MLG | MICHAUD
RENEWABLE ENERGY LAW IS OUR BUSINESS LAWGROUP

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October 16, 2024

VIA ELECTRONIC MAIL AND HAND DELIVERY

Melanie Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

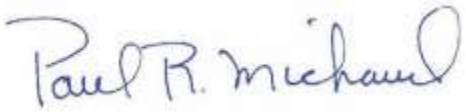
Re: Petition of Kinsley Energy Systems for a Declaratory Ruling that No Certificate of Environmental Compatibility and Public Need is Required for the Construction, Operation, and Maintenance of a 688-kWh Battery Energy Storage System and Associated Equipment to be located at 564 South Avenue, New Canaan, Connecticut.

Dear Ms. Bachman:

I am writing on behalf of my client, Kinsley Energy Systems, LLC, a subsidiary of Kinsley Group, Inc. ("Kinsley"), who is submitting the enclosed petition for a battery energy storage system to be located at the above-referenced location in New Canaan, Connecticut and support the New Canaan YMCA's role as an emergency shelter. I am enclosing the original and fifteen copies of the Petition and Exhibits with this letter. I am requesting that the application fee be waived for this project as it provides a community service and will be owned by a nonprofit organization.

Please contact me if you have any questions concerning this submittal.

Very truly yours,



Paul R. Michaud

cc: Town Clerk, Town of New Canaan, Connecticut

STATE OF CONNECTICUT

SITING COUNCIL

PETITION OF KINSLEY ENERGY SYSTEMS, LLC FOR A DECLARATORY RULING THAT NO CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED IS REQUIRED FOR THE CONSTRUCTION, OPERATION, AND MAINTENANCE OF A 688-KWH BATTERY ENERGY STORAGE SYSTEM AND ASSOCIATED EQUIPMENT TO BE LOCATED AT 564 SOUTH AVENUE, NEW CANAAN, CONNECTICUT	**PETITION NO. _____** **October 16, 2024**

Under Connecticut General Statutes (C.G.S.) §§ 4-176 and 16-50k, Kinsley Energy Systems, LLC, a subsidiary of Kinsley Group, Inc. ("Petitioner"), requests that the Connecticut Siting Council ("Council") approve by a declaratory ruling the construction, operation, and maintenance of a 688-kWh battery energy storage system and associated equipment ("BESS Project"). The proposed BESS Project will be constructed as part of a more extensive behind-the-meter self-generation project to be located at the local YMCA at 564 South Avenue (Parcel ID 36-232-K62) in the Town of New Canaan, Connecticut. The technical evidence, evaluations, and analysis presented herein by Petitioner demonstrate that the proposed BESS Project will meet the air and water quality standards of the State of Connecticut Department of Energy and Environmental Protection and have no substantial adverse environmental effects. Therefore, Petitioner respectfully requests that the Siting Council approve the proposed BESS Project by a declaratory ruling.

I. PETITIONER INFORMATION

Petitioner is a comprehensive onsite energy solutions supplier based in East Granby, Connecticut. With a history of nearly 60 years in the industry, Petitioner specializes in

delivering cogeneration, battery energy storage, standby generators, and supporting electrical and thermal auxiliary equipment. Petitioner's team–one of the country's largest power equipment technical service teams–provides expert services throughout the lifecycle of microgrid and BESS projects, including initial feasibility assessment, detailed design, equipment supply, installation, and long-term operations and maintenance. Petitioner's extensive experience and commitment to providing efficient and dependable BESS energy solutions will ensure the success of this project. Please address all correspondence and communications regarding this Petition to Petitioner's attorney:

Paul R. Michaud
Michaud Law Group LLC
515 Centerpoint Drive
Suite 503
Middletown, Connecticut 06457
Phone: 860-338-3728
pmichaud@michaud.law

II. NOTICE AND OUTREACH

Under the Regulations of Connecticut State Agencies § 16-50j-40, Petitioner provided written notice of this Petition to all Project abutters, appropriate officials in the Town of New Canaan, and other government officials and agencies on or about September 5, 2024. **Exhibit A – Certification of Service and Model Notice Letter**. Petitioner has engaged with the Town of New Canaan representatives for the proposed BESS Project and as part of the more extensive behind-the-meter self-generation project. In addition, Petitioner held a video conference with abutters, town officials, and other appropriate state and federal government officials and presented an overview of the proposed BESS Project on September 18, 2024. The proposed BESS Project at the New Canaan YMCA would greatly benefit the local community during grid power outages. This Project is not just about energy; it is about enhancing the community's

resilience and safety during grid power outage emergencies**.** On September 9, 2024, I mailed a notice letter to all appropriate abutters, town officials, and other state and federal officials.

III. PROJECT, SITE, AND PURPOSE

The proposed BESS Project is a 688-kWh battery energy storage system and associated equipment to be located at the New Canaan YMCA, 564 South Avenue (Parcel ID 36-232-K62) in the Town of New Canaan, Connecticut. It will be part of a more extensive self-generation project, including a 285-kW CHP generator system. The New Canaan YMCA will own and operate the battery energy storage equipment behind the YMCA's electricity meter. The purpose of the proposed project is to provide backup power during grid power outages, ensure uninterrupted services at the YMCA, and serve as an emergency shelter for the community. The proposed BESS Project's turnkey solution includes approximately $1 million for equipment, design, and installation. The cost is recovered from the YMCA through energy charge reductions, demand charge reductions, and technology tax rebates.

The proposed BESS Project site is home to the New Canaan YMCA, which provides programs and other support for the community. The YMCA's focus areas include youth development, healthy living, and social responsibility. The Property site is developed with an existing building housing the YMCA, associated parking areas, and youth outdoor recreation areas. Some utilities are located near the southeast corner of the building within a fenced-in area also screened with Giant Arborvitae. The proposed BESS Project is consistent with New Canaan's 2014 Plan of Conservation and Development (as amended in 2016) (the "POCD"). Specifically, the POCD discusses enhancing electrical service reliability, noting that "severe storm events have raised awareness about electrical service reliability." The reliability offered by this project would allow the YMCA to manually facilitate a handover to the standby power

during grid power outages and provide an emergency shelter during and after storm events that impact the power supply to New Canaan.

No existing town facility is presently able to accommodate an emergency shelter. The Town of New Canaan has committed some of its American Rescue Plan Act (ARPA) funds to assist the YMCA with financing the self-generation project, including the proposed BESS Project. Petitioner utilized its internal experience and the knowledge and expertise of third-party electrical engineering, civil engineering, consultants, and legal counsel to carefully review, analyze, and select the proposed BESS Project. The proposed BESS Project minimizes land disturbance and preserves the current site, occupying a similar footprint in place of the existing propane storage at the southeast corner of the building. Petitioner conducted an extensive site assessment and analysis to prepare this Petition. The Project and site assessment involved an experienced and well-respected consultant, Solli Engineering, LLC.

IV. BESS EQUIPMENT

The proposed BESS Project will include the following base items and associated equipment. The DC Battery blocks, supplied through LithTech LLC., consist of two 04HC-0344-DC model systems with 344 kWh capacity each. These models meet all industry-standard certifications, including UL9540, and are equipped with an aerosol fire suppression system. The BESS will recharge during off-peak hours while the system is grid parallel. The recharge interval will occur outside of peak hours and is capable of a 95% depth of discharge. BESS will utilize power to cool and heat the battery packs from stored energy. The inverter is a DynaPower CPS 1250 model, mounted in an outdoor-rated enclosure, and is UL1741-SA certified. A 750 kVA isolation transformer will also be provided in a NEMA 3R enclosure with a 200C UL Insulation System. All equipment is to be contained in a secure, fenced yard designed to minimize both

visual and noise impacts through screening and landscaping. No adverse impact to the surrounding neighborhood is anticipated as the enclosure surrounding the BESS Project will be located 163 feet from the nearest property line.

V. CONSTRUCTION, OPERATION, MAINTENANCE, AND MONITORING

If approved by the Council, Petitioner anticipates that construction of the proposed BESS Project will begin on or about January 6th, 2025, and will take approximately 16 weeks to complete. As this site is already developed, minimal tree clearing, grubbing, and grading will be necessary to commence construction. Separate from the BESS and associated equipment, temporary erosion and sedimentation (E&S) controls will be installed and the construction contractor will begin building the concrete equipment pad for this generative equipment yard. Start of construction for the BESS Project will begin with the rigging and mounting of BESS equipment to the prepared concrete pad. Termination of all wiring to the facility's electrical room will follow. The perimeter fence and gate access will be installed, along with final grading, seeding and planting as needed. The Table below shows the Estimated BESS Project Construction Schedule.

Estimated BESS Project Construction Schedule	
Task	**Duration**
Mobilization and Project Site Preparation	2 weeks
Civil Work: Road Construction, Grading	2 weeks
Electrical Installation	8 weeks
Approvals & Commissioning	4 weeks

Once the proposed BESS Project is operational, Kinsley Energy will monitor it. The proposed BESS Project will be equipped with Web Supervisor, a remote monitoring software

that will allow secure access to the health and status of the equipment for service and operations. Routine maintenance schedules will include work for on-site inspections and preventative maintenance. The schedule will include maintenance with the necessary frequency to adhere to all manufacturers' recommendations and applicable codes and laws. Occasional vegetative control, mowing, and snow removal will be required to maintain the site and guarantee access throughout the year. The YMCA will remove all equipment at the end of the proposed BESS Project's operational life.

VI. PUBLIC HEALTH AND SAFETY

The proposed BESS Project is designed to meet all industry, state, and local codes and standards and will not pose a safety concern or create an undue hazard to the public. The proposed BESS Project will be constructed to comply with all applicable National Fire Protection Association and other State and local safety standards. The BESS design features included to prevent thermal runaway include Prismatic LFP cell chemistry, which will ensure that the ignition temperature of adjacent cells is higher than the burning temperature of the failed cell, preventing thermal runaway. Additionally, the BESS cell structure has passed both crush and puncture testing for stability. In addition, liquid cooling provides high thermal stability between battery units to prevent a fire from spreading to an adjacent battery unit. Also, the failure of a battery unit would initiate aerosol fire-extinguishing chemicals to put out ongoing fires. Factory Acceptance Testing prior to installation will be conducted to validate the functionality of all alarms and safety measures through the battery management system. Also, an eight-foot-tall chain link fence will be installed around the perimeter of the Project to maintain controlled access to the equipment. Lastly, the site will be monitored remotely twenty-four hours

a day to allow for remote power shut-off and to notify local emergency responders if there is an issue.

Petitioner will consult with the Town of New Canaan, including representatives from the fire department and emergency response services. Petitioner intends to establish communication with the local emergency staff once the Project is operational. The proposed BESS Project is part of a more extensive self-generation behind-the-meter project to be owned by the YMCA. As such, Petitioner does not have an Emergency Operations Plan (EOP) but will be working with the YMCA to develop an EOP.

VII. ENVIRONMENTAL ASSESSMENT

Solli Engineering, LLC prepared a comprehensive Environmental Assessment ("EA") of the proposed BESS Project and site, provided in the attached **Exhibit B—Environmental Assessment, Proposed Battery Storage Facility, 564 South Avenue, New Canaan, CT**.

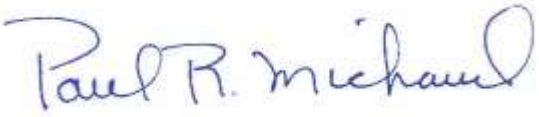
VIII. CONCLUSION

As discussed above and in the attached EA, Attachments, and Appendices, the Petition is for constructing a 688-kWh battery energy storage system and associated equipment. It would be part of a more extensive behind-the-meter self-generation system, including a 285-kW CHP system. The New Canaan YMCA would own and connect the proposed BESS Project and a more extensive self-generation system behind the YMCA's electricity meter. On September 24, 2024, the Project was presented to the Town of New Canaan Planning and Zoning Commission during a public hearing, at which the Commission unanimously voted in favor for its zoning permit approval and construction. The proposed system would serve the daily needs of the YMCA operations and allow the YMCA to serve as an emergency shelter for the community during power grid outages. No existing town facility is presently able to accommodate an

emergency shelter. The Town of New Canaan has committed some of its American Rescue Plan Act (ARPA) funds to assist the YMCA with financing the proposed BESS Project that is the subject of this Petition. Based on the evaluation and analysis presented in this Petition, the proposed BESS Project will not have a substantial adverse environmental effect.

RESPECTFULLY SUBMITTED,

Kinsley Energy Systems, LLC



By: _____

Paul R. Michaud
Michaud Law Group LLC
515 Centerpoint Drive, Suite 503
Middletown, Connecticut 06457
Direct Phone: 860-338-3728

Its Attorney

EXHIBIT A

Certification of Service and Model Notice Letter

NOTICE OF PETITION TO CONNECTICUT SITING COUNCIL
CERTIFICATE OF SERVICE

Legislative Representatives	Date Michaud Law Group LLC Mailed Notice
U.S. Senator Richard Blumenthal 90 State House Square, 10th Floor Hartford, CT 06103	09/09/2024
U.S. Senator Christopher Murphy 120 Huyshope Avenue, Suite 401 Hartford, CT 06106	09/09/2024
U.S. Congressman Jim Himes 888 Washington Boulevard, 10th Floor Stamford, CT 06901	09/09/2024
State Representative Tom O'Dea Connecticut Legislative Office Building 300 Capitol Avenue, Room 4200 Hartford, CT 06106	09/09/2024
State Senator Ryan Fazio Connecticut Legislative Office Building 300 Capitol Avenue, Room 3400 Hartford, CT 06106	09/09/2024
State Officials	**Date Michaud Law Group LLC Mailed Notice**
Attorney General William Tong Office of the Attorney General State of Connecticut 165 Capitol Avenue Hartford, CT 06106	09/09/2024
Executive Director Paul Aresta Council on Environmental Quality State of Connecticut 79 Elm Street Hartford, CT 06106	09/09/2024
Commissioner Michelle Gilman Department of Administrative Services State of Connecticut 450 Columbus Boulevard, Suite 1501 Hartford, CT 06103	09/09/2024

Commissioner Bryan Hurlburt Department of Agriculture State of Connecticut 450 Columbus Boulevard, Suite 701 Hartford, CT 06103	09/09/2024
Commissioner Bryan Cafferelli Department of Consumer Protection State of Connecticut 450 Columbus Boulevard, Suite 901 Hartford, CT 06103	09/09/2024
Commissioner Daniel O'Keefe Department of Economic & Community Development State of Connecticut 450 Columbus Boulevard, Suite 5 Hartford, CT 06103	09/09/2024
Commissioner James Rovella Department of Emergency Services & Public Protection State of Connecticut 1111 Country Club Middletown, CT 06457	09/09/2024
Commissioner Dante Bartolomeo Department of Labor State of Connecticut 200 Folly Brook Boulevard Wethersfield, CT 06109	09/09/2024
Commissioner Manisha Juthani, MD Department of Public Health State of Connecticut 410 Capitol Avenue Hartford, CT 06106	09/09/2024
Commissioner Garrett Eucalitto Department of Transportation State of Connecticut PO Box 317546 Newington, CT 06131	09/09/2024
Secretary Jeffrey Beckham Office of Policy & Management State of Connecticut 450 Capitol Avenue Hartford, CT 06106	09/09/2024

Chairman Marissa Gillett Public Utilities Regulatory Authority State of Connecticut 10 Franklin Square New Britain, CT 06051	09/09/2024
Commissioner Katie Dykes Department of Energy & Environmental Protection State of Connecticut 79 Elm Street Hartford, CT 06106	09/09/2024
Local Officials	**Date Michaud Law Group LLC Mailed Notice**
First Selectman Dionna Carlson Town of New Canaan 77 Main Street New Canaan, CT 06840	09/09/2024
Selectman Stephen Karl Town of New Canaan 77 Main Street New Canaan, CT 06840	09/09/2024
Selectman Amy Murphy Carroll Town of New Canaan 77 Main Street New Canaan, CT 06840	09/09/2024
Zoning Enforcement Officer Sarah Carey Planning & Zoning Commission Town of New Canaan 77 Main Street New Canaan, CT 06840	09/09/2024
Director Kathleen Holland Inland Wetlands & Water Courses Commission Town of New Canaan 77 Main Street New Canaan, CT 06840	09/09/2024
Chairman Robin Bates-Mason Conservation Commission Town of New Canaan 77 Main Street New Canaan, CT 06840	09/09/2024

Economic Development Commission Town of New Canaan 77 Main Street New Canaan, CT 06840	09/09/2024
New Canaan YMCA 564 South Avenue New Canaan, CT 06840	09/09/2024
Executive Director Francis Pickering Western Connecticut Council of Governments 1 Riverside Road Sandy Hook, CT 06482	09/09/2024

CERTIFICATION

I hereby certify that Notices of the Siting Council Petition were mailed via certified U.S. mail, return receipt requested, to the above Federal, State, and Local officials and/or agencies on September 9, 2024.

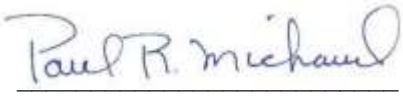
Paul R. Michaud

NOTICE OF PETITION TO CONNECTICUT SITING COUNCIL
CERTIFICATION OF SERVICE

Owner(s)	Address	Map/Block/Lot	Mailing Address
Town of New Canaan	77 Main Street New Canaan, CT 06840	37/232/13	77 Main Street New Canaan, CT 06840
Roger S. Williams	195 Putnam Road New Canaan, CT 06840	30/232/K63	195 Putnam Road New Canaan, CT 06840
Chonc LLC	137 Putnam Road New Canaan, CT 06840	36/232/K86	137 Putnam Road New Canaan, CT 06840

CERTIFICATION

I hereby certify that Notices of the Siting Council Petition were mailed via certified U.S. mail, return receipt requested, to the abutters listed above on September 9, 2024.



Paul R. Michaud

MODEL NOTICE LETTER – ABUTTERS & GOVERNMENT OFFICIALS

MLG | MICHAUD
RENEWABLE ENERGY LAW IS OUR BUSINESS LAWGROUP

PAUL R. MICHAUD
Managing Attorney / Principal
515 Centerpoint Drive, Suite 503
Middletown, CT 06457
Direct Telephone: (860) 338-3728
Email: pmichaud@michaud.law
Web: www.michaud.law

September 5, 2024

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

<<AddressBlock>>

Re: Notice of a Proposed 688-kWh Battery Energy Storage System to be Located at 564 South Avenue (Parcel ID 36-232-K62) in the Town of New Canaan, CT

<<GreetingLine>>

On behalf of Kinsley Energy Systems ("Kinsley"), I write to inform you that Kinsley intends to file a petition for a declaratory ruling ("Petition") with the Connecticut Siting Council ("Council") seeking the Council's approval of the construction, operation, maintenance, and decommissioning of the above-referenced Battery Energy Storage System ("BESS"). The proposed BESS Project and associated equipment will be part of a more extensive behind-the-meter self-generation system. The New Canaan Community YMCA will own this system, which will supply backup power to the facility as an emergency shelter during grid outages.

Kinsley expects to file the Petition with the Council by the end of September 2024. This letter serves as notice to you, as an abutter or appropriate government official or agency, under § 16-50j-40 of the Regulations of Connecticut State Agencies. Once filed, you may review the Petition at the Council's office located at 10 Franklin Square, New Britain, Connecticut 06051, or on the Council's webpage at https://portal.ct.gov/CSC. Alternatively, you may contact Associate Monica Sterling at MSterling@michaud.law, who will provide you with a copy of the Petition via e-mail attachment or link.

Additionally, on September 18, 2024, from 6:00 p.m. to 7:00 p.m., Kinsley will host a virtual Project Abutters and Government Officials and State Agencies Informational Meeting ("Outreach Meeting") on the BESS. If you want to attend this Outreach Meeting, please e-mail our Associate Monica Sterling at MSterling@michaud.law as soon as possible. She will reply to your email with a Teams invitation and link to the virtual meeting.

Please feel free to contact me or Associate Monica Sterling if you have any questions.

Very truly yours,

Paul R. Michaud

Paul R. Michaud

EXHIBIT B

Environmental Assessment
Proposed Battery Storage Facility, 564 South Avenue, New Canaan, CT

Environmental Assessment

Proposed 688-kWh Battery Storage Facility
564 South Avenue
New Canaan, Connecticut

Prepared For
Kinsley Energy Systems
14 Connecticut South Drive
East Granby, Connecticut 06026

October 7th, 2024

501 Main Street, Suite 2A
Monroe, CT 06468
Office: (203) 880-5455

993 Farmington Avenue, Suite 206
West Hartford, CT 06107
Office: (959) 888-3999

11 Vanderbilt Avenue, Suite 240
Norwood, MA 02062
Office: (781) 352-8491

www.SolliEngineering.com

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LIST OF TABLES & CALCULATIONS

APPENDICES

SOLLI ENGINEERING

1.0 INTRODUCTION

Solli Engineering (Solli) has prepared this Environmental Assessment (EA) on behalf of Kinsley Energy Solutions, (Petitioner) as an exhibit to the Connecticut Siting Council for a Petition for a Declaratory Ruling that a Certificate of Environmental Compatibility and Public Need is not required for the construction, maintenance, and operation of a 688± kilowatt hour (kWh) battery energy storage system (BESS) (Project/Facility) to be located at 564 South Avenue in New Canaan, Connecticut (Site).

2.0 PROJECT DESCRIPTION

2.1 EXISTING SITE CONDITIONS

The Project area is comprised of a 4,000± SF portion of the 7.01± acre Site. The Site is currently developed as the New Canaan Community YMCA. The Site resides within the 1 Acre Residence (1AC) zoning district within the Town of New Canaan. Surrounding land uses consist of wooded residential properties as well as institutional and recreational properties such as New Canaan High School, Saxe Middle School, and Waveny Park.

The Site is generally developed, and improvements include the YMCA building, playgrounds, and asphalt parking areas/drives. Improvements are relegated to the central and western portions of the property. A large, maintained lawn area is located in the eastern portion of the property. The proposed Project area is located in a previously developed, central portion of the property. It is currently enclosed by a chain-link fence and arborvitaes and consists of a 845-square foot gravel area with a 43-sf concrete pad and underground propane tanks. All existing equipment is to be removed prior to the installation of the proposed Facility.

The Project area's topography is relatively flat, with grassed slopes to the south and east. The Project area currently. There are no wetlands located on the Site. See Appendix C for the Wetland and Watercourse Determination.

2.2 PROPOSED DEVELOPMENT

As designed, the proposed BESS and associated equipment will be located on an irregularly shaped 1,155-square foot concrete pad adjacent to the south of the existing building. The equipment pad will be enclosed by an 8' tall chain link fence with green privacy slats and acoustic dampening panels. Landscape screening will be planted around the outside of the chain link fence. Electric conduits will be mounted on the exterior wall of the existing YMCA building from the proposed equipment within the Project area to the existing electrical room within the building. Access to the Facility will be from the existing parking lot to the south of the Project area.

For more information regarding the proposed Project conditions, refer to Figure 3, Proposed Conditions Map, included in Appendix A and the proposed Site Plans in Appendix B.

2.2.1 PUBLIC HEALTH AND SAFETY

The Facility will not consume any raw materials, will not produce any by-products, and will be unstaffed under normal operating conditions. No chemicals will be used during the operation of the facility.

An 8-ft tall chain link fence, with gate, surrounding the Facility is provided per the Best Management Practices for Electric and Magnetic Fields and National Electric Code. This fence will mitigate potential electric hazards. The proposed Project equipment has internal fail-safes to further mitigate the risk of electrical fires. As noted, a 6-ft wide gate is proposed at the entrance to the Facility and will limit access to

authorized personnel only. Town emergency response personnel will have access to the Project via a Knox padlock.

2.2.2 LAND USE PLAN

The BESS has been designed in accordance with state and federal policies and will support the State of Connecticut's energy goals by constructing a renewable energy resource with no substantial adverse environmental impact. The BESS will comply with the current Connecticut State Building Code and National Electric Code.

The distance, direction, and address of the nearest property line and nearest off-site residence from the proposed 8' chain link fence and BESS modules is shown in Table 1. For more information regarding abutting parcels, refer to Figure 4, Abutting Parcels Map, included in Appendix A.

Table 1: Proposed Development Limits Table

	Distance (ft)	Direction	Address
Perimeter Fence to Property Line	160'	South	Putnam Road
Perimeter Fence to Residence	286'	West	137 Putnam Road
BESS Module to Property Line	294'	South	Putnam Road
BESS Module to Residence	290'	West	137 Putnam Road

3.0 ENVIRONMENTAL CONDITIONS

This section provides a summary of the existing environmental conditions in and around the Site, as well as the potential impacts on the environment from the BESS development. The results discussed in this section demonstrate that the development complies with CT DEEP air and water quality standards and will have no adverse effect on the existing environment and ecology.

3.1 AIR QUALITY

Normal operations of the Facility will not produce hazardous air emissions. Temporary air emissions from construction activities are expected and will include emissions from construction vehicles and equipment transportation. Implementing an efficient work sequence for construction activities, limiting idling times, and maintaining equipment properly will reduce these emissions. During construction, the Project will have the potential to cause limited dust emissions. A water spray will be utilized to control dust emissions during construction as needed.

3.2 WATER RESOURCES

The proposed BESS Facility does not use water for standard operations and only utilizes water in the event the sprinkler system is engaged. The Facility's liquid cooling system requires an initial fill of water which is recycled for the liquid cooling process. The Facility will be unmanned and does not require potable water use or release sanitary discharges. The proposed Project will not impact water resources, existing groundwater quality or existing drainage or stormwater discharge.

3.2.1 WETLANDS & WATERCOURSES

No wetlands and watercourses were identified on the property or within 50' of its northern border as assessed by William Kenny Associates LLC ("WKA") on July 10, 2024. For more information, refer to the Wetland and Watercourse Determination in Appendix C.

3.2.2 FLOODPLAIN AREAS

The most recent available mapping from the Federal Emergency Management Agency (FEMA) was reviewed regarding the presence or absence of flood zones or floodways at the property. According to the FEMA Flood Map Service Center (MSC), flood map number *09001C0388F*, effective on August 18, 2010, the project site falls within "Zone X" as defined by FEMA. Zone X is defined as "the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood." This indicates that the project site is not within a regulated flood zone and requires no special considerations relative to flooding for its implementation.

3.2.3 GROUNDWATER

The CT DEEP *Water Quality Classifications New Canaan, CT* map, dated October 2018, was reviewed to assess the quality of ground and surface water at the property. The map classifies that the majority of the property falls within an area classified as "GA" groundwater quality with a small area in the southern portion of the property falling within an Area of Contribution to Public Supply Well. "GA" standards are defined as "existing private and potential public or private supplies of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies."

According to the CT DEEP Public Water Supply Map, the property does not fall within an aquifer protection area. The nearest aquifer protection area is approximately 2.6 miles to the southwest of the proposed project site. The proposed facility will be unstaffed, and no potable water uses or sanitary discharges are planned.

3.2.4 STORMWATER MANAGEMENT PLAN

The BESS will be constructed within an area of less than one acre of land and, as a result, the Project will not require a *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* under Conn. Gen. Stat. 22a-430b. Total disturbance of land area by the Project is estimated at approximately 4,000± SF. The areas surrounding the concrete pad within the fence will consist of gravel. No material effects to drainage patterns or stormwater discharges are anticipated. The Petitioner will implement sedimentation and erosion controls during construction in accordance with *2024 Connecticut Guidelines for Soil Erosion and Sediment Control* as noted on the Site Plans included in Appendix B.

3.3 HABITAT & WILDLIFE

Two upland habitat types are present at the property. These consist of the buildings and pavements as well as lawn, trees and other ornamental vegetation. As noted above, there are no wetland or watercourse habitats present onsite. Upland habitat types are further discussed in Section 3.3.1, and the acreage of proposed habitat alteration is provided in Table 2. Also refer to the Ecological Communities Map (Appendix C) for additional information.

3.3.1 HABITAT TYPES

Lawn, Trees, and Other Ornamental Vegetation (U1)

The eastern portion of the property is maintained as lawn with narrow fringes of bordering tree, shrub, and groundcover plantings along the northern and southern property boundaries. No buildings or pavements are currently located within this area of the property. According to historic aerial imagery, the property was maintained as agricultural fields in 1934 and converted to its current commercial / institutional state sometime between 1950 and 1970. Minor additional property improvements have occurred since. Vegetation throughout this habitat is limited to common lawn grasses and weeds, save for the narrow fringes of trees, shrubs, and groundcovers which support common native canopy trees such as pines, oaks, and maples. Soils throughout the habitat are primarily moderately well drained fine sandy loams formed from

undisturbed and disturbed glacial till deposits. Less than one percent, (0.02 of 4.4-acres) of this habitat is proposed to be altered to complete the proposed project. Please see Table 2 for the total acreage of habitat alteration.

Buildings and Pavements (U2)

The central and western portions of the property are mostly developed with improvements, such as the YMCA building, asphalt drives, and parking areas. Minimal vegetation is present within this habitat, including small islands of lawn and other ornamental plantings. Soils throughout this habitat are primarily moderately well drained fine sandy loams forming in human altered deposits. Approximately one percent (0.04 of 2.6 acres) of this habitat is proposed to be altered to complete the proposed project. Please see Table 2 for the total acreage of habitat alteration.

Table 2: Habitat Area Table

Habitat Type	Total Area Onsite (±Acres)	Area of Disturbance (±Acres)
Lawn, Trees & Other Ornamental Vegetation	4.4	.02
Buildings & Pavements	2.6	.04

The proposed Project and its habitat alterations are not expected to have adverse impacts to wildlife as only a minor portion of the one vegetated habitat will be altered. Due to its mostly ornamental nature and its proximity to buildings and pavements, the ornamental habitat has a relatively low habitat quality and is primarily used by generalist avian, small mammal, and insect species. Generalist species are tolerant of site disturbance and will find other suitable habitats if they cannot adapt to the minor changes proposed with the project. Additionally, during the project's construction, noise, light pollution and other anthropogenic activities will be minimal, and should not displace these generalist species during the short construction period. Post construction, the facility will be unstaffed and will not generate any significant noise or increase vehicle traffic within the parking lot or along South Avenue.

3.3.2 RARE SPECIES

Publicly available state and federal information was reviewed to determine whether listed species and/or critical habitats are known to be, or could potentially be, present, absent, or adjacent to the proposed project site. In consulting with the CT DEEP, state records indicate that no listed species are present within the project area. As such, no state listed species will be affected by project activities. Federal records indicate that no officially listed endangered, threatened or special concern species are known to occur within the project site. However, the site may potentially serve as a stop for protected migratory birds. A limited onsite review of the property was completed on July 10, 2024. Based on the results of the review of state and federal records and field investigations, and due to the nature of the proposed Project, it is concluded that no adverse impacts to state or federal rare species will occur.

3.3.3 NATURAL DIVERSITY DATA BASE

The CT DEEP Natural Diversity Data Base (NDDB) maintains a collection of maps that show the approximate locations in Connecticut where state endangered, threatened and special concern species and important natural communities are known to have been present in the past. The locations shown on the maps are based on information collected over the years by DEEP personnel and others. The maps are intended to serve as a pre-screening tool for preventing potential impacts to listed species. Maps are generated for each town. The map for the Town of New Canaan is dated June 2024. To protect individuals of listed flora and fauna, their exact locations are not shown on the maps. Rather, the maps show broad zones that extend over and beyond known locations of listed individuals. These zones are shown with gray line hatching and areas of critical habitat are shown with green polygons. If a project site falls within or

near a hatched area, a request for determination should be filed with the CT DEEP for more accurate information and field work should occur to determine the presence or absence of these species onsite.

According to the Town of New Canaan NDDB map, a portion of the subject property falls within a hatched buffer area. As such, a filing for NDDB review request was submitted to the CT DEEP and the results of this review indicate that no extant populations of federal or state endangered, threatened or special concern species are known to occur within the proposed project area. For more information regarding the location of the hatched buffer area in relation to the Project area, refer to Figure 2, Existing Conditions Map.

The NDDB Determination Letter, dated August 8, 2024, is attached in Appendix C. This determination applies only to the project described in the submission and a new determination will be obtained if work has not begun by August 8, 2026, or if Project plans substantially change.

3.3.4 USFWS CONSULTATION

The US Fish and Wildlife Service ("USFWS") provides an online planning tool, its Information for Planning and Consultation ("IPaC") system, allowing project planners the ability to perform a regulatory review for protected species under the Endangered Species Act (ESA) that inhabit or potentially may inhabit their project sites. This resource is designed to provide a list of potential ESA-protected and/or candidate species, migratory bird species protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, critical habitats, as well as the ability to consult whether a proposed project has the potential to result in "take" of listed species. "Take" refers to any means to "harass, harm, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct to threatened and endangered species". In consulting this resource, projects can determine whether they are in compliance with the ESA and other federal acts. William Kenny Associates filed on August 8, 2024, an IPaC review of the project Site and received a letter report from the USFWS titled "*List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project*". This report is attached in Appendix C. The report specifies that one proposed endangered, one candidate species, and twelve migratory bird species have the potential to be impacted by the proposed project. The proposed endangered species is the tricolored bat, the candidate species is the monarch butterfly and the migratory birds are listed in the report in the attached Appendix C.

The tricolored bat is a species proposed under draft ruling by the USFWS to be endangered. A "Proposed Endangered" species is: "Any species the Service has determined is in danger of extinction throughout all or a significant portion of its range and the Service has proposed a draft rule to list as endangered. Proposed endangered species are not protected by the take prohibitions of section 9 of the ESA until the rule to list is finalized". Until the species is officially listed, this species is not entitled to legal protection under the ESA, and they are not considered when making a determination as to "take"

The monarch butterfly is a candidate species for protection under the ESA. Candidate species are "species which the USFWS has sufficient information to propose as endangered or threatened under the ESA, but for which their development of a proposed listing regulation is precluded by other higher priority listing activities." As such, until they are proposed for listing, these species are not officially entitled to legal protection under the ESA, and they are not considered when making a determination as to "take".

3.4 SOILS & GEOLOGY

The Project grading is not expected to generate export of material. Before any fill material is removed or used, the topsoil will be stripped and stockpiled for later seeding of disturbed areas. Any soil exposed due to construction will be treated according to the *2024 Connecticut Guidelines for Soil Erosion and Sediment Control*.

The following soils exist onsite and in surrounding areas:

1. Woodbridge fine sandy loam, 0 to 3 percent slopes.
2. Woodbridge fine sandy loam, 3 to 8 percent slopes

3.5 HISTORIC & ARCHAELOGICAL RESOURCES

Archaeological Consulting Services LLC performed a Phase 1A cultural resources assessment survey in August 2024. This included a pedestrian survey and photo-documentation of the survey area. This survey concluded that no additional studies are required for the Project.

The report was submitted to the Connecticut State Historic Preservation Office (SHPO) for review and SHPO agreed that no additional studies are required for the Project. For more information, please refer to the Phase 1A report and SHPO's response letter in Appendix D, Cultural Resources.

3.6 SCENIC AND RECREATIONAL AREAS

No state road or local road will be affected physically or impaired visually by the Project. The closest open space is Waveny Park which is approximately 0.1 miles west of the project site. Due to tree cover and grading, the Project area will not be visible from Waveny Park. The Project will not physically affect or visually impair these spaces. For more information regarding resources located within one mile of the Site refer to Figure 8, Surrounding Features Map, included in Appendix A.

3.7 LIGHTING

Proposed permanent exterior lighting is not currently anticipated for the Project. There may be onsite equipment that have small lights which will only be activated during maintenance.

3.8 FAA DETERMINATION

The closest federally obligated airport is Westchester County Airport located approximately 12.3 miles southwest of the Site.

Solli Engineering has submitted the required project information to the Federal Aviation Administration (FAA) for review. Upon review, the FAA issued a Determination of No Hazard to Air Navigation. For more information see Appendix E, FAA Determinations.

3.9 VISIBILITY

The BESS cabinets are a maximum of 6-ft off finished grade within the fenced facility. The Project area will be contained within a 8-ft chain link fence with green privacy slats and acoustic dampening panels. Existing evergreen plantings will be replaced in kind, as necessary, to provide screening in all directions. Due to the existing landscaping along Putnam Road, to the south, and the proposed landscape screening and privacy slats in the chain link fence, the Project will have minimal visibility to neighboring properties. For more information on the proposed screening please refer to the Site Plans in Appendix B.

3.10 NOISE

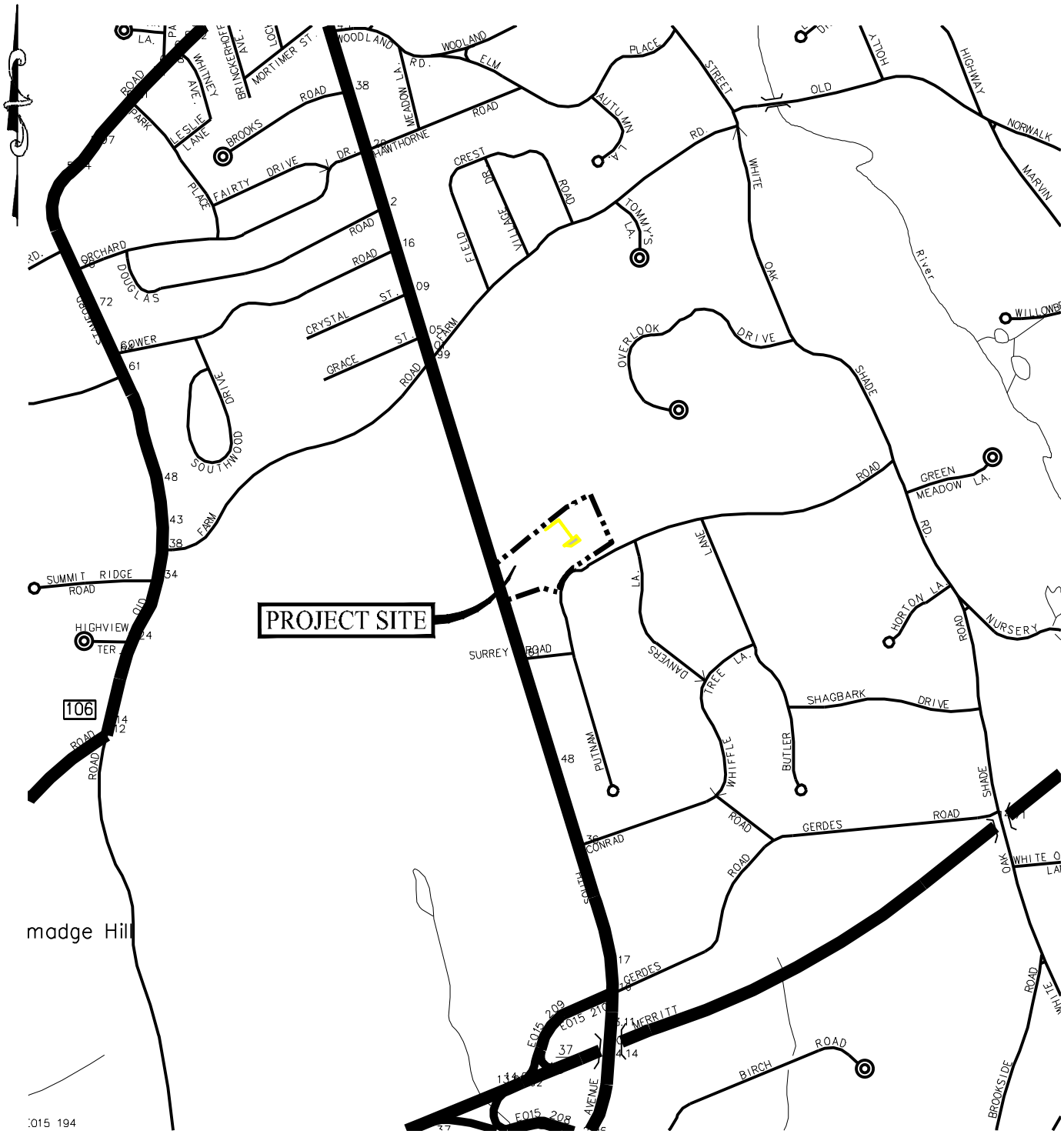
Noise from the construction of the BESS Facility is exempted under Connecticut regulations for the control of noise. For more information refer to RCSA 22a-69-1.8(g). During construction, the increase in noise will likely lead to a subsequent elevation in ambient sound levels in the immediate vicinity of the Project. Standard construction equipment will be used for the Project, and the highest level of noise generated from this equipment - such as backhoes, bulldozers, cranes and trucks – is expected to be approximately 88 dBA from the origin.

The primary sources of noise generation associated with the Facility will be the transformer, inverter and BESS Container. An Acoustical Study for the proposed equipment was prepared by Acoustical Technologies Inc. and can be found in Appendix G.

4.0 CONCLUSION

As demonstrated by the information outlined herein, the Project complies with the CT DEEP air and water quality standards and will not have a substantial adverse environmental effect.

Appendix A: Figures



LEGEND

PROPERTY LINE

PROJECT AREA

NOTE:
BASE MAP INFORMATION TAKEN FROM CT DOT TRU MAP #89

1,000 0 500 1,000

SOLLI ENGINEERING
MONROE, CT | W. HARTFORD, CT | NORWOOD, MA
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SITE LOCATION MAP

564 SOUTH AVENUE
NEW CANAAN, CONNCECTICUT

Project #:	24110501
Plan Date:	10/07/24
Scale:	1" = 1,000'
Figure:	1

LEGEND

- PROPERTY LINE
- PROJECT AREA
- NDDB AREA

MAP NOTES:

1. BASE MAP TAKEN FROM CT ECO 2019 AERIAL PHOTOGRAPHY.
2. PRIME FARMLAND SOILS, NDDB POLYGONS, & PROPERTY LINE TAKEN FROM CT ECO ADVANCED VIEWER.

200 0 100 200

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EXISTING CONDITIONS MAP

564 SOUTH AVENUE
NEW CANAAN, CONNCECTICUT

Project #:	24110501
Plan Date:	10/07/24
Scale:	1" = 200'
Figure:	2

LEGEND

- PROPERTY LINE
- PROJECT AREA
- 8' TALL CHAIN LINK FENCE
- CONCRETE PAD

MAP NOTES:

1. BASE MAP TAKEN FROM CT ECO 2019 AERIAL PHOTOGRAPHY.
2. PRIME FARMLAND SOILS, NDDB POLYGONS, & PROPERTY LINE TAKEN FROM CT ECO ADVANCED VIEWER

200 0 100 200

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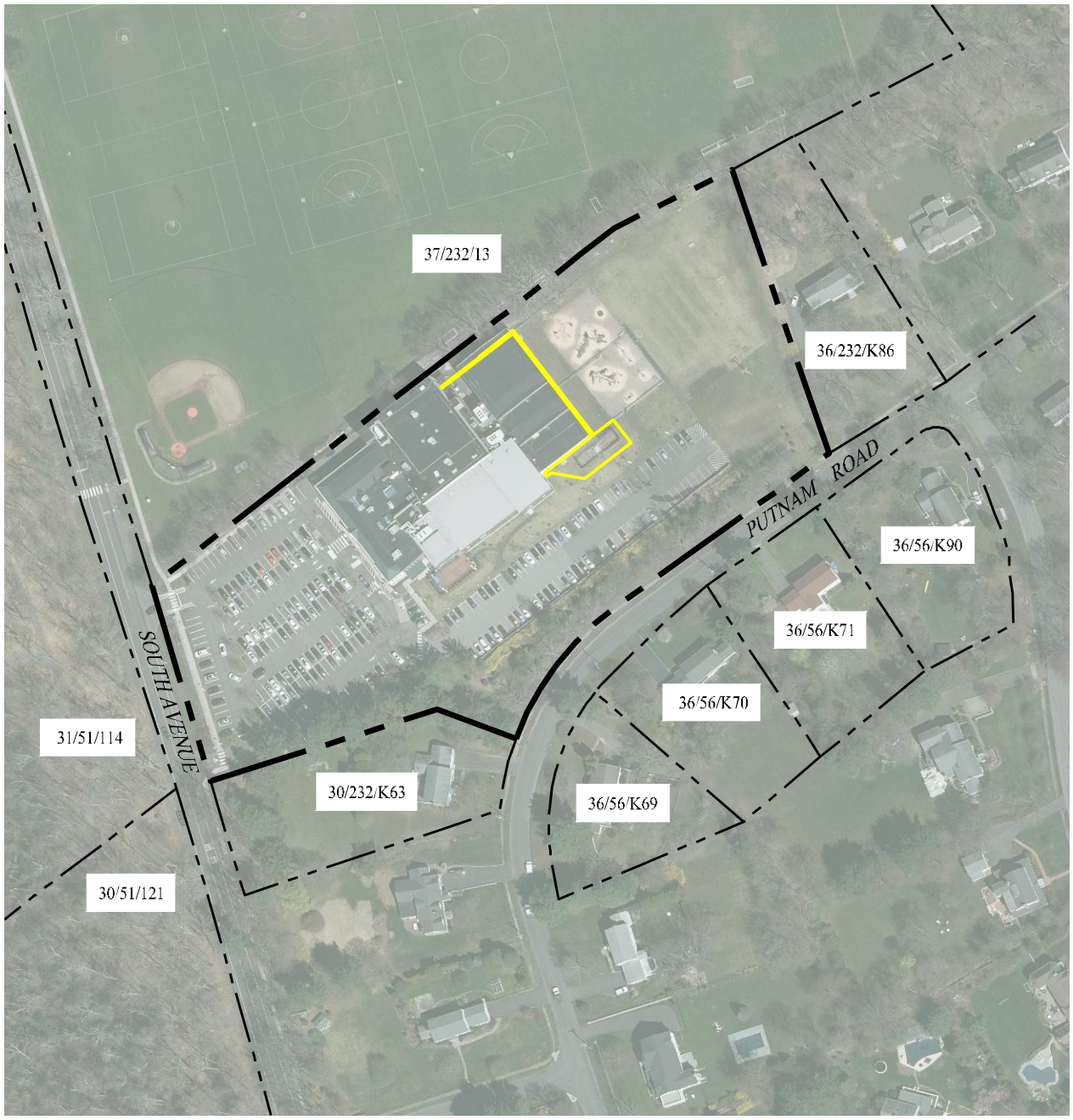
PROPOSED CONDITIONS MAP

564 SOUTH AVENUE
NEW CANAAN, CONNCECTICUT

Project #:	24110501
Plan Date:	10/07/24
Scale:	1" = 200'
Figure:	3



LEGEND

- PROPERTY LINE
- ADJOINING LOT LINE
- PROJECT AREA

MAP NOTES:

1. BASE MAP TAKEN FROM CT ECO 2019 AERIAL PHOTOGRAPHY.
2. PROPERTY INFORMATION TAKEN FROM TOWN OF NEW CANAAN GIS.

200 0 100 200

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ABUTTING PARCELS MAP

564 SOUTH AVENUE
NEW CANAAN, CONNCECTICUT

Project #:	24110501
Plan Date:	10/07/24
Scale:	1" = 200'
Figure:	4

LEGEND

- PROPERTY LINE
- PROJECT AREA
- PRIME FARMLAND SOILS

MAP NOTES:

1. BASE MAP TAKEN FROM CT ECO 2019 AERIAL PHOTOGRAPHY.
2. FARMLAND SOILS INFORMATION TAKEN FROM CT ECO ADVANCED VIEWER.

200 0 100 200

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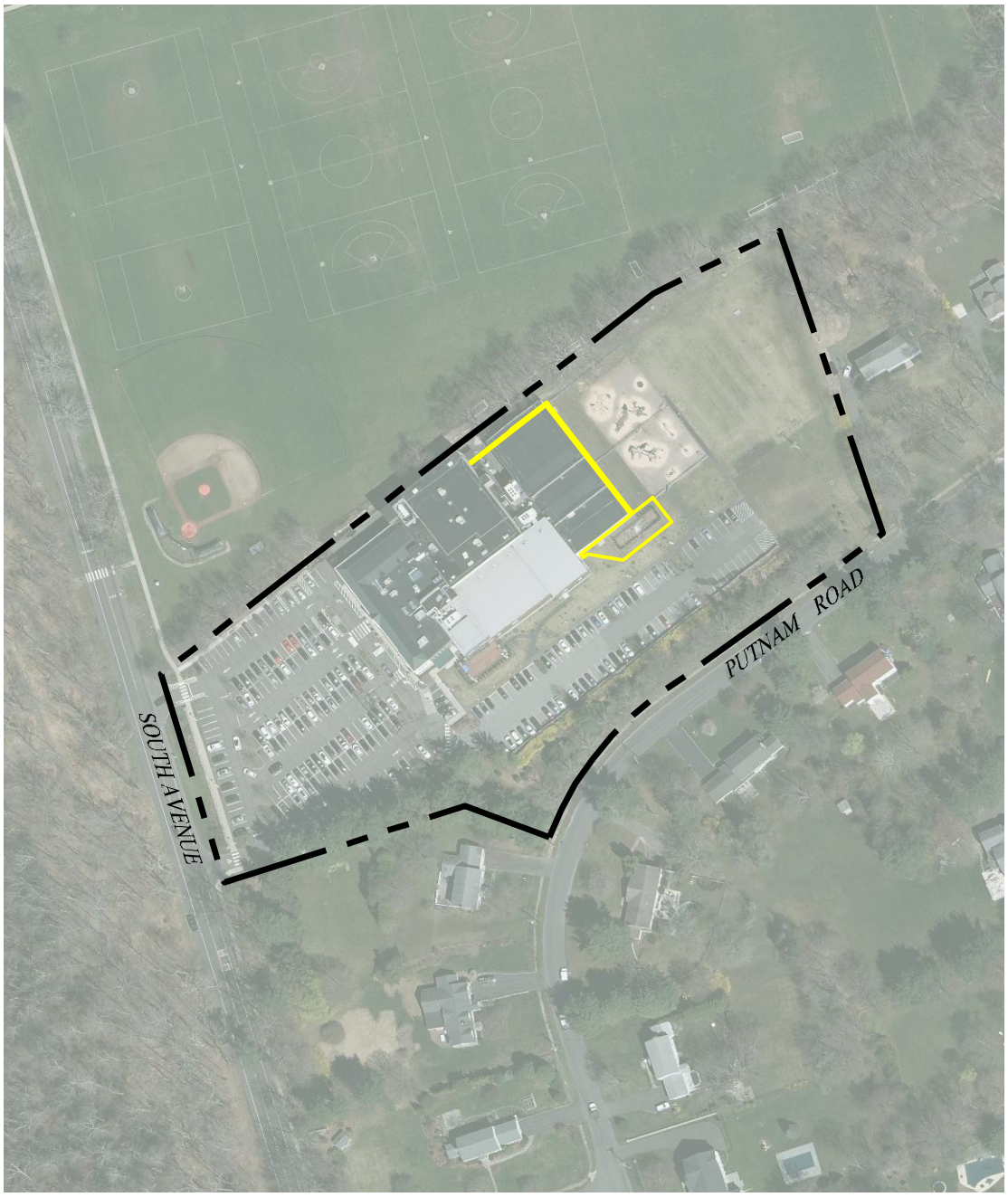
FARMLAND SOILS MAP

564 SOUTH AVENUE
NEW CANAAN, CONNCECTICUT

Project #:	24110501
Plan Date:	10/07/24
Scale:	1" = 200'
Figure:	5



LEGEND

- PROPERTY LINE
- PROJECT AREA
- CORE FOREST

MAP NOTES:

1. BASE MAP TAKEN FROM CT ECO 2019 AERIAL PHOTOGRAPHY.
2. PROPERTY INFORMATION TAKEN FROM THE CONNECTICUT FORESTLAND HABITAT IMPACT MAP.

200 0 100 200

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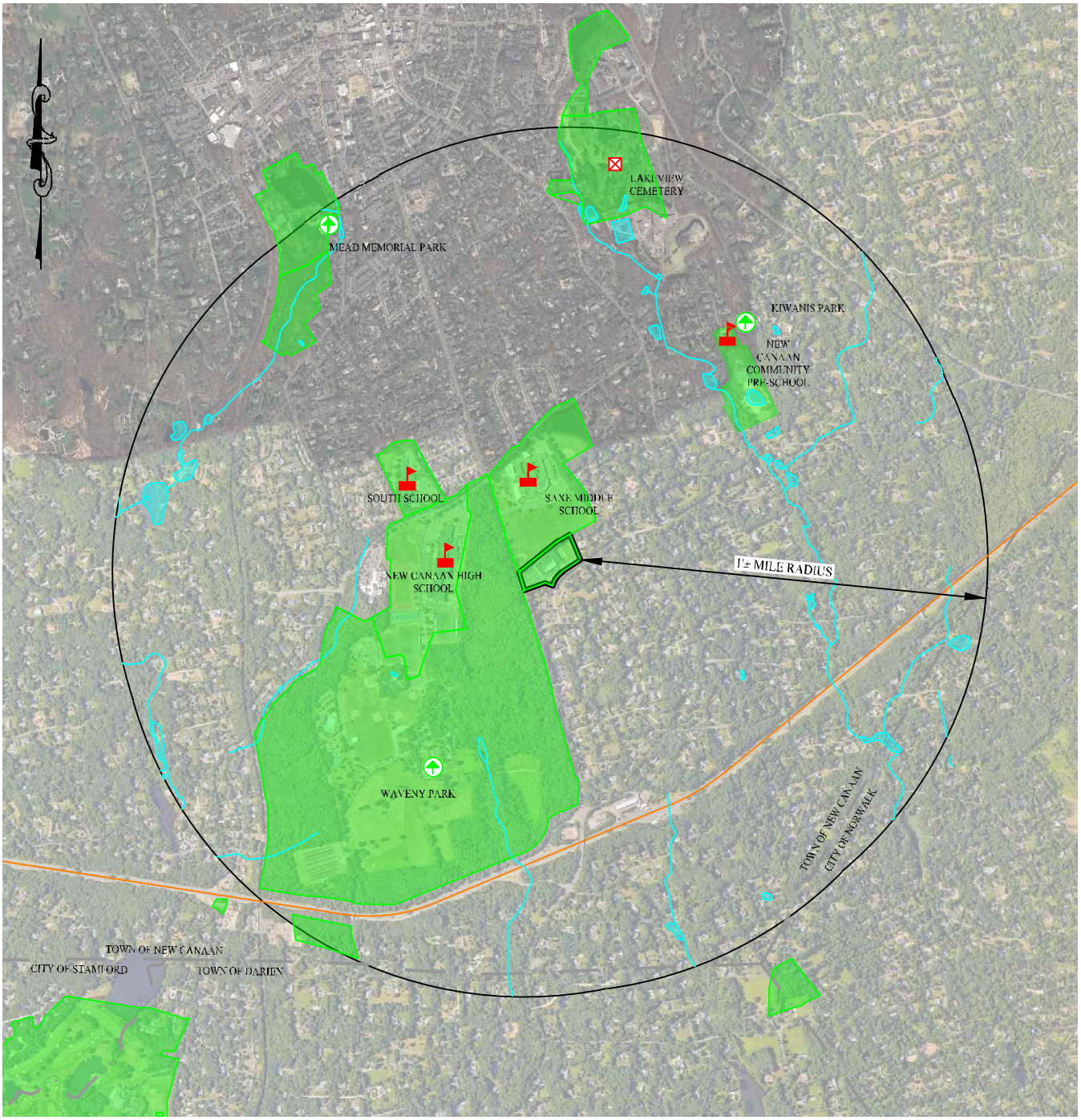
FORESTED HABITAT IMPACT MAP

564 SOUTH AVENUE
NEW CANAAN, CONNCECTICUT

Project #:	24110501
Plan Date:	10/07/24
Scale:	1" = 200'
Figure:	6



LEGEND

- PROPERTY LINE
- PROJECT AREA
- 1 MILE RADIUS
- TOWN BOUNDARY
- NTL. SCENIC ROADWAY
- STATE SCENIC ROADWAY
- WATERCOURSES (CT DEEP)
- OPEN WATER (CT DEEP)
- OPEN SPACE (CT ECO)
- SCHOOL
- CEMETERY
- PARK

MAP NOTES:

1. BASE MAP TAKEN FROM CT ECO 2019 AERIAL PHOTOGRAPHY.
2. SURFACE WATER TAKEN FROM CT DEEP HYDROGRAPHY. PROTECTED OPEN SPACES TAKEN FROM CT ECO ADVANCED VIEWER.

2,000 0 1,000 2,000

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SURROUNDING FEATURES MAP

564 SOUTH AVENUE
NEW CANAAN, CONNCECTICUT

Project #:	24110501
Plan Date:	10/07/24
Scale:	1" = 2,000'
Figure:	7

WATER QUALITY CLASSIFICATIONS
NEW CANAAN, CT

SURFACE WATER QUALITY CLASSES

A	A
AA	AA
B, B*	B, B*
SA	SA
SB	SB

NOTES:
Surface Water Classifications beginning with S refer to Coastal and Marine Surface Water.
B* is a subset of Class B where no direct wastewater discharges are allowed other than those consistent with Class AA, A and SA surface waters.

GROUND WATER QUALITY CLASSES

GA (white background)
GAA, GAAs
GA, GAA may not meet current standards
GB
GC

Area of Contribution to Public Supply Well

Final Aquifer Protection Area (Level A)
Major Basin Boundary

EXPLANATION

WATER QUALITY CLASSIFICATIONS (WQC) MAPS are one of the elements of the Water Quality Standards (WQS) for the State of Connecticut. The WQS are a part of Connecticut's clean water program and are essential for protecting and improving water quality. The WQS follow the principles of Connecticut's Clean Water Act which is in Chapter 446K of the Connecticut General Statutes. The WQS provide policy guidance in many areas, for example decisions on acceptable discharges to water resources, siting of landfills, remediation or prioritization of municipal sewerage system projects. The first two elements of the WQS are the Standards, which set an overall policy for management of water quality, and the Criteria, which are descriptive and numerical standards that describe the allowable parameters and goals for various water quality classifications. A discussion of these two elements is found in the Water Quality Standards document available on the CT DEEP website. The third element is the Classifications and the Water Quality Classification Maps which show the Classification assigned to each surface and groundwater resource throughout the State. The WQS are adopted using a public participation process. The WQC maps are also adopted using a public participation process but go through hearings separately from the Standards and Criteria hearings. Revision and adoption of the WQC data occurs in accordance with the public participation procedures contained in Section 22a-426 of the Connecticut General Statutes. Ground WQC is subject to Connecticut regulation and changes must be reviewed and adopted. All changes to the Surface WQC require an adoption process which is subject to federal review and approval in addition to CT regulation. The adoption dates for the WQC by major drainage basin are: Housatonic River, Hudson River and Southwest Coastal Basins - March 1999; Connecticut River and South Central Coastal Basins - February 1993; Thames River, Pawcatuck River and Southeast Coastal Basins - December 1986. Surface Water Classifications do not change after the adoption date until the next major revision. Ground Water Classifications may change after the adoption date under specific circumstances. The map may have more than one WQC adoption date because a town may be in more than one major drainage basin.

SURFACE WATERS in Connecticut are divided into freshwater classified as AA, A, B or B* and saline waters classified as SA or SB. Class AA designated uses are existing or proposed drinking water supplies; habitat for fish and other aquatic life and wildlife; recreation; and water supply for industry and agriculture. Class A designated uses are habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture. Class SA designated uses are habitat for marine fish, other aquatic life and wildlife; shellfish harvesting for direct human consumption; recreation; industrial water supply; and navigation. Class B designated uses are habitat for fish and aquatic life and wildlife; recreation; navigation; and industrial and agricultural water supply. Class B*, applicable to Candlewood Lake, is a subset of Class B and is identical in all ways to the designated uses, criteria and standards for Class B waters except for the restriction on direct discharges. Class SB designated uses are habitat for marine fish and aquatic life and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation.

Surface waters which are not specifically classified shall be considered as Class A or Class AA. Surface waters in GA ground water areas are assumed Class A or Class SA unless otherwise indicated. Surface waters in GAA ground water areas are assumed Class AA unless otherwise indicated.

On the WQC map a surface water quality goal of A is represented by blue colored water bodies. Surface water quality goal of AA is represented by purple colored water bodies. Surface water quality goal of B is represented by gold colored water bodies.

GROUND WATERS in Connecticut are classified as GAA, GA, GB and GC. Class GAA designated uses are existing or potential public supply of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. The Class GAAs is a subclass of GAA for ground water that is tributary to a public water supply reservoir. The area of contribution to a public water supply well is represented by a 500-foot radius around the well and is assumed to be Class GAA unless otherwise classified. Class GA designated uses are existing private and potential public or private supplies of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. All ground waters not specifically classified are considered as Class GA. Class GB designated uses are industrial process water and cooling waters and baseflow for hydraulically-connected water bodies and is presumed not suitable for human consumption without treatment. Class GC designated uses are assimilation of discharges authorized by the Commissioner pursuant to Section 22a-430 of the General Statutes.

On the WQC map GA is represented by white colored land areas. Class GAA and class GAAs are represented by blue colored land areas. The area of contribution to a public water supply well is shown by a blue cross-hatch overprint. A notation of GAA followed by a state abbreviation indicates a watershed that contributes to the public water supply for a state other than Connecticut. Class GA or Class GAA areas that currently may not be meeting the GA or GAA standards are represented on the WQC maps by tan colored land areas. Class GB is represented by green colored land areas. Class GC is represented by magenta colored land areas.

FINAL AQUIFER PROTECTION AREAS (Level A) are included on the WQC maps for informational purposes. These areas are anticipated to be reclassified GAA during the next major basin updates, subject to public participation. The Aquifer Protection Program helps protect Connecticut's public drinking water resources by delineating aquifer protection areas (also called wellhead protection areas) for public supply wells and establishing land use regulations within these areas. These areas represent the land area contributing ground water to active public water supply wells or well fields that serve more than 1000 people and are set in sand and gravel aquifers (stratified drift deposits).

DATA SOURCES

WATER QUALITY CLASSIFICATIONS DATA – Water quality classifications shown on this map are based on information from the following digital spatial datasets that are typically shown together – Ground Water Quality Classifications Poly, Surface Water Quality Classifications Line, and Surface Water Quality Classifications Poly. The map legend above reflects the content of these three data sources. These WQC data were initially compiled on 1:24,000-scale 7.5 minute USGS topographic quadrangle maps and later digitized at 1:24,000 scale. For example, the Surface Water Quality Classifications Line and Surface Water Quality Classifications Poly digital data assigns surface water quality classifications to water bodies such as rivers, streams, reservoirs, lakes, ponds and coves found in 1:24,000-scale hydrography data available from CT DEEP. The hydrography may not include all the waterbodies in Connecticut. The Ground Water Quality Classifications Poly data assigns ground water quality classifications, at 1:24,000 scale, to the remaining land areas in Connecticut.

AQUIFER PROTECTION AREA DATA – Aquifer Protection Areas shown on this map are from the Aquifer Protection Area digital dataset which contains polygon data intended to be used at 1:24,000 scale. The dataset contains regulated areas classified as Level A Aquifer Protection Area (Final) and Level B Aquifer Protection Area (Preliminary). The Level B areas are not shown on the WQC maps. The data was collected from 1991 to the present and is actively updated as Final area mapping replaces earlier Preliminary areas. The Aquifer Protection Areas are delineated by the individual water companies owning the well fields and submitted to the CT DEEP for approval. Preliminary mapping provides a general estimate of the area contributing ground water to the well field. Final mapping is based on extensive, site-specific, detailed modeling of the ground water flow system. CT DEEP may adjust Final area boundaries to be consistent with 1:24,000 scale topography and base map data where appropriate during the approval process.

MAJOR DRAINAGE BASIN DATA – Major drainage basins shown on this map are from Major Basin Line data developed by CT DEEP and intended to be used at 1:24,000 scale.

BASE MAP DATA - Based on data originally from 1:24,000-scale USGS 7.5 minute topographic quadrangle maps published between 1969 and 1992. It includes political boundaries, railroads, airports, hydrography, geographic names and geographic places. Streets and street names are from Tele Atlas® copyrighted data. Base map information is neither current nor complete.

RELATED INFORMATION
This map is intended to be printed at its original dimensions in order to maintain the 1:24,000 scale (1 inch = 2000 feet).
WATER QUALITY STANDARDS - Go to the CT DEEP website for a summary and the full text of the "Water Quality Standards" and for other information on water quality.
AQUIFER PROTECTION AREAS - Go to the CT DEEP website for more information.

ADOPTED DATES

Water Quality Standards
February 25, 2011

Thames River, Pawcatuck River and Southeast Coastal Basins: December 1986

Connecticut River and South Central Coastal Basins: February 1993

Housatonic River, Hudson River and Southwest Coastal Basins: March 1999

MAJOR BASINS

1 Pawcatuck
2 Southeast Coast
3 Thames
4 Connecticut
5 South Central Coast
6 Housatonic
7 Southwest Coast
8 Hudson

MAP LOCATION

State Plane Coordinate System of 1983, Zone 3526
Lambert Conformal Conic Projection
North American Datum of 1983

SCALE 1:24,000 (1 inch = 2000 feet) when map is printed at original size

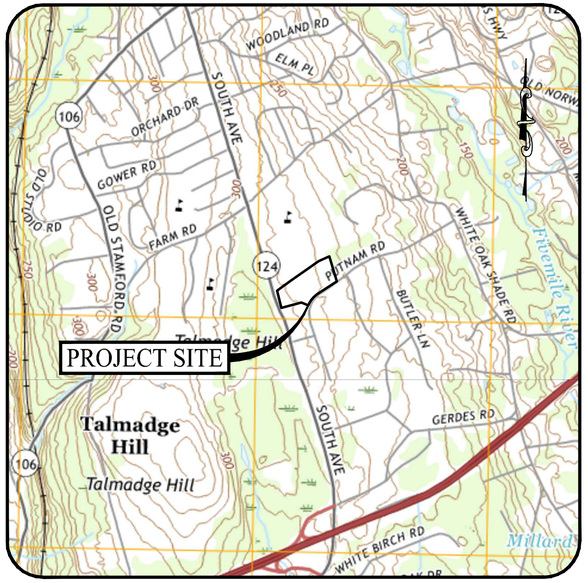
STATE OF CONNECTICUT
DEPARTMENT OF
ENERGY & ENVIRONMENTAL PROTECTION
79 Elm Street
Hartford, CT 06106-5127

Map created by CT DEEP
October 2018

Map is not colorfast
Protect from light and moisture

Appendix B: Site Plans

SOLLI ENGINEERING

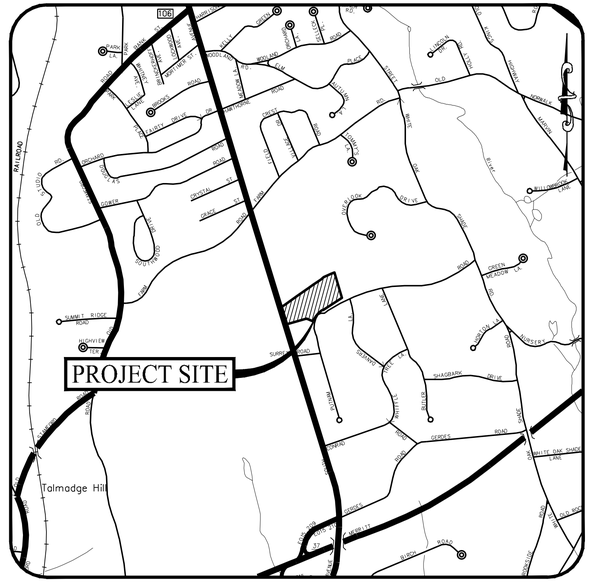


USGS MAP

SCALE: 1" = 1,000'

PROPOSED 688-kWh BESS SYSTEM

564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT



LOCATION MAP

SCALE: 1" = 1,000'

PREPARED FOR:

KINSLEY ENERGY SYSTEMS

14 CONNECTICUT SOUTH DRIVE
EAST GRANBY, CONNECTICUT

PREPARED BY:

SOLLI ENGINEERING

MONROE, CT | WEST HARTFORD, CT | NORWOOD, MA

OWNER

NEW CANAAN COMM. Y.M.C.A INC.
564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT, 06840

APPLICANT

KINSLEY ENERGY SYSTEMS
14 CONNECTICUT SOUTH DRIVE
EAST GRANBY, CONNECTICUT 06026

PROPERTY INFORMATION

ADDRESS: 564 SOUTH AVENUE, NEW CANAAN, CONNECTICUT
ID: 12521
MAP-LOT: 36 232 K62
AREA: 7.01± AC
BOOK/PAGE: 0152/0612

SOIL SCIENTIST

WILLIAM KENNY, CPWS, PLA, ASLA
WILLIAM KENNY ASSOCIATES
195 TUNXIS HILL CUTOFF SOUTH
FAIRFIELD, CT 06825
(203) 366-0588

ENGINEER OF RECORD

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MONROE, CONNECTICUT 06468
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LANDSCAPE ARCHITECT

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SURVEYOR OF RECORD

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RKW LAND SURVEYING
22 EAST AVENUE
NEW CANAAN, CONNECTICUT 06840

ELECTRICAL ENGINEER

KINSLEY ENERGY SYSTEMS
14 CONNECTICUT SOUTH DRIVE
EAST GRANBY, CONNECTICUT 06026

DRAWING LIST

SHEET #	SHEET NAME	PLAN DATE	LATEST REVISION
0.00	COVER SHEET	10.07.24	N/A
1 OF 1	ZONING LOCATION SURVEY	09.05/12	10/25/19
2.10	OVERALL SITE PLAN	10.07.24	N/A
2.11	SITE LAYOUT PLAN	10.07.24	N/A
2.31	SOIL EROSION AND SEDIMENT CONTROL PLAN	10.07.24	N/A
2.41	SOIL EROSION AND SEDIMENT CONTROL DETAILS	10.07.24	N/A
3.01	CONSTRUCTION DETAILS	10.07.24	N/A

STATE OF CONNECTICUT · KEVIN M. SOLLI · 25759 · LICENSED PROFESSIONAL ENGINEER

Rev. #:	Date	Description

Project:
PROPOSED 688-kWh BESS SYSTEM
564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT

Sheet Title: COVER SHEET

Sheet #: 0.00

ASSESSORS AERIAL MAP 36 BLOCK 232 LOT K 62

PER FILED MAP #3444

ONE ACRE ZONING REQUIREMENTS

REQUIRED	EXISTING
FRONT SETBACK = 35'	west 236.7 south 157.2'
SIDE SETBACK = 25'	north 14.5' east 266.7
REAR SETBACK = 35'	

WETLANDS/WATERCOURSE UPLAND REVIEW AREA = 50'

MAXIMUM BUILDING COVERAGE = 18,311 SQ. FT. (6%)
PER SECTION 3.7 E.2.a.iv.
MAXIMUM PERMITTED INCREASE IN BUILDING COVERAGE
BY SPECIAL PERMIT, FOR RECREATIONAL CLUBS

EXISTING BUILDING COVERAGE = 52,280 SQ. FT.

247 EXISTING PARKING SPACES (INCL. 6 HANDICAP SPACES)
267 PROPOSED PARKING SPACES (INCL. 7 HANDICAP SPACES)

LOADING SPACES: 1 EXISTING

WETLANDS SHOWN HEREON WERE DESIGNATED BY MB SOIL MAPPING ON AUGUST 17, 2004 AND FIELD LOCATED BY R K W LAND SURVEYING ON SEPTEMBER 30, 2004.

SUBJECT TO ELECTRIC AND/OR TELEPHONE COMPANY EASEMENTS, IF ANY, FOR OVERHEAD AND/OR UNDERGROUND SERVICE.

SUBSTRUCTURES AND/OR THEIR ENCROACHMENTS BELOW GRADE, IF ANY, NOT SHOWN.

THIS MAP IS NOT TO BE USED FOR CONVEYANCE PURPOSES.

ALTERATIONS OF THIS MAP OTHER THAN BY A LICENSED LAND SURVEYOR IS ILLEGAL.

REFERENCE HEREBY MADE TO MAP # 7656, 3444 + 7641 ON FILE IN THE NEW CANAAN TOWN CLERK'S OFFICE.

REFERENCE HEREBY MADE TO THE FOLLOWING DEEDS ON FILE IN THE NEW CANAAN TOWN CLERKS OFFICE :
Vol. 152 Pg. 612, Vol. 116 Pg. 280, and Vol. 152 Pg. 547

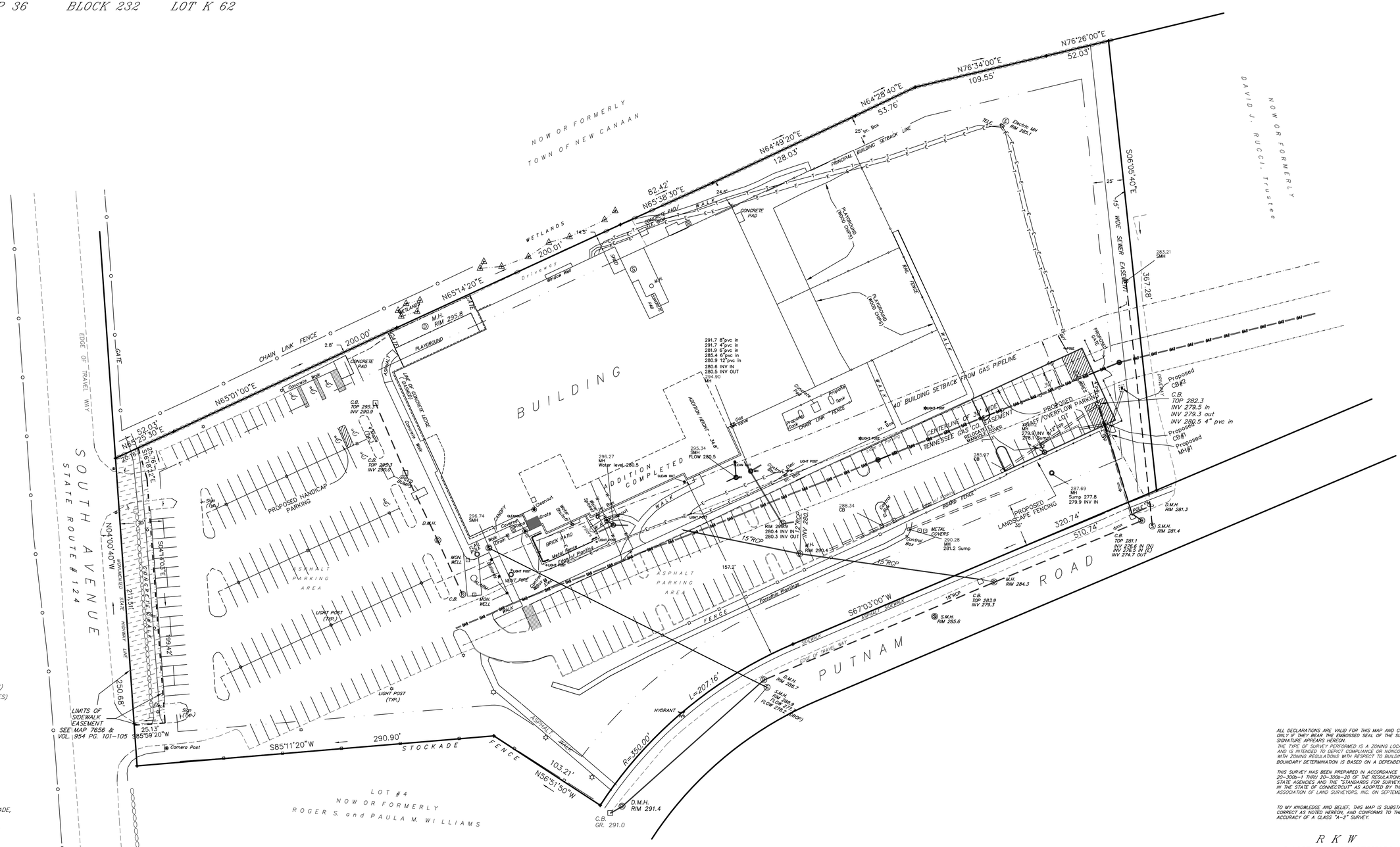
REFERENCE HEREBY MADE TO SITE PLANS, AND MODIFICATIONS THERETO, APPROVED BY THE NEW CANAAN PLANNING AND ZONING COMMISSION ON THE FOLLOWING DATES:
12/12/1961, 2/27/1962; 2/18/1964; 4/6/1965; 1/9/1968; 9/28/1976; 8/26/1997; 1/29/2002; 6/27/2006; 7/31/2007 and 4/29/2014.

REFERENCE IS MADE TO SPECIAL PERMITS GRANTED BY THE NEW CANAAN PLANNING AND ZONING COMMISSION ON THE FOLLOWING DATES:
8/13/1985; 6/24/1986; 7/21/1986; 8/26/1997 and 4/29/2014

REFERENCE IS MADE TO VARIANCES GRANTED BY THE NEW CANAAN ZONING BOARD OF APPEALS ON THE FOLLOWING DATES;
2/19/1968; 1/10/1977; AND 10/6/1997

REFERENCE HEREBY MADE TO SITE LAYOUT AND UTILITY PLAN PREPARED BY MCCHORD ENGINEERING ASSOCIATES DATED OCTOBER 25, 2019

REFERENCE HEREBY MADE TO SITE GRADING AND SOIL AND EROSION PLAN PREPARED BY MCCHORD ENGINEERING ASSOCIATES ON OCTOBER 25, 2019



ZONING LOCATION SURVEY
Prepared for
NEW CANAAN COMMUNITY Y.M.C.A.
564 South Avenue
New Canaan, Connecticut
AREA = 7.006 Acres
ONE ACRE RESIDENCE ZONE

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

ALL DECLARATIONS ARE VALID FOR THIS MAP AND COPIES THEREOF ONLY IF THEY BEAR THE EMBOSSED SEAL OF THE SURVEYOR WHOSE SIGNATURE APPEARS HEREON.
THE TYPE OF SURVEY PERFORMED IS A ZONING LOCATION SURVEY AND IS INTENDED TO DEPICT COMPLIANCE OR NONCOMPLIANCE WITH ZONING REGULATIONS WITH RESPECT TO BUILDING LOCATION. BOUNDARY DETERMINATION IS BASED ON A DEPENDENT RESURVEY.

THIS SURVEY HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300b-1 THRU 20-300b-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26 , 1996.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON, AND CONFORMS TO THE HORIZONTAL ACCURACY OF A CLASS "A-2" SURVEY.

R K W
LAND SURVEYING
New Canaan , Connecticut
Survey date: SEPTEMBER 5, 2012
Tel. 203 - 966 - 3501
Fax 203 - 966 - 3503

MAP REVISED AUGUST 19, 2012
MAP REVISED SEPTEMBER 9, 2012
FLAGGED UNDERGROUND UTILITIES ADDED AND PARKING REVISED OCT. 7, 2013
PROPOSED CANOPY AND SLIDE ADDED OCT. 10, 2013
REVISED FOR SUBMISSION OCTOBER 21, 2013
PROPOSED ADDITIONS ADDED NOVEMBER 5, 2015
SIDEWALK EASEMENT ADDED FEBRUARY, 29, 2016
FOUNDATION ADDED - JULY 15, 2016
AS BUILT OF ADDITION ADDED - AUGUST 24, 2017
TOPOGRAPHY ADDED (EAST END OF BLDG.) - JUNE 5, 2019
PROPOSED PARKING LOT EXPANSION ADDED SEPTEMBER 13, 2019
PROPOSED PARKING LOT EXPANSION REVISED OCT. 25, 2019

FRANCIS J. WALSH JR. L.S. # 70034

LDD4-19/NC-YMCA-2019 FILED: WILSER #270

LEGEND

- PROPERTY LINE
- BUILDING SETBACK LINE
- EASEMENT LINE
- LIMIT OF DISTURBANCE
- CHAIN LINK FENCE
- GAS LINE
- ELECTRIC CONDUIT
- WATER SUPPLY / RETURN
- CONCRETE EQUIPMENT PAD
- EVERGREEN TREE

Rev. #:	Date	Description

Graphic Scale: 40 0 40 80

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Drawn By:	CSH
Checked By:	EEL
Approved By:	KMS
Project #:	24110501
Plan Date:	10/07/24
Scale:	1" = 40'

STATE OF CONNECTICUT · KEVIN M. SOLLI · 25759 · LICENSED PROFESSIONAL ENGINEER

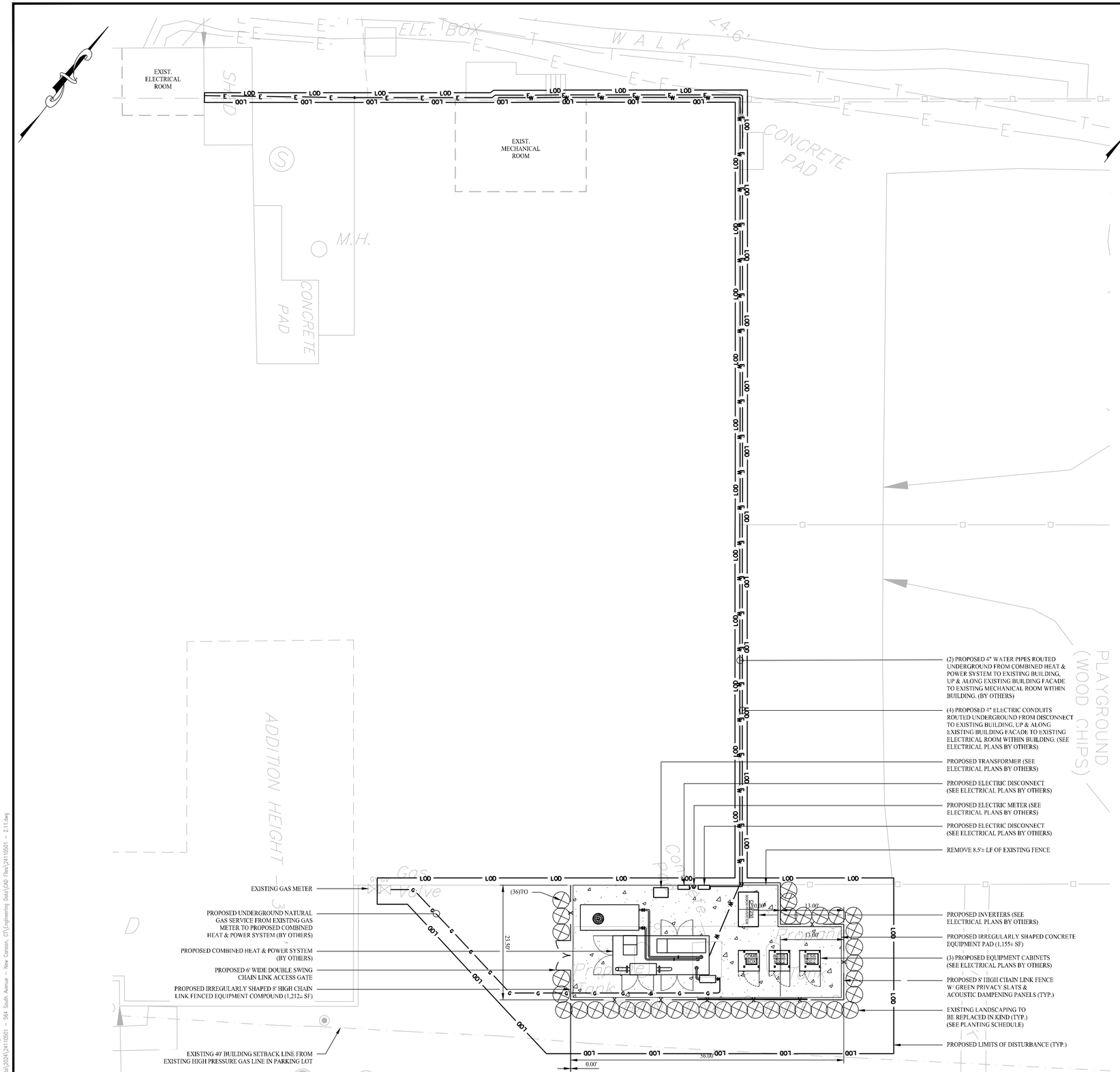
Kevin Solli, P.E.
CT 25759

Project:

PROPOSED 688-kWh BESS SYSTEM

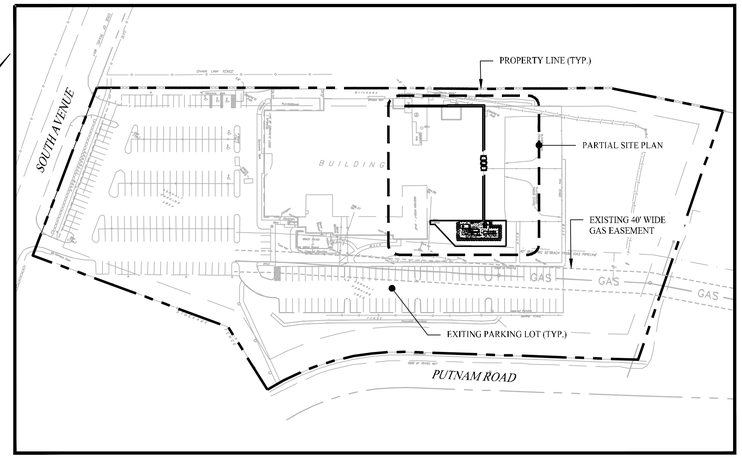
564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT

Sheet Title:	Sheet #:
OVERALL SITE PLAN	2.10



PARTIAL SITE PLAN

SCALE: 1" = 10'



OVERALL SITE PLAN

SCALE: 1" = 100'

PLANTING SCHEDULE

KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	COMMENTS
TREES						
TO	36	THUJA OCCIDENTALIS 'EMERALD GREEN'	EMERALD GREEN ARBORVITAE	B&B	7-8' HT	FULL, EXTRA HEAVY

GENERAL NOTES

1. THESE PLANS ARE FOR PERMITTING PURPOSES ONLY AND ARE NOT FOR CONSTRUCTION. NO CONSTRUCTION OR DEMOLITION SHALL BEGIN UNTIL APPROVAL OF THE FINAL PLANS IS GRANTED BY ALL GOVERNING AND REGULATORY AGENCIES.
2. EXISTING BOUNDARY, TOPOGRAPHICAL, AND WETLAND INFORMATION TAKEN FROM A SURVEY TITLED "ZONING LOCATION SURVEY", DATED: SEPTEMBER 5, 2012, REVISED OCTOBER 25, 2019, SCALE: 1" = 40', BY RKW LAND SURVEYING.
3. ALL CONSTRUCTION SHALL COMPLY WITH TOWN OF NEW CANAAN STANDARDS, CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS, CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION STANDARDS, AND SPECIFICATIONS IN THE ABOVE REFERENCED INCREASING HIERARCHY. IF SPECIFICATIONS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION SHALL APPLY. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE OSHA, FEDERAL, STATE AND LOCAL REGULATIONS.
4. THE OWNER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY ZONING PERMITS REQUIRED BY GOVERNMENT AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN ALL COUNTY AND TOWN CONSTRUCTION PERMITS. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK.
5. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS IN THE FIELD AND CONTACT THE ENGINEER OF RECORD IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING. ANY CONFLICT BETWEEN THE DRAWINGS SHALL BE CONFIRMED WITH THE OWNER'S CONSTRUCTION MANAGER PRIOR TO BIDDING.
6. SHOULD ANY UNCHARTED OR INCORRECTLY CHARTED, EXISTING PIPING OR OTHER UTILITY BE UNCOVERED DURING EXCAVATION, CONSULT THE ENGINEER OF RECORD IMMEDIATELY FOR DIRECTIONS BEFORE PROCEEDING FURTHER WITH WORK IN THIS AREA.
7. DO NOT INTERRUPT EXISTING UTILITIES SERVICING FACILITIES OCCUPIED AND USED BY THE OWNER OR OTHERS DURING OCCUPIED HOURS EXCEPT WHEN SUCH INTERRUPTIONS HAVE BEEN AUTHORIZED IN WRITING BY THE OWNER AND THE LOCAL MUNICIPALITIES. INTERRUPTIONS SHALL ONLY OCCUR AFTER ACCEPTABLE TEMPORARY SERVICE HAS BEEN PROVIDED.
8. THE CONTRACTOR SHALL RESTORE ANY DRAINAGE STRUCTURE, PIPE, UTILITY, PAVEMENT, CURBS, SIDEWALKS, LANDSCAPED AREAS OR SIGNAGE DISTURBED DURING CONSTRUCTION TO THEIR ORIGINAL CONDITION OR BETTER, AS APPROVED BY THE ENGINEER OF RECORD.
9. THE ENGINEER OF RECORD IS NOT RESPONSIBLE FOR SITE SAFETY MEASURES TO BE EMPLOYED DURING CONSTRUCTION. THE ENGINEER OF RECORD HAS NO CONTRACTUAL DUTY TO CONTROL THE SAFEST METHODS OR MEANS OF THE WORK, JOB SITE RESPONSIBILITIES, SUPERVISION OR TO SUPERVISE SAFETY AND DOES NOT VOLUNTARILY ASSUME ANY SUCH DUTY OR RESPONSIBILITY.
10. THE CONTRACTOR SHALL COMPLY WITH CFR 29 PART 1926 FOR EXCAVATION TRENCHING AND TRENCH PROTECTION REQUIREMENTS.
11. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE ENGINEER OF RECORD, AND APPROPRIATE REGULATORY AGENCY PRIOR TO INSTALLATION DURING THE BIDDING PROCESS.
12. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE SYSTEMS HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY PROVIDER AND MUNICIPAL RECORD MAPS AND/OR FIELD SURVEY AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE SYSTEMS ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE AND THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STORM DRAINAGE SYSTEMS INCLUDING SERVICES. PRIOR TO DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" 72 HOURS BEFORE COMMENCEMENT OF WORK AT "(800) 922-4455" AND VERIFY ALL UTILITY AND STORM DRAINAGE SYSTEM LOCATIONS.

LEGEND

- PROPERTY LINE
- BUILDING SETBACK LINE
- EASEMENT LINE
- LOD — LIMIT OF DISTURBANCE
- CHAIN LINK FENCE
- G — GAS LINE
- E — ELECTRIC CONDUIT
- W — WATER SUPPLY / RETURN
- CONCRETE EQUIPMENT PAD
- EVERGREEN TREE

Rev. #:	Date	Description

Graphic Scale: 10 0 10 20

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Drawn By:	ADH
Checked By:	EEL
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STATE OF CONNECTICUT · KEVIN M. SOLLI · 25759 · LICENSED PROFESSIONAL ENGINEER

Kevin Solli, P.E.
CT 25759

Project:

PROPOSED 688-kWh BESS SYSTEM
564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT

Sheet Title:	Sheet #:
SITE LAYOUT PLAN	2.11

LEGEND

	PROPERTY LINE
LOD	LIMIT OF DISTURBANCE
SF SF	SILT FENCE PROTECTION
X X	CHAIN LINK FENCE
	TEMPORARY MATERIAL STOCKPILE AREA
	TEMPORARY CONCRETE WASHPIT

CONSTRUCTION OPERATION & MAINTENANCE PLAN

E&S MEASURE	INSPECTION SCHEDULE	MAINTENANCE REQUIRED
COMPOST FILTER SOCK	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED.
SILT FENCE	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE FENCE.
TOPSOIL/BORROW STOCKPILES	DAILY	REPAIR/REPLACE SEDIMENT BARRIERS AS NECESSARY.
TEMPORARY SOIL PROTECTION	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR ERODED OR BARE AREAS IMMEDIATELY. RESEED AND MULCH.

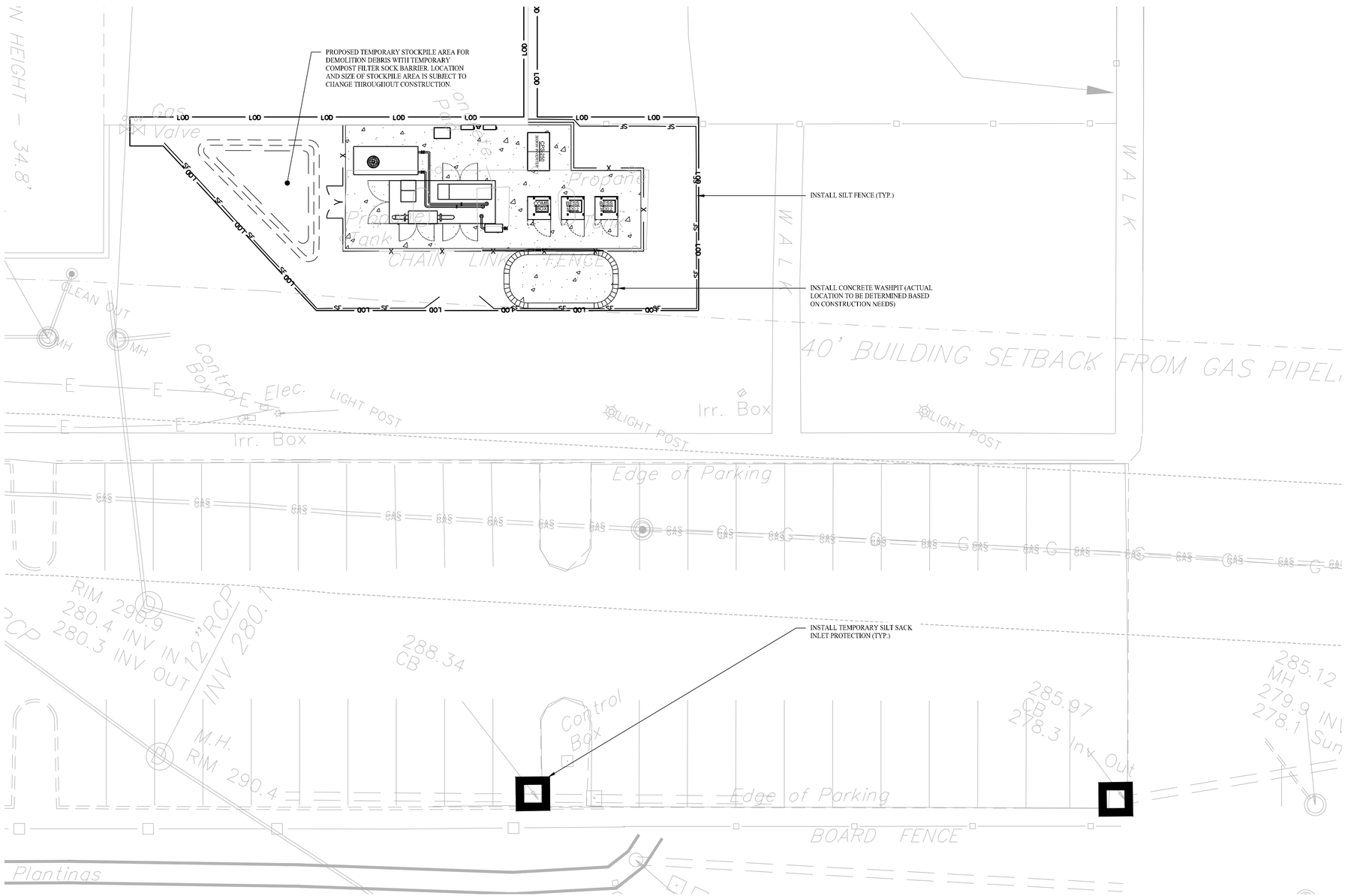
CONSTRUCTION SEQUENCE

THE FOLLOWING SUGGESTED SEQUENCE OF CONSTRUCTION ACTIVITIES IS PROJECTED BASED UPON ENGINEERING JUDGEMENT AND BEST MANAGEMENT PRACTICES. THE CONTRACTOR MAY ELECT TO ALTER THE SEQUENCING TO BEST MEET THE CONSTRUCTION SCHEDULE, THE EXISTING SITE ACTIVITIES AND WEATHER CONDITIONS. SHOULD THE CONTRACTOR ALTER THE CONSTRUCTION SEQUENCE OR ANY EROSION AND SEDIMENTATION CONTROL MEASURES THEY SHALL MODIFY THE STORMWATER POLLUTION CONTROL PLAN ("SWPCP") AS REQUIRED BY THE GENERAL PERMIT. MAJOR CHANGES IN SEQUENCING AND/OR METHODS MAY REQUIRE REGULATORY APPROVAL PRIOR TO IMPLEMENTATION.

1. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING. PHYSICALLY FLAG THE LIMITS OF DISTURBANCE IN THE FIELD AS NECESSARY TO FACILITATE THE PRE-CONSTRUCTION MEETING.
2. CONDUCT A PRE-CONSTRUCTION MEETING TO DISCUSS THE PROPOSED WORK AND EROSION AND SEDIMENTATION CONTROL MEASURES. THE MEETING SHOULD BE ATTENDED BY THE OWNER, THE OWNER'S REPRESENTATIVE(S), THE GENERAL CONTRACTOR, DESIGNATED SUB-CONTRACTORS AND THE PERSON, OR PERSONS, RESPONSIBLE FOR THE IMPLEMENTATION, OPERATION, MONITORING AND MAINTENANCE OF THE EROSION AND SEDIMENTATION MEASURES. THE CONSTRUCTION PROCEDURES FOR THE ENTIRE PROJECT SHALL BE REVIEWED AT THIS MEETING.
3. NOTIFY CALL BEFORE YOU DIG AT 811, AS REQUIRED, PRIOR TO THE START OF CONSTRUCTION.
4. INSTALL SILT FENCE / PERIMETER SEDIMENTS AS PROPOSED (CLEAR ONLY THOSE AREAS NECESSARY TO INSTALL SEDIMENTS).
5. REMOVE EXISTING LANDSCAPE SCREENING.
6. INSTALL EQUIPMENT PAD, ASSOCIATED EQUIPMENT & UTILITIES.
7. INSTALL CHAIN LINK FENCE.
8. INSTALL LANDSCAPE SCREENING.
9. FINE GRADE, RAKE, SEED, AND MULCH ALL REMAINING DISTURBED AREAS.

SEDIMENT & EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE 2024 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE TOWN OF PROSPECT, PERMITTEE, AND/OR SWPCP MONITOR. ALL PERIMETER SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.
2. THESE DRAWINGS ARE ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL MEASURES FOR THIS SITE. SEE CONSTRUCTION SEQUENCE FOR ADDITIONAL INFORMATION. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN ARE SHOWN AS REQUIRED BY THE ENGINEER OF RECORD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EROSION CONTROL MEASURES ARE CONFIGURED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION OF SOILS AND PREVENT THE TRANSPORT OF SEDIMENTS AND OTHER POLLUTANTS TO STORM DRAINAGE SYSTEMS AND/OR WATERCOURSES. ACTUAL SITE CONDITIONS OR SEASONAL AND CLIMATIC CONDITIONS MAY WARRANT ADDITIONAL CONTROLS OR CONFIGURATIONS, AS REQUIRED, AND AS DIRECTED BY THE PERMITTEE AND/OR SWPCP MONITOR. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.
3. A BOND OR LETTER OF CREDIT MAY BE REQUIRED TO BE POSTED WITH THE GOVERNING AUTHORITY FOR THE EROSION CONTROL INSTALLATION AND MAINTENANCE.
4. THE CONTRACTOR SHALL APPLY THE MINIMUM EROSION & SEDIMENT CONTROL MEASURES SHOWN ON THE PLAN IN CONJUNCTION WITH CONSTRUCTION SEQUENCING, SUCH THAT ALL ACTIVE WORK ZONES ARE PROTECTED. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, ENGINEER OF RECORD, MUNICIPAL OFFICIALS, OR ANY GOVERNING AGENCY. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CONSTRUCTION SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR INSTALLED SEDIMENTATION AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS WEEKLY AND WITHIN 24 HOURS OF A STORM WITH A RAINFALL AMOUNT OF 0.25 INCHES OR GREATER TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS AS NECESSARY IN A TIMELY MANNER.
6. THE CONTRACTOR SHALL KEEP A SUPPLY OF EROSION CONTROL MATERIAL (SILT FENCE, COMPOSITE FILTER SOCK, EROSION CONTROL BLANKET, ETC.) ON-SITE FOR PERIODIC MAINTENANCE AND EMERGENCY REPAIRS.
7. ALL FILL MATERIAL PLACED ADJACENT TO ANY WETLAND AREA SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN), SHALL BE PLACED IN MAXIMUM ONE FOOT LIFTS, AND SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS.
8. PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING, ORANGE SAFETY FENCE, CONSTRUCTION TAPE, OR EQUIVALENT FENCING/TAPE. ANY LIMB TRIMMING SHOULD BE DONE AFTER CONSULTATION WITH AN ARBORIST AND BEFORE CONSTRUCTION BEGINS IN THAT AREA. FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION.
9. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SEDIMENT BARRIER UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE BARRIER.
10. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS. ALL SLOPES SHALL BE SEEDED AND BANKS WILL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.
11. DIRECT ANY DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE CONFORMING TO THE GUIDELINES WITHIN THE APPROVED LIMIT OF DISTURBANCE IF REQUIRED. DISCHARGE TO STORM DRAINS OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR AND APPROVED BY THE PERMITTEE OR MUNICIPALITY.
12. THE CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AND SHALL NOT ALLOW THE ACCUMULATION OF RUBBISH OR CONSTRUCTION DEBRIS ON THE SITE. PROPER SANITARY DEVICES SHALL BE MAINTAINED ON-SITE AT ALL TIMES AND SECURED APPROPRIATELY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID THE SPILLAGE OF FUEL OR OTHER POLLUTANTS ON THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL APPLICABLE POLICIES AND REGULATIONS RELATED TO SPILL PREVENTION AND RESPONSE/CONTAINMENT.
13. MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (2 WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE. IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.
14. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. FOR DUST CONTROL, PERIODICALLY MOISTEN EXPOSED SOIL SURFACES WITH WATER ON UNPAVED TRAVELWAYS TO KEEP THE TRAVELWAYS DAMP. CALCIUM CHLORIDE MAY ALSO BE APPLIED TO ACCESS ROADS. DUMP TRUCK LOADS EXITING THE SITE SHALL BE COVERED.
15. VEGETATIVE ESTABLISHMENT SHALL OCCUR ON ALL DISTURBED SOIL UNLESS THE AREA IS UNDER ACTIVE CONSTRUCTION, IT IS COVERED IN STONE OR SCHEDULED FOR PAVING WITHIN 30 DAYS. TEMPORARY SEEDING OR NON-LIVING SOIL PROTECTION OF ALL EXPOSED SOILS AND SLOPES SHALL BE INITIATED WITHIN THE FIRST 7 DAYS OF SUSPENDING WORK IN AREAS TO BE LEFT LONGER THAN 30 DAYS.
16. MAINTAIN ALL PERMANENT AND TEMPORARY SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP CONCRETE PADS, CLEAN THE STORMWATER MANAGEMENT SYSTEMS AND REMOVE ALL TEMPORARY SEDIMENT CONTROLS ONCE THE SITE IS FULLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM PERMITTEE OR THE MUNICIPALITY.
17. REFER TO SHEET 2.41 FOR SEDIMENT & EROSION CONTROL NARRATIVE & DETAILS.



Rev. #: Date Description

Graphic Scale: 10 0 10 20

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STATE OF CONNECTICUT — KEVIN M. SOLLI — 25759 — REGISTERED PROFESSIONAL ENGINEER

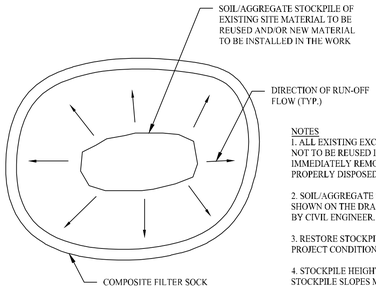
Kevin Solli, P.E.
CT 25759

Project:

PROPOSED 688-kWh BESS SYSTEM

564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT

Sheet Title:	Sheet #:
SOIL EROSION & SEDIMENT CONTROL PLAN	2.31



NOTES
1. ALL EXISTING EXCAVATED MATERIAL THAT IS NOT TO BE REUSED IN THE WORK IS TO BE IMMEDIATELY REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.

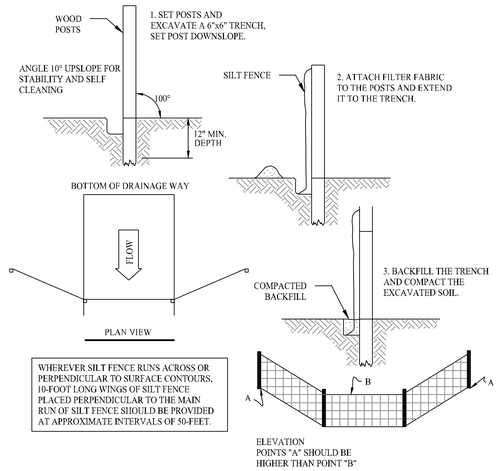
2. SOIL/AGGREGATE STOCKPILE SITES TO BE WHERE SHOWN ON THE DRAWINGS OR WHERE APPROVED BY CIVIL ENGINEER.

3. RESTORE STOCKPILE SITES TO PRE-EXISTING PROJECT CONDITION AND RESEED AS REQUIRED.

4. STOCKPILE HEIGHTS MUST NOT EXCEED 35'. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

MATERIALS STOCKPILE DETAIL

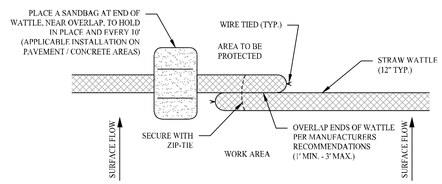
SCALE: NTS



WHEREVER SILT FENCE RUNS ACROSS OR PERPENDICULAR TO SURFACE CONTOURS, 10-FOOT LONG WINGS OF SILT FENCE PLACED PERPENDICULAR TO THE MAIN RUN OF SILT FENCE SHOULD BE PROVIDED AT APPROXIMATE INTERVALS OF 50-FEET.

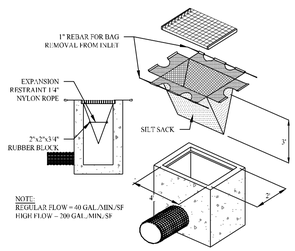
SILT FENCE PROTECTION DETAIL

SCALE: NTS



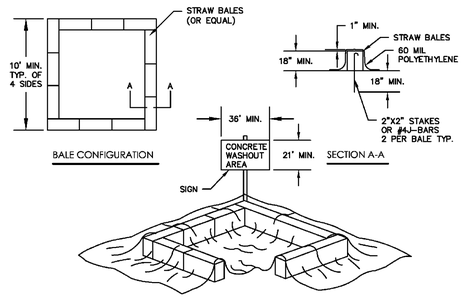
COMPOST FILTER SOCK

SCALE: NTS



SILT SACK DETAIL

SCALE: NTS



CONCRETE WASHOUT PIT

SCALE: NTS

SEDIMENT & EROSION CONTROL NARRATIVE

1. THE PROJECT INVOLVES THE CONSTRUCTION OF A GROUND MOUNTED BESS FACILITY WITH ASSOCIATED EQUIPMENT OF APPROXIMATELY 0.1± ACRES OF EXISTING LOT.

   THE PROPOSED PROJECT INVOLVES THE FOLLOWING CONSTRUCTION:

   A. CLEARING, GRUBBING, AND GRADING OF EXISTING LOT.
   B. CONSTRUCTION OF IRREGULARLY SHAPED (1,212± SF) CHAIN LINK FENCED EQUIPMENT COMPOUND WITH IRREGULARLY SHAPED (1,155± SF) CONCRETE EQUIPMENT PAD, EQUIPMENT & UTILITIES.
   C. THE STABILIZATION OF DISTURBED AREAS WITH PERMANENT VEGETATIVE TREATMENTS.

2. FOR THIS PROJECT, THERE ARE APPROXIMATELY 0.1± ACRES OF THE SITE BEING DISTURBED WITH NEGLIGIBLE INCREASE IN THE IMPERVIOUS AREA OF THE SITE. IMPERVIOUS AREAS ARE LIMITED TO THE CONCRETE PADS FOR ELECTRICAL EQUIPMENT.

3. THE PROJECT AREA, AS MAPPED IN THE SOIL SURVEY OF STATE OF CONNECTICUT (NRCS, VERSION 1, SEPTEMBER 15, 2023), CONTAINS TYPE 45A (HYDROLOGIC SOIL GROUP C/D) AND 45B (HYDROLOGIC SOIL GROUP C/D). A GEOTECHNICAL ENGINEERING REPORT IS SCHEDULED AND WILL BE PROVIDED UNDER SEPARATE COVER.

4. IT IS ANTICIPATED THAT CONSTRUCTION WILL BE COMPLETED IN APPROXIMATELY 3 MONTHS.

5. REFER TO THE CONSTRUCTION SEQUENCING AND EROSION AND SEDIMENTATION NOTES FOR INFORMATION REGARDING SEQUENCING OF MAJOR OPERATIONS IN THE ON-SITE CONSTRUCTION PHASES.

6. STORMWATER MANAGEMENT DESIGN CRITERIA UTILIZES THE APPLICABLE SECTIONS OF THE 2024 CONNECTICUT STORMWATER QUALITY MANUAL, TO THE EXTENT POSSIBLE AND PRACTICABLE FOR THIS PROJECT ON THIS SITE. EROSION AND SEDIMENTATION MEASURES ARE BASED UPON ENGINEERING PRACTICE, JUDGEMENT AND THE APPLICABLE SECTIONS OF THE CONNECTICUT EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, LATEST EDITION.

7. DETAILS FOR THE TYPICAL STORMWATER MANAGEMENT AND EROSION AND SEDIMENTATION MEASURES ARE SHOWN ON THE PLAN SHEETS OR PROVIDED AS SEPARATE SUPPORT DOCUMENTATION FOR REVIEW IN THIS PLAN.

8. CONSERVATION PRACTICES TO BE USED DURING CONSTRUCTION:

   A. MINIMIZE THE DISTURBED AREAS TO THE EXTENT PRACTICABLE DURING CONSTRUCTION;
   B. STABILIZE DISTURBED AREAS WITH TEMPORARY OR PERMANENT MEASURES AS SOON AS POSSIBLE, BUT NO LATER THAN 7-DAYS FOLLOWING DISTURBANCE;
   C. MINIMIZE IMPERVIOUS AREAS;
   D. UTILIZE APPROPRIATE CONSTRUCTION EROSION AND SEDIMENTATION MEASURES.

Rev. #:	Date	Description

SOLLI ENGINEERING
MONROE, CT | W. HARTFORD, CT | NORWOOD, MA
SOLLIENGINEERING.COM
T: (203) 880-5455 | F: (203) 880-9695

Drawn By:	CSH
Checked By:	EEL
Approved By:	KMS
Project #:	24110501
Plan Date:	10/07/24
Scale:	AS NOTED

STATE OF CONNECTICUT · KEVIN M. SOLLI · 25759 · LICENSED PROFESSIONAL ENGINEER

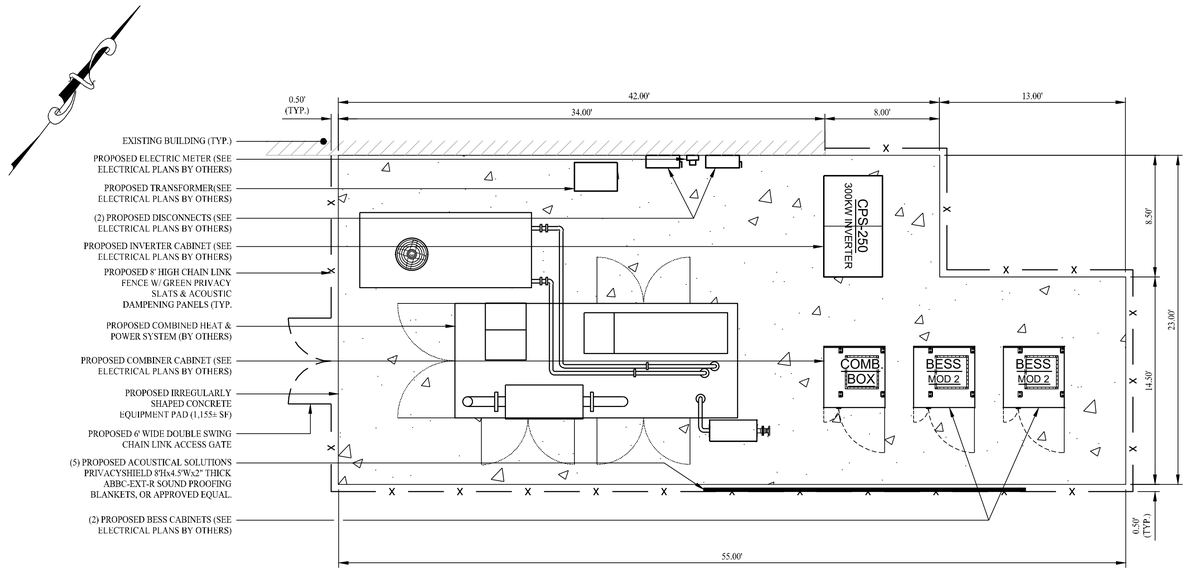
Kevin Solli, P.E.
CT 25759

Project:

PROPOSED 688-kWh
BESS SYSTEM
564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT

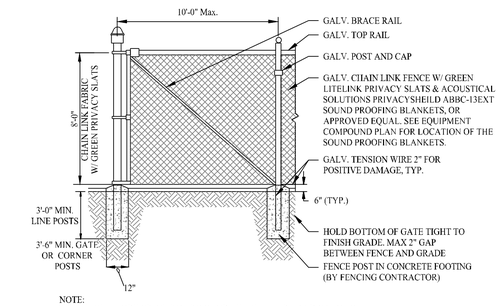
Sheet Title: SOIL EROSION & SEDIMENT CONTROL DETAILS

Sheet #: 2.41



EQUIPMENT COMPOUND PLAN

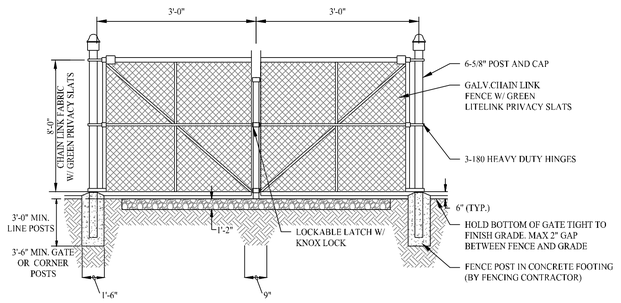
SCALE: 1" = 5'



NOTE:
SEE THE SITEWORK SPECIFICATIONS FOR THE SIZE, TYPE, AND GAUGE OF MATERIALS THAT WILL BE USED FOR CONSTRUCTION OF A CHAIN LINK FENCE.

8' HIGH CHAIN LINK FENCE DETAIL

SCALE: NTS

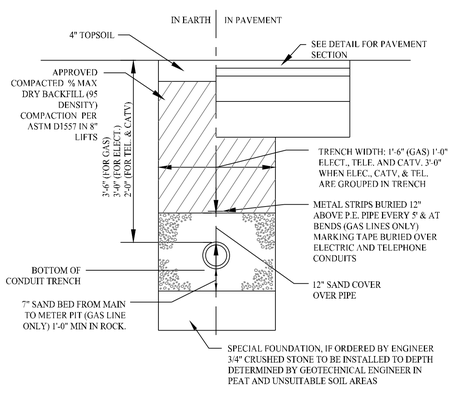


DOUBLE SWING GATE DETAIL

SCALE: NTS

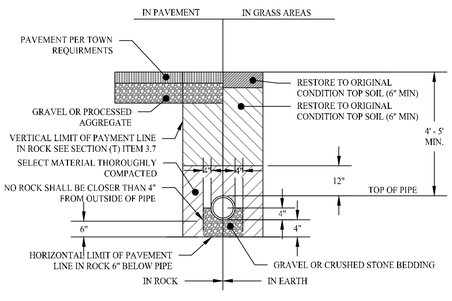
CONCRETE EQUIPMENT PAD

SCALE: NTS



UTILITY TRENCH DETAIL

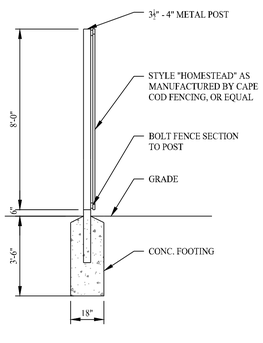
SCALE: NTS



TYPICAL WATER TRENCH DETAIL

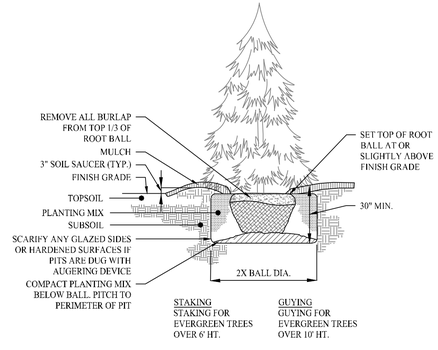
SCALE: NTS

DETAIL PROVIDED BY AQUARION WATER COMPANY



FENCE POST INSTALLATION

SCALE: NTS



EVERGREEN TREE PLANTING

SCALE: NTS

Rev. #:	Date	Description

SOLLI ENGINEERING
MONROE, CT | W. HARTFORD, CT | NORWOOD, MA
SOLLIENGINEERING.COM
T: (203) 880-5455 | F: (203) 880-9695

Drawn By:	CSH
Checked By:	EEL
Approved By:	KMS
Project #:	24110501
Plan Date:	10/07/24
Scale:	NTS

STATE OF CONNECTICUT KEVIN M. SOLLI 25759 LICENSED PROFESSIONAL ENGINEER

Kevin Solli, P.E.
CT 25759

Project:

PROPOSED 688-kWh BESS SYSTEM

564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT

Sheet Title:	Sheet #:
CONSTRUCTION DETAILS	3.01

Appendix C: Ecological Resources

SOLLI ENGINEERING

WILLIAM KENNY ASSOCIATES
LANDSCAPE ARCHITECTURE ▪ ECOLOGICAL SERVICES

July 10, 2024

Mr. Eric Labatte
Solli Engineering, LLC
501 Main Street, Suite 2-A
Monroe, CT 06468

Re: Wetland and Watercourse Determination
YMCA, 564 South Avenue, New Canaan, Connecticut

Dear Mr. Labatte:

As requested, we visited the referenced property and land 50 feet to the north to determine the presence or absence of wetlands and/or watercourses, to demarcate (flag) the boundaries of wetlands and watercourses identified, and to identify onsite soil types. This letter includes the methods and results of our investigation, which we completed today, July 10, 2024. In summary, no inland wetlands or watercourses were observed at the property or within 50 feet of its northern border.

Regulatory Definitions

The Inland Wetlands and Watercourses Act (Connecticut General Statutes §22a-38) defines inland wetlands as "land, including submerged land...which consists of any soil types designated as poorly drained, very poorly drained, alluvial, and floodplain." Watercourses are defined in the act as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof." The Act defines Intermittent Watercourses as having a defined permanent channel and bank and the occurrence of two or more of the following characteristics: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration longer than a particular storm incident, and C) the presence of hydrophytic vegetation.

Methodology

A second order soil survey in accordance with the principles and practices noted in the USDA publication *Soil Survey Manual* (1993) was completed at the subject site. The classification system of the National Cooperative Soil Survey was used in this investigation. Soil map units identified at the project site generally correspond to those included in the *Soil Survey of Fairfield County, Connecticut* (USDA 2005).

1899 Bronson Road
Fairfield CT 06824
203 366 0588
www.wkassociates.net

Wetland determinations were completed based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils. Soil types were identified by observation of soil morphology (soil texture, color, structure, etc.). To observe the morphology of the property's soils, test pits and/or borings (maximum depth of two feet) were completed at the site.

Intermittent watercourse determinations were made based on the presence of a defined permanent channel and bank and the occurrence of two or more of the following characteristics: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration longer than a particular storm incident, and C) the presence of hydrophytic vegetation.

The wetland and watercourse determination is subject to change until adopted by local, state, or federal regulatory agencies.

Results

The approximate 7.0-acre institutional property is located at 564 South Avenue in New Canaan, Connecticut. South Avenue borders the western boundary of the property and Putnam Road borders the southern boundary of the property. The investigation was limited to the area shown on the attached map. Property improvements include a YMCA building, and an asphalt driveway and parking area. The primary vegetative cover at the property is lawn with other ornamentals.

No inland wetlands or watercourses were observed at the property or within 50 feet of its northern border. The identified soils are neither poorly drained, very poorly drained, or from alluvial deposits. They are moderately well drained and formed from glacial till deposits or are forming from human altered deposits.

Three soil map units were identified on the property. The map units represent a specific area on the landscape and consists of one or more soils for which the unit is named. Other soils (inclusions that are generally too small to be delineated separately) may account for 10 to 15 percent of each map unit. The mapped units are identified in the following table by name and symbol and typical characteristics (parent material, drainage class, high water table, depth to bedrock, and slope). These characteristics are generally the primary characteristics to be considered in land use planning and management. A description of each characteristic and their land use implications follows the table. A complete description of the soil map unit can be found in the *Soil Survey of Fairfield County, Connecticut* (USDA 2005), and at *https://soilseries.sc.egov.usda.gov/osdname.aspx.* On the day of the review the soil was moist. The sky was clear and air temperatures were in the 80's ° F.

Map Unit		Parent Material	Slope (%)	Drainage Class	High Water Table			Depth To Bedrock (in)
Sym.	Name				Depth (ft)	Kind	Mos.	
	Upland Soil							
45	Woodbridge fine sandy loam	Compact Glacial Till	0-15	Moderately Well Drained	1.5-3.0	Perched	Nov-May	>60
306	Udorthents -	Excavated or Filled Soil (>2 feet)	0-45	Moderately Well Drained	1.5->6.0	Apparent	Nov-May	>60

Map Unit Sym.	Map Unit Name	Parent Material	Slope (%)	Drainage Class	High Water Table Depth (ft)	High Water Table Kind	High Water Table Mos.	Depth To Bedrock (in)
	Urban Land Complex	Pavement & structures account for 85% or more of the area. Additional investigations required to determine characteristics						
308	Udorthents, Smoothed	Excavated or Filled Soil (>2 feet)	0-45	Moderately Well Drained	1.5->6.0	Apparent	Nov-May	>60

Parent material is the unconsolidated organic and mineral material in which soil forms. Soil inherits characteristics, such as mineralogy and texture, from its parent material. Glacial till is unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice. Glacial outwash consists of gravel, sand, and silt, which are commonly stratified and deposited by glacial melt water. Alluvium is material such as sand, silt, or clay, deposited on land by streams. Organic deposits consist of decomposed plant and animal parts.

A soil's texture affects the ease of digging, filling, and compacting and the permeability of a soil. Generally sand and gravel soils, such as outwash soils, have higher permeability rates than most glacial till soils. Soil permeability affects the cost to design and construct subsurface sanitary disposal facilities and, if too slow or too fast, may preclude their use. Outwash soils are generally excellent sources of natural aggregates (sand and gravel) suitable for commercial use, such as construction sub base material. Organic layers in soils can cause movement of structural footings. Compacted glacial till layers make excavating more difficult and may preclude the use of subsurface sanitary disposal systems or increase their design and construction costs if fill material is required.

Generally, soils with steeper slopes increase construction costs, increase the potential for erosion and sedimentation impacts, and reduce the feasibility of locating subsurface sanitary disposal facilities.

Drainage class refers to the frequency and duration of periods of soil saturation or partial saturation during soil formation. Seven classes of natural drainage classes exist. They range from excessively drained, where water is removed from the soil very rapidly, to very poorly drained, where water is removed so slowly that free water remains at or near the soil surface during most of the growing season. Soil drainage affects the type and growth of plants found in an area. When landscaping or gardening, drainage class information can be used to assure that proposed plants are adapted to existing drainage conditions or that necessary alterations to drainage conditions (irrigation or drainage systems) are provided to assure plant survival.

High water table is the highest level of a saturated zone in the soil in most years. The water table can affect the timing of excavations; the ease of excavating, constructing, and grading; and the supporting capacity of the soil. Shallow water tables may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.

The depth to bedrock refers to the depth to fixed rock. Bedrock depth affects the ease and cost of construction, such as digging, filling, compacting, and planting. Shallow depth bedrock may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.

Conclusions

Today, we investigated the property located at 564 South Avenue in New Canaan, Connecticut and land 50 feet to the north. No inland wetlands or watercourses were observed at the property or within 50 feet of its northern border. Thank you for the opportunity to assist you. If you should have any questions or comments, please do not hesitate to contact us.

Sincerely,

William L. Kenny, PWS, PLA
Soil Scientist

Enclosure

Ref. No. 2730

SOIL LEGEND

UPLAND

45 WOODBRIDGE FINE SANDY LOAMS
306 UDORTHENTS-URBAN LAND COMPLEX
308 UDORTHENTS, SMOOTHED

WILLIAM KENNY ASSOCIATES
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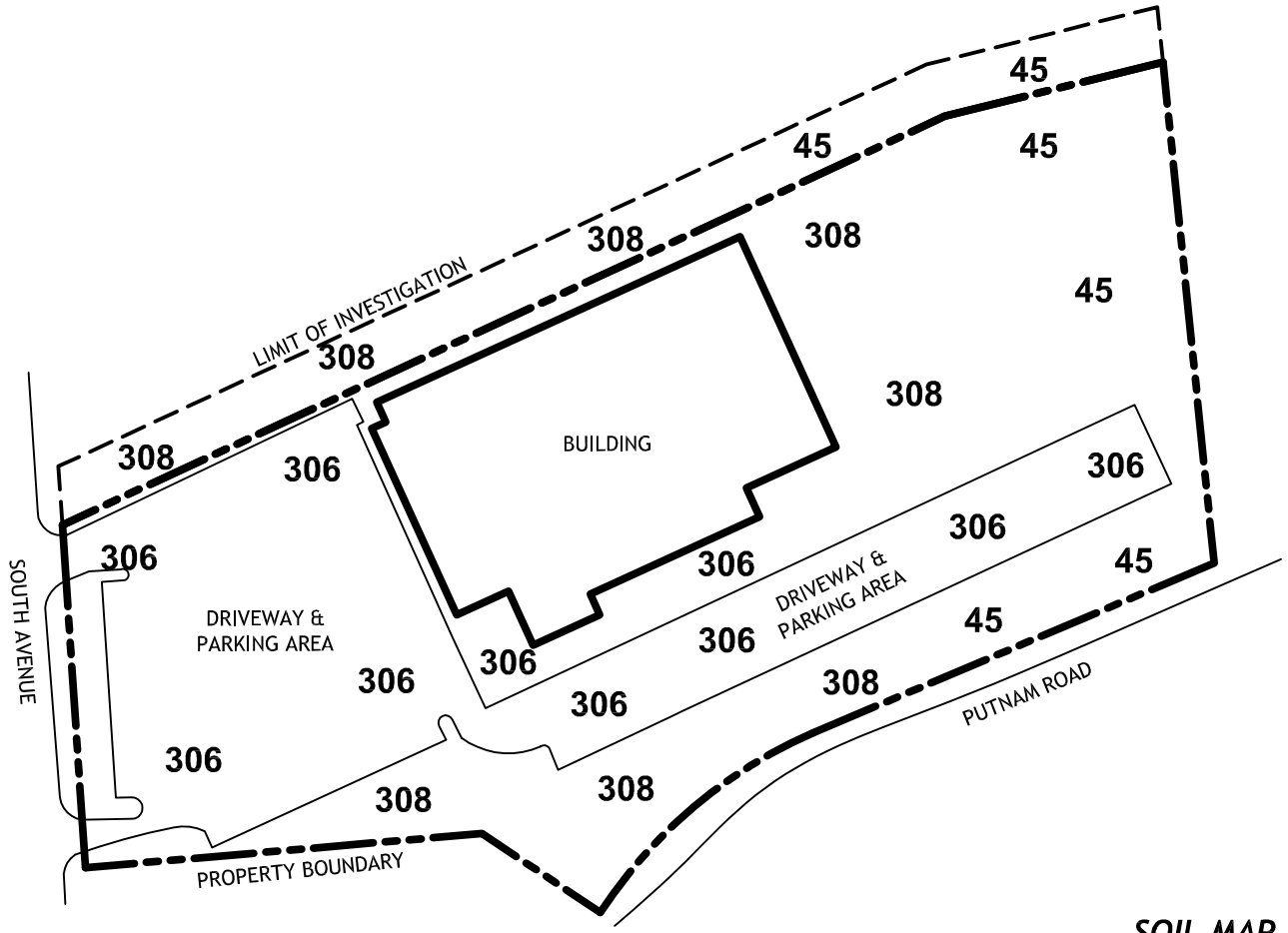


NOTES:

- *INFORMATION SHOWN ON THIS DRAWING IS APPROXIMATE.*
- *SOIL INFORMATION PROVIDED BY WILLIAM KENNY ASSOC. OTHER INFORMATION TAKEN FROM A DRAWING PREPARED BY R K W LAND SURVEYING.*
- ***45, 306** AND **308** ARE SOIL MAPPING UNIT SYMBOLS. SEE DETERMINATION REPORT FOR THE SOIL MAP UNIT NAMES AND ADDITIONAL RELATED INFORMATION.*

I CERTIFY THAT THIS SOIL MAP SUBSTANTIALLY REPRESENTS THE SOILS MAPPED IN THE FIELD

WILLIAM L. KENNY, SOIL SCIENTIST

SOIL MAP

564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT

SCALE: NOT TO SCALE
DATE: JULY 10, 2024

Ref. No. 2730

NORTH

WILLIAM KENNY ASSOCIATES
LANDSCAPE ARCHITECTURE ▪ ECOLOGICAL SERVICES
1899 Bronson Road Fairfield CT 06824
203 366 0588 www.wkassociates.net

ECOLOGICAL COMMUNITY

SYM.	*NAME*
UPLAND	
U1	*LAWN, TREES & OTHER ORNAMENTAL VEGETATION*
U2	*BUILDINGS & PAVEMENTS*

ECOLOGICAL COMMUNITIES MAP

LOCATION:
NEW CANAAN YMCA, 564 SOUTH AVENUE
NEW CANAAN, CONNECTICUT

DATE: AUGUST 29, 2024

SCALE: *0'* *50'* *100'*

NORTH

REF. NO. 2730

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Generated by eNDDB on:
9/30/2024

Jackson Smith
WILLIAM KENNY ASSOCIATES LLC
1899 Bronson Rd
Fairfield, CT 06824
jsmith@wkassociates.net

Subject: 564 South Avenue New Canaan Battery Storage
Filing # 118769
NDDB – New Determination Number: 202409841
564 SOUTH AVE
NEW CANAAN

Expiration Date: 9/30/2026

Based on current data maintained by the Natural Diversity Database (NDDB) and housed in the DEEP ezFile portal, no extant populations of Federal or State Endangered, Threatened or Special Concern species (RCSA Sec. 26-306) are known to occur within the project area delineated for the Energy and Utility Production Facilities and Distribution Infrastructure / New facility construction, 564 South Avenue New Canaan Battery Storage.

This NDDB – New determination may be utilized to fulfill the Endangered and Threatened Species requirements for state-issued permit applications, licenses, registration submissions, and authorizations. However, please be aware of the following limitations and conditions:

- This determination does not preclude the possibility that listed species may be encountered on site. Should this occur, a report must be submitted to the Natural Diversity Database promptly and additional action may be necessary to remain in compliance with certain state permits. Please fill out the appropriate survey form and follow the instructions for submittal.
- If your project involves preparing an Environmental Impact Assessment, this NDDB consultation and determination should not be substituted for conducting biological field surveys assessing on-site habitat and species presence.
- This determination applies only to the project as described in the submission and summarized at the end of this letter. Please re-submit an updated Request for Review if the project's scope of work and/or timeframe changes, including if work has not begun by 9/30/2026.

The NDDB – New determination for the 564 South Avenue New Canaan Battery Storage at 564 SOUTH AVE, NEW CANAAN as described in the submitted information and summarized at the end of this document is valid for two years from the date on this letter.

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, land owners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Database and accessed through the ezFile portal as it becomes available.

This letter is computer generated and carries no signature. If however, any clarification is needed, or if you have further questions, please contact the following:

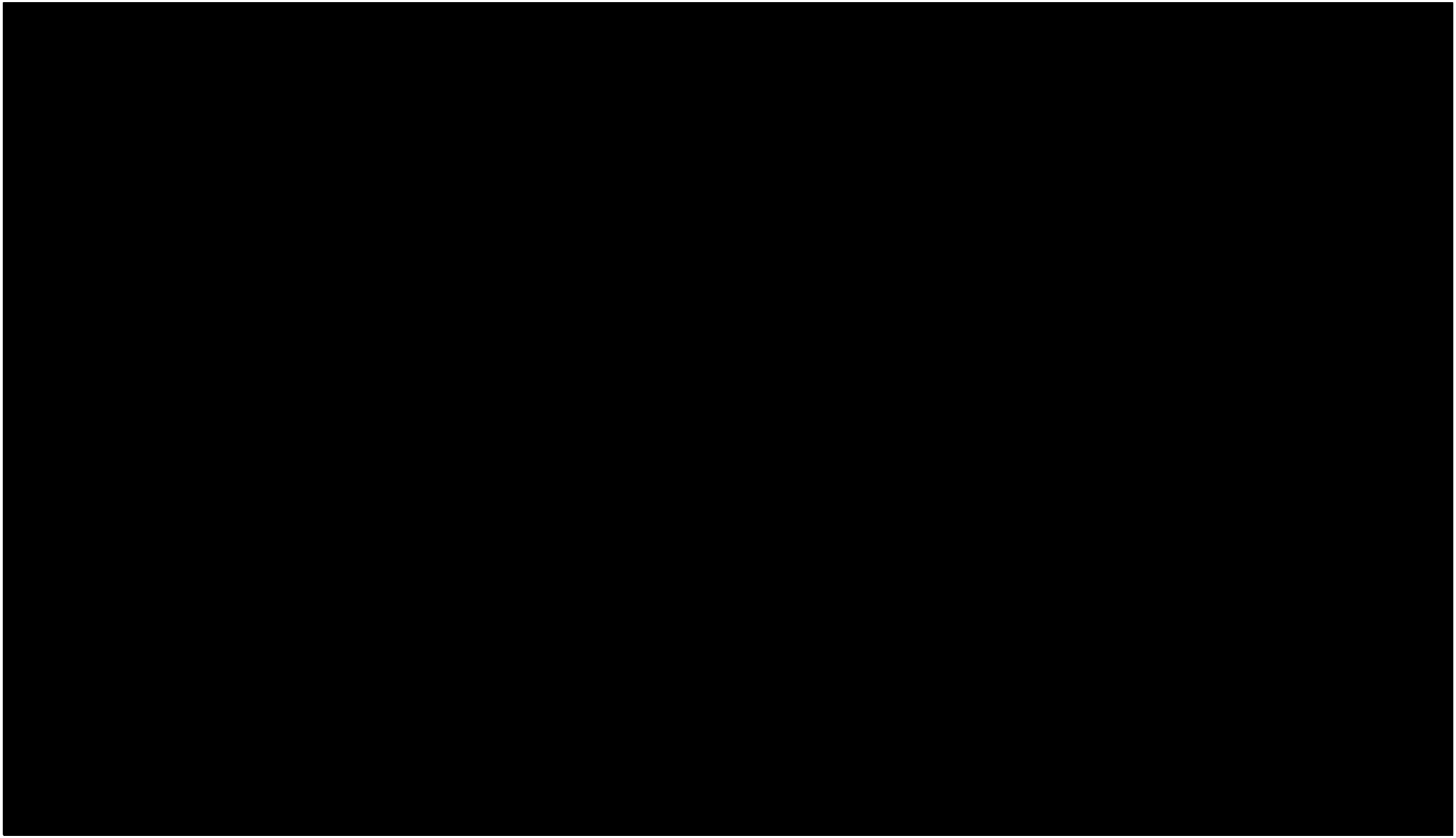
CT DEEP Bureau of Natural Resources
Wildlife Division
Natural Diversity Database
79 Elm Street, 6th floor
Hartford, CT 06106-5127
(860) 424-3011
deep.nddbrequest@ct.gov

Please reference the Determination Number provided in this letter when you e-mail or write. Thank you for submitting your project through DEEP's ezFile portal for Natural Diversity Database reviews.

Application Details:

Project involves federal funds or federal permit:	No
Project involves state funds, state agency action, or relates to CEPA request:	No
Project requires state permit, license, registration, or authorization:	Yes
DEEP enforcement action related to project:	
Project Type:	Energy and Utility Production Facilities and Distribution Infrastructure
Project Sub-type:	New facility construction
Project Name:	564 South Avenue New Canaan Battery Storage
Project Description:	

564 South Avenue New Canaan Battery Storage Map



September 30, 2024

1:1,200

0 0.01 0.02 0.04 mi

0 0.015 0.03 0.06 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: 09/30/2024 16:10:27 UTC
Project Code: 2024-0118452
Project Name: New Canaan

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (**Updated 4/12/2023**) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

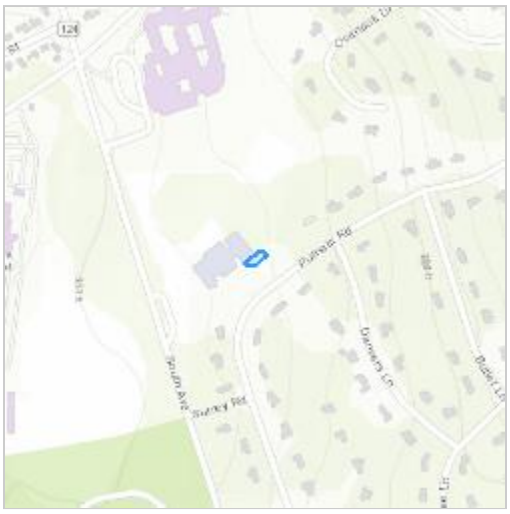
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

PROJECT SUMMARY

Project Code: 2024-0118452
Project Name: New Canaan
Project Type: Power Gen - Other
Project Description: The proposed development is for a battery storage project . The property is located at 564 South Avenue, New Canaan, CT. The property is approximately 7-acres, the project will impact less than 0.5 acres in a previously developed area. The proposed project will not adversely impact wetlands or watercourses as no wetlands or watercourses are onsite. All work is proposed more than 100 feet from any offsite wetlands and watercourses.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.12886035,-73.48400014254364,14z



Counties: Fairfield County, Connecticut

ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Jackson Smith
Address: 1899 Bronson Road
City: Fairfield
State: CT
Zip: 06824
Email jsmith@wkassociates.net
Phone: 8609131480

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

New Canaan

LOCATION

Fairfield County, Connecticut

DESCRIPTION

Some(The proposed development is for a battery storage project . The property is located at 564 South Avenue, New Canaan, CT. The property is approximately 7-acres, the project will impact less than 0.5 acres in a previously developed area. The proposed project will

not adversely impact wetlands or watercourses as no wetlands or watercourses are onsite. All work is proposed more than 100 feet from any offsite wetlands and watercourses.)

Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of

Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

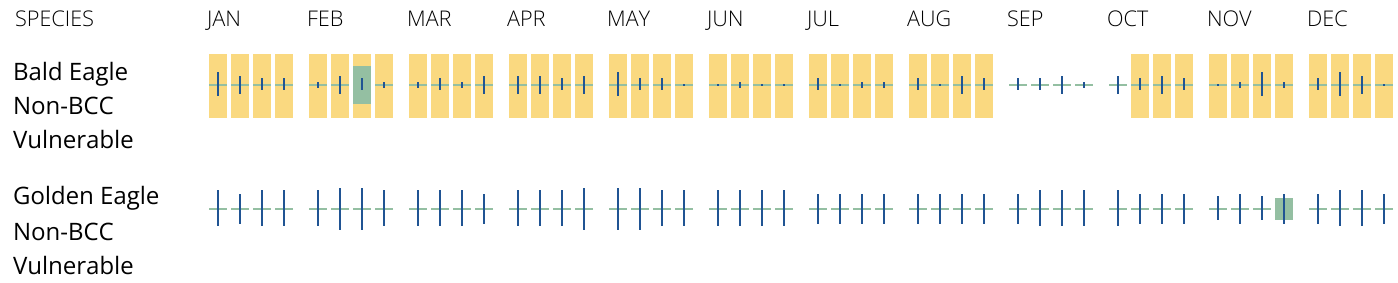
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▪ probability of presence ▪ breeding season | survey effort – no data



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31

Blue-winged Warbler Vermivora cyanoptera — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden Eagle Aquila chrysaetos — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Prairie Warbler Setophaga discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Scarlet Tanager Piranga olivacea — Breeds May 10 to Aug 10
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

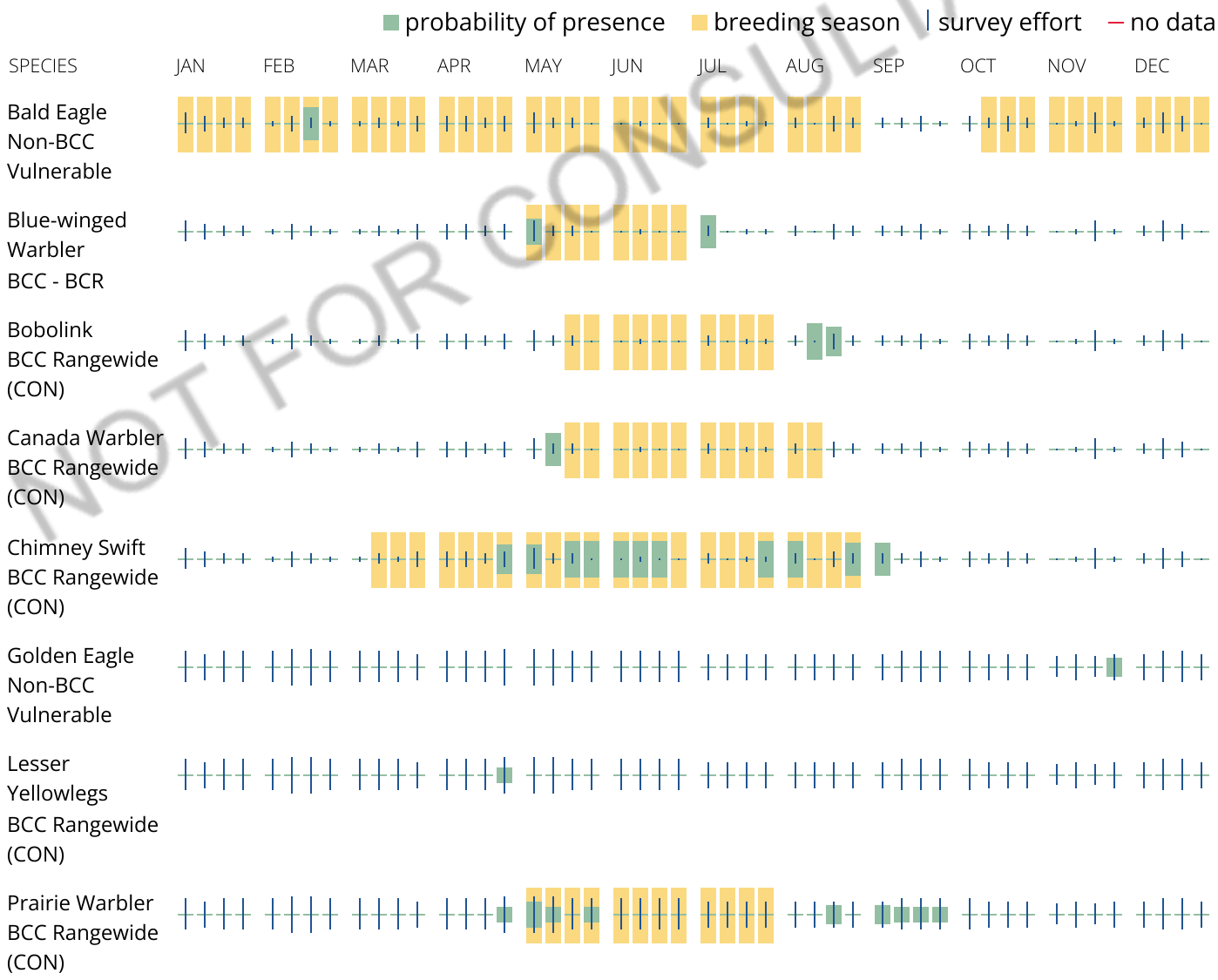
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

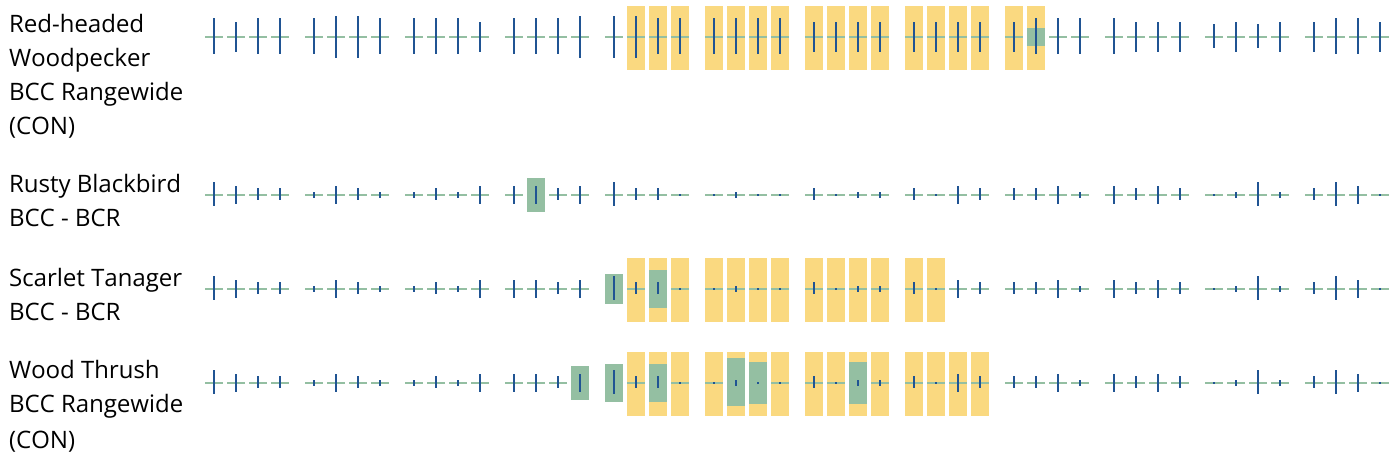
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location did not intersect any wetlands mapped by NWI.

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix D: Cultural Resources

SOLLI ENGINEERING

Phase Ia Archaeological Assessment Survey
Proposed Battery Storage Facility
564 South Avenue
Town of New Canaan, Connecticut

August, 2024

ACS

◆ *Archaeological Consulting Services* ◆

Phase Ia Archaeological Assessment Survey
Proposed Battery Storage Facility
564 South Avenue
Town of New Canaan, Connecticut

by

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Abstract

This report contains the results of a Phase Ia archaeological assessment survey conducted by ACS (Archaeological Consulting Services) during the month of August, 2024. The project calls for an evaluation of potential cultural resources to be affected by the construction of a battery storage facility on a property that measures seven acres in New Canaan, Connecticut. The project property is at 564 South Avenue, on the east side of the road in southern New Canaan. The project property is the site of an existing YMCA facility, with the specific project area consisting of a 20-foot by 50-foot area already containing a utility station with gas service line. The project is being coordinated by Solli Engineering, a civil engineering firm based in Monroe, Connecticut. Solli supplied site plans which show the proposed development and existing conditions. The project is subject to review by the Connecticut Siting Council and the Connecticut State Historic Preservation Office (SHPO).

Background research indicates a low sensitivity for potential prehistoric cultural resources, with a statistical prehistoric landscape sensitivity model developed and utilized by ACS indicating a score of 8.2 out of a possible 100.0, and therefore within the low sensitivity range (0-20). The low prehistoric sensitivity of the property largely derives from its hill ridge setting at a great distance to the nearest major water source. There are no previously recorded prehistoric archaeological sites within one mile of the project area. ACS recommends no further archaeological conservation efforts for potential prehistoric cultural resources.

Land records and historic maps indicate no likely substantial historical development within the project area. South Avenue was not established until 1857, and homes of the area were mostly constructed after the start of the 20th century. Owned by the William B. Fish family and descendants until the mid-20th century, the project property contained farm fields until sold to the YMCA in 1962, when construction of the facility would have severely impacted the project area. There are no previously recorded historic archaeological sites within one mile of the project area. The closest significant historic resource is the Waveny Park property, listed with the National Register of Historic Places, and consisting of an early 20th century estate converted into a park on the other side of South Avenue about one-quarter mile to the south. ACS recommends no further archaeological conservation efforts for potential historic cultural resources.

Project Summary

Project Name: Proposed Battery Storage Facility, 564 South Avenue, New Canaan, Connecticut.

Project Purpose: To investigate possible cultural resources which may be impacted by the construction of a battery storage facility in New Canaan, Connecticut, in compliance with requirements of the Connecticut Siting Council and the Connecticut State Historic Preservation Office.

Project Funding: Kinsley Energy Systems, LLC, East Granby, Connecticut.

Project Location: 564 South Avenue, Tax Map 36, Block 232, Lot K62, New Canaan, Connecticut.

Project Size: 7.01 acres (project property).

Investigation Type: Phase Ia archaeological assessment survey.

Investigation Methods: Background research, pedestrian surface survey.

Dates of Investigation: August, 2024.

Performed by: ACS (Archaeological Consulting Services), 118 Whitfield Street, Guilford, Connecticut 06437, (203) 458-0550 (telephone), (203) 672-2442 (fax), acsinfo@yahoo.com.

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Submitted to:

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Connecticut Office of State Archaeology (Dr. Sarah Sportman, State Archaeologist), University of Connecticut, 354 Mansfield Road, Storrs, Connecticut 06269-1176, (860) 486-5248.

Reviewing Agency:

Connecticut State Historic Preservation Office (Catherine Labadia, Staff Archaeologist), 450 Columbus Boulevard, Hartford, Connecticut 06103, (860) 500-2329.

Recommendations: Project property bears low prehistoric and historic archaeological sensitivity, no further archaeological conservation efforts warranted.

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CHAPTER 1: INTRODUCTION

Project Description

This report provides the results of a Phase Ia archaeological assessment survey conducted by ACS for the planned development of a new battery storage facility in New Canaan, Fairfield County, Connecticut. The owner of the project is Kinsley Energy Sytems, LLC of East Granby, Connecticut. The project is contained within a single lot owned by the New Canaan Community YMCA, Inc., and consists of 7.01 acres on the east side of South Avenue (Route 124) in the south-central part of New Canaan. The address for the property is 564 South Avenue, which is listed in the New Canaan assessor office as Tax Map 36, Block 232, Lot K62. The property contains a YMCA facility, including extensive parking and infrastructure. The project area is limited to an area measuring about 20 feet by 50 feet where there is an existing utility station for the facility, as well as some utility lines along the perimeter of the existing building.

ACS was contacted by Solli Engineering, a civil engineering firm based in Monroe, Connecticut to conduct the archaeological assessment survey for the project. Solli supplied ACS with a survey map, indicating that the survey was likely required for review by the Connecticut State Historic Preservation Office (SHPO) and Connecticut Siting Council. The survey map shows the proposed development and existing conditions, including topography and wetlands.

ACS conducted the assessment survey in conformance with the *Environmental Review Primer for Connecticut Archaeological Resources* issued by SHPO. The assessment survey evaluated the potential need, if any, for a Phase Ib archaeological reconnaissance survey. The archaeological assessment survey consisted of a thorough background research effort and pedestrian surface survey to evaluate the potential sensitivity of the project area for any prehistoric and/or historic cultural resources, with SHPO to serve as review agency for the final report.

CHAPTER 2: BACKGROUND

Environmental Setting

The project area is located in the Town of New Canaan, Fairfield County, Connecticut. The project setting is within the Western Coastal (V-A) ecoregion of Connecticut. The project area lies in the south-central part of New Canaan, on the east side of South Avenue (Route 124), and within a mile to the north of the Darien border to the south. The surrounding area contains a mix of open land, residential neighborhoods, and school properties. The overall lot measures 7.01 acres, with the proposed project development set within a very small area to the southeast of the main building measuring about 20 by 50 feet and already containing a facility utility station (Figure 1).

Underlying bedrock is dominated by units of Trap Falls Schist (Otf) and contemporaneous granitic gneiss, Ordovician formations on the order of 500 to 440 million years old (Rodgers 1985). These are highly foliated formations, with nearby bedrock outcrops revealing steep variable dips of up to 75 degrees. The formations are part of the Connecticut Valley Synclinorium of western Connecticut, just east of Cameron's Line, a fault separating the synclinorium from the carbonate shelf formations to the west. The project property is set in a hillslope environment dominated by a large glacial moraine (Stone et al. 1992), concentrated along the course of Route 124. The bulk of the YMCA facility is within the 280 to 290 foot USGS contour lines (Figure 2).

The property is just within the Fivemile River drainage basin (#7401), which is separated from the Darien River drainage basin (#7402) immediately to the west by the course of Route 124 and the long glacial moraine that supports it. Both drainages flow into the Long Island Sound about five miles to the south (McElroy 1991). There are no wetlands in the direct vicinity of the project area.

The principal soil type for the project area is Woodbridge fine sandy loam (WxA / 45A) according to the USDA soil book for Fairfield County (Wolf 1981) and the USDA NRCS websoil survey (2024) (Figure 3). The Woodbridge soil is moderately drained, and typically has a stratigraphic profile that includes a surface layer of very dark grayish brown fine sandy loam to eight inches deep, followed by a two-foot subsoil of yellowish brown fine sandy loam that is mottled in lower parts of the layer, and a substratum of firm grayish-brown mottled fine sandy loam to five feet deep or more. The mottling in the lower parts of the soil stratigraphy reflects the slow permeability of the soil and need for drainage in agricultural settings. For areas that were not wooded, the soil was historically used for corn, hay, vegetables, and pasturing.

Figure 1: Map of the Project Area

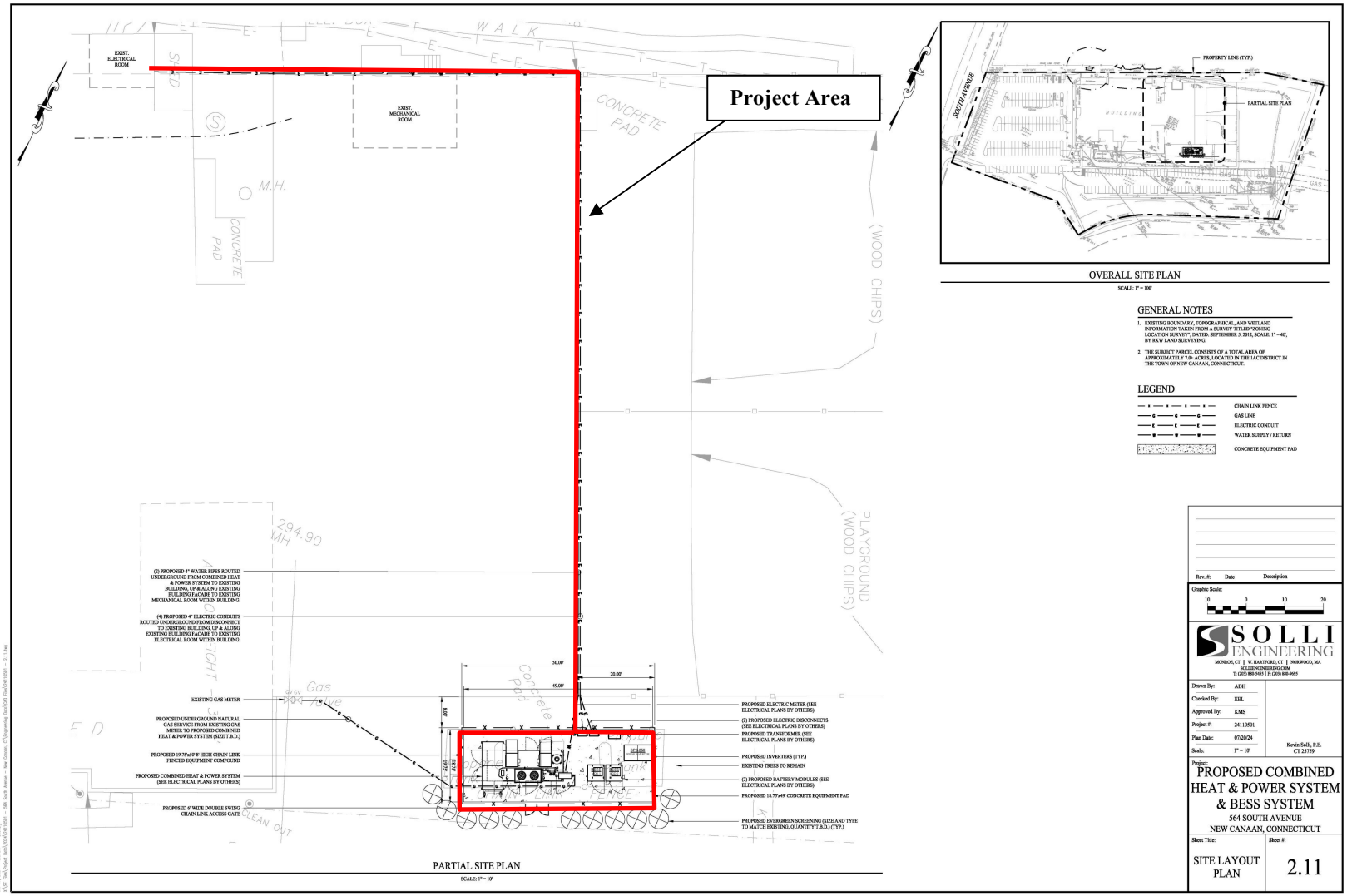

Figure 1: Map of the project area, from site plans drafted by Solli Engineering. Scale 1:480 (1"=40').

Figure 2: USGS 7.5' Topographic Map, Norwalk North Quadrangle

Figure 2: From USGS 1975.

Figure 3: USDA Websoil Survey Map

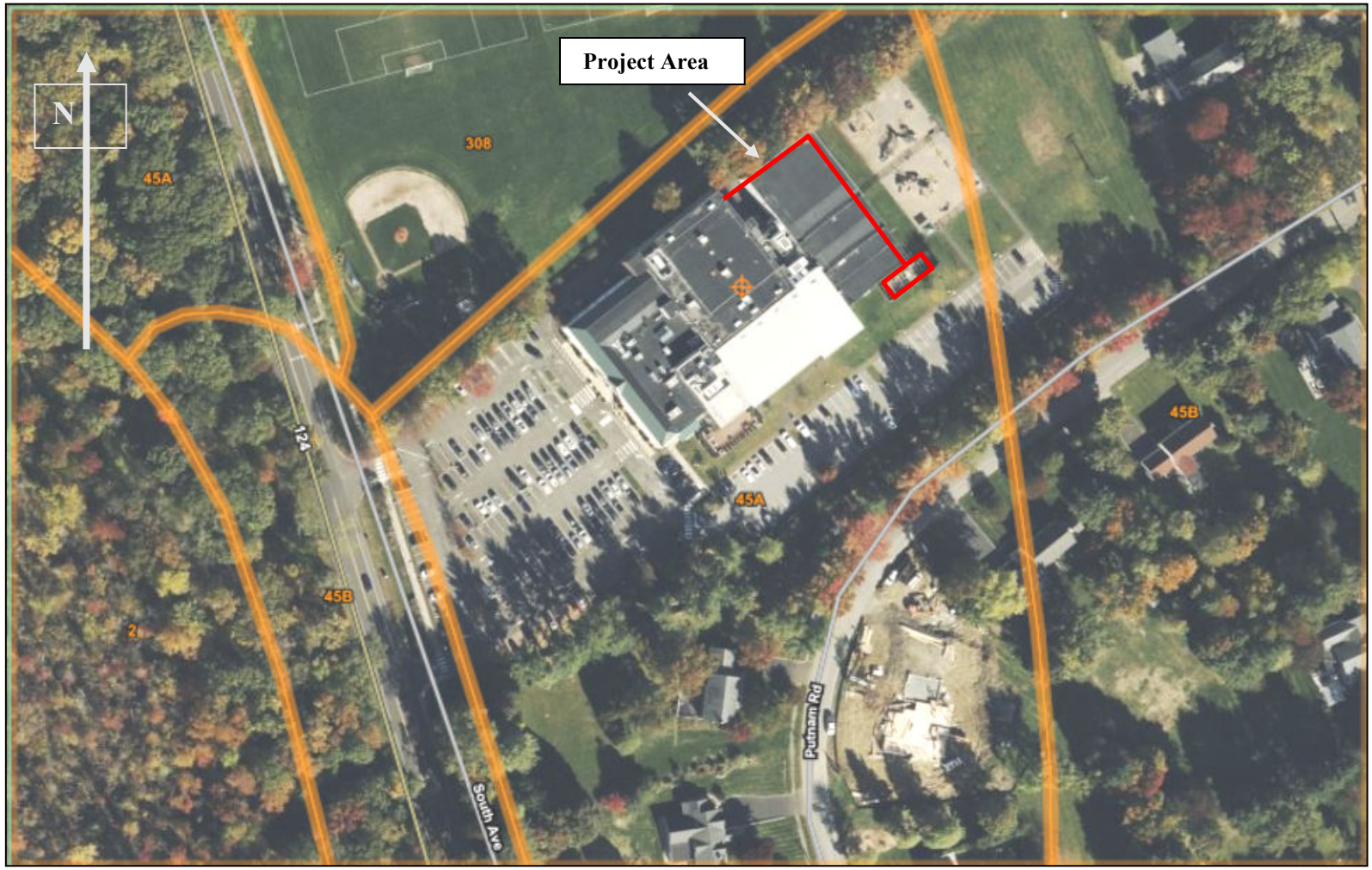

Figure 3: From USDA NRCS websoil survey, 2024.

Cultural Setting

Regional Prehistory

The prehistory of the project region and New England in general can be broadly divided into periods reflecting changes in environment, Native American subsistence and settlement patterns, and the material culture which is preserved in the archaeological record. Although it remains controversial today, the conservative estimates for the first occupations of North America are about 18,000 to 15,000 years ago, just after the maximum extent of the last glaciation and the broadest extent of the Bering land bridge (Kehoe 1981:7; Parker 1987:4; Jennings 1989:52). Southern Connecticut itself remained glaciated until about 15,200 B.P. (Snow 1980:103; Gordon 1983:71; Parker 1987:5; McWeeney 1994:181, 1999:6).

Paleo-Indian

The Paleo-Indian period is documented in Connecticut after 13,000 years ago and extends to roughly 9,500 B.P. (Swigart 1974; Snow 1980:101; Lavin 1984:7; Moeller 1984, 1999). The earliest radiocarbon date in Connecticut was secured recently at the Brian D. Jones site, at about 12,500 B.P. (Leslie and Sportman 2020). An unpublished date of 12,600 B.P. was also obtained from the site (Sportman pers. comm. 2022). This was a period of climatic amelioration from full glacial conditions, and a rise in sea levels which fell short of inundating the continental shelf. It was during this time that tundra vegetation was replaced by patches of boreal forests dominated by spruce trees (Snow 1980:114; Parker 1987:5-6), and eventually white pine and several pioneering deciduous genera (McWeeney 1994:182, 1999:7). Early in the period, the environment was conducive to the existence of large herbivores and a low population density of humans who procured these animals as a major subsistence resource, although warming temperatures and denser forests contributed to the extinction of certain species. The projected human social and settlement patterns are those of small bands of semi-nomadic or restricted wandering people who hunted mammoth, mastodon, bison, elk, caribou, musk ox, and several smaller mammals especially after the extinction of megafauna (Ritchie 1969:10-11; Snow 1980:117-120; Jones and Forrest 2003). Episodes of sparse vegetation during this period encouraged the use of high lookout points over hollows and larger valleys by people in pursuit of large game. The southern part of New England had an earlier recovery from glacial conditions when compared to areas to the north, however, with a higher density of vegetation that might have precluded Paleo-Indians of Connecticut from focussing heavily on the larger mammals (McWeeney 1994:182).

The cultural material associated with this period includes large to medium-sized, fluted projectile points (cf. Clovis), in addition to knives, drills, pieces esquillees and gravers, scrapers, perforators, awls, abraders, spokeshaves, retouched pieces, utilized flakes, and hammerstones (Wilbur 1978:5; Snow 1980:122-127; Moeller 1980). Although numerous finds from this period have been found in Connecticut, only a few, small *in situ* sites exist throughout the state. Finds tend to be located near very large streams in the lower Connecticut River Valley, and in rockshelters of other regions (McBride 1981). A survey performed by the Connecticut Office of State Archaeology and the Archaeological Society of Connecticut resulted in the documentation of 53 Paleo-Indian "find spots" in Connecticut (Bellantoni and Jordan 1995), while a more updated research survey indicates up to 72 locations and sites (Bouchard 2014). Many more sites have likely been eradicated by rising sea levels since the Paleoindian period (Anderson 2001).

Early Archaic

The Early Archaic period lasted from approximately 9,500 B.P. to 7,500 B.P. (Snow 1980:159; Lavin 1984:9; Moeller 1984). Sea levels and temperatures continued to rise during this period as denser stands of forests dominated by pine and various deciduous species replaced the vegetation of the former period (Davis 1969:418-419; Snow 1980:114; Parker 1987:9; McWeeney 1994:184-185, 1999:8-9). This environmental change was rapid and caused a major shift in the animals it supported, including deer, moose, other small to medium-sized mammals, migratory birds, fish, and shellfish. The material culture changed along with the environmental conditions to include the atlatl and smaller stemmed and bifurcated projectile points (Stanly, cf. Kanawha and Lecroy) for procuring smaller, faster game in more closed settings (Wilbur 1978:6-7). The expanded tool set included choppers and anvil stones. Fish weirs and nets with stone weights could have been used as early as the Early Archaic in Connecticut (Wegner 2018). Settlement patterns were probably becoming more territorialized towards a central-based wandering character (Snow 1980:171; see also Forrest 1999), and possibly a greater focus on wetlands (Jones and Forrest 2003). Some semi-subterranean habitation structural features are evident in the region at this time, and may be part of a Gulf of Maine Archaic tradition in which there was a focus on quartz as a lithic resource without a high emphasis on projectile points (Robinson et al. 1992; Forrest 1999) and instead more of a focus on more expedient tool forms than the more formalized Paleoindian toolkit (Anderson 2001). The Early Archaic period is poorly represented in Connecticut and the lower coastal river valleys, probably resulting from a combined effect of low population densities in response to rapidly changing environmental conditions, as well as site location and preservation factors (Snow 1980:168; McBride 1981; McBride and Dewar 1981:45; Lavin 1984:9; McWeeney 1986; see also Forrest 1999).

Middle Archaic

The Middle Archaic period extended from approximately 7,500 B.P. to 6,000 B.P. (Snow 1980:173; Lavin 1984:9; McBride 1984; Jones 1999). It was by the end of this period of increased warming that sea levels and coastal configurations had stabilized and approached their present conditions (Kehoe 1981:211; Gordon 1983:82; Parker 1987:9). The period is marked by the establishment of forests with increasing proportions of deciduous hardwoods in relation to the pine predecessors in Connecticut (Davis 1969; Snow 1980:114; McWeeney 1999:10). The material culture included square or contracting-stemmed points (Neville, Stark, and Merrimac), semi-lunar groundstone knives, ground and winged banner stones for atlatls, plummets for nets, gouges, denticulates, perforators, percussed celts and adzes and grooved axes for woodworking (Snow 1980:183-184), as well as tools used in previous periods and rare triangular projectile points that may be precursors of Squibnocket points of the Late Archaic (Forrest 2010). This more extensive range of material culture indicates a broader subsistence base than in previous periods, including greater fish and shellfish procurement (Wilbur 1978:8; Snow 1980:178-182; Anderson 2001) which was associated with the stabilization of sea levels towards the end of the period. The increased breadth of subsistence resources had the effect of increasing scheduling efforts and may have caused settlement patterns to take on more of a central-based or seasonally circulating pattern with bands joining and dispersing on a seasonal basis (Snow 1980:183). Sites found in the lower Connecticut River Valley region suggest that a wider range of environments

and associated site types were exploited, including both large and special task sites in upland areas (McBride 1981, 1984:56). This regional pattern may confirm the suggested settlement pattern of central-based, seasonally circulating or restricted circulating groups of people supported by logistical procurement sites throughout the state. Middle Archaic sites are fairly rare in Connecticut, again a combined product of rising sea levels and poor site preservation (see Forrest 1999).

Late Archaic

The Late Archaic period ranged from approximately 6,000 B.P. to 3,700 B.P. (Snow 1980:187; Lavin 1984:11; McBride 1984; Pfeiffer 1984; Cassedy 1999). This period is marked by a warm-dry maximum evident from pollen cores in the region (Davis 1969:414; Ogden 1977; Anderson 2001). Hardwood, oak-dominated forests very similar in character to ones established today covered most of Connecticut by the Late Archaic (Parker 1987:10). The Late Archaic in Connecticut has been divided into two traditions: the Laurentian and the Narrow Point (Lavin 1984:11), with the former perhaps being distributed more in the interior. The Laurentian tradition is defined by wider-bladed, notched and eared triangular points, and ground slate points and ulus, while the Narrow Point tradition includes smaller, thicker, and narrower points, which as a succinct tradition may have survived well into the Woodland era (Millis and Millis 2007). The tool kit and general material culture became even more expanded during this period, with the advent of ground stone manos, nut mortars, pestles, and bowls, as well as stone pipes, bone tools, corner-notched (Vosburg, Brewerton, and Vestal), side-notched (Otter Creek, Brewerton, Normanskill), smaller narrow-stemmed (Dustin, Lamoka, Squibnocket, and Wading River), and triangular points (Squibnocket, Brewerton, and Beekman), grooved and perforated weights, fish weirs and harpoons, and decorative gorgets (Wilbur 1978:15-24; Snow 1980:228-231). The groundstone material has been inferred as being associated with an increased vegetable diet that consisted of berries, nuts, and seeds (Snow 1980:231; Lavin 1984:13), including acorn, butternut, chestnut, walnut, hickory, bayberry, blackberry, goose foot, cranberry, partridge berry, service berry, strawberry, and swamp current (Cruson 1991:29). Deer continued to be the predominant meat source, although animal remains recovered from archaeological sites in the region include black bear, raccoon, woodchuck, rabbit, otter, gray squirrel, red fox, gray fox, wolf, wild turkey, grouse, pigeon, migratory fowl, and anadromous and freshwater fish and shellfish (Cruson 1991:28-29). Various sea mammals and fish were procured along the coast.

The increasing breadth of the subsistence base and material culture was in turn associated with a central-based settlement pattern in which a restricted range of seasonally scheduled and used areas were exploited in a more semi-sedentary fashion than previously (Lavin 1984:13; Dincauze 1990:25). Sites in the lower Connecticut River Valley suggest that the larger rivers served more as long-term bases within a central-based circulating system than in the Middle Archaic (McBride 1981; McBride and Dewar 1981:48). The interior uplands of Connecticut may have supported a relatively independent set of seasonally circulating groups which used larger wetlands as long-term bases (Wadleigh 1981). Mortuary practices of the time suggest some sedentism for certain groups of people who were buried in specialized secondary cremation cemeteries and who may have had some control over restricted resources (e.g. riparian transportation routes) (Walwer 1996). Although the cremation sites largely include utilitarian funerary objects, some contain non-local materials which suggest trade association with cultures to the west of Connecticut (Walwer 1996).

Terminal Archaic

The Terminal Archaic period extended from approximately 3,700 B.P. to 2,700 B.P., as defined by the Susquehanna and Small-Stemmed traditions (Swigart 1974; Snow 1980:235; Lavin 1984:14; Pfeiffer 1984; Pagoulatos 1988; Cruson 1991; Cassedy 1999). Steatite, or soapstone, was a frequently used material by this time, and could be fashioned into bowls and other objects. The mass, permanency, and labor intensiveness of creating these heavy items have led to the inference of more sedentary base camps, especially on large rivers where the development of a canoe technology had become fully established and increased the effective catchment area within which groups of people were gathering resources on a continuous basis. The material culture of the period was very similar to the Late Archaic, with a proliferation of stemmed projectile point types including Snook Kill, Bare Island and Poplar Island stemmed points, Orient Fishtail points, Sylvan and Vestal side-notched points, and Susquehanna corner-notched points. The resource base continued to consist of deer and small mammals, nuts, shellfish, turtles, and birds (Snow 1980:249). The first signs of ceramics (Vinette I pottery) tempered with steatite fragments appeared during this period (Lavin 1984:15; Lavin and Kra 1994:37; see also Cassedy 1999:131), and archaeological evidence of trade with other regions becomes more substantial for this time (Pfeiffer 1984:84).

The distribution of sites and site types in the lower Connecticut River Valley during this period suggests that there was a change in settlement to one with fewer, yet larger sites in riverine settings, and associated satellite task-specific sites in the uplands (McBride 1981; McBride and Dewar 1981:49). The implications are less foraging-strategy residential movement and more task-oriented collection activities within a radiating settlement pattern, but probably one in which some degree of seasonal circulation of settlement took place. Pagoulatos (1988) has shown that while sites associated with the Small-Stemmed tradition tend to suggest a more mobile settlement pattern in the interior uplands, sites of the Susquehanna tradition indicate a semi-sedentary collector strategy in major riverine and estuarine environments. At least certain groups exhibited semi-sedentism and some control over restricted resources, as indicated by the elaborate burials of the Terminal Archaic (Walwer 1996). Mortuary practices from the period include secondary cremation interments in formalized cemetery areas, with individual pits containing fragmented utilitarian material from communal cremation areas, as well as highly stylized funerary objects from non-local material (Walwer 1996). The lack of other, less formalized burial types evident in the archaeological record may be a matter of poor preservation, in which case it has been proposed that the cremation cemeteries are representative of a stratified society in which a portion of the people (of the Susquehanna "tradition") were able to generate a surplus economy that supported a semi-sedentary settlement pattern. This surplus may have been generated by the procurement and control over the transportation of steatite from various areas in Connecticut and surrounding territory.

Early Woodland

The Early Woodland period in Connecticut extended from about 2,700 B.P. to 2,000 B.P. (Lavin 1984:17; Juli and McBride 1984; Cruson 1991; Juli 1999). A cooling trend during the Early Woodland (Davis 1969:414; Parker 1987:10; McWeeney 1999:11; Fiedel 2001) is thought to have reduced population sizes and regional ethnic distinction as the hickory nut portion of the resource base was significantly decreased, although the apparent decline in populations may possibly be related to other factors such as the inability to confidently distinguish Early

Woodland sites from those of other periods (Filios 1989; Concannon 1993). Climatic deterioration and depopulation are in turn thought to have inhibited the progression towards, and association with, more complex social structures and networks that were developing further to the west and south (Kehoe 1981:215). A proliferation of tobacco pipes may indicate the beginnings of agricultural efforts in the northeast. The Early Woodland of this region, however, exhibits no direct traces of subsistence crop remains, indicating continuity with previous periods in terms of subsistence practices (Lavin 1984:18).

Materially, the period is marked by a substantial development of a ceramic technology, with the Early Windsor tradition of pottery being dominant in the Early Woodland of Connecticut (Rouse 1980:68; Lavin 1984:17, 1987). Both Early Windsor cord-marked and Linear Dentate ceramic forms were being produced at this time. Diagnostic projectile points can be developmentally traced to indigenous points of previous periods, consisting of many stemmed forms in addition to Meadowood and Fulton side-notched points, Steubenville points, and Adena-Rossville types, but now may have been used in conjunction with the bow and arrow (Lavin 1984:18). Adena-like boatstones are also found in this period. Although rare contact with the Adena culture is evident throughout assemblages of the period, the Early Woodland in southern New England remained a very gradual transitional period (Snow 1980:279,287; Lavin 1984:19).

A heightened use of ceramics has been erroneously promoted as an automatic indication of increased sedentism in many areas. Instead, central-based camps with restricted seasonal encampments appear to be the dominant settlement pattern (Snow 1980:287). Minimal archaeological evidence from the lower Connecticut River Valley appears to suggest a similar settlement pattern to the Terminal Archaic in which large riverine sites served as central bases with upland seasonal dispersal or specific task sites (McBride 1981; McBride and Dewar 1981:49), but with a lesser degree of sedentism. Interior uplands populations also decreased during the Woodland era, perhaps related to the intensification of agricultural resources along major riverine and coastal areas (Wadleigh 1981:83). The trend towards greater mobility may in part be attributed to the decline in the use of steatite that no longer gave certain groups control over critical and restricted resources, as indicated by the declining ceremonialism of burial sites at the time which were more often located in habitation sites and exhibited combinations of secondary cremation features and primary inhumations (Walwer 1996). This transition in the socio-economics of the region was brought about by the decrease in importance of steatite as ceramics obscured its value for producing durable containers. Partially preserved primary inhumations appear for the first time in the region based on preservation considerations.

Middle Woodland

The Middle Woodland period lasted from about 2,000 B.P. to 1,000 B.P. (Lavin 1984:19; Juli and McBride 1984; Cruson 1991; Juli 1999). The climate was returning to the conditions basically witnessed today (Davis 1969:420; McWeeney 1999:11). It is a period which exhibited considerable continuity with previous periods in terms of both subsistence and material culture. Cylindrical pestles and groundstone hoes are tools diagnostic of the period and reflect developing agricultural efforts, including the cultivation of squash, corn, and beans on a seasonally tended basis (Snow 1980:279). Direct evidence for agriculture in the form of preserved vegetal remains, however, does not generally appear until the early Late Woodland (Lavin 1984:21) when corn is thought to have been introduced into the Connecticut River Valley from the upper Susquehanna

and Delaware River Valleys (Bendremer and Dewar 1993:386). Projectile point forms from the period include Snyders corner-notched, LongBay and Port Maitland side-notched, Rossville stemmed, and Greene lanceolate types. A proliferation of ceramic styles was witnessed during the Middle Woodland (Rouse 1980; Lavin 1984:19-20, 1987; Lavin and Kra 1984:37), including Rocker Dentate, Windsor Brushed, Sebonac Stamped, Hollister Stamped, Selden Island, and Windsor Plain types that were all also produced in the Late Woodland, with the exception of the Rocker Dentate. Net and fabric-marked ceramics are key indicators of the shift into the Windsor tradition that would follow into the Late Woodland (Wink and Leslie 2021), although ceramic forms from the Early Woodland were still being produced as well. Minor traces of the Hopewell cultures to the west are also present in the archaeological record of this period. Site types and distributions in the lower Connecticut River Valley imply that a moderate increase of sedentism with aspects of a radiating settlement pattern took place on large rivers, supported by differentiated upland task sites (McBride 1981; McBride and Dewar 1981:49). This trend may have been supported by the expansion of tidal marshes up larger rivers (McBride 1992:14).

Late Woodland

The Late Woodland period extended from approximately 1,000 B.P. to 1600 A.D., the time of widespread European contact in the broader region (Snow 1980:307; Kehoe 1981:231; Lavin 1984:21; Feder 1984, 1999). A warmer climate and increased employment of large scale agriculture for subsistence in New England were associated with increased population densities, more sedentary settlements, and more permanent living structures and facilities in larger villages. Settlements in Connecticut, however, tended to remain smaller with only small scale agricultural efforts, and as part of a seasonal round in which smaller post-harvest hunting and task-specific settlements were established in fall, and protected settlements occupied in winter (Guillette 1979:CI5-6; McBride and Bellantoni 1982; Lavin 1984:23; Starna 1990:36-37). Instead of maintaining permanent villages near agricultural plots, aboriginal populations engaged in the slashing and burning new plots and let old plots lie fallow periodically (Salwen 1983:89). In this area, domestic resources included corn, beans, squash, Jerusalem artichoke, and tobacco (Guillette 1979:CI5; Starna 1990:35). Agriculture was largely maintained by women, with the exception of tobacco (Salwen 1983:89; Starna 1990:36). Deer, small mammals, fish and shellfish, migratory birds, nuts and berries, and other wild foods continued to contribute significantly to the diet (Waters 1965:10-11; Russell 1980). Many of the foods produced were dried and/or smoked and stored in baskets and subterranean holes or trenches.

The increasing diversity of wild estuary resources may have served to increase sedentism in the coastal ecoregions of Connecticut (Lavin 1988:110; Bragdon 1996:67), while agriculture and sedentism may have been even more prominent along the larger river bottoms as floodplains stabilized and experienced less flooding (Bragdon 1996:71; Forrest et al. 2008:11). Late Woodland settlement patterns of groups in the uplands interior ecozones of Connecticut may have included the highest degree of mobility, while many sites from the central lowlands represent task-specific sites associated with larger settlements along the Connecticut River (McBride 1992:16). House structures consisted of wigwams or dome-shaped wooden pole frameworks lashed and covered with hides or woven mats, and clothing was made from animal hides (Guillette 1979:CI7-8; Starna 1990:37-38). Pottery for the period is defined as the Late Windsor tradition in Connecticut (Rouse 1980:68; Lavin 1984:22, 1987). Most of the ceramic forms of the Middle Woodland were still being produced, in addition to the newer Niantic

Stamped and Hackney Pond forms. Ceramics of the East River tradition also appear in the area during the Late Woodland, having originated and been concentrated in the New York area (Rouse 1980; Wiegand 1987; Lavin 1987). The period exhibits some continuity in terms of projectile point forms, although the Jack's Reef, Madison triangular, and Levanna points are considered diagnostic for the period. As likely with earlier periods, the material culture included various textile products such as baskets and mats, and wooden utensils such as bowls, cups, and spoons (Willoughby 1935; Russell 1980:56).

Unlike groups of the Mississippi valley, the overall cultural pattern for the entire Connecticut Woodland era exhibits considerable continuity. Interregional contact increased during this period, however, with non-local lithic materials increasing from as low as 10% to as high as 90% from the early Middle Woodland to the Late Woodland (McBride and Bellantoni 1982:54; Feder 1984:105), although most trade appears to have been done between neighboring groups rather than initiated through long-distance forays (Salwen 1983:94). The lack of enormous agricultural surpluses for the time is indicated by the low density of small storage features in habitation sites, as well as the ubiquitous primary inhumation of people without a select portion of graves exhibiting special treatment that would require high energy expenditure (Walwer 1996). As confirmed by early ethnohistoric accounts, this suggests a largely egalitarian and relatively mobile society for the Late Woodland despite the fact that this period marks the highest development of food production (i.e. agriculture) during the course of prehistory in the region. Corn was undoubtedly important, however, as a disproportionate amount of the simple, flexed burials were oriented towards the southwest which was the aboriginally acknowledged direction for the origins of corn and the Spirit Land.

Local Sites and Surveys

According to site files of the Connecticut Office of State Archaeology (CT OSA 2024) and Connecticut State Historic Preservation Office (CT SHPO 2024), there are no previously recorded prehistoric archaeological sites within or adjacent to the project property, and none within a one-mile radius. There are several sites clustered along Ponus Ridge Road a couple of miles to the west at the heads of Springdale Brook and the Noroton River (Figure 4). The Thurton Site (90-001), where farm fields were surface collected by the property owner, reportedly revealed hundreds of projectile points originating from the Middle Archaic through Late Woodland periods. At the Shaw Site (90-002), that family collected a bifurcate point base, Brewerton points, small-stemmed quartz point, and Levanna projectile point, as well as lithic knives and scrapers, and some steatite, all indicating Late Archaic through Late Woodland occupations. At the Norris Site (90-004), no other information is provided other than location.

Summary

A low density of archaeological sites has been recorded in the region surrounding the project area. This is likely attributable to the headlands position of the site, but also likely due to a low density of professional surveys. A few sites have been found in headland settings of smaller drainages. More sites are likely yet to be discovered in the area, and probably located according to well established settlement models with a focus on proximity to fresh water sources and well drained soils, and sites more abundantly located on the larger streams further along the drainages.

Figure 4: Prehistoric Sites of the Region

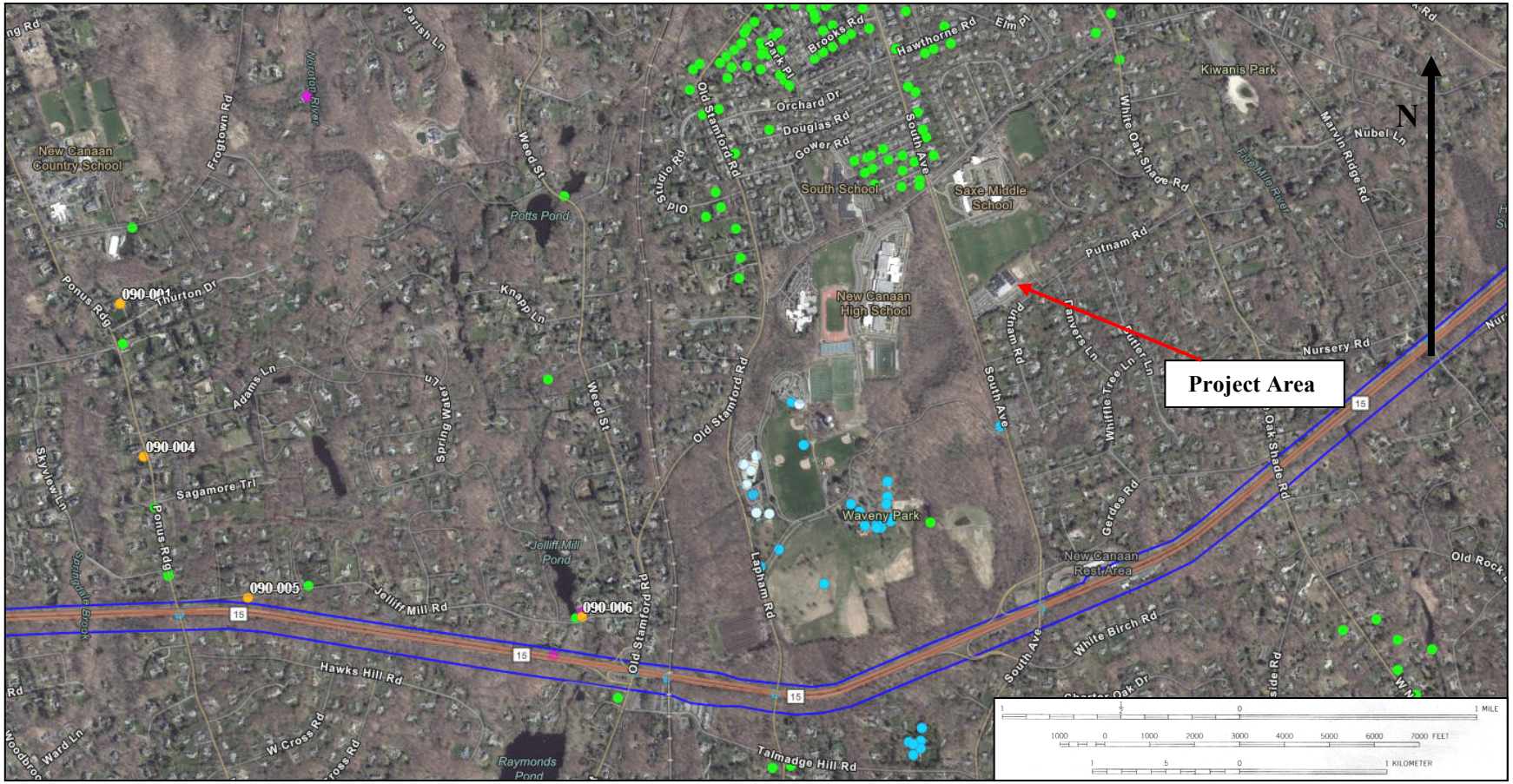

Figure 4: From CT SHPO 2024. Orange dots are previously identified archaeological site locations, green dots are state historic inventory sites, blue dots are National Register of Historic Places sites. All archaeological sites within a two-mile radius of the project area are prehistoric except for the two mill sites (90-005 / 006). The Waveny Park historic district is the closest NRHP property to the southwest.

Local History

Contact Period

The Contact period is designated here as the time ranging from the first substantial contact between Europeans and Native American inhabitants of the area, to the time the area was thoroughly occupied by Euroamerican settlers, from roughly 1600 to 1700. The first contact between aboriginal populations of the broader region and European explorers occurred in 1524 when Verrazano reached the coast of New England (Terry 1917:16). Others followed in the first decade of the 1600s (Salwen 1983). In 1614, Dutch explorers reached the Connecticut River (DeForest 1852:70; DeLaet 1909 [1625-1640]:43), and in 1625 they were met by the Quinnipiac in New Haven Harbor (Brusic 1986:9) when they established fur trading relationships with the native inhabitants in the region until the early 1630s (Guillette 1979:WP2-4). Substantial English settlements in the area started in 1635-1636. DeForest (1852:48) estimated about 6,000 to 7,000 Native Americans in Connecticut at this time, while Winthrop had estimated somewhere between 12,000 and 15,000 and most others (Trumbull 1818:40; Gookin 1970[1674]; Cook 1976; Snow 1980:35; Bragdon 1996:25) estimate between 16,000 and 20,000.

The spatial configuration of tribal territories at the time of initial contact is fairly well known, although boundaries are known to have fluctuated significantly, as did the political alliances by which the tribes could be defined (Thomas 1985:138). Three major divisions of Algonkian speaking groups can be delineated in eastern Connecticut, and their original territories conform well to present ecozone distributions (see Dowhan and Craig 1976:26 and Speck 1928:Plate 20). Centralized in East Windsor and South Windsor (Trumbull 1818:40; DeForest 1852:54-55; Spiess 1933), the Podunks occupied that part of the Connecticut River drainage basin which constitutes the North-Central Lowlands east of the river. Linguistically, the Podunks were part of the Wappinger or Mattabesec Confederacy of tribes that extended west of the Connecticut River and onto Long Island (Speck 1928). The validity of the Wappinger-Mattabesec Confederacy as a cultural entity has been challenged (Salwen 1983:108-109), however, with many smaller and somewhat independent tribes occupying much of the western half of the state. In the northeast part of the state, the Nipmucs occupied areas covering the Northeast Uplands and Northeast Hills ecoregions, but were centrally based in Massachusetts (Gookin 1970 [1674]; Van Dusen 1975:21; DeForest 1852:57). Blanketing the Southeast Hills and Eastern Coastal regions, the territory of the Pequots lay adjacent to the Narragansetts of Rhode Island to the east (Speck 1928).

Several cultural distinctions can be made at a higher level of resolution within these three broad divisions. For instance, the Western Nehantics were concentrated just east of the Connecticut River on the coast, while the Eastern Nehantics occupied the southeast corner of the state and part of Rhode Island (Speck 1928: Plate 20; Swanton 1952:31 and map insert). Although considered to be two separate cultural groups, the Nehantics may have been historically divided by an incursion of the Mohegan-Pequots. The Western Nehantics are frequently cited as having been confederates of the Pequots (Guillette 1979:WP2), while the Eastern Nehantics may have been more aligned with the Narragansetts of Rhode Island (Caulkins 1895:20).

The fluctuating nature of tribal territory boundaries can be additionally attributed to aspects of mobility and subsistence. Ethnohistoric sources offer descriptions of terminal Woodland and early Contact subsistence-settlement strategies of the area (McBride and Bellantoni 1982; Starna 1990:36-37). Spring settlements were located to take advantage of anadromous fish runs in larger drainages and along the coast. By late spring, attention was focussed on tending corn fields on alluvial terraces and glacial meltwater features along perennial streams and rivers. Semi-sedentary settlements near these fields were supported by task-specific hunting and gathering sites. Dispersal in the late fall and winter brought smaller groups into protected, upland or interior valleys where hunting and gathering continued. This model is confirmed by an archaeological survey of the lower Connecticut River Valley (McBride and Dewar 1981:49-50) in which large, early Contact period villages were found to be a part of a central-based circulating settlement pattern, with family units dispersing from and returning to the major settlement on a seasonal basis (McBride 1981). The dispersal phase had a longer duration in the Contact period than the Late Woodland, and consisted of smaller subsistence units (e.g. single families).

The fortification of some larger villages in the early Contact period was likely a response to intertribal and intercultural political conflicts resulting from increased economic pressures induced by Euroamerican trade relationships (Salwen 1983:94; McBride 1990:101; but see Thomas 1985:136). The fortified villages are representative of the trend towards increasing sedentism and territoriality during the Contact period. Eventually, Native American populations became dispersed and afflicted by disease, warfare, and intertribal conflict to the point that small, scattered reservations served as the final restricted territories for some indigenous populations.

The economic base for Native Americans in Connecticut during the Contact period continued to consist of hunting deer and small mammals, gathering berries, nuts, and roots, and procuring shellfish and fish on larger drainages and along the coast (Waters 1965:7; Salwen 1970:5). This basic subsistence strategy was supported by various horticultural products, including corn as a staple, squash, beans, Jerusalem artichoke, and tobacco (Guillette 1979:CI5; Starna 1990:35). The importance of corn is evident in historic descriptions of ritual activities, including variations of the Green Corn Festival that extended with various groups, including the Mohegans, into the present day (Speck 1909:194; Speck 1928:255; Tantaquidgeon 1972:81; Fawcett 1995:54-57). Elderly women possessed extensive knowledge of wild plants which provided a host of medicines and treatments (Russell 1980:35-37).

The material culture included a mix of aboriginal forms and European goods such as metal kettles and implements (e.g. knives and projectile points), cloth, glass beads, and kaolin pipes (Salwen 1966, 1983:94-96). Wigwams continued to serve as the principal form of housing, in some cases well into the 18th Century (Sturtevant 1975). Unlike the Late Woodland, Contact aboriginal lithic products were predominantly manufactured from local quartz sources (McBride and Bellantoni 1982:54). Dugout canoes may have continued to provide a major form of transportation in larger drainages (Salwen 1983:91). Late Contact period Euroamerican trade goods included various metal tools, glass bottles, ceramic vessels, kaolin clay pipes, and nails (McBride and Grumet 1992).

Wampum (shell beads) served as an important item for exchange by Native Americans with European traders, but their original use was in the form of belts as symbolic signs of allegiance or reciprocity between tribes, and as sacred markers or tokens of honor for individuals

(Guillette 1979:CI8; Ceci 1990:58-59; Salisbury 1990:87; Fawcett 1995:59). With European metal drill bits, tribes along the coast were now mass producing wampum for trade with the Dutch and English, who in turn used the shell beads to trade for fur procured by other tribes farther inland (Salwen 1983:96; Ceci 1990:58). Control of wampum production along the eastern Connecticut coast may have contributed to Pequot dominance over other tribes at this time. Although wampum was initially traded for Euroamerican goods, it was eventually used to pay fines imposed by colony governments on the tribes for "illegal" acts. While colonization brought new material goods to Native Americans in the area in exchange for fur, land, and services, the indigenous inhabitants became increasingly subject to legislative economic restrictions by the colonists (Salisbury 1990:83).

Sachems and councils of leading males formed the basic political unit for groups of villages (Gookin 1970 [1674]; Simmons 1986:12). The authoritative roles of clan mothers had diminished as a result of a strong European leadership bias towards males in trade relationships (Fawcett pers. comm. 1996). Tributes paid to sachems were generally used as reserves for the tribe at large. Although sachems were generally assigned by hereditary lineage, this was not always the case (Bragdon 1996:140-141). Additionally, authority was usually enforced by persuasion of a council. Shamans were "magico-religious" specialists of the tribes who also had a considerable role in leadership and decision-making (Speck 1909:195-196; Simmons 1986:43; Starna 1990:42-43). Other special status roles included warriors and persons who had visions, thus social status was largely based on achievement and recognition. Rules of obligation and reciprocity operated on all levels of tribal-wide decision-making (Bragdon 1996:131-134), serving to diffuse centralized authority. While the assignment of lineality (i.e. matrilineal vs. patrilineal) for the area tribes is still debated (Bragdon 1996:157), the well established practice of bride-pricing and traditional accounts support a patrilineal social organization (Speck 1909:193; Salwen 1983:97). Post-marital residence appears to have been ambilocal.

On a larger scale, more powerful tribes demanded tributes from smaller ones, often resulting in loose alliances between the latter. This process created a dynamic political environment that prompted intertribal conflict, especially after contact with Euroamericans (Guillette 1979; Bragdon 1996). The European settlers of the Contact period used this embedded rivalry system to their advantage in trade relationships and the procurement of land. The colonists were placed at a further political advantage because of the severe reduction in aboriginal populations as a result of disease (Starna 1992). Major epidemics occurred between 1616 and 1619, and more severely around 1633 (Snow and Lanphear 1988; Starna 1990:45; Snow and Starna 1989). Diseases introduced into the Americas included chicken pox, cholera, diphtheria, malaria, measles, oncercerosis, poliomyelitis, scarlet fever, smallpox, tapeworms, trachoma, trichinosis, typhoid fever, whooping cough, and yellow fever (Newman 1976:671).

The area that was to become New Caanan consisted of over 14,000 northern acres of the towns of Norwalk and Stamford (King 1981:3). Stamford was settled in 1641 by the Colony of New Haven, and Norwalk was settled in 1651 by the Colony of Connecticut (King 1981:4). Originally, several large tracts of land were purchased from the local indigenous populations by the competing colonies and they sought settlers to develop these investments (King 1981:4-5). The colonies competed for acquisition of land, however the Colony of Connecticut was focused

on developing agriculture, while the Colony of New Haven was looking to establish a trading center (King 1981:5).

In 1639-1640, Roger Ludlow of Windsor, acting on behalf of the Colony of Connecticut, bought a large tract of land that would become the town of Fairfield, which blocked the Colony of New Haven's efforts to obtain much of the coastal areas (Hoyt 1935:8; King 1981:5). A year later, Ludlow made a deal for the land between the Norwalk and Saugatuck Rivers and a substantial amount of inland territory (DeForest 1852:177). The deed was signed by Sachem Mahackemo, who likely believed the intent was a form of co-existence, with the territory exchanged for a mere sum of "eight fathoms of wampum, six coats, ten hatchets, ten hoes, ten knives, ten scissors, ten jewsharps, ten fathoms of tobacco, three kettles of six hands about, and ten looking-glasses."

Acting on behalf of the Colony of Connecticut, Captain Daniel Patrick bought two large tracts in 1640, including the area that would become western Norwalk and the area that would become Greenwich (Hoyt 1935:8-9; King 1981:5-6; see also DeForest 1852:177). The area known as Rippowam, later to be known as Stamford, was located between these two tracts of land bought by Captain Daniel Patrick, and in 1640, the Rippowam area was bought for the Colony of New Haven, blocking the rival colony's total acquisition of the continuous area (King 1981:6; see also DeForest 1852:177-178 from Sachems Ponus and Wancussup). Much of New Canaan was likely within another tract to the west of the Patrick tract, acquired from Runckingheage in 1651 (Hoyt 1935:9). The various sachems of the area (including those of Mahackemo, Ponus, and Wancussup - DeForest 1852) were part of a larger group of Siwanog Indians that extended west into New York (Spiess 1933:31-32), debatably part of a Wappinger Confederacy, and extending east into Connecticut to include Greenwich, Ridgefield, Norwalk, and all towns between including New Canaan.

Disputes over the rightful ownership of an area in what was to become the center of New Caanan continued between Norwalk and Stamford until 1685, when an official survey was required and established a permanent boundary (King 1981:7-8). The Preambulation Line stone wall was constructed in 1686 and established the boundary between Norwalk and Stamford (King 1981:8). This significant landmark was established after the official survey was done in 1685-1686 (King 1981:8).

18th Century

Stamford was originally bought for 33 pounds by 30 men from the Colony of New Haven (King 1981:10). Of the tract of land in which they invested, 276 acres were quickly divided and developed among the proprietors, varying in size and location by the amount invested, and were concentrated in the southern area of Stamford near the coastline (King 1981:10). The remaining several hundred acres were left as "common lands," undeveloped and reserved for later expansion and development (King 1981:10). Norwalk's settlement history was similar to Stamford's allocation of a small portion of land to the proprietors, with the remaining land left as undeveloped common lands (King 1981:10). The area that was to become New Caanan was established in the area of the "common lands" of the towns of Stamford and Norwalk, and not sold to individuals, except for one four-acre tract of land (King 1981:10). In 1684, this four-acre tract was bought by Samuel Finch in the Ponus Ridge area of Stamford (King 1981:10). As the

towns grew, new generations and new settlers required more land, therefore the proprietors of each town would open up the common lands to individual sales by gradually moving the "Sequest Line" (King 1981:10-11). Early development of the area of the newly acquired lands began as mill sites, hay fields, and barns, but no homes initially (King 1981:11).

Settlement in the areas of what was to become the Caanan Parish area began in 1715, and Theophilus Hamford built the first home in the area in 1719 (King 1981:12). In 1731, the settlers of northwestern Norwalk and northeastern Stamford petitioned the legislature to establish Canaan Parish, form a Congregational church, and construct a meetinghouse (Hoyt 1935:13; King 1981:4,22). The last distribution of the common lands in Norwalk was called the "Upper Division" from 1738 to 1744 (King 1981:39). During the "Upper Division," about 900 acres in the Canaan Parish area of Norwalk were transferred (King 1981:39). The farmers in this area relied on subsistence farming, gardening, and animal husbandry, but many also shipped their products to sell in the markets of Norwalk and Stamford, including timber, salted meat, cheese, and butter (King 1981:40). In the 18th century, most residents of the area were also tradesmen, including shoemakers, weavers, tanners, millers, and horse traders (King 1981:41).

By 1751, the population of Canaan Parish was 600 (King 1981:38). As the population increased, a new meetinghouse was required, and a larger one was built in 1752 (Hoyt 1935:16; King 1981:46). Ten years later, the first Episcopal church was built (Hoyt 1935:18). Both Stamford and Norwalk became import ports for trades and markets for the early settlers of the Canaan Parish (King 1982:14). Both towns had shipbuilding industries, and found a trading market in New York and the West Indies (King 1981:16). In 1788, the western boundary of the Canaan Parish was moved to the east, because some residents there petitioned and won the right to attend the North Stamford Parish (King 1981:104).

19th Century

New Caanan was incorporated in 1801, and the Perambulation Line was no longer a landmark of significance as many residents tore sections of it down (King1981:8). Over 120 families had moved out of the Canaan Parish by the early 19th century, lured by the low cost farmland in other states (King 1981:101). The residents' industries and trades continued to prosper in the early 19th century (King 1981:121). Weaving continued to be a prominent industry in the area, and three grist mills were located along the watercourses of the area (King 1981:121). Important industries included shoemaking, saw mills, and grist mills (King 1981:122). Other industries arose in the area, including a tool factory and a brick factory (King 1981:122). Products shipped to New York markets from farmers in the area included diary products, hay, dried apples, and cider (King 1981:122).

In 1807, several residents petitioned for the construction of a road that would be more direct route from New Canaan to Norwalk Harbor to facilitate travel and commerce (King 1981:125). However, some residents fought against this petition, but it was built after much controversy (King 1981:126). A Shaker community was established in New Canaan in 1810 on over 11 acres of farmland, where they constructed a granary and built several stone walls (King 1981:127-128). In 1816, the New Canaan Academy was built (Hoyt 1935:23). As of 1820, New Canaan's population was 1,689 (King 1981:137). Of those 1,689 residents, agriculture was listed

as the industry of 271 of the men, and 193 men were in manufacturing industries (King 1981:137).

Shoemaking became the largest manufacturing industry in New Canaan during the early 19th century (Hoyt 1935:24; King 1981:137). The two prominent families in the shoemaking industry were the Benedicts and the Ayres of New Canaan (King 1981:137). The Benedicts became known for their durable pegged shoes appealing to workmen in New York City and for field hands and slaves of the southern states (King 1981:139). The Ayres shoemakers became well known for their quality shoes, and they eventually bought the local tannery and bark mill located on Five Mile River (King 1981:138). The industry supported many apprentices and journeymen in the area (King 1981:139). By 1830, many residents were manufacturing shoes in their homes in New Canaan, including many of the women of the town (King 1981152).

The prominent shoemaking industry in New Canaan developed a need of transportation to and from New York City (King 1981:141). The earliest of transportation included sloops, which sailed between Norwalk and New York (King 1981:141). As transportation progressed, two stagecoach lines were running by 1821, with stops in New Canaan (King 1981:141). By 1824, a steamboat line was established from Norwalk to New York (Hoyt 1935:25; King 1981:141).

The first town hall was constructed in 1825 (King 1981:147). Various churches other than the Congregational and Episcopal demoninations emerged during the 19th century and into the beginning of the next (Hoyt 1935:101-106). The mid-19th century was a time of developing industry throughout New Canaan. Shoemaking expanded, and more shoemakers came to New Canaan (King 1981:150). Other industries established in the area included a hatter's shop, carriage works, shirt manufacturing, and a leather supplier (King 1981:150,171). In 1848, Captain Stephen Hoyt, Jr. and David Schofield partnered to form the New Canaan Nursery on 15 acres (King 1981:171). Becoming New Canaan's longest running manufacturing business, it became New England's largest tree nursery and stayed in business until the late 20th century (King 1981:171-172). Trains lines were constructed in 1848 from New Haven to New York, but did not travel through New Canaan. New Canaan residents had to travel to a train station in Norwalk, Darien, or Stamford to catch a train to New York (King 1981:182).

By 1850, the population of New Canaan was 2,600 (King 1981:183). Industries listed as employment in the census were primarily shoemaking, but also included farmers, with just two weavers and four coopers (King 1981:182). However, the shoemaking industry began to decline after 1850 (King 1981:189-190). Shoes made from industrial machines, including sewing machines, began out-pricing the hand sewn shoes of the New Canaan industry (King 1981:190).

Many roads were constructed in the mid-19th century throughout New Canaan, including South Avenue in 1857 (King 1981:195). The population of New Canaan had risen to 2,770 in 1860, reflecting the decline in shoemaking as a profession, but the rise of farmers (King 1981:197). Other industries in the town at this time included a cigar factory, a hardware store, book binder, a basket manufacturer, clock repair, a lightning rod installer, and a sash and blind manufacturer (King 1981:197).

In 1868, a branch railroad was constructed between Stamford and New Canaan (King 1981:207). With a produce car attached, products like cheese, nuts, apples, cider could be moved to New York markets easily (King 1981:207). Although the train made it easier for transportation, it failed to attract new residents, and in 1870, the population had declined to 2,473

(King 1981:211). That year, the Young Men's Christian Association was formed in New Canaan, seemingly devoted to public lectures with some religious emphasis (King 1981:213). A sewing machine manufacturing industry as well as a perfume manufacturing industry both failed in New Canaan at this time (King 1981:209).

By 1880, New Canaan's population was 2,673, with Hoyt's Nurseries and Henry B Rogers' men clothing business becoming prominent employers in the area (King 1981:221). The Carter Street Tannery was still in business, and a wire manufacturer was established (King 1981:221). The late 19th century saw the appearance of other businesses, including weighing scales, coal and lumberyard, sieve factory, and larger shoe factories (King 1981:233-237). Late 19th century utilities included a water company that formed a reservoir and brought water into central New Canaan by 1895 (Hoyt 1935:121-123; King 1981:242-244). The stone masonry required for the project increased the population of Italian immigrants in the area (Hoyt 1935:122; King 1981:244).

The late 19th century witnessed an increase in public entertainments in New Canaan, including those not necessarily having a religious emphasis, including dances and minstrel shows, horse racing on South Avenue, and a baseball club (King 1981:212-213), as well as other clubs and social organizations (King 1981:248-249). New Canaan had its first library building in the late 19th century in the downtown area, in a brick building, at the time also occupied by the town clerk office (King 1981:227-228), and an opera house was built in 1890 (King 1981:249-250). The New Canaan Hook and Ladder and Fire Engine Company was organized in 1881 (King 1981:229). Two newspapers of the late 19th century include the *Messenger* and the *Herald* of New Canaan (King 1981:236-237). The Borough of New Canaan in the central part of town was established in 1889 in order to maintain roads and sidewalks, public lighting, and a police force (Hoyt 1935:117-118; King 1981:237-242). The infrastructure improvements to New Canaan and proximity to New York City encouraged the occupation of the area by summer residences (King 1981:244-247). The school system of New Canaan was consolidated in 1893 (King 1981:252-255).

Historic maps reveal that South Avenue did not exist until at least the 1850s. "Darien Road" or South Avenue was used by the 1860s, although there were no structural developments at that time, and Farm Road was not an established cross road yet (Figures 5a and 5b). William B. Fish accumulated many parcels of land in the vicinity of the project property during the mid to late 19th century, and had a house on the west side of White Oak Shade Road well east of the project area. The estate of William B. Fish was settled in 1896 (New Canaan Land Records, volume 22, page 689). In 1900, heir Charles P. Fish quit claimed his portion of a four-acre tract around the project area to Clarissa Fish (NCLR 23/202).

20th Century+

Automobiles competed with pedestrians and horses on New Canaan roads early in the 20th century, causing the town to spend much more on road improvements than ever before (King 1981:268-271). Utilities expanded to include electricity and telephone lines (Hoyt 1935:122). Businesses rotated in and out of town early in the 20th century, with the end of clothing manufacture that was replaced by a furniture business, and a bakery replaced a shoe manufacturer (King 1981:272-274). A growth in building in the first decades of the 20th century saw the replacement of many wooden structures with more durable brick buildings (King 1981:274-277).

Figure 5a: Historic Sites of the Area (1856 Map)

Figure 5a: From Clark 1856.

Figure 5b: Historic Sites of the Area (1867 Map)

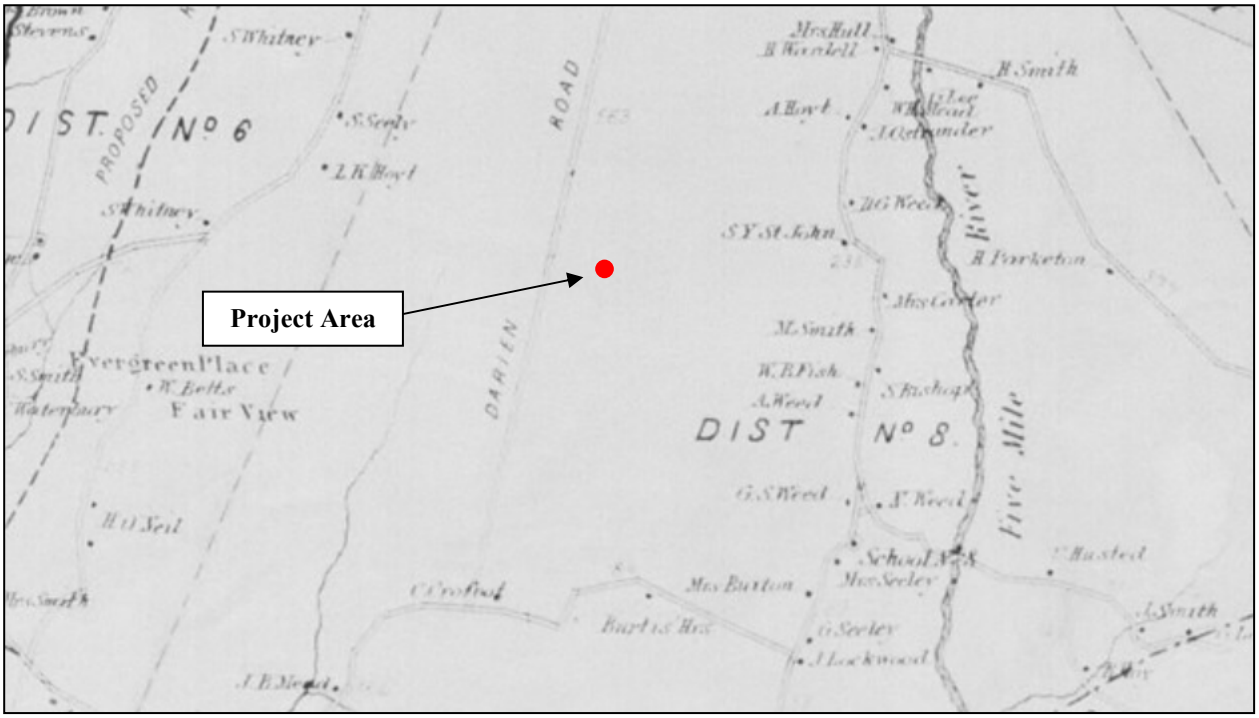

Figure 5b: From Beers 1867.

The population of New Canaan was up to 3,667 by 1910, with about half living in the central borough (King 1981:278). This was a time of grand estates being built, including that of Lewis Lapham, who built the Waveny house after acquiring the Prospect Farm from Thomas Hall in 1904 on the west side of South Avenue (King 1981:278). New Canaan had various patriotic organizations in town during the early 20th century, including a very active Red Cross presence that increased during World War I (King 1981:286-293). A continued focus on improved infrastructure in town resulted in many summer residences turning into permanent homes for its wealthy and influential residents (King 1981:293-294; see Finnie 2001; Smith 2012; and Hahn 2019). New Canaan had its first high school built in 1926, before which students attended Stamford High School (King 1981:298-300).

During the Great Depression, local civic organizations and groups offered assistance, and the town expanded its employment for public works projects (King 1981:301-304). To save money, the town and borough governments were once again consolidated in 1935 (King 1981:304-305), and federal funds were used for various public works projects (King 1981:305-307). This was followed by the establishment of a strong planning and zoning commission that had a hand in the nature of future development in town (King 1981:309).

The population of New Canaan was over 6,000 by the start of World War II (King 1981:314). One industry in town manufactured nuts and bolts for military aircraft (King 1981:315). Right after World War II, there was a housing boom and associated road construction, with 35 farms containing over 4,000 acres in 1930 disappeared by 1950 (King 1981:317). By 1980, the population had risen to 18,000 (King 1981:320).

In 1929, the estate of Clarissa Fish was settled, including land in the vicinity of the project area (NCLR 48/468). She willed her land holdings to her three children, which included J. Irene Benedict. At the time, aerial and topographic maps reveal farm fields occupying the east side of South Avenue without any structures, and still no structures by the onset of World War II (Figures 5c and 5d). In 1958, Benedict sold 52.5 acres of land to three owners, including T. William Benedict, Harold G. Wilser, and E. Eric Lundberg. A 1962 map at the New Canaan town hall (survey map #3444) reveals the parcel to be 52.327 acres, and the lands were subdivided. That year, a seven-acre section was sold to the YMCA (NCLR 152/612).

Local Sites and Surveys

There are no previously recorded historic archaeological sites within or adjacent to the project property according to site files of the Connecticut Office of State Archaeology (CT OSA 2024) and Connecticut State Historic Preservation Office (CT SHPO 2024). The closest is the Jellif Mill Pond Site (90-006), located over one mile to the southwest. A professional archaeological survey of a bridge replacement project adjacent to the site did not reveal any traces of the former mill structure or associated artifacts (Raber 2009). The Talc Mill historic site (90-005) lies about another mile to the west. The historic White Oak Shade Cemetery is located about one-half mile to the northeast of the project area.

The historic architecture of New Canaan is very well documented in a town wide survey published less than ten years ago (Carley 2015). Just a quarter mile to the north of the project area, Farm Road crosses South Avenue where the middle and high schools are located on either side of South Avenue, while a high density of early 20th century Colonial Revival homes are mixed in with more recent home on either side of South Avenue to the north. The closest

Figure 5c: Historic Sites of the Area (1934 Map)

Figure 5c: From Fairchild 1934.

Figure 5d: Historic Sites of the Area (1943 Map)

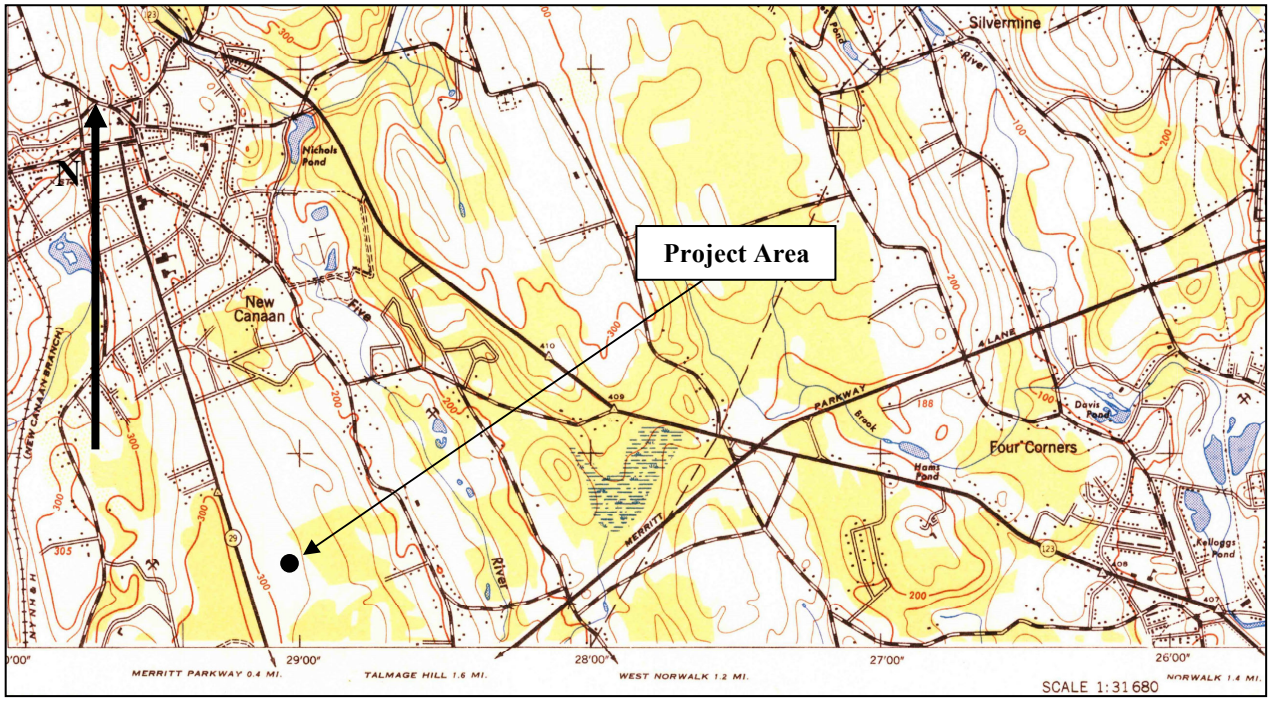

Figure 5d: From USGS 1943.

property listed with the National Register of Historic Places (NRHP) is Waveny Park at about one-quarter mile to the south on the other side of the road (Adams et al. 2019). The entrance to the park on the west side of South Avenue is the closest contributing element, dating to about 1895, but altered in 1913 and again in 1981. The once private estate is 285 acres with landscape designs by the Olmsted Brothers in the early 20th century, and was donated to the town of New Canaan in 1967 for public park use.

Summary

New Canaan territory was settled on lands acquired from local Native American groups, including those led by Sachem Mahackemo. With populations severely depleted by disease, Native American presence in the area rapidly diminished. Euroamerican settlement of New Canaan started in 1715, and was dominated by self-subsistence agriculture along with the shipment of products like timber, salted meat, cheese, and butter to regional markets. Shoemaking was a particularly prevalent home industry in town during the late 18th to early 19th centuries, eventually moving to factory settings, with production targeting both working class and high end fashion consumers of New York City. South Avenue was not built until 1857, at a time when the project property was part of a much larger estate owned by William B. Fish who lived on the west side of White Oak Shade Road to the east. The property remained as farmland into the early 20th century, owned by the Fish family and descendants, with the seven-acre portion sold to the YMCA in 1962. A small utility station occupies the project area now with gas service, and is proposed to be expanded to include an electric battery storage facility. There are no known historic archaeological sites nearby, and Waveny park and historic estate structural components on the other side of South Avenue to the south are parts of the nearest property listed with the National Register of Historic Places.

CHAPTER 3: CONCLUSION

Prehistoric Sensitivity

Background research and the pedestrian surface survey indicate a low sensitivity for potential prehistoric cultural resources within the project area. A statistical prehistoric landscape sensitivity model developed and employed by ACS utilizes eight environmental variables to rank sections of project properties relative to a scale of 100.0 (www.acsarcheaology.com/sensitivity-model.html). In this case, the project area scores 8.2 out of a possible 100.0, and therefore within the low (0-20) sensitivity range. The low sensitivity for the project area relates to its hill ridge setting at a considerable distance to the nearest major water source, moderate soil drainage, and low stream rank setting. There are no previously recorded prehistoric archaeological sites within a mile radius on the project area. ACS recommends no further archaeological conservation efforts for potential prehistoric cultural resources at the project area.

Historic Sensitivity

Historically, the project area has a low sensitivity for historic cultural resources. The project setting is in the southern part of New Canaan that had a relatively light settlement density over time, concentrated along White Oak Shade Road well to the east. South Avenue was not built until 1857, when the project area was part of the larger land holdings of the William B. Fish family. Historic maps and land records reveal no structural occupations of the project area or immediate surroundings until the early 20th century, when homes were being built along South Avenue and side streets. The project area remained as farmland into the early 20th century, then was severely impacted by the development of the YMCA facility built in 1962, and especially when the existing utility station servicing a gas line was built (Figures 6 and 7). There are no previously recorded historic archaeological sites near the project property, and the closest significant historic resource is the Waveny Park, a historic district and former estate listed with the National Register of Historic Places lying on the west side of South Avenue about one-quarter mile to the south. ACS recommends no further archaeological conservation efforts for potential historic archaeological cultural resources at the project area.

Figure 6: Project Area

Figure 6: Northwest view of project area where the battery storage facility will be built. At the southeast corner of the YMCA building, there is already a small utility station.

Figure 7: Existing Infrastructure

Figure 7: Southwest view of existing infrastructure at the battery storage site. The project also included underground wiring around the perimeter of the building in background.

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State Historic Preservation Office
Department of Economic and Community Development

CONNECTICUT

September 13, 2024

Dr. Gregory F. Walwer
Archaeological Consulting Services
118 Whitfield Street
Guilford, CT 06437
(sent only via email to acsinfo@yahoo.com)

Subject: Cultural Resources Assessment Survey of a Proposed BESS
564 South Avenue
New Canaan, Connecticut

Dear Dr. Gregory F. Walwer:

The State Historic Preservation Office (SHPO) received the technical report prepared by Archaeological Consulting Services (ACS) titled *Phase Ia Archaeological Assessment Survey: Proposed Battery Storage Facility, 564 South Avenue, Town of New Canaan, Connecticut* dated August 2024. The completed investigation meets the standards set forth in the *Environmental Review Primer for Connecticut's Archaeological Resources*. SHPO understands that the proposed project consists of the construction of a battery energy storage system (BESS) with associated site improvements at the referenced address. The project will require approval from the Connecticut Siting Council. As a result, it is subject to review by this office.

The archaeological assessment survey consisted of comprehensive background research that examined historic maps and aerial imagery as well as previously identified cultural resources in proximity to the project location. The assessment survey failed to identify any previously recorded archaeological sites or properties listed on National Register of Historic Places (NRHP) in proximity to the project area. The assessment survey concluded, and a pedestrian survey confirmed, that the project area retains no/low archaeological sensitivity. The entirety of the proposed project area is characterized by previous disturbances related to building and associated infrastructure construction. Therefore, it is unlikely that significant archaeological resources will be impacted by the proposed actions. Based on the information provided to our office, it is the opinion of SHPO that no historic properties will be affected by the proposed BESS project and no additional archeological investigations are warranted.

This office appreciates the opportunity to review and comment upon this project. For additional information, please contact Cory Atkinson, Staff Archaeologist and Environmental Reviewer, at (860) 500-2458 or cory.atkinson@ct.gov.

Sincerely,

Jonathan Kinney
State Historic Preservation Officer

450 Columbus Boulevard, Suite 5
Hartford, CT 06103
860-500-2300

Appendix E: Product Information

SOLLI ENGINEERING

ESS **Cabinet** 344 kWh

Liquid-cooled battery storage system

Liquid-cooled battery storage system based on prismatic LFP ESS Cells 280 Ah with high cyclic lifetime

Improved safety characteristics and specially optimised for the highest requirements on safety, reliability and performance. Suitable e.g. for industrial, utility, and grid serving applications.

- Product certifications:
  IEC 62619, IEC 62477, IEC 63056, IEC 61000, UL 1973, UL 9540A, NFPA 855, UN 38.3
- Company certifications:
  ISO 9001, ISO 14001, ISO 45001, SA 8000
- Environmental Compliance:
  RoHS, REACH, Cobalt free

High safety

- High thermal stability thanks to liquid cooling
- Multi-stage, active fire protection system, compliance to NFPA 855
- Use of highly safe prismatic LFP cells
- Ultra-wide operating temperature range

Low LCOS (Levelised Cost of Storage)

- Excellent thermal management improves energy throughput by ensuring optimal operating temperature
- High energy density
- Highly integrated: including thermal management system, fire protection system, BMS, etc.

ESS **Cabinet** 344 kWh

Liquid-cooled battery storage system based on prismatic LFP cells with high cyclic lifetime

GENERAL	
Battery Type	LFP280-1P48S
No. of Battery Modules	4 … 8
Configuration	Serial connection of modules
Cooling Method	Liquid cooling
BMS Communication	CAN
Gravimetric	≥ 98 Wh/kg [1]
Volumetric	≥ 86 Wh/L [1]
Application Altitude	≤ 3,000 m

ELECTRICAL	
Nominal Voltage Cabinet	1,228.8 V [1]
Nominal Voltage Module	153.6 V
Operating Voltage Cabinet	960 … 1,401.6 V [1]
Operating Voltage Module	T > 0 °C 120 … 175.2 V [1]
	T ≤ 0 °C 96 … 175.2 V [1]
Nominal Energy Cabinet	344.06 kWh [1, 2, 3]
Nominal Energy Module	43.01 kWh [2, 3]
Nominal SOC at delivery	27 % [3]
Nominal Charge/Discharge Rate	0.5 P / 0.5 P
Round Trip Efficiency	≥ 94 %

[1] *8 modules*
[2] *0.5 P / 0.5 P*
[3] *25°C +/- 2.0*
[4] *ambient temperature*

MECHANICAL	
Dimensions (L x W x H)	1,300 x 1,300 x 2,350 mm
Weight Cabinet	< 3,500 kg [1]
Weight Battery Module	310 kg
Protection Level	IP 55

TEMPERATURE RANGE	
Operating	-30 °C … 50 °C [4]
Storing (recommended)	-20 °C … 35 °C [4]

PRODUCT CERTIFICATIONS	
Safety Certificates	IEC 62619, IEC 62477, IEC 63056, IEC 61000, UL 1973, UL 9540A, NFPA 855
Safe Transportation	UN 38.3

ENVIRONMENTAL	
Compliance	RoHS, REACH, Cobalt free
Battery Regulation (EU)	2023/1542

COMPANY CERTIFICATIONS	
	ISO 9001, ISO 14001, ISO 45001, SA 8000

DYNAPOWER

POWERING A CLEANER PLANET™

Energy Storage Inverter
CPS-2500 & CPS-1250

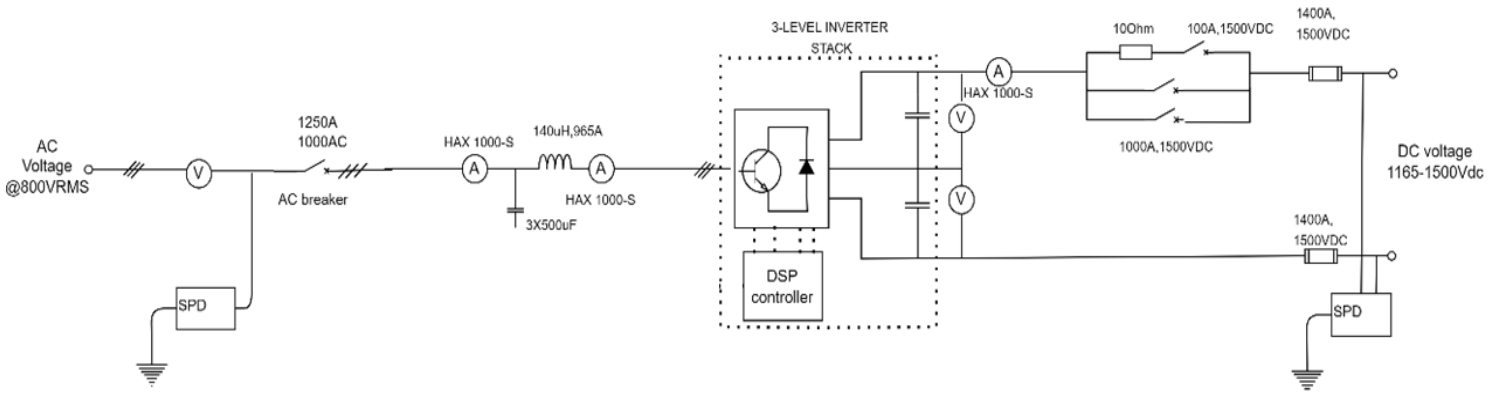
1,250kVa/2,500kVA
Bidirectional Power Conversion System

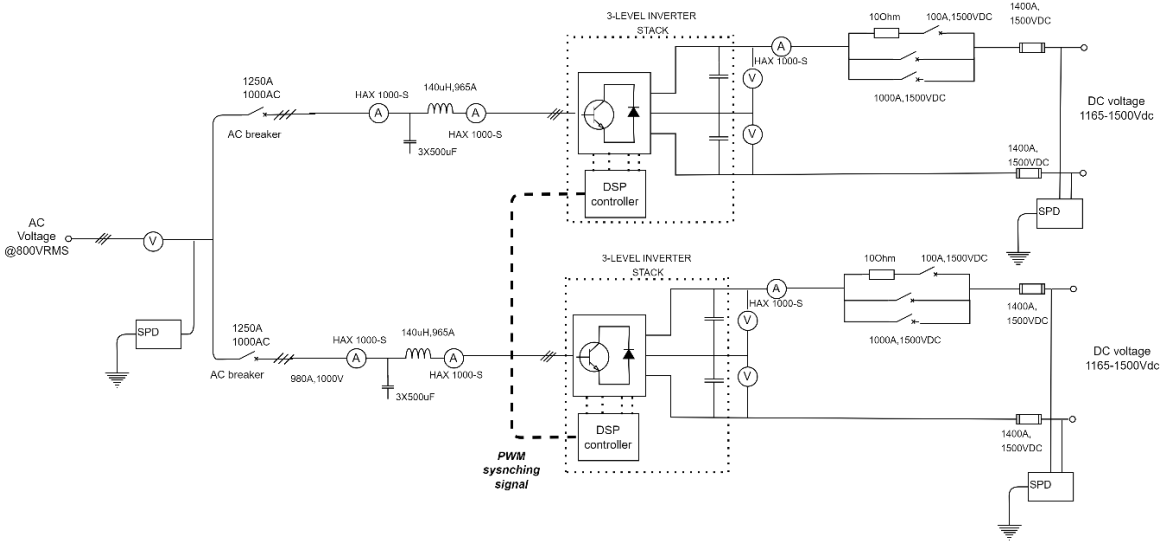
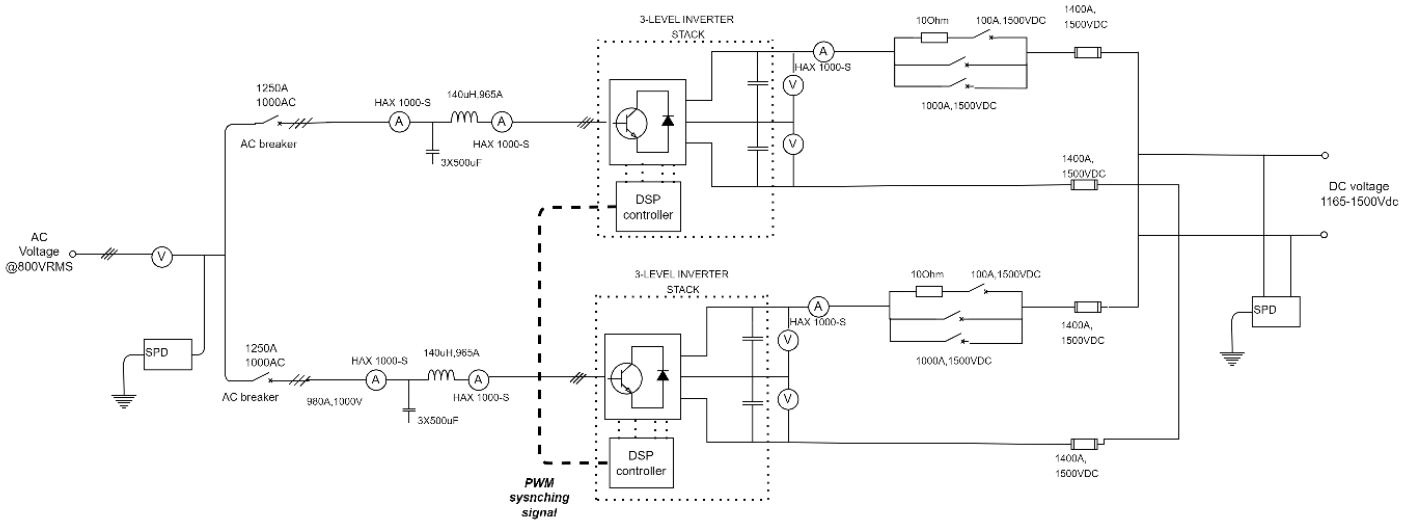
SPECIFICATION MANUAL

REV 3

	CPS-1250 Indoor	CPS-1250 Outdoor	CPS-2500 Indoor	CPS-2500 Outdoor
Enclosure Options				
Installation Location	Indoor	Outdoor	Indoor.	Indoor/Outdoor
Ingress Protection Rating	NEMA 1 / IP 20 Protected against solid foreign objects of 12 mm diameter and greater. No water protection.	NEMA 3R / IP 54: Protected against dust limited ingress, no harmful deposits and protected against water splashed from all directions, limited ingress permitted.	NEMA 1 / IP 20 Protected against solid foreign objects of 12 mm diameter and greater. No water protection.	NEMA 3R / IP 54: Protected against dust limited ingress, no harmful deposits and protected against water splashed from all directions, limited ingress permitted.
W x D x H	49.0 L x 43.3 W x 79.72 H inches	49.0 L x 43.3 W x 79.72 H inches	85.04L x 43.3 W x 79.72H inches	85.04L x 49.21 W x 79.72H inches
Weight	1,980 lbs.	1,980 lbs.	4,409 lbs.	4,409 lbs.
Humidity	95% RH non-condensing	95% RH non-condensing	95% RH non-condensing	100% RH non-condensing
Cooling	Forced Air. Controls are segregated within the enclosure to limit the exposure of the controls to the external air.			
Grounding Provisions	Ground terminals available in AC & DC wiring compartments			
Operational Temp Range	-30°C to +60°C (> 45°C deratings)			
Storage Temp Range	-40°C to +70°C			
Altitude	3,000 meters max for electrical safety, derate operation above 1000m			
Sound Pressure	80 dBA at 1m			
Seismic Rating	IEEE 693-2018 High 0.5G ZPA- Dynamic Analysis IBC 2018/ ASCE 7-16-SDS = 2.5g, Ip = 1.0			
Wind Loading	IBC 2018-V = 150mph (Risk Category II) 180mph pending.			
Design Life	20 years with Preventative Maintenance and Scheduled Service			
Color	White; RAL 9003			

Notional System Architecture

CPS-1250	

CPS-2500 Independent DC Input	
CPS-2500 Single DC Input	

Electrical Ratings

CPS-1250 kVA	585	693	802	902	1002	1052	1102	1152	1336
	Input DC								
Operating Voltage range	511-1500	604-1500	697-1500	783-1500	869-1500	912-1500	995-1500	998-1500	1157-1500
Min Voltage for Full Active Power (V)	511	604	697	783	869	912	995	998	1157
DC Power (kW)	593	702	813	914	1015	1066	1117	1167	1354
Max Voltage (V)	1500								
Continuous Current (A)	1158	1162	1165	1167	1168	1169	1122	1169	1170
Overload Continuous Current (A)	1404								
Voltage Ripple (%) /current Ripple	1% / <5% for rated current 2% typical								
Peak Efficiency	98.60 @1500Vdc & 98.70 @1280Vdc								
	Output AC								
Continuous AC Power (kW)	585	693	802	902	1002	1052	1102	1152	1336
Line Voltage (V)	350	415	480	540	600	630	660	690	800
Line Frequency (Hz)	60								
Continuous AC Current (A)	964								
Overload AC Current (A)	1157								
Power Efficiency	Four Quadrant								

CPS-2500 kVA	1169	1386	1603	1803	2004	2104	2204	2304	2672
	Input DC								
Operating Voltage range	**511-1500**	**604-1500**	**697-1500**	**783-1500**	**869-1500**	**912-1500**	**995-1500**	**998-1500**	**1157-1500**
Min Voltage for Full Active Power (V)	**511**	**604**	**697**	**783**	**869**	**912**	**995**	**998**	**1157**
DC Power (kW)	1184	1404	1624	1827	2030	2132	2233	2335	2707
Max Voltage (V)	**1500**								
Continuous Current (A)	**2316**	**2324**	**2330**	**2333**	**2336**	**2337**	**2244**	**2338**	**2340**
Overload Continuous Current (A)	**2808**								
Voltage Ripple (%) /current Ripple	**1% / <5% for rated current 2% typical**								
Peak Efficiency	**98.60 @1500Vdc & 98.70 @1280Vdc**								
	Output AC								
Continuous AC Power (kW)	1169	1386	1603	1803	2004	2104	2204	2304	2672
Line Voltage (V)	**350**	**415**	**480**	**540**	**600**	**630**	**660**	**690**	**800**
Line Frequency (Hz)	**60**								
Continuous AC Current (A)	**1928**								
Overload AC Current (A)	**2313.6**								
Power Factor	**Four Quadrant**								

AC Configuration

AC Configuration	CPS-1250	Notes
Number AC Inputs	1	Single 3 phase Input
AC Input Configuration Options	Bottom entry standard/Side entry optional	
AC Input Configuration	L1, L2, L3, and chassis ground; no neutral terminal.	
AC Isolation Requirements	IT - Galvanic isolation from earth ground required.	
Number of Inverters Permissible on a Single Transformer Winding	1	
Suggested Typical AC Cable Scheme	(5) 500 MCM Cu 90°C conductors per phase, (6) 500 MCM Al 90°C conductors per phase	(Qty) Size per Phase
	Must comply with NEC	

AC Configuration	CPS-2500	Notes
Number AC Inputs	1	Single 3 phase Input
AC Input Configuration Options	Bottom entry standard/Side entry optional	
AC Input Configuration	L1, L2, L3, and chassis ground; no neutral terminal	
AC Isolation Requirements	IT - Galvanic isolation from earth ground required.	
Number of Inverters Permissible on a Single Transformer Winding	1	
Suggested Typical AC Cable Scheme	(9) 500 MCM Cu 90°C conductors per phase, (11) 500 MCM Al 90°C conductors per phase	(Qty) Size per Phase
	Must comply with NEC	

DC Configuration

DC Configuration	CPS-1250 DC Input Configuration	Notes
Number DC inputs	1	Independent DC terminal sets
DC Input Configuration Options	Bottom entry standard/Side entry optional	
DC Network Configuration	Fully isolated from earth ground	
DC Precharge	Included	For initial charging of DC capacitors through resistor
Typical DC Cable Scheme	(6) 500MCM Cu 90°C conductors per pole, (7) 500MCM Al 90°C conductors per pole	(Qty) Size per pole

DC Configuration	CPS-2500 Single DC Input Configuration	Notes
Number DC inputs	1	Single DC terminal sets
DC Input Configuration Options	Bottom entry standard/Side entry pending	
DC Network Configuration	Fully isolated from earth ground	
DC Precharge	Included	For initial charging of DC capacitors through resistor
Typical DC Cable Scheme	(8) 600 MCM Cu 90°C conductors per pole, (8) 900MCM Al 90°C conductors per pole	(Qty) Size per pole
	Must Comply with NEC	

DC Configuration	CPS-2500 Independent DC Input Configuration	Notes
Number DC inputs	2	Independent DC terminal sets
DC Input Configuration Options	Bottom entry standard/Side entry pending	
DC Network Configuration	Fully isolated from earth ground	
DC Precharge	Included	For initial charging of DC capacitors through resistor
Typical DC Cable Scheme	(11) 500 MCM Cu 90°C conductors per pole, (13) 500MCM Al 90°C conductors per pole	(Qty) Size per pole
	Must Comply with NEC	

Auxiliary Configuration

Auxiliary Configuration	CPS-1250	CPS-2500	Unit of Measure / Notes
Auxiliary Power Configuration	Auxiliary (Aux) power derived from DC and AC input terminals with seamless transition between them in the case of loss of voltage from either. AC Aux power will be pulled from the line side of the AC breaker.		
Auxiliary Power Consumption	Estimated 1kVA	Estimated 2kVA	(kW) Aux Power included in system efficiency data.
Active Standby Power Consumption	Estimated 1kVA	Estimated 2kVA	(kW) See Modes of Operation for Active Standby description.

Performance Characteristics

Performance Characteristics	All Configurations	Unit of Measure / Notes
Overload Rating (PQ Mode)	120% for 10s	20-minute cool-down timer after overload
Current Harmonic Distortion (PQ Mode)	<5%	I_{THD}; Full Power
Maximum Line-Line Voltage Unbalance (PQ Mode)	10%	$V_{L\text{-}L\_MAX}$ - $V_{L\text{-}L\_MIN}$
Voltage Harmonic Distortion (UF Mode)	<1%	V_{THD}; Resistive Load
Maximum Phase Load Unbalance (UF Mode)	50%	P_{PHASE_MIN} / P_{PHASE_MAX}
Common Mode Voltage (CMV)	<500V peak to peak	System is completely isolated from earth ground
Fastest Power Transition; 0-100% Rated Power (PQ Mode)	80	ms ramp time from 0-100%
Total 0-100% Response Time (from issuance of P command to full power output)	130	ms average
Short Circuit Current Ratio	<2	

AC/DC Protections

AC/DC Protections	CPS-2500/CPS-1250	Unit of Measure / Notes
AC Circuit Breaker Ampacity	1200	A_{RMS}
AC Circuit Breaker Operator	Motorized	Status available through Modbus
AC Circuit Breaker Shunt Trip	Yes	
AC Circuit Breaker UL Interrupt Rating	85kA@480v, 50kA@600V	kA
AC Circuit Breaker Lockable	Yes	
AC Surge Protection Device	Included and monitored	
DC Isolation	DC Contactor	Status available through Modbus
DC Switch Lockable	Yes	
DC Fuse	1400	A_{DC} per fuse, 4 per CPS-2500 2 per CPS-1250
DC Fuse Class	1500Vdc aR	
DC Fuse Short Circuit Current Interrupt Rating	250	kA per DC input

Max Fault Contribution

Max Fault Contribution	CPS-1250	CPS-2500	Unit of Measure / Notes
AC Fault Current Contribution	5	10	kA_{PEAK} Measured at inverter terminals.
AC Fault Current Duration	8		ms
DC Short Circuit Contribution	8	16	kA_{PEAK} Measured at inverter terminals.
DC Fault Current Duration	<10		ms

Available Electrical Measurements

Available Electrical Measurements	Accuracy*
AC Output (Grid) Voltage, A/B/C Phase (L-L)	0.5% Nominal Voltage
AC Current, Phase A/B/C	0.5% Nominal Current
AC Output Real Power	1% Nominal Power Calculated
AC Output Reactive Power	1% Nominal Power Calculated
AC Output Apparent Power	1% Nominal Power Calculated
AC Output Power Factor	Calculated
AC Output Frequency	0+/-.005Hz
DC Battery Current	2%
DC Battery Voltage	2%

***Accuracy as a % of full-scale rating. System readings are available at a 2Hz minimum update rate, unless otherwise noted, and all readings have a max error of 1% of full scale/rated for AC meters, and 2% of full scale/rating for DC meters. All these meter readings and calculations are provided through the PCS main DSP control board.**

Software Protections

All Configurations
Battery Voltage and Current Curtail Limits to protect battery
AC Current Limiting Pending
DC Over/Under Voltage, Over Current faults
AC Over/Under Voltage, Over/Under Frequency, Over Current faults by software
Anti-islanding Protection, Open Phase at inverter terminals
Temperature monitoring and protective power curtailment
Watchdog Timer to detect loss of communications

Codes and Standards

All Configurations* Pending
UL 1741 Edition 3
Conforms to standards for use in UL 9540 Listed system
IEEE 1547-2018 IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces
IEEE 693-2018 IEEE Recommended Practice for Seismic Design of Substations
IEEE 519-2014 IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems
Sunspec Modbus
Hawaii Rule 14H Compliant
California Rule 21 Compliant

Communications Interfaces

All Configurations	
Communications Protocols	Modbus TCP/IP; MESA Sunspec compliant 2030.5
Communications Port	RJ-45 provided; separate static IP address per CPS-1250, CPS-2500
Communications Rates	10 Mbps, 100 Mbps, auto negotiated
Compatibility	IEEE 802.3
Remote Access Options	Remote access available via VPN and FTP
Local Status Indicator Lights	Included
Local Operation	Modbus
Human Machine Interface	Not Included

Local Event Monitoring Data Log

All Configurations	
All event logs stored locally on CPS; up to 20 files of each type	
Fault Buffer Event Log	The fifth generation CPS (CPS Gen 5) records all electrical waveforms at 50kHz for 400ms (300ms before the fault and 100ms after the fault) to document conditions leading up to fault and system response.
Dynamic Transfer Event Log	Similar to Fault Buffer Event Log, the CPS Gen 5 records all PQ to UF transitions and UF to PQ transitions to document grid events and resultant system response.
Slow Fault Buffer Log	Sampled at 1Hz for 30s (20s before the fault and 10s after the fault).

AC Voltage Protection and Ride-Through Settings

By default, these settings will match the requirements of IEEE 1547. Per IEEE 1547, given the rating of this model line, the trip levels and trip times for most of the windows are adjustable by the end user such as to ensure that all trip levels and time comply with local utility interconnect agreement.

Regions	Default Settings (% Nominal Voltage)	System Default Clearing Time Settings (s)	Range of Adjustability (% Nominal Voltage)	Range of Clearing Time (s)	Available Ride-Through Operational Mode*
Over-voltage instantaneous	>=120	0.16	fixed 120	0-30	MO or MC
Over-voltage level 5	115<V<120	1	102-120	0-30	MO or MC
Over-voltage level 4	115<V<120	1	102-120	0-30	MO or MC
Over-voltage level 3	115<V<120	1	102-120	0-30	MO or MC
Over-voltage level 2	115<V<120	1	102-120	0-30	MO or MC
Over-voltage level 1	110<V<=115	1	102-120	0-30	MO or MC
Normal Operation	88<=V<=110	NA	NA	NA	NA
Under-voltage level 1	70<=V<88	2	50-98	0-30	MO or MC
Under-voltage level 2	50<=V<70	2	50-98	0-30	MO or MC
Under-voltage level 3	50<=V<70	2	50-98	0-30	MO or MC
Under-voltage level 4	50<=V<70	2	50-98	0-30	MO or MC
Under-voltage level 5	50<=V<70	2	50-98	0-30	MO or MC
Under-voltage instantaneous	V<50	0.16	50-98	0-30	MO or MC

***MO – Momentary Operation, where converter provides at least 80% of active current command**
MC – Momentary Cessation, where converter ceases export, but does not fault
NA – Not Applicable

AC Frequency Protective Functions

All models have integrated Grid frequency protection windows. Similar to the AC voltage protective functions, these default windows meet IEEE 1547, and are user adjustable such as to ensure that all trip levels and time comply with local utility interconnect agreement.

Regions	System Default Settings (Hz)	System Default Clearing Time Settings (s)	Range of Adjustability (Hz)	Range of Clearing Time (s)	Ride-Through Operational Mode*
Over-frequency 5	>64	0.16	60.1 - 67	0-300	NA
Over-frequency 4	60.5<f<=61.5	1	60.1 - 67	0-300	MO
Over-frequency 3	60.5<f<=61.5	1	60.1 - 67	0-300	MO
Over-frequency 2	60.5<f<=61.5	1	60.1 - 67	0-300	MO
Over-frequency 1	60.5<f<=61.5	1	60.1 - 67	0-300	MO
Normal Operation	59.5<=f<=60.5	NA	NA	NA	NA
Under-frequency 1	57<=f<59.5	2	50 - 59.9	0-300	MO
Under-frequency 2	57<=f<59.5	2	50 - 59.9	0-300	MO
Under-frequency 3	57<=f<59.5	2	50 - 59.9	0-300	MO
Under-frequency 4	57<=f<59.5	2	50 - 59.9	0-300	MO
Under-frequency 5	f<57	0.16	50 - 59.9	0-300	NA

***MO – Momentary Operation, where converter provides at least 80% of active current command**
MC – Momentary Cessation, where converter ceases export, but does not fault
NA – Not Applicable

Temperature Derate Curve

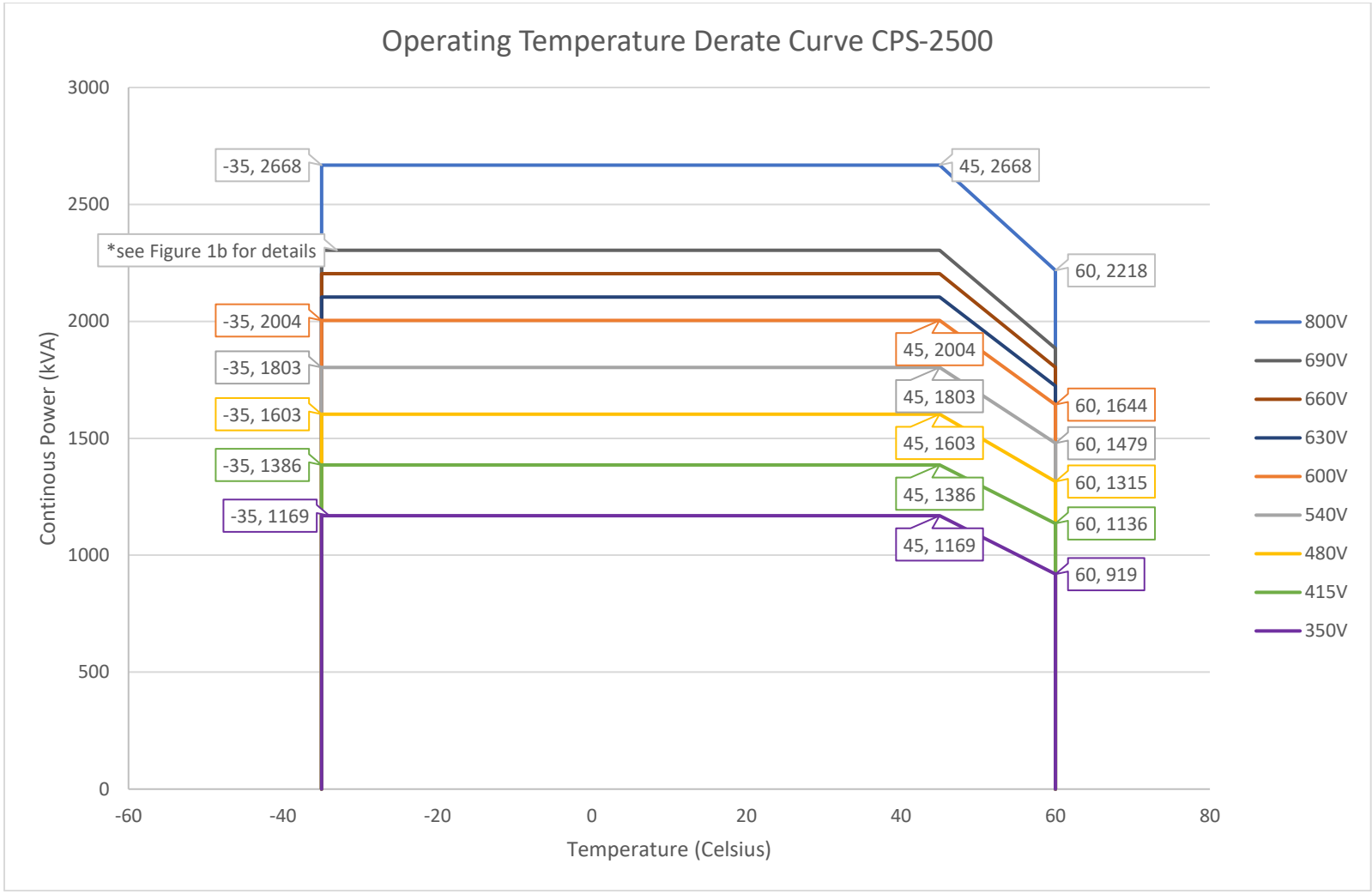


Figure 1a: Operating Temperature Derate Curves CPS-2500

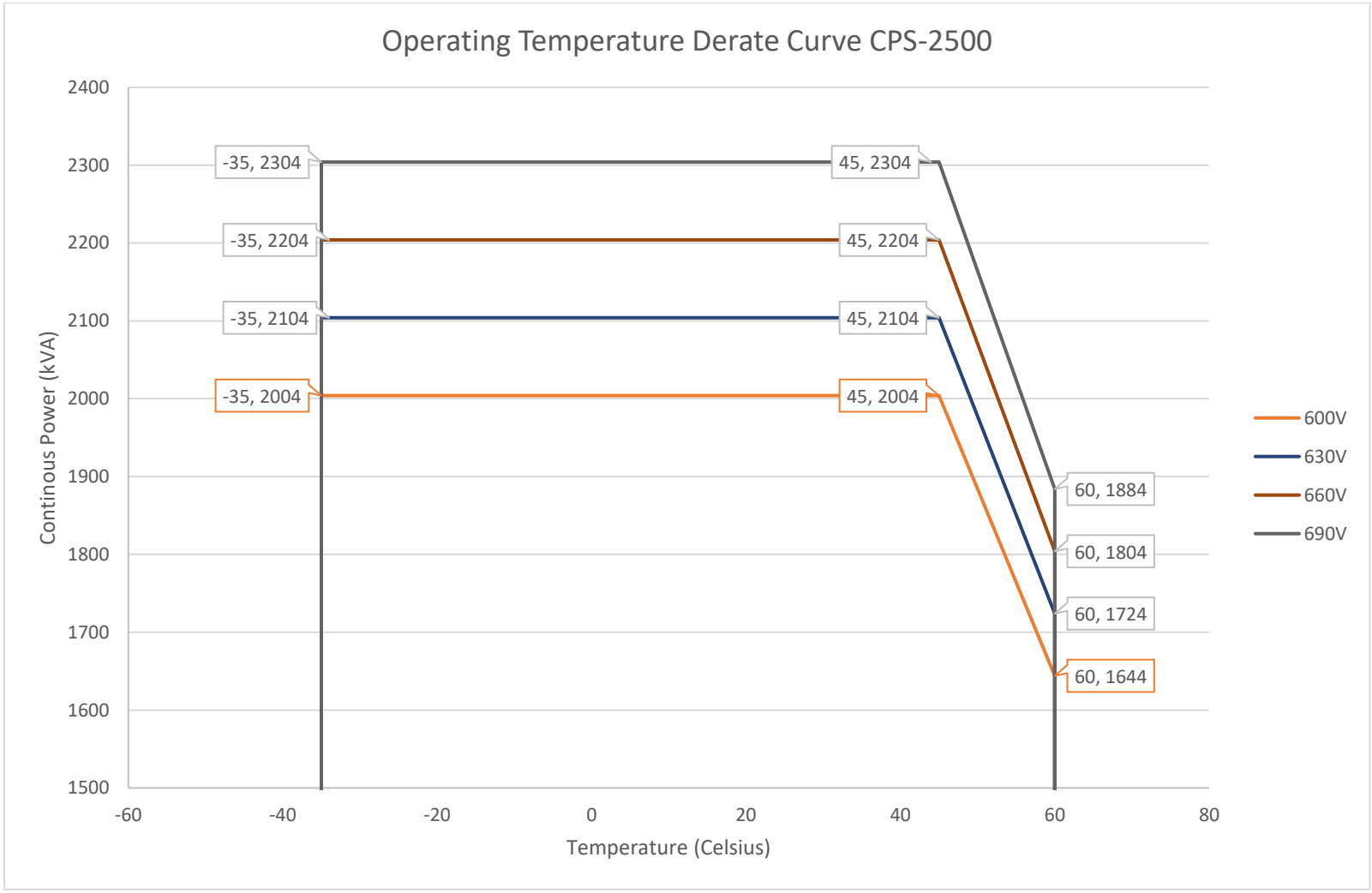


Figure 1b: Operating Temperature Derate Curves CPS-2500 600-690 Vac Operation

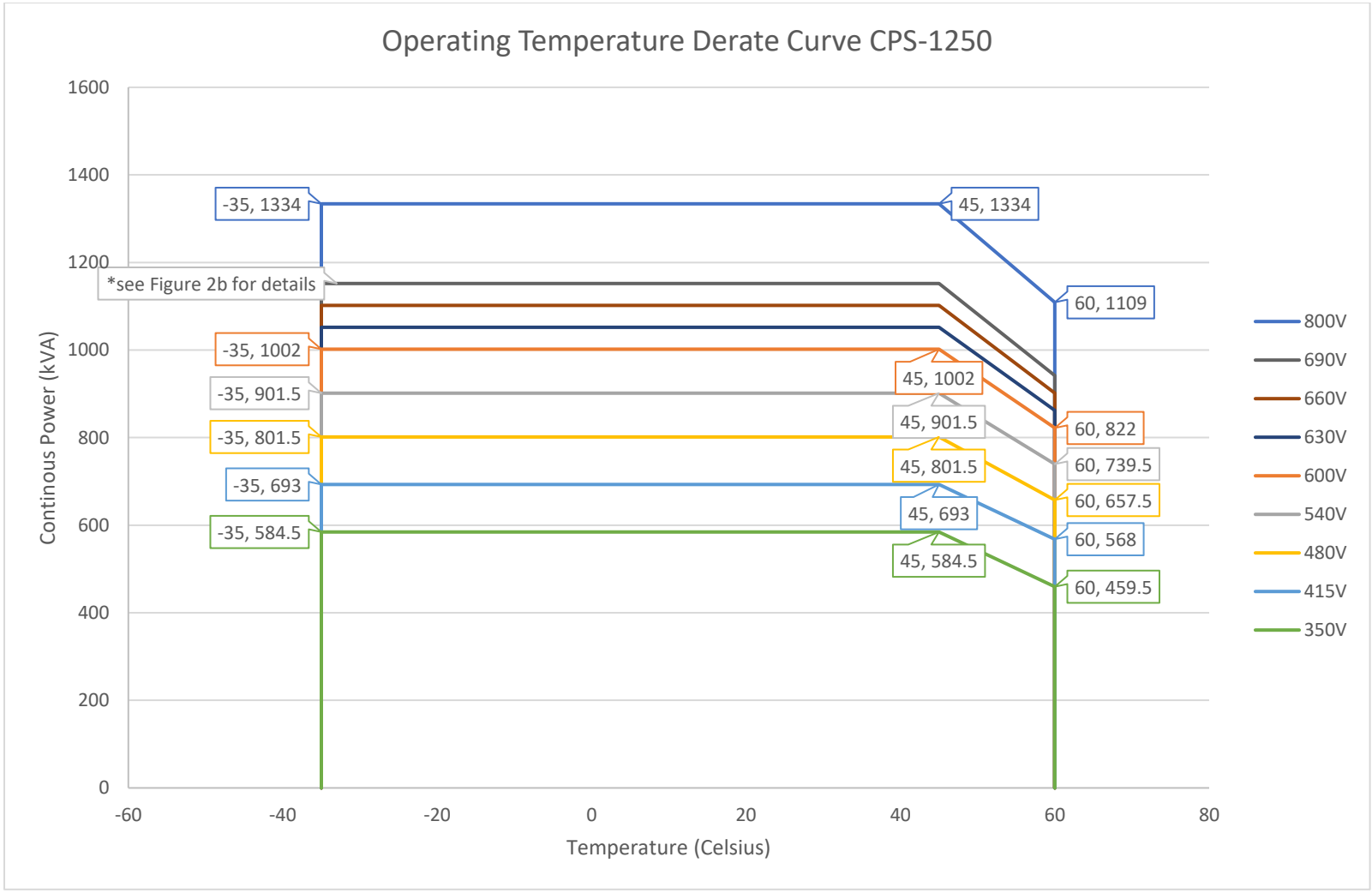


Figure 2a: Operating Temperature Derate Curves CPS-1250

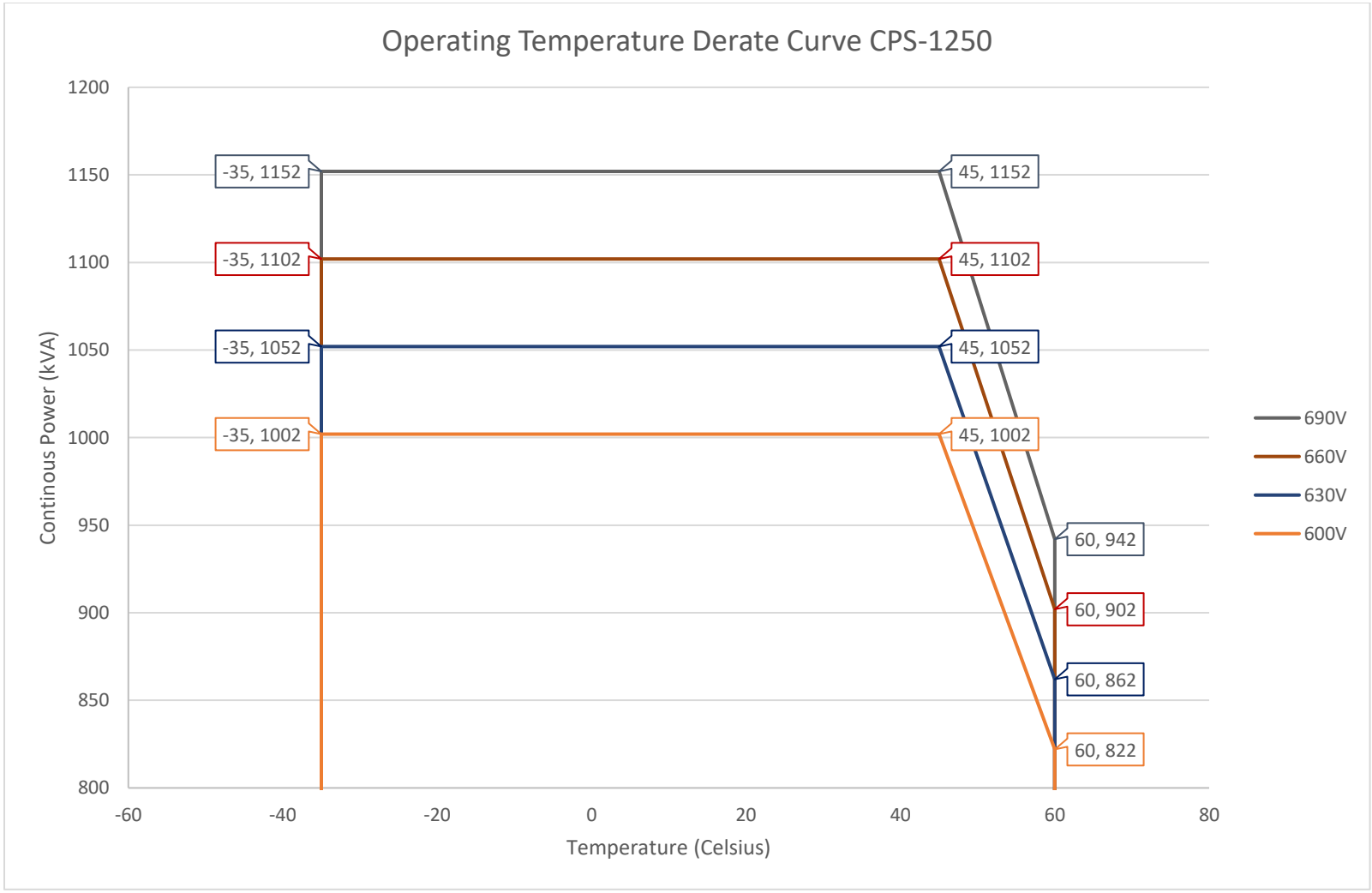
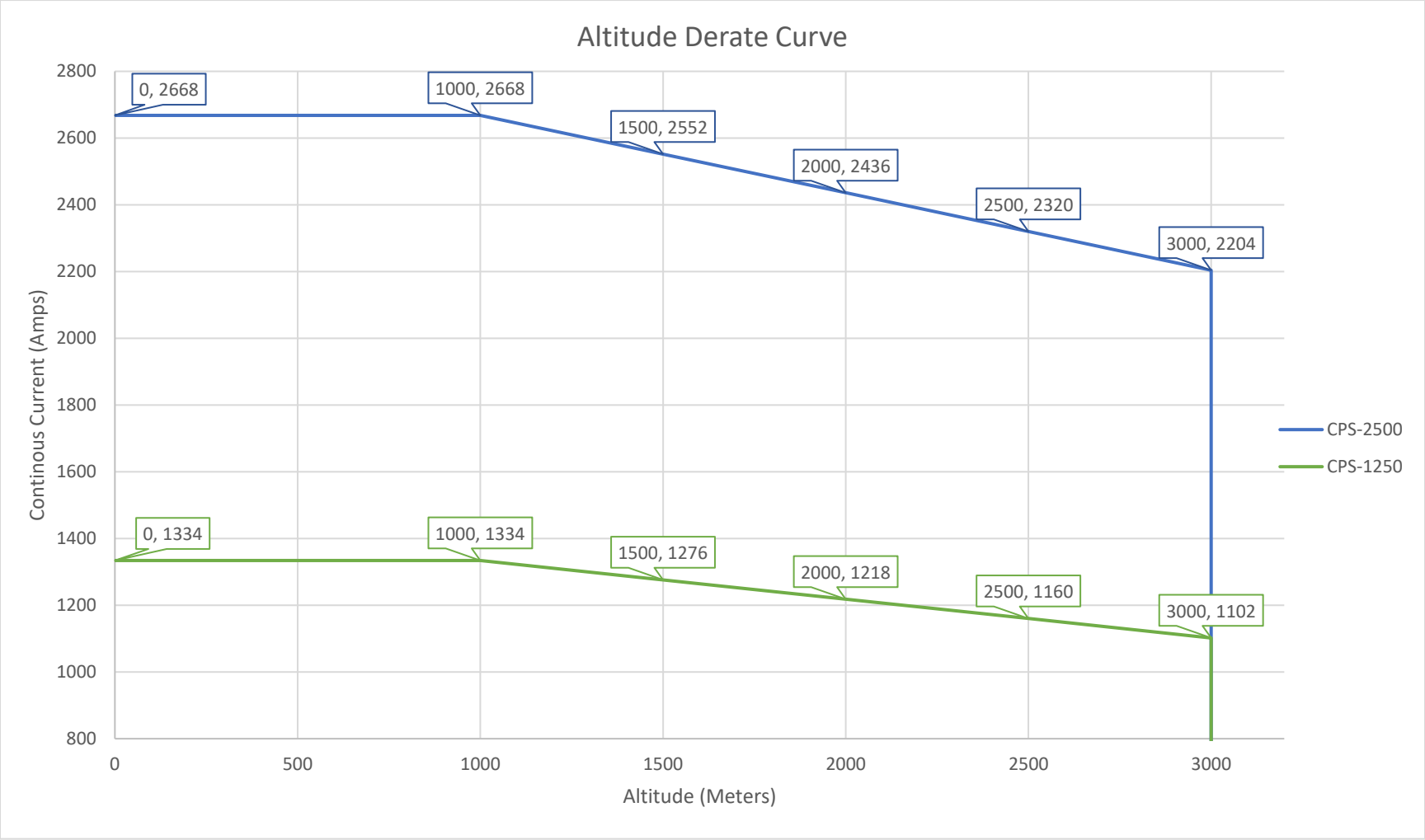


Figure 2b: Operating Temperature Derate Curves CPS-1250 600-690 Vac Operation

Altitude Derate Curve



Operation and Control-PQ Modes

PQ Mode – Grid Tied Operation

In grid tied mode, the CPS Gen 5 accepts P (real power) and Q (reactive power) commands with a 10Hz (100ms) update rate. When running PQ mode, the system will accept commands up to the max allowed per the CPS Gen 5 rating, including any allowed overload levels. In such case that the maximum allowed kVA is exceeded, the P command (real power) will have priority, forcing a curtail of the Q (reactive power) command. The CPS may actively curtail power at high or maximum power command settings when the line voltage drops such as to maintain the max allowed AC output current.

PQ Mode – Overload

All CPS Gen 5 models have an allowed over-load for system AC current of 120% for 10 seconds, with a maximum lockout timer of 20 minutes once over-load time expires. At nominal AC voltage, this would mean 120% rated power for 10 seconds, but at lower than nominal AC voltage output power would be less than 120% rated power. The overload function monitors the integrated inverter module AC current and allows for longer overload times for lower overload currents and/or times. In any case, the system status will indicate when overload is locked out.

Note that PCS full power is at nominal line voltage. The PCS may actively curtail power at high or maximum power command settings when the line voltage drops such as to maintain the max allowed AC output current.

PQ Mode – Commanded and Automatic Standby Mode

All CPS Gen 5 models support the option to enter a standby state. Standby is an operational mode, always entered from PQ mode, where the system gating stops, and power motorized breakers are left closed for all power modules. Since the minimum battery voltage is higher than the AC rectified voltage, there is no current flow through the power modules. This eliminates system losses while the unit is otherwise idle and exiting standby such as to resume following required P or Q command can be done within 2 cycles, as opposed to stopping and restarting the system, which can take multiple seconds. During the standby state, AC filter capacitor current is seen at the grid port. Standby may be commanded by a user entered and exited upon command. Standby may also be setup to enter automatically when the P and Q commands are both within a hysteresis dead band and auto-exiting standby when the P/Q command changes outside the set dead band. See Figure 3 below this will be implemented in our panel.

Operation and Control-UF Modes

UF Mode – Islanded Operation

All CPS Gen 5 models include the ability to run islanded mode (voltage source) operation, also called UF mode. In islanded mode, the CPS accepts Voltage (U) and Frequency (F) setpoints. The CPS Gen 5can handle full real power transitions with extremely tight voltage and frequency regulation forming a 'stiff backbone' to the microgrid.

UF mode settings are only available digitally (Modbus-TCP). When running UF mode, the system will still have all PCS trip levels active, including all AC and DC current and voltage trip levels.

UF Mode – Microgrid Mode

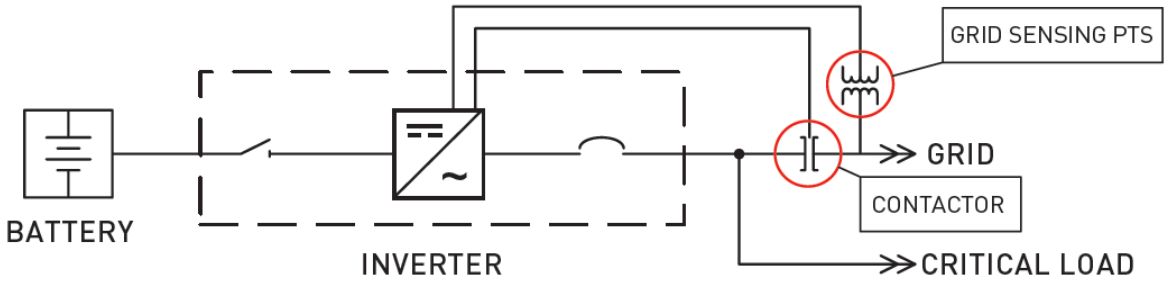
The CPS Gen 5 will control the voltage and frequency in accordance with the V/F droop settings of the CPS Gen 5. The CPS Gen 5 will synchronize with any external AC voltage sources. Other generating assets may operate with the CPS Gen 5 in droop control.

UF Mode – Isochronous

The CPS will control the voltage and frequency to the nominal setpoints of the CPS. The CPS will not synchronize with or connect to an external AC voltage source and operates as an AC voltage-controlled voltage-source inverter. Other generating assets may synchronize with the CPS and operate in grid-tied mode.

Dynamic Transfer

Dynamic Transfer is a patented technology that enables Dynapower Energy Storage Inverters to transition from Grid Tied (current source) mode of operation to Microgrid (voltage source) and back to Grid Tied (current source) mode of operation seamlessly. Dynamic Transfer is commonly used in microgrids as a method to combine multiple generation resources or to provide backup power to customer loads. Options indicated in this section are available on all CPS Gen 5 products.



The figure above shows a typical implementation of Dynamic Transfer. In Grid Tied mode the contactor is closed; this provides a grid connection to the

critical loads as well as a grid-tied to the inverter. During operation the inverter is continuously monitoring the grid's voltage and frequency. If either the grid voltage or grid frequency go out of the allowable range the inverter will implement an autonomous Dynamic Transfer by opening the grid disconnect device (in this example this is shown as a contactor) and transitioning to Microgrid mode. By opening the contactor, the inverter has isolated itself and the critical loads from the grid. This type of operation is considered 'intentional islanding' and is not to be confused with anti-islanding. It should be noted that the Grid Sensing PTs and contactor are external to the CPS and not included with the CPS. The contactor will be controlled by the inverter.

While operating in UF mode the inverter will continuously monitor the Grid Sensing PTs to determine when grid fault has been resolved and that the grid has returned to stable operating condition. The energy storage inverter will wait for a 'Grid Ok Timer' (settable by customer but typically 5 minutes) to ensure that the grid is present and stable before reclosing the contactor and returning to Grid Tied mode of operation. The transition time from Grid Tied to Microgrid mode of operation depends upon the nature of the grid fault. If the grid fault is a high impedance fault the transition time is < 1 60 Hz cycle, however, if the grid fault is a low impedance fault the transition time will be limited by the opening time of the grid disconnecting device.

In addition to the above describe "autonomous" Dynamic Transfer, the CPS can perform commanded Dynamic Transfers, seamlessly transferring from Grid tied to Microgrid mode or vice versa on command. If dynamic transfer is enabled then system is automatically capable of transferring from PQ(grid tied mode) to UF(off grid mode/islanded mode) and UF to PQ mode when commanded by an external controller. In this case, the external controller is responsible for opening the islanding switch when transitioning to UF mode. When grid is available, the inverter will resynchronize with the grid while closing islanding switch and transition to PQ mode from UF.

UF Mode - Black-Start

The CPS Gen 5 can be configured to perform soft startup of a “black” islanded microgrid. The black-start function of the CPS Gen 5 ramps the AC voltage during startup of the islanded microgrid to reduce inrush currents drawn by large transformer (XFMR) or motor loads. This ramp is parameter settable to tune the performance of the black-start to the load characteristics of the microgrid. This requires the AC voltage off, and DC voltage on for start-up. Since the AC voltage is off, a system Battery BMS contactor needed to be Close position to start system in UF mode. Black-start feature will be available in all standard panes

In the case of parallel unit deployment, the CPS Gen 5 supports additional capabilities to allow the successful parallel black-start of multiple inverters. The CPS Gen 5 supports timestamp synchronization to allow the synchronized startup of multiple parallel inverters without the need of additional master-slave controls or additional unit to unit communication.

AC Current Limiting (In-rush Current Handling in UF mode)

The CPS Gen 5 has AC current limiting, so that the system will deliver up to (but not exceed) full rated AC current to avoid nuisance AC overcurrent faults due to excessive load inrush current demand. When current limiting in UF, the AC voltage and frequency may deviate from nominal, and this is permissible within the CPS Gen 5 abnormal voltage frequency limits and timers. It is expected that, if the system is properly sized to the microgrid, that any voltage or frequency deviations due to large inrush loads will be very minor and short duration, and not affect the load.

UF Mode – Synchronization

For systems with dynamic transfer, the system will typically run at the voltage and frequency set on Page 14 and Page 15. Once the system is told to switch to PQ (or once grid is stable if PQ set), the system would typically begin the synchronization process before closing the grid disconnect. An option exists to automatically sync to the grid frequency once the grid is in bounds helping where external synchronization checks are required before closing the grid disconnect via grid stabilization timer. This timer is the time the grid must initially be within all trip windows before allowing a start-up. This same timer is also used when returning to grid connected mode from islanded mode in systems with optional UF mode dynamic transfer, requiring the grid having been in bounds for a set time before allowing a transfer. This timer is shipped with a setting of 300 seconds but may be modified by the end user onsite through the OIT.

VDC Mode

In VDC mode, the CPS Gen 5 accepts DC voltage commands with a 10Hz (100ms) update rate. When running VDC mode, the system will accept commands within the range of high and low DC Voltage limits. In VDC mode the CPS Gen 5 attempts to control the DC input voltage to the Voltage setpoint by alternatively injecting or absorbing power to or from the grid. In such case that the maximum allowed kVA is exceeded, the CPS Gen 5 will curtail operation to the maximum allowed kVA and current limits.

Frequency Compensation Mode (F-Comp)

The CPS Gen 5 product line has an optional function called FComp. F-Comp is ideally suited to very rapid Fast Frequency Regulation applications as well as power quality correction of critical facility loads. Because the power dispatch is calculated by the inverter, all external controls latency is avoided.
F-Comp monitors the grid frequency for deviations from nominal, and if a deviation exceeds a max allowed, the CPS Gen 5 will automatically follow a user-defined frequency correction curve. F-Comp is differentiated from F-W mode, as defined in UL Supp SA, in that it is an active correction and not a passive curtail. Additionally, when FComp activates, the real power output from the function is added to the user issued real power command.

FComp allows the user definition of:

- a frequency dead-band around nominal frequency,
- a response curve with associated max allowed minimum and maximum real power output for compensation purposes,
- a response rate of change (ramp).
-

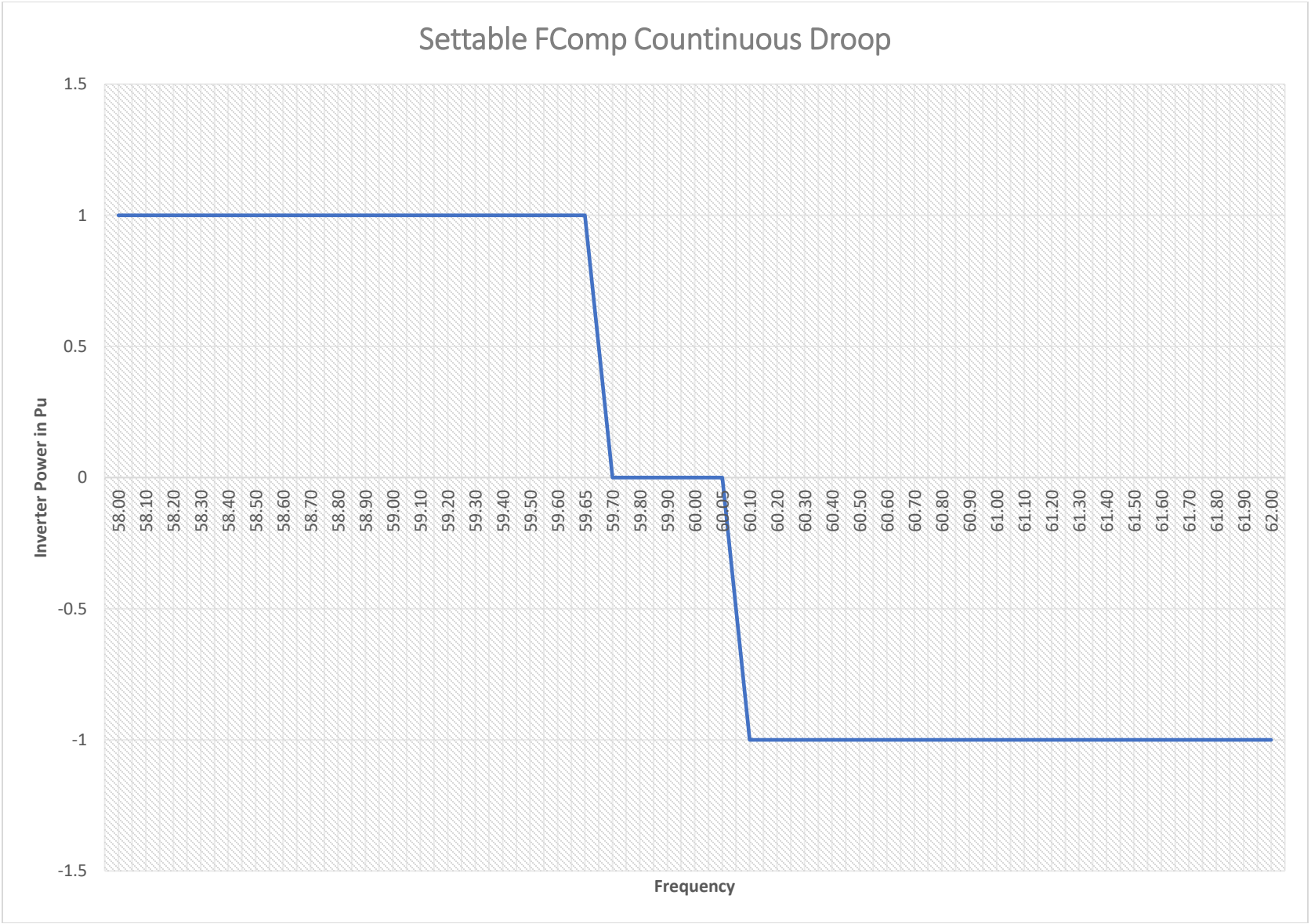
When in use, the mode would be enabled but would not do anything until it is activated. Activation is defined as an excursion outside the set dead-band. Mode feedbacks would indicate when enabled and when it is active.

When FComp activates (only possible if enabled), it would take control of the system real power (P) and follow the defined compensation curve. The function, when triggered, allows for three possible means of correction.

These three options are user selectable as part of the function settings.

- The first is a response which would be the direct compensation curve output only
- The second being compensation curve plus command at time of activation
- Third option being whatever the higher of curve requirement or current command.

Once the frequency returns to in-bounds values (within user set dead-band), the function would de-activate, and the system would return to following real-power commands directly.
A filter setting is available for this mode allowing user control over overall function response, from 1-2 cycle response to multi-second response. F Comp chart is below.



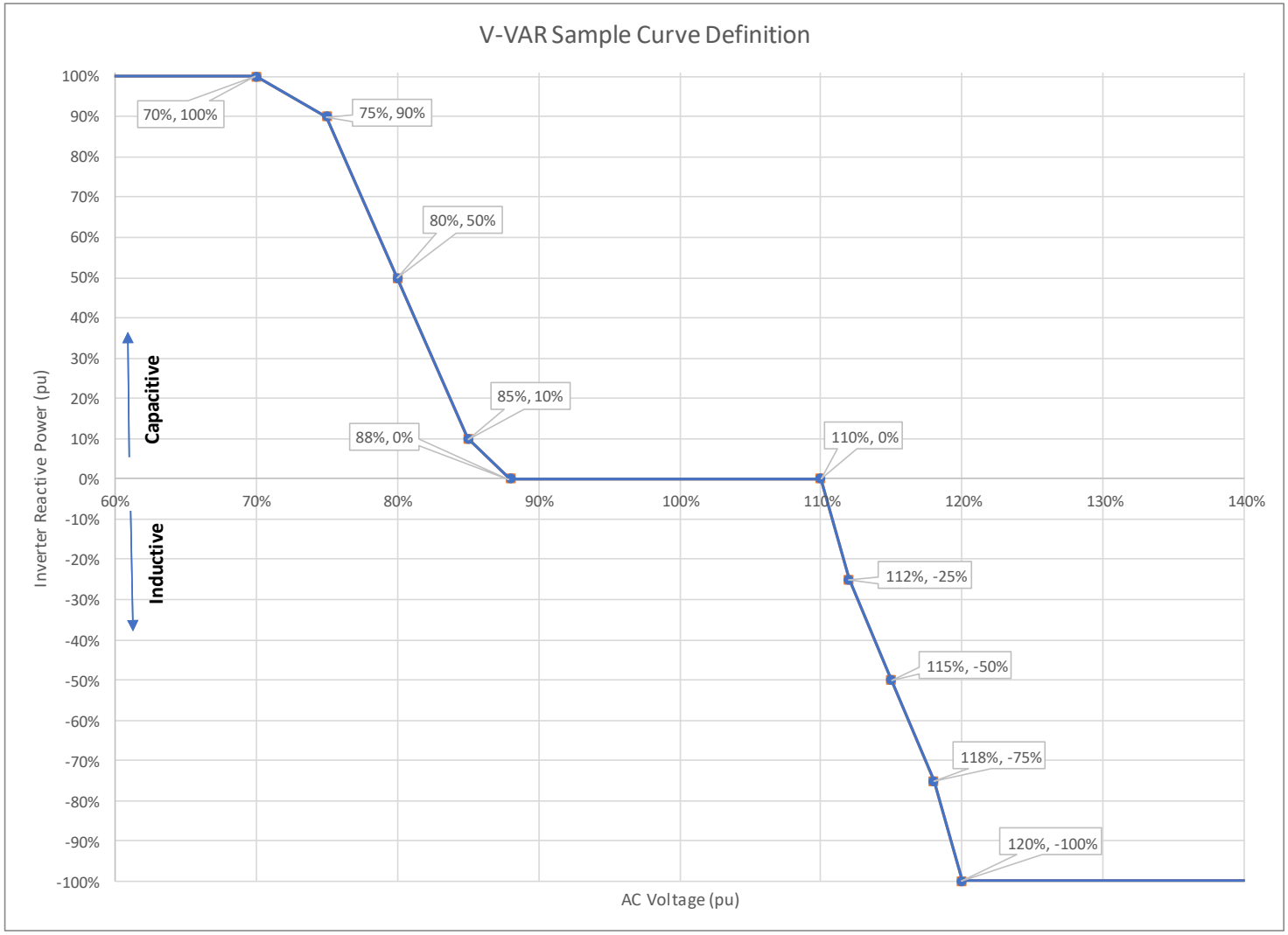
Volt-VAR Compensation Mode (E-Comp)

E-Comp is ideally suited to backup power applications. The CPS Gen 5 will automatically attempt to correct three-phase voltage magnitude deviations (usually voltage sags) experienced by a critical load in an effort to avoid the need to transfer to backup power mode.

E-Comp is a mode which will monitor the grid voltage for deviations from nominal and automatically follow a user-defined voltage correction curve (default curve definitions provided) defining Q. A filter setting is available for this mode allowing user control over overall function response, from 1-2 cycle response to multi-second response.

The CPS Gen 5 product line has an optional function called EComp. EComp is an enablable mode which will monitor the grid voltage for deviations from nominal the PCS will automatically follow a user-defined voltage correction curve (default curve definitions provided) defining Q. EComp allows for user definition of a voltage dead-band around nominal voltage, a response curve with associated max allowed minimum and maximum reactive power output for compensation purposes, as well as a response rate of change (ramp).
For use, the mode would be enabled but would not do anything until it activated, where activation is defined as an excursion outside the set dead-band. Mode feedbacks would indicate when enabled, and when active.

When EComp activates (only possible if enabled), it would take control of the system reactive power (Q) and follow the defined compensation curve. The function, when triggered, allows for three possible means of correction. These three options are user selectable as part of the function settings. The first is a response which would be the direct compensation curve output only, the second being compensation curve plus Q command at time of activation, and the third option being whatever the higher of curve requirement or current command. Once the voltage returns to in-bounds values (within user set dead-band), the function would de-activate, and the system would return to following Q command input (either direct input or other active mode required Q command). A filter setting is available for this mode allowing user control over overall function response, from 1-2 cycle response to multi-second response.



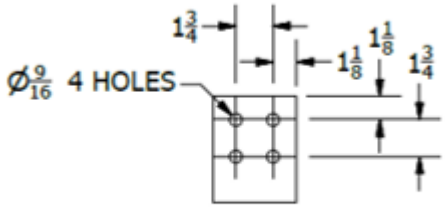
Volt-VAR Mode Example Curve Definition Settings

Document Information and Approvals

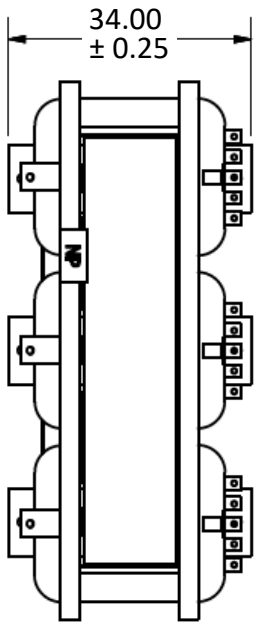
REVISION HISTORY			
Version #	**Date**	**Revised By**	**Reason for change**
0	10/25/2022	AIK	Original Issue
1	12/2/2022	AIK, MB, TV	Format changes. Spec revisions
2	05/10/2023	AIK, MB, CmC	Operational Modes, Format, Layout
3	05/15/2023	CJS, AIK	Formatting

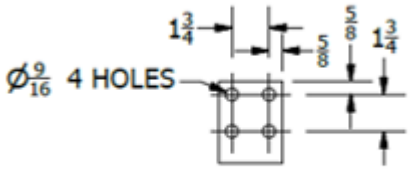
DYNAPOWER DOCUMENT APPROVALS			
Approver Name	**Project Role**	**Signature/Electronic Approval**	**Date**

CUSTOMER DOCUMENT APPROVALS			
Approver Name	**Project Role**	**Signature/Electronic Approval**	**Date**



1/4 x 4 Cu Bar
X1, X2, X3 Terminals





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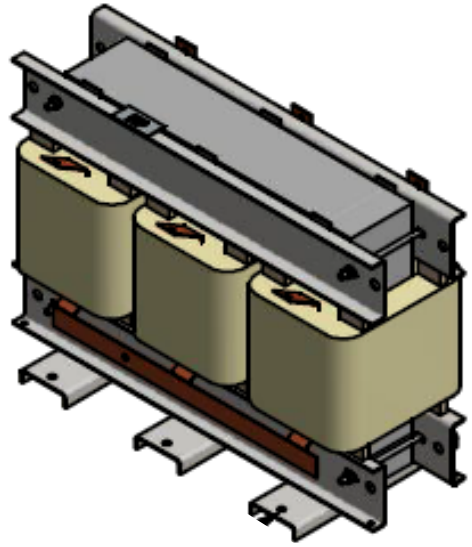
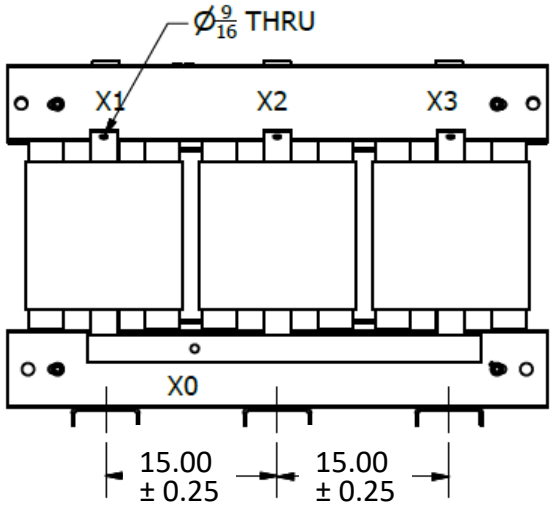
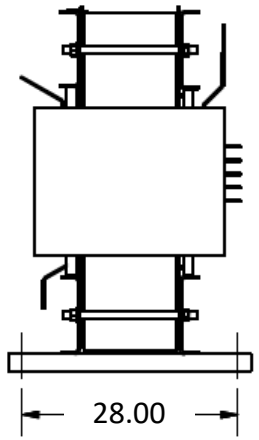
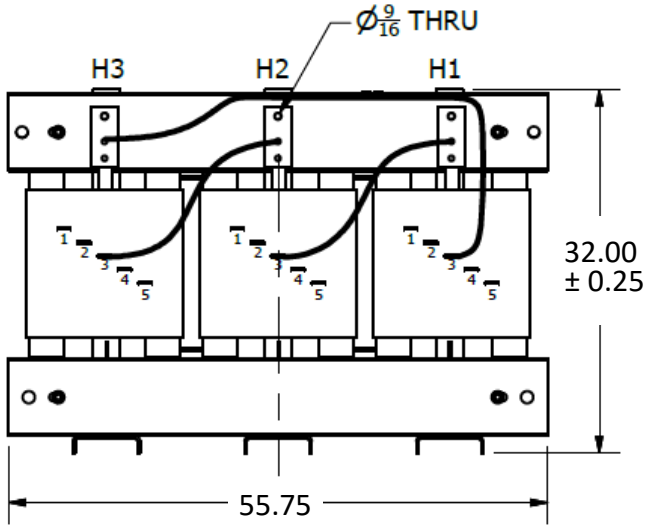
H1, H2, H3 Terminals



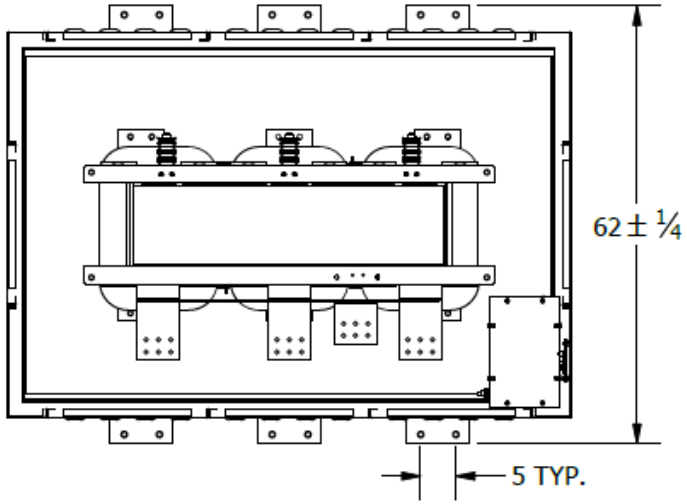


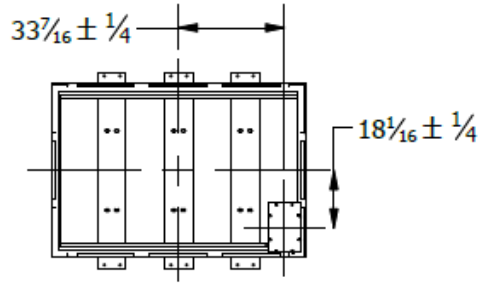


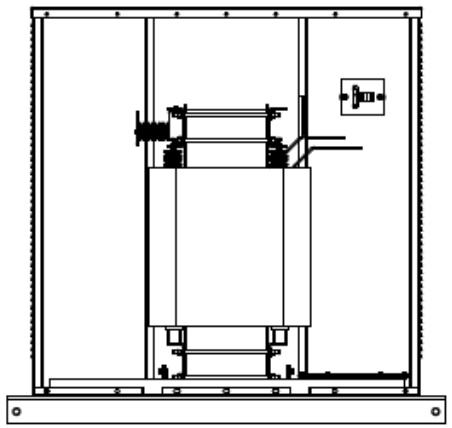


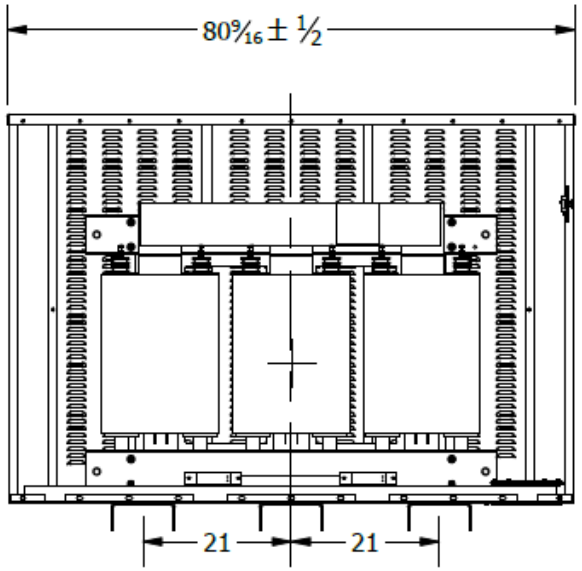
Part# Q38823E

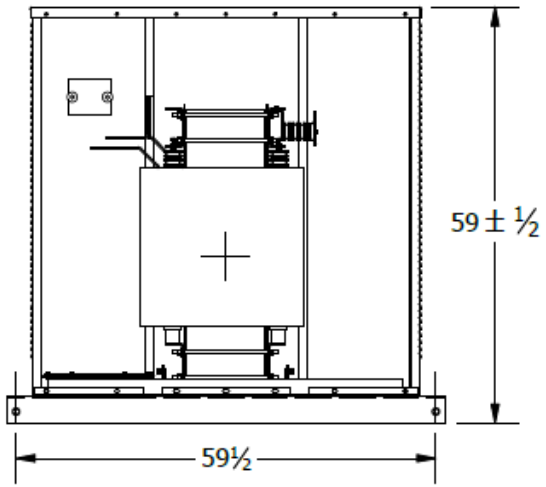
Part Description: 750kVA, Primary 480V Delta (10kV BIL) +\-2x2.5% Tap, Secondary 480/277V WYE (10kV BIL), 60Hz, 150C Rise, Aluminum Conductor, 200C UL Insulation System. Three Phase Dry Type Transformer, NEMA 3R











Part# ENC-Q38823E

Part Description: Enclosure 80 x 60 x 60 NEMA 3R

LITELINK®

The LiteLink® Slat is one of the most economical chain-link enhancement products available in the market today.

Manufactured using the same durable outdoor plastic as our standard tubular fence slats, this single wall “M” shaped slat will give you the visual screening and color enhancement you desire at a very affordable price. LiteLink also uses our innovative Bottom Locking system for fast and easy installation.

Design
Compact and lightweight, LiteLink’s unique shape enables the slat to self stack. It comes in a box (2" x 5" x slat length) making it easy to ship and efficient to store.

Standard Heights
4, 5, 6, 7, 8, 10 and 12 feet. Special heights available upon request.

Slat Length
3½” shorter than the overall height of fence.

Bottom Locking Channel
10 feet provided in each bag.

Wind Load & Privacy Factor
Approximately 75%.

SLAT PROFILE:

Colors*
White, Green, Brown, Black, Beige, Gray, Redwood, Royal Blue, Light Blue

Made in the USA

* Exact representation of slat colors in printing is difficult. Please refer to actual color samples for final matching.
Covered by one or more of the following patents: US Patent 6,068,243 / 5,165,664 / 5,234,199

www.PrivacySlatKing.com | (800) 878-7829 | Sales@PrivacySlatKing.com

PRODUCT SPECIFICATIONS

Slat Type	Slat Width	Mesh Size	Wire Gauge	Slats Per Bag	Approx. Coverage Per Box
LiteLink®	1¼"	2", 2¼" or 2⅜"	9, 11 or 11½	82	10 linear feet

Materials

The LiteLink product is extruded from High Density Polyethylene (HDPE), color pigments and ultra violet (UV) inhibitors, specifically designed to retard the harmful effects of the sun and lengthen the life of the product.

Durability

Pexco PDS® HDPE Fence Products are resistant to: severe weather conditions, salt water, sand, road dirt, most acids, alcohol, alkaline, ammonia, petroleum distillates, and common environmental pollutants.

Maintenance

Pressure cleaning of surface contaminants is quickly accomplished with plain water.

Wind Load Disclaimer

Pexco will not be responsible for damage due to wind load conditions resulting from insufficient structural support.

Limited Warranty

LiteLink carries a 7-year, pro-rata warranty against breakage under normal conditions. Write Pexco for full warranty information.

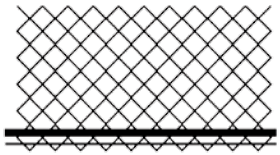
HDPE Technical Properties

Property	Value
Melt Idex	(.35) Optimum extrusion processing conditions for Fence Slats
Density	(.945) Polyethylene ranges anywhere from .914 to .960 in density
Minimum Temp.	(-70°) Under no stress, HDPE remains flexible at this temperature
Maximum Temp.	(180°) Under no stress, HDPE will not distort at this temperature
Tensile Strength	(3,700 psi) HDPE will not distort at lesser loads or impacts

Installation Instructions

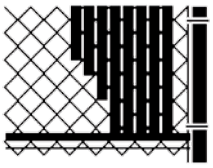
Step 1

Insert rail horizontally in first full diamond at bottom of fence with open side facing up.



Step 2

Insert vertical slats with interlocking tab downward. Slat engages and interlocks with bottom rail.



Step 3

Push the vertical slat into the horizontal channel to lock-in place.

Acoustical® SOLUTIONS
For every environment of your life

2420 Grenoble Road
Richmond, VA 23294
Toll Free: 800-782-5742

PRIVACYSHIELD® OUTDOOR ABSORPTIVE SOUNDPROOFING BLANKET DATA SHEET

TECHNICAL CHARACTERISTICS

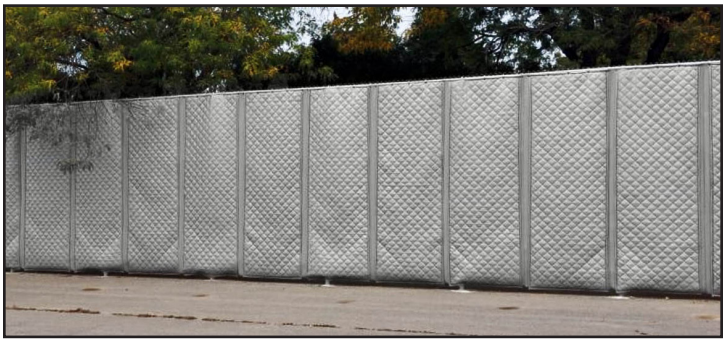
SIZE:	54" x 96", Up to 54" x 20'
THICKNESS:	1", 2" (actual size may vary after quilt); 4" (special order)
CONTRUCTION:	UV resistant heavy-duty vinyl coated polyester faced quilted fiberglass backed with a one pound per square foot reinforced mass loaded vinyl sound barrier
FACING COLOR:	Grey, Tan (standard) Black, Off-White (special order)
BARRIER COLOR:	Grey, Tan (standard)
WEIGHT (P.S.F.):	1.2 (1"), 1.45 (2"), 2.9 (4")
TEMP RANGE:	-20 to 180 degrees F

DESCRIPTION

The PrivacyShield® Outdoor Absorptive Soundproofing Blanket (formerly ABBC-13EXT) is a barrier backed panel used to block and absorb sound for exterior applications.

The blanket is an exterior grade barrier backed composite (BBC), consisting of UV and tear resistant vinyl coated polyester facing. The facing is quilted on environmentally sustainable 1-2 inch fiberglass batting with Gore® Tenara® thread. It also has a reinforced 1 lb./sq. ft. mass loaded vinyl barrier bonded to one side.

These blankets are a combination of sound blocking and sound absorbing material. The sound attenuation blankets are constructed with grommets across the top and Velcro® along the vertical edges of the blankets for easy installation and layering. The exterior grade blanket is great for use in outdoor environments where extended lifespan and durability are required.



SOUND ABSORPTION (ASTM C 423)							
Thickness	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC
1"	0.18	0.68	0.74	0.72	0.42	0.29	0.65
2"	0.45	0.96	0.87	0.66	0.47	0.28	0.75
4"	0.67	1.05	0.97	0.84	0.86	0.52	0.95

SOUND TRANSMISSION LOSS (ASTM E90 & E413)							
Thickness	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	STC
1"	15	17	28	40	45	52	29
2"	14	20	32	41	42	41	33
4"	16	21	30	41	52	56	34

Appendix F: FAA Determination

SOLLI ENGINEERING

Federal Aviation Administration

The FAA is currently experiencing delays in processing off-airport aeronautical studies. These delays are currently resulting in an approximate 15 additional days in processing time. The FAA will continue to work aeronautical studies on a first come, first served basis. Please take this possible delay into consideration when determining when to submit your case. If your submitted aeronautical study requires priority and 60 days has elapsed since submission, please contact the OEG Specialist for your state with the rationale for your request and it will be reviewed for escalation. The issue causing these delays is actively being mitigated and is expected to be resolved around August.

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

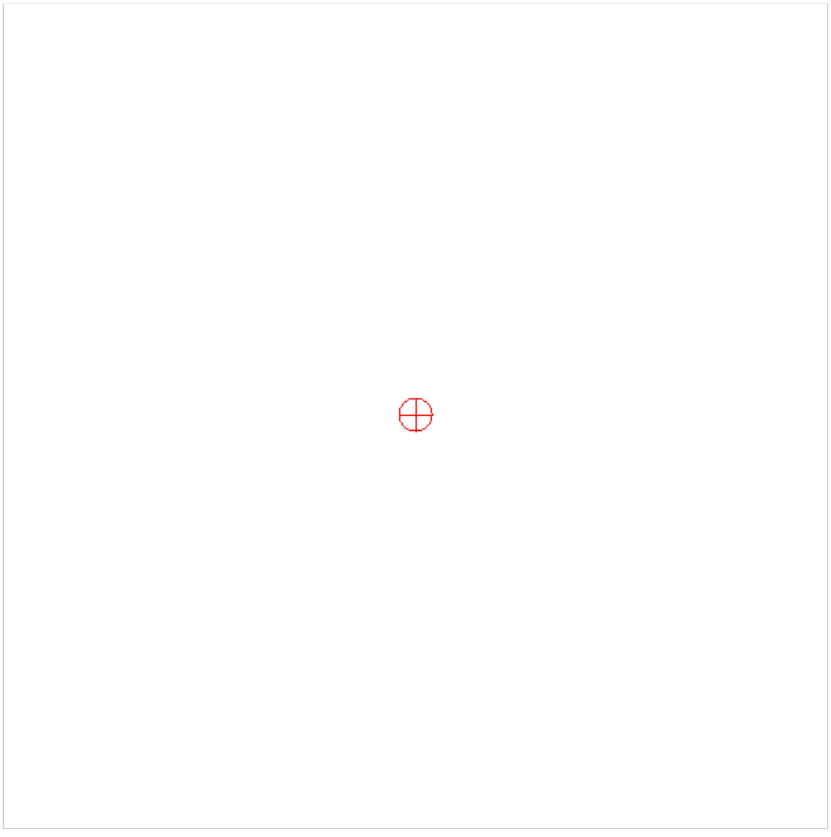
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	CRANE | Mobile Crane Please select structure type and complete location point information.
Latitude:	41 Deg 7 M 43.82 S N
Longitude:	73 Deg 29 M 2.62 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	295 (nearest foot)
Structure Height :	40 (nearest foot)
Is structure on airport:	(•) No ( ) Yes

Results

You do not exceed Notice Criteria.



Appendix G: Acoustical Study

SOLLI ENGINEERING

Prepared For: Kinsley Energy Systems

Point of Contact: Jonathan Rheaume

Prepared by: Acoustical Technologies Inc.
50 Myrock Avenue
Waterford, CT 06385-3008

Subject: New Canaan Community YMCA
Noise Treatment Recommendations
564 South Avenue
New Canaan, CT 06840

Author: Carl Cascio

Date: September 24, 2024

Revision: 1

Table of Contents

Summary

This document makes acoustic noise control recommendations that should assist in meeting the acoustic noise concerns during the operation of a behind the meter power generation and Battery Energy Storage System (BESS) at the 564 South Avenue site in New Canaan, CT. An acoustic assessment plan was developed and executed to acquire acoustic information useful in explaining and mitigating the potential airborne noise issues associated with the future operation of the BESS System at the New Canaan YMCA site. This has been accomplished and the results show that the acoustic impact of operating the System will be minimal with the recommended mitigation.

The airborne noise levels expected to be generated by the BESS & CHP System operating at the New Canaan site were estimated using data supplied by vendors to Kinsley Energy Systems. The System components were expected to produce average overall A-weighted sound pressure levels of 55 dBA to 80 dBA reference 20 microPascals at 1 meter[1,2]. The airborne noise levels from each component of the System were estimated at the closest property line on Putnam Road, southeast of where the equipment was to be placed. The total sum of these airborne noise estimates is expected to be about 1 dB above the allowed night time limit of 45 dBA in a residential zone[3,4]. The 55 dBA day time limit can be met without treatment but the night time limit requires at least a 5 dB decrease in airborne noise from the inverter.

The New Canaan YMCA site is located in a one-acre Residential Zone on South Avenue and is surrounded by a 1/3-acre Residential Zone to the North, a Waveny Zone (Park) to the West and more one-acre Residential Zone to the East and South. Based on Noise Tools analysis[5] the airborne noise from the System should be below the 45 dBA noise limit at distances greater than about 75 meters. All nearby residential properties at greater distances are expected to be well below the day time and night time Residential Zone noise limits for an emitter in a Residential Zone. The closest property line on Putnam Road is only about 66 meters to the south east so noise mitigation will be required to bring the property line noise level below the night time noise limit of 45 dBA. No mitigation is necessary to meet the 55 dBA day time limit.

Operation during night time hours mean reducing the inverter's airborne noise and should be directed at adding a sound barrier treatment to block the inverter's noise from reaching the adjacent residential property to the south east. This approach places a transmission loss treatment on a chain link fence along the southern side closest to 158 and 172 Putnam Road. ABBC-EXT-R Sound Curtains can be used to provide the necessary mitigation. The inverter should be treated as shown in Figure 3 with five 8-foot by 4.5-foot by 2-inch-thick noise barriers on the chain link fence to limit airborne noise escaping to the southeast. Predicted airborne noise levels as shown in the last column of Table 1 are expected to be below 45 dBA at the residential property lines on Putnam Road given this noise mitigation. The next closest home to the north east (137 Putnam Road) is at least 78 meters away and does not require noise mitigation. All other property lines are much further away and should see airborne noise levels below 42 dBA. This noise control approach should remove any acoustic concerns about siting and operating the System at the New Canaan YMCA site at 564 South Avenue. The Connecticut's Noise Code[3] also calls for review of acoustic issues associated with impulse noise, prominent discrete tones, infrasonic and ultrasonic noise. Operation of the BESS & CHP System is expected to meet all of these requirements at all of the nearby property lines.

Introduction

Acoustical Technologies Inc. was tasked with an assessment of potential acoustic noise issues associated with a BESS & CHP System generating airborne noise that may reach the residential properties adjacent to the New Canaan YMCA site at 564 South Avenue in New Canaan, CT. The CHP System is a TEDOM model Cento 285 Combined Heat and Power System providing 286 kiloWatts of power and 1.44 MMBTU of heat/hour. Responding to a request from Jonathan Rheaume, a task to evaluate the airborne noise issue was issued on September 4, 2024. The task estimates the property line airborne noise to be produced by the System in order to identify potential noise issues. If necessary, noise mitigation will be developed to implement a noise control approach that will eliminate any acoustic noise concerns during the equipment's operation.

The purpose of this effort is to utilize the available acoustic information[1,2] to mitigate the potential airborne noise issues associated with the operation of the System at 564 South Avenue in New Canaan, CT. The State of Connecticut[3] and the Town of New Canaan[4] Noise Ordinances have been consulted to assess the impact of the estimated acoustic levels. (The day time airborne noise levels should be kept below 55 dBA reference 20 µPa while the night time noise levels should be kept below 45 dBA.) Noise mitigation may be required and could be appropriate in order to reduce the airborne noise propagated by the System to the closest neighbors' properties on Putnam Road across the street and southeast of the BESS & CHP location.

Acoustic Plan

Table 1 provides estimates of the expected sound pressure levels from the System components in dB reference 20 microPascals (20 µPa) at the closest property line. Columns 2 and 3 provide the distance from the component to the property line across Putnam Road. Column 4 provides the A-weighted airborne source levels while the last two numbers in columns 6 & 7 power sum the individual estimates to create the expected property line noise level without and with noise mitigation. The estimates show that the 80 dBA inverter causes the level to exceed the 45 dBA night time limit at the property line. The accuracy of these estimates is plus or minus 1 dB so the inverter requires noise mitigation to ensure the 45 dBA limit is met. Given at least 5 dB of noise mitigation, the total expected airborne level will be below 45 dBA for the System.

Table 1. Estimated Noise Level at the Closest Property Line without and with Noise Mitigation

CHP	Distance	Distance	Source	Sound Level	Sound Level	Comparable
Component	Feet	Meters	Level (dBA)	dBA re 20 µPa	dBA re 20 µPa	**to**
Ventilation	215.8	65.8	75	38	38	Quiet Conversation
Engine	216.1	65.9	75	38	38	Quiet Conversation
Inverter	216.9	66.1	80	43.3	37.7	Quiet Conversation
Batteries	216.0	65.9	70	33.4	30.2	"Silent" Library
Transformer	217.2	66.2	55	18.3	18.3	Rustling Leaves
Combined				45.6	42.9	Light Rainfall
Overall	Levels	In dBA	reference	**Untreated**	**Treated**	

Figure 1 shows the zoning near 564 South Avenue in New Canaan, CT. The New Canaan YMCA site is located in a one-acre Residential Zone on South Avenue and is surrounded by a 1/3-acre Residential Zone to the North, a Waveny Zone (Park) to the West and more one-acre Residential Zones to the East and South. Based on Noise Tools analysis[5] the airborne noise from the CHP System should be below the 45 dBA noise limit at distances greater than about 75 meters. All nearby residential properties at greater distances are expected to be well below the day time and night time Residential Zone noise limits for an emitter in a Residential Zone. The closest property line on Putnam Road is only about 66 meters to the south east so noise mitigation will be required to bring the property line noise level below the night time noise limit of 45 dBA. No mitigation is necessary to meet the 55 dBA day time limit.

Figure 1. Section of the New Canaan Zoning Map Near the Site

Figure 2 below shows the proposed System layout along with the property lines on Putnam Road. The layouts in Figures 2 and 4 were taken from Reference 6 that was provided by Kingsley Energy Systems. The CHP Engine and Ventilation components listed in Reference 1 as 78 dBA and 94 dBA sources at 1 meter were combined in reference 2 as a closed unit with an overall source level of 58 dBA at 10 meters. This was split into two equal noise sources of 75 dBA at 1 meter for use in Table 1. The closed unit is proposed for the New Canaan YMCA.

Figure 2. Drawing Showing CHP System at the New Canaan YMCA

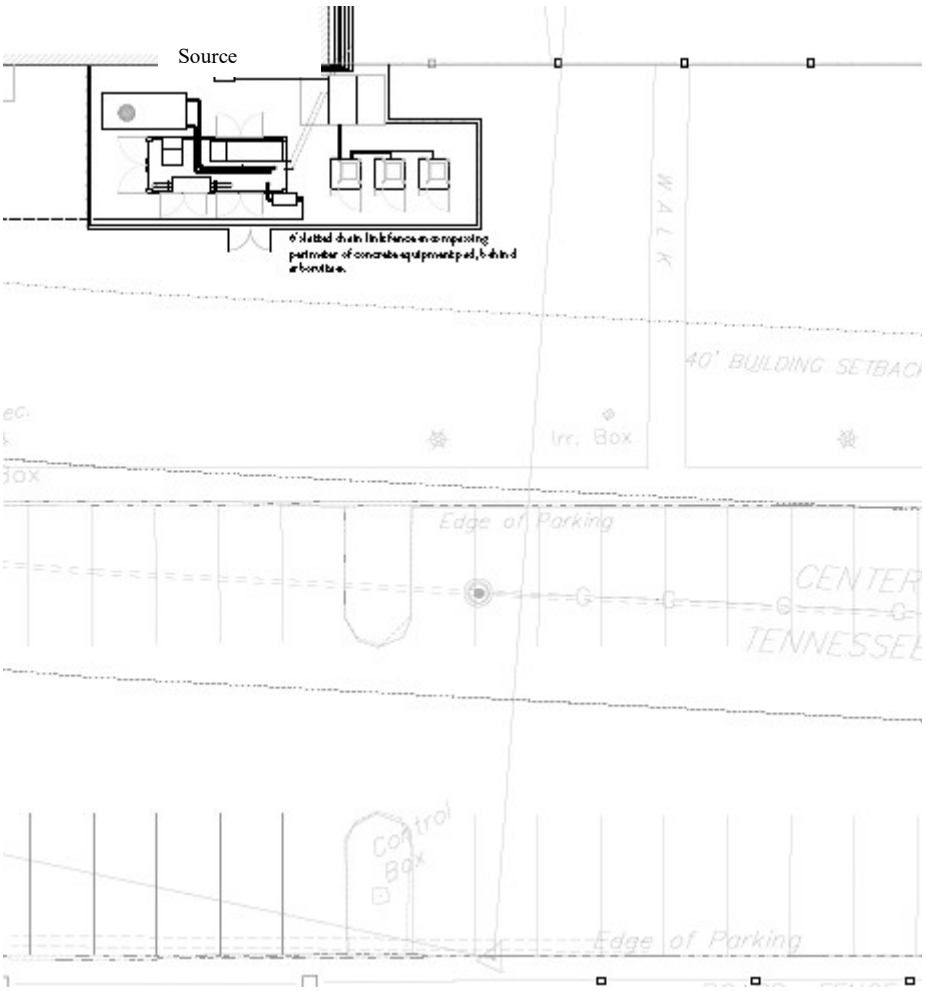
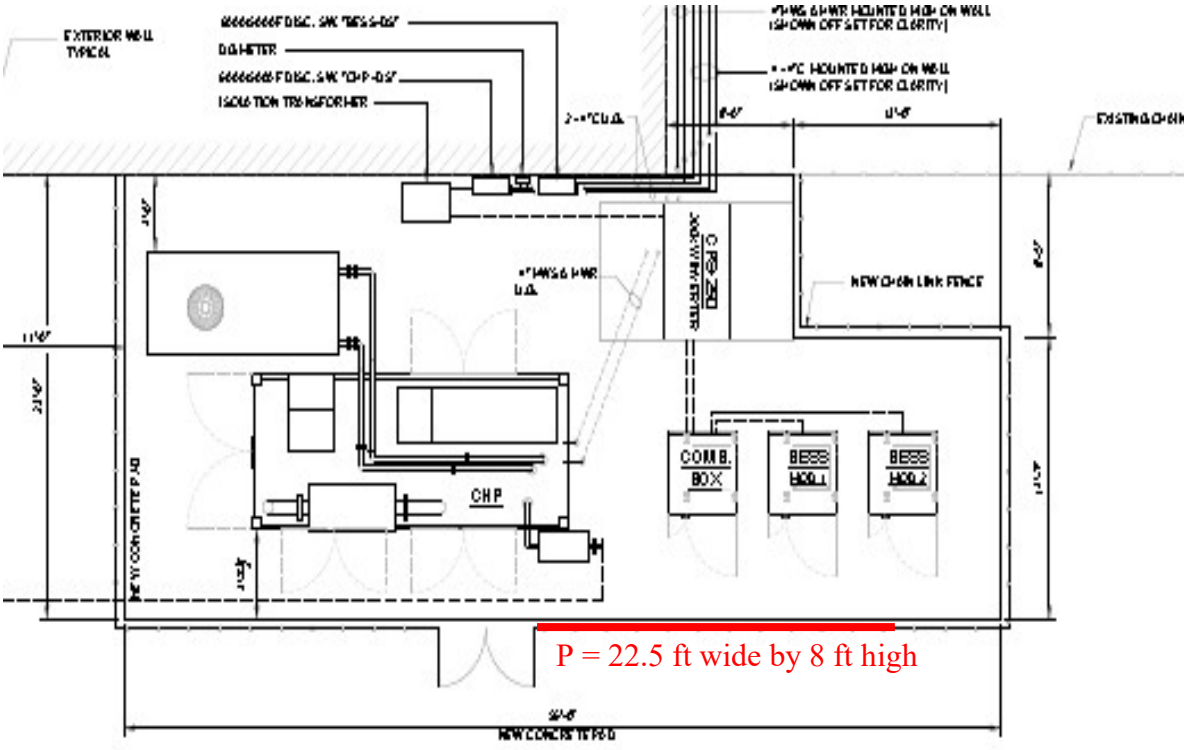


Figure 3 below provides a Google Map of the New Canaan YMCA and the properties along Putnam Road. The homes at 158 and 172 Putnam Road have the closest property lines to the CHP System at a distance of approximately 66 meters. Here the expected airborne sound level is 45.6 dBA without noise mitigation. The second closest property line is at 137 Putnam Road at a distance of approximately 78 meters. Here the expected sound level is 44.1 dBA without noise mitigation. The next closest home is at 194 Putnam Road at a distance of approximately 95 meters. The next closest home is at 9 Danvers Lane at a distance of approximately 100 meters. These two homes and the other homes more than 100 meters away are expected to see airborne noise levels well below 45 dBA. The Saxe Middle School and its ball fields to the north are more than 75 meters away. New Canaan High School is more than 375 meters to the west and shielded by the YMCA building. The two schools should not be affected by the System.

Figure 3. Google Map of New Canaan YMCA and Nearby Properties

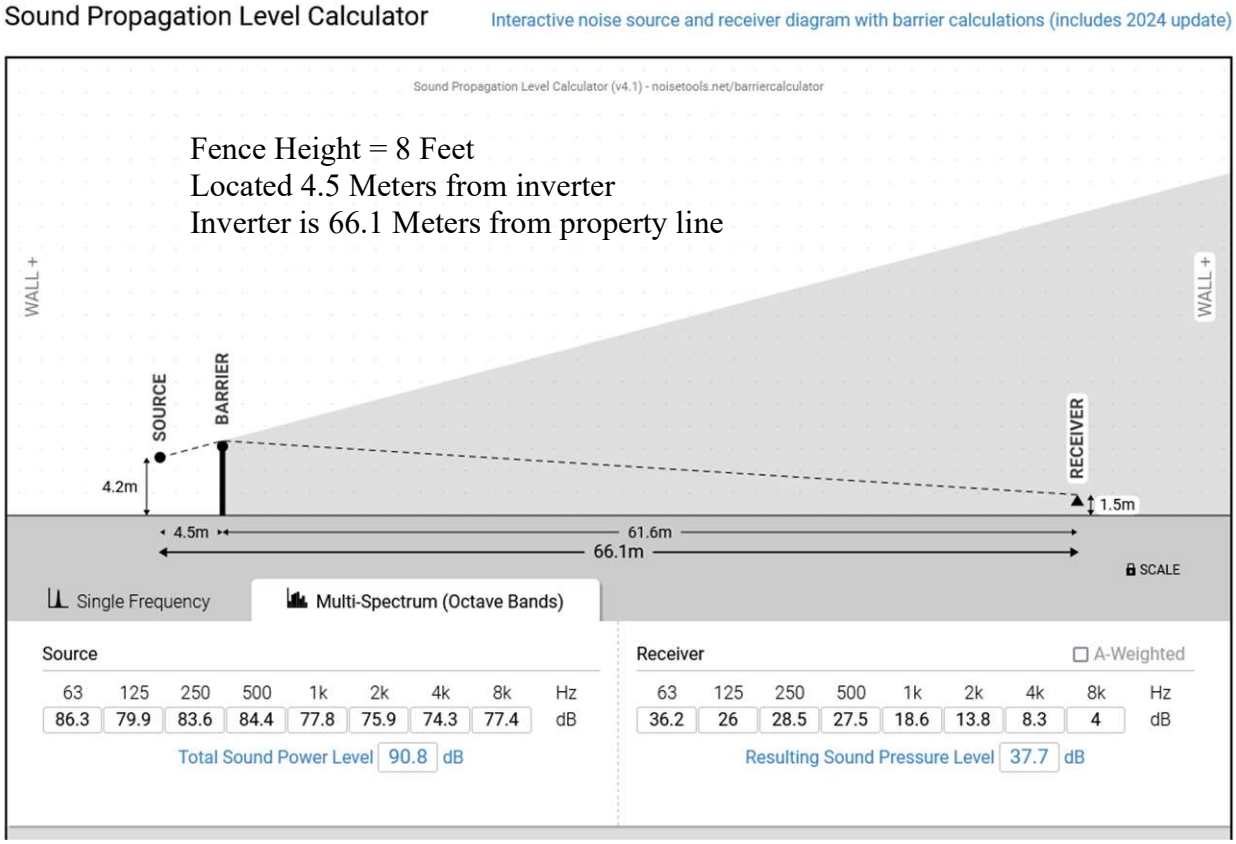
Figure 4. Equipment Yard Partial Plan from Reference 3 with Noise Mitigation (**P**)



Efforts to reduce the BESS & CHP System airborne noise at the South Avenue location should be directed at adding a sound barrier treatment to block the inverter's noise from reaching the adjacent residential property. The other components do not need noise mitigation since their airborne source level (55 dBA to 75 dBA) are lower than the inverter (80 dBA). The noise control approach places a transmission loss treatment on a chain link fence. The last column of Table 1 calculates the performance of the noise barrier for the inverter. In this table the noise barrier is about 4.5 meters from the inverter on the proposed chain link fence near the Equipment Yard entrance.

A typical calculation of the inverter noise mitigation is shown in Figure 5.

Figure 5. Estimated Property Line Noise Level from the Inverter in dBA re 20 µPa



A typical barrier blanket is 4.5 feet by 8 feet by 2 inches in thickness costing $542 from AcousticalSolutions.com. The inverter is assumed to be 4 feet wide and 8 feet in length. The noise mitigation in the table assumes five blankets stretched horizontally extend 22.5 feet in front of the inverter. See Figure 4 above for the approximate noise barrier locations. This acoustic barrier treatment should keep the property line noise level below 45 dBA in order to meet the town and state night time noise requirement.

Allowable Noise Levels

CT section 22a-69-3.1 (Reference 4) states that no person shall cause or allow the emission of excessive noise beyond the boundaries of his/her Noise Zone so as to violate any provisions of these Regulations. The Town of New Canaan and the CT noise ordinances have been used to evaluate the noise generated by the inverter. The day time noise limit is 55 dBA and the night time limit is 45 dBA in both ordinances. Two properties to the southeast could see airborne noise levels just above the 45 dBA night time noise requirement. Noise mitigation is recommended for the inverter in order to meet the night time limit of 45 dBA. The day time limit can be met without treatment.

All the other residential properties at greater distances (more than 75 meters) are expected to be below the day time and night time Residential Zone noise limits for an emitter in a Residential Zone without noise mitigation. The airborne noise from the System should be well below the 45 dBA noise limit at both of the nearby schools without noise mitigation.

Prominent Discrete Tones

The Connecticut regulation for the control of noise states in *CT section 22a-69-3.3 Prominent discrete tones:* Continuous noise measured beyond the boundary of the Noise Zone of the noise emitter in any other Noise Zone which possesses one or more audible discrete tones shall be considered excessive noise when a level of 5 dBA below the levels specified in section 3 of these Regulations is exceeded. The CT Regulations establish different noise limits for different land use zones. Residential (homes and condominiums) and hotel uses are in Class A. Schools, business, parks, recreational activities and government services are in Class B. Forestry and related services are in Class C. By my reading of the regulations the BESS & CHP System source is a Class A emitter in a Residential Zone. The noise zone standards in *CT section 22a-69-3.5* state that a Class A emitter cannot exceed the following overall sound pressure levels:

To Class C 62 dBA To Class B 55dBA To Class A 55 dBA (day) 45 dBA (night)

The discrete tones limits are 5 dBA lower so that no tone may be higher than the following:

To Class C 57 dBA To Class B 50 dBA To Class A 50 dBA (day) 40 dBA (night)

The New Canaan noise ordinance does not discuss discrete tones so the CT Noise Ordinance will be used. To address the discrete tone issue, we use measured spectral data from the Reference 7 TEDOM data. The data is the airborne noise level received in 1/3 octave bands for frequencies from 12.5 to 20,000 Hz. The data shows a discrete tone at 8000 Hertz produced by the TEDOM Cento 285 system at a level of 62.5 dBA. This tone has to meet a 40 dBA limit while the overall noise level expected at the closest property line is expected to be 40.9 dBA. It turns out that the CHP noise signature is dominated by low frequency noises at 80 and 160 Hertz that are roughly 10 dB higher than the 8000 Hertz noise level. This means the 8000 Hertz level at the property line will be some 10 dB below noise generated at 80 and 160 Hertz (which adds to 40.9 dBA). Therefore, the 8000 Hertz tone will be at least 9 dB below 40 dBA and thus not an issue. The CHP System will meet all the discrete tone requirements. There should be no acoustic

issue with the CT discrete tone noise requirements at any of the nearby properties.

Noise Treatment Recommendations

The layout of the BESS & CHP System is shown in Figure 4. Estimates from the Kingsley Energy System reports indicate that the System's noise contribution may be above the night time noise limit at the closest adjoining property line. Noise treatment of the System to reduce the inverter noise by at least 5 dB is needed to effectively remove this noise issue.

The mitigation necessary to meet a 45 dBA night time limit can be obtained by building an acoustic barrier between the inverter and the property line This approach places a transmission loss treatment on a chain link fence near the inverter as was shown in Figure 4. The other System components do not need mitigation.

The noise control is provided by attaching an acoustic barrier material to a chain link fence. Calculating the acoustic performance of the barrier requires an estimate of the transmission loss through the barrier as well as an estimate of the acoustic leakage over and around the barrier. Typical noise treatments will have at least 20 dB of performance for sound traveling through the treatment as shown in Figure 6 below. This means diffraction over the top and sides of the barrier will be the dominant noise path. The path through the treatment only adds 0.1 to 0.2 dB to the total noise. An 8-foot-high barrier at a distance of 4.5 meters will work on the new fence.

Materials such as the ABBC-EXT-R Sound Curtains from Acoustical Solutions (Reference 8) or equivalent should be sufficient to produce the needed 5 dB of sound reduction. One path of noise transmission to consider is the path directly through the barrier. The transmission loss for a two-inch-thick material from Acoustical Solutions called ABBC-EXT-R Sound Curtains[8] is shown in Figure 6. The material has great high frequency performance and the lower frequencies still have 10 dB better performance than the diffraction of sound over the barrier. An example of the noise treatment installation at Mt Sinai Hospital in Hartford, CT is shown in Figure 7. The ABBC-EXT-R Sound Curtains were hung from the front and side of a security fence around a cooling module to mitigate the airborne noise at the site. Current pricing is $542 for a 2-inch thick, 54 inch wide by 96-inch-high curtain from AcousticalSolutions.com.

Meeting the 45 dBA night time limit is required, so my recommendation is to install an 8-foot barrier on the south side of the inverter as shown in Figure 4. This barrier is expected to bring the property line airborne noise levels below 45. Since propagation through the barrier material exceeds 20 dB the property line noise level would be at or below the 45 dBA limit for this treatment configuration.

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Figure 6. The Effect of an Acoustic Barrier on Transmission to Nearby Properties

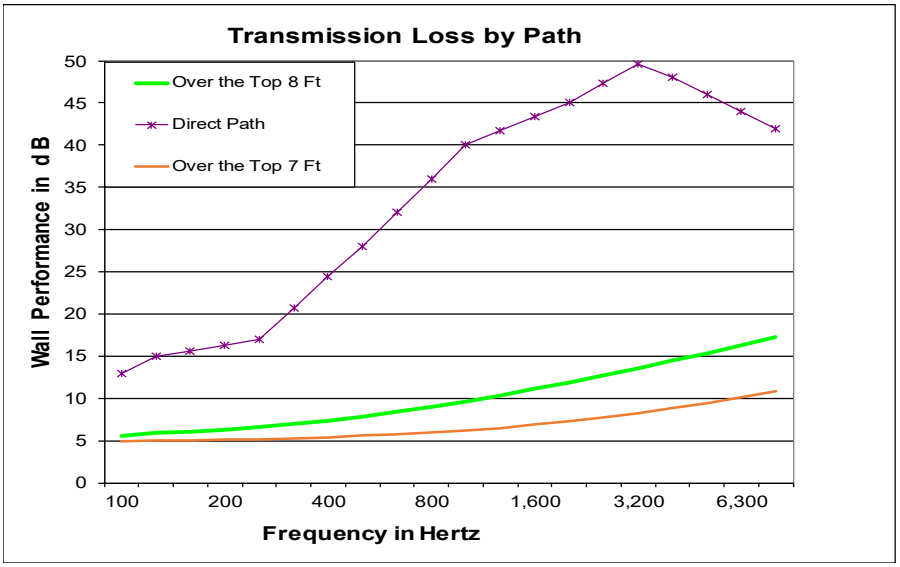

Figure 7. Eight Foot Fence Surrounding a Cooling Module with Noise Treatment

Conclusions

The purpose of this effort has been to evaluate the acoustical environment at the New Canaan site near 564 South Avenue in New Canaan, CT. This has been accomplished and the results show that the acoustic impact to the two closest properties southeast of the BESS & CHP System, needs to be addressed. No mitigation is necessary to meet the 55 dBA requirement at the site. An eight-foot-high barrier is required to meet the 45 dBA night time requirement. Airborne noise levels with this noise treatment are expected to be below 45 dBA at all the property lines.

The acoustic barrier as described in this report should mitigate the noise issue on the southeast side of the inverter location. An 8-foot-high barrier wall on the southeast side of the inverter would be effective in meeting the night time 45 dBA limit for the inverter that is 66 meters from the property line. The separation between the inverter and barrier will be about 4.5 meters. The other System components do not need noise mitigation. This noise control approach should remove any acoustic concerns about siting and operating the System at the New Canaan YMCA site at 564 South Avenue.

References

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4) New Canaan Noise Ordinance.pdf, https://portal.ct.gov/search-results/?q=new%20canaan#gsc.tab=0&gsc.q=new%20canaan&gsc.page=1

   a) *Chrome Extension: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/ https://portal.ct.gov/-/media/deep/air/noise/ordinances/ newcanaannoiseordinancepdf.pdf*

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