

Nicole Roberts, Conservation & Planning Agent

Town of Winchendon

109 Front Street
Winchendon, MA 01475

July 10, 2023

RE: Solar Energy Storage Facility – Site B
Stormwater Permit/Site Plan Application
0 Murdock Avenue
Winchendon, Massachusetts

Dear Ms. Roberts,

Hannigan Engineering, Inc is in receipt of peer review comments from Tighe and Bond in a letter dated May 11, 2023 relative to a Stormwater Permit Application & Site Plan Review for the construction of an Energy Storage Facility a 0 Murdock Avenue in Winchendon, Massachusetts. It should be noted that per a comment raised by a Planning Board member the datum of the site has been updated to reflect the NAVD1988 datum. We offer the following responses to their comments below.

Review Comments:

Comments Pertain to the Town of Winchendon Zoning Bylaws

Comment #1: Section 12.6.1(B) requires consideration of the adequacy of traffic circulation. The Consultant should provide a vehicle tracking diagram showing adequate turning radii for emergency vehicles, especially fire department vehicles, from the curb cuts around the islands.

Response: Vehicle turning layouts utilizing a typical emergency vehicle (SU-40) has been included with this review

Comment #2: Section 12.6.1(P) requires consideration of the microclimate, including noise levels of the immediate environment. The Consultant should provide a statement addressing potential noise pollution, or lack thereof, from the proposed project.

Response: A noise analysis of the electrical equipment is forthcoming.

Comments pertain to the Town of Winchendon Stormwater Management Regulations:

Comment #3: Section 8(B)(2)(b) requires the Stormwater Management Plan contain contact information, including name, address, and phone number, of all persons having a legal interest in the property. The Consultant should include this information.

Response: The Stormwater Operation and Maintenance Plan has been updated to include the contact information for the projects associated parties. This list shall be amended as necessary for changes in ownership.

Comment #4: Section 8(B)(3)(d) requires that the watershed plans include a breakdown summary of various surface conditions by soil hydrologic group rating. The Consultant should revise the plans to include this information.

Response: Additional information for surface area breakdown has been added to the watershed plans.

Comment #5: Section 8(B)(4)(b) requires groundwater recharge calculations and BMP drawdown (time to empty) calculations. The Applicant should provide these calculations in accordance with this section.

Response: Recharge calculations were included within Section 3.1 of the provided Drainage Analysis and Report.

Comment #6: Section 8(B)(4)(c) requires water quality calculations. The Applicant should provide these calculations in accordance with this section.

Response: Water Quality calculations were included within Section 3.1 of the provided Drainage Analysis and Report.

Comment #7: Section 8(B)(4)(d) requires hydraulic calculations. The Applicant should provide these calculations in accordance with this section.

Response: Hydraulic calculations were included within Section 2.0 of the provided Drainage Analysis and Report.

Comment #8: Section 8(D) requires that new development areas remove 60% of the annual load of total phosphorus loads and 90% of the average annual load of TSS. The Consultant should provide calculations or documentation that illustrates compliance with this standard.

Response: The applicable calculations were included within Section 3.1 of the provided Drainage Analysis and Report.

Comment #9: Section 8(F)(12) requires that drainage pipes are sized to accommodate the 25-year storm event and maintain velocities between 2.5 and 10 feet per second, and that calculations using Manning's Equation are provided. The Consultant should provide this information.

Response: Each pipe has been modeled within the HydroCAD to document the ability to adequately transmit runoff during all storm events. In addition, the individual Manning's Calculations have been included within the Drainage Analysis and Report documenting compliance.

Comment #10: Section 8(F)(14) requires that culverts are sized to accommodate the 50-year storm event with adequate erosion protection. The Consultant should provide this information.

- Response:** There are no new proposed culverts required for this project as such the calculation for the 50-year storm event was not included. It is noted that there is an existing culvert located within Murdock Avenue, which will remain intact as part of this project.
- Comment #11:* Section 8(F)(20) requires that all drainpipes are to be reinforced concrete pipe or high-density polyethylene pipe and have a minimum diameter of 12 inches. Three of the proposed pipes do not meet this criteria. The Consultant should revise.
- Response:** Piping has been revised to the required standard.
- Comment #12:* Section 10(B)(2) requires the Operation and Maintenance Plan contain a map showing location of the stormwater systems and facilities requiring maintenance. The Consultant should include this as part of the O&M Plan
- Response:** Maps showing the locations of the stormwater features have been incorporated in the draft Operation and Maintenance Plan (O&M).
- Comment #13:* Section 10(B)(3) requires a maintenance agreement. The Consultant should provide a draft maintenance agreement for the Town's review
- Response:** A copy of the draft maintenance agreement has been incorporated into the O&M Plan as well as included in this review.
- Comment #14:* The time of concentration flowpath for Drainage Area E12 on the existing watershed plan does not contain topographic information. The Consultant should indicate how the slopes of each segment were determined. Additionally, the Consultant should indicate why there is a discrepancy between the longest flowpaths in Drainage Areas E12 and P12
- Response:** Within Drainage area E12, the Time of Concentration (Tc) flow path has been emphasized within the Watershed Plans for a clearer depiction. As for the topographic information, the areas outside of the wetland areas were derived from the on-the-ground survey information. Areas within the resource area were presumed utilizing a consistent slope for the purposes of review based on the elevation of the wetland at the high-end of the wetland and the elevation of the existing pipe culvert at Murdock Avenue. To ensure consistency, both Pre- (E12) and Post-Development (P12) sub-catchments utilized this Tc presumption.
- Comment #15:* The site plans appear to show catch basins within the proposed islands. Typically, islands are curbed and raised up compared to their surroundings. The Consultant should provide additional information on how runoff is directed to the catch basins.
- Response:** It is agreed that catchbasins typically are set along the roadway and utilize a curb to capture runoff. As the proposed access drives are gravel, the ability to install curbing is not practicable. As such the catchbasins have been located within the landscaped islands areas with bee-hive grates and surrounded with rip rap. These grates are to be set approximately six inches below the grade of the abutting access drive to capture runoff from the access drives.

- Comment #16:** *The rain garden is partially proposed within groundwater. The drainage report notes the PVC sub-drain system has a dual purpose of draining the basin between storm events and preventing groundwater from entering the basin; however, since the basin is not lined, it is possible groundwater can still get into the system. The Consultant should consider lining the basin to prevent groundwater from permeating into the rain garden system.*
- Response:** **Based on the consistent nature of the soil within this area it is presumed that the groundwater table is approximately 28-inches to 30-inches below the existing grade. The proposed rain garden has been relocated further west such that the bottom of the Basin is approximately a foot above existing grade, providing approximately 3 feet separation to groundwater.**
- Comment #17:** *Sheet 5 of 5 contains details for a detention basin. The plans do not indicate use of a detention basin. The Consultant should clarify the intention of these details*
- Response:** **The details have been revised to indicate a Rain Garden rather than detention basin.**
- Comment #18:** *The hydrologic calculations appear to consider the wetland areas contained within the drainage areas as HSG C. Since wetlands are poorly drained features, we recommend the Consultant consider using HSG D soils in these areas*
- Response:** **The hydrologic calculations have been revised to model the wetland areas as HSG-D soils.**
- Comment #19:** *Section 3.3.4(A) requires names and full contact information for every person involved in developing the plan, including mail address, phone number, fax number, and email address. The Consultant should include this information*
- Response:** **The full contact information for the individuals associated with developing the plan are included in the project contact list provided.**
- Civil Engineer/Land Surveyor**
Hannigan Engineering, Inc.
8 Monument Square
Leominster, Massachusetts 01453
978-534-1234
canderson@hanniganengineering.com
- Site/Battery Developer**
ZP Battery DevCo, LLC
1 Mercantile Street, Suite 630
Worcester, Massachusetts 01608
774-479-9870
tcorbett@zpeenergy.com
- Wetland Scientist**
LEC Environmental Consultants, Inc.
100 Grove Street, Suite 302
Worcester, Massachusetts 01605
508-753-3077
akendall@lecenvironmental.com

- Comment #20:** *Section 3.3.4(H) requires water balance calculations for sites all or partly within a Groundwater Protection Overlay District. The Consultant should confirm whether the site is within the Overlay District, and, if so, provide the necessary calculations*
- Response:** **This office has requested the Plan as reference within the Bylaw from the Town Clerk and at this time it has been unable to be located. As such a review of MassGIS “MassMapper” has revealed that there are no mapped aquifer areas located within the project scope. As such it is anticipated that the project is not subject to the Groundwater Protection Overlay District.**
- Comment #21:** *Section 3.3.4(P) requires a separate plan sheet containing landscape information, including a planting table with botanical and common names of each species, heights, spread (at maturity), and quantity to be planted. Landscaping details, including a typical detail of a tree well, tree planting, and specialty planting area, if applicable, are also required. Additionally, the callouts on Sheet 2 of 5 which reference evergreen plantings appear incomplete as they end in the word “and”. The Consultant should consider preparing a separate landscape plan and details in accordance with this section.*
- Response:** **A separate landscape plan has been included within the Site Development Plans.**
- Comment #22:** *Section 3.3.4(Q) requires all proposed signage is shown on the site plan. We note two sign details are provided on Sheet 4 of 5; however, the locations of the signs are not shown in plan view. The sign details should also include the materials of each sign. The Consultant should consider revising the plan and details in accordance with this section.*
- Response:** **Additional detail has been provided relative to the material of the signage. The locations of the signage have been depicted on the revised site plans.**
- Comment #23:** *Section 3.3.4(V) requires clear identification of each area intended to be used as open space with the square footage of each such area shown. A separate sheet may be necessary to show these areas adequately. Additionally, all driveway entrances should be dimensioned and intersections and driveway entrances on other lots within 75 feet of the site should be identified with the distance between driveways dimensioned. The Consultant should consider inclusion of this information in accordance with this section,*
- Response:** **The areas demarcated as open space have been identified on the plans. There are no adjacent driveways entrances within 75-feet from the property along Murdock Avenue. The exception to this would be the access for #256 Murdock Avenue as shown.**
- Comment #24:** *Section 3.3.5(E)(4)(b) requires estimates of construction costs for consideration in determining the amount of performance bond or cash security. We note the Applicant has stated costs will be provided prior to construction if a performance bond is required. We recommend the Board consider a condition of approval that the cost is provided prior to issuance of a Building Permit*
- Response:** **Acknowledged.**

**HANNIGAN
ENGINEERING, INC.**

8 MONUMENT SQUARE, LEOMINSTER, MA 01453 PHONE: (978) 534-1234 CIVIL ENGINEERS & LAND SURVEYORS

This information is being provided as part of the review of the Stormwater Permit Application and Special Permit Application project submitted to the Town. Hannigan Engineering, Inc would like to thank the Planning staff and the Board for its continued cooperation during the review of this project.

Sincerely,
HANNIGAN ENGINEERING, INC.



Christopher M. Anderson, PE
Vice President – Engineering



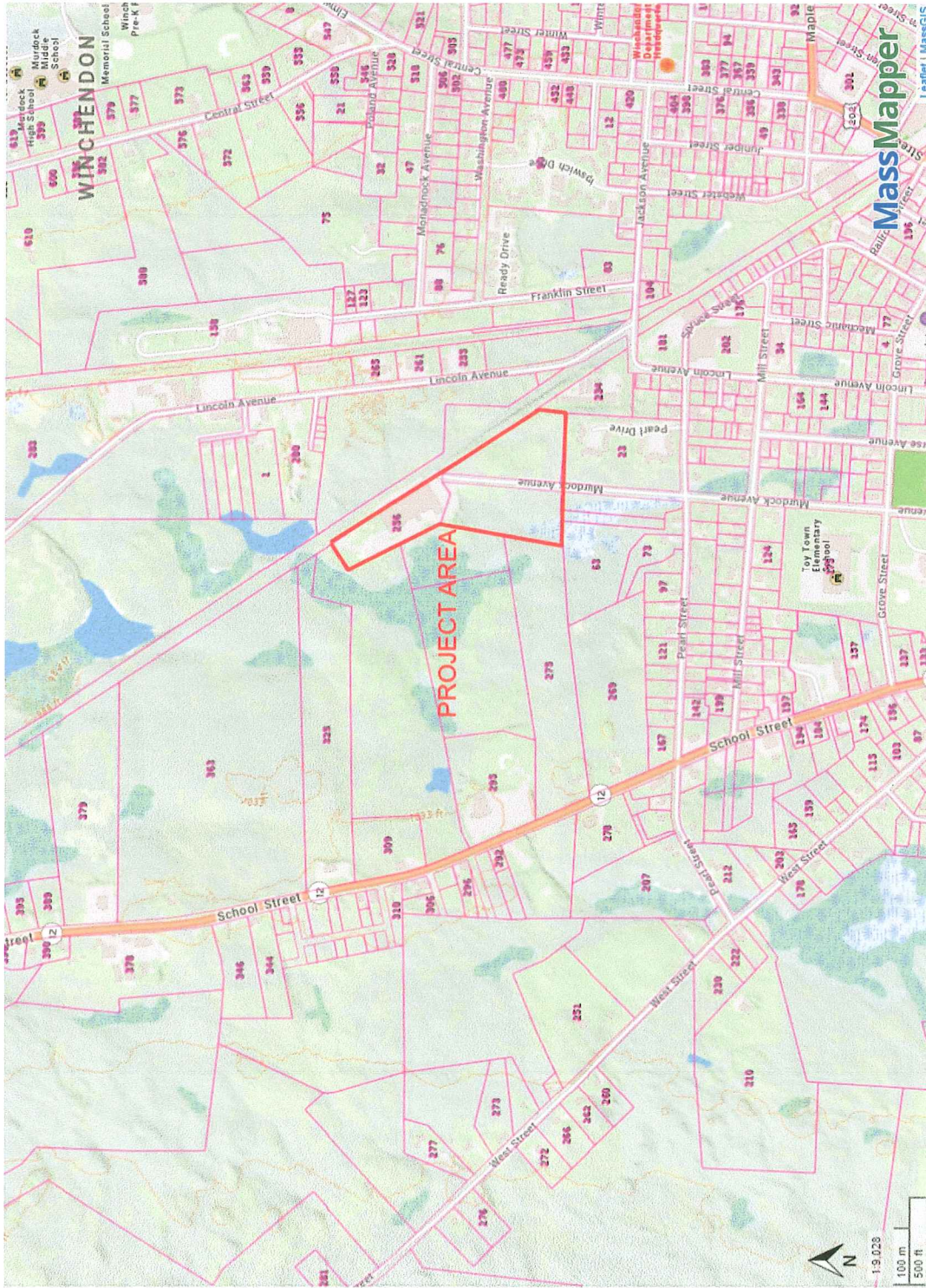
William D. Hannigan, PE
President

Pc: Pete Forte–ZP Battery DevCo, LLC
Tom Corbett–ZP Battery DevCo, LLC
Brendan Gove –ZP Battery DevCo, LLC

CMA/WDH:brm

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Groundwater Protection Review



Zone IIs



Zone Is



IWPAs



Zone C



Zone B

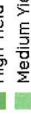


Zone A

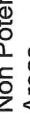


Aquifers by Yield

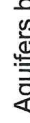
High Yield



Medium Yield



Non Potential Drinking Water Source Areas



Aquifers by Yield Green Shades

High Yield



Medium Yield

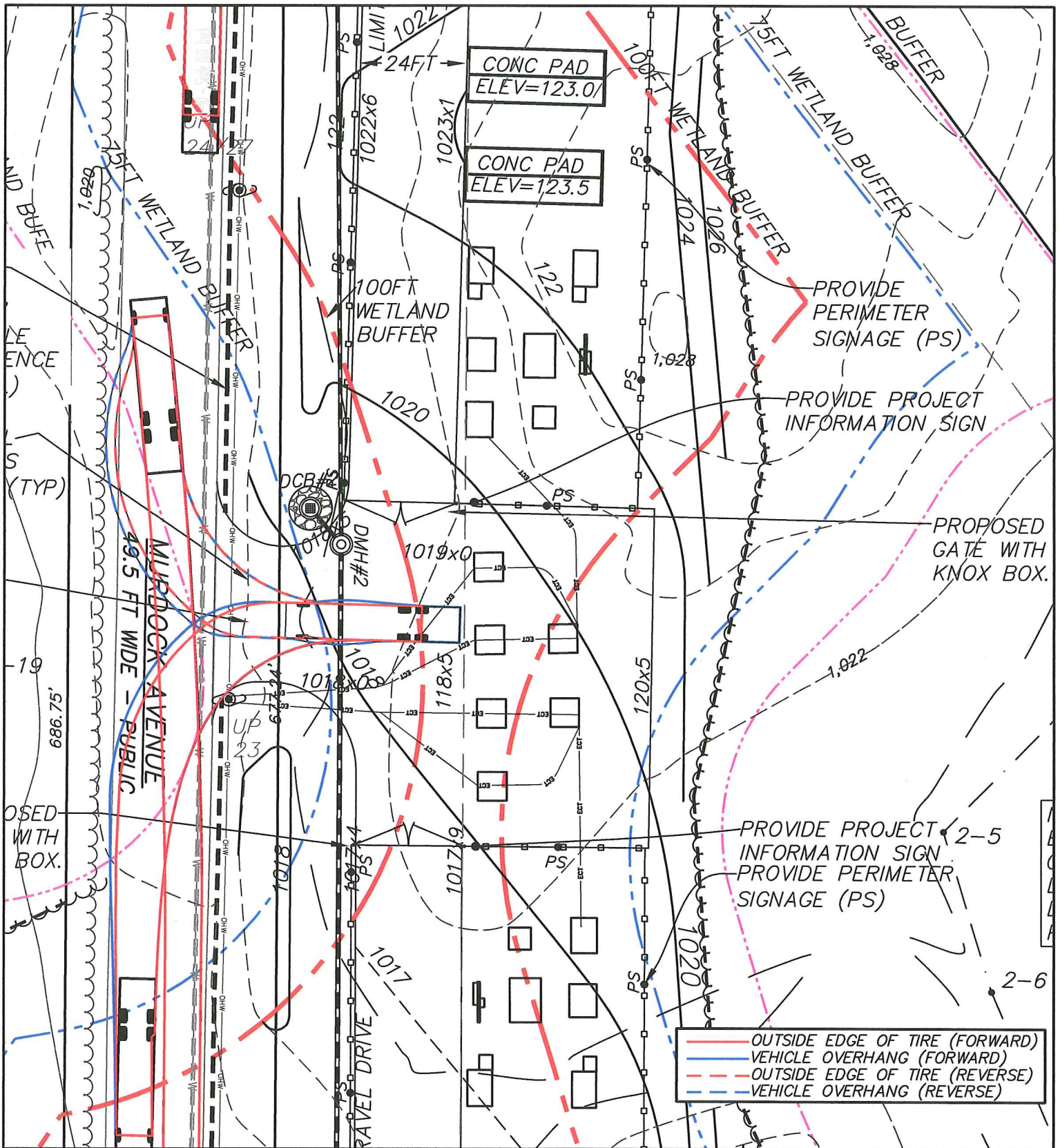


Property Tax Parcels



MassMapper

Leaflet | Mapbox



HANNIGAN ENGINEERING, INC.

CIVIL ENGINEERS & LAND SURVEYORS

8 MONUMENT SQUARE
LEOMINSTER, MASSACHUSETTS 01453

(978) 534-1234 (T)
(978) 534-6060 (F)

WWW.HANNIGANENGINEERING.COM

VEHICLE MANEUVERING (SU40)

JUNE 28, 2023

SCALE: 1" = 30'

PREPARED FOR:
ZP BATTERY DEVCO, LLC
1 MERCANTILE STREET, SUITE 630
WORCESTER, MASSACHUSETTS 01608

STORMWATER MANAGEMENT OPERATION, MAINTENANCE, AND INSPECTION AGREEMENT

**Town of Winchendon, MA
Department of Public Works
(978) 297-1212**

THIS AGREEMENT, made and entered into this 26 day of June, 2023, by and between (Insert Full Name of Owner) ZP Battery DevCo, LLC hereinafter called the "Project Owner", and the Town of Winchendon, hereinafter called the "Town".

WITNESSETH, that WHEREAS, the Project Owner is the Lessee of certain real property at (Street Address) 256 Murdock Ave as described as (Town of Winchendon Assessors Map/Parcel/Lot Number) 5A2-0-25, 5A2-0-26 as recorded by notice in the land records of Worcester County, Massachusetts, Deed Book 17143 Page 339, hereinafter called the "Property". WHEREAS, the Project Owner is proceeding to build on and develop a portion the property; and WHEREAS, the Site Plan/Subdivision Plan known as Site Development Plan- Solar Energy Storage System- 0 Murdock Ave (Name of Plan/Development) hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by the Town, which provides for the conveyance, treatment, and/or detention of stormwater within the confines of the Property; and

WHEREAS, the Town and the Project Owner, its successors and assigns agree that the health, safety, and welfare of the residents of the Town of Winchendon, Massachusetts, require that on-site stormwater management facilities be constructed and maintained on the Property; and

WHEREAS, the Town requires that on-site stormwater management facilities as shown on the Plan be constructed and adequately maintained by the Project Owner, its successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, in accordance with the Winchendon Stormwater Management Ordinance, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management facilities shall be constructed by the Project Owner, its successors and assigns, in accordance with the plans and specifications identified in the Plans and documents reviewed and approved by the Winchendon Planning Board.
2. The Project Owner, its successors and assigns shall adequately maintain the stormwater management facilities according to the maintenance schedule described in **Attachment A**. This includes all pipes and channels built to convey stormwater to the facility, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. Adequate maintenance is herein defined as good working condition so that these facilities are performing their design functions and so that water quality standards are met in all seasons and throughout the life of the stormwater system.

3. The Project Owner, its successors and assigns, shall notify the Planning Board of any changes in ownership, assignments, reconstruction of the approved stormwater management facilities and/or amendments to the maintenance schedule described in Attachment A.

4. The Project Owner, its successors and assigns, shall provide stormwater management easements as necessary for all areas used for off-site stormwater control, preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities, including flood routes for the 100-year storm event, and access for facility maintenance and inspection. The Project Owner, its successors and assigns shall record all easements in the land records of the Worcester County Registry of Deeds, Commonwealth of Massachusetts.

5. This Agreement shall be recorded by the Project Owner or at the Project Owners expense among the land records of Worcester County, Commonwealth of Massachusetts, and shall constitute a covenant running with the land, and shall be binding on the Project Owner, its administrators, executors, assigns, heirs and any other successors in interests.

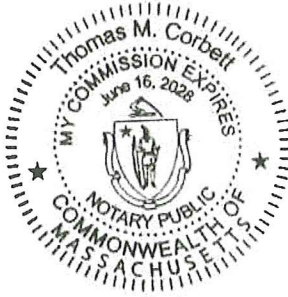
WITNESS the following signatures and seals:

2P Battery DrCo LLC
Company/Corporation/Partnership Name (Seal)

By: [Signature]

Peter Forte
(Type Name)

Vice President
(Type Title)



COMMONWEALTH OF MASSACHUSETTS

County of Worcester

On this 26 day of June, 2023, before me, the undersigned notary public, personally appeared Peter Forte, proved to me through satisfactory evidence of identification, which was MA DL to be the person whose name is signed on the proceeding document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Thomas M Corbett
NOTARY PUBLIC Thomas M Corbett

My Commission Expires: 6-16-2028

Town of Winchendon

By: _____

(Type Name)

(Type Title)

COMMONWEALTH OF MASSACHUSETTS

County of Worcester

On this _____ day of _____, 20____, before me, the undersigned notary public, personally appeared _____, proved to me through satisfactory evidence of identification, which was _____, to be the person whose name is signed on the proceeding document, and acknowledged to me that he signed it voluntarily for its stated purpose.

NOTARY PUBLIC

My Commission Expires: _____

ATTACHMENT A

Maintenance Schedule

<u>Structure Type</u>	<u>Inspection</u>	<u>Maintenance</u>	<u>Task</u>
Rip/Rap Aprons	Twice a Year	Every 10 Years	Remove Debris & Add Stone
Subdrains	Twice a Year	Every 4 Years	Replace Peastone
Detention Basins	Monthly (May-Oct)	Monthly (May-Oct)	Mow Grass Areas & Remove Debris Remove Sediment if present
Outfall Structures	Twice a Year	Every 10 Years	Remove Debris & Add Stone
Drainage Swale	Twice a Year	Monthly	Remove debris and vegetation. Mow Grass and replace stone as necessary
Access Roads	Twice a Year	Yearly	Replace gravel as necessary
Full Site Inspection	Twice a Year	As Needed	Remove Trash & Debris
Mowing	Four Times a Year	As Needed	Grass max height of 18" and cut to height of 4-6" Reseed bare spots as needed
Vegetated Buffer	Twice a Year	Every 4 Years	Pruned as needed