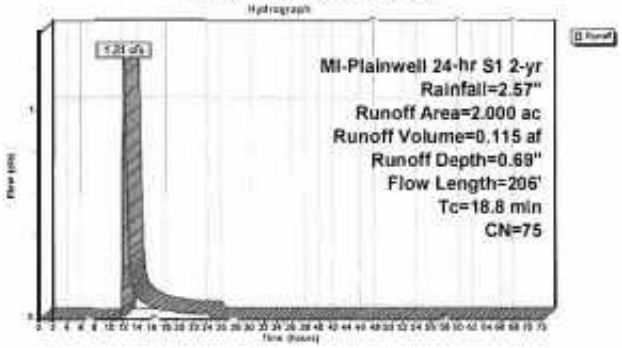
Runoff = 1.21 cfs @ 12.25 hrs, Volume= 0.115 af, Depth= 0.69"
Routed to Pond SP : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

	Area (ac)	CN	Description
*	1.625	79	ROW CROPS TYPE B, HSG B
*	0.375	60	WOODS TYPE B, HSG B
*	0.000	69	GRASSLAND TYPE B, HSG B
	2.000	75	Weighted Average
	2.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4	100	0.0038	0.10		Sheet Flow, WOODLAND Woods: Light underbrush n= 0.400 P2= 3.22"
1.4	106	0.0630	1.25		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
18.8	206	Total			

Subcatchment 001S: POST-DA-001



Summary for Subcatchment 002S: POST-DA-002

[49] Hint: Tc<2dt may require smaller dt

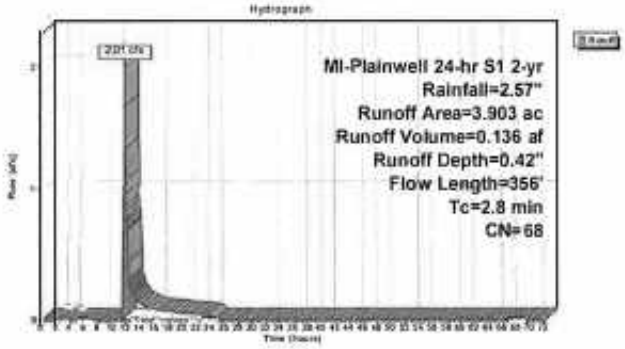
Runoff = 2.01 cfs @ 12.02 hrs, Volume= 0.136 af, Depth= 0.42"
Routed to Pond SP : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

	Area (ac)	CN	Description
*	0.117	79	ROW CROPS TYPE B, HSG B
*	0.607	98	IMPERVIOUS TYPE B, HSG B
*	2.561	60	WOODS TYPE B, HSG B
*	0.618	69	GRASSLAND TYPE B, HSG B
	3.903	68	Weighted Average
	3.296		84.45% Pervious Area
	0.607		15.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.1092	2.72		Sheet Flow, IMPERVIOUS/GRAVEL Smooth surfaces n= 0.011 P2= 3.22"
0.1	30	0.0726	5.47		Shallow Concentrated Flow, IMPERVIOUS/GRAVEL Paved Kv= 20.3 fps
2.1	226	0.1315	1.81		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
2.8	356	Total			

Subcatchment 002S: POST-DA-002



Summary for Subcatchment 003S: POST-DA-003

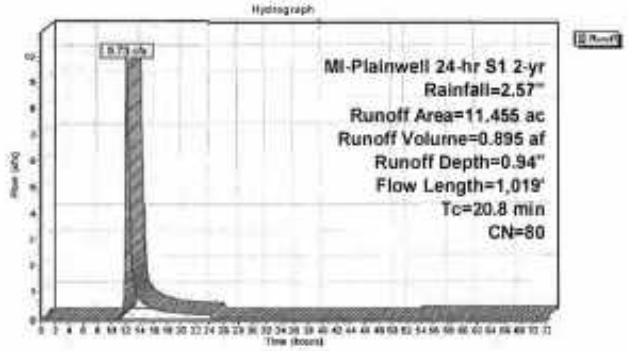
Runoff = 9.73 cfs @ 12.26 hrs, Volume= 0.895 af, Depth= 0.94"
Routed to Pond SP : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

	Area (ac)	CN	Description
*	3.680	79	ROW CROPS TYPE B, HSG B
*	1.491	98	IMPERVIOUS TYPE B, HSG B
*	0.624	60	WOODS TYPE B, HSG B
*	2.139	69	GRASSLAND TYPE B, HSG B
*	3.521	85	GRAVEL TYPE B, HSG B
	11.455	80	Weighted Average
	9.964		86.98% Pervious Area
	1.491		13.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0151	0.20		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
8.5	506	0.0201	0.99		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
1.6	212	0.0121	2.23		Shallow Concentrated Flow, IMPERVIOUS/GRAVEL Paved Kv= 20.3 fps
1.7	164	0.0544	1.63		Shallow Concentrated Flow, MEADOW/PASTURE Short Grass Pasture Kv= 7.0 fps
0.5	37	0.0562	1.19		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
20.8	1,019	Total			

Subcatchment 003S: POST-DA-003



Summary for Subcatchment 004S: POST-DA-004

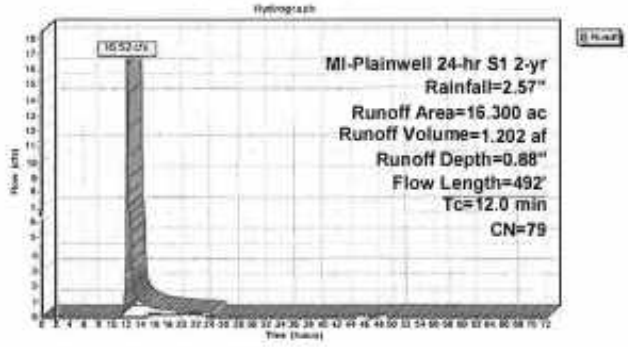
Runoff = 16.52 cfs @ 12.13 hrs, Volume= 1.202 af, Depth= 0.88"
Routed to Pond 5P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 2-yr Rainfall=2.57"

Area (ac)	CN	Description
* 2.925	79	ROW CROPS TYPE B, HSG B
* 2.018	98	IMPERVIOUS TYPE B, HSG B
* 1.871	60	WOODS TYPE B, HSG B
* 3.307	69	GRASSLAND TYPE B, HSG B
* 6.179	85	GRAVEL TYPE B, HSG B
16.300	79	Weighted Average
14.282		87.62% Pervious Area
2.018		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0384	0.28		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
0.7	116	0.0208	2.93		Shallow Concentrated Flow, IMPERVIOUS/GRAVEL Paved Kv= 20.3 fps
4.6	230	0.0141	0.83		Shallow Concentrated Flow, MEADOW/PASTURE Short Grass Pasture Kv= 7.0 fps
0.8	46	0.0404	1.00		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
12.0	492	Total			

Subcatchment 004S: POST-DA-004



Summary for Pond 5P: (new Pond)

Inflow Area = 33.658 ac, 12.23% Impervious, Inflow Depth = 0.84" for 2-yr event
Inflow = 26.33 cfs @ 12.17 hrs, Volume= 2.348 af
Outflow = 1.21 cfs @ 16.16 hrs, Volume= 2.057 af, Atten= 95%, Lag= 239.7 min
Primary = 1.21 cfs @ 16.16 hrs, Volume= 2.057 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Starting Elev= 853.50' Surf.Area= 84,071 sf Storage= 312,185 cf
Peak Elev= 854.24' @ 16.16 hrs Surf.Area= 91,819 sf Storage= 376,982 cf (64,797 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 789.5 min (1,651.9 - 862.4)

Volume	Invert	Avail.Storage	Storage Description
#1	848.75'	781,606 cf	Custom Stage Data (Conic) Listed below (Recalc)

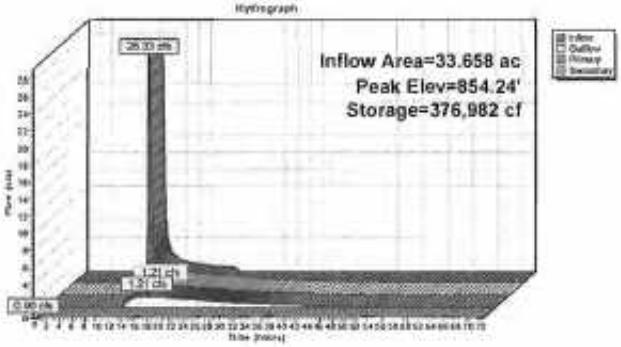
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
848.75	48,946	0	0	48,946
849.00	50,670	12,451	12,451	50,681
850.00	57,643	54,119	66,570	57,703
851.00	64,717	61,146	127,716	64,831
852.00	71,891	68,273	195,989	72,065
853.00	79,164	75,498	271,487	79,402
853.17	80,397	13,563	285,050	80,647
853.50	84,071	27,135	312,185	84,336
854.00	88,644	43,421	355,606	89,934
855.00	99,056	94,311	449,917	99,409
857.00	114,459	213,330	663,246	114,985
858.00	122,304	118,360	781,606	122,924

Device	Routing	Invert	Outlet Devices
#1	Secondary	857.00'	1.0' long x 4.0' TideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	853.50'	12.0" Round Culvert L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 853.50' / 853.00' S= 0.0132 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#3	Device 2	856.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 2	853.50'	4.0" Vert. Orifice/Grate X 3.00 columns X 2 rows with 6.0" cc spacing C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.21 cfs @ 16.16 hrs HW=854.24' (Free Discharge)
└─2=Culvert (Barrel Controls 1.21 cfs @ 2.71 fps)
└─3=OrificeGrate (Controls 0.00 cfs)
└─4=OrificeGrate (Passes 1.21 cfs of 1.28 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=853.50' (Free Discharge)
└─1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P: (new Pond)



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 001S: POST-DA-001 — Runoff Area=2.000 ac 0.00% Impervious Runoff Depth=1.42"
Flow Length=206' Tc=18.8 min CN=75 Runoff=2.84 cfs 0.236 af

Subcatchment 002S: POST-DA-002 — Runoff Area=3.903 ac 15.55% Impervious Runoff Depth=1.00"
Flow Length=356' Tc=2.8 min CN=68 Runoff=6.54 cfs 0.324 af

Subcatchment 003S: POST-DA-003 — Runoff Area=11.455 ac 13.02% Impervious Runoff Depth=1.76"
Flow Length=1,019' Tc=20.8 min CN=80 Runoff=19.91 cfs 1.684 af

Subcatchment 004S: POST-DA-004 — Runoff Area=16.300 ac 12.38% Impervious Runoff Depth=1.69"
Flow Length=492' Tc=12.0 min CN=79 Runoff=34.88 cfs 2.297 af

Pond 5P: (new Pond) — Peak Elev=854.32' Storage=442,505 cf Inflow=55.76 cfs 4.541 af
Primary=2.41 cfs 4.205 af Secondary=0.00 cfs 0.000 af Outflow=2.41 cfs 4.205 af

Total Runoff Area = 33.658 ac Runoff Volume = 4.541 af Average Runoff Depth = 1.62"
87.77% Pervious = 29.542 ac 12.23% Impervious = 4.116 ac

Summary for Subcatchment 001S: POST-DA-001

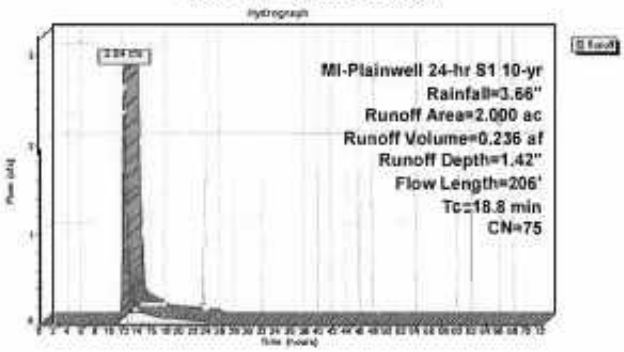
Runoff = 2.84 cfs @ 12.23 hrs, Volume= 0.236 af, Depth= 1.42"
Routed to Pond 5P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

	Area (ac)	CN	Description
*	1.625	79	ROW CROPS TYPE B, HSG B
*	0.375	60	WOODS TYPE B, HSG B
*	0.000	69	GRASSLAND TYPE B, HSG B
	2.000	75	Weighted Average
	2.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4	100	0.0338	0.10		Sheet Flow, WOODLAND Woods: Light underbrush n= 0.400 P2= 3.22"
1.4	106	0.0630	1.25		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
18.8	206	Total			

Subcatchment 001S: POST-DA-001



Summary for Subcatchment 002S: POST-DA-002

[49] Hint: Tc<2dt may require smaller dt

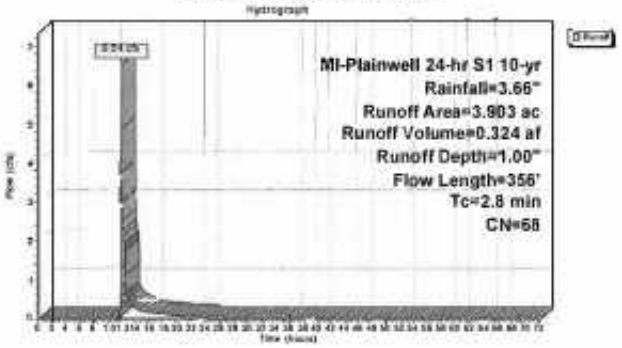
Runoff = 6.54 cfs @ 12.01 hrs, Volume= 0.324 af, Depth= 1.00"
Routed to Pond 5P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

	Area (ac)	CN	Description
*	0.117	79	ROW CROPS TYPE B, HSG B
*	0.607	98	IMPERVIOUS TYPE B, HSG B
*	2.561	60	WOODS TYPE B, HSG B
*	0.618	69	GRASSLAND TYPE B, HSG B
	3.903	68	Weighted Average
	3.296		84.45% Pervious Area
	0.607		15.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.1002	2.72		Sheet Flow, IMPERVIOUS/GRAVEL Smooth surfaces n= 0.011 P2= 3.22"
0.1	30	0.0726	5.47		Shallow Concentrated Flow, IMPERVIOUS/GRAVEL Paved Kv= 20.3 fps
2.1	226	0.1315	1.81		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
2.8	356	Total			

Subcatchment 002S: POST-DA-002



Summary for Subcatchment 003S: POST-DA-003

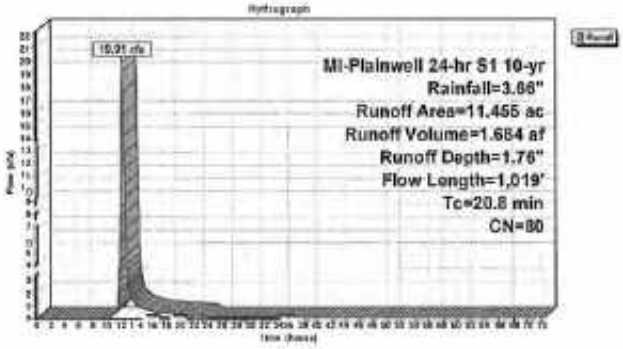
Runoff = 19.91 cfs @ 12.25 hrs, Volume= 1.684 af, Depth= 1.76"
Routed to Pond SP : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

	Area (ac)	CN	Description
*	3.680	79	ROW CROPS TYPE B, HSG B
*	1.491	98	IMPERVIOUS TYPE B, HSG B
*	0.524	60	WOODS TYPE B, HSG B
*	2.139	69	GRASSLAND TYPE B, HSG B
*	3.521	85	GRAVEL TYPE B, HSG B
	11.455	80	Weighted Average
	9.964		86.98% Pervious Area
	1.491		13.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0151	0.20		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
8.5	506	0.0201	0.99		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
1.9	212	0.0121	2.23		Shallow Concentrated Flow, IMPERVIOUS/GRAVEL Paved Kv= 20.3 fps
1.7	164	0.0544	1.63		Shallow Concentrated Flow, MEADOW/PASTURE Short Grass Pasture Kv= 7.0 fps
0.5	37	0.0562	1.19		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
20.8	1,019	Total			

Subcatchment 003S: POST-DA-003



Summary for Subcatchment 004S: POST-DA-004

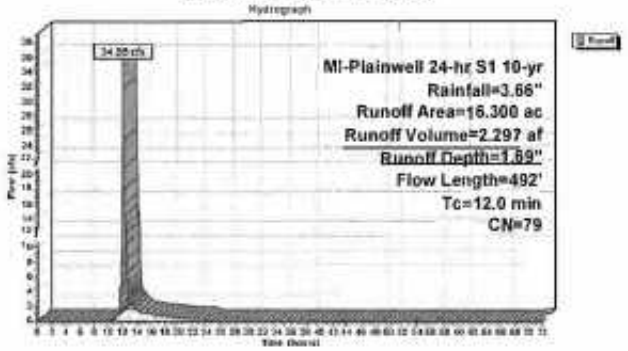
Runoff = 34.88 cfs @ 12.12 hrs, Volume= 2.297 af, Depth= 1.69"
Routed to Pond SP : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 10-yr Rainfall=3.66"

	Area (ac)	CN	Description
*	2.925	79	ROW CROPS TYPE B, HSG B
*	2.018	98	IMPERVIOUS TYPE B, HSG B
*	1.871	60	WOODS TYPE B, HSG B
*	3.307	69	GRASSLAND TYPE B, HSG B
*	6.179	85	GRAVEL TYPE B, HSG B
	16.300	79	Weighted Average
	14.282		87.62% Pervious Area
	2.018		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0384	0.28		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
0.7	116	0.0208	2.93		Shallow Concentrated Flow, IMPERVIOUS/GRAVEL Paved Kv= 20.3 fps
4.6	230	0.0141	0.83		Shallow Concentrated Flow, MEADOW/PASTURE Short Grass Pasture Kv= 7.0 fps
0.8	46	0.0404	1.00		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
12.0	492	Total			

Subcatchment 004S: POST-DA-004



Summary for Pond 5P: (new Pond)

Inflow Area = 33.658 ac, 12.23% Impervious, Inflow Depth = 1.62" for 10-yr event
Inflow = 55.76 cfs @ 12.16 hrs, Volume= 4.541 af
Outflow = 2.41 cfs @ 15.15 hrs, Volume= 4.205 af, Atten= 96%, Lag= 179.6 min
Primary = 2.41 cfs @ 15.15 hrs, Volume= 4.205 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Starting Elev= 853.50' Surf.Area= 84,071 sf Storage= 312,185 cf
Peak Elev= 854.92' @ 15.15 hrs Surf.Area= 98,333 sf Storage= 442,505 cf (130,320 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 740.5 min (1,577.5 - 837.0)

Volume	Invert	Avail.Storage	Storage Description
#1	848.75'	781,606 cf	Custom Stage Data (Conic) Listed below (Recalc)

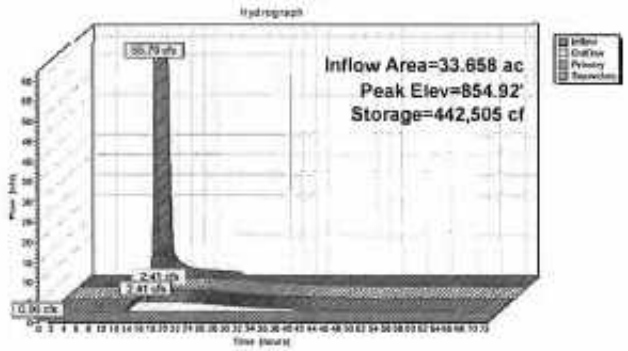
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
848.75	48,946	0	0	48,946
849.00	50,670	12,451	12,451	50,681
850.00	57,643	54,119	66,570	57,703
851.00	64,717	61,146	127,716	64,831
852.00	71,891	68,273	195,989	72,065
853.00	79,164	75,498	271,487	79,402
853.17	80,397	13,563	285,050	80,647
853.50	84,071	27,135	312,185	84,336
854.00	89,644	43,421	355,606	89,934
855.00	99,056	94,311	449,917	99,409
857.00	114,459	213,330	663,246	114,985
858.00	122,304	118,360	781,606	122,924

Device	Routing	Invert	Outlet Devices
#1	Secondary	857.00'	1.0' long x 4.0' SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	853.50'	12.0" Round Culvert L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 853.50' / 853.00' S= 0.0132 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#3	Device 2	856.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 2	853.50'	4.0" Vert. Orifice/Grate X 3.00 columns X 2 rows with 6.0" cc spacing C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.41 cfs @ 15.15 hrs HW=854.92' (Free Discharge)
└2=Culvert (Barrel Controls 2.41 cfs @ 3.07 fps)
├3=Orifice/Grate (Controls 0.00 cfs)
└4=Orifice/Grate (Passes 2.41 cfs of 2.51 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=853.50' (Free Discharge)
└1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P: (new Pond)



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 001S: POST-DA-001 Runoff Area=2.000 ac 0.00% Impervious Runoff Depth=3.31"
Flow Length=206' Tc=18.8 min CN=75 Runoff=0.71 cfs 0.551 af

Subcatchment 002S: POST-DA-002 Runoff Area=3.903 ac 15.55% Impervious Runoff Depth=2.64"
Flow Length=386' Tc=2.8 min CN=68 Runoff=18.38 cfs 0.860 af

Subcatchment 003S: POST-DA-003 Runoff Area=11.456 ac 13.02% Impervious Runoff Depth=3.81"
Flow Length=1,019' Tc=20.8 min CN=80 Runoff=42.22 cfs 3.635 af

Subcatchment 004S: POST-DA-004 Runoff Area=16.300 ac 12.38% Impervious Runoff Depth=3.71"
Flow Length=492' Tc=12.0 min CN=79 Runoff=75.00 cfs 5.035 af

Pond 5P: (new Pond) Peak Elev=856.66' Storage=624,997 cf Inflow=121.83 cfs 10.081 af
Primary=4.09 cfs 9.560 af Secondary=0.00 cfs 0.000 af Outflow=4.09 cfs 9.560 af

Total Runoff Area = 33.658 ac Runoff Volume = 10.081 af Average Runoff Depth = 3.59"
87.77% Pervious = 29.542 ac 12.23% Impervious = 4.116 ac

Summary for Subcatchment 001S: POST-DA-001

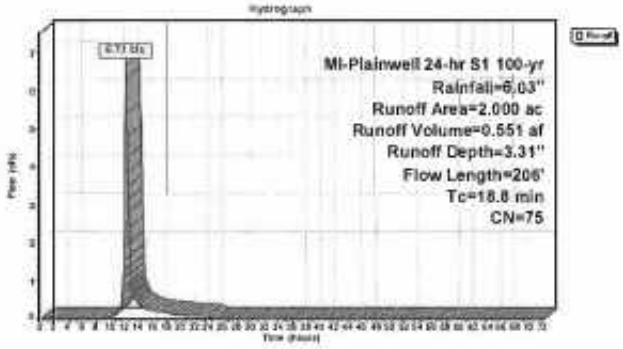
Runoff = 6.71 cfs @ 12.22 hrs, Volume= 0.551 af, Depth= 3.31"
Routed to Pond 5P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

	Area (ac)	CN	Description
*	1.625	79	ROW CROPS TYPE B, HSG B
*	0.375	60	WOODS TYPE B, HSG B
*	0.000	69	GRASSLAND TYPE B, HSG B
	2.000	75	Weighted Average
	2.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4	100	0.0038	0.10		Sheet Flow, WOODLAND Woods: Light underbrush n= 0.400 P2= 3.22"
1.4	106	0.0630	1.25		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
18.8	206	Total			

Subcatchment 001S: POST-DA-001



Summary for Subcatchment 002S: POST-DA-002

[49] Hint: Tc<2dt may require smaller dt

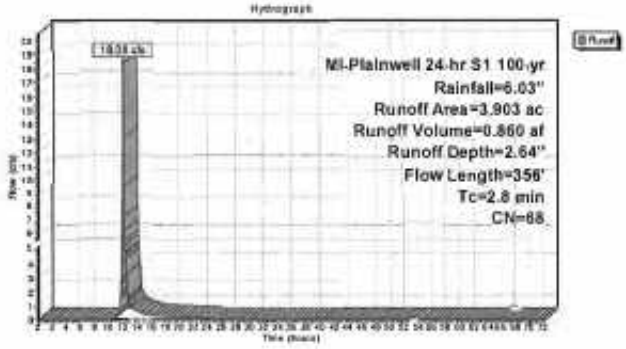
Runoff = 18.38 cfs @ 12.00 hrs, Volume= 0.860 af, Depth= 2.64"
Routed to Pond 5P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

	Area (ac)	CN	Description
*	0.117	79	ROW CROPS TYPE B, HSG B
*	0.607	98	IMPERVIOUS TYPE B, HSG B
*	2.561	60	WOODS TYPE B, HSG B
*	0.618	69	GRASSLAND TYPE B, HSG B
	3.903	68	Weighted Average
	3.296		84.45% Pervious Area
	0.607		15.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.1092	2.72		Sheet Flow, IMPERVIOUS/GRAVEL Smooth surfaces n= 0.011 P2= 3.22"
0.1	30	0.0726	5.47		Shallow Concentrated Flow, IMPERVIOUS/GRAVEL Paved Kv= 20.3 fps
2.1	226	0.1315	1.81		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
2.8	356	Total			

Subcatchment 002S: POST-DA-002



Summary for Subcatchment 003S: POST-DA-003

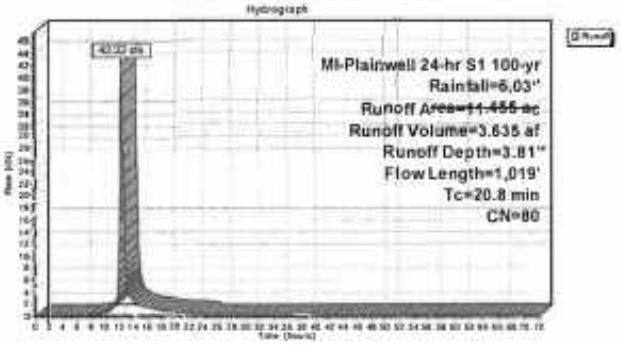
Runoff = 42.22 cfs @ 12.25 hrs, Volume= 3.635 af, Depth= 3.81"
Routed to Pond 5P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

	Area (ac)	CN	Description
*	3.880	79	ROW CROPS TYPE B, HSG B
*	1.491	98	IMPERVIOUS TYPE B, HSG B
*	0.624	60	WOODS TYPE B, HSG B
*	2.139	69	GRASSLAND TYPE B, HSG B
*	3.521	85	GRAVEL TYPE B, HSG B
	11.455	80	Weighted Average
	9.964		86.98% Pervious Area
	1.491		13.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0151	0.20		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
8.5	506	0.0201	0.99		Shallow Concentrated Flow, CROPLAND Cultivated Straight Rows Kv= 7.0 fps
1.6	212	0.0121	2.23		Shallow Concentrated Flow, IMPERVIOUS/GRAVEL Paved Kv= 20.3 fps
1.7	164	0.0544	1.63		Shallow Concentrated Flow, MEADOW/PASTURE Short Grass Pasture Kv= 7.0 fps
0.5	37	0.0562	1.19		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
20.8	1,019	Total			

Subcatchment 003S: POST-DA-003



Summary for Subcatchment 004S: POST-DA-004

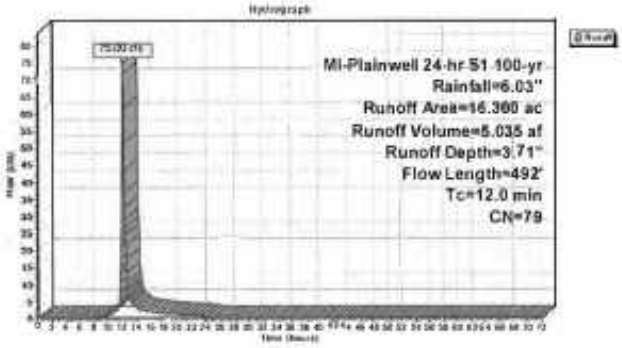
Runoff = 75.00 cfs @ 12.12 hrs, Volume= 5.035 af, Depth= 3.71"
Routed to Pond 5P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MI-Plainwell 24-hr S1 100-yr Rainfall=6.03"

	Area (ac)	CN	Description
*	2.925	79	ROW CROPS TYPE B, HSG B
*	2.018	98	IMPERVIOUS TYPE B, HSG B
*	1.871	60	WOODS TYPE B, HSG B
*	3.307	69	GRASSLAND TYPE B, HSG B
*	6.179	85	GRAVEL, TYPE B, HSG B
	16.300	79	Weighted Average
	14.282		87.62% Pervious Area
	2.018		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0384	0.28		Sheet Flow, CROPLAND Cultivated: Residue<=20% n= 0.110 P2= 3.22"
0.7	116	0.0208	2.93		Shallow Concentrated Flow, IMPERVIOUS/GRAVEL Paved Kv= 20.3 fps
4.6	230	0.0141	0.83		Shallow Concentrated Flow, MEADOW/PASTURE Short Grass Pasture Kv= 7.0 fps
0.8	46	0.0404	1.00		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
12.0	492	Total			

Subcatchment 004S: POST-DA-004



Summary for Pond 5P: (new Pond)

Inflow Area = 33.658 ac, 12.23% Impervious, Inflow Depth = 3.59" for 100-yr event
Inflow = 121.83 cfs @ 12.15 hrs, Volume= 10.081 af
Outflow = 4.09 cfs @ 15.75 hrs, Volume= 9.593 af, Atten= 97%, Lag= 216.1 min
Primary = 4.09 cfs @ 15.75 hrs, Volume= 9.593 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Starting Elev= 853.50' Surf.Area= 84,071 sf Storage= 312,185 cf
Peak Elev= 856.66' @ 15.75 hrs Surf.Area= 111,749 sf Storage= 624,607 cf (312,423 cf above start)

Plug-Flow detention time= 2,101.0 min calculated for 2.427 af (24% of inflow)
Center-of-Mass det. time= 937.8 min (1,756.3 - 818.4)

Volume	Invert	Avail.Storage	Storage Description
#1	848.75'	781,606 cf	Custom Stage Data (Conic) Listed below (Recalc)

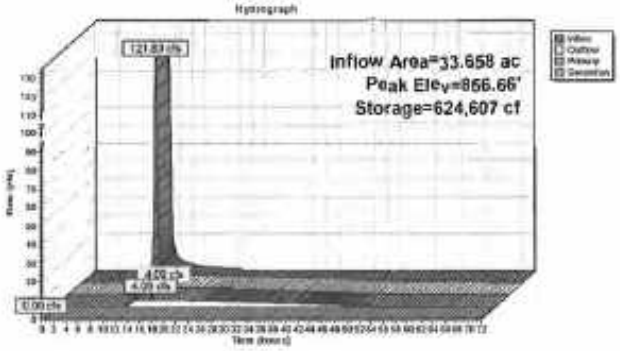
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
848.75	48,946	0	0	48,946
849.00	50,670	12,451	12,451	50,681
850.00	57,543	54,119	66,570	57,703
851.00	64,717	61,146	127,716	64,801
852.00	71,891	68,273	195,989	72,065
853.00	79,164	75,498	271,487	79,402
853.17	80,397	13,563	285,050	80,647
853.50	84,071	27,135	312,185	84,336
854.00	89,644	43,421	355,606	89,934
855.00	99,056	94,311	449,917	99,409
857.00	114,459	213,330	663,246	114,985
858.00	122,304	118,360	781,606	122,924

Device	Routing	Invert	Outlet Devices
#1	Secondary	857.00'	1.0' long x 4.0' / SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	853.50'	12.0" Round Culvert L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 853.50' / 853.00' S= 0.0132 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#3	Device 2	856.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 2	853.50'	4.0" Vert. Orifice/Grate X 3.00 columns X 2 rows with 6.0" cc spacing C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.09 cfs @ 15.75 hrs HW=856.66' (Free Discharge)
└2=Culvert (Barrel Controls 4.09 cfs @ 5.21 fps)
├3=Orifice/Grate (Passes < 21.95 cfs potential flow)
└4=Orifice/Grate (Passes < 4.17 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=853.50' (Free Discharge)
└1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond SP: (new Pond)



PROJECT NARRATIVE

FOR

HERON BESS

SITE PLAN REVIEW APPLICATION – BATTERY ENERGY STORAGE SYSTEM

ALLEGAN COUNTY, MICHIGAN

MARCH 2026 | VERSION 1

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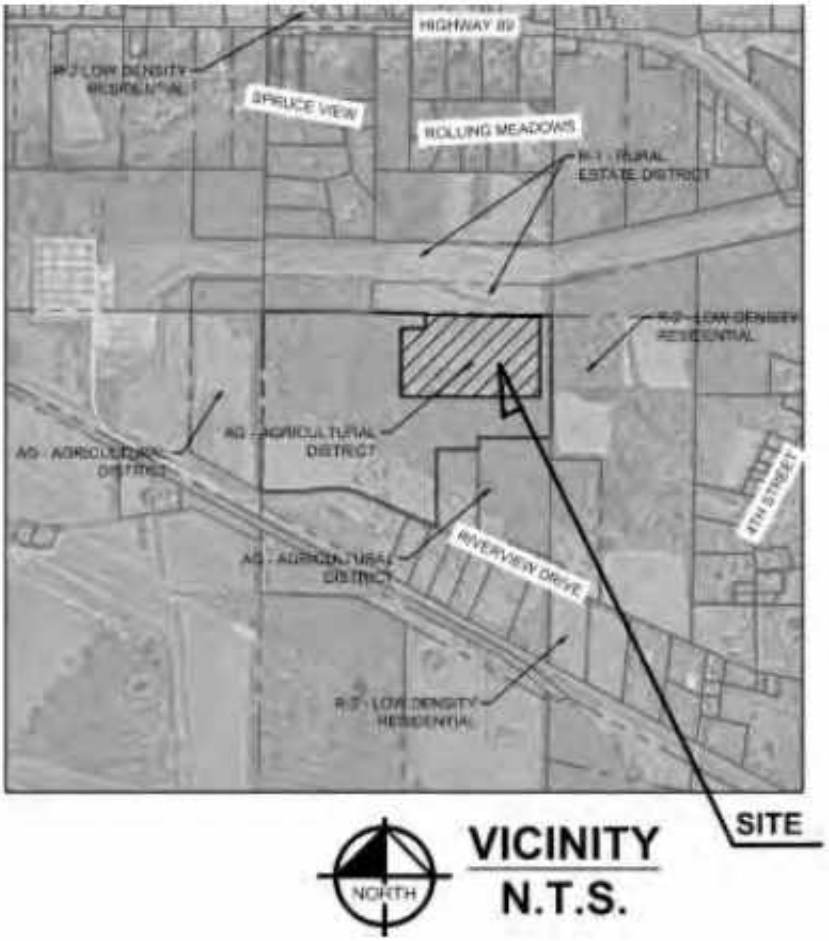
1.0 PROJECT LOCATION

1.1 GENERAL LOCATION

Heron Energy Storage LLC (CIP) is proposing the Heron Battery Energy Storage System (BESS) on a 23.90 acre portion of Parcel No. 08-034-021-50 in Gun Plain Charter Township, Allegan County, MI generally North of Industrial Pkwy, South of Allegan Street, and west of 4th Street in Allegan County, Michigan. The project area is within the northeast ¼ of the northwest ¼ of section 34, township 1 north, range 11 west. To the North of the project area are areas zoned R-1 Rural Estate District, to the East there are areas zoned as R-2 Low Density Residential, and to the West is AG Agricultural District.



The applicant for the Heron BESS project is requesting Site Plan and Special Use Permit Approval to construct, operate, and eventually decommission the Heron BESS facility and related infrastructure within the existing AG Agricultural zoning district. The facility will provide up to 250 megawatts (MW) of capacity, 1000 megawatt-hours (MWh) of energy storage capacity.

2.0 PURPOSE OF REQUEST

2.1 ZONING ANALYSIS

Gun Plain Charter Township adopted an ordinance, effective May 21, 2025, which amended the Zoning Ordinance to include definitions and provisions for regulating battery energy storage systems (BESS). BESS Ordinance No.187 distinguishes between on-site and off-site battery energy storage systems. Heron BESS is a Large Off-Site BESS since it has a nameplate capacity of 50 MW or more and an energy discharge of 200 MWh or more. Heron BESS is designed to meet or exceed all requirements of the Zoning Ordinance, while mitigating any potential impacts on non-participating properties.

3.0 DESCRIPTION OF PROPOSAL

3.1 OVERVIEW

The proposed project will consist of the following development activities:

- Site preparation, including removal of existing crops/vegetation and grading (as necessary). Special care will be provided to protect existing trees and wetlands.
- Installation of a 250 MW/1000 MWh BESS consisting of lithium-ion batteries, storage containers, transformers and electrical cabling and associated equipment.
- A 6-foot chain link fence along the north and south side of the BESS facility and north side of the project substation, and locked access gates with Knox box for emergency access.
- Construction of a 345 kV generator intertie electrical transmission line or "gen-tie", including transmission poles and associated electricity transmission facilities, connecting from the project site to the existing substation to the west.
- Construction of temporary and permanent on-site access roads for construction and maintenance activities.
- Construction of permanent stormwater management facilities and site utilities.
- Construction of other necessary infrastructure, including one permanent operation and maintenance (O&M) building.

3.2 PROPOSED USE

The proposed use of the property is a Battery Energy Storage System (BESS) facility with supporting infrastructure designed to enhance grid stability, optimize energy utilization, and facilitate renewable energy integration. The BESS will provide essential services such as frequency regulation, voltage support, and additional capacity during peak demand periods, ensuring compliance with regulatory standards. By storing energy during off-peak hours and discharging during peak demand, the system will improve generation efficiency, reduce costs, and manage local peak loads, which will help defer expensive transmission and distribution upgrades.

Additionally, the facility will mitigate renewable energy intermittency, enable time-shifting of energy supply to better align with demand, and support power restoration following outages, thereby strengthening grid resilience. The BESS will also supply backup power to critical infrastructure during emergencies, enhancing energy security. This investment represents a strategic step toward modernizing the grid, supporting renewable energy adoption, and improving overall efficiency and reliability—contributing to a more sustainable and resilient energy future. The system will be charged from the electrical grid and will have a storage capacity of up to 250 MW/1000 MWh.

The proposed BESS is sited on undeveloped land that minimizes new disturbance and supports efficient interconnection. The BESS is sited on the closest undeveloped land to the existing electrical infrastructure, as other sites were not suitable to accommodate the technical, spatial, environmental, or access needs for the BESS facility. Given those complexities, the chosen parcel represents the most practical, lowest-impact siting option.

3.3 HOURS OF OPERATION

The BESS system will be in operation 24/7 once connected to the grid, however instances of charging and discharge will vary depending on the local power supply and demand.

3.4 PROJECT COMPONENTS

Below is a description of the individual project components.

3.4.1 PROJECT SUBSTATION AND GEN-TIE

The project's on-site (Customer) substation will interconnect the proposed Battery Energy Storage System (BESS) yard via multiple medium voltage underground feeders. The customer substation yard will house a Generator Step Up (GSU) transformer that will step up the voltage from the BESS yard, up to the interconnection voltage of 345 kV. The proposed substation yard will include an electrical control house; an operational building used to control/monitor the substation. It houses ancillary equipment for systems necessary for the overall function of a substation. Such systems include control relays, server racks, telecommunications and technical security, fire alarm and protection, etc. It will occupy approximately 588 square feet within the customer substation yard.

A generator intertie will be interconnected at 345 kV from the customer substation to the point of interconnection at the existing utility substation 0.44 miles to the west. The exact gen-tie route to be determined by others as the project progresses. As shown on the Site Plan, the proposed substation will be enclosed by a 6-foot chain link fence, located within the designated building envelope.

3.4.2 Energy Storage System

The project will feature a stand-alone lithium-ion BESS facility with a capacity of up to 250 MW and 4-hour duration (1000 MWh). The system will be housed in enclosures containing racks with battery modules and string inverters. An Emergency Management System (EMS) will monitor performance and condition while providing operational control. The facility will be overseen by an unmanned control center operating 24/7.

Safety and security measures will include an electronic security system, smoke detectors, and alarm system. Additional fire safety protocols are detailed in Section 3.7.2.

Battery systems operate silently, with noise limited to HVAC units required for temperature regulation.

Energy stored in the BESS will be connected to the electrical grid. The system will utilize integral inverters with bidirectional capability which enable charging and discharging from/to the grid and provide essential grid support.

3.4.3 Transformers

The project will utilize stand-alone medium voltage transformers. The GSU transformer will be maintained within the customer substation. Refer to the Civil Package accompanied by this application for further explanation of the location of the MV transformers and BESS containers.

3.4.4 Permanent Buildings and Structures

Ancillary facilities such as the O&M building, exterior lighting, telecommunications, and meteorological data collection system may also be installed.

To comply with NFPA 855 standards, battery storage containers will be set back a minimum of 100 ft from the property line.

An O&M building may be required for the project. The proposed O&M building will be located near the entrance to the project. It is currently estimated 6 parking spaces will be required given the current building size of 588 square feet, which is compliant with Gun Plain Charter Township Zoning Ordinance, Section 18.03. Facility performance will be monitored including amount of energy transferred, equipment failure, and weather. The facility will have controlled access with gated entrance equipped with a Knox Box.

3.5 PERIMETER FENCING AND GATES

Perimeter fencing will include a 6-foot chain link fence along the north, west, and south side of the BESS facility and north, east, south, and west side of the client substation, a 10-foot sound wall along the east side of the BESS facility, and locked access gates with Knox Box for emergency access to the BESS facility. The substation perimeter fence is proposed as a chain link fence in the height of 6 feet on the north, south, east, and west side. Per Section 10.04 of the Charter Township of Gun Plain Zoning Ordinance the Planning Commission may approve a height of up to six (6) feet if the Planning Commission determines that a higher fence is necessary for the safety and security of the site based on the use of the site and per Section 17.36 of the Charter Township of Gun Plain Zoning Ordinance. Noise Gates with Knox Box will be located at key access points for the construction, operations, and maintenance phases. The proposed substation and BESS yard will be largely screened by existing and proposed vegetation between the public right-of-way and project site. Proposed locations of all fencing, walls, and gates are illustrated on the Site Plan Package of this application in **Exhibit A**. The Noise Analysis can be found in **Exhibit G**.

3.5.1 Site Security and Outdoor Lighting

Security cameras will be installed on the control enclosure and O&M building. Cameras will be mounted on poles at an appropriate height and will face inward to monitor on-site activity. Lighting poles will also be placed within the project site. All outdoor lighting shall be in accordance with Section 20.04B of the Gun Plain Charter Township Zoning Ordinance and all county standards, regulations, and requirements. Project design will include lighting at the front gate, O&M building, BESS yard, and Substation. Additional

lighting specific to the project area may be either motion activated or light sensitive to come on in the evenings and shut off in the morning automatically. Exterior lighting will be shielded downward to prevent any spillover into adjacent properties. All project specific lighting will be included in the Site Plan package in this application. The Photometric Plan can be found in **Exhibit E**.

3.6 CONSTRUCTION

Construction of the energy storage system will include site preparation as well as the installation of the battery storage structures, safety systems, inverters, substation, and interconnection.

3.6.1 Signage

During all phases of this project, signage for safety, information on system type, special hazards, fire suppression system, 24-hour emergency contact information, visible warning sign concerning voltage placed at the base of all pad mounted transformers and substations, and identification will be posted around the perimeter of the project site. No large billboards or other forms of advertising signage are proposed. All signage will conform to Gun Plain Charter Township Zoning Ordinance signage requirements for this zone, described in Chapter 16 of the Gun Plain Charter Township Zoning Ordinance.

The Project will comply with NFPA 855 "Standard for the Installation of Stationary Energy Storage Systems" or any applicable successor standard adopted by the Michigan Public Service Commission.

3.6.2 Drainage

Permanent stormwater basins will be designed and constructed to support site drainage. On-site drainage areas have been delineated, and detention basins are proposed in each to provide the required storage to accommodate the runoff volume from the specified storm event. A specific drainage plan for the project intending to meet the requirements of Allegan County Drainage Commission can be found in the Site Plan Package attached to this application.

3.7 CONSTRUCTION SCHEDULE AND WORKFORCE

Construction is anticipated to begin early 2027 and could last up to 18 months. Construction is anticipated to be undertaken in phases that may overlap, including an initial site preparation phase, a phase during which the energy storage system will be installed, and a phase during which the power conversion station and substation will be installed. Following the installation, testing and commissioning will take place. Most of the labor force is expected to come from the surrounding communities within the Kalamazoo Metropolitan Area. There will be an estimated workforce of up to 50-100 full-time employees during construction.

Construction equipment will be primarily operated between 7:00 AM and 7:00 PM, Monday through Friday. Depending on schedule demand, working hours in the early morning, evening, nights, and weekends may occur during certain construction phases. However, this is not an expected aspect of project construction. All construction work, including any weekend work, will comply with the policies and requirements established by Gun Plain Charter Township Zoning Ordinance.

3.7.1 Personnel Training

The applicant will coordinate with the local fire department to provide a collaborative approach to Emergency Responses. The project applicant will also implement the following measures during project construction and operation:

• All applicable Allegan County and Gun Plain Charter Township standards and requirements will be followed to ensure accessibility and ground clearance of emergency vehicles (e.g., fire engines)

• Smoking will be prohibited at the project site, except within designated areas.

• Work crews will be required to park vehicles away from flammable vegetation such as dry grass and brush. At the end of each workday, heavy equipment will be required to be parked over gravel, mineral soil, asphalt, or concrete where available to reduce the risk of fire.

• All heavy equipment will be required to include mechanisms for fire suppression, including spark arresters or turbocharging (which eliminates sparks in exhaust) and fire extinguishers.

3.8 OPERATION AND MAINTENANCE

Upon commissioning, the project will enter the operation phase with energy storage and dispatching power during both daylight and non-daylight hours as required by grid operators year-round.

Operational activities at the project site will include:

• Vegetation, weed, and pest management.

• Security.

• Responding to automated electronic alerts based on monitored data for a safe operating system.

• Occasional equipment repair and replacement.

• Communicating with transmission system operators and other entities involved in facility operations.

Project site maintenance and equipment repairs will be generally conducted during daytime hours. Maintenance typically will include inspection of the substation and battery energy storage system components. O&M at the substation and MV transformers in the BESS yard will include visual inspections of the oil/water separators systems. As part of the ongoing O&M, the energy storage system will be inspected regularly. A more detailed maintenance schedule will be developed based on selected battery manufacturer requirements.

Regular preventative maintenance will include checking security of DC and AC connections: replacement of fans, filters, and pumps as required or recommended, and validating measurements of key electrical and environmental sensors. The project will maintain up to 6 parking spaces to accommodate both O&M staff as well as first responders throughout the project lifespan.

3.8.1 O&M Workface

The project will employ staff members for ongoing facility maintenance and repairs. A record of inspections will be kept on-site. The operational labor force is expected to be from the greater Kalamazoo Metropolitan Area.

3.8.2 Fire Prevention and Safety Program

Heron BESS recognizes that fire safety, as well as the safety of our first responders and Gun Plain citizens, are central to the Township's review and approval of this project. During the O&M phase of the project, the Fire Prevention, Suppression, and Safety Program, including all training and practices, will be consistent with those described above under construction activities. Fire safety requirements and development standards for the project will comply with all applicable codes and regulations, including NFPA855. The Emergency Response Guide will be included as **Exhibit B**.

BESS systems are designed with external (site alarm panel, and emergency stop system) as well as internal (interior sensors for heat, smoke, and gas and audible and visual alarms) safety systems. Internal systems are designed to work within battery enclosures to prevent or detect the formation of a fire. The climate control system (HVAC and chillers) would keep the batteries running at optimal and safe temperatures to maximize performance and longevity. Should the cooling units fail, the batteries and their control systems have redundant mechanisms to shut the batteries down. External systems alert and assist first responders. The BESS would be designed to meet all applicable fire safety codes. Once operational, the BESS facility will be monitored remotely 24/7, as well as experience routine facility checks by full-time personnel. The Emergency Response Guide will be included as **Exhibit B**.

3.9 DECOMSSIONING AND SITE RECLAMATION

3.9.1 Decommissioning of Facilities

The project is anticipated to have an operating life of up to 20 years. Upon site decommissioning all above grade buildings, structures, and concrete foundations will be removed from the site. After this period, the project will be either repowered or decommissioned. Project decommissioning will involve the removal of above-grade facilities, buried electrical conduit, and all concrete foundations. Equipment will be repurposed off-site, recycled, or disposed of in a landfill as appropriate.

When the energy storage system will be decommissioned, most battery components will be recycled. Lithium-ion (li-ion) phosphate batteries and their constituent parts will likely be recycled.

Decommissioning is expected to occur in 3 phases:

- Phase 1 will involve shutting down the systems and removing hazardous materials and wiring;
- Phase 2 will include removing the battery storage containers, inverters, and substations; and
- Phase 3 will include removing site fencing, driveways, and the final soils reclamation process.

Decommissioning will involve the use of heavy equipment similar to that used for construction. Appropriate hazardous materials control and erosion control measures will be used throughout the decommissioning process. It is anticipated that such controls will be substantially similar to those implemented during construction, although the intensity of activities will be lower.

3.9.2 Site Reclamation

All roads, driveways, and other areas compacted during original construction or by equipment used for decommissioning will be tilled in a manner adequate to restore the sub-grade material to the proper density and depth consistent with adjacent properties. Low areas will be filled with clean, compatible sub-grade material. After proper sub-grade depth is established, locally sourced topsoil will be placed to a depth and density consistent with adjacent properties. Locally sourced compost will be applied to the

topsoil, and revegetation with native seeds or plantings will be accomplished. More detail on decommissioning will be provided with the Final Site Plan Approval Package. The Decommissioning Plan can be found in **Exhibit H**.

4.0 RELATIONSHIP TO SURROUNDING PROPERTIES

4.1 SURROUNDING PARCELS

The project parcel is located adjacent to parcels zoned R-1 Rural Estate District, R-2 Low Density Residential, and AG Agricultural District. The project site is located within a parcel zoned for AG Agricultural District, maintaining a compatible use for an energy storage facility. The proposed project is located approximately 2.1 miles southeast from Gun Plain Charter Township Fire Department.

Surrounding parcels maintain vacant, transportation, residential, agricultural, and industrial uses. Land use directly to the north is zoned R-1 Rural Estate District, to the East there are areas zoned as R-2 Low Density Residential, and to the West is AG Agricultural District.

Residential uses are located approximately 0.2 miles south of the project area. The residential area to the south is separated from the project area by Riverview Drive. This road system, as well as the designated project setbacks, and fencing, will act as a barrier between residential communities located in proximity to the project area.

4.2 BENEFITS TO THE COMMUNITY AND SURROUNDING AREA

4.2.1 Economic Benefits

The BESS Project will also promote the general welfare of Gun Plain Charter Township by enhancing grid resiliency and increasing local tax revenues. The BESS Project will enter into a Community Host Agreement with the Township amounting to $2,000/MW, for a total amount of $500,000, which will provide additional resources to be used as determined by the Township for police, fire, public safety, and other infrastructure.

4.2.2 Environmental Benefits

This project is a 250 MW battery energy storage system, which will increase energy availability for the growing population of Allegan County. Energy stored may include renewable sources such as solar or wind accessed through the utility grid. As energy demand grows, the function of a BESS is to enhance grid resilience and stabilize, reducing the need for new energy system development in the future. This can lead to a reduction in Allegan County's overall energy emissions. Environmental benefits include reduced greenhouse gas emissions and improving overall system efficiency. The BESS project will be implemented with a focus on optimal sizing, siting, and adherence to all regulatory and permitting requirements, with detailed impact assessments to ensure minimal environmental disruption and community benefits. The project team has conducted due diligence on environmental and natural resources including wetlands & sensitive water features, protected species, and cultural resources, and no significant impacts are expected by the project's development.

The Applicant affirms that the proposed BESS system will not commence commercial operation until it is in full compliance with all applicable state and federal environmental laws, including but not limited to the Natural Resources and Environmental Protection Act, 1993 PA 451 (MCL 324.101 to 324.90106).

The site is 51% Farmland of local importance, 47% Not prime farmland, and the remaining being All areas are prime farmland (1.9%). Farmland Classifications can be found in **Exhibit K**, and the Custom Soil Resource Report for Allegan County can be found in **Exhibit L**.

The BESS Project the system is not expected to have an impact on television signals, microwave signals, agricultural global position systems, military defense radar, radio reception, or weather and doppler radio.

5.0 PROJECT ACCESSIBILITY AND CIRCULATION

5.1 SITE ACCESSIBILITY AND CIRCULATION

Access to the site will be provided from the west via one entrance from a private drive off Riverview Drive. All internal roads are proposed to be compacted gravel. Once operational, on-site vehicle circulation will consist of O&M vehicles. The site access roads are designed to allow for the circulation of a fire truck design vehicle. The Truck Circulation Plan can be found in **Exhibit F**.

6.0 DEVELOPMENT SCHEDULE

6.1 PROJECT SCHEDULE

Below is an indicative schedule for development:

• Q1 2026—Attain Site Plan approvals. All required planning and zoning approvals, which may include Preliminary Site Plan Approval, Special Use Permit, Allegan County Stormwater Approval, and Final Site Plan Approval.

• Q4 2026—Attain Building Permits, Allegan County Soil Erosion and Sedimentation Control (SESC) Permit, and EGLE Notice of Coverage NOC, which may include building, earthwork, grading & drainage, tree clearing, erosion control, etc.

• Q1 2027—Construction starts (earliest anticipated)

• Q2 2028—Construction complete. Operations begin, (earliest anticipated)

• 2028 to 2048—O&M Phase (up to 20 years).

7.0 COMMUNITY FACILITIES AND SERVICES

7.1 PROJECT PROXIMITY TO LOCAL FACILITIES

The proposed project is located approximately 2.1 miles southeast from Gun Plain Charter Township Fire Department.

8.0 PUBLIC UTILITES

Utility services to the site will be provided by proposed on-site septic and well systems. Communication lines will be pulled from the public ROW and coordinated with a local service provider. During the construction phase of the project portable restroom facilities will be provided. See the table in Section 8.1 for additional information on utility providers for the project.

8.1 Utility Providers

Utility	Provider and Contact Information
Police	Allegan County Sheriff's Office – (269) 673-0500
Fire Protection	The Gun Plain Charter Township Fire Department – (269) 685-9471
Electric Service	Consumers Energy Company – (517) 788-0550
Telephone Service	TBD
Waste & Recycle	Republic Services – (888) 249-5112

EXHIBIT A: CIVIL PLANS

SITE DEVELOPMENT PLANS
FOR
HERON ENERGY STORAGE LLC

RIVERVIEW DR., PLAINWELL, MI 49080
SECTION 34,
GUN PLAIN CHARTER TOWNSHIP, ALLEGAN COUNTY, MICHIGAN

PROJECT TEAM:

CIVIL ENGINEER
KIMLEY-HORN OF MICHIGAN, INC.
Kimley»Horn of Michigan, Inc.
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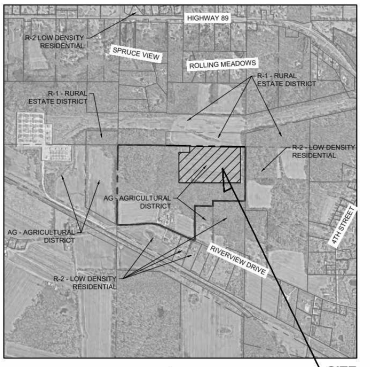
ENGINEER OF RECORD: BRIAN GAMMON, P.E.
TELEPHONE (612) 503-8532

OWNER / DEVELOPER
HERON ENERGY STORAGE LLC
CIP Copenhagen Infrastructure Partners
200 S WACKER DRIVE, STE. 1600
CHICAGO, IL 60606
CONTACT: SIMONE MARLETTI
TELEPHONE: (917) 451-0718

LANDSCAPE ARCHITECT
KIMLEY-HORN OF MICHIGAN, INC.
Kimley»Horn of Michigan, Inc.
3000 TOWN CTR, STE. 2600
SOUTHFIELD, MI 48075
CONTACT: RYAN HYLLESTED
TELEPHONE: (612) 568-0698

SURVEYOR
ROWE PROFESSIONAL SERVICES COMPANY
ROWE
507 36TH ST SE
GRAND RAPIDS, MI 49548
CONTACT: ROBERT CHURCH, P.S.
TELEPHONE: (616) 272-7125



NORTH **VICINITY N.T.S.**

PROJECT INFORMATION

ZONING:	AG AGRICULTURAL DISTRICT
PROPOSED USE:	BATTERY ENERGY STORAGE SYSTEM
FLOODPLAIN:	ZONE X
FRONT YARD SETBACK:	50'
SIDE YARD SETBACK:	20'
REAR YARD SETBACK:	10'
NFPA 855 REMOTE LOCATION BATTERY SETBACK:	100'
NON-PARTICIPATING STRUCTURE SETBACK:	300'
MAXIMUM BUILDING HEIGHT:	20'
PROJECT AREA SIZE:	26.65 AC / 1,160,900 SQ FT
PARCEL NUMBER:	08-034-021-50

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE INSTALLATION OF A 250 MW / 1000 MWH BATTERY ENERGY STORAGE SYSTEM.
PROJECT AREA (EXCLUDING ALL EXISTING AND PROPOSED PUBLIC RIGHTS-OF-WAY): 1,057,637 (SF)

LEGAL DESCRIPTION

PARCEL (08-034-021-50):
ALL THAT PART OF NW 1/4 LYING N OF RIVER RD EX BEG AT INTERSECTION OF THE CENT LIN OF RIVER RD & N & S 1/4 LIN TH N 1323 TH W 660 TH S TO A PT 938 N OF CENT LIN OF SD RD TH W 375 TH S TO CENT LIN OF RD TH SELY ALG SD RD TO POB SEC 34 T1N T11W TAX MAP: 91.92 AC (96).

NOTES:

1. CONTRACTOR SHALL CONFIRM THAT THE EXISTING CONDITIONS FOR THE SITE MATCH WHAT IS SHOWN ON THE DRAWINGS INCLUDED PRIOR TO CONSTRUCTION.
2. IF REPRODUCED, THE SCALES SHOWN ON THESE PLANS ARE BASED ON A 22x34 SHEET.
3. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICES COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICES.
4. ALL GENERAL CONTRACTOR WORK TO BE COMPLETED (EARTHWORK, FINAL UTILITIES, AND FINAL GRADING) BY THE MILESTONE DATE IN PROJECT DOCUMENTS.

Sheet List Table

Sheet Number	Sheet Title
C000	COVER SHEET
C100	GENERAL NOTES
C200	EXISTING CONDITIONS AND DEMOLITION PLAN
TP201	TREE INVENTORY & PRESERVATION PLAN
LP202	TREE INVENTORY
C300	EROSION AND SEDIMENT CONTROL PLAN - PHASE 1
C301	EROSION AND SEDIMENT CONTROL PLAN - PHASE 2
C310	EROSION CONTROL DETAILS
C311	EROSION CONTROL DETAILS
C312	EROSION CONTROL DETAILS
C313	EROSION CONTROL DETAILS
C314	EROSION CONTROL DETAILS
C400A	OVERALL SITE PLAN
C400B	OVERALL SITE PLAN
C401	SITE PLAN
C410	CIRCULATION PLAN
C500	GRADING AND DRAINAGE PLAN
C501	STORMWATER MANAGEMENT PLAN
C510	SITE CROSS SECTIONS
C600	UTILITY PLAN
C700	CIVIL DETAILS
C701	CIVIL DETAILS
C800	SIGNAGE PLAN
C801	SIGNAGE PLAN
L100	LANDSCAPE PLAN
L101	LANDSCAPE DETAILS
PP100	PHOTOMETRICS PLAN

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/06/2026	BFG

Kimley»Horn of Michigan, Inc.
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CIP Copenhagen Infrastructure Partners

STATE OF MICHIGAN BRIAN GAMMON ENGINEER 6201051208 LICENSED PROFESSIONAL ENGINEER

Brian Gammon

KHA PROJECT 191250003
DATE: 02/06/2026
SCALE: AS SHOWN
DESIGNED BY: JLL
DRAWN BY: CEB
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COVER SHEET

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HERON ENERGY STORAGE LLC
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GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR AND SUBCONTRACTORS SHALL OBTAIN A COPY OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS OF THE LOCAL JURISDICTION AND STATE DEPARTMENT OF TRANSPORTATION AND BECOME FAMILIAR WITH THE CONTENTS PRIOR TO COMMENCING WORK. UNLESS OTHERWISE NOTED, ALL WORK SHALL CONFORM AS APPLICABLE TO THESE STANDARDS AND SPECIFICATIONS.
2. PERFORM ALL WORK IN COMPLIANCE WITH APPLICABLE TOWNSHIP REGULATIONS, STATE CODES, AND O.S.H.A. STANDARDS. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING THE NECESSARY MATERIALS & LABOR TO CONSTRUCT THE FACILITY AS SHOWN AND DESCRIBED IN THE CONSTRUCTION DOCUMENTS, AND IN ACCORDANCE WITH THE SPECIFICATIONS AND REQUIREMENTS OF THE APPROPRIATE APPROVING AUTHORITIES.
4. CONTRACTOR SHALL CLEAR AND GRUB ALL AREAS UNLESS OTHERWISE INDICATED, REMOVING TREES, STUMPS, ROOTS, MUCK, EXISTING PAVEMENT AND ALL OTHER DELETERIOUS MATERIAL.
5. THE EXISTING SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS QUALITY LEVEL "D" UNLESS OTHERWISE NOTED. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ACSE 38/02, ENTITLED STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF SUBSURFACE QUALITY DATA BY THE FHA. EXISTING UTILITIES SHOWN ARE LOCATED ACCORDING TO THE INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME OF THE TOPOGRAPHIC SURVEY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER. GUARANTEE IS NOT MADE THAT ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN OR THAT THE LOCATION OF THOSE SHOWN ARE ENTIRELY ACCURATE. FINDING THE ACTUAL LOCATION OF ANY EXISTING UTILITIES IS THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE DONE BEFORE COMMENCING ANY WORK IN THE VICINITY. FURTHERMORE, THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES, NOR FOR TEMPORARY BRACING AND SHORING OF SAME. IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.
6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE 48 HOURS MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED CONSTRUCTION PERMITS AND BONDS IF REQUIRED PRIOR TO CONSTRUCTION.
8. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES ONE COPY OF THE CONSTRUCTION DOCUMENTS INCLUDING PLANS, SPECIFICATIONS, GEOTECHNICAL REPORT AND SPECIAL CONDITIONS AND COPIES OF ANY REQUIRED CONSTRUCTION PERMITS.
9. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER AND NOTIFICATION TO THE ENGINEER.
10. ALL COPIES OF COMPACTION, CONCRETE AND OTHER REQUIRED TEST RESULTS ARE TO BE SENT TO THE OWNER DIRECTLY FROM THE TESTING AGENCY.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DOCUMENTING AND MAINTAINING AS-BUILT INFORMATION WHICH SHALL BE RECORDED AS CONSTRUCTION PROGRESSES OR AT THE COMPLETION OF APPROPRIATE CONSTRUCTION INTERVALS AND SHALL BE RESPONSIBLE FOR PROVIDING AS-BUILT DRAWINGS TO THE OWNER FOR THE PURPOSE OF CERTIFICATION TO JURISDICTIONAL AGENCIES AS REQUIRED. ALL AS-BUILT DATA SHALL BE COLLECTED BY A STATE PROFESSIONAL LAND SURVEYOR WHOSE SERVICES ARE ENGAGED BY THE CONTRACTOR.
12. ANY WELLS DISCOVERED ON SITE THAT WILL HAVE NO USE MUST BE PLUGGED BY A LICENSED WELL DRILLING CONTRACTOR IN A MANNER APPROVED BY ALL JURISDICTIONAL AGENCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY WELL ABANDONMENT PERMITS REQUIRED.
13. ANY WELL DISCOVERED DURING EARTH MOVING OR EXCAVATION SHALL BE REPORTED TO THE APPROPRIATE JURISDICTIONAL AGENCIES WITHIN 24 HOURS AFTER DISCOVERY IS MADE.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK THAT WOULD BE AFFECTED. FAILURE TO NOTIFY OWNER OF AN IDENTIFIABLE CONFLICT PRIOR TO PROCEEDING WITH INSTALLATION RELIEVES OWNER OF ANY OBLIGATION TO PAY FOR A RELATED CHANGE ORDER.
15. SHOULD CONTRACTOR ENCOUNTER ANY DEBRIS LADEN SOIL, STRUCTURES NOT IDENTIFIED IN THE DOCUMENTS, OR OTHER SOURCE OF POTENTIAL CONTAMINATION, THEY SHALL IMMEDIATELY CONTACT THE ENGINEER AND OWNER.
16. CONTRACTOR SHALL NOTIFY OWNER AND/OR ENGINEER 48 HOURS IN ADVANCE OF THE FOLLOWING ACTIVITIES: PRE-CONSTRUCTION MEETING, SUBGRADE PREPARATION, BASE INSTALLATION, ASPHALT INSTALLATION, UNDERGROUND PIPING AND UTILITIES INSTALLATION, INSTALLATION OF STRUCTURES, CHECK VALVES, HYDRANTS, METERS, ETC., SIDEWALK INSTALLATION, CONNECTIONS TO WATER AND SEWER MAINS, TESTS OF UTILITIES.

EROSION CONTROL NOTES

1. THE STORM WATER POLLUTION PREVENTION PLAN ("SWPPP") IS COMPRISED OF THE EROSION CONTROL PLAN, THE STANDARD DETAILS, THE PLAN NARRATIVE, ATTACHMENTS INCLUDED IN THE SPECIFICATIONS OF THE SWPPP, PLUS THE PERMIT AND ALL SUBSEQUENT REPORTS AND RELATED DOCUMENTS.
2. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH STORM WATER POLLUTION PREVENTION SHALL OBTAIN A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN AND THE STATE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT (NPDES PERMIT) AND BECOME FAMILIAR WITH THEIR CONTENTS.
3. BEST MANAGEMENT PRACTICES (BMP'S) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE, OR LOCAL REQUIREMENTS OR MANUAL OF PRACTICE, AS APPLICABLE. THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY THE PERMITTING AGENCY OR OWNER.
4. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION, AND SHALL MAINTAIN COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS FOR THE DURATION OF CONSTRUCTION.
5. THE CONTRACTOR SHALL FIELD ADJUST AND/OR PROVIDE ADDITIONAL EROSION CONTROL BMP'S AS NEEDED TO PREVENT EROSION AND OFF-SITE SEDIMENT DISCHARGE FROM THE CONSTRUCTION SITE. LOG AND RECORD ANY ADJUSTMENTS AND DEVIATIONS FROM THE APPROVED EROSION CONTROL PLANS WITHIN THE SWPPP DOCUMENTS STORED IN THE JOB SITE TRAILER.
6. BMP'S SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLAN, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION AS REQUIRED BY ALL JURISDICTIONS UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A CERTIFIED PERSON AT LEAST ONCE EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A 0.5-INCH OR GREATER RAINFALL EVENT.
7. EROSION & SEDIMENT CONTROL BMPS SHALL BE MAINTAINED IN ACCORDANCE WITH THE FOLLOWING:
   - 7.1. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING OR DETERIORATION.
   - 7.2. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO VERIFY THAT A HEALTHY STAND OF VEGETATION IS MAINTAINED. SEEDED AREAS SHOULD BE FERTILIZED, WATERED AND RE-SEEDED AS NEEDED. REFER TO THE LANDSCAPE PLAN AND PROJECT SPECIFICATIONS.
   - 7.3. SILT FENCES SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCES WHEN IT REACHES ONE-THIRD THE HEIGHT OF THE SILT FENCE.
   - 7.4. THE ROCK CONSTRUCTION ENTRANCE(S) SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC ADDITIONS OF ROCK TOP DRESSING AS CONDITIONS DEMAND.
   - 7.5. THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE). THIS MAY REQUIRE PERIODIC ADDITIONS OF TOP DRESSING IF THE TEMPORARY PARKING CONDITIONS DEMAND.
   - 7.6. PERFORM ALL MAINTENANCE OPERATIONS IN A TIMELY MANNER BUT IN NO CASE LATER THAN 2 CALENDAR DAYS FOLLOWING THE INSPECTION.

PAVING AND STRIPING NOTES

1. ALL PAVING, CONSTRUCTION, MATERIALS, AND WORKMANSHIP WITHIN JURISDICTION'S RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE LOCAL TOWNSHIP OR COUNTY SPECIFICATIONS AND STANDARDS, OR THE STATE DOT SPECIFICATIONS AND STANDARDS IF NOT COVERED BY LOCAL TOWNSHIP OR COUNTY REGULATIONS.
2. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D) AND TOWNSHIP STANDARDS.
3. CONTRACTOR SHALL FURNISH ALL PAVEMENT MARKINGS FOR FIRE LANES, ROADWAY LANES, PARKING STALLS, ACCESSIBLE PARKING SYMBOLS, ACCESS AISLES, STOP BARS AND SIGNS, AND MISCELLANEOUS STRIPING WITHIN THE PARKING LOT AS SHOWN ON THE PLANS.
4. ALL EXPANSION JOINTS SHALL EXTEND THROUGH THE CURB.
5. THE MINIMUM LENGTH OF OFFSET JOINTS AT RADIUS POINTS SHALL BE 2 FEET.
6. ALL JOINTS, INCLUDING EXPANSION JOINTS WITH REMOVABLE TACK STRIPS, SHALL BE SEALED WITH JOINT SEALANT.
7. THE MATERIALS AND PROPERTIES OF ALL CONCRETE SHALL MEET THE APPLICABLE REQUIREMENTS IN THE A.C.I. (AMERICAN CONCRETE INSTITUTE) MANUAL OF CONCRETE PRACTICE.
8. CONTRACTOR SHALL APPLY A SECOND COATING OVER ALL PAVEMENT MARKINGS PRIOR TO ACCEPTANCE BY OWNER FOLLOWED BY A COAT OF GLASS BEADS AS APPLICABLE PER THE PROJECT DOCUMENTS.
9. ANY EXISTING PAVEMENT, CURBS AND/OR SIDEWALKS DAMAGED OR REMOVED WILL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE TO THE SATISFACTION OF THE ENGINEER AND OWNER.
10. BEFORE PLACING PAVEMENT, CONTRACTOR SHALL VERIFY SUITABLE ACCESSIBLE ROUTES (PER A.D.A) GRADING FOR ALL SIDEWALKS AND ACCESSIBLE ROUTES INCLUDING CROSSING DRIVEWAYS SHALL CONFORM TO CURRENT ADA STATE/NATIONAL STANDARDS. IN NO CASE SHALL ACCESSIBLE RAMP SLOPES EXCEED 1 VERTICAL TO 12 HORIZONTAL. IN NO CASE SHALL SIDEWALK CROSS SLOPES EXCEED 2%. IN NO CASE SHALL LONGITUDINAL SIDEWALK SLOPES EXCEED 5%. IN NO CASE SHALL ACCESSIBLE PARKING STALLS OR AISLES EXCEED 2% (1.5% TARGET) IN ALL DIRECTIONS. SIDEWALK ACCESS TO EXTERNAL BUILDING DOORS AND GATES SHALL BE ADA COMPLIANT. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY IF ADA CRITERIA CANNOT BE MET IN ANY LOCATION PRIOR TO PAVING. NO CONTRACTOR CHANGE ORDERS WILL BE ACCEPTED FOR A.D.A COMPLIANCE ISSUES.
11. MAXIMUM JOINT SPACING IS TWICE THE DEPTH OF THE CONCRETE PAVEMENT IN FEET.

GRADING AND DRAINAGE NOTES

1. GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE START OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
2. THE CONTRACTOR SHALL GRADE THE SITE TO THE ELEVATIONS INDICATED AND SHALL ADJUST BMP'S AS NECESSARY AND REGRADE WASHOUTS WHERE THEY OCCUR AFTER EVERY RAINFALL UNTIL A GRASS STAND IS WELL ESTABLISHED OR ADEQUATE STABILIZATION OCCURS.
3. CONTRACTOR SHALL ENSURE THERE IS POSITIVE DRAINAGE FROM THE PROPOSED BUILDINGS SO THAT SURFACE RUNOFF WILL DRAIN BY GRAVITY TO NEW OR EXISTING DRAINAGE OUTLETS. CONTRACTOR SHALL ENSURE NO PONDING OCCURS IN PAVED AREAS AND SHALL NOTIFY ENGINEER IF ANY GRADING DISCREPANCIES ARE FOUND IN THE EXISTING AND PROPOSED GRADES PRIOR TO PLACEMENT OF PAVEMENT OR UTILITIES.
4. CONTRACTOR SHALL PROTECT ALL MANHOLE COVERS, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, POWER POLES, GUY WIRES, AND TELEPHONE BOXES THAT ARE TO REMAIN IN PLACE AND UNDISTURBED DURING CONSTRUCTION. EXISTING CASTINGS AND STRUCTURES TO REMAIN SHALL BE ADJUSTED TO MATCH THE PROPOSED FINISHED GRADES.
5. BACKFILL FOR UTILITY LINES SHALL BE PLACED PER DETAILS, STANDARDS, AND SPECIFICATIONS SO THAT THE UTILITY WILL BE STABLE. WHERE UTILITY LINES CROSS THE PARKING LOT, THE TOP 6 INCHES SHALL BE COMPACTED SIMILARLY TO THE REMAINDER OF THE LOT. UTILITY DITCHES SHALL BE VISUALLY INSPECTED DURING THE EXCAVATION PROCESS TO ENSURE THAT UNDESIRABLE FILL IS NOT USED.
6. CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF 4" OF TOPSOIL AT COMPLETION OF WORK. ALL UNPAVED AREAS IN EXISTING RIGHTS-OF-WAY DISTURBED BY CONSTRUCTION SHALL BE REGRADED AND SODDED.
7. AFTER PLACEMENT OF SUBGRADE AND PRIOR TO PLACEMENT OF PAVEMENT, CONTRACTOR SHALL TEST AND OBSERVE PAVEMENT AREAS FOR EVIDENCE OF PONDING. ALL AREAS SHALL ADEQUATELY DRAIN TOWARDS THE INTENDED STRUCTURE TO CONVEY STORM RUNOFF. CONTRACTOR SHALL IMMEDIATELY NOTIFY OWNER AND ENGINEER IF ANY DISCREPANCIES ARE DISCOVERED.
8. WHERE EXISTING PAVEMENT IS INDICATED TO BE REMOVED AND REPLACED, THE CONTRACTOR SHALL SAW CUT FULL DEPTH FOR A SMOOTH AND STRAIGHT JOINT AND REPLACE THE PAVEMENT WITH THE SAME TYPE AND DEPTH OF MATERIAL AS EXISTING OR AS INDICATED.
9. THE CONTRACTOR SHALL INSTALL PROTECTION OVER ALL DRAINAGE STRUCTURES FOR THE DURATION OF CONSTRUCTION AND UNTIL ACCEPTANCE OF THE PROJECT BY THE OWNER. ALL DRAINAGE STRUCTURES SHALL BE CLEANED OF DEBRIS AS REQUIRED DURING AND AT THE END OF CONSTRUCTION TO PROVIDE POSITIVE DRAINAGE FLOWS.
10. IF DEWATERING IS REQUIRED, THE CONTRACTOR SHALL OBTAIN ANY APPLICABLE REQUIRED PERMITS. THE CONTRACTOR IS TO COORDINATE WITH THE OWNER AND THE DESIGN ENGINEER PRIOR TO ANY EXCAVATION.
11. FIELD DENSITY TESTS SHALL BE TAKEN AT INTERVALS IN ACCORDANCE WITH THE LOCAL JURISDICTIONAL AGENCY OR TO STATE DOT STANDARDS. IN THE EVENT THAT THE CONTRACT DOCUMENTS AND THE JURISDICTIONAL AGENCY REQUIREMENTS ARE NOT IN AGREEMENT, THE MOST STRINGENT SHALL GOVERN.
12. ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED AS PER PLANS. THE AREAS SHALL THEN BE SODDED OR SEEDED AS SPECIFIED IN THE PLANS, FERTILIZED, MULCHED, WATERED AND MAINTAINED UNTIL GROWTH IS ESTABLISHED TO MINIMUM COVERAGE OF 70% IN ALL AREAS. ANY AREAS DISTURBED FOR ANY REASON PRIOR TO FINAL ACCEPTANCE OF THE JOB SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. ALL EARTHEN AREAS WILL BE SODDED OR SEEDED AND MULCHED AS SHOWN ON THE LANDSCAPING PLAN.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF DUST AND DIRT RISING AND SCATTERING IN THE AIR DURING CONSTRUCTION AND SHALL PROVIDE WATER SPRINKLING OR OTHER SUITABLE METHODS OF CONTROL. THE CONTRACTOR SHALL COMPLY WITH ALL GOVERNING REGULATIONS PERTAINING TO ENVIRONMENTAL PROTECTION.
14. SOD, WHERE CALLED FOR, MUST BE INSTALLED AND MAINTAINED ON EXPOSED SLOPES WITHIN 48 HOURS OF COMPLETING FINAL GRADING, AND AT ANY OTHER TIME AS NECESSARY, TO PREVENT EROSION, SEDIMENTATION OR TURBID DISCHARGES.
15. THE CONTRACTOR SHALL ENSURE THAT LANDSCAPE ISLAND PLANTING AREAS AND OTHER PLANTING AREAS ARE NOT COMPACTED AND DO NOT CONTAIN ROAD BASE MATERIALS. THE CONTRACTOR SHALL ALSO EXCAVATE AND REMOVE ALL UNDESIRABLE MATERIAL FROM ALL AREAS ON THE SITE TO BE PLANTED AND PROPERLY DISPOSED OF IN A LEGAL MANNER.
16. THE CONTRACTOR SHALL INSTALL ALL UNDERGROUND STORM WATER PIPING PER MANUFACTURER'S RECOMMENDATIONS AND STATE DOT SPECIFICATIONS.
17. PAVEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATION OF THE SITE SPECIFIC GEOTECHNICAL EVALUATION REPORT AND TOWNSHIP & STATE DOT SPECIFICATIONS.
18. SPOT ELEVATIONS REPRESENT THE FINISHED SURFACE GRADE OR FLOWLINE OF CURB UNLESS OTHERWISE NOTED.
19. LIMITS OF CONSTRUCTION ARE TO THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED ON THE PLAN.
20. IMMEDIATELY REPORT TO THE OWNER ANY DISCREPANCIES FOUND BETWEEN ACTUAL FIELD CONDITIONS AND CONSTRUCTION DOCUMENTS.
21. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING EXISTING UTILITIES, AND SHALL REPAIR ALL DAMAGE TO EXISTING UTILITIES THAT OCCUR DURING CONSTRUCTION WITHOUT COMPENSATION.
22. BLEND NEW EARTHWORK SMOOTHLY TO TRANSITION BACK TO EXISTING GRADE.
23. ALL PROPOSED GRADES ONSITE SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE INDICATED ON THE PLANS. ANY SLOPES STEEPER THAN 4:1 REQUIRE EROSION AND SEDIMENT CONTROL BLANKET.
24. ADHERE TO ALL TERMS AND CONDITIONS AS NECESSARY IN THE GENERAL N.P.D.E.S. PERMIT AND STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES.
25. ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.

WATER STORM SEWER & SANITARY SEWER NOTES

1. THE CONTRACTOR SHALL CONSTRUCT GRAVITY SEWER LATERALS, MANHOLES, GRAVITY SEWER LINES, AND DOMESTIC WATER AND FIRE PROTECTION SYSTEM AS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL FURNISH ALL NECESSARY MATERIALS, EQUIPMENT, MACHINERY, TOOLS, MEANS OF TRANSPORTATION AND LABOR NECESSARY TO COMPLETE THE WORK IN FULL AND COMPLETE ACCORDANCE WITH THE SHOWN, DESCRIBED AND REASONABLY INTENDED REQUIREMENTS OF THE CONTRACT DOCUMENTS AND JURISDICTIONAL AGENCY REQUIREMENTS. IN THE EVENT THAT THE CONTRACT DOCUMENTS AND THE JURISDICTIONAL AGENCY REQUIREMENTS ARE NOT IN AGREEMENT, THE MOST STRINGENT SHALL GOVERN.
2. ALL EXISTING UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS FOR UTILITY LOCATION AND COORDINATION IN ACCORDANCE WITH THE NOTES CONTAINED IN THE GENERAL CONSTRUCTION SECTION OF THIS SHEET.
3. THE CONTRACTOR SHALL RESTORE ALL DISTURBED VEGETATION IN KIND, UNLESS SHOWN OTHERWISE.
4. DEFLECTION OF PIPE JOINTS AND CURVATURE OF PIPE SHALL NOT EXCEED THE MANUFACTURER'S SPECIFICATIONS. SECURELY CLOSE ALL OPEN ENDS OF PIPE AND FITTINGS WITH A WATERTIGHT PLUG WHEN WORK IS NOT IN PROGRESS. THE INTERIOR OF ALL PIPES SHALL BE CLEAN AND JOINT SURFACES WIPED CLEAN AND DRY AFTER THE PIPE HAS BEEN LOWERED INTO THE TRENCH. VALVES SHALL BE PLUMB AND LOCATED ACCORDING TO THE PLANS.
5. ALL PIPE AND FITTINGS SHALL BE CAREFULLY STORED FOLLOWING MANUFACTURER'S RECOMMENDATIONS. CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE COATING OR LINING IN ANY D.I. PIPE FITTINGS. ANY PIPE OR FITTING WHICH IS DAMAGED OR WHICH HAS FLAWS OR IMPERFECTIONS WHICH, IN THE OPINION OF THE ENGINEER OR OWNER, RENDERS IT UNFIT FOR USE, SHALL NOT BE USED. ANY PIPE NOT SATISFACTORY FOR USE SHALL BE CLEARLY MARKED AND IMMEDIATELY REMOVED FROM THE JOB SITE, AND SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
6. WATER FOR FIRE FIGHTING SHALL BE MADE AVAILABLE FOR USE BY THE CONTRACTOR PRIOR TO COMBUSTIBLES BEING BROUGHT ON SITE.
7. ALL UTILITY AND STORM DRAIN TRENCHES LOCATED UNDER AREAS TO RECEIVE PAVING SHALL BE COMPLETELY BACK FILLED IN ACCORDANCE WITH THE GOVERNING JURISDICTIONAL AGENCY'S SPECIFICATIONS. IN THE EVENT THAT THE CONTRACT DOCUMENTS AND THE JURISDICTIONAL AGENCY REQUIREMENTS ARE NOT IN AGREEMENT, THE MOST STRINGENT SHALL GOVERN.
8. UNDERGROUND UTILITY LINES SHALL BE SURVEYED BY A STATE LICENSED PROFESSIONAL LAND SURVEYOR PRIOR TO BACK FILLING.
9. CONTRACTOR SHALL PERFORM, AT THEIR OWN EXPENSE, ANY AND ALL TESTS REQUIRED BY THE SPECIFICATIONS AND/OR ANY AGENCY HAVING JURISDICTION. THESE TESTS MAY INCLUDE, BUT MAY NOT BE LIMITED TO, INFILTRATION AND EXFILTRATION, TELEVISION INSPECTION AND A MANDREL TEST ON GRAVITY SEWER. A COPY OF THE TEST RESULTS SHALL BE PROVIDED TO THE UTILITY PROVIDER, OWNER AND JURISDICTIONAL AGENCY AS REQUIRED.
10. BETWEEN WATER AND SEWER MANHOLES AND PIPES, CONTRACTOR SHALL PROVIDE FOR A MINIMUM HORIZONTAL CLEARANCE OF 10-FEET AND A MINIMUM VERTICAL SEPARATION OF 18-INCHES.
11. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
12. ALL STORM PIPE ENTERING STRUCTURES SHALL BE GASKETED AND/OR GROUTED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT UNLESS OTHERWISE STATED BY TOWNSHIP AND STATE DESIGN STANDARDS AND SPECIFICATIONS.
13. UNLESS OTHERWISE STATED IN TOWNSHIP AND STATE DESIGN STANDARDS AND SPECIFICATIONS, ALL STORM SEWER MANHOLES IN PAVED AREAS SHALL BE FLUSH WITH PAVEMENT, AND SHALL HAVE TRAFFIC BEARING RING & COVERS. MANHOLES IN UNPAVED AREAS SHALL BE 9" ABOVE FINISH GRADE. LIDS SHALL BE LABELED "STORM SEWER". EXISTING CASTINGS AND STRUCTURES WITHIN PROJECT LIMITS SHALL BE ADJUSTED TO MEET THESE CONDITIONS AND THE PROPOSED FINISHED GRADE.
14. TOPOGRAPHIC INFORMATION IS TAKEN FROM A TOPOGRAPHIC SURVEY BY LAND SURVEYORS. IF THE CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, THEN THE CONTRACTOR SHALL SUPPLY, AT THEIR EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR TO THE OWNER FOR REVIEW.
15. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
16. ALL STORM STRUCTURES SHALL HAVE A SMOOTH UNIFORM POURED MORTAR FROM INVERT IN TO INVERT OUT.
17. ROOF DRAINS SHALL BE CONNECTED TO STORM SEWER BY PREFABRICATED WYES OR AT STORM STRUCTURES. ROOF DRAINS AND TRUCK WELL DRAIN SHALL RUN AT A MINIMUM 2.0% SLOPE, UNLESS NOTED OTHERWISE, AND TIE IN AT THE CENTERLINE OF THE STORM MAIN.
18. PROVIDE INSULATION OF UNDERGROUND ROOF DRAINS AND SANITARY SEWER SERVICES IF ADEQUATE FROST DEPTH CANNOT BE PROVIDED.
19. THE CONTRACTOR SHALL PROTECT EXISTING UNDERGROUND UTILITIES AND APPURTENANCES THAT ARE TO REMAIN FROM DAMAGE DURING CONSTRUCTION OPERATIONS.
20. THE LOCATION OF EXISTING UTILITIES, STORM DRAINAGE STRUCTURES AND OTHER ABOVE AND BELOW-GRADE IMPROVEMENTS ARE APPROXIMATE AS SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION, SIZE AND INVERT ELEVATIONS OF EACH PRIOR TO THE START OF CONSTRUCTION.
21. A MINIMUM SEPARATION OF 5-FEET IS REQUIRED BETWEEN UNDERGROUND UTILITIES AND TREES UNLESS A ROOT BARRIER IS UTILIZED.
22. GAS, PHONE AND ELECTRIC SERVICES SHOWN FOR INFORMATIONAL PURPOSES ONLY. DRY UTILITY COMPANIES MAY ALTER THE DESIGN LAYOUT DURING THEIR REVIEW. CONTRACTOR TO COORDINATE FINAL DESIGN AND INSTALLATION WITH UTILITY COMPANIES.
23. COORDINATE UTILITY INSTALLATION WITH IRRIGATION DESIGN AND INSTALLATION.
24. ALL DIMENSIONS ARE TO FLOW LINE OF CURB UNLESS OTHERWISE NOTED. PERIMETER WALL DIMENSIONS ARE TO INSIDE WALL FACE. REFERENCE ARCHITECTURAL PLANS FOR EXACT WALL WIDTH AND SPECIFICATIONS.
25. REFERENCE ARCHITECTURAL PLANS (BY OTHERS) FOR EXACT BUILDING DIMENSIONS, MATERIALS SPECIFICATIONS.
26. REFERENCE M.E.P. PLANS (BY OTHERS) FOR MECHANICAL EQUIPMENT DIMENSIONS AND SPECIFICATIONS.
27. CONTRACTOR SHALL REFERENCE STRUCTURAL PLANS (BY OTHERS) FOR FOOTING AND FOUNDATION PAD PREPARATION SPECIFICATIONS.
28. CONTRACTOR SHALL REFERENCE M.E.P. PLANS (BY OTHERS) FOR ROUTING OF PROPOSED ELECTRICAL & COMMUNICATIONS SERVICES AND SITE LIGHTING LAYOUT.

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/06/2026	BPG

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BRIAN GANNON
NAME OF ENGINEER
No. 6201046
LICENSED PROFESSIONAL ENGINEER

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JL
DRAWN BY CEB
CHECKED BY BPG

GENERAL NOTES

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP, MICHIGAN

MISS DIG 811

SHEET NUMBER
C100

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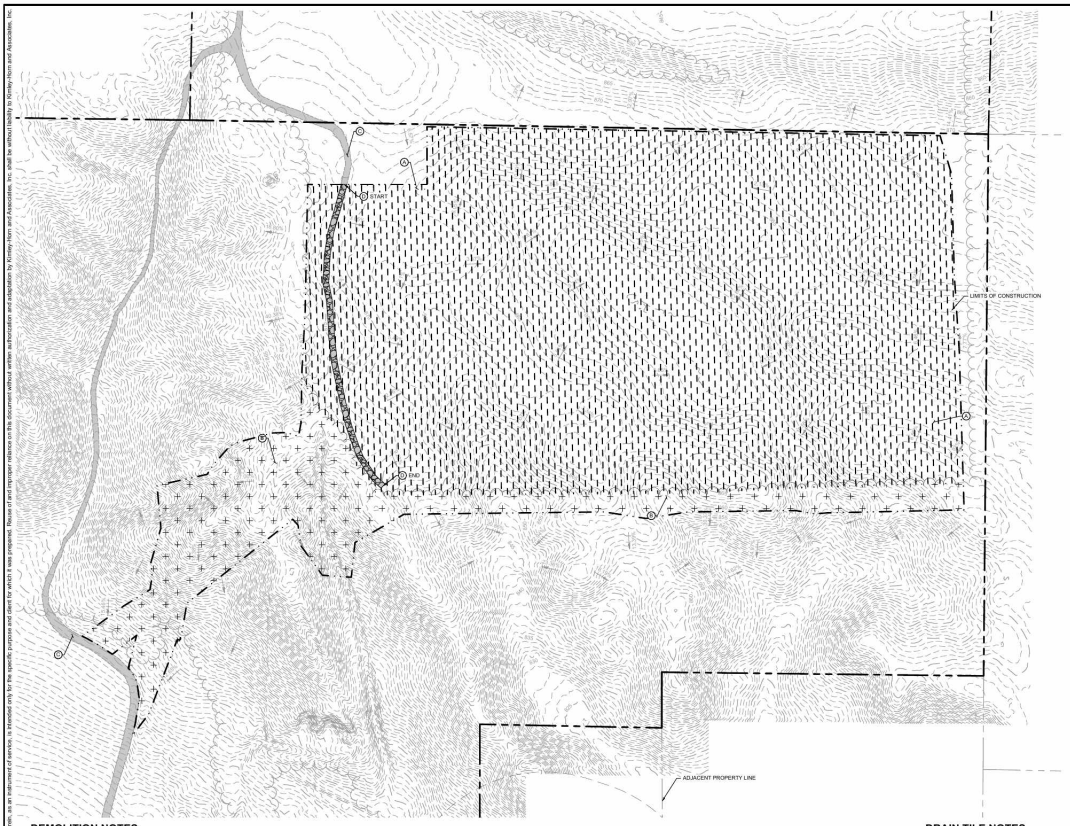

KEYNOTE LEGEND

- (A) CLEARING AND GRUBBING
- (B) REMOVE EXISTING TREES
- (C) PROTECT EXISTING ROAD
- (D) DEMO EXISTING ROAD

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- R/W — EXISTING RIGHT-OF-WAY
- CLEARING AND GRUBBING
- EXISTING GRAVEL ROAD
- DEMO GRAVEL ROAD
- TREE REMOVAL, SEE TREE PROTECTION PLANS
- LIMITS OF CONSTRUCTION
- 880 — EXISTING CONTOUR LINE
- EXISTING TREE LINE

DEMOLITION NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR THE DEMOLITION, REMOVAL AND DISPOSAL (IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES) OF ALL STRUCTURES, PADS, WALLS, FLUMES, FOUNDATIONS, PARKING, ROADWAYS, UTILITIES, TREES, AND OTHER ITEMS AS NEEDED. IMPROVEMENTS ON THE PLANS CAN BE CONSTRUCTED. FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE PROJECT DOCUMENTS.
2. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEBRIS FROM THE SITE AND DISPOSING OF THE DEBRIS IN A LAWFUL MANNER AND IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS. THE CONTRACTOR SHALL OBTAIN ANY REQUIRED PERMITS FOR DEMOLITION AND DISPOSAL FROM THE APPROPRIATE LOCAL AND STATE AGENCIES. CONTRACTOR SHALL PROVIDE COPIES OF THE PERMIT AND RECEIPTS OF DISPOSAL OF MATERIALS TO THE OWNER AND OWNERS REPRESENTATIVE, INCLUDING THE TYPE OF DEBRIS AND LOCATION WHERE IT WAS DISPOSED.
3. THE CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ADJACENT PROPERTIES AT ALL TIMES. UTILITY SERVICES SHALL NOT BE INTERRUPTED WITHOUT APPROVAL FROM THE CONSTRUCTION MANAGER AND COORDINATION WITH THE ADJACENT PROPERTIES AND/OR THE TOWNSHIP.
4. THE CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANY'S FORCES AND ANY FEES WHICH ARE TO BE PAID TO THE UTILITY COMPANY FOR THEIR SERVICES. THE CONTRACTOR IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES.
5. THE LOCATIONS OF EXISTING UTILITIES SHOWN ON THE PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE AFFECTED UTILITY COMPANIES TO PROVIDE LOCATIONS OF EXISTING UTILITIES WITHIN PROPOSED WORK AREA.
6. EXISTING SEWERS, PIPING AND UTILITIES SHOWN ARE BASED ON AVAILABLE RECORD PLAN DATA AND/OR FIELD UTILITY MARKINGS AND ARE NOT TO BE INTERPRETED AS THE EXACT LOCATION. ADDITIONAL SEWERS, PIPING AND UTILITIES MAY BE PRESENT. VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED UNDERGROUND FEATURES. GIVE NOTICE TO AFFECTED UTILITY COMPANIES REGARDING REMOVAL OF SERVICE LINES AND CAP ANY ABANDONED LINES BEFORE PRECEDING WITH THE PROPOSED WORK.
7. ELECTRICAL, TELEPHONE, CABLE, WATER, FIBER OPTIC, AND/OR GAS LINES NEEDING TO BE REMOVED OR RELOCATED SHALL BE COORDINATED WITH THE AFFECTED UTILITY COMPANY. ADEQUATE TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY IS NECESSARY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE. CONTRACTOR SHALL PAY CLOSE ATTENTION TO EXISTING UTILITIES WITHIN ANY ROAD RIGHT-OF-WAY DURING CONSTRUCTION.
8. CONTRACTOR MUST PROTECT THE PUBLIC AT ALL TIMES WITH FENCING, BARRICADES, ENCLOSURES, ETC. (AND OTHER APPROPRIATE BEST MANAGEMENT PRACTICES) AS APPROVED BY THE CONSTRUCTION MANAGER. MAINTENANCE OF TRAFFIC CONTROL SHALL BE COORDINATED IN ACCORDANCE WITH THE TOWNSHIP, ALLEGAN COUNTY, AND MICHIGAN DOT AS NECESSARY.
9. CONTRACTOR SHALL MAINTAIN ACCESS TO ADJACENT PROPERTIES DURING CONSTRUCTION, AND SHALL NOTIFY ADJACENT PROPERTY OWNERS IF ACCESS WILL BE INTERRUPTED OR ALTERED AT ANY TIME DURING CONSTRUCTION.
10. PRIOR TO THE START OF DEMOLITION, INSTALL EROSION CONTROL BMP'S IN ACCORDANCE WITH THE EROSION & SEDIMENT CONTROL PLANS / SWPPP.
11. CONTRACTOR MAY LIMIT SAW-CUT AND PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THESE CONSTRUCTION PLANS BUT IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT OR CURB, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR.
12. THE CONTRACTOR SHALL COORDINATE WATER MAIN WORK WITH THE TOWNSHIP WATER AND FIRE DEPARTMENTS TO ENSURE ADEQUATE FIRE PROTECTION IS CONSTANTLY AVAILABLE TO THE SITE AND SURROUNDING PROPERTIES THROUGH ALL PHASES OF CONSTRUCTION. CONTRACTOR SHALL PAY ALL COSTS ASSOCIATED WITH WATER MAIN SHUT OFFS WITH THE GUN PLAIN TOWNSHIP. ANY COSTS ASSOCIATED WITH WATER MAIN SHUT OFFS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NO EXTRA COMPENSATION WILL BE PROVIDED.
13. IN THE EVENT A WELL IS FOUND, THE CONTRACTOR SHALL CONTACT THE ENGINEER AND OWNER IMMEDIATELY. ALL WELLS SHALL BE SEALED BY A LICENSED WELL CONTRACTOR IN ACCORDANCE WITH STATE REQUIREMENTS.
14. IN THE EVENT THAT UNKNOWN CONTAINERS OR TANKS ARE ENCOUNTERED, THE CONTRACTOR SHALL CONTACT THE OWNER AND/OR OWNERS REPRESENTATIVE IMMEDIATELY. ALL CONTAINERS SHALL BE DISPOSED OF AT A PERMITTED LANDFILL PER THE PROJECT DOCUMENTS.
15. CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY EXISTING DRAINTILE IS ENCOUNTERED ON SITE. ACTIVE DRAINTILE SHALL NOT BE REMOVED WITHOUT APPROVAL FROM THE ENGINEER.
16. IF CONTAMINATED MATERIAL IS ENCOUNTERED ON THE PROJECT SITE, THE CONTRACTOR SHALL STOP WORK AND NOTIFY THE OWNER AND ENGINEER IMMEDIATELY.

DRAIN TILE NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT DRAIN TILES MAY BE PRESENT IN AGRICULTURAL FIELDS. THE EXACT LOCATION AND/OR ELEVATION OF POTENTIAL DRAIN TILES ARE UNKNOWN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL AVAILABLE DRAIN TILE MAPS FROM THE LAND OWNER AND LOCATE ANY EXISTING DRAIN TILES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL RELOCATE AND/OR REPAIR ALL DRAIN TILES THAT ARE IN CONFLICT WITH THE PROPOSED IMPROVEMENTS OR THAT ARE IMPACTED DURING CONSTRUCTION.
2. CONTRACTOR SHALL CONTACT ENGINEER IMMEDIATELY IF ADDITIONAL ENGINEERING IS REQUIRED TO REPAIR OR RELOCATE DRAIN TILES BASED ON UNFORSEEN SITE CONDITIONS

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

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	ENTITLEMENT SET	02/06/2026	BFG

Kimley»Horn
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CIP
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GANNON
ENGINEER
6201037000
LICENSED PROFESSIONAL ENGINEER

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CAS
CHECKED BY BFG

EXISTING CONDITIONS AND DEMOLITION PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP
ALLEGAN COUNTY
MICHIGAN

SHEET NUMBER
C200

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LEGEND

- PROPERTY LINE
- TREE TO REMAIN
- TREE TO BE REMOVED
- EXISTING VEGETATION EDGE
- LIMITS OF DISTURBANCE
- TP — TREE PROTECTION FENCE

TREE MITIGATION DATA

TOTAL SIGNIFICANT TREES ON SITE: 443 TREES (7,082 INCHES)
TOTAL SIGNIFICANT TREES REMOVED: 189 TREES (3,204 INCHES)
TOTAL SIGNIFICANT TREES SAVED: 254 TREES (3,878 INCHES)

NOTE: SIGNIFICANT TREES ARE ALL TREES 12 INCHES OR GREATER

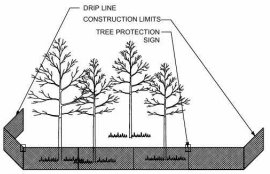
TREE PROTECTION NOTES

1. PRUNING WILL BE DONE BY PROFESSIONALS DURING APPROPRIATE PRUNING SEASON.
2. NO STORAGE OF MATERIALS, OPERATION OF MACHINERY, OR DEVELOPMENT OF ANY SORT WILL OCCUR WITHIN THE FENCE-LINE WITHOUT APPROVAL IN WRITING FROM TOWNSHIP.
3. SITE GRADING TO BE DONE ONLY AFTER PROTECTIVE MEASURES HAVE BEEN TAKEN, TOWNSHIP HAS APPROVED FENCING LOCATIONS, AND ALL CONTRACTORS HAVE BEEN BRIEFED ON TREE PRESERVATION TECHNIQUES.
4. EXISTING TREES TO REMAIN OR REMOVED TO BE CLEARLY IDENTIFIED, WITHIN DISTURBANCE LIMITS AND 10' OUTSIDE OF THE DISTURBANCE LIMITS.
5. TREE PRESERVATION TO BE APPROVED BY OWNER AND PER LOCAL GOVERNMENTAL AUTHORITY.

KEYNOTE LEGEND

- (A) EXISTING TREE TO BE SAVED (TYP.)
- (B) EXISTING TREE TO BE REMOVED (TYP.)
- (C) TREE PROTECTION FENCE (SEE DETAIL) (TYP.)

NOTE: ONLY SIGNIFICANT TREES IN THE SUBJECT PROPERTY SHOWN ON PLAN/ INVENTORY.



FURNISH AND INSTALL TEMPORARY FENCE AT THE TREE'S DRIPLINE OR CONSTRUCTION LIMITS AS SPECIFIED, PRIOR TO ANY CONSTRUCTION. WHEN POSSIBLE PLACE FENCE 25 FEET BEYOND THE DRIP LINE. PLACE PROTECTION SIGNS ALONG FENCE AT 20' INTERVALS.

1 TEMPORARY TREE PROTECTION FENCE PLACEMENT
SCALE: N.T.S. TP201

NORTH

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0 50 100 200

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	ENTITLEMENT SET	02/06/2026	BIG

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Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GANNON
ENGINEER
PE-001-072050

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY CFK
DRAWN BY CFK
CHECKED BY RAH

TREE INVENTORY & PRESERVATION PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
TP201

MISS DIG 811

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TAG #	COMMON NAME	DBH	CONDITION	STATUS
1	American Elm	13	Good	SAVED
2	White Ash	14	Good	SAVED
3	Oak	18	Good	SAVED
4	Red Maple	18	Good	SAVED
5	Black Cherry	15	Good	SAVED
6	Black Oak	26	Good	SAVED
7	Black Oak	14	Good	SAVED
8	Black Oak	24	Good	SAVED
9	American Elm	35	Good	SAVED
10	White Oak	40	Good	REMOVED
11	Black Oak	15	Good	REMOVED
12	Black Oak	20	Good	REMOVED
13	Black Oak	12	Good	SAVED
14	Black Oak	21	Good	SAVED
15	Black Oak	17	Good	SAVED
16	White Oak	16	Good	SAVED
17	White Oak	14	Good	SAVED
18	Red Maple	17	Good	SAVED
19	Black Oak	26	Good	SAVED
20	Black Oak	17	Good	SAVED
21	American Basswood	12	Good	SAVED
22	Black Walnut	23	Good	SAVED
23	Elm	12	Good	SAVED
24	Elm	12	Good	SAVED
25	Beech	12	Good	SAVED
26	Black Walnut	16	Good	SAVED
27	Black Oak	13	Good	REMOVED
28	Beech	12	Good	SAVED
29	Slippery Elm	20	Good	SAVED
30	Beech	15	Good	SAVED
31	American Beech	13	Good	SAVED
32	American Elm	15	Good	SAVED
33	Black Oak	15	Good	SAVED
34	Black Oak	14	Good	SAVED
35	Black Oak	24	Good	SAVED
36	Black Oak	12	Good	SAVED
37	White Oak	15	Good	SAVED
38	White Ash	18	Good	SAVED
39	Black Oak	14	Good	SAVED
40	Black Oak	22	Good	SAVED
41	White Oak	35	Good	SAVED
42	Chestnut	15	Good	REMOVED
43	Northern Red Oak	14	Good	REMOVED
44	Black Oak	14	Good	SAVED
45	Oak	14	Good	REMOVED
46	Black Oak	13	Good	SAVED
47	Pignut Hickory	13	Good	REMOVED
48	Black Oak	22	Good	REMOVED
49	American Elm	12	Good	REMOVED
50	Eastern Red Cedar	16	Good	SAVED
51	Black Oak	44	Good	REMOVED
52	Slippery Elm	17	Good	SAVED
53	Black Oak	21	Good	SAVED
54	Black Oak	15	Good	SAVED
55	White Oak	12	Good	SAVED
56	White Oak	12	Good	SAVED
57	Black Oak	22	Good	SAVED
58	Black Oak	13	Good	SAVED
59	Black Walnut	12	Good	SAVED
60	Black Oak	14	Good	SAVED
61	Black Cherry	14	Good	SAVED
62	Black Walnut	12	Good	SAVED
63	Black Cherry	12	Good	SAVED
64	Black Oak	13	Good	SAVED
65	Black Oak	14	Good	SAVED
66	Willow	22	Good	SAVED
67	Oak	14	Good	SAVED
68	Black Walnut	16	Good	SAVED
69	Walnut	12	Good	SAVED
70	Sugar Maple	12	Good	SAVED
71	Black Walnut	12	Good	SAVED
72	Black Walnut	14	Good	SAVED
73	American Elm	12	Good	SAVED
74	Black Oak	14	Good	SAVED
75	Black Cherry	18	Good	SAVED
76	Black Walnut	15	Good	SAVED
77	American Elm	12	Good	SAVED
78	American Elm	12	Good	SAVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
79	Black Walnut	15	Good	SAVED
80	Black Cherry	12	Good	SAVED
81	American Elm	12	Good	SAVED
82	Black Walnut	30	Good	SAVED
83	Black Oak	16	Good	SAVED
84	Mulberry	26	Good	SAVED
85	Black Oak	17	Good	REMOVED
86	Black Oak	12	Good	REMOVED
87	Willow	60	Good	REMOVED
88	American Elm	12	Good	REMOVED
89	Black Oak	18	Good	REMOVED
90	Black Walnut	20	Good	REMOVED
91	American Hophornbeam	12	Good	REMOVED
92	Beech	14	Good	REMOVED
93	Black Cherry	14	Good	REMOVED
94	American Elm	17	Good	REMOVED
95	Black Oak	14	Good	REMOVED
96	American Elm	12	Good	REMOVED
97	American Elm	18	Good	REMOVED
98	American Elm	12	Good	REMOVED
99	American Elm	12	Good	REMOVED
100	Beech	14	Good	REMOVED
101	Black Walnut	14	Good	REMOVED
102	American Elm	12	Good	REMOVED
103	Northern Red Oak	12	Good	SAVED
104	Black Ash	12	Good	SAVED
105	Black Cherry	12	Good	SAVED
106	Hickory	14	Good	SAVED
107	Black Cherry	12	Good	SAVED
108	Black Cherry	12	Good	SAVED
109	American Elm	16	Good	SAVED
110	American Elm	12	Good	SAVED
111	Black Cherry	16	Good	SAVED
112	Beech	13	Good	SAVED
113	Sassafras	14	Good	SAVED
114	Black Oak	18	Good	SAVED
115	Black Cherry	12	Good	SAVED
116	Sassafras	12	Good	SAVED
117	Sassafras	12	Good	SAVED
118	Black Cherry	18	Good	SAVED
119	Black Cherry	30	Good	SAVED
120	Black Cherry	14	Good	SAVED
121	Sassafras	12	Good	SAVED
122	Sugar Maple	18	Good	SAVED
123	Sassafras	14	Good	SAVED
124	Black Cherry	15	Good	SAVED
125	Black Cherry	12	Good	SAVED
126	Black Cherry	16	Good	SAVED
127	Sassafras	12	Good	SAVED
128	Northern Red Oak	14	Good	SAVED
129	Sassafras	12	Good	SAVED
130	Black Cherry	21	Good	SAVED
131	Sassafras	14	Good	SAVED
132	Sassafras	17	Good	SAVED
133	Sassafras	12	Good	SAVED
134	Sassafras	14	Good	SAVED
135	Sassafras	12	Good	SAVED
136	Sassafras	15	Good	SAVED
137	Sassafras	15	Good	SAVED
138	Sassafras	12	Good	REMOVED
139	Sassafras	12	Good	SAVED
140	Sassafras	12	Good	SAVED
141	Sassafras	15	Good	SAVED
142	Black Cherry	12	Good	SAVED
143	Mulberry	16	Good	SAVED
144	Black Cherry	12	Good	SAVED
145	American Elm	12	Good	SAVED
146	Black Cherry	16	Good	SAVED
147	American Elm	14	Good	SAVED
148	American Elm	12	Good	SAVED
149	Northern Red Oak	14	Good	SAVED
150	Northern Red Oak	12	Good	SAVED
151	American Elm	12	Good	SAVED
152	Northern Red Oak	12	Good	SAVED
153	Sugar Maple	12	Good	REMOVED
154	Black Cherry	30	Good	REMOVED
155	Black Cherry	16	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
156	Northern Red Oak	12	Good	SAVED
157	Black Cherry	16	Good	SAVED
158	Northern Red Oak	12	Good	SAVED
159	Northern Red Oak	12	Good	SAVED
160	Northern Red Oak	12	Good	SAVED
161	Black Cherry	30	Good	SAVED
162	Honey Locust	13	Good	SAVED
163	Northern Red Oak	16	Good	SAVED
164	Shagbark Hickory	12	Good	SAVED
165	Northern Red Oak	21	Good	SAVED
166	Black Oak	18	Good	SAVED
167	Black Oak	12	Good	SAVED
168	Black Oak	12	Good	SAVED
169	Northern Red Oak	21	Good	SAVED
170	Black Oak	14	Good	SAVED
171	Black Ash	14	Good	SAVED
172	Black Oak	35	Good	SAVED
173	Black Oak	17	Good	SAVED
174	Black Oak	12	Good	SAVED
175	Sassafras	14	Good	REMOVED
176	American Elm	16	Good	REMOVED
177	American Elm	12	Good	REMOVED
178	Black Cherry	12	Good	REMOVED
179	American Elm	12	Good	REMOVED
180	Black Cherry	18	Good	SAVED
181	Black Oak	12	Good	REMOVED
182	American Elm	12	Good	SAVED
183	Black Cherry	12	Good	SAVED
184	Eastern Red Cedar	20	Good	SAVED
185	Black Oak	14	Good	REMOVED
186	Black Oak	12	Good	REMOVED
187	Black Oak	16	Good	REMOVED
188	Black Oak	18	Good	REMOVED
189	Black Oak	13	Good	REMOVED
190	Chestnut Oak	14	Good	SAVED
191	Chestnut Oak	24	Good	SAVED
192	Black Oak	14	Good	REMOVED
193	Black Oak	12	Good	REMOVED
194	Black Oak	12	Good	REMOVED
195	Black Oak	14	Good	REMOVED
196	Black Oak	16	Good	REMOVED
197	Black Oak	14	Good	REMOVED
198	Black Oak	14	Good	REMOVED
199	Black Oak	17	Good	SAVED
200	Black Oak	14	Good	REMOVED
201	Black Cherry	12	Good	REMOVED
202	Black Oak	28	Good	REMOVED
203	Black Oak	14	Good	SAVED
204	Black Oak	12	Good	SAVED
205	Black Cherry	13	Good	SAVED
206	Black Cherry	14	Good	SAVED
207	Black Oak	12	Good	SAVED
208	Black Oak	14	Good	SAVED
209	White Oak	12	Good	SAVED
210	Black Cherry	12	Good	SAVED
211	Black Cherry	14	Good	SAVED
212	White Oak	21	Good	SAVED
213	Black Oak	13	Good	SAVED
214	Black Oak	14	Good	SAVED
215	Chestnut Oak	15	Good	SAVED
216	Chestnut Oak	15	Good	SAVED
217	White Oak	14	Good	SAVED
218	Black Oak	24	Good	SAVED
219	Black Oak	16	Good	SAVED
220	Black Oak	12	Good	SAVED
221	Black Oak	14	Good	SAVED
222	Black Oak	18	Good	SAVED
223	Black Oak	18	Good	SAVED
224	Black Oak	12	Good	SAVED
225	Black Oak	12	Good	SAVED
226	Black Cherry	14	Good	REMOVED
227	Black Oak	24	Good	REMOVED
228	Black Oak	20	Good	REMOVED
229	Black Oak	14	Good	SAVED
230	Black Cherry	14	Good	REMOVED
231	Black Cherry	14	Good	REMOVED
232	Black Cherry	14	Good	REMOVED
233	Black Cherry	16	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
234	Black Oak	12	Good	SAVED
235	Black Oak	15	Good	SAVED
236	Shagbark Hickory	12	Good	SAVED
237	Black Cherry	18	Good	SAVED
238	Black Cherry	14	Good	REMOVED
239	Black Cherry	12	Good	SAVED
240	Black Oak	17	Good	SAVED
241	American Elm	15	Good	SAVED
242	Black Cherry	15	Good	SAVED
243	Oak	14	Good	REMOVED
244	Oak	56	Good	REMOVED
245	Shagbark Hickory	12	Good	SAVED
246	Oak	35	Good	REMOVED
247	Black Cherry	12	Good	SAVED
248	Black Cherry	12	Good	SAVED
249	Black Cherry	24	Good	SAVED
250	American Elm	12	Good	REMOVED
251	Oak	23	Good	SAVED
252	Black Cherry	14	Good	SAVED
253	American Elm	16	Good	SAVED
254	Black Oak	14	Good	REMOVED
255	American Elm	16	Good	SAVED
256	Black Cherry	12	Good	SAVED
257	Oak	12	Good	SAVED
258	Black Cherry	12	Good	SAVED
259	Black Oak	25	Good	SAVED
260	American Elm	12	Good	SAVED
261	Oak	12	Good	SAVED
262	Oak	14	Good	SAVED
263	Oak	13	Good	SAVED
264	Oak	16	Good	SAVED
265	Oak	16	Good	SAVED
266	Black Cherry	16	Good	REMOVED
267	Oak	12	Good	REMOVED
268	Oak	21	Good	SAVED
269	Sassafras	17	Good	REMOVED
270	Sassafras	17	Good	REMOVED
271	Oak	24	Good	SAVED
272	Oak	12	Good	SAVED
273	Oak	17	Good	REMOVED
274	Oak	12	Good	REMOVED
275	American Elm	12	Good	REMOVED
276	Black Oak	12	Good	REMOVED
277	Black Cherry	12	Good	REMOVED
278	Black Oak	12	Good	REMOVED
279	Black Cherry	16	Good	REMOVED
280	Black Cherry	33	Good	REMOVED
281	American Elm	12	Good	SAVED
282	Black Oak	13	Good	SAVED
283	Black Cherry	17	Good	SAVED
284	Black Oak	14	Good	SAVED
285	Black Oak	14	Good	SAVED
286	American Elm	12	Good	SAVED
287	American Elm	14	Good	SAVED
288	Black Oak	14	Good	SAVED
289	White Oak	17	Good	SAVED
290	American Elm	25	Good	REMOVED
291	Black Cherry	15	Good	SAVED
292	White Oak	25	Good	REMOVED
293	Black Oak	15	Good	REMOVED
294	Black Cherry	18	Good	REMOVED
295	American Elm	14	Good	REMOVED
296	Black Oak	16	Good	REMOVED
297	American Elm	12	Good	SAVED
298	Black Oak	20	Good	SAVED
299	Black Oak	13	Good	SAVED
300	Black Oak	12	Good	SAVED
301	Black Cherry	14	Good	SAVED
302	Black Cherry	14	Good	SAVED
303	Black Cherry	12	Good	SAVED
304	American Elm	12	Good	SAVED
305	Black Cherry	12	Good	SAVED
306	Oak	16	Good	SAVED
307	Beech	14	Good	SAVED
308	Oak	14	Good	SAVED
309	Oak	12	Good	SAVED
310	Oak	12	Good	SAVED
311	American Elm	16	Good	SAVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
312	American Elm	12	Good	SAVED
313	Sassafras	14	Good	REMOVED
314	Sassafras	14	Good	REMOVED
315	Sassafras	12	Good	REMOVED
316	Sassafras	14	Good	REMOVED
317	Sassafras	14	Good	REMOVED
318	Sassafras	18	Good	REMOVED
319	Sassafras	13	Good	REMOVED
320	Sassafras	15	Good	SAVED
321	American Elm	13	Good	REMOVED
322	Oak	17	Good	REMOVED
323	Black Cherry	15	Good	SAVED
324	Black Cherry	13	Good	REMOVED
325	Oak	14	Good	SAVED
326	Oak	16	Good	SAVED
327	Oak	12	Good	SAVED
328	Black Oak	50	Good	REMOVED
329	Black Oak	16	Good	REMOVED
330	Black Cherry	12	Good	REMOVED
331	American Elm	14	Good	SAVED
332	Black Oak	34	Good	REMOVED
333	Oak	14	Good	SAVED
334	Black Oak	21	Good	REMOVED
335	American Elm	14	Good	REMOVED
336	American Elm	12	Good	REMOVED
337	Shagbark Hickory	14	Good	REMOVED
338	Black Cherry	12	Good	REMOVED
339	American Elm	22	Good	REMOVED
340	Oak	15	Good	REMOVED
341	American Elm	12	Good	REMOVED
342	Oak	12	Good	REMOVED
343	Oak	12	Good	REMOVED
344	Black Oak	22	Good	REMOVED
345	Black Oak	60	Good	REMOVED
346	Sassafras	12	Good	REMOVED
347	Oak	23	Good	REMOVED
348	Oak	21	Good	REMOVED
349	Oak	21	Good	REMOVED
350	Black Cherry	15	Good	REMOVED
351	Black Oak	16	Good	REMOVED
352	Shagbark Hickory	20	Good	REMOVED
353	Shagbark Hickory	14	Good	REMOVED
354	Bitternut Hickory	12	Good	SAVED
355	Black Oak	36	Good	SAVED
356	Oak	14	Good	REMOVED
357	White Oak	12	Good	SAVED
358	Oak	21	Good	SAVED
359	Mulberry	18	Good	SAVED
360	American Elm	24	Good	SAVED
361	Oak	14	Good	SAVED
362	Oak	14	Good	SAVED
363	Black Oak	12	Good	SAVED
364	American Elm	12	Good	SAVED
365	Black Cherry	13	Good	SAVED
366	American Elm	22	Good	REMOVED
367	American Elm	15	Good	REMOVED
368	American Elm	12	Good	REMOVED
369	Oak	12	Good	REMOVED
370	American Elm	21	Good	REMOVED
371	Black Oak	16	Good	REMOVED
372	Black Oak	29	Good	REMOVED
373	Black Oak	29	Good	REMOVED
374	Black Oak	24	Good	REMOVED
375	Black Oak	20	Good	REMOVED
376	Black Oak	25	Good	REMOVED
377	Oak	17	Good	REMOVED
378	Oak	17	Good	REMOVED
379	Black Oak	22	Good	REMOVED
380	Black Oak	12	Good	REMOVED
381	Black Oak	22	Good	REMOVED
382	Black Oak	22	Good	REMOVED
383	White Oak	12	Good	REMOVED
384	Oak	14	Good	REMOVED
385	Black Oak	16	Good	REMOVED
386	American Elm	12	Good	REMOVED
387	Oak	14	Good	REMOVED
388	Oak	16	Good	REMOVED
389	Shagbark Hickory	15	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
390	Sassafras	12	Good	REMOVED
391	Black Oak	23	Good	REMOVED
392	Oak	24	Good	REMOVED
393	Oak	14	Good	REMOVED
394	Oak	12	Good	REMOVED
395	Black Oak	12	Good	REMOVED
396	Sassafras	14	Good	REMOVED
397	Sassafras	14	Good	REMOVED
398	Oak	14	Good	REMOVED
399	Bitternut Hickory	13	Good	REMOVED
400	Bitternut Hickory	14	Good	REMOVED
401	American Elm	13	Good	REMOVED
402	Shagbark Hickory	12	Good	REMOVED
403	Bitternut Hickory	15	Good	SAVED
404	Black Cherry	12	Good	SAVED
405	White Oak	20	Good	SAVED
406	American Elm	12	Good	SAVED
407	Black Cherry	12	Good	REMOVED
408	Black Oak	12	Good	REMOVED
409	Black Oak	14	Good	REMOVED
410	Black Oak	18	Good	REMOVED
411	Oak	21	Good	REMOVED
412	Black Oak	13	Good	SAVED
413	Oak	12	Good	REMOVED
414	Black Oak	12	Good	REMOVED
415	Oak	17	Good	REMOVED
416	Oak	15	Good	REMOVED
417	Oak	13	Good	REMOVED
418	Oak	20	Good	REMOVED
419	American Elm	16	Good	REMOVED
420	Oak	15	Good	REMOVED
421	Black Oak	12	Good	REMOVED
422	Black Oak	12	Good	SAVED
423	Black Oak	12	Good	SAVED
424	Black Oak	14	Good	SAVED
425	Black Oak	17	Good	REMOVED
426	Oak	19	Good	REMOVED
427	Black Oak	18	Good	REMOVED
428	Oak	14	Good	REMOVED
429	American Elm	12	Good	REMOVED
430	Black Oak	20	Good	REMOVED
431	Black Oak	21	Good	REMOVED
432	American Elm	14	Good	REMOVED
433	American Elm	14	Good	REMOVED
434	Oak	12	Good	REMOVED
435	Oak	14	Good	REMOVED
436	Black Oak	14	Good	REMOVED
437	Black Cherry	15	Good	REMOVED
438	Black Oak	14	Good	REMOVED
439	Black Oak	15	Good	REMOVED
440	Black Ash	12	Good	REMOVED
441	Shagbark Hickory	12	Good	REMOVED
442	Black Ash	12	Good	REMOVED
443	Black Oak	18	Good	SAVED

MISS DIG 811

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP, MICHIGAN

TREE INVENTORY

KHA PROJECT 191290003

DATE 02/06/2026

SCALE: AS SHOWN

DESIGNED BY: CFK

DRAWN BY: CFK

CHECKED BY: RAH

SHEET NUMBER

LP202

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/06/2026	BIG

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Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GAMMON
ENGINEER
6201101206
LICENSED PROFESSIONAL ENGINEER

Brian Gammon

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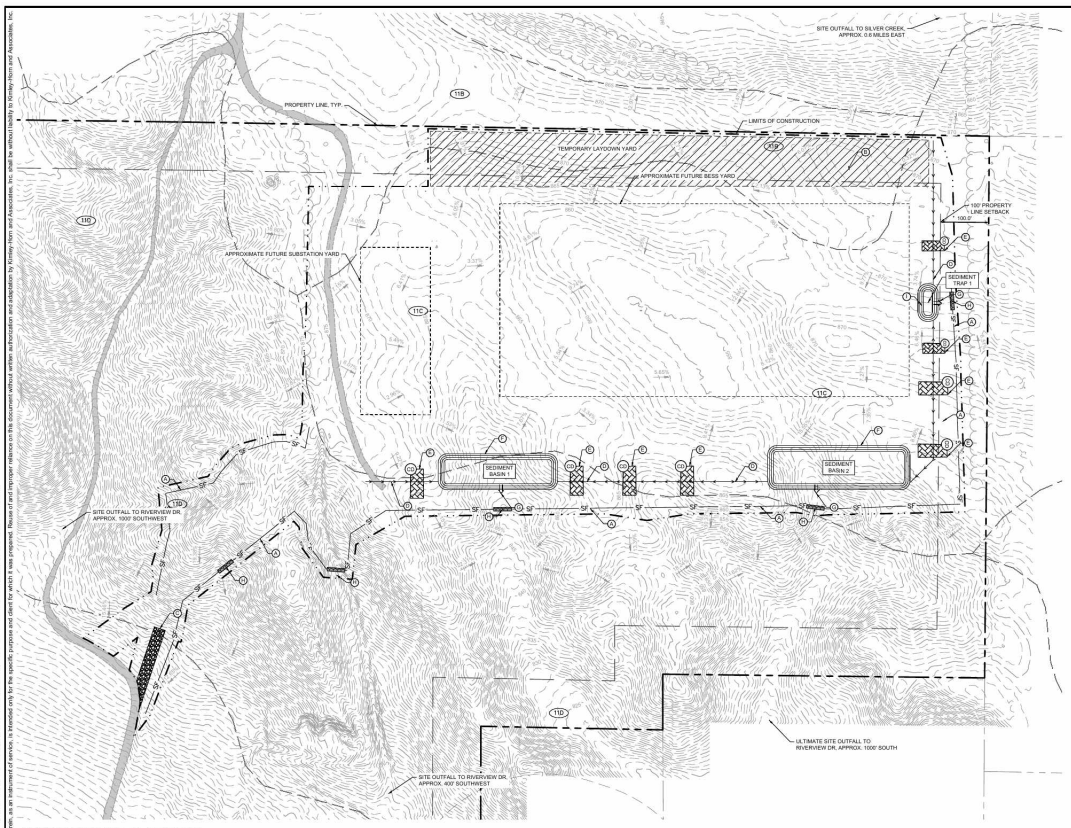
K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_M12 Design\CAD\PlanSheets\L1 TREE INVENTORY AND PRESERVATION PLAN.dwg March 18, 2026 - 2:11pm



KEYNOTE LEGEND

- A SILT FENCE
- B TEMPORARY LAYDOWN AREA
- C ROCK CONSTRUCTION ENTRANCE
- D DRAINAGE DITCH
- E ROCK CHECK DAMS
- F TEMPORARY SEDIMENT BASIN
- G TEMPORARY SEDIMENT BASIN OUTFALL
- H SILT FENCE ROCK OUTLET
- I TEMPORARY SEDIMENT TRAP

LEGEND

	MDTMB SESC KEYING SYSTEM NO.
STABILIZED CONSTRUCTION ENTRANCE	SS3
TEMPORARY LAYDOWN AREA	
SILT FENCE	SS1
DIVERSION DITCH	ES37
LIMITS OF DISTURBANCE	
TEMPORARY SAFETY FENCE	
PROPERTY LINE	
PARCEL LINE	
PROPERTY LINE SETBACK	
RESIDENTIAL BUILDING SETBACK	
SOIL BOUNDARY	
PROPOSED BESS AND SUBSTATION YARD FOOTPRINT	
ROCK CHECK DAM	ES31
SILT FENCE ROCK OUTLET	

SWPPP UPDATES & AMENDMENTS

THE CONTRACTOR MUST UPDATE THE SWPPP BY NOTING ON THE SITE MAPS IN THE JOB SITE BINDER TO REFLECT THE PROGRESS OF CONSTRUCTION ACTIVITIES AND GENERAL CHANGES TO THE PROJECT SITE FOR THE DURATION OF LAND DISTURBING ACTIVITIES. AT A MINIMUM, UPDATES SHALL BE MADE DAILY TO TRACK CONSTRUCTION PROGRESS DESCRIBED IN THE SEQUENCE OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR NOTING THE LOCATION OF THE JOB SITE TRAILER, TEMPORARY PARKING & LAYDOWN AREAS, PORTA-POTTY, WHEEL WASH, CONCRETE WASHOUT, FUEL & MATERIAL STORAGE, SOLID WASTE CONTAINERS, AND OTHER CONSTRUCTION RELATED FACILITIES THAT MAY IMPACT STORMWATER RUNOFF.

PHASE 1 SEQUENCE OF CONSTRUCTION

1. INSTALL PERIMETER EROSION CONTROL (I.E. SILT FENCE) AND INLET PROTECTION AT EXISTING STORMWATER INLETS.
2. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT
3. PREPARE TEMPORARY PARKING AND STORAGE AREA.
4. CONSTRUCT AND STABILIZE DIVERSIONS AND TEMPORARY SEDIMENT BASINS.
5. CLEAR AND GRUB THE SITE.
6. BEGIN MASS SITE GRADING AND ROUGH GRADE SITE SUFFICIENTLY TO ESTABLISH PROPOSED DRAINAGE PATTERNS.
7. START CONSTRUCTION OF THE BUILDING PAD AND STRUCTURES.
8. TEMPORARILY SEED, THROUGHOUT CONSTRUCTION, DISTURBED AREAS THAT WILL BE INACTIVE FOR 7 DAYS OR MORE OR AS REQUIRED BY THE NPDES AND/OR TOWNSHIP GRADING PERMITS(S).

NOTE: THE SEQUENCE OF CONSTRUCTION IS INTENDED TO CONVEY THE GENERAL CONCEPTS OF THE EROSION CONTROL DESIGN AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETAILED PHASING AND CONSTRUCTION SEQUENCING NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING IMMEDIATELY, PRIOR TO AND/OR DURING CONSTRUCTION IF ANY ADDITIONAL INFORMATION ON THE CONSTRUCTION SEQUENCE IS NECESSARY.

EROSION CONTROL PLAN NOTES

1. THE STORM WATER POLLUTION PREVENTION PLAN ("SWPPP") IS COMPRISED OF THE EROSION CONTROL PLAN, THE STANDARD DETAILS, THE PLAN NARRATIVE, ATTACHMENTS INCLUDED IN THE SPECIFICATIONS OF THE SWPPP PLUS THE PERMIT AND ALL SUBSEQUENT REPORTS AND RELATED DOCUMENTS.
2. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH LAND DISTURBING ACTIVITIES SHALL OBTAIN A COPY OF THE SWPPP AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT, AND BECOME FAMILIAR WITH THEIR CONTENTS.
3. BEST MANAGEMENT PRACTICES (BMPS) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE AND LOCAL REQUIREMENTS. AS APPLICABLE, THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY THE PERMITTING AGENCY, ENGINEER OR OWNER.
4. SITE ENTRY AND EXIT LOCATIONS SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT THE TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO A PUBLIC ROADWAY FROM THE CONSTRUCTION SITE MUST BE REMOVED AS SOON AS PRACTICABLE. WHEN WASHING IS REQUIRED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO A PUBLIC ROADWAY, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN. ANY FINES IMPOSED FOR DISCHARGING SEDIMENT ONTO A PUBLIC RIGHT OF WAY SHALL BE PAID BY THE CONTRACTOR.
5. TEMPORARY SEEDING OR OTHER APPROVED METHODS OF STABILIZATION SHALL BE INITIATED WITHIN 7 DAYS OF THE LAST DISTURBANCE ON ANY AREA OF THE SITE.
6. THE CONTRACTOR SHALL MINIMIZE LAND DISTURBANCE AND CLEARING TO THE MAXIMUM EXTENT PRACTICAL OR AS REQUIRED BY THE GENERAL PERMIT.
7. CONTRACTOR SHALL DENOTE ON THE PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.
8. ALL WASH WATER FROM THE CONSTRUCTION SITE (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) SHALL BE DETAINED AND PROPERLY TREATED BEFORE DISPOSAL.
9. SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL ON SITE. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
11. RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DEPOSITED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE PREMISES THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.
12. STAGING AREAS, STOCKPILES, SPOILS, ETC. SHALL BE LOCATED OUTSIDE OF DRAINAGE WAYS SUCH THAT STORM WATER RUNOFF WILL NOT BE ADVERSELY AFFECTED. PROVIDE STABILIZATION MEASURES SUCH AS PERIMETER EROSION CONTROL BMPS, SEEDING, OR OTHER COVERING AS NECESSARY TO PREVENT EROSION.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING ANY EROSION CONTROL BMP DISTURBED DURING CONSTRUCTION OPERATIONS. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DEFICIENCIES IN THE ESTABLISHED EROSION CONTROL MEASURES THAT MAY LEAD TO UNAUTHORIZED DISCHARGE OF STORM WATER POLLUTANTS. UNAUTHORIZED POLLUTANTS INCLUDE (BUT ARE NOT LIMITED TO) EXCESS CONCRETE DUMPING, CONCRETE RESIDUE, PAINTS, SOLVENTS, GREASES, FUELS, LUBRICANT OILS, PESTICIDES, AND SOLID WASTE MATERIALS.
14. EROSION CONTROL BMP'S SHOWN ON THESE PLANS SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBING ACTIVITIES ON THE PROJECT, AND INITIATED AS SOON AS PRACTICABLE.
15. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION, AND SHALL MAINTAIN COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS FOR THE DURATION OF CONSTRUCTION.
16. THE CONTRACTOR SHALL FIELD ADJUST AND/OR PROVIDE ADDITIONAL EROSION CONTROL BMP'S AS NEEDED TO PREVENT EROSION AND OFF-SITE SEDIMENT DISCHARGE FROM THE CONSTRUCTION SITE. LOG AND RECORD ANY ADJUSTMENTS AND DEVIATIONS FROM THE APPROVED EROSION CONTROL PLANS WITHIN THE SWPPP DOCUMENTS STORED IN THE JOB SITE TRAILER.

SOILS LEGEND	
OSHTEMO/CHELSEA COMPLEX, 0 TO 6 PERCENT SLOPS	11B
OSHTEMO/CHELSEA COMPLEX, 6 TO 12 PERCENT SLOPS	11C
OSHTEMO/CHELSEA COMPLEX, 6 TO 12 PERCENT SLOPS	11D
OSHTEMO/CHELSEA COMPLEX, 18 TO 35 PERCENT SLOPS	11E

PHASE I BMP QUANTITIES	
SILT FENCE	± 3,163 LF
ROCK CONSTRUCTION ENTRANCE	1 EA.
DIVERSION DITCH	± 1,247 LF
ROCK CHECK DAM	8 EA.
SILT FENCE ROCK OUTLET	5 EA.

SEDIMENT BASIN/TRAP SIZING TABLE					
	DRAINAGE AREA (AC)	TOTAL REQUIRED VOLUME (CF)	MIN. DEPTH (FT)	MIN. BOTTOM LENGTH (FT)	MIN. BOTTOM WIDTH (FT)
BASIN 1	8.58	± 30,888	3.00	224	51
BASIN 2	13.74	± 49,483	3.00	272	68
TRAP 1	1.48	± 2,672	3.00	54	18

GRAPHIC SCALE IN FEET 0 50 100 200

NORTH

MISS DIG 811

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/06/2026	BPG

Kimley»Horn
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Copenhagen Infrastructure Partners

STATE OF MICHIGAN BRIAN GANNON ENGINEER 6201053000 LICENSED PROFESSIONAL ENGINEER

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CAS
CHECKED BY BPG

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

EROSION AND SEDIMENT CONTROL PLAN - PHASE 1

PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP
MICHIGAN

SHEET NUMBER
C300

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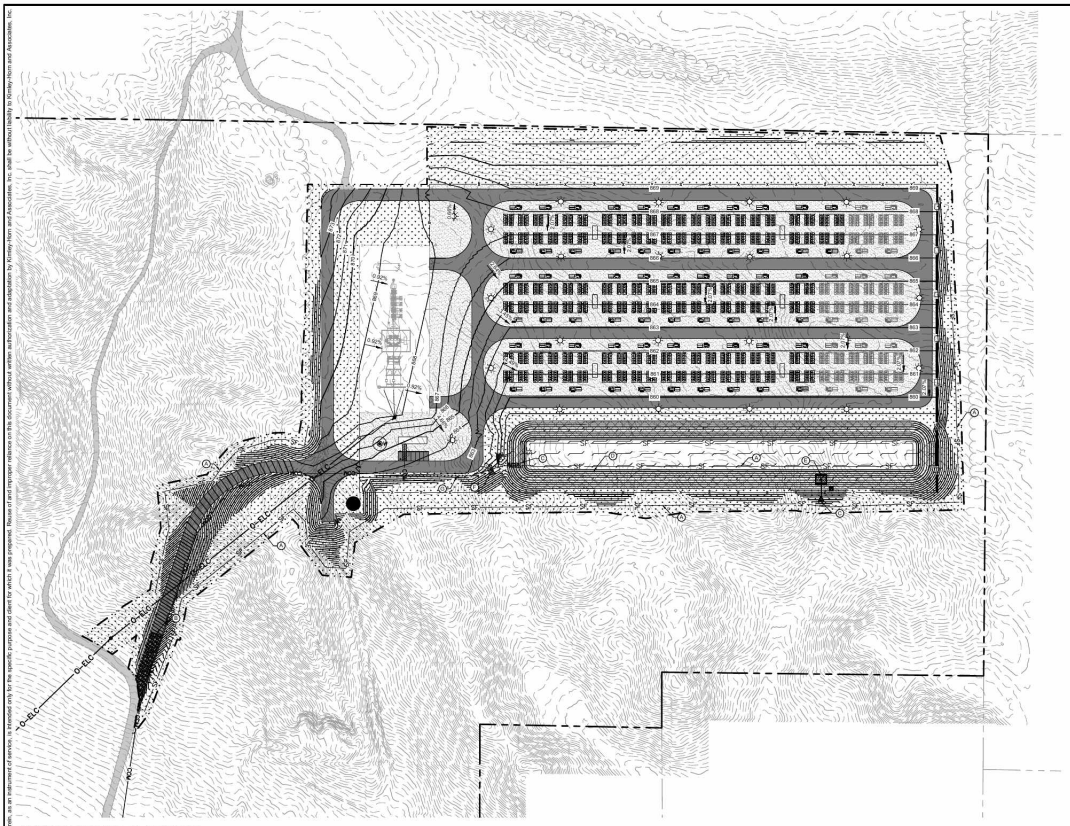
K:\TCOV_LDEV\Copenhagen Infrastructure Partners\Heron BESS_MI\2 Design\CAD\PlanSheets\C3-EROS PH1 PLAN.dwg March 16, 2026 - 2:12pm



PHASE II BMP QUANTITIES	
SILT FENCE	± 4,848 LF
ROCK CONSTRUCTION ENTRANCE	1 EA
INLET PROTECTION	1 EA
ROCK CHECK DAM	1 EA
DIVERSION DITCH	± 280 LF

KEYNOTE LEGEND

- A SILT FENCE
- B ROCK CONSTRUCTION ENTRANCE
- C RIPRAP
- D EROSION CONTROL BLANKET
- E INLET PROTECTION
- F ROCK CHECK DAM
- G DIVERSION DITCH

LEGEND

	MDTMB SESC KEYING SYSTEM NO.
STABILIZED CONSTRUCTION ENTRANCE	SS3
EROSION CONTROL BLANKET	E9
POND	
VEGETATION	
RIPRAP	E12
SF SILT FENCE	S51
LIMITS OF DISTURBANCE	
SAFETY FENCE	
INLET PROTECTION	S58
ROCK CHECK DAM	ES31
DIVERSION DITCH	ES37
SOUND WALL	

SWPPP UPDATES & AMENDMENTS

THE CONTRACTOR MUST UPDATE THE SWPPP BY NOTING ON THE SITE MAPS IN THE JOB SITE BINDER TO REFLECT THE PROGRESS OF CONSTRUCTION ACTIVITIES AND GENERAL CHANGES TO THE PROJECT SITE FOR THE DURATION OF LAND DISTURBING ACTIVITIES. AT A MINIMUM, UPDATES SHALL BE MADE DAILY TO TRACK CONSTRUCTION PROGRESS DESCRIBED IN THE SEQUENCE OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR NOTING THE LOCATION OF THE JOB SITE TRAILER, TEMPORARY PARKING & LAYDOWN AREAS, PORTA-POTTY, WHEEL WASH, CONCRETE WASHOUT, FUEL & MATERIAL STORAGE, SOLID WASTE CONTAINERS, AND OTHER CONSTRUCTION RELATED FACILITIES THAT MAY IMPACT STORMWATER RUNOFF.

PHASE 2 SEQUENCE OF CONSTRUCTION

1. TEMPORARILY SEED, THROUGHOUT CONSTRUCTION, DENUDED AREAS THAT WILL BE INACTIVE FOR 7 DAYS OR MORE.
2. CONSTRUCT UNDERGROUND SITE UTILITIES AND STORM SEWER, INCLUDING UNDERGROUND STORMWATER MANAGEMENT SYSTEM.
3. INSTALL APPROPRIATE INLET PROTECTION AT ANY NEW STORM SEWER STRUCTURES AS EACH STRUCTURE IS CONSTRUCTED.
4. COMPLETE SITE GRADING AND PERMANENTLY STABILIZE AREAS TO BE VEGETATED AS THEY ARE BROUGHT TO FINAL GRADE.
5. PLACE PAVEMENT BASE MATERIAL AND INSTALL SUBDRAINAGE SYSTEM.
6. CONSTRUCT PAVEMENTS, CURB & GUTTER, AND SIDEWALKS.
7. AS APPROPRIATE, REPLACE & MAINTAIN INLET PROTECTION DEVICES WITHIN PAVED AREAS AS WORK PROGRESSES.
8. SOON AFTER PAVING IS COMPLETED, INSTALL OF PERMANENT STABILIZATION (SEEDING, SODDING, ETC.) WITHIN LANDSCAPED AREAS.
9. WHEN THE SITE HAS ACHIEVED FINAL STABILIZATION AS DEFINED BY THE APPLICABLE EROSION CONTROL PERMITS, REMOVE ALL REMAINING TEMPORARY EROSION & SEDIMENT CONTROL BMPS AND RE-STABILIZE ANY AREAS DISTURBED BY THE REMOVAL.

NOTE: THE SEQUENCE OF CONSTRUCTION IS INTENDED TO CONVEY THE GENERAL CONCEPTS OF THE EROSION CONTROL DESIGN AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETAILED PHASING AND CONSTRUCTION SEQUENCING NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING IMMEDIATELY, PRIOR TO ANDOR DURING CONSTRUCTION IF ANY ADDITIONAL INFORMATION ON THE CONSTRUCTION SEQUENCE IS NECESSARY.

EROSION CONTROL PLAN NOTES

1. THE STORM WATER POLLUTION PREVENTION PLAN ("SWPPP") IS COMPRISED OF THE EROSION CONTROL PLAN, THE STANDARD DETAILS, THE PLAN NARRATIVE, ATTACHMENTS INCLUDED IN THE SPECIFICATIONS OF THE SWPPP, PLUS THE PERMIT AND ALL SUBSEQUENT REPORTS AND RELATED DOCUMENTS.
2. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH LAND DISTURBING ACTIVITIES SHALL OBTAIN A COPY OF THE SWPPP AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT, AND BECOME FAMILIAR WITH THEIR CONTENTS.
3. BEST MANAGEMENT PRACTICES (BMPS) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE AND LOCAL REQUIREMENTS. AS APPLICABLE, THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY THE PERMITTING AGENCY, ENGINEER OR OWNER.
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5. TEMPORARY SEEDING OR OTHER APPROVED METHODS OF STABILIZATION SHALL BE INITIATED WITHIN 7 DAYS OF THE LAST DISTURBANCE ON ANY AREA OF THE SITE.
6. THE CONTRACTOR SHALL MINIMIZE LAND DISTURBANCE AND CLEARING TO THE MAXIMUM EXTENT PRACTICAL OR AS REQUIRED BY THE GENERAL PERMIT.
7. CONTRACTOR SHALL DENOTE ON THE PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.
8. ALL WASH WATER FROM THE CONSTRUCTION SITE (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) SHALL BE DETAINED AND PROPERLY TREATED BEFORE DISPOSAL.
9. SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL ON SITE. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
11. RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DEPOSITED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE PREMISES THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.
12. STAGING AREAS, STOCKPILES, SPOILS, ETC. SHALL BE LOCATED OUTSIDE OF DRAINAGE WAYS SUCH THAT STORM WATER RUNOFF WILL NOT BE ADVERSELY AFFECTED. PROVIDE STABILIZATION MEASURES SUCH AS PERIMETER EROSION CONTROL BMPS, SEEDING, OR OTHER COVERING AS NECESSARY TO PREVENT EROSION.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING ANY EROSION CONTROL BMP DISTURBED DURING CONSTRUCTION OPERATIONS. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DEFICIENCIES IN THE ESTABLISHED EROSION CONTROL MEASURES THAT MAY LEAD TO UNAUTHORIZED DISCHARGE OF STORM WATER POLLUTANTS. UNAUTHORIZED POLLUTANTS INCLUDE (BUT ARE NOT LIMITED TO) EXCESS CONCRETE DUMPING, CONCRETE RESIDUE, PAINTS, SOLVENTS, GREASES, FUELS, LUBRICANT OILS, PESTICIDES, AND SOLID WASTE MATERIALS.
14. EROSION CONTROL BMP'S SHOWN ON THESE PLANS SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBING ACTIVITIES ON THE PROJECT, AND INITIATED AS SOON AS PRACTICABLE.
15. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION, AND SHALL MAINTAIN COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS FOR THE DURATION OF CONSTRUCTION.
16. THE CONTRACTOR SHALL FIELD ADJUST AND/OR PROVIDE ADDITIONAL EROSION CONTROL BMP'S AS NEEDED TO PREVENT EROSION AND OFF-SITE SEDIMENT DISCHARGE FROM THE CONSTRUCTION SITE. LOG AND RECORD ANY ADJUSTMENTS AND DEVIATIONS FROM THE APPROVED EROSION CONTROL PLANS WITHIN THE SWPPP DOCUMENTS STORED IN THE JOB SITE TRAILER.

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

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STATE OF MICHIGAN
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PE-6201053150
LICENSED PROFESSIONAL ENGINEER

Brian Jennings

KHA PROJECT 191250003
DATE 02/26/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

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EROSION AND SEDIMENT CONTROL PLAN - PHASE 2

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP
KALAMAZOO COUNTY
MICHIGAN

SHEET NUMBER
C301

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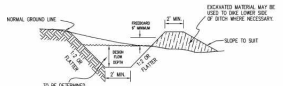
ES37 DIVERSION DITCH



CUT SECTION FOR DITCHES

NOTES:
- ALL STRUCTURAL BEST MANAGEMENT PRACTICES TO BE DESIGNED BY A REGISTERED ENGINEER OR LANDSCAPE ARCHITECT
- ALL DIVERSIONS SHOULD BE FLAT BOTTOM - AVOID "V" PROFILES.
- MAY USE VEGETATED CHANNELS (SEE E11).

STANDARD SYMBOL

STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET STATE FACILITIES ADMINISTRATION

DIVERSION DITCH SPECIFICATIONS ES37

When
- Temporarily diverts runoff around disturbed construction areas, highly erodible soils and other sensitive areas such as steep slopes.

Why
- To reduce erosion and sedimentation and route surface flows away from vulnerable areas, to divert flows to proposed sediment basins, and to prevent slope failures.

Where
- Where diversion of upslope runoff is necessary to prevent damage to unstabilized or disturbed construction areas and other vulnerable areas such as steep slopes.

How
1. Review site plan to determine areas subject to erosive surface runoff, construction areas needing protection from runoff, or collection and conveyance areas requiring runoff be directed into sediment basins or traps.
2. Locate diversion ditches prior to excavation of area to be protected and with consideration of pre-construction drainage patterns and capacities.
3. Temporary diversion ditches should be sized to carry at least a 10-year 24 hour storm event, unless local ordinances require greater capacity.
4. Permanent diversion ditches should be sized by a professional engineer.
5. Ditches should be located above, not on, a cut or fill slope and should run essentially perpendicular to the direction of runoff.
6. Ditch should have a minimum 2' wide bottom, a minimum 18" depth, with side slopes 1:2 or flatter.
7. Ditch grade minimum is usually 1%, maximum grade is dependent upon ditch armoring, capacity and diversion outlet (generally not greater than 10%).
8. Ditches may be vegetated or stabilized with rock riprap or matting.

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ES37 DIVERSION DITCH SPECIFICATIONS

How (cont.)
9. Care should be taken to prevent placement of material from ditch excavation into waterbodies, wetlands, or other sensitive areas.
10. Excavated material sidecast along diversion ditch should be compacted and stabilized.
11. Seed and mulch ditches with less than 5% grade; riprap and sod ditches with greater than 5% grade.

Maintenance
- Diversion should be inspected after every rainfall.
- Sediment should be removed from the diversion ditch and repairs made as necessary.
- Mow to remove excess growth of woody vegetation (design consideration).
- Except for maintenance, keep vehicles out of the ditch.

Limitations
- Diversion ditches should not adversely impact upstream or downstream properties.
- Use may be limited by quantity of diverted runoff.
- Seeding ditches will delay use until cover established.

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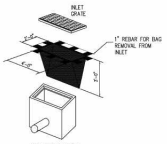
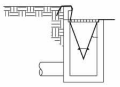
S58 INLET PROTECTION – FABRIC DROP



ISOMETRIC VIEW

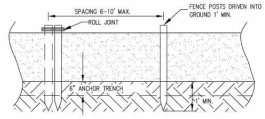


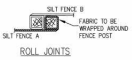
INSTALLATION DETAIL

STANDARD SYMBOL

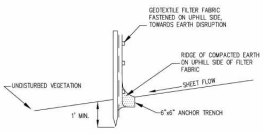
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET STATE FACILITIES ADMINISTRATION

S51 SILT FENCE





ROLL JOINTS



STANDARD SYMBOL

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SILT FENCE SPECIFICATIONS S51

When
- A temporary measure for preventing sediment movement.

Why
- Used to prevent sediment suspended in runoff from leaving an earth change area.

Where
- Use adjacent to critical areas, wetlands, base of slopes, and watercourses.

How
1. Install parallel to a contour.
2. The silt fence should be made of woven geotextile fabric.
3. Silt fence should accomodate no more than 1/2 to 1 acre of drainage per 100' of fence.
4. Dig a 6" trench along the area where the fence is to be installed.
5. Place 6" of the silt fence bottom flap into the trench.
6. Backfill the trench with soil and compact the soil on both sides. Create a small ridge on the up-slope side of the fence.
7. Install wooden stakes 6 – 10' apart and drive into the ground a minimum of 12".
8. Staple the geotextile fabric to the wooden stakes.
9. Join sections of silt fence by wrapping ends together (See drawing).

Maintenance
- Inspect frequently and immediately after each storm event. Check several times during prolonged storm events. If necessary, repair immediately.
- If the sediment has reached 1/3 the height of the fence, the soil should be removed and disposed of in a stable upland site.
- The fence should be re-installed if water is seeping underneath it or if the fence has become ineffective.
- Silt fence should be removed once vegetation is established and up-slope area has stabilized.

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S51 SILT FENCE SPECIFICATIONS

Limitations
- Silt fence may cause temporary ponding and could fail if too much water flows through the area.
- Do not use in areas with concentrated flows.
- Chance of failure increases if fence is installed incorrectly or if sediment accumulation is not removed.

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INLET PROTECTION – FABRIC DROP SPECIFICATIONS S58

When
- When sediment laden stormwater requires treatment before entering a stormwater drainage system.

Why
- To prevent sediment from entering stormwater systems.

Where
- Use in or at stormwater inlets, especially at construction sites or in streets.

How
1. A filter fabric bag is hung inside the inlet, beneath the grate.
2. Replace grate, which will hold bag in place.
3. Anchor filter bag with 1" rebar for removal from inlet.
4. Flaps of bag that extend beyond the bag can be buried in soil in earth areas.

Maintenance
- Drop inlet filters should be inspected routinely and after each major rain event.
- Damaged filter bags should be replaced.
- Clean and/or replace filter bag when 1/2 full.
- Replace clogged fabric immediately.
- If needed, initiate repairs immediately upon inspection.
- Remove entire protective mechanism when upgradient areas are stabilized and streets have been swept.

Limitations
- Can only accommodate small flow quantities.
- Requires frequent maintenance.
- Ponding may occur around storm drains if filter is clogged.

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Brian Gunnoe
FOR REFERENCE ONLY

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

EROSION CONTROL DETAILS

HERON BESS
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN MICHIGAN

SHEET NUMBER
C310

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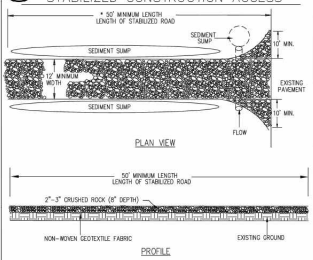
S53 STABILIZED CONSTRUCTION ACCESS



NOTES:
1. Establish stabilized construction entrance prior to the initiation of site construction activities.
2. Care should be taken to prevent material movement into adjacent wetlands/waterbodies.
3. Care should be taken to maintain existing roadside drainage via culvert installation, with sediment sump placed downflow of culvert.

STANDARD SYMBOL

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STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS S53

When
- Construction traffic is expected to leave a construction site.
- Stabilization of interior construction roads is desired.

Why
- To minimize tracking of sediment onto public roadways and to minimize disturbance of vegetation.

Where
- Stabilized construction entrances shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must be routed over the rock ingress/egress corridor.

How
1. Stabilized construction access road should be established at the onset of the construction activities and maintained in place for the duration of the construction project.
2. Installation of this practice should be the responsibility of the site clearing or excavating contractor.
3. Access location should be cleared of woody vegetation.
4. Non-woven geotextile fabric shall be placed over the existing ground prior to placing stone.
5. Access size should be a minimum of 50'. (30' for single residence lot).
6. Access width should be 12' minimum, flared at the existing road to provide a turning radius.
7. Crushed aggregate (2" to 3"), or reclaimed or recycled concrete equivalent, shall be placed at least 8" deep over the length and width of the ingress/egress corridor.

Maintenance
- Periodic inspection and needed maintainence shall be provided after each rain event.
- Stabilized entrances shall be repaired and rock added as necessary.

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STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS S53

Maintenance (cont.)
- Sediment deposited on public rights-of-way shall be removed immediately and returned to the construction site.
- If soils are such that washing of tires is required, it shall be done in a wash rack area, stabilized with stone, immediately prior to the construction access stabilized corridor.
- At the project completion, rock access road should be removed and disposed of unless utilized as subgrade for final road.

Limitations
- Effectiveness limited, sediment may be tracked onto roads requiring additional action.

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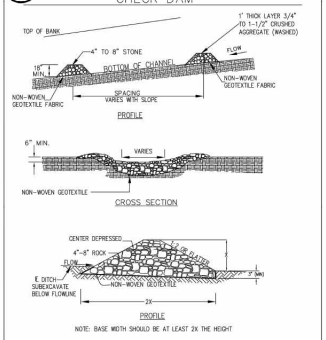
ES31 CHECK DAM

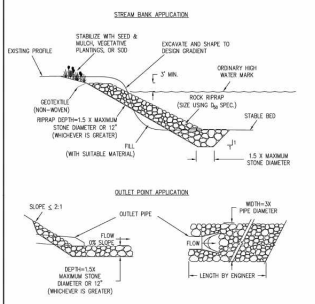


NOTE: BASE WIDTH SHOULD BE AT LEAST 2X THE HEIGHT

STANDARD SYMBOL

STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET STATE FACILITIES ADMINISTRATION

E12 RIPRAP



STANDARD SYMBOL

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RIPRAP SPECIFICATIONS E12

When
- When concentrated water flows have the potential to create scour, down-cutting, or lateral cutting.

Why
- To prevent loss of land or damage to utilities or structures. In aquatic applications, riprap is used to control channel meander and maintain capacity, protect against wave attack, and reduce sediment load.

Where
- In natural or constructed channels with areas susceptible to erosion from the action of water, ice, or debris, or to damage by livestock or vehicular traffic.
- In shoreline areas where the erosion problem may be solved through simple structural measures.
- On slopes with profiles measuring 1:1.5 or less.

How
1. Review subject site to identify areas subject to concentrated flows or wave/current attack.
2. The appropriateness and extent of riprap placement is site specific and should be determined in the field.
3. The area under review for riprap placement must be shaped and contoured appropriately by grading prior to material placement.
4. Non-woven geotextile fabric should be installed prior to riprap placement, with upper end and toe end of fabric buried or anchored to prevent movement.
5. Riprap placement should be started at a stabilized location and ended at a stabilized or contoured point.
6. Material selected for riprap should be hard, angular, and resistant to weathering. Appropriate material size depends on expected water energy and intended function of the material.

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RIPRAP SPECIFICATIONS E12

How (cont.)
7. Riprap mixture should be an even mixture of stone sizes based on the average, or D_{50}. This means 50% of the stone, by size, will be larger than the diameter specified, and 50% will be smaller than the size specified. The diameter of the largest stone should not be more than 1.5 times the D_{50} stone size.
8. See table on the following page for typical riprap stone sizes.
9. Rock shall be placed so that larger rocks are uniformly distributed and in contact with one another. Smaller rocks should fill the voids.
10. When in contact with moving water, riprap will tie into a stable bank at the downstream end and will be keyed into the bank at the upstream end. Riprap should extend 3 ft. above the ordinary high water mark or to the top of the bank on short slopes. Extend riprap a minimum 10 ft. beyond active erosion area.

Maintenance
- All installations should be inspected immediately after the first rainfall to confirm the stability of the placed material. Follow-up inspections should occur regularly and provisions made for prompt repair if needed.

Limitations
- Area is cleared prior to the addition of riprap, therefore no areas are preserved with native vegetation.

SIZE OF TYPICAL RIPRAP STONES

Weight (lbs.)	Average Spherical Diameter (in.) D_{50}	Typical Rectangular Shape Length (in.)	Width/Height (in.)
50	15	18	6
100	12	21	7
150	14	24	8
250	18	30	9
500	22	36	12
1000	27	45	15
1500	30	51	17
2000	34	57	19
4000	43	72	24
6000	48	81	28
8000	54	90	30

Source: Adapted from USDA NRCS

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CHECK DAM SPECIFICATIONS ES31

When
- To reduce surface flow velocities.

Why
- To minimize erosion in flow corridors.

Where
- Within constructed flow corridors to reduce velocity until permanent stabilization is achieved.
- Within existing flow corridors to address or prevent velocity-caused erosion.

How
1. The check dam shall be constructed of rock only.
2. The rock shall be placed on non-woven geotextile fabric.
3. Remove woody vegetation prior to placing non-woven geotextile fabric.
4. Non-woven geotextile fabric shall be inset a minimum of 3" below adjacent grades.
5. The check dam shall be constructed of 4"-8" stone. The stone shall be placed to completely cover the width of the flow corridor and shall be keyed into adjacent banks.
6. The middle of the check dam shall be lower than the outer edges, such that no flow goes around the structure.
7. The up-stream side of the check dam can be lined with smaller crushed aggregate to improve efficiency.
8. Slopes of check dam should be 1:2 or flatter.

Maintenance
- Check dams should be inspected after each runoff event.
- Clogged stone should be periodically cleaned.
- Needed repairs should be initiated immediately after inspection.
- Accumulated upflow sediment should be periodically removed.
- If check dam is intended as temporary structure, remove after stabilization is achieved.

Limitations
- Use only in small open channels which drain 10 acres or less.
- Not to be used in live streams.

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DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

EROSION CONTROL DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON BESS
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN MICHIGAN

SHEET NUMBER
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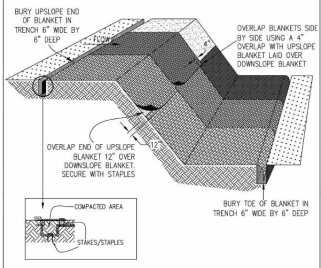
E9 MULCH BLANKETS



NOTES:
1. PLACE MULCH BLANKET PARALLEL TO FLOW AND ANCHOR SECURELY.
2. WHEN BLANKETS ARE USED IN FLOWING DITCH, BLANKETS SHOULD NOT OVERLAP IN DITCH CENTER PARALLEL TO FLOW.
3. STAPLES INSTALLED/SECURED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
4. WHERE POSSIBLE, CONSTRUCT WITH BIODEGRADABLE MATERIAL.

STANDARD SYMBOL

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STATE FACILITIES ADMINISTRATION

E9 MULCH BLANKETS SPECIFICATIONS

When • When seeded areas are subject to erosive surface flows, severe wind, or to protect non-vegetated slopes or areas during the winter.

Why • Protects seeded areas and slopes against erosion from rain or wind. Holds soil moisture to allow for seed germination and reduces wind dessication of germinated seeds.

Where • Use on exposed slopes, newly seeded areas, new ditch bottoms, and other areas subject to erosion.

How
1. Prepare subgrade to proper grade and compaction requirements.
2. Remove ruts, roots, soil clods, or other debris from surface subject to mulch blanket installation.
3. Spread or drill seed.
4. Consult with erosion control material supplier to select mulch blanket based on slope gradient, expected surface run-off, and protection term necessary (long or short term).
5. Position selected mulch blanket as close as possible to intended use location.
6. Install blanket at top of slope, first anchoring toe in trench 6" wide X 6" deep, progressing down-slope or down-gradient with approximately 12" of blanket extended beyond the up-slope portion of the trench.
7. Anchor the blanket with staples/stakes placed approximately 12" apart in the bottom of the trench. Backfill and compact the trench after securing.
8. Apply seed to compacted soil and fold the 12" portion of the blanket over compacted area and secure with a row of staples/stakes placed 12" apart across the width of the blanket.
9. Unroll the blankets down or horizontally across the slope.

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E9 MULCH BLANKETS SPECIFICATIONS

How (cont.)
10. Overlap blanket edges by a minimum of 4" and blanket ends by a minimum of 12". Overlaps should be in the direction of expected flow with the up-slope blanket placed over the down-slope blanket edge.
11. Secure down-slope end of blanket with staples/stakes and trench in.

Maintenance • Check after a rain event to ensure the blanket is still in place.
• Keep eroded soil, vehicular and pedestrian traffic, and concentrated runoff away from the blanketed area.

Limitations • Mulch blankets and anchors may inhibit mowing.

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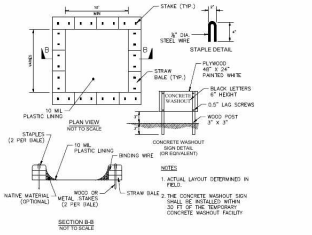
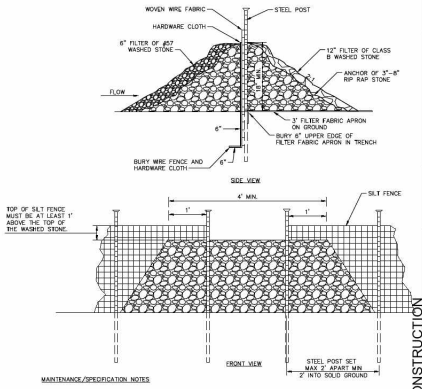


NOTES
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT OF THE TEMPORARY CONCRETE WASHOUT FACILITY

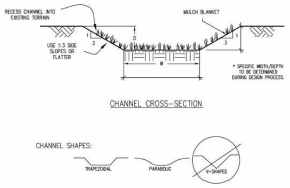
1 CONCRETE WASHOUT DETAIL
NO SCALE



MAINTENANCE/SPECIFICATION NOTES
1. REMOVE SEDIMENT WHEN HALF OF STONE OUTLET IS COVERED.
2. REPLACE STONE AS NEEDED TO ENSURE DEWATERING.
3. SILT FENCE OUTLETS SHOULD NOT BE LOCATED WHERE THE OUTFLOW WILL ERODE THE SOIL BELOW.

2 SILT FENCE ROCK OUTLET DETAIL
NO SCALE

E11 VEGETATED CHANNELS



CHANNEL CROSS-SECTION

SOIL ERODIBILITY	
SOIL TEXTURE	ERODIBILITY
SILT, SAND, LOAM, SILTY LOAM, SANDY LOAM	EASILY ERODIBLE
CLAY LOAM, SILTY CLAY LOAM, SANDY CLAY LOAM, SILT LOAM, SILTY CLAY	EROSION RESISTANT SOILS

NOTES:
1. LOCATE VEGETATED CHANNELS TO FOLLOW NATURAL TOPOGRAPHY.
2. UTILIZE PARABOLIC OR TRAPEZOIDAL CHANNEL SHAPES.
3. AVOID V-SHAPED CHANNELS AS THEY PROMOTE EROSION.
4. SELECT APPROPRIATE VEGETATION BASED ON RETARDANCE TO FLOW VELOCITIES.
5. MAY NEED MULCH BLANKET IN HIGH VELOCITY FLOW AREAS OR DITCH BOTTOMS.

STANDARD SYMBOL

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION

VEGETATED CHANNELS SPECIFICATIONS E11

When • When surface flow velocities within a created stormwater channel have the potential to cause erosion.

Why • To slow water velocity and reduce erosion and sediment loading in the stormwater channel.

Where • For use in constructed drainageways where run-off may cause erosion.

How
1. Review subject site to identify channel areas potentially susceptible to high flows, erosive velocities or flooding.
2. Consult a professional lanscape architect or engineer regarding considerations of channel design based on water velocity, channel slope, discharge volume, and soil type.
3. General capacity requirements should allow for conveyance of a 10-year, 24-hour rain event at a minimum, unless local requirements exceed this minimum.
4. Channel shape should either be parabolic ◡ or ◡ trapezoidal. V-shaped channels are not recommended as they form gullies and increase the erosion potential.
5. All vegetated channels should have a depth of one foot or more.
6. Excavate or grade channel surface according to design. Locate channels in natural topographic depressions where possible. Recess channel into existing grade so that channel top is flush with adjacent grade.
7. Determine vegetative species based on the depth to water table, climate, anticipated flow velocities, and final managed length of vegetation. Utilize native species for vegetation purposes.
8. In channels to be seeded, prepare seedbed, apply seed, and install mulch blanket.
9. In channels planted with vegetative plugs or seedlings, prepare channel, and install mulch blanket.

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E11 VEGETATED CHANNELS SPECIFICATIONS

How (cont.)
10. Not recommended to use dormant seedings due to high failure rate.
11. Establish vegetated channel prior to periods of high run-off.
12. Prior to construction work in area surrounding channel, allow vegetation in channel to establish.
13. Check dams or velocity dissipators may be needed until vegetation is established.

Maintenance • Inspect periodically during establishment of vegetation to ensure vegetative establishment is successful.
• Inspect after each rain event during vegetative establishment period for erosion problems.
• If necessary, repair, replant, reseed eroded areas immediately.
• Remove sediment concentrations that occur in vegetated channel.
• Remove fallen woody debris that may direct flows out of vegetated channel.

Limitations • In constructed channels, additional protectives measures may be required prior to establishment of vegetation.

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cip
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PROFESSIONAL ENGINEER
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FOR REFERENCE ONLY

KHA PROJECT 191260003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

EROSION CONTROL DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
CHERRY ENERGY STORAGE LLC
CHERRY VALLEY TOWNSHIP, MICHIGAN

MISS DIG 811

SHEET NUMBER
C312

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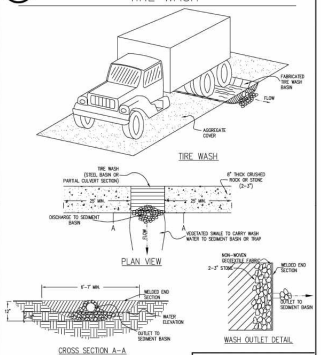
S54 TIRE WASH



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TIRE WASH SPECIFICATIONS S54

When
- Whenever traffic will be entering or leaving a construction site with soil capable of clinging onto construction vehicles; resulting in tracking of mud onto paved roads.

Why
- Reduces excessive sediment tracking of soil onto paved roads.

Where
- As an addition to aggregate construction entrances.

How
1. Construct tire wash on level ground at minimum length of 6'-7', a minimum of 10' wide to match width of aggregate road.
2. Construct 25' minimum approaches to tire wash with minimum 8" thickness of 2-3" stone.
3. Construct tire wash of partial culvert section or fabricated metal. Weld metal plates to culvert ends to contain water.
4. Provide outlet on one end of tire wash to allow excess water to drain. Outlet invert should be located 6-8" above bottom of tire wash.
5. Within tire wash structure, protect outlet pipe with non-woven geotextile fabric and 2-3" stone to prevent sediment discharge.
6. Protect swale with 2-3" stone on non-woven geotextile fabric.
7. Fill tire wash basin with water daily or when water depth is reduced to 1/2 the distance between basin bottom and outlet point.
8. Wash rack discharges should be directed into a sediment basin through a vegetated channel.
9. Remove sediment accumulation daily.

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S54 TIRE WASH SPECIFICATIONS

Maintenance
- Sediment accumulation in wash shall be removed regularly and placed into proper disposal location.
- Maintain to specified dimensions by adding approach rock when necessary each day.
- Monitor water levels throughout working hours.
- Discharge swale should be inspected regularly to ensure tire wash discharge path is maintained to receiving sediment basin.
- Damage to tire wash shall be repaired prior to additional use of rock.

Limitations
- Requires daily maintenance.
- May not clean tire tread completely.

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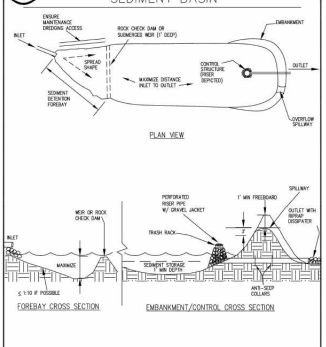
S55 SEDIMENT BASIN



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SEDIMENT BASIN SPECIFICATIONS S55

When
- When site runoff is sediment-laden and/or runoff release rate is required.

Why
- To detain runoff sufficiently to allow excessive sediment to settle out before stormwater leaves construction site.

Where
- At the outlet of any disturbed area or at the ultimate site outlet.
- Should be used in association with dikes, temporary channels, and pipes to divert stormwater from the disturbed areas into the basin.
- May be combined with permanent detention basin.

How
1. Basin to be designed by engineer to ensure adequate storage volume from the contributing drainage area.
2. Basins should be constructed before clearing and grading work begins.
3. Basins should be located at the stormwater outlet for the site and multiple basins may be located throughout the site.
4. Basin location should ensure suitable access for maintenance and cleanout.
5. Do not locate in a stream.
6. All basin sites should be located where embankment failure will not result in loss of life or property damage.
7. The basin volume should be designed to handle the volume of stormwater expected from the disturbed acreage for a minimum 10-year storm event.
8. The basin volume consists of two zones
   - A sediment storage zone to a 1' minimum depth.
   - A settling zone at least 2 feet deep.

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S55 SEDIMENT BASIN SPECIFICATIONS

How (cont.)
9. Design should contain sufficient capacity to detain runoff for 24-48 hours, maximizing sediment settlement potential.
10. Length to width ratio should be greater than 4:1 to allow for sufficient settlement time.
11. Utilize a well anchored riser pipe with anti-seep collars as the principal outlet, along with an emergency overflow spillway for major events.

Maintenance
- Inspect weekly and after each major storm event.
- Check the depth of sediment deposit to insure capacity of basin storage is adequate for stormwater and sediment deposition.
- Remove sediment when the forebay or basin design depth is 50% full of sediment.

Limitations
- Liability concerns based on failure of the basin and flooding of adjacent properties.
- May become an attractive nuisance to children and waterfowl.
- Typically, permanent basins are used for drainage of 5 acres or more.
- Effective in removing sediment down to the medium silt size fraction, however, not effective with fine silt and clay without extending detention time.

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FOR REFERENCE ONLY

KHA PROJECT 191250003
DATE 02/06/26
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

EROSION CONTROL DETAILS

HERON ENERGY STORAGE LLC
PREPARED FOR
CHERRY ENERGY STORAGE LLC
CHARLEVOIX TOWNSHIP, MICHIGAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

MISS DIG 811

SHEET NUMBER
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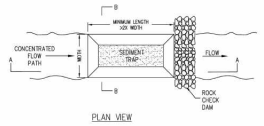
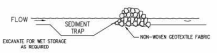
S56

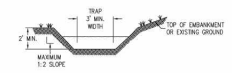
SEDIMENT TRAP



PLAN VIEW



CROSS SECTION AA



CROSS SECTION BB

STANDARD SYMBOL

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STATE FACILITIES ADMINISTRATION

S56

SEDIMENT TRAP SPECIFICATIONS

When
- When runoff from construction sites contains suspended sediment.

Why
- Should be used as a temporary measure.
- To collect and store sediment from sites cleared and/or graded during construction.

Where
- In small drainage areas with less than 5 acres of contributing drainage.
- Along the construction site perimeter where runoff is discharged offsite.
- Above check dams and/or upslope of drain inlet protection measures.

How
1. Prior to construction initiation, identify stormwater drainage routes likely to carry construction site runoff.
2. Build sediment traps in site runoff corridors before clearing, grubbing, and grading begin.
3. Install traps in natural depressions or in small drainageways to minimize vegetation removal.
4. A sediment trap is intended as a temporary measure.
5. In-stream applications should be designed by a professional engineer, with consideration for the type of soil, size of drainage area, and desired sediment removal efficiency.
6. Locate where the trap can be easily cleared of sediment.
7. Collection channels should enter the trap from the upslope side.
8. The sediment trap should have a minimum length to width ratio of 2:1.
9. The outlet of the trap must be stabilized with rock, vegetation, or another suitable material.

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S56

SEDIMENT TRAP SPECIFICATIONS

Maintenance
- Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in an upland area in such a manner that it will not erode.
- The structure shall be inspected after each rain event and repairs made as needed.
- The sediment trap shall be removed and the area stabilized when the contributary drainage area has been properly stabilized. The swale sediment trap will be properly backfilled and the swale or ditch reconstructed.

Limitations
- Only use for drainage areas up to 5 acres.
- Removes coarse sediment only (medium silt size or larger) unless trap area is sized similar to a sediment basin with extended residence time.

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KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

EROSION CONTROL DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
CHERAN ENERGY STORAGE LLC
CHARLOTTE TOWNSHIP
MICHIGAN

SHEET NUMBER
C314

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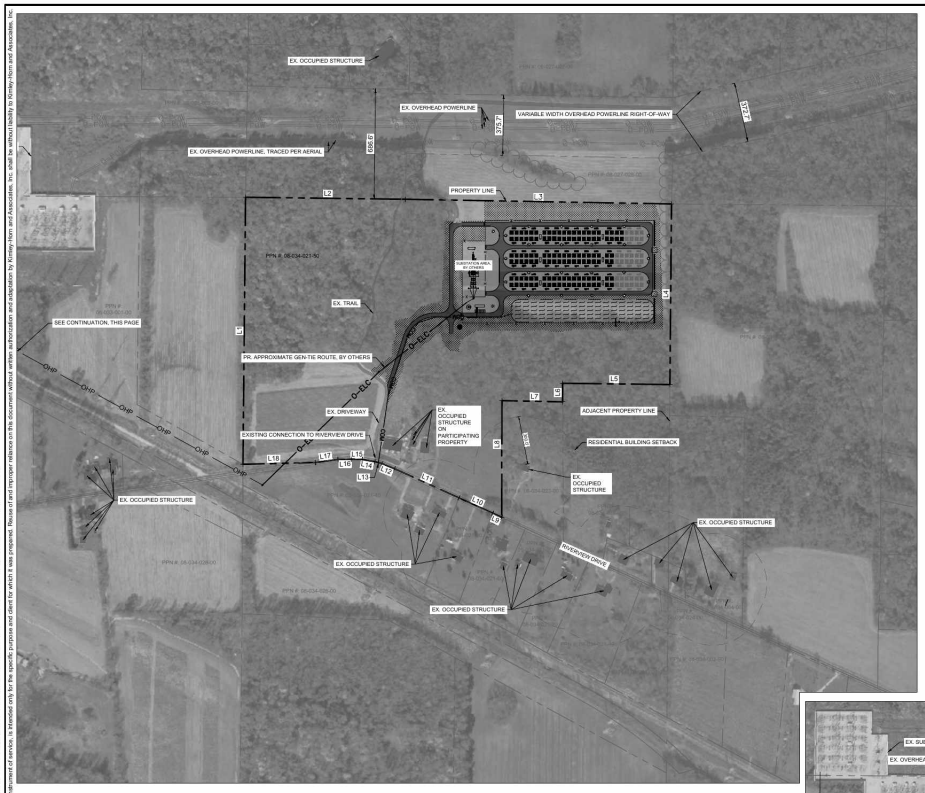
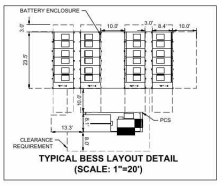




TYPICAL BESS LAYOUT DETAIL (SCALE: 1"=20')

LEGEND

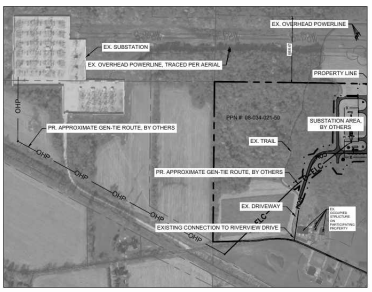
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- R/W — RIGHT-OF-WAY LINE
- PROPOSED SITE FENCE
- D-ELC — PROPOSED GEN-TIE ROUTE, BY OTHERS
- PROPOSED GATE
- BATTERY ENCLOSURE
- BATTERY ENCLOSURE (AUGMENTED)
- LIGHT FIXTURE, SEE PHOTOMETRIC PLAN FOR DETAILS
- PROPOSED GRAVEL ACCESS ROAD
- PROPOSED STORM WATER POND
- PROPOSED LANDSCAPING, SEE LANDSCAPE PLANS
- BESS YARD ROCK, SIZE AND DEPTH TBD
- PROPOSED DRAINAGE SWALE
- PROPOSED SOUND WALL

SITE PLAN NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL APPLICABLE GUN PLAIN CHARTER TOWNSHIP,STATE, AND FEDERAL LAWS AND REQUIREMENTS.
2. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULES, SLOPE PAVING, SIDEWALKS, EXIT PORCHES, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
3. ALL INNER CURBED RADII ARE TO BE 1.5 FEET AND OUTER CURBED RADII ARE TO BE 4.5m UNLESS OTHERWISE NOTED. STRIPED RADII ARE TO BE 1'.
4. ALL DIMENSIONS AND RADII ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
5. EXISTING STRUCTURES WITHIN CONSTRUCTION LIMITS ARE TO BE ABANDONED, REMOVED OR RELOCATED AS NECESSARY. ALL COST SHALL BE INCLUDED IN BASE BID.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS, (UNLESS OTHERWISE NOTED ON PLANS) INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC., AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES REQUIREMENTS AND PROJECT SITE WORK SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
7. SITE BOUNDARY TAKEN FROM THE GUN PLAIN PARCEL MAP. TOPOGRAPHY TAKEN FROM PUBLIC LIDAR DATA, UTILITY AND ROAD INFORMATION TRACED VIA AERIAL IMAGERY. KIMLEY-HORN ASSUMES NO LIABILITY FOR ANY ERRORS, INACCURACIES, OR OMISSIONS CONTAINED THEREIN.
8. CONTRACTOR SHALL REFERENCE ARCH / MEP PLANS FOR SITE LIGHTING AND ELECTRICAL PLAN.
9. NO PROPOSED LANDSCAPING SUCH AS TREES OR SHRUBS, ABOVE AND UNDERGROUND STRUCTURES, OR OTHER OBSTRUCTIONS SHALL BE LOCATED WITHIN EXISTING OR PROPOSED UTILITY EASEMENTS AND RIGHTS OF WAY UNLESS SPECIFICALLY NOTED ON PLANS OTHERWISE.
10. REFER TO PLAN OF SURVEY FOR EXACT LOT AND PROPERTY BOUNDARY DIMENSIONS.
11. ALL AREAS ARE ROUNDED TO THE NEAREST TENTH SQUARE METER.
12. ALL DIMENSIONS ARE ROUNDED TO THE NEAREST TENTH METER.

LINE TABLE

LINE	LENGTH	BEARING	BEGINNING COORDINATES	END COORDINATES
L1	1665.71	S0°33'36.49"W	N:343495.966 E:12789788.578	N:341830.334 E:12789772.294
L2	997.07	N89°16'41.29"W	N:343483.404 E:12790785.573	N:343495.966 E:12789788.578
L4	1126.59	N0°30'01.46"E	N:342327.610 E:12792437.438	N:343454.159 E:12792447.277
L5	669.83	S89°19'38.69"E	N:342335.473 E:12791767.653	N:342327.610 E:12792437.438
L6	115.86	N0°01'17.10"W	N:342219.612 E:12791767.697	N:342335.473 E:12791767.653
L7	378.45	S88°51'13.82"E	N:342227.182 E:12791389.318	N:342219.612 E:12791767.697
L8	728.19	N0°08'30.38"E	N:341498.996 E:12791387.516	N:342227.182 E:12791389.318
L9	62.12	S64°58'58.99"E	N:341525.268 E:12791331.220	N:341498.996 E:12791387.516
L10	231.31	S65°41'47.18"E	N:341620.467 E:12791120.413	N:341525.268 E:12791331.220
L11	441.44	S65°36'42.09"E	N:341802.745 E:12790718.364	N:341620.467 E:12791120.413
L12	84.83	S67°31'19.50"E	N:341835.180 E:12790639.974	N:341802.745 E:12790718.364
L13	45.99	S75°11'46.72"E	N:341846.930 E:12790595.512	N:341835.180 E:12790639.974
L14	79.38	S80°07'37.68"E	N:341860.540 E:12790517.311	N:341846.930 E:12790595.512
L15	69.18	S88°27'04.73"E	N:341862.410 E:12790448.154	N:341860.540 E:12790517.311
L16	82.51	N88°42'05.53"E	N:341860.540 E:12790365.663	N:341862.410 E:12790448.154
L17	142.59	N82°16'54.09"E	N:341841.390 E:12790224.367	N:341860.540 E:12790365.663
L18	452.21	N88°35'56.36"E	N:341830.334 E:12789772.294	N:341841.390 E:12790224.367



1 APPROXIMATE GEN-TIE ROUTE, BY OTHERS
SCALE 1"=600'

GRAPHIC SCALE IN FEET
0 150 300 600

NORTH

MISS DIG 811

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	ENTITLEMENT SET	02/06/2026	BIG

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Brian Jannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CAS
CHECKED BY BPG

OVERALL SITE PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
C400A

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- PROPOSED GRAVEL ACCESS ROAD
- PROPOSED STORM WATER POND
- PROPOSED LANDSCAPING, SEE LANDSCAPE PLANS
- BESS YARD ROCK, SIZE AND DEPTH TBD
- PROPOSED DRAINAGE SWALE
- PROPOSED SOUND WALL

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

MISS DIG 811

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HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP

MICHIGAN

OVERALL SITE PLAN

SHEET NUMBER
C400B

KHA PROJECT	191292003
DATE	02/26/2026
SCALE	AS SHOWN
DESIGNED BY	JLL
DRAWN BY	CEB
CHECKED BY	BPG

Brian Gammon
STATE OF MICHIGAN
BRIAN P. GAMMON
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LICENSED PROFESSIONAL ENGINEER

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K:\TCOV_LDEV\Copenhagen Infrastructure Partners\Heron BESS_MI\2 Design\CAD\PlanSheets\C4-OVERALL SITE PLAN.dwg March 16, 2026 - 2:29pm

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- R/W — RIGHT-OF-WAY LINE
- PROPOSED SITE FENCE
- O—ELC — PROPOSED GEN-TIE ROUTE, BY OTHERS
- PROPOSED GATE
- BATTERY ENCLOSURE
- BATTERY ENCLOSURE (AUGMENTED)
- LIGHT FIXTURE, SEE PHOTOMETRIC PLAN FOR DETAILS
- PROPOSED GRAVEL ACCESS ROAD
- PROPOSED STORM WATER POND
- PROPOSED LANDSCAPING, SEE LANDSCAPE PLANS
- BESS YARD ROCK, SIZE AND DEPTH TBD
- PROPOSED DRAINAGE SWALE
- PROPOSED SOUND WALL

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

MISS DIG 811

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP

MICHIGAN

OVERALL SITE PLAN

SHEET NUMBER
C400B

KHA PROJECT 191230033
DATE 02/26/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

Brian Gannon
STATE OF MICHIGAN
BRIAN P. GANNON
PROFESSIONAL ENGINEER
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Cip
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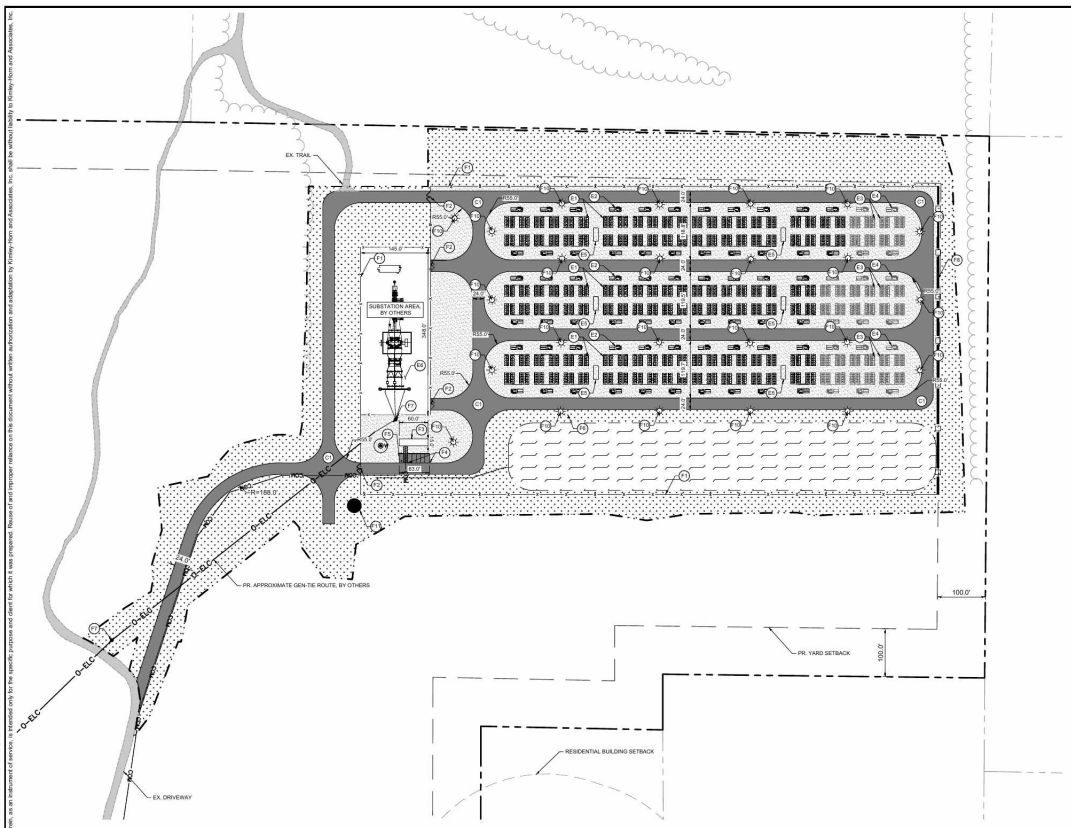
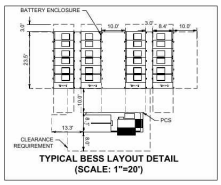


SITE PLAN NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL APLLICABLE GUN PLAIN CHARTER TOWNSHIP, STATE, AND FEDERAL LAWS AND REQUIREMENTS.
2. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULES, SLOPE PAVING, SIDEWALKS, EXIT PORCHES, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
3. ALL INNER CURBED RADII ARE TO BE 1.5 FEET AND OUTER CURBED RADII ARE TO BE 4.5m UNLESS OTHERWISE NOTED. STRIPED RADII ARE TO BE 1'.
4. ALL DIMENSIONS AND RADII ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
5. EXISTING STRUCTURES WITHIN CONSTRUCTION LIMITS ARE TO BE ABANDONED, REMOVED OR RELOCATED AS NECESSARY. ALL COST SHALL BE INCLUDED IN BASE BID.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS, (UNLESS OTHERWISE NOTED ON PLANS) INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES REQUIREMENTS AND PROJECT SITE WORK SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
7. SITE BOUNDARY TAKEN FROM THE GUN PLAIN PARCEL MAP. TOPOGRAPHY TAKEN FROM PUBLIC LIDAR DATA, UTILITY AND ROAD INFORMATION TRACED VIA AERIAL IMAGERY. KIMLEY-HORN ASSUMES NO LIABILITY FOR ANY ERRORS, INACCURACIES, OR OMISSIONS CONTAINED THEREIN.
8. CONTRACTOR SHALL REFERENCE ARCH / MEP PLANS FOR SITE LIGHTING AND ELECTRICAL PLAN.
9. NO PROPOSED LANDSCAPING SUCH AS TREES OR SHRUBS, ABOVE AND UNDERGROUND STRUCTURES, OR OTHER OBSTRUCTIONS SHALL BE LOCATED WITHIN EXISTING OR PROPOSED UTILITY EASEMENTS AND RIGHTS OF WAY UNLESS SPECIFICALLY NOTED ON PLANS OTHERWISE.
10. REFER TO PLAN OF SURVEY FOR EXACT LOT AND PROPERTY BOUNDARY DIMENSIONS.
11. ALL AREAS ARE ROUNDED TO THE NEAREST TENTH SQUARE METER.
12. ALL DIMENSIONS ARE ROUNDED TO THE NEAREST TENTH METER.



TYPICAL BESS LAYOUT DETAIL (SCALE: 1"=20')

GRAPHIC SCALE IN FEET 0 50 100 200

NORTH

PROPERTY SUMMARY

PROJECT ANALYSIS AREA	+/- 91.91 / 4,003,600 SQ FT
DISTURBED AREA	+/- 26.65 AC / 1,160,900 SQ FT
DISTURBED AREA MINUS RIGHT-OF-WAY	+/- 26.65 AC / 1,160,900 SQ FT
PERMANENT DISTURBED AREA	+/- 23.90 AC / 1,041,000 SQ FT
BESS YARD FENCED AREA	+/- 10.72 AC / 467,000 SQ FT
SUBSTATION YARD FENCED AREA	+/- 1.16 AC / 50,500 SQ FT

SITE DATA

EXISTING ZONING	AG
PROPOSED ZONING	AG
PROPOSED LAND USE	INDUSTRIAL DISTRICT
GUN PLAIN TOWNSHIP SETBACKS	PROPERTY LINE = 100' RESIDENTIAL STRUCTURE = 300' PUBLIC R.O.W = 50'
NFPA 855 SETBACK	REMOTE LOCATION = 100'
PARKING STALLS REQUIRED/PROVIDED	5/5
ADA PARKING STALLS REQUIRED/PROVIDED	1/1

BESS SUMMARY

POWER [MW]		250 MW
ENERGY [MWh]		1000 MWh
TOTAL NO. OF BATTERY ENCLOSURES (BOL)		248
NO. OF SKID (BOL)		62
1ST AUGMENTATION	YEAR	5
	NO. OF SKID	16
	NO. OF BATTERY ENCLOSURE	64
CUMULATIVE NO. OF BATTERY ENCLOSURES (EOL)		312
CUMULATIVE NO. OF SKID (EOL)		78

LEGEND

- PROPERTY LINE
- PARCEL LINE
- R/W — RIGHT-OF-WAY LINE
- PROPERTY SETBACK LINE
- LIMITS OF DISTURBANCE
- PROPOSED SITE FENCE
- O–ELC — PROPOSED GEN-TIE ROUTE, BY OTHERS
- PROPOSED GATE
- BATTERY ENCLOSURE
- BATTERY ENCLOSURE (AUGMENTED)
- LIGHT FIXTURE, SEE PHOTOMETRIC PLAN FOR DETAILS
- PROPOSED GRAVEL ACCESS ROAD
- PROPOSED STORM WATER POND
- PROPOSED LANDSCAPING, SEE LANDSCAPE PLANS
- BESS YARD ROCK, SIZE AND DEPTH TBD
- PROPOSED DRAINAGE SWALE
- PROPOSED SOUND WALL

KEYNOTE LEGEND

EQUIPMENT

- B1 BATTERY ENCLOSURE
- B2 PCS
- B3 FUTURE AUGMENTATION BATTERY ENCLOSURE
- B4 FUTURE AUGMENTATION PCS
- B5 AUXILIARY PAD
- B6 SUBSTATION ENCLOSURE, BY OTHERS

CURB, SIDEWALK & PAVEMENT

- C1 GRAVEL ACCESS ROAD

SITE FIXTURES

- F1 6' CHAIN-LINK FENCE, WITH 1' BARBED WIRE
- F2 24' WIDE CHAIN-LINK FENCE SWING GATE, PROVIDE KNOX BOX PER LOCAL REQUIREMENTS
- F3 OPERATIONS AND MAINTENANCE BUILDING, +-900 SF
- F4 STANDARD PARKING STALLS
- F5 ADA PARKING STALL W/ ADA SIGNAGE
- F6 STORMWATER MANAGEMENT AREA
- F7 POWER POLE, BY OTHERS
- F8 10' SOUND WALL
- F9 NOT USED
- F10 LIGHT POLE, SEE LIGHTING PLANS
- F11 ~30,000 GALLON WATER TANK, BY OTHERS

MISS DIG 811

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HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP

MICHIGAN

SITE PLAN

SHEET NUMBER

C401

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/06/2026	BIG

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Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GANNON
ENGINEER
6201037000
EXPIRES 12/31/2026

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

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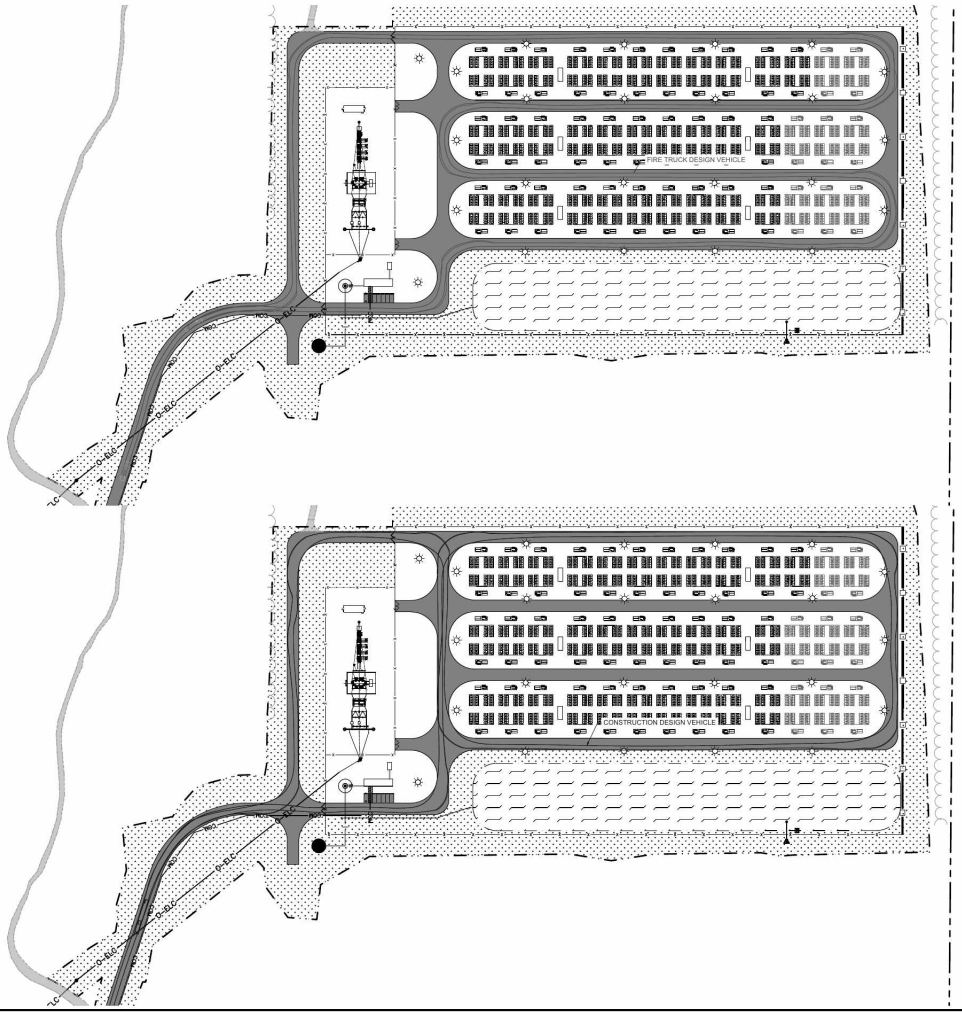
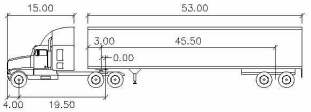


LEGEND

- PROPERTY LINE
- PARCEL LINE
- RIGHT-OF-WAY LINE
- LIMITS OF DISTURBANCE
- PROPOSED SITE FENCE
- O-ELC — PROPOSED GEN-TIE ROUTE, BY OTHERS
- PROPOSED GATE
- BATTERY ENCLOSURE
- BATTERY ENCLOSURE (AUGMENTED)
- LIGHT FIXTURE, SEE PHOTOMETRIC PLAN FOR DETAILS
- PROPOSED ACCESS ROAD - SURFACE SECTION TBD
- PROPOSED STORM WATER POND
- PROPOSED LANDSCAPING, SEE LANDSCAPE PLANS
- BESS YARD ROCK, SIZE AND DEPTH TBD
- PROPOSED RIP RAP
- PROPOSED SOUND WALL

CONSTRUCTION DESIGN VEHICLE

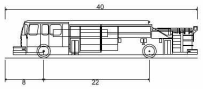


WB-67

feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

FIRE TRUCK DESIGN VEHICLE



Pumper Fire Truck

Overall Length	40.000ft
Overall Width	8.167ft
Overall Body Height	7.745ft
Min Body Ground Clearance	0.656ft
Track Width	8.167ft
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

THE VEHICLE MANEUVERING IDENTIFIED ON THIS PLAN WAS PREPARED USING VEHICLE TRACKING SOFTWARE AND DOES NOT NECESSARILY REPRESENT ACTUAL CONDITIONS NOR DOES IT ACCOUNT FOR EXTERNAL FACTORS. THIS ANALYSIS SHOULD NOT BE USED AS THE SOLE BASIS FOR THE CLIENT'S DECISION MAKING

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

MISS DIG 811

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STATE OF MICHIGAN
BRIAN GANNON
ENGINEER
0701-0000-0000
LICENSED PROFESSIONAL ENGINEER

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BFG

CIRCULATION PLAN

HERON ENERGY STORAGE LLC

PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
C410

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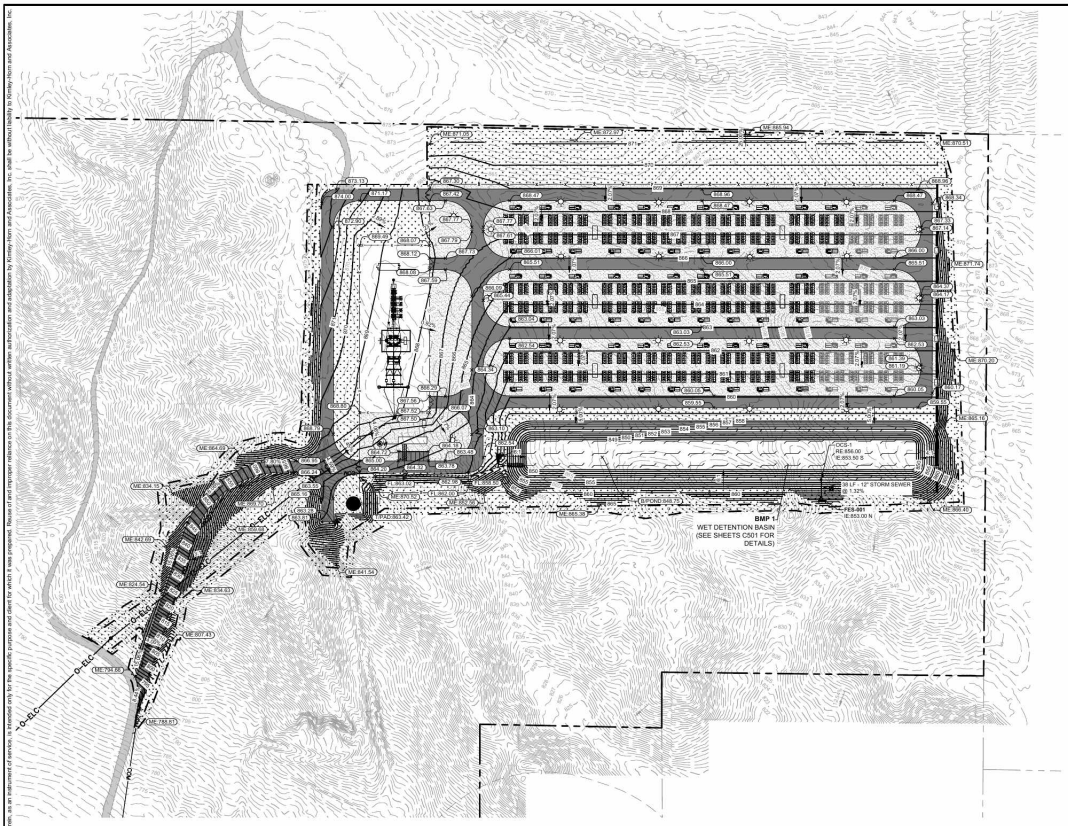
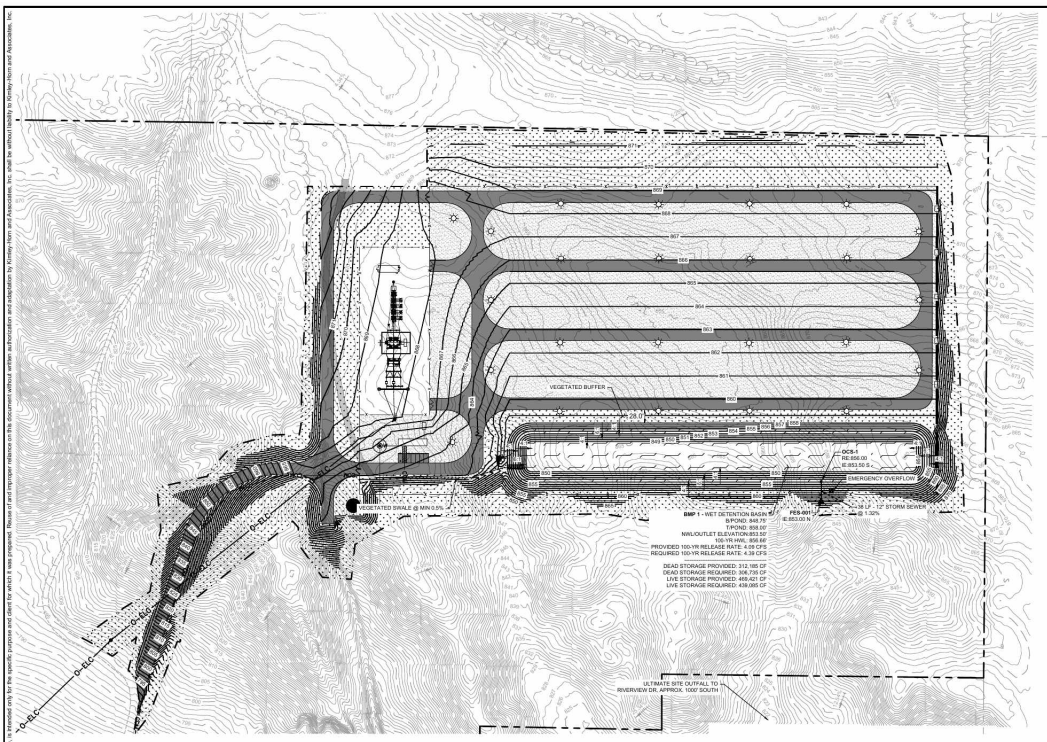
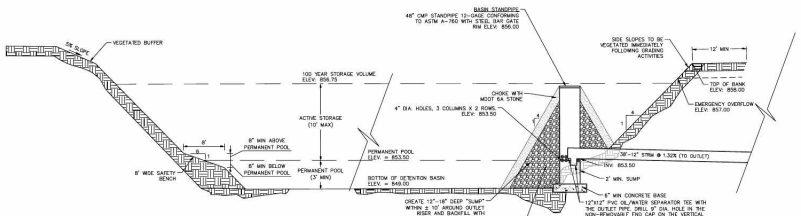

BMP 1
WET DETENTION BASIN
(SEE SHEETS C501 FOR DETAILS)
FES-001
E:853.00 N
OCS-1
RE:856.00
IE:853.50 S
48 LF - 12" STORM SEWER
@ 1.33%
EXPOSE 5x5 FES
ROD
ROD
ROD





DETENTION BASIN W/ OUTLET CONTROL DETAIL

N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED STORM MANHOLE (SOLID CASTING)
- PROPOSED STORM MANHOLE (ROUND INLET CASTING)
- PROPOSED STORM MANHOLE/ CATCH BASIN (CURB INLET CASTING)
- PROPOSED STORM SEWER CLENOUT
- PROPOSED FLARED END SECTION
- PROPOSED PIPE RIPRAP
- PROPOSED DIVERSION DITCH RIP RAP
- PROPOSED STORM SEWER
- PROPOSED SWALE

STORM SEWER NOTES

1. INSTALL STORM SEWER IN ACCORDANCE WITH APPLICABLE TOWNSHIP OR STATE SPECIFICATIONS, STATE PLUMBING CODE, AND BUILDING PERMIT REQUIREMENTS.
2. CONTACT STATE 811 CALL-BEFORE-YOU-DIG LOCATING SERVICE AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION FOR UNDERGROUND UTILITY LOCATIONS.
3. STORM SEWER PIPE SHALL BE:
   RCP: ASTM C-76
   HDPE: ASTM F-714, F-894
   PVC: ASTM D-2729
   PVC SCH40: ASTM D-1785, D-2665, F-794
   DRAIN TILE SHALL BE:
   PE: ASTM F-667
   PVC: ASTM D-2729
   FITTINGS SHALL BE:
   RCP: ASTM C-443, JOINTS PER ASTM C-361, C-990, AND C-443
   HDPE: ASTM D-3212
   PVC: ASTM D-2729, JOINTS PER ASTM D-3212
   PVC SCH40: ASTM D-2665, F-794, F-1866
4. CONTRACTOR IS RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL.
5. FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES PRIOR TO THE START OF LAND DISTURBING ACTIVITIES. NOTIFY THE PROJECT ENGINEER OF ANY DISCREPANCIES OR VARIATIONS IMPACTING THE PROPOSED DESIGN OF THE PROJECT.
6. EXCAVATE DRAINAGE TRENCHES TO FOLLOW PROPOSED STORM SEWER ALIGNMENTS. REFER TO THE UTILITY PLANS FOR LAYOUT AND ELEVATIONS FOR PROPOSED SANITARY SEWER, WATER MAIN, AND OTHER BUILDING UTILITY SERVICE CONNECTIONS. REFER TO THE GRADING PLAN FOR DETAILED SURFACE ELEVATIONS.
7. EXCESS MATERIAL, BITUMINOUS SURFACING, CONCRETE ITEMS, ABANDONED UTILITY ITEMS, AND OTHER UNSUITABLE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF THE CONSTRUCTION SITE.
8. COORDINATE WITH THE PLUMBING PLANS FOR THE LOCATION, SIZE AND ELEVATION OF THE PROPOSED UNDERGROUND ROOF DRAIN CONNECTIONS.
9. WHERE STORM SEWER ROOF DRAINS HAVE LESS THAN 4-FEET OF COVER IN PAVED AREAS OR 3-FEET OF COVER IN LANDSCAPE AREAS, PROVIDE 3-INCH THICK INSULATION A MINIMUM OF 5-FEET IN WIDTH, CENTERED ON THE PIPE.
10. ALL STORM SEWER PIPE JOINTS SHALL BE WATER-TIGHT CONNECTIONS.
11. ALL STORM SEWER PIPE CONNECTIONS TO MANHOLES SHALL BE GASKETED AND WATER TIGHT. BOOTED COUPLERS AT THE STRUCTURE OR A WATER STOP WITH NON-SHRINK GROUT MAY BE USED IN ACCORDANCE WITH LOCAL CODES.
12. CONTRACTORS SHALL AIR TEST ALL STORM SEWER PIPE IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

MISS DIG 811

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PROFESSIONAL ENGINEER

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

STORMWATER MANAGEMENT PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP, MICHIGAN

SHEET NUMBER
C501

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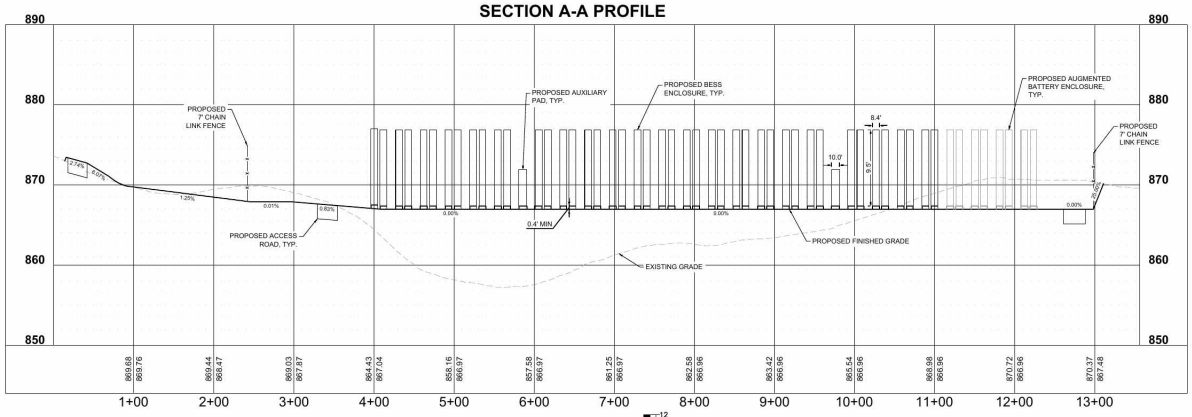
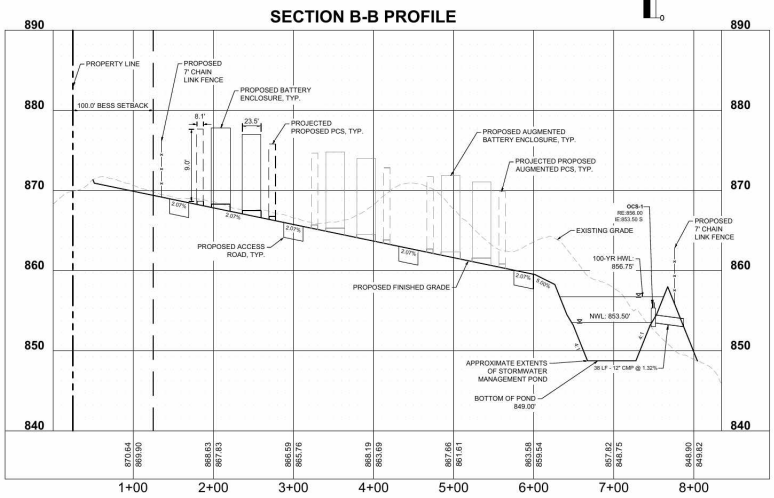
SECTION A-A PROFILE

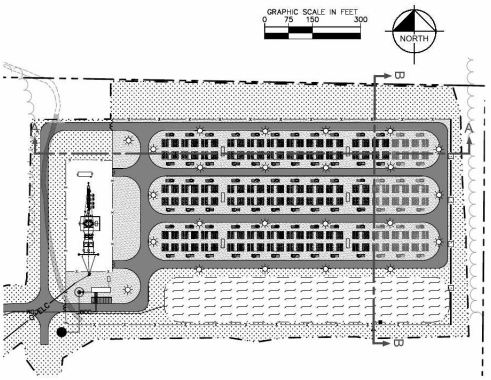


GRAPHIC SCALE IN FEET
0 30 60 120
HORIZONTAL

VERTICAL
12
6
3
0

SECTION B-B PROFILE





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HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP

MICHIGAN

SHEET NUMBER

C510

SITE CROSS SECTIONS

KHA PROJECT 191250033

DATE 02/26/2026

SCALE: AS SHOWN

DESIGNED BY JLL

DRAWN BY CEB

CHECKED BY BPG

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Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GANNON
STATE LICENSED
PROFESSIONAL ENGINEER

Brian Gannon

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/26/2026	BPG

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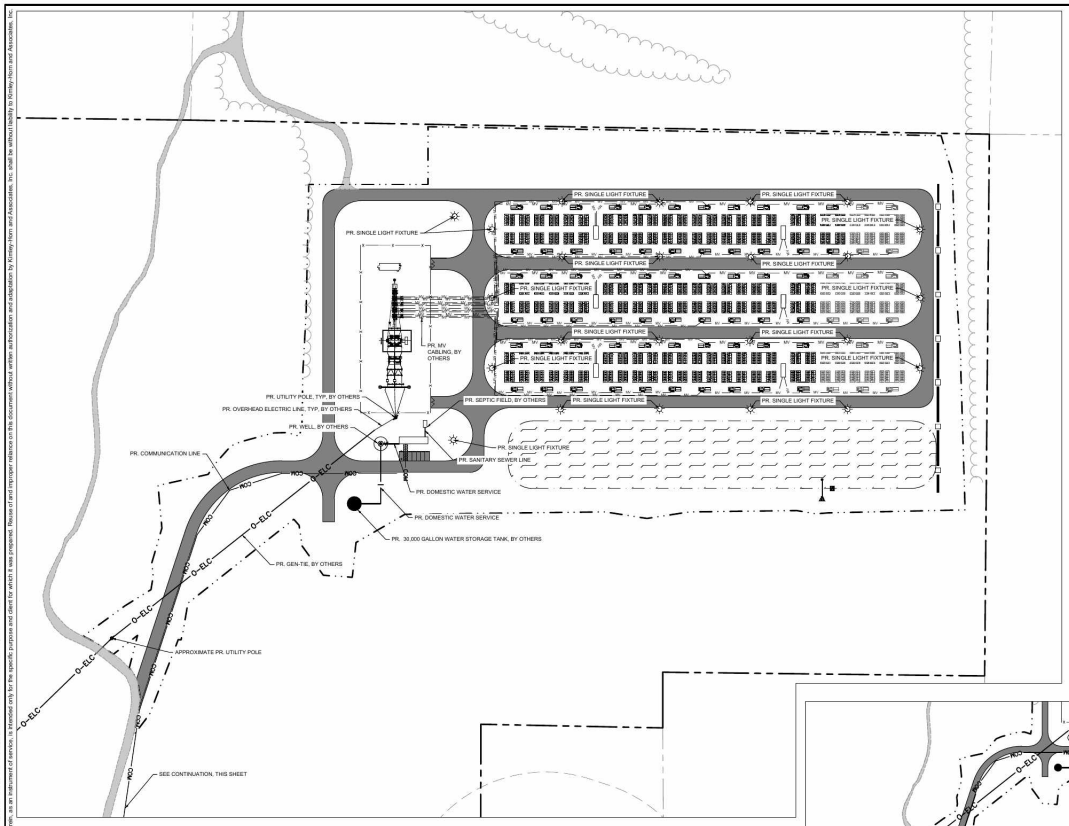

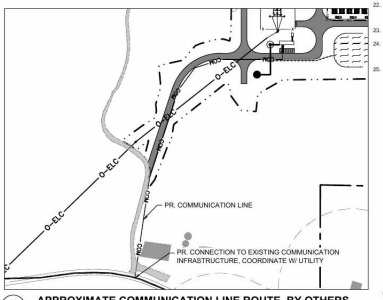

1 **APPROXIMATE COMMUNICATION LINE ROUTE, BY OTHERS**

SCALE 1"=250'

LEGEND

EXISTING	PROPOSED	
W	W	WATERMAIN
S	S	SANITARY SEWER
D	D	STORM SEWER
COM	COM	COMMUNICATION

UTILITY PLAN NOTES

1. INSTALL UTILITIES IN ACCORDANCE WITH APPLICABLE TOWNSHIP SPECIFICATIONS, STATE PLUMBING CODE, AND BUILDING PERMIT REQUIREMENTS.
2. CONTACT STATE 811 CALL-BEFORE-YOU-DIG LOCATING SERVICE AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION FOR UNDERGROUND UTILITY LOCATIONS.
3. CONTRACTOR IS RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL.
4. SANITARY SEWER PIPE SHALL BE:
   PVC: ASTM D-2729, D-3034
   PVC SCH 40: ASTM D-1785, F-714, F-894
   SANITARY SEWER FITTINGS SHALL BE:
   PVC: ASTM D-2729, D-3034
   PVC SCH40: ASTM D-2665, F-2794, F-1866
5. WATER MAIN PIPE SHALL BE:
   PVC: ASTM D-1785, D-2241, AWWA C-900
   PVC SCH 40: ASTM D-1785
   WATER MAIN FITTINGS SHALL BE:
   PVC: ASTM D-2466, D-2665, D-2467, F-1970, AWWA C-907
   DUCTILE IRON: AWWA C-153, C-110, ASME 316.4
6. WHEN CONNECTING TO AN EXISTING UTILITY LINE, FIELD VERIFY THE LOCATION, DEPTH, AND SIZE OF THE EXISTING PIPE(S) PRIOR TO INSTALLATION OF THE NEW LINES. NOTIFY THE PROJECT ENGINEER OF ANY DISCREPANCIES OR VARIATIONS IMPACTING THE PROPOSED DESIGN OF THE PROJECT.
7. PLACE AND COMPACT ALL FILL MATERIAL PRIOR TO INSTALLATION OF PROPOSED UNDERGROUND UTILITIES. MINIMUM TRENCH WIDTH SHALL BE 2 FEET.
8. MAINTAIN A MINIMUM OF 7'-6" COVER ON ALL WATER LINES.
9. FOR WATER LINES AND STUB-OUTS UTILIZE MECHANICAL JOINTS WITH RESTRAINTS SUCH AS THRUST BLOCKING, WITH STAINLESS STEEL OR COBALT BLUE BOLTS, OR AS INDICATED IN THE TOWNSHIP SPECIFICATIONS AND PROJECT DOCUMENTS.
10. MAINTAIN 18-INCH MINIMUM VERTICAL SEPARATION WHERE SEWER PIPE CROSSES WATER LINES (OUTSIDE EDGE OF PIPE TO OUTSIDE EDGE OF PIPE OR STRUCTURE). PROVIDE 10-FOOT HORIZONTAL SEPARATION BETWEEN SEWER PIPE AND WATER LINES.
11. IN THE EVENT OF A VERTICAL CONFLICT BETWEEN WATER LINES, SANITARY LINES, STORM LINES AND GAS LINES (OR ANY OBSTRUCTION EXISTING AND PROPOSED), THE SANITARY PIPE MATERIAL SHALL BE PVC SCHEDULE 40 OR PVC C900 AND HAVE MECHANICAL JOINTS AT LEAST 10 FEET ON EITHER SIDE OF THE CENTER LINE OF THE CROSSING. THE WATER LINE SHALL HAVE A MINIMUM OF 18-INCH VERTICAL SEPARATE MEETING REQUIREMENTS OF AND A21.10 OR ANSI/AWWA C-600 (VERTICAL SEPARATION MEETING REQUIREMENTS OF AND A21.10 OR ANSI/21.11 (AWWA C-151) (CLASS 50).
12. ALL PVC & HDPE SEWER AND WATER PIPE SHALL HAVE A TRACER WIRE INSTALLED IN THE TRENCH AND TERMINATED PER THE DETAILS.
13. UNDERGROUND UTILITY LINES SHALL BE INSTALLED, INSPECTED AND APPROVED PRIOR TO PLACING BACKFILL.
14. IN PAVEMENT AREAS, RAISE MANHOLE CASTINGS TO BE FLUSH WITH PROPOSED FINISHED SURFACE GRADE. IN GREEN AREAS, RAISE MANHOLE CASTINGS TO BE ONE FOOT ABOVE FINISHED GROUND ELEVATION & INSTALL A WATERTIGHT LID.
15. REFER TO PLUMBING PLANS FOR LOCATION, SIZE AND ELEVATION OF UTILITY SERVICE CONNECTIONS AND ROOF DRAINS TO THE INTERIOR BUILDING SYSTEMS. BACKFLOW DEVICES (DDCV AND PRZ ASSEMBLIES) & METERS ARE LOCATED INSIDE THE BUILDING.
16. CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
17. CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES. COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.
18. REFER TO THE SITE ELECTRICAL PLANS FOR SPECIFICATIONS OF THE PROPOSED SITE LIGHTING AND ELECTRICAL EQUIPMENT.
19. EXCAVATE DRAINAGE TRENCHES TO FOLLOW PROPOSED STORM SEWER ALIGNMENTS. REFER TO THE UTILITY PLANS FOR LAYOUT AND ELEVATIONS FOR PROPOSED SANITARY SEWER, WATER MAIN, AND OTHER BUILDING UTILITY SERVICE CONNECTIONS. REFER TO THE GRADING PLAN FOR DETAILED SURFACE ELEVATIONS.
20. EXCESS MATERIAL, ABANDONED UTILITY ITEMS, AND OTHER UNUSABLE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF THE CONSTRUCTION SITE.
21. COORDINATE WITH THE PLUMBING PLANS FOR THE LOCATION, SIZE AND ELEVATION OF THE PROPOSED UNDERGROUND ROOF DRAIN CONNECTIONS.
22. WHERE STORM SEWER ROOF DRAINS HAVE LESS THAN 4 FEET OF COVER IN PAVED AREAS OR 3-FEET OF COVER IN LANDSCAPE AREAS, PROVIDE 3-INCH THICK INSULATION A MINIMUM OF 5-FEET IN WIDTH, CENTERED ON THE PIPE.
23. ALL STORM SEWER PIPE JOINTS SHALL BE WATER-TIGHT CONNECTIONS.
24. ALL STORM SEWER PIPE CONNECTIONS TO MANHOLES SHALL BE GASKETED AND WATER TIGHT. BOOTED COUPLERS AT THE STRUCTURE OR A WATER STOP WITH NON-SHRINK GROUT MAY BE USED IN ACCORDANCE WITH LOCAL CODES.
25. CONTRACTOR SHALL AIR TEST ALL STORM SEWER PIPE IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

GRAPHIC SCALE IN FEET
0 50' 100' 200'

NORTH

MISS DIG 811

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	ENTITLEMENT SET	02/06/2026	BPG

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STATE OF MICHIGAN
BRIAN GANNON
MECHANICAL ENGINEER
16001 CONSULTING

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

UTILITY PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
C600

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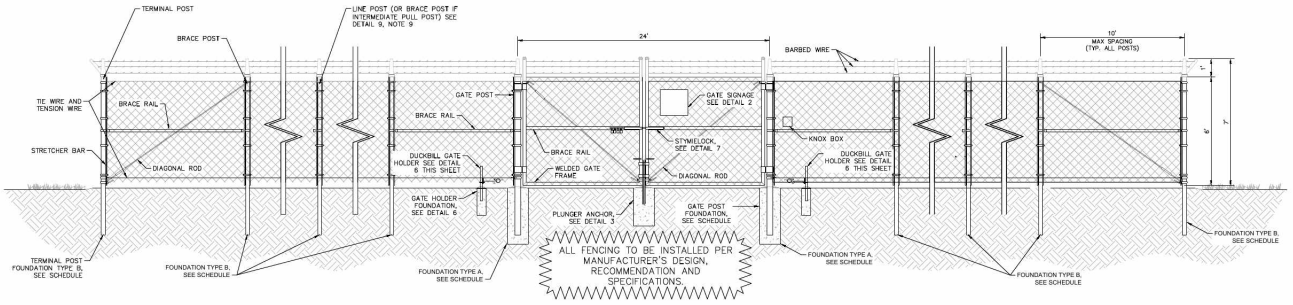
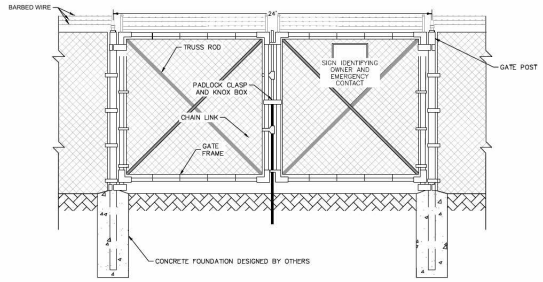


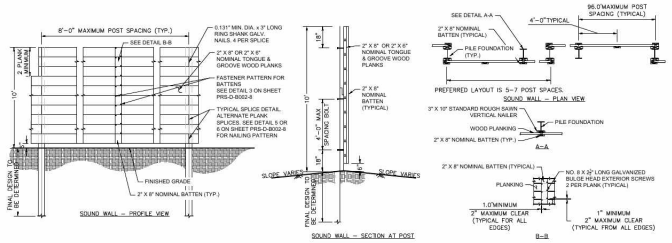
1 CHAIN LINK FENCE - BARBED WIRE DETAIL

NO SCALE



2 DOUBLE SWING GATE DETAIL WITH BARBED WIRE

NO SCALE



3 SOUND WALL - FOR REFERENCE ONLY

NO SCALE

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP

MICHIGAN

MISS DIG 811

SHEET NUMBER

C700

CIVIL DETAILS

KHA PROJECT 191250033

DATE: 02/26/2026

SCALE: AS SHOWN

DESIGNED BY: JLL

DRAWN BY: CEB

CHECKED BY: BPG

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Copenhagen Infrastructure Partners

STATE OF MICHIGAN BRIAN GANNON ENGINEER 6201037000 LICENSED PROFESSIONAL ENGINEER

Brian Gannon

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/26/2026	BPG

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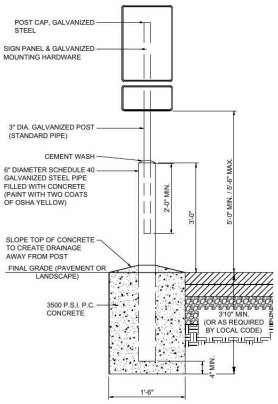
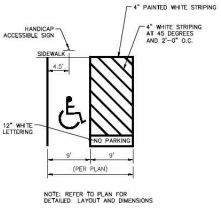
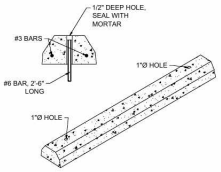


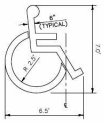
1 **ACCESSIBLE PARKING SIGN IN BOLLARD**
NO SCALE



4 **TYPICAL HANDICAP STRIPING**
NO SCALE



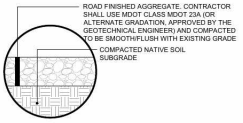
2 **PRECAST WHEEL STOP**
NO SCALE



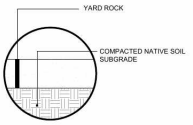
3 **ACCESSIBLE PARKING SYMBOL**
NO SCALE

5 **HP-3-1218 ADA PARKING SIGN**
NO SCALE

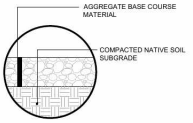
PAVEMENT SECTIONS SHOWN ARE PROVIDED AS A REFERENCE ONLY. REFER TO GEOTECHNICAL REPORT FOR ALL PAVEMENT, SUBGRADE PREPARATION AND COMPACTION REQUIREMENTS.



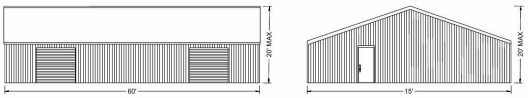
6 **ACCESS ROAD PAVEMENT SECTION**
SCALE: NTS



7A **BESS YARD SECTION (REFER TO ELECTRICAL PLANS)**
NO SCALE



7B **TEMPORARY LAYDOWN AREA SECTION**
NO SCALE



8 **OPERATIONS & MAINTENANCE BUILDING - FOR REFERENCE ONLY**
NO SCALE

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STATE OF MICHIGAN
BRIAN GANNON
STATE LICENSED
PROFESSIONAL ENGINEER
6201 037000

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BFG

CIVIL DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

MISS DIG 811

SHEET NUMBER
C701

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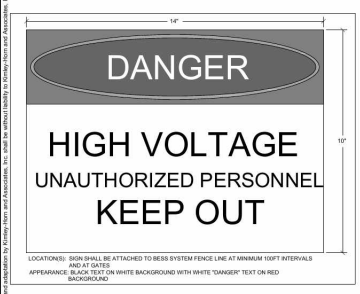
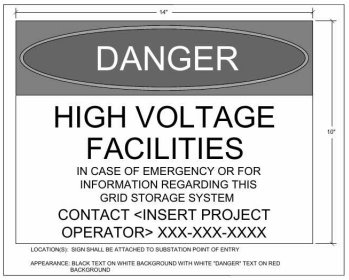
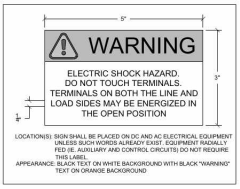


LOCATION(S): SIGN SHALL BE ATTACHED TO BESS SYSTEM FENCE LINE AT MINIMUM 100FT INTERVALS AND AT GATES
APPEARANCE: BLACK TEXT ON WHITE BACKGROUND WITH WHITE "DANGER" TEXT ON RED BACKGROUND



LOCATION(S): SIGN SHALL BE ATTACHED TO SUBSTATION POINT OF ENTRY
APPEARANCE: BLACK TEXT ON WHITE BACKGROUND WITH WHITE "DANGER" TEXT ON RED BACKGROUND

LOCATION(S): SIGN SHALL BE PLACED ON DC AND AC ELECTRICAL EQUIPMENT, INCLUDING DISCONNECTS, INVERTERS, PANELBOARDS, METERS, ETC. UNLESS SUCH WORDS ALREADY EXIST.
APPEARANCE: BLACK TEXT ON WHITE BACKGROUND WITH BLACK "WARNING" TEXT ON ORANGE BACKGROUND

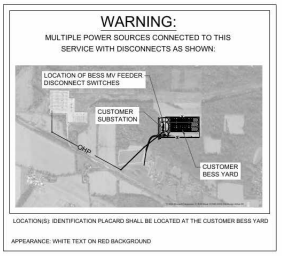


LOCATION(S): SIGN SHALL BE PLACED ON DC AND AC ELECTRICAL EQUIPMENT UNLESS SUCH WORDS ALREADY EXIST. EQUIPMENT RADIALLY FED (IE. AUXILIARY AND CONTROL CIRCUITS) DO NOT REQUIRE THIS LABEL.
APPEARANCE: BLACK TEXT ON WHITE BACKGROUND WITH BLACK "WARNING" TEXT ON ORANGE BACKGROUND

LOCATION(S): PLACARD SHALL BE APPLIED TO EACH BESS CONTAINER
APPEARANCE: WHITE TEXT ON RED BACKGROUND

GENERAL NOTES:

1. PLACARDS AND LABELS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN ACCORDANCE WITH NEC.
2. COMPONENTS IN BATTERY CONTAINERS ARE SUPPLIED FROM THE MANUFACTURER WITH MARKINGS PRE-APPLIED TO MEET THE REQUIREMENTS OF NEC.
3. MARKING IDENTIFIED AS PLACARDS WILL BE ETCHED WITH WHITE GRAPHICS ONTO 1/16" PLASTIC PLACARDS WITH COLORS AS SHOWN. THE PLACARDS WILL BE ATTACHED MECHANICALLY OR WITH DOUBLE-SIDED ADHESIVE TO THE APPROPRIATE COMPONENT ENCLOSURES IN RELEVANT AND CONSPICUOUS LOCATIONS.
4. MARKS IDENTIFIED AS LABELS WILL BE ADHESIVE VINYL LABELS. THOSE SHOWN AS RED SHALL BE REFLECTIVE RED VINYL WITH WHITE LETTERING; THOSE SHOWN AS ORANGE SHALL HAVE AN ORANGE "WARNING" HEADER WITH WHITE BODY AND BLACK TEXT.
5. MARKINGS IDENTIFIED AS SIGNS SHALL BE METAL OR UV-RESISTANT PLASTIC SUITABLE FOR THE EXTERIOR ENVIRONMENT.



LOCATION(S) IDENTIFICATION PLACARD SHALL BE LOCATED AT THE CUSTOMER BESS YARD

APPEARANCE: WHITE TEXT ON RED BACKGROUND

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STATE OF MICHIGAN
BRIAN GANNON
ENGINEER
6201012025
LICENSED PROFESSIONAL ENGINEER

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BFG

SIGNAGE PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
CHERRY ROAD ENERGY STORAGE LLC
CLAYTON TOWNSHIP
MICHIGAN

SHEET NUMBER
C800

MISS DIG 811

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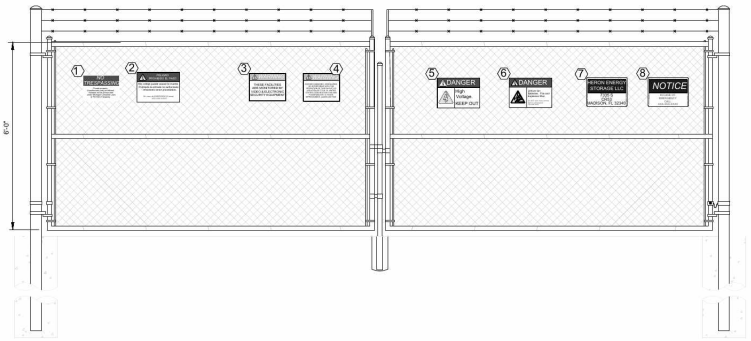
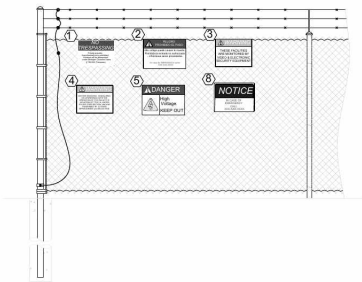


1 VEHICLE GATE FENCE
Scale: N.T.S.



2 CORNER POST FENCE
Scale: N.T.S.

NOTES:
1. THE SIGN DESIGNER OR INSTALLER SHALL ENSURE ALL SIGNS ARE OF DURABLE MATERIAL, FORMATTED CONSISTENTLY IN A HORIZONTAL ORIENTATION, 18"x24" FOR GATE/FENCE SIGNS AND 12"x18" FOR EQUIPMENT/CONTAINER SIGNS. SIGNS FOR ACCESS GATES/FENCE SHALL BE MOUNTED USING GALVANIZED OR STAINLESS STEEL HOG RINGS.
2. REQUIRED SIGNS SHALL BE MAINTAINED VISIBLE, WITHOUT OBSTRUCTIONS. IF SECURITY AND SAFETY SIGNS ARE DAMAGED, WEATHERED, OR MISSING THEY SHALL BE PROMPTLY REPLACED.
3. ARC FLASH STICKERS SHALL BE INSTALLED ON EACH ELECTRICAL EQUIPMENT DOOR OR COVER THAT MAY BE OPENED OR REMOVED FOR MAINTENANCE SERVICE. ALL DOORS ON SWITCHGEAR AND MOTOR CONTROL CENTERS SHALL BE LABELED, EVEN IF OPENING A DOOR DOES NOT EXPOSE UN INSULATED CONDUCTORS.
4. ARC FLASH STICKERS SHALL BE INSTALLED BASED ON ARC FLASH CALCULATIONS. PER SOPR/SMS 301.4, SOPR 272, AND SMS 270. STICKERS ON EQUIPMENT SHALL NOT BE REMOVED OR COVERED.

MISS DIG 811

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HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SIGNAGE PLAN

SHEET NUMBER
C801

No.	REVISIONS	DATE	BY
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STATE OF MICHIGAN
BRIAN GANNON
ENGINEER
6201 CERTIFICATE
REGISTERED PROFESSIONAL ENGINEER

Brian Gannon

KHA PROJECT	191250003
DATE	02/06/2026
SCALE	AS SHOWN
DESIGNED BY	JLL
DRAWN BY	CEB
CHECKED BY	BPG

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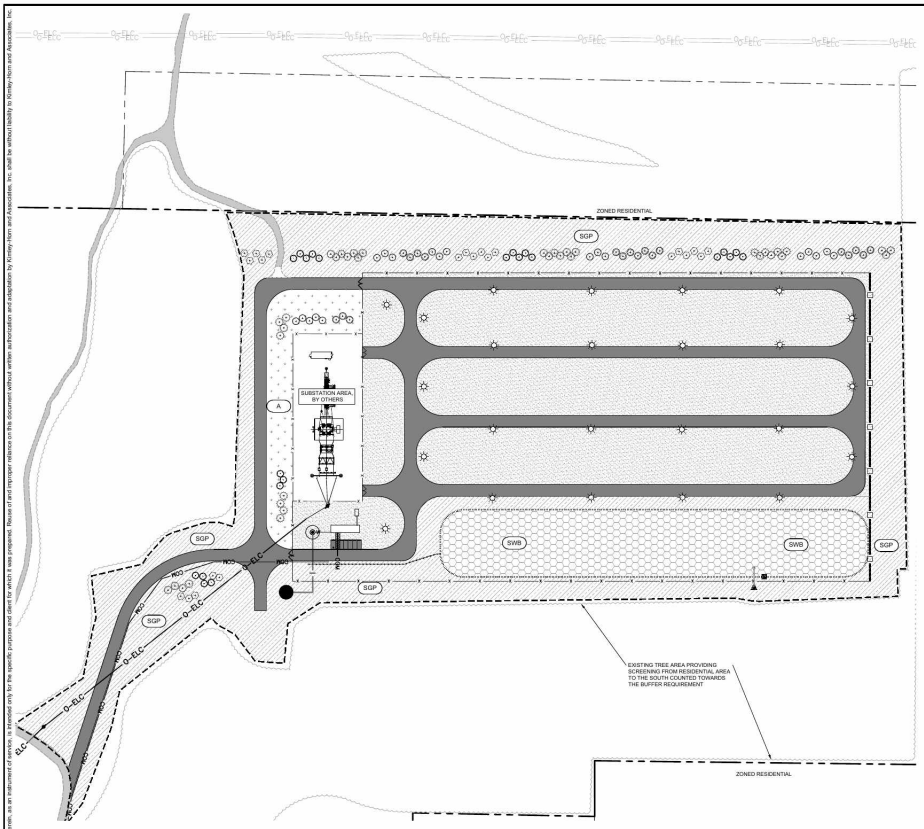

LANDSCAPE SUMMARY

BUFFER REQUIREMENTS

REQUIREMENT:	WHERE THE PROPERTY ABUTS A RESIDENTIAL DISTRICT OR USE, A GREENBELT, A BERM, OR A BUFFER STRIP IS REQUIRED TO PROVIDE FULL SCREENING
BUFFER STRIP REQUIRED:	MINIMUM 10' WIDE, EVERGREEN TREES STAGGERED, AND / OR OTHER VEGETATION AND GROUNDCOVER
PROVIDED:	MINIMUM 10' WIDE, EVERGREEN TREES STAGGERED, AND / OR OTHER VEGETATION AND GROUNDCOVER

LANDSCAPE LEGEND

- EXISTING TREE LINE (TYP.)
- EDGER (TYP.)
- APPROXIMATE LIMITS OF SEEDING / SEED ALL DISTURBED AREAS (TYP.)
- SEED EDGE (TYP.)

SEEDING KEYNOTES

- A — SEED WITH MDOT CLASS A MUNICIPAL LAWN SEED MIX, OR APPROVED EQUAL (TYP.)
- SGP — SEED WITH NATIVE CONNECTIONS BASIC SHORT GRASS PRAIRIE SEED MIX, OR APPROVED EQUAL (TYP.)
- SWB — SEED WITH NATIVE CONNECTIONS STORMWATER BASIN SEED MIX, OR APPROVED EQUAL (TYP.)

PLANT SCHEDULE

SYMBOL	CODE	QTY	COMMON NAME	BOTANICAL NAME	CONT	CAL
CONIFEROUS TREE						
	BFR	19	BALSAM FIR	ABIES BALSAMEA	B & B	6' HT.
	ERC	22	EASTERN RED CEDAR	JUNIPERUS VIRGINIANA	B & B	6' HT.
	RDP	22	RED PINE	PINUS RESINOSA	B & B	6' HT.
	WHC	19	WHITE CEDAR	THUJA OCCIDENTALIS 'WHITE CEDAR'	B & B	6' HT.
	WHP	36	WHITE PINE	PINUS STROBUS	B & B	5' HT.

NOTE:
QUANTITIES ON PLAN SUPERSEDE LIST QUANTITIES IN THE EVENT OF A DISCREPANCY.

ABBREVIATIONS:
B&B = BALLED AND BURLAPPED CAL. = CALIPER HT. = HEIGHT MIN. = MINIMUM O.C. = ON CENTER SP. = SPECIES
QTY. = QUANTITY

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

MISS DIG 811

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CHARTER TOWNSHIP MICHIGAN

SHEET NUMBER
L100

LANDSCAPE PLAN

KHA PROJECT 191230003
DATE: 02/26/2026
SCALE: AS SHOWN
DESIGNED BY: CFK
DRAWN BY: CFK
CHECKED BY: RAH

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No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/26/2026	BIG

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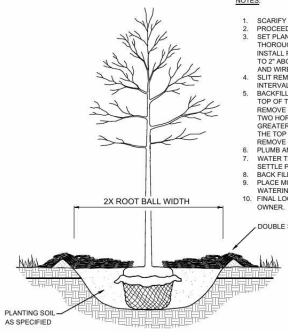
K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_MI\2 Design\CAD\PlanSheets\L1 LANDSCAPE PLAN.DWG March 16, 2026 - 2:22pm



NOTES:

1. SCARIFY SIDES AND BOTTOM OF HOLE.
2. PROCEED WITH CORRECTIVE PRUNING.
3. SET PLANT ON UNDISTURBED NATIVE SOIL OR THOROUGHLY COMPACTED PLANTING SOIL. INSTALL PLANT SO THE ROOT FLARE IS AT OR UP TO 2" ABOVE THE FINISHED GRADE WITH BURLAP AND WIRE BASKET, (IF USED), INTACT.
4. SLIT REMAINING TREATED BURLAP AT 6" INTERVALS.
5. BACKFILL TO WITHIN APPROXIMATELY 12" OF THE TOP OF THE ROOTBALL, THEN WATER PLANT. REMOVE THE TOP 1/3 OF THE BASKET OR THE TOP TWO HORIZONTAL RINGS WHICHEVER IS GREATER. REMOVE ALL BURLAP AND NAILS FROM THE TOP 1/3 OF THE BALL. REMOVE ALL TWINE. REMOVE OR CORRECT STEM GIRDLING ROOTS.
6. PLUMB AND BACKFILL WITH PLANTING SOIL.
7. WATER THOROUGHLY WITHIN 2 HOURS TO SETTLE PLANTS AND FILL VOIDS.
8. BACK FILL VOIDS AND WATER SECOND TIME.
9. PLACE MULCH WITHIN 48 HOURS OF THE SECOND WATERING UNLESS SOIL MOISTURE IS EXCESSIVE.
10. FINAL LOCATION OF TREE TO BE APPROVED BY OWNER.

1 TREE PLANTING DETAIL

SCALE: N.T.S.

L101

MDOT CLASS A SEED MIX

SEED	MINIMUM PURITY	MINIMUM GERMINATION	MIXTURE
CREEPING RED FESCUE	98.5%	85%	40%
KENTUCKY BLUE GRASS	98.5%	75%	30%
PERENNIAL RYEGRASS	99.5%	85%	30%

LANDSCAPE NOTES

PLANTING

1. CONTACT COMMON GROUND ALLIANCE AT 811 OR CALL811.COM TO VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY PLANTS OR LANDSCAPE MATERIAL.
2. ACTUAL LOCATION OF PLANT MATERIAL IS SUBJECT TO FIELD AND SITE CONDITIONS.
3. NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. ALL SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO SUBMISSION OF ANY BID AND/OR QUOTE BY THE LANDSCAPE CONTRACTOR.
5. PROVIDE TWO YEAR GUARANTEE OF ALL PLANT MATERIALS. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNER'S WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
6. ALL PLANTS TO BE SPECIMEN GRADE, MICHIGAN-GROWN AND/OR HARDY. SPECIMEN GRADE SHALL ADHERE TO, BUT IS NOT LIMITED BY, THE FOLLOWING STANDARDS:
   ALL PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, SCARS, ETC.
   ALL PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES.
   ALL PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES.
   ALL PLANTS SHALL HAVE HEAVY, HEALTHY BRANCHING AND LEAFING.
   CONIFEROUS TREES SHALL HAVE AN ESTABLISHED MAIN LEADER AND A HEIGHT TO WIDTH RATIO OF NO LESS THAN 5:3.
7. PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
8. PLANTS TO BE INSTALLED AS PER MDOT & ANSI STANDARD PLANTING PRACTICES.
9. INSTALL PLANTS BY PLANT INSTALLATION PERIOD INFORMATION IN THE LATEST STANDARD PLANTING DETAILS FROM MDOT. PLANTINGS BEFORE OR AFTER THESE DATES ARE DONE AT RISK.
10. PLANTS SHALL BE IMMEDIATELY PLANTED UPON ARRIVAL AT SITE. PROPERLY HEEL-IN MATERIALS IF NECESSARY; TEMPORARY ONLY.
11. PRIOR TO PLANTING, FIELD VERIFY THAT THE ROOT COLLAR/ROOT FLARE IS LOCATED AT THE TOP OF THE BALLED & BURLAP TREE. IF THIS IS NOT THE CASE, SOIL SHALL BE REMOVED DOWN TO THE ROOT COLLAR/ROOT FLARE. WHEN THE BALLED & BURLAP TREE IS PLANTED, THE ROOT COLLAR/ROOT FLARE SHALL BE EVEN OR SLIGHTLY ABOVE FINISHED GRADE.
12. OPEN TOP OF BURLAP ON BB MATERIALS; REMOVE POT ON POTTED PLANTS; SPLIT AND BREAK APART PEAT POTS.
13. PRUNE PLANTS AS NECESSARY - PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
14. WRAP ALL SMOOTH-BARKED TREES - FASTEN TOP AND BOTTOM. REMOVE BY APRIL 1ST.
15. STAKING OF TREES AS REQUIRED; REPOSITION, PLUMB AND STAKE IF NOT PLUMB AFTER ONE YEAR.

SOIL

16. TOPSOIL SHALL BE LOCAL, FERTILE AGRICULTURAL SOIL FREE OF SUBSOILS, ROCKS LARGER THAN ONE INCH, CLAYS, PLANTS, WEEDS, ROOTS AND OTHER IMPURITIES. PH VALUE TO BE BETWEEN 5.4 AND 7.0. REMOVE DEBRIS AND WEEDS FROM SUBSOIL. MINIMUM 4" DEPTH TOPSOIL FOR ALL LAWN GRASS AREAS AND 12" DEPTH TOPSOIL FOR TREES, SHRUBS AND PERENNIALS. LIGHTLY COMPACT TOPSOIL AFTER PLACEMENT AND PROHIBIT CONSTRUCTION TRAFFIC FROM AREAS WITH TOPSOIL.
17. THE NEED FOR SOIL AMENDMENTS SHALL BE DETERMINED UPON SITE SOIL CONDITIONS PRIOR TO PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT FOR THE NEED OF ANY SOIL AMENDMENTS.

MULCH

18. MULCH TO BE AT ALL TREE, SHRUB, PERENNIAL, AND MAINTENANCE AREAS. TREE AND SHRUB PLANTING BEDS SHALL HAVE 4" DEPTH OF DOUBLE SHREDDED HARDWOOD MULCH. DOUBLE SHREDDED HARDWOOD MULCH TO BE USED AROUND ALL PLANTS WITHIN TURF AREAS. PERENNIAL AND ORNAMENTAL GRASS BEDS SHALL HAVE 2" DEPTH DOUBLE SHREDDED HARDWOOD MULCH. MULCH TO BE FREE OF DELETERIOUS MATERIAL AND NATURAL IN COLOR (DYE-FREE), OR APPROVED EQUAL. ROCK MULCH TO BE TRAP ROCK, BUFF LIMESTONE, RIVER ROCK, 1 1/2" DIAMETER, AT MINIMUM 3" DEPTH, OR APPROVED EQUAL. APPLY PREMEMERGENT HERBICIDE PRIOR TO MULCH PLACEMENT PER MANUFACTURER RECOMMENDATIONS. USE PREEN OR PRE-APPROVED EQUAL. ROCK MULCH TO BE ON COMMERCIAL GRADE FILTER FABRIC, BY TYPAR, OR APPROVED EQUAL WITH NO EXPOSURE. MULCH AND FABRIC TO BE APPROVED BY OWNER PRIOR TO INSTALLATION. MULCH TO MATCH EXISTING CONDITIONS (WHERE APPLICABLE).

SEED

19. ALL DISTURBED AREAS TO BE SEEDED, UNLESS OTHERWISE NOTED. SOD TO BE STANDARD MICHIGAN GROWN AND HARDY BLUEGRASS MIX, FREE OF LAWN WEEDS. ALL TOPSOIL AREAS TO BE RAKED TO REMOVE DEBRIS AND ENSURE DRAINAGE. SLOPES OF 3:1 OR GREATER SHALL BE STAKED. SEED AS SPECIFIED, PER MDOT SPECIFICATIONS AND SUPPLIER/MANUFACTURER RECOMMENDATIONS. IF NOT INDICATED ON LANDSCAPE PLAN, SEE EROSION CONTROL PLAN.

ESTABLISHMENT

20. PROVIDE NECESSARY WATERING OF PLANT MATERIALS UNTIL THE PLANT IS FULLY ESTABLISHED OR IRRIGATION SYSTEM IS OPERATIONAL. OWNER WILL NOT PROVIDE WATER FOR CONTRACTOR.
21. REPAIR, REPLACE, OR PROVIDE SOD/SEED AS REQUIRED FOR ANY ROADWAY BOULEVARD AREAS ADJACENT TO THE SITE DISTURBED DURING CONSTRUCTION.

WARRANTY

22. REPAIR ALL DAMAGE TO PROPERTY FROM PLANTING OPERATIONS AT NO COST TO OWNER.
23. MAINTAIN TREES, SHRUBS, SEED AND OTHER PLANTS UNTIL PROJECT COMPLETION, BUT IN NO CASE, LESS THAN FOLLOWING PERIOD: 1 YEAR AFTER PROJECT COMPLETION. MAINTAIN TREES, SHRUBS, SEED AND OTHER PLANTS BY PRUNING, CULTIVATING, AND WEEDING AS REQUIRED FOR HEALTHY GROWTH. RESTORE PLANTING SAUCERS. TIGHTEN AND REPAIR STAKE AND GUY SUPPORTS AND RESET TREES AND SHRUBS TO PROPER GRADES OR VERTICAL POSITION AS REQUIRED. RESTORE OR REPLACE DAMAGED WRAPPINGS. SPRAY AS REQUIRED TO KEEP TREES AND SHRUBS FREE OF INSECTS AND DISEASE. REPLENISH MULCH TO THE REQUIRED DEPTH. MAINTAIN LAWNS FOR 60 DAYS AFTER INSTALLING SOD INCLUDING MOWING WHEN SOD RECITES 4" IN HEIGHT. WEED PLANTING BEDS AND MULCH SAUCERS AT MINIMUM ONCE A MONTH DURING THE GROWING SEASON. PROVIDE A MONTHLY REPORT TO THE OWNER ON WEEDING AND OTHER MAINTENANCE RESPONSIBILITIES.

Native Connections
3815 N Westnedge Ave, Kalamazoo, MI 49004
(P) 269.459.6900
info@nativeconnections.net
www.nativeconnections.net

Basic Shortgrass Prairie Mix

This is the economy version of our Dry Shortgrass Prairie Mix. Though the diversity and seed density are greatly reduced, this is a great starter prairie where a low stature on dry soils is needed or desired.

Total Seeding Rate: 31.35 lbs per acre
4 lbs grasses + 2.25 lbs forbs + 25 lbs nurse crop
43 native seeds per sq ft

Call, e-mail or visit our website for pricing.

Grasses		PLS Oz/acre	Seeds/sq ft
Bouteloua curtipendula	Side-oats Grama	22.00	3.03
Carex bicolor	Bicolor Sedge	4.00	1.61
Elymus canadensis	Canada Wild Rye	8.00	0.51
Koeleria macrantha	June Grass	0.25	1.19
Schizachyrium scoparium	Little Bluestem	32.00	11.02
Sporobolus heterolepis	Prairie Dropseed	0.25	0.09
	Total Grasses	**64.50**	**16.97**

Forbs		PLS Oz/acre	Seeds/sq ft
Asclepias tuberosa	Butterfly Milkweed	0.50	0.05
Aster sparsus (A. oolentangiensis)	Arrow-leaved Aster	0.50	0.92
Cassia fasciculata (Chamaecrista f.)	Partridge Pea	8.00	0.60
Ceanothus herbaceus	Lance-leaf Ceanothus	7.00	3.21
Dalea purpurea (Petalostemon p.)	Purple Prairie Clover	4.00	1.65
Liatris aspera	Rough Blazing Star	0.50	0.07
Monarda fistulosa	Wild Bergamot	0.50	6.80
Penstemon digitalis	Foxglove Beardtongue	0.50	1.49
Potentilla arguta (Drymarilla a.)	Prairie Cinquefoil	0.50	2.64
Ratibida pinnata	Yellow Coneflower	0.70	0.48
Rudbeckia hirta	Black-eyed Susan	5.25	11.09
Solidago nemoralis	Old-field Goldenrod	0.25	1.73
Solidago rigida	Stiff Goldenrod	0.50	0.56
Verbena stricta	Hoary Vervain	0.50	0.38
	Total Forbs	**30.00**	**29.66**

Temporary Grass Cover		Oz/acre	Seeds/sq ft
Lolium multiflorum	Annual Ryegrass	80.00	24.70
Avena sativa	Seed Oats	320.00	7.55
	Total Temp Grasses	**400.00**	**32.14**

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Stormwater Mix

This mix is designed to withstand the low water quality and highly variable conditions associated with stormwater features. Most of the species are salt tolerant and most species will do well in mesic to wet hydrology with others filling in the wetted and dried ends of the spectrum. The high native seed count and heavy annual nurse crop in this mix ensure full and aggressive establishment.

Total Seeding Rate: 36.66 lbs per acre
3.13 lbs grasses + 2.85 lbs forbs + 30 lbs nurse crop
113.11 native seeds per sq ft

Call, email or visit our website for pricing.

Grasses, Sedges & Rushes		PLS Oz/acre	Seeds/sq ft
Andropogon gerardii	Big Bluestem	3.00	0.90
Carex lupulinoidea	Fox Sedge	2.00	4.58
Elleocharis palustris	Great Spike Rush	0.40	0.47
Elymus canadensis	Canada Wild Rye	12.00	1.430
Elymus virginicus	Virginia Wild Rye	12.00	1.16
Glyceria striata	Fowl Manna Grass	1.00	4.410
Juncus effusus	Soft Rush	0.30	3.15
Juncus tenuis	Path Rush	0.40	8.16
Panicum virgatum	Switchgrass	4.00	1.29
Schizachyrium scoparium	Little Bluestem	8.00	2.750
Scirpus cyperinus	Wool Grass	0.40	15.610
Scirpus validus (S. tabernaemontani)	Soft-stem Bulrush	1.00	0.85
Sorghastrum nutans	Indian Grass	4.00	0.83
Spartina pectinata	Prairie Cordgrass	2.00	0.75
	Total Grasses	**39.00**	**50.74**

Forbs		PLS Oz/acre	Seeds/sq ft
Allium cernuum	Nodding Wild Onion	2.00	0.30
Asclepias incarnata	Swamp Milkweed	2.40	0.26
Asclepias tuberosa	Butterfly Milkweed	2.40	0.24
Bidens cernua	Nodding Bur Marigold	0.60	0.39
Boehmeria cylindrica	False Nettle	0.40	1.60
Eupatorium perfoliatum	Common Boneset	0.40	0.52
Eutrochium purpureum	Sweet Joe-Pye Weed	1.20	1.16
Helianthus angustifolius	Swamp Sunflower	0.80	0.29
Helianthus grosseserratus	Sawtooth Sunflower	0.80	0.29
Helianthus helianthoides	False sunflower	4.00	0.58
Lobelia siphilitica	Great Blue Lobelia	0.40	4.66
Mimulus ringens	Monkey Flower	0.40	21.12
Monarda fistulosa	Wild Bergamot	0.80	1.29
Penstemon digitalis	Foxglove Beardtongue	0.80	2.38
Physostegia virginiana	Obedient Plant	0.40	0.10
Polygonum pensylvanicum (Persicaria p.)	Pennsylvania Smartweed	4.00	1.19
Pycnanthemum virginianum	Mountain mint	0.40	2.02
Ratibida pinnata	Yellow Coneflower	1.60	1.10
Rudbeckia hirta	Black-eyed Susan	6.00	12.67
Senna hebecarpa	Wild Senna	4.00	0.13
Solidago rigida	Stiff Goldenrod	0.40	0.45
Symphyotrichum novae-angliae	New England Aster	0.40	0.61
Verbena hastata	Blue Vervain	1.60	3.42
Zizia aurea	Golden Alexander	2.00	0.51
	Total Forbs	**45.60**	**68.38**

Temporary Grass Cover		Oz/acre	Seeds/sq ft
Lolium multiflorum	Annual Ryegrass	112.00	34.71
Avena sativa	Seed Oats	320.00	8.45
	Total Temp Grasses	**432.00**	**43.16**

MISS DIG 811

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CHARTER TOWNSHIP MICHIGAN

SHEET NUMBER
L101

LANDSCAPE DETAILS

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS DESCRIBED
DESIGNED BY KHA
DRAWN BY KHA
CHECKED BY RAH

Brian Jannson

Cityscape Infrastructure Partners

Kimley»Horn
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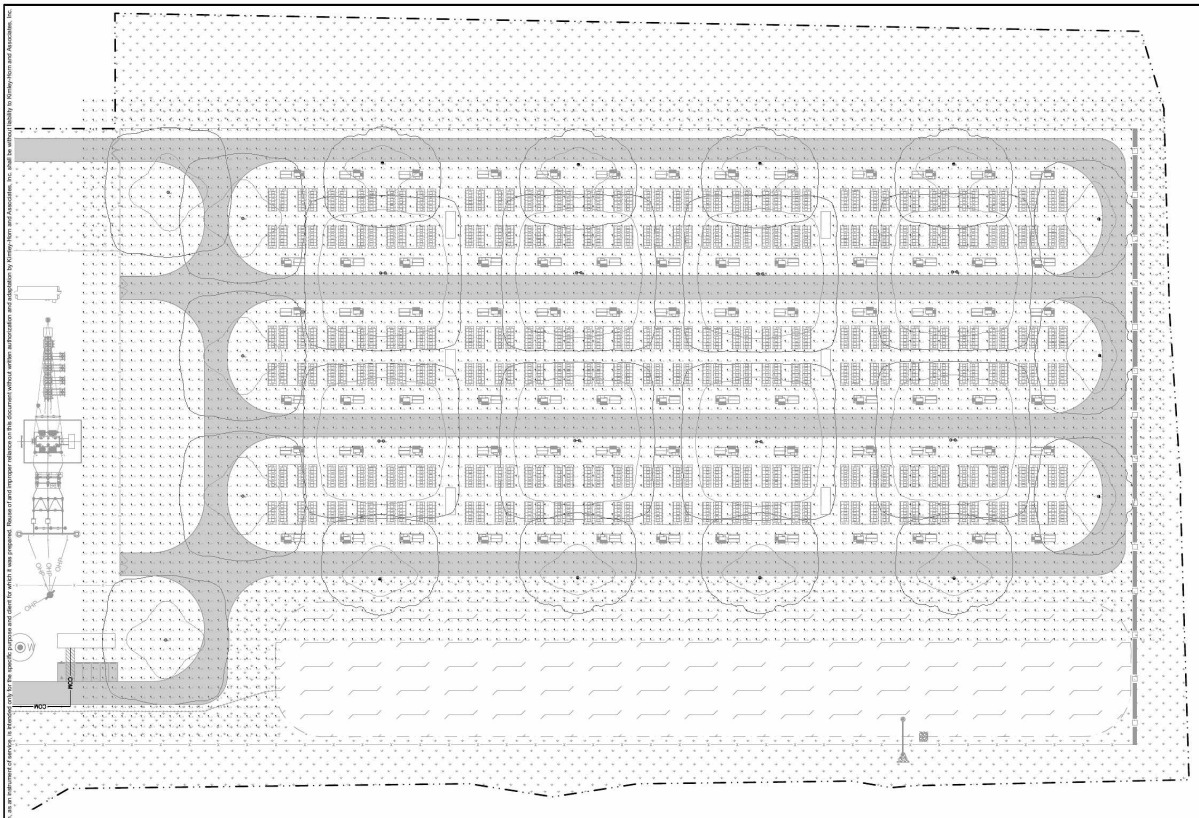

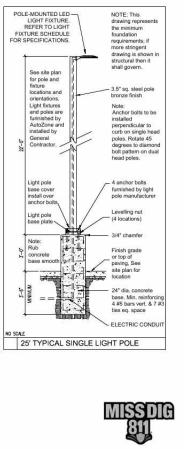

25' TYPICAL SINGLE LIGHT POLE

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

GENERAL NOTES

1. PROPOSED POLE MOUNTED LUMINAIRES TO BE POST TOP MOUNTED ON A 25 FOOT POLE ATOP A CONCRETE BASE FLUSHED MOUNTED WITH THE GROUND UNLESS OTHERWISE SPECIFIED. POLE MOUNTING HEIGHT CHOSEN TO COMPLY WITH THE TOWNSHIP OF GUN PLAIN CHARTER, MICHIGAN JURISDICTIONAL STANDARDS.
2. CALCULATED VALUES ARE DERIVED THROUGH A COMPUTER BASED MODEL WITH LIGHT FIXTURE DATA AS SUPPLIED BY MANUFACTURER THROUGH IES FILES.
3. ANY DEVIATION FROM SPECIFIED FIXTURE MODELS AND MOUNTING HEIGHTS IN THIS EXHIBIT WILL DISCOUNT THE VALIDITY OF THESE CALCULATIONS.
4. NO EXCESS OF 0.2 FOOT-CANDLE MEASURED AT THE PROPERTY LINE.
5. ALL C LIGHT FIXTURES SHALL INCLUDE EXTERNAL GLARE SHIELD AND NOT CREATE GLARE.
6. ALL LUMINAIRE SYMBOLS ARE DIAGRAMMATIC ONLY. CONTRACTOR TO FIELD COORDINATE EXACT LOCATIONS AND SETBACKS AGAINST UNDERGROUND UTILITY AND OTHER OBSTRUCTIONS.
7. ALL PROPOSED LUMINAIRES SHALL BE DARK SKY COMPLIANT AND SHALL HAVE A CORRELATED COLOR TEMPERATURE (CCT) OF 3000K OR LOWER. LUMINAIRES SHALL BE DESIGNED AND INSTALLED TO MINIMIZE UPLIGHT, GLARE, AND LIGHT TRESPASS IN ACCORDANCE WITH APPLICABLE LOCAL ORDINANCES.

LIGHT FIXTURE SCHEDULE

FIXTURE TAG	SYMBOL	QTY	DESCRIPTION	ARRANGEMENT	LLF	LUMENS	LUMINAIRE WATTS	MOUNTING HEIGHT(FT)
A1		5	DSX1 LED P7 30K 70CRI T5W	SINGLE	0.9	22609	184	25
B1		8	DSX1 LED P7 30K 70CRI T5W	BACK-TO-BACK	0.9	22609	184	25
C1		11	DSX1 LED P7 30K 70CRI T5W EGS	SINGLE	0.9	15626	184	25

CALCULATION SUMMARY

LABEL	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
CALCPTS_1	ILLUMINANCE	FC	0.64	3.30	0.00	N/A	N/A
ISLAND_1	ILLUMINANCE	FC	0.80	3.30	0.00	N/A	N/A
ISLAND_2	ILLUMINANCE	FC	0.75	2.30	0.00	N/A	N/A
ISLAND_3	ILLUMINANCE	FC	0.81	3.10	0.00	N/A	N/A

LIGHT DISTRIBUTION AND RANGE (FC)

	0.5 - 1.0
	> 1.0

MISS DIG 811

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Copenhagen Infrastructure Partners

Brian Jannon

KHA PROJECT 191250003
DATE 12/16/2025
SCALE AS SHOWN
DESIGNED BY NA
DRAWN BY TZ
CHECKED BY NA

PHOTOMETRICS PLAN

HERON BESS

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TWP MICHIGAN

SHEET NUMBER
PP100

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EXHIBIT B: EMERGENCY RESPONSE GUIDE

OWNER LOGO

JF2 DC LINK
Battery Energy Storage System at Heron BESS Facility

This plan has been developed to assist the local emergency responders with important safety and emergency response information concerning JF2 DC LINK BESS Installation.

This document and supporting layout plans should be consulted prior to any fire service personnel entering the site.

Emergency Response Guide

[Date]
Rev. 0

Approved by:

Document No. [Plan ID]

Heron Energy Storage, LLC

Date

DRAFT

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DRAFT

Record of Revisions

Change #	Date of Change	Substance of Change	Entered By
Revision 0	December 2025	Initial Issue	Jensen Hughes

On an annual basis, a review of this ERG shall be conducted and documented with the Site Owner/Operator and the local first responders and county emergency managers, as necessary. The plan shall also be reviewed and amended whenever there is a change in facility design, construction, operation, or maintenance that affects emergency response planning. If outside resources are changed or modified, the document shall be reviewed and updated to reflect the changes that may affect this ERG.

DRAFT

Section 1 – General Information

1. FACILITY NAME – **Heron Battery Energy Storage System (BESS)**

2. TYPE OF BATTERY SYSTEM – **JF2 DC LINK 5.1 Enclosures**

3. LOCATION OF FACILITY:

   [XXX] Riverview Drive / Industrial Parkway, Gun Plain Charter Township, MI
   (Entrance Drive @ 42°25'53.14"N, 85°35'57.62"W)

4. OWNER/OPERATOR

   Site Owner

   Heron Energy Storage, LLC (H.E.S.)

   Operator

   [TBD]

   Battery Energy Storage System Manufacturer:

   LG Energy Solution

5. EMERGENCY CONTACT NUMBERS:

Emergency Contact	Main Number	Alternate Number
Heron Energy Storage, LLC Emergency Contact	[XXX-XXX-XXXX]	[XXX-XXX-XXXX]
Operator Emergency Contact	[XXX-XXX-XXXX]	[XXX-XXX-XXXX]
BESS Emergency Support	[XXX-XXX-XXXX]	[XXX-XXX-XXXX]
Community Notification Contact	[XXX-XXX-XXXX]	[XXX-XXX-XXXX]

DRAFT

6. FACILITY DESCRIPTION:

The Heron BESS facility is situated on a ≈100 acre property with a single access on the north side of Riverview Drive (aka Industrial Parkway). The entire facility comprises ≈20 acres, excluding the entrance drive. The entrance drive extends approximately 1,200' to the closer of two access gates for the fenced BESS yard. The facility is positioned on the northeasterly portion of the overall property, with a considerable buffer from the nearest improved lots. The BESS facility includes a ≈1.2 acre substation, located west of the BESS yard. This Pre-Incident Planning / Emergency Response Guide focuses only on the BESS portion of the facility.

In addition to the BESS yard and substation, the facility includes an Operation and Maintenance (O&M) area and a stormwater management basin. The substation will be equipped with an oil-filled transformers and an unmanned 588 ft^2 control building. The substation and BESS yard are enclosed with security fencing, and the yards and access drives consist of stone paving. There is a water well located in side the fence, south of the substation and west of the O&M area. This well serves as the fire protection water supply.

Heron BESS will consist of 248 JF2 DC LINK 5.1 BESS enclosures (not including future augmentation). The enclosures consist of three M-LINK cabinets and a control panel (E-Panel). Each M-LINK cabinet contains two racks which each hold 14 battery packs. Each battery pack contains 120 battery cells. The battery chemistry is lithium iron phosphate technology. One Power Conversion System (PCS) skid is dedicated to every four BESS enclosures. The PCS skids are comprised of an inverter system and a MV transformer.

This project property and the adjacent parcels are primarily agricultural use. The area is wooded with some farmfield. Based on aerial imagery, there are no occupied structures within 1,000 feet of the battery enclosures.

Refer to Section 2 for site location and yard equipment layouts.

Additional information on the equipment located on-site is provided in the following sections.

DRAFT

Section 2 – Site Plans and Layout Drawings

This section contains the following information:

- ***Aerial View***
- ***BESS Site Plan and Equipment Arrangement Plan***

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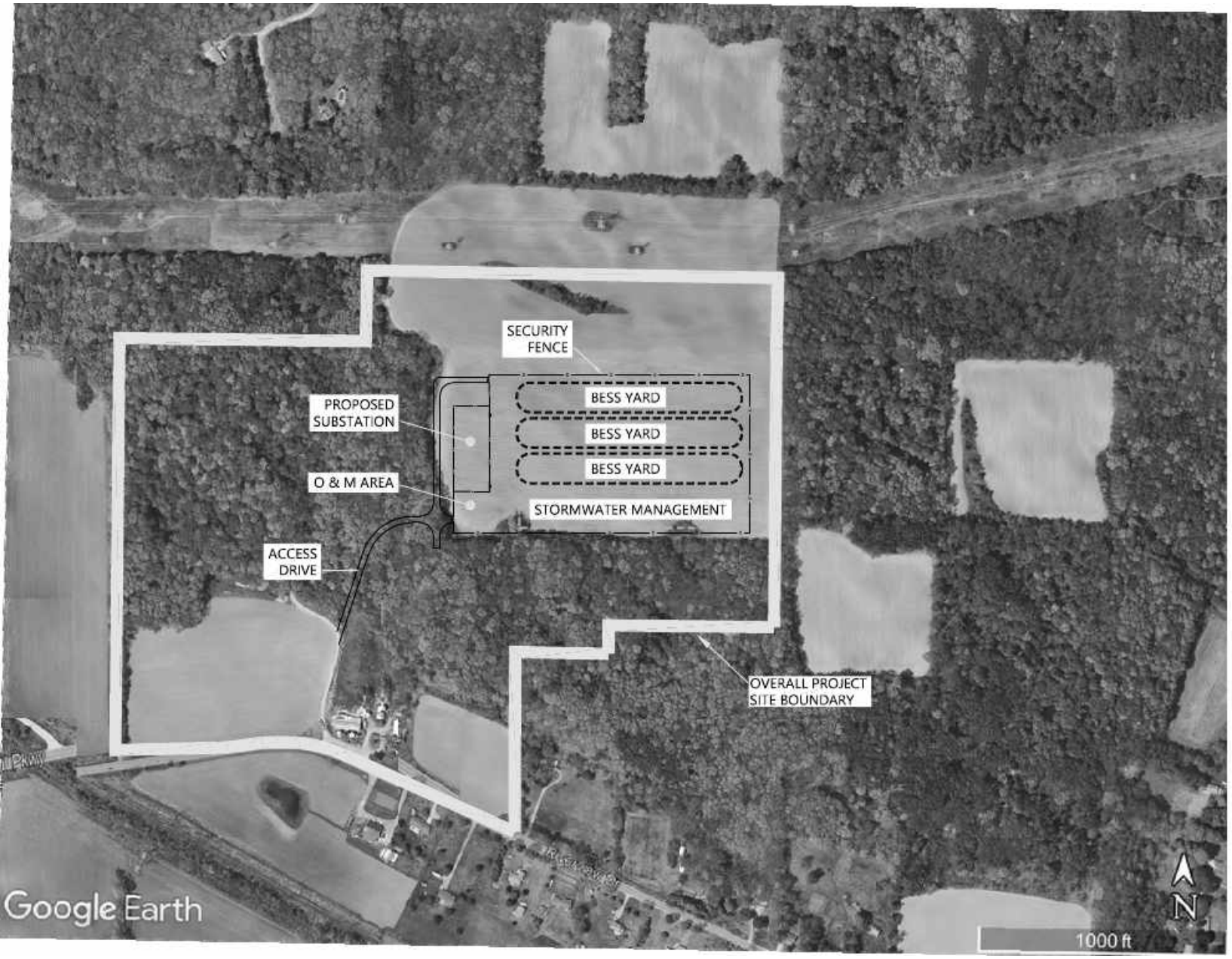
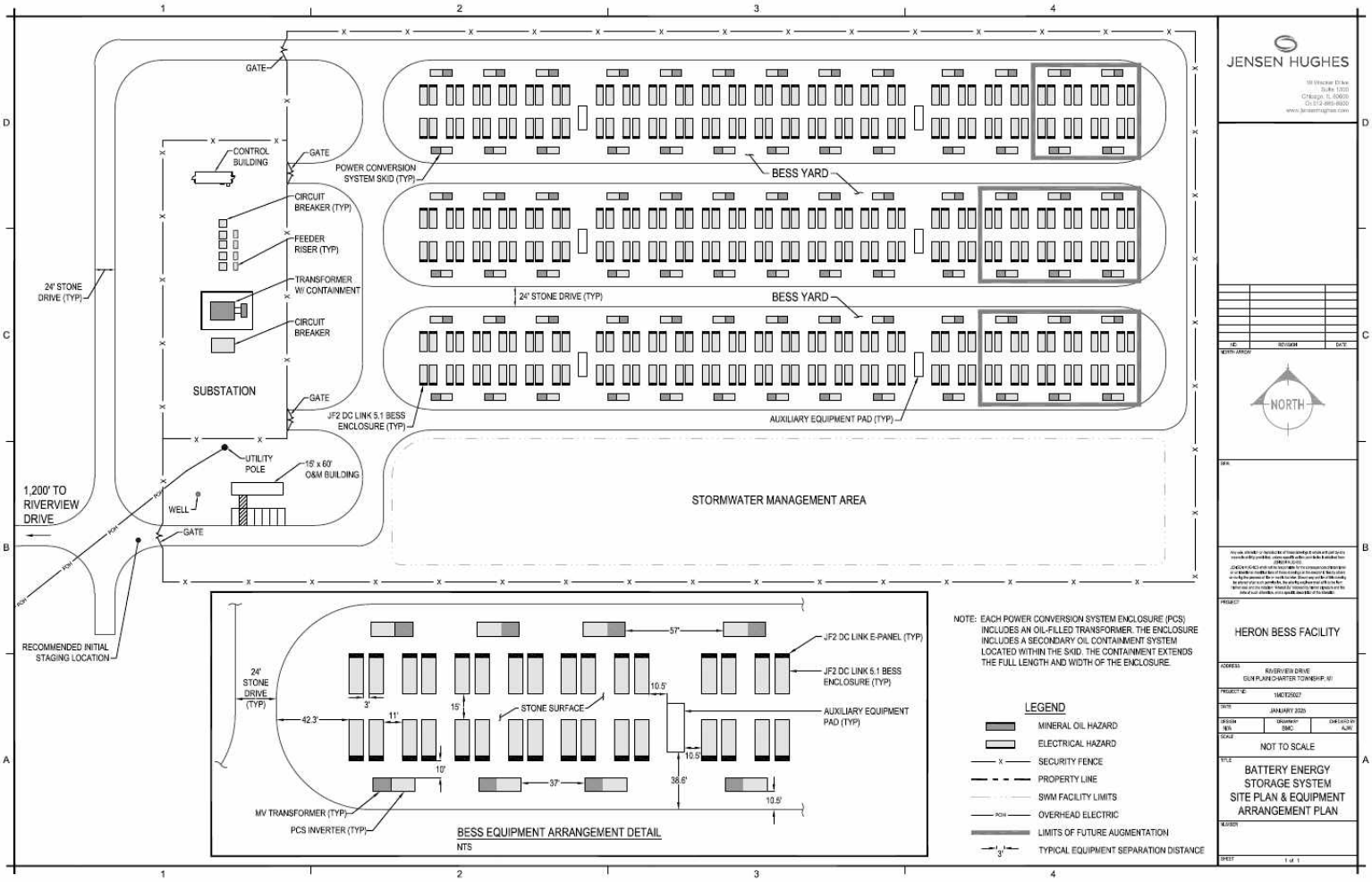

SECURITY FENCE
PROPOSED SUBSTATION
BESS YARD
BESS YARD
BESS YARD
O & M AREA
STORMWATER MANAGEMENT
ACCESS DRIVE
OVERALL PROJECT SITE BOUNDARY
Google Earth
N
1000 ft


GATE
CONTROL BUILDING
GATE
POWER CONVERSION SYSTEM SKID (TYP)
BESS YARD
CIRCUIT BREAKER (TYP)
FEEDER RISER (TYP)
TRANSFORMER W/ CONTAINMENT
CIRCUIT BREAKER
24' STONE DRIVE (TYP)
24' STONE DRIVE (TYP)
BESS YARD
SUBSTATION
GATE
JF2 DC LINK 5.1 BESS ENCLOSURE (TYP)
AUXILIARY EQUIPMENT PAD (TYP)
UTILITY POLE
15' x 60' O&M BUILDING
1,200' TO RIVERVIEW DRIVE
WELL
GATE
STORMWATER MANAGEMENT AREA
RECOMMENDED INITIAL STAGING LOCATION
24' STONE DRIVE (TYP)
57'
JF2 DC LINK E-PANEL (TYP)
JF2 DC LINK 5.1 BESS ENCLOSURE (TYP)
10.5'
3'
15'
STONE SURFACE
AUXILIARY EQUIPMENT PAD (TYP)
42.3'
11'
10.5'
10'
37'
36.6'
10.5'
MV TRANSFORMER (TYP)
PCS INVERTER (TYP)
BESS EQUIPMENT ARRANGEMENT DETAIL
NTS
NOTE: EACH POWER CONVERSION SYSTEM ENCLOSURE (PCS) INCLUDES AN OIL-FILLED TRANSFORMER. THE ENCLOSURE INCLUDES A SECONDARY OIL CONTAINMENT SYSTEM LOCATED WITHIN THE SKID. THE CONTAINMENT EXTENDS THE FULL LENGTH AND WIDTH OF THE ENCLOSURE.
LEGEND
MINERAL OIL HAZARD
ELECTRICAL HAZARD
SECURITY FENCE
PROPERTY LINE
SWM FACILITY LIMITS
OVERHEAD ELECTRIC
LIMITS OF FUTURE AUGMENTATION
TYPICAL EQUIPMENT SEPARATION DISTANCE
JENSEN HUGHES
NORTH
HERON BESS FACILITY
RIVERVIEW DRIVE
GUN PLAIN CHARTER TOWNSHIP, MI
JANUARY 2025
NOT TO SCALE
BATTERY ENERGY STORAGE SYSTEM SITE PLAN & EQUIPMENT ARRANGEMENT PLAN
1 of 1

Section 3 –Battery System Precautions / Hazards

NO ACCESS SHOULD BE MADE INTO THE BATTERY ENCLOSURE OR SURROUNDING AREA WITHOUT H.E.S. AUTHORIZATION AND VERIFICATION THAT CONDITIONS ARE SAFE FOR ACCESS.

- ***Lithium-Ion Battery Energy Storage System (BESS)***

Energized lithium-ion batteries (lithium iron phosphate cell chemistry) are located within the JF2 BESS enclosures. Batteries present an electrical, thermal, and corrosive hazard, and are not de-energized when the unit is disconnected from the generating station or power grid. It is extremely unlikely that the system will be fully de-energized during an event and should be assumed to contain hazardous energy at all times. No access should be made into the BESS enclosure.

- ***Lithium-Ion Batteries - Thermal Runaway***

Thermal runaway is the uncontrolled build-up of heat within a lithium-ion (Li-Ion) battery. Battery damage, exposure to heat, electrical malfunction or defects can cause a breakdown in the separator barrier between the cathode and anode, causing uninhibited energy transfer through the electrolyte. This causes heat generation which reduces electrolyte resistance, allowing the energy transfer rate to further increase, creating a self-sustaining reaction. Thermal runaway results in a condition that requires copious amounts of water to extinguish. The approach at Heron BESS, however, will be to allow the fire to self-terminate. Even after appearing to be extinguished, batteries may still be undergoing thermal runaway and reignite, so continued monitoring is required. Smoke from thermal runaway is extremely toxic and should be avoided. Hydrogen off-gassing will also occur (see "Deflagration/Explosion Potential").

- ***Potential Toxic Gas Emission***

When Li-Ion batteries experience a thermal runaway failure, they can rupture and produce a toxic gas mixture that can include hydrogen fluoride and carbon monoxide. The likelihood of a toxic gas mixture being produced is actually greater if the batteries do not catch fire. Exercise caution and always wear SCBA when operating near a battery enclosure that has experienced a failure.

- ***Deflagration/Explosion Potential***

Hydrogen and other flammable gases are released from Li-Ion batteries during thermal runaway. These gases may build up within the BESS enclosure. Without proper ventilation, this creates an explosive atmosphere. Introduction of oxygen into the container while an explosive atmosphere is present can lead to a deflagration or explosion.

The M-LINK battery enclosures have built in vents/dampers to remove flammable gases and smoke. However, it should always be assumed that an explosive mixture could be present until proven otherwise.

- ***BESS Enclosures – Liquid Cooling System***

The batteries within each enclosure are cooled using a liquid heat exchanger system that utilizes a 50% ethylene glycol / 50% water mixture. Ethylene glycol is a combustible liquid that, if released from the cooling system, could exacerbate and/or spread any fire conditions. Additionally, if the liquid is released from the system and comes into contact with energized equipment, additional arcing or thermal runaway events could occur. The cooling system also contains R513A refrigerant. Leaked refrigerant does not pose fire spread or arcing hazards.

- ***Electrical Hazard***

Most electrical components are contained within the BESS and PCS enclosures. However, some connections and circuits may not be protected and could expose firefighters to an electrical hazard.

CONSIDER all equipment ENERGIZED until CONFIRMED DE-ENERGIZED, GROUNDED and safe by QUALIFIED H.E.S. personnel.

The batteries in a BESS are NEVER FULLY DISCHARGED. Even when a BESS is shut down, the batteries still contain stored energy corresponding to the state of charge at the time it was shut down. Consult with H.E.S. personnel before applying water on BESS equipment.

Use of Firefighting Water on Energized Electrical Equipment Could Be Hazardous to Firefighters. Utilization of installed systems is preferred (see Section 5). Exercise caution when putting handlines in service.

DO NOT USE metal ladders or other metal firefighting tools (pike poles, axes, halligans, etc.) around high voltage equipment as they can be CONDUCTIVE.

- ***Oil-Filled Transformers***

The BESS yard includes oil-filled auxiliary transformers containing XXX gallons of insulating oil. The PCS enclosures include MV transformers containing 932 gallons of insulating oil each. (The adjacent substation contains one transformer containing XXX gallons of insulating oil.) This oil presents a significant fire load at the facility. Once de-energized, fire in a transformer container may be considered an enclosed container fire. The process of de-energizing the transformer must be completed in its entirety before commencing fireground operations. In order to de-energize, power must be isolated on both the high side and the low side of the transformer. Because determining the location of the fault is not possible, both the high side and the low side must be grounded. Isolate station DC power used in monitoring the unit.

Each of the PCS integrated MV transformers is provided with a secondary oil containment system. Each system is designed to hold the insulating oil from its respective transformer. Leaking oil or oil lost in a transformer rupture can spread fire due to flowing, burning oil if it is not captured within the secondary containment. Burning oil within a containment system may behave as a pool fire.

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- ***Adjacent Exposures / Hazards***

The primary exposure concerns for a BESS enclosure fire are the adjacent enclosures and other equipment within the BESS yard itself. Additionally, there is vulnerable substation equipment that is within 220' of BESS containers. This includes an oil-filled transformer, circuit breakers and the control house.

The equipment arrangement in the BESS yards consists of groups of four JF2 DC LINK 5.1 enclosures. A back-to-back separation of 3' is provided between the enclosures within their groups. The front-to-front separation between groups of enclosures is 11'. The end-to-end separation between the groups is 15'. The separation between the PCS enclosures and the BESS enclosures is 10'. Auxiliary equipment is provided on separate pads within the BESS yards and are separated from the PCS and BESS enclosures by 10.5'. This equipment includes oil-filled transformers, UPS and/or panel/protection devices. The O&M area located near the southwest corner of the BESS yard contains a 15' x 60' structure.

Refer to Section 2 for site location and yard equipment layouts.

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Section 4 – Fire Response Guidelines and Precautions

Section 4.1 – Lithium-Ion BESS Specific Guidelines and Precautions

ONLY INDIVIDUALS TRAINED IN LI-ION BATTERY FIRES SHOULD ENGAGE IN A BESS FIRE EVENT.

Lithium-ion battery fires are extremely difficult to extinguish due to the self-sustaining reaction and large quantity of energy. Additionally, Li-Ion battery failures can produce flammable and/or toxic gases and can be extremely volatile and unpredictable. Due to the nature of their failure and inherent energy, response to a Li-Ion battery event should be **DEFENSIVE** in nature. No manual suppression should be used on a burning battery enclosure. The approach is to allow the fire self-terminate.

The preferred response to a battery enclosure on fire is to contain and protect exposures. That is to say, suppression efforts should be focused on ensuring that other units do not fail. A fire condition in a BESS enclosure can actually be beneficial, as the fire consumes many of the toxic gases that can be produced by a thermal runaway event.

A JF2 DC LINK BESS is comprised of one or more M-LINK enclosures and an E-Panel. The M-LINK enclosures house the batteries. The E-Panel contains the FACP, battery system control, communications, dry-type transformers and other power components and electronics.

The E-Panel is attached to the M-LINK enclosures but is isolated. A fire in the E-Panel should remain isolated from the M-LINK battery enclosures.

A personnel standoff distance of 300 feet is advised. Some monitoring activities or protection of exposures may require personnel to operate within this "warm zone." The minimum recommended standoff distance for such activities is 30 feet. Do not operate within the standoff distance, or downwind from the enclosure, without the use of SCBA, as toxic gases may be present in the gas plume.

Each M-LINK enclosure is equipped with two roof exhaust vents and two door intake dampers with an intake fan. The vents/dampers open automatically and the intake fan operates upon detection of smoke or hydrogen and evacuates heat and toxic/flammable gases from the enclosure. Manual ventilation (opening the enclosure front door) should not be needed and is unadvised.

If the automatic ventilation fails and BESS data is available, monitor the temperature and flammable gas concentration within the enclosure. Manual gas monitoring can also be performed downwind and at a distance (such as at the fenceline) to determine if toxic gases are present and if evacuations or shelter in place orders are needed. In the event internal atmospheric conditions of the enclosure cannot be determined, no manual ventilation or access should be attempted.

The use of thermal imagers can be used to monitor the surface temperature of equipment adjacent to the failed unit. Coordinate with Operator and/or H.E.S. personnel to determine if water should be applied to the exposure units to prevent cascading failures. Any firefighting water applied to electrical

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equipment via handlines should be done with a minimum 30 degree fog pattern from a minimum of 30 feet away from the enclosure. Be aware of any standing water that may accumulate.

DO NOT OPEN AN ENCLOSURE UNTIL ELECTRICAL FAILURE EVENT IS VERIFIED BY QUALIFIED H.E.S. PERSONNEL TO BE COMPLETE AND THE ABOVE GUIDELINES HAVE BEEN CONSIDERED

If neither installed nor handheld gas monitoring of the enclosure is available, manual ventilation of the enclosure should NOT be performed.

Due to the volatile nature of Li-Ion batteries after failure, it is possible for the batteries to reignite, even after the event appears to be concluded. Batteries can continue to hold electricity (called "stranded energy"). Internal damage to the battery may result in a continued reaction even after the initial event concludes. Additionally, any mechanical agitation to the battery could result in a stopped reaction restarting.

Never assume that a battery enclosure is safe after suppression.

Section 4.2 – Fire Response Guidelines

NOTE: These guidelines are meant to assist first responders in safely responding to a fire or thermal runaway incident involving A BESS Enclosure. These guidelines are not meant to supersede existing Standard Operating Procedures/Guidelines established by the first responders' organization.

1. When responding to a fire involving an JF2 DC LINK System Enclosure, **DO NOT** cut any perimeter gate locks, approach the enclosure or associated equipment, or force entry into the enclosure. **WAIT** outside the perimeter fence or at a safe distance (at least 300 feet) until H.E.S. personnel arrive on scene to provide assistance. If H.E.S. personnel are not present, **CALL** the emergency contact number listed in Section 1 of this plan or request that the Local 911 Center Fire Communications call H.E.S. using H.E.S. Emergency Number].
2. Once H.E.S. personnel arrive(s), make contact and establish a continuous point of contact (POC) for the incident and establish a unified command with H.E.S. POC. For your safety, while you are on the premises, qualified H.E.S. personnel **MUST** be present and **REMAIN** with the incident commander.
3. Firefighter **ACCOUNTABILITY** within the facility is the responsibility of the Fire Department. **USE** SCBA when entering smoke environment. The combustion gases given off may be toxic and/or corrosive.
4. At the request of the Fire Department, and as safe and practical to do so, H.E.S. will **DE-ENERGIZE** required equipment and circuits. Please note that this may take a considerable amount of time. This will be a prolonged evolution.
5. If not already active, consider manually activating the door intake dampers and roof exhaust vents via the electrical control panel. However, extreme caution should be exercised if employing this option. The ventilation cannot be activated remotely.

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6. If available (and conditions warrant), utilize gas meters downwind from the failed unit to determine if significant quantities of toxic gases (such as Carbon Monoxide or Hydrogen Fluoride) are present. When performing gas samples, maintain as much distance as possible and never approach any of the enclosure doors head-on. Sampling at the fenceline will provide a good metric for the amount of gases escaping to the public. Based on gas sampling and wind direction, consideration should be given to shelter-in-place or evacuation orders for surrounding exposures.
7. If fire condition is present, monitor surface temperature of exposures using a thermal imaging camera, if available. Discuss whether water-based suppression should be used on the exposures. If there are no immediate exposures and no immediate danger to the public, letting the enclosure burn may be the best and safest approach. If the fire presents an immediate hazard to exposures or the public, connection to the water supply and bringing handlines into the yard should be considered.
8. If water-based suppression is to be utilized to protect exposures or on burning equipment that does not contain Li-Ion batteries, H.E.S. personnel will determine when equipment is electrically **SAFE** to fight a fire (especially in applying water on or near electrical equipment). **CAUTION -** adjacent electrical equipment not involved in the fire may still be energized.
9. Handlines should only be used on energized or potentially energized equipment in extreme situations. Only with proper training and approval by H.E.S. should firefighters consider using water on electrical equipment. Equipment and application factors affecting the safe use of water on potentially energized electrical components:

   - Proper nozzle and proper nozzle pressure
   - Proper patterns used (at least 30 degrees - never a straight or solid stream)
   - Proper distance from the component (at least 30 ft)

   Other factors that affect safety are:

   - Impact of overspray on energized electrical components
   - Water runoff or pooling that may become energized
   - Impact of water runoff and pool on other components in the area
   - Weather conditions; wind, rain and humidity

   Follow your fire department's SOPs and consult H.E.S. prior to using water on Class "B," "C" or Class "D" fires.

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Section 5 – Fire/Explosion Protection Systems

- ***Fire Alarm and Detection System(s)***

  Each M-LINK enclosure is provided with an automatic smoke detection system. One smoke detector and one hydrogen detector are located within each battery compartment. One smoke detector is located within the E-Panel. The detectors communicate to the fire alarm control panel (FACP) located in the E-Panel electrical enclosure. The FACP is monitored by the BESS Energy Storage Management System (ESMS) and remotely by H.E.S..

  Activation of either detector within the M-LINK enclosure will initiate an alarm condition, activate horn & strobe notification, and shut down the HVAC system within the M-LINK enclosure.

  Activation of the E-Panel detector will initiate an alarm condition and activate horn & strobe notification.

- ***Explosion/Deflagration Prevention***

  Each M-LINK enclosure uses a combination of hydrogen detection and ventilation to prevent explosions/deflagrations within the enclosure.

  - ***Hydrogen Detection System***

    Each M-LINK battery enclosure is provided with a hydrogen detection system. One hydrogen detector is located with the smoke detector in the battery compartment and are monitored by the FACP. The hydrogen detectors will alarm at 0.4% hydrogen by volume.

  - ***Flammable Gas Ventilation System***

    The M-LINK battery enclosure is outfitted with a flammable gas ventilation system. Two roof exhaust vents are located on the enclosure roof and the intake dampers are provided on the front door. An intake fan is provided for the door openings. These vents/dampers may be capable of being operated remotely.

  - ***Explosion/Deflagration System Operation***

    - Activation of the smoke detector or the hydrogen detector within an M-LINK enclosure will initiate the system operation.
    - Once the alarm is received, FACP in the E-Panel controls the opening of the ventilation openings and intake fan.

- ***Water Supply***

  - ***Well***

    See Section 2 for location of the well. The well is located just inside the fence, near the southerly gated entrance to the BESS facility. There are no alternative water sources identified.

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- ***Oil Containment System***

  Each of the PCS integrated MV transformers is provided with a secondary oil containment system which is designed to hold the full volume of insulating oil from its respective transformer. The containment is located within the skid below both the transformer and PCS inverter equipment. These systems will prevent potential environmental contamination as well as prevent the spread of fire due to flowing, burning oil.

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Section 6 – Site Photos

[PHOTO]

Photo 1

JF2 DC Link BESS Enclosure

The Heron BESS has 248 battery enclosures installed in groups of four. Each contains 6 racks (2 per M-LINK) with 14 battery modules/rack. These batteries can never be fully discharged or de-energized.

See Section 4.1 for information regarding Thermal Runaway. **DO NOT** attempt fire suppression until all power sources have been **DE-ENERGIZED** and **GROUNDED**.

[PHOTO]

Photo 2

JF2 DC Link BESS Enclosure Internal View

This is a front view of the enclosure with the panels removed.

This enclosure is an **ELECTROCUTION HAZARD** if not **DE-ENERGIZED** and **GROUNDED**.

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OWNER LOGO

[PHOTO]

Photo 3

JF2 DC Link BESS Enclosure E-Panel

This is the panel located at the end of each BESS enclosure. It contains the FACP, battery system control, communications, dry-type transformers and other power components and electronics.

This enclosure is an **ELECTROCUTION HAZARD** if not **DE-ENERGIZED** and **GROUNDED**.

[PHOTO]

Photo 4

Power Conversion System (PCS) Enclosure

The BESS has 62 PCS enclosures. The PCS is an inverter equipped with an MV transformer. The transformer contains 932 gallons of mineral oil (combustible liquid). Secondary oil-containment is provided beneath the enclosure. These units are in close proximity to other BESS yard equipment.

This enclosure is an **ELECTROCUTION HAZARD. DO NOT** attempt fire suppression until all power sources have been **DE-ENERGIZED** and **GROUNDED**. If oil ignites, follow your department procedures for a Class "B" fire.

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[PHOTO]

Photo 5

Oil-Filled Transformer

The BESS yard is equipped with oil-filled transformers. The transformers contain [XXX] gallons of mineral oil (combustible liquid). They are in close proximity to other BESS yard equipment.

DO NOT attempt fire suppression until all power sources have been **DE-ENERGIZED** and **GROUNDED**. Follow your department procedures for a Class "B" fire.

[PHOTO]

Photo 6

[Equipment TBD]

[Write-up when other auxiliary equipment is finalized.]

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Section 7 –Safety Data Sheets (SDS)

SDS for Materials within the facility:

- **Lithium-Ion Batteries**
- **Mineral Oil**
- **Liquid Coolant**
- **Refrigerant**

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Lithium-Ion Battery

DRAFT

Mineral Oil

DRAFT

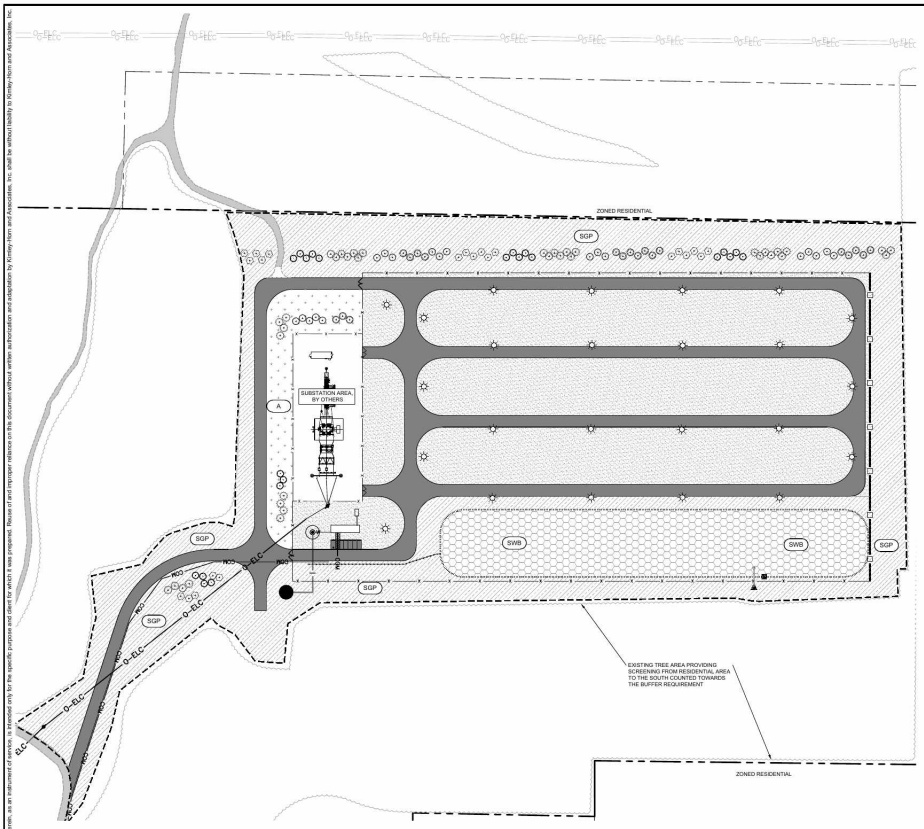
Liquid Coolant

DRAFT

Refrigerant

DRAFT

EXHIBIT C: LANDSCAPE PLANS



LANDSCAPE SUMMARY

BUFFER REQUIREMENTS

REQUIREMENT:	WHERE THE PROPERTY ABUTS A RESIDENTIAL DISTRICT OR USE, A GREENBELT, A BERM, OR A BUFFER STRIP IS REQUIRED TO PROVIDE FULL SCREENING
BUFFER STRIP REQUIRED:	MINIMUM 10' WIDE, EVERGREEN TREES STAGGERED, AND / OR OTHER VEGETATION AND GROUNDCOVER
PROVIDED:	MINIMUM 10' WIDE, EVERGREEN TREES STAGGERED, AND / OR OTHER VEGETATION AND GROUNDCOVER

LANDSCAPE LEGEND

- EXISTING TREE LINE (TYP.)
- EDGER (TYP.)
- APPROXIMATE LIMITS OF SEEDING / SEED ALL DISTURBED AREAS (TYP.)
- SEED EDGE (TYP.)

SEEDING KEYNOTES

- A — SEED WITH MDOT CLASS A MUNICIPAL LAWN SEED MIX, OR APPROVED EQUAL (TYP.)
- SGP — SEED WITH NATIVE CONNECTIONS BASIC SHORT GRASS PRAIRIE SEED MIX, OR APPROVED EQUAL (TYP.)
- SWB — SEED WITH NATIVE CONNECTIONS STORMWATER BASIN SEED MIX, OR APPROVED EQUAL (TYP.)

PLANT SCHEDULE

SYMBOL	CODE	QTY	COMMON NAME	BOTANICAL NAME	CONT	CAL
CONIFEROUS TREE						
	BFR	19	BALSAM FIR	ABIES BALSAMEA	B & B	6' HT.
	ERC	22	EASTERN RED CEDAR	JUNIPERUS VIRGINIANA	B & B	6' HT.
	RDP	22	RED PINE	PINUS RESINOSA	B & B	6' HT.
	WHC	19	WHITE CEDAR	THUJA OCCIDENTALIS 'WHITE CEDAR'	B & B	6' HT.
	WHP	36	WHITE PINE	PINUS STROBUS	B & B	5' HT.

NOTE:
QUANTITIES ON PLAN SUPERSEDE LIST QUANTITIES IN THE EVENT OF A DISCREPANCY.

ABBREVIATIONS:
B&B = BALLED AND BURLAPPED CAL. = CALIPER HT. = HEIGHT MIN. = MINIMUM O.C. = ON CENTER SP. = SPECIES
QTY. = QUANTITY

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

MISS DIG 811

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CHARTER TOWNSHIP MICHIGAN

LANDSCAPE PLAN

KHA PROJECT 191230003
DATE: 02/26/2026
SCALE: AS SHOWN
DESIGNED BY: CFK
DRAWN BY: CFK
CHECKED BY: RAH

SHEET NUMBER
L100

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/26/2026	BIG

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CIP
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN JANNSON
ENGINEER
LICENSED PROFESSIONAL ENGINEER

Brian Jannson

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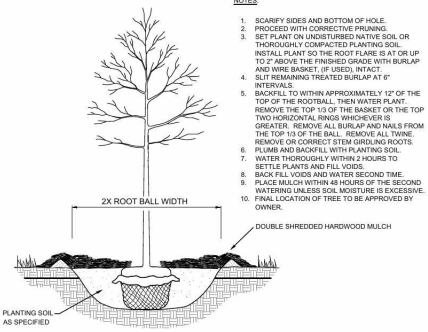
K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_MI\2 Design\CAD\PlanSheets\L1-LANDSCAPE PLAN.DWG March 13, 2026 - 11:42am



NOTES:

1. SCARIFY SIDES AND BOTTOM OF HOLE.
2. PROCEED WITH CORRECTIVE PRUNING.
3. SET PLANT ON UNDISTURBED NATIVE SOIL OR THOROUGHLY COMPACTED PLANTING SOIL. INSTALL PLANT SO THE ROOT FLARE IS AT OR UP TO 2" ABOVE THE FINISHED GRADE WITH BURLAP AND WIRE BASKET, (IF USED), INTACT.
4. SLIT REMAINING TREATED BURLAP AT 6" INTERVALS.
5. BACKFILL TO WITHIN APPROXIMATELY 12" OF THE TOP OF THE ROOTBALL, THEN WATER PLANT. REMOVE THE TOP 1/3 OF THE BASKET OR THE TOP TWO HORIZONTAL RINGS WHICHEVER IS GREATER. REMOVE ALL BURLAP AND NAILS FROM THE TOP 1/3 OF THE BALL. REMOVE ALL TWINE. REMOVE OR CORRECT STEM GIRDLING ROOTS.
6. PLUMB AND BACKFILL WITH PLANTING SOIL.
7. WATER THOROUGHLY WITHIN 2 HOURS TO SETTLE PLANTS AND FILL VOIDS.
8. BACK FILL VOIDS AND WATER SECOND TIME.
9. PLACE MULCH WITHIN 48 HOURS OF THE SECOND WATERING UNLESS SOIL MOISTURE IS EXCESSIVE.
10. FINAL LOCATION OF TREE TO BE APPROVED BY OWNER.

1 TREE PLANTING DETAIL

SCALE: N.T.S.

L101

MDOT CLASS A SEED MIX

SEED	MINIMUM PURITY	MINIMUM GERMINATION	MIXTURE
CREEPING RED FESCUE	98.5%	85%	40%
KENTUCKY BLUE GRASS	98.5%	75%	30%
PERENNIAL RYEGRASS	99.5%	85%	30%

LANDSCAPE NOTES

PLANTING

1. CONTACT COMMON GROUND ALLIANCE AT 811 OR CALL811.COM TO VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY PLANTS OR LANDSCAPE MATERIAL.
2. ACTUAL LOCATION OF PLANT MATERIAL IS SUBJECT TO FIELD AND SITE CONDITIONS.
3. NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. ALL SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO SUBMISSION OF ANY BID AND/OR QUOTE BY THE LANDSCAPE CONTRACTOR.
5. PROVIDE TWO YEAR GUARANTEE OF ALL PLANT MATERIALS. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNER'S WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
6. ALL PLANTS TO BE SPECIMEN GRADE, MICHIGAN-GROWN AND/OR HARDY. SPECIMEN GRADE SHALL ADHERE TO, BUT IS NOT LIMITED BY, THE FOLLOWING STANDARDS:
   ALL PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, SCARS, ETC.
   ALL PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES.
   ALL PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES.
   ALL PLANTS SHALL HAVE HEAVY, HEALTHY BRANCHING AND LEAFING.
   CONIFEROUS TREES SHALL HAVE AN ESTABLISHED MAIN LEADER AND A HEIGHT TO WIDTH RATIO OF NO LESS THAN 5:3.
7. PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
8. PLANTS TO BE INSTALLED AS PER MDOT & ANSI STANDARD PLANTING PRACTICES.
9. INSTALL PLANTS BY PLANT INSTALLATION PERIOD INFORMATION IN THE LATEST STANDARD PLANTING DETAILS FROM MDOT. PLANTINGS BEFORE OR AFTER THESE DATES ARE DONE AT RISK.
10. PLANTS SHALL BE IMMEDIATELY PLANTED UPON ARRIVAL AT SITE. PROPERLY HEEL-IN MATERIALS IF NECESSARY; TEMPORARY ONLY.
11. PRIOR TO PLANTING, FIELD VERIFY THAT THE ROOT COLLAR/ROOT FLARE IS LOCATED AT THE TOP OF THE BALLED & BURLAP TREE. IF THIS IS NOT THE CASE, SOIL SHALL BE REMOVED DOWN TO THE ROOT COLLAR/ROOT FLARE. WHEN THE BALLED & BURLAP TREE IS PLANTED, THE ROOT COLLAR/ROOT FLARE SHALL BE EVEN OR SLIGHTLY ABOVE FINISHED GRADE.
12. OPEN TOP OF BURLAP ON BB MATERIALS; REMOVE POT ON POTTED PLANTS; SPLIT AND BREAK APART PEAT POTS.
13. PRUNE PLANTS AS NECESSARY - PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
14. WRAP ALL SMOOTH-BARKED TREES - FASTEN TOP AND BOTTOM. REMOVE BY APRIL 1ST.
15. STAKING OF TREES AS REQUIRED; REPOSITION, PLUMB AND STAKE IF NOT PLUMB AFTER ONE YEAR.

SOIL

16. TOPSOIL SHALL BE LOCAL, FERTILE AGRICULTURAL SOIL FREE OF SUBSOILS, ROCKS LARGER THAN ONE INCH, CLAYS, PLANTS, WEEDS, ROOTS AND OTHER IMPURITIES. PH VALUE TO BE BETWEEN 5.4 AND 7.0. REMOVE DEBRIS AND WEEDS FROM SUBSOIL. MINIMUM 4" DEPTH TOPSOIL FOR ALL LAWN GRASS AREAS AND 12" DEPTH TOPSOIL FOR TREES, SHRUBS AND PERENNIALS. LIGHTLY COMPACT TOPSOIL AFTER PLACEMENT AND PROHIBIT CONSTRUCTION TRAFFIC FROM AREAS WITH TOPSOIL.
17. THE NEED FOR SOIL AMENDMENTS SHALL BE DETERMINED UPON SITE SOIL CONDITIONS PRIOR TO PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT FOR THE NEED OF ANY SOIL AMENDMENTS.

MULCH

18. MULCH TO BE AT ALL TREE, SHRUB, PERENNIAL, AND MAINTENANCE AREAS. TREE AND SHRUB PLANTING BEDS SHALL HAVE 4" DEPTH OF DOUBLE SHREDDED HARDWOOD MULCH. DOUBLE SHREDDED HARDWOOD MULCH TO BE USED AROUND ALL PLANTS WITHIN TURF AREAS. PERENNIAL AND ORNAMENTAL GRASS BEDS SHALL HAVE 2" DEPTH DOUBLE SHREDDED HARDWOOD MULCH. MULCH TO BE FREE OF DELETERIOUS MATERIAL AND NATURAL IN COLOR (DYE-FREE), OR APPROVED EQUAL. ROCK MULCH TO BE TRAP ROCK, BUFF LIMESTONE, RIVER ROCK, 1 1/2" DIAMETER, AT MINIMUM 3" DEPTH, OR APPROVED EQUAL. APPLY PREMEMERGENT HERBICIDE PRIOR TO MULCH PLACEMENT PER MANUFACTURER RECOMMENDATIONS. USE PREEN OR PRE-APPROVED EQUAL. ROCK MULCH TO BE ON COMMERCIAL GRADE FILTER FABRIC, BY TYPAR, OR APPROVED EQUAL WITH NO EXPOSURE. MULCH AND FABRIC TO BE APPROVED BY OWNER PRIOR TO INSTALLATION. MULCH TO MATCH EXISTING CONDITIONS (WHERE APPLICABLE).

SEED

19. ALL DISTURBED AREAS TO BE SEEDED, UNLESS OTHERWISE NOTED. SOD TO BE STANDARD MICHIGAN GROWN AND HARDY BLUEGRASS MIX, FREE OF LAWN WEEDS. ALL TOPSOIL AREAS TO BE RAKED TO REMOVE DEBRIS AND ENSURE DRAINAGE. SLOPES OF 3:1 OR GREATER SHALL BE STAKED. SEED AS SPECIFIED, PER MDOT SPECIFICATIONS AND SUPPLIER/MANUFACTURER RECOMMENDATIONS. IF NOT INDICATED ON LANDSCAPE PLAN, SEE EROSION CONTROL PLAN.

ESTABLISHMENT

20. PROVIDE NECESSARY WATERING OF PLANT MATERIALS UNTIL THE PLANT IS FULLY ESTABLISHED OR IRRIGATION SYSTEM IS OPERATIONAL. OWNER WILL NOT PROVIDE WATER FOR CONTRACTOR.
21. REPAIR, REPLACE, OR PROVIDE SOD/SEED AS REQUIRED FOR ANY ROADWAY BOULEVARD AREAS ADJACENT TO THE SITE DISTURBED DURING CONSTRUCTION.

WARRANTY

22. REPAIR ALL DAMAGE TO PROPERTY FROM PLANTING OPERATIONS AT NO COST TO OWNER.
23. MAINTAIN TREES, SHRUBS, SEED AND OTHER PLANTS UNTIL PROJECT COMPLETION, BUT IN NO CASE, LESS THAN FOLLOWING PERIOD: 1 YEAR AFTER PROJECT COMPLETION. MAINTAIN TREES, SHRUBS, SEED AND OTHER PLANTS BY PRUNING, CULTIVATING, AND WEEDING AS REQUIRED FOR HEALTHY GROWTH. RESTORE PLANTING SAUCERS. TIGHTEN AND REPAIR STAKE AND GUY SUPPORTS AND RESET TREES AND SHRUBS TO PROPER GRADES OR VERTICAL POSITION AS REQUIRED. RESTORE OR REPLACE DAMAGED WRAPPINGS. SPRAY AS REQUIRED TO KEEP TREES AND SHRUBS FREE OF INSECTS AND DISEASE. REPLENISH MULCH TO THE REQUIRED DEPTH. MAINTAIN LAWNS FOR 60 DAYS AFTER INSTALLING SOD INCLUDING MOWING WHEN SOD RECITES 4" IN HEIGHT. WEED PLANTING BEDS AND MULCH SAUCERS AT MINIMUM ONCE A MONTH DURING THE GROWING SEASON. PROVIDE A MONTHLY REPORT TO THE OWNER ON WEEDING AND OTHER MAINTENANCE RESPONSIBILITIES.

Native Connections

3815 N Westnedge Ave, Kalamazoo, MI 49004
(P) 269.459.6900
info@nativeconnections.net
www.nativeconnections.net

Basic Shortgrass Prairie Mix

This is the economy version of our Dry Shortgrass Prairie Mix. Though the diversity and seed density are greatly reduced, this is a great starter prairie where a low stature on dry soils is needed or desired.

Total Seeding Rate: 31.35 lbs per acre
4 lbs grasses + 2.25 lbs forbs + 25 lbs nurse crop
43 native seeds per sq ft

Call, e-mail or visit our website for pricing.

Grasses		PLS Oz/acre	Seeds/sq ft
Bouteloua curtipendula	Side-oats Grama	22.00	3.03
Carex bicolor	Bicolor Sedge	4.00	1.61
Elymus canadensis	Canada Wild Rye	8.00	0.51
Koeleria macrantha	June Grass	0.25	1.19
Schizachyrium scoparium	Little Bluestem	32.00	11.02
Sporobolus heterolepis	Prairie Dropseed	0.25	0.09
	Total Grasses	**66.50**	**16.97**

Forbs		PLS Oz/acre	Seeds/sq ft
Asclepias tuberosa	Butterfly Milkweed	0.50	0.05
Aster sparsus (A. oolentangiensis)	Arrow-leaved Aster	0.50	0.92
Cassia fasciculata (Chamaecrista f.)	Partridge Pea	8.00	0.60
Ceanothus herbaceus	Lance-leaf Ceanopsis	7.00	3.21
Dalea purpurea (Petalostemon p.)	Purple Prairie Clover	4.00	1.65
Liatris aspera	Rough Blazing Star	0.50	0.12
Monarda fistulosa	Wild Bergamot	0.50	6.80
Penstemon digitalis	Foxglove Beardtongue	0.50	1.49
Potentilla arguta (Drymarilla a.)	Prairie Cinquefoil	0.50	2.64
Ratibida pinnata	Yellow Coneflower	0.70	0.48
Rudbeckia hirta	Black-eyed Susan	5.25	11.09
Solidago nemoralis	Old-field Goldenrod	0.25	1.73
Solidago rigida	Stiff Goldenrod	0.50	0.56
Verbena stricta	Hoary Vervain	0.50	0.38
	Total Forbs	**30.00**	**29.68**

Temporary Grass Cover		Oz/acre	Seeds/sq ft
Lolium multiflorum	Annual Ryegrass	80.00	24.70
Avena sativa	Seed Oats	320.00	7.50
	Total Temp Grasses	**400.00**	**32.14**

Native Connections

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Stormwater Mix

This mix is designed to withstand the low water quality and highly variable conditions associated with stormwater features. Most of the species are salt tolerant and most species will do well in mesic to wet hydrology with others filling in the wettest and driest ends of the spectrum. The high native seed count and heavy annual nurse crop in this mix ensure full and aggressive establishment.

Total Seeding Rate: 36.66 lbs per acre
3.13 lbs grasses + 2.85 lbs forbs + 30 lbs nurse crop
113.11 native seeds per sq ft

Call, email or visit our website for pricing.

Grasses, Sedges & Rushes		PLS Oz/acre	Seeds/sq ft
Andropogon gerardii	Big Bluestem	3.00	0.90
Carex vulpinoidea	Fox Sedge	2.00	4.58
Eleocharis palustris	Great Spike Rush	0.40	0.47
Elymus canadensis	Canada Wild Rye	12.00	1.430
Elymus virginicus	Virginia Wild Rye	12.00	1.16
Glyceria striata	Fowl Mannna Grass	1.00	4.410
Juncus effusus	Soft Rush	0.40	9.18
Juncus tenuis	Path Rush	0.40	8.16
Panicum virgatum	Switchgrass	4.00	1.29
Schizachyrium scoparium	Little Bluestem	8.00	2.760
Scirpus cyperinus	Wool Grass	0.40	15.610
Scirpus validus (S. tabernaemontani)	Soft-stem Bulrush	1.00	0.85
Sorghastrum nutans	Indian Grass	4.00	0.83
Spartina pectinata	Prairie Cordgrass	2.00	0.73
	Total Grasses	**39.00**	**52.74**

Forbs		PLS Oz/acre	Seeds/sq ft
Allium cernuum	Nodding Wild Onion	2.00	0.30
Asclepias incarnata	Swamp Milkweed	2.40	0.26
Asclepias tuberosa	Butterfly Milkweed	2.40	0.24
Bidens cernua	Nodding Bur Marigold	0.60	0.39
Boehmeria cylindrica	Flat-topped Aster	0.40	1.60
Eupatorium perfoliatum	False Boneset	0.40	0.51
Eutrochium purpureum	Sweet Joe-Pye Weed	1.20	1.16
Helenium autumnale	Sneezeweed	0.80	2.39
Helopsis helianthoides	False sunflower	4.00	0.58
Lobelia siphilitica	Great Blue Lobelia	0.40	4.68
Mimulus ringens	Monkey Flower	0.40	21.12
Monarda fistulosa	Wild Bergamot	0.80	1.29
Penstemon digitalis	Foxglove Beardtongue	0.50	1.49
Physostegia virginiana	Obedient Plant	0.40	0.10
Pycnanthemum virginianum	Pennsylvania Smartweed	4.00	1.19
Pycnanthemum virginianum	Mountain mint	0.40	2.02
Ratibida pinnata	Yellow Coneflower	1.60	1.10
Rudbeckia hirta	Black-eyed Susan	6.00	12.67
Senna hebecarpa	Wild Senna	4.00	0.13
Solidago rigida	Stiff Goldenrod	0.50	0.56
Symphyotrichum novae-angliae	New England Aster	0.40	0.61
Verbena hastata	Blue Vervain	1.60	3.42
Zizia aurea	Golden Alexander	2.00	0.51
	Total Forbs	**45.60**	**60.36**

Temporary Grass Cover		Oz/acre	Seeds/sq ft
Lolium multiflorum	Annual Ryegrass	112.00	34.71
Avena sativa	Seed Oats	360.00	8.43
	Total Temp Grasses	**472.00**	**43.14**

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K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_M12 Design\CAD\Plan Sheets\L1 LANDSCAPE DETAILS.DWG March 13, 2026 - 11:43am

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/06/2026	BIG

Kimley»Horn
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CIP
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GANNON
ENGINEER
No. 6201053600
LICENSED PROFESSIONAL ENGINEER

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS DESCRIBED
DESIGNED BY KHA
DRAWN BY KHA
CHECKED BY RAH

LANDSCAPE DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CHARTER TOWNSHIP MICHIGAN

MISS DIG 811

SHEET NUMBER
L101

EXHIBIT D: TREE PRESERVATION PLAN

LEGEND

- PROPERTY LINE
- TREE TO REMAIN
- TREE TO BE REMOVED
- EXISTING VEGETATION EDGE
- LIMITS OF DISTURBANCE
- TP — TREE PROTECTION FENCE

TREE MITIGATION DATA

TOTAL SIGNIFICANT TREES ON SITE: 443 TREES (7,082 INCHES)
TOTAL SIGNIFICANT TREES REMOVED: 189 TREES (3,204 INCHES)
TOTAL SIGNIFICANT TREES SAVED: 254 TREES (3,878 INCHES)

NOTE: SIGNIFICANT TREES ARE ALL TREES 12 INCHES OR GREATER

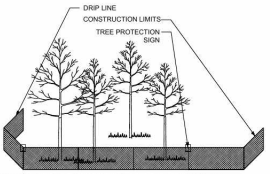
TREE PROTECTION NOTES

1. PRUNING WILL BE DONE BY PROFESSIONALS DURING APPROPRIATE PRUNING SEASON.
2. NO STORAGE OF MATERIALS, OPERATION OF MACHINERY, OR DEVELOPMENT OF ANY SORT WILL OCCUR WITHIN THE FENCE-LINE WITHOUT APPROVAL IN WRITING FROM TOWNSHIP.
3. SITE GRADING TO BE DONE ONLY AFTER PROTECTIVE MEASURES HAVE BEEN TAKEN, TOWNSHIP HAS APPROVED FENCING LOCATIONS, AND ALL CONTRACTORS HAVE BEEN BRIEFED ON TREE PRESERVATION TECHNIQUES.
4. EXISTING TREES TO REMAIN OR REMOVED TO BE CLEARLY IDENTIFIED, WITHIN DISTURBANCE LIMITS AND 10' OUTSIDE OF THE DISTURBANCE LIMITS.
5. TREE PRESERVATION TO BE APPROVED BY OWNER AND PER LOCAL GOVERNMENTAL AUTHORITY.

KEYNOTE LEGEND

- (A) EXISTING TREE TO BE SAVED (TYP.)
- (B) EXISTING TREE TO BE REMOVED (TYP.)
- (C) TREE PROTECTION FENCE (SEE DETAIL) (TYP.)

NOTE: ONLY SIGNIFICANT TREES IN THE SUBJECT PROPERTY SHOWN ON PLAN/ INVENTORY.



FURNISH AND INSTALL TEMPORARY FENCE AT THE TREE'S DRIPLINE OR CONSTRUCTION LIMITS AS SPECIFIED, PRIOR TO ANY CONSTRUCTION. WHEN POSSIBLE PLACE FENCE 25 FEET BEYOND THE DRIP LINE. PLACE PROTECTION SIGNS ALONG FENCE AT 20' INTERVALS.

1 TEMPORARY TREE PROTECTION FENCE PLACEMENT
SCALE: N.T.S. TP201

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/06/2026	BIG

Kimley»Horn
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CIP
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GANNON
STATE LICENSED
PROFESSIONAL ENGINEER
No. 6201053500

Brian Gannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY CFK
DRAWN BY CFK
CHECKED BY RAH

TREE INVENTORY & PRESERVATION PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
TP201

MISS DIG 811

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TAG #	COMMON NAME	DBH	CONDITION	STATUS
1	American Elm	13	Good	SAVED
2	White Ash	14	Good	SAVED
3	Oak	18	Good	SAVED
4	Red Maple	18	Good	SAVED
5	Black Cherry	15	Good	SAVED
6	Black Oak	26	Good	SAVED
7	Black Oak	14	Good	SAVED
8	Black Oak	24	Good	SAVED
9	American Elm	35	Good	SAVED
10	White Oak	40	Good	REMOVED
11	Black Oak	15	Good	REMOVED
12	Black Oak	20	Good	REMOVED
13	Black Oak	12	Good	SAVED
14	Black Oak	21	Good	SAVED
15	Black Oak	17	Good	SAVED
16	White Oak	16	Good	SAVED
17	White Oak	14	Good	SAVED
18	Red Maple	17	Good	SAVED
19	Black Oak	26	Good	SAVED
20	Black Oak	17	Good	SAVED
21	American Basswood	12	Good	SAVED
22	Black Walnut	23	Good	SAVED
23	Elm	12	Good	SAVED
24	Elm	12	Good	SAVED
25	Beech	12	Good	SAVED
26	Black Walnut	16	Good	SAVED
27	Black Oak	13	Good	REMOVED
28	Beech	12	Good	SAVED
29	Slippery Elm	20	Good	SAVED
30	Beech	15	Good	SAVED
31	American Beech	13	Good	SAVED
32	American Elm	15	Good	SAVED
33	Black Oak	15	Good	SAVED
34	Black Oak	14	Good	SAVED
35	Black Oak	24	Good	SAVED
36	Black Oak	12	Good	SAVED
37	White Oak	15	Good	SAVED
38	White Ash	18	Good	SAVED
39	Black Oak	14	Good	SAVED
40	Black Oak	22	Good	SAVED
41	White Oak	35	Good	SAVED
42	Chestnut	15	Good	REMOVED
43	Northern Red Oak	14	Good	REMOVED
44	Black Oak	14	Good	SAVED
45	Oak	14	Good	REMOVED
46	Black Oak	13	Good	SAVED
47	Pignut Hickory	13	Good	REMOVED
48	Black Oak	22	Good	REMOVED
49	American Elm	12	Good	REMOVED
50	Eastern Red Cedar	16	Good	SAVED
51	Black Oak	44	Good	REMOVED
52	Slippery Elm	17	Good	SAVED
53	Black Oak	21	Good	SAVED
54	Black Oak	15	Good	SAVED
55	White Oak	12	Good	SAVED
56	White Oak	12	Good	SAVED
57	Black Oak	22	Good	SAVED
58	Black Oak	13	Good	SAVED
59	Black Walnut	12	Good	SAVED
60	Black Oak	14	Good	SAVED
61	Black Cherry	14	Good	SAVED
62	Black Walnut	12	Good	SAVED
63	Black Cherry	12	Good	SAVED
64	Black Oak	13	Good	SAVED
65	Black Oak	14	Good	SAVED
66	Willow	22	Good	SAVED
67	Oak	14	Good	SAVED
68	Black Walnut	16	Good	SAVED
69	Walnut	12	Good	SAVED
70	Sugar Maple	12	Good	SAVED
71	Black Walnut	12	Good	SAVED
72	Black Walnut	14	Good	SAVED
73	American Elm	12	Good	SAVED
74	Black Oak	14	Good	SAVED
75	Black Cherry	18	Good	SAVED
76	Black Walnut	15	Good	SAVED
77	American Elm	12	Good	SAVED
78	American Elm	12	Good	SAVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
79	Black Walnut	15	Good	SAVED
80	Black Cherry	12	Good	SAVED
81	American Elm	12	Good	SAVED
82	Black Walnut	30	Good	SAVED
83	Black Oak	16	Good	SAVED
84	Mulberry	26	Good	SAVED
85	Black Oak	17	Good	REMOVED
86	Black Oak	12	Good	REMOVED
87	Willow	60	Good	REMOVED
88	American Elm	12	Good	REMOVED
89	Black Oak	18	Good	REMOVED
90	Black Walnut	20	Good	REMOVED
91	American Hophornbeam	12	Good	REMOVED
92	Beech	14	Good	REMOVED
93	Black Cherry	14	Good	REMOVED
94	American Elm	17	Good	REMOVED
95	Black Oak	14	Good	REMOVED
96	American Elm	12	Good	REMOVED
97	American Elm	18	Good	REMOVED
98	American Elm	12	Good	REMOVED
99	American Elm	12	Good	REMOVED
100	Beech	14	Good	REMOVED
101	Black Walnut	14	Good	REMOVED
102	American Elm	12	Good	REMOVED
103	Northern Red Oak	12	Good	SAVED
104	Black Ash	12	Good	SAVED
105	Black Cherry	12	Good	SAVED
106	Hickory	14	Good	SAVED
107	Black Cherry	12	Good	SAVED
108	Black Cherry	12	Good	SAVED
109	American Elm	16	Good	SAVED
110	American Elm	12	Good	SAVED
111	Black Cherry	16	Good	SAVED
112	Beech	13	Good	SAVED
113	Sassafras	14	Good	SAVED
114	Black Oak	18	Good	SAVED
115	Black Cherry	12	Good	SAVED
116	Sassafras	12	Good	SAVED
117	Sassafras	12	Good	SAVED
118	Black Cherry	18	Good	SAVED
119	Black Cherry	30	Good	SAVED
120	Black Cherry	14	Good	SAVED
121	Sassafras	12	Good	SAVED
122	Sugar Maple	18	Good	SAVED
123	Sassafras	14	Good	SAVED
124	Black Cherry	15	Good	SAVED
125	Black Cherry	12	Good	SAVED
126	Black Cherry	16	Good	SAVED
127	Sassafras	12	Good	SAVED
128	Northern Red Oak	14	Good	SAVED
129	Sassafras	12	Good	SAVED
130	Black Cherry	21	Good	SAVED
131	Sassafras	14	Good	SAVED
132	Sassafras	17	Good	SAVED
133	Sassafras	12	Good	SAVED
134	Sassafras	14	Good	SAVED
135	Sassafras	12	Good	SAVED
136	Sassafras	15	Good	SAVED
137	Sassafras	15	Good	SAVED
138	Sassafras	12	Good	REMOVED
139	Sassafras	12	Good	SAVED
140	Sassafras	12	Good	SAVED
141	Sassafras	15	Good	SAVED
142	Black Cherry	12	Good	SAVED
143	Mulberry	16	Good	SAVED
144	Black Cherry	12	Good	SAVED
145	American Elm	12	Good	SAVED
146	Black Cherry	16	Good	SAVED
147	American Elm	14	Good	SAVED
148	American Elm	12	Good	SAVED
149	Northern Red Oak	14	Good	SAVED
150	Northern Red Oak	12	Good	SAVED
151	American Elm	12	Good	SAVED
152	Northern Red Oak	12	Good	SAVED
153	Sugar Maple	12	Good	REMOVED
154	Black Cherry	30	Good	REMOVED
155	Black Cherry	16	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
156	Northern Red Oak	12	Good	SAVED
157	Black Cherry	16	Good	SAVED
158	Northern Red Oak	12	Good	SAVED
159	Northern Red Oak	12	Good	SAVED
160	Northern Red Oak	12	Good	SAVED
161	Black Cherry	30	Good	SAVED
162	Honey Locust	13	Good	SAVED
163	Northern Red Oak	16	Good	SAVED
164	Shagbark Hickory	12	Good	SAVED
165	Northern Red Oak	21	Good	SAVED
166	Black Oak	18	Good	SAVED
167	Black Oak	12	Good	SAVED
168	Black Oak	12	Good	SAVED
169	Northern Red Oak	21	Good	SAVED
170	Black Oak	14	Good	SAVED
171	Black Ash	14	Good	SAVED
172	Black Oak	35	Good	SAVED
173	Black Oak	17	Good	SAVED
174	Black Oak	12	Good	SAVED
175	Sassafras	14	Good	REMOVED
176	American Elm	16	Good	REMOVED
177	American Elm	12	Good	REMOVED
178	Black Cherry	12	Good	REMOVED
179	American Elm	12	Good	REMOVED
180	Black Cherry	18	Good	SAVED
181	Black Oak	12	Good	REMOVED
182	American Elm	12	Good	SAVED
183	Black Cherry	12	Good	SAVED
184	Eastern Red Cedar	20	Good	SAVED
185	Black Oak	14	Good	REMOVED
186	Black Oak	12	Good	REMOVED
187	Black Oak	16	Good	REMOVED
188	Black Oak	18	Good	REMOVED
189	Black Oak	13	Good	REMOVED
190	Chestnut Oak	14	Good	SAVED
191	Chestnut Oak	24	Good	SAVED
192	Black Oak	14	Good	REMOVED
193	Black Oak	12	Good	REMOVED
194	Black Oak	12	Good	REMOVED
195	Black Oak	14	Good	REMOVED
196	Black Oak	16	Good	REMOVED
197	Black Oak	14	Good	REMOVED
198	Black Oak	14	Good	REMOVED
199	Black Oak	17	Good	SAVED
200	Black Oak	14	Good	REMOVED
201	Black Cherry	12	Good	REMOVED
202	Black Oak	28	Good	REMOVED
203	Black Oak	14	Good	SAVED
204	Black Oak	12	Good	SAVED
205	Black Cherry	13	Good	SAVED
206	Black Cherry	14	Good	SAVED
207	Black Oak	12	Good	SAVED
208	Black Oak	14	Good	SAVED
209	White Oak	12	Good	SAVED
210	Black Cherry	12	Good	SAVED
211	Black Cherry	14	Good	SAVED
212	White Oak	21	Good	SAVED
213	Black Oak	13	Good	SAVED
214	Black Oak	14	Good	SAVED
215	Chestnut Oak	15	Good	SAVED
216	Chestnut Oak	15	Good	SAVED
217	White Oak	14	Good	SAVED
218	Black Oak	24	Good	SAVED
219	Black Oak	16	Good	SAVED
220	Black Oak	12	Good	SAVED
221	Black Oak	14	Good	SAVED
222	Black Oak	18	Good	SAVED
223	Black Oak	18	Good	SAVED
224	Black Oak	12	Good	SAVED
225	Black Oak	12	Good	SAVED
226	Black Cherry	14	Good	REMOVED
227	Black Oak	24	Good	REMOVED
228	Black Oak	20	Good	REMOVED
229	Black Oak	14	Good	SAVED
230	Black Cherry	14	Good	REMOVED
231	Black Cherry	14	Good	REMOVED
232	Black Cherry	14	Good	REMOVED
233	Black Cherry	16	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
234	Black Oak	12	Good	SAVED
235	Black Oak	15	Good	SAVED
236	Shagbark Hickory	12	Good	SAVED
237	Black Cherry	18	Good	SAVED
238	Black Cherry	14	Good	REMOVED
239	Black Cherry	12	Good	SAVED
240	Black Oak	17	Good	SAVED
241	American Elm	15	Good	SAVED
242	Black Cherry	15	Good	SAVED
243	Oak	14	Good	REMOVED
244	Oak	56	Good	REMOVED
245	Shagbark Hickory	12	Good	SAVED
246	Oak	35	Good	REMOVED
247	Black Cherry	12	Good	SAVED
248	Black Cherry	12	Good	SAVED
249	Black Cherry	24	Good	SAVED
250	American Elm	12	Good	REMOVED
251	Oak	23	Good	SAVED
252	Black Cherry	14	Good	SAVED
253	American Elm	16	Good	SAVED
254	Black Oak	14	Good	REMOVED
255	American Elm	16	Good	SAVED
256	Black Cherry	12	Good	SAVED
257	Oak	12	Good	SAVED
258	Black Cherry	12	Good	SAVED
259	Black Oak	25	Good	SAVED
260	American Elm	12	Good	SAVED
261	Oak	12	Good	SAVED
262	Oak	14	Good	SAVED
263	Oak	13	Good	SAVED
264	Oak	16	Good	SAVED
265	Oak	16	Good	SAVED
266	Black Cherry	16	Good	REMOVED
267	Oak	12	Good	REMOVED
268	Oak	21	Good	SAVED
269	Sassafras	17	Good	REMOVED
270	Sassafras	17	Good	REMOVED
271	Oak	24	Good	SAVED
272	Oak	12	Good	SAVED
273	Oak	17	Good	REMOVED
274	Oak	12	Good	REMOVED
275	American Elm	12	Good	REMOVED
276	Black Oak	12	Good	REMOVED
277	Black Cherry	12	Good	REMOVED
278	Black Oak	12	Good	REMOVED
279	Black Cherry	16	Good	REMOVED
280	Black Cherry	33	Good	REMOVED
281	American Elm	12	Good	SAVED
282	Black Oak	13	Good	SAVED
283	Black Cherry	17	Good	SAVED
284	Black Oak	14	Good	SAVED
285	Black Oak	14	Good	SAVED
286	American Elm	12	Good	SAVED
287	American Elm	14	Good	SAVED
288	Black Oak	14	Good	SAVED
289	White Oak	17	Good	SAVED
290	American Elm	25	Good	REMOVED
291	Black Cherry	15	Good	SAVED
292	White Oak	25	Good	REMOVED
293	Black Oak	15	Good	REMOVED
294	Black Cherry	18	Good	REMOVED
295	American Elm	14	Good	REMOVED
296	Black Oak	16	Good	REMOVED
297	American Elm	12	Good	SAVED
298	Black Oak	20	Good	SAVED
299	Black Oak	13	Good	SAVED
300	Black Oak	12	Good	SAVED
301	Black Cherry	14	Good	SAVED
302	Black Cherry	14	Good	SAVED
303	Black Cherry	12	Good	SAVED
304	American Elm	12	Good	SAVED
305	Black Cherry	12	Good	SAVED
306	Oak	16	Good	SAVED
307	Beech	14	Good	SAVED
308	Oak	14	Good	SAVED
309	Oak	12	Good	SAVED
310	Oak	12	Good	SAVED
311	American Elm	16	Good	SAVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
312	American Elm	12	Good	SAVED
313	Sassafras	14	Good	REMOVED
314	Sassafras	14	Good	REMOVED
315	Sassafras	12	Good	REMOVED
316	Sassafras	14	Good	REMOVED
317	Sassafras	14	Good	REMOVED
318	Sassafras	18	Good	REMOVED
319	Sassafras	13	Good	REMOVED
320	Sassafras	15	Good	SAVED
321	American Elm	13	Good	REMOVED
322	Oak	17	Good	REMOVED
323	Black Cherry	15	Good	SAVED
324	Black Cherry	13	Good	REMOVED
325	Oak	14	Good	SAVED
326	Oak	16	Good	SAVED
327	Oak	12	Good	SAVED
328	Black Oak	50	Good	REMOVED
329	Black Oak	16	Good	REMOVED
330	Black Cherry	12	Good	REMOVED
331	American Elm	14	Good	SAVED
332	Black Oak	34	Good	REMOVED
333	Oak	14	Good	SAVED
334	Black Oak	21	Good	REMOVED
335	American Elm	14	Good	REMOVED
336	American Elm	12	Good	REMOVED
337	Shagbark Hickory	14	Good	REMOVED
338	Black Cherry	12	Good	REMOVED
339	American Elm	22	Good	REMOVED
340	Oak	15	Good	REMOVED
341	American Elm	12	Good	REMOVED
342	Oak	12	Good	REMOVED
343	Oak	12	Good	REMOVED
344	Black Oak	22	Good	REMOVED
345	Black Oak	60	Good	REMOVED
346	Sassafras	12	Good	REMOVED
347	Oak	23	Good	REMOVED
348	Oak	21	Good	REMOVED
349	Oak	21	Good	REMOVED
350	Black Cherry	15	Good	REMOVED
351	Black Oak	16	Good	REMOVED
352	Shagbark Hickory	20	Good	REMOVED
353	Shagbark Hickory	14	Good	REMOVED
354	Bitternut Hickory	12	Good	SAVED
355	Black Oak	36	Good	SAVED
356	Oak	14	Good	REMOVED
357	White Oak	12	Good	SAVED
358	Oak	21	Good	SAVED
359	Mulberry	18	Good	SAVED
360	American Elm	24	Good	SAVED
361	Oak	14	Good	SAVED
362	Oak	14	Good	SAVED
363	Black Oak	12	Good	SAVED
364	American Elm	12	Good	SAVED
365	Black Cherry	13	Good	SAVED
366	American Elm	22	Good	REMOVED
367	American Elm	15	Good	REMOVED
368	American Elm	12	Good	REMOVED
369	Oak	12	Good	REMOVED
370	American Elm	21	Good	REMOVED
371	Black Oak	16	Good	REMOVED
372	Black Oak	29	Good	REMOVED
373	Black Oak	29	Good	REMOVED
374	Black Oak	24	Good	REMOVED
375	Black Oak	20	Good	REMOVED
376	Black Oak	25	Good	REMOVED
377	Oak	17	Good	REMOVED
378	Oak	17	Good	REMOVED
379	Black Oak	22	Good	REMOVED
380	Black Oak	12	Good	REMOVED
381	Black Oak	22	Good	REMOVED
382	Black Oak	22	Good	REMOVED
383	White Oak	12	Good	REMOVED
384	Oak	14	Good	REMOVED
385	Black Oak	16	Good	REMOVED
386	American Elm	12	Good	REMOVED
387	Oak	14	Good	REMOVED
388	Oak	16	Good	REMOVED
389	Shagbark Hickory	15	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
390	Sassafras	12	Good	REMOVED
391	Black Oak	23	Good	REMOVED
392	Oak	24	Good	REMOVED
393	Oak	14	Good	REMOVED
394	Oak	12	Good	REMOVED
395	Black Oak	12	Good	REMOVED
396	Sassafras	14	Good	REMOVED
397	Sassafras	14	Good	REMOVED
398	Oak	14	Good	REMOVED
399	Bitternut Hickory	13	Good	REMOVED
400	Bitternut Hickory	14	Good	REMOVED
401	American Elm	13	Good	REMOVED
402	Shagbark Hickory	12	Good	REMOVED
403	Bitternut Hickory	15	Good	SAVED
404	Black Cherry	12	Good	SAVED
405	White Oak	20	Good	SAVED
406	American Elm	12	Good	SAVED
407	Black Cherry	12	Good	REMOVED
408	Black Oak	12	Good	REMOVED
409	Black Oak	14	Good	REMOVED
410	Black Oak	18	Good	REMOVED
411	Oak	21	Good	REMOVED
412	Black Oak	13	Good	SAVED
413	Oak	12	Good	REMOVED
414	Black Oak	12	Good	REMOVED
415	Oak	17	Good	REMOVED
416	Oak	15	Good	REMOVED
417	Oak	13	Good	REMOVED
418	Oak	20	Good	REMOVED
419	American Elm	16	Good	REMOVED
420	Oak	15	Good	REMOVED
421	Black Oak	12	Good	REMOVED
422	Black Oak	12	Good	SAVED
423	Black Oak	12	Good	SAVED
424	Black Oak	14	Good	SAVED
425	Black Oak	17	Good	REMOVED
426	Oak	19	Good	REMOVED
427	Black Oak	18	Good	REMOVED
428	Oak	14	Good	REMOVED
429	American Elm	12	Good	REMOVED
430	Black Oak	20	Good	REMOVED
431	Black Oak	21	Good	REMOVED
432	American Elm	14	Good	REMOVED
433	American Elm	14	Good	REMOVED
434	Oak	12	Good	REMOVED
435	Oak	14	Good	REMOVED
436	Black Oak	14	Good	REMOVED
437	Black Cherry	15	Good	REMOVED
438	Black Oak	14	Good	REMOVED
439	Black Oak	15	Good	REMOVED
440	Black Ash	12	Good	REMOVED
441	Shagbark Hickory	12	Good	REMOVED
442	Black Ash	12	Good	REMOVED
443	Black Oak	18	Good	SAVED

MISS DIG 811

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP

MICHIGAN

TREE INVENTORY

KHA PROJECT 191292003

DATE 02/26/2026

SCALE: AS SHOWN

DESIGNED BY: CFK

DRAWN BY: CFK

CHECKED BY: RAH

SHEET NUMBER

LP202

Kimley»Horn
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TROY, MICHIGAN 48083
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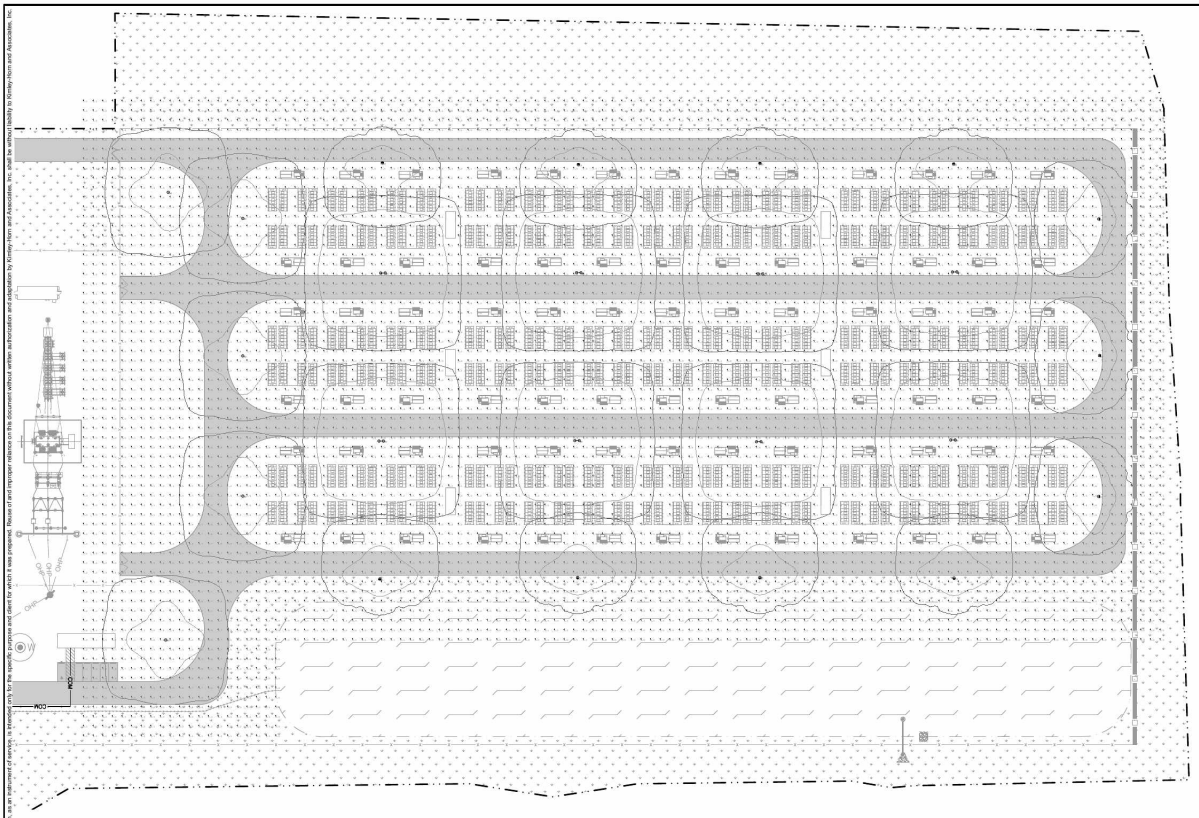
CIP
Copenhagen Infrastructure Partners

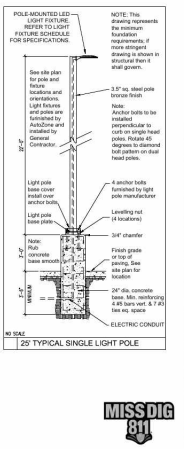
STATE OF MICHIGAN BRIAN JANNSON ENGINEER 6201101208 LICENSED PROFESSIONAL ENGINEER

Brian Jannson

No.	REVISIONS	DATE	BY
	ENTITLEMENT SET	02/26/2026	BRG

EXHIBIT E: PHOTOMETRIC PLAN





GENERAL NOTES

1. PROPOSED POLE MOUNTED LUMINAIRES TO BE POST TOP MOUNTED ON A 25 FOOT POLE ATOP A CONCRETE BASE FLUSHED MOUNTED WITH THE GROUND UNLESS OTHERWISE SPECIFIED. POLE MOUNTING HEIGHT CHOSEN TO COMPLY WITH THE TOWNSHIP OF GUN PLAIN CHARTER, MICHIGAN JURISDICTIONAL STANDARDS.
2. CALCULATED VALUES ARE DERIVED THROUGH A COMPUTER BASED MODEL WITH LIGHT FIXTURE DATA AS SUPPLIED BY MANUFACTURER THROUGH IES FILES.
3. ANY DEVIATION FROM SPECIFIED FIXTURE MODELS AND MOUNTING HEIGHTS IN THIS EXHIBIT WILL DISCOUNT THE VALIDITY OF THESE CALCULATIONS.
4. NO EXCESS OF 0.2 FOOT-CANDLE MEASURED AT THE PROPERTY LINE.
5. ALL C LIGHT FIXTURES SHALL INCLUDE EXTERNAL GLARE SHIELD AND NOT CREATE GLARE.
6. ALL LUMINAIRE SYMBOLS ARE DIAGRAMMATIC ONLY. CONTRACTOR TO FIELD COORDINATE EXACT LOCATIONS AND SETBACKS AGAINST UNDERGROUND UTILITY AND OTHER OBSTRUCTIONS.
7. ALL PROPOSED LUMINAIRES SHALL BE DARK SKY COMPLIANT AND SHALL HAVE A CORRELATED COLOR TEMPERATURE (CCT) OF 3000K OR LOWER. LUMINAIRES SHALL BE DESIGNED AND INSTALLED TO MINIMIZE UPLIGHT, GLARE, AND LIGHT TRESPASS IN ACCORDANCE WITH APPLICABLE LOCAL ORDINANCES.

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

LIGHT FIXTURE SCHEDULE

FIXTURE TAG	SYMBOL	QTY	DESCRIPTION	ARRANGEMENT	LLF	LUMENS	LUMINAIRE WATTS	MOUNTING HEIGHT(FT)
A1		5	DSX1 LED P7 30K 70CRI T5W	SINGLE	0.9	22609	184	25
B1		8	DSX1 LED P7 30K 70CRI T5W	BACK-TO-BACK	0.9	22609	184	25
C1		11	DSX1 LED P7 30K 70CRI T5W EGS	SINGLE	0.9	15626	184	25

CALCULATION SUMMARY

LABEL	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
CALCPTS_1	ILLUMINANCE	FC	0.64	3.30	0.00	N/A	N/A
ISLAND_1	ILLUMINANCE	FC	0.80	3.30	0.00	N/A	N/A
ISLAND_2	ILLUMINANCE	FC	0.75	2.30	0.00	N/A	N/A
ISLAND_3	ILLUMINANCE	FC	0.81	3.10	0.00	N/A	N/A

LIGHT DISTRIBUTION AND RANGE (FC)

	0.5 - 1.0
	> 1.0

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Copenhagen Infrastructure Partners

BRIAN JENNINGS
STATE OF MICHIGAN
JENNINGS
P-0101-0125
PROFESSIONAL ENGINEER

Brian Jennings

KHA PROJECT 191250003
DATE 12/12/2025
SCALE AS SHOWN
DESIGNED BY NA
DRAWN BY TZ
CHECKED BY NA

PHOTOMETRICS PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON BESS

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TWP MICHIGAN

SHEET NUMBER
PP100

K:\TCOV_LDEV\Copenhagen Infrastructure Partners\Heron BESS_M\2 Design\CAD\PlanSheets\PP100-PHOTOMETRICS PLAN.dwg March 13, 2026 - 11:43am

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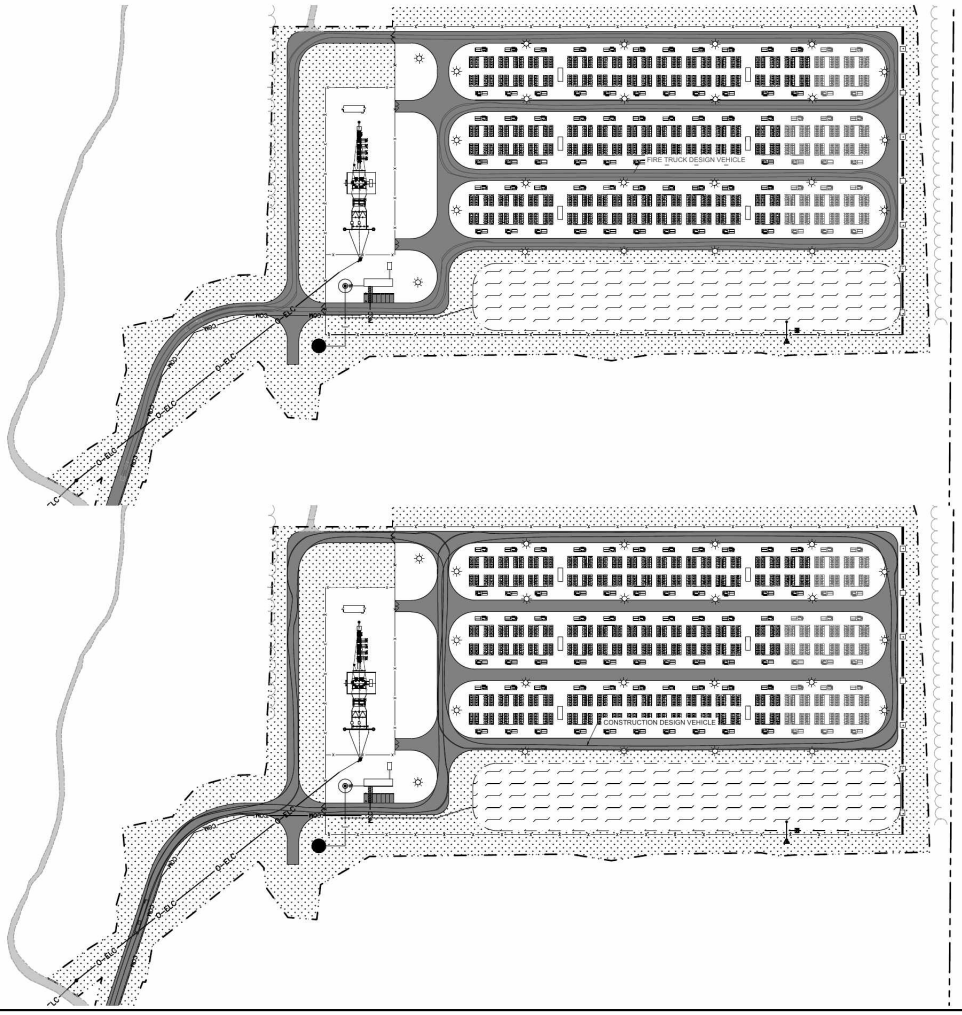
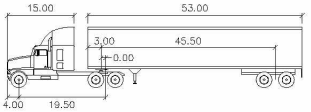
EXHIBIT F: TRUCK CIRCULATION PLAN



LEGEND

- PROPERTY LINE
- PARCEL LINE
- RIGHT-OF-WAY LINE
- LIMITS OF DISTURBANCE
- PROPOSED SITE FENCE
- O-ELC — PROPOSED GEN-TIE ROUTE, BY OTHERS
- PROPOSED GATE
- BATTERY ENCLOSURE
- BATTERY ENCLOSURE (AUGMENTED)
- LIGHT FIXTURE, SEE PHOTOMETRIC PLAN FOR DETAILS
- PROPOSED ACCESS ROAD - SURFACE SECTION TBD
- PROPOSED STORM WATER POND
- PROPOSED LANDSCAPING, SEE LANDSCAPE PLANS
- BESS YARD ROCK, SIZE AND DEPTH TBD
- PROPOSED RIP RAP
- PROPOSED SOUND WALL

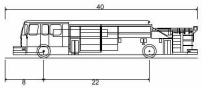
CONSTRUCTION DESIGN VEHICLE



WB-67

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

FIRE TRUCK DESIGN VEHICLE



Pumper Fire Truck

Overall Length	40.000ft
Overall Width	8.167ft
Overall Body Height	7.745ft
Min Body Ground Clearance	0.656ft
Track Width	8.167ft
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

THE VEHICLE MANEUVERING IDENTIFIED ON THIS PLAN WAS PREPARED USING VEHICLE TRACKING SOFTWARE AND DOES NOT NECESSARILY REPRESENT ACTUAL CONDITIONS NOR DOES IT ACCOUNT FOR EXTERNAL FACTORS. THIS ANALYSIS SHOULD NOT BE USED AS THE SOLE BASIS FOR THE CLIENT'S DECISION MAKING

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

MISS DIG 811

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Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN JANNON
PROFESSIONAL ENGINEER
No. 6201053

Brian Jannon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BFG

CIRCULATION PLAN

HERON ENERGY STORAGE LLC

PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
C410

K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_MY2 Design\CAD\PlanSheets\C4-CIRCULATION PLAN.dwg March 13, 2026 - 11:39am
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EXHIBIT G: NOISE STUDY

Kimley»Horn
of Michigan, Inc.

March 16, 2026

Simone Marletti
Heron Energy Storage LLC
c/o Copenhagen Infrastructure Service Co.

Subject: ***Heron BESS – Noise Study***
Gun Plain Charter Township, Allegan County, Michigan

Executive Summary

The purpose of this technical memorandum is to summarize the evaluated sound levels associated with the operational equipment to be located at the proposed Heron Battery Energy Storage System (BESS) site located in Gun Plain Charter Township, MI. The proposed Heron BESS project site is located approximately 1.5 miles east of Plainwell, approximately 7.5 miles northwest of Richland, approximately 7.5 miles north of Kalamazoo, and 9 miles southwest of Delton. The site is generally located south of Allegan Street/M-43/M-89, east of 4th Street, and north of Riverview Drive/Industrial Parkway. Additionally, Grand Elk Railroad, LLC (GDLK) railroad tracks are located approximately 1.5 miles west of the site. The Heron BESS site will be located on agricultural land with residences to the north, east, and south and an existing substation to the west. The location of the proposed Heron BESS site is shown in **Figure 1**.

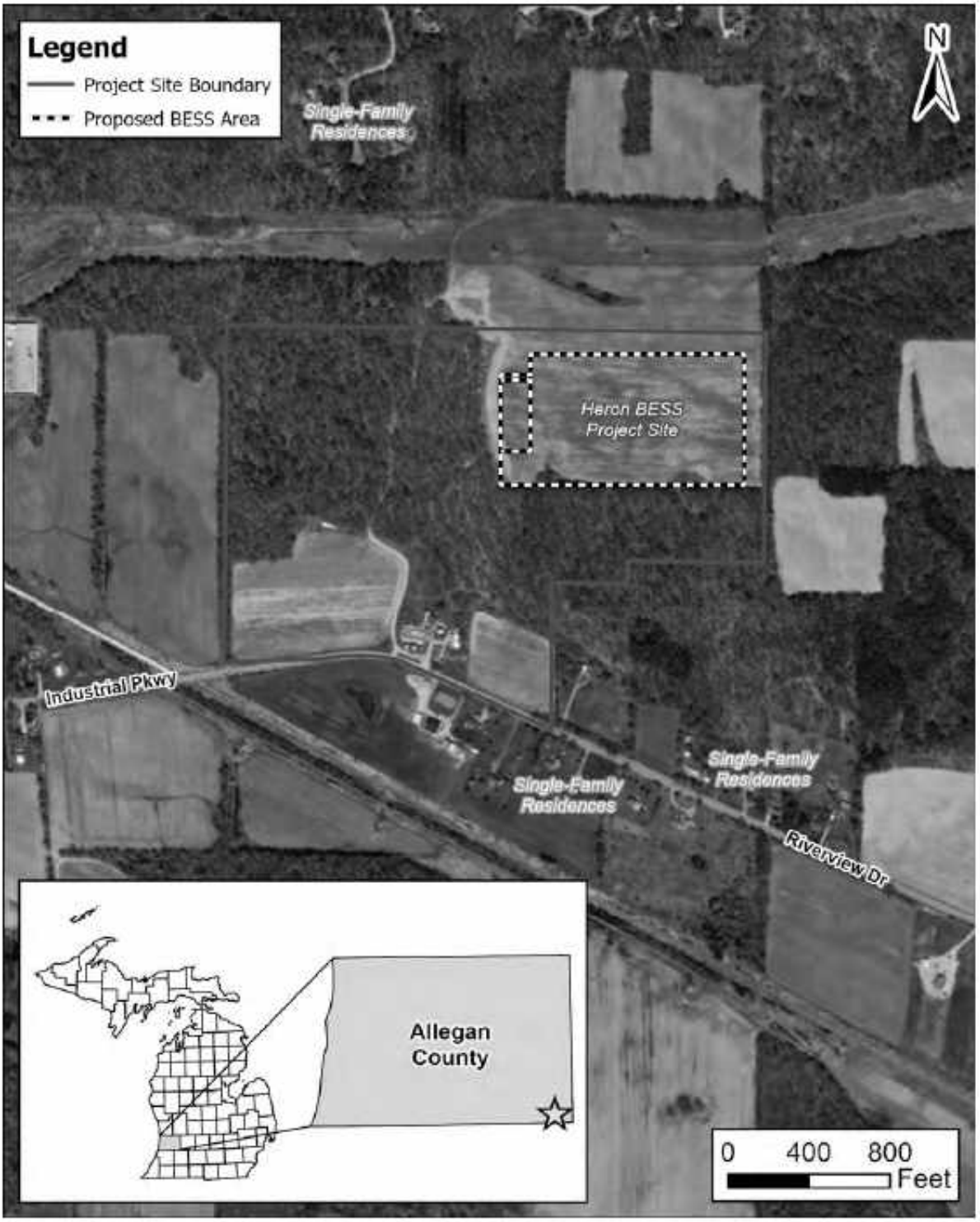
Analysis Findings

- *The Heron BESS site will be located on agricultural land with residences to the north, east, and south and an existing substation and railroad tracks to the west. The Gun Plain Charter Township Zoning Ordinance establishes an allowable sound level of 55 dB(A) as measured at the property line of an adjacent non-participating property. Unmitigated equivalent operational noise levels at the project boundary were estimated to be near or below approximately 58 dB(A) during peak operations; therefore, noise mitigation is recommended at this time. To mitigate noise, a 10-foot sound wall, approximately 600 feet in length, is recommended on the eastern edge of the property near the proposed BESS area.*

Project Description

The proposed Heron BESS site will be constructed on nearly 23 acres of approximately 34 acres of agricultural land in Gun Plain Charter Township, MI. The proposed site will consist of a BESS area towards the northeast corner of the property with seventy-eight (78) inverters, three hundred twelve (312) battery storage cabinets, and a substation located directly west of the BESS area.

Figure 1: Site Location and Vicinity



Characteristics of Noise

Noise is generally defined as unwanted sound. It is emitted from many natural and man-made sources. Sound pressure levels are usually measured and expressed in decibels (dB). The decibel scale is logarithmic and expresses the ratio of the sound pressure unit being measured to a standard reference level. Most sounds occurring in the environment do not consist of a single frequency, but rather a broad band of differing frequencies. The intensities of each frequency add together to generate sound. Because the human ear does not respond to all frequencies equally, the method commonly used to quantify environmental noise consists of evaluating all of the frequencies of a sound according to a weighting system. It has been found that the A-weighted decibel [dB(A)] filter on a sound level meter, which includes circuits to differentially measure selected audible frequencies, best approximates the frequency response of the human ear.

The degree of disturbance from exposure to unwanted sound – noise – depends upon three factors:

1. The amount, nature, and duration of the intruding noise
2. The relationship between the intruding noise and the existing sound environment; and
3. The situation in which the disturbing noise is heard

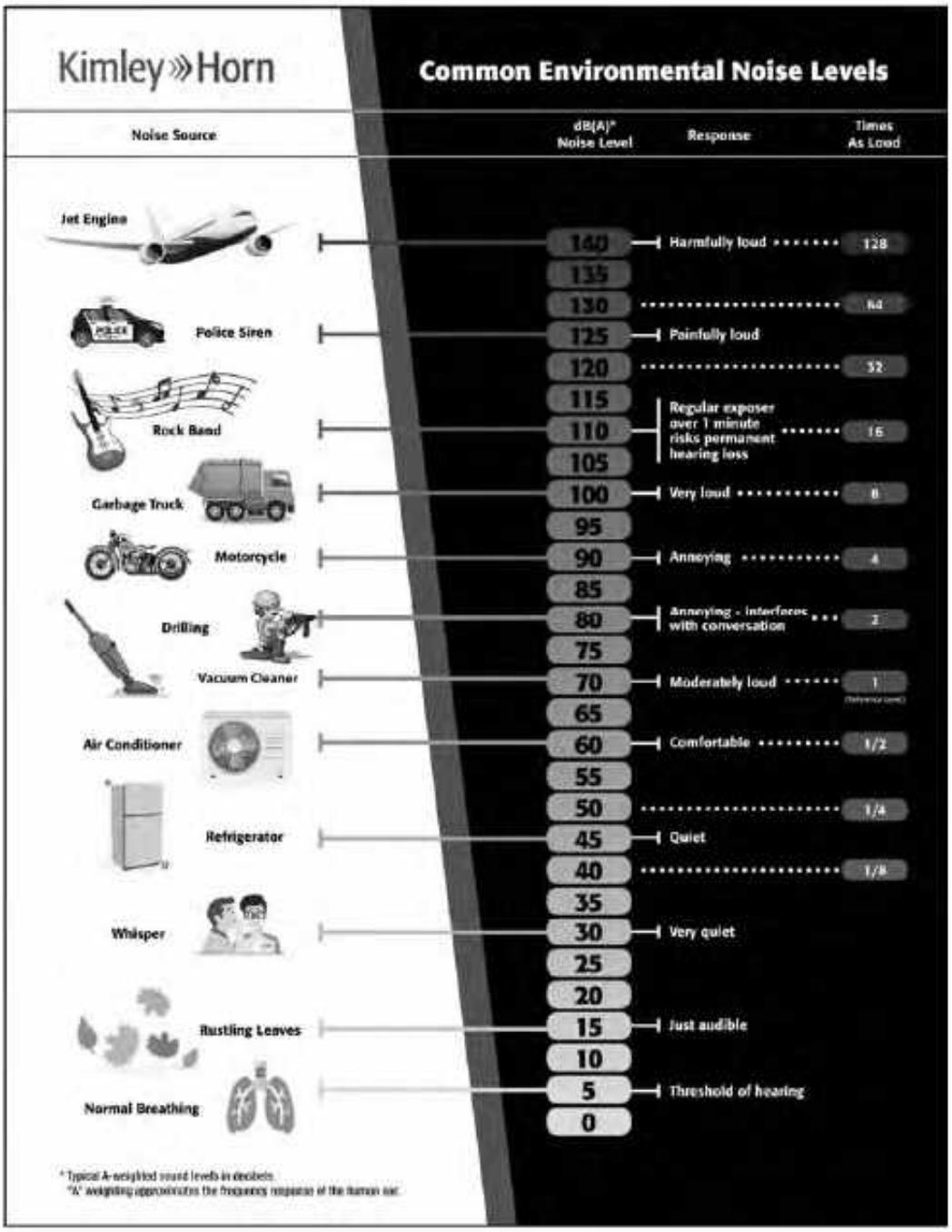
In considering the first of these factors, it is important to note that individuals have varying sensitivity to noise. Loud noises bother some people more than other people, and some individuals become increasingly upset if an unwanted noise persists. The time patterns and durations of noise(s) also affect perception as to whether or not it is offensive. For example, noises that occur during nighttime (sleeping) hours are typically considered to be more offensive than the same noises in the daytime.

With regard to the second factor, individuals tend to judge the annoyance of an unwanted noise in terms of its relationship to noise from other sources (background noise). A car horn blowing at night when background noise levels are low would generally be more objectionable than one blowing in the afternoon when background noise levels are typically higher. The response to noise stimulus is analogous to the response to turning on an interior light. During the daytime an illuminated bulb simply adds to the ambient light, but when eyes are conditioned to the dark of night, a suddenly illuminated bulb can be temporarily blinding.

The third factor – situational noise – is related to the interference of noise with activities of individuals. In a 60 dB(A) environment such as is commonly found in a large business office, normal conversation would be possible, while sleep might be difficult. Loud noises may easily interrupt activities that require a quiet setting for greater mental concentration or rest; however, the same loud noises may not interrupt activities requiring less mental focus or tranquility.

As shown in **Figure 2**, most individuals are exposed to fairly high noise levels from many sources on a regular basis. To perceive sounds of greatly varying pressure levels, human hearing has a non-linear sensitivity to sound pressure exposure. Doubling the sound pressure results in a three decibel change in the noise level; however, variations of three decibels [3 dB(A)] or less are commonly considered "barely perceptible" to normal human hearing. A five decibel [5 dB(A)] change is more readily noticeable. A ten-fold increase in the sound pressure level correlates to a 10 decibel [10 dB(A)] noise level increase; however, it is judged by most people as only sounding "twice as loud".

Figure 2: Common Noise Levels



Over time, individuals tend to accept the noises that intrude into their lives on a regular basis. However, exposure to prolonged and/or extremely loud noise(s) can prevent use of exterior and interior spaces and has been theorized to pose health risks.

Noise Regulations

The proposed Heron BESS site is located in Gun Plain Charter Township, MI. According to Chapter 17, Section 17.36, Section II(7) of the Gun Plain Charter Township Zoning Ordinance, "The [energy storage] system may not generate a maximum sound in excess of 55 average hourly decibels as measured at the property line of an adjacent non-participating property."

Noise Analysis

Operational sound levels from the proposed Heron BESS site were evaluated using SoundPLAN. This program computes predicted sound levels at noise-sensitive areas through a series of adjustments to reference sound levels. SoundPLAN also accounts for topography, groundcover type, and intervening structures. Sound levels generated from inverters, the transformer at the substation, and battery storage cabinets are anticipated to be the main sources of sound from the proposed BESS site.

It should be noted that noise from surrounding roadways was not modeled in this analysis, although Allegan Street/M-43/M-89, 4th Street, Riverview Drive/Industrial Parkway, and other nearby roadways are anticipated to contribute to the ambient noise environment throughout the entire day. According to the Federal Railroad Administration (FRA) Rail Crossing Inventory, the GDLK railroad tracks located west of the project site are anticipated to have approximately two (2) train pass-by events during daytime hours and approximately one (1) train switching event daily. However, noise from train pass-by and switching events was not modeled in this analysis.

Inverters

Inverter equipment can generate steady, unvarying sound that may create issues when located near noise-sensitive areas. According to the current site layout, seventy-eight (78) inverters will be located on the site directly north or south of the battery cabinets. Based on noise emission information provided for the EPC Power M10 Inverter, a reference sound pressure level of 75 dB(A) at 1 meter (i.e., 3 feet) for each inverter was used. The sound from the simultaneous operation of the inverter equipment was calculated at the closest adjacent non-participating property boundary using SoundPLAN.

Transformers

Transformers can also generate steady, unvarying sound that may create issues when located near noise-sensitive areas. It was assumed that one (1) transformer would be located at the substation directly west of the BESS area. Based on emission levels for typical transformer equipment, a reference sound level of 75 dB(A) at 1 meter was used. The sound from the operation of the transformer was calculated at the closest adjacent non-participating property boundary using SoundPLAN.

Sound generated by the transformer is not anticipated to significantly contribute to the existing environmental sound levels surrounding the site. Also, sound generated by the transformer is expected to be mitigated by providing sufficient offsets between the transformer and surrounding noise-sensitive land uses.

Battery Storage Cabinets

Battery storage cabinets can also generate steady, unvarying sound that may create issues when located near noise-sensitive areas. According to the current site layout, three hundred twelve (312) battery storage cabinets will be located on the site in the BESS area in the northeast portion of the site. The battery storage cabinets in the BESS area will contain up to three (3) chillers and four (4) HVAC units. Based on noise emission information provided for the LG JF2 DC Link 5.1, a reference sound pressure level of 70 dB(A) at 1 meter for each chiller was used and a reference sound pressure level of 71 dB(A) at 1 meter for each HVAC unit was used. The sound from the simultaneous operation of the battery storage cabinet chillers and HVAC units was calculated at the closest adjacent non-participating property boundary using SoundPLAN. It was assumed that the chillers and HVAC units are located facing the aisles between cabinets.

Results

The SoundPLAN-predicted maximum equivalent operational sound levels at the closest property line of an adjacent non-participating property are anticipated to be near or below approximately 58 dB(A) which exceeds the established noise level limit of 55 dB(A). The anticipated operational noise contours are shown in **Figure 3**.

Figure 3: Anticipated Operational Noise Contours

Noise Abatement Measures

Passive noise abatement measures are effective because they absorb sound energy, extend the source-to-receptor sound transmission path, or both. Sound absorption is a function of abatement medium (e.g. earth berms absorb more sound energy than noise walls of the same height because earth berms are more massive). The source-to-receptor path is extended by placement of an obstacle, such as an earth berm or concrete wall, that sufficiently blocks the transmission of sound waves that travel from the source to the receptor.

Sound barriers are primarily constructed as earth berms or solid-mass walls adjacent to sources of noise that are in proximity to noise-sensitive land use(s). To be effective, a sound barrier must be long enough and tall enough to shield potentially impacted areas.

Since on-site operational noise levels are predicted to exceed the allowable sound level established in the Gun Plain Charter Township Zoning Ordinance in the eastern portion of the Heron BESS site, noise abatement was analyzed to reduce noise levels from the anticipated operations to be near or below 55 dB(A).

A 10-ft sound wall, along the eastern edge of the project boundary near the proposed BESS area in the northeast portion of the site, was determined to reduce the anticipated on-site operational noise by up to approximately 2 dB(A) at the project property boundary, which is anticipated to reduce on-site operational noise levels to be near or below the established sound level limit of 55 dB(A). The proposed wall would be approximately 600 feet in length. The anticipated operational noise contours with the analyzed sound wall are shown in **Figure 4**.

Conclusions

The proposed BESS project site is generally located south of Allegan Street/M-43/M-89, east of 4th Street, and north of Riverview Drive/Industrial Parkway. Additionally, GDLK railroad tracks are located approximately 1.5 miles west of the site. The Heron BESS site will be located on agricultural land with residences to the north, east, and south and an existing substation to the west.

After modeling and analyzing the anticipated worst-case operational scenarios at the proposed Heron BESS site, it was determined that on-site operational noise levels are anticipated to exceed the noise level limit established in the Gun Plain Charter Township Zoning Ordinance. As a result, a 10-foot sound wall along the eastern edge of the project boundary near the proposed BESS area in the northeast portion of the site is recommended for implementation.

Figure 4: Anticipated Operational Noise Contours with Sound Wall

EXHIBIT H: DECOMMISSIONING PLAN

DECOMMISSIONING PLAN

HERON BESS

GUN PLAIN

ALLEGAN COUNTY, MI

PREPARED FOR:

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Prepared on: March 13, 2026

Kimley»Horn
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APPENDICES

Appendix A **14**

1. INTRODUCTION

1.1 PURPOSE

This decommissioning plan is provided by Heron Energy Storage, LLC. (or the "Project Company") and will detail the projected decommissioning demands associated with the proposed project.

The purpose of this decommissioning plan is to provide procedures and an opinion of probable construction cost for partial or full closure and removal of the Battery Energy Storage System (BESS) facility. Allegan County requires a decommissioning plan to supplement plans submitted as part of a Special Use Permit (SUP) package. This decommissioning plan details provisions for facility deconstruction and site restoration and shall ensure that the site will be restored to a useful, nonhazardous condition. This decommissioning plan shall take effect upon facility abandonment, discontinuation of operation, or expiration of the use permit as defined by Gun Plain Township.

1.2 SITE LOCATION

Heron Energy Storage, LLC. is proposing to develop a BESS facility with a nameplate capacity of approximately 250 MW / 1,000 MWh in Gun Plain Township, Allegan County, Michigan. The project site is located North of Industrial Pkwy, South of Allegan Street, and west of 4th Street in Allegan County, Michigan and within tax parcel identification number 08-034-021-50 and is zoned agricultural.

Heron Energy Storage, LLC. will design and permit the project with the authorities having jurisdiction, including Gun Plain Township. Upon permit issuance, Owner/Operator will manage the construction, operation, and decommissioning of the project.

1.3 ANTICIPATED SERVICE LIFE

Unless the system is purchased by Gun Plain Township or other entity, the facility shall be decommissioned in accordance with this Decommissioning Plan ("Plan"), restoring the site to as close to its agreed-upon post-decommissioned state as practicably possible upon expiration or termination of the Power Purchase Agreement. Heron BESS has an anticipated project life of 20 years, with the option to re-evaluate for continuation or decommissioning at the end of this 20-year period.

Decommissioning responsibilities shall include:

- Removal of aboveground and below ground cables, equipment, structures, fences, and foundations
- Restoration of the surface grade and soil after removal of equipment
- Revegetation of restored soil areas with native seed mixes, excluding any invasive species
- Management of materials and waste, projected costs, and a decommissioning fund agreement overview
- The time frame for the completion of site restoration work
- All other requirements of the Gun Plain Township Zoning Board of Appeals

This decommissioning plan shall take effect upon any of the following conditions:

- The land lease (including the exercise of any extension options) ends and will either not be renewed or a new lease will not be entered into for the Project.
- The system does not produce power for sale for a consecutive 12-month period, except in the instance of a force majeure event in which the Project is being repaired and/or restored.
- The system is damaged and will not be repaired or replaced.
- System abandonment, discontinuation of operation, or as required by the Gun Plain Township Zoning Board of Appeals.

1.4 DECOMISSIONING RISK OVER PROJECT LIFECYCLE

The probability of an event that would lead to abandonment or long-term interruption is extremely low during the first 15 to 20 years of the Project life. Accordingly, the risk of decommissioning the Project is extremely low during this time frame. The reasons why the risk to decommission the Project is extremely low in the early phases of the Project include, but are not limited to:

- Project owners have sophisticated financing structures that allow the lender or tax equity partner to step in and rectify the event that may lead to abandonment.

- Most critical BESS components have original equipment manufacturer (OEM) warranties with terms exceeding five years that include labor and parts. A warranty is an agreement or guarantee outlined by a manufacturer to a customer that defines performance requirements for a product or service. Warranties give customers a form of insurance if the purchased product or service does not adhere to quality standards. These warranties assure the Project owner, financing parties, and other stakeholders, that equipment will perform as expected which minimizes the risk of a decommissioning event. Average warranty lengths for critical BESS components range from 10 to 15 years, with some warranties on BESS units extending to 20 or 25+ years.

- BESS projects consist of many networked components designed to store and release electrical energy. The failure of any single component will not result in a substantial reduction of energy generation that could lead to a decommissioning event.

- BESS projects are required to maintain replacement value property damage insurance coverage and business interruption insurance coverage. Business interruption insurance covers the loss of income that a business suffers after a disaster or equipment failure.

- The replacement costs of BESS components will typically decline over time, and accordingly, costs to replace failed or damaged equipment after lapsed OEM warranties will not create large financial hurdles for the Project.

- In the early stages of the Project, the resale value of the equipment is significantly higher than the decommissioning costs, resulting in a net positive (revenue).

Per BESS Ordinance No. 187, the Project will provide a surety bond or cash deposit for site decommissioning and stabilization.

Battery Energy Storage Systems (BESS) are an increasingly popular form of grid stability and backup power around the world and are an essential energy option for the future of the planet. BESS also offers the additional benefit of being easier to build, operate, and decommission with minimal environmental risks. Recent rises in popularity and use can be linked to lower installation and operation costs and it is expected that this pattern will continue, further reducing the risk of a decommissioning event.

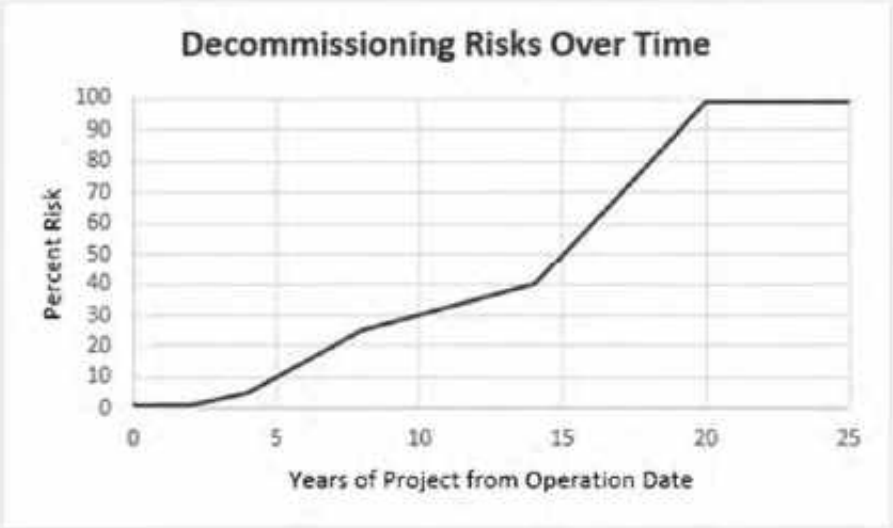
1.5 DECOMMISSIONING RISKS OVER TIME

As previously noted, the probability of a decommissioning event that would lead to abandonment or long-term financial interruption is extremely low during the first 15 to 20 years of the Project life and accordingly, the financial risk to decommission the Project is also extremely low. A risk analysis approach is presented here for informational purposes only and has not been considered in the decommissioning cost estimates present in this Plan.

It is important to note that there are two aspects to consider when evaluating the risk for decommissioning the Project:

1. The risk of the need to decommission the Project as a whole (Project termination risk), and
2. The risk of failing to recuperate the cost of the decommissioning activities (decommissioning funding).

The most important concern for the Gun Plain Township Zoning Board of Appeals is the ability to recuperate the cost of decommissioning and restoration of the land to pre-Project conditions. The presence of a Power Purchase Agreement (PPA) in the first 20 years of the Project makes the likelihood of decommissioning very low during that time. The graph below summarizes the estimated decommissioning risk of cost recovery for the Project. The graph utilizes a "one percent" risk as the lowest risk; however, the financial value of the Project or equipment in the early years would far exceed the cost of the decommissioning and restoration activities and therefore, the graph is conservative.



The factors taken into consideration in estimating the risk include, but were not limited to:

- Years 1-5 – Minimal Project termination or financial risk due to presence of PPA with guarantee to purchase power, resale of value components, component warranties, value of facility.
- Years 5-10 – Similar consideration of previous period, except minimal increased financial risk due to the decrease in resale value of used components and rise in technological improvements of new equipment in market.
- Years 10-15 – Similar consideration of previous period, with slightly increased risk as warranties start to expire. Value of equipment is still substantial but decreasing.
- Years 15-20 – Similar consideration of previous period, warranties continue to expire; value of equipment diminishes with age and technological improvements in market.

Years 20-25 – PPA expires, Project termination and funding risks increase, value of equipment diminishes, and technological improvements in market. A rise in salvage value of removed equipment due to diminishing natural resources and improvements in the efficiency of recycling/extraction technologies will offset the cost of decommissioning. Per Township requirements, salvage value is not considered in the decommissioning cost estimate.

2. PROJECT COMPONENTS

2.1 SITE WORK PREPARATION

Prior to construction, appropriate construction best management practices shall be installed. This includes, but is not limited to, construction entrance and soil stabilization, perimeter control, and other security and erosion and sediment control measures. The stockpile area shall be delineated upon the implementation of silt fence or approved equal.

2.2 PROPOSED SITE IMPROVEMENTS

The existing site is approximately 92 acres and has historically operated as agricultural row crops. The project area for the proposed BESS facility is approximately 25.60 acres. The existing contour elevations within the project area range from 845' – 870'. Slopes are generally lower on the Northeast quadrant, averaging around 5-10%. In the remaining quarters of the site a range of 4-40% is present. within the wooded areas on the southern and western sides of the site, around 10-15%, and slopes are less within the row crop area, around 2-5%. Existing crops appear to be corn or soybean based on historical aerial imagery.

The proposed site conditions include gravel access road, gravel ground cover, substation area, battery storage system equipment, and grass lined stormwater control pond. These developments will be located within the existing row crop area of the site. The entrance of the asphalt drive will be along an existing dirt agricultural access road off of Industrial Pkwy to the south. The proposed access drive will run through existing forested area to the south of the row crops, and the trees within this area will be removed. Additional tree removal along the southern edge of the row crops as well as clearing and grubbing of the row crops is proposed. Re-grading will occur within the BESS and substation area.

2.3 BESS/ELECTRICAL EQUIPMENT

Initially on site there will be 248 battery enclosures and 62 skids installed in the project. The first augmentation in year 5 will install 64 battery enclosures and 16 skids at the end of the system's installation. Electrical equipment shall be installed on concrete pads and shall maintain clearances as required by Gun Plain Township, National Electric Code ("NEC"), and National Fire Protection Association ("NFPA"). To connect the battery containers to the on-site substation 11,223 linear feet of medium voltage wiring and 5,647 linear feet of low voltage wiring are proposed.

2.4 STORMWATER MANAGEMENT

Post-development stormwater runoff will be captured by proposed stormwater ponds on-site. The storm water basin will be located next to the BESS facility to capture, detain/retain, and treat runoff as well as protect the site from flooding during the project lifespan. The basin will be decommissioned with the rest of the project in addition to the site equipment. The stormwater basin will be backfilled with soil similar to existing soils in the project site.

2.5 SITE ACCESS

The project will feature internal roadways and perimeter fencing. All access roads on the site will comply with county regulations for emergency response and equipment manufacturer specifications for delivery and maintenance. During the project's lifespan, the roadways and fencing will be consistently maintained. After decommissioning, the access roads may be kept to ensure continued access to the property area

3. PROJECT DECOMMISSIONING AND RECYCLING

3.1 DECOMMISSIONING OBJECTIVES

The decommissioning plan adheres to the standards of the Battery Energy Storage System (BESS) industry and standard lease and easement agreement terms. The decommissioning process will ensure the safe execution of the following tasks:

1. Remove and clean every battery storage unit or energy storage device, transformer, balance of plant (BOP) equipment, and substation equipment constructed on the property.

2. Remove and clean all structural foundations of the battery storage facility on the property. All holes or cavities created during removal will be backfilled with the excavated soil. Foundations will be removed to a depth of three feet.

3. Remove and clean all buried cables, including power, grounding, fiber-optic, and communication cables installed on the property. Any holes or cavities created during removal will be backfilled with the excavated soil. Cables buried deeper than four feet will remain.

4. Remove all overhead power or communication lines constructed on the property. Disconnection from the utility power grid.

5. Remove all stormwater basins established on the property. All holes or cavities created during removal will be backfilled with the excavated soil.

6. Remove all fences, gates, and onsite access roads established on the property. All holes or voids created during removal will be backfilled with the excavated soil.

7. Remove all underground utilities, including water service, irrigation service, sanitary sewer, storm sewer installed on the property. Any holes or cavities created during removal will be backfilled with the excavated soil. Utilities buried deeper than three feet will remain with proper abandonment.

The decommissioning project will be approached as a single, comprehensive effort, allowing for the most cost-effective demolition methods. Various means and methods may be employed for the dismantling process, though the specific means and methods will be determined by the contractor performing the work to ensure safe dismantling of the project.

This decommissioning plan is based on current best management practices and procedures. This Plan may be subject to revision based on new standards and emergent best management practices at the time of decommissioning. Permits will be obtained as required and notification will be given to necessary stakeholders prior to decommissioning.

The Project Company is responsible for this decommissioning, provided however that the Project Company may contract with a third-party to perform the decommissioning on its behalf. Nothing in this plan relieves any obligation that the Project Company may have to remove the Facility as outlined in Special Use Permit in the event the operator of the Facility does not fulfill this obligation.

3.2 TIMELINE

Once it is determined that the Project has reached the end of its usable life and decommissioning should begin, a detailed decommissioning report will be prepared. This report will coordinate the schedules and stages of decommissioning activities, record the equipment or materials removed, document the recipients of disposed or recycled materials, track changes in equipment custody, and provide a final site condition report. Preparation for decommissioning should commence before ceasing site operations, with all decommissioning activities expected to be completed within 12 months of the Project's closure.

Decommissioning of various stages can happen concurrently, but decommissioning the site will generally follow the order below.

1. BESS battery units, transformers and support equipment
2. Substation components and transmission line structures (if required)
3. Foundations
4. Underground Cables and Utilities
5. Stormwater BMPs
6. Perimeter fencing
7. Site access and internal roadways

3.3 DECOMMISSIONING TASKS

Upon determining that the Project has reached the end of its life and decommissioning can commence, the Project will be disconnected from its point of interconnection (POI) at the substation located [direction] of the Project site. Prior to shutting down the facility, the Battery Energy Storage System (BESS) will be discharged to below 30% state of charge, or follow more stringent requirements set by the Department of Energy or Department of Transportation at the time of decommissioning. This ensures compliance with transportation guidelines for safely transferring the lithium-ion batteries for reuse or recycling. All

equipment on-site, from the Project's substation to the BESS enclosures, will be isolated and grounded to minimize potential energy risks to personnel. The contractor responsible for decommissioning will provide all necessary equipment and ensure compliance with lockout/tagout (LOTO) procedures to minimize risks. Proper personal protective equipment (PPE) will be required for all personnel at all times.

High-value assets will be removed early in the decommissioning schedule to reduce theft risk, improve cash flow, and separate recyclable materials for maximizing scrap recovery. High-value assets include precious alloys like copper, aluminum-brass tubes, stainless steel tubes, and other valuable metals used in plant systems. This category includes transformers, transformer coils, circuit breakers, electrical cables, batteries, and inverters. The removal methods will vary based on the asset's location and nature. Smaller transformers, equipment, and cables will likely be removed and shipped to scrap yards, while large transformers and inverters will require on-site disassembly before being sent to scrap yards.

Construction and Demolition (C&D) waste will be kept separate from scrap and concrete to prevent cross-contamination of waste or recycling streams. C&D demolition crews will use equipment like excavators with material handling attachments and skid steers to remove these materials. The materials will then be consolidated and loaded into bulk containers for disposal.

3.4 BESS BATTERY UNITS AND SUPPORT EQUIPMENT

The Project's Battery Energy Storage System (BESS) will be the first component to be removed from the site. All personnel working on the BESS equipment must be certified and trained in decommissioning procedures according to both manufacturer requirements and federal hazardous materials regulations. The batteries within the custom-built enclosures will be isolated down to the smallest individual component recommended by the manufacturer for on-site handling and then removed and packaged for reuse or recycling. Following the removal of battery modules, any internal equipment such as heating and cooling systems, fire suppression systems, and other components will be separated for recycling. The custom-built enclosures themselves will then be disassembled and separated for recycling. When decommissioning the electrical components, the grounding circuit will, whenever possible, be the last to be removed to ensure personnel safety. Foundations for the enclosures will remain in place until all other equipment has been disassembled and removed from the site. Specialized equipment needed for this task may include a crane, forklift, and specific equipment provided by the BESS manufacturer.

3.5 POWER CONVERSION SKIDS

All personnel decommissioning the power conversion equipment will be trained according to the manufacturer's requirements. Electrical cabling between battery enclosures and inverter or transformer components will be removed for recycling. Electronic equipment and transformers will be separated from power conversion equipment for resale or recycling. All on-site transformers will be drained of oil before being moved offsite. Cables connecting the power conversion systems to the Project substation will also be recycled. The grounding circuit will be the last to be removed whenever possible for safety. Foundations for the power conversion systems will remain until all other equipment is disassembled and removed. Specialized equipment may include a crane and tools from the power conversion system manufacturer.

3.6 AUXILIARY ELECTRICAL SYSTEMS

All personnel decommissioning the auxiliary electrical equipment will be trained according to the manufacturer's requirements. Auxiliary systems may include transformers, switchboards, panelboards, fire protection equipment, and heating and cooling systems. These components, connected to the BESS power conversion system, will be removed and organized for recycling per manufacturer recommendations and relevant regulations. Additional handling requirements may be needed for certain equipment before recycling. The grounding circuit will be the last to be removed whenever possible for safety. Foundations will remain until all equipment is disassembled and removed. Specialized equipment, such as a crane and forklift, may be needed for this work.

3.7 ELECTRICAL CABLES AND CONDUITS

All direct buried electrical cables and conduits between equipment must be excavated and removed. The materials will be separated for recycling or C&D waste disposal. The BESS ground grid and underground electrical cables connecting to the Project substation will be removed for recycling up to the substation yard. Gravel terrain will be removed and disposed of off-site. All cavities created will be filled with soil similar to the original soil intended for agricultural development. Specialized equipment may include graders, skid steers, excavators, bulldozers, and dump trucks.

3.8 FOUNDATIONS

The remaining structures and foundations will be demolished up to three feet. Steel components will be separated, crushed, and recycled. Concrete will be crushed and disposed of. At the end of this task, there should be no in-ground components of the project besides site fencing (See section 3.3.8 for site perimeter fencing).

3.9 STORMWATER BASIN

All site stormwater basins on site will be backfilled and graded to match existing terrain. All voids created in completing this work will be filled with soil consistent to the existing conditions.

3.10 PERIMETER FENCING

Perimeter fencing will remain until all other assets of the project have been removed. The fencing will continue to provide site security and safety during the decommissioning process. Once the rest of the site has been cleared, fencing will be removed, and materials will be sent to recycling or waste.

3.11 SITE ACCESS AND DRIVES

Internal site roadways and drives will be removed and restored to the original site conditions and grades. All materials removed will be reused or recycled. All voids created during this process will be filled with soil consistent to the existing conditions. Site access roads may be preserved after the project with written approval from the owner.

3.12 RESTORATION OF SITE

The projects disturbed land will be restored to the original uses before construction. This work will follow all removal as described in Section 3.3 above. Restoration will consist of re-grading to re-establish the preexisting topography. In order to adequately restore the site to its previous condition, documentation

using pre-construction video and/or digital photography will be performed prior to construction activities. This information will be reviewed prior to preparation of decommissioning demolition documents and included in the submittal to the Gun Plain Township. Pre-construction documentation will also consist of detailed descriptions of existing vegetative and soil conditions as well as existing topography and drainage patterns.

At the time of decommissioning, the Project Company will restore the BESS Facility to a meadow-like condition. All waste and excess materials will be disposed of in accordance with municipal, provincial and federal regulations. Waste that can be recycled under municipal programs will be recycled accordingly. Provided, however, the Project Company shall not be required to replace any structures that were removed to build the BESS Facility.

The restoration will consist of de-compaction of the topsoil by disking or tilling and re-vegetation of the property. The Project Company will provide dust control during site restoration. At the end of the project, the area will be seeded and fertilized with native vegetation as needed to return the site to as close as practicable to original or initially agreed-upon condition. The future use of the land will be determined at the time of decommissioning. Deciding factors will be influenced by Gun Plain Township land use and comprehensive plans and regulations at such time in the future.

The developer will coordinate with the Gun Plain Township to monitor vegetation and drainage following restoration until permanent vegetation is established. Erosion and sediment control, re-seeding, soil stabilization, weed control and fertilization will be provided by the developer as needed until the site is stabilized and approved to be completed by the Gun Plain Township.

Upon completion of the site restoration, a final report of activities will be submitted to the Gun Plain Township documenting the process and results.

4. PROJECT DECOMMISSIONING COSTS

An engineer's opinion of probable construction cost was prepared as part of this decommissioning plan. Appendix A summarizes the probable costs associated with decommissioning.

Industry standard prices in 2026 for removal costs were determined using RSMeans cost data supplemented with other local data. Removal cost includes materials, contractor installation/demolition, mobilization and demobilization, overhead and profit, performance bonding, contingency, and engineering plans and permitting. Resale value of equipment of significant value were calculated with straight-line depreciation of the original material cost. The following assumptions were included in our estimate:

- All costs are shown in current 2026 dollars.
- Trucking costs are based on Q1, 2026 rates
- Site mobilization for decommissioning is assumed to initiate from Kalamazoo, Michigan
- Project quantities are based on the Heron BESS Electrical Plans dated 11/02/2025
- Waste disposal is assumed to be hauled to WM-Autumn Hills Landfill approximately 42 miles from the site.
- Recycled material is assumed to be hauled to Kent County Recycling and Education Center approximately 40 miles from the site.
- Cost fluctuations are expected based on market conditions prior to contract execution.
- Land value and/or sales are excluded from this estimate.

The net probable value of decommissioning was calculated as the removal value adjusted for inflation in Year 20. The expected removal value subtotal is **$6,243,000**. Approximately **$1,400,000** is assumed for soft costs and contingencies, bringing the probable net present value of decommissioning including contingencies to **$7,648,000.** Assuming an inflation rate of 3.25% for 20 years, the probable value of decommissioning is estimated to be **$14,499,000.**

Disclaimer

Kimley-Horn of Michigan, Inc. ("KHMI") is not obligated to update these materials beyond the current date, even if the information becomes outdated or inaccurate.

The information, analysis, and opinions contained herein are based on publicly available sources, market research, financial or operational data. KHMI relies on provided information as current, accurate, and complete. KHMI has not conducted exhaustive research nor independently verified this information, and therefore does not guarantee its accuracy, completeness, or current status. The projections and conclusions presented are based on the mentioned information and reflect KHMI's opinions. They should not be interpreted as definitive forecasts or guaranteed outcomes, as actual conditions and pricing may vary significantly.

KHMI does not have control over factors such as material and equipment availability, labor availability, energy or commodity pricing, demand and usage, market conditions, technological advancements, weather, and other economic or political factors that could influence these estimates, analyses, and recommendations.

Appendix A

Engineer's Opinion of Probable Construction Cost

Heron Energy Stroage, LLC
Gun Plain Township, Allegan County MI
Decommissioning Estimate Pro Forma w/o Salvage for BESS Facility: 20 Year Removal

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs. LS = Lump Sum, HR = Hours, EA = Each, LF = Linear Feet.

Item	Quantity	Unit	Unit Price	Total Price
Disassembly, Removal and Demolition (COST)				
Removal of BESS Batteries (Modules)	8,738	EA	$507.68	$4,435,093.35
BESS Battery Disassembly and Removal of BESS Containers and Pads	312	EA	$252.45	$78,764.44
Power Conversion System (PCS)	78	EA	$125.22	$9,767.16
Low Voltage Wiring	5,647	LF	$0.24	$1,367.58
Medium Voltage Wiring	11,223	LF	$0.44	$4,955.46
Fence (8' tall chain link)	4,060	LF	$5.05	$20,503.18
General Conditions	1.0	LS	$10,000.00	$10,000.00
Substation	1	EA	$183,405.36	$183,405.36
			Sub-Total	**$4,743,856.51**
Haul-Off and Disposal (COST)				
Aggregate Road Base	11,553	CY	$35.00	$404,361.27
Steel Piles	2,496	EA	$5.27	$13,153.92
BESS Equipment*	1	LS	$971,576.46	$971,576.46
			Sub-Total	**$1,389,091.65**
Restoration Grade & Seed (COST)				
Topsoiling, Grading	119,041	SY	$0.47	$56,324.45
Seeding, Fertilizing, and Stabilization	119,041	SY	$0.45	$53,733.33
			Sub-Total	**$110,057.78**

SUBTOTAL (w/o Salvage)	**$6,243,005.95**
10% Contingency	$624,300.59
12.5% Soft Costs	$780,375.74
Total Present Cost (w/o Salvage)	$7,647,682.28
3.25% Inflation/year	$6,851,083.82
TOTAL COST (YR 20)	**$14,498,766.11**

1. Equipment removal costs include associated pad removal and conduit removal (or abandonment).
2. Costs based on RSmeans city cost index (cci, heavy construction 2026) for Kalamazoo, MI and locally provided data.
3. The engineer has no control over the cost of labor, materials, equipment, or over the contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to engineer at this time and represent only the engineer's judgment as a design professional familiar with the construction industry. The engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.
4. The following assumptions were made in the analysis: 28 modules per battery enclosure.
*see BESS trucking cost spreadsheet for detail.

EXHIBIT I: PROOF OF PROPERTY OWNERSHIP OR CONTROL

Transaction Identification Data, for which the Company assumes no liability as set forth in Commitment Condition 5.e.:
Issuing Agent: First American Title Insurance Company National Commercial Services
Issuing Office: 9255 Towne Center Drive, Suite 200, San Diego, CA 92121
(858)352-2073
Issuing Office's ALTA® Registry ID: z
Commitment Number: NCS-FA500MI28-NRG
Issuing Office File Number: NCS-FA500MI28-NRG
Property Address: APN 08-034-021-50, , MI
Revision Number:

SCHEDULE A

1. Commitment Date: November 11, 2025 at 8:00 AM

2. Policy to be issued:
   a. ALTA® Standard Owner's Policy
      Proposed Insured: Prospective Purchaser
      Proposed Amount of Insurance: $TBD
      The estate or interest to be insured: Leasehold

3. The estate or interest in the Land at the Commitment Date is:

   Fee Simple

4. The Title is, at the Commitment Date, vested in:

   Thomas and Gwendolyn Chapman Revocable Trust

5. The Land is described as follows:

   See Schedule C attached hereto and made a part hereof

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Commitment No. NCS-FA500MI28-NRG

SCHEDULE B, PART I—Requirements

All of the following Requirements must be met:

1. The Proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.

2. Pay the agreed amount for the estate or interest to be insured.

3. Pay the premiums, fees, and charges for the Policy to the Company.

4. Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.

5. Receipt by the Company of an ALTA/NSPS Land Title Survey, certified to First American Title Insurance Company, and in form and content satisfactory to the Company. The Company reserves the right to make further requirements and/or exceptions upon review of this survey.

6. In connection with any lease and easement agreements ("Agreements") to be insured by the Company, fully executed copies of the underlying Agreements must be provided for review and prior to closing. A memorandum of the Agreement must be recorded in the Public Records. At closing the Company will also require a current, duly authorized estoppel executed by the grantor/landlord stating:
   (i) that the Agreement is in full force and effect,
   (ii) that there are no defaults or violations under the terms of the Agreement,
   (iii) that all lease payments due and owing the landlord have been paid current,
   (iv) that neither party to the Agreement has any Known claims against the other under the terms of the Agreement and
   (v) that there are no amendments or modifications to the Agreement other than as set forth in the estoppel, and
   (vi) a duly authorized consent by the grantor/landlord, which may be included in the estoppel described above, to the transaction creating the estate, interest or Mortgage to be insured by the policy, if such consent is required under the terms of the Agreement.

7. Authority documents for all parties executing documents including the following, which will be required for each entity of such kind comprising any tier of ownership of each party

   Corporation:
   1. Certificate of Incorporation from Secretary of State of state of formation.

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2. Certificate of Legal Existence and Good Standing from Secretary of State of state of formation.
3. Copies of Articles of Organization and Corporate By-Laws.
4. Clerk's certificate and Certificate of Incumbency to be provided with copy of Corporation Resolution authorizing officers' action.

Limited Liability Company:
1. Documents to be signed by member, manager, officer of other authorized agent of the LLC.
2. Certificate of Legal existence/Good Standing from the Secretary of State of state of formation, disclosing names of member(s) or manager(s) authorized to act on behalf of company, and naming person or entity authorized to act with respect to real estate.
3. Copy of the LLC's Articles of Organization and Operating Agreement.
4. Written approval by authorized member(s) or manager(s).
5. If any LLC member or manager is a corporation, see requirements for corporations above.

Limited Partnership:
1. Documents to be signed by general partner(s).
2. Copy of Limited Partnership Agreement and all amendments identifying the general partner(s).
3. Certificate of Good Standing from Secretary of State in state of formation.
4. If general partner is a corporation, see requirements for corporation above.

General Partnership:
1. Copy of general partnership agreement and all amendments.
2. Certificate by a general partner, certifying Partnership to be in full force and effect and identifying the partners of said Partnership.
3. If any partner is a corporation, see requirements for corporation (above).

Trust:
1. Copy of the Trust instrument to be provide to the Company for review.
2. Trustee's Certificate to be recorded indicating that the Trustee(s) are actually Trustee(s) under the instrument of trust, that the trust is in existence and has not been amended or revoked, and that the Trustee(s) have the authority to convey.

8. Pay unpaid taxes and assessments unless shown as paid.

9. All Taxes paid to and including 2024
2024 Winter Taxes PAID in the amount of $2,379.51
2025 Summer Taxes PAID in the amount of $1,149.03
2025 Winter Taxes DUE, amounts and special assessments, if any, unavailable
Tax Item No. 08-034-021-50
Property Address: Riverview Dr., Plainwell, MI 49080
If any amounts are shown as DUE, the total does not include collection fees, penalties or interest.

Special Assessment: None

NOTE: The Tax Assessor's legal description is inconsistent with the insured legal description.

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10. If the Land is connected to public/community water or sewer, furnish a copy of the current bill to First American Title Insurance Company showing that all charges have been paid to date or the Policy to be issued will include an exception on Schedule B for water and sewer charges which became a lien prior to the Date of Policy.

11. When the proposed insured is identified additional requirements and/or exceptions may be made.

12. Provide evidence of the purchase price and/or the amount of the mortgage to be insured.

13. Submit "Affidavit by Owner". Additional requirements may be made or exceptions taken for matters disclosed therein.

14. Submit proper evidence that the tax legal description has been corrected to conform with the legal description set forth on this commitment.

15. We find no outstanding voluntary liens of record affecting subject property. Disclosure should be made concerning the existence of any unrecorded lien or other indebtedness which could give rise to any possible security interest in the subject property.

16. The Michigan Commercial Real Estate Broker Lien Act applies to a sale, lease, option, loan or other transfer of commercial real estate. The Company must be provided proof, in affidavit form from the Seller and Purchaser, satisfactory to the Company, (a) of payment in full of any broker's services which have been engaged with regard to the management, sale, purchase, lease, option or other conveyance or proposed conveyance of any interest in the subject commercial real estate, together with a lien waiver or estoppel letter from any party determined by such affidavit to have a right to file a broker's lien, and (b) that no notice of lien for any such services has been received. In the event that said affidavit(s) contain any qualification with respect to any such services, proof of payment in full for all such services, together with a lien waiver or estoppel letter from such identified Broker(s) must be obtained.

    NOTE: Where the possibility of a right to file a broker's lien is determined and no lien waiver or estoppel letter provided to the Company, the following exception will be included in the policy to be issued pursuant to this Commitment.

    Any broker's lien, or right to a broker's lien, imposed by law.

17. NOTE: The following endorsement(s) will be attached to the Leasehold Owners Policy, when issued, and made a part thereof: ALTA 13-06

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Commitment No. NCS-FA500MI28-NRG

SCHEDULE B, PART II—Exceptions

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage.

The Policy will not insure against loss or damage resulting from the terms and conditions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

1. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I—Requirements are met.

2. Any facts, rights, interests or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or by making inquiry of persons in possession of the Land.

3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.

4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title including discrepancies, conflicts in boundary lines, shortage in area, or any other facts that would be disclosed by an accurate and complete land survey of the Land, and that are not shown in the Public Records.

5. Taxes and assessments not due and payable at Commitment Date.

6. Any lien or right to a lien, imposed by law, as a result of services, labor, and/or materials used, or to be used, for improvement to the Land.

7. Water rights, claims or title to water, whether or not shown by the Public Records.

8. Any claim to (a) ownership of or rights to minerals and similar substances, including but not limited to ores, metals, coal, lignite, oil, gas, uranium, clay, rock, sand, and gravel located in, on, or under the Land or produced from the Land, whether such ownership or rights arise by lease, grant, exception, conveyance, reservation, or otherwise; and (b) any rights, privileges, immunities, rights of way, and easements associated therewith or appurtenant thereto, whether or not the interests or rights excepted in (a) or (b) appear in the Public Records or are shown in Schedule B.

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9. All Tax Map Numbers referred to in the title report and final policy are for informational purposes only and First American Title Insurance Company does not insure, nor limit the exceptions, to the tax map numbers indicated.

10. Oil and Gas lease between Fritz Jager and Lillian Jager, his wife, lessor, and Lawrence A. Richardson, lessee, dated December 08, 1939, recorded December 14, 1939 in/as Liber 339, Page 223, of Allegan County Records.

    Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records are not shown herein.

11. Right of Way by and between Ronald Jager and Doris Jager, husband and wife and Michigan Bell Telephone Company, a Michigan corporation created by instrument recorded July 03, 1974 in/as Liber 852, Page 428, of Allegan County Records.

12. Interest of others in oil, gas and mineral rights, if any, whether or not recorded in the Public Records.

13. Interest, if any, of the United States, State of Michigan, or any political subdivision thereof, in the oil, gas and minerals in and under and that may be produced from the Land.

14. Rights of tenants under unrecorded leases.

15. To the extent a tract is bounded by a public road, rights of others in and to any portion of the property that lies within said road.

16. A lease dated November 11, 2025, executed by Thomas A. Chapman (a/k/a Thomas Chapman) and Gwendolyn K. Chapman (a/k/a Gwendolyn Chapman), as Trustees of the Thomas and Gwendolyn Chapman Revocable Trust as lessor and Heron Energy Storage LLC, a Delaware limited liability company as lessee, recorded November 21, 2025 as Liber 5089, Page 287 of Official Records.

    Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records are not shown herein.

NOTE: The tax assessor's legal description is inconsistent with the insured legal description.

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Commitment No. NCS-FA500MI28-NRG

SCHEDULE C

Land in the Township of Gun Plain, Allegan County, MI, described as follows:

Commencing at the Northwest corner of Section 34, Township 1 North, Range 11 West, thence South 89 degrees 44 minutes 34 seconds East, along the North line of said Section, 2659.70 feet, to the North quarter corner of said section, thence South 00 degrees 00 minutes 03 Seconds West, along the North-South quarter line of said Section, 1103.88 feet, thence West 1035.00 feet, thence South 865.93 feet to the center line of Riverview Road, thence North 65 degrees 59 minutes 39 seconds West, along the said centerline, 729.23 feet to a curve which bears left, that has a central angle of 32 degrees 55 minutes 55 seconds, a radius of 750.00 feet, a chord of 425.17 feet, which bears North 82 degrees 27 minutes 37 seconds West, thence along said curve, 431.08 feet, thence South 81 degrees 04 minutes 26 seconds West, along said center line, 532.60 feet, to the West line of said Section 34, thence North 00 degrees 21 minutes 48 seconds West, along the said West line, 1711.96 feet to the point of beginning.

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ALTA COMMITMENT FOR TITLE INSURANCE
issued by
FIRST AMERICAN TITLE INSURANCE COMPANY

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, First American Title Insurance Company, a Nebraska Corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within six months after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

FIRST AMERICAN TITLE INSURANCE COMPANY

Sally F. Tyler, President

Lisa W. Cornehl, Secretary

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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COMMITMENT CONDITIONS

1. DEFINITIONS

a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that is unenforceable under applicable law because it illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.

b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.

c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.

d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.

e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.

f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.

g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.

h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.

i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.

j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

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3. The Company's liability and obligation is limited by and this Commitment is not valid without:
- a. the Notice;
- b. the Commitment to Issue Policy;
- c. the Commitment Conditions;
- d. Schedule A;
- e. Schedule B, Part I—Requirements;
- f. Schedule B, Part II—Exceptions; and
- g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY
- a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
  - i. comply with the Schedule B, Part I—Requirements;
  - ii. eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
  - iii. acquire the Title or create the Mortgage covered by this Commitment.
- b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
- c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
- d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.
- e. The Company is not liable for the content of the Transaction Identification Data, if any.
- f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
- g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

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6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.

b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.

c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.

d. The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.

e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.

f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. CLAIMS PROCEDURES

This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.

10. CLASS ACTION

ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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EXHIBIT J: BESS SPECIFICATIONS

epcpower

excellence in power conversion

M System Installation Manual

Contacting EPC

When contacting EPC for support, please have the following information available:

- Unit Model Number
- Unit Serial Number
- Application information
- Background information of the problem

North America
+1.858.748.5590
cs.support@epcpower.com

13250 Gregg Street, Suite A-2
Poway, CA 92064

This is a preliminary release of the M Installation Manual; information and dimensions are subject to change.

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EPC Power Corporation
www.epcpower.com

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1 Introduction

This installation manual is intended to provide step-by-step instructions to install the M System successfully. This manual also provides information for installation planning and verification.

1.1 Applicability

M System models

- 50-103421

M Inverter models

- 50-200100

Please read all applicable sections during the engineering process and before you apply power to your system.

1.2 Revision History

Rev	Date	Change
0.0	June 2024	Preliminary draft
0.01	October 2024	2nd preliminary draft
1		

1.3 Related Documents and Manuals

Document number	Document Title	Revision
[70-100094]	M System Technical Manual	00
[70-100092]	M System O&M Manual	00
[70-100091]	M Isolation Transformer Guide	00

1.4 Additional Support

When requesting support for any issues, the following information is typically required:

- PC tool for the system control via laptop and associated files
- Electrical Site Drawing including ground system
- System Drawings

2 Safety

This section contains important information regarding the safe and proper use of equipment. System integrators & OEMs must provide a final set of service instructions / manual to their end customer as part of the final product. Trained and qualified personnel are required for installation and operation of this equipment. Failure to follow safety instructions can result in damage to equipment, injury, or death.

Busbars, fuses, disconnects, cooling system components, and similar may be hot if the unit has been operating recently. It is recommended to wait for the components to cool for a few hours (depending on the ambient temperature and operating point of the unit) before working on the device.

Warnings and Notes
This manual contains the following safety notices:

DANGER	**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.	**DANGER** indique une situation dangereuse qui, si elle n'est pas évitée, causera des blessures graves ou la mort.
WARNING	**WARNING** indicates hazardous conditions that could damage equipment or cause personal injury or death.	**AVERTISSEMENT** indique des conditions dangereuses qui pourraient endommager l'équipement ou causer des blessures ou la mort de personnes
CAUTION	**CAUTION** indicates a hazardous situation which, if not avoided, could result in equipment damage, minor or moderate injury.	**ATTENTION** indique une situation dangereuse qui, si elle n'est pas évitée, pourrait causer des dommages à l'équipement et des blessures mineures ou modérées au personnes
	ESD Electrostatic discharge warning, indicating that equipment can be damaged if proper ESD protections (e.g., wrist straps) are not used.	**ESD** Risques de décharges électrostatiques, ceci indique que l'équipement peut être endommagé si les protections ESD appropriées (par exemple bracelets antistatiques) ne sont pas utilisées.

2.1 Electrical Safety

WARNING	**WARNING** Basic electrical precautions must be followed by all personnel when working on electrical systems. Equipment damage, injury, or death can occur as a result of failure to follow these instructions or installation by unqualified personnel.	**AVERTISSEMENT** Les précautions électriques de base doivent être respectées par toute personne travaillant sur les systèmes électriques. Des dommages matériels, blessures ou la mort peuvent être provoqués suite au non-respect de ces instructions ou l'installation par du personnel non qualifié.
WARNING	**WARNING** High touch current. Earth connection is essential before connecting supply.	**AVERTISSEMENT** Courant de contact élevé. Raccordement à la terre indispensable avant le raccordement à l'alimentation.

Review the following steps before performing any installation or maintenance work:

1. Work must be performed by qualified personnel only.
2. Clearly identify work locations.
3. Ensure that all sources of power have been disconnected.
4. Inverters contain capacitors which require several minutes to discharge after removing power. Verify that system and component voltages are at or near 0 V by measuring with a voltmeter.
5. All electrical installations must comply with the electrical standards applicable on-site.

2.2 Stored Energy

DANGER	**DANGER** Inverters contain capacitors which retain voltage even after the system has been de-energized. By design, these capacitors self-discharge to less than 5 V within 5 minutes or within the time stated on the inverter. System and component voltage should always be verified prior to working on equipment to ensure the discharge has been completed successfully.	**DANGER** Les onduleurs contiennent des condensateurs qui restent chargés après la coupure de toutes les sources d'alimentation. Ces condensateurs sont conçus pour se décharger à moins de 5 V en moins de 5 minutes. Assurez-vous de toujours mesurer les tensions du système et des composants pour s'assurer qu'elles ne soient plus dangereuses.

After powering down, and before working on the system:

1. Disconnect or turn off and lock out ***all sources of power*** (see Figure 1 for sample disconnect options):
    a. Main AC
    b. Main DC
    c. Lock out power sources of M System
    d. Auxiliary power (optional for properly trained personnel)
2. Ensure that power cannot be re-applied while working on the equipment by following proper lockout/tagout procedures for all power sources (e.g., the AC grid disconnect switch, battery bank disconnect switch, etc.).
3. Wait at least 5 minutes (or as indicated by the inverter labeling) after disconnecting power to the inverter to allow stored energy to discharge (e.g., charged capacitors within the inverter).
4. Use of voltage detector accepted and designed for detecting the absence of AC and DC voltages on high power installation.
5. Measure voltages and ensure that they are below ~5 V by using a 1,500-V rated DMM (Digital Multimeter). ***Measurements must be taken by a trained professional. The list below is suggested as a minimum set of measurements, however personnel performing maintenance are responsible for taking all proper and necessary measurements to ensure that all stored energy is removed prior to work and all sources are properly locked out to ensure safety.***
    a. Suggested AC side measurements
        i. With DMM in AC measurement mode, on the **incoming side of the AC fuses** (common AC of M System):
            1. from L1 phase to L2 phase
            2. from L2 phase to L3 phase
            3. from L3 phase to L1 phase
            4. from L1 phase to GND
            5. from L2 phase to GND
            6. from L3 phase to GND
            7. *Repeat all above measurements with the DMM in DC voltage measurement mode.*
        ii. With DMM in AC measurement mode, on the **inverter side of each AC switch** (if AC switch option is not present, inverter side of each AC fuse set):
            1. from L1 phase to L2 phase
            2. from L2 phase to L3 phase
            3. from L3 phase to L1 phase
            4. from L1 phase to GND
            5. from L2 phase to GND
            6. from L3 phase to GND
            7. *Repeat all above measurements with the DMM in DC voltage measurement mode.*
    b. Suggested DC side measurements

i. With DMM in DC measurement mode, on the **incoming side of the DC fuses**:
   1. from POS-NEG
   2. from POS-GND
   3. from NEG-GND
   4. *Repeat all the above measurements with the DMM in AC voltage measurement mode.*

ii. With DMM in DC measurement mode, on the **inverter side of the DC switch** (if DC switch option is not present, inverter side of the DC fuse):
   1. from POS-NEG
   2. from POS-GND
   3. from NEG-GND
   4. *Repeat all the above measurements with the DMM in AC voltage measurement mode.*

6. Install safety grounding as appropriate.

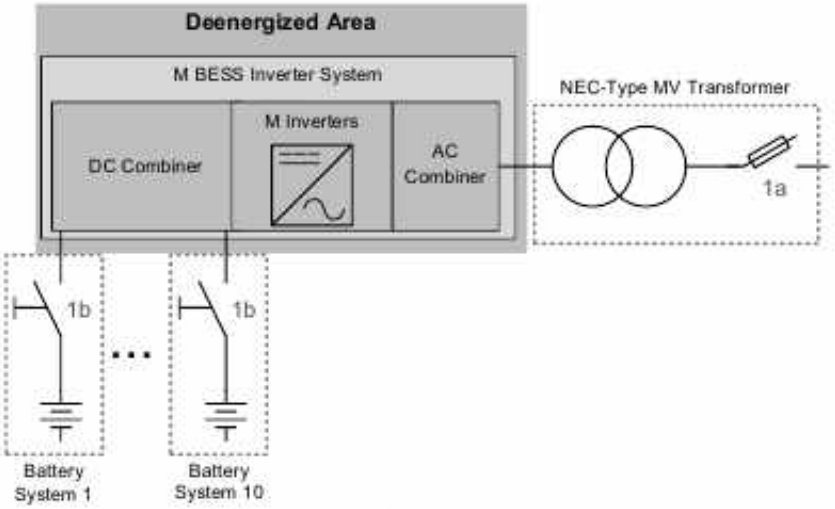


Figure 1. The disconnection and isolation of the AC connection (1a) and all DC connections (1b) of M BESS Inverter System: NEC-type transformer with openable MV-side fuses,

2.3 Grounding & Hipot

WARNING	**WARNING** The inverter may or may not include a GFDI device. If not, this system must be used with an external GFDI device as required by local jurisdictions.	**AVERTISSEMENT** Cet onduleur n'est peut-être pas équipé d'un dispositif de détection de défaut à la terre interne. S'il n'est pas présent, cet onduleur doit être équipé d'un dispositif de détection de défaut à la terre externe en conformité avec les réglementations locales.
CAUTION	**CAUTION** Only qualified personnel should perform this work. If you do not follow these instructions, electrical noise may be increased, resulting in operational errors, or communication interference.	**ATTENTION** Seul un personnel qualifié doit effectuer ce travail. Si vous ne suivez pas ces instructions, les perturbations électromagnétiques seront amplifiées, entraînant des défauts de fonctionnement et des interférences au niveau des communications.

Grounding

- The equipment grounding of the M System is the responsibility of the integrator or installer.
- When working with the M System, always install a protective ground from the M System chassis to the DC and AC power circuits with conductors of sufficient cross section. DC-side and AC-side power circuits are isolated from the enclosure.
- When servicing the M System, protective grounds may be used and they must be removed upon completion of work, prior to energizing the equipment.

Hipot

- A hipot test has been performed by EPC at the factory and is **NOT PERMITTED to be performed in the field by the user**.

2.4 Cleanliness / Debris

CAUTION	**CAUTION** The M System has air vents. Debris should not be allowed to fall into the venting, including metallic chips from drilling, weld splatter, etc. as it may result in damage to the system. Covering the vents is good practice if there is a chance of debris falling. The covers MUST be removed prior to operation to provide adequate ventilation.	**ATTENTION** l'onduleur est pourvu de bouches d'aération. Il faut éviter d'y faire tomber des débris (les copeaux métalliques de forage, les projections de soudure, etc.) car ils provoqueraient des dommages à l'onduleur. Recouvrir les bouches est une bonne pratique s'il y a un risque de chute de débris. Les couvercles doivent être enlevés avant l'utilisation pour assurer une bonne ventilation.

2.5 Personnel

All the procedures described in this manual may be dangerous and may be performed by personnel certified by EPC Power Corp only. Some procedures are limited to EPC Power Corp personnel only and may not be attempted by anyone else. Please contact EPC for your training and certification needs.

3 Inspection and Receiving

3.1 Inspection

When picking up units at the EPC Power facility, ensure M System assemblies are well secured for transit.

On receipt of equipment, inspect equipment for:

- The part number indicated on the nameplate corresponds with the part number of your order.
- No damage occurred during transport.

In case of equipment damage, please submit an RMA (Return Merchandise Authorization) to EPC Power with appropriate pictures of the damaged equipment.

3.2 Specification Label

M System and individual M inverter specification labels include the main data including ratings, certification, type designation and serial number. A sample EPC Power specification label for a M10 System is shown in Figure 2.

Figure 2. Sample M10 Nameplate

Rating plate information is detailed in Table 1 below.

Table 1. M System rating plate clarification.

No.	Name	Description
1	System Model	50-103421 = M System as BESS Inverter with 10 M Inverters 50-200100= M Inverter Unit
2	AC Voltage	Inverter Rated AC Voltage
3	Serial Number	The serial number in a format: ***yymmddxxxx*** yy = manufacturing year mm = manufacturing month dd = manufacturing day xxxx = total running number in SAP Serial: 24120322 means 22nd unit on Dec. 3rd, 2024
4	Date Code	The serial number in a format: ***yyww*** yy = manufacturing year ww = manufacturing week Code: 2451 means manufactured on week 51 in the year 2024
5	Data Matrix Code	Serial number in a data matrix code

3.3 Test Reports

EPC provides a certificate of conformance with every inverter and system that guarantees the M System and the M Inverters have passed all acceptance tests before leaving the factory. Figure 3 show example Certificate of Conformance (CoC) and data for reference only.

Certificate of Conformance

Verification Tests Completed

Figure 3. Example CoC of an EPC Power Inverter.

3.4 Storage

An M System is shipped and stored without a package.

EPC Power recommends having humidity limitation included in the M System during shipping and storage especially when the duration between shipping and connection of auxiliary power is expected to be weeks instead of days.

- The standard method is packing the M System cabinets with desiccant which needs to be checked monthly until the internal humidity control system of M System is powered.
    - It is possible to have temporary external 48-V_{DC} power supply connection in cases when an internal auxiliary power supply option (+IAP or +IDP) is selected and the main power is not yet available.
        - Contact EPC Power for additional information.
- As an option available later, a PV roof option is provided. In it, the humidity control system is self-powered by the roof covered by PV (photovoltaic) modules and the controlled humidity prevents internal condensation over the storage period.

Alternatively, the M System can be stored inside in dry location when a humidity limitation via desiccant or the humidity control system is not necessary.

When the outdoor storage location does not have solar irradiation for several days, it is recommended to apply external auxiliary power to the M System so that it can regulate the internal humidity to prevent internal condensation.

When external auxiliary power is used, connect the inputs to suitable power supply as shown in section 4.4 or contact EPC Power for possible temporary solutions.

During the storage period, the M System must be stored in the following conditions.

1. A safe place free from risk of damage.
2. Protected against animals/rodents.
3. The surface must be flat and must be placed on non-corrosive supportive structure >10" above the ground/soil.
    - The support of the frame must be the same as is required in the foundation (see section 4.1.2).

4 Installation and Wiring

4.1 Installation Preparations

EPC will provide 3D models in STEP format upon request. Dimensions are provided below. M System is an outdoor rated device, if installed inside building or closed container, please contact EPC Power or the project engineer.

4.1.1 Site Installation Requirement

M Systems must be installed on a level surface, detailed in section 4.1.2, adhering to the anchoring information, and relevant clearance and conduit entry requirements identified in sections 4.1.3 through 4.1.10. The M System is suitable for mounting on concrete or other non-combustible surfaces only and to be installed in a limited access electrical operating area. Only properly trained and certified personnel should be allowed to perform work on the M System and inverters.

4.1.2 Foundation

The inverter foundation must be non-combusting, flat, and level surface with adequate support to system frame. Requirements:

- Flatness: the surface shall not exceed 4 mm vertically over the 2 m horizontal distance within the M System footprint
- Levelness: the surface of the foundation in total shall not exceed a slope of 0.5% within the M System footprint
- The foundation must support the frame of M System as shown with two example cases in Figure 4.
    - The cable entry spaces are shown in detail in sections 4.1.7 and 4.1.9 and recommended to be considered as a keep out area shown in Figure 4.
        - In the non-pylon case of foundation shown in Figure 4b, it is recommended to consider the necessity of the foundation under the DC combiner marked by lighter gray.
    - See section 4.1.10 for the details of the mass distribution and CoG (Center of Gravity).
    - The weight per pylon is 850 kg [1875 lbs].
- Take local requirements such as possible wind load and seismic requirement into account on the installation and foundation construction.
- If the holes of the M System frame are used for anchoring, their locations need to be considered in pylon and foundation designs.
    - There are eight Ø28 mm (Ø1.1") holes in the frame as marked in Figure 4.
    - **Note**. It is the customer's responsibility to provide robust anchoring of the M System as required by the seismic and wind conditions of the plant.

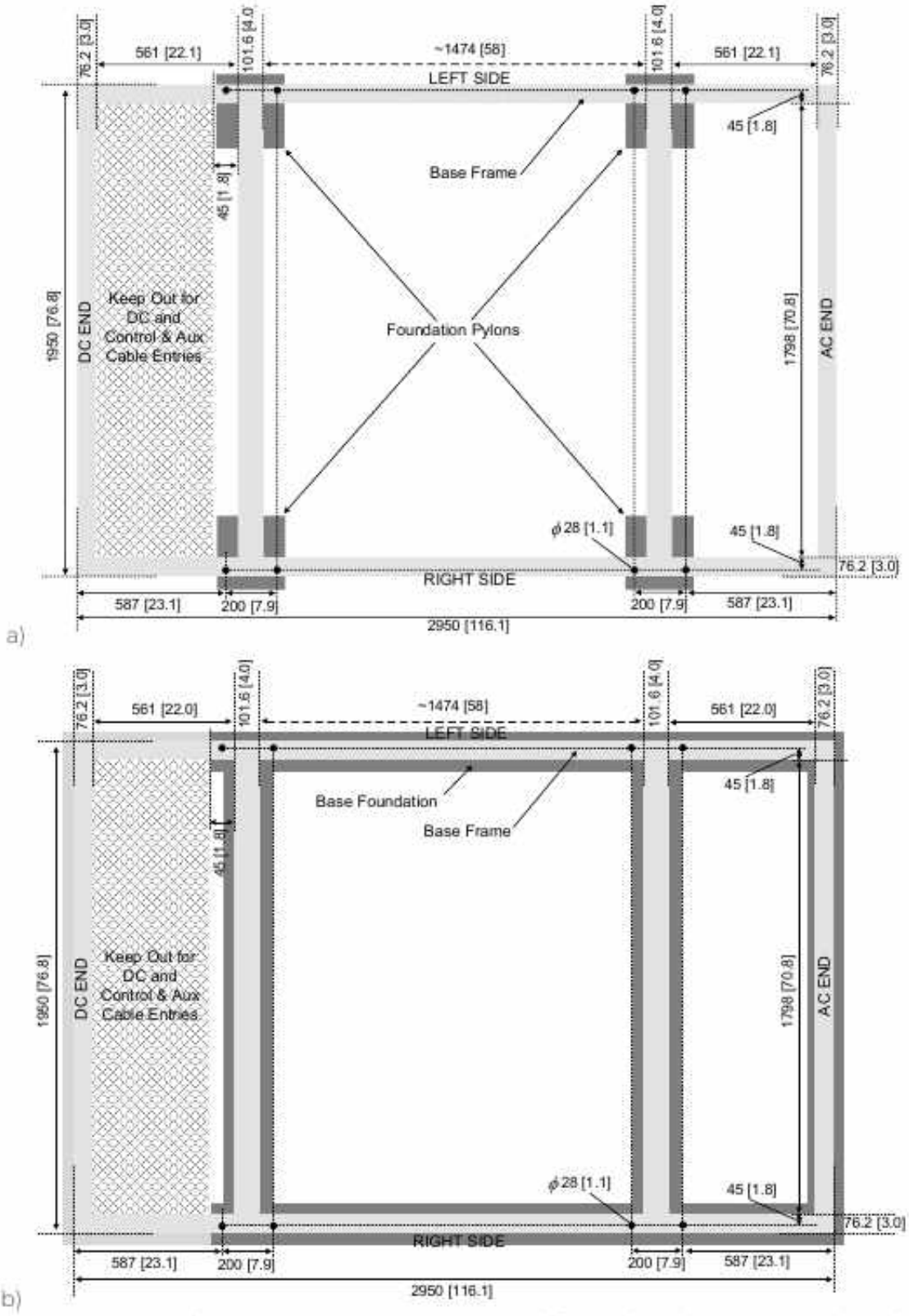


Figure 4. M System frame dimensions (units in mm [in]) and foundation examples: a) four foundation pylons in main weight points. b) base foundation under the frame

4.1.3 M System Dimensions

M System dimensions are shown in Figure 5 and naming convention in Figure 6.

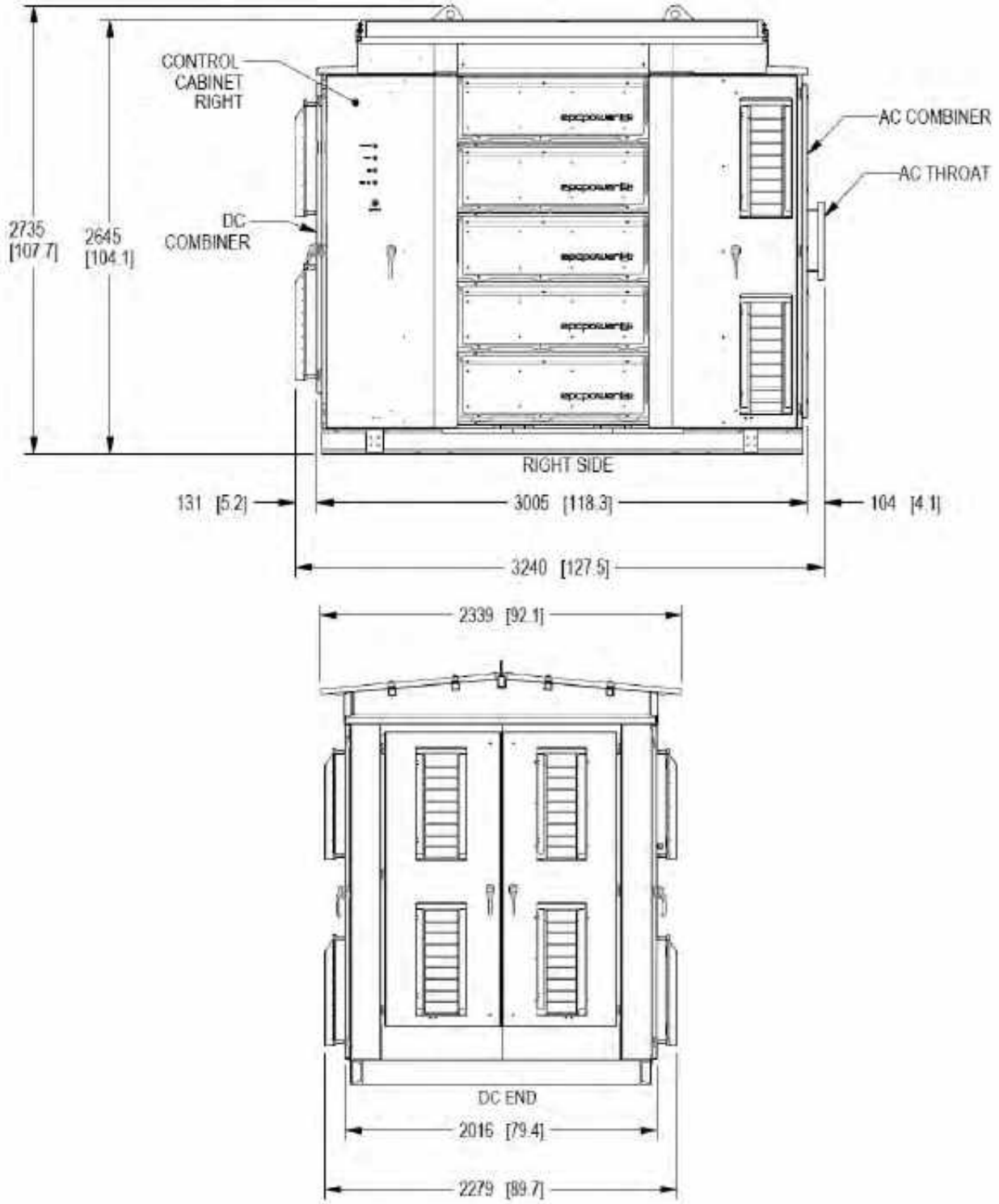


Figure 5. M System dimensions (units in mm [in]).

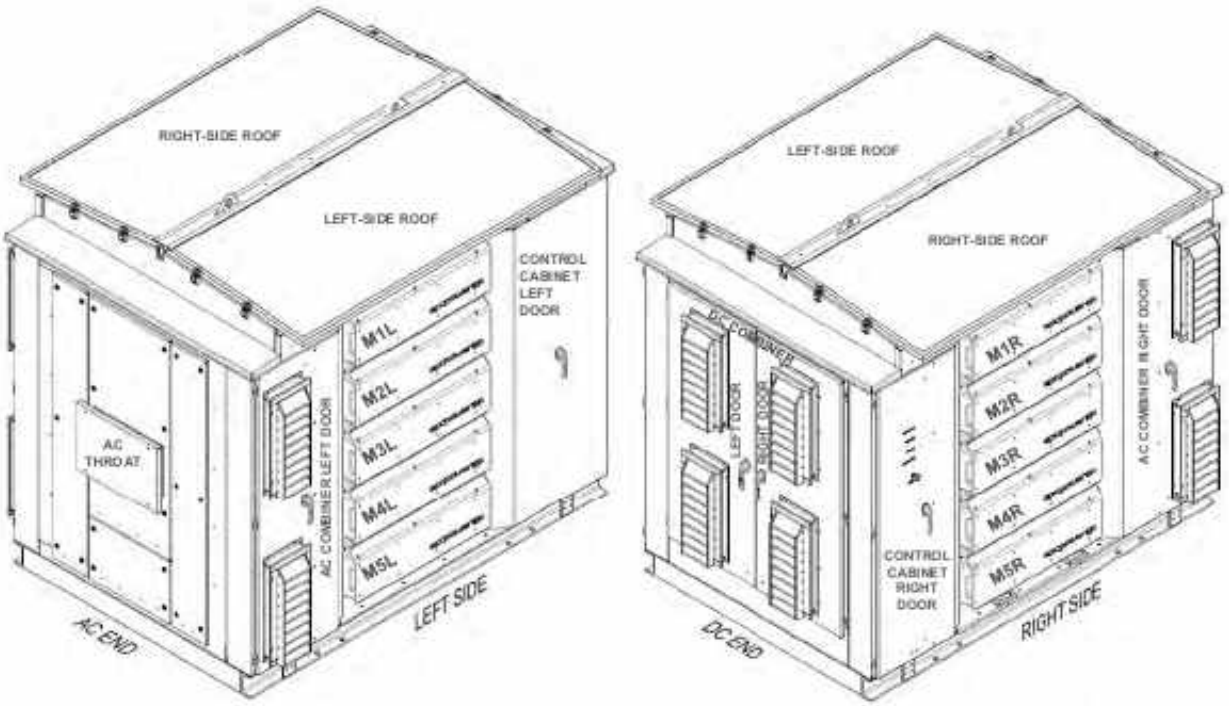


Figure 6. M System naming convention.

Note! The final dimensions, and e.g. locations of the combiner air intakes and exhausts are subject to change. However, general locations are as illustrated in this manual.

4.1.4 Ventilation Clearance

Each M Inverter has air intakes on their front. Therefore, the M Inverter air intakes are present on both sides of the M System. The exhaust air of the inverters is routed to the center and top of M System. Both combiner cabinets have their own ventilation, having air intakes on the DC end and on the right side of the AC combiner. DC combiner exhausts are also in the DC end whereas the air exhaust of the AC combiner is on the left side. As a result, the air intakes and the air exhausts as illustrated in Figure 7, Figure 8, Figure 9, and Figure 10. In all of them, intake air is marked with blue and outlet air with dark red. The ventilation clearances are shown as light-yellow areas.

The minimum ventilation clearances to be considered in the site/plant design are:

- Both sides and DC end must have a horizontal clearance of ≥2000 mm [80"].
- The AC end must have a horizontal clearance of ≥2000 mm [80"] on top of the MV transformer
- Vertically, the clearances reach up to ≥2000 mm [80"] above the M System over the whole ventilation clearance area.
- Walls, roofs, or other structures restricting the air flow are not allowed within the ventilation clearance area.

In the final installation, none of the air vents may be covered or obstructed.

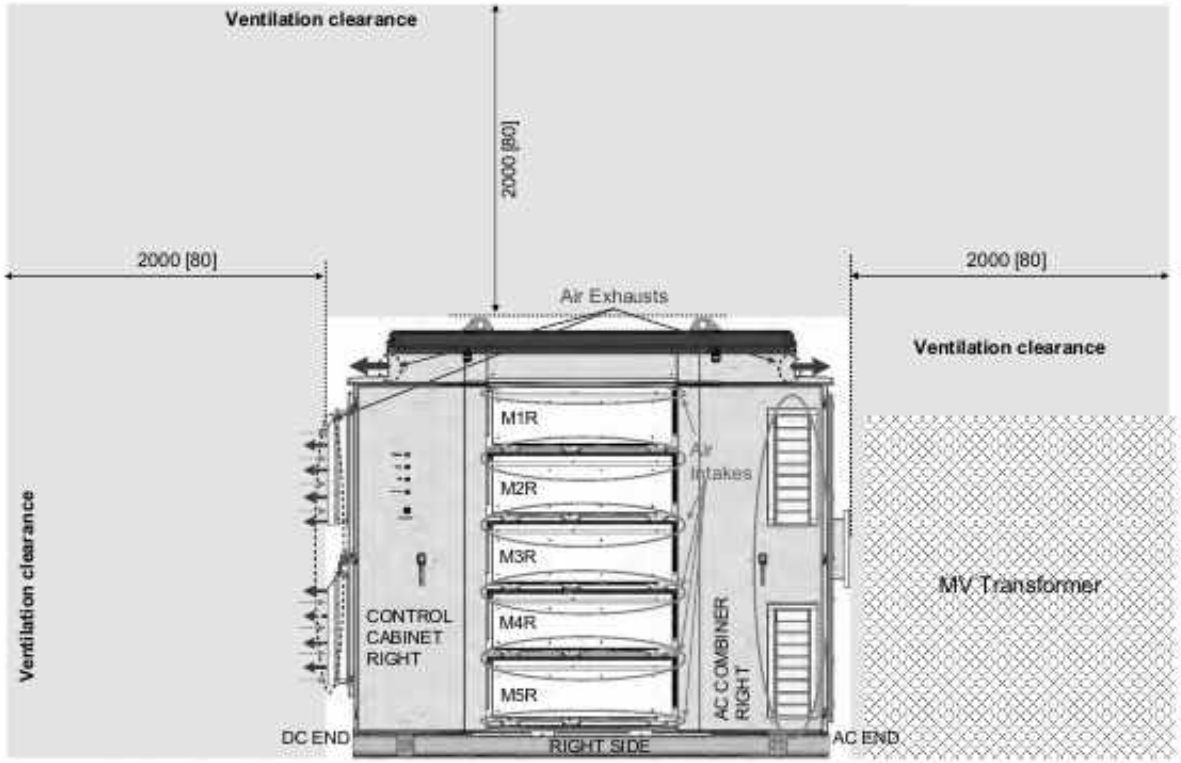


Figure 7. Air intakes (blue) and exhausts (dark red) with the ventilation clearances in the ends and top with right-side view (units in mm [in]).

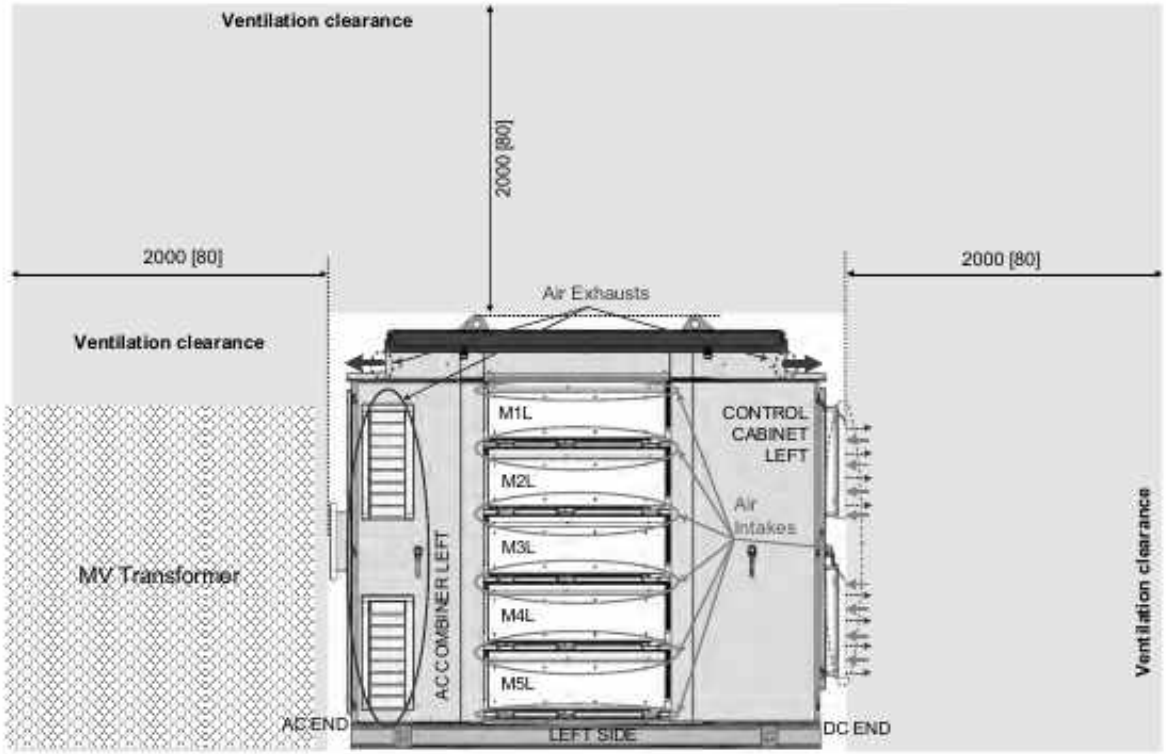


Figure 8. Air intakes (blue) and exhausts (dark red) with the ventilation clearances in the ends and top with left-side view (units in mm [in]).

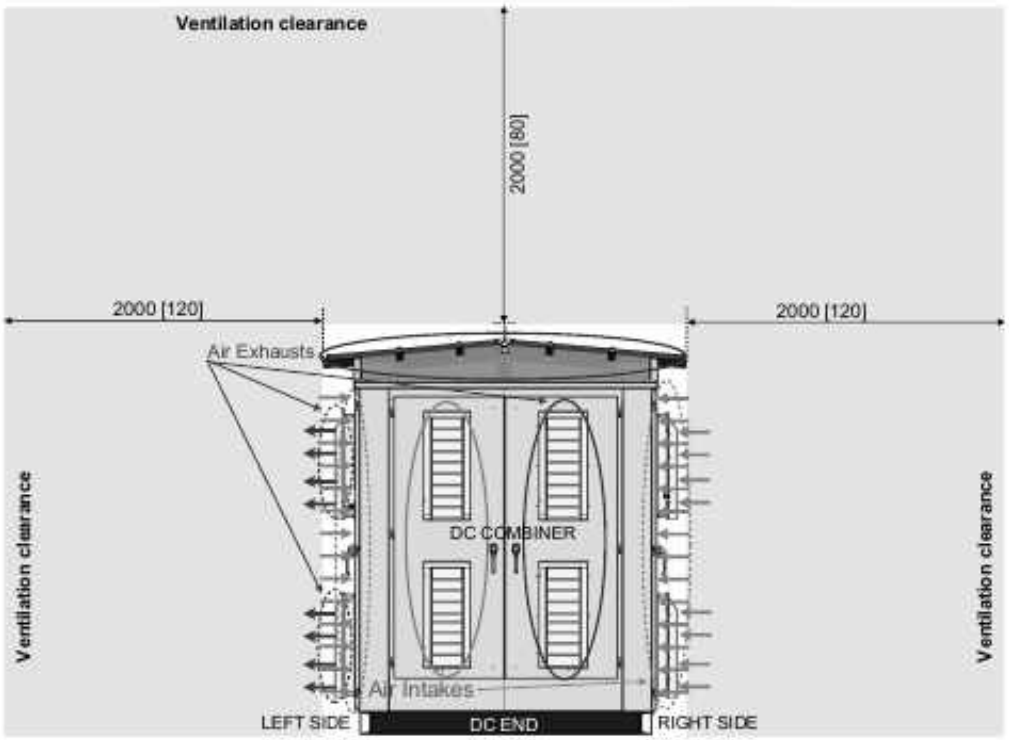


Figure 9. Air intakes (blue) and exhausts (dark red) in the DC with the ventilation clearances in the sides and top (units in mm [in]).

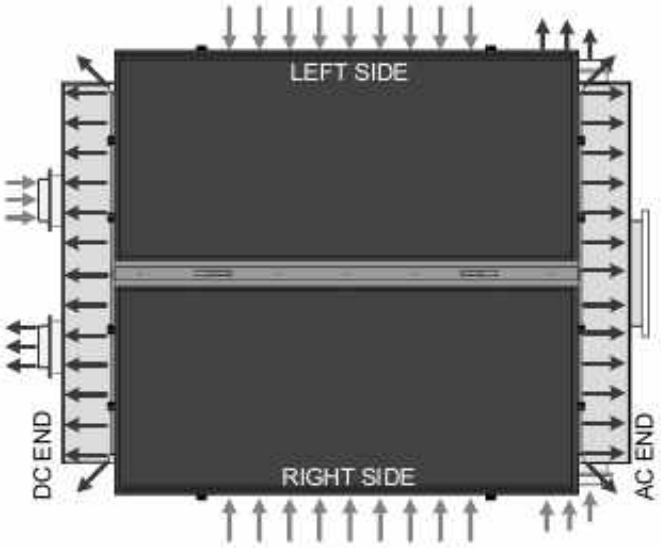


Figure 10. Top view about all air intake routes (blue arrows) and outlet routes (dark red arrows).

4.1.5 Maintenance Clearance

Clearance must also be considered for maintenance. At minimum the service clearances are as shown in Figure 11 and Figure 12:

- Both sides must have the clearance of ≥1000 mm [40"] for door openings and Inverter interchange and additional clearance of ≥1000 mm [40"] for the cabinet access and interchange work or as guided by local regulation for electrical work if that is wider.
- DC end must have a clearance of ≥1000 mm [40"] for door openings and additional clearance of ≥1000 mm [40"] or as guided by local regulation for electrical work if that is wider.
- On the side of the space between the AC end MV transformer, there must be ≥800 mm [32"] clearance to access the AC throat or as guided by local regulations.
- Vertically, the clearance reaches up to ≥1000 mm [40"] above the M System over the whole area.
    - Note that this vertical space is not adequate for lifting an M System, but only the requirement for service and maintenance.
- No obstacles are allowed within the service and maintenance area.
- EPC Power recommends the surface of the service and maintenance area to be flat and to have weatherproof basement soil and surface layer with concrete, blacktop, revetment, compact gravel, etc.

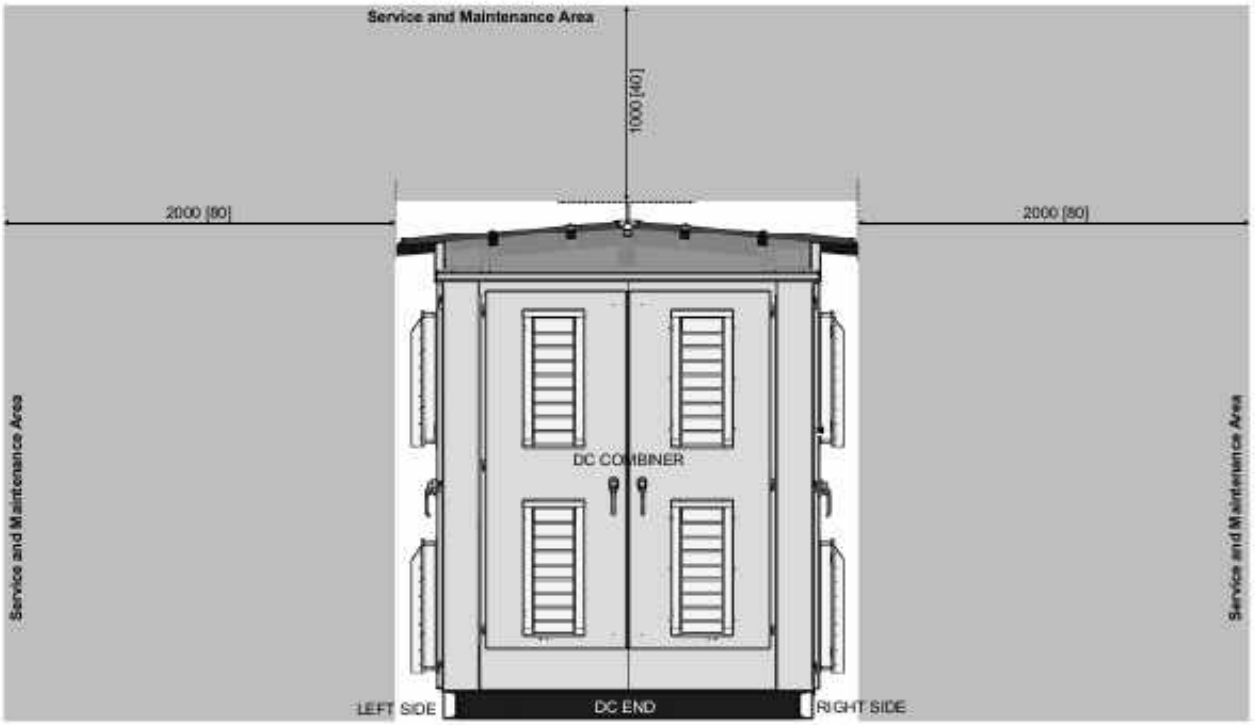


Figure 11. Service and Maintenance spacing (on gold) around the M System on the ground, DC end view (units in mm [in])

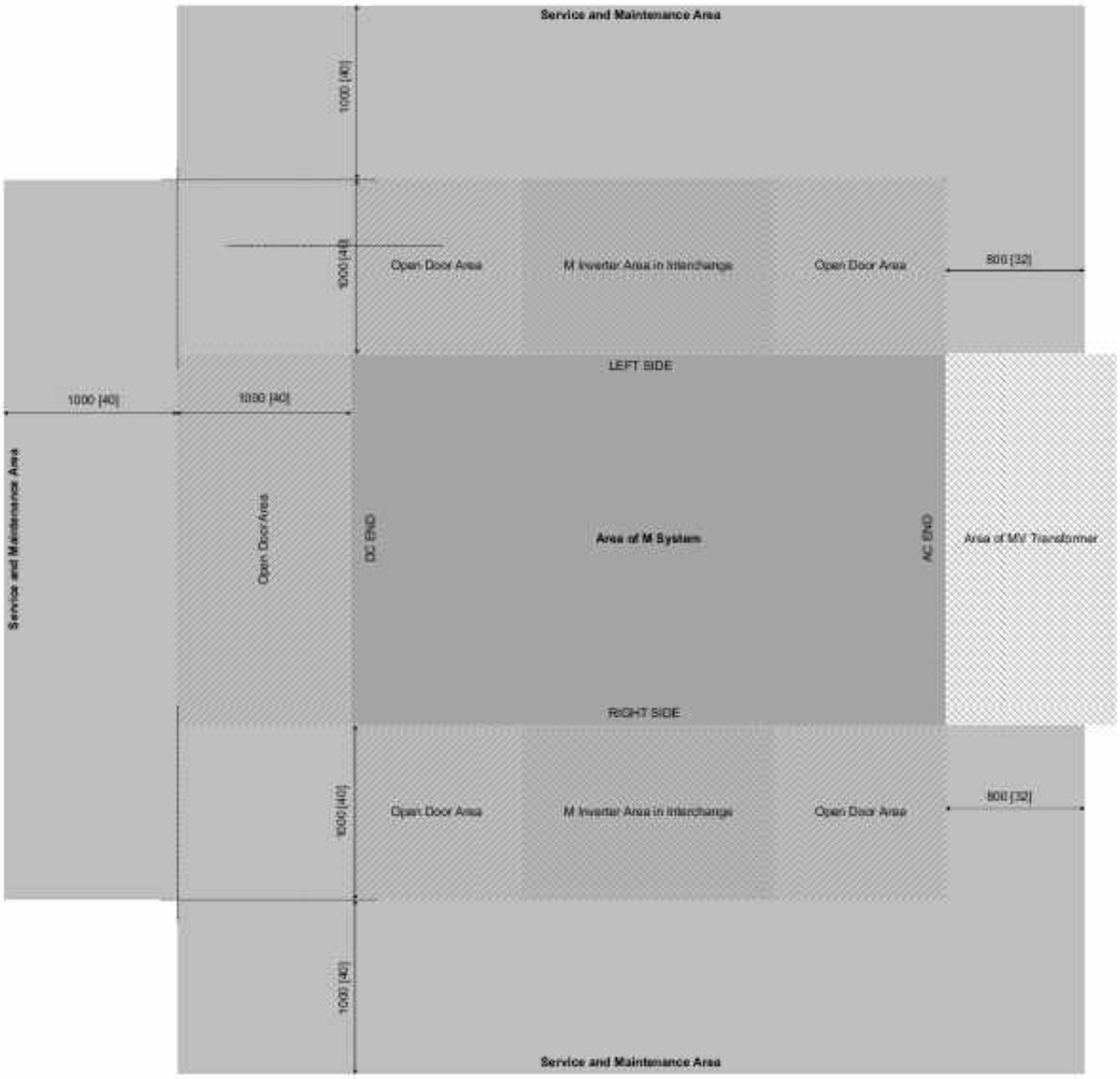


Figure 12. Service and Maintenance spacing (on gold) around the M System above the ground, top view (units in mm [in])

4.1.6 Clearances between Multiple M Systems

Follow the spacing shown in Figure 13 when locating M Systems next to each other:

- 4 m [13 ⅛'] between the right and left side of the adjacent M Systems
- 4 m [13 ⅛'] between the DC end of the M System and the MV transformer of the next M System

Figure 13. Clearances between M Systems sidewise and lengthwise (units in mm [in])

4.1.7 DC Cable Entry and Routing

There are two options for DC cable entry, both options are from the ground direction:

- The standard: conduit entry requiring customer modification of EPC provided gland plates.
- Option +DGP: cable gland plates

Both DC entry plates panels are located in the same combiner cabinet as shown in Figure 14.

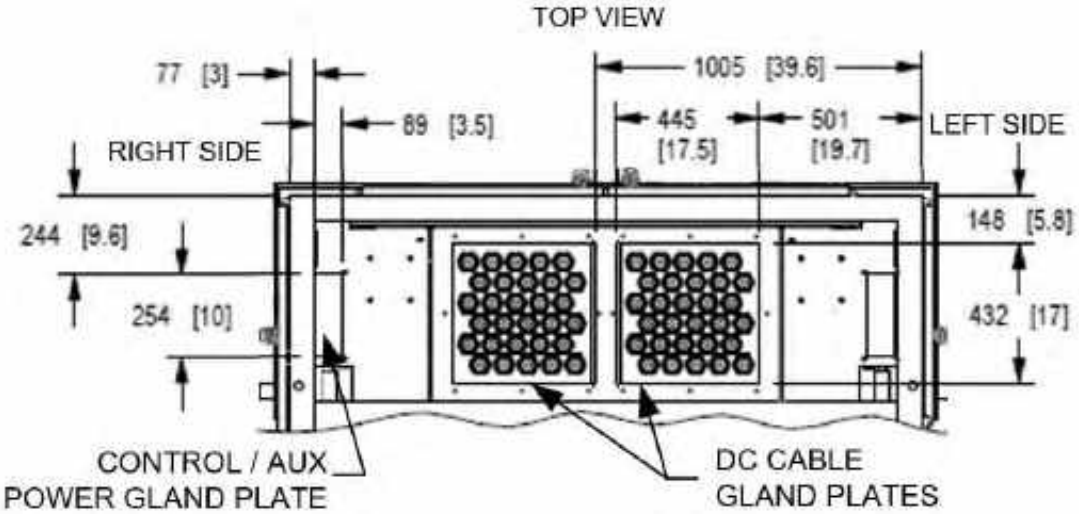


Figure 14. Location of the DC cable gland plates and Control & AUX power gland plate in M System DC Combiner base, top view (units in mm [in]).

Depending on the site construction, the entry type may affect the cable and conduit routing of the site, and it is recommended to be considered when the base of the M System is designed and constructed.

Due to the DC cabling space shown in Figure 15, it is essential to plan the DC cable entries and routing according to the ordered DC configuration.

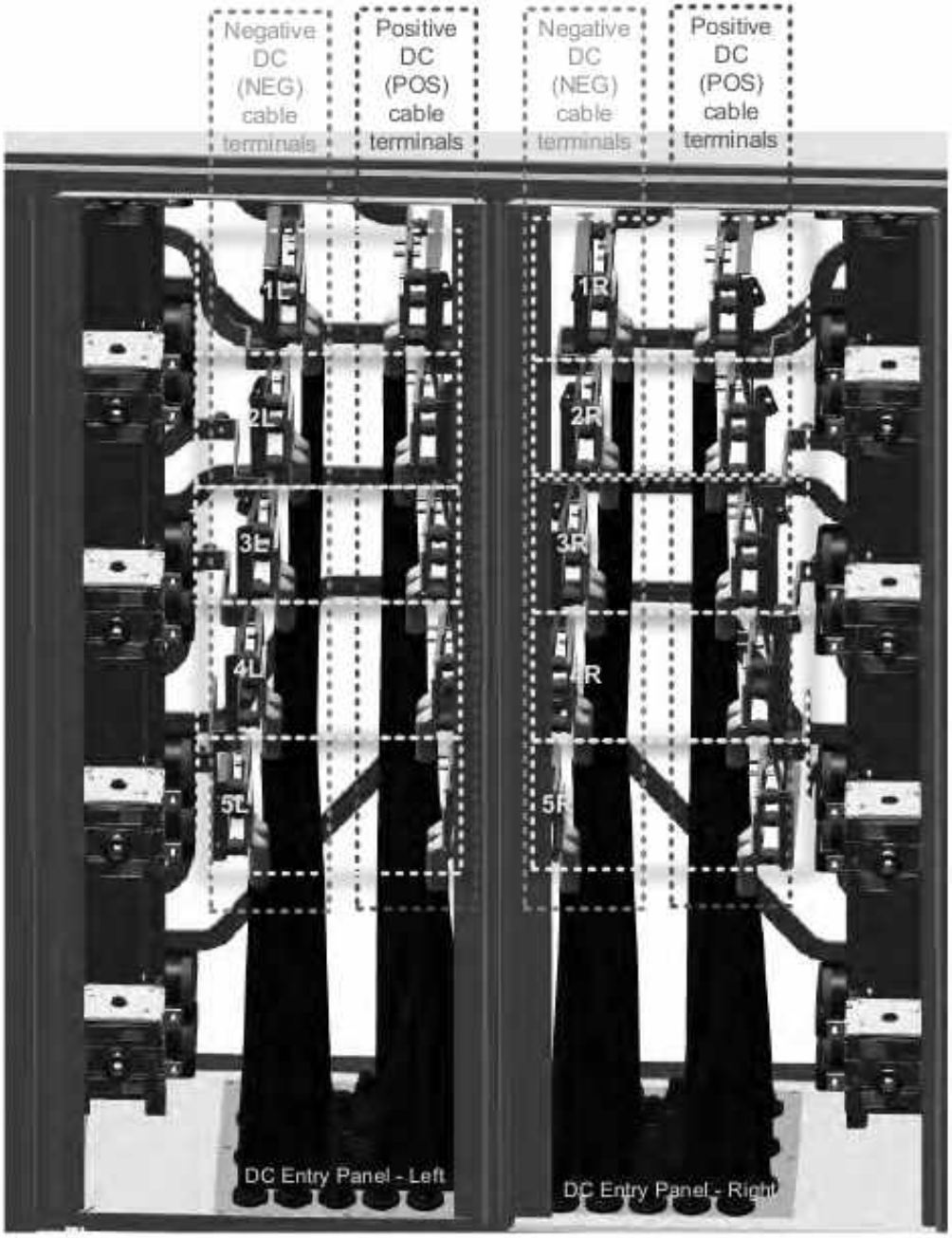


Figure 15. DC combiner end view of DC cabling section.

Some simplified examples of how DC sources and DC cable routing are linked to virtual inverters are shown in Figure 16. The exact configuration depends always on the case due to various points of optimization, and electrical drawings of the configuration ordered must be referred.

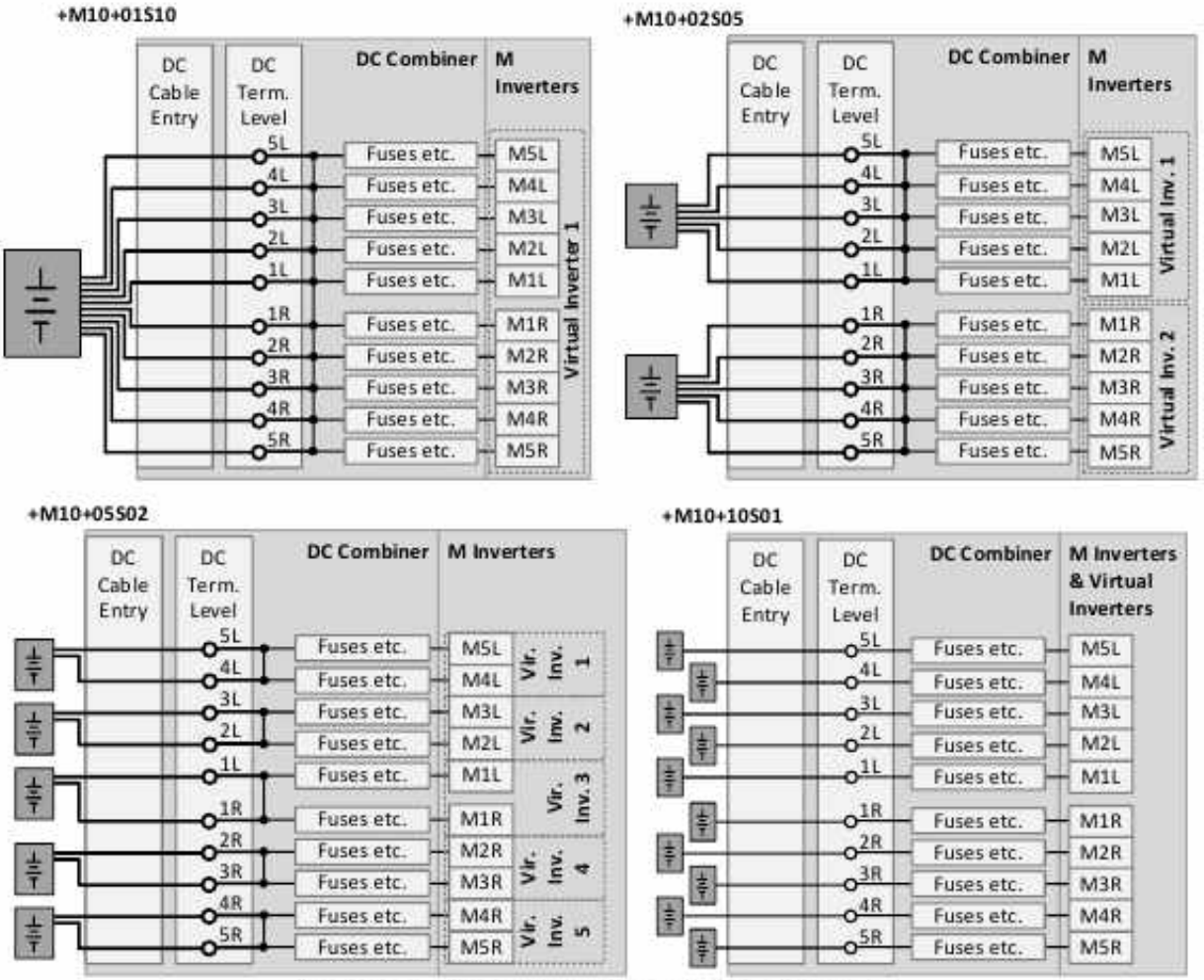


Figure 16. Examples of BESS DC configurations.

4.1.8 AC Throat Entry

The AC throat is in the AC combiner end of M System and has the AC terminal busbars as illustrated in Figure 17 with the recommended order of the AC phases L1, L2, and L3. The connection between the AC terminal busbars and MV transformer requires braids or busbars and cover ensuring the integrity of the enclosure of M System.

The AC busbar details are shown in Section 4.2.4.

EPC Power recommends the customer to use an option AC Throat Parts (option code +THR) to make sure that the connection is adequately rated in amperage and has proper ingress protection.

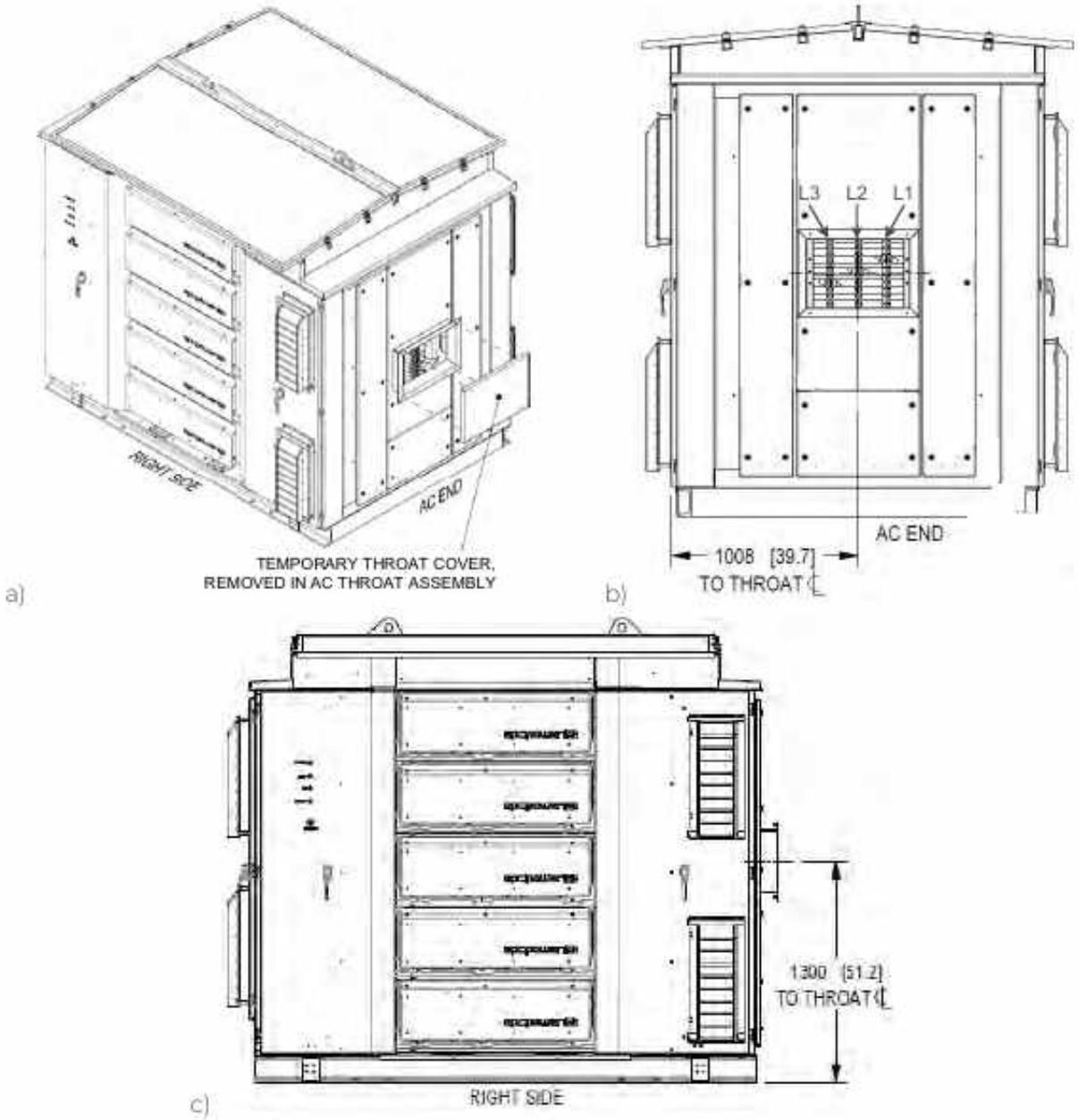


Figure 17. AC throat location (units in mm [in]), a) tilted view from the AC end top, b) AC end view with recommended phase order marked in red, c) right-side view.

4.1.9 Control and Auxiliary Power Wiring Entry Points

The location of the control and auxiliary wiring gland plate in a M System is shown in Figure 14 together with DC cable entry plates. The panel has a selection of adjustable-diameter cable glands and space for customer-fitted conduit entries.

An illustration showing recommended control and auxiliary wiring routing outside the M System is shown in Figure 18.

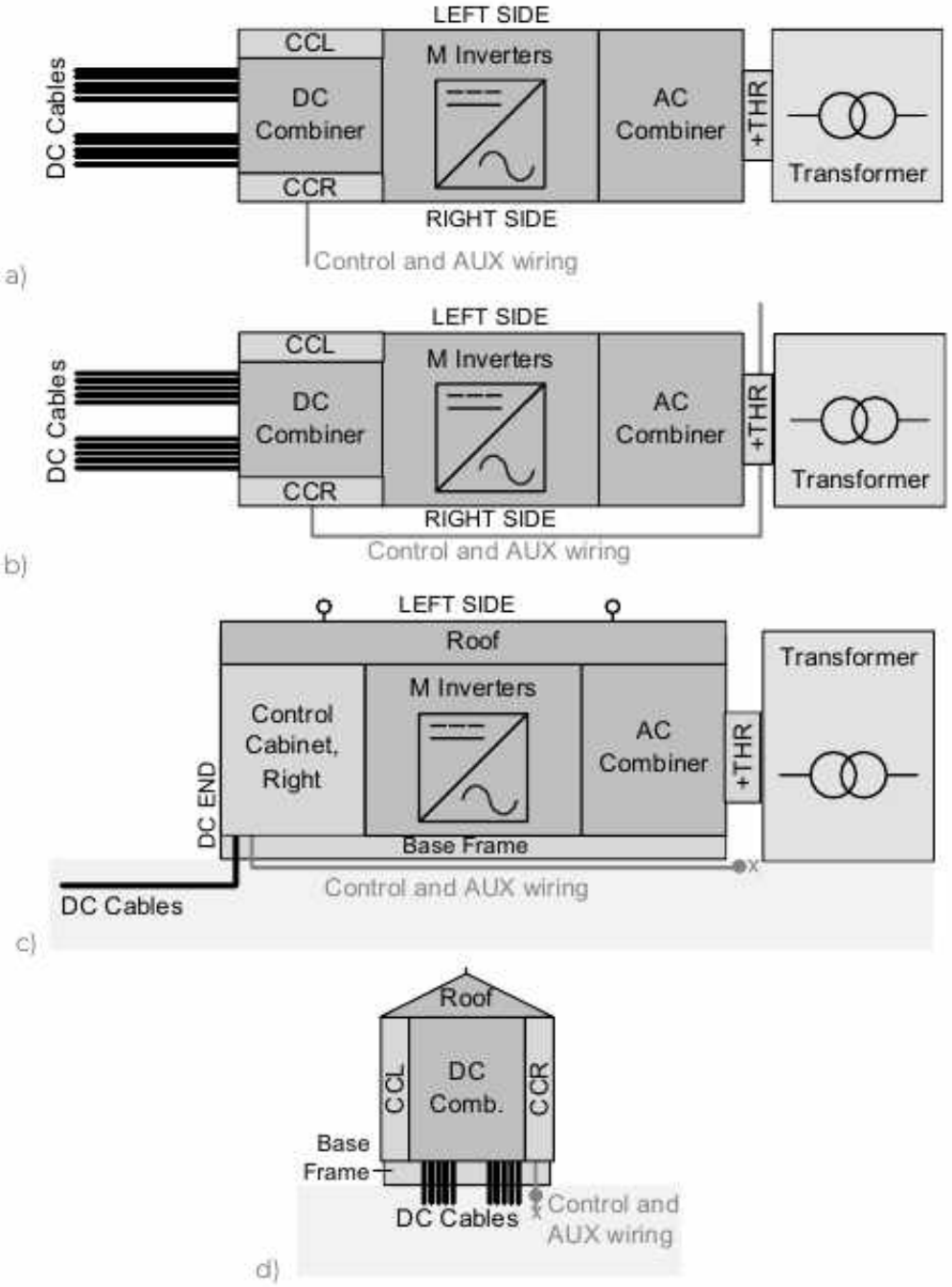


Figure 18. Recommended control and AUX wire routing without crossing the DC cables, where CCL and CCR are Control Cabinet Left and Right, respectively: a) top view of with wiring from right, b) top view with wiring from left, c) right-side view with wiring changing the side under the AC throat, c) DC end view of case c.

When control and auxiliary wire routing is planned, some requirements must be considered:

- Aligning or crossing the control and AUX wiring with the DC power cables should be avoided as shown in in Figure 18.

- If the plant design does not allow the separation of the power cables and the control and AUX wiring:
    - Leading the control and AUX cables with DC power cables in alignment should be avoided in the plant design.
    - If the control and auxiliary cables must cross the DC power cables, this should be at a 90° angle to the DC power cables.

4.1.10 Lifting

M Systems can only be lifted using an overhead lift or a crane. Prior to lifting, inspect eyebolts to make sure they are free from defects. The center of gravity (CoG) is located as listed in Table 2 and illustrated in Figure 19 and Figure 20 with the lifting lug locations. The BESS type M System with DC and AC switches is assumed in defining the total mass and its equal distribution between the quarters of the M System (DC end left and right and AC end left and right) in Table 2 and CoG. Different options may lead to slightly different masses and CoG.

The general overhead lifting guidance is also shown in Figure 19 and Figure 20. It is the only method of lifting the M System into location. Install two separate lift lines (lengths L_A and L_B in Figure 19), one to each lifting eye.

Table 2. Center of gravity (CoG)

	CoG from DC End door (mm [in])	CoG from bottom (mm [in])	CoG from left side door (mm [in])	Total Mass (kg [lbs])	Mass per 1/4 (kg [lbs])
M System	1502 [59.1]	1322 [52.1]	1008 [39.7]	3400 [7500]	850 [1875]

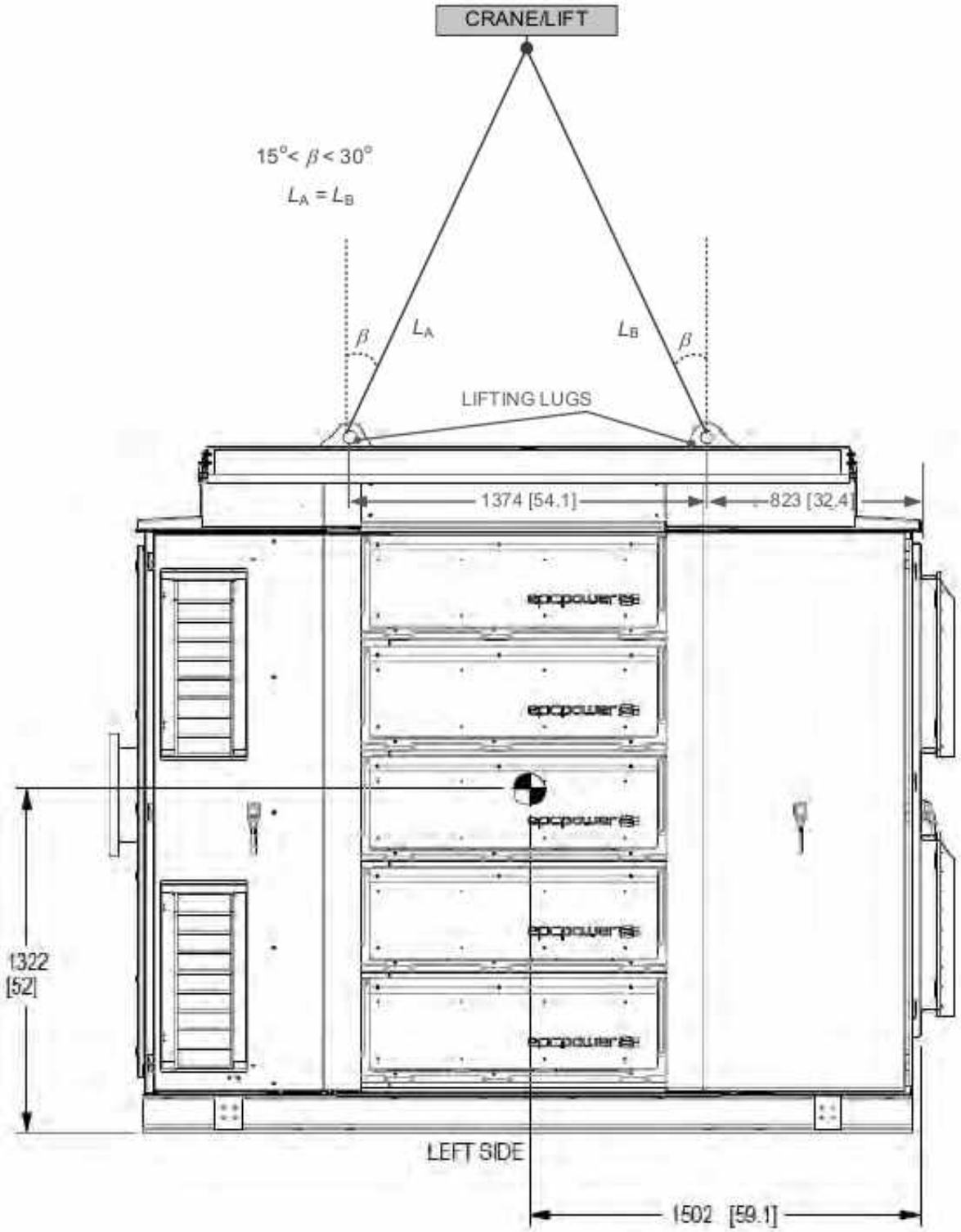


Figure 19. The CoG, lifting lug locations (in blue) and lifting principle with angle range (in dark red), left-side view (units in mm [in]).

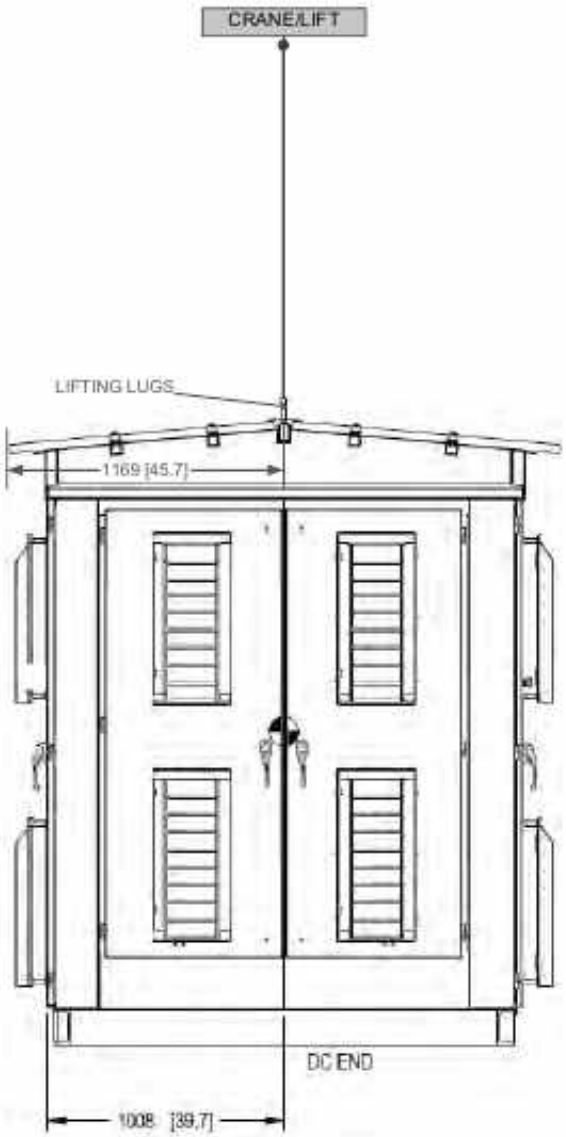


Figure 20. The CoG. lifting lug locations (in blue) and lifting principle with angle range (in dark red); DC-end view (units in mm [in]).

CAUTION	**CAUTION** Do not allow the M System to tip over; always set it on a level surface. Use lifting eyes and straps when appropriate.	**ATTENTION** Ne laissez pas 'onduleur basculer; placez toujours l'onduleur sur une surface plane. Utilisez des anneaux et des sangles de levage, le cas échéant.
CAUTION	**CAUTION** When lifting from overhead, ensure a vertical lift on both eyebolts.	**ATTENTION** Lors du levage depuis le plafond, assurez un levage vertical de tous les boulons à œil.

4.1.11 Transportation

The default transportation mode for M Systems is overland transportation, and an M System complies with typical North American road transportation requirements. An M System can be transported on flat-bed trucks or by rail as part of a skid or alone.

A M System can only be lifted using an overhead lift or a crane. Prior to lifting, inspect eyebolts to make sure they are free from defects. The center of gravity (CoG) is located as listed in Table 2 and illustrated in Figure 19 and Figure 20. A typical BESS M System with DC and AC switches is assumed in defining the masses and CoG. Different options may lead to slightly different masses and CoG.

4.1.12 Environmental Considerations

The M System combiner cabinets have NEMA Type 3R and IP55 rated enclosures, providing protection against rain, sleet, excess dust, sand, and snow protection in outdoor environments.

The M inverters have IP 65 rating fully preventing dust entry to sensitive areas in addition to the elements listed above.

4.2 Field Installation

CAUTION	**CAUTION** After the installation, inspect the lifting eyes to ensure that they are not damaged.	**ATTENTION** Après l'installation, inspectez chacun des anneaux de levage pour vous assurer qu'ils ne sont pas endommagés.

The surface, clearance etc. requirements to be complied with before the field installation of M System starts are explained in section 4.1 and the field-storage conditions are specified in section 3.4.

4.2.1 M System Installation Procedure

The step-by-step procedure to install M System is explained below.

1. Check that you have all the tools required to perform the installation.
2. Check the foundation and clean the mounting surface from all sand, soil, leaves, etc.
    - See section 4.1.2 for the details.

3. Check that M System is not damaged
    - Confirm that all the mounting and anchoring features of the M System are undamaged.
4. Remove conduit entry plates and place them in a safe location where their gasketing is not damaged.
    - Note! The cable gland entry plates with option +DGP are not removed at this stage.
    - Removing the conduit entry plate(s) requires opening the DC-end doors and the dead front of the DC combiner. Put the dead front back in its place and close the doors after removing the entry plates.
5. Lift (see section 4.1.10) and position the M System on its location on the foundation.
6. Fasten the M System to the mounting features of the surface.
    - The locations of the available anchoring holes in the bottom frame beam (8 pcs of Ø28 mm (Ø1.1") holes) are shown in Figure 4. Other anchoring methods, e.g. side clips for the edge of the bottom, are permitted.
7. Proceed to DC cabling connection as instructed in section 4.2.2 or 4.2.3.
    - Without the option +DGP, the conduits and DC cables must be installed and sealed immediately following section 4.2.2.
8. Proceed to AC throat connection as instructed in section 0.
    - If AC busbars are not exposed and covered by the transportation plate, the AC throat connection can be delayed, e.g. until the transformer is installed.
9. Proceed to control wiring as instructed in section 4.2.5.
    - As long as the cable glands of the control wiring are not opened, the control wiring can be delayed.
    - To ensure the operation of the humidity control regardless of the solar irradiation, it is recommended to connect the auxiliary power supply in the earliest possible instant (see section 0 for the details).
10. Make sure that all doors are properly closed and remaining package in place until commissioning occurs.
    - The general guidance for storage is presented in section 3.4.

Actions before commissioning (<2 weeks before):

11. Complete items 7, 8, 9, and 10, if previously delayed.
12. Check the air intakes, exhausts, and filters to make sure they are properly mounted, fully open, and without any blockages.

13. Check the entire surface of the M System for defects. All damage to the paint or to the galvanization in metal surfaces must be repaired once installation is complete to prevent corrosion.
    - Fill any defects in painted metal surfaces with appropriate paint
    - Cover any defects in galvanized metal surfaces with zinc paint or spray as e.g. 3M Zinc Spray, Maston Zinc Spray, Ambro-Sol Pure EP Zinc spray, or David's Zinc 182 which are available as spray and paint.
    - Order replacement parts for damaged plastic covers if M Inverter air intakes are affected.
14. Confirm the integrity of the enclosure and repair any inadequate sealing.
    - Check that the DC cabling entries are properly sealed (see section 4.2.2 or 4.2.3.).
    - Check that the control wiring entries are properly sealed (see section 4.2.5).
    - Check that the AC throat is properly sealed (see section 0).
    - Check the sealings of all the doors.
    - Make sure that all doors are properly closed, and all the latches are closed.

4.2.2 DC Entry Plate for Conduits

As a background, the required DC cable entry planning is presented in section 4.1.7.

The standard DC cable entry method is to use conduits and blind DC entry plates.
The procedure of the work is:

1. Remove the DC entry plates from the floor for the conduits as instructed in 4.2.1.
2. Measure the position of the bottom entry metal conduits and cut holes in the bottom DC conduit entry plates slightly larger than conduits.
3. Install conduit entry plates on the floor and seal entry points leaving no gaps between the plate and conduits.

See section 4.3.3 for information on how DC cables are mounted on the DC terminals.

Notes on sealing the conduit:

1. Once the conduit entry plates are reinstalled, the conduit must be sealed around its outer surface to prevent moisture, dust, air and debris from entering the cabinet.

2. Once the DC power cables are installed and are in their final position, any excess space in the conduit must be sealed with an expansion foam or sealant to prevent moisture, dust, air and debris from entering through the conduit.

An example sealing case of conduits is shown in Figure 21.

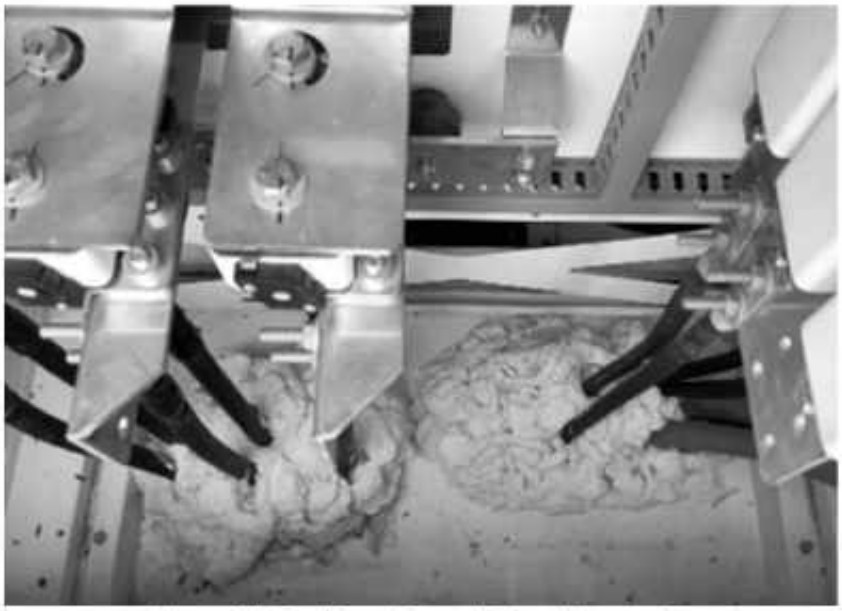


Figure 21. Sealing of conduit cable entries.

If external changes are made to the entry plates or DC combiner cabinet in DC cablings, all leakage gaps around the entry plates or conduits should be sealed with spray foam around the panels and conduits after the cables are inserted from the bottom. A possible sealant is GREAT STUFF (TM) Big Gap Filler Insulating Foam by The Dow Chemical Company 16oz HC ES QP.

4.2.3 DC Entry Plate for Cable Glands

As a background, the required DC cable entry planning is shown in section 4.1.7.

With the option code +DGP, cable glands are used as shown in Figure 22 and Figure 23.

- 30 cable glands per plate, a plate per side
    - 60 cable glands in total
    - IP66 / UL Type 4X
- The gland accommodates cable diameters of 22...36 mm

Cable gland type: Icotek KEL-DPF 50

See section 4.3.3 about where and how DC cables are mounted on the DC terminals.

Figure 22. Cable-gland plates of the DC entry (+DGP option): 30 glands per plate.

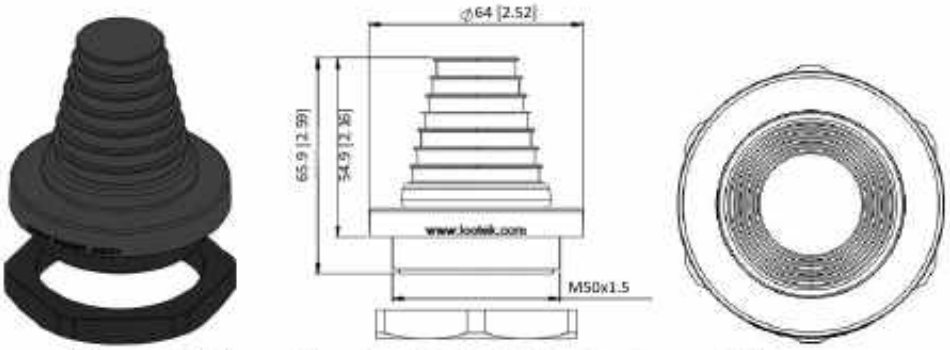


Figure 23. The cable gland in detail, (units in mm [in]).

4.2.4 AC Throat

As introduced in section 4.1.8, the AC throat to connect the M System to an MV transformer is located in the AC end. The busbar connection details are shown in Figure 24.

Remove the plate protecting the AC throat busbars only when the AC connections to the medium voltage transformer is being performed. See section 4.3.4 for the details.

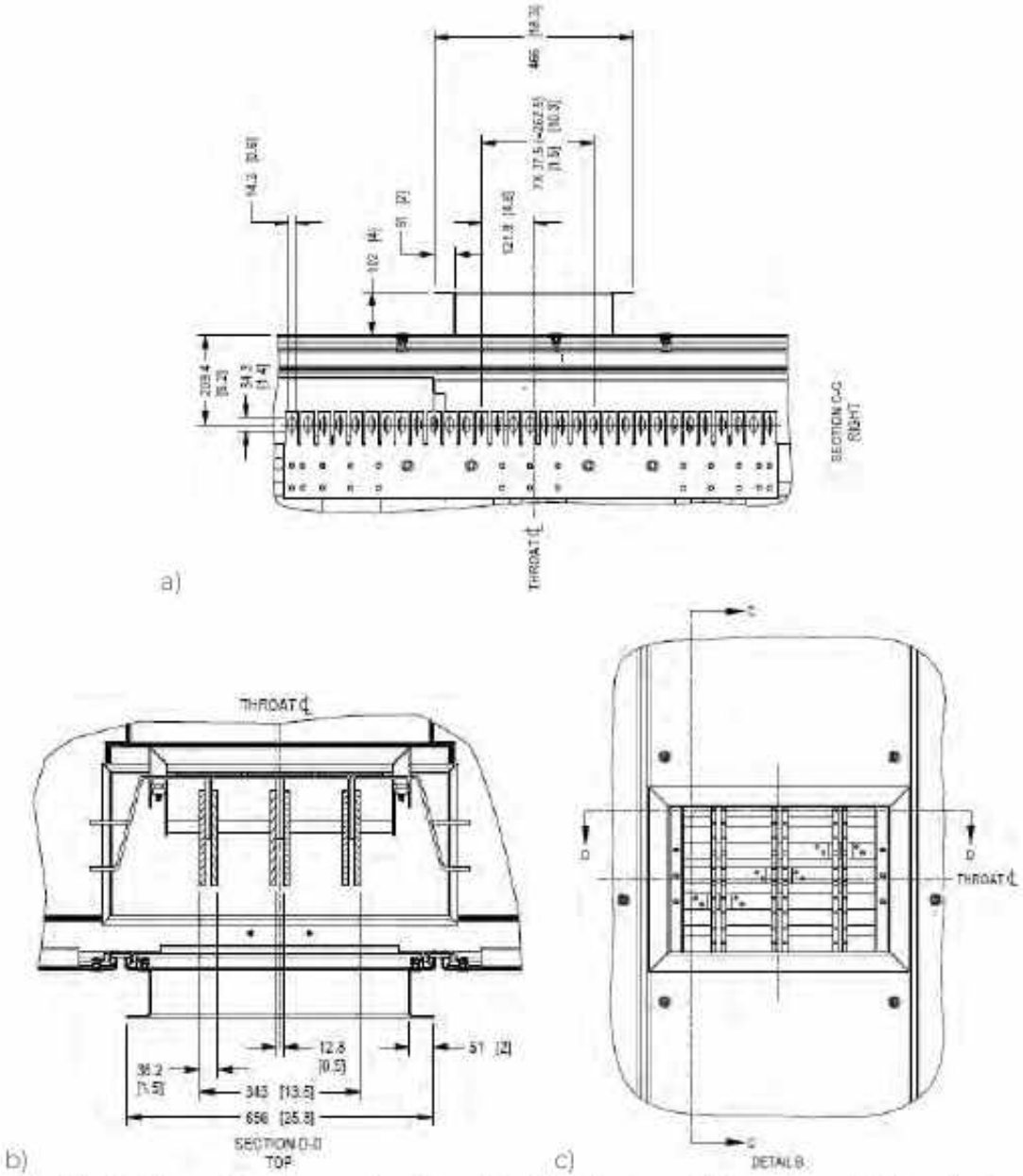


Figure 24. The AC throat busbar and collar a) right-side view, b) top view, c) AC-end view (units in mm [in]).

4.2.5 Control and Auxiliary Wiring Entry Plate

As a background, the required planning for Control and Auxiliary wiring cable entry is shown in section 4.1.9 and in Figure 14.

The customer may use the cable glands in the method considered the most optimum for the case. It is recommended to separate the control signal cables and possible AUX power wiring and to match their locations to the terminal blocks introduced in section 4.4.

4.3 Main Power Connections

WARNING	**WARNING** This unit may not be provided with a GFDI device. This inverter must be used with an external GFDI device if required by the Article 690 [Solar Photovoltaic (PV) Systems] of the National Electrical Code for the installation location.	**AVERTISSEMENT** Cet appareil peut ne pas être fourni avec un appareil GFDI. Cet onduleur doit être utilisé avec un appareil GFDI externe si requis par l'article 690 [Systèmes solaires photovoltaïques (PV)] du Code national de l'électricité pour le lieu d'installation.

4.3.1 Power Connection Overview

Figure 25 and Figure 26 have two typical high-level drawings of M System.

- A 10-inverter M BESS System with two DC supplies (batteries) with all main circuit options is shown in Figure 25, i.e. the variant +M10+02S05
- A 10-inverter M BESS System with ten DC supplies is shown in Figure 26, i.e. the variant +M10+10S01.

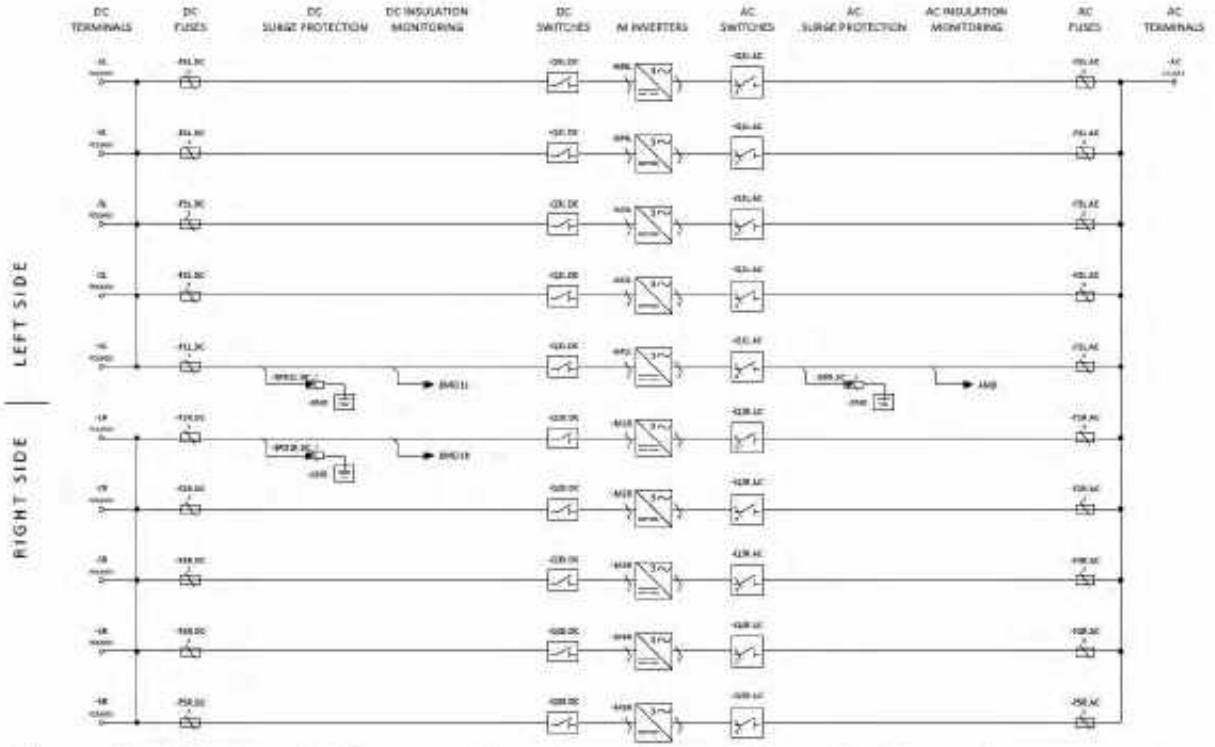


Figure 25. 10-inverter M System with two batteries as DC supplies for two inverter sets, i.e. variant +M10+02S05.

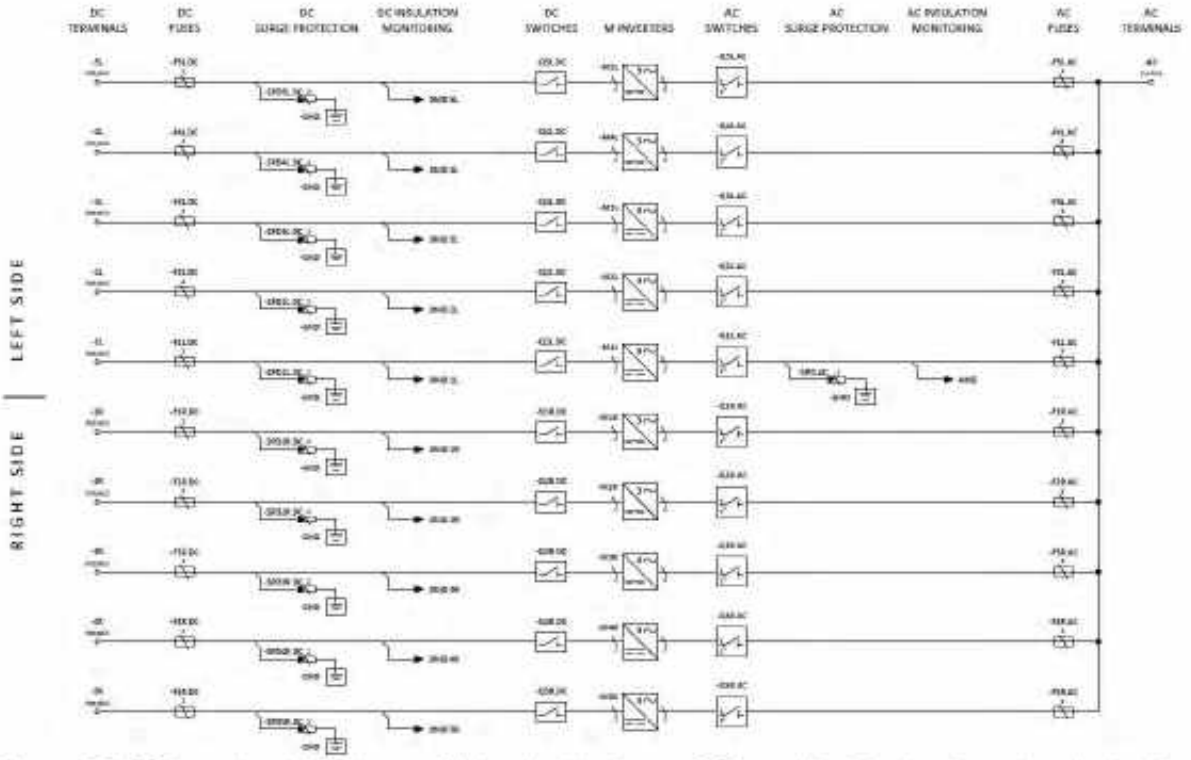


Figure 26. 10-inverter M System with ten batteries as DC supplies for ten inverters (sets) , i.e. variant +M10+10S01.

The power connections to the M System made in the field must comply with applicable local standards. General guidance for the power connections is presented in sections 4.3.2-4.3.4.

Please contact EPC Power if you have any questions regarding your specific unit.

M System uses L1/L2/L3 to identify AC voltage phases. L1/L2/L3 is equivalent to A/B/C, R/S/T, or U/V/W. The phases may be connected in any order; the inverter will self-detect the phase rotation when in the grid following mode.

4.3.2 Equipment Grounding Connections

The equipment grounding conductor (Protective Earthing conductor, i.e. PE conductor) must be connected to the M System.:

- The connection points are external frame-mounted terminals in the AC end shown in Figure 27
    - The terminal busbar details are shown in Figure 28.
    - This connection is exposed to weather and non-corrosive cable lugs, bolts, and nuts are to be used in the mounting of the ground conductors.
- **Equipment grounding (PE conductor) must enter the M System only from a single location.**

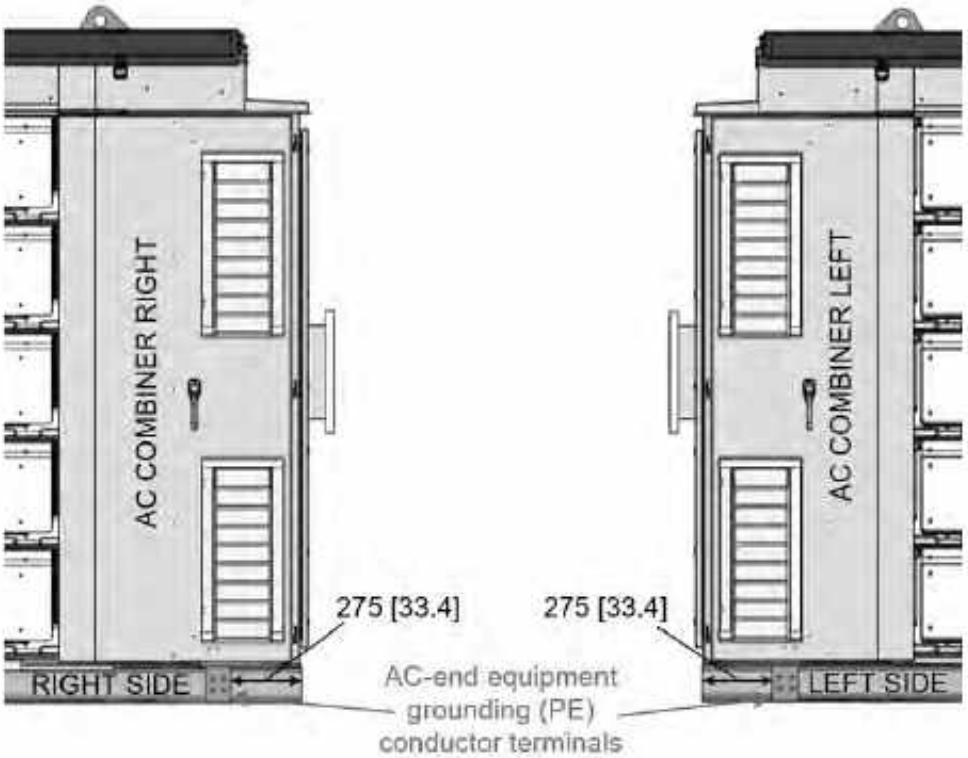


Figure 27. Location of the equipment grounding (PE conductor) terminals (units in mm [in]).

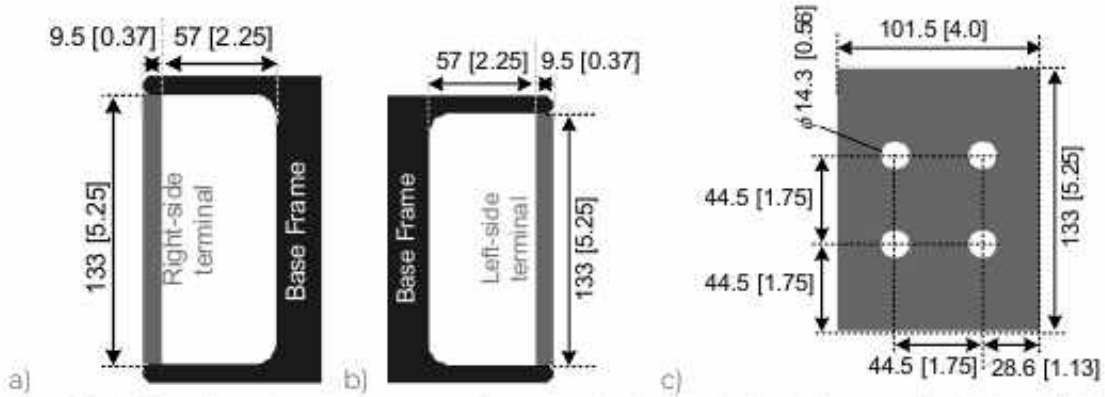


Figure 28. AC-end equipment grounding terminal details (units in mm [in]): a) and b) the terminal and base frame, c) terminal busbar.

The bolt hole pattern in the AC-end equipment grounding (PE conductor) connection is 4-hole wide NEMA pad:

- Hole spacing: 1 ¾", i.e. 44.5 mm
- Hole diameter: 0.56", i.e. 14.3 mm
- Terminal width: 4", i.e. 101.5 mm

The use of double-hole crimped tongue cable lugs is recommended for all grounding connection when cables are used.

The equipment grounding conductor must be sized per the governing standard for site application and location.

- In USA and Canada, the equipment grounding conductor must typically be rated at ⅓ of the current rating of the main AC conductors.
    - Some example conductor cases are collected in Table 3.

Table 3: Equipment grounding current rating and conductor examples in the USA.

M System Variant	AC current [A_{AC}]	US ratings in 50°C [122°F] ambient				
		~1/3 current [A_{AC}]	75°C [167°F] cables in air		Bare conductors	
			Cu	Al	Cu	Al
+M10	4400	1467	4x400kcmil / 3x700kcmil	4x600kcmil	2x600kcmil	3x500kcmil
+M09	3960	1320	4x350kcmil / 3x600kcmil	4x500kcmil	2x500kcmil	3x400kcmil
+M08	3520	1173	4x300kcmil / 3x500kcmil	4x500kcmil / 3x700kcmil	2x500kcmil	3x300kcmil / 2x600kcmil
+M07	3080	1027	4x250kcmil / 3x400kcmil	4x350kcmil / 3x600kcmil	2x350kcmil	3x250kcmil / 2x500kcmil
+M06	2640	880	4x4/0AWG / 3x300kcmil	4x300kcmil / 3x500kcmil	2x300kcmil	2x400kcmil

4.3.3 DC Combiner Power Connections

DC cable entries and their optimal locations are introduced in section 4.1.7.

The dimensions of the terminal locations are shown in Figure 29 and Figure 30. The hole size and spacing of the terminal in the BESS variant is shown in Figure 31.

The use of double-hole crimped tongue cable lugs is recommended for all DC power and ground cables in DC combiner.

The bolt pattern provided in DC terminals is NEMA 2:

- Hole spacing: 1 ¾", i.e. 44.5 mm
- Hole diameter: ½", i.e. 13 mm

When the number of DC cables used does not match the number of M Inverters evenly (see Table 4), the cables should be distributed as evenly as possible between the DC terminals of the respective M Inverters. This may have an effect on the optimal DC cable route discussed in section 4.1.7.

Care must be taken during design and installation to ensure that the DC cables do not apply undue stresses or torques to the DC busbars. Therefore, the DC cabling entries must be made below the DC terminal busbars (see section 4.1.7) to eliminate unnecessary / any significant

cabling bend. The DC cabling without fasteners installed should align with the DC terminal busbars as exactly as possible. Under no circumstances should the fasteners between the DC terminal busbars and the DC cables be used to force the cables into alignment.

The cables must be mounted so that these distances are complied with:

- The distance through air between the bare metal DC-potential conductors/parts and between them and the frame parts other than the enclosure wall of the DC combiner: >18 mm
- The distance over the surface between the bare metal DC-potential conductors/parts and between them and the frame parts other than the enclosure wall of the DC combiner: >31 mm
- The distance between all bare metal DC-potential conductors/parts and the DC combiner enclosure wall: ≥42 mm.

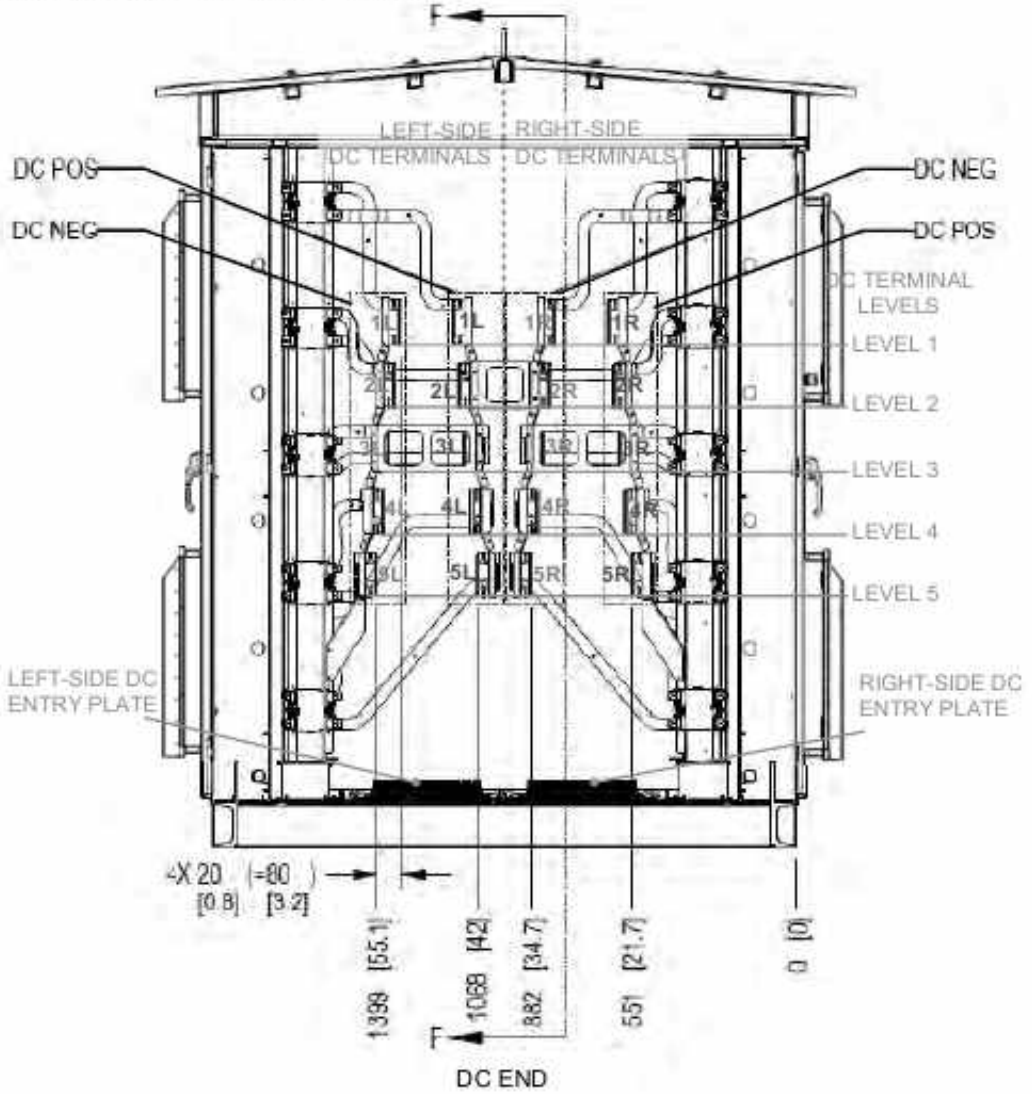


Figure 29. Cabling area dimensions in busbar terminal locations from DC End view (units in mm [in]). Sectioning of Figure 30 marked by F.

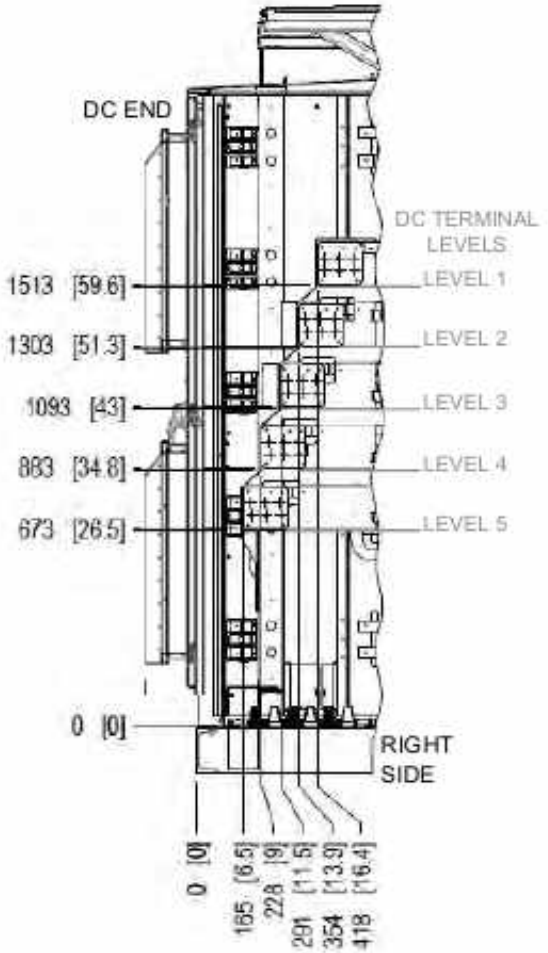


Figure 30. Sectioned right-side view with terminal levels (units in mm [in]).

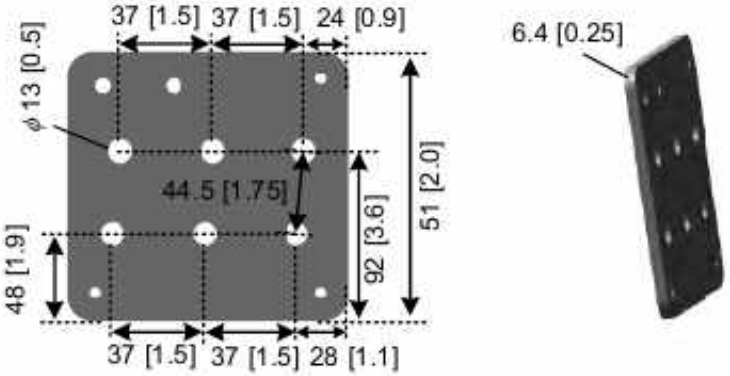


Figure 31. Terminal busbar in BESS-type M System for POS and NEG and in PV-type M System for NEG (units in mm [in]).

4.3.4 AC Throat Connection

The AC throat connection details are shown in section 4.2.4.

Mount the braids of +THR option or the customer's braids in the AC throat busbars. Mount the other ends of the braids in the terminal busbars of the medium voltage transformer.

Care must be taken during design and installation to ensure that the mounting AC braids do not apply undue stresses or torques to the AC busbars. Any damage to the M System or to +THR components caused by failure to follow these instructions is non-warrantable and must be repaired at cost.

When the +THR option is not used, it is the customer's responsibility to provide a solution per the governing standard for your application and location in addition to meeting the requirements introduced in section 4.1.8.

4.3.5 DC Power Cable Specifications

The DC power cables connected to the DC terminals are not to exceed 90°C [194°F] temperature in operation. The cables should be rated for 90°C [194°F] temperature.

Most ampacity charts provide cable size as a function of temperature rise above 30°C [86°F] ambient. This must be adjusted according to the expected maximum ambient temperature of the location and according to the cable assembly and routing concept: separate cables buried in ground, how many per conduit, etc.

NOTE! The cable dimensioning must be done according to nameplate DC current rating of the M Inverters / M System.

EPC Power recommends using a cable with an insulation system rated at the maximum DC bus voltage or greater.

Some DC power cable size and number examples (total number of cables including positive and negative ones) are shown in
Table **4** for different BESS configurations.

- The maximum number of DC power cables in BESS is 3 pcs per DC potential per M Inverter, but it is recommended to use cables with ampacities high-enough to allow the number to be limited to 2 pcs per DC potential.

Table 4. Some cabling examples of four BESS variants with symmetric DC sources.

	DC sources [pcs]	Minimum number of DC cables (POS and NEG summed) [pcs]							
		+M10		+M09		+M08		+M06	
		Total	Total per Inverter	Total	Total per Inverter	Total	Total per Inverter	Total	Total per Inverter
Al Cable: 600 kcmil / 300 mm²	1	36 (2x1x18)	3.6	32 (2x1x16)	3.55	28 (2x1x14)	3.5	22 (2x1x11)	3.67
	2	36 (2x2x9)	3.6	-	-	28 (2x2x7)	3.5	24 (2x2x6)	4
	3	-	-	36 (2x3x6)	4	-	-	24 (2x3x4)	4
	4	-	-	-	-	32 (2x4x4)	4	-	-
	5	40 (2x5x4)	4	-	-	-	-	-	-
	6	-	-	-	-	-	-	24 (2x6x2)	4
	8	-	-	-	-	32 (2x8x2)	4	-	-
	9	-	-	36 (2x9x2)	4	-	-	-	-
	10	40 (2x10x2)	4	-	-	-	-	-	-
Al Cable: 750 kcmil / 400 mm²	1	32 (2x1x16)	3.2	28 (2x1x14)	3.11	26 (2x1x13)	3.25	20 (2x1x10)	3.33
	2	32 (2x2x8)	3.2	-	-	28 (2x2x7)	3.5	20 (2x2x5)	3.33
	3	-	-	30 (2x3x5)	3.33	-	-	24 (2x3x4)	4
	4	-	-	-	-	32 (2x4x4)	4	-	-
	5	40 (2x5x4)	4	-	-	-	-	-	-
	6	-	-	-	-	-	-	24 (2x6x2)	4
	8	-	-	-	-	32 (2x8x2)	4	-	-
	9	-	-	36 (2x9x2)	4	-	-	-	-
	10	40 (2x10x2)	4	-	-	-	-	-	-

4.4 Control and Auxiliary Power Connections

	When working on control or communication circuits, a wrist strap, heel strap, or other ESD precaution should be used. Failure to do so may result in damage to the inverter or its control circuits.	Lorsque vous travaillez sur des circuits de commande ou de communication, un bracelet antistatique, une sangle de talon ou d'autres précautions ESD doivent être utilisés. Le non-respect des instructions peut entraîner des dommages à l'onduleur ou aux circuits de commande.
CAUTION	When directly supplying 24 V_{DC} power to the inverter the supplied voltage must not exceed 27 V_{DC}.	Lors de la fourniture directe d'une alimentation 24 V_{CC} à l'onduleur, la tension fournie ne doit pas dépasser 27 V_{CC}.
CAUTION	When directly supplying 48 V_{DC} power to the inverter the supplied voltage must not exceed 55 V_{DC}.	Lors de la fourniture directe d'une alimentation 48 V_{CC} à l'onduleur, la tension fournie ne doit pas dépasser 55 V_{CC}.

4.4.1 Terminal Block Interface

The layout of the interior of the control section, i.e. the left control cabinet of the M System is shown in Figure 32.

The control/communication wire and auxiliary (AUX) terminal blocks are detailed in

Table 5.

Terminal blocks used are DIN-rail mounted Phoenix Contact PT 1,5/S-QUATTRO blocks:

- Terminal blocks can accommodate conductors described in Table 6.
    - Use wire conductor cross section high enough for the ampacity required by the function.
- Push-in connections to spring contacts

Route cables and/or wires directly from the entry plate to the correct terminal blocks and fasten them to the back wall plate by zip ties.

- Avoid mixing possible auxiliary power supply cable/wires with the signal cables/wires.

Table 5. Terminal block arrangement

Block Section	Block #	Interface	Function	Notes
X01	.1	200-415 V_{AC} aux power input, 3-phase 50 Hz / 60 Hz	Line 1	Max. power: 2 kW (<6 A_{RMS}). Available with option +EAP (not with +IAP or +IDP)
	.2		Line 2	
	.3		Line 3	
	.4	TBD		Reserve
X02	.1	Remote voltage sense	L1 or L12	Wired with option +REM only. Maximum allowed line-to-line voltage: 50 V_{RMS}
	.2		L2 or L23	
	.3		L3 or L31	
X03	.1	+24 V_{DC} output	+24 V_{DC}	Maximum continuous output: 500 mA
	.2		0 V (GND)	
	.3	External IMD alarm	IMD alarm	For external dry contact, i.e. internally powered by 24 V_{DC}, max output ≤10 mA)
	.4		0 V (GND)	
	.5	Customer-defined alarm	Custom alarm	For external dry contact, i.e. internally powered by 24 V_{DC}, max output ≤10 mA)
	.6		0 V (GND)	
	.7	Customer-defined DI 1	DI 1	For external dry contact, i.e. internally powered by 24 V_{DC}, max output ≤10 mA)
	.8		0 V (GND)	
	.9	Customer-defined DI 2	DI 2	Externally powered, 24 V_{DC}
	.10		0 V (GND)	
	.11	Customer-defined DO 1	DO 1	Internally powered by 24 V_{DC}, max output of a DO: ≤20 mA continuous, ≤100 mA peak
	.12		0 V (GND)	
	.13	Customer-defined DO 2	DO 2	
	.14		0 V (GND)	
X04	.1	MV transformer alarm 1	Alarm 1	For external dry contacts, i.e. internally powered by 24 V_{DC}, max output ≤5 mA per alarm.
	.2	MV transformer alarm 2	Alarm 2	
	.3	MV transformer alarm 3	Alarm 3	
	.4	MV transformer alarm 4	Alarm 4	
	.5	MV transformer alarm 5	Alarm 5	
	.6	MV transformer alarm return	0 V (GND)	
	.7		0 V (GND)	

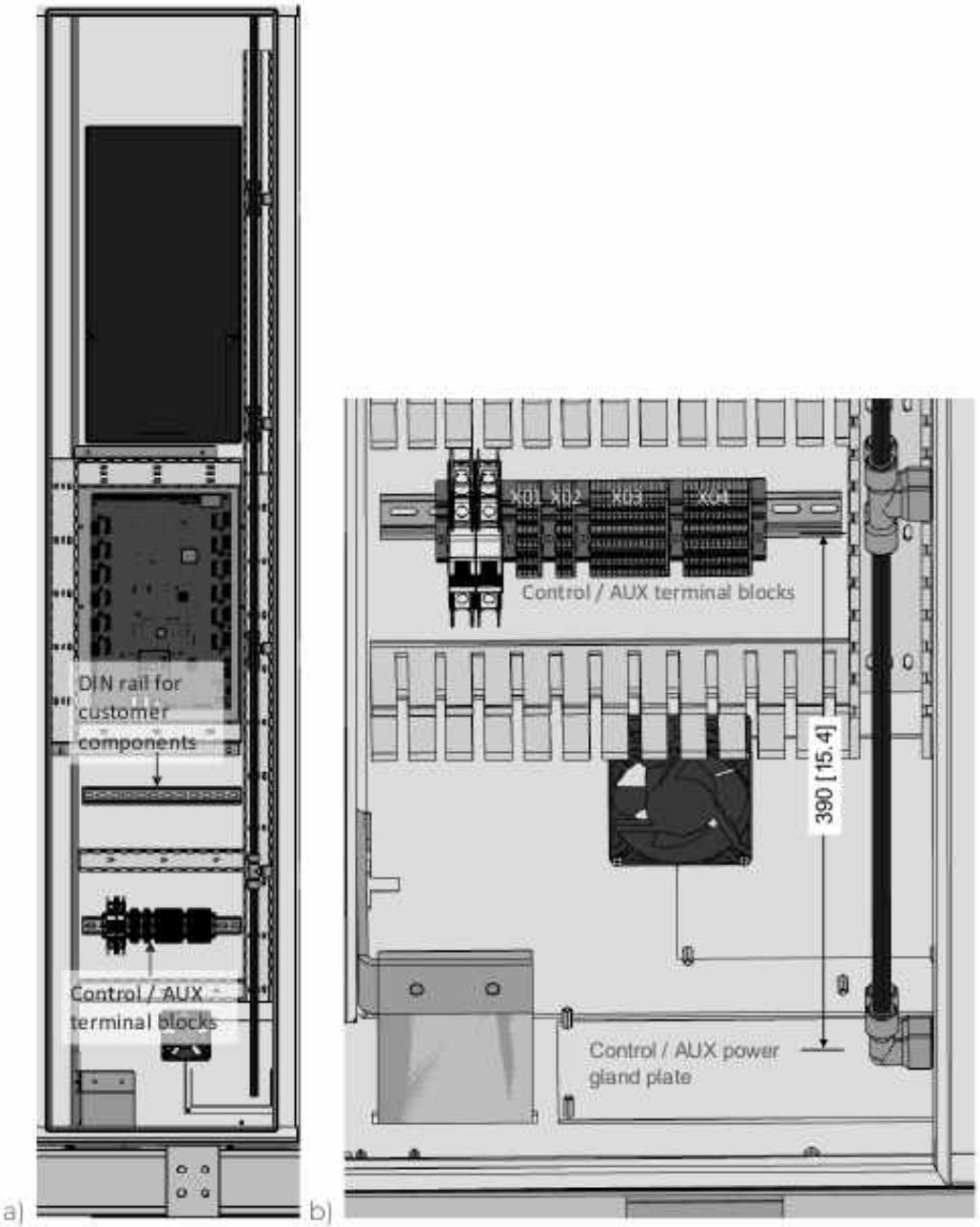


Figure 32. Control section (interior of right control cabinet) of M System a) general right-side view with open left control cabinet door, b) control / AUX wiring in detail (units in mm [in]).

Use a small screwdriver or similar tool to open terminal block clamps when installing wires as shown in Figure 33. Wires should be terminated by ferrules before inserting them into terminal blocks. If ferrules cannot be used, any other termination method specified by manufacturer's instructions is acceptable. Use strain relief methods for conductors terminating on the DIN rail.

Table 6. Terminal block wiring details

Connection Type	Limit SI	Limit AWG/US
Conductor cross section solid/flexible min.	0.14 mm^2	26
Conductor cross section solid/flexible max.	1.5 mm^2	16
Conductor cross section flexible, with ferrule with/without plastic sleeve min.	0.14 mm^2	26
Conductor cross section flexible, with ferrule without plastic sleeve max.	1.5 mm^2	16
Conductor cross section flexible, with ferrule with plastic sleeve max.	1 mm^2	18
Stripping length	8...10 mm	0.315...0.393"
Internal cylindrical gage	A1 / B1	

Figure 33. Opening the terminal block clamp

4.4.2 Communication Interface

The communication interface (Modbus TCP/IP) must have a dedicated (Ethernet) cable which is routed outside the M System, and it enters the left control cabinet through the dedicated cable gland in Control & AUX power entry plate. The cable is secured to the cabinet wall by zip ties so that the terminal plug has appropriate strain.

4.4.3 Integrated Fast Stop (FSTOP)

The integrated Fast Stop (FSTOP) button is located on the control cabinet left door as shown in Figure 34. Make sure that the FSTOP button is pushed down until commissioning to prevent unintentional operation of the M Inverters.

For additional external FSTOP, the customer-defined alarm in terminal X03.5 and X03.6 can be used.

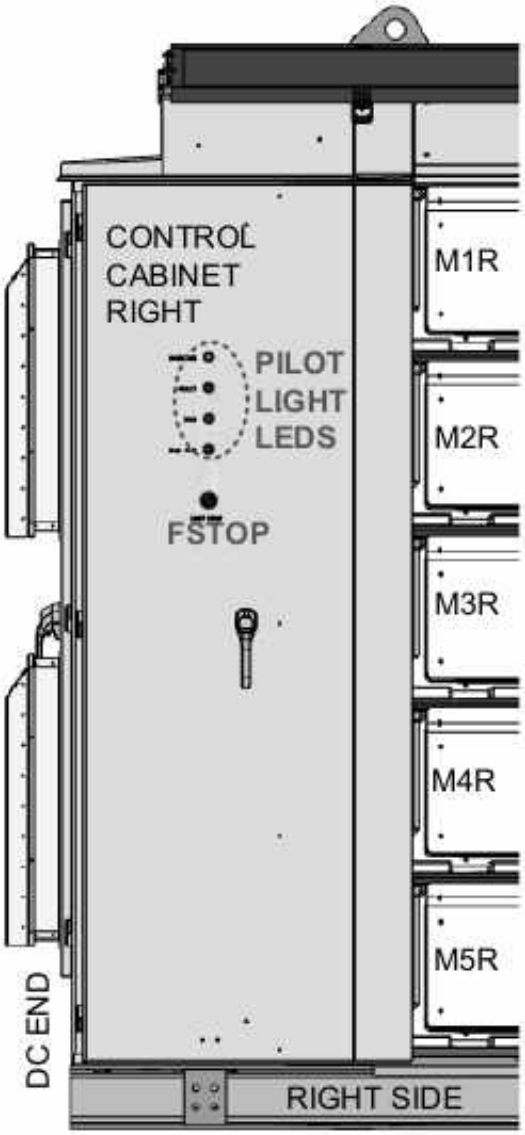


Figure 34. Location of FSTOP button.

5 Sealing Confirmation

A properly sealed inverter is critical for ensuring the long life of the inverter. To properly check the inverter, confirm the following:

1. All latches in all doors are closed
2. All cable entry points are sealed with airtight expanding foam or properly sized cable glands and all the cable entry plates are tightly on their place.
    a. See sections 4.2.2, 4.2.3, and 4.2.5
3. AC throat (see section 0):
    a. the covers are mounted tightly
    b. the throat interfaces are mounted tightly in both the M System and in the MV transformer end.

6 Installation Complete

Once the above sections are complete and the **Installation Check Sheet** (see the end of the document) is completed, the system is ready to be commissioned.

7 Photographic Feedback

For remote commissioning and ensuring long-term project success, photographs of the installation should be sent to EPC Power for review.

Appendix A - Acronym Index

A_{AC}	Ampere Alternating Current
AC	Alternating Current
AUX	Auxiliary
AWG	American Wire Gauge
BESS	Battery Energy Storage System
CCL	Control Cabinet, Left
CCR	Control Cabinet, Right
CoG	Center of Gravity
DC	Direct Current
DMM	Digital Multimeter
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
GFDI	Ground Fault Detector Interrupter
GND	Ground
IEC	International Electrotechnical Commission
IMD	Insulation Monitoring Device
NEC	National Electric Code
OEM	Original Equipment Manufacturer
RMA	Return Merchandise Authorization
SC	Short-circuit Current
UPS	Uninterruptible Power Supply
V_{AC}	Volts AC Power
V_{DC}	Volts DC Power

Installation Check Sheet

This check list is intended as a sign-off to confirm that each installation step is completed, and the system is ready for commissioning. Failure to complete this check sheet may cause commissioning delays and could potentially impact on the warranty.

Product Code	Serial Number	Customer Name	Customer Tag	Location of Equipment

Sections	Description	Initial	Date
3.1	M System has been received undamaged in the factory		
4.1	The site has been built according to the instructions and is fit for the installation of M System(s)		
4.1.1	M System has arrived at the site without transportation damage		
4.2	M System has been installed without installation damage		
4.3.2	Equipment grounding (PE) conductors have been installed and torqued per applicable standard and marked		
4.3.3	DC cables have been installed and torqued per applicable standard and marked		
4.3.4	AC throat braids have been installed and torqued per instructions. AC throat covers are assembled per instructions.		
4.2.5 4.4.2	Control and communication wiring has been installed and connected per instructions		
4.2.5	Auxiliary power has been connected when required		

	Name	Signature	Date
Installer			
Customer Representative			

JF2 DC LINK 5.1 CIVIL INFORMATION

Customer

Supplier LG EnergySolution

LG Energy Solution

Product Information

Product Model : LINK-FDA2AR13

Product Description : JF2 DC LINK 5.1 (0.25CP, US)

Document No. : F2D4-5.1US-DW04

Editing date : 2025.03.24

Supplier : LG EnergySolution

Total : 7

REV	DESCRIPTION	DATE	DRWN	CHKD	APPD
A	INITIAL RELEASE	2025.03.24	KM PARK	MC KIM	JB PARK

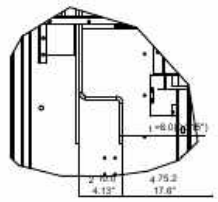
SCALE N/A

TITLE JF2 DC LINK 5.1 CIVIL INFORMATION

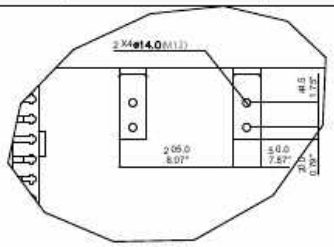
NO. F2D4-5.1US-MC02

SIZE A3

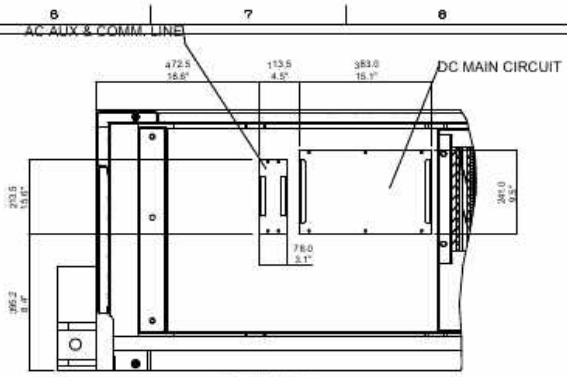
SHEET 1 OF 7



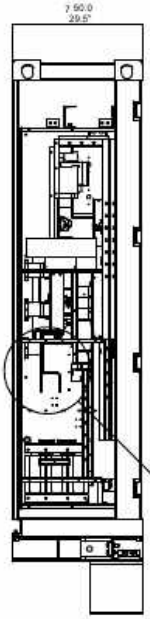
Detail A(6:1)
MAIN POWER CONNECTION



Detail B(8:1)
MAIN POWER CONNECTION [FRONT VIEW]



Detail C (5:1)
CABLE ENTRY



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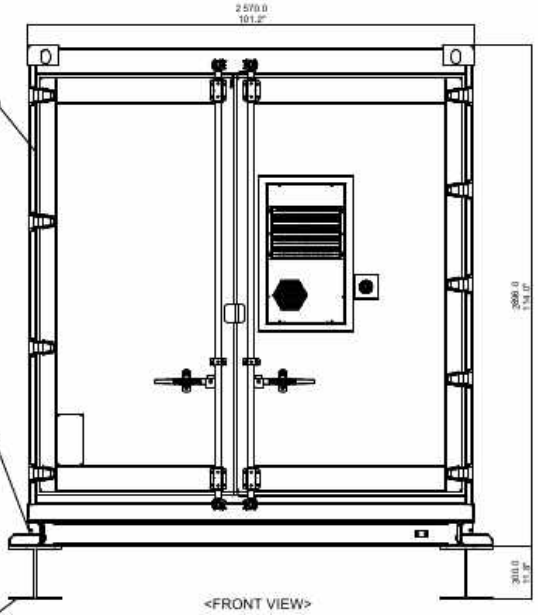

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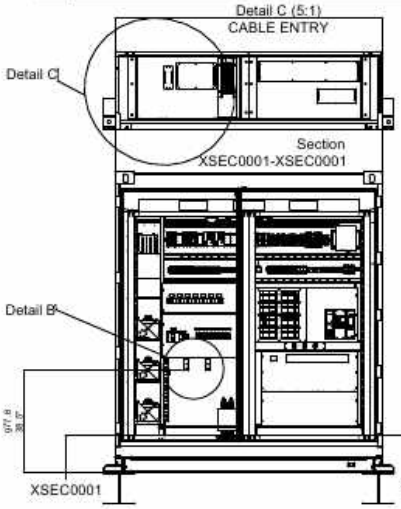

R. EV	DESCRIPTION	DATE	DRWN	CHKD	APPD
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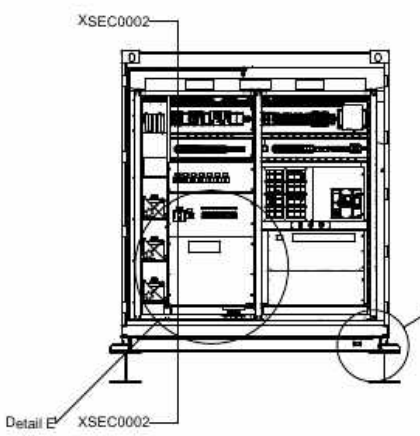
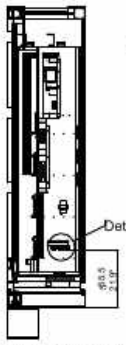
SCALE: N/A

JF2 DC LINK 5.1 CIVIL INFORMATION

F2D4-5.1US-MC02 | A3 | SHEET 02 OF 07





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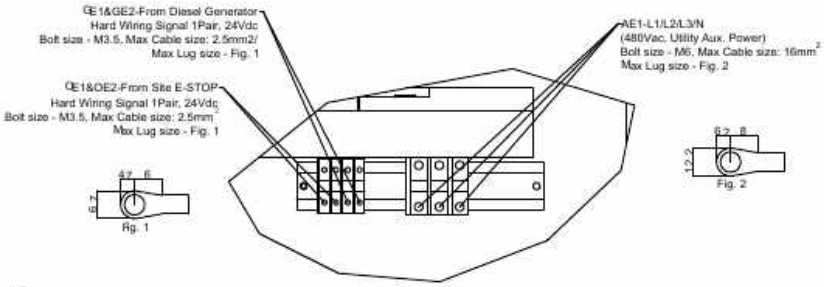
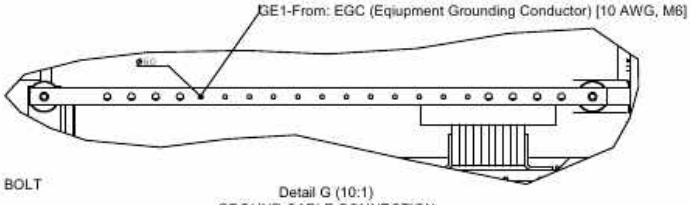
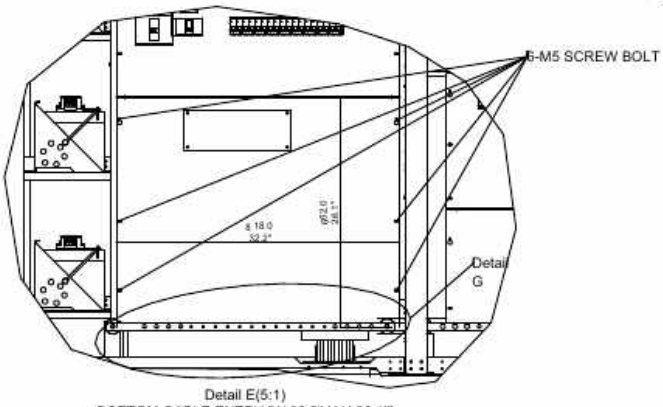


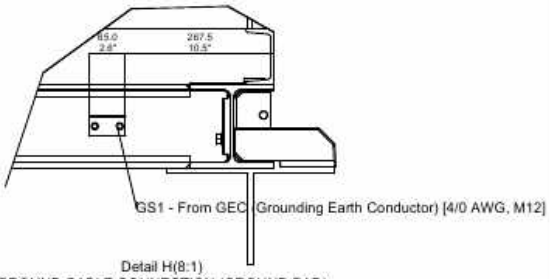
Detail D(20:1)
AUX POWER/E-STOP S/W CONNECTION



Detail G (10:1)
GROUND CABLE CONNECTION



Detail E(5:1)
BOTTOM CABLE ENTRY [W:32.2" X H:26.1"]



Detail H(8:1)
GROUND CABLE CONNECTION (GROUND PAD)

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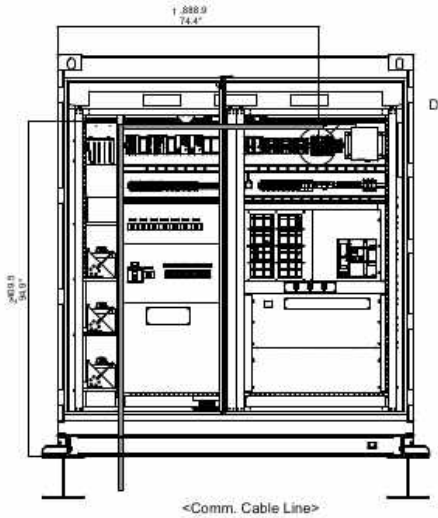
SCALE: N/A

JF2 DC LINK 5.1 CIVIL INFORMATION

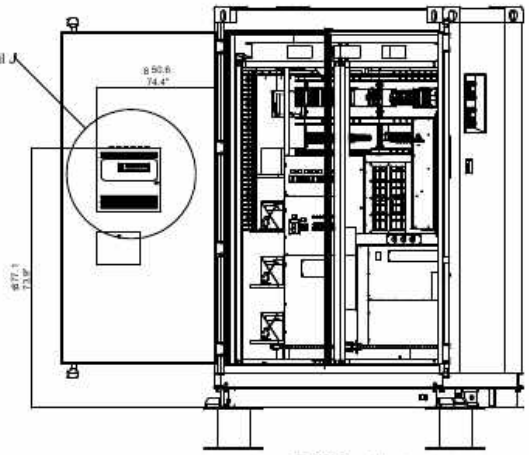
DWG NO: F2D4-5.1US-MC02

SIZE: A3

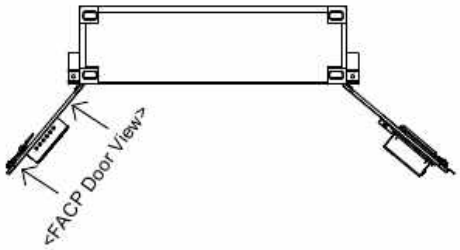
SHEET: 03 / 07

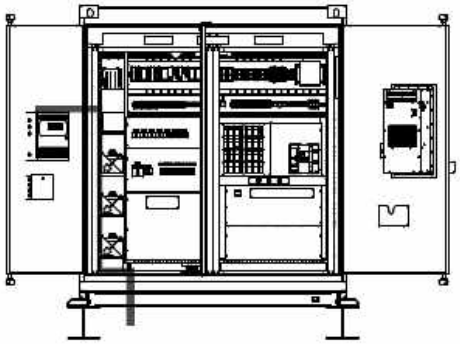


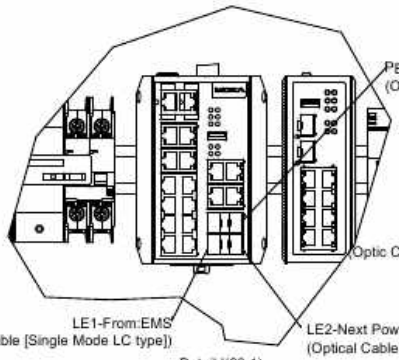
<Comm. Cable Line>



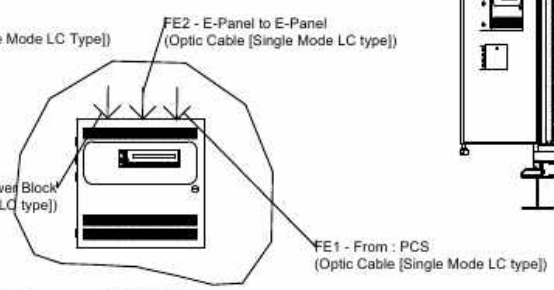
<FACP Door View>







Detail I(20:1)
Fiber Optic & Ethernet Cable Connection



Detail J(4:1)
FACP Fiber Optic Connection

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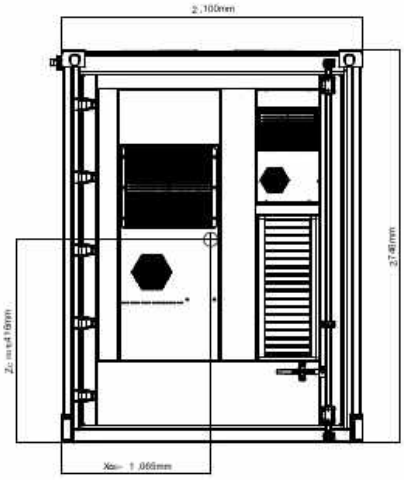
JF2 DC LINK 5.1 CIVIL INFORMATION

F2D4-5.1US-MC02 | A3 | N/A

JF2 M-LINK COG INFORMATION



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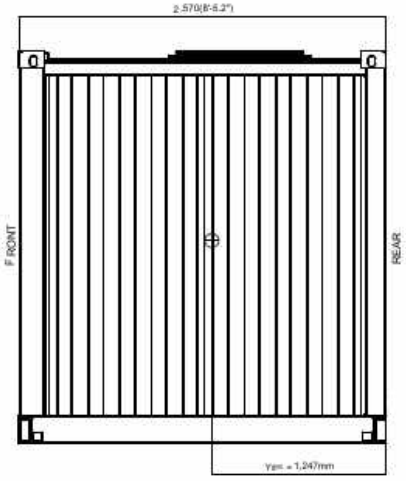
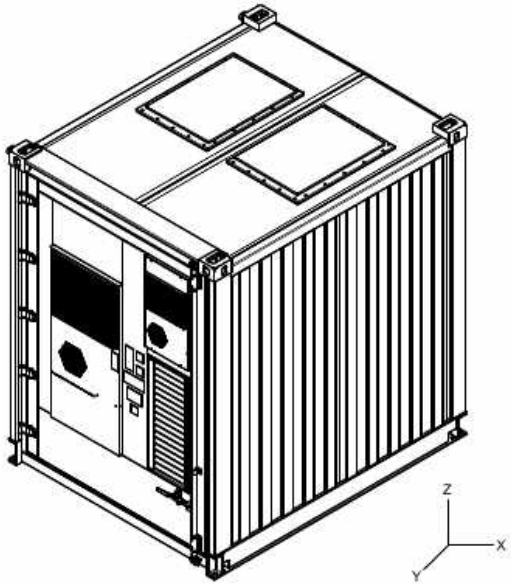


<RIGHT VIEW>



<ISOMETRIC VIEW>

JF2 M-LINK APPROXIMATE WEIGHT & DIMENSION INFORMATION			
DESCRIPTION	DIMENSION (W X D X H, mm)	WEIGHT (LBS OR Ton)	REMARK
GROSS	2,100 X 2,570 X 2,746	14.5 Ton Approx	-

CENTER OF GRAVITY COORDINATES		
$X_{C.O.G}$[mm]	$Y_{C.O.G}$[mm]	$Z_{C.O.G}$[mm]
1,065	1,247	1,416
$X_{C.O.G}$[ft-in]	$Y_{C.O.G}$[ft-in]	$Z_{C.O.G}$[ft-in]
3'-5.9"	4'-1.1"	4'-7.7"

THE SPECIFICATION MAY BE SUBJECT TO CHANGE

REV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2025.03.24	KM PARK	MC KIM	JB PARK

TITLE: JF2 DC LINK 5.1 CIVIL INFORMATION

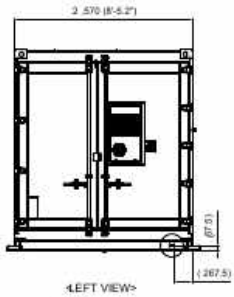
SCALE: N/A

DWG NO: F2D4-5.1US-MC02

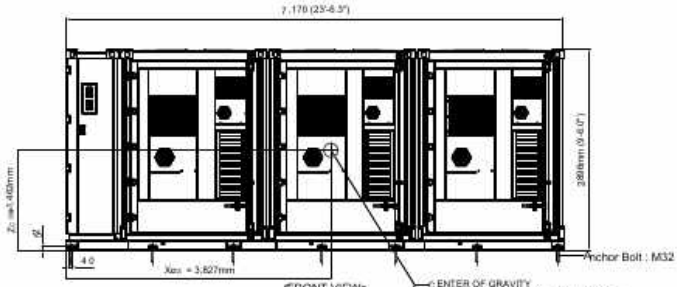
SIZE: A3

SHEET 05 OF 05

JF2 DC LINK 5.1 COG&ANCHORING INFORMATION



<LEFT VIEW>



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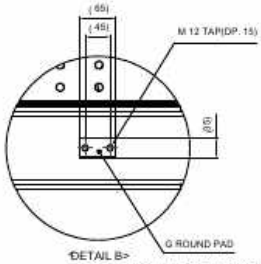
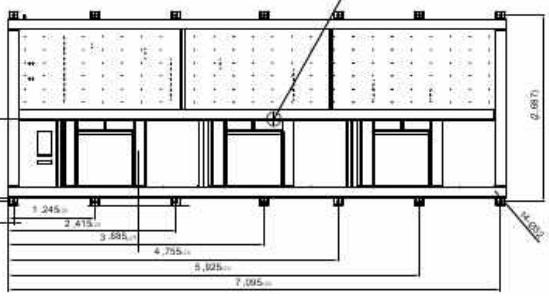
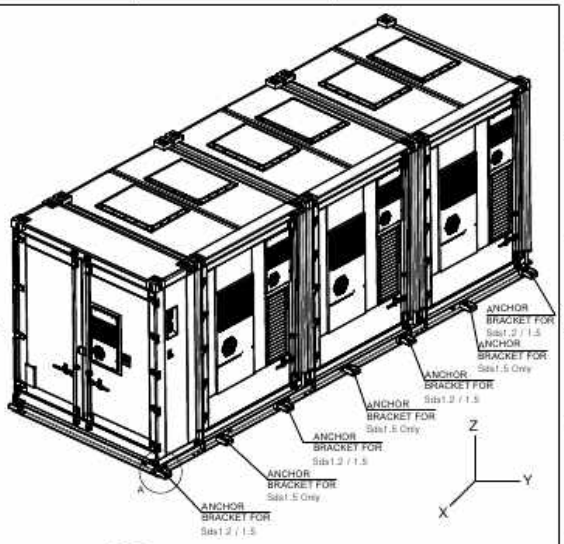


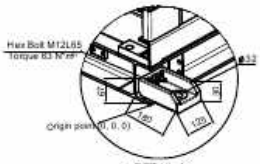
<DETAIL B>

*THIS FIGURE IS IN THE SAME(MIRROR) POSITION ON BOTH SIDES.



<BOTTOM VIEW>





<DETAIL A>

MAXIMUM ANCHOR DIRECTIONAL LOAD BY EXTERNAL CONDITIONS (2)	
AXIAL LOAD [N]	Sds 1.2 : 123,241N Sds 1.5 : 80,734N
SHEAR LOAD [N]	Sds 1.2 : 43,307N Sds 1.5 : 38,600N

(1) EACH ANCHOR AT DC-LINK BOTTOM EXERTS WEIGHT (AXIAL DIRECTION) ON GROUND PIERS. THIS TABLE SHALL BE USED WHEN INSTALLING DC-LINK ON GROUND SURFACE.

(2) TABLE INDICATES MAXIMUM POSSIBLE LOAD ON ANCHOR BOLT IN WORST CASE OF EXTERNAL CONDITION. EXTERNAL CONDITIONS INCLUDES DEAD LOAD, SEISMIC LOAD, WIND LOAD, SNOW LOAD. DETAIL EXTERNAL CONDITION CAN BE CHECKED IN JF2 DC LINK 5.1 ANALYSIS REPORTS.

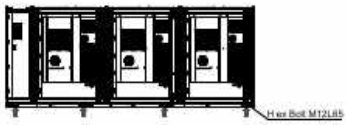
(3) EACH ANCHOR BRACKET OF SDS 1.2 IS SHIPPED ATTACHED TO THE SKID. THE ADDITIONAL ANCHOR BRACKETS OF SDS 1.5 ARE ALSO SHIPPED ATTACHED TO THE SKID. ALL ANCHOR BRACKETS SHOULD BE INSTALLED ON-SITE.

(4) FOR HOLES FOR FIXING ANCHOR BRACKET, IT IS RECOMMENDED TO WORK AFTER ASSEMBLING THE ANCHOR BRACKET AND CONFIRMING THE POSITION OF THE HOLE

JF2 DC LINK 5.1 APPROXIMATE WEIGHT & DIMENSION INFORMATION			
DESCRIPTION	DIMENSION (W X D X H, mm)	WEIGHT (LBS OR Ton)	REMARK
GROSS	7,170 X 2,570 X 2,896	48 Ton Approx.	-
SHIPPING	7,170 X 2,570 X 2,896	48 Ton Approx.	

CENTER OF GRAVITY COORDINATES		
x_{COG} [mm]	y_{COG} [mm]	z_{COG} [mm]
3,827	1,256	1,462
x_{COG} [ft-in]	y_{COG} [ft-in]	z_{COG} [ft-in]
12'-6.7"	4'-1.2"	4'-9.6"

ANCHOR BRACKET ATTACHED TO THE SKID



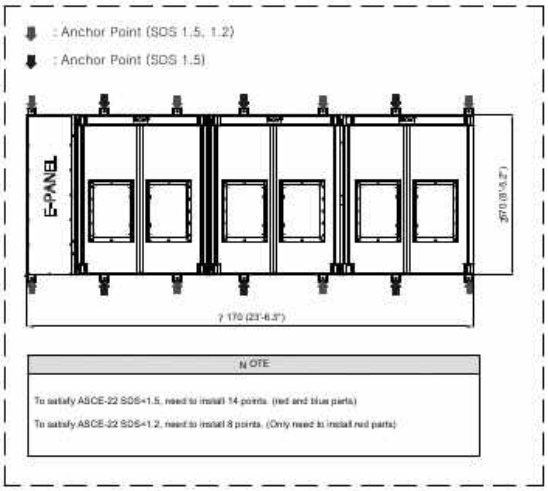
: ANCHOR BRACKET ATTACHED TO THE SKID POINT
IT IS IN THE SAME POSITION ON THE BACKS

THE SPECIFICATION MAY BE SUBJECT TO CHANGE

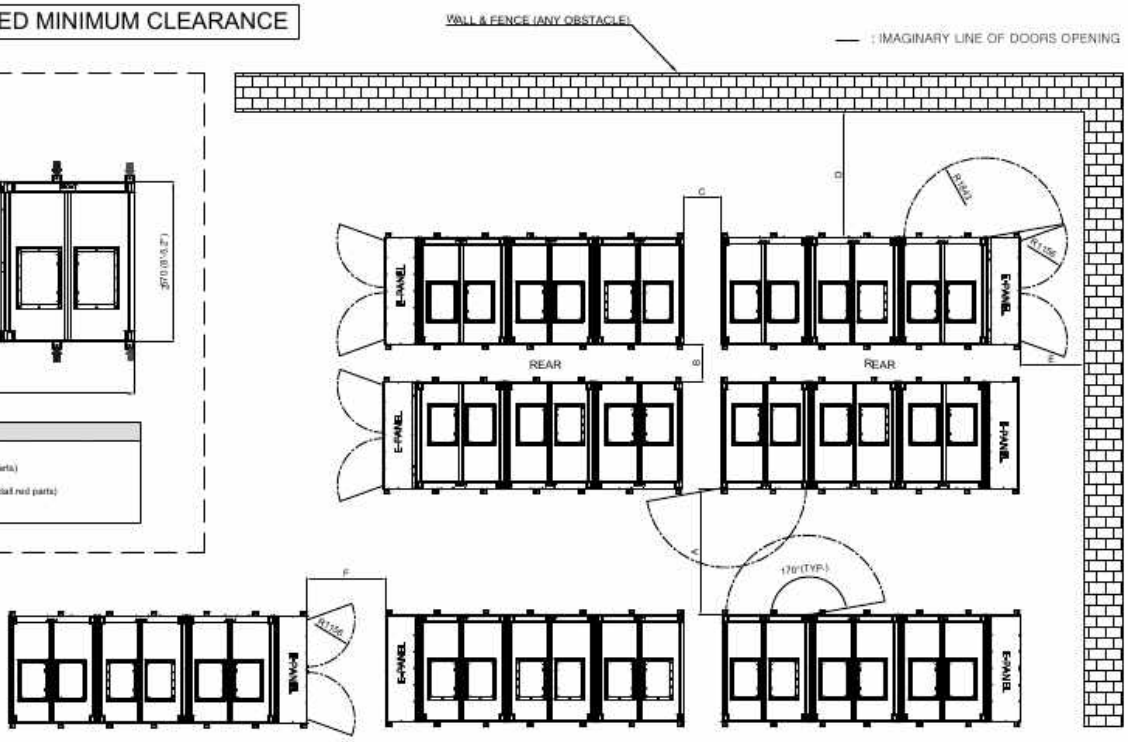
R. EV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2023.03.24	KM PARK	MC KIM	JB PARK

SCALE	N/A
UNIT	mm (ft-in/t)
TITLE	JF2 DC LINK 5.1 CIVIL INFORMATION
NO.	F2D4-5.1US-MC02
SIZE	A3
SHEET	06 / 03

JF2 DC LINK 5.1 RECOMMENDED MINIMUM CLEARANCE



NOTE
To satisfy ASCE-22 SDS=1.5, need to install 14 points. (red and blue parts)
To satisfy ASCE-22 SDS=1.2, need to install 8 points. (Only need to install red parts)



ITEM	LOCATION	RECOMMENDED MINIMUM CLEARANCE [mm/ft]
A	FRONT TO FRONT	3,048 / 10'
B	REAR TO REAR	914.4 / 3'
C	SIDE TO SIDE	914.4 / 3'
D	FRONT TO FENCE	3,048 / 10'
E	SIDE TO FENCE	1,524 / 5'
F	E-PANEL TO E-PANEL	1,524 / 5'

NOTE
MINIMUM SWING OF DOOR, REGULATIONS FOR INSTALLATING ESS, SPACE FOR INSTALLING SITE ARE CONSIDERED WHEN CHOOSING THE MINIMUM CLEARANCE. THE CLEARANCE SHALL BE CHANGEABLE DEPENDING ON THE OTHER VARIOUS REQUIREMENTS. (EG. SITE CONDITIONS, LOCAL PERMIT, AHJ APPROVAL ETC.)

THE SPECIFICATION MAY BE SUBJECT TO CHANGE

REV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2023.03.24	KM PARK	MC KIM	JB PARK

SCALE: N/A

TITLE: JF2 DC LINK 5.1 CIVIL INFORMATION

NO: F2D4-5.1US-MC02 | SIZE: A3 | SHEET: 01 / 03

JF2 DC LINK 5.1 CIVIL INFORMATION

Customer

Supplier LG EnergySolution

LG Energy Solution

Product Information

Product Model : LINK-FDA2BL

Product Description : JF2 DC LINK 5.1 (0.25CP, US)

Document No. : F2D4-5.1US-MC02

Editing date : 2025.03.24

Supplier : LG EnergySolution

Total : 7

THE SPECIFICATION MAY BE SUBJECT TO CHANGE

REV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2025.03.24	KM PARK	MC KIM	JB PARK

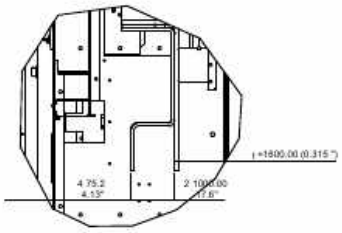
SCALE N/A

TITLE JF2 DC LINK 5.1 CIVIL INFORMATION

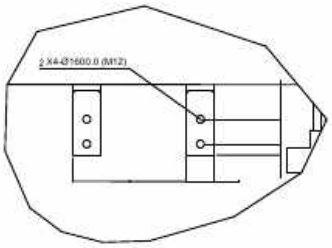
DWG NO. F2D4-5.1US-MC02

REV. A3

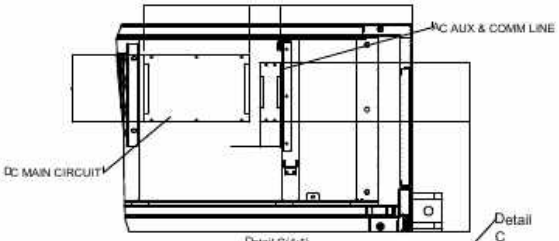
SHEET 01 / 02



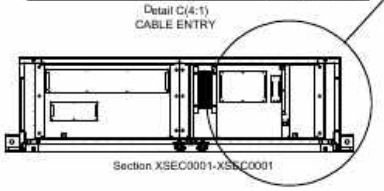
Detail A(6:1)
MAIN POWER CONNECTION



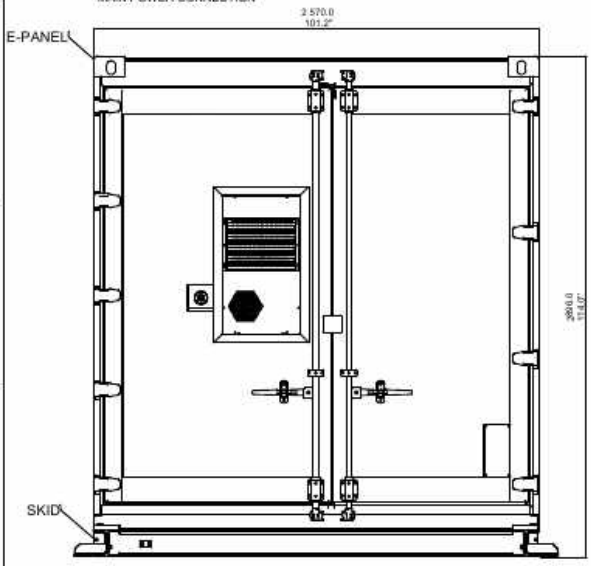
Detail B(8:1)
MAIN POWER CONNECTION [FRONT VIEW]



Detail C(4:1)
CABLE ENTRY



Section XSEC0001-XSEC0001



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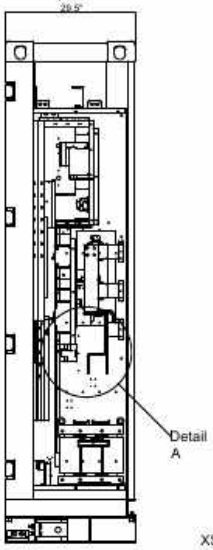

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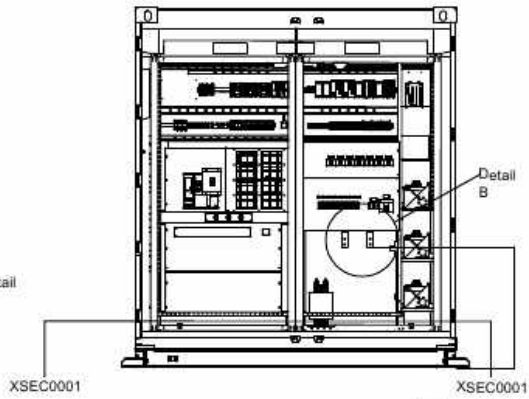
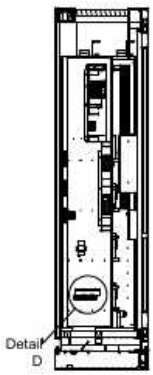


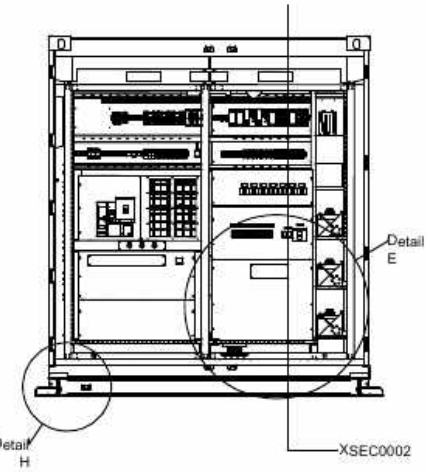
R. EV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2025.03.24	SW JEON	HW YU	TS CHO

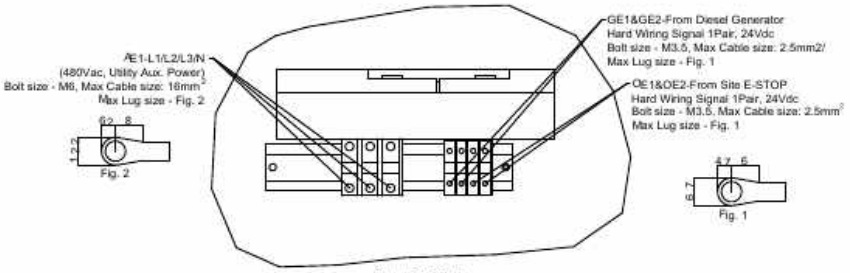
SCALE: N/A

JF2 DC LINK 5.1 CIVIL INFORMATION

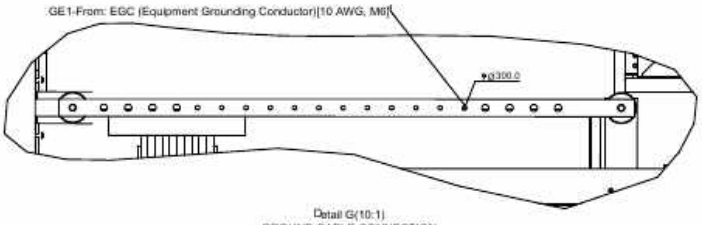
F2D4-5.1US-MC02 | A3 | 02 / 07



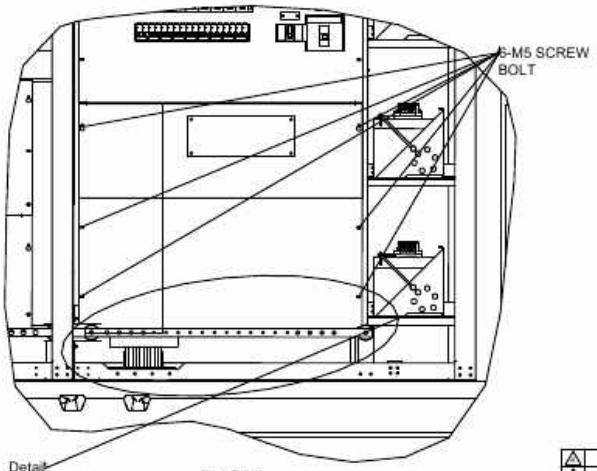




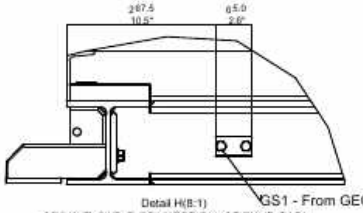
Detail D(20:1)
AUX POWER/E-STOP S/W
CONNECTION



Detail G(10:1)
GROUND CABLE CONNECTION



Detail E(5:1)
BOTTOM CABLE ENTRY [W:32.2 X H:26.1"]

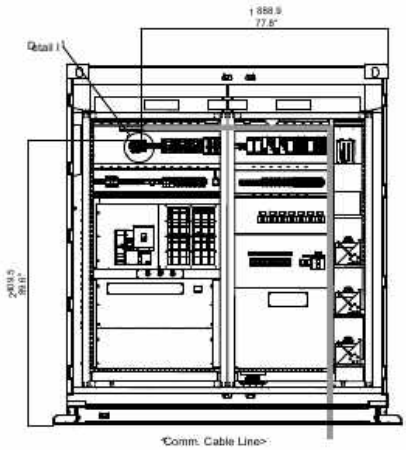


Detail H(8:1)
GROUND CABLE CONNECTION (GROUND PAD)

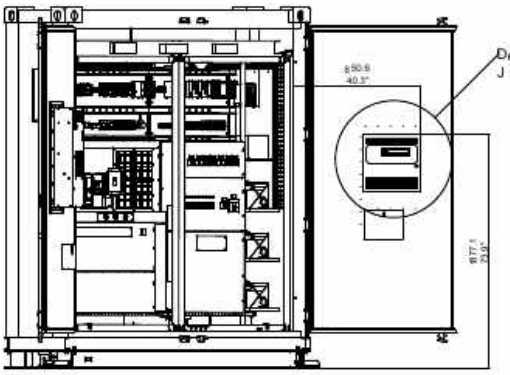
GS1 - From GEC (Grounding Earth Conductor) [4/0 AWG, M12]

REV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2025.03.24	SW JEON	HW YU	TS CHO

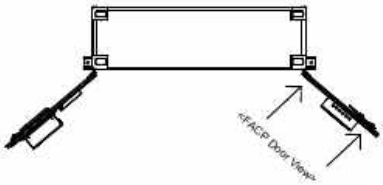
SCALE	N/A
TITLE	JF2 DC LINK 5.1 CIVIL INFORMATION
DWG NO.	F2D4-5.1US-MC02
SIZE	A3
SHEET	02 / 07

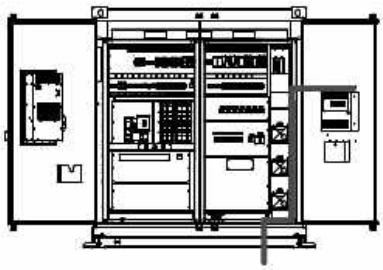


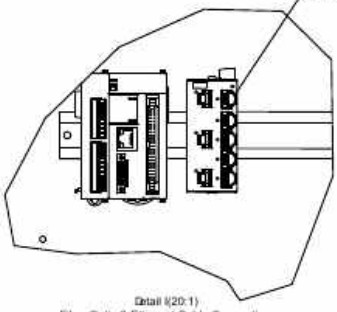
<Comm. Cable Line>



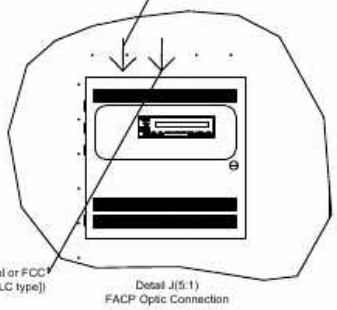
<FACP Door View>







Detail I(20:1)
Fiber Optic & Ethernet Cable Connection



Detail J(5:1)
FACP Optic Connection

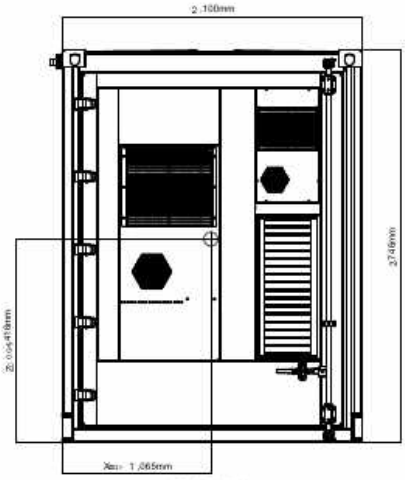
REV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2025.03.24	SW JEON	HW YU	TS CHO

SCALE: N/A

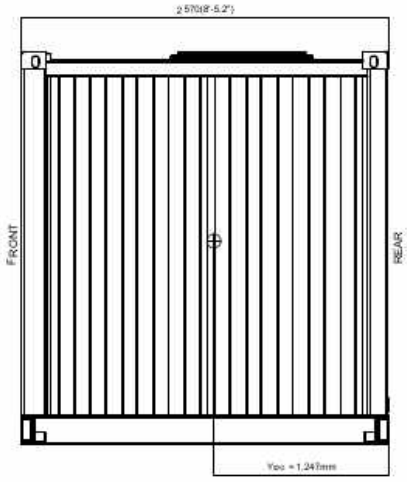
JF2 DC LINK 5.1 CIVIL INFORMATION

F2D4-5.1US-MC02 | A3 | SHEET 04 OF 07

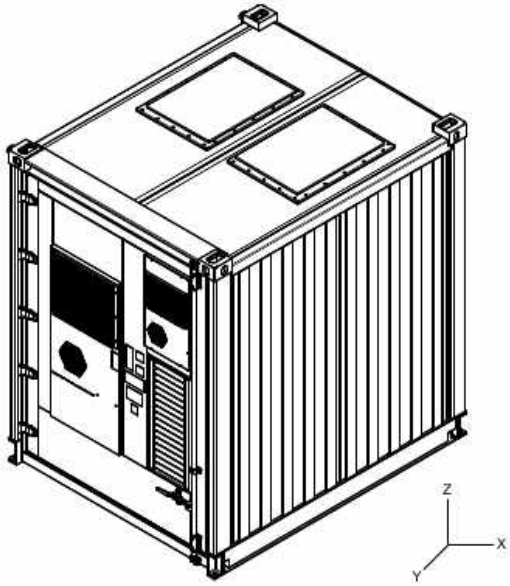
JF2 M-LINK COG INFORMATION



<FRONT VIEW>



<RIGHT VIEW>



<ISOMETRIC VIEW>

JF2 M-LINK APPROXIMATE WEIGHT & DIMENSION INFORMATION			
DESCRIPTION	DIMENSION (W X D X H, mm)	WEIGHT (LBS OR Ton)	REMARK
GROSS	2,100 X 2,570 X 2,746	14.5 Ton A parts	-

CENTER OF GRAVITY COORDINATES		
$x_{C.cg}$[mm]	$y_{C.cg}$[mm]	$z_{C.cg}$[mm]
1,065	1,247	1,416
$x_{C.cg}$[ft-in]	$y_{C.cg}$[ft-in]	$z_{C.cg}$[ft-in]
3'-5.9"	4'-1.1"	4'-7.7"

THE SPECIFICATION MAY BE SUBJECT TO CHANGE

REV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2023.03.24	KM PARK	MC KIM	JB PARK

SCALE: N/A

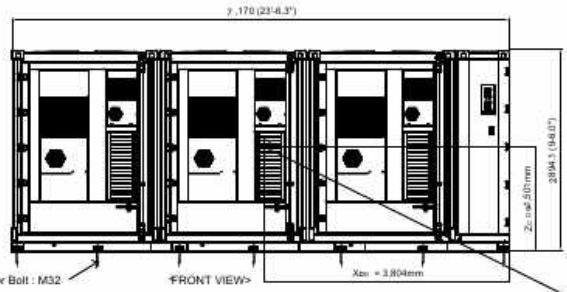
JF2 DC LINK 5.1 CIVIL INFORMATION

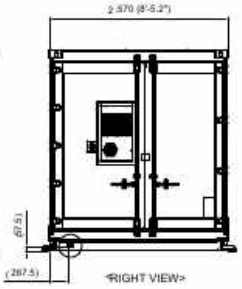
F2D4-5.1US-MC02

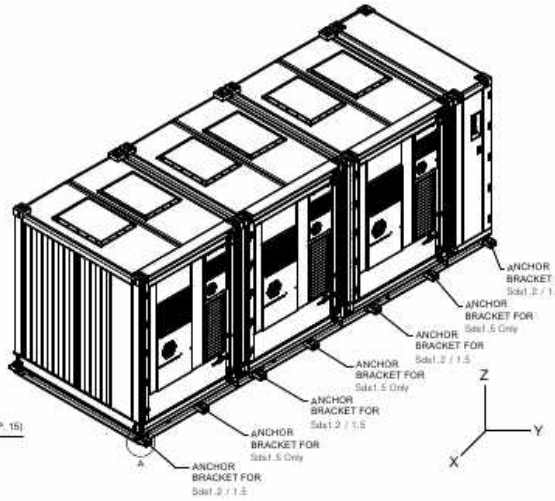
A3

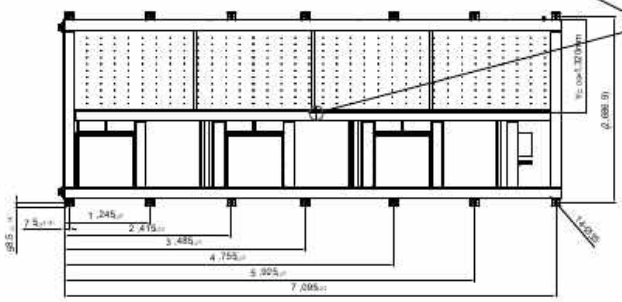
SHEET 05 OF 05

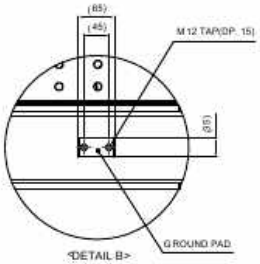
JF2 DC LINK 5.1 COG&ANCHORING INFORMATION



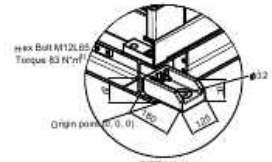








*THIS FIGURE IS IN THE SAME(MIRROR) POSITION ON BOTH SIDES.



MAXIMUM ANCHOR DIRECTIONAL LOAD BY EXTERNAL CONDITIONS (2)	
AXIAL LOAD [N]	Sds 1.2 : 123,241N Sds 1.5 : 90,734N
SHEAR LOAD [N]	Sds 1.2 : 43,307N Sds 1.5 : 38,600N

(1) EACH ANCHOR AT DC-LINK BOTTOM EXERTS WEIGHT (AXIAL DIRECTION) ON GROUND PIERS. THIS TABLE SHALL BE USED WHEN INSTALLING DC-LINK ON GROUND SURFACE.

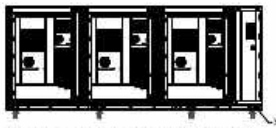
(2) TABLE INDICATES MAXIMUM POSSIBLE LOAD ON ANCHOR BOLT IN WORST CASE OF EXTERNAL CONDITION. EXTERNAL CONDITIONS INCLUDES DEAD LOAD, SEISMIC LOAD, WIND LOAD, SNOW LOAD. DETAIL EXTERNAL CONDITION CAN BE CHECKED IN JF2 DC LINK 5.1 ANALYSIS REPORTS.

(3) EACH ANCHOR BRACKET OF SDS 1.2 IS SHIPPED ATTACHED TO THE SKID. THE ADDITIONAL ANCHOR BRACKETS OF SDS 1.5 ARE ALSO SHIPPED ATTACHED TO THE SKID. ALL ANCHOR BRACKETS SHOULD BE INSTALLED ON-SITE.

(4) FOR HOLES FOR FIXING ANCHOR BRACKET, IT IS RECOMMENDED TO WORK AFTER ASSEMBLING THE ANCHOR BRACKET AND CONFIRMING THE POSITION OF THE HOLE

JF2 DC LINK 5.1 APPROXIMATE WEIGHT & DIMENSION INFORMATION			
DESCRIPTION	DIMENSION (W X D X H, mm)	WEIGHT (LBS OR Ton)	REMARK
GROSS	7,170 X 2,570 X 2,896	48 Ton Approx.	-
SHIPPING	7,170 X 2,570 X 2,896	48 Ton Approx.	

CENTER OF GRAVITY COORDINATES		
x_{COG} [mm]	y_{COG} [mm]	z_{COG} [mm]
3,804	1,320	1,501
x_{COG} [ft-in]	y_{COG} [ft-in]	z_{COG} [ft-in]
12'- 5.8"	4'- 4"	4'-11.1"



: ANCHOR BRACKET ATTECHED TO THE SKID POINT
IT IS IN THE SAME POSITION ON THE BACKS

THE SPECIFICATION MAY BE SUBJECT TO CHANGE

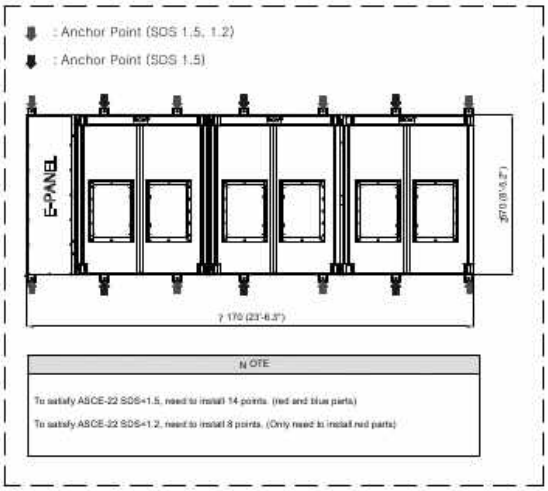
REV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2023.03.24	KM PARK	MC KIM	JB PARK

SCALE: N/A
UNITS: mm (ft-in/t)

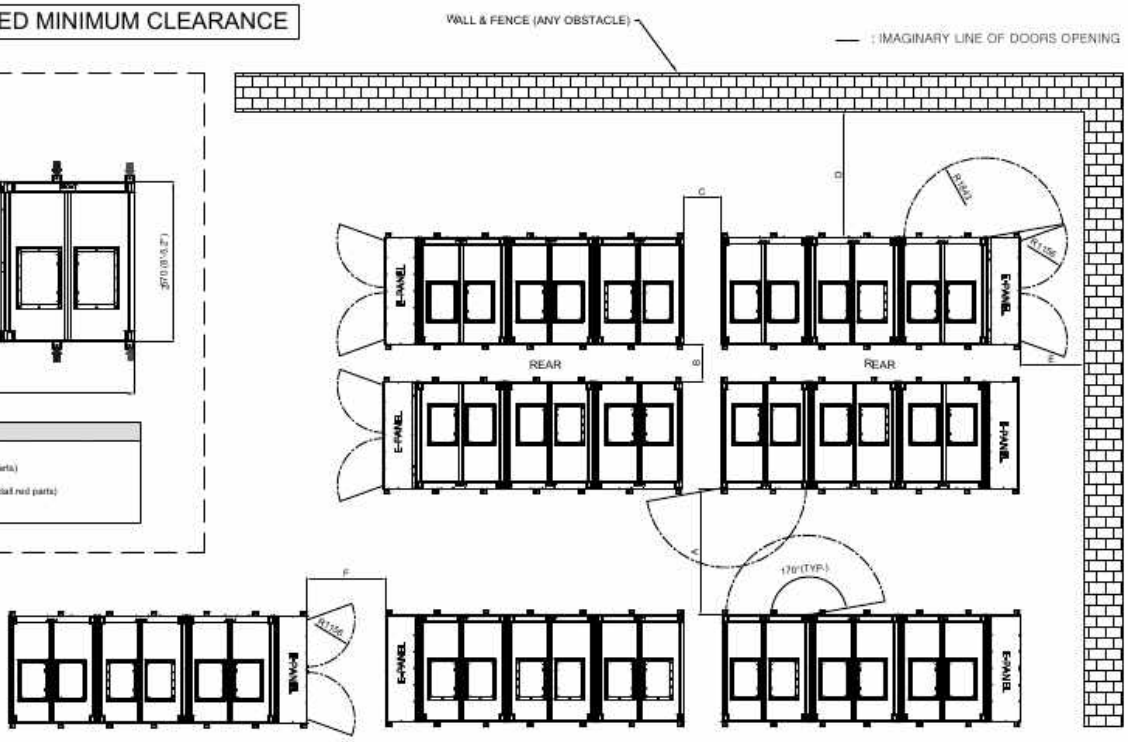
TITLE: JF2 DC LINK 5.1 CIVIL INFORMATION

DWG NO: F2D4-5.1US-MC02 | SIZE: A3 | REV: 00 | SHEET: 02

JF2 DC LINK 5.1 RECOMMENDED MINIMUM CLEARANCE



NOTE
To satisfy ASCE-22 SDS=1.5, need to install 14 points. (red and blue parts)
To satisfy ASCE-22 SDS=1.2, need to install 8 points. (Only need to install red parts)



ITEM	LOCATION	RECOMMENDED MINIMUM CLEARANCE [mm/ft]
A	FRONT TO FRONT	3,048 / 10'
B	REAR TO REAR	914.4 / 3'
C	SIDE TO SIDE	914.4 / 3'
D	FRONT TO FENCE	3,048 / 10'
E	SIDE TO FENCE	1,524 / 5'
F	E-PANEL TO E-PANEL	1,524 / 5'

NOTE
MINIMUM SWING OF DOOR, REGULATIONS FOR INSTALLATING ESS, SPACE FOR INSTALLING SITE ARE CONSIDERED WHEN CHOOSING THE MINIMUM CLEARANCE. THE CLEARANCE SHALL BE CHANGEABLE DEPENDING ON THE OTHER VARIOUS REQUIREMENTS. (EG. SITE CONDITIONS, LOCAL PERMIT, AHJ APPROVAL ETC.)

THE SPECIFICATION MAY BE SUBJECT TO CHANGE

REV	DESCRIPTION	DATE	DRWN	CHKD	APPD
1	INITIAL RELEASE	2023.03.24	KM PARK	MC KIM	JB PARK

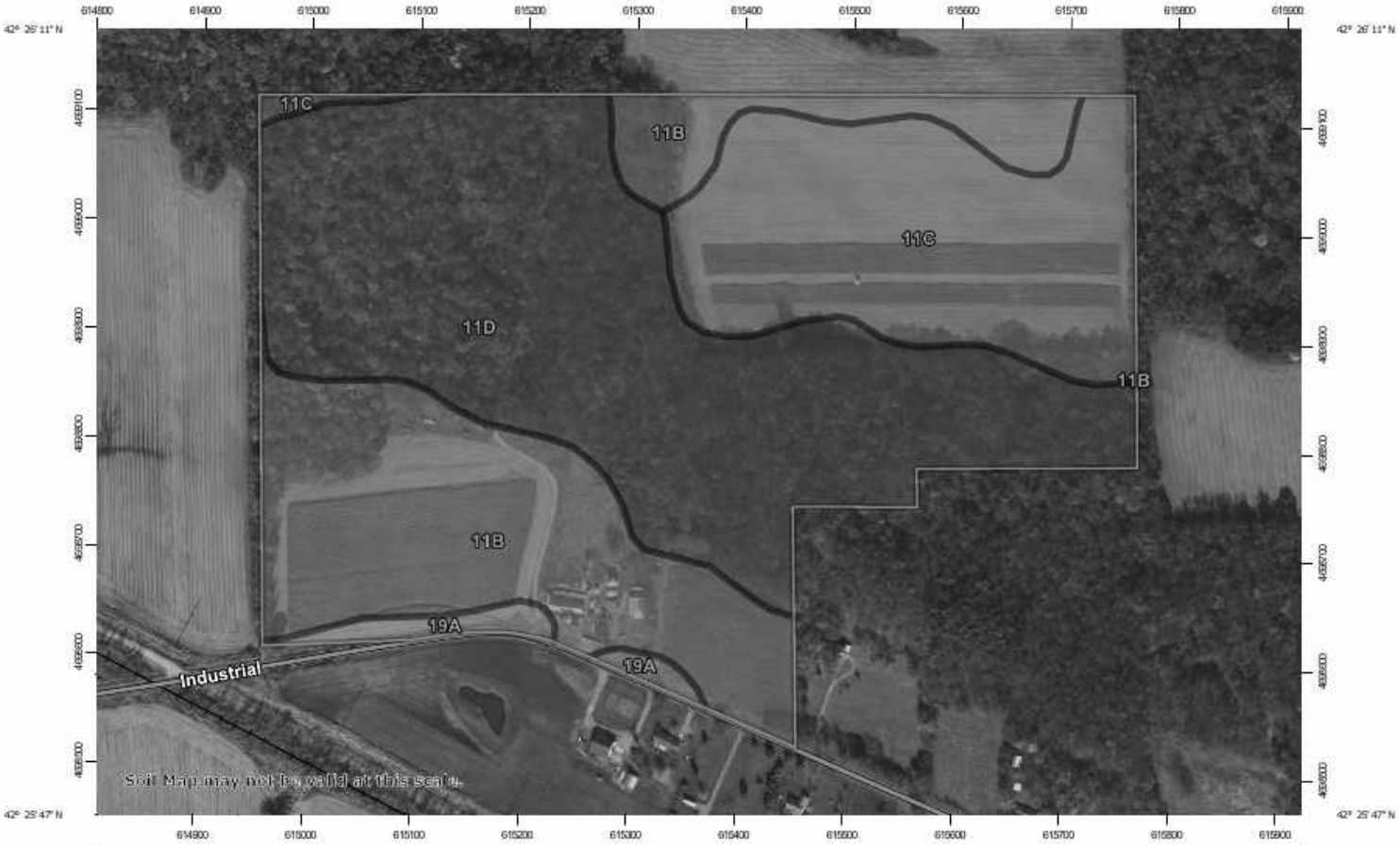
SCALE: N/A

JF2 DC LINK 5.1 CIVIL INFORMATION

F2D4-5.1US-MC02 | A3 | 01 / 01

EXHIBIT K: FARMLAND CLASSIFICATION

Farmland Classification—Allegan County, Michigan
(Heron BESS)



Map Scale: 1:5,090 if printed on A landscape (11" x 8.5") sheet.

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Farmland Classification—Allegan County, Michigan
(Heron BESS)

- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated

- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Allegan County, Michigan
Survey Area Data: Version 23, Sep 2, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 4, 2022—Nov 7, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
11B	Oshtemo-Chelsea complex, 0 to 6 percent slopes	Farmland of local importance	26.0	28.3%
11C	Oshtemo-Chelsea complex, 6 to 12 percent slopes	Farmland of local importance	21.1	23.0%
11D	Oshtemo-Chelsea complex, 12 to 18 percent slopes	Not prime farmland	43.0	46.8%
19A	Brady sandy loam, 0 to 3 percent slopes	All areas are prime farmland	1.8	1.9%
Totals for Area of Interest			**91.9**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

EXHIBIT L: CUSTOM SOIL RESOURCE REPORT FOR ALLEGAN COUNTY, MICHIGAN

United States Department of Agriculture

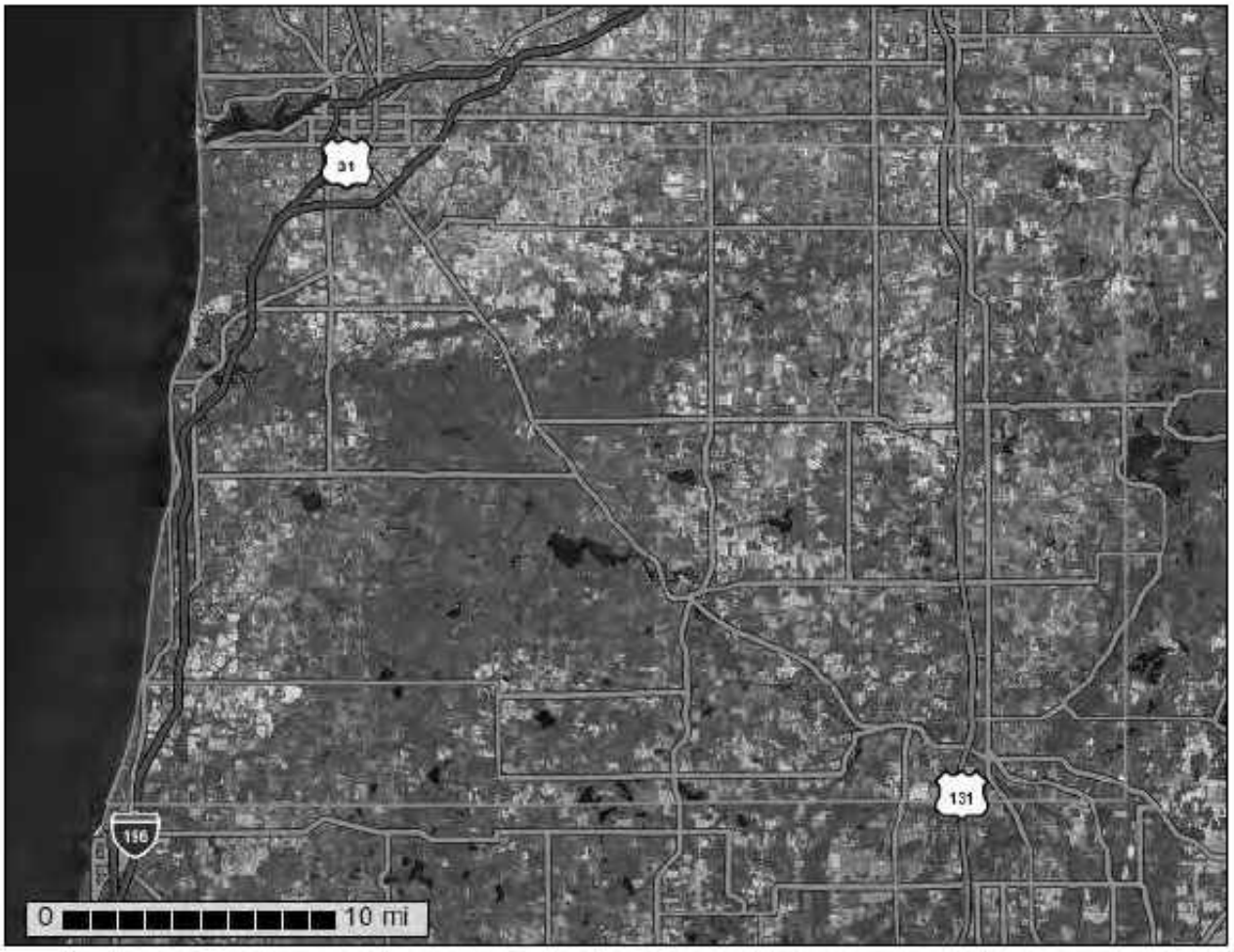
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Allegan County, Michigan



February 13, 2026

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

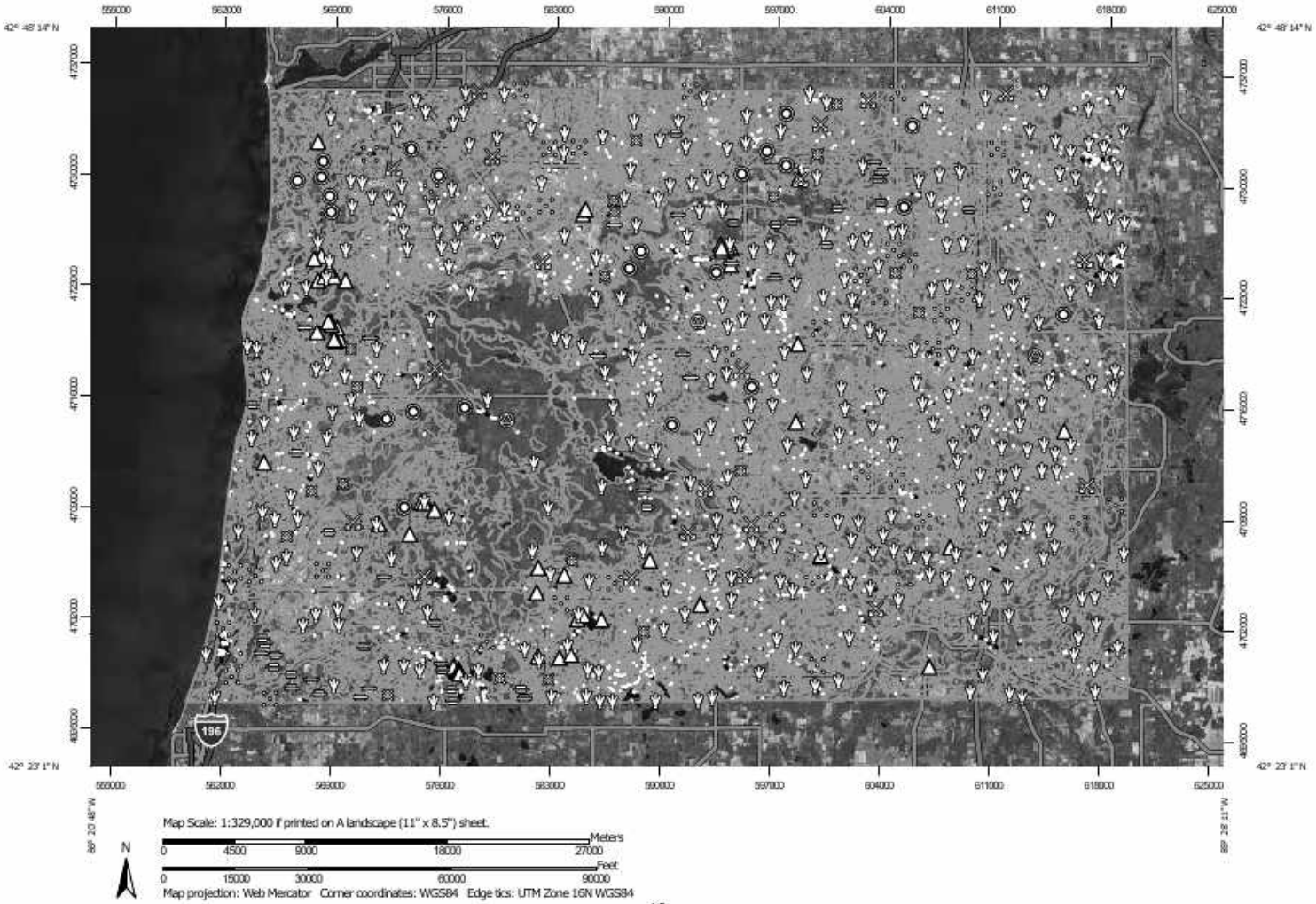
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:329,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 4500 9000 18000 27000

Feet
0 15000 30000 60000 90000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Allegan County, Michigan
Survey Area Data: Version 23, Sep 2, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Glendora loamy sand	10,756.1	2.0%
4	Dune land and Beaches	1,074.9	0.2%
8B	Glynwood clay loam, 1 to 6 percent slopes	3,611.2	0.7%
8C	Glynwood clay loam, 6 to 12 percent slopes	2,248.3	0.4%
10E	Oakville fine sand, lake moderated, 18 to 50 percent slopes	3,080.9	0.6%
11B	Oshtemo-Chelsea complex, 0 to 6 percent slopes	20,576.5	3.8%
11C	Oshtemo-Chelsea complex, 6 to 12 percent slopes	8,560.7	1.6%
11D	Oshtemo-Chelsea complex, 12 to 18 percent slopes	5,134.6	1.0%
11E	Oshtemo-Chelsea complex, 18 to 35 percent slopes	1,972.5	0.4%
12B	Ockley loam, 1 to 6 percent slopes	12,102.2	2.2%
12C	Ockley loam, 6 to 12 percent slopes	6,975.3	1.3%
12D	Ockley loam, 12 to 18 percent slopes	3,004.5	0.6%
12E	Ockley loam, 18 to 30 percent slopes	1,135.9	0.2%
14C	Filer loam, 6 to 12 percent slopes	7,198.3	1.3%
14D	Filer loam, 12 to 18 percent slopes	3,006.5	0.6%
14E	Filer loam, 18 to 35 percent slopes	2,099.2	0.4%
15B	Morocco-Newton complex, 0 to 3 percent slopes	8,720.7	1.6%
16B	Capac loam, Lake Michigan lobe, 0 to 4 percent slopes	27,844.6	5.2%
17	Brookston loam, 0 to 2 percent slopes	2,904.1	0.5%
18	Pits	1,229.1	0.2%
19A	Brady sandy loam, 0 to 3 percent slopes	6,424.7	1.2%
21B	Capac-Wixom complex, 1 to 4 percent slopes	8,247.0	1.5%
22A	Matherton loam, 0 to 3 percent slopes	2,628.3	0.5%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
23	Sebewa loam, 0 to 2 percent slopes	5,231.2	1.0%
27B	Metea loamy fine sand, 1 to 6 percent slopes	8,551.8	1.6%
27C	Metea loamy fine sand, 6 to 12 percent slopes	3,012.5	0.6%
28A	Rimer loamy sand, 0 to 4 percent slopes	15,916.3	3.0%
29	Cohoctah silt loam	6,714.1	1.2%
30	Colwood silt loam	7,251.0	1.3%
31B	Tekenink loamy fine sand, 2 to 6 percent slopes	3,444.5	0.6%
31C	Tekenink loamy fine sand, 6 to 12 percent slopes	2,065.1	0.4%
31D	Tekenink loamy fine sand, 12 to 18 percent slopes	895.9	0.2%
31E	Tekenink loamy fine sand, 18 to 35 percent slopes	503.7	0.1%
33A	Kibbie fine sandy loam, 0 to 3 percent slopes	5,799.2	1.1%
34	Aquents, sandy and loamy	1,100.3	0.2%
36	Corunna sandy loam	1,980.9	0.4%
39	Granby loamy sand, lake plain, 0 to 2 percent slopes	13,216.0	2.5%
41B	Blount silt loam, 1 to 4 percent slopes	26,452.0	4.9%
42B	Metamora sandy loam, 1 to 4 percent slopes	5,112.4	0.9%
44B	Chelsea loamy fine sand, 0 to 6 percent slopes	33,847.5	6.3%
44C	Chelsea loamy fine sand, 6 to 12 percent slopes	5,547.2	1.0%
44D	Chelsea loamy fine sand, 12 to 18 percent slopes	1,727.0	0.3%
44E	Chelsea loamy fine sand, 18 to 30 percent slopes	748.6	0.1%
45	Pewamo silt loam	5,576.1	1.0%
47	Napoleon muck	694.3	0.1%
48	Belleville loamy sand	2,192.2	0.4%
49A	Tedrow fine sand, 0 to 4 percent slopes	9,492.1	1.8%
50	Aquents and Histosols, ponded	6,759.2	1.3%
51A	Thetford loamy fine sand, 0 to 4 percent slopes	9,146.7	1.7%
53B	Oakville fine sand, loamy substratum, 0 to 6 percent slopes	3,318.4	0.6%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
57A	Covert sand, 0 to 4 percent slopes	6,460.1	1.2%
60B	Seward loamy fine sand, 1 to 6 percent slopes	2,790.2	0.5%
62	Sloan silt loam	2,829.1	0.5%
63B	Riddles loam, lake moderated, 0 to 6 percent slopes	3,140.5	0.6%
63C	Riddles loam, lake moderated, 6 to 12 percent slopes	1,075.9	0.2%
64	Belleville-Brookston complex	2,013.3	0.4%
65	Cohoctah silt loam, protected	1,796.1	0.3%
66	Udipsamments, nearly level to gently sloping	1,010.3	0.2%
67	Martisco muck	1,321.9	0.2%
69	Newton mucky fine sand	4,000.3	0.7%
70A	Morocco fine sand, 0 to 3 percent slopes	7,034.8	1.3%
72B	Urban land-Oakville complex, 0 to 6 percent slopes	5,144.9	1.0%
73A	Algansee loamy sand, protected, 0 to 3 percent slopes	2,671.7	0.5%
74	Glendora loamy sand, protected	5,198.0	1.0%
75B	Capac-Marlette loams, 1 to 6 percent slopes	11,745.3	2.2%
AdraaA	Adrian muck, 0 to 1 percent slopes	3,002.8	0.6%
AdraeA	Adrian muck, lake moderated, 0 to 1 percent slopes	4,285.1	0.8%
CovabB	Covert-Pipestone sands, 0 to 6 percent slopes	35.9	0.0%
HgtacA	Houghton muck, lake moderated, 0 to 1 percent slopes	12,734.6	2.4%
HgtahA	Houghton muck, 0 to 1 percent slopes	3,070.4	0.6%
PlfabB	Plainfield sand, lake plain, 0 to 6 percent slopes	86,382.8	16.0%
PlfabD	Plainfield sand, lake plain, 6 to 18 percent slopes	14,157.5	2.6%
PlfabE	Plainfield sand, high ecological site, 18 to 30 percent slopes	0.7	0.0%
PlfacF	Plainfield sand, dunes, 18 to 60 percent slopes	14.1	0.0%
PmsabA	Palms muck, lake moderated, 0 to 1 percent slopes	1,659.2	0.3%
PmsacA	Palms muck, 0 to 1 percent slopes	320.6	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PpsadB	Pipestone sand, lake moderated, 0 to 4 percent slopes	8,678.4	1.6%
PpsaeB	Pipestone sand, 0 to 4 percent slopes	24.9	0.0%
W	Water	9,746.2	1.8%
Totals for Area of Interest		**539,177.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Allegan County, Michigan

2—Glendora loamy sand

Map Unit Setting

National map unit symbol: 7420
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Glendora and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glendora

Setting

Landform: Depressions flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

Ap - 0 to 11 inches: loamy sand
C - 11 to 59 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 7 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Houghton

Percent of map unit: 6 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

4—Dune land and Beaches

Map Unit Setting

National map unit symbol: 742l
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Dune land: 60 percent
Beaches: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dune Land

Setting

Landform: Dunes
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy beach sand

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: R097XA001MI - Beach And Foredune
Hydric soil rating: Unranked

Description of Beaches

Setting

Landform: Lakeshores
Parent material: Sandy beach sand

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: R097XA001MI - Beach And Foredune
Hydric soil rating: Unranked

8B—Glynwood clay loam, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 743m
Elevation: 620 to 840 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 10 inches: clay loam
Bt - 10 to 29 inches: clay
C - 29 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Blount

Percent of map unit: 7 percent
Landform: Moraines
Landform position (three-dimensional): Rise
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

8C—Glynwood clay loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 743n
Elevation: 620 to 840 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Glynwood and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Hills on till plains, Moraines, Till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 10 inches: clay loam
Bt - 10 to 29 inches: clay
C - 29 to 60 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Blount

Percent of map unit: 5 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Marlette

Percent of map unit: 5 percent
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

10E—Oakville fine sand, lake moderated, 18 to 50 percent slopes

Map Unit Setting

National map unit symbol: 2zdks
Landscape: Lake plains
Elevation: 580 to 740 feet
Mean annual precipitation: 34 to 41 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Oakville and similar soils: 96 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oakville

Setting

Landscape: Lake plains
Landform: Beach ridges, Dunes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Eolian sands

Typical profile

A - 0 to 4 inches: fine sand
Bw - 4 to 30 inches: fine sand
C - 30 to 79 inches: fine sand

Properties and qualities

Slope: 18 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Morocco

Percent of map unit: 1 percent
Landscape: Lake plains
Landform: Dunes, Beach ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Newton

Percent of map unit: 1 percent
Landscape: Lake plains
Landform: Depressions, Interdunes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F097XA007MI - Wet Acidic Sandy Flatwoods
Hydric soil rating: Yes

Adrian

Percent of map unit: 1 percent
Landscape: Lake plains
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Maumee

Percent of map unit: 1 percent
Landscape: Lake plains
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

11B—Oshtemo-Chelsea complex, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 741h
Elevation: 360 to 1,500 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 65 percent
Chelsea and similar soils: 27 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Flats outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy outwash

Typical profile

Ap - 0 to 10 inches: loamy sand
Bt - 10 to 35 inches: sandy loam
E and Bt - 35 to 60 inches: sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Description of Chelsea

Setting
Landform: Flats, Outwash plains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian sands

Typical profile
A - 0 to 4 inches: loamy fine sand
E ans Bt - 4 to 60 inches: fine sand

Properties and qualities
Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Minor Components

Ockley
Percent of map unit: 4 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, rise
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Brady
Percent of map unit: 4 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

11C—Oshtemo-Chelsea complex, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 741j
Elevation: 360 to 1,500 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 60 percent
Chelsea and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy over sandy outwash

Typical profile

Ap - 0 to 10 inches: loamy sand
Bt - 10 to 35 inches: sandy loam
E and Bt - 35 to 60 inches: sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Description of Chelsea

Setting

Landform: Flats, Outwash plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy eolian sands

Typical profile

A - 0 to 4 inches: loamy fine sand
E and Bt - 4 to 60 inches: fine sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Minor Components

Brady

Percent of map unit: 3 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Ockley

Percent of map unit: 2 percent
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

11D—Oshtemo-Chelsea complex, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 741k
Elevation: 360 to 1,500 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Oshtemo and similar soils: 60 percent
Chelsea and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Hills moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy over sandy outwash

Typical profile

Ap - 0 to 10 inches: loamy sand
Bt - 10 to 35 inches: sandy loam
E and Bt - 35 to 60 inches: loamy sand

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Description of Chelsea

Setting

Landform: Flats, Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Parent material: Sandy eolian sands

Typical profile

A - 0 to 4 inches: loamy fine sand
E and Bt - 4 to 60 inches: fine sand

Properties and qualities

Slope: 12 to 20 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Ockley

Percent of map unit: 8 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Brady

Percent of map unit: 2 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

11E—Oshtemo-Chelsea complex, 18 to 35 percent slopes

Map Unit Setting

National map unit symbol: 741l
Elevation: 360 to 1,500 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Oshtemo and similar soils: 55 percent
Chelsea and similar soils: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Uplands outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy over sandy outwash

Typical profile

Ap - 0 to 10 inches: loamy sand
Bt - 10 to 35 inches: sandy loam
E and Bt - 35 to 60 inches: sand

Properties and qualities

Slope: 18 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Description of Chelsea

Setting

Landform: Flats, Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Sandy eolian sands

Typical profile

A - 0 to 4 inches: loamy fine sand
E and Bt - 4 to 60 inches: fine sand

Properties and qualities

Slope: 18 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Ockley

Percent of map unit: 3 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Brady

Percent of map unit: 2 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

12B—Ockley loam, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 741m
Elevation: 360 to 1,500 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ockley and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ockley

Setting

Landform: Moraines, Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Bt - 11 to 42 inches: sandy clay loam
E and Bt - 42 to 60 inches: gravelly sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Brady

Percent of map unit: 7 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Chelsea

Percent of map unit: 6 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

12C—Ockley loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 741n
Elevation: 360 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Ockley and similar soils: 93 percent
Minor components: 7 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ockley

Setting

Landform: Moraines, Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Bt - 11 to 42 inches: sandy clay loam
E and Bt - 42 to 60 inches: gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Brady

Percent of map unit: 7 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

12D—Ockley loam, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 741p
Elevation: 360 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Ockley and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ockley

Setting

Landform: Moraines, Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Bt - 11 to 42 inches: sandy clay loam
E and Bt - 42 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Brady

Percent of map unit: 13 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

12E—Ockley loam, 18 to 30 percent slopes

Map Unit Setting

National map unit symbol: 741q
Elevation: 360 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Ockley and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ockley

Setting

Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Bt - 11 to 42 inches: sandy clay loam
E and Bt - 42 to 60 inches: gravelly sand

Properties and qualities

Slope: 18 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Brady

Percent of map unit: 13 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

14C—Filer loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2tpkn
Landscape: Till plains
Elevation: 720 to 990 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Farmland of local importance

Map Unit Composition

Filer and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Filer

Setting

Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
B/E - 8 to 16 inches: clay loam
Bt - 16 to 36 inches: clay loam
C - 36 to 80 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.02 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.1 to 0.4 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Capac

Percent of map unit: 6 percent
Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Parkhill, non dense till subsoil

Percent of map unit: 2 percent
Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Metea

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Oshtemo

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, head slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

14D—Filer loam, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 2w5mh
Landscape: Till plains
Elevation: 700 to 990 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Filer and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Filer

Setting

Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
B/E - 7 to 15 inches: clay loam
Bt - 15 to 35 inches: clay loam
C - 35 to 80 inches: loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.02 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.1 to 0.4 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Capac
Percent of map unit: 3 percent
Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Spinks
Percent of map unit: 3 percent
Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Parkhill, non dense till subsoil
Percent of map unit: 2 percent
Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Oshtemo
Percent of map unit: 2 percent
Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

14E—Filer loam, 18 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2x2sx
Landscape: Till plains
Elevation: 660 to 1,000 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Filer and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Filer

Setting

Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

A - 0 to 3 inches: loam
E - 3 to 7 inches: loam
B/E - 7 to 15 inches: clay loam
Bt - 15 to 35 inches: clay loam
C - 35 to 80 inches: loam

Properties and qualities

Slope: 18 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.02 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.1 to 0.4 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Oshtemo

Percent of map unit: 3 percent
Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Spinks

Percent of map unit: 3 percent
Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, nose slope, head slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Capac

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Boyer

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

15B—Morocco-Newton complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 741v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morocco and similar soils: 50 percent
Newton and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morocco

Setting

Landform: Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy outwash

Typical profile

Ap - 0 to 1 inches: fine sand
C - 1 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A/D
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Description of Newton

Setting

Landform: Outwash plains, Depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy outwash

Typical profile

A - 0 to 11 inches: mucky fine sand
C - 11 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F097XA007MI - Wet Acidic Sandy Flatwoods
Hydric soil rating: Yes

Minor Components

Oakville

Percent of map unit: 10 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

16B—Capac loam, Lake Michigan lobe, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2w63q
Landscape: Till plains
Elevation: 630 to 990 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Capac and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Capac

Setting

Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
B/E - 9 to 16 inches: clay loam
Bt - 16 to 31 inches: clay loam
C - 31 to 80 inches: loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.1 to 0.4 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Parkhill, non dense till subsoil

Percent of map unit: 4 percent
Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Selfridge

Percent of map unit: 3 percent
Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Marlette

Percent of map unit: 2 percent
Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope, head slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Filer

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Till plains, Moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, head slope, nose slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

17—Brookston loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w64l
Landscape: Till plains
Elevation: 640 to 940 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 230 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 90 percent
Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landscape: Till plains
Landform: Depressions on moraines, Drainageways on moraines, Depressions on till plains, Drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 12 inches: loam
Btg - 12 to 32 inches: clay loam
BCg - 32 to 40 inches: loam
Cg - 40 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Conover

Percent of map unit: 5 percent
Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Belleville

Percent of map unit: 3 percent

Landscape: Till plains
Landform: Depressions on moraines, Depressions on till plains, Drainageways on moraines, Drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

Corunna

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Drainageways on moraines, Drainageways on till plains, Depressions on moraines, Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Linwood

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Depressions on moraines, Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

18—Pits

Map Unit Setting

National map unit symbol: 741y
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

19A—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 741z
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy and/or sandy outwash; loamy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt - 9 to 36 inches: loam
BC - 36 to 55 inches: loamy sand
C - 55 to 60 inches: coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 7 percent
Landform: Depressions
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Oshtemo

Percent of map unit: 6 percent
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

21B—Capac-Wixom complex, 1 to 4 percent slopes

Map Unit Setting

National map unit symbol: 7421
Elevation: 500 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Capac and similar soils: 55 percent
Wixom and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Capac

Setting

Landform: Knolls, Moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 27 inches: clay loam
C - 27 to 60 inches: loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Description of Wixom

Setting

Landform: Lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy drift over loamy till

Typical profile

Ap - 0 to 9 inches: loamy sand
Bs - 9 to 27 inches: sand
2C - 27 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Minor Components

Corunna

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Pipestone

Percent of map unit: 5 percent
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods

Hydric soil rating: No

Brookston

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

22A—Matherton loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 7422
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Matherton and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Matherton

Setting

Landform: Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly outwash

Typical profile

Ap - 0 to 8 inches: loam
Btg - 8 to 26 inches: sandy clay loam
2C - 26 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Oshtemo

Percent of map unit: 3 percent
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

23—Sebewa loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v2c9
Landscape: Till plains
Elevation: 700 to 1,050 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landscape: Till plains
Landform: Drainageways on moraines, Drainageways on outwash plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam

Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton

Percent of map unit: 5 percent
Landscape: Till plains
Landform: Drainageways on moraines, Drainageways on outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford

Percent of map unit: 2 percent
Landscape: Till plains
Landform: Drainageways on moraines, Drainageways on outwash plains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

27B—Metea loamy fine sand, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 7425
Elevation: 600 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Metea and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metea

Setting

Landform: Moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and/or loamy till

Typical profile

Ap - 0 to 12 inches: loamy fine sand
BE - 12 to 25 inches: loamy fine sand
2Bt - 25 to 41 inches: clay loam
2C - 41 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Minor Components

Rimer

Percent of map unit: 5 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Marlette

Percent of map unit: 5 percent
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

27C—Metea loamy fine sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 7426
Elevation: 600 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Metea and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metea

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Rise
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy and/or loamy till

Typical profile

Ap - 0 to 12 inches: loamy fine sand
BE - 12 to 25 inches: loamy fine sand
2Bt - 25 to 41 inches: clay loam
2C - 41 to 60 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Minor Components

Marlette

Percent of map unit: 6 percent
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Rimer

Percent of map unit: 4 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

28A—Rimer loamy sand, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 7427
Elevation: 590 to 870 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Rimer and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rimer

Setting

Landform: Till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits over loamy till

Typical profile

Ap - 0 to 11 inches: loamy sand
Bw - 11 to 22 inches: loamy sand

Bt - 22 to 33 inches: sandy loam
2C - 33 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Minor Components

Belleville

Percent of map unit: 3 percent
Landform: Depressions
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Capac

Percent of map unit: 3 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Metea

Percent of map unit: 2 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Seward

Percent of map unit: 2 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

29—Cohoctah silt loam

Map Unit Setting

National map unit symbol: 7428
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 140 to 150 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Cohoctah and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cohoctah

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

A - 0 to 12 inches: silt loam
Cg1 - 12 to 42 inches: sandy loam
Cg2 - 42 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Sloan

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Glendora

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

30—Colwood silt loam

Map Unit Setting

National map unit symbol: 7429
Elevation: 600 to 1,500 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified sandy and/or silty and/or loamy glaciolacustrine deposits

Typical profile

Ap - 0 to 12 inches: silt loam
Bg - 12 to 32 inches: silt loam
Cg - 32 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Minor Components

Granby

Percent of map unit: 13 percent
Landform: Depressions
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

31B—Tekenink loamy fine sand, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 742b
Elevation: 600 to 1,500 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Tekenink and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tekenink

Setting

Landform: Till plains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 10 inches: loamy fine sand
B/E - 10 to 15 inches: sandy loam
Bt - 15 to 24 inches: sandy loam
Bt - 24 to 50 inches: sandy loam
BC - 50 to 60 inches: sandy loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent

Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Oshtemo

Percent of map unit: 5 percent
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Chelsea

Percent of map unit: 4 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Marlette

Percent of map unit: 4 percent
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

31C—Tekenink loamy fine sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 742c
Elevation: 600 to 1,500 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Tekenink and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tekenink

Setting

Landform: Till plains
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 10 inches: loamy fine sand

B/E - 10 to 15 inches: sandy loam
Bt - 15 to 24 inches: sandy loam
Bt - 24 to 50 inches: sandy loam
BC - 50 to 60 inches: sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Chelsea

Percent of map unit: 4 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Marlette

Percent of map unit: 3 percent
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

31D—Tekenink loamy fine sand, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 742d
Elevation: 600 to 1,500 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Tekenink and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tekenink

Setting

Landform: Till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

Ap - 0 to 10 inches: loamy fine sand
B/E - 10 to 15 inches: sandy loam
Bt - 15 to 24 inches: sandy loam
Bt - 24 to 50 inches: sandy loam
BC - 50 to 60 inches: sandy loam

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Chelsea

Percent of map unit: 5 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Marlette

Percent of map unit: 5 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex

Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

31E—Tekenink loamy fine sand, 18 to 35 percent slopes

Map Unit Setting

National map unit symbol: 742f
Elevation: 600 to 1,500 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Tekenink and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tekenink

Setting

Landform: Till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

Ap - 0 to 10 inches: loamy fine sand
B/E - 10 to 15 inches: sandy loam
Bt - 15 to 24 inches: sandy loam
Bt - 24 to 50 inches: sandy loam
BC - 50 to 60 inches: sandy loam

Properties and qualities

Slope: 18 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Chelsea

Percent of map unit: 4 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Marlette

Percent of map unit: 3 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

33A—Kibbie fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 742g
Elevation: 600 to 1,500 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kibbie and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting

Landform: Broad flats lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits and/or silty glaciolacustrine deposits

Typical profile

Ap - 0 to 9 inches: fine sandy loam
Bt - 9 to 25 inches: loam
C - 25 to 60 inches: stratified very fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 3 percent
Landform: Depressions
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Rimer

Percent of map unit: 2 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Thetford

Percent of map unit: 2 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

34—Aquents, sandy and loamy

Map Unit Setting

National map unit symbol: 742h
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days

Farmland classification: Not prime farmland

Map Unit Composition

Aquents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aquents

Setting

Landform: Depressions, Marshes
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

C - 0 to 60 inches: variable

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydric soil rating: Yes

36—Corunna sandy loam

Map Unit Setting

National map unit symbol: 742j
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Corunna and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corunna

Setting

Landform: Depressions till plains, Till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy lacustrine deposits and/or loamy till

Typical profile

Ap - 0 to 11 inches: sandy loam
Bg - 11 to 33 inches: sandy loam
2Cg - 33 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Minor Components

Granby

Percent of map unit: 13 percent
Landform: Depressions
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

39—Granby loamy sand, lake plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w5mw
Landscape: Outwash plains, lake plains
Elevation: 580 to 770 feet
Mean annual precipitation: 34 to 41 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 170 to 230 days
Farmland classification: Farmland of local importance

Map Unit Composition

Granby, lake plain, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby, Lake Plain

Setting

Landscape: Outwash plains, lake plains
Landform: Depressions on nearshore zones (relict), Depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits

Typical profile

Ap - 0 to 11 inches: loamy sand
Bg - 11 to 34 inches: sand
Cg - 34 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 14 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Minor Components

Thetford

Percent of map unit: 5 percent
Landscape: Outwash plains, lake plains
Landform: Outwash plains, Nearshore zones (relict)
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Pipestone

Percent of map unit: 3 percent
Landscape: Lake plains, outwash plains
Landform: Nearshore zones (relict), Outwash plains

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Adrian

Percent of map unit: 1 percent
Landscape: Outwash plains, lake plains
Landform: Depressions on outwash plains, Depressions on nearshore zones (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Sickles

Percent of map unit: 1 percent
Landscape: Lake plains, outwash plains
Landform: Depressions on nearshore zones (relict), Depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

41B—Blount silt loam, 1 to 4 percent slopes

Map Unit Setting

National map unit symbol: 742m
Elevation: 580 to 1,530 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Till plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 6 inches: silt loam
Bt - 6 to 27 inches: silty clay loam
BC - 27 to 30 inches: silty clay loam
C - 30 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 3 percent
Landform: Depressions
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Rimer

Percent of map unit: 3 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Glynwood

Percent of map unit: 2 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Seward

Percent of map unit: 2 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

42B—Metamora sandy loam, 1 to 4 percent slopes

Map Unit Setting

National map unit symbol: 742n
Elevation: 600 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: sandy loam
E - 9 to 20 inches: sandy loam
Btg - 20 to 28 inches: clay loam
C - 28 to 60 inches: loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Corunna

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Rimer

Percent of map unit: 5 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

44B—Chelsea loamy fine sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2zc58
Landscape: Ice-margin complexes
Elevation: 590 to 900 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Chelsea and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chelsea

Setting

Landscape: Ice-margin complexes
Landform: Moraines, Outwash plains
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Side slope, interfluve, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy drift

Typical profile

Ap - 0 to 9 inches: loamy fine sand
E - 9 to 29 inches: fine sand
E and Bt - 29 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained

Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 1.5
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Minor Components

Metea

Percent of map unit: 8 percent
Landscape: Ice-margin complexes
Landform: Moraines
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Side slope, interfluve, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Thetford

Percent of map unit: 3 percent
Landscape: Ice-margin complexes
Landform: Moraines, Outwash plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Oshtemo

Percent of map unit: 2 percent
Landscape: Ice-margin complexes
Landform: Outwash plains, Moraines
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Side slope, interfluve, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

44C—Chelsea loamy fine sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2zc5c
Landscape: Ice-margin complexes
Elevation: 650 to 940 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Chelsea and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chelsea

Setting

Landscape: Ice-margin complexes
Landform: Moraines, Outwash plains
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Eolian sands

Typical profile

Ap - 0 to 7 inches: loamy fine sand
E - 7 to 29 inches: fine sand
E and Bt - 29 to 80 inches: fine sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 1.5
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Minor Components

Metea
Percent of map unit: 3 percent
Landscape: Ice-margin complexes
Landform: Moraines
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Thetford
Percent of map unit: 3 percent
Landscape: Ice-margin complexes
Landform: Outwash plains, Moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Oshtemo
Percent of map unit: 2 percent
Landscape: Ice-margin complexes
Landform: Outwash plains, Outwash terraces, Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, head slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

44D—Chelsea loamy fine sand, 12 to 18 percent slopes

Map Unit Setting
National map unit symbol: 742r
Elevation: 600 to 1,500 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Chelsea and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chelsea

Setting

Landform: Outwash plains, Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Sandy eolian sands

Typical profile

A - 0 to 4 inches: loamy fine sand
E and Bt - 4 to 60 inches: fine sand

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Oshtemo

Percent of map unit: 7 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Tedrow

Percent of map unit: 3 percent
Landform: End moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave

Across-slope shape: Convex
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

44E—Chelsea loamy fine sand, 18 to 30 percent slopes

Map Unit Setting

National map unit symbol: 742s
Elevation: 600 to 1,500 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Chelsea and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chelsea

Setting

Landform: Moraines, Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Sandy eolian sands

Typical profile

A - 0 to 4 inches: loamy fine sand
E and Bt - 4 to 60 inches: fine sand

Properties and qualities

Slope: 18 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Oshtemo

Percent of map unit: 4 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: F097XA017MI - Loamy Slopes
Hydric soil rating: No

Granby

Percent of map unit: 2 percent
Landform: Depressions
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Tedrow

Percent of map unit: 2 percent
Landform: End moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

45—Pewamo silt loam

Map Unit Setting

National map unit symbol: 742t
Elevation: 580 to 1,530 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions till plains, Till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Loamy till

Typical profile

Ap - 0 to 10 inches: silt loam
Btg - 10 to 30 inches: silty clay
Cg - 30 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 5 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Belleville

Percent of map unit: 4 percent
Landform: Depressions
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

47—Napoleon muck

Map Unit Setting

National map unit symbol: 742v
Elevation: 300 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Napoleon and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Napoleon

Setting

Landform: Depressions outwash plains, Outwash plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Acid herbaceous organic material

Typical profile

Oa - 0 to 3 inches: muck
Oe - 3 to 60 inches: mucky peat

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 29.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: F098XA007MI - Acidic Peaty Depressions
Hydric soil rating: Yes

Minor Components

Newton

Percent of map unit: 7 percent
Landform: Depressions
Ecological site: F098XA018MI - Wet Acidic Drift Depressions
Hydric soil rating: Yes

48—Belleville loamy sand

Map Unit Setting

National map unit symbol: 742w
Elevation: 600 to 1,000 feet

Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Belleville and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Belleville

Setting

Landform: Depressions till plains, Till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits over loamy till

Typical profile

Ap - 0 to 13 inches: loamy sand
Bg - 13 to 32 inches: loamy sand
2Cg - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Minor Components

Rimer

Percent of map unit: 7 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

49A—Tedrow fine sand, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 742x
Landscape: Lake plains
Elevation: 590 to 900 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Tedrow and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tedrow

Setting

Landscape: Lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits

Typical profile

Ap - 0 to 10 inches: fine sand
Bw - 10 to 34 inches: fine sand
C - 34 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A/D
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Minor Components

Granby

Percent of map unit: 4 percent
Landform: Depressions
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Morocco

Percent of map unit: 3 percent
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Oakville

Percent of map unit: 3 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

50—Aquents and Histosols, ponded

Map Unit Setting

National map unit symbol: 742z
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Aquents and similar soils: 51 percent
Histosols and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aquents

Setting

Landform: Depressions, Marshes
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

C - 0 to 60 inches: variable

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydric soil rating: Yes

Description of Histosols

Setting

Landform: Depressions, Marshes
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa - 0 to 51 inches: muck
C - 51 to 60 inches: variable

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

51A—Thetford loamy fine sand, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 7430
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Thetford and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Thetford

Setting

Landform: Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy outwash

Typical profile

Ap - 0 to 9 inches: loamy fine sand
E - 9 to 17 inches: fine sand
E and Bt - 17 to 49 inches: fine sand
C - 49 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Minor Components

Kibbie

Percent of map unit: 6 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Granby

Percent of map unit: 6 percent
Landform: Depressions
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

53B—Oakville fine sand, loamy substratum, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 7431

Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Oakville, loamy substratum, and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oakville, Loamy Substratum

Setting

Landform: Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy outwash

Typical profile

Ap - 0 to 10 inches: fine sand
Bw - 10 to 48 inches: fine sand
C - 48 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Minor Components

Oakville

Percent of map unit: 7 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

57A—Covert sand, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 7432
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Covert and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Covert

Setting

Landform: Lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy lacustrine deposits

Typical profile

A - 0 to 3 inches: sand
E - 3 to 7 inches: sand
Bhs - 7 to 19 inches: sand
BC - 19 to 34 inches: sand
C - 34 to 60 inches: sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Minor Components

Pipestone

Percent of map unit: 4 percent
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Oakville

Percent of map unit: 3 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Granby

Percent of map unit: 3 percent
Landform: Depressions
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

60B—Seward loamy fine sand, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 7434
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Seward and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Seward

Setting

Landform: Till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits over clayey and/or loamy till

Typical profile

Ap - 0 to 11 inches: loamy fine sand
Bw - 11 to 30 inches: loamy fine sand
2Bt - 30 to 39 inches: sandy loam
2C - 39 to 60 inches: silty clay loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Minor Components

Rimer

Percent of map unit: 5 percent
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

62—Sloan silt loam

Map Unit Setting

National map unit symbol: 7435
Elevation: 570 to 850 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Sloan and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Loamy and/or silty alluvium

Typical profile

A - 0 to 10 inches: silt loam
Bg - 10 to 34 inches: loam
Cg - 34 to 60 inches: very fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Cohoctah

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Palms

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

63B—Riddles loam, lake moderated, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 31gt3
Landscape: Till plains, ice-margin complexes
Elevation: 660 to 840 feet
Mean annual precipitation: 34 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Riddles and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riddles

Setting

Landscape: Till plains, ice-margin complexes
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, interfluve, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
E - 8 to 13 inches: sandy loam
Bt1 - 13 to 23 inches: sandy clay loam
Bt2 - 23 to 42 inches: sandy clay loam
BC - 42 to 55 inches: sandy loam
C - 55 to 79 inches: sandy loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 9.0
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Blount

Percent of map unit: 8 percent
Landscape: Ice-margin complexes, till plains
Landform: Moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear

Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Capac

Percent of map unit: 1 percent
Landscape: Ice-margin complexes, till plains
Landform: Moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 1 percent
Landscape: Ice-margin complexes, till plains
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

63C—Riddles loam, lake moderated, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 31gt4
Landscape: Till plains, ice-margin complexes
Elevation: 660 to 840 feet
Mean annual precipitation: 34 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Riddles and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riddles

Setting

Landscape: Till plains, ice-margin complexes
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex

Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
E - 8 to 13 inches: sandy loam
Bt1 - 13 to 23 inches: sandy clay loam
Bt2 - 23 to 42 inches: sandy clay loam
BC - 42 to 55 inches: sandy loam
C - 55 to 79 inches: sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 9.0
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Blount

Percent of map unit: 3 percent
Landscape: Ice-margin complexes, till plains
Landform: Moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Crosier

Percent of map unit: 3 percent
Landscape: Till plains, ice-margin complexes
Landform: Moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Capac

Percent of map unit: 2 percent
Landscape: Ice-margin complexes, till plains
Landform: Moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 2 percent
Landscape: Ice-margin complexes, till plains
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

64—Belleville-Brookston complex

Map Unit Setting

National map unit symbol: 7438
Elevation: 500 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Belleville and similar soils: 55 percent
Brookston and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Belleville

Setting

Landform: Till plains, Depressions till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits over loamy till

Typical profile

Ap - 0 to 13 inches: loamy sand
Bg - 13 to 32 inches: loamy sand

2Cg - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Description of Brookston

Setting

Landform: Broad flats, depressions till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 10 inches: loam
Btg - 10 to 46 inches: clay loam
Cg - 46 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Minor Components

Capac

Percent of map unit: 10 percent
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

65—Cohoctah silt loam, protected

Map Unit Setting

National map unit symbol: 7439
Elevation: 250 to 1,500 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Cohoctah and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cohoctah

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

A - 0 to 12 inches: silt loam
Cg1 - 12 to 42 inches: sandy loam
Cg2 - 42 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Sloan

Percent of map unit: 4 percent
Landform: Flood plains
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Glendora

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Palms

Percent of map unit: 3 percent
Landform: Depressions
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

66—Udipsamments, nearly level to gently sloping

Map Unit Setting

National map unit symbol: 743b
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Udipsamments and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udipsamments

Setting

Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy drift

Typical profile

C - 0 to 60 inches: sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: A
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

67—Martisco muck

Map Unit Setting

National map unit symbol: 743c
Elevation: 50 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Martisco and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Martisco

Setting

Landform: Depressions outwash plains, Outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 11 inches: muck
Lma - 11 to 60 inches: marly material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

69—Newton mucky fine sand

Map Unit Setting

National map unit symbol: 743d
Elevation: 600 to 1,000 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Newton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Newton

Setting

Landform: Depressions outwash plains, Outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy outwash

Typical profile

A - 0 to 11 inches: mucky fine sand
C - 11 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F097XA007MI - Wet Acidic Sandy Flatwoods
Hydric soil rating: Yes

Minor Components

Morocco

Percent of map unit: 5 percent
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Pipestone

Percent of map unit: 5 percent
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

70A—Morocco fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 743g
Elevation: 600 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morocco and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morocco

Setting

Landform: Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy outwash

Typical profile

Ap - 0 to 1 inches: fine sand
C - 1 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained

Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A/D
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Minor Components

Oakville

Percent of map unit: 4 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Newton

Percent of map unit: 3 percent
Landform: Depressions
Ecological site: F097XA007MI - Wet Acidic Sandy Flatwoods
Hydric soil rating: Yes

72B—Urban land-Oakville complex, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 31gtj
Landscape: Lake plains
Elevation: 580 to 620 feet
Mean annual precipitation: 34 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Oakville and similar soils: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landscape: Lake plains
Anthropogenic Feature: Urban land

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: 0 inches to manufactured layer

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Oakville

Setting

Landscape: Lake plains
Landform: Dunes, Beach ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Nose slope, side slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Eolian sands

Typical profile

A - 0 to 7 inches: fine sand
Bw - 7 to 30 inches: fine sand
C - 30 to 79 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Minor Components

Brems

Percent of map unit: 3 percent
Landscape: Outwash plains
Landform: Dunes, Ridges
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F097XA012MI - Moist Sandy Depression

Hydric soil rating: No

Tedrow

Percent of map unit: 2 percent
Landscape: Ice-margin complexes, till plains
Landform: Outwash plains, Glacial drainage channels, Glacial drainage channels
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

73A—Algansee loamy sand, protected, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 743j
Elevation: 600 to 1,500 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Algansee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Algansee

Setting

Landform: Flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

Ap - 0 to 9 inches: loamy sand
C - 9 to 59 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: Rare

Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F097XA025MI - Moist Floodplain
Hydric soil rating: No

Minor Components

Glendora
Percent of map unit: 4 percent
Landform: Flood plains
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Oakville
Percent of map unit: 3 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Chelsea
Percent of map unit: 3 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

74—Glendora loamy sand, protected

Map Unit Setting
National map unit symbol: 743k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition
Glendora and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glendora

Setting
Landform: Depressions flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

Ap - 0 to 10 inches: loamy sand
C - 10 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F097XA027MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Algansee

Percent of map unit: 5 percent
Ecological site: F097XA025MI - Moist Floodplain
Hydric soil rating: No

Oakville

Percent of map unit: 5 percent
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

75B—Capac-Marlette loams, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2w63s
Landscape: Till plains
Elevation: 710 to 990 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Capac and similar soils: 46 percent
Marlette and similar soils: 41 percent
Minor components: 13 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Capac

Setting

Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
B/E - 9 to 16 inches: clay loam
Bt - 16 to 31 inches: clay loam
C - 31 to 80 inches: loam

Properties and qualities

Slope: 1 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.1 to 0.4 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Description of Marlette

Setting

Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope, head slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
B/E - 9 to 16 inches: clay loam
Bt - 16 to 36 inches: clay loam

C - 36 to 80 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.1 to 0.4 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Parkhill, non dense till subsoil

Percent of map unit: 10 percent
Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Metea

Percent of map unit: 3 percent
Landscape: Till plains
Landform: Moraines, Till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

AdraaA—Adrian muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdl7
Landscape: Till plains
Elevation: 670 to 1,010 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Adrian and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adrian

Setting

Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material over sandy glaciofluvial deposits

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 34 inches: muck
Cg - 34 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.3 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 0.2
Available water supply, 0 to 60 inches: Very high (about 15.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Kingsville

Percent of map unit: 3 percent
Landscape: Outwash plains, lake plains
Landform: Outwash plains, Nearshore zones (relict)
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 2 percent
Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Houghton

Percent of map unit: 2 percent
Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landscape: Outwash plains, till plains
Landform: Glacial drainage channels, Glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

AdraeA—Adrian muck, lake moderated, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlj
Landscape: Till plains
Elevation: 580 to 800 feet
Mean annual precipitation: 34 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Adrian and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adrian

Setting

Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material over sandy glaciofluvial deposits

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 34 inches: muck
Cg - 34 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.3 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 0.2
Available water supply, 0 to 60 inches: Very high (about 15.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Minor Components

Kingsville

Percent of map unit: 3 percent
Landscape: Outwash plains, lake plains
Landform: Outwash plains, Nearshore zones (relict)
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Edwards

Percent of map unit: 2 percent
Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Houghton

Percent of map unit: 2 percent
Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landscape: Outwash plains, till plains
Landform: Glacial drainage channels, Glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

CovabB—Covert-Pipestone sands, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2rfgw
Landscape: Lake plains, outwash plains
Elevation: 580 to 830 feet
Mean annual precipitation: 33 to 37 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 129 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Covert and similar soils: 69 percent
Pipestone and similar soils: 19 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Covert

Setting

Landscape: Lake plains, outwash plains
Landform: Nearshore zones (relict), Outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits

Typical profile

A - 0 to 8 inches: sand
E - 8 to 13 inches: sand
Bs1 - 13 to 18 inches: fine sand
Bs2 - 18 to 29 inches: sand
BC - 29 to 47 inches: fine sand
C - 47 to 80 inches: sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 to 59.98 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A/D
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Description of Pipestone

Setting

Landscape: Lake plains, outwash plains
Landform: Nearshore zones (relict), Outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits

Typical profile

A - 0 to 2 inches: sand
E - 2 to 4 inches: sand
Bs1 - 4 to 13 inches: sand
Bs2 - 13 to 19 inches: sand
BC - 19 to 28 inches: fine sand
C - 28 to 80 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 59.98 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Minor Components

Plainfield, high ecological site

Percent of map unit: 7 percent
Landscape: Lake plains, outwash plains
Landform: Beach ridges, Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Kingsville

Percent of map unit: 2 percent
Landscape: Outwash plains, lake plains
Landform: Nearshore zones (relict), Outwash plains
Landform position (three-dimensional): Dip, rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Kaleva

Percent of map unit: 1 percent
Landscape: Outwash plains, lake plains
Landform: Outwash plains, Beach ridges
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Saugatuck

Percent of map unit: 1 percent
Landscape: Lake plains, outwash plains
Landform: Nearshore zones (relict), Outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Covert, stratified substratum

Percent of map unit: 1 percent
Landscape: Lake plains
Landform: Nearshore zones (relict)
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

HgtacA—Houghton muck, lake moderated, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlf
Landscape: Till plains
Elevation: 580 to 820 feet
Mean annual precipitation: 34 to 41 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 135 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave

Across-slope shape: Linear
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landscape: Till plains, outwash plains
Landform: Drainageways on moraines, Drainageways on outwash plains, Depressions on outwash plains, Depressions on till plains, Swamps on outwash plains, Swamps on till plains, Depressions on moraines, Swamps on moraines, Drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landscape: Till plains, outwash plains
Landform: Glacial drainage channels, Glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

HgtahA—Houghton muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlc
Landscape: Till plains
Elevation: 720 to 1,100 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days

Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear

Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landscape: Till plains
Landform: Depressions on outwash plains, Depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landscape: Till plains, outwash plains
Landform: Depressions on moraines, Swamps on moraines, Drainageways on till plains, Drainageways on moraines, Drainageways on outwash plains, Depressions on outwash plains, Depressions on till plains, Swamps on outwash plains, Swamps on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landscape: Outwash plains, till plains
Landform: Glacial drainage channels, Glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

PlfabB—Plainfield sand, lake plain, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2w4kc
Landscape: Lake plains
Elevation: 580 to 750 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, lake plain, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Lake Plain

Setting

Landscape: Lake plains
Landform: Nearshore zones (relict)
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits

Typical profile

A - 0 to 8 inches: sand
Bw - 8 to 27 inches: sand
BC - 27 to 35 inches: sand
C - 35 to 80 inches: sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 0.1 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Minor Components

Brems

Percent of map unit: 8 percent
Landscape: Lake plains
Landform: Nearshore zones (relict)
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Kaleva

Percent of map unit: 4 percent
Landscape: Lake plains
Landform: Nearshore zones (relict)
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Brethren

Percent of map unit: 2 percent
Landscape: Lake plains
Landform: Nearshore zones (relict)
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Spinks

Percent of map unit: 1 percent
Landscape: Lake plains
Landform: Nearshore zones (relict)
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

PlfabD—Plainfield sand, lake plain, 6 to 18 percent slopes

Map Unit Setting

National map unit symbol: 2w5ll
Landscape: Lake plains
Elevation: 580 to 760 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, lake plain, and similar soils: 90 percent
Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Lake Plain

Setting

Landscape: Lake plains
Landform: Low inland dunes, Beach ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex, linear
Parent material: Eolian sands

Typical profile

A - 0 to 6 inches: sand
Bw - 6 to 25 inches: sand
BC - 25 to 33 inches: sand
C - 33 to 80 inches: sand

Properties and qualities

Slope: 6 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 0.1 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Minor Components

Brems

Percent of map unit: 5 percent
Landscape: Lake plains
Landform: Low inland dunes, Beach ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, convex, linear
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Kaleva

Percent of map unit: 3 percent
Landscape: Lake plains
Landform: Low inland dunes, Beach ridges

Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex, linear
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Thompsonville

Percent of map unit: 2 percent
Landscape: Lake plains
Landform: Low inland dunes, Beach ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, convex, linear
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

PlfabE—Plainfield sand, high ecological site, 18 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2rfgm
Landscape: Lake plains, outwash plains
Elevation: 580 to 770 feet
Mean annual precipitation: 33 to 37 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 129 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, high ecological site, and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, High Ecological Site

Setting

Landscape: Lake plains, outwash plains
Landform: Lake plains, Outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder
Landform position (three-dimensional): Head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Sandy lacustrine deposits

Typical profile

A - 0 to 9 inches: sand
Bs1 - 9 to 16 inches: sand
Bs2 - 16 to 36 inches: sand

BC - 36 to 75 inches: sand
C - 75 to 80 inches: sand

Properties and qualities

Slope: 18 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Kaleva

Percent of map unit: 5 percent
Landscape: Lake plains, outwash plains
Landform: Lake plains, Outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, head slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Brems

Percent of map unit: 3 percent
Landscape: Lake plains, outwash plains
Landform: Outwash plains, Lake plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Spinks

Percent of map unit: 2 percent
Landscape: Outwash plains, lake plains
Landform: Outwash plains, Lake plains
Landform position (two-dimensional): Backslope, footslope, shoulder
Landform position (three-dimensional): Side slope, head slope, nose slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

Tekenink

Percent of map unit: 1 percent
Landscape: Lake plains, outwash plains
Landform: Lake plains, Outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder
Landform position (three-dimensional): Head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F097XA010MI - Sandy Slopes
Hydric soil rating: No

PlfacF—Plainfield sand, dunes, 18 to 60 percent slopes

Map Unit Setting

National map unit symbol: 2ptc2
Landscape: Lake plains
Elevation: 580 to 810 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, dune, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Dune

Setting

Landscape: Lake plains
Landform: Dunes on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Eolian sands

Typical profile

AE - 0 to 2 inches: sand
E - 2 to 4 inches: sand
Bs1 - 4 to 8 inches: sand
Bs2 - 8 to 18 inches: sand
BC - 18 to 24 inches: sand
C - 24 to 80 inches: sand

Properties and qualities

Slope: 18 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F097XA002MI - Backdune
Hydric soil rating: No

Minor Components

Plainfield, dune

Percent of map unit: 14 percent
Landscape: Lake plains
Landform: Dunes on lake plains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F097XA002MI - Backdune
Hydric soil rating: No

Platteriver

Percent of map unit: 5 percent
Landscape: Lake plains
Landform: Dunes on lake plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F097XA002MI - Backdune
Hydric soil rating: No

Dune land

Percent of map unit: 1 percent
Landscape: Lake plains
Landform: Dunes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Side slope, base slope, head slope, nose slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F097XA002MI - Backdune
Hydric soil rating: Unranked

PmsabA—Palms muck, lake moderated, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 30n58
Landscape: Outwash plains, till plains
Elevation: 630 to 770 feet
Mean annual precipitation: 34 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Palms and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landscape: Outwash plains, till plains
Landform: Depressions on moraines, Swamps on outwash plains, Swamps on till plains, Drainageways on moraines, Depressions on outwash plains, Depressions on till plains, Swamps on moraines, Drainageways on outwash plains, Drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Herbaceous organic material over loamy drift

Typical profile

Oa1 - 0 to 11 inches: muck
Oa2 - 11 to 28 inches: muck
Cg - 28 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Very high (about 17.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Minor Components

Barry

Percent of map unit: 3 percent
Landscape: Till plains
Landform: Broad flats on till plains, Depressions on moraines, Drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 2 percent
Landscape: Outwash plains, till plains
Landform: Glacial drainage channels, Glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Houghton

Percent of map unit: 2 percent
Landscape: Ice-margin complexes, till plains
Landform: Drainageways on glacial drainage channels, Drainageways on moraines, Depressions on outwash plains, Depressions on moraines, Depressions on outwash plains, Drainageways on moraines, Drainageways on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F097XA030MI - Mucky Depression
Hydric soil rating: Yes

Edwards

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Lakebeds (relict) on outwash plains, Lakebeds (relict) on moraines, Lakebeds (relict) on glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F097XA030MI - Mucky Depression

Hydric soil rating: Yes

PmsacA—Palms muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 30n59
Landscape: Outwash plains, till plains
Elevation: 760 to 1,060 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Palms and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landscape: Outwash plains, till plains
Landform: Depressions on moraines, Swamps on outwash plains, Swamps on till plains, Drainageways on moraines, Depressions on outwash plains, Depressions on till plains, Swamps on moraines, Drainageways on outwash plains, Drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Herbaceous organic material over loamy drift

Typical profile

Oa1 - 0 to 11 inches: muck
Oa2 - 11 to 28 inches: muck
Cg - 28 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0

Available water supply, 0 to 60 inches: Very high (about 17.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Barry

Percent of map unit: 3 percent
Landscape: Till plains
Landform: Broad flats on till plains, Depressions on moraines, Drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 2 percent
Landscape: Outwash plains, till plains
Landform: Glacial drainage channels, Glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

Houghton

Percent of map unit: 2 percent
Landscape: Ice-margin complexes, till plains
Landform: Drainageways on moraines, Depressions on outwash plains, Depressions on moraines, Depressions on outwash plains, Drainageways on moraines, Drainageways on outwash plains, Drainageways on glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Lakebeds (relict) on outwash plains, Lakebeds (relict) on moraines, Lakebeds (relict) on glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear

Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

PpsadB—Pipestone sand, lake moderated, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 31gts
Landscape: Lake plains, ice-margin complexes
Elevation: 600 to 760 feet
Mean annual precipitation: 34 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Pipestone and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pipestone

Setting

Landscape: Lake plains, ice-margin complexes
Landform: Lakebeds (relict), Moraines on till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits

Typical profile

A - 0 to 8 inches: sand
E - 8 to 9 inches: sand
Bhs - 9 to 17 inches: sand
Bs - 17 to 31 inches: sand
C - 31 to 79 inches: sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F097XA006MI - Moist Acidic Sandy Flatwoods
Hydric soil rating: No

Minor Components

Kingsville

Percent of map unit: 4 percent
Landscape: Ice-margin complexes, lake plains
Landform: Moraines on till plains, Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F097XA008MI - Wet Sandy Flatwoods
Hydric soil rating: Yes

Thetford

Percent of map unit: 3 percent
Landscape: Ice-margin complexes, lake plains, outwash plains
Landform: Depressions, Moraines on till plains, Lakebeds (relict)
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Oakville

Percent of map unit: 1 percent
Landscape: Ice-margin complexes, lake plains, outwash plains
Landform: Depressions, Moraines on till plains, Lakebeds (relict)
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F097XA004MI - Dry Sandy Lake Plain
Hydric soil rating: No

Rimer

Percent of map unit: 1 percent
Landscape: Ice-margin complexes, lake plains
Landform: Moraines on till plains, Lakebeds (relict)
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

PpsaeB—Pipestone sand, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 31gtv
Landscape: Ice-margin complexes, outwash plains
Elevation: 720 to 930 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Pipestone and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pipestone

Setting

Landscape: Ice-margin complexes, outwash plains
Landform: Depressions, Moraines on till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Sandy outwash

Typical profile

A - 0 to 4 inches: sand
E - 4 to 9 inches: sand
Bhs - 9 to 17 inches: sand
Bs - 17 to 31 inches: sand
C - 31 to 79 inches: sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F098XA017MI - Moist Acidic Drift Flats
Hydric soil rating: No

Minor Components

Kingsville

Percent of map unit: 4 percent
Landscape: Ice-margin complexes, outwash plains
Landform: Moraines on till plains, Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

Covert

Percent of map unit: 3 percent
Landscape: Outwash plains, ice-margin complexes
Landform: Depressions, Moraines on till plains
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Side slope, nose slope, interfluve, head slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F098XA017MI - Moist Acidic Drift Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 2 percent
Landscape: Ice-margin complexes, outwash plains
Landform: Moraines on till plains, Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA017MI - Moist Acidic Drift Flats
Hydric soil rating: No

Oakville

Percent of map unit: 1 percent
Landscape: Outwash plains, ice-margin complexes
Landform: Depressions, Moraines on till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA013MI - Piney Dry Sandy Drift Plains
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

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EXHIBIT 2

STAFF REPORTS

A. M. VANDENBERG

B. PCI

C. K&S ENGINEERING, LLC

Heron Energy Storage System

CHAPTER XX

SITE PLAN REVIEW PROCEDURES

SECTION 20.01 PURPOSE

The purpose of site plan review is to provide for consultation and cooperation between the land developer and the Township in order to accomplish the developer's objectives in harmony with the existing and prospective use and development of adjacent properties. It shall be the further purpose of this Section to insure that each proposed development and its components, appearance, and function is in compliance with this Ordinance, other Township ordinances, and State and Federal laws. These purposes apply to development of previously unimproved sites; to the redevelopment, expansion, contraction or alteration of existing sites; and to the alteration or replacement of existing uses.

Further purposes of site plan approval shall include: privacy, efficiency for the public and local government servicing, preservation of the natural landscape, environmental and ecological protection, emergency access, effective drainage, vehicular and pedestrian safety and conveniences; prevention of air, water and noise pollution; and limitation of obnoxious odors, glare, and exposure to toxic substances and wastes.

The site plan review procedures and standards in this Section are intended to provide a consistent and uniform method of review for proposed development plans. Through the application of the following provisions, the attainment of the Gun Plain Township Master Land Use Plan will be assured, and the Township will develop in an orderly fashion.

SECTION 20.02 WHEN A SITE PLAN AND REVIEW BY THE PLANNING COMMISSION IS REQUIRED

A. **Site Plan Required.** Submission of a site plan shall be required for any of the following:

1. Any development or use for which submission of a site plan is required by provisions of this Ordinance.

2. Any proposal to construct, move, relocate, convert or structurally alter a building, including accessory buildings, except as noted in Section 20.02 of this Ordinance. A structural alteration shall be defined as one that changes the location of the exterior walls and/or the area of the building. This shall include alterations to construct or relocate pedestrian entrances or windows. This requirement shall in no way permit the expansion of a nonconforming structure so as to become more nonconforming or increase the area already in violation of the provisions of this zoning code.

3. Any proposal to change, replace with a different use, add or recommence a use on an existing site, including expansions in area, volume or intensity of an existing use unless otherwise permitted by this Ordinance.

5. Project description, including the total project title, number of structures, units, bedrooms, offices, square feet, total and usable floor area, parking spaces, carports or garages, employees by shift, amount of recreation and open space, and other pertinent information.

6. The gross and net acreage of all lots or parcels in the project.

7. Existing zoning classification, land uses, and structures on the subject parcel.

8. Name and address of developer (if different from the applicant), engineer, architect and/or land surveyor.

9. Project completion schedule/development phases.

10. Written statements relative to project impacts on existing infrastructure (including traffic capacity of streets, schools, and existing utilities) and on the natural environment of the site and adjoining lands.

B. **Site Plan Information.** Each submittal for site plan review shall be accompanied by a detailed site plan which shall consist of an accurate drawing, showing the entire site and all land within 150 feet of the site. The scale of the site plan shall be not less than 1 inch = 50 feet if the subject property is less than 3 acres, and 1 inch = 100 feet if three acres or more. If multiple sheets are used, each shall be labeled and the preparer identified. If there is an accurate site plan for the lot on file with the Township, the Township Superintendent may waive the requirement for a site plan. The following information shall be included:

1. Name of development and general location sketch.

2. Name, address and phone number of owner(s), developer, engineer, architect and/or designer.

3. North arrow, scale, and date of original drawing and revisions.

4. The seal of one of the following professionals registered in the State of Michigan: Registered Architect, Registered Civil Engineer, Registered Landscape Architect, Registered Land Surveyor or Registered Professional Community Planner. The architectural plans of the buildings shall be prepared by and bear the seal of a Registered Architect. A site plan for an alteration or addition to an existing structure may be prepared by the builder or contractor.

5. A legal description and address of the property in question.

6. The area of the site in square feet and acres excluding all existing and proposed public rights-of-way.

7. The dimensions of all lots and subject properties, showing the relationship of the subject property to abutting properties, including lots across rights-of-way and easements. The boundaries of the subject property shall be clearly indicated on the site plan, differentiated from other contiguous property. If the parcel is a part of a larger parcel, boundaries of total land holding shall be indicated.

8. Existing topographic elevations at two foot intervals, including ground elevations of all existing buildings, drives and/or parking lots, and any adjacent unusual surface conditions. Indicate direction of drainage flow.

9. The location and elevations of existing water courses and water bodies, including county drains and man-made surface drainage ways, floodplains, and wetlands.

10. Location and type of existing vegetation, including location of all existing trees over five (5) inches in diameter.

11. Any significant site amenities and unique features.

12. Existing land uses and zoning classification of the subject parcels and adjacent parcels.

13. All required minimum setbacks from the existing or proposed right-of-way and from adjacent lots.

NO Houses

14. The location and dimensions (length, width, height) of all existing and proposed structures on the subject property and all existing structures within 100 feet of the subject property.

15. The location and width of all existing public roads, rights-of-way or private easements of record, abutting streets, alleys, and driveway locations to abutting streets.

NA 16. With residential proposals, a site summary indicating the number and location of one bedroom units, two bedroom units, etc., typical floor plans with the square feet on floor areas; density computation, recreation facilities, open spaces, street names, and lot coverage.

no offices

17. With non-residential proposals, the number of offices, number of employees, the number of floors and typical floor plans and cross sections.

18. Proposed parking lots including layout and typical dimensions of parking spaces, number of spaces provided (including how computed per ordinance requirements) and type of surfacing.

19. Location of and dimensions of proposed streets, drives, curb cuts, and access easements, as well as acceleration, deceleration and passing lanes (if any) serving the development.

C401 C400

Site Plan notes

1. Township not City

NA 20. Proposed traffic and pedestrian circulation patterns, both within the site and on the public streets adjacent to the site and the proposed location and dimensions of any required pedestrian sidewalks. Designate loading and unloading areas, barrier free access, any fire lanes, and carports.

21. Proposed finish grade of buildings, driveways, walkways, and parking lots.

22. Proposed type of building materials, roof design, projections, canopies and overhangs, roof-located mechanical equipment, such as: air conditioning, heating units and transformers that will be visible from the exterior.

23. Proposed water service including any proposed tap ins, main extensions or extensions for adequate fire hydrant spacing, and/or considerations for extensions to loop other public water mains.

24. Proposed sanitary sewer facilities and the location of all existing utilities, easements and the general placement of lines, manholes, tap-ins, pump stations, and lift stations.

25. Proposed storm water management plan including design of sewers, outlets (enclosed or open ditches), and retention or detention ponds. Sufficient data regarding site run-off estimates and off-site drainage patterns shall be provided to permit review of feasibility and permanency of drainage detention and/or retention as well as the impact on local surface and groundwater. The plan shall indicate location and status of any floor drains in structures on the site. The point of discharge for all drains and pipes should be specified on the site plan.

NA 26. Locations of existing and proposed fire hydrants with reasonable access thereto for fire fighting, police and other emergency equipment.

27. Location of all other utilities on the site including but not limited to natural gas, electric, cable TV, telephone and steam.

28. Soil erosion and sedimentation control measures.

29. Detailed landscaping plan indicating location, types and sizes of material.

30. All proposed screening and free standing architectural walls, including typical cross-sections and the height above ground on both sides.

31. The dimensions and location of all signs, both wall signs and free-standing signs and of lighting structures and shielding.

32. Location, size and specifications for screening of all trash receptacles and other solid waste disposal facilities.

NA

33. Location and specifications for any existing or proposed outdoor or below ground storage facilities as well as any screening or containment structures or clear zones required by government authorities.

34. Easements for proposed public rights-of-way, utilities, access, shared access, and drainage.

NA

35. Notation of any variances which have been or must be secured.

36. Notation of performance guarantees to be provided including amounts, types, and terms.

37. Statement that applicant will comply with state, local and federal laws, as applicable to the site or intended use.

38. Information and special data which may be critical to the adequate review of the proposed use and its impacts on the site or Township. Such data requirements may include traffic studies, market analysis, environmental assessments (including inventory and impact data on flora, fauna, natural resources, hazardous materials, erosion control and pollution), demands on public facilities and services, impact on historical or cultural resources, displacement of people or other uses as a result of the proposed development, alterations of the character of the surrounding area, effect on the Township 's tax base and adjacent property values, or other data which the Township may reasonably deem necessary for adequate review.

39. The size, location and description of any proposed interior or exterior areas or structures for storing, using, loading or unloading of hazardous substances. A listing of types and quantities of hazardous substances which will be used or stored on-site in quantities greater than 100 kilograms or 25 gallons per month.

NA

40. Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of the cleanup.

41. Plans depicting existing and proposed building elevations.

NA

42. For developments that are of a scale to warrant phased development, the phasing of construction shall be indicated. A detailed site plan need be submitted only for that portion of the property for which a building permit will be applied for; a general site plan which clearly indicates the overall project intent may be submitted for the remainder of the site.

43. Building elevations of the proposed structure(s) from each direction shall be shown.

SECTION 20.05 CRITERIA FOR GRANTING SITE PLAN APPROVAL

O. A major objective shall be to retain, enhance and protect the quality, value and privacy of all residential land uses.

P. All development phases shall be designed in logical sequence to insure that each phase will independently function in a safe, convenient and efficient manner without being dependent upon improvements of a subsequent development potential of lands.

Q. All sites shall be designed to comply with state and local barrier- free requirements and to reasonably accommodate the handicapped and elderly.

SECTION 20.06 REVIEW AND APPROVAL Site Plans shall be reviewed in accordance with the following procedures:

A. **Department Review.** The Township Superintendent may secure comments from the Township Building Inspector, Allegan County Road Commission, Sheriff's Department, and the Township or consultant Engineer and Planner, and forward all comments to the Planning Commission for its review. The Planning Commission shall review the plans and may solicit further comments from an Engineer, Planning Consultant and other agencies, groups or persons, as appropriate.

B. **Site Plan Approval.** The Township Planning Commission is hereby authorized to review and approve, with or without conditions or to review and deny approval, all site plans submitted under this Ordinance. Guidelines for consideration of each case shall follow the zoning ordinance and other applicable ordinances. When the Planning Commission approves a site plan with conditions from the applicant, the Township Superintendent shall require a revised site plan with a revision date, indicating said conditions on the site plan.

C. **Record of Action.** Each action taken with reference to site plan review and approval shall be duly recorded in the minutes of the Gun Plain Charter Township Planning Commission. A final copy of the approved site plan shall be so marked and placed on file with the Township Clerk's office.

D. **Final Site Plan.** When a site plan approval is required, no building permit shall be issued until three copies of a final site plan, which includes all conditions of approval, a revision date and notation of all variances has been signed by the Planning Commission, the Township Superintendent or their designees. Prior to issuance of a permit, one copy of the final signed plan shall be filed with each of the following: Township Clerk, Zoning Official and the Applicant.

SECTION 20.07 ISSUANCE OF BUILDING PERMIT AFTER SITE PLAN APPROVAL

PCI PROFESSIONAL CODE INSPECTIONS

1575 142nd Ave, DORR, MI 49323
Ph. (616) 877-2000 Fax (616) 877-4455
www.pcimi.com

STAFF REPORT

TO:	Gun Plain Charter Township Planning Commission
FROM:	Lori Castello, AICP, Planner/ Zoning Administrator
DATE:	April 6, 2026
RE:	**Heron Energy Storage LLC, SUP: BESS**

GENERAL OVERVIEW

Property Information

The unaddressed property known as Permanent Parcels 03-08-034-021-50 resides on the north/northeast side of Riverview Drive and comprises approximately 91.93 acres. It is currently zoned Agricultural, with R-1 Residential to the north and R-2 Residential to the east. The proposed project area lies within open tilled area surrounded on three sides by trees and abutting additional open cropland under the ownership of the same property owner to the north- the parcel appears to have been configured across section lines of the township, causing a separately numbered parcel in Section 27. To the northwest, adjacent property is owned by Consumers Energy where a large transmission line transects the township in a roughly east-west direction. An existing substation lies on the next parcels to the west, again owned by Consumers Energy

Request Information

The applicant is requesting a Special Use Permit and site plan approval to construct and operate a Battery Energy Storage System ("BESS") on the northeastern 26.65 acres of the parcel.

Information provided by Applicant

The applicant has provided a completed application for site plan review and engineered plan as well as numerous documents within the packet including a narrative.

RELEVANT LANGUAGE AND COMMENTS

Comments will have bold, red, footnote-like numbers referencing the summary at the end of the memo to allow for quick reference to items not completely aligned to a specific ordinance section or requiring further discussion.

SECTION 17.36. ENERGY STORAGE SYSTEM REGULATIONS
Section 1. Section 1. Energy Storage Systems.

The following requirements shall apply to all energy storage systems:

1. *Site Selection. In the "AG" Agricultural District, this land use shall not unreasonably diminish farmland, including, but not limited to, prime farmland and, to the extent that evidence of such farmland is available in the evidentiary record, farmland dedicated to the cultivation of specialty crops.*
   Findings: The proposed project area consists of open cropland which appears to have been farmed in recent years. Based on satellite and aerial views it appears the crops that have traditionally been planted and harvested are consistent with those within the general area and not specifically dedicated to specialty crops. The 2022 USGS soil map shows a combination of "not prime farmland" and "farmland of local importance" generally within and surrounding the project area.

2. *Energy Storage Systems, Small shall be allowed as a special land use in the following zoning districts:*
   A. *AG Agricultural*
   B. *I-1 Industrial*

Findings: N/A: this is a large storage system.

3. *Energy Storage Systems, Large shall be allowed as a special land use in the following zoning districts:*
   A. *AG Agricultural*
   B. *I-1 Industrial*
   Findings: The project area is within the AG district meeting this standard.

4. *The following minimum setbacks shall be required. Setbacks are measured from the nearest facility structure to the nearest point on the associated item:*
   A. *100 feet from any property line of a non-participating property*
   B. *300 feet from the nearest point on the outer wall of a dwelling on nonparticipating property.*
   C. *50 feet measured from the nearest edge of a public road right-of-way.*

Findings: The proposed battery containers are approximately 150 feet from the north boundary line, well over 700 feet from the nearest nonparticipating residential dwelling and the Riverview Drive Road Right of Way, meeting this standard.

5. *Height. The height of energy storage system structures, except for electric distribution and transmission poles, shall not exceed a height of twenty (20) feet as measured from the natural grade of the property beneath the structure. Stacking of energy storage system components is prohibited.*

Findings: The proposed battery cabinets are just under nine feet tall and are not designed for stacking; ventilation and maintenance clearances show the cabinets must be singular and separated, which meets this standard.

6. *Fencing. The system shall be completely enclosed with fencing in compliance with the latest version of the National Electrical Safety Code or any applicable successor standard approved by the Michigan Public Service Commission.*
   Findings: The proposed fence is proposed to be six feet high chain link, with an additional foot consisting of three strands of barbed wire above it. A knox box is planned to allow for emergency access as required.

7. *Sound. The system may not generate a maximum sound in excess of 55 average hourly decibels as measured at the property line of an adjacent non-participating property. Decibel modeling shall use the A- weighted scale designed by the American National Standards Institute. The Planning Commission shall require the applicant to provide a sounds study as part of the special land use review process.*
   Findings: The applicant asserts that the only noise that will be generated by the project is that of the HVAC units providing climate control for the cabinets. A sound study has been provided and the plans include a sound barrier to mitigate noise. **The study should be reviewed by a technical expert to verify report methodology and results.** [1]

8. *Lighting. The system must implement dark sky-friendly lighting solutions.* Exhibit 4.E notes this requirement, and sheet PP 100 (page 181 of PDF application packet) demonstrates that lighting will be compliant with this requirement.

9. *Impacts of Energy Storage System, Small and Large Energy Storage System.*

   A. *The following requirements shall apply to the entire system, or to designated components of the system, as indicated:*

      1. *Safety Signage. The system shall post signs in compliance with NFPA 70/70E or any applicable successor code in place at the time of application for approval. Additionally, signage shall be provided per NFPA 855 7.4.4, or any applicable successor code in place at the time of application for approval, including information on the system type and technology, special hazards, fire suppression system and 24-hour emergency contact information, including reach-back phone number. A clearly visible warning sign concerning voltage shall be placed at the base of all pad-mounted transformers and substations.*

      Findings: The applicant has provided the specs for the proposed signage and locations, meeting this standard.

      2. *Other Signage: Additional signage may be permitted or required by the Planning Commission as is necessary to ensure the safe operation of the system.*

      Findings: The proposed location and security measures isolate the proposed storage system and appear to meet safety standards as well as the signage requirements herein. If the Planning Commission determines that additional signage is necessary, it

should provide the applicant with direction on what it seeks and how it will better serve to protect the general health safety and welfare.

3. *The facility shall comply with NFPA 855 "Standard for the Installation of Stationary Energy Storage Systems" or any applicable successor standard adopted by the Michigan Public Service Commission.*

Findings: The application should be reviewed by the Gun Plain Fire Department and/or Allegan County Emergency Services for confirmation with this requirement.

B. *The Planning Commission shall require reasonable measures to minimize visual impacts by preserving existing natural vegetation, requiring new vegetative screening or other appropriate measures. The Planning Commission shall determine such visual screening measures as may be required on a site-specific basis pursuant to the standards for Special Land Use approval as specified in Section 17.36, the landscaping and screening standards of Chapter 21 Section 21.01-21.10, and/or the standards for site plan approval as specified in Chapter 20 Section 20.01-20.06 of the Zoning Ordinance of 2002 as Amended by Gun Plain Charter Township Board. In making this determination the Planning Commission is specifically authorized to consider whether additional visual screening measures are appropriate where a system is proposed to be located on property adjacent to a residential use and/or a residential district zoning classification. All screening/landscaping shall be properly maintained throughout the life of the project including replacement of any dead landscaping within six months.*

Findings: The applicant asserts that the existing vegetation and distance from adjacent property lines and residences provides ample screening to three sides. The Allegan County GIS indicates that the property is bounded by a wood line situated at the eastern edge of the parcel as well as on the south and west side of the project area, and that the only unscreened area is that which abuts the Consumers Power transmission line to the north. Sheet L100 provides landscaping information including the proposed buffer line that includes approximately 120 trees in 6 varieties. Sheet TP 201 provides a visual reference concerning the potential removal of existing trees. The most sensitive area of trees for visual buffering is that on the east side of the project area, where it is indicated no trees shall be disturbed. It appears that the naturally existing buffer is well suited to protect neighboring parcels from any visual impact. **Any approval should include a condition that the applicant understands and agrees to replacement of any trees as required by the Gun Plain Charter Township Zoning Ordinance.** Additionally, a note on Sheet L100 states that "quantities on plan supersede list quantities in the event of a discrepancy." **The Planning Commission may choose to require that the language in said note be amended to state that in the event of a discrepancy between the plan and list quantity, the greater number of plantings shall be required".**[2]

C. *If the system includes an access drive(s) for maintenance purposes, the surface of the access drive(s) shall be permeable (unless on brownfield land or on an already paved surface at the time of application for approval, such as a parking lot or former building foundation.)*

Findings: Sheet C410 indicates that the proposed surface is "TBD", and the narrative references the use of gravel. **Applicant must provide information regarding the proposed service drive composition.** [3]

D. *Subject to approval of the Planning Commission, the area within which the system is located shall not be paved with asphalt/concrete or any other surface material that is*

impermeable to water other than for slab foundations for structures and equipment. This shall not apply to a system located on brownfield land or on an existing paved area such as a former building slab or in an unused parking area when adequate parking remains for all other uses on the site.

Findings: Sheet C410 indicates that the proposed surface is "TBD", and the narrative references the use of gravel. **Applicant must provide information regarding the proposed service drive composition.** [3]

E. *All surface water runoff created by construction and operation of the project shall be effectively managed on-site.*

Findings: Sheet C500 provides drainage information. **Drainage information and calculations should be reviewed by the Township Engineer and/or Allegan County Drain Commissioner to verify feasibility as a preconstruction requirement.** [4]

8. *Installation and Operational Safety. The system shall comply with all of the following requirements:*

   A. *The system shall be designed and constructed for interconnection to a Michigan Public Service Commission or Midcontinent Independent System Operator regulated utility electrical power grid and shall be operated with such interconnection.*

   B. *The system and all foundation elements shall comply with all applicable building and electrical code requirements, and any applicable federal/state regulations. The manufacturer's engineer or another qualified engineer shall provide written certification that the design, installation (including foundations), and interconnection is compliant with the manufacturer and industry standards, all applicable local construction and electrical codes, and any applicable federal/state regulations.*

   C. *Other than transmission or distribution lines for interconnection to the electric power grid, all electrical wiring shall be buried underground; except where the manufacturer's engineer or a qualified engineer employed by the utility that owns/operates the electrical power grid to which the system shall be interconnected certifies an underground wiring installation is not permitted by an applicable code and/or applicable federal/state regulation, with attached complete documentation supporting any such certification.*

   D. *The system shall be designed, located, and maintained so as to comply with all applicable codes and regulations.*

   Findings: The applicant recognizes this and these shall be pre-construction and construction/installation/operational requirements if the project is approved.

9. *Public Safety. The Emergency Response Plan and Fire Response Plan shall provide reasonable protection of the public health, welfare and safety including but not limited an internal fire suppression system, an emergency shutdown procedure in place and shall provide the local fire department site safety plans to include electrical, fire, smoke, and hazardous materials release, emergency response protocols and identification of typical hazards related to, electrical, fire, smoke and hazardous materials pertinent to the facility. Upon request, all systems shall provide first responder training at the site.*

Findings: The applicant has provided Emergency and Fire Response Plans. **The plans should be reviewed by the Gun Plain Charter Township Fire Department and/or Allegan County Emergency Management Services to confirm this standard is met. Of particular concern is that the ERP/FRP note that emergency personnel should not access the property, even in an emergency, without operator personnel on site. Applicant should verify that the project will be manned 24/7 or provide emergency access at the discretion of the Fire Chief.** [5]

10. *Repair and Augmentation. In addition to repairing or replacing facility components to maintain the system, the facility may at any time be augmented without the need to submit a new site plan so long as the augmentation is within the same footprint (e.g., same dedicated use building or on footings/foundations in the same location) as the original permit. If there is a change in the energy storage system chemistry, an updated Hazard Mitigation Analysis and Emergency Operation Plan shall be provided. When a facility is anticipated to be augmented over its lifetime by adding additional components, the applicant shall apply for the final/augmented site arrangement. A proposal to increase the size the project footprint may be considered a new application, subject to the ordinance standards at the time of the request.*

Findings: The applicant acknowledges the above in their narrative. The project area includes space to accommodate additional batteries to those shown in the first phase, indicating their intention to add on to the proposed storage without further expanding the footprint.

11. *Decommissioning and Removal. A decommissioning plan is required at the time of application.*

    A. *The decommission plan shall include:*

        i. The anticipated manner in which the project will be decommissioned, including a description of which above-grade and below-grade improvements will be removed, retained (e.g., access drive, fencing), or restored for viable reuse of the property consistent with the zoning district. Pursuant to this requirement, the decommissioning plan shall be required to include that any structures up to forty-eight (48) inches below-grade shall be removed for disposal.

        ii. The projected decommissioning costs shall reflect the estimated current cost and any future anticipated costs of the decommissioning project. Salvage value shall not be included in the cost to decommission the project.

        iii. The method of ensuring that funds will be available for site decommissioning and stabilization (in the form of surety bond or cash deposit).

The applicant's decommissioning plan (Exhibit 4.H) states that foundations (sections 3.1.2 and 3.8) and underground utilities (section 3.1.7) are proposed to be removed to a depth of only 3 feet, which does not meet this standard. **Applicant must provide amended plan confirming compliance with the 4 feet removal requirements herein.** [6]

A decommissioning cost projection was submitted and does not include salvage value, meeting the general requirement of this section. Adjustments should be made to reflect deeper removal of foundations and utilities, and the amended plan should be reviewed by a qualified engineer.

Section 3.2 states that it is the operators intent to prepare a detailed decommissioning report "once it is determined that the project has reached the end of its usable life and decommissioning should begin'. The Planning Commission should discuss whether the general plan that has been submitted is acceptable or if it will require a more detailed plan.

The applicant states on Page 5 of the decommissioning plan that it will provide a surety bond or cash deposit for site decommissioning, however no further details of the methods, holders, etc. have been provided. **Submission and approval of appropriate financial guarantee must be a condition of any preliminary approval to be addressed as part of any final approval and development agreement.** [6]

B. A review of the amount of the surety bond, based on inflation, and current removal costs shall be completed every 2 years, for the life of the project, and approved by the Planning Commission. A Energy Storage System owner may at any time:

i. Proceed with the decommissioning plan approved by the Planning Commission, and remove the system as indicated in the most recent approved plan; or

ii. Amend the decommissioning plan with Planning Commission approval and proceed according to the revised plan.

C. Decommissioning of an Energy Storage System must commence when the soil is dry to prevent soil compaction and must be complete within 12 months after abandonment. An Energy Storage System that has not operated for 12 consecutive months shall prompt an abandonment hearing.

i. Restoration shall include bringing soil and topography of the land to their pre-development composition unless the Planning Commission waives any part of this requirement to ensure permitted uses upon restoration. Soil tests shall be required as part of the decommissioning plan both before development and prior to the decommissioning.

12. *Special Land Use Permit and Site Plan Application Requirements. Applications for Special Land Use permit approval shall comply with Chapter 22, Section 22.01-22.02 of the Zoning Ordinance of 2002 as Amended by Gun Plain Charter Township Board. A formal application for site plan approval for this land use shall comply with Chapter 20 Section 20.01-20.06 of the Zoning Ordinance of 2002 as Amended by Gun Plain Charter Township Board. An incomplete application will not be accepted by the Planning Commission. Each such application shall also be subject to the following additional submission requirements:*

    A. *The complete name, address, and telephone number of the applicant.*

    B. *The planned date for the start of construction and the expected duration of construction.* The proposed schedule includes zoning approval and outside agency approval through 2026, with potential earthwork and site preparation toward the end of the year and the earliest anticipated actual construction beginning in early 2027. Construction would be completed and operations commencing in mid-2028 with an operational phase for an expected 20 years following commencement.

C. *A description of the system, including a site plan as described in Section 224 of the Clean and Renewable Energy Waste Reduction Act, 2008 PA 295, MCL 460.1224. The following items must be shown on the site plan:*

   i. *A map of all properties upon which any component of a facility or ancillary feature would be located, and all properties within one thousand (1,000) feet. This should indicate the location of all existing structures and shall identify such structures as occupied or vacant.*

   ii. *Lot lines and required setbacks shown and dimensioned including horizontal and vertical elevation drawings that show the location and height of the Energy Storage System on the land and dimensions of the Energy Storage System.*

   iii. *Size and location of existing and proposed water utilities, including any proposed connections to public, or private community sewer or water supply systems.*

   iv. *A map of any existing overhead and underground major facilities for electric, gas, telecommunications transmission within the facility and surrounding area*

   v. *The location and size of all surface water drainage facilities, including source, volume expected, route, and course to final destination.*

   vi. *A map depicting the proposed facilities, adjacent properties, all structures within participating and adjacent properties, property lines, and the projected sound isolines along with the modeled sound isolines including the statutory limit.*

The referenced MCL is an abbreviated list of site plan requirements that include general specifications that appear to be specifically addressed within this and other relevant subsections of the Gun Plain Charter Township Zoning Ordinance.

D. *A description of the expected use of the system.*

E. *Expected public benefits of the proposed system.*

F. *Information on the effects of the proposed system on public health and safety.*

The applicant has provided multiple studies regarding potential environmental, health and safety concerns or potential nuisances. I would recommend these submissions be closely reviewed by engineering staff with technical expertise to verify the methodology and findings of the reports.[7]

G. *A description of the portion of the community where the system will be located.*

H. *The expected direct impacts of the proposed system on the environment and natural resources and how the applicant intends to address and mitigate these impacts.*

The applicant has noted the current use and location near existing substations as well as screening methods for sound, visual impact and lighting. Concerns regarding potential air, water or soil pollution are addressed within various environmental impact studies.

I. *A statement and reasonable evidence that the proposed system will not commence commercial operation until it complies with applicable state and federal environmental laws, including, but not limited to, the Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.*

J. *Evidence of consultation, before submission of the application, with the Department of Environment, Great Lakes, and Energy and other relevant state and federal agencies*

before submitting the application, including, but not limited to, the Department of Natural Resources and the Department of Agriculture and Rural Development.

The applicant has stated they have been in contact with various agencies, however no typical evidence, such as a copy of any written acknowledgement of the proposal has been submitted. While there has been no such documentation submitted, these same outside agencies will ultimately have jurisdictional authority over specific elements of the proposal. As the applicant acknowledges this, it would be reasonable to take their assertion as being valid and consider this standard to be met.

K. *The Soil and Economic Survey Report under Section 60303 of the Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.60303, for the county where the proposed system will be located.*

L. *Interconnection queue information for the applicable regional transmission organization.*

M. *If the proposed site of the system is undeveloped land, a description of feasible alternative developed locations, including, but not limited to, vacant industrial property and brownfields, and an explanation of why they were not chosen. This requirement may be waived by the Planning Commission.*

The applicant has requested a waiver of this requirement as it asserts that the proposed location, with its close proximity to an existing substation on a vacant and substantially isolate parcel, is uniquely positioned to provide ideal siting for the project. **The Planning Commission may waive this requirement or require additional information from the applicant as it deems appropriate.** [8]

N. *If the system is reasonably expected to have an impact on television signals, microwave signals, agricultural global position systems, military defense radar, radio reception, or weather and doppler radio, a plan to minimize and mitigate that impact. Information in the plan concerning military defense radar is exempt from disclosure under the Freedom of Information Act, 1976 PA 442, MCL 15.231 to 15.246, and shall not be disclosed by the commission or the electric provider or independent power producer except pursuant to court order.*

O. *A storm water assessment and a plan to mitigate and repair any drainage impacts at the expense of the applicant. The applicant shall consult with the county drain commissioner before submitting the application and shall include evidence of those efforts in its application.*

The applicant has provided drainage plans and acknowledges the authority of the Allegan County Drain Commission. Any preliminary approval should include Drain Commissioner Approval as a preconstruction condition.[4]

P. *A fire response plan and an emergency response plan.*

   i. *The fire response plan (FRP) shall include:*

      1. *Will consult with the local fire department representatives and the local emergency manger to ensure that the FRP is in alignment with acceptable operating procedures, capabilities, resources, etc.*

2. *A description of all on-site equipment and systems to be provided to prevent or handle fire emergencies.*

3. *A description of all contingency plans to be implemented in response to the occurrence of a fire emergency.*

4. *A commitment to review and update the FRP with fire departments, first responders, and county emergency managers at least once every year.*

5. *An analysis of whether plans to be implemented in response to a fire emergency can be fulfilled by existing local emergency response capacity. The analysis should include identification of any specific equipment or training deficiencies in local emergency response capacity and recommendations for measures to mitigate deficiencies.*

6. *Other information the Fire Department finds relevant.*

ii. The emergency response plan (ERP) shall include:

1. *Will consult with local first responders and county emergency managers to ensure that the ERP is in alignment with acceptable operating procedures, capabilities, resources, etc.*

2. *An identification of contingencies that would constitute a safety or security emergency (fire emergencies are to be addressed in a separate fire response plan);*

3. *Emergency response measures by contingency;*

4. *Evacuation control measures by contingency;*

5. *Community notification procedures by contingency;*

6. *An identification of potential approach and departure routes to and from the facility site for police, fire, ambulance, and other emergency vehicles;*

7. *A commitment to review and update the ERP with fire departments, first responders, and county emergency managers at least once every year;*

8. *An analysis of whether plans to be implemented in response to an emergency can be fulfilled by existing local emergency response capacity, and identification of any specific equipment or training deficiencies in local emergency response capacity; and*

9. *Other information the Fire Department finds relevant.*

The applicant has provided draft plans which should be reviewed and approved by the Gun Plain Charter Township Fire Chief with the assistance and input of the Allegan County Emergency Management Department as a condition of preliminary approval, to be formally approved prior to any final approval and as part of a recorded development agreement. Items that do not appear to be within the plan include an analysis of whether existing equipment is adequate (for example, does the department have enough non-metal hand tools, ladders etc.?), and community notification and evacuation control procedures (if determined to be necessary). Of note: while the plan does include most of the listed requirements herein, the Township may wish to consider

adding a condition that the operator consult with and plan for on-site training on not less than an annual basis for local first responders and reciprocal agreement neighboring jurisdictions. Further, the plan notes that there is potential for toxic gases and flammable liquids and gases to be released in the event of failure. Additional information regarding these materials should be provided detailing the potential endangered radius and necessary remediation or evacuation actions for the area in case a catastrophic failure occurs. [5]

Q. A report detailing the sound modeling results along with mitigation plans to ensure that sound emitted from the system will remain below the statutory limit throughout the operational life of the system.

A sound study has been submitted with the application in Exhibit G. The Township may require that this study be reviewed by a technical professional to verify methodology and projected outcomes as a condition of preliminary approval. [1]

R. Any other information regarding compliance with the requirements herein.[9]

Findings: The site plan includes all of the applicable items required in Section 20.04.A with the following exceptions:

20.04.A.22. "*Proposed type of building materials, roof design, projections...*" Sheet C701 (page 176 of compiled application PDF) indicates an operations and maintenance building, however the sketch is basic, not to scale and does not include detailed information as required herein.

20.04.A.32. *"Location, size and specifications for screening of all trash receptacles and other solid waste disposal" I* found no dumpster location or enclosure listed on the plans or in the details. Once construction is complete there is likely to be very little waste generated, so it is possible that no dumpster is necessary due to the nature of the facility. Applicant should provide additional information confirming or correcting this assumption.

20.04.A.43. *"Building elevations of the proposed structure (s) from each direction shall be shown".* Again there are few details regarding the proposed maintenance. There are however detailed sketches showing the battery cabinets which are the primary use and focus of the project.

13. Waiver. Because of the ever-changing technical capabilities of battery storage infrastructure and of new technology in general, the Township Planning Commission shall have the authority to review and consider alternatives in both the dimensional and physical requirements contained in this ordinance as part of the special land use review process, and other requirements annually.

14. Building Permit. Prior to issuance of a Building Permit, the following information shall be provided.

A. Equipment specification sheets.

B. Identification and contact information for the installer(s) of the proposed system.

C. Augmentation Plan.

D. Approved Decommissioning Plan and Decommissioning Agreement in recordable form and acceptable to the Township Attorney.

E. Life expectancy of the system components including the anticipated schedule for battery replacement to maintain megawatts over the system's lifetime.

F. Hazard Mitigation Analysis.

G. Operation and Maintenance Manual.

H. Identification and contact information for the installer of the system.

I. Electrical schematic plan for the system, including disconnect devices.

J. An approved FRP and ERP.

K. An executed Community Host Agreement in the amount of $2,000 per megawatt.

L. Proof of financial guarantee for decommissioning.

15. Transfers. No transfer in ownership of the Energy Storage System shall occur prior to providing 60 days' notice to the Township and upon Township approval verifying that the new owner agrees to carry out the terms of the special land use and site plan approval.

Findings: The requirements of Sections 14 and 15 have been addressed in other areas of this report.

SUMMARY & CONCLUSION

Should the Planning Commission consider preliminary/conceptual approval of this site plan, the following items should be discussed and/or stipulated as conditions for final approval. If the Planning Commission determines that an approval or conditional approval is appropriate, I would recommend a provisional approval be granted subject to the drafting and review of a resolution to approve/approve conditionally at a subsequent meeting. A final development agreement which contains all required information, amendments, conditions, financial agreements etc. should be reviewed and approved by the Township and its legal counsel prior to any final approval. The development agreement, if accepted and approved by the Township, should then be filed with the Allegan County Register of Deeds to preserve the document (unless legal counsel provides contrary advice).

Potential Discussion Topics and Conditions

Ref. Number	Memo Page	Ordinance Section	Potential Condition
1	3	**§17.36.1.7**	➢ Engineer review of sound study to verify methodology and results.
2	4	**§ 17.36.1.9.B**	➢ Landscape comments should be amended to clarify if a discrepancy exists the greater of the either the list number or pictured plantings will apply. ➢ Statement should be included acknowledging operator obligation to replace plantings that have died in a timely manner
3	4	**§ 17.36.1.9.C** **§ 17.36.1.9.D**	➢ Applicant must provide information regarding proposed service drive materials
4	5, 9	**§ 17.36.1.9.E** **§17.36.12.O**	➢ Allegan County Drain Commissioner Approval as a preconstruction condition
5	6, 7, 10, 11	**§ 17.36.9** **§17.36.12.P**	➢ ERP/FRP reports to be reviewed and approved by Fire Department and Emergency Services. ➢ If project is not manned, plan for emergency entry without project personnel. ➢ ERP and FRP should include additional information.
6	7	**§ 17.36.11**	➢ Decommissioning plan must be amended to include removal of foundations and utilities to a depth of 4 feet. ➢ Applicant must provide financial guarantee in a form acceptable to the Township.
7	8	**§17.36.12.F**	➢ Environmental studies should be reviewed by technical staff to verify methodology and results.
8	9	**§17.36.12.M**	➢ Discussion of whether waiver will be granted or if applicant will be required to submit a feasibility study of alternate locations.
9	11	**§20.04.A**	➢ Note should be included requiring additional information for potential Operations/Maintenance building or require additional site plan review for building if needed; if not included, SUP would need to be amended to add later. ➢ Applicant should verify no trash receptacle should be on site or provide siting/screening information.

I hope the information provided is helpful to you as you review this application. It is a large amount of material and my suggestion is that you consider the public hearing an opportunity to review the application and public comments, then determine what, if any, additional information will be required for further review at subsequent meetings leading to a potential conceptual/preliminary approval, approval with conditions or denial. Unlike many projects that can be comprehensively reviewed and approved in a single meeting, a development of this scope is one that it is reasonable to divide up and work through the process in a manner that allows Planning Commissioners, applicant and public to have important dialogue and documentation supporting any final decision. If you have any questions or concerns, please contact me at your convenience and I will assist in any way that I am able. You may reach me by phone at (616) 888-6156 or by email at lcastello@pcimi.com.

With Warm Regards,

Lori Castello, AICP
Community Planner
Professional Code Inspections of Michigan, Inc.

NOTICE

K&S Engineering Report, "Review of the Heron BESS Application Noise Study", is hereby incorporated by reference. The document may be accessed at the following link:

https://www.gunplain.org/document/2026-012-review-of-the-july-17-2026-heron-bess-noise-study-2/

EXHIBIT 3

NOTICE OF PUBLIC HEARING AND AFFIDAVIT OF PUBLICATION

AFFIDAVIT OF PUBLICATION

State of Michigan
County of Allegan

R. Michael Wilcox, being duly sworn, says he is one of the principal clerks of the Allegan County News, a weekly newspaper published and circulated in said counties. The annexed is a printed copy of a notice which was published in said newspaper on the following date(s), to wit: 3/26

R. Michael Wilcox
R. Michael Wilcox

Subscribed and sworn to before me this

27 day of March A.D. 2026

Arteria C. Taylor
Arteria C. Taylor

Notary Public, State of Michigan,
County of Saint Joseph

My commission expires 05/11/2030

WILCOX NEWSPAPERS, LLC
DBA WILCOX NEWSPAPERS
P.O. Box 189, Allegan, MI 49010 - (269) 657-5080

PUBLIC NOTICE
GUN PLAIN CHARTER TOWNSHIP
PLANNING COMMISSION

To: The residents and property owners of the Charter Township of Gun Plain, Allegan County, Michigan and any other interested persons.

PLEASE TAKE NOTICE that the Gun Plain Charter Township Planning Commission will hold a Public Hearing on Wednesday April 15, 2026 at 6:00 P.M. at the Gun Plain Charter Township Hall, 381 8th St., Plainwell, Michigan for the purpose of taking comments pertaining to a request for a Special Land Use Permit to permit a Battery Energy Storage Facility on the following parcel ID#03-08-034-021-50, known as Riverview Drive, Plainwell, MI. 49080.

PLEASE TAKE FURTHER NOTICE that written comments will be received from any interested person at the Township Office, 381 8th Street, P.O. Box 146, Plainwell, Michigan 49080 up to and including the date of the public hearing and may also be submitted to the Planning Commission at the public hearing.

PLEASE TAKE FURTHER NOTICE that Gun Plain Township will provide necessary, reasonable auxiliary aids and services at the hearing to individuals with disabilities upon seven (7) days written notice to the Township Clerk at 381 8th Street, P.O. Box 146, Plainwell, Michigan 49080 or by Phone 269-685-9471 or FAX 269-685-5169.

GUN PLAIN TOWNSHIP
PLANNING COMMISSION
381 8th Street, P.O. Box 146
Plainwell, MI 49080
Phone 269-685-9471/Fax 269-685-5169

EXHIBIT 4

AMENDED SITE PLANS PER CONDITIONS OF APPROVAL

SITE DEVELOPMENT PLANS
FOR
HERON ENERGY STORAGE LLC

RIVERVIEW DR., PLAINWELL, MI 49080
SECTION 34,
GUN PLAIN CHARTER TOWNSHIP, ALLEGAN COUNTY, MICHIGAN

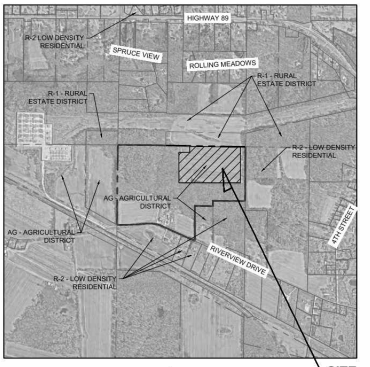
PROJECT TEAM:

CIVIL ENGINEER
KIMLEY-HORN OF MICHIGAN, INC.
Kimley»Horn of Michigan, Inc.
3000 TOWN CTR, STE. 2600
SOUTHFIELD, MI 48075
ENGINEER OF RECORD: BRIAN GAMMON, P.E.
TELEPHONE (612) 503-8532

OWNER / DEVELOPER
HERON ENERGY STORAGE LLC
CIP Copenhagen Infrastructure Partners
200 S WACKER DRIVE, STE. 1600
CHICAGO, IL 60606
CONTACT: SIMONE MARLETTI
TELEPHONE: (917) 451-0718

LANDSCAPE ARCHITECT
KIMLEY-HORN OF MICHIGAN, INC.
Kimley»Horn of Michigan, Inc.
3000 TOWN CTR, STE. 2600
SOUTHFIELD, MI 48075
CONTACT: RYAN HYLLESTED
TELEPHONE: (612) 568-0698

SURVEYOR
ROWE PROFESSIONAL SERVICES COMPANY
ROWE
507 36TH ST SE
GRAND RAPIDS, MI 49548
CONTACT: ROBERT CHURCH, P.S.
TELEPHONE: (616) 272-7125



NORTH **VICINITY N.T.S.**

Sheet List Table

Sheet Number	Sheet Title
C000	COVER SHEET
C100	GENERAL NOTES
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V101	ALTA NSPS LAND TITLE SURVEY (BY OTHERS)
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V103	ALTA NSPS LAND TITLE SURVEY (BY OTHERS)
V104	ALTA NSPS LAND TITLE SURVEY (BY OTHERS)
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C200	EXISTING CONDITIONS AND DEMOLITION PLAN
TP201	TREE INVENTORY & PRESERVATION PLAN
LP202	TREE INVENTORY
C300	EROSION AND SEDIMENT CONTROL PLAN - PHASE 1
C301	EROSION AND SEDIMENT CONTROL PLAN - PHASE 2
C310	EROSION CONTROL DETAILS
C311	EROSION CONTROL DETAILS
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C314	EROSION CONTROL DETAILS
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C800	SIGNAGE PLAN
C801	SIGNAGE PLAN
L100	LANDSCAPE PLAN
L101	LANDSCAPE DETAILS
PP100	PHOTOMETRICS PLAN

PROJECT INFORMATION

ZONING:	AG AGRICULTURAL DISTRICT
PROPOSED USE:	BATTERY ENERGY STORAGE SYSTEM
FLOODPLAIN:	ZONE X
FRONT YARD SETBACK:	50'
SIDE YARD SETBACK:	20'
REAR YARD SETBACK:	10'
NFPA 855 REMOTE LOCATION BATTERY SETBACK:	100'
NON-PARTICIPATING STRUCTURE SETBACK:	300'
MAXIMUM BUILDING HEIGHT:	20'
PROJECT AREA SIZE:	27.76 AC / 1,209,200 SQ FT
PARCEL NUMBER:	08-034-021-50

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE INSTALLATION OF A 250 MW / 1000 MWH BATTERY ENERGY STORAGE SYSTEM.
PROJECT AREA (EXCLUDING ALL EXISTING AND PROPOSED PUBLIC RIGHTS-OF-WAY): 1,057,637 (SF)

LEGAL DESCRIPTION

PARCEL (08-034-021-50):
ALL THAT PART OF NW 1/4 LYING N OF RIVER RD EX BEG AT INTERSECTION OF THE CENT LIN OF RIVER RD & N & S 1/4 LIN TH N 1323 TH W 660 TH S TO A PT 938 N OF CENT LIN OF SD RD TH W 375 TH S TO CENT LIN OF RD TH SELY ALG SD RD TO POB SEC 34 T1N T11W TAX MAP: 91.92 AC (96).

NOTES:

1. CONTRACTOR SHALL CONFIRM THAT THE EXISTING CONDITIONS FOR THE SITE MATCH WHAT IS SHOWN ON THE DRAWINGS INCLUDED PRIOR TO CONSTRUCTION.
2. IF REPRODUCED, THE SCALES SHOWN ON THESE PLANS ARE BASED ON A ANSI full bleed D (34.00 x 22.00 Inches) SHEET.
3. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICES COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICES.
4. ALL GENERAL CONTRACTOR WORK TO BE COMPLETED (EARTHWORK, FINAL UTILITIES, AND FINAL GRADING) BY THE MILESTONE DATE IN PROJECT DOCUMENTS.

MISS DIG 811

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	05/01/2026	BIG
2	ENTITLEMENT SET	04/10/2026	BIG
1	ENTITLEMENT SET	03/13/2026	BIG
	ENTITLEMENT SET	02/06/2026	BIG

Kimley»Horn of Michigan, Inc.
© 2026 KIMLEY-HORN AND ASSOCIATES, INC.
3000 TOWN CENTER, SUITE 2600
SOUTHFIELD, MI 48075
WWW.KIMLEY-HORN.COM

CIP Copenhagen Infrastructure Partners

STATE OF MICHIGAN BRIAN GAMMON 61331 REGISTERED PROFESSIONAL ENGINEER

Brian Gammon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

COVER SHEET

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
C000

K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_MI\2 Design\CAD\PlanSheets\C0-COVER SHEET.dwg July 15, 2026 - 4:22pm
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR AND SUBCONTRACTORS SHALL OBTAIN A COPY OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS OF THE LOCAL JURISDICTION AND STATE DEPARTMENT OF TRANSPORTATION AND BECOME FAMILIAR WITH THE CONTENTS PRIOR TO COMMENCING WORK. UNLESS OTHERWISE NOTED, ALL WORK SHALL CONFORM AS APPLICABLE TO THESE STANDARDS AND SPECIFICATIONS.

3. PERFORM ALL WORK IN COMPLIANCE WITH APPLICABLE TOWNSHIP REGULATIONS, STATE CODES, AND O.S.H.A. STANDARDS. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING THE NECESSARY MATERIALS & LABOR TO CONSTRUCT THE FACILITY AS SHOWN AND DESCRIBED IN THE CONSTRUCTION DOCUMENTS, AND IN ACCORDANCE WITH THE SPECIFICATIONS AND REQUIREMENTS OF THE APPROPRIATE APPROVING AUTHORITIES.

4. CONTRACTOR SHALL CLEAR AND GRUB ALL AREAS UNLESS OTHERWISE INDICATED, REMOVING TREES, STUMPS, ROOTS, MUCK, EXISTING PAVEMENT AND ALL OTHER DELETERIOUS MATERIAL.

5. THE EXISTING SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS QUALITY LEVEL "D" UNLESS OTHERWISE NOTED. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ACSE 38/02, ENTITLED STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF SUBSURFACE QUALITY DATA BY THE FHA. EXISTING UTILITIES SHOWN ARE LOCATED ACCORDING TO THE INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME OF THE TOPOGRAPHIC SURVEY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER. GUARANTEE IS NOT MADE THAT ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN OR THAT THE LOCATION OF THOSE SHOWN ARE ENTIRELY ACCURATE. FINDING THE ACTUAL LOCATION OF ANY EXISTING UTILITIES IS THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE DONE BEFORE COMMENCING ANY WORK IN THE VICINITY. FURTHERMORE, THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES, NOR FOR TEMPORARY BRACING AND SHORING OF SAME. IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.

6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE 48 HOURS MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED CONSTRUCTION PERMITS AND BONDS IF REQUIRED PRIOR TO CONSTRUCTION.

8. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES ONE COPY OF THE CONSTRUCTION DOCUMENTS INCLUDING PLANS, SPECIFICATIONS, GEOTECHNICAL REPORT AND SPECIAL CONDITIONS AND COPIES OF ANY REQUIRED CONSTRUCTION PERMITS.

9. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER AND NOTIFICATION TO THE ENGINEER.

10. ALL COPIES OF COMPACTION, CONCRETE AND OTHER REQUIRED TEST RESULTS ARE TO BE SENT TO THE OWNER DIRECTLY FROM THE TESTING AGENCY.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DOCUMENTING AND MAINTAINING AS-BUILT INFORMATION WHICH SHALL BE RECORDED AS CONSTRUCTION PROGRESSES OR AT THE COMPLETION OF APPROPRIATE CONSTRUCTION INTERVALS AND SHALL BE RESPONSIBLE FOR PROVIDING AS-BUILT DRAWINGS TO THE OWNER FOR THE PURPOSE OF CERTIFICATION TO JURISDICTIONAL AGENCIES AS REQUIRED. ALL AS-BUILT DATA SHALL BE COLLECTED BY A STATE PROFESSIONAL LAND SURVEYOR WHOSE SERVICES ARE ENGAGED BY THE CONTRACTOR.

12. ANY WELLS DISCOVERED ON SITE THAT WILL HAVE NO USE MUST BE PLUGGED BY A LICENSED WELL DRILLING CONTRACTOR IN A MANNER APPROVED BY ALL JURISDICTIONAL AGENCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY WELL ABANDONMENT PERMITS REQUIRED.

13. ANY WELL DISCOVERED DURING EARTH MOVING OR EXCAVATION SHALL BE REPORTED TO THE APPROPRIATE JURISDICTIONAL AGENCIES WITHIN 24 HOURS AFTER DISCOVERY IS MADE.

14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK THAT WOULD BE AFFECTED. FAILURE TO NOTIFY OWNER OF AN IDENTIFIABLE CONFLICT PRIOR TO PROCEEDING WITH INSTALLATION RELIEVES OWNER OF ANY OBLIGATION TO PAY FOR A RELATED CHANGE ORDER.

15. SHOULD CONTRACTOR ENCOUNTER ANY DEBRIS LADEN SOIL, STRUCTURES NOT IDENTIFIED IN THE DOCUMENTS, OR OTHER SOURCE OF POTENTIAL CONTAMINATION, THEY SHALL IMMEDIATELY CONTACT THE ENGINEER AND OWNER.

16. CONTRACTOR SHALL NOTIFY OWNER AND/OR ENGINEER 48 HOURS IN ADVANCE OF THE FOLLOWING ACTIVITIES: PRE-CONSTRUCTION MEETING, SUBGRADE PREPARATION, BASE INSTALLATION, ASPHALT INSTALLATION, UNDERGROUND PIPING AND UTILITIES INSTALLATION, INSTALLATION OF STRUCTURES, CHECK VALVES, HYDRANTS, METERS, ETC., SIDEWALK INSTALLATION, CONNECTIONS TO WATER AND SEWER MAINS, TESTS OF UTILITIES.

EROSION CONTROL NOTES

1. THE STORM WATER POLLUTION PREVENTION PLAN ("SWPPP") IS COMPRISED OF THE EROSION CONTROL PLAN, THE STANDARD DETAILS, THE PLAN NARRATIVE, ATTACHMENTS INCLUDED IN THE SPECIFICATIONS OF THE SWPPP, PLUS THE PERMIT AND ALL SUBSEQUENT REPORTS AND RELATED DOCUMENTS.

2. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH STORM WATER POLLUTION PREVENTION SHALL OBTAIN A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN AND THE STATE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT (NPDES PERMIT) AND BECOME FAMILIAR WITH THEIR CONTENTS.

3. BEST MANAGEMENT PRACTICES (BMP'S) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE, OR LOCAL REQUIREMENTS OR MANUAL OF PRACTICE, AS APPLICABLE. THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY THE PERMITTING AGENCY OR OWNER.

4. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION, AND SHALL MAINTAIN COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS FOR THE DURATION OF CONSTRUCTION.

5. THE CONTRACTOR SHALL FIELD ADJUST AND/OR PROVIDE ADDITIONAL EROSION CONTROL BMP'S AS NEEDED TO PREVENT EROSION AND OFF-SITE SEDIMENT DISCHARGE FROM THE CONSTRUCTION SITE. LOG AND RECORD ANY ADJUSTMENTS AND DEVIATIONS FROM THE APPROVED EROSION CONTROL PLANS WITHIN THE SWPPP DOCUMENTS STORED IN THE JOB SITE TRAILER.

6. BMP'S SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLAN, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION AS REQUIRED BY ALL JURISDICTIONS UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A CERTIFIED PERSON AT LEAST ONCE EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A 0.5-INCH OR GREATER RAINFALL EVENT.

7. EROSION & SEDIMENT CONTROL BMPS SHALL BE MAINTAINED IN ACCORDANCE WITH THE FOLLOWING:

7.1. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING OR DETERIORATION.

7.2. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO VERIFY THAT A HEALTHY STAND OF VEGETATION IS MAINTAINED. SEEDED AREAS SHOULD BE FERTILIZED, WATERED AND RE-SEEDED AS NEEDED. REFER TO THE LANDSCAPE PLAN AND PROJECT SPECIFICATIONS.

7.3. SILT FENCES SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCES WHEN IT REACHES ONE-THIRD THE HEIGHT OF THE SILT FENCE.

7.4. THE ROCK CONSTRUCTION ENTRANCE(S) SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC ADDITIONS OF ROCK TOP DRESSING AS CONDITIONS DEMAND.

7.5. THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE). THIS MAY REQUIRE PERIODIC ADDITIONS OF TOP DRESSING IF THE TEMPORARY PARKING CONDITIONS DEMAND.

7.6. PERFORM ALL MAINTENANCE OPERATIONS IN A TIMELY MANNER BUT IN NO CASE LATER THAN 2 CALENDAR DAYS FOLLOWING THE INSPECTION.

PAVING AND STRIPING NOTES

1. ALL PAVING, CONSTRUCTION, MATERIALS, AND WORKMANSHIP WITHIN JURISDICTION'S RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE LOCAL TOWNSHIP OR COUNTY SPECIFICATIONS AND STANDARDS, OR THE STATE DOT SPECIFICATIONS AND STANDARDS IF NOT COVERED BY LOCAL TOWNSHIP OR COUNTY REGULATIONS.

2. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D) AND TOWNSHIP STANDARDS.

3. CONTRACTOR SHALL FURNISH ALL PAVEMENT MARKINGS FOR FIRE LANES, ROADWAY LANES, PARKING STALLS, ACCESSIBLE PARKING SYMBOLS, ACCESS AISLES, STOP BARS AND SIGNS, AND MISCELLANEOUS STRIPING WITHIN THE PARKING LOT AS SHOWN ON THE PLANS.

4. ALL EXPANSION JOINTS SHALL EXTEND THROUGH THE CURB.

5. THE MINIMUM LENGTH OF OFFSET JOINTS AT RADIUS POINTS SHALL BE 2 FEET.

6. ALL JOINTS, INCLUDING EXPANSION JOINTS WITH REMOVABLE TACK STRIPS, SHALL BE SEALED WITH JOINT SEALANT.

7. THE MATERIALS AND PROPERTIES OF ALL CONCRETE SHALL MEET THE APPLICABLE REQUIREMENTS IN THE A.C.I. (AMERICAN CONCRETE INSTITUTE) MANUAL OF CONCRETE PRACTICE.

8. CONTRACTOR SHALL APPLY A SECOND COATING OVER ALL PAVEMENT MARKINGS PRIOR TO ACCEPTANCE BY OWNER FOLLOWED BY A COAT OF GLASS BEADS AS APPLICABLE PER THE PROJECT DOCUMENTS.

9. ANY EXISTING PAVEMENT, CURBS AND/OR SIDEWALKS DAMAGED OR REMOVED WILL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE TO THE SATISFACTION OF THE ENGINEER AND OWNER.

10. BEFORE PLACING PAVEMENT, CONTRACTOR SHALL VERIFY SUITABLE ACCESSIBLE ROUTES (PER A.D.A) GRADING FOR ALL SIDEWALKS AND ACCESSIBLE ROUTES INCLUDING CROSSING DRIVEWAYS SHALL CONFORM TO CURRENT ADA STATE/NATIONAL STANDARDS. IN NO CASE SHALL ACCESSIBLE RAMP SLOPES EXCEED 1 VERTICAL TO 12 HORIZONTAL. IN NO CASE SHALL SIDEWALK CROSS SLOPES EXCEED 2%. IN NO CASE SHALL LONGITUDINAL SIDEWALK SLOPES EXCEED 5%. IN NO CASE SHALL ACCESSIBLE PARKING STALLS OR AISLES EXCEED 2% (1.5% TARGET) IN ALL DIRECTIONS. SIDEWALK ACCESS TO EXTERNAL BUILDING DOORS AND GATES SHALL BE ADA COMPLIANT. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY IF ADA CRITERIA CANNOT BE MET IN ANY LOCATION PRIOR TO PAVING. NO CONTRACTOR CHANGE ORDERS WILL BE ACCEPTED FOR A.D.A COMPLIANCE ISSUES.

11. MAXIMUM JOINT SPACING IS TWICE THE DEPTH OF THE CONCRETE PAVEMENT IN FEET.

GRADING AND DRAINAGE NOTES

1. GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE START OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.

2. THE CONTRACTOR SHALL GRADE THE SITE TO THE ELEVATIONS INDICATED AND SHALL ADJUST BMP'S AS NECESSARY AND REGRADE WASHOUTS WHERE THEY OCCUR AFTER EVERY RAINFALL UNTIL A GRASS STAND IS WELL ESTABLISHED OR ADEQUATE STABILIZATION OCCURS.

3. CONTRACTOR SHALL ENSURE THERE IS POSITIVE DRAINAGE FROM THE PROPOSED BUILDINGS SO THAT SURFACE RUNOFF WILL DRAIN BY GRAVITY TO NEW OR EXISTING DRAINAGE OUTLETS. CONTRACTOR SHALL ENSURE NO PONDING OCCURS IN PAVED AREAS AND SHALL NOTIFY ENGINEER IF ANY GRADING DISCREPANCIES ARE FOUND IN THE EXISTING AND PROPOSED GRADES PRIOR TO PLACEMENT OF PAVEMENT OR UTILITIES.

4. CONTRACTOR SHALL PROTECT ALL MANHOLE COVERS, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, POWER POLES, GUY WIRES, AND TELEPHONE BOXES THAT ARE TO REMAIN IN PLACE AND UNDISTURBED DURING CONSTRUCTION. EXISTING CASTINGS AND STRUCTURES TO REMAIN SHALL BE ADJUSTED TO MATCH THE PROPOSED FINISHED GRADES.

5. BACKFILL FOR UTILITY LINES SHALL BE PLACED PER DETAILS, STANDARDS, AND SPECIFICATIONS SO THAT THE UTILITY WILL BE STABLE. WHERE UTILITY LINES CROSS THE PARKING LOT, THE TOP 6 INCHES SHALL BE COMPACTED SIMILARLY TO THE REMAINDER OF THE LOT. UTILITY DITCHES SHALL BE VISUALLY INSPECTED DURING THE EXCAVATION PROCESS TO ENSURE THAT UNDESIRABLE FILL IS NOT USED.

6. CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF 4" OF TOPSOIL AT COMPLETION OF WORK. ALL UNPAVED AREAS IN EXISTING RIGHTS-OF-WAY DISTURBED BY CONSTRUCTION SHALL BE REGRADED AND SODDED.

7. AFTER PLACEMENT OF SUBGRADE AND PRIOR TO PLACEMENT OF PAVEMENT, CONTRACTOR SHALL TEST AND OBSERVE PAVEMENT AREAS FOR EVIDENCE OF PONDING. ALL AREAS SHALL ADEQUATELY DRAIN TOWARDS THE INTENDED STRUCTURE TO CONVEY STORM RUNOFF. CONTRACTOR SHALL IMMEDIATELY NOTIFY OWNER AND ENGINEER IF ANY DISCREPANCIES ARE DISCOVERED.

8. WHERE EXISTING PAVEMENT IS INDICATED TO BE REMOVED AND REPLACED, THE CONTRACTOR SHALL SAW CUT FULL DEPTH FOR A SMOOTH AND STRAIGHT JOINT AND REPLACE THE PAVEMENT WITH THE SAME TYPE AND DEPTH OF MATERIAL AS EXISTING OR AS INDICATED.

9. THE CONTRACTOR SHALL INSTALL PROTECTION OVER ALL DRAINAGE STRUCTURES FOR THE DURATION OF CONSTRUCTION AND UNTIL ACCEPTANCE OF THE PROJECT BY THE OWNER. ALL DRAINAGE STRUCTURES SHALL BE CLEANED OF DEBRIS AS REQUIRED DURING AND AT THE END OF CONSTRUCTION TO PROVIDE POSITIVE DRAINAGE FLOWS.

10. IF DEWATERING IS REQUIRED, THE CONTRACTOR SHALL OBTAIN ANY APPLICABLE REQUIRED PERMITS. THE CONTRACTOR IS TO COORDINATE WITH THE OWNER AND THE DESIGN ENGINEER PRIOR TO ANY EXCAVATION.

11. FIELD DENSITY TESTS SHALL BE TAKEN AT INTERVALS IN ACCORDANCE WITH THE LOCAL JURISDICTIONAL AGENCY OR TO STATE DOT STANDARDS. IN THE EVENT THAT THE CONTRACT DOCUMENTS AND THE JURISDICTIONAL AGENCY REQUIREMENTS ARE NOT IN AGREEMENT, THE MOST STRINGENT SHALL GOVERN.

12. ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED AS PER PLANS. THE AREAS SHALL THEN BE SODDED OR SEEDED AS SPECIFIED IN THE PLANS, FERTILIZED, MULCHED, WATERED AND MAINTAINED UNTIL GROWTH IS ESTABLISHED TO MINIMUM COVERAGE OF 70% IN ALL AREAS. ANY AREAS DISTURBED FOR ANY REASON PRIOR TO FINAL ACCEPTANCE OF THE JOB SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. ALL EARTHEN AREAS WILL BE SODDED OR SEEDED AND MULCHED AS SHOWN ON THE LANDSCAPING PLAN.

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF DUST AND DIRT RISING AND SCATTERING IN THE AIR DURING CONSTRUCTION AND SHALL PROVIDE WATER SPRINKLING OR OTHER SUITABLE METHODS OF CONTROL. THE CONTRACTOR SHALL COMPLY WITH ALL GOVERNING REGULATIONS PERTAINING TO ENVIRONMENTAL PROTECTION.

14. SOD, WHERE CALLED FOR, MUST BE INSTALLED AND MAINTAINED ON EXPOSED SLOPES WITHIN 48 HOURS OF COMPLETING FINAL GRADING, AND AT ANY OTHER TIME AS NECESSARY, TO PREVENT EROSION, SEDIMENTATION OR TURBID DISCHARGES.

15. THE CONTRACTOR SHALL ENSURE THAT LANDSCAPE ISLAND PLANTING AREAS AND OTHER PLANTING AREAS ARE NOT COMPACTED AND DO NOT CONTAIN ROAD BASE MATERIALS. THE CONTRACTOR SHALL ALSO EXCAVATE AND REMOVE ALL UNDESIRABLE MATERIAL FROM ALL AREAS ON THE SITE TO BE PLANTED AND PROPERLY DISPOSED OF IN A LEGAL MANNER.

16. THE CONTRACTOR SHALL INSTALL ALL UNDERGROUND STORM WATER PIPING PER MANUFACTURER'S RECOMMENDATIONS AND STATE DOT SPECIFICATIONS.

17. PAVEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATION OF THE SITE SPECIFIC GEOTECHNICAL EVALUATION REPORT AND TOWNSHIP & STATE DOT SPECIFICATIONS.

18. SPOT ELEVATIONS REPRESENT THE FINISHED SURFACE GRADE OR FLOWLINE OF CURB UNLESS OTHERWISE NOTED.

19. LIMITS OF CONSTRUCTION ARE TO THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED ON THE PLAN.

20. IMMEDIATELY REPORT TO THE OWNER ANY DISCREPANCIES FOUND BETWEEN ACTUAL FIELD CONDITIONS AND CONSTRUCTION DOCUMENTS.

21. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING EXISTING UTILITIES, AND SHALL REPAIR ALL DAMAGE TO EXISTING UTILITIES THAT OCCUR DURING CONSTRUCTION WITHOUT COMPENSATION.

22. BLEND NEW EARTHWORK SMOOTHLY TO TRANSITION BACK TO EXISTING GRADE.

23. ALL PROPOSED GRADES ONSITE SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE INDICATED ON THE PLANS. ANY SLOPES STEEPER THAN 4:1 REQUIRE EROSION AND SEDIMENT CONTROL BLANKET.

24. ADHERE TO ALL TERMS AND CONDITIONS AS NECESSARY IN THE GENERAL N.P.D.E.S. PERMIT AND STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES.

25. ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.

WATER STORM SEWER & SANITARY SEWER NOTES

1. THE CONTRACTOR SHALL CONSTRUCT GRAVITY SEWER LATERALS, MANHOLES, GRAVITY SEWER LINES, AND DOMESTIC WATER AND FIRE PROTECTION SYSTEM AS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL FURNISH ALL NECESSARY MATERIALS, EQUIPMENT, MACHINERY, TOOLS, MEANS OF TRANSPORTATION AND LABOR NECESSARY TO COMPLETE THE WORK IN FULL AND COMPLETE ACCORDANCE WITH THE SHOWN, DESCRIBED AND REASONABLY INTENDED REQUIREMENTS OF THE CONTRACT DOCUMENTS AND JURISDICTIONAL AGENCY REQUIREMENTS. IN THE EVENT THAT THE CONTRACT DOCUMENTS AND THE JURISDICTIONAL AGENCY REQUIREMENTS ARE NOT IN AGREEMENT, THE MOST STRINGENT SHALL GOVERN.

2. ALL EXISTING UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS FOR UTILITY LOCATION AND COORDINATION IN ACCORDANCE WITH THE NOTES CONTAINED IN THE GENERAL CONSTRUCTION SECTION OF THIS SHEET.

3. THE CONTRACTOR SHALL RESTORE ALL DISTURBED VEGETATION IN KIND, UNLESS SHOWN OTHERWISE.

4. DEFLECTION OF PIPE JOINTS AND CURVATURE OF PIPE SHALL NOT EXCEED THE MANUFACTURER'S SPECIFICATIONS. SECURELY CLOSE ALL OPEN ENDS OF PIPE AND FITTINGS WITH A WATERTIGHT PLUG WHEN WORK IS NOT IN PROGRESS. THE INTERIOR OF ALL PIPES SHALL BE CLEAN AND JOINT SURFACES WIPED CLEAN AND DRY AFTER THE PIPE HAS BEEN LOWERED INTO THE TRENCH. VALVES SHALL BE PLUMB AND LOCATED ACCORDING TO THE PLANS.

5. ALL PIPE AND FITTINGS SHALL BE CAREFULLY STORED FOLLOWING MANUFACTURER'S RECOMMENDATIONS. CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE COATING OR LINING IN ANY D.I. PIPE FITTINGS. ANY PIPE OR FITTING WHICH IS DAMAGED OR WHICH HAS FLAWS OR IMPERFECTIONS WHICH, IN THE OPINION OF THE ENGINEER OR OWNER, RENDERS IT UNFIT FOR USE, SHALL NOT BE USED. ANY PIPE NOT SATISFACTORY FOR USE SHALL BE CLEARLY MARKED AND IMMEDIATELY REMOVED FROM THE JOB SITE, AND SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

6. WATER FOR FIRE FIGHTING SHALL BE MADE AVAILABLE FOR USE BY THE CONTRACTOR PRIOR TO COMBUSTIBLES BEING BROUGHT ON SITE.

7. ALL UTILITY AND STORM DRAIN TRENCHES LOCATED UNDER AREAS TO RECEIVE PAVING SHALL BE COMPLETELY BACK FILLED IN ACCORDANCE WITH THE GOVERNING JURISDICTIONAL AGENCY'S SPECIFICATIONS. IN THE EVENT THAT THE CONTRACT DOCUMENTS AND THE JURISDICTIONAL AGENCY REQUIREMENTS ARE NOT IN AGREEMENT, THE MOST STRINGENT SHALL GOVERN.

8. UNDERGROUND UTILITY LINES SHALL BE SURVEYED BY A STATE LICENSED PROFESSIONAL LAND SURVEYOR PRIOR TO BACK FILLING.

9. CONTRACTOR SHALL PERFORM, AT THEIR OWN EXPENSE, ANY AND ALL TESTS REQUIRED BY THE SPECIFICATIONS AND/OR ANY AGENCY HAVING JURISDICTION. THESE TESTS MAY INCLUDE, BUT MAY NOT BE LIMITED TO, INFILTRATION AND EXFILTRATION, TELEVISION INSPECTION AND A MANDREL TEST ON GRAVITY SEWER. A COPY OF THE TEST RESULTS SHALL BE PROVIDED TO THE UTILITY PROVIDER, OWNER AND JURISDICTIONAL AGENCY AS REQUIRED.

10. BETWEEN WATER AND SEWER MANHOLES AND PIPES, CONTRACTOR SHALL PROVIDE FOR A MINIMUM HORIZONTAL CLEARANCE OF 10-FEET AND A MINIMUM VERTICAL SEPARATION OF 18-INCHES.

11. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.

12. ALL STORM PIPE ENTERING STRUCTURES SHALL BE GASKETED AND/OR GROUTED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT UNLESS OTHERWISE STATED BY TOWNSHIP AND STATE DESIGN STANDARDS AND SPECIFICATIONS.

13. UNLESS OTHERWISE STATED IN TOWNSHIP AND STATE DESIGN STANDARDS AND SPECIFICATIONS, ALL STORM SEWER MANHOLES IN PAVED AREAS SHALL BE FLUSH WITH PAVEMENT, AND SHALL HAVE TRAFFIC BEARING RING & COVERS. MANHOLES IN UNPAVED AREAS SHALL BE 9" ABOVE FINISH GRADE. LIDS SHALL BE LABELED "STORM SEWER". EXISTING CASTINGS AND STRUCTURES WITHIN PROJECT LIMITS SHALL BE ADJUSTED TO MEET THESE CONDITIONS AND THE PROPOSED FINISHED GRADE.

14. TOPOGRAPHIC INFORMATION IS TAKEN FROM A TOPOGRAPHIC SURVEY BY LAND SURVEYORS. IF THE CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, THEN THE CONTRACTOR SHALL SUPPLY, AT THEIR EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR TO THE OWNER FOR REVIEW.

15. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.

16. ALL STORM STRUCTURES SHALL HAVE A SMOOTH UNIFORM POURED MORTAR FROM INVERT IN TO INVERT OUT.

17. ROOF DRAINS SHALL BE CONNECTED TO STORM SEWER BY PREFABRICATED WYES OR AT STORM STRUCTURES. ROOF DRAINS AND TRUCK WELL DRAIN SHALL RUN AT A MINIMUM 2.0% SLOPE, UNLESS NOTED OTHERWISE, AND TIE IN AT THE CENTERLINE OF THE STORM MAIN.

18. PROVIDE INSULATION OF UNDERGROUND ROOF DRAINS AND SANITARY SEWER SERVICES IF ADEQUATE FROST DEPTH CANNOT BE PROVIDED.

19. THE CONTRACTOR SHALL PROTECT EXISTING UNDERGROUND UTILITIES AND APPURTENANCES THAT ARE TO REMAIN FROM DAMAGE DURING CONSTRUCTION OPERATIONS.

20. THE LOCATION OF EXISTING UTILITIES, STORM DRAINAGE STRUCTURES AND OTHER ABOVE AND BELOW-GRADE IMPROVEMENTS ARE APPROXIMATE AS SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION, SIZE AND INVERT ELEVATIONS OF EACH PRIOR TO THE START OF CONSTRUCTION.

21. A MINIMUM SEPARATION OF 5-FEET IS REQUIRED BETWEEN UNDERGROUND UTILITIES AND TREES UNLESS A ROOT BARRIER IS UTILIZED.

22. GAS, PHONE AND ELECTRIC SERVICES SHOWN FOR INFORMATIONAL PURPOSES ONLY. DRY UTILITY COMPANIES MAY ALTER THE DESIGN LAYOUT DURING THEIR REVIEW. CONTRACTOR TO COORDINATE FINAL DESIGN AND INSTALLATION WITH UTILITY COMPANIES.

23. COORDINATE UTILITY INSTALLATION WITH IRRIGATION DESIGN AND INSTALLATION.

24. ALL DIMENSIONS ARE TO FLOW LINE OF CURB UNLESS OTHERWISE NOTED. PERIMETER WALL DIMENSIONS ARE TO INSIDE WALL FACE. REFERENCE ARCHITECTURAL PLANS FOR EXACT WALL WIDTH AND SPECIFICATIONS.

25. REFERENCE ARCHITECTURAL PLANS (BY OTHERS) FOR EXACT BUILDING DIMENSIONS, MATERIALS SPECIFICATIONS.

26. REFERENCE M.E.P. PLANS (BY OTHERS) FOR MECHANICAL EQUIPMENT DIMENSIONS AND SPECIFICATIONS.

27. CONTRACTOR SHALL REFERENCE STRUCTURAL PLANS (BY OTHERS) FOR FOOTING AND FOUNDATION PAD PREPARATION SPECIFICATIONS.

28. CONTRACTOR SHALL REFERENCE M.E.P. PLANS (BY OTHERS) FOR ROUTING OF PROPOSED ELECTRICAL & COMMUNICATIONS SERVICES AND SITE LIGHTING LAYOUT.

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	05/01/2026	BIG
2	ENTITLEMENT SET	04/10/2026	BIG
1	ENTITLEMENT SET	03/06/2026	BIG
	ENTITLEMENT SET	02/06/2026	BIG

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KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

GENERAL NOTES

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP, MICHIGAN

SHEET NUMBER
C100

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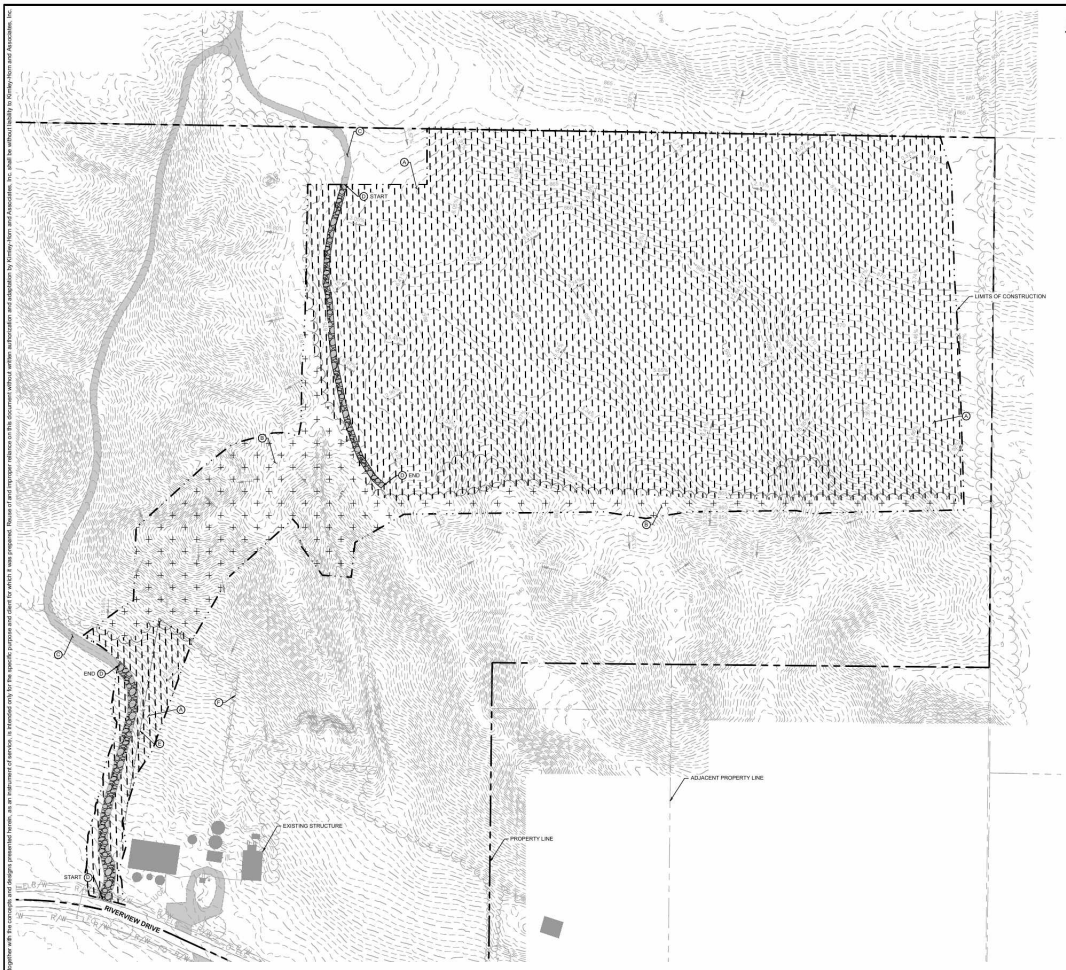
START
END
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LIMITS OF CONSTRUCTION
ADJACENT PROPERTY LINE
PROPERTY LINE
EXISTING STRUCTURE
RIVERVIEW DRIVE
R/W
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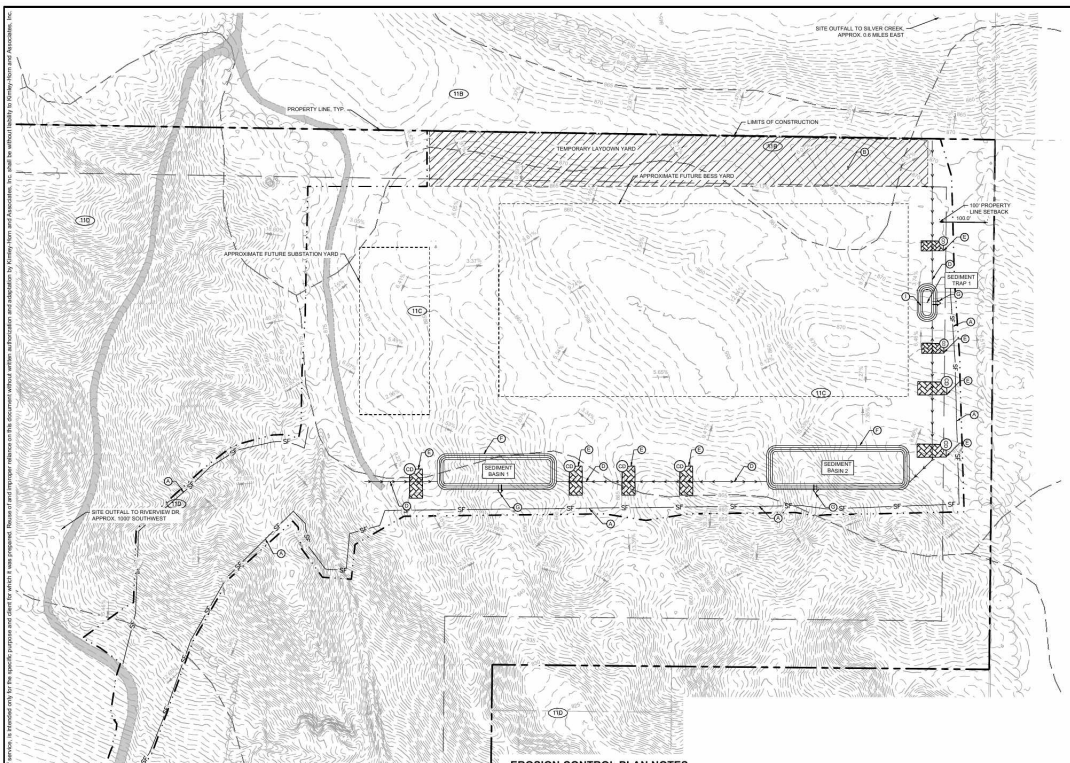
R/W



KEYNOTE LEGEND

- (A) SILT FENCE
- (B) TEMPORARY LAYDOWN AREA
- (C) ROCK CONSTRUCTION ENTRANCE
- (D) DRAINAGE DITCH
- (E) ROCK CHECK DAMS
- (F) TEMPORARY SEDIMENT BASIN
- (G) TEMPORARY SEDIMENT BASIN OUTFALL
- (H) SILT FENCE ROCK OUTLET
- (I) TEMPORARY SEDIMENT TRAP

LEGEND

	MDTMB SESC KEYING SYSTEM NO.
STABILIZED CONSTRUCTION ENTRANCE	S53
TEMPORARY LAYDOWN AREA	
SILT FENCE	S51
DIVERSION DITCH	ES37
LIMITS OF DISTURBANCE	
TEMPORARY SAFETY FENCE	
PROPERTY LINE	
PARCEL LINE	
PROPERTY LINE SETBACK	
RESIDENTIAL BUILDING SETBACK	
SOIL BOUNDARY	
PROPOSED BESS AND SUBSTATION YARD FOOTPRINT	
ROCK CHECK DAM	ES31

SWPPP UPDATES & AMENDMENTS

THE CONTRACTOR MUST UPDATE THE SWPPP BY NOTING ON THE SITE MAPS IN THE JOB SITE BINDER TO REFLECT THE PROGRESS OF CONSTRUCTION ACTIVITIES AND GENERAL CHANGES TO THE PROJECT SITE FOR THE DURATION OF LAND DISTURBING ACTIVITIES. AT A MINIMUM, UPDATES SHALL BE MADE DAILY TO TRACK CONSTRUCTION PROGRESS DESCRIBED IN THE SEQUENCE OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR NOTING THE LOCATION OF THE JOB SITE TRAILER, TEMPORARY PARKING & LAYDOWN AREAS, PORTA-POTTY, WHEEL WASH, CONCRETE WASHOUT, FUEL & MATERIAL STORAGE, SOLID WASTE CONTAINERS, AND OTHER CONSTRUCTION RELATED FACILITIES THAT MAY IMPACT STORMWATER RUNOFF.

PHASE 1 SEQUENCE OF CONSTRUCTION

1. INSTALL PERIMETER EROSION CONTROL (I.E. SILT FENCE) AND INLET PROTECTION AT EXISTING STORMWATER INLETS.
2. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT
3. PREPARE TEMPORARY PARKING AND STORAGE AREA.
4. CONSTRUCT AND STABILIZE DIVERSIONS AND TEMPORARY SEDIMENT BASINS.
5. CLEAR AND GRUB THE SITE.
6. BEGIN MASS SITE GRADING AND ROUGH GRADE SITE SUFFICIENTLY TO ESTABLISH PROPOSED DRAINAGE PATTERNS.
7. START CONSTRUCTION OF THE BUILDING PAD AND STRUCTURES.
8. TEMPORARILY SEED, THROUGHOUT CONSTRUCTION, DISTURBED AREAS THAT WILL BE INACTIVE FOR 7 DAYS OR MORE OR AS REQUIRED BY THE NPDES AND/OR TOWNSHIP GRADING PERMIT(S).

NOTE: THE SEQUENCE OF CONSTRUCTION IS INTENDED TO CONVEY THE GENERAL CONCEPTS OF THE EROSION CONTROL DESIGN AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETAILED PHASING AND CONSTRUCTION SEQUENCING NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING IMMEDIATELY, PRIOR TO AND/OR DURING CONSTRUCTION IF ANY ADDITIONAL INFORMATION ON THE CONSTRUCTION SEQUENCE IS NECESSARY.

SOILS LEGEND	
OSHTEMO-CHELSEA COMPLEX, 0 TO 6 PERCENT SLOPS	11B
OSHTEMO-CHELSEA COMPLEX, 6 TO 12 PERCENT SLOPS	11C
OSHTEMO-CHELSEA COMPLEX, 6 TO 12 PERCENT SLOPS	11D
OSHTEMO-CHELSEA COMPLEX, 18 TO 35 PERCENT SLOPS	11E

PHASE I BMP QUANTITIES

SILT FENCE	± 3,163 LF
ROCK CONSTRUCTION ENTRANCE	1 EA.
DIVERSION DITCH	± 1,247 LF
ROCK CHECK DAM	8 EA.
SILT FENCE ROCK OUTLET	5 EA.

SEDIMENT BASIN/TRAP SIZING TABLE

	DRAINAGE AREA (AC)	TOTAL REQUIRED VOLUME (CF)	MIN. DEPTH (FT)	MIN. BOTTOM LENGTH (FT)	MIN. BOTTOM WIDTH (FT)
BASIN 1	8.58	± 30,888	3.00	224	51
BASIN 2	13.74	± 49,483	3.00	272	68
TRAP 1	1.48	± 2,672	3.00	54	18

EROSION CONTROL PLAN NOTES

1. THE STORM WATER POLLUTION PREVENTION PLAN ("SWPPP") IS COMPRISED OF THE EROSION CONTROL PLAN, THE STANDARD DETAILS, THE PLAN NARRATIVE, ATTACHMENTS INCLUDED IN THE SPECIFICATIONS OF THE SWPPP, PLUS THE PERMIT AND ALL SUBSEQUENT REPORTS AND RELATED DOCUMENTS.
2. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH LAND DISTURBING ACTIVITIES SHALL OBTAIN A COPY OF THE SWPPP AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT, AND BECOME FAMILIAR WITH THEIR CONTENTS.
3. BEST MANAGEMENT PRACTICES (BMP'S) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE AND LOCAL REQUIREMENTS, AS APPLICABLE. THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY THE PERMITTING AGENCY, ENGINEER OR OWNER.
4. SITE ENTRY AND EXIT LOCATIONS SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT THE TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO A PUBLIC ROADWAY FROM THE CONSTRUCTION SITE MUST BE REMOVED AS SOON AS PRACTICABLE. IF SEDIMENT IS TRACKED ONTO A PUBLIC ROADWAY PRIOR TO ENTRANCE ONTO A PUBLIC ROADWAY, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN. ANY FINES IMPOSED FOR DISCHARGING SEDIMENT ONTO A PUBLIC RIGHT OF WAY SHALL BE PAID BY THE CONTRACTOR.
5. TEMPORARY SEEDING OR OTHER APPROVED METHODS OF STABILIZATION SHALL BE INITIATED WITHIN 7 DAYS OF THE LAST DISTURBANCE ON ANY AREA OF THE SITE.
6. THE CONTRACTOR SHALL MINIMIZE LAND DISTURBANCE AND CLEARING TO THE MAXIMUM EXTENT PRACTICAL OR AS REQUIRED BY THE GENERAL PERMIT.
7. CONTRACTOR SHALL DENOTE ON THE PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.
8. ALL WASH WATER FROM THE CONSTRUCTION SITE (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) SHALL BE DETAINED AND PROPERLY TREATED BEFORE DISPOSAL.
9. SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL ON SITE. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
11. RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DEPOSITED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE PREMISES THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.
12. STAGING AREAS, STOCKPILES, SPOILS, ETC. SHALL BE LOCATED OUTSIDE OF DRAINAGE WAYS SUCH THAT STORM WATER RUNOFF WILL NOT BE ADVERSELY AFFECTED. PROVIDE STABILIZATION MEASURES SUCH AS PERIMETER EROSION CONTROL BMP'S, SEEDING, OR OTHER COVERING AS NECESSARY TO PREVENT EROSION.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING ANY EROSION CONTROL BMP DISTURBED DURING CONSTRUCTION OPERATIONS. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DEFICIENCIES IN THE ESTABLISHED EROSION CONTROL MEASURES THAT MAY LEAD TO UNAUTHORIZED DISCHARGE OF STORM WATER POLLUTANTS. UNAUTHORIZED POLLUTANTS INCLUDE (BUT ARE NOT LIMITED TO) EXCESS CONCRETE DUMPING, CONCRETE RESIDUE, PAINTS, SOLVENTS, GREASES, FUELS, LUBRICANT OILS, PESTICIDES, AND SOLID WASTE MATERIALS.
14. EROSION CONTROL BMP'S SHOWN ON THESE PLANS SHALL BE INSTALLED PRIOR TO THE START OF LAND-DISTURBING ACTIVITIES ON THE PROJECT, AND INITIATED AS SOON AS PRACTICABLE.
15. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION, AND SHALL MAINTAIN COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS FOR THE DURATION OF CONSTRUCTION.
16. THE CONTRACTOR SHALL FIELD ADJUST AND/OR PROVIDE ADDITIONAL EROSION CONTROL BMP'S AS NEEDED TO PREVENT EROSION AND OFF-SITE SEDIMENT DISCHARGE FROM THE CONSTRUCTION SITE. LOG AND RECORD ANY ADJUSTMENTS AND DEVIATIONS FROM THE APPROVED EROSION CONTROL PLANS WITHIN THE SWPPP DOCUMENTS STORED IN THE JOB SITE TRAILER.

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BY GARNON
2026.03.26 15:45:21 -04'00'
REGISTERED
Brian Garnon

KHA PROJECT 191250003
DATE 03/26/2026
SCALE: AS SHOWN
DESIGNED BY: JLL
DRAWN BY: CAS
CHECKED BY: BPG

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EROSION AND SEDIMENT CONTROL PLAN - PHASE 1

HERON ENERGY STORAGE LLC

PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP, MICHIGAN

SHEET NUMBER
C300

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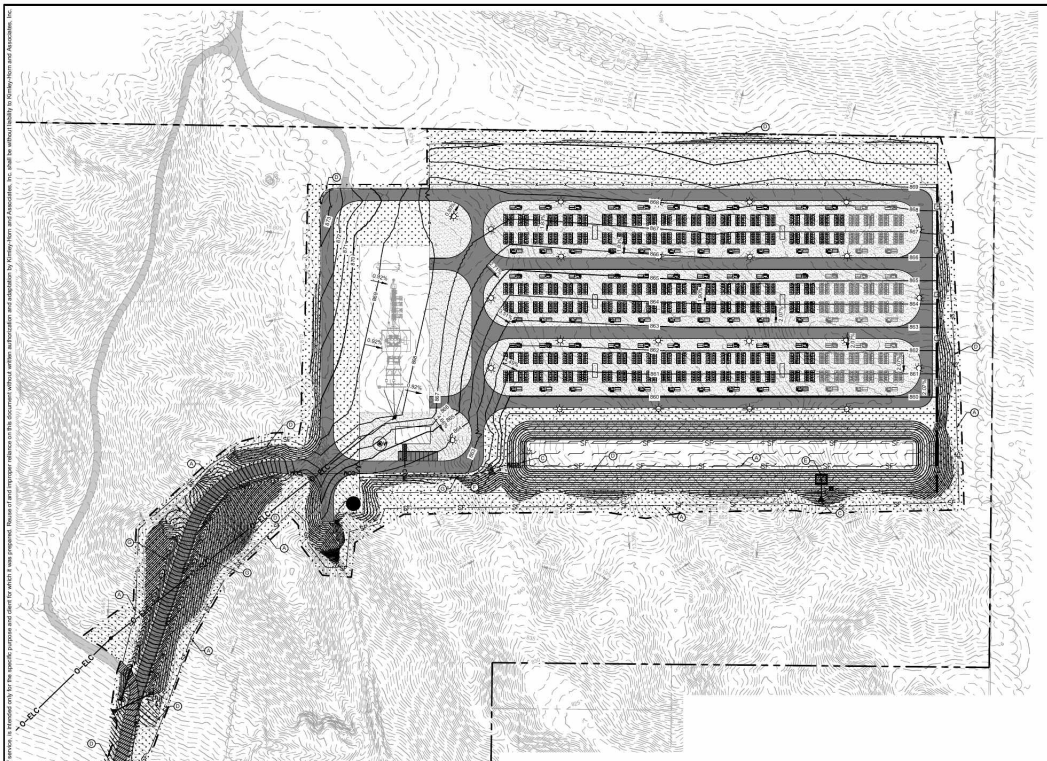

PHASE II BMP QUANTITIES	
SILT FENCE	± 4,848 LF
ROCK CONSTRUCTION ENTRANCE	1 EA
INLET PROTECTION	1 EA
ROCK CHECK DAM	1 EA
DIVERSION DITCH	± 280 LF

KEYNOTE LEGEND

- (A) SILT FENCE
- (B) ROCK CONSTRUCTION ENTRANCE
- (C) RIPRAP
- (D) EROSION CONTROL BLANKET
- (E) INLET PROTECTION
- (F) ROCK CHECK DAM
- (G) DIVERSION DITCH

LEGEND

MDTMB SESC KEYING SYSTEM NO.

- STABILIZED CONSTRUCTION ENTRANCE — SS3
- EROSION CONTROL BLANKET — E9
- POND
- VEGETATION
- RIPRAP — E12
- SF — SILT FENCE — S51
- LIMITS OF DISTURBANCE
- SAFETY FENCE
- INLET PROTECTION — S58
- ROCK CHECK DAM — ES31
- DIVERSION DITCH — ES37
- SOUND WALL

SWPPP UPDATES & AMENDMENTS

THE CONTRACTOR MUST UPDATE THE SWPPP BY NOTING ON THE SITE MAPS IN THE JOB SITE BINDER TO REFLECT THE PROGRESS OF CONSTRUCTION ACTIVITIES AND GENERAL CHANGES TO THE PROJECT SITE FOR THE DURATION OF LAND DISTURBING ACTIVITIES. AT A MINIMUM, UPDATES SHALL BE MADE DAILY TO TRACK CONSTRUCTION PROGRESS DESCRIBED IN THE SEQUENCE OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR NOTING THE LOCATION OF THE JOB SITE TRAILER, TEMPORARY PARKING & LAYDOWN AREAS, PORTA-POTTY, WHEEL WASH, CONCRETE WASHOUT, FUEL & MATERIAL STORAGE, SOLID WASTE CONTAINERS, AND OTHER CONSTRUCTION RELATED FACILITIES THAT MAY IMPACT STORMWATER RUNOFF.

PHASE 2 SEQUENCE OF CONSTRUCTION

1. TEMPORARILY SEED, THROUGHOUT CONSTRUCTION, DENUDED AREAS THAT WILL BE INACTIVE FOR 7 DAYS OR MORE.
2. CONSTRUCT UNDERGROUND SITE UTILITIES AND STORM SEWER, INCLUDING: UNDERGROUND STORMWATER MANAGEMENT SYSTEM.
3. INSTALL APPROPRIATE INLET PROTECTION AT ANY NEW STORM SEWER STRUCTURES AS EACH STRUCTURE IS CONSTRUCTED.
4. COMPLETE SITE GRADING AND PERMANENTLY STABILIZE AREAS TO BE VEGETATED AS THEY ARE BROUGHT TO FINAL GRADE.
5. PLACE PAVEMENT BASE MATERIAL AND INSTALL SUBDRAINAGE SYSTEM.
6. CONSTRUCT PAVEMENTS, CURB & GUTTER, AND SIDEWALKS.
7. AS APPROPRIATE, REPLACE & MAINTAIN INLET PROTECTION DEVICES WITHIN PAVED AREAS AS WORK PROGRESSES.
8. COMPLETE FINAL GRADING AND INSTALL OF PERMANENT STABILIZATION (SEEDING, SODDING, ETC.) WITHIN LANDSCAPED AREAS.
9. WHEN THE SITE HAS ACHIEVED FINAL STABILIZATION AS DEFINED BY THE APPLICABLE EROSION CONTROL PERMITS, REMOVE ALL REMAINING TEMPORARY EROSION & SEDIMENT CONTROL BMP'S AND RE-STABILIZE ANY AREAS DISTURBED BY THE REMOVAL.

NOTE: THE SEQUENCE OF CONSTRUCTION IS INTENDED TO CONVEY THE GENERAL CONCEPTS OF THE EROSION CONTROL DESIGN AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETAILED PHASING AND CONSTRUCTION SEQUENCING NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING IMMEDIATELY, PRIOR TO ANDERS, DURING CONSTRUCTION IF ANY ADDITIONAL INFORMATION ON THE CONSTRUCTION SEQUENCE IS NECESSARY.

EROSION CONTROL PLAN NOTES

1. THE STORM WATER POLLUTION PREVENTION PLAN ("SWPPP") IS COMPRISED OF THE EROSION CONTROL PLAN, THE STANDARD DETAILS, THE PLAN NARRATIVE, ATTACHMENTS INCLUDED IN THE SPECIFICATIONS OF THE SWPPP, PLUS THE PERMIT AND ALL SUBSEQUENT REPORTS AND RELATED DOCUMENTS.
2. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH LAND DISTURBING ACTIVITIES SHALL OBTAIN A COPY OF THE SWPPP AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT, AND BECOME FAMILIAR WITH THEIR CONTENTS.
3. BEST MANAGEMENT PRACTICES (BMPS) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE AND LOCAL REQUIREMENTS, AS APPLICABLE. THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY THE PERMITTING AGENCY, ENGINEER OR OWNER.
4. SITE ENTRY AND EXIT LOCATIONS SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT THE TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO A PUBLIC ROADWAY FROM THE CONSTRUCTION SITE MUST BE REMOVED AS SOON AS PRACTICABLE. WHEN WASHING IS REQUIRED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO A PUBLIC ROADWAY, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN. ANY FINES IMPOSED FOR DISCHARGING SEDIMENT ONTO A PUBLIC RIGHT OF WAY SHALL BE PAID BY THE CONTRACTOR.
5. TEMPORARY SEEDING OR OTHER APPROVED METHODS OF STABILIZATION SHALL BE INITIATED WITHIN 7 DAYS OF THE LAST DISTURBANCE ON ANY AREA OF THE SITE.
6. THE CONTRACTOR SHALL MINIMIZE LAND DISTURBANCE AND CLEARING TO THE MAXIMUM EXTENT PRACTICAL OR AS REQUIRED BY THE GENERAL PERMIT.
7. CONTRACTOR SHALL DENOTE ON THE PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.
8. ALL WASH WATER FROM THE CONSTRUCTION SITE (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) SHALL BE DETAINED AND PROPERLY TREATED BEFORE DISPOSAL.
9. SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL ON SITE. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
11. RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DEPOSITED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE PREMISES THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.
12. STAGING AREAS, STOCKPILES, SPOILS, ETC. SHALL BE LOCATED OUTSIDE OF DRAINAGE WAYS SUCH THAT STORM WATER RUNOFF WILL NOT BE ADVERSELY AFFECTED. PROVIDE STABILIZATION MEASURES SUCH AS PERIMETER EROSION CONTROL BMP'S, SEEDING, OR OTHER COVERING AS NECESSARY TO PREVENT EROSION.
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REVISIONS

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STATE OF MICHIGAN
BRIAN GANNON
BIG-GANNON
REGISTERED PROFESSIONAL ENGINEER

Brian Gannon

KHA PROJECT 191250003
DATE 02/26/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

EROSION AND SEDIMENT CONTROL PLAN - PHASE 2

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP, MICHIGAN

SHEET NUMBER
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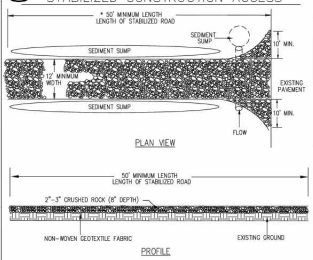
S53 STABILIZED CONSTRUCTION ACCESS



NOTES:
1. Establish stabilized construction entrance prior to the initiation of site construction activities.
2. Care should be taken to prevent material movement into adjacent wetlands/waterbodies.
3. Care should be taken to maintain existing roadside drainage via culvert installation, with sediment sump placed downflow of culvert.

STANDARD SYMBOL

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STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS S53

When
- Construction traffic is expected to leave a construction site.
- Stabilization of interior construction roads is desired.

Why
- To minimize tracking of sediment onto public roadways and to minimize disturbance of vegetation.

Where
- Stabilized construction entrances shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must be routed over the rock ingress/egress corridor.

How
1. Stabilized construction access road should be established at the onset of the construction activities and maintained in place for the duration of the construction project.
2. Installation of this practice should be the responsibility of the site clearing or excavating contractor.
3. Access location should be cleared of woody vegetation.
4. Non-woven geotextile fabric shall be placed over the existing ground prior to placing stone.
5. Access size should be a minimum of 50'. (30' for single residence lot).
6. Access width should be 12' minimum, flared at the existing road to provide a turning radius.
7. Crushed aggregate (2" to 3"), or reclaimed or recycled concrete equivalent, shall be placed at least 8" deep over the length and width of the ingress/egress corridor.

Maintenance
- Periodic inspection and needed maintainence shall be provided after each rain event.
- Stabilized entrances shall be repaired and rock added as necessary.

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STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS S53

Maintenance (cont.)
- Sediment deposited on public rights-of-way shall be removed immediately and returned to the construction site.
- If soils are such that washing of tires is required, it shall be done in a wash rack area, stabilized with stone, immediately prior to the construction access stabilized corridor.
- At the project completion, rock access road should be removed and disposed of unless utilized as subgrade for final road.

Limitations
- Effectiveness limited, sediment may be tracked onto roads requiring additional action.

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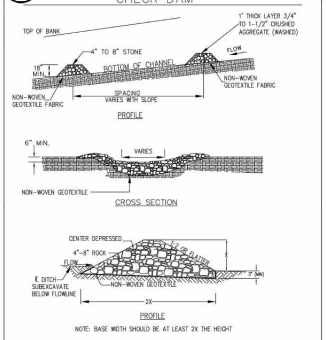
ES31 CHECK DAM



NOTE: BASE WIDTH SHOULD BE AT LEAST 2X THE HEIGHT

STANDARD SYMBOL

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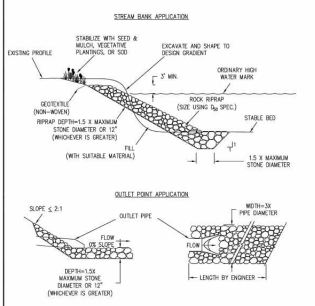
E12 RIPRAP



STANDARD SYMBOL

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RIPRAP SPECIFICATIONS E12

When
- When concentrated water flows have the potential to create scour, down-cutting, or lateral cutting.

Why
- To prevent loss of land or damage to utilities or structures. In aquatic applications, riprap is used to control channel meander and maintain capacity, protect against wave attack, and reduce sediment load.

Where
- In natural or constructed channels with areas susceptible to erosion from the action of water, ice, or debris, or to damage by livestock or vehicular traffic.
- In shoreline areas where the erosion problem may be solved through simple structural measures.
- On slopes with profiles measuring 1:1.5 or less.

How
1. Review subject site to identify areas subject to concentrated flows or wave/current attack.
2. The appropriateness and extent of riprap placement is site specific and should be determined in the field.
3. The area under review for riprap placement must be shaped and contoured appropriately by grading prior to material placement.
4. Non-woven geotextile fabric should be installed prior to riprap placement, with upper end and toe end of fabric buried or anchored to prevent movement.
5. Riprap placement should be started at a stabilized location and ended at a stabilized or contoured point.
6. Material selected for riprap should be hard, angular, and resistant to weathering. Appropriate material size depends on expected water energy and intended function of the material.

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E12 RIPRAP SPECIFICATIONS

How (cont.)
7. Riprap mixture should be an even mixture of stone sizes based on the average, or D_{50}. This means 50% of the stone, by size, will be larger than the diameter specified, and 50% will be smaller than the size specified. The diameter of the largest stone should not be more than 1.5 times the D_{50} stone size.
8. See table on the following page for typical riprap stone sizes.
9. Rock shall be placed so that larger rocks are uniformly distributed and in contact with one another. Smaller rocks should fill the voids.
10. When in contact with moving water, riprap will tie into a stable bank at the downstream end and will be keyed into the bank at the upstream end. Riprap should extend 3 ft. above the ordinary high water mark or to the top of the bank on short slopes. Extend riprap a minimum 10 ft. beyond active erosion area.

Maintenance
- All installations should be inspected immediately after the first rainfall to confirm the stability of the placed material. Follow-up inspections should occur regularly and provisions made for prompt repair if needed.

Limitations
- Area is cleared prior to the addition of riprap, therefore no areas are preserved with native vegetation.

SIZE OF TYPICAL RIPRAP STONES

Weight (lbs.)	Average Spherical Diameter (in.) D_{50}	Typical Rectangular Shape Length (in.)	Width/Height (in.)
50	10	18	6
100	12	21	7
150	14	24	8
200	15	27	9
300	18	30	12
1000	27	45	15
1500	31	51	17
2000	34	57	19
4000	43	72	24
6000	48	81	28
8000	54	90	30

Source: Adapted from USDA NRCS

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CHECK DAM SPECIFICATIONS ES31

When
- To reduce surface flow velocities.

Why
- To minimize erosion in flow corridors.

Where
- Within constructed flow corridors to reduce velocity until permanent stabilization is achieved.
- Within existing flow corridors to address or prevent velocity-caused erosion.

How
1. The check dam shall be constructed of rock only.
2. The rock shall be placed on non-woven geotextile fabric.
3. Remove woody vegetation prior to placing non-woven geotextile fabric.
4. Non-woven geotextile fabric shall be inset a minimum of 3" below adjacent grades.
5. The check dam shall be constructed of 4"-8" stone. The stone shall be placed to completely cover the width of the flow corridor and shall be keyed into adjacent banks.
6. The middle of the check dam shall be lower than the outer edges, such that no flow goes around the structure.
7. The up-stream side of the check dam can be lined with smaller crushed aggregate to improve efficiency.
8. Slopes of check dam should be 1:2 or flatter.

Maintenance
- Check dams should be inspected after each runoff event.
- Clogged stone should be periodically cleaned.
- Needed repairs should be initiated immediately after inspection.
- Accumulated upflow sediment should be periodically removed.
- If check dam is intended as temporary structure, remove after stabilization is achieved.

Limitations
- Use only in small open channels which drain 10 acres or less.
- Not to be used in live streams.

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BRIGHAM
ENGINEER
LICENSED

Brian Garner

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

EROSION CONTROL DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON BESS
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN MICHIGAN

SHEET NUMBER
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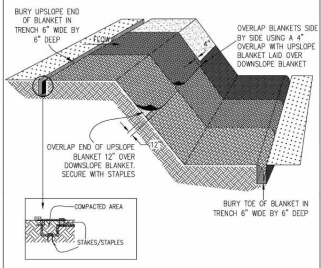
E9 MULCH BLANKETS



NOTES:
1. PLACE MULCH BLANKET PARALLEL TO FLOW AND ANCHOR SECURELY.
2. WHEN BLANKETS ARE USED IN FLOWING DITCH, BLANKETS SHOULD NOT OVERLAP IN DITCH CENTER PARALLEL TO FLOW.
3. STAPLES INSTALLED/SECURED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
4. WHERE POSSIBLE, CONSTRUCT WITH BIODEGRADABLE MATERIAL.

STANDARD SYMBOL

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E9 MULCH BLANKETS SPECIFICATIONS

When
- When seeded areas are subject to erosive surface flows, severe wind, or to protect non-vegetated slopes or areas during the winter.

Why
- Protects seeded areas and slopes against erosion from rain or wind. Holds soil moisture to allow for seed germination and reduces wind dessication of germinated seeds.

Where
- Use on exposed slopes, newly seeded areas, new ditch bottoms, and other areas subject to erosion.

How
1. Prepare subgrade to proper grade and compaction requirements.
2. Remove ruts, roots, soil clods, or other debris from surface subject to mulch blanket installation.
3. Spread or drill seed.
4. Consult with erosion control material supplier to select mulch blanket based on slope gradient, expected surface run-off, and protection term necessary (long or short term).
5. Position selected mulch blanket as close as possible to intended use location.
6. Install blanket at top of slope, first anchoring toe in trench 6" wide X 6" deep, progressing down-slope or down-gradient with approximately 12" of blanket extended beyond the up-slope portion of the trench.
7. Anchor the blanket with staples/stakes placed approximately 12" apart in the bottom of the trench. Backfill and compact the trench after securing.
8. Apply seed to compacted soil and fold the 12" portion of the blanket over compacted area and secure with a row of staples/stakes placed 12" apart across the width of the blanket.
9. Unroll the blankets down or horizontally across the slope.

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E9 MULCH BLANKETS SPECIFICATIONS

How (cont.)
10. Overlap blanket edges by a minimum of 4" and blanket ends by a minimum of 12". Overlaps should be in the direction of expected flow with the up-slope blanket placed over the down-slope blanket edge.
11. Secure down-slope end of blanket with staples/stakes and trench in.

Maintenance
- Check after a rain event to ensure the blanket is still in place.
- Keep eroded soil, vehicular and pedestrian traffic, and concentrated runoff away from the blanketed area.

Limitations
- Mulch blankets and anchors may inhibit mowing.

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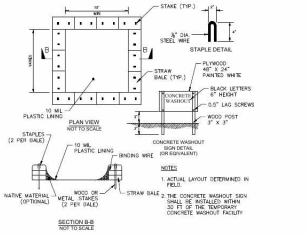
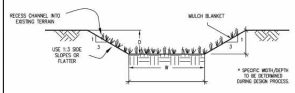


1 CONCRETE WASHOUT DETAIL
NO SCALE

E11 VEGETATED CHANNELS



CHANNEL CROSS-SECTION

CHANNEL SHAPES:

SOIL ERODIBILITY	
SOIL TEXTURE	ERODIBILITY
SILT, SAND, LOAM, SILTY LOAM, SANDY LOAM	EASILY ERODIBLE
CLAY LOAM, SILTY CLAY LOAM, SANDY CLAY LOAM, SILTY CLAY, CLAY	EROSION RESISTANT SOILS

NOTES:
1. LOCATE VEGETATED CHANNELS TO FOLLOW NATURAL TOPOGRAPHY.
2. UTILIZE PARABOLIC OR TRAPEZOIDAL CHANNEL SHAPES.
3. AVOID V-SHAPED CHANNELS AS THEY PROMOTE EROSION.
4. SELECT APPROPRIATE VEGETATION BASED ON RETARDANCE TO FLOW VELOCITIES.
5. MAY NEED MULCH BLANKET IN HIGH VELOCITY FLOW AREAS OR DITCH BOTTOMS.

STANDARD SYMBOL

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION

VEGETATED CHANNELS SPECIFICATIONS E11

When
- When surface flow velocities within a created stormwater channel have the potential to cause erosion.

Why
- To slow water velocity and reduce erosion and sediment loading in the stormwater channel.

Where
- For use in constructed drainageways where run-off may cause erosion.

How
1. Review subject site to identify channel areas potentially susceptible to high flows, erosive velocities or flooding.
2. Consult a professional lanscape architect or engineer regarding considerations of channel design based on water velocity, channel slope, discharge volume, and soil type.
3. General capacity requirements should allow for conveyance of a 10-year, 24-hour rain event at a minimum, unless local requirements exceed this minimum.
4. Channel shape should either be parabolic ◡ or ◡ trapezoidal. V-shaped channels are not recommended as they form gullies and increase the erosion potential.
5. All vegetated channels should have a depth of one foot or more.
6. Excavate or grade channel surface according to design. Locate channels in natural topographic depressions where possible. Recess channel into existing grade so that channel top is flush with adjacent grade.
7. Determine vegetative species based on the depth to water table, climate, anticipated flow velocities, and final managed length of vegetation. Utilize native species for vegetation purposes.
8. In channels to be seeded, prepare seedbed, apply seed, and install mulch blanket.
9. In channels planted with vegetative plugs or seedlings, prepare channel, and install mulch blanket.

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E11 VEGETATED CHANNELS SPECIFICATIONS

How (cont.)
10. Not recommended to use dormant seedings due to high failure rate.
11. Establish vegetated channel prior to periods of high run-off.
12. Prior to construction work in area surrounding channel, allow vegetation in channel to establish.
13. Check dams or velocity dissipators may be needed until vegetation is established.

Maintenance
- Inspect periodically during establishment of vegetation to ensure vegetative establishment is successful.
- Inspect after each rain event during vegetative establishment period for erosion problems.
- If necessary, repair, replant, reseed eroded areas immediately.
- Remove sediment concentrations that occur in vegetated channel.
- Remove fallen woody debris that may direct flows out of vegetated channel.

Limitations
- In constructed channels, additional protectives measures may be required prior to establishment of vegetation.

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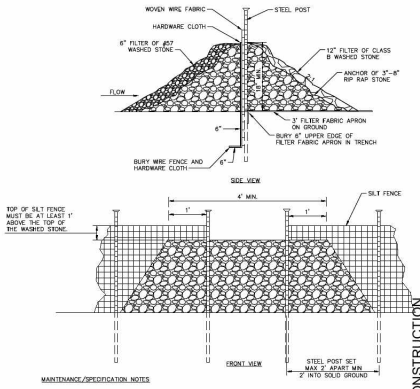

MAINTENANCE/SPECIFICATION NOTES
1. REMOVE SEDIMENT WHEN HALF OF STONE OUTLET IS COVERED.
2. REPLACE STONE AS NEEDED TO ENSURE DEWATERING.
3. SILT FENCE OUTLETS SHOULD NOT BE LOCATED WHERE THE OUTFLOW WILL ERODE THE SOIL BELOW.

2 SILT FENCE ROCK OUTLET DETAIL
NO SCALE

MISS DIG 811

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No.	DATE	BY
3	05/01/2026	BIG
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STATE OF MICHIGAN BRIAN GARNER ENGINEER 6201053150

KHA PROJECT 191260003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

EROSION CONTROL DETAILS

HERON ENERGY STORAGE LLC
PREPARED FOR
CHERRY ENERGY STORAGE LLC
CHERRY VALLEY TOWNSHIP, MICHIGAN

SHEET NUMBER
C312

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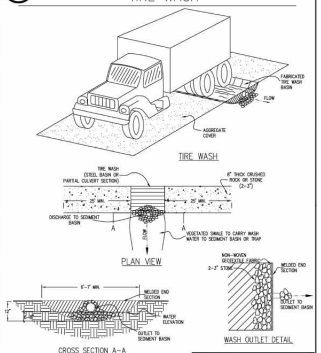
S54

TIRE WASH



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STATE FACILITIES ADMINISTRATION

TIRE WASH SPECIFICATIONS

S54

When
- Whenever traffic will be entering or leaving a construction site with soil capable of clinging onto construction vehicles; resulting in tracking of mud onto paved roads.

Why
- Reduces excessive sediment tracking of soil onto paved roads.

Where
- As an addition to aggregate construction entrances.

How
1. Construct tire wash on level ground at minimum length of 6'-7', a minimum of 10' wide to match width of aggregate road.
2. Construct 25' minimum approaches to tire wash with minimum 8" thickness of 2-3" stone.
3. Construct tire wash of partial culvert section or fabricated metal. Weld metal plates to culvert ends to contain water.
4. Provide outlet on one end of tire wash to allow excess water to drain. Outlet invert should be located 6-8" above bottom of tire wash.
5. Within tire wash structure, protect outlet pipe with non-woven geotextile fabric and 2-3" stone to prevent sediment discharge.
6. Protect swale with 2-3" stone on non-woven geotextile fabric.
7. Fill tire wash basin with water daily or when water depth is reduced to 1/2 the distance between basin bottom and outlet point.
8. Wash rock discharges should be directed into a sediment basin through a vegetated channel.
9. Remove sediment accumulation daily.

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TIRE WASH SPECIFICATIONS

S54

Maintenance
- Sediment accumulation in wash shall be removed regularly and placed into proper disposal location.
- Maintain to specified dimensions by adding approach rock when necessary each day.
- Monitor water levels throughout working hours.
- Discharge swale should be inspected regularly to ensure tire wash discharge path is maintained to receiving sediment basin.
- Damage to tire wash shall be repaired prior to additional use of rock.

Limitations
- Requires daily maintenance.
- May not clean tire tread completely.

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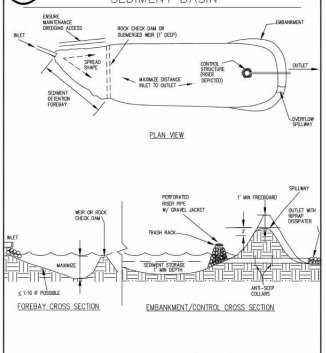
S55

SEDIMENT BASIN



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SEDIMENT BASIN SPECIFICATIONS

S55

When
- When site runoff is sediment-laden and/or runoff release rate is required.

Why
- To detain runoff sufficiently to allow excessive sediment to settle out before stormwater leaves construction site.

Where
- At the outlet of any disturbed area or at the ultimate site outlet.
- Should be used in association with dikes, temporary channels, and pipes to divert stormwater from the disturbed areas into the basin.
- May be combined with permanent detention basin.

How
1. Basin to be designed by engineer to ensure adequate storage volume from the contributing drainage area.
2. Basins should be constructed before clearing and grading work begins.
3. Basins should be located at the stormwater outlet for the site and multiple basins may be located throughout the site.
4. Basin location should ensure suitable access for maintenance and cleanout.
5. Do not locate in a stream.
6. All basin sites should be located where embankment failure will not result in loss of life or property damage.
7. The basin volume should be designed to handle the volume of stormwater expected from the disturbed acreage for a minimum 10-year storm event.
8. The basin volume consists of two zones
   - A sediment storage zone to a 1' minimum depth.
   - A settling zone at least 2 feet deep.

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SEDIMENT BASIN SPECIFICATIONS

S55

How (cont.)
9. Design should contain sufficient capacity to detain runoff for 24-48 hours, maximizing sediment settlement potential.
10. Length to width ratio should be greater than 4:1 to allow for sufficient settlement time.
11. Utilize a well anchored riser pipe with anti-seep collars as the principal outlet, along with an emergency overflow spillway for major events.

Maintenance
- Inspect weekly and after each major storm event.
- Check the depth of sediment deposit to insure capacity of basin storage is adequate for stormwater and sediment deposition.
- Remove sediment when the forebay or basin design depth is 50% full of sediment.

Limitations
- Liability concerns based on failure of the basin and flooding of adjacent properties.
- May become an attractive nuisance to children and waterfowl.
- Typically, permanent basins are used for drainage of 5 acres or more.
- Effective in removing sediment down to the medium silt size fraction, however, not effective in fine silt and clay without extending detention time.

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STATE OF MICHIGAN
BRIAN GAMMON
ENGINEER
6201101610

Brian Gammon

KHA PROJECT 191250003
DATE 02/26/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

EROSION CONTROL DETAILS

HERON ENERGY STORAGE LLC
PREPARED FOR
CHERRY ROAD ENERGY STORAGE LLC
CHARTER TOWNSHIP
MICHIGAN

MISS DIG 811

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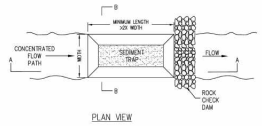
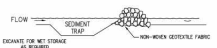
S56

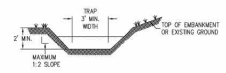
SEDIMENT TRAP



PLAN VIEW



CROSS SECTION AA



CROSS SECTION BB

STANDARD SYMBOL

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S56

SEDIMENT TRAP SPECIFICATIONS

When
- When runoff from construction sites contains suspended sediment.

Why
- Should be used as a temporary measure.
- To collect and store sediment from sites cleared and/or graded during construction.

Where
- In small drainage areas with less than 5 acres of contributing drainage.
- Along the construction site perimeter where runoff is discharged offsite.
- Above check dams and/or upslope of drain inlet protection measures.

How
1. Prior to construction initiation, identify stormwater drainage routes likely to carry construction site runoff.
2. Build sediment traps in site runoff corridors before clearing, grubbing, and grading begin.
3. Install traps in natural depressions or in small drainageways to minimize vegetation removal.
4. A sediment trap is intended as a temporary measure.
5. In-stream applications should be designed by a professional engineer, with consideration for the type of soil, size of drainage area, and desired sediment removal efficiency.
6. Locate where the trap can be easily cleared of sediment.
7. Collection channels should enter the trap from the upslope side.
8. The sediment trap should have a minimum length to width ratio of 2:1.
9. The outlet of the trap must be stabilized with rock, vegetation, or another suitable material.

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SEDIMENT TRAP SPECIFICATIONS

Maintenance
- Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in an upland area in such a manner that it will not erode.
- The structure shall be inspected after each rain event and repairs made as needed.
- The sediment trap shall be removed and the area stabilized when the contributary drainage area has been properly stabilized. The swale sediment trap will be properly backfilled and the swale or ditch reconstructed.

Limitations
- Only use for drainage areas up to 5 acres.
- Removes coarse sediment only (medium silt size or larger) unless trap area is sized similar to a sediment basin with extended residence time.

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STATE OF MICHIGAN
BRIAN GARNON
BFG-0001
REGISTERED ENGINEER

Brian Garnon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BFG

EROSION CONTROL DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
CHERRY ENERGY STORAGE LLC
CHARLEVOIX TOWNSHIP
MICHIGAN

SHEET NUMBER
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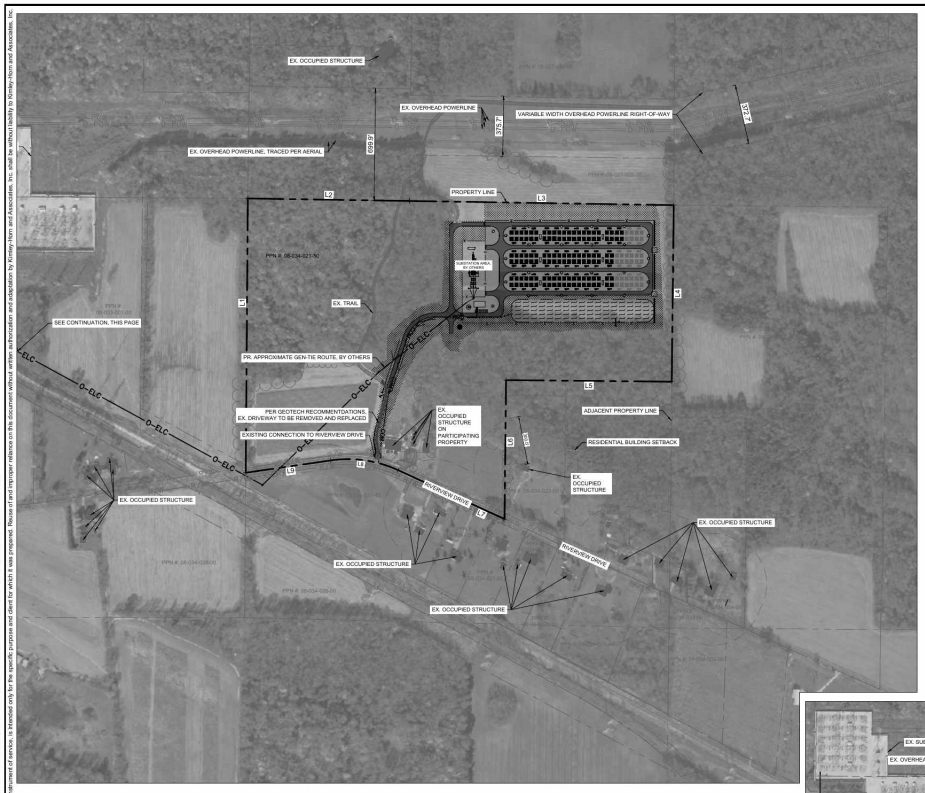

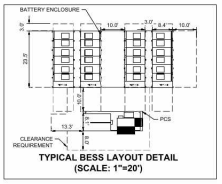

TYPICAL BESS LAYOUT DETAIL (SCALE: 1"=20')

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- R/W — RIGHT-OF-WAY LINE
- PROPOSED SITE FENCE
- ELC — PROPOSED GEN-TIE ROUTE, BY OTHERS
- PROPOSED GATE
- BATTERY ENCLOSURE
- BATTERY ENCLOSURE (AUGMENTED)
- LIGHT FIXTURE, SEE PHOTOMETRIC PLAN FOR DETAILS
- PROPOSED GRAVEL ACCESS ROAD, SEE DETAIL 4 ON SHEET C701
- PROPOSED STORM WATER POND
- PROPOSED LANDSCAPING, SEE LANDSCAPE PLANS
- BESS YARD ROCK, SIZE AND DEPTH TBD
- PROPOSED DRAINAGE SWALE
- PROPOSED SOUND WALL
- PROPOSED REMOVED AND REPLACED ROAD

SITE PLAN NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL APPLICABLE GUN PLAIN CHARTER TOWNSHIP,STATE, AND FEDERAL LAWS AND REQUIREMENTS.
2. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULES, SLOPE PAVING, SIDEWALKS, EXIT PORCHES, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
3. ALL INNER CURBED RADII ARE TO BE 1.5 FEET AND OUTER CURBED RADII ARE TO BE 4.5m UNLESS OTHERWISE NOTED. STRIPED RADII ARE TO BE 1'.
4. ALL DIMENSIONS AND RADII ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
5. EXISTING STRUCTURES WITHIN CONSTRUCTION LIMITS ARE TO BE ABANDONED, REMOVED OR RELOCATED AS NECESSARY. ALL COST SHALL BE INCLUDED IN BASE BID.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS, (UNLESS OTHERWISE NOTED ON PLANS) INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC., AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES REQUIREMENTS AND PROJECT SITE WORK SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
7. SITE BOUNDARY TAKEN FROM THE GUN PLAIN PARCEL MAP, TOPOGRAPHY TAKEN FROM PUBLIC LIDAR DATA, UTILITY AND ROAD INFORMATION TRACED VIA AERIAL IMAGERY. KIMLEY-HORN ASSUMES NO LIABILITY FOR ANY ERRORS, INACCURACIES, OR OMISSIONS CONTAINED THEREIN.
8. CONTRACTOR SHALL REFERENCE ARCH / MEP PLANS FOR SITE LIGHTING AND ELECTRICAL PLAN.
9. NO PROPOSED LANDSCAPING SUCH AS TREES OR SHRUBS, ABOVE AND UNDERGROUND STRUCTURES, OR OTHER OBSTRUCTIONS SHALL BE LOCATED WITHIN EXISTING OR PROPOSED UTILITY EASEMENTS AND RIGHTS OF WAY UNLESS SPECIFICALLY NOTED ON PLANS OTHERWISE.
10. REFER TO PLAN OF SURVEY FOR EXACT LOT AND PROPERTY BOUNDARY DIMENSIONS.
11. ALL AREAS ARE ROUNDED TO THE NEAREST TENTH SQUARE FOOT.
12. ALL DIMENSIONS ARE ROUNDED TO THE NEAREST TENTH FOOT.
13. SITE USE NOT ANTICIPATED TO PRODUCE LARGE AMOUNT OF WASTE, SO NO RUBBISH RECEPTACLES ARE PROPOSED. OWNER SHALL ARRANGE FOR TRASH/DEBRIS PICKUP WEEKLY OR AS-NEEDED.

LINE TABLE

LINE	LENGTH	BEARING	BEGINNING COORDINATES	END COORDINATES
L1	1711.23	N0°26'09.25"E	N:341777.457 E:12789789.699	N:343488.634 E:12788802.718
L2	1009.09	S89°05'52.81"E	N:343488.634 E:12788802.718	N:343472.749 E:12790811.685
L3	1649.69	S89°05'52.81"E	N:343472.749 E:12790811.685	N:343446.779 E:12792461.171
L4	1101.57	S0°38'19.20"W	N:343446.779 E:12792461.171	N:342345.273 E:12792448.892
L5	1034.14	N89°26'48.36"W	N:342345.273 E:12792448.892	N:342355.258 E:12791414.797
L6	866.71	S0°38'56.63"W	N:342355.258 E:12791414.797	N:341488.606 E:12791404.979
L7	730.94	N65°19'34.97"W	N:341488.606 E:12791404.979	N:341793.734 E:12790740.777
L9	535.86	S81°44'30.03"W	N:341854.426 E:12790320.001	N:341777.457 E:12789789.699

CURVE TABLE

CURVE	LENGTH	BEARING	BEGINNING COORDINATES	END COORDINATES
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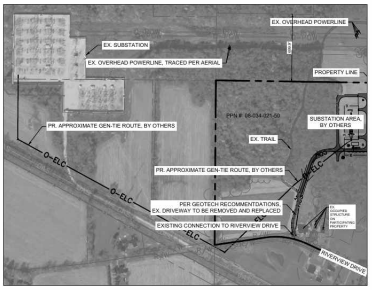

1 **APPROXIMATE GEN-TIE ROUTE, BY OTHERS**
SCALE 1"=600'

GRAPHIC SCALE IN FEET 0 150 300 600

NORTH

MISS DIG 811

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	05/01/2026	BIG
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STATE OF MICHIGAN BRIAN GARNER BRIGHT ENGINEER 6201053203

Brian Garner

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CAS
CHECKED BY BPG

OVERALL SITE PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
C400A

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- BATTERY ENCLOSURE
- BATTERY ENCLOSURE (AUGMENTED)
- LIGHT FIXTURE, SEE PHOTOMETRIC PLAN FOR DETAILS
- PROPOSED GRAVEL ACCESS ROAD, SEE DETAIL 6 ON SHEET C701
- PROPOSED STORM WATER POND
- PROPOSED LANDSCAPING, SEE LANDSCAPE PLANS
- BESS YARD ROCK, SIZE AND DEPTH TBD
- PROPOSED DRAINAGE SWALE
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- PROPOSED REMOVED AND REPLACED ROAD

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STATE OF MICHIGAN
BRIAN GAMMON
BY LICENSE
LICENSED PROFESSIONAL ENGINEER

Brian Gammon

KHA PROJECT 191292003
DATE 02/26/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

OVERALL SITE PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP

MICHIGAN

SHEET NUMBER

C400B

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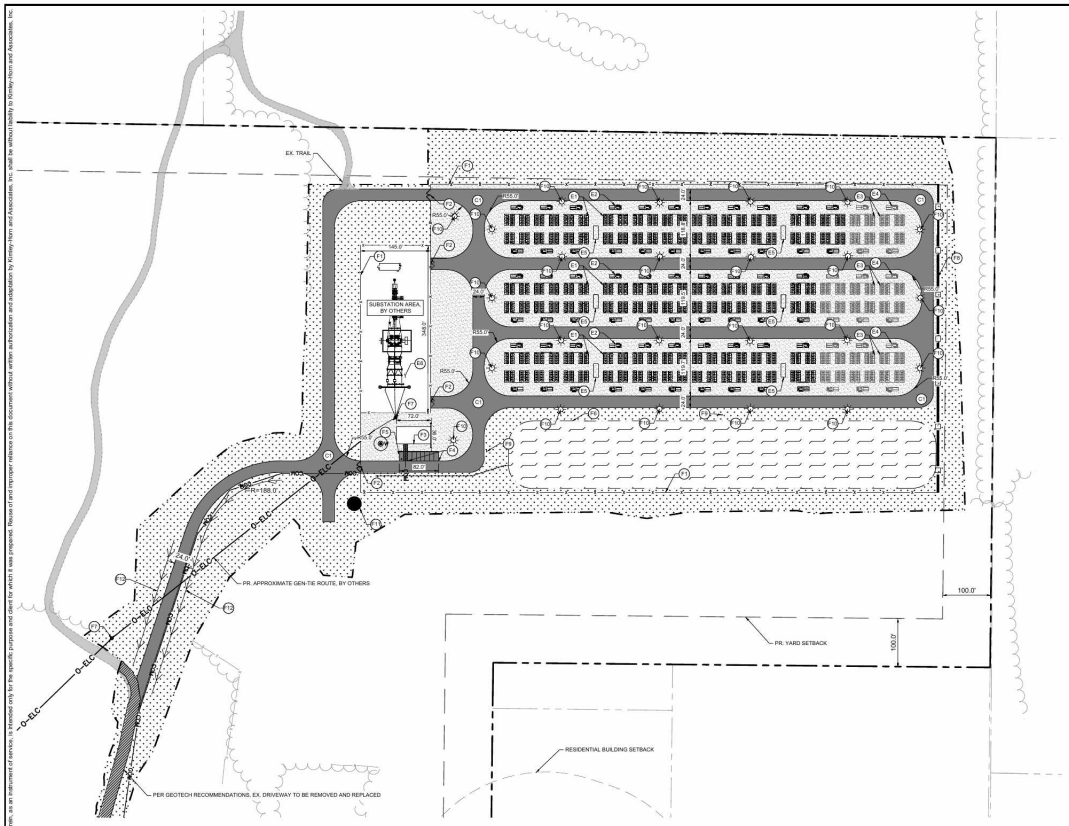
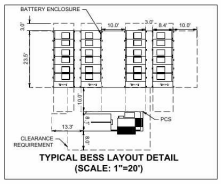
K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_M12 Design\CAD\PlanSheets\C4-OVERALL SITE PLAN.dwg July 15, 2026 - 4:24pm



SITE PLAN NOTES

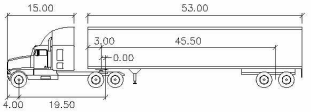
1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL APLLICABLE GUN PLAIN CHARTER TOWNSHIP, STATE, AND FEDERAL LAWS AND REQUIREMENTS.
2. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULES, SLOPE PAVING, SIDEWALKS, EXIT PORCHES, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
3. ALL INNER CURBED RADII ARE TO BE 1.5 FEET AND OUTER CURBED RADII ARE TO BE 4.5m UNLESS OTHERWISE NOTED. STRIPED RADII ARE TO BE 1'.
4. ALL DIMENSIONS AND RADII ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
5. EXISTING STRUCTURES WITHIN CONSTRUCTION LIMITS ARE TO BE ABANDONED, REMOVED OR RELOCATED AS NECESSARY. ALL COST SHALL BE INCLUDED IN BASE BID.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS, (UNLESS OTHERWISE NOTED ON PLANS) INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES REQUIREMENTS AND PROJECT SITE WORK SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
7. SITE BOUNDARY TAKEN FROM THE GUN PLAIN PARCEL MAP. TOPOGRAPHY TAKEN FROM PUBLIC LIDAR DATA, UTILITY AND ROAD INFORMATION TRACED VIA AERIAL IMAGERY. KIMLEY-HORN ASSUMES NO LIABILITY FOR ANY ERRORS, INACCURACIES, OR OMISSIONS CONTAINED THEREIN.
8. CONTRACTOR SHALL REFERENCE ARCH / MEP PLANS FOR SITE LIGHTING AND ELECTRICAL PLAN.
9. NO PROPOSED LANDSCAPING SUCH AS TREES OR SHRUBS, ABOVE AND UNDERGROUND STRUCTURES, OR OTHER OBSTRUCTIONS SHALL BE LOCATED WITHIN EXISTING OR PROPOSED UTILITY EASEMENTS AND RIGHTS OF WAY UNLESS SPECIFICALLY NOTED ON PLANS OTHERWISE.
10. REFER TO PLAN OF SURVEY FOR EXACT LOT AND PROPERTY BOUNDARY DIMENSIONS.
11. ALL AREAS ARE ROUNDED TO THE NEAREST TENTH SQUARE FOOT.
12. ALL DIMENSIONS ARE ROUNDED TO THE NEAREST TENTH FOOT.
13. SITE USE NOT ANTICIPATED TO PRODUCE LARGE AMOUNT OF WASTE. SO NO RUBBISH RECEPTACLES ARE PROPOSED. OWNER SHALL ARRANGE FOR TRASH/DEBRIS PICKUP WEEKLY OR AS-NEEDED.


BATTERY ENCLOSURE
10.0'
3.0'
8.4'
10.0'
2.5'
2.5'
W/10
W/10
W/10

LEGEND

- PROPERTY LINE
- PARCEL LINE
- RIGHT-OF-WAY LINE
- LIMITS OF DISTURBANCE
- PROPOSED SITE FENCE
- O-ELC — PROPOSED GEN-TIE ROUTE, BY OTHERS
- PROPOSED GATE
- BATTERY ENCLOSURE
- BATTERY ENCLOSURE (AUGMENTED)
- LIGHT FIXTURE, SEE PHOTOMETRIC PLAN FOR DETAILS
- PROPOSED ACCESS ROAD - SURFACE SECTION TBD
- PROPOSED STORM WATER POND
- PROPOSED LANDSCAPING, SEE LANDSCAPE PLANS
- BESS YARD ROCK, SIZE AND DEPTH TBD
- PROPOSED RIP RAP
- PROPOSED SOUND WALL
- PROPOSED REMOVED AND REPLACED ROAD

CONSTRUCTION DESIGN VEHICLE

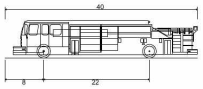


WB-67

feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

FIRE TRUCK DESIGN VEHICLE



Pumper Fire Truck	
Overall Length	40.000ft
Overall Width	8.167ft
Overall Body Height	7.745ft
Min Body Ground Clearance	0.656ft
Track Width	8.167ft
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

THE VEHICLE MANEUVERING IDENTIFIED ON THIS PLAN WAS PREPARED USING VEHICLE TRACKING SOFTWARE AND DOES NOT NECESSARILY REPRESENT ACTUAL CONDITIONS NOR DOES IT ACCOUNT FOR EXTERNAL FACTORS. THIS ANALYSIS SHOULD NOT BE USED AS THE SOLE BASIS FOR THE CLIENT'S DECISION MAKING

GRAPHIC SCALE IN FEET
0 100 200 400

NORTH

MISS DIG 811

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	05/01/2026	BIG
2	ENTITLEMENT SET	04/10/2026	BIG
1	ENTITLEMENT SET	03/13/2026	BIG
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ROCHESTER HILLS, MI 48307
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Cip
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GARNER
BRIGHAM
01/15/2026
REGISTERED PROFESSIONAL ENGINEER

Brian Garner

KHA PROJECT 191250003
DATE 01/15/2026
SCALE: AS SHOWN
DESIGNED BY: JLL
DRAWN BY: CEB
CHECKED BY: BPG

CIRCULATION PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP

MICHIGAN

SHEET NUMBER
C410

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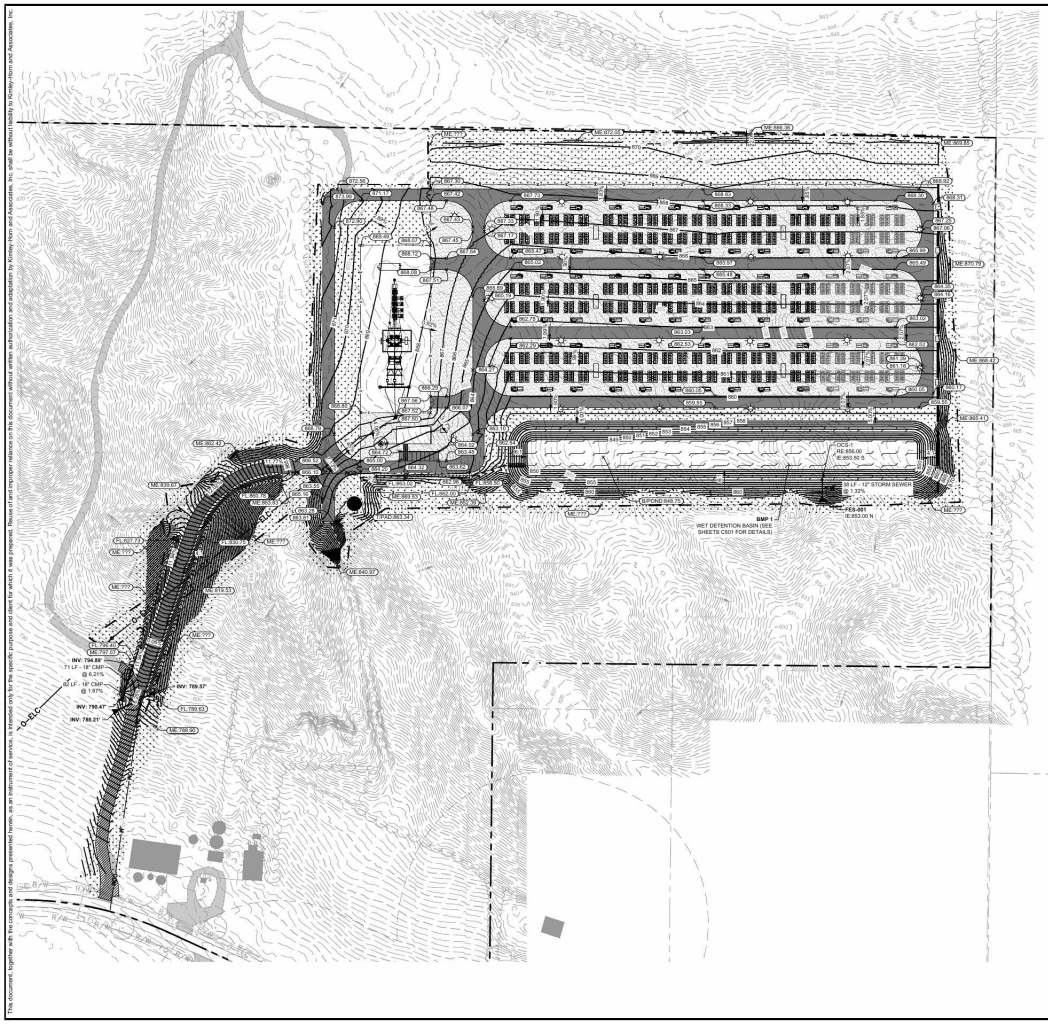

LEGEND

- PROPERTY LINE
- LIMITS OF DISTURBANCE
- 875 EXISTING CONTOUR
- 1025 PROPOSED CONTOUR
- PROPOSED RIDGE LINE
- PROPOSED SWALE
- PROPOSED STORM MANHOLE (SOLID CASTING)
- PROPOSED STORM MANHOLE (ROUND INLET CASTING)
- PROPOSED STORM MANHOLE/ CATCH BASIN (CURB INLET CASTING)
- PROPOSED STORM SEWER CLENOUT
- PROPOSED FLARED END SECTION
- PROPOSED PIPE RIPRAP
- PROPOSED DIVERSION DITCH RIP RAP
- PROPOSED STORM SEWER
- 100.00 PROPOSED SPOT ELEVATION
- (B:POND 0.0) PROPOSED BOTTOM OF POND ELEVATION
- ME 0.0 MATCH EXISTING ELEVATION
- FL 0.0 PROPOSED FLOW LINE ELEVATION
- (TP:PAD 0.0) PROPOSED TOP OF PAD ELEVATION
- 0.0% PROPOSED DRAINAGE DIRECTION
- 0.50% PROPOSED GRADE BETWEEN POINTS

GRADING PLAN NOTES

1. PERFORM GRADING WORK IN ACCORDANCE WITH APPLICABLE TOWNSHIP SPECIFICATIONS AND BUILDING PERMIT REQUIREMENTS.
2. CONTACT STATE 811 CALL-BEFORE-YOU-DIG LOCATING SERVICE AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION FOR UNDERGROUND UTILITY LOCATIONS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL.
4. FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES PRIOR TO THE START OF LAND DISTURBING ACTIVITIES. NOTIFY THE PROJECT ENGINEER OF ANY DISCREPANCIES OR VARIATIONS IMPACTING THE PROPOSED DESIGN OF THE PROJECT.
5. IN PAVED AREAS, ROUGH GRADE TO SUBGRADE ELEVATION AND LEAVE THE SITE READY FOR SUB-BASE.
6. SUBGRADE EXCAVATION SHALL BE BACKFILLED IMMEDIATELY AFTER EXCAVATION TO HELP OFFSET ANY STABILITY PROBLEMS DUE TO WATER SEEPAGE OR STEEP SLOPES. WHEN PLACING NEW SURFACE MATERIAL ADJACENT TO EXISTING PAVEMENT, THE EXCAVATION SHALL BE BACKFILLED PROMPTLY TO AVOID UNDERMINING OF EXISTING PAVEMENT.
7. ELEVATIONS SHOWN REPRESENT FINISHED SURFACE GRADES. SPOT ELEVATIONS ALONG CURB & GUTTER REPRESENT THE FLOW LINE UNLESS OTHERWISE NOTED.
8. EXCESS MATERIAL, BITUMINOUS SURFACING, CONCRETE ITEMS, ABANDONED UTILITY ITEMS, AND OTHER UNSTABLE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF THE CONSTRUCTION SITE.
9. CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION OF PAVEMENTS AND CURB AND GUTTER WITH SMOOTH UNIFORM SLOPES THAT PROVIDE POSITIVE DRAINAGE TO COLLECTION POINTS. MAINTAIN A MINIMUM SLOPE OF 1.25% IN ASPHALT PAVEMENT AREAS AND A MINIMUM SLOPE OF 0.50% IN CONCRETE PAVEMENT AREAS.
10. MAINTAIN A MINIMUM SLOPE OF 0.50% ALONG CURB & GUTTER. REVIEW PAVEMENT GRADIENT AND CONSTRUCT "INFALL" CURB WHERE PAVEMENT DRAINS TOWARD THE GUTTER, AND "OUTFALL" CURB WHERE PAVEMENT DRAINS AWAY FROM THE GUTTER.
11. INSTALL A MINIMUM OF 4-INCHES OF AGGREGATE BASE MATERIAL UNDER PROPOSED CONCRETE CURB & GUTTER, SIDEWALKS, AND TRAILS UNLESS OTHERWISE DETAILED.
12. GRADING FOR SIDEWALKS AND ACCESSIBLE ROUTES, INCLUDING CROSSING DRIVEWAYS, SHALL CONFORM TO CURRENT STATE & NATIONAL ADA STANDARDS:

    ACCESSIBLE RAMP SLOPES SHALL NOT EXCEED 8.3% (1:12).
    SIDEWALK CROSS-SLOPES SHALL NOT EXCEED 2.0%.
    LONGITUDINAL SIDEWALK SLOPES SHALL NOT EXCEED 5.0%.
    ACCESSIBLE PARKING STALLS AND ACCESS AISLES SHALL NOT EXCEED 2.0% IN ANY DIRECTION. A MAXIMUM SLOPE OF 1.50% IS PREFERRED.

    SIDEWALK ACCESS TO EXTERNAL BUILDING DOORS AND GATES SHALL BE ADA COMPLIANT. NOTIFY ENGINEER IMMEDIATELY IF ADA CRITERIA CANNOT BE MET IN ANY LOCATION PRIOR TO PAVEMENT INSTALLATION. CHANGE ORDERS WILL NOT BE ACCEPTED FOR ADA COMPLIANCE ISSUES.
13. UPON COMPLETION OF LAND DISTURBING ACTIVITIES, RESTORE ADJACENT OFFSITE AREAS DISTURBED BY CONSTRUCTION TO MATCH OR EXCEED THE ORIGINAL CONDITION. LANDSCAPE AREAS SHALL BE RE-VEGETATED WITH A MINIMUM OF 4-INCHES OF TOPSOIL.
14. EXCAVATE DRAINAGE TRENCHES TO FOLLOW PROPOSED STORM SEWER ALIGNMENTS. REFER TO THE UTILITY PLANS FOR LAYOUT AND ELEVATIONS FOR PROPOSED SANITARY SEWER, WATER MAIN, AND OTHER BUILDING UTILITY SERVICE CONNECTIONS.

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

MISS DIG 811

No.	DATE	BY
3	05/01/2025	BIG
2	04/10/2025	BIG
1	03/10/2025	BIG
	02/26/2025	BIG

ENTITLEMENT SET
ENTITLEMENT SET
ENTITLEMENT SET
ENTITLEMENT SET
REVISIONS

Kimley»Horn
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STATE OF MICHIGAN
BRIAN GAMMON
COMPANY NO. 6201201201
REGISTERED ENGINEER

Brian Gammon

KHA PROJECT 191292003
DATE 02/26/2025
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

GRADING AND DRAINAGE PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
C500

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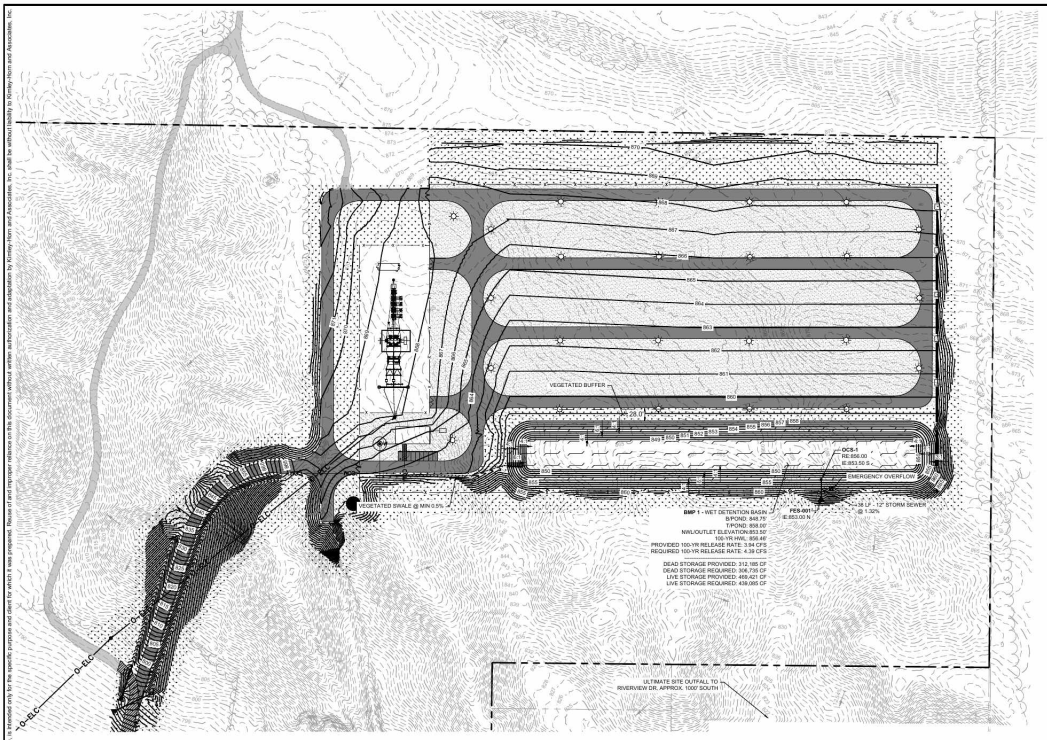

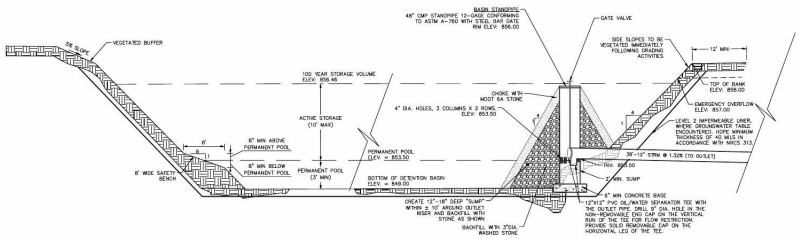

DETENTION BASIN W/ OUTLET CONTROL DETAIL

N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED STORM MANHOLE (SOLID CASTING)
- PROPOSED STORM MANHOLE (ROUND INLET CASTING)
- PROPOSED STORM MANHOLE/ CATCH BASIN (CURB INLET CASTING)
- PROPOSED STORM SEWER CLENOUT
- PROPOSED FLARED END SECTION
- PROPOSED PIPE RIPRAP
- PROPOSED OVERSION DITCH RIP RAP
- PROPOSED STORM SEWER
- PROPOSED SWALE

STORM SEWER NOTES

1. INSTALL STORM SEWER IN ACCORDANCE WITH APPLICABLE TOWNSHIP OR STATE SPECIFICATIONS, STATE PLUMBING CODE, AND BUILDING PERMIT REQUIREMENTS.
2. CONTACT STATE 811 CALL-BEFORE-YOU-DIG LOCATING SERVICE AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION FOR UNDERGROUND UTILITY LOCATIONS.
3. STORM SEWER PIPE SHALL BE:
   RCP: ASTM C-76
   HDPE: ASTM F-714, F-894
   PVC: ASTM D-3729
   PVC SCH40: ASTM D-1785, D-2665, F-794
   DRAIN TILE SHALL BE:
   PE: ASTM F-667
   PVC: ASTM D-3729
   FITTINGS SHALL BE:
   RCP: ASTM C-76, JOINTS PER ASTM C-361, C-990, AND C-443
   HDPE: ASTM D-3212
   PVC: ASTM D-3729, JOINTS PER ASTM D-3212
   PVC SCH40: ASTM D-2665, F-794, F-1866
4. CONTRACTOR IS RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL.
5. FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES PRIOR TO THE START OF LAND DISTURBING ACTIVITIES. NOTIFY THE PROJECT ENGINEER OF ANY DISCREPANCIES OR VARIATIONS IMPACTING THE PROPOSED DESIGN OF THE PROJECT.
6. EXCAVATE DRAINAGE TRENCHES TO FOLLOW PROPOSED STORM SEWER ALIGNMENTS. REFER TO THE UTILITY PLANS FOR LAYOUT AND ELEVATIONS FOR PROPOSED SANITARY SEWER, WATER MAIN, AND OTHER BUILDING UTILITY SERVICE CONNECTIONS. REFER TO THE GRADING PLAN FOR DETAILED SURFACE ELEVATIONS.
7. EXCESS MATERIAL, BITUMINOUS SURFACING, CONCRETE ITEMS, ABANDONED UTILITY ITEMS, AND OTHER UNSTABLE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF THE CONSTRUCTION SITE.
8. COORDINATE WITH THE PLUMBING PLANS FOR THE LOCATION, SIZE AND ELEVATION OF THE PROPOSED UNDERGROUND ROOF DRAIN CONNECTIONS.
9. WHERE STORM SEWER ROOF DRAINS HAVE LESS THAN 4-FEET OF COVER IN PAVED AREAS OR 3-FEET OF COVER IN LANDSCAPE AREAS, PROVIDE 3-INCH THICK INSULATION A MINIMUM OF 5-FEET IN WIDTH, CENTERED ON THE PIPE.
10. ALL STORM SEWER PIPE JOINTS SHALL BE WATER-TIGHT CONNECTIONS.
11. ALL STORM SEWER PIPE CONNECTIONS TO MANHOLES SHALL BE GASKETED AND WATER TIGHT. BOOTED COUPLERS AT THE STRUCTURE OR A WATER STOP WITH NON-SHRINK GROUT MAY BE USED IN ACCORDANCE WITH LOCAL CODES.
12. CONTRACTOR SHALL AIR TEST ALL STORM SEWER PIPE IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

MISS DIG 811

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	05/01/2026	BIG
2	ENTITLEMENT SET	04/10/2026	BIG
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Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GARNON
BRIAN GARNON
01/13/2026
REGISTERED ENGINEER

KHA PROJECT 191250003
DATE 01/13/2026
SCALE: AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

STORMWATER MANAGEMENT PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC

PREPARED FOR

HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP, MICHIGAN

SHEET NUMBER
C501

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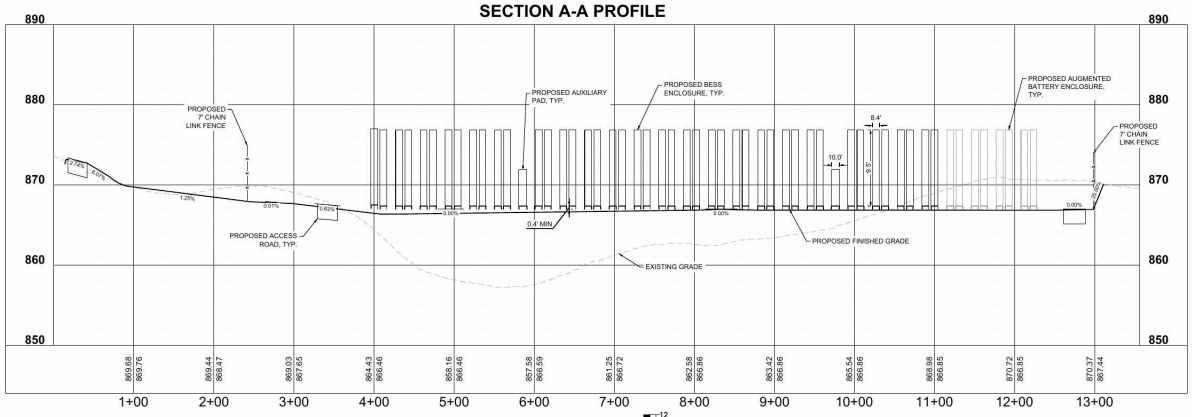
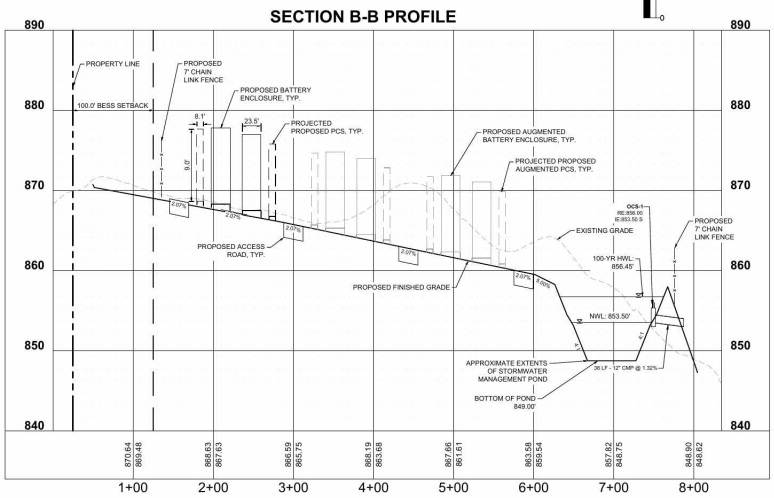
SECTION A-A PROFILE

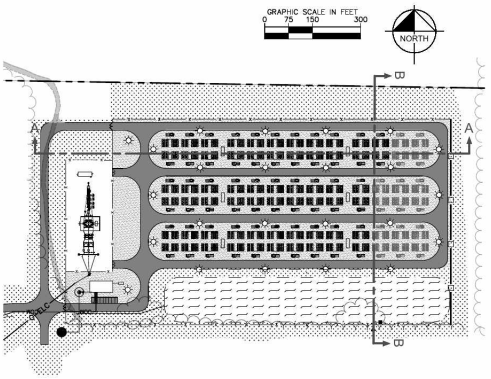


GRAPHIC SCALE IN FEET
0 30 60 120
HORIZONTAL

VERTICAL
12
6
3
0

SECTION B-B PROFILE





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	ENTITLEMENT SET	02/26/2026	BIG

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Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GANNON
ENGINEER
LICENSE
6201053179

Brian Gannon

KHA PROJECT 191250003
DATE 02/26/2026
SCALE: AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BFG

SITE CROSS SECTIONS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
C510

MISS DIG 811

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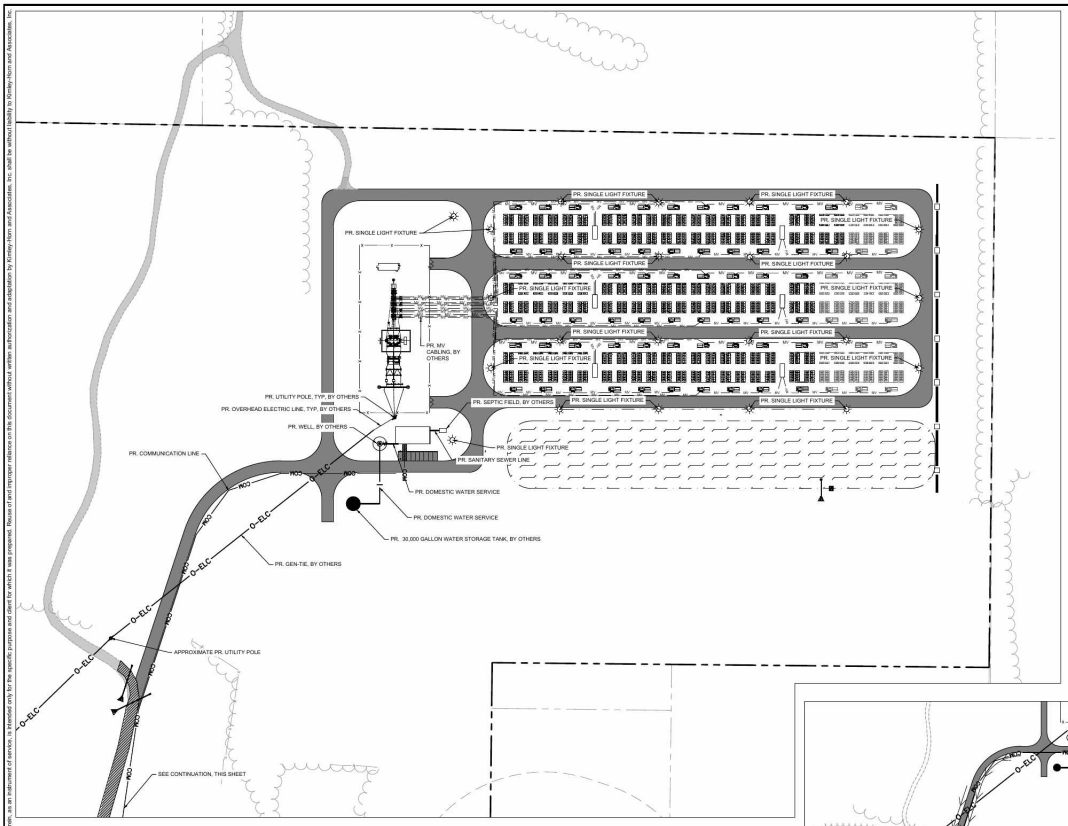

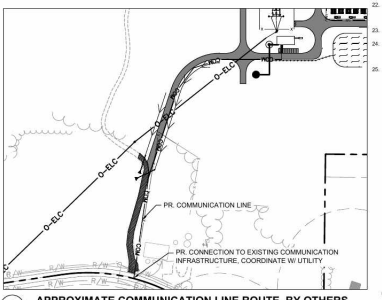

1 **APPROXIMATE COMMUNICATION LINE ROUTE, BY OTHERS**

SCALE 1"=250'

LEGEND

EXISTING	PROPOSED	
W	W	WATERMAIN
S	S	SANITARY SEWER
D	D	STORM SEWER
COM	COM	COMMUNICATION

UTILITY PLAN NOTES

1. INSTALL UTILITIES IN ACCORDANCE WITH APPLICABLE TOWNSHIP SPECIFICATIONS, STATE PLUMBING CODE, AND BUILDING PERMIT REQUIREMENTS.
2. CONTACT STATE 811 CALL-BEFORE-YOU-DIG LOCATING SERVICE AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION FOR UNDERGROUND UTILITY LOCATIONS.
3. CONTRACTOR IS RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL.
4. SANITARY SEWER PIPE SHALL BE:
   PVC: ASTM D-2729, D-3034
   PVC SCH 40: ASTM D-1785, F-714, F-894
   SANITARY SEWER FITTINGS SHALL BE:
   PVC: ASTM D-2729, D-3034
   PVC SCH40: ASTM D-2665, F-2794, F-1866
5. WATER MAIN PIPE SHALL BE:
   PVC: ASTM D-1785, D-2241, AWWA C-900
   PVC BLUE PIPE: AWWA C-900
   WATER MAIN FITTINGS SHALL BE:
   PVC: ASTM D-2466, D-2468, D-2467, F-1970, AWWA C-907
   DUCTILE IRON: AWWA C-153, C-110, ASME 316.4
6. WHEN CONNECTING TO AN EXISTING UTILITY LINE, FIELD VERIFY THE LOCATION, DEPTH, AND SIZE OF THE EXISTING PIPE(S) PRIOR TO INSTALLATION OF THE NEW LINES. NOTIFY THE PROJECT ENGINEER OF ANY DISCREPANCIES OR VARIATIONS IMPACTING THE PROPOSED DESIGN OF THE PROJECT.
7. PLACE AND COMPACT ALL FILL MATERIAL PRIOR TO INSTALLATION OF PROPOSED UNDERGROUND UTILITIES. MINIMUM TRENCH WIDTH SHALL BE 2 FEET.
8. MAINTAIN A MINIMUM OF 7'-6" COVER ON ALL WATER LINES.
9. FOR WATER LINES AND STUB-OUTS UTILIZE MECHANICAL JOINTS WITH RESTRAINTS SUCH AS THRUST BLOCKING, WITH STAINLESS STEEL OR COBALT BLUE BOLTS, OR AS INDICATED IN THE TOWNSHIP SPECIFICATIONS AND PROJECT DOCUMENTS.
10. MAINTAIN 18-INCH MINIMUM VERTICAL SEPARATION WHERE SEWER PIPE CROSSES WATER LINES (OUTSIDE EDGE OF PIPE TO OUTSIDE EDGE OF PIPE OR STRUCTURE). PROVIDE 10-FOOT HORIZONTAL SEPARATION BETWEEN SEWER PIPE AND WATER LINES.
11. IN THE EVENT OF A VERTICAL CONFLICT BETWEEN WATER LINES, SANITARY LINES, STORM LINES AND GAS LINES (OR ANY OBSTRUCTION EXISTING AND PROPOSED), THE SANITARY PIPE MATERIAL SHALL BE PVC SCHEDULE 40 OR PVC C900 AND HAVE MECHANICAL JOINTS AT LEAST 10 FEET ON EITHER SIDE OF THE CENTER LINE OF THE CROSSING. THE WATER LINE SHALL HAVE A MEDIUM OF JOINTS WITH ADEQUATE DEFLECTION AS REQUIRED TO PROVIDE A MINIMUM 18-INCH VERTICAL SEPARATION MEETING REQUIREMENTS OF ANSI A21.10 OR ANSI (21.11 (AWWA C-151) (CLASS 50).
12. ALL PVC & HDPE SEWER AND WATER PIPE SHALL HAVE A TRACER WIRE INSTALLED IN THE TRENCH AND TERMINATED PER THE DETAILS.
13. UNDERGROUND UTILITY LINES SHALL BE INSTALLED, INSPECTED AND APPROVED PRIOR TO PLACING BACKFILL.
14. IN PAVEMENT AREAS, RAISE MANHOLE CASTINGS TO BE FLUSH WITH PROPOSED FINISHED SURFACE GRADE. IN GREEN AREAS, RAISE MANHOLE CASTINGS TO BE ONE FOOT ABOVE FINISHED GROUND ELEVATION & INSTALL A WATERTIGHT LID.
15. REFER TO PLUMBING PLANS FOR LOCATION, SIZE AND ELEVATION OF UTILITY SERVICE CONNECTIONS AND ROOF DRAINS TO THE INTERIOR BUILDING SYSTEMS. BACKFLOW DEVICES (DDCV AND PRZ ASSEMBLIES) & METERS ARE LOCATED INSIDE THE BUILDING.
16. CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
17. CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES. COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.
18. REFER TO THE SITE ELECTRICAL PLANS FOR SPECIFICATIONS OF THE PROPOSED SITE LIGHTING AND ELECTRICAL EQUIPMENT.
19. EXCAVATE DRAINAGE TRENCHES TO FOLLOW PROPOSED STORM SEWER ALIGNMENTS. REFER TO THE UTILITY PLANS FOR LAYOUT AND ELEVATIONS FOR PROPOSED SANITARY SEWER, WATER MAIN, AND OTHER BUILDING UTILITY SERVICE CONNECTIONS. REFER TO THE GRADING PLAN FOR DETAILED SURFACE ELEVATIONS.
20. EXCESS MATERIAL, ABANDONED UTILITY ITEMS, AND OTHER UNUSABLE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF THE CONSTRUCTION SITE.
21. COORDINATE WITH THE PLUMBING PLANS FOR THE LOCATION, SIZE AND ELEVATION OF THE PROPOSED UNDERGROUND ROOF DRAIN CONNECTIONS.
22. WHERE STORM SEWER ROOF DRAINS HAVE LESS THAN 4 FEET OF COVER IN PAVED AREAS OR 3-FEET OF COVER IN LANDSCAPE AREAS, PROVIDE 3-INCH THICK INSULATION A MINIMUM OF 5-FEET IN WIDTH, CENTERED ON THE PIPE.
23. ALL STORM SEWER PIPE JOINTS SHALL BE WATER-TIGHT CONNECTIONS.
24. ALL STORM SEWER PIPE CONNECTIONS TO MANHOLES SHALL BE GASKETED AND WATER TIGHT. BOOTED COUPLERS AT THE STRUCTURE OR A WATER STOP WITH NON-SHRINK GROUT MAY BE USED IN ACCORDANCE WITH LOCAL CODES.
25. CONTRACTOR SHALL AIR TEST ALL STORM SEWER PIPE IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

GRAPHIC SCALE IN FEET
0 50' 100' 200'

NORTH

MISS DIG 811

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	05/01/2026	BIG
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CIP
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GAMMON
GAMMON
BRIAN
6201101
PROFESSIONAL ENGINEER

Brian Gammon

KHA PROJECT 191292003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

UTILITY PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN TOWNSHIP
KALAMAZOO COUNTY
MICHIGAN

SHEET NUMBER
C600

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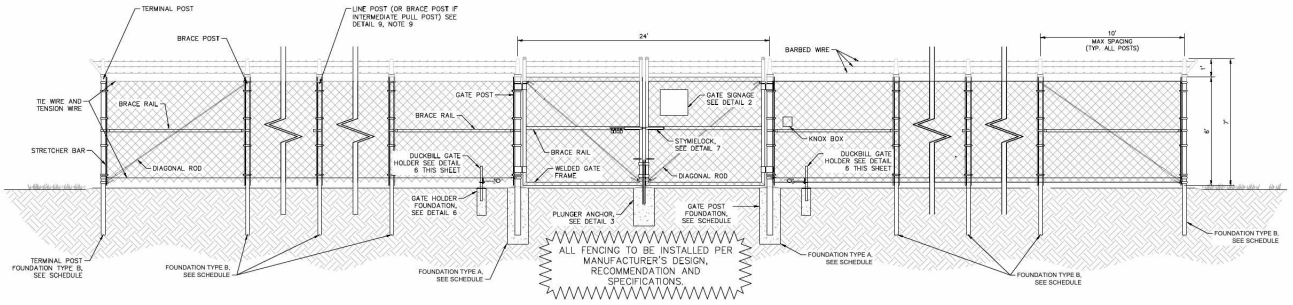
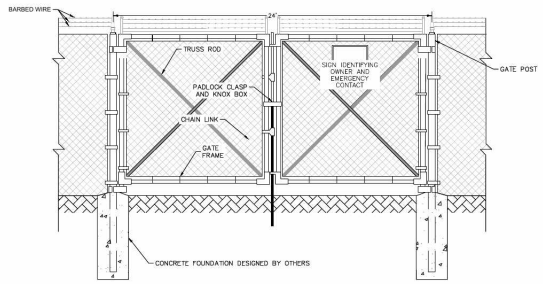


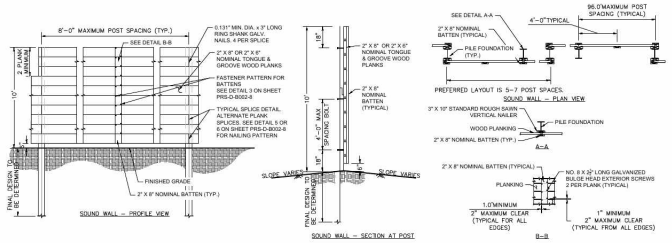
1 **CHAIN LINK FENCE - BARBED WIRE DETAIL**

NO SCALE



2 **DOUBLE SWING GATE DETAIL WITH BARBED WIRE**

NO SCALE



3 **SOUND WALL - FOR REFERENCE ONLY**

NO SCALE

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Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GARNON
BRIAN GARNON
EXPIRES 12/31/2026
EXPIRES 12/31/2026

Brian Garnon

KHA PROJECT 191292003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

CIVIL DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

MISS DIG 811

SHEET NUMBER
C700

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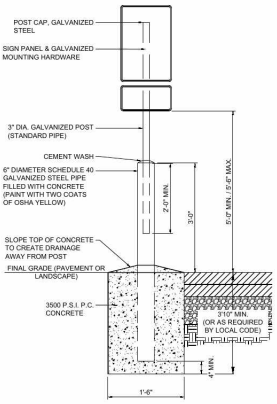
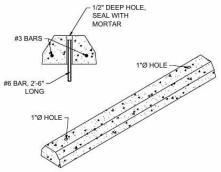
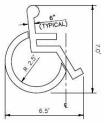


1 **ACCESSIBLE PARKING SIGN IN BOLLARD**
NO SCALE

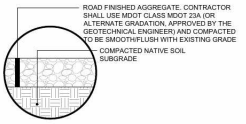


2 **PRECAST WHEEL STOP**
NO SCALE

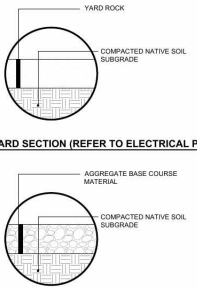


3 **ACCESSIBLE PARKING SYMBOL**
NO SCALE

PAVEMENT SECTIONS SHOWN ARE PROVIDED AS A REFERENCE ONLY. REFER TO GEOTECHNICAL REPORT FOR ALL PAVEMENT, SUBGRADE PREPARATION AND COMPACTION REQUIREMENTS.

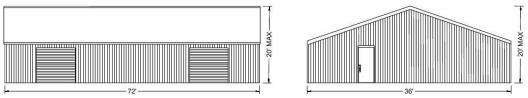


6 **ACCESS ROAD PAVEMENT SECTION**
SCALE: NTS

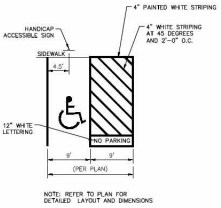


7A **BESS YARD SECTION (REFER TO ELECTRICAL PLANS)**
NO SCALE

7B **TEMPORARY LAYDOWN AREA SECTION**
NO SCALE



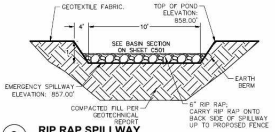
8 **OPERATIONS & MAINTENANCE BUILDING - FOR REFERENCE ONLY**
NO SCALE



NOTE: REFER TO PLAN FOR DETAILED LAYOUT AND DIMENSIONS

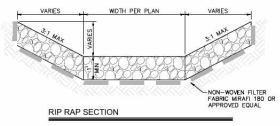
4 **TYPICAL HANDICAP STRIPING**
NO SCALE

5 **HP-3-1218 ADA PARKING SIGN**
NO SCALE



9 **RIP RAP SPILLWAY**
NO SCALE

10 **DETENTION BASIN WARNING SIGN**
NO SCALE



RIP RAP SECTION

11 **ARMORED SWALE**
NO SCALE

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STATE OF MICHIGAN
BRIAN GAMMON
PROFESSIONAL ENGINEER
6201 038 0001
Brian Gammon

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

CIVIL DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CONVENTION TOWNSHIP
MICHIGAN

SHEET NUMBER
C701

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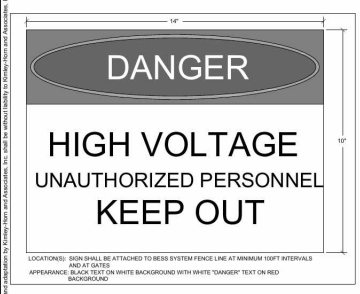
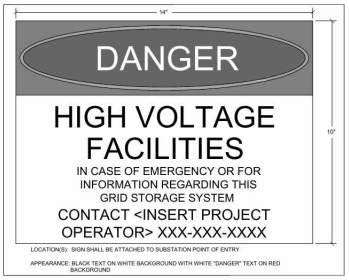


LOCATION(S): SIGN SHALL BE ATTACHED TO BESS SYSTEM FENCE LINE AT MINIMUM 100FT INTERVALS AND AT GATES

APPEARANCE: BLACK TEXT ON WHITE BACKGROUND WITH WHITE "DANGER" TEXT ON RED BACKGROUND

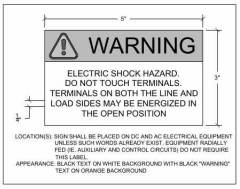


LOCATION(S): SIGN SHALL BE ATTACHED TO SUBSTATION POINT OF ENTRY

APPEARANCE: BLACK TEXT ON WHITE BACKGROUND WITH WHITE "DANGER" TEXT ON RED BACKGROUND

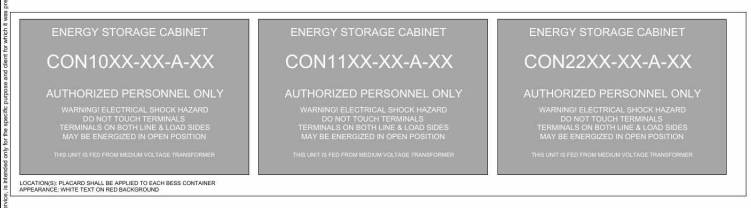
LOCATION(S): SIGN SHALL BE PLACED ON DC AND AC ELECTRICAL EQUIPMENT, INCLUDING DISCONNECTS, INVERTERS, PANELBOARDS, METERS, ETC. UNLESS SUCH WORDS ALREADY EXIST.

APPEARANCE: BLACK TEXT ON WHITE BACKGROUND WITH BLACK "WARNING" TEXT ON ORANGE BACKGROUND



LOCATION(S): SIGN SHALL BE PLACED ON DC AND AC ELECTRICAL EQUIPMENT UNLESS SUCH WORDS ALREADY EXIST. EQUIPMENT RADIALLY FED (IE. AUXILIARY AND CONTROL CIRCUITS) DO NOT REQUIRE THIS LABEL.

APPEARANCE: BLACK TEXT ON WHITE BACKGROUND WITH BLACK "WARNING" TEXT ON ORANGE BACKGROUND

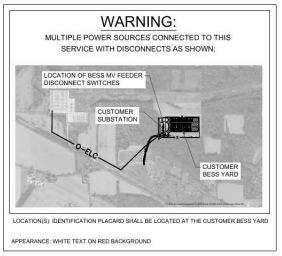


LOCATION(S): PLACARD SHALL BE APPLIED TO EACH BESS CONTAINER

APPEARANCE: WHITE TEXT ON RED BACKGROUND

GENERAL NOTES:

1. PLACARDS AND LABELS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN ACCORDANCE WITH NEC.
2. COMPONENTS IN BATTERY CONTAINERS ARE SUPPLIED FROM THE MANUFACTURER WITH MARKINGS PRE-APPLIED TO MEET THE REQUIREMENTS OF NEC.
3. MARKING IDENTIFIED AS PLACARDS WILL BE ETCHED WITH WHITE GRAPHICS ONTO 1/16" PLASTIC PLACARDS WITH COLORS AS SHOWN. THE PLACARDS WILL BE ATTACHED MECHANICALLY OR WITH DOUBLE-SIDED ADHESIVE TO THE APPROPRIATE COMPONENT ENCLOSURES IN RELEVANT AND CONSPICUOUS LOCATIONS.
4. MARKS IDENTIFIED AS LABELS WILL BE ADHESIVE VINYL LABELS. THOSE SHOWN AS RED SHALL BE REFLECTIVE RED VINYL WITH WHITE LETTERING; THOSE SHOWN AS ORANGE SHALL HAVE AN ORANGE "WARNING" HEADER WITH WHITE BODY AND BLACK TEXT.
5. MARKINGS IDENTIFIED AS SIGNS SHALL BE METAL OR UV-RESISTANT PLASTIC SUITABLE FOR THE EXTERIOR ENVIRONMENT.



LOCATION(S): IDENTIFICATION PLACARD SHALL BE LOCATED AT THE CUSTOMER BESS YARD

APPEARANCE: WHITE TEXT ON RED BACKGROUND

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	05/01/2026	BIG
2	ENTITLEMENT SET	04/10/2026	BIG
1	ENTITLEMENT SET	03/13/2026	BIG
	ENTITLEMENT SET	02/26/2026	BIG

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WALL, NJ 07719, 732-282-0860
WWW.KIMLEY-HORN.COM

Cip
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN GARNON
BRIGNAN
0101101101

Brian Garnon

KHA PROJECT 191250003
DATE 03/26/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BFG

SIGNAGE PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
CHERRY ENERGY STORAGE LLC
CHARLEVOIX TOWNSHIP
MICHIGAN

SHEET NUMBER
C800

MISS DIG 811

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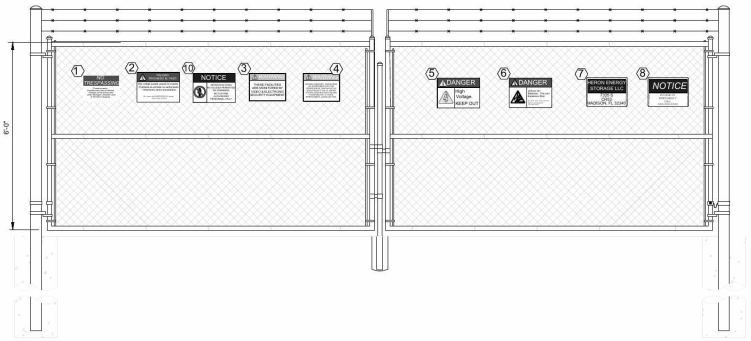
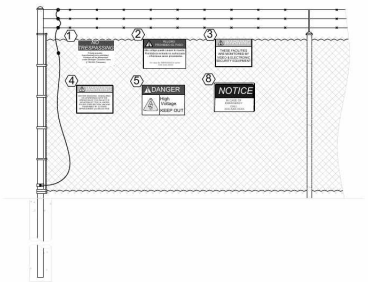


1 VEHICLE GATE FENCE
Scale: N.T.S.



2 CORNER POST FENCE
Scale: N.T.S.

NOTES:
1. THE SIGN DESIGNER OR INSTALLER SHALL ENSURE ALL SIGNS ARE OF DURABLE MATERIAL, FORMATTED CONSISTENTLY IN A HORIZONTAL ORIENTATION. 18"x24" FOR GATE/FENCE SIGNS AND 12"x18" FOR EQUIPMENT/CONTAINER SIGNS. SIGNS FOR ACCESS GATES/FENCE SHALL BE MOUNTED USING GALVANIZED OR STAINLESS STEEL HOG RINGS.
2. REQUIRED SIGNS SHALL BE MAINTAINED VISIBLE, WITHOUT OBSTRUCTIONS. IF SECURITY AND SAFETY SIGNS ARE DAMAGED, WEATHERED, OR MISSING THEY SHALL BE PROMPTLY REPLACED.
3. ARC FLASH STICKERS SHALL BE INSTALLED ON EACH ELECTRICAL EQUIPMENT DOOR OR COVER THAT MAY BE OPENED OR REMOVED FOR MAINTENANCE SERVICE. ALL DOORS ON SWITCHGEAR AND MOTOR CONTROL CENTERS SHALL BE LABELED, EVEN IF OPENING A DOOR DOES NOT EXPOSE UN INSULATED CONDUCTORS.
4. ARC FLASH STICKERS SHALL BE INSTALLED BASED ON ARC FLASH CALCULATIONS. PER SOPR/SMS 301.4, SOPR 272, AND SMS 270. STICKERS ON EQUIPMENT SHALL NOT BE REMOVED OR COVERED.

No.	REVISIONS	DATE	BY
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1	ENTITLEMENT SET	03/13/2026	BIG
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WWW.KIMLEY-HORN.COM

CIP
CopenHagen Infrastructure Partners

KHA PROJECT 191250003
DATE 02/26/2026
SCALE AS SHOWN
DESIGNED BY JLL
DRAWN BY CEB
CHECKED BY BPG

SIGNAGE PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN TOWNSHIP
KALAMAZOO COUNTY
MICHIGAN

SHEET NUMBER
C801

MISS DIG 811

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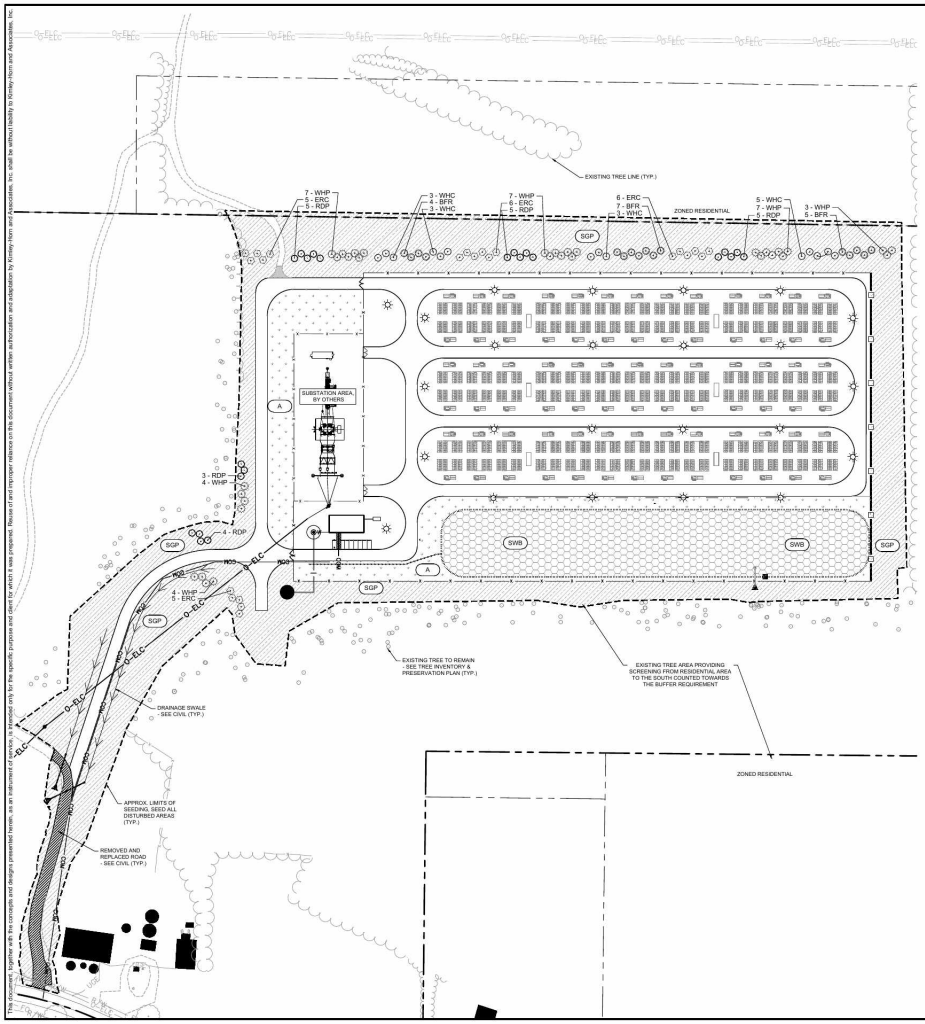

LANDSCAPE SUMMARY

BUFFER REQUIREMENTS

REQUIREMENT:	WHERE THE PROPERTY ABUTS A RESIDENTIAL DISTRICT OR USE, A GREENBELT, A BERM, OR A BUFFER STRIP IS REQUIRED TO PROVIDE FULL SCREENING
BUFFER STRIP REQUIRED:	MINIMUM 10' WIDE, EVERGREEN TREES STAGGERED, AND / OR OTHER VEGETATION AND GROUNDCOVER
PROVIDED:	MINIMUM 10' WIDE, EVERGREEN TREES STAGGERED, AND / OR OTHER VEGETATION AND GROUNDCOVER

LANDSCAPE LEGEND

- EDGER (TYP.)
- APPROXIMATE LIMITS OF SEEDING / SEED ALL DISTURBED AREAS (TYP.)
- SEED EDGE (TYP.)
- ROCK MULCH (TYP.)

SEEDING KEYNOTES

- A — SEED WITH MDOT CLASS A MUNICIPAL LAWN SEED MIX, OR APPROVED EQUAL (TYP.)
- SGP — SEED WITH NATIVE CONNECTIONS BASIC SHORT GRASS PRAIRIE SEED MIX, OR APPROVED EQUAL (TYP.)
- SWB — SEED WITH NATIVE CONNECTIONS STORMWATER BASIN SEED MIX, OR APPROVED EQUAL (TYP.)

PLANT SCHEDULE

SYMBOL	CODE	QTY	COMMON NAME	BOTANICAL NAME	CAL	HT
CONIFEROUS TREE						
	BFR	16	BALSAM FIR	ABIES BALSAMEA	B & B	6' HT.
	ERC	22	EASTERN RED CEDAR	JUNIPERUS VIRGINIANA	B & B	6' HT.
	RDP	22	RED PINE	PINUS RESINOSA	B & B	6' HT.
	WHC	14	WHITE CEDAR	THUJA OCCIDENTALIS 'WHITE CEDAR'	B & B	6' HT.
	WHP	32	WHITE PINE	PINUS STROBUS	B & B	5' HT.

NOTE:
IN THE EVENT OF A DISCREPANCY BETWEEN PLAN AND LIST QUANTITIES, THE GREATER NUMBER OF PLANTINGS SHALL BE REQUIRED.

ABBREVIATIONS:
B&B = BALLED AND BURLAPPED CAL. = CALIPER HT. = HEIGHT MIN. = MINIMUM O.C. = ON CENTER SP. = SPECIES
QTY. = QUANTITY

GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

MISS DIG 811

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CHARTER TOWNSHIP MICHIGAN

LANDSCAPE PLAN

SHEET NUMBER
L100

KHA PROJECT 191250003
DATE 02/26/2020
SCAL. AS SHOWN
DESIGNED BY CFK
DRAWN BY CFK
CHECKED BY RAH

Copenhagen Infrastructure Partners

Kimley»Horn
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FARMINGTON HILLS, MI 48335
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STATE OF MICHIGAN
CHRISTOPHER A. HAYES
LICENSED
LANDSCAPE ARCHITECT
No. 1301006978

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	05/01/2020	BIG
2	ENTITLEMENT SET	04/10/2020	BIG
1	ENTITLEMENT SET	03/26/2020	BIG
	ENTITLEMENT SET	02/26/2020	BIG

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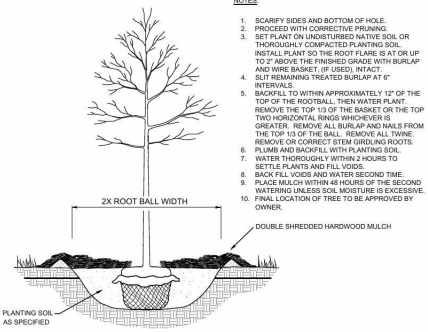

NOTES:

1. SCARIFY SIDES AND BOTTOM OF HOLE.
2. PROCEED WITH CORRECTIVE PRUNING.
3. SET PLANT ON UNDISTURBED NATIVE SOIL OR THOROUGHLY COMPACTED PLANTING SOIL. INSTALL PLANT SO THE ROOT FLARE IS AT OR UP TO 2" ABOVE THE FINISHED GRADE WITH BURLAP AND WIRE BASKET, (IF USED), INTACT.
4. SLIT REMAINING TREATED BURLAP AT 6" INTERVALS.
5. BACKFILL TO WITHIN APPROXIMATELY 12" OF THE TOP OF THE ROOTBALL. THEN WATER PLANT. REMOVE THE TOP 1/3 OF THE BASKET OR THE TOP TWO HORIZONTAL RINGS WHICHEVER IS GREATER. REMOVE ALL BURLAP AND NAILS FROM THE TOP 1/3 OF THE BALL. REMOVE ALL TWINE. REMOVE OR CORRECT STEM GIRDLING ROOTS.
6. PLUMB AND BACKFILL WITH PLANTING SOIL.
7. WATER THOROUGHLY WITHIN 2 HOURS TO SETTLE PLANTS AND FILL VOIDS.
8. BACK FILL VOIDS AND WATER SECOND TIME.
9. PLACE MULCH WITHIN 48 HOURS OF THE SECOND WATERING UNLESS SOIL MOISTURE IS EXCESSIVE.
10. FINAL LOCATION OF TREE TO BE APPROVED BY OWNER.

1 TREE PLANTING DETAIL

SCALE: N.T.S.

L101

MDOT CLASS A SEED MIX

SEED	MINIMUM PURITY	MINIMUM GERMINATION	MIXTURE
CREEPING RED FESCUE	98.5%	85%	40%
KENTUCKY BLUE GRASS	98.5%	75%	30%
PERENNIAL RYEGRASS	99.5%	85%	30%

LANDSCAPE NOTES

PLANTING

1. CONTACT COMMON GROUND ALLIANCE AT 811 OR CALL811.COM TO VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY PLANTS OR LANDSCAPE MATERIAL.
2. ACTUAL LOCATION OF PLANT MATERIAL IS SUBJECT TO FIELD AND SITE CONDITIONS.
3. NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. ALL SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO SUBMISSION OF ANY BID AND/OR QUOTE BY THE LANDSCAPE CONTRACTOR.
5. PROVIDE TWO YEAR GUARANTEE OF ALL PLANT MATERIALS. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNER'S WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
6. ALL PLANTS TO BE SPECIMEN GRADE, MICHIGAN-GROWN AND/OR HARDY. SPECIMEN GRADE SHALL ADHERE TO, BUT IS NOT LIMITED BY, THE FOLLOWING STANDARDS:
   ALL PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, SCARS, ETC.
   ALL PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES.
   ALL PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES.
   ALL PLANTS SHALL HAVE HEAVY, HEALTHY BRANCHING AND LEAFING.
   CONIFEROUS TREES SHALL HAVE AN ESTABLISHED MAIN LEADER AND A HEIGHT TO WIDTH RATIO OF NO LESS THAN 5:3.
7. PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
8. PLANTS TO BE INSTALLED AS PER MDOT & ANSI STANDARD PLANTING PRACTICES.
9. INSTALL PLANTS BY PLANT INSTALLATION PERIOD INFORMATION IN THE LATEST STANDARD PLANTING DETAILS FROM MDOT. PLANTINGS BEFORE OR AFTER THESE DATES ARE DONE AT RISK.
10. PLANTS SHALL BE IMMEDIATELY PLANTED UPON ARRIVAL AT SITE. PROPERLY HEEL-IN MATERIALS IF NECESSARY. TEMPORARY ONLY.
11. PRIOR TO PLANTING, FIELD VERIFY THAT THE ROOT COLLAR/ROOT FLARE IS LOCATED AT THE TOP OF THE BALLED & BURLAP TREE. IF THIS IS NOT THE CASE, SOIL SHALL BE REMOVED DOWN TO THE ROOT COLLAR/ROOT FLARE. WHEN THE BALLED & BURLAP TREE IS PLANTED, THE ROOT COLLAR/ROOT FLARE SHALL BE EVEN OR SLIGHTLY ABOVE FINISHED GRADE.
12. OPEN TOP OF BURLAP ON BB MATERIALS; REMOVE POT ON POTTED PLANTS; SPLIT AND BREAK APART PEAT POTS.
13. PRUNE PLANTS AS NECESSARY - PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
14. WRAP ALL SMOOTH-BARKED TREES - FASTEN TOP AND BOTTOM. REMOVE BY APRIL 1ST.
15. STAKING OF TREES AS REQUIRED; REPOSITION, PLUMB AND STAKE IF NOT PLUMB AFTER ONE YEAR.

SOIL

16. TOPSOIL SHALL BE LOCAL, FERTILE AGRICULTURAL SOIL FREE OF SUBSOILS, ROCKS LARGER THAN ONE INCH, CLAYS, PLANTS, WEEDS, ROOTS AND OTHER IMPURITIES. PH VALUE TO BE BETWEEN 5.4 AND 7.0. REMOVE DEBRIS AND WEEDS FROM SUBSOIL. MINIMUM 4" DEPTH TOPSOIL FOR ALL LAWN GRASS AREAS AND 12" DEPTH TOPSOIL FOR TREES, SHRUBS AND PERENNIALS. LIGHTLY COMPACT TOPSOIL AFTER PLACEMENT AND PROHIBIT CONSTRUCTION TRAFFIC FROM AREAS WITH TOPSOIL.
17. THE NEED FOR SOIL AMENDMENTS SHALL BE DETERMINED UPON SITE SOIL CONDITIONS PRIOR TO PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT FOR THE NEED OF ANY SOIL AMENDMENTS.

MULCH

18. MULCH TO BE AT ALL TREE, SHRUB, PERENNIAL, AND MAINTENANCE AREAS. TREE AND SHRUB PLANTING BEDS SHALL HAVE 4" DEPTH OF DOUBLE SHREDDED HARDWOOD MULCH. DOUBLE SHREDDED HARDWOOD MULCH TO BE USED AROUND ALL PLANTS WITHIN TURF AREAS. PERENNIAL AND ORNAMENTAL GRASS BEDS SHALL HAVE 2" DEPTH DOUBLE SHREDDED HARDWOOD MULCH. MULCH TO BE FREE OF DELETERIOUS MATERIAL AND NATURAL IN COLOR (DYE-FREE), OR APPROVED EQUAL. ROCK MULCH TO BE TRAP ROCK, BUFF LIMESTONE, RIVER ROCK, 1 1/2" DIAMETER, AT MINIMUM 3" DEPTH, OR APPROVED EQUAL. APPLY PREMEMERGENT HERBICIDE PRIOR TO MULCH PLACEMENT PER MANUFACTURER RECOMMENDATIONS. USE PREEN OR PRE-APPROVED EQUAL. ROCK MULCH TO BE ON COMMERCIAL GRADE FILTER FABRIC, BY TYPAR, OR APPROVED EQUAL WITH NO EXPOSURE. MULCH AND FABRIC TO BE APPROVED BY OWNER PRIOR TO INSTALLATION. MULCH TO MATCH EXISTING CONDITIONS (WHERE APPLICABLE).

SEED

19. ALL DISTURBED AREAS TO BE SEEDED, UNLESS OTHERWISE NOTED. SOD TO BE STANDARD MICHIGAN GROWN AND HARDY BLUEGRASS MIX, FREE OF LAWN WEEDS. ALL TOPSOIL AREAS TO BE RAKED TO REMOVE DEBRIS AND ENSURE DRAINAGE. SLOPES OF 3:1 OR GREATER SHALL BE STAKED. SEED AS SPECIFIED, PER MDOT SPECIFICATIONS AND SUPPLIER/MANUFACTURER RECOMMENDATIONS. IF NOT INDICATED ON LANDSCAPE PLAN, SEE EROSION CONTROL PLAN.

ESTABLISHMENT

20. PROVIDE NECESSARY WATERING OF PLANT MATERIALS UNTIL THE PLANT IS FULLY ESTABLISHED OR IRRIGATION SYSTEM IS OPERATIONAL. OWNER WILL NOT PROVIDE WATER FOR CONTRACTOR.
21. REPAIR, REPLACE, OR PROVIDE SOD/SEED AS REQUIRED FOR ANY ROADWAY BOULEVARD AREAS ADJACENT TO THE SITE DISTURBED DURING CONSTRUCTION.

WARRANTY

22. REPAIR ALL DAMAGE TO PROPERTY FROM PLANTING OPERATIONS AT NO COST TO OWNER.
23. MAINTAIN TREES, SHRUBS, SEED AND OTHER PLANTS UNTIL PROJECT COMPLETION, BUT IN NO CASE, LESS THAN FOLLOWING PERIOD: 1 YEAR AFTER PROJECT COMPLETION. MAINTAIN TREES, SHRUBS, SEED AND OTHER PLANTS BY PRUNING, CULTIVATING, AND WEEDING AS REQUIRED FOR HEALTHY GROWTH. RESTORE PLANTING SAUCERS. TIGHTEN AND REPAIR STAKE AND GUY SUPPORTS AND RESET TREES AND SHRUBS TO PROPER GRADES OR VERTICAL POSITION AS REQUIRED. RESTORE OR REPLACE DAMAGED WRAPPINGS. SPRAY AS REQUIRED TO KEEP TREES AND SHRUBS FREE OF INSECTS AND DISEASE. REPLENISH MULCH TO THE REQUIRED DEPTH. MAINTAIN LAWNS FOR 60 DAYS AFTER INSTALLING SOD INCLUDING MOWING WHEN SOD RECITES 4" IN HEIGHT. WEED PLANTING BEDS AND MULCH SAUCERS AT MINIMUM ONCE A MONTH DURING THE GROWING SEASON. PROVIDE A MONTHLY REPORT TO THE OWNER ON WEEDING AND OTHER MAINTENANCE RESPONSIBILITIES.

Native Connections

3815 N Westnedge Ave, Kalamazoo, MI 49004
(P) 269.459.6900
info@nativeconnections.net
www.nativeconnections.net

Basic Shortgrass Prairie Mix

This is the economy version of our Dry Shortgrass Prairie Mix. Though the diversity and seed density are greatly reduced, this is a great starter prairie where a low stature on dry soils is needed or desired.

Total Seeding Rate: 31.35 lbs per acre
4 lbs grasses + 2.25 lbs forbs + 25 lbs nurse crop
43 native seeds per sq ft

Call, e-mail or visit our website for pricing.

Grasses		PLS Oz/acre	Seeds/sq ft
Bouteloua curtipendula	Side-oats Grama	22.00	3.03
Carex bicolor	Bicolor Bunch Sedge	4.00	1.61
Elymus canadensis	Canada Wild Rye	8.00	0.51
Koeleria macrantha	June Grass	0.25	1.19
Schizachyrium scoparium	Little Bluestem	32.00	11.02
Sporobolus heterolepis	Prairie Dropseed	0.25	0.09
	Total Grasses	**66.50**	**16.97**

Forbs		PLS Oz/acre	Seeds/sq ft
Asclepias tuberosa	Butterfly Milkweed	0.50	0.05
Aster sparsus (A. oolentangiensis)	Arrow-leaved Aster	0.50	0.92
Cassia fasciculata (Chamaecrista f.)	Partridge Pea	8.00	0.60
Ceanothus herbaceus	Lance-leaf Ceanothus	7.00	3.21
Dalea purpurea (Petalostemon p.)	Purple Prairie Clover	4.00	1.65
Liatris aspera	Rough Blazing Star	0.50	0.07
Monarda fistulosa	Wild Bergamot	0.50	0.80
Penstemon digitalis	Foxglove Beardtongue	0.50	1.49
Potentilla arguta (Drymarilla a.)	Prairie Cinquefoil	0.50	2.64
Ratibida pinnata	Yellow Coneflower	0.70	0.48
Rudbeckia hirta	Black-eyed Susan	5.25	11.09
Solidago nemoralis	Old-field Goldenrod	0.25	1.73
Solidago rigida	Stiff Goldenrod	0.50	0.56
Verbena stricta	Hoary Vervain	0.50	0.86
	Total Forbs	**30.00**	**26.66**

Temporary Grass Cover		Oz/acre	Seeds/sq ft
Lolium multiflorum	Annual Ryegrass	80.00	24.70
Avena sativa	Seed Oats	320.00	7.35
	Total Temp Grasses	**400.00**	**32.14**

Native Connections

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Stormwater Mix

This mix is designed to withstand the low water quality and highly variable conditions associated with stormwater features. Most of the species are salt tolerant and most species will do well in mesic to wet hydrology with others filling in the wettest and driest ends of the spectrum. The high native seed count and heavy annual nurse crop in this mix ensure full and aggressive establishment.

Total Seeding Rate: 36.66 lbs per acre
3.13 lbs grasses + 2.85 lbs forbs + 30 lbs nurse crop
113.11 native seeds per sq ft

Call, email or visit our website for pricing.

Grasses, Sedges & Rushes		PLS Oz/acre	Seeds/sq ft
Andropogon gerardii	Big Bluestem	3.00	0.90
Carex sylvatoides	Fox Sedge	2.00	4.58
Elymus riparius	Great Spike Rush	0.40	0.47
Elymus canadensis	Canada Wild Rye	12.00	1.430
Elymus virginicus	Virginia Wild Rye	12.00	1.16
Glyceria striata	Fowl Manna Grass	1.00	4.410
Juncus effusus	Soft Rush	0.40	9.18
Juncus tenuis	Path Rush	0.40	8.16
Panicum virgatum	Switchgrass	4.00	1.29
Schizachyrium scoparium	Little Bluestem	8.00	2.760
Scirpus cyperinus	Wool Grass	0.40	15.610
Scirpus validus (S. tabernaemontani)	Soft-stem Bulrush	1.00	0.85
Sorghastrum nutans	Indian Grass	4.00	0.83
Spartina pectinata	Prairie Cordgrass	2.00	0.73
	Total Grasses	**39.00**	**52.74**

Forbs		PLS Oz/acre	Seeds/sq ft
Allium cernuum	Nodding Wild Onion	2.00	9.38
Asclepias incarnata	Swamp Milkweed	2.40	0.26
Asclepias tuberosa	Butterfly Milkweed	2.40	0.24
Bidens cernua	Nodding Bur Marigold	0.60	0.39
Boehmeria cylindrica	Flat-topped Aster	0.40	1.60
Eupatorium perfoliatum	False Boneset	0.40	0.51
Eutrochium purpureum	Sweet Joe-Pye Weed	1.20	1.16
Helianthus angustifolia	Sneezeweed	0.80	2.39
Helopsis helianthoides	False sunflower	4.00	0.58
Lobelia siphilitica	Great Blue Lobelia	0.40	4.68
Mimulus ringens	Monkey Flower	0.40	21.12
Monarda fistulosa	Wild Bergamot	0.80	1.29
Penstemon digitalis	Foxglove Beardtongue	0.50	1.49
Physostegia virginiana	Obedient Plant	0.40	0.10
Pycnanthemum virginianum	Pennsylvania Smartweed	4.00	1.19
Pycnanthemum virginianum	Mountain mint	0.40	2.02
Ratibida pinnata	Yellow Coneflower	1.60	1.10
Rudbeckia hirta	Black-eyed Susan	6.00	12.67
Senna hebecarpa	Wild Senna	4.00	0.13
Solidago rigida/ris	Stiff Goldenrod	0.50	0.56
Symphyotrichum novae-angliae	New England Aster	0.40	0.61
Verbena hastata	Blue Vervain	1.60	3.42
Zizia aurea	Golden Alexander	2.00	2.51
	Total Forbs	**45.60**	**68.38**

Temporary Grass Cover		Oz/acre	Seeds/sq ft
Lolium multiflorum	Annual Ryegrass	112.00	34.71
Avena sativa	Seed Oats	352.00	8.40
	Total Temp Grasses	**464.00**	**43.10**

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	05/01/2026	BIG
2	ENTITLEMENT SET	04/10/2026	BIG
1	ENTITLEMENT SET	03/13/2026	BIG
	ENTITLEMENT SET	02/06/2026	BIG

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WWW.KIMLEY-HORN.COM

CIP
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
REGISTERED
MICHAEL J. ROSS
No. 6201058
LICENSED LANDSCAPE ARCHITECT

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS DESCRIBED
DESIGNED BY RHA
DRAWN BY RHA
CHECKED BY RAH

LANDSCAPE DETAILS

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN CHARTER TOWNSHIP MICHIGAN

MISS DIG 811

SHEET NUMBER
L101

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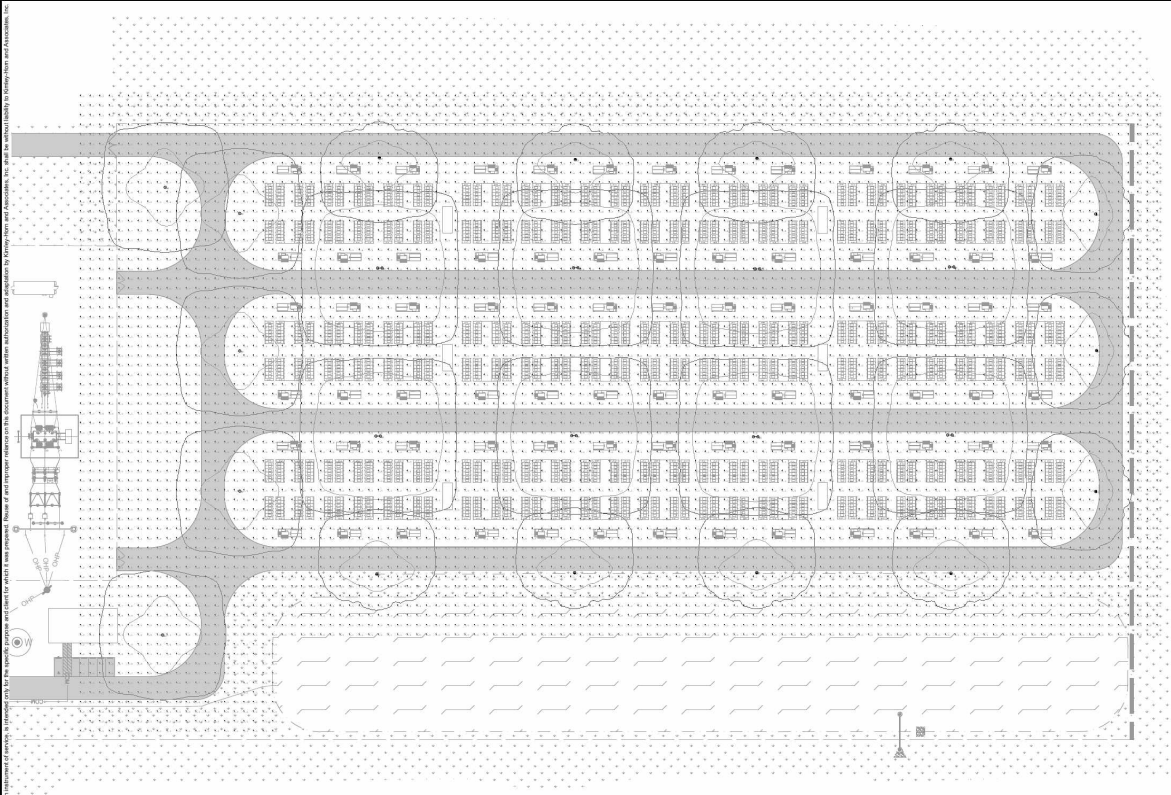
K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_MI\2 Design\CAD\Plan Sheets\L1 LANDSCAPE DETAILS.DWG July 15, 2026 - 11:43am



GRAPHIC SCALE IN FEET
0 25 50 100

GENERAL NOTES

1. PROPOSED POLE-MOUNTED LUMINAIRES SHALL BE MOUNTED 25 FT ABOVE FINISHED GRADE AND INSTALLED ON A CONCRETE FOUNDATION EXTENDING ABOVE FINISHED GRADE. POLE MOUNTING HEIGHT CHOSEN TO COMPLY WITH THE TOWNSHIP OF GUN PLAIN CHARTER, MICHIGAN JURISDICTIONAL STANDARDS.
2. CALCULATED VALUES ARE DERIVED THROUGH A COMPUTER BASED MODEL WITH LIGHT FIXTURE DATA AS SUPPLIED BY MANUFACTURER THROUGH IES FILES.
3. ANY DEVIATION FROM SPECIFIED FIXTURE MODELS AND MOUNTING HEIGHTS IN THIS EXHIBIT WILL DISCOUNT THE VALIDITY OF THESE CALCULATIONS.
4. TARGET ILLUMINATION LEVELS ARE BASED ON IES RECOMMENDATIONS FOR LOW-ACTIVITY INDUSTRIAL OUTDOOR AREAS, CORRESPONDING TO A TARGET AVERAGE ILLUMINANCE OF 0.5 - 1.0 FC
5. NO EXCESS OF 0.2 FOOT-CANDLE MEASURED AT THE PROPERTY LINE.
6. ALL C LIGHT FIXTURES SHALL INCLUDE EXTERNAL GLARE SHIELD AND NOT CREATE GLARE.
7. ALL LUMINAIRE SYMBOLS ARE DIAGRAMMATIC ONLY. CONTRACTOR TO FIELD COORDINATE EXACT LOCATIONS AND SETBACKS AGAINST UNDERGROUND UTILITY AND OTHER OBSTRUCTIONS.
8. ALL PROPOSED LUMINAIRES SHALL BE DARK SKY COMPLIANT AND SHALL HAVE A CORRELATED COLOR TEMPERATURE (CCT) OF 3000K OR LOWER. LUMINAIRES SHALL BE DESIGNED AND INSTALLED TO MINIMIZE UPLIGHT, GLARE, AND LIGHT TRESPASS IN ACCORDANCE WITH APPLICABLE LOCAL ORDINANCES.

LIGHT FIXTURE SCHEDULE

FIXTURE TAG	SYMBOL	QTY	DESCRIPTION	ARRANGEMENT	LLF	LUMENS	LUMINAIRE WATTS	MOUNTING HEIGHT(FT)
A1		5	DSX1 LED P7 30K 70CRI T5W	SINGLE	0.9	22609	184	25
B1		8	DSX1 LED P7 30K 70CRI T5W	BACK-TO-BACK	0.9	22609	184	25
C1		11	DSX1 LED P7 30K 70CRI T5W EGS	SINGLE	0.9	15626	184	25

CALCULATION SUMMARY

LABEL	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
SITE CALCS	ILLUMINANCE	FC	0.64	3.30	0.00	N/A	N/A
ISLAND_1	ILLUMINANCE	FC	0.80	3.30	0.00	N/A	N/A
ISLAND_2	ILLUMINANCE	FC	0.75	2.30	0.00	N/A	N/A
ISLAND_3	ILLUMINANCE	FC	0.81	3.10	0.00	N/A	N/A
ROADWAY	ILLUMINANCE	FC	1.81	2.90	0.40	4.53	7.25

LIGHT DISTRIBUTION AND RANGE (FC)

_____	0.5 - 1.0
_____	> 1.0

D-Series Size 1
LED Area Luminaire
Specifications
Ordering Information
Accessories
Mounting
Optics
Performance Data
Control Options
Photometry
Product warranty
Shop Area Lighting
Area Lighting
Architectural Wall Sconces
Wall Mounting
Ordering
Accessories
Mounting
Optics
Performance Data
Control Options
Photometry
External Glare Shield (EGS)
Visor Mounting Hardware
MOUNTING ORIENTATION
Top View
Top View
Note:
Visor Mounting Hardware
Visor Mounting Hardware
DSX1 Area Luminaire - EPA
Notes
Visor Mounting Hardware
Visor Mounting Hardware
Visor Mounting Hardware

LEGEND

- PROPERTY LINE
- TREE TO REMAIN
- TREE TO BE REMOVED
- EXISTING VEGETATION EDGE
- LIMITS OF DISTURBANCE
- TP — TREE PROTECTION FENCE

TREE MITIGATION DATA

TOTAL SIGNIFICANT TREES ON SITE: 443 TREES (7,082 INCHES)
TOTAL SIGNIFICANT TREES REMOVED: 221 TREES (3,728INCHES)
TOTAL SIGNIFICANT TREES SAVED: 222 TREES (3,354 INCHES)

NOTE: SIGNIFICANT TREES ARE ALL TREES 12 INCHES OR GREATER

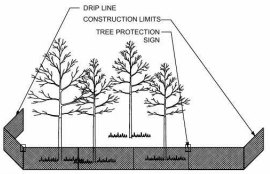
TREE PROTECTION NOTES

1. PRUNING WILL BE DONE BY PROFESSIONALS DURING APPROPRIATE PRUNING SEASON.
2. NO STORAGE OF MATERIALS, OPERATION OF MACHINERY, OR DEVELOPMENT OF ANY SORT WILL OCCUR WITHIN THE FENCE-LINE WITHOUT APPROVAL IN WRITING FROM TOWNSHIP.
3. SITE GRADING TO BE DONE ONLY AFTER PROTECTIVE MEASURES HAVE BEEN TAKEN, TOWNSHIP HAS APPROVED FENCING LOCATIONS, AND ALL CONTRACTORS HAVE BEEN BRIEFED ON TREE PRESERVATION TECHNIQUES.
4. EXISTING TREES TO REMAIN OR REMOVED TO BE CLEARLY IDENTIFIED, WITHIN DISTURBANCE LIMITS AND 10' OUTSIDE OF THE DISTURBANCE LIMITS.
5. TREE PRESERVATION TO BE APPROVED BY OWNER AND PER LOCAL GOVERNMENTAL AUTHORITY.

KEYNOTE LEGEND

- (A) EXISTING TREE TO BE SAVED (TYP.)
- (B) EXISTING TREE TO BE REMOVED (TYP.)
- (C) TREE PROTECTION FENCE (SEE DETAIL) (TYP.)

NOTE: ONLY SIGNIFICANT TREES IN THE SUBJECT PROPERTY SHOWN ON PLAN/ INVENTORY.



FURNISH AND INSTALL TEMPORARY FENCE AT THE TREE'S DRIPLINE OR CONSTRUCTION LIMITS AS SPECIFIED, PRIOR TO ANY CONSTRUCTION. WHEN POSSIBLE PLACE FENCE 25 FEET BEYOND THE DRIP LINE. PLACE PROTECTION SIGNS ALONG FENCE AT 20' INTERVALS.

1 TEMPORARY TREE PROTECTION FENCE PLACEMENT
SCALE: N.T.S. TP201

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

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Cip
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
CHRISTOPHER FRANCIS KOSTER
LICENSED
LANDSCAPE ARCHITECT
No. 1301001918

KHA PROJECT 191250003
DATE 02/06/2026
SCALE AS SHOWN
DESIGNED BY CFK
DRAWN BY CFK
CHECKED BY RAH

TREE INVENTORY & PRESERVATION PLAN

ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC

GUN PLAIN CHARTER TOWNSHIP
MICHIGAN

SHEET NUMBER
TP201

MISS DIG 811

K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_MI\2 Design\CAD\PlanSheets\L1-TREE INVENTORY AND PRESERVATION PLAN.dwg July 15, 2026 - 4:29pm
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

TAG #	COMMON NAME	DBH	CONDITION	STATUS
1	American Elm	13	Good	SAVED
2	White Ash	14	Good	SAVED
3	Oak	18	Good	SAVED
4	Red Maple	18	Good	SAVED
5	Black Cherry	15	Good	SAVED
6	Black Oak	26	Good	REMOVED
7	Black Oak	14	Good	REMOVED
8	Black Oak	24	Good	REMOVED
9	American Elm	35	Good	REMOVED
10	White Oak	40	Good	REMOVED
11	Black Oak	15	Good	SAVED
12	Black Oak	20	Good	SAVED
13	Black Oak	12	Good	SAVED
14	Black Oak	21	Good	SAVED
15	Black Oak	17	Good	SAVED
16	White Oak	16	Good	SAVED
17	White Oak	14	Good	SAVED
18	Red Maple	17	Good	SAVED
19	Black Oak	26	Good	SAVED
20	Black Oak	17	Good	SAVED
21	American Basswood	12	Good	SAVED
22	Black Walnut	23	Good	SAVED
23	Elm	12	Good	SAVED
24	Elm	12	Good	SAVED
25	Beech	12	Good	SAVED
26	Black Walnut	16	Good	SAVED
27	Black Oak	13	Good	REMOVED
28	Beech	12	Good	SAVED
29	Slippery Elm	20	Good	SAVED
30	Beech	15	Good	SAVED
31	American Beech	13	Good	SAVED
32	American Elm	15	Good	SAVED
33	Black Oak	15	Good	SAVED
34	Black Oak	14	Good	SAVED
35	Black Oak	24	Good	REMOVED
36	Black Oak	12	Good	REMOVED
37	White Oak	15	Good	SAVED
38	White Ash	18	Good	SAVED
39	Black Oak	14	Good	SAVED
40	Black Oak	22	Good	SAVED
41	White Oak	35	Good	SAVED
42	Chestnut	15	Good	REMOVED
43	Northern Red Oak	14	Good	REMOVED
44	Black Oak	14	Good	SAVED
45	Oak	14	Good	REMOVED
46	Black Oak	13	Good	SAVED
47	Pignut Hickory	13	Good	REMOVED
48	Black Oak	22	Good	REMOVED
49	American Elm	12	Good	REMOVED
50	Eastern Red Cedar	16	Good	SAVED
51	Black Oak	44	Good	REMOVED
52	Slippery Elm	17	Good	SAVED
53	Black Oak	21	Good	SAVED
54	Black Oak	15	Good	REMOVED
55	White Oak	12	Good	SAVED
56	White Oak	12	Good	SAVED
57	Black Oak	22	Good	SAVED
58	Black Oak	13	Good	REMOVED
59	Black Walnut	12	Good	SAVED
60	Black Oak	14	Good	SAVED
61	Black Cherry	14	Good	SAVED
62	Black Walnut	12	Good	SAVED
63	Black Cherry	12	Good	SAVED
64	Black Oak	13	Good	SAVED
65	Black Oak	14	Good	SAVED
66	Willow	22	Good	SAVED
67	Oak	14	Good	SAVED
68	Black Walnut	16	Good	SAVED
69	Walnut	12	Good	SAVED
70	Sugar Maple	12	Good	SAVED
71	Black Walnut	12	Good	SAVED
72	Black Walnut	14	Good	SAVED
73	American Elm	12	Good	SAVED
74	Black Oak	14	Good	SAVED
75	Black Cherry	18	Good	SAVED
76	Black Walnut	15	Good	SAVED
77	American Elm	12	Good	SAVED
78	American Elm	12	Good	SAVED
79	Black Walnut	15	Good	SAVED
80	Black Cherry	12	Good	SAVED
81	American Elm	12	Good	SAVED
82	Black Walnut	30	Good	SAVED
83	Black Oak	16	Good	SAVED
84	Mulberry	26	Good	SAVED
85	Black Oak	17	Good	REMOVED
86	Black Oak	12	Good	REMOVED
87	Willow	60	Good	REMOVED
88	American Elm	12	Good	REMOVED
89	Black Oak	18	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
90	Black Walnut	20	Good	REMOVED
91	American Hophornbeam	12	Good	REMOVED
92	Beech	14	Good	REMOVED
93	Black Cherry	14	Good	REMOVED
94	American Elm	17	Good	REMOVED
95	Black Oak	14	Good	REMOVED
96	American Elm	12	Good	REMOVED
97	American Elm	18	Good	REMOVED
98	American Elm	12	Good	REMOVED
99	American Elm	12	Good	REMOVED
100	Beech	14	Good	REMOVED
101	Black Walnut	14	Good	REMOVED
102	American Elm	12	Good	REMOVED
103	Northern Red Oak	12	Good	SAVED
104	Black Ash	12	Good	SAVED
105	Black Cherry	12	Good	SAVED
106	Hickory	14	Good	SAVED
107	Black Cherry	12	Good	SAVED
108	Black Cherry	12	Good	SAVED
109	American Elm	16	Good	SAVED
110	American Elm	12	Good	SAVED
111	Black Cherry	16	Good	SAVED
112	Beech	12	Good	SAVED
113	Sassafras	14	Good	SAVED
114	Black Oak	18	Good	SAVED
115	Black Cherry	12	Good	SAVED
116	Sassafras	12	Good	SAVED
117	Sassafras	12	Good	SAVED
118	Black Cherry	18	Good	SAVED
119	Black Cherry	30	Good	SAVED
120	Black Cherry	14	Good	SAVED
121	Sassafras	12	Good	SAVED
122	Sugar Maple	18	Good	SAVED
123	Sassafras	14	Good	SAVED
124	Black Cherry	15	Good	SAVED
125	Black Cherry	12	Good	REMOVED
126	Black Cherry	16	Good	SAVED
127	Sassafras	12	Good	SAVED
128	Northern Red Oak	14	Good	SAVED
129	Sassafras	12	Good	SAVED
130	Black Cherry	21	Good	SAVED
131	Sassafras	14	Good	REMOVED
132	Sassafras	17	Good	REMOVED
133	Sassafras	12	Good	SAVED
134	Sassafras	14	Good	SAVED
135	Sassafras	12	Good	SAVED
136	Sassafras	15	Good	SAVED
137	Sassafras	15	Good	SAVED
138	Sassafras	12	Good	REMOVED
139	Sassafras	12	Good	SAVED
140	Sassafras	12	Good	SAVED
141	Sassafras	15	Good	SAVED
142	Black Cherry	12	Good	SAVED
143	Mulberry	16	Good	REMOVED
144	Black Cherry	12	Good	SAVED
145	American Elm	12	Good	SAVED
146	Black Cherry	16	Good	SAVED
147	American Elm	14	Good	SAVED
148	American Elm	12	Good	SAVED
149	Northern Red Oak	14	Good	SAVED
150	Northern Red Oak	12	Good	SAVED
151	American Elm	12	Good	SAVED
152	Northern Red Oak	12	Good	SAVED
153	Sugar Maple	12	Good	REMOVED
154	Black Cherry	30	Good	REMOVED
155	Black Cherry	16	Good	REMOVED
156	Northern Red Oak	12	Good	SAVED
157	Black Cherry	16	Good	SAVED
158	Northern Red Oak	12	Good	SAVED
159	Northern Red Oak	12	Good	SAVED
160	Northern Red Oak	12	Good	SAVED
161	Black Cherry	30	Good	SAVED
162	Honey Locust	13	Good	SAVED
163	Northern Red Oak	16	Good	SAVED
164	Shagbark Hickory	12	Good	SAVED
165	Northern Red Oak	21	Good	SAVED
166	Black Oak	18	Good	SAVED
167	Black Oak	12	Good	SAVED
168	Black Oak	12	Good	SAVED
169	Northern Red Oak	21	Good	SAVED
170	Black Oak	14	Good	SAVED
171	Black Ash	14	Good	SAVED
172	Black Oak	35	Good	SAVED
173	Black Oak	17	Good	SAVED
174	Black Oak	12	Good	SAVED
175	Sassafras	14	Good	REMOVED
176	American Elm	16	Good	REMOVED
177	American Elm	12	Good	REMOVED
178	Black Cherry	12	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
179	American Elm	12	Good	REMOVED
180	Black Cherry	18	Good	REMOVED
181	Black Oak	12	Good	REMOVED
182	American Elm	12	Good	REMOVED
183	Black Cherry	12	Good	SAVED
184	Eastern Red Cedar	20	Good	SAVED
185	Black Oak	14	Good	REMOVED
186	Black Oak	12	Good	REMOVED
187	Black Oak	16	Good	REMOVED
188	Black Oak	18	Good	REMOVED
189	Black Oak	13	Good	REMOVED
190	Chestnut Oak	14	Good	SAVED
191	Chestnut Oak	24	Good	SAVED
192	Black Oak	14	Good	REMOVED
193	Black Oak	12	Good	REMOVED
194	Black Oak	12	Good	REMOVED
195	Black Oak	14	Good	REMOVED
196	Black Oak	16	Good	REMOVED
197	Black Oak	14	Good	REMOVED
198	Black Oak	14	Good	REMOVED
199	Black Oak	17	Good	SAVED
200	Black Oak	14	Good	REMOVED
201	Black Cherry	12	Good	REMOVED
202	Black Oak	28	Good	REMOVED
203	Black Oak	14	Good	REMOVED
204	Black Oak	12	Good	REMOVED
205	Black Cherry	13	Good	SAVED
206	Black Cherry	14	Good	SAVED
207	Black Oak	12	Good	SAVED
208	Black Oak	14	Good	REMOVED
209	White Oak	12	Good	SAVED
210	Black Cherry	12	Good	SAVED
211	Black Cherry	14	Good	SAVED
212	White Oak	21	Good	SAVED
213	Black Oak	13	Good	SAVED
214	Black Oak	14	Good	SAVED
215	Chestnut Oak	15	Good	SAVED
216	Chestnut Oak	15	Good	SAVED
217	White Oak	14	Good	SAVED
218	Black Oak	24	Good	SAVED
219	Black Oak	16	Good	SAVED
220	Black Oak	12	Good	SAVED
221	Black Oak	14	Good	SAVED
222	Black Oak	18	Good	SAVED
223	Black Oak	18	Good	SAVED
224	Black Oak	12	Good	SAVED
225	Black Oak	12	Good	SAVED
226	Black Cherry	14	Good	REMOVED
227	Black Oak	24	Good	REMOVED
228	Black Oak	20	Good	REMOVED
229	Black Oak	14	Good	SAVED
230	Black Cherry	14	Good	REMOVED
231	Black Cherry	14	Good	REMOVED
232	Black Cherry	14	Good	REMOVED
233	Black Cherry	16	Good	REMOVED
234	Black Oak	12	Good	SAVED
235	Black Oak	15	Good	SAVED
236	Shagbark Hickory	12	Good	SAVED
237	Black Cherry	18	Good	SAVED
238	Black Cherry	14	Good	REMOVED
239	Black Cherry	12	Good	SAVED
240	Black Oak	17	Good	SAVED
241	American Elm	15	Good	SAVED
242	Black Cherry	15	Good	SAVED
243	Oak	14	Good	REMOVED
244	Oak	58	Good	REMOVED
245	Shagbark Hickory	12	Good	SAVED
246	Oak	35	Good	REMOVED
247	Black Cherry	12	Good	SAVED
248	Black Cherry	12	Good	SAVED
249	Black Cherry	24	Good	SAVED
250	American Elm	12	Good	REMOVED
251	Oak	23	Good	SAVED
252	Black Cherry	14	Good	SAVED
253	American Elm	16	Good	SAVED
254	Black Oak	14	Good	REMOVED
255	American Elm	16	Good	SAVED
256	Black Cherry	12	Good	SAVED
257	Oak	12	Good	SAVED
258	Black Cherry	12	Good	SAVED
259	Black Oak	25	Good	SAVED
260	American Elm	12	Good	SAVED
261	Oak	12	Good	SAVED
262	Oak	14	Good	SAVED
263	Oak	13	Good	SAVED
264	Oak	16	Good	SAVED
265	Oak	16	Good	REMOVED
266	Black Cherry	16	Good	REMOVED
267	Oak	12	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
268	Oak	21	Good	SAVED
269	Sassafras	17	Good	REMOVED
270	Sassafras	17	Good	REMOVED
271	Oak	24	Good	SAVED
272	Oak	12	Good	SAVED
273	Oak	17	Good	REMOVED
274	Oak	12	Good	REMOVED
275	American Elm	12	Good	REMOVED
276	Black Oak	12	Good	REMOVED
277	Black Cherry	12	Good	REMOVED
278	Black Oak	12	Good	REMOVED
279	Black Cherry	16	Good	REMOVED
280	Black Cherry	33	Good	REMOVED
281	American Elm	12	Good	SAVED
282	Black Oak	13	Good	SAVED
283	Black Cherry	17	Good	SAVED
284	Black Oak	14	Good	SAVED
285	Black Oak	14	Good	SAVED
286	American Elm	12	Good	SAVED
287	American Elm	14	Good	SAVED
288	Black Oak	14	Good	SAVED
289	White Oak	17	Good	SAVED
290	American Elm	25	Good	REMOVED
291	Black Cherry	15	Good	SAVED
292	White Oak	25	Good	REMOVED
293	Black Oak	15	Good	REMOVED
294	Black Cherry	18	Good	REMOVED
295	American Elm	14	Good	REMOVED
296	Black Oak	16	Good	REMOVED
297	American Elm	12	Good	SAVED
298	Black Oak	20	Good	SAVED
299	Black Oak	13	Good	SAVED
300	Black Oak	12	Good	SAVED
301	Black Cherry	14	Good	SAVED
302	Black Cherry	14	Good	SAVED
303	Black Cherry	12	Good	SAVED
304	American Elm	12	Good	REMOVED
305	Black Cherry	12	Good	REMOVED
306	Oak	16	Good	REMOVED
307	Beech	14	Good	REMOVED
308	Oak	14	Good	SAVED
309	Oak	12	Good	SAVED
310	Oak	12	Good	SAVED
311	American Elm	16	Good	SAVED
312	American Elm	12	Good	SAVED
313	Sassafras	14	Good	REMOVED
314	Sassafras	14	Good	REMOVED
315	Sassafras	12	Good	REMOVED
316	Sassafras	14	Good	REMOVED
317	Sassafras	14	Good	REMOVED
318	Sassafras	18	Good	REMOVED
319	Sassafras	13	Good	REMOVED
320	Sassafras	15	Good	REMOVED
321	American Elm	13	Good	REMOVED
322	Oak	17	Good	REMOVED
323	Black Cherry	15	Good	REMOVED
324	Black Cherry	13	Good	REMOVED
325	Oak	14	Good	SAVED
326	Oak	16	Good	SAVED
327	Oak	12	Good	REMOVED
328	Black Oak	50	Good	REMOVED
329	Black Oak	16	Good	REMOVED
330	Black Cherry	12	Good	REMOVED
331	American Elm	14	Good	SAVED
332	Black Oak	34	Good	REMOVED
333	Oak	14	Good	SAVED
334	Black Oak	21	Good	REMOVED
335	American Elm	14	Good	REMOVED
336	American Elm	12	Good	REMOVED
337	Shagbark Hickory	14	Good	REMOVED
338	Black Cherry	12	Good	REMOVED
339	American Elm	22	Good	REMOVED
340	Oak	15	Good	REMOVED
341	American Elm	12	Good	REMOVED
342	Oak	12	Good	REMOVED
343	Oak	12	Good	REMOVED
344	Black Oak	22	Good	REMOVED
345	Black Oak	60	Good	REMOVED
346	Sassafras	12	Good	REMOVED
347	Oak	23	Good	REMOVED
348	Oak	21	Good	REMOVED
349	Oak	21	Good	REMOVED
350	Black Cherry	15	Good	REMOVED
351	Black Oak	16	Good	REMOVED
352	Shagbark Hickory	20	Good	REMOVED
353	Shagbark Hickory	14	Good	REMOVED
354	Bitternut Hickory	12	Good	REMOVED
355	Black Oak	38	Good	REMOVED
356	Oak	14	Good	REMOVED

TAG #	COMMON NAME	DBH	CONDITION	STATUS
357	White Oak	12	Good	SAVED
358	Oak	21	Good	SAVED
359	Mulberry	18	Good	SAVED
360	American Elm	24	Good	SAVED
361	Oak	14	Good	REMOVED
362	Oak	14	Good	REMOVED
363	Black Oak	12	Good	SAVED
364	American Elm	12	Good	REMOVED
365	Black Cherry	13	Good	REMOVED
366	American Elm	22	Good	REMOVED
367	American Elm	15	Good	REMOVED
368	American Elm	12	Good	REMOVED
369	Oak	12	Good	REMOVED
370	American Elm	21	Good	REMOVED
371	Black Oak	16	Good	REMOVED
372	Black Oak	29	Good	REMOVED
373	Black Oak	29	Good	REMOVED
374	Black Oak	24	Good	REMOVED
375	Black Oak	20	Good	REMOVED
376	Black Oak	25	Good	REMOVED
377	Oak	17	Good	REMOVED
378	Oak	17	Good	REMOVED
379	Black Oak	22	Good	REMOVED
380	Black Oak	12	Good	REMOVED
381	Black Oak	22	Good	REMOVED
382	Black Oak	22	Good	REMOVED
383	White Oak	12	Good	REMOVED
384	Oak	14	Good	REMOVED
385	Black Oak	16	Good	REMOVED
386	American Elm	12	Good	REMOVED
387	Oak	14	Good	REMOVED
388	Oak	16	Good	REMOVED
389	Shagbark Hickory	15	Good	REMOVED
390	Sassafras	12	Good	REMOVED
391	Black Oak	23	Good	REMOVED
392	Oak	24	Good	REMOVED
393	Oak	14	Good	REMOVED
394	Oak	12	Good	REMOVED
395	Black Oak	12	Good	REMOVED
396	Sassafras	14	Good	REMOVED
397	Sassafras	14	Good	REMOVED
398	Oak	14	Good	REMOVED
399	Bitternut Hickory	13	Good	REMOVED
400	Bitternut Hickory	14	Good	REMOVED
401	American Elm	13	Good	REMOVED
402	Shagbark Hickory	12	Good	REMOVED
403	Bitternut Hickory	15	Good	REMOVED
404	Black Cherry	12	Good	SAVED
405	White Oak	20	Good	REMOVED
406	American Elm	12	Good	SAVED
407	Black Cherry	12	Good	REMOVED
408	Black Oak	12	Good	REMOVED
409	Black Oak	14	Good	SAVED
410	Black Oak	18	Good	REMOVED
411	Oak	21	Good	REMOVED
412	Black Oak	13	Good	REMOVED
413	Oak	12	Good	REMOVED
414	Black Oak	12	Good	REMOVED
415	Oak	17	Good	REMOVED
416	Oak	15	Good	REMOVED
417	Oak	13	Good	REMOVED
418	Oak	20	Good	REMOVED
419	American Elm	16	Good	REMOVED
420	Oak	15	Good	REMOVED
421	Black Oak	12	Good	REMOVED
422	Black Oak	12	Good	SAVED
423	Black Oak	12	Good	SAVED
424	Black Oak	14	Good	SAVED
425	Black Oak	17	Good	REMOVED
426	Oak	19	Good	REMOVED
427	Black Oak	18	Good	REMOVED
428	Oak	14	Good	REMOVED
429	American Elm	12	Good	REMOVED
430	Black Oak	20	Good	REMOVED
431	Black Oak	21	Good	REMOVED
432	American Elm	14	Good	REMOVED
433	American Elm	14	Good	REMOVED
434	Oak	12	Good	REMOVED
435	Oak	14	Good	REMOVED
436	Black Oak	14	Good	REMOVED
437	Black Cherry	15	Good	REMOVED
438	Black Oak	14	Good	REMOVED
439	Black Oak	15	Good	REMOVED
440	Black Ash	12	Good	REMOVED
441	Shagbark Hickory	12	Good	REMOVED
442	Black Ash	12	Good	REMOVED
443	Black Oak	18	Good	REMOVED

No.	REVISIONS	DATE	BY
3	ENTITLEMENT SET	09/01/2025	BIG
2	ENTITLEMENT SET	04/10/2025	BIG
1	ENTITLEMENT SET	03/03/2025	BIG
0	ENTITLEMENT SET	02/06/2025	BIG

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CIP
Copenhagen Infrastructure Partners

STATE OF MICHIGAN
BRIAN J. BOSTICK
No. 6201058128
LICENSED
PROFESSIONAL ENGINEER

KHA PROJECT 191290003
DATE 09/09/2025
SCALE AS SHOWN
DESIGNED BY CPK
DRAWN BY CPK
CHECKED BY RAH

TREE INVENTORY

HERON ENERGY STORAGE LLC
PREPARED FOR
HERON ENERGY STORAGE LLC
GUN PLAIN TOWNSHIP, MICHIGAN

MISS DIG 811

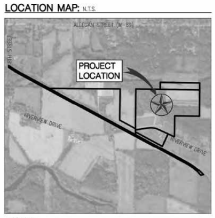
ISSUED FOR PERMIT - NOT FOR CONSTRUCTION

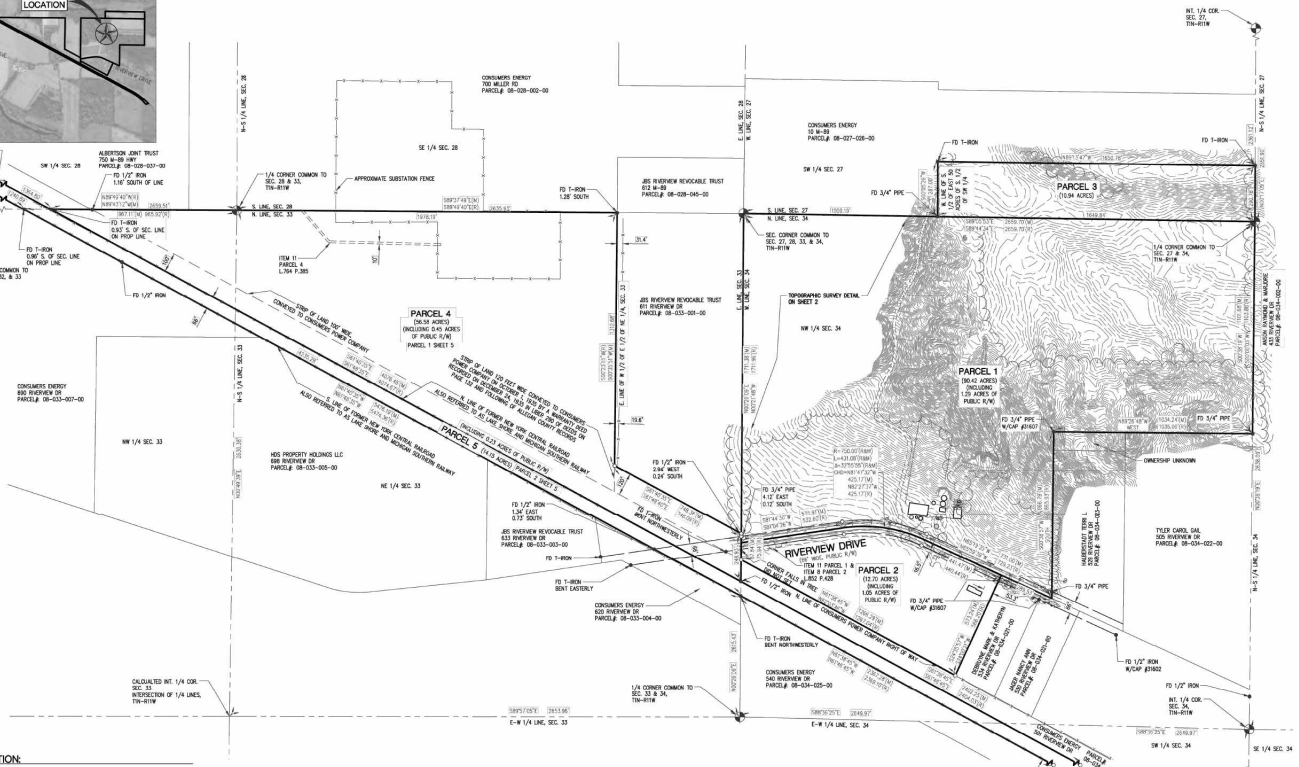
SHEET NUMBER
TP202

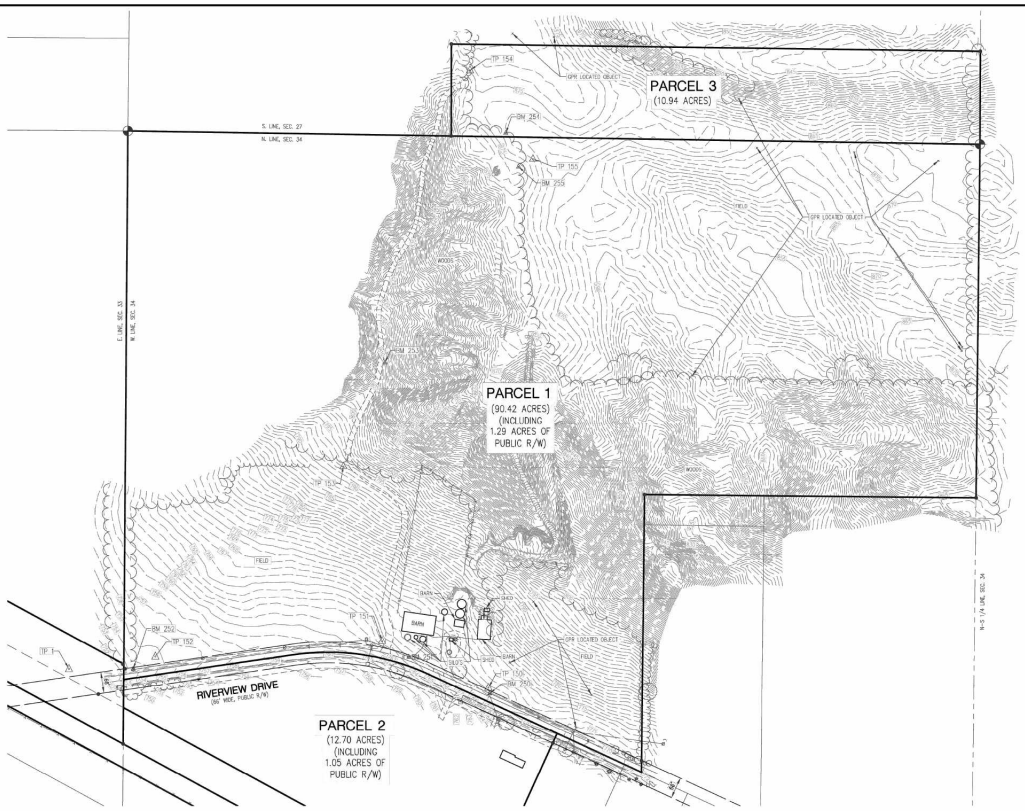
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

K:\TCW_LDEV\Copenhagen Infrastructure Partners\Heron BESS_M12 Design\CAD\Plan Sheets\L1 TREE INVENTORY AND PRESERVATION PLAN.dwg July 15, 2026 - 4:29pm

LOCATION MAP: N.T.S.




PARCEL 1
(90.42 ACRES)
(INCLUDING 1.29 ACRES OF PUBLIC R/W)
PARCEL 2
(12.70 ACRES)
(INCLUDING 1.05 ACRES OF PUBLIC R/W)
PARCEL 3
(10.94 ACRES)
PARCEL 4
(56.56 ACRES)
(INCLUDING 0.45 ACRES OF PUBLIC R/W)
PARCEL 1 SHEET 5
PARCEL 5
(14.15 ACRES) PARCEL 1 SHEET 5
RIVERVIEW DRIVE
(66' WIDE PUBLIC R/W)
CONSUMERS ENERGY
700 MILLER RD
PARCEL# 08-028-002-00
CONSUMERS ENERGY
10 W-89
PARCEL# 08-027-028-00
CONSUMERS ENERGY
800 RIVERVIEW DR
PARCEL# 08-033-007-00
CONSUMERS ENERGY
820 RIVERVIEW DR
PARCEL# 08-033-004-00
CONSUMERS ENERGY
540 RIVERVIEW DR
PARCEL# 08-034-025-00
HDS PROPERTY HOLDINGS LLC
698 RIVERVIEW DR
PARCEL# 08-033-005-00
JBS RIVERVIEW REVOCABLE TRUST
612 W-89
PARCEL# 08-028-045-00
JBS RIVERVIEW REVOCABLE TRUST
611 RIVERVIEW DR
PARCEL# 08-033-001-00
JBS RIVERVIEW REVOCABLE TRUST
833 RIVERVIEW DR
PARCEL# 08-033-003-00
ALBERTSON JOINT TRUST
750 W-89 UNIT
PARCEL# 08-028-037-00
OWNERSHIP UNKNOWN
TYLER CAROL GAIL
525 RIVERVIEW DR
PARCEL# 08-034-022-00
HAUSERSTAUT TERR L
535 RIVERVIEW DR
PARCEL# 08-034-021-00
HEDS SURVEY CAP
PARCEL# 08-034-021-00
HEDS SURVEY CAP
PARCEL# 08-034-020-00
CONSUMERS ENERGY PARCEL# 08-034-043-00
SW 1/4 SEC. 28
SE 1/4 SEC. 28
SW 1/4 SEC. 27
NW 1/4 SEC. 34
NW 1/4 SEC. 33
NE 1/4 SEC. 33
SW 1/4 SEC. 34
SE 1/4 SEC. 34
N-S 1/4 LINE, SEC. 28
N-S 1/4 LINE, SEC. 33
N-S 1/4 LINE, SEC. 27
N-S 1/4 LINE, SEC. 34
E-W 1/4 LINE, SEC. 33
E-W 1/4 LINE, SEC. 34
S. LINE, SEC. 28
N. LINE, SEC. 33
E. LINE, SEC. 28
N. LINE, SEC. 27
E. LINE, SEC. 33
N. LINE, SEC. 34
N. LINE OF SW 1/4 OF SW 1/4
E. LINE OF W 1/2 OF E 1/2 OF NE 1/4, SEC. 33
N. LINE OF CONSUMERS POWER COMPANY RIGHT OF WAY
N. LINE OF FORMER NEW YORK CENTRAL RAILROAD
N. LINE OF FORMER NEW YORK CENTRAL RAILROAD
ALSO REFERRED TO AS LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY
ALSO REFERRED TO AS LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY
NORTHEAST PARCEL 5 DETAIL SEE SHEET 6
SOUTHEAST PARCEL 5 DETAIL SEE SHEET 6
TOPOGRAPHIC SURVEY DETAIL ON SHEET 2
SEC. CORNER COMMON TO SEC. 28, 29, 32, & 33 T1N-R11W
SEC. CORNER COMMON TO SEC. 27, 28, 33, & 34, T1N-R11W
1/4 CORNER COMMON TO SEC. 28 & 33, T1N-R11W
1/4 CORNER COMMON TO SEC. 27 & 34, T1N-R11W
1/4 CORNER COMMON TO SEC. 33 & 34, T1N-R11W
APPROXIMATE SUBSTATION FENCE
ITEM 11 PARCEL 4 L.7614 P.385
ITEM 11 PARCEL 1 & PARCEL 2 L.852 P.428
CALCULATED INT. 1/4 COR. SEC. 33 INTERSECTION OF 1/4 LINES, T1N-R11W
INT. 1/4 COR. SEC. 27, T1N-R11W
INT. 1/4 COR. SEC. 34, T1N-R11W
S. 1/4 COR. SEC. 34, T1N-R11W
FD 1/2" IRON W/CAP #71802
FD 3/4" PIPE W/CAP #31807
FD 3/4" PIPE W/CAP #31807
FD 1/2" IRON W/CAP #71293
FD 1/2" IRON 1.16' SOUTH OF LINE
FD T-IRON 0.90' S. OF SEC. LINE ON PROP LINE
FD T-IRON 0.60' S. OF SEC. LINE ON PROP LINE
FD 1/2" IRON
FD T-IRON 1.28' SOUTH
FD 1/2" IRON 3.94' WEST 0.24' SOUTH
FD 3/4" PIPE 4.12' EAST 0.12' SOUTH
FD 1/2" IRON 1.34' EAST 0.72' SOUTH
FD T-IRON BENT NORTHWESTERLY
FD T-IRON BENT EASTERLY
FD T-IRON BENT NORTHWESTERLY
FD T-IRON
FD 1/2" IRON N. LINE OF CONSUMERS POWER COMPANY RIGHT OF WAY
FD 3/4" PIPE
FD 1/2" IRON
FD T-IRON
FD T-IRON
FD T-IRON
FD 3/4" PIPE
FD 3/4" PIPE
FD 3/4" PIPE
FD 3/4" PIPE
R=1500.00'(R&M)
L=433.00'(R&M)
Δ=16°53'05"(R&M)
CH=N88°41'32"W
425.17'(M)
N82°27'13"W
425.17'(T)
R=1500.00'(M)
L=433.00'(M)
Δ=16°53'05"(M)
CH=N88°14'37"W
425.17'(M)
N82°27'13"W
425.17'(T)
N88°14'34"W 2659.70'(M)
N88°14'34"W 1659.87'
N88°26'18"W 1034.24'(M)
N88°26'18"W 1035.04'(M)
N88°37'49"E(M)
S88°49'40"E(R)
2635.51'
S88°37'49"E(M)
S88°49'40"E(R)
2635.51'
S87°13'05"E 2615.66'
S88°36'20"E 2649.87'
S88°36'20"E 2649.87'
N87°17'14"W 2634.78'
N87°17'14"W 2634.78'
N87°17'14"W 2634.78



N

0 150 300

1 inch = 150 Ft.

TOPOGRAPHIC SURVEY

LEGEND

- TRAVERSE POINT
- BENCHMARK
- SECTION & 1/4 CORNER
- SET IRON
- FOUND IRON
- EXISTING WATER WELL
- CABLE TV RISER
- GAS PUMP
- CONIFEROUS TREE
- DECIDUOUS TREE
- GUY WIRE
- WOOD LIGHT POLE
- UTILITY POLE
- TELEPHONE RISER
- FIBER OPTIC MARKER POST
- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING OVERHEAD UTILITY LINE
- EXISTING FENCE
- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- EXISTING EDGE OF WOODS
- EXISTING EDGE OF BRUSH
- EXISTING EDGE OF GRAVEL
- EXISTING EDGE OF ASPHALT
- EXISTING EDGE OF CONCRETE
- EXISTING BUILDING
- EXISTING ROAD CENTERLINE
- RD LOCATED U.G. ELECTRIC LINE
- RD LOCATED U.G. FIBER OPTIC LINE

STATE OF MICHIGAN
RICHARD A. CHAMBERLAIN
No. 25253
PROFESSIONAL SURVEYOR

PLAN DATE: APRIL 24TH, 2026
PROJECT MGR.: RAC
REVIEWER: JHR
SCALE: 1" = 150'

ROWE PROFESSIONAL SERVICES COMPANY
O: (616) 272-7125
www.rowepsc.com
507 36th Street SE
Grand Rapids, MI 49548

TOPOGRAPHIC SURVEY PREPARED FOR
HERON BESS ENERGY STORAGE, LLC
HERON BESS PROJECT
PART OF SECTIONS 27, 28, 33, AND 34, T1N, R11W
GUN PLAIN TOWNSHIP, ALLEGAN COUNTY, MICHIGAN

REV:

SHT# V101

JOB No: 2600019

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R:\Projects\2600019\Proj Survey\01-2600019-V1.dwg

LEGAL DESCRIPTION PER FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-FA500MI28-NRG, DATED NOVEMBER 11, 2025 AT 8:00 AM.

RECORD LEGAL DESCRIPTION: (PARCEL 1 ON THIS DRAWING)

COMMENCING AT THE NORTHWEST CORNER OF SECTION 34, TOWNSHIP 1 NORTH, RANGE 11 WEST, THENCE SOUTH 89 DEGREES 44 MINUTES 34 SECONDS EAST, ALONG THE NORTH LINE OF SAID SECTION, 2659.70 FEET, TO THE NORTH QUARTER CORNER OF SAID SECTION, THENCE SOUTH 00 DEGREES 00 MINUTES 03 SECONDS WEST, ALONG THE NORTH-SOUTH QUARTER LINE OF SAID SECTION, 1103.68 FEET, THENCE WEST 1035.00 FEET, THENCE SOUTH 865.93 FEET TO THE CENTER LINE OF RIVERVIEW ROAD, THENCE NORTH 65 DEGREES 59 MINUTES 39 SECONDS WEST, ALONG THE SAID CENTERLINE, 729.23 FEET TO A CURVE WHICH BEARS LEFT, THAT HAS A CENTRAL ANGLE OF 32 DEGREES 59 MINUTES 55 SECONDS, A RADIUS OF 750.00 FEET, A CHORD OF 426.17 FEET, WHICH BEARS NORTH 82 DEGREES 27 MINUTES 37 SECONDS WEST, THENCE ALONG SAID CURVE, 431.08 FEET, THENCE SOUTH 81 DEGREES 04 MINUTES 26 SECONDS WEST, ALONG SAID CENTER LINE, 532.60 FEET, TO THE WEST LINE OF SAID SECTION 34, THENCE NORTH 00 DEGREES 21 MINUTES 48 SECONDS WEST, ALONG THE SAID WEST LINE, 1711.96 FEET TO THE POINT OF BEGINNING.

UTILITY INFORMATION:

PER MISS DIG TICKET NUMBER: 2026020900233--000, SUBMITTED ON 02/09/2026

MISS DIG TICKET RESPONDERS (AS OF APRIL 24TH, 2026):

ATT	MAP PROVIDED--SITE IS CLEAR
CONSUMERS ENERGY ELECTRIC	SITE IS CLEAR
CONSUMERS ENERGY GAS	MAP PROVIDED--UNABLE TO PLOT

MISS DIG TICKET NON-RESPONDERS (AS OF APRIL 24TH, 2026):
123NET FIBER OPTICS

THERE MAY BE ABOVE GROUND AND BELOW GROUND UTILITIES THAT WERE NOT GRAPHICALLY SHOWN ON THE DRAWING DUE TO MISS DIG TICKET MEMBERS NOT RESPONDING TO THE ABOVE MENTIONED TICKET.

TRAVERSE POINTS:

TP #1
SET 1/2" X 18" REROD WITH ROWE TRAV CAP 68'± NORTHWEST OF CENTERLINE RIVERVIEW DRIVE 120'± NORTHEAST OF GRAVEL DRIVE TO SUBSTATION
NORTHING = 341810.423
EASTING = 1278619.124

TP #150
SET 1/2" X 18" REROD WITH ROWE TRAV CAP 28'± NORTH OF NORTH EDGE OF RIVERVIEW DRIVE 75'± SOUTHEAST OF 36" MAPLE
NORTHING = 341751.588
EASTING = 1279297.628

TP #151
SET 1/2" X 18" REROD WITH ROWE TRAV CAP 35'± NORTHEAST OF NORTH EDGE OF RIVERVIEW DRIVE 15'± WEST OF GRAVEL ACCESS DRIVE
NORTHING = 341897.416
EASTING = 1279595.964

TP #152
SET 1/2" X 18" REROD WITH ROWE TRAV CAP 75'± NORTHEAST OF CENTERLINE RIVERVIEW DRIVE 110'± EAST OF NORTH-SOUTH TREE LINE EXTENDED SOUTH
NORTHING = 341846.686
EASTING = 1279588.649

TP #153
SET 1/2" X 18" REROD WITH ROWE TRAV CAP 25'± WEST OF GRAVEL ACCESS DRIVE AT ENTRY TO TREE LINE
NORTHING = 342442.969
EASTING = 1279047.173

TP #154
SET 1/2" X 18" REROD WITH ROWE TRAV CAP 300'± SOUTH OF TRANSMISSION LINE 20'± EAST OF TREE LINE
NORTHING = 343679.202
EASTING = 1278970.241

TP #155
SET 1/2" X 18" REROD WITH ROWE TRAV CAP NORTHERLY END OF FIELD 450'± SOUTH OF TRANSMISSION TOWER LEG 40'± EAST OF NORTH-SOUTH TREE LINE
NORTHING = 343400.835
EASTING = 1279066.584

ALL COORDINATE VALUES ARE GRID.

BENCHMARKS:

BM #250
SET SPIKE IN SOUTH SIDE OF POWER POLE NORTH SIDE OF RIVERVIEW DRIVE 150'± EAST OF GRAVEL DRIVE TO ADDRESS #555
NORTHING = 341733
EASTING = 1279093.1
ELEVATION = 768.85

BM #251
SET SPIKE IN NORTH SIDE OF POWER POLE NORTH SIDE OF RIVERVIEW DRIVE 70'± EAST OF GRAVEL ACCESS DRIVE
NORTHING = 341847
EASTING = 1279067.9
ELEVATION = 767.68

BM #252
SET SPIKE IN NORTH SIDE OF POWER POLE NORTH SIDE OF RIVERVIEW DRIVE 30'± EAST OF NORTH-SOUTH TREE LINE
NORTHING = 341809
EASTING = 1278881.9
ELEVATION = 752.97

BM #253
SET VERTICAL SPIKE IN SOUTHWEST ROOT OF 16" BUTTERNUT 13'± EAST OF GRAVEL ACCESS DRIVE
NORTHING = 342765
EASTING = 1279305
ELEVATION = 810.40

BM #254
SET SPIKE IN NORTH SIDE OF 10" BUTTERNUT 150'± NORTHWEST OF TP 155
NORTHING = 343481
EASTING = 1279098.1
ELEVATION = 874.81

BM #255
SET SPIKE IN NNE SIDE OF 12" BUTTERNUT 50'± SOUTHWEST OF TP 155
NORTHING = 343375
EASTING = 1279102.1
ELEVATION = 875.92

ALL COORDINATE VALUES ARE GRID

SCHEDULE B, PART II, EXCEPTIONS, PER FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-FA500MI28-NRG, DATED NOVEMBER 11, 2025 AT 8:00 AM.

1. ANY DEFECT, LIEN, ENCUMBRANCE, ADVERSE CLAIM, OR OTHER MATTER THAT APPEARS FOR THE FIRST TIME IN THE PUBLIC RECORDS OR IS CREATED, ATTACHES, OR IS DISCLOSED BETWEEN THE COMMITMENT DATE AND THE DATE ON WHICH ALL OF THE SCHEDULE B, PART I—REQUIREMENTS ARE MET.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
2. ANY FACTS, RIGHTS, INTERESTS OR CLAIMS THAT ARE NOT SHOWN BY THE PUBLIC RECORDS BUT THAT COULD BE ASCERTAINED BY AN INSPECTION OF THE LAND OR BY MAKING INQUIRY OF PERSONS IN POSSESSION OF THE LAND.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
3. EASEMENTS, LIENS OR ENCUMBRANCES, OR CLAIMS THEREOF, NOT SHOWN BY THE PUBLIC RECORDS.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
4. ANY ENCROACHMENT, ENCUMBRANCE, VIOLATION, VARIATION, OR ADVERSE CIRCUMSTANCE AFFECTING THE TITLE INCLUDING DISCREPANCIES, CONFLICTS IN BOUNDARY LINES, SHORTAGE IN AREA, OR ANY OTHER FACTS THAT WOULD BE DISCLOSED BY AN ACCURATE AND COMPLETE LAND SURVEY OF THE LAND, AND THAT ARE NOT SHOWN IN THE PUBLIC RECORDS.
   VESTING DEED RECORDED AS A QUIT CLAIM DEED IN LIBER 3646 PAGE 828 IS INCONSISTENT WITH SCHEDULE C DESCRIPTION FOUND WITHIN THIS TITLE COMMITMENT. DESCRIPTION IN SCHEDULE C MATCHES A DESCRIPTION FOUND IN WARRANTY DEED LIBER 1532 PAGE 511. THE QUIT CLAIM DEED FROM THE CHAPMAN'S TO THEIR OWN TRUST COULDN'T HAVE CONVEYED MORE LAND THAN THEY OWNED. NO OTHER CONVEYANCES FOR THE PROPERTY WERE FOUND THAT TAKE PLACE AFTER THE EFFECTIVE DATE OF THE WARRANTY DEED. THE DESCRIPTION FOUND IN SCHEDULE C WAS HELD AS THE RECORD DESCRIPTION AS SHOWN. THE RESULTS OF THE SURVEY ARE SHOWN HEREON.
5. TAXES AND ASSESSMENTS NOT DUE AND PAYABLE AT COMMITMENT DATE.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
6. ANY LIEN OR RIGHT TO A LIEN, IMPOSED BY LAW, AS A RESULT OF SERVICES, LABOR, AND/OR MATERIALS USED, OR TO BE USED, FOR IMPROVEMENT TO THE LAND.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
7. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
8. ANY CLAIM TO (A) OWNERSHIP OR OR RIGHTS TO MINERALS AND SIMILAR SUBSTANCES, INCLUDING BUT NOT LIMITED TO ORES, METALS, COAL, LIGNITE, OIL, GAS, URANIUM, CLAY, ROCK, SAND, AND GRAVEL LOCATED IN, ON, OR UNDER THE LAND OR PRODUCED FROM THE LAND, WHETHER SUCH OWNERSHIP OR RIGHTS ARISE BY LEASE, GRANT, EXCEPTION, CONVEYANCE, RESERVATION, OR OTHERWISE; AND (B) ANY RIGHTS, PRIVILEGES, IMMUNITIES, RIGHTS OF WAY, AND EASEMENTS ASSOCIATED THEREWITH OR APPURTENANT THERETO, WHETHER OR NOT THE INTERESTS OR RIGHTS EXCEPTED IN (A) OR (B) APPEAR IN THE PUBLIC RECORDS OR ARE SHOWN IN SCHEDULE B.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
9. ALL TAX MAP NUMBERS REFERRED TO IN THE TITLE REPORT AND FINAL POLICY ARE FOR INFORMATIONAL PURPOSES ONLY AND FIRST AMERICAN TITLE INSURANCE COMPANY DOES NOT INSURE, NOR LIMIT THE EXCEPTIONS, TO THE TAX MAP NUMBERS INDICATED.
   ADJOINING PARCEL LINES AND OWNER INFORMATION SHOWN PER AVAILABLE GIS/TAX MAP AND ARE APPROXIMATE
10. OIL AND GAS LEASE BETWEEN FRITZ JAGER AND LILLIAN JAGER, HIS WITE, LESSOR, AND LAWRENCE A. RICHARDSON, LESSEE, DATED DECEMBER 08, 1939, RECORDED DECEMBER 14, 1939 IN/AS LIBER 339, PAGE 223, OF ALLEGAN COUNTY RECORDS. DEFECTS, LIENS, ENCUMBRANCES OR OTHER MATTERS AFFECTING THE LEASEHOLD ESTATE, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS ARE NOT SHOWN HEREON.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
11. RIGHT OF WAY BY AND BETWEEN RONALD JAGER AND DORIS JAGER, HUSBAND AND WIFE AND MICHIGAN BELL TELEPHONE COMPANY, A MICHIGAN CORPORATION CREATED BY INSTRUMENT RECORDED JULY 03, 1974 IN/AS LIBER 852, PAGE 428, OF ALLEGAN COUNTY RECORDS.
    EASEMENT SHOWN HEREON AS DESCRIBED, DOESN'T ENCUMBER PARCEL
12. INTEREST OF OTHERS IN OIL, GAS AND MINERAL RIGHTS, IF ANY, WHETHER OR NOT RECORDED IN THE PUBLIC RECORDS.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
13. INTEREST, IF ANY, OF THE UNITED STATES, STATE OF MICHIGAN, OR ANY POLITICAL SUBDIVISION THEREOF, IN THE OIL, GAS AND MINERALS IN AND UNDER AND THAT MAY BE PRODUCED FROM THE LAND.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
14. RIGHTS OF TENANTS UNDER UNRECORDED LEASES.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
15. TO THE EXTENT A TRACT IS BOUNDED BY A PUBLIC ROAD, RIGHTS OF OTHERS IN AND TO ANY PORTION OF THE PROPERTY THAT LIES WITHIN SAID ROAD.
    PUBLIC ROAD RIGHTS OF WAY SHOWN HEREON
16. A LEASE DATED NOVEMBER 11, 2025, EXECUTED BY THOMAS A. CHAPMAN (A/K/A THOMAS CHAPMAN) AND GWENDOLYN K. CHAPMAN (A/K/A GWENDOLYN CHAPMAN), AS TRUSTEES OF THE THOMAS AND GWENDOLYN CHAPMAN REVOCABLE TRUST AS LESSOR AND HERON ENERGY STORAGE, LLC, A DELAWARE LIMITED LIABILITY COMPANY AS LESSEE, RECORDED NOVEMBER 21, 2025 AS LIBER 9089, PAGE 287 OF OFFICIAL RECORDS. DEFECTS, LIENS, ENCUMBRANCES OR OTHER MATTERS AFFECTING THE LEASEHOLD ESTATE, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS ARE NOT SHOWN HEREON.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING.

    NOTE: THE TAX ASSESSOR'S LEGAL DESCRIPTION IS INCONSISTENT WITH THE INSURED LEGAL DESCRIPTION

SURVEYOR'S NOTES:

1. VERTICAL DATUM IS NAVD88.
2. HORIZONTAL DATUM IS MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE NAD83 (2011).
3. GRID DISTANCE x 0.99997745 = GROUND DISTANCE.
4. BEARINGS ARE BASED UPON MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE NAD83 (2011).
5. THE SUBJECT PROPERTY IS THE SAME AS THE PROPERTY DESCRIBED IN SCHEDULE C OF THE PROVIDED TITLE COMMITMENT.
6. THE LEGAL DESCRIPTION PROVIDED IN SCHEDULE C OF THE PROVIDED TITLE COMMITMENT CONTAINS PROPERTY MEASUREMENTS AS RECORDED.
8. ALL PROPERTY BOUNDARY MEASUREMENTS SHOWN HEREON ARE MEASURED AND DISTANCES HAVE BEEN CONVERTED TO GROUND DISTANCES (REFER TO NOTE 3).
9. ALL SECTION CORNERS SHOWN HEREON WERE FOUND IN GOOD CONDITION.
10. ALL TITLE DOCUMENTS ARE SHOWN AND/OR NOTED HEREON.
11. ALL UTILITIES OBSERVED ABOVE GROUND SHOWN HEREON. UNDERGROUND UTILITIES SHOWN BY GROUND PENETRATING RADAR AND UTILITY LOCATING INSTRUMENTS.

ALTA STANDARDS - TABLE A NOTES:

1. MONUMENTS PLACED (OR A REFERENCE MONUMENT OR WITNESS TO THE CORNER) AT ALL MAJOR CORNERS OF THE BOUNDARY OF THE SURVEYED PROPERTY, UNLESS ALREADY MARKED OR REFERENCED BY EXISTING MONUMENTS OR WITNESSES IN CLOSE PROXIMITY TO THE CORNER.
   ALL CORNERS HAVE BEEN SET
3. FLOOD ZONE CLASSIFICATION (WITH PROPER ANNOTATION BASED ON FEDERAL FLOOD INSURANCE RATE MAPS OR THE STATE OR LOCAL EQUIVALENT) DEPICTED BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY.
   THE SUBJECT PARCEL(S) IS FULLY WITHIN FLOOD ZONE X (AREA OF MINIMAL FLOOD HAZARD) PER FEMA FIRM MAP 26005C0650G EFFECTIVE 6/21/2023
4. GROSS LAND AREA (AND OTHER AREAS IF SPECIFIED BY THE CLIENT).
   PARCEL 1: 90.42 ACRES
   PARCEL 2: 12.70 ACRES
   PARCEL 3: 10.94 ACRES
   PARCEL 4: 56.58 ACRES
   PARCEL 5: 14.14 ACRES
5. VERTICAL RELIEF WITH THE SOURCE OF INFORMATION (E.G., GROUND SURVEY, AERIAL MAP), CONTOUR INTERVAL, DATUM, WITH ORIGINATING BENCHMARK, WHEN APPROPRIATE.
   VERTICAL RELIEF DETERMINED BY GROUND SURVEY FOR PARCELS 1 & 3
8. SUBSTANTIAL FEATURES OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK (IN ADDITION TO THE IMPROVEMENTS AND FEATURES REQUIRED PURSUANT TO SECTION 5 ABOVE) (E.G., PARKING LOTS, BILLBOARDS, SIGNS, SWIMMING POOLS, LANDSCAPED AREAS, SUBSTANTIAL AREAS OF REFUSE).
   ALL IMPROVEMENTS OBSERVED DURING SURVEY ARE SHOWN HEREON FOR PARCELS 1 & 3
9. NUMBER AND TYPE (E.G., DISABLED, MOTORCYCLE, REGULAR, AND OTHER MARKED SPECIALIZED TYPES) OF CLEARLY IDENTIFIABLE PARKING SPACES ON SURFACE PARKING AREAS, LOTS, AND IN PARKING STRUCTURES. STRIPING OF CLEARLY IDENTIFIABLE PARKING SPACES ON SURFACE PARKING AREAS AND LOTS.
   0 PARKING SPACES ON SITE
11. EVIDENCE OF UNDERGROUND UTILITIES EXISTING ON OR SERVING THE SURVEYED PROPERTY (IN ADDITION TO THE OBSERVED EVIDENCE OF UTILITIES REQUIRED PURSUANT TO SECTION 5.E.IV.) AS DETERMINED BY:
    a. PLANS AND/OR REPORTS PROVIDED BY CLIENT (WITH REFERENCE AS TO THE SOURCES OF INFORMATION)
    PLANS AND INFORMATION RECEIVED VIA MISS DIG DESIGN TICKET NO. 2026020900233--000 SHOWN AND NOTED HEREON AS APPLICABLE FOR PARCELS 1, 2, AND 3
    b. MARKINGS COORDINATED BY THE SURVEYOR PURSUANT TO A PRIVATE UTILITY LOCATE REQUEST.
    VISIBLE AND UNDERGROUND UTILITIES SHOWN FOR PARCELS 1, 2, AND 3.

    NOTE TO THE CLIENT, INSURER, AND LENDER — WITH REGARD TO TABLE A, ITEM 11, INFORMATION FROM THE SOURCES CHECKED ABOVE WILL BE COMBINED WITH OBSERVED EVIDENCE OF UTILITIES PURSUANT TO SECTION 5.E.IV. TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE, IN WHICH CASE THE SURVEYOR SHALL NOTE ON THE PLAT OR MAP HOW THIS AFFECTED THE SURVEYOR'S ASSESSMENT OF THE LOCATION OF THE UTILITIES. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION MAY BE NECESSARY.
13. NAMES OF ADJOINING OWNERS ACCORDING TO CURRENT TAX RECORDS. IF MORE THAN ONE OWNER, IDENTIFY THE FIRST OWNER'S NAME LISTED IN THE TAX RECORDS FOLLOWED BY "ET AL."
    ADJOINER NAME AND PARCEL NUMBER SHOWN HEREON, PER ALLEGAN COUNTY GIS
16. EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION, OR BUILDING ADDITIONS OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK.
    NO RECENT ACTIVITY OBSERVED DURING FIELD SURVEY

STATE OF MICHIGAN — BRIAN J. HOEKSTRA — 47000 — PROFESSIONAL SURVEYOR

PLAN DATE: APRIL 24TH, 2026
PROJECT MGR: RAC
REVIEWER: JHR
SCALE: NO SCALE

ROWE PROFESSIONAL SERVICES COMPANY
O: (616) 272-7125
www.rowepsc.com
507 36th Street SE
Grand Rapids, MI 49548

ALTA/NSPS LAND TITLE SURVEY PREPARED FOR
HERON ENERGY STORAGE, LLC.
HERON BESS PROJECT
PART OF SECTIONS 27, 28, 33, AND 34, T1N, R11W
GUN PLAIN TOWNSHIP, ALLEGAN COUNTY, MICHIGAN

REV:
SHT# V102
JOB No: 2600019

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LEGAL DESCRIPTION PER FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-FA500MI29-NRG, DATED NOVEMBER 12, 2025 AT 8:00 AM.

RECORD LEGAL DESCRIPTION: (PARCEL 2 ON THIS DRAWING)
LAND IN THE TOWNSHIP OF GUN PLAIN, ALLEGAN COUNTY, MI, DESCRIBED AS FOLLOWS:

FROM THE NORTHWEST CORNER OF SECTION 34, TOWN 1 NORTH, RANGE 11 WEST, MEASURE SOUTH 00 DEGREES 12 MINUTES 14 SECONDS EAST ALONG THE WEST LINE OF SAID SECTION 1711.96 FEET TO THE CENTER OF RIVERVIEW ROAD, ALSO BEING THE POINT OF BEGINNING OF THE LAND HEREIN DESCRIBED; THENCE NORTH 81 DEGREES 04 MINUTES 26 SECONDS EAST, ALONG SAID RIVERVIEW ROAD, 532.60 FEET TO A CURVE THAT BEARS RIGHT; THENCE CONTINUING ALONG SAID ROAD AND ALONG SAID CURVE 431.08 FEET, SAID CURVE HAS A CENTRAL ANGLE OF 32 DEGREES 55 MINUTES 56 SECONDS, A RADIUS OF 750.0 FEET AND A CHORD THAT BEARS SOUTH 82 DEGREES 27 MINUTES 37 SECONDS EAST, 425.17 FEET; THENCE CONTINUING ALONG SAID RIVERVIEW ROAD SOUTH 65 DEGREES 59 MINUTES 39 SECONDS EAST, 440.44 FEET; THENCE SOUTH 24 DEGREES 00 MINUTES 21 SECONDS WEST, 566.20 FEET TO THE NORTH LINE OF CONSUMERS POWER COMPANY RIGHT OF WAY; THENCE ALONG SAID NORTH LINE NORTH 62 DEGREES 03 MINUTES 46 SECONDS WEST, 1267.04 FEET TO THE SAID WEST LINE OF SECTION 34; THENCE NORTH 00 DEGREES 12 MINUTES 14 SECONDS WEST, ALONG SAID WEST LINE 75.94 FEET TO THE POINT OF BEGINNING.

SCHEDULE B, PART II, EXCEPTIONS, PER FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-FA500MI29-NRG, DATED NOVEMBER 12, 2025 AT 8:00 AM.

1. ANY DEFECT, LIEN, ENCUMBRANCE, ADVERSE CLAIM, OR OTHER MATTER THAT APPEARS FOR THE FIRST TIME IN THE PUBLIC RECORDS OR IS CREATED, ATTACHES, OR IS DISCLOSED BETWEEN THE COMMITMENT DATE AND THE DATE ON WHICH ALL OF THE SCHEDULE B, PART I—REQUIREMENTS ARE MET.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
2. ANY FACTS, RIGHTS, INTERESTS OR CLAIMS THAT ARE NOT SHOWN BY THE PUBLIC RECORDS BUT THAT COULD BE ASCERTAINED BY AN INSPECTION OF THE LAND OR BY MAKING INQUIRY OF PERSONS IN POSSESSION OF THE LAND.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
3. EASEMENTS, LIENS OR ENCUMBRANCES, OR CLAIMS THEREOF, NOT SHOWN BY THE PUBLIC RECORDS.
   NO EVIDENCE OF EASEMENTS OR ENCUMBRANCES WERE OBSERVED DURING THE SURVEY
4. ANY ENCROACHMENT, ENCUMBRANCE, VIOLATION, VARIATION, OR ADVERSE CIRCUMSTANCE AFFECTING THE TITLE INCLUDING DISCREPANCIES, CONFLICTS IN BOUNDARY LINES, SHORTAGE IN AREA, OR ANY OTHER FACTS THAT WOULD BE DISCLOSED BY AN ACCURATE AND COMPLETE LAND SURVEY OF THE LAND, AND THAT ARE NOT SHOWN IN THE PUBLIC RECORDS.
   RESULTS OF SURVEY SHOWN HEREON
5. TAXES AND ASSESSMENTS NOT DUE AND PAYABLE AT COMMITMENT DATE.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
6. ANY LIEN OR RIGHT TO A LIEN, IMPOSED BY LAW, AS A RESULT OF SERVICES, LABOR, AND/OR MATERIALS USED, OR TO BE USED, FOR IMPROVEMENT TO THE LAND.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
7. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
8. THE TERMS, PROVISIONS AND EASEMENT(S) CONTAINED IN THE DOCUMENT ENTITLED RIGHT OF WAY RECORDED JULY 12, 1974 AS LIBER 853, PAGE 428.
   PLOTTED AS DESCRIBED HEREON
9. INTEREST, IF ANY, OF THE UNITED STATES, STATE OF MICHIGAN, OR ANY POLITICAL SUBDIVISION THEREOF, IN THE OIL, GAS AND MINERALS IN AND UNDER AND THAT MAY BE PRODUCED FROM THE LAND.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
10. RIGHTS OF TENANTS UNDER UNRECORDED LEASES.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
11. ANY RIGHTS, TITLE INTEREST OR CLAIM THEREOF TO THAT PORTION OF THE LAND TAKEN, USED OR GRANTED FOR STREETS, ROADS OR HIGHWAYS.
    ROAD RIGHTS OF WAY SHOWN HEREON
12. ANY CLAIM TO (A) OWNERSHIP OF OR RIGHTS TO MINERALS AND SIMILAR SUBSTANCES, INCLUDING BUT NOT LIMITED TO ORES, METALS, COAL, LIGNITE, OIL, GAS, URANIUM, CLAY, ROCK, SAND, AND GRAVEL LOCATED IN, ON, OR UNDER THE LAND OR PRODUCED FROM THE LAND, WHETHER SUCH OWNERSHIP OR RIGHTS ARISE BY LEASE, GRANT, EXCEPTION, CONVEYANCE, RESERVATION, OR OTHERWISE; AND (B) ANY RIGHTS, PRIVILEGES, IMMUNITIES, RIGHTS OF WAY, AND EASEMENTS ASSOCIATED THEREWITH OR APPURTENANT THERETO, WHETHER OR NOT THE INTERESTS OR RIGHTS EXCEPTED IN (A) OR (B) APPEAR IN THE PUBLIC RECORDS OR ARE SHOWN IN SCHEDULE B.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
13. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING

LEGAL DESCRIPTION PER FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-FA500MI30-NRG, DATED MARCH 9, 2026 AT 8:00 AM.

RECORD LEGAL DESCRIPTION: (PARCEL 3 ON THIS DRAWING)
LAND IN THE TOWNSHIP OF GUNPLAIN, ALLEGAN COUNTY, MI, DESCRIBED AS FOLLOWS:

SOUTH 1/2 OF THE EAST 50 ACRES OF THE SOUTH HALF OF THE SOUTHWEST QUARTER OF SECTION 27, TOWN 1 NORTH RANGE 11 WEST, EXCEPT THE NORTH 371 FEET THEREOF SECTION 27 TOWN 1 NORTH RANGE 11 WEST.

SCHEDULE B, PART II, EXCEPTIONS, PER FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-FA500MI30-NRG, DATED MARCH 9, 2026 AT 8:00 AM.

1. ANY DEFECT, LIEN, ENCUMBRANCE, ADVERSE CLAIM, OR OTHER MATTER THAT APPEARS FOR THE FIRST TIME IN THE PUBLIC RECORDS OR IS CREATED, ATTACHES, OR IS DISCLOSED BETWEEN THE COMMITMENT DATE AND THE DATE ON WHICH ALL OF THE SCHEDULE B, PART I—REQUIREMENTS ARE MET.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
2. ANY FACTS, RIGHTS, INTERESTS OR CLAIMS THAT ARE NOT SHOWN BY THE PUBLIC RECORDS BUT THAT COULD BE ASCERTAINED BY AN INSPECTION OF THE LAND OR BY MAKING INQUIRY OF PERSONS IN POSSESSION OF THE LAND.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
3. EASEMENTS, LIENS OR ENCUMBRANCES, OR CLAIMS THEREOF, NOT SHOWN BY THE PUBLIC RECORDS.
   NONE OBSERVED DURING FIELD SURVEY OR DISCOVERED AS A RESULT OF FURTHER RESEARCH
4. ANY ENCROACHMENT, ENCUMBRANCE, VIOLATION, VARIATION, OR ADVERSE CIRCUMSTANCE AFFECTING THE TITLE INCLUDING DISCREPANCIES, CONFLICTS IN BOUNDARY LINES, SHORTAGE IN AREA, OR ANY OTHER FACTS THAT WOULD BE DISCLOSED BY AN ACCURATE AND COMPLETE LAND SURVEY OF THE LAND, AND THAT ARE NOT SHOWN IN THE PUBLIC RECORDS.
   RESULTS OF SURVEY SHOWN HEREON
5. TAXES AND ASSESSMENTS NOT DUE AND PAYABLE AT COMMITMENT DATE.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
6. ANY LIEN OR RIGHT TO A LIEN, IMPOSED BY LAW, AS A RESULT OF SERVICES, LABOR, AND/OR MATERIALS USED, OR TO BE USED, FOR IMPROVEMENT TO THE LAND.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
7. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
8. ANY CLAIM TO (A) OWNERSHIP OF OR RIGHTS TO MINERALS AND SIMILAR SUBSTANCES, INCLUDING BUT NOT LIMITED TO ORES, METALS, COAL, LIGNITE, OIL, GAS, URANIUM, CLAY, ROCK, SAND, AND GRAVEL LOCATED IN, ON, OR UNDER THE LAND OR PRODUCED FROM THE LAND, WHETHER SUCH OWNERSHIP OR RIGHTS ARISE BY LEASE, GRANT, EXCEPTION, CONVEYANCE, RESERVATION, OR OTHERWISE; AND (B) ANY RIGHTS, PRIVILEGES, IMMUNITIES, RIGHTS OF WAY, AND EASEMENTS ASSOCIATED THEREWITH OR APPURTENANT THERETO, WHETHER OR NOT THE INTERESTS OR RIGHTS EXCEPTED IN (A) OR (B) APPEAR IN THE PUBLIC RECORDS OR ARE SHOWN IN SCHEDULE B.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
9. ALL TAX MAP NUMBERS REFERRED TO IN THE TITLE REPORT AND FINAL POLICY ARE FOR INFORMATIONAL PURPOSES ONLY AND FIRST AMERICAN TITLE INSURANCE COMPANY DOES NOT INSURE, NOR LIMIT THE EXCEPTIONS, TO THE TAX MAP NUMBERS INDICATED.
   ADJOINING PARCEL LINES AND OWNER INFORMATION SHOWN PER AVAILABLE GIS/TAX MAP AND ARE APPROXIMATE
10. THE TERMS, PROVISIONS AND EASEMENT(S) CONTAINED IN THE DOCUMENT ENTITLED WARRANTY DEED RECORDED FEBRUARY 03, 1926 AS LIBER 244, PAGE 396.
    EASEMENT DOES NOT ENCUMBER SUBJECT PARCEL, NOT SHOWN
11. THE TERMS, PROVISIONS AND EASEMENT(S) CONTAINED IN THE DOCUMENT ENTITLED EASEMENT RECORDED MAY 23, 1996 AS LIBER 1577, PAGE 706.
    EASEMENT DOES NOT ENCUMBER SUBJECT PARCEL, NOT SHOWN
12. THE ACREAGE STATED IN THE LEGAL DESCRIPTION OF THE LAND IS FOR DESCRIPTION PURPOSES ONLY. THE QUANTITY OF THE LAND IS NOT INSURED.
    THE AREA BASED ON THE SURVEY IS SHOWN HEREON
13. INTEREST OF OTHERS IN OIL, GAS AND MINERAL RIGHTS, IF ANY, WHETHER OR NOT RECORDED IN THE PUBLIC RECORDS.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
14. INTEREST, IF ANY, OF THE UNITED STATES, STATE OF MICHIGAN, OR ANY POLITICAL SUBDIVISION THEREOF, IN THE OIL, GAS AND MINERALS IN AND UNDER AND THAT MAY BE PRODUCED FROM THE LAND.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
15. RIGHTS OF TENANTS UNDER UNRECORDED LEASES.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
16. THE PUBLIC RECORDS DO NOT SHOW ANY LEGAL RIGHT OF ACCESS TO OR FROM THE LAND, AND, BY REASON THEREOF, THE COMPANY DOES NOT INSURE ANY RIGHT OF ACCESS TO AND FROM THE INSURED PROPERTY.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
17. TO THE EXTENT A TRACT IS BOUNDED BY A PUBLIC ROAD, RIGHTS OF OTHERS IN AND TO ANY PORTION OF THE PROPERTY THAT LIES WITHIN SAID ROAD.
    THE TRACT IS NOT BOUND BY A PUBLIC ROAD

SURVEYOR'S NOTES:

1. VERTICAL DATUM IS NAVD88.
2. HORIZONTAL DATUM IS MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE NAD83 (2011).
3. GRID DISTANCE x 0.99990745 = GROUND DISTANCE.
4. BEARINGS ARE BASED UPON MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE NAD83 (2011).
5. THE SUBJECT PROPERTY IS THE SAME AS THE PROPERTY DESCRIBED IN SCHEDULE C OF THE PROVIDED TITLE COMMITMENT.
6. THE LEGAL DESCRIPTION PROVIDED IN SCHEDULE C OF THE PROVIDED TITLE COMMITMENT CONTAINS PROPERTY MEASUREMENTS AS RECORDED.
8. ALL PROPERTY BOUNDARY MEASUREMENTS SHOWN HEREON ARE MEASURED AND DISTANCES HAVE BEEN CONVERTED TO GROUND DISTANCES (REFER TO NOTE 3).
9. ALL SECTION CORNERS SHOWN HEREON WERE FOUND IN GOOD CONDITION.
10. ALL TITLE DOCUMENTS ARE SHOWN AND/OR NOTED HEREON.
11. ALL UTILITIES OBSERVED ABOVE GROUND SHOWN HEREON. UNDERGROUND UTILITIES SHOWN BY GROUND PENETRATING RADAR AND UTILITY LOCATING INSTRUMENTS.

PLAN DATE: APRIL 24TH, 2026
PROJECT MGR: RAC
REVIEWER: JHR
SCALE: NO SCALE

ROWE PROFESSIONAL SERVICES COMPANY
O: (616) 272-7125
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507 36th Street SE
Grand Rapids, MI 49548

ALTA/NSPS LAND TITLE SURVEY PREPARED FOR
HERON ENERGY STORAGE, LLC.
HERON BESS PROJECT
PART OF SECTIONS 27, 28, 33, AND 34, T1N, R11W
GUN PLAIN TOWNSHIP, ALLEGAN COUNTY, MICHIGAN

REV:
SHT# V103
JOB No: 2600019

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LEGAL DESCRIPTION PER FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-FA500MI31-NRG, DATED MARCH 17, 2026 AT 7:30 AM.

RECORD LEGAL DESCRIPTION:

LAND IN THE TOWNSHIP OF GUN PLAIN, ALLEGAN COUNTY, MICHIGAN, DESCRIBED AS FOLLOWS:

PARCEL 1: (PARCEL 4 ON THIS DRAWING)

A PARCEL OF LAND IN THE SE 1/4 OF SECTION 28, T1N, R11W, AND IN THAT PART OF THE W 1/2 OF SECTION 33, T1N, R11W, LYING NE'LY OF THE 100-FEET WIDE STRIP OF LAND HERETOFORE CONVEYED TO CONSUMERS POWER COMPANY ON OCTOBER 1, 1935 BY A WARRANTY DEED RECORDED ON DECEMBER 24, 1935 IN LIBER 290 OF DEEDS ON PAGE 132 AND FOLLOWING OF ALLEGAN COUNTY RECORDS, SAID PARCEL OF LAND BEING DESCRIBED AS FOLLOWS: COMMENCE AT THE 1/4 POST COMMON TO SECTIONS 28 AND 33 FOR THE PLACE OF BEGINNING; THENCE S 89° 49' 40" E ALONG THE SECTION LINE COMMON TO SECTIONS 28 AND 33, 1317.84 FEET TO THE EAST 1/8 LINE COMMON TO SECTIONS 28 AND 33; THENCE N 00° 15' 45" E ALONG THE EAST 1/8 LINE OF SECTION 28, 1314.84 FEET TO THE SOUTH 1/8 LINE OF SECTION 28; THENCE S 89° 45' 50" E ALONG THE SOUTH 1/8 LINE OF SECTION 28, 661.32 FEET TO THE EAST LINE OF THE W 1/2 OF THE SE 1/4 OF THE SE 1/4 OF SECTION 28; THENCE S 00° 23' 00" W ALONG THE EAST LINE OF THE W 1/2 OF THE SE 1/4 OF THE SE 1/4 OF SECTION 28, 1314.1 FEET TO A POINT ON THE SECTION LINE COMMON TO SECTIONS 28 AND 33; THENCE S 00° 23' 15" W ALONG THE EAST LINE OF THE W 1/2 OF THE E 1/2 OF THE NE 1/4 OF SECTION 33, 1448.06 FEET TO A POINT ON THE NE'LY LINE OF SAID HEREINBEFORE DESCRIBED STRIP OF LAND 100 FEET WIDE HERETOFORE CONVEYED TO CONSUMERS POWER COMPANY; THENCE N 61° 49' 40" W ALONG THE NE'LY LINE OF SAID HEREINBEFORE DESCRIBED STRIP OF LAND 100 FEET WIDE 3085.38 FEET TO A POINT ON THE SECTION LINE COMMON TO SECTIONS 28 AND 33; THENCE S 89° 49' 40" E ALONG THE SECTION LINE COMMON TO SECTIONS 28 AND 33, 752.91 FEET TO THE PLACE OF BEGINNING; EXCEPTING THEREFROM ANY PORTION THEREOF FALLING WITHIN SECTION 28.

AND

A STRIP OF LAND 120 FEET WIDE LYING NE'LY OF A LINE WHICH IS PARALLEL WITH AND 100 FEET DISTANT NE'LY OF THE NE'LY LINE OF THE NEW YORK CENTRAL RAILROAD RIGHT-OF-WAY AND N'LY OF THE CENTER LINE OF RIVERVIEW ROAD ACROSS THAT PART OF THE E 1/2 OF THE E 1/2 OF THE NE 1/4 OF SECTION 33, T1N, R11W, DESCRIBED AS FOLLOWS: TO FIND THE PLACE OF BEGINNING OF THIS DESCRIPTION COMMENCE AT THE E 1/4 POST OF SAID SECTION; RUN THENCE N 00° 17' 20" E ALONG THE EAST LINE OF SAID SECTION 902.39 FEET TO A POINT IN THE CENTER LINE OF RIVERVIEW ROAD AND THE PLACE OF BEGINNING OF THIS DESCRIPTION; THENCE S 81° 37' 00" W ALONG THE CENTER LINE OF SAID RIVERVIEW ROAD 120.19 FEET TO A POINT WHICH SAID POINT IS 100 FEET DISTANT FROM AND MEASURED AT RIGHT ANGLES TO THE NE'LY RIGHT-OF-WAY LINE OF THE NEW YORK CENTRAL RAILROAD, (THE STRIP OF LAND 100 FEET WIDE WHICH LIES BETWEEN THE NE'LY RIGHT-OF-WAY LINE OF THE NEW YORK CENTRAL RAILROAD AND THE STRIP OF LAND 120 FEET WIDE WHICH IS HEREIN CONVEYED IS LAND WHICH WAS HERETOFORE CONVEYED TO CONSUMERS POWER COMPANY ON OCTOBER 1, 1935 BY A WARRANTY DEED RECORDED ON DECEMBER 24, 1935 IN LIBER 290 OF DEEDS ON PAGE 132 AND FOLLOWING OF ALLEGAN COUNTY RECORDS); THENCE N 61° 49' 40" W PARALLEL WITH AND 100 FEET DISTANT FROM AND MEASURED AT RIGHT ANGLES TO THE NE'LY LINE OF THE NEW YORK CENTRAL RAILROAD RIGHT-OF-WAY AND ALONG THE NE'LY SIDE OF SAID HEREINBEFORE DESCRIBED STRIP OF LAND 100 FEET WIDE HERETOFORE CONVEYED TO CONSUMERS POWER COMPANY 603.82 FEET TO THE WEST LINE OF THE E 1/2 OF THE E 1/2 OF THE NE 1/4 OF SAID SECTION WHICH SAID POINT IS S 00° 23' 15" W, 1448.56 FEET FROM THE NORTH LINE OF SAID SECTION, AS MEASURED ALONG THE WEST LINE OF THE E 1/2 OF THE E 1/2 OF THE NE 1/4 OF SAID SECTION; THENCE N 00° 23' 15" E ALONG THE WEST LINE OF THE E 1/2 OF THE E 1/2 OF THE NE 1/4 OF SAID SECTION 133.56 FEET; THENCE S 61° 49' 40" E PARALLEL WITH AND 220 FEET DISTANT FROM THE NE'LY LINE OF THE NEW YORK CENTRAL RAILROAD RIGHT-OF-WAY 748.09 FEET TO THE EAST LINE OF SAID SECTION; THENCE S 00° 17' 20" W ALONG THE EAST LINE OF SAID SECTION 48.71 FEET TO THE PLACE OF BEGINNING.

AND

A STRIP OF LAND ONE HUNDRED (100) FEET IN WIDTH LYING ON THE NORTHEASTERLY SIDE OF AND ALONG AND ADJOINING THE NORTHEASTERLY LINE OF THE LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY RIGHT OF WAY ACROSS THE NORTHEAST QUARTER (NE1/4) OF NORTHWEST QUARTER (NW1/4) OF SECTION THIRTY-THREE (33), TOWNSHIP ONE (1) NORTH, RANGE ELEVEN (11) WEST.

AND

A STRIP OF LAND ONE HUNDRED (100) FEET IN WIDTH LYING ON THE NORTHEASTERLY SIDE OF AND ALONG AND ADJOINING THE NORTHEASTERLY LINE OF THE LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY RIGHT OF WAY ACROSS THE NORTHWEST QUARTOR (NW1/4) OF NORTHEAST QUARTER (NE1/4) OF SECTION THIRTY-THREE (33), TOWNSHIP ONE (1) NORTH, RANGE ELEVEN (11) WEST.

AND

A STRIP OF LAND ONE HUNDRED (100) FEET IN WIDTH LYING ON THE NORTHEASTERLY SIDE OF AND ALONG AND ADJOINING THE NORTHEASTERLY LINE OF THE LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY RIGHT OF WAY ACROSS THE EAST HALF (E1/2) OF NORTHEAST QUARTER (NE1/4) SECTION THIRTY-THREE (33) TOWNSHIP ONE (1) NORTH, RANGE ELEVEN (1) WEST; AND ALSO THAT PART OF THE EAST HALF (E1/2) OF NORTHEAST QUARTER (NE1/4) OF SAID SECTION THIRTY-THREE LYING NORTH OF THE LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY, BOUNDED ON THE NORTH BY THE HIGHWAY LEADING FROM THE VILLAGE OF PLAINWELL TO SILVER CREEK, ON THE EAST BY LANDS FORMERLY OWNED BY A. J. MURPHY, AND ON THE SOUTH BY SAID LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY.

PARCEL 2: (PARCEL 5 ON THIS DRAWING)

ALL THAT STRIP OR PARCEL OF LAND SITUATE IN THE TOWNSHIP OF GUN PLAINS, COUNTY OF ALLEGAN AND STATE OF MICHIGAN, BEING ACROSS THE SOUTHWEST QUARTER OF SECTION 28, NORTHEAST QUARTER OF THE NORTHWEST QUARTER, AND NORTHEAST QUARTER OF SECTION 33 AND THE WEST HALF AND THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 34, ALL IN TOWNSHIP 1 NORTH, RANGE 11 WEST, BOUNDED AND DESCRIBED AS FOLLOWS:

COMMENCE AT THE NORTH QUARTER CORNER OF SAID SECTION 33; RUN THENCE NORTH 89 DEGREES 48 MINUTES 35 SECONDS WEST, ALONG THE NORTH LINE OF SAID SECTION 33, THE DISTANCE OF 965.92 FEET TO THE PLACE OF BEGINNING OF THIS DESCRIPTION; THENCE SOUTH 61 DEGREES 48 MINUTES 35 SECONDS EAST, ALONG THE SOUTHWESTERLY LINE OF AN EXISTING CONSUMERS POWER COMPANY 100-FOOT WIDE FEE STRIP, 4074.67 FEET TO A POINT ON THE WEST LINE OF SAID SECTION 34, SAID POINT BEING 702.89 FEET NORTH OF THE WEST QUARTER CORNER OF SAID SECTION 34 AS MEASURED ALONG SAID WEST SECTION LINE; THENCE CONTINUING ALONG THE SOUTHWESTERLY LINE OF AN EXISTING CONSUMERS POWER COMPANY 100-FOOT WIDE FEE STRIP SOUTH 61 DEGREES 46 MINUTES 45 SECONDS EAST, 2404.03 FEET TO A POINT OF CURVE; THENCE SOUTHEASTERLY 631.55 FEET, ALONG A CURVE CONCAVE TO THE SOUTHWEST; SAID CURVE HAVING A RADIUS OF 2897.79 FEET, AND A CHORD BEARING SOUTH 55 DEGREES 32 MINUTES 05 SECONDS EAST, 630.38 FEET TO THE NORTH-SOUTH QUARTER LINE OF SAID SECTION 34; THENCE NORTH 0 DEGREES 31 MINUTES 30 SECONDS EAST, ALONG SAID QUARTER LINE, 22.47 FEET; THENCE SOUTHEASTERLY 267.38 FEET, ALONG A CURVE CONCAVE TO THE SOUTHWEST; SAID CURVE HAVING A RADIUS OF 2914.79 FEET AND A CHORD BEARING SOUTH 46 DEGREES 53 MINUTES 10 SECONDS EAST, 267.29 FEET; THENCE SOUTH 73 DEGREES 11 MINUTES 16 SECONDS WEST, BY REMAINING LAND OF THE GRANTOR, 113.22 FEET TO THE SOUTHWESTERLY LINE OF THE FORMER NEW YORK CENTRAL RAILROAD RIGHT-OF-WAY; THENCE NORTHWESTERLY, ALONG SAID SOUTHWESTERLY LINE, 121.29 FEET, ALONG A CURVE CONCAVE TO THE SOUTHWEST; SAID CURVE HAVING A RADIUS OF 2814.79 FEET AND A CHORD BEARING NORTH 46 DEGREES 29 MINUTES 25 SECONDS WEST, 121.27 FEET TO SAID NORTH-SOUTH QUARTER LINE OF SAID SECTION 34; THENCE NORTH 0 DEGREES 31 MINUTES 30 SECONDS EAST, ALONG SAID QUARTER LINE, 22.46 FEET TO A POINT, SAID POINT BEING 1821.45 FEET NORTH OF THE SOUTH QUARTER CORNER OF SAID SECTION 34 AS MEASURED ALONG THE NORTH-SOUTH QUARTER LINE OF SAID SECTION 34; THENCE NORTHWESTERLY 673.40 FEET, ALONG A CURVE CONCAVE TO THE SOUTHWEST; SAID CURVE HAVING A RADIUS OF 2831.79 FEET AND A CHORD BEARING NORTH 54 DEGREES 58 MINUTES WEST, 671.83 FEET TO A POINT OF TANGENT; THENCE NORTH 61 DEGREES 46 MINUTES 45 SECONDS WEST, ALONG THE NORTHEASTERLY LINE OF EXISTING CONSUMERS POWER COMPANY PROPERTY AND THE SOUTHWESTERLY LINE OF THE FORMER NEW YORK CENTRAL RAILROAD RIGHT-OF-WAY, 2369.10 FEET TO A POINT ON THE WEST LINE OF SAID SECTION 34, SAID POINT BEING 628.22 FEET NORTH OF THE WEST QUARTER CORNER OF SAID SECTION 34 AS MEASURED ALONG SAID WEST SECTION LINE; THENCE CONTINUING ALONG THE NORTHEASTERLY LINE OF EXISTING CONSUMERS POWER COMPANY PROPERTY AND THE SOUTHWESTERLY LINE OF THE FORMER NEW YORK CENTRAL RAILROAD RIGHT-OF-WAY NORTH 61 DEGREES 46 MINUTES 35 SECONDS WEST, 5474.36 FEET TO A POINT OF CURVE, THENCE NORTHWESTERLY, ALONG SAID SOUTHWESTERLY RIGHT-OF-WAY LINE, 535.21 FEET, ALONG A CURVE CONCAVE TO THE NORTHEAST; SAID CURVE HAVING A RADIUS OF 5404.56 FEET AND A CHORD BEARING NORTH 58 DEGREES 58 MINUTES 20 SECONDS WEST, 535.07 FEET TO A POINT ON THE WEST LINE OF SAID SECTION 28, SAID POINT BEING 856.72 FEET NORTH OF THE SOUTHWEST CORNER OF SAID SECTION 28 AS MEASURED ALONG SAID WEST SECTION LINE; THENCE NORTH 0 DEGREES 10 MINUTES 05 SECONDS EAST, ALONG THE WEST LINE OF SAID SECTION 28, THE DISTANCE OF 79.54 FEET; THENCE SOUTHEASTERLY, ALONG THE SOUTHWEST LINE OF EXISTING CONSUMERS POWER COMPANY PROPERTY, 572.83 FEET, ALONG A CURVE CONCAVE TO THE NORTHEAST, SAID CURVE HAVING A RADIUS OF 5338.56 FEET AND A CHORD BEARING SOUTH 58 DEGREES 44 MINUTES 08 SECONDS EAST, 572.61 FEET TO A POINT OF TANGENT, THENCE SOUTH 61 DEGREES 48 MINUTES 35 SECONDS EAST, ALONG SAID CONSUMERS POWER COMPANY PROPERTY LINE, 1364.76 FEET TO THE PLACE OF BEGINNING. BEARINGS ARE BASED ON THE NORTH LINE OF SECTION 33 BETWEEN THE NORTH QUARTER CORNER AND NORTHWEST CORNER ASSUMED AS NORTH 89 DEGREES 48 MINUTES 35 SECONDS WEST.

SCHEDULE B, PART II, EXCEPTIONS, PER FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-FA500MI31-NRG, DATED MARCH 17, 2026 AT 7:30 AM.

1. ANY DEFECT, LIEN, ENCUMBRANCE, ADVERSE CLAIM, OR OTHER MATTER THAT APPEARS FOR THE FIRST TIME IN THE PUBLIC RECORDS OR IS CREATED, ATTACHES, OR IS DISCLOSED BETWEEN THE COMMITMENT DATE AND THE DATE ON WHICH ALL OF THE SCHEDULE B, PART I-REQUIREMENTS ARE MET.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
2. ANY FACTS, RIGHTS, INTERESTS OR CLAIMS THAT ARE NOT SHOWN BY THE PUBLIC RECORDS BUT THAT COULD BE ASCERTAINED BY AN INSPECTION OF THE LAND OR BY MAKING INQUIRY OF PERSONS IN POSSESSION OF THE LAND.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
3. EASEMENTS, LIENS OR ENCUMBRANCES, OR CLAIMS THEREOF, NOT SHOWN BY THE PUBLIC RECORDS.
   NONE OBSERVED DURING FIELD SURVEY OR DISCOVERED AS A RESULT OF FURTHER RESEARCH
4. ANY ENCROACHMENT, ENCUMBRANCE, VIOLATION, VARIATION, OR ADVERSE CIRCUMSTANCE AFFECTING THE TITLE INCLUDING DISCREPANCIES, CONFLICTS IN BOUNDARY LINES, SHORTAGE IN AREA, OR ANY OTHER FACTS THAT WOULD BE DISCLOSED BY AN ACCURATE AND COMPLETE LAND SURVEY OF THE LAND, AND THAT ARE NOT SHOWN IN THE PUBLIC RECORDS.
   RESULTS OF SURVEY SHOWN HEREON
5. TAXES AND ASSESSMENTS NOT DUE AND PAYABLE AT COMMITMENT DATE.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
6. ANY LIEN OR RIGHT TO A LIEN, IMPOSED BY LAW, AS A RESULT OF SERVICES, LABOR, AND/OR MATERIALS USED, OR TO BE USED, FOR IMPROVEMENT TO THE LAND.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
7. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
8. ANY CLAIM TO (A) OWNERSHIP OF OR RIGHTS TO MINERALS AND SIMILAR SUBSTANCES, INCLUDING BUT NOT LIMITED TO ORES, METALS, COAL, LIGNITE, OIL, GAS, URANIUM, CLAY, ROCK, SAND, AND GRAVEL LOCATED IN, ON, OR UNDER THE LAND OR PRODUCED FROM THE LAND, WHETHER SUCH OWNERSHIP OR RIGHTS ARISE BY LEASE, GRANT, EXCEPTION, CONVEYANCE, RESERVATION, OR OTHERWISE; AND (B) ANY RIGHTS, PRIVILEGES, IMMUNITIES, RIGHTS OF WAY, AND EASEMENTS ASSOCIATED THEREWITH OR APPURTENANT THERETO, WHETHER OR NOT THE INTERESTS OR RIGHTS EXCEPTED IN (A) OR (B) APPEAR IN THE PUBLIC RECORDS OR ARE SHOWN IN SCHEDULE B.
   LEGAL IN NATURE, NOT A MATTER OF SURVEYING
9. ALL TAX MAP NUMBERS REFERRED TO IN THE TITLE REPORT AND FINAL POLICY ARE FOR INFORMATIONAL PURPOSES ONLY AND FIRST AMERICAN TITLE INSURANCE COMPANY DOES NOT INSURE, NOR LIMIT THE EXCEPTIONS, TO THE TAX MAP NUMBERS INDICATED.
   ADJOINING PARCEL LINES AND OWNER INFORMATION SHOWN PER AVAILABLE GIS/TAX MAP AND ARE APPROXIMATE
10. RIGHT OF WAY IN FAVOR OF AMERICAN TELEGRAPH AND TELEPHONE COMPANY, ITS SUCCESSORS AND ASSIGNS, RECORDED AUGUST 24, 1927 IN LIBER 240, PAGE 528.
    EASEMENT NOT PLOTTABLE DUE TO NATURE OF BLANKET EASEMENT
11. EASEMENT FOR UNDERGROUND TELEPHONE CABLE AND/OR CONDUITS IN FAVOR OF MICHIGAN BELL TELEPHONE COMPANY, ITS SUCCESSORS AND ASSIGNS, RECORDED AUGUST 20, 1969 IN LIBER 764, PAGE 385.
    PLOTTED HEREON AS DESCRIBED
12. SUPPLEMENT NO. 1 TO AMENDED AND RESTATED EASEMENT AGREEMENT MADE BETWEEN CONSUMERS ENERGY COMPANY (FORMERLY KNOWN AS CONSUMERS POWER COMPANY), A MICHIGAN CORPORATION, (SUCCESSOR BY MERGER TO CONSUMERS POWER COMPANY, A MAINE CORPORATION) AND MICHIGAN ELECTRIC TRANSMISSION COMPANY, RECORDED MAY 13, 2002 IN LIBER 2239, PAGE 776.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
13. CONDITIONS SET FORTH IN WARRANTY DEED MADE BY GEORGE T. ARNOLD AND SUSAN B. ARNOLD HIS WIFE, TO MICHIGAN RAILWAY ENGINEERING COMPANY, RECORDED APRIL 3, 1913 IN LIBER 194, PAGE 88.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
14. RESERVATION SET FORTH IN DEED MADE BY HOWARD STEELE AND THEO B. STEELE, ALSO KNOWN AS THEO BELLE STEELE, HIS WIFE, AND CONSUMERS POWER COMPANY, RECORDED DECEMBER 21, 1965 IN LIBER 713, PAGE 426.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
15. RESERVATIONS SET FORTH IN QUITCLAIM DEED MADE BY UNITED RAILROAD CORP. AND THE PENN CENTRAL CORPORATION TO CONSUMERS POWER COMPANY, RECORDED JUNE 15, 1984 IN LIBER 1060, PAGE 142.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
16. INTEREST OF OTHERS IN OIL, GAS AND MINERAL RIGHTS, IF ANY, WHETHER OR NOT RECORDED IN THE PUBLIC RECORDS.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
17. INTEREST, IF ANY, OF THE UNITED STATES, STATE OF MICHIGAN, OR ANY POLITICAL SUBDIVISION THEREOF, IN THE OIL, GAS AND MINERALS IN AND UNDER AND THAT MAY BE PRODUCED FROM THE LAND.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
18. ANY RIGHTS, TITLE, INTEREST OR CLAIM THEREOF TO THAT PORTION OF THE LAND TAKEN, USED OR GRANTED FOR STREETS, ROADS OR HIGHWAYS.
    PUBLIC ROAD RIGHTS OF WAY SHOWN HEREON
19. SIXTY-SEVENTH SUPPLEMENTAL INDENTURE DATED AS OF NOVEMBER 15, 1989 AND RECORDED DECEMBER 11, 1989 IN LIBER 1241, PAGE 508, MADE BY CONSUMERS POWER COMPANY, AND MANUFACTURERS HANOVER TRUST COMPANY, AS TRUSTEE UNDER THE INDENTURE DATED AS OF SEPTEMBER 1, 1945 BETWEEN CONSUMERS POWER COMPANY AND CITY BANK FARMERS TRUST COMPANY (CITIBANK, N.A., SUCCESSOR), AND THE TERMS AND PROVISIONS THEREOF.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
20. TRUST INDENTURES, BOND INDENTURES, TRUST AGREEMENTS, DEEDS OF TRUST, MORTGAGES OR OTHER DOCUMENTS WHICH MAY NOT DESCRIBE THE LAND BUT WHICH MAY AFFECT THE TITLE OR IMPOSE LIENS THEREON, OTHER THAN AS SPECIFICALLY SET FORTH HEREIN.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING
21. EXISTING UNRECORDED LEASES, IF ANY, AND RIGHTS OF ALL PARTIES CLAIMING THERELUNDER.
    LEGAL IN NATURE, NOT A MATTER OF SURVEYING

SURVEYOR'S NOTES:

1. VERTICAL DATUM IS NAVD88.
2. HORIZONTAL DATUM IS MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE NAD83 (2011).
3. GRID DISTANCE x 0.99990745 = GROUND DISTANCE.
4. BEARINGS ARE BASED UPON MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE NAD83 (2011).
5. THE SUBJECT PROPERTY IS THE SAME AS THE PROPERTY DESCRIBED IN SCHEDULE C OF THE PROVIDED TITLE COMMITMENT.
6. THE LEGAL DESCRIPTION PROVIDED IN SCHEDULE C OF THE PROVIDED TITLE COMMITMENT CONTAINS PROPERTY MEASUREMENTS AS RECORDED.
7. ALL PROPERTY BOUNDARY MEASUREMENTS SHOWN HEREON ARE MEASURED AND DISTANCES HAVE BEEN CONVERTED TO GROUND DISTANCES (REFER TO NOTE 3).
8. ALL SECTION CORNERS SHOWN HEREON WERE FOUND IN GOOD CONDITION.
9. ALL TITLE DOCUMENTS ARE SHOWN AND/OR NOTED HEREON.

STATE OF MICHIGAN
JOHN M. HOFFMAN
PROFESSIONAL SURVEYOR

PLAN DATE: APRIL 24TH, 2026
PROJECT MGR: RAC
REVIEWER: JHR
SCALE: NO SCALE

ROWE PROFESSIONAL SERVICES COMPANY
O: (616) 272-7125
www.rowepsc.com
507 36th Street SE
Grand Rapids, MI 49548

ALTA/NSPS LAND TITLE SURVEY PREPARED FOR:
HERON ENERGY STORAGE, LLC.
HERON BESS PROJECT
PART OF SECTIONS 27, 28, 33, AND 34, T1N, R11W
GUN PLAIN TOWNSHIP, ALLEGAN COUNTY, MICHIGAN

REV:
SHT# V104
JOB No: 2600019

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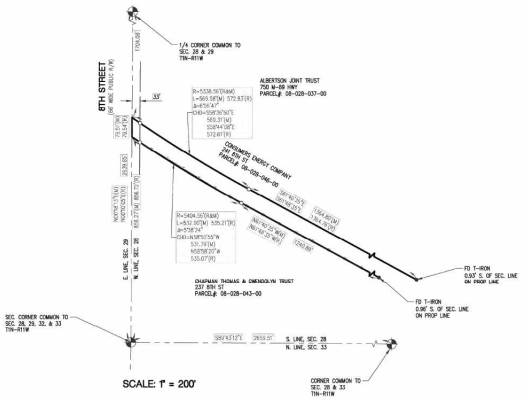
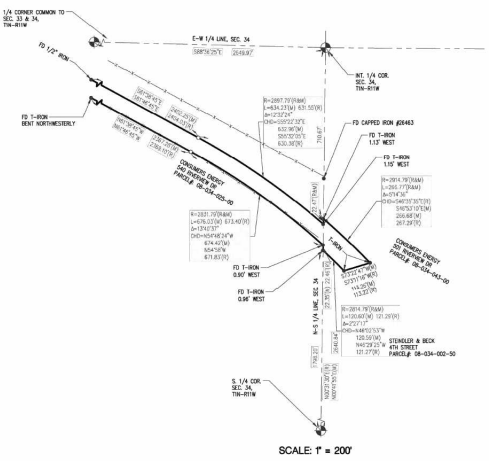
NORTHWEST PARCEL 5 DETAIL



SCALE: 1" = 200'

SOUTHEAST PARCEL 5 DETAIL



SCALE: 1" = 200'

LEGEND:

- SECTION & 1/4 CORNER
- SET 1/2" IRON WITH CAP #71293
- FOUND IRON
- SECTION LINE
- PROPERTY LINE
- ADJOINING PARCEL LINE
- EXISTING EASEMENT LINE
- EXISTING RIGHT OF WAY

PLAN DATE: APRIL 24TH, 2026
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