Connecticut Green Bank
CEFIA Holdings LLC

PETITION OF CONNECTICUT GREEN BANK AND CEFIA HOLDINGS LLC FOR A DECLARATORY RULING THAT A CERTIFICATE OFENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED IS NOT REQUIRED FOR THE CONSTRUCTION, OPERATION, AND MAINTENANCE OF A 1.95 MEGA WATT (AC) SOLAR PHOTOVOLTAIC POWER GENERATION FACILITY AT THE MANSON YOUTH CORRECTIONAL INSTITUTION, 42 JARVIS STREET IN CHESHIRE, CONNECTICUT

May 17, 2022

Prepared for:

Connecticut Green Bank
75 Charter Oak Avenue, Suite 1-103
Hartford, CT 06106

CEFIA Holdings LLC
75 Charter Oak Avenue, Suite 1-103
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Project No. 2021-040:MYI

Prepared by:

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EXHIBIT LIST

I. INTRODUCTION

Pursuant to Conn. Gen. Stat.§§ 4-176(a) and 16-50k(a) and Conn. Agencies Regs.§ 16- 50j-38 *et seq.,* Connecticut Green Bank, a Connecticut quasi-public agency ("Green Bank") and CEFIA Holdings LLC, a Connecticut limited liability company and subsidiary of Green Bank (together the "Petitioner") requests that the Connecticut Siting Council ("Siting Council") approve by declaratory ruling the location, construction, operation, and maintenance of a solar photovoltaic facility capable of up to 2 MW AC, and associated equipment ("Project") consisting of approximately 6.7 acres of solar panels to be constructed at the Manson Youth Correctional Institutions at 42 Jarvis Street in Cheshire, Connecticut (the "Project Site").

Conn. Gen. Stat. § 16-50k(a) provides:

> Notwithstanding the provisions of this chapter or title 16a, the council shall, in the exercise of its jurisdiction over the siting of generating facilities, approve by declaratory ruling... the construction or location of any customer-side distributed resources project or facility… with a capacity of not more than sixty-five megawatts, as long as: (i) Such project meets air and water quality standards of the Department of Energy and Environmental Protection, and (ii) the Council does not find a substantial adverse environmental effect...

As discussed in this Petition, the Petitioner's goal is to design and construct an environmentally compatible project that produces the maximum amount of energy while avoiding and minimizing adverse environmental impacts. Based on the information presented in this Petition, the Project will meet the air and water quality standards established by the Department of Energy and Environmental Protection ("DEEP"), and will not cause any substantial adverse environmental effects to the immediate and surrounding area. Accordingly, the construction, operation, and maintenance of the Project satisfies the criteria of Conn. Gen. Stat. § l6-50k(a).

II. PETITIONER

Green Bank is a quasi-public agency established and authorized pursuantto Conn. Gen. Stat. § l6-245n. As the nation's first full-scale green bank, it is leading the clean energy finance movement by leveraging public and private funds to scale-up renewable energy deployment and energy efficiency projects across Connecticut. CEFIA Holdings LLC is a wholly-owned subsidiary of Green Bank. The Petitioner is currentlyworking with the State of Connecticut (the "State') to facilitate solar photovoltaic ("PV") deployment at sites operated by the State's Department of Correction ("DOC").

Leading the development on behalf of the Petitioner is SunPower Corporation ("SunPower") SunPower is based in California, but is familiar with the requirements of projects in the Northeast as it has a regional office at 262 Washington St, Suite 700, Boston, MA. SunPoweris an industry leading developer and operator of solar energy facilities with over 36 years of experience with solar energy development having developed more than 1.2 GW of commercial solar projects in North America.

Please address all correspondence and/or communications regarding this Petition to:

Evan Mazzaglia
Project Manager
SunPower Corporation
262 Washington Street, Suite 700
Boston, MA 02108
Evan.Mazzaglia@sunpower.com

A copy of all such correspondence and/or communications to the Petitioner's Engineering Consultant:

Timothy Coon, P.E.
Principal Engineer
J.R. Russo & Associates, LLC
P.O. Box 938
East Windsor, CT 06088
tcoon@jrrusso.com

III. PROPOSED PROJECT

A. PROJECT BACKGROUND

In developing this Project, the Petitioner has taken into account the State's energy policy which includes: (i) having all electricity purchased and generated by the Executive Branch being 100% zero carbon by 2030, and (ii) deploying an average of 10,000 kWDC of new solar capacity annually for the next 10 years, primarily through new projects sited on state buildings or property.[1] As a solar development, the proposed Project is considered a Class I renewable energy source under General Statutes § 16- 1(a)(26).

The Project creates a significant benefit for the State and its residents. Over the course of a 25-year Power Purchase Agreement (PPA) between the Petitioner and the State's Department of Administrative Services (DAS), the Project will produce solar power for consumption at DOC facilities while also reducing their electric bills. When the solar array is removed from the Property upon expiration of the lease, the prior agricultural use of the Property can resume, if so desired. During its lifespan, the Project will help to reduce greenhouse gas emissions and pollutants and also reduce the electric cost of the State.

B. SITE SELECTION

The Petitioner based the site selection process for the Project on a detailed evaluation of the following key criteria.

- Site suitability (size, topography, and apparent lack of biological and hydrological conflicts in initial screening);
- Site availability and mutual benefits (ability to come to suitable lease terms with landowner and offer meaningful savings under a Power Purchase Agreement); and
- Proposed cost of interconnecting to and proximity to critical infrastructure (suitable electrical grid access).

[1] See Governor Ned Lamont's Executive Order No. 21-03

After performing an initial site evaluation, the Petitioner began a preliminary design of a site layout that would best minimize negative environmental impacts. In addition, the Petitioner retained the following consultants to assist in the evaluation and design of the Project:

- Archaeological Consulting Services (ACS) - Archaeologist
- J.R. Russo & Associates, LLC - Civil Engineering/Surveying/Planning
- Davison Environmental - Wetland Delineation Report
- KMG Design Group - Electrical Design and Utility Interconnection

C. PROPERTY DESCRIPTION

The Project Site consists of approximately 13 acres of undeveloped land, part of a larger 167-acre parcel located at 42 Jarvis Street in Cheshire, Connecticut. A Vicinity Map is provided as Exhibit 1. The property is owned by the State of Connecticut and is the current location of the Manson Youth Correctional Institution. The property is bounded to the northeast, north, and west by commercial and industrial properties; to the southwest by the parking lot for the Farmington Canal Heritage Hiking Trail; to the south by Jarvis Street and across Jarvis Street by the Maloney & Webster and Cheshire Correctional Institution; and to the east by Highland Avenue (Rte. 10) and across the highway the Cheshire Town Park and residentially zoned land. The Farmington Canal appears to run along a portion of the western property boundary. The property is improved with several buildings associated with the correctional institution. However, much of the property consists of undeveloped woodland and open hay fields. The main access is via a driveway off of Jarvis Street at the southwest corner of the property. Exhibit II includes a Land Use Map which depicts the surrounding zoning within one-half mile of the property. In addition,

Exhibit III includes an overall aerial plan showing the surrounding land uses within one-half mile of the subject property.

The Project Site consists of two proposed arrays: Array 1 located to the southwest of the main facility buildings and Array 2 located to the southeast of the main facility buildings adjacent to the west side of the main driveway. Both array areas are currently maintained as hay fields, with the exception of a small peninsula of trees located in the southern portion of the Array 1 area. The Array 1 area is classified by the Natural Resource Conservation Service (NRCS) as Farmland of Statewide Importance. The Array 2 area is classified as an area of Prime Farmland (Exhibit IV.)

D. PROJECT DESCRIPTION

As discussed above, the project will consist of two arrays. Array 1 is anticipated to include 2,880 PV modules within a 4.04 acre fenced area. Array 2 is anticipated to include 1,800 PV modules within a 2.65 acre fenced area. Construction activities will include minor clearing and grubbing of approximately 1.37 acres of existing trees in the southern area of Array 1; construction of access roads; layout and placement of foundation systems, racking, solar PV panels, and string inverters; installation of utility pads and associated electrical equipment; installation of electrical conduit, conduit supports; installation of underground transmission line; and installation of security fencing. Each array will be completely enclosed with a 7-foot chain-link security fence with gated access elevated 8" off the ground to allow for small animal movement into and out of the array areas. Detailed Site Plans are provided in Exhibit V.

The PV panels and inverters will be mounted on a driven post racking system at a 25- degree tilt facing due south. Inverters will be mounted to the racking system, underneath the PV panels. The minimum and maximum height of the panels

above grade will be two feet (2') and ten feet (10'), respectively. The aisle width between rows of panels will be 16.65 feet. A specification sheet for the anticipated PV module is included as Exhibit VI. However, the PV module is subject to change as additional optimization and market conditions may dictate.

The panels will be installed at existing grades. Some minor grading will be required to fill and smooth off the stump holes remaining from clearing and grubbing activities, but, otherwise, excavation and grading will be limited to the construction of the stormwater management controls, access road, and equipment pads and trenching for conduit installation. Minor soil disturbance will also be required to drive the piles that will support the PV racking systems. As a result, the majority of the Prime Farmland Soils of Statewide Importance will be maintained.

Construction of the project is anticipated to begin in the summer of 2022. The project construction period is estimated at 4-6 months from Notice to Proceed. Once operational, the Project will have a design life of twenty-five (25) years. The anticipated wattage of the Project is 1,950 kW AC. At the end of the operational life of the Project, the Petitioner will remove all equipment (e.g. racking system, panels, inverters, electrical collection system, etc.) from the Project Site. A Decommissioning Plan is provided as Exhibit VII. At that point, the land can be reverted back to its current use as hay fields.

E. INTERCONNECTION

The Petitioner proposes interconnecting the Project to the existing 25 kV switchgear located on the property. The interconnection will require the installation of new underground MV conduit runs in trench from each (East and West) proposed ground mounted PV arrays to the switchgear located outside the existing facility. A 25 kV metal enclosed switch and metering compartment will be installed at the location of the existing switchgear. A

pad mounted transformer will be installed at each PV array (east and west) to step-up the native voltage of the inverters from 480 V AC to 23 kV. The interconnection point will be behind the meter, and all of the power produced will be utilized by existing on-site DOC facilities.

F. LOCAL INPUT & NOTICE

The Petitioner has actively sought input and approval from the Town of Cheshire, and remains committed to providing the Town with as much information regarding the Project as possible. In support of this goal, the Petitioner submitted 50% drawings to the Town Planner in early February and attended a meeting with the Town Planner, Assistant Town Planner, Town Manager, and Public Safety Official on February 15, 2022 to present the site plan and solicit feedback. The project was well received by all parties. Final Site Plans will be provided to the Cheshire Planning Department concurrently with the submittal of this Petition to the Siting Council.

Additionally, as required by the Regulations of Connecticut State Agencies § 16-50j-40(a), the Petitioner provided notice of its intent to file this petition to all adjacent property owners and appropriate municipal and state legislative officials. Attached as Exhibit VIII, is a copy of the notice, a list of those notified and a map showing the abutting property owners.

IV. POTENTIAL ENVIRONMENTALIMPACTS

The Petitioner and its consultants have completed a comprehensive environmental and cultural resources assessment of the Site. As part of this process, relevant agencies were consulted and environmental impacts were evaluated and mitigated as appropriate.

For these reasons and those addressed further below, this Project avoids, reduces, and mitigates potential environmental impacts.

A. AIR QUALITY

The Project will have no air emissions during operation and only very minor air emissions of regulated air pollutants and greenhouse gases during construction. The Petitioner will control any temporary emissions at the Project Site by enacting appropriate mitigation measures (e.g., water for dust control; avoid mass early morning vehicle startups and excessive idling times, etc.). Accordingly, any potential air effects produced by the Project's construction activities will be *de minimis*. During operation, the Project will not emit regulated air pollutants or greenhouse gases (e.g., PM, VOCs, GHG or ozone). No air permit will be required for either construction or operation of the Project. Moreover, as discussed above, the Project will provide a benefit to Air Quality by eliminating the discharge of CO_2 and other pollutants by displacing other fossil fuel burning energy sources.

B. BIOLOGICAL RESOURCES

An initial request for review of the Natural Diversity Database (NDDB) was submitted to DEEP during the spring of 2020. DEEP responded with a letter on July 22, 2020 (Exhibit IX). The NDDB review identified the potential existence of Eastern Box Turtle in the vicinity of the site and recommended implementation of specific Protection Strategies during construction to protect against the unintentional harm of the turtles. A copy of the Turtle Protection Strategies is included as Exhibit X. These strategies have been incorporated in the development of the Site Plans and proposed construction sequence. As a result, the Project is not anticipated to have an adverse impact on the Eastern Box Turtle or any DEEP listed species.

C. WETLANDS

The state and federal wetlands in the vicinity of the Project were delineated by Davison Environmental on October 7, 2021 and December 10, 2021. The investigations identified two small man-made wetlands located adjacent to the proposed transmission route between Array 1 and the interconnection point. These wetlands appear to have been historically created to manage stormwater from the adjacent developed parking lots. They are fed and discharge through underground piping. These wetland flags have been surveyed and mapped, and the wetland resources are shown on the attached detailed Site plans (Exhibit V.) In addition, another wetland was delineated in the wooded area to the west of Array 1. However, this wetland was determined to be well over 200 feet for any Project activity, and as a result it was not surveyed or shown on the Site Plans. Davison's Wetland Delineation report is provided in Exhibit XI.

The proposed Project was designed to avoid impacts to the existing wetland resources at the Project Site. No work is being proposed within the delineated wetland boundaries. The nearest activity to the wetlands involves the trenching and installation of utility conduit. The closest the trenching will come to the wetland is approximately 25'. Silt fence will be installed between the trench excavation and the wetland in order to provide protection from sedimentation. The trench excavation and conduit installation in this area should take no more than a day or two. The disturbed area will then be seeded and mulched immediately to facilitate the stabilization of the area and minimize the potential impact to the adjacent wetland. The silt fence will be maintained until vegetation becomes established. As a result of the limited activity, distance from the wetland, and erosion and sediment control measures to be implemented, no adverse impact to the wetland is anticipated as a result of the construction of the Project.

D. STORMWATER MANAGEMENT

The Petitioner conducted outreach and met on February 1, 2022 with Chris Stone, Neal Williams, and Laura Gaughran of the DEEPs Stormwater section to discuss the Project's location, environmental characteristics and proposed stormwater management measures. This consultation was performed early on so that the DEEP's comments could be incorporated into the site design, particularly as they related to stormwater management and erosion and sedimentation measures.

As discussed above, the Project will include two separate solar arrays. The Array 1 site currently consists of a hayed field, with the exception of a small peninsula of woods at the southern end of the array. Runoff from the Array 1 area currently sheet flows westerly across the field and woods through the field to the northwest. The Array 2 site consists entirely of an existing hayed field. Runoff from the Array 2 site currently sheet flows northerly across the hay field into the adjacent driveway where it enters the existing catch basins and drainage system in the driveway.

The two arrays will be installed at existing grades. Thus, existing drainage patterns will be maintained and soil disturbance will essentially be limited to the construction of the stormwater management basins. The proposed fixed panel solar arrays will be installed on elevated racks that provide adequate height above the ground to promote the continued growth of the existing vegetative cover and allow for infiltration. As a result, post construction, the areas containing the solar arrays can be considered pervious vegetated groundcover. A series of stormwater management basins will be constructed downgradient of the arrays in order collect the runoff and provide treatment, groundwater recharge, and retention of the stormwater. These basins have been designed in accordance with the Connecticut Stormwater Quality Manual and DEEP's

General Permit for Discharge of Stormwater and Dewatering Wastewater Activities Associated with Construction Activities ("General Permit").

A detailed Drainage Report has been prepared by J.R. Russo & Associates, LLC (Exhibit XII). As detailed in the report, the development of the site is anticipated to result in slight reduction of runoff from the site. Other temporary soil erosion and sedimentation control measures will include silt fencing, fiber rolls, anti-tracking pads, outlet protection, and permanent seeding to stabilize disturbed soils as soon as possible during construction. With these measures, the completed development is not anticipated to have an adverse impact to the surrounding water and wetland resources.

Since the construction will disturb more than 1 acre of land, the Petitioner must register under the DEEP's General Permit at least sixty (60) days prior to commencing construction activities. The Petitioner will prepare a Stormwater Pollution Control Plan, submit it to the DEEP for review, and register under the General Permit in accordance with the requirements and timelines established by the General Permit.

E. FLOODPLAINS

The attached Federal Emergency Management Agency (FEMA) Flood Map (Exhibit XIII) indicates that the Project is not located within the 100-year flood zone. As a result, the proposed project is not expected to have an impact on the floodplain.

F. DRINKING WATER RESOURCES

The proposed activities associated with the Project do not involve the withdrawal of water, nor the storage or use of oil or hazardous materials (other than what is present in the construction equipment). Any water utilized during construction for dust control will be minimal. Thus, the proposed project is not anticipated to have an impact on the water quality in the vicinity of the Site.

A review of the Connecticut Aquifer Protection Area Map prepared by the CT DEEP Aquifer Protection Area Program (Exhibit XIV) indicates that the Project is not located within an area identified as an Aquifer Protection Area. The nearest Aquifer Protection Area is located approximately 1,600 feet northwest of the Project Site. Based on the separation distance, the proposed project is not anticipated to have an impact on the Aquifer Protection Area.

G. HISTORIC RESOURCES

On January 14, 2022, a request was submitted to the Connecticut State Historic Preservation Office (SHPO) for review of the Project in relation to historic and archaeological resources. SHPO's response dated February 7, 2022 is provided as Exhibit XV. Based on the environmental characteristics of the Site, SHPO determined that the Project does have the potential to contain significant archeological resources. As a result, SHPO requested a professional archaeological assessment and reconnaissance survey be completed prior to construction.

Based on SHPO's request, Archaeological Consulting Services (ACS), was retained to conduct a Phase 1 archaeological reconnaissance survey at the Project Site. The assessment was completed during March and April 2022. An Interim Report prepared by ACS is provided as Exhibit XVI. The report concludes that no positively identified prehistoric feature contexts or artifacts were identified during the survey and recommends no further archaeological conservation effort be required. A copy of the Interim Report will be submitted to SHPO for their concurrence with the findings of the report. Based on the results of the survey, the Project is not anticipated to have a negative effect on any historical or archaeological resources.

H. SCENIC VALUES & VISUAL IMPACTS

As discussed above, the Site Property is the location of an existing State correctional facility. The majority of the abutting land consists of commercial and industrial uses or other land utilized by the State for correctional facilities. The nearest sensitive visual

receptors to the Project appear to be the parking lot for the Farmington Canal Heritage Trail to the west and the Cheshire Town Park across Highland Avenue to the east. However, as shown on the Overall Plan (Exhibit IV), the Project Site is located over 1,000 feet from the Farmington Canal Heritage Trail parking lot with an approximate 500-foot-wide swath of mature forest between the parking lot and the Project Site. Similarly, the Project Site is located over 450 feet from Highland Avenue. The view from Highland Avenue and the park across the street is screened by a row of mature evergreen trees along the edge of the road. Array 1 is also located over 500 feet from Jarvis Street, separated from view by an approximate 300' wide strip of mature forest. Array 2 is located over 300 feet from Jarvis Street, separated from view by an approximate 250' wide strip of existing trees and prison facility buildings. As a result, the visibility of the Project from the surrounding streets will be extremely limited, and the potential for visual impacts is minor. In addition, the use of low-profile Project components less than ten (10) feet above grade (e.g., racking system, panels, inverters, etc.) also significantly reduces potential visible impact.

I. PUBLIC HEALTH AND SAFETY

Overall, the Project will meet or exceed all health and safety requirements applicable for electric power generation. Each employee working on the Project Site will:

- Receive required general and site-specific health and safety training;
- Comply with all health and safety controls as directed by local and state, requirements;
- Understand and employ the Site health and safety plan;
- Know the location of local emergency care facilities, travel times, ingress and egress routes; and
- Report all unsafe conditions to the construction manager.

During construction, heavy equipment and construction vehicles will be required to access the Project Site during normal working hours (7 a.m. to 7 p.m. Monday

through Saturdays; Sundays only as required). After construction is complete and during operation, traffic to the Site will be limited to one to two light-duty vehicles on a monthly recurring basis for the standard operations and maintenance activities. There will not be a permanent staff present at the Site, and the facility will be monitored remotely by SunPower staff or contracted third-party operations and maintenance providers.

The project will not produce significant noise during operation. During the construction of the Project, higher levels of noise are anticipated. However, all work will be conducted during normal working hours and it is not anticipated that the levels of noise will exceed State or local noise standards or limits.

Because the solar modules are designed to absorb incoming solar radiation and minimize reflectivity, only a small percentage of incidental light will be reflected off the panels. This incidental light is significantly less reflective than common building materials, such as steel, and the surface of smooth water.

Prior to beginning the Project operation, the Petitioner will meet with Town first responders to provide them information regarding response to emergencies at PV facilities, discuss industry best practices, and provide a tour of the Site. The first responders will also be provided keys to the facility gates so that, in the event of a fire or emergency requiring site access, they will have access to the sites.

J. FEDERAL AVIATION ADMINISTRATION NOTIFICATION

Pursuant to 14 CFR § 77.9 regarding the Federal Aviation Administration (FAA) Notice of Proposed Construction or Alteration, an evaluation was performed using the FAA's on-line Notice Criteria Tool. Based on the proximity to the nearby airports, the Notice Criteria Tool concluded that FAA notification is required. As a result, a Notice of Proposed Construction or Alteration – Off Airport (form 7460-1) was completed and

submitted to the FAA on March 10, 2022. Subsequently, the FFA conducted an aeronautical study and concluded that the proposed structure (i.e. solar array) will not be a hazard to air navigation provided a Notice of Actual Construction or Alteration (FAA Form 7460-2) be e-filed within 5 days after construction reaches its greatest height. The Petitioner will submit this required FAA notification at the appropriate time during construction. A copy of the FAA Determination is included as Exhibit XIV.

V. CONCLUSION

The Project will provide numerous and significant benefits to the Town, State and its citizens, and will provide a step toward the State's goal of achieving cleaner, less expensive, and more reliable sources of energy. This development of a source of green energy will produce substantial environmental benefits with minimal environmental impacts. Pursuant to CGS § 16-50k(a), the Siting Council shall approve by declaratory ruling the construction or location of a customer-side distributed resources project or facility with a capacity of not more than sixty-five (65) MW, as long as such project meets DEEP air and water quality standards and will not have a substantial adverse environmental effect. As demonstrated within this petition, the Project meets the criteria.

Accordingly, and for the reasons stated herein, because the proposed Project will meet state air and water quality standards and will not have a substantial adverse effect on the environment, the Petitioner requests that the Siting Council approve the location and construction of the proposed Project by declaratory ruling.

[signature page follows]

Respectfully submitted,

Connecticut Green Bank

By: 

Brian Farnen
General Counsel and Chief Legal Officer

CEFIA Holdings LLC

By Connecticut Green

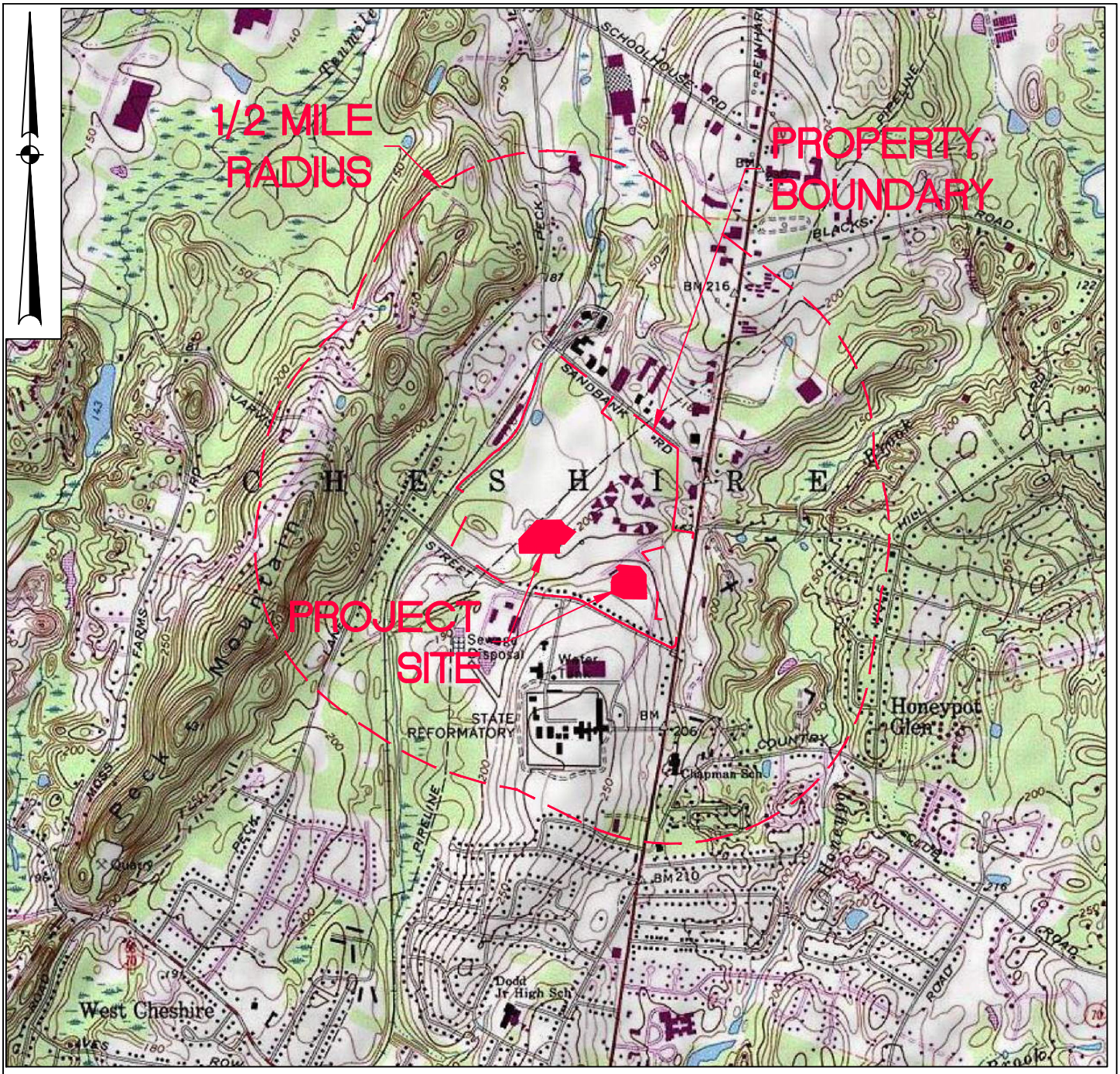
Bank, its Manager

By: 

Brian Farnen
General Counsel and Chief Legal Officer

EXHIBIT I

VICINITY MAP



SOURCE:
SOUTHINGTON, CT USGS QUADRANGLE
NATIONAL GEOGRAPHIC
REVISION DATE 1992

VICINITY MAP

CT GREEN BANK SOLAR
Manson Youth Institution

42 Jarvis Street
Cheshire, Connecticut

RUSSO
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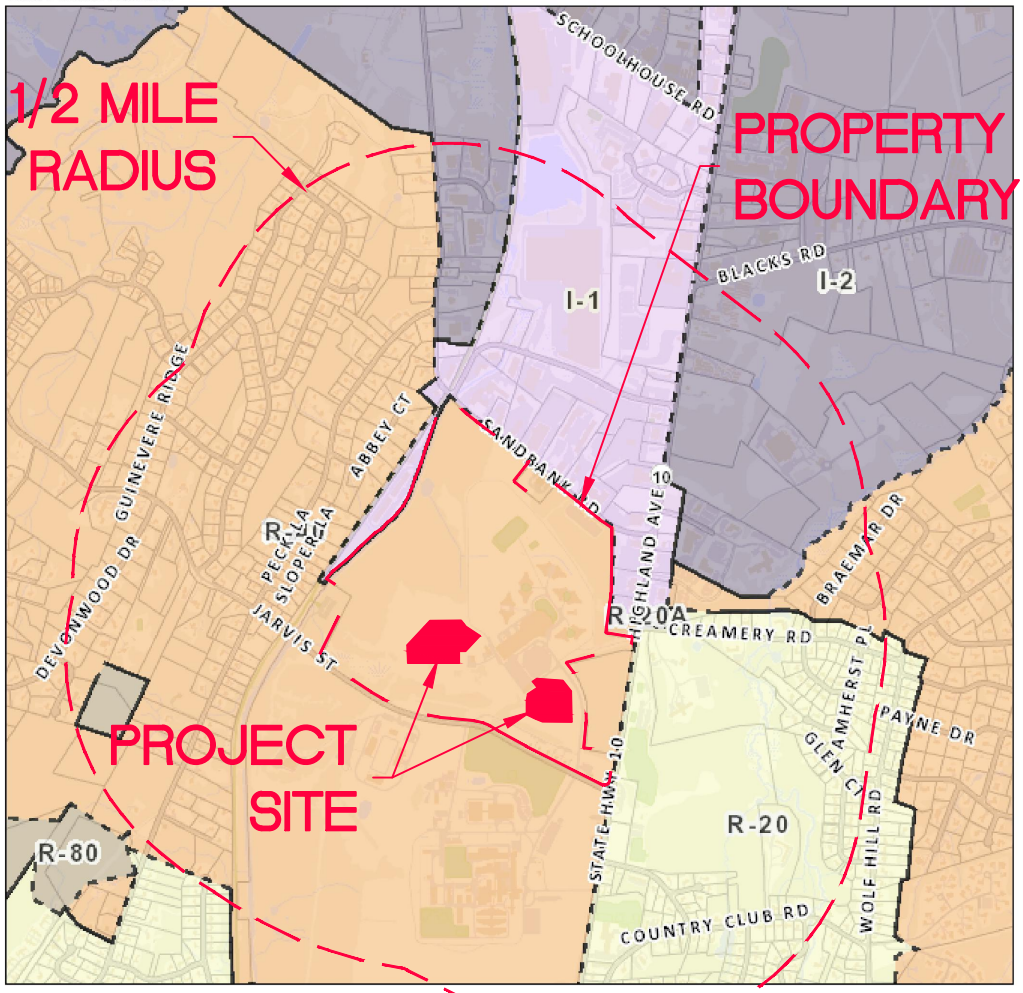
DATE	4–27–2022
SCALE	1"=2,000'
JOB NUMBER	2021–040M
SHEET	EXHIBIT I

EXHIBIT II

LAND USE MAP

Town of Cheshire
Geographic Information System (GIS)

Date Printed: 2/9/2022



MAP DISCLAIMER - NOTICE OF LIABILITY
This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Cheshire and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 1500 feet

0 1,500 Feet

N W E S

ZONING LEGEND:

I-1	INDUSTRIAL DISTRICT 1
I-2	INDUSTRIAL DISTRICT 2
R-20	RESIDENTIAL DISTRICT 20
R-20A	RESIDENTIAL DISTRICT 20A
R-40	RESIDENTIAL DISTRICT 40

SOURCE:
CHESHIRE CT GIS ZONING MAP

LAND USE MAP

CT GREEN BANK SOLAR
Manson Youth Institution

42 Jarvis Street
Cheshire, Connecticut

RUSSO
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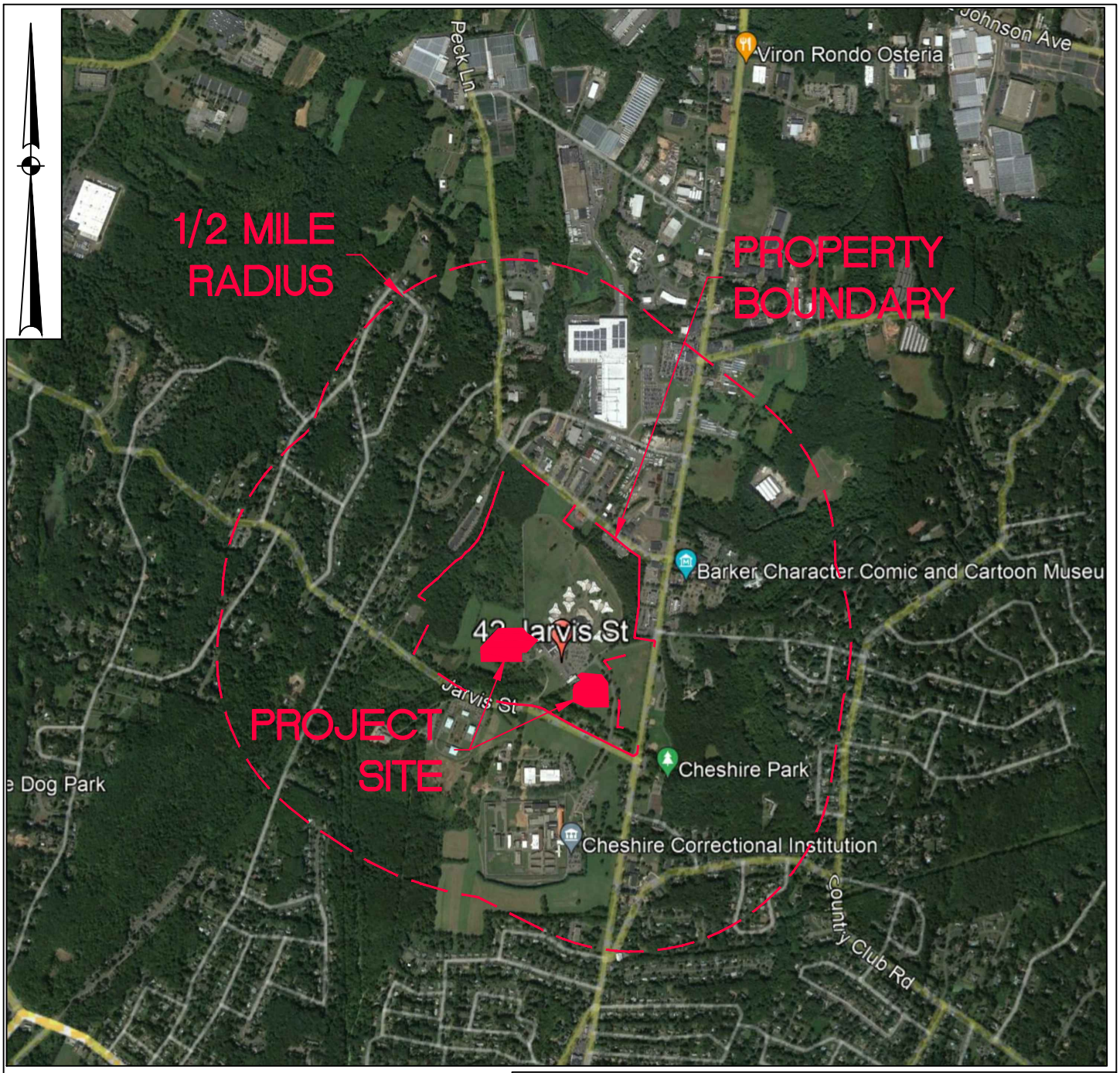
EXHIBIT III

OVERALL AERIAL PLAN



OVERALL AERIAL PLAN

CT GREEN BANK SOLAR
Manson Youth Institution

42 Jarvis Street
Cheshire, Connecticut

SOURCE: GOOGLE EARTH

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EXHIBIT IV

FARMLAND CLASSIFICATION

Farmland Classification—State of Connecticut
(Manson Youth Farmland Classification)

Map Scale: 1:3,440 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

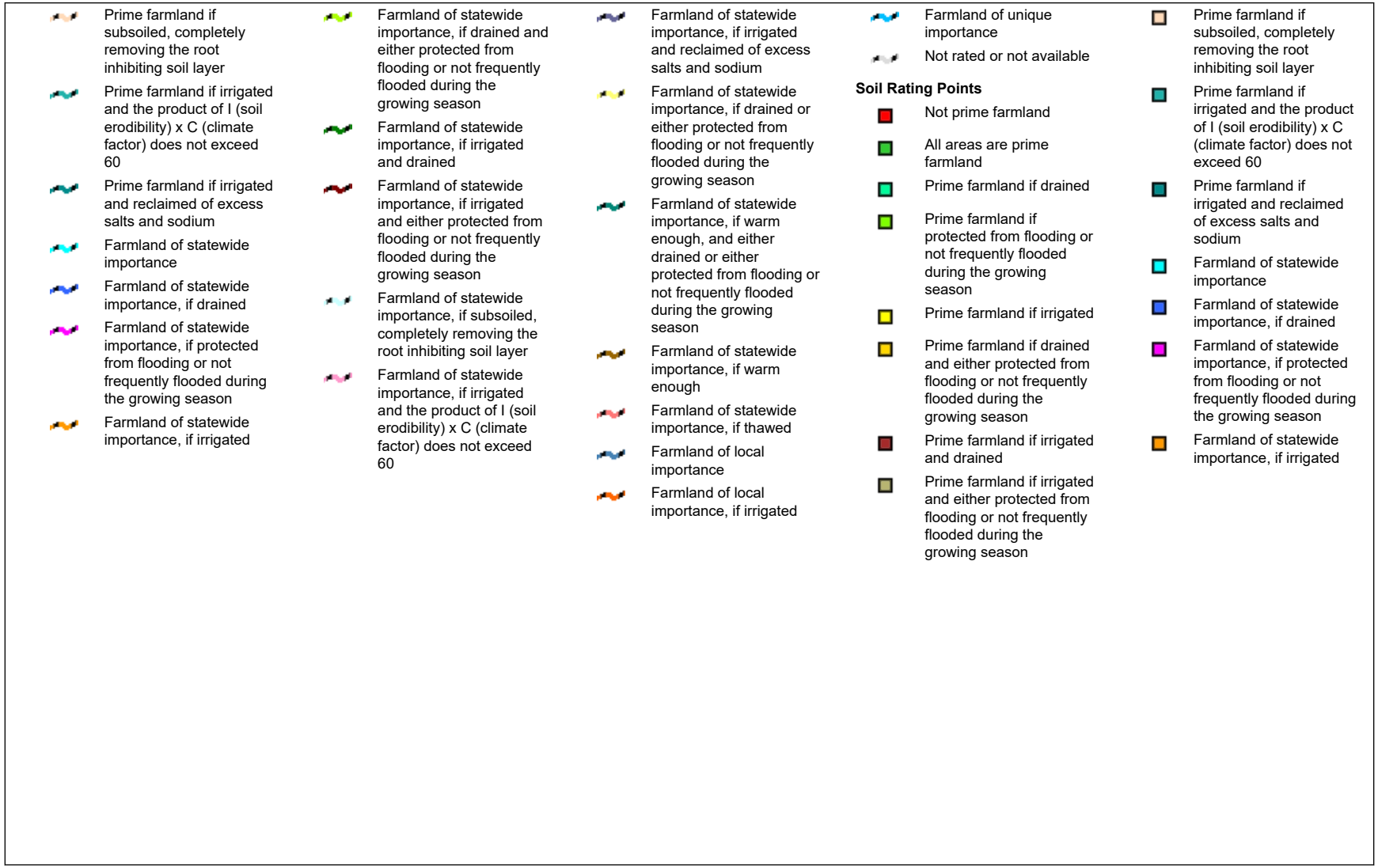
Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season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Farmland of statewide importance
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Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated
Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated and drained
Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if warm enough
Farmland of statewide importance, if thawed
Farmland of local importance
Farmland of local importance, if irrigated
Farmland of unique importance
Not rated or not available
Soil Rating Points
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated

- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 21, Sep 7, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 8, 2020—Jun 12, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
20A	Ellington silt loam, 0 to 5 percent slopes	All areas are prime farmland	0.3	2.5%
37A	Manchester gravelly sandy loam, 0 to 3 percent slopes	Farmland of statewide importance	3.4	26.2%
37C	Manchester gravelly sandy loam, 3 to 15 percent slopes	Farmland of statewide importance	4.0	30.6%
63B	Cheshire fine sandy loam, 3 to 8 percent slopes	All areas are prime farmland	5.3	40.2%
308	Udorthents, smoothed	Not prime farmland	0.1	0.5%
Totals for Area of Interest			**13.1**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

EXHIBIT V

SITE PLANS
(BOUND SEPARATELY)

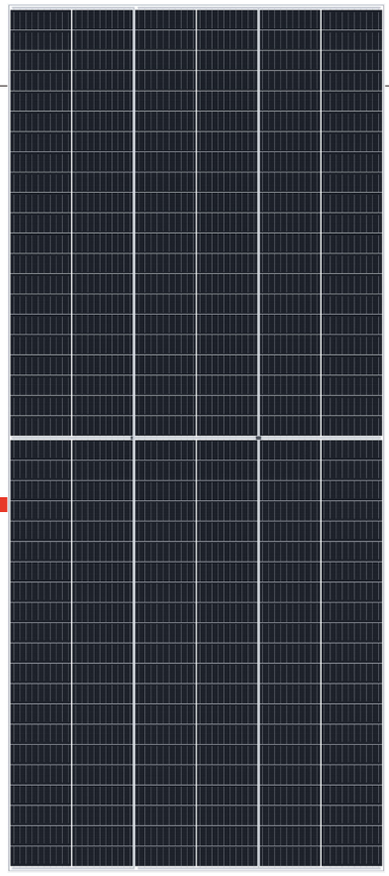
EXHIBIT VI

PV MODULE SPECIFICATIONS

THE

DUOMAX twin

BIFACIAL DUAL GLASS 252 LAYOUT MODULE



252 LAYOUT
MONOCRYSTALLINE MODULE

465-485W
POWER OUTPUT RANGE

20.6%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

PRODUCTS	POWER RANGE
TSM-DEG15VC.20(II)	465-485W

Founded in 1997, Trina Solar is the world's leading total solution provider for solar energy. With local presence around the globe, Trina Solar is able to provide exceptional service to each customer in each market and deliver our innovative, reliable products with the backing of Trina as a strong, bankable brand. Trina Solar now distributes its PV products to over 100 countries all over the world. We are committed to building strategic, mutually beneÿcial collaborations with installers, developers, distributors and other partners in driving smart energy together.

Comprehensive Products and System Certificates

IEC61215/IEC61730/IEC61701/IEC62716/UL61730
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
ISO45001: Occupation Health and Safety Management System

High power

- Up to 485W front power and 20.6% module efficiency with 1/3-cut and MBB (Multi Busbar) technology enable higher BOS savings
- Lower resistance and good reflection effect of MBB ensure higher power

High reliability

- Improved PID resistance through cell process and module material control
- Resistant to salt, acid, and ammonia
- Proven to be reliable in high temperature and humidity areas
- Mechanical performance: Up to 5400 Pa positive load and 2400 Pa negative load

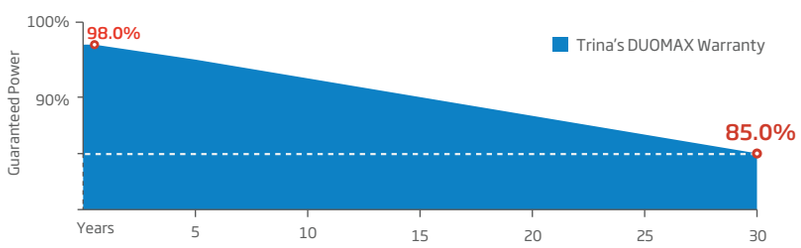
High energy generation

- Up to 25% additional power gain from back side depending on the albedo
- Excellent IAM and low light performance validated by 3rd party with cell process and module material optimization
- Better anti-shading performance and lower operating temperature

Easy to install

- Frame design makes module compatible with all racking and installation methods
- Easy to handle during transportation and install as normal framed module

Trina Solar's DUOMAX Performance Warranty

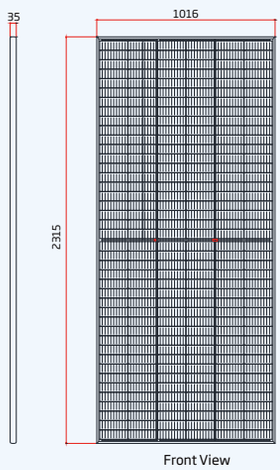


Trinasolar

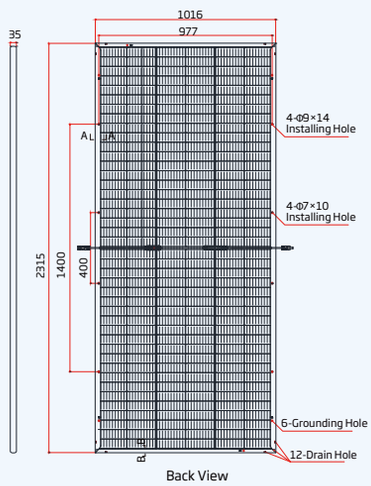
DUOMAX twin

BIFACIAL DUAL GLASS 252 LAYOUT MODULE

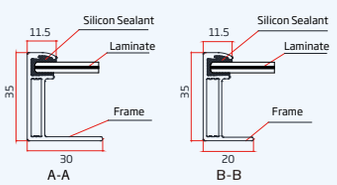
DIMENSIONS OF PV MODULE(mm)



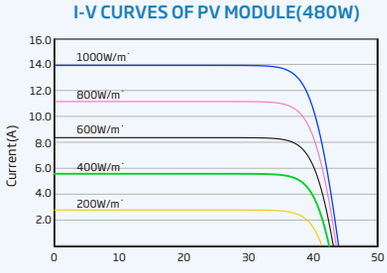
Front View



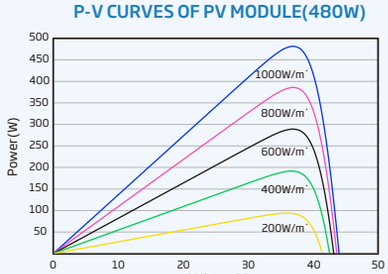
Back View



I-V CURVES OF PV MODULE(480W)



P-V CURVES OF PV MODULE(480W)



ELECTRICAL DATA (STC)

Peak Power Watts-P_{MAX} (Wp)*	465	470	475	480	485
Power Tolerance-P_{MAX} (W)			0 ~ +5		
Maximum Power Voltage-V_{MPP} (V)	35.8	35.9	36.0	36.1	36.2
Maximum Power Current-I_{MPP} (A)	12.99	13.09	13.19	13.29	13.39
Open Circuit Voltage-V_{OC} (V)	43.0	43.1	43.2	43.3	43.4
Short Circuit Current-I_{SC} (A)	13.58	13.68	13.80	13.92	13.97
Module Efficiency η_m (%)	20.0	20.0	20.2	20.4	20.6

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

Electrical characteristics with different rear side power gain (reference to 485 Wp front)

Maximum Power-P_{MAX} (Wp)	509	534	558	582	606
Maximum Power Voltage-V_{MPP} (V)	36.2	36.2	36.2	36.2	36.2
Maximum Power Current-I_{MPP} (A)	14.06	14.73	15.40	16.07	16.74
Open Circuit Voltage-V_{OC} (V)	43.4	43.4	43.4	43.4	43.4
Short Circuit Current-I_{SC} (A)	14.67	15.37	16.07	16.76	17.46
Pmax gain	5%	10%	15%	20%	25%

Power Bifaciality: 70±5%.

ELECTRICAL DATA (NOCT)

Maximum Power-P_{MAX} (Wp)	350	354	358	361	365
Maximum Power Voltage-V_{MPP} (V)	33.6	33.7	33.8	33.8	34.1
Maximum Power Current-I_{MPP} (A)	10.41	10.49	10.59	10.68	10.69
Open Circuit Voltage-V_{OC} (V)	40.5	40.6	40.7	40.8	40.8
Short Circuit Current-I_{SC} (A)	10.94	11.02	11.12	11.22	11.26

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline PERC
Cell Orientation	252 cells (12 × 21)
Module Dimensions	2315 × 1016 × 35 mm (91.14 × 40 × 1.38 inches)
Weight	30.0 kg (66.1 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant Material	POE/EVA
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)
Frame	35 mm (1.38 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²), Portrait: N 450 mm/P 450 mm (17.72/17.72 inches) Landscape: N 1400/P 1400 mm (55.12/55.12 inches)
Connector	MC4 EVO2 / TS4

TEMPERATURE RATINGS

NOCT(Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P_{MAX}	- 0.34 %/°C
Temperature Coefficient of V_{OC}	- 0.25 %/°C
Temperature Coefficient of I_{SC}	0.04 %/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum SystemVoltage	1500V DC (IEC)
	1500V DC (UL)
Max Series Fuse Rating	25A

(Do not connect Fuse in Combiner Box with two or more strings in parallel connection)

WARRANTY

12 year Product Workmanship Warranty

30 year Power Warranty

(Please refer to product warranty for details)

PACKAGING CONFIGUREATION

Modules per box: 31 pieces

Modules per 40' container: 589 pieces

** Back-side power gain varies depending upon the specific project albedo

Trinasolar

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

Version number: TSM_DEG15VC.20(II)_2021_B

www.trinasolar.com

EXHIBIT VII

DECOMMISSIONING PLAN

SUNPOWER

Decommissioning Plan
DOC Site Solar Projects

This Decommissioning Plan (Plan) is set to establish the procedures of decommissioning activities for the permanent closures of solar sites, removal of electrical equipment, solar arrays, and structures. The Plan will be implemented at the end of the useful life at each of the DOC solar sites operated by the Connecticut Green Bank as described below. The Plan also describes the planned land-restoration activities post removal of the solar site on DOC properties.

This Plan will take place at each of the following sites:

- 289 & 391 Shaker Road, Enfield - Enfield, Robinson A&B, Willard
- 264 Bilton Road, Somers - Cybulski
- 335 Bilton Road, Somers – Osborne
- 900 Highland Avenue, Cheshire - Maloney & Webster
- 42 Jarvis Street, Cheshire - Mason Youth

Decommissioning Activities

Decommissioning will involve the removal, disposal or recycling of all project components. All materials that can be recycled will be shipped to local recycling centers. Any materials that cannot be recycled will be transported to landfills. The majority of the materials and components from the site are recyclable.

Decommissioning Preparation

Site decommissioning and removal will be scheduled at the end of the contracted useful life of the solar sites. The sites will be powered down and disassembled over the course of several months on each of the individual sights. The duration of the decommissioning and removal will vary from site to site depending on the size of the site. Materials and components will be stockpiled on site in temporary locations prior to being transported off site to recycling or transfer stations.

All power to the solar facility will be disconnected and any power required for the decommissioning will be made available though portable generators.

SUNPOWER

PV Module Removal and Recycling

During decommissioning, all solar site components will be removed from site, including all electrical equipment and cabinets, utility disconnects, all PV, racking, driven piles, inverters, above grade conductors, above grade conduit, and equipment pads.

PV modules will be stacked temporarily, prior to transport to a predetermined PV recycling center. Nearly 100% of the PV modules materials are recyclable and recoverable.

Inverter, Conductor (wire), and Conduit Removal and Recycling

Through the process of decommissioning the site will be de-energized and disconnected from the grid and facility in which it is providing electrical power to. Upon completing this at each site the conductors will be removed from all above grade conduit and all above grade conduit will be removed as well. All metal conduit removed will be recycled. This includes metal conduit at electrical equipment pads, utility pads and interconnection points, and within the solar arrays.

The inverters will be removed from the arrays and stockpiled prior to disposal. Some of the components in the invertors can be removed (specifically metals like copper and aluminum) and recycled the remainder will be properly disposed of.
All above grade conductors will be cut at existing grade level and stockpiled prior to transport to a recycling center. Wherever possible conductors may be pulled out of under ground conduit to recover the materials, stockpiled, and transported to the recycling center.

Access Roads

Roads created to access the solar arrays in and around the solar sites will be left in place until the entire solar facility is decommissioned and removed. At the time of completed decommission the access roads will be removed and returned to original site condition.

Security Fence

Security fencing will be removed and recycled. All driven fence posts will be pulled and stockpiled prior to transport to the recycling center. All fence posts placed in concrete will be cut free from concrete base, stockpiled with rest of like materials prior to transport to the recycling center.

Electrical Equipment Removal and Recycling
All electrical equipment will be removed from their respective concrete pads demolished. Concrete will be sent to landfills. Electrical equipment will be stripped of all recyclable metals and sent to the recycling center. All circuit breakers will be removed and refurbished if possible or disposed of in a landfill.

Site Reclamation

After the solar facility has been completely decommissioned and all components of the facility have been removed from site, site reclamation activities will be preformed to return the individual sites to the preconstruction condition as a hayfield.

Restoration Process
The decommissioning process will remove solar structures, electrical equipment, concrete pads, and fencing as described in previous sections. After completion of this process, site reclamation activities will begin. The process will involve any necessary minor grading, replacement of topsoil, reseeding, and drainage. The goal will be to return the site to its preconstruction state matching onsite existing soils and compatible grasses.

All areas excavated as part of construction for equipment pads and roads will be backfilled and compacted to 80% of surrounding compaction with soils typical of the respective site. These areas will be replanted with seed mix to match onsite ground cover.

At the completion of decommissioning if any soils are compacted to levels unsuitable for regeneration of onsite vegetation or for new growth of applied seed mix those soils will be de-compacted to a depth suitable for targeted vegetation growth.

Original site drainage characteristics will be restored if substantially altered from preconstruction conditions. At the completion of regrading to recreate original drainage the same process of reseeding and replacement of local soils will occur.

Any bare earth created by the decommissioning process will be reseeded with the same seed mix to match the surrounding grasses.

Restoration Monitoring
The respective sites will be monitored by the contracted party after completion of the site restoration on a quarterly bases for two full growing seasons to ensure the regrowth of

existing grasses and reseeding process was successful. Any areas that failed to generate new grown of grasses (either from regeneration or reseeding) or were subject to soil erosion where decommissioning work took place will be restabilized and reseeded for the duration described above.

EXHIBIT VIII

NOTICE TO TOWN AND STATE OFFICIALS AND ABUTTERS AND ABUTTERS MAP

CERTIFICATION OF SREVICE

I hereby certify that on this 13th day of May, 2022 notice of intent to file the Connecticut Green Bank Petition for Declaratory Ruling was sent, via certified mail, to the following:

Cheshire Town Officials:
Sean Kimball, Town Manager
Town of Cheshire
84 South Main Street
Cheshire, CT 06410

Earl Kurtz, Chairman
Cheshire Inland Wetlands & Watercourses Commission
84 South Main Street
Cheshire, CT 06410

Earl Kurtz III, Chairperson
Cheshire Planning & Zoning Commission
84 South Main Street
Cheshire, CT 06410

Regional Council of Governments:
Naugatuck Valley Council of Governments (NVCOG)
49 Leavenworth Street, 3rd Floor
Waterbury, CT 06702

State Officials:
Rob Sampson
Senator – District S16
Legislative Office Building
300 Capitol Avenue, Room 4200
Hartford, CT 06106

Craig Fishbein
Representative – 90th District
Legislative Office Building
300 Capitol Avenue, Room 4200
Hartford, CT 06106

The Honorable William Tong
Attorney General
Office of the Attorney General
165 Capitol Avenue
Hartford, CT 06106

James C. Rovella, Commissioner
Department of Emergency Services and Public Protection
Emergency Management and Homeland Security Division
1111 Country Club Road
Middletown, CT 06457

Katie Dykes, Commissioner
Department of Energy & Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Manisha Juthani, M.D, Commissioner
Department of Public Health
410 Capitol Avenue
Hartford, CT 06134

Peter B Hearn, Executive Director
Council on Environmental Quality
79 Elm Street
P.O. Box 5066
Hartford, CT 06106

Marissa Gillett, Chair
Public Utilities Regulatory Authority
Ten Franklin Square
New Britain, CT 06051

Jeffrey R. Beckham, Acting Secretary
Office of Policy and Management
450 Capitol Avenue
Hartford, CT 06106

David Lehman, Commissioner
Department of Economic and Community Development
450 Columbus Boulevard
Hartford, CT 06103

Joseph Giulietti, Commissioner
Department of Transportation
P.O. Box 317546
2800 Berlin Turnpike
Newington, CT 06131-7546

Jonathan Kinney
State Historic Preservation Officer
Department of Economic & Community Development
450 Columbus Boulevard, Suite 5
Hartford, CT 06103

Bryan P. Hurlburt, Commissioner
Department of Agriculture
450 Columbus Boulevard, Suite 701
Hartford, CT 06103

Michelle Gilman, Commissioner
Department of Administrative Services
450 Columbus Boulevard
Hartford, CT 06103

(See attached List of Abutters)

List of Abutters

Norman Wium & Vanessa Dacunto
76 Curve Hill Road
Cheshire, CT 06410

State of Connecticut
79 Elm Street
Hartford, CT 06106

Town of Cheshire
84 South Main Street
Cheshire, CT 06410

Andrew A. & Rosemary Tranquilli
390 Contour Drive
Cheshire, CT 06410

Karen Slade Hekeler
380 Contour Drive
Cheshire, CT 06410

Marsha A. & Peter A. Lowe, Jr.
366 Contour Drive
Cheshire, CT 06410

Krista M. Casso
350 Contour Drive
Cheshire, CT 06410

Karen M. & Robert G. Zeena, Jr.
332 Contour Drive
Cheshire, CT 06410

Robert & Maryellen Price
316 Contour Drive
Cheshire, CT 06410

John W. & Joanne D. Gill
300 Contour Drive
Cheshire, CT 06410

Sanaa Baroudjian
282 Contour Drive
Cheshire, CT 06410

Judson W. Moore
366 Contour Drive
Cheshire, CT 06410

Joan B. Dube Family Trust
250 Contour Drive
Cheshire, CT 06410

Tinamaire Finoia
234 Contour Drive
Cheshire, CT 06410

Property Edge LLC
P.O. Box 275
Marion, CT 06444

Charlan K. Walston
180 Curve Hill Road
Cheshire, CT 06410

Sean W. & Leslie A. Burke
172 Curve Hill Road
Cheshire, CT 06410

John M. & Janet L. O'Dell
160 Curve Hill Road
Cheshire, CT 06410

Amy K. & Frank F. Wild, Jr.
148 Curve Hill Road
Cheshire, CT 06410

Sonia Irizarry
136 Curve Hill Road
Cheshire, CT 06410

James Maxwell Peltier, Jr. Trustee
124 Curve Hill Road
Cheshire, CT 06410

Brian E. Stancavage
112 Curve Hill Road
Cheshire, CT 06410

Joselyn Montalvo Romero
100 Curve Hill Road
Cheshire, CT 06410

Norman L. & Kathleen L. Bouchard
88 Curve Hill Road
Cheshire, CT 06410

New Meditrust Company LLC
173 Bridge Plaza North
Ft. Lee, NJ 07024

Meditrust
173 Bridge Plaza North
Ft. Lee, NJ 07024

List of Abutters

Dee & Dee Inc.
116 South Rolling Acres
Cheshire, CT 06410

Ronald B. Sbordone
50 Bridgets Lane
Cheshire, CT 06410

Camichello LLC
P.O. Box 752
Milldale, CT 06467

CNT Holdings LLC
28 David Street
Naugatuck, CT 06770

L&N Associates of Cheshire LLC
35 Sandbank Road #B8
Cheshire, CT 06410

Randall J. Raines
420 Sharon Drive
Cheshire, CT 06410

Life Safety Service & Supply LLC
325 Sandbank Road #11
Cheshire, CT 06410

SRD Enterprises LLC
P.O. Box 546
Milldale, CT 06467

Mobilio Estates LLC
30 Saddle Street
Prospect, CT 06410

Matthew & Thomas LLC
10 Abbey Court
Cheshire, CT 06410

Life Safety Service & Supply LLC
325 Sandbank Road #12
Cheshire, CT 06410

Gary J. Zimmitti
321 Sandbank Road #A1
Cheshire, CT 06410

DLS Properties LLC
250 Fenn Road
Cheshire, CT 06410

Mare Realty LLC
531 Blacks Road
Cheshire, CT 06410

Mare Realty II LLC
546 Blacks Road
Cheshire, CT 06410

327 Sandbank Road LLC
182 Sandbank Road
Cheshire, CT 06410

CAN-AM RE LLC
13000 South Tryon Street
Charlotte, NC 28278

BWTK-Watertown LLC
59 Lovley Drive
Watertown, CT 06795

The Cheshire Community Food
175 Sandbank Road
Cheshire, CT 06410

IAT Insurance Group Inc.
4200 Six Forks Road
Raleigh, NC 27609

Marshall Enterprises LLC
P.O. Box 416
Cheshire, CT 06410

Town of Cheshire
84 South Main Street
Cheshire, CT 06410

May 13, 2022

Via Certificate of Mailing

<Name & Address>

Re: Connecticut Green Bank – Notice of Intent to File a Petition for Declaratory Ruling for the Construction, Operation and Maintenance of a 1.95 MW(ac) Solar Photovoltaic Electric Generating Facility at the State of Connecticut Department of Correction's Manson Youth Correctional Institution located at 42 Jarvis Street in Cheshire, Connecticut

Dear <Salutation>:

Pursuant to the provisions of §16-50j-40(a) of the Regulations of Connecticut State Agencies, this letter serves as notice that the Connecticut Green Bank intends to file a Petition for Declaratory Ruling (Petition) with the Connecticut Siting Council (Council) on or about May 13, 2022, seeking approval of the construction, operation and maintenance of a 1.95 megawatt (MW)(ac) solar power generating facility, including all associated equipment, related site improvements, and interconnection (the Project).

The Project is located on property of the State of Connecticut which is currently occupied by the Manson Youth Correctional Institution operated by the Department of Corrections (DOC). The Project will include two solar arrays totaling approximately 6.7 acres to the south and west of the Manson Youth Correctional Institution buildings. The Project shall provide power behind the meter to serve the on-site DOC facilities. The Project will consist of the installation of ground-mounted photovoltaic panels, centralized inverters and transformers, electrical lines, electrical transformers and a perimeter fence. For details regarding the location and layout of the Project, please see the attached reduced sized copy of the Overall Site Plan.

Pursuant to the provisions of the Connecticut General Statutes §16-50g et seq., the location of certain project features may change as this Petition proceeds through the Council's regulatory review process.

If you have any questions, please feel free to contact me. My contact information is provided below.

Respectfully,

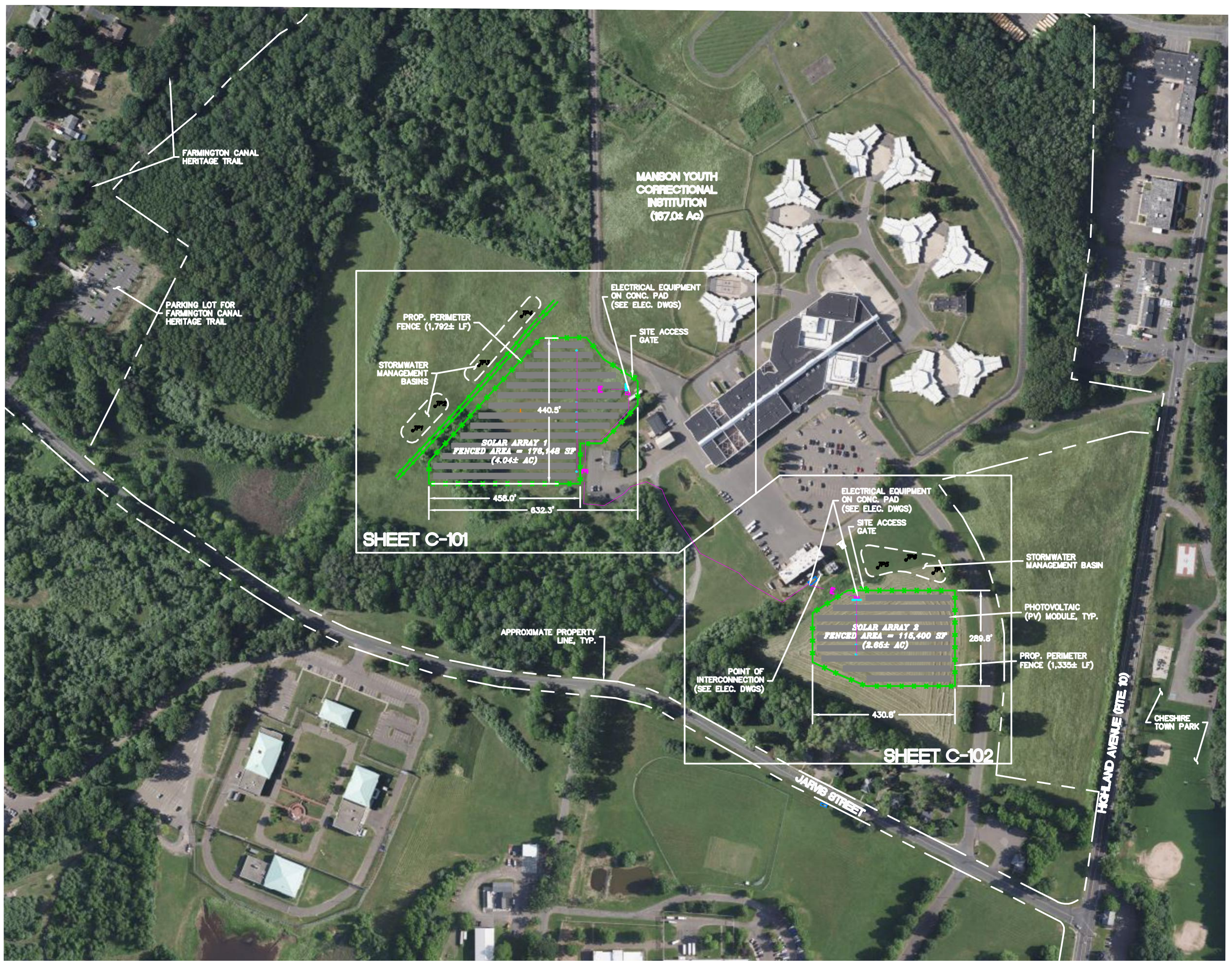
Timothy A. Coon, P.E.
J.R. Russo & Associates, LLC

Attachment (Overall Plan)

GRAPHIC SCALE

(IN FEET)
1 inch = 150 ft.

BLOCK	# MODULE	#STRING	KW (DC)	18 INPUT CB (W/ 12 STR)	SHP_150_US_20	KW (AC)	TILT (°)	GCR	CSI AZIMUTH (°)	SPWR AZIMUTH (°)	DC RUN (CB-INV)
1	2880	96	1353.6	8	8	1200	25	0.50	180	0	90, 35, 230, 170, 140, 110, 80, 50
2	1800	60	846	5	5	750					165, 140, 80, 50, 30
TOTAL	4680	156	2199.6	13	13	1950					



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1 Shoham Rd East Windsor, CT 06088 · CT 860.623.0569 · MA 413.785.1158
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Alternative Power Generation Inc.

SUNPOWER®
1414 HARBOUR WAY SOUTH
RICHMOND, CA 94804 USA
(510) 540-0550

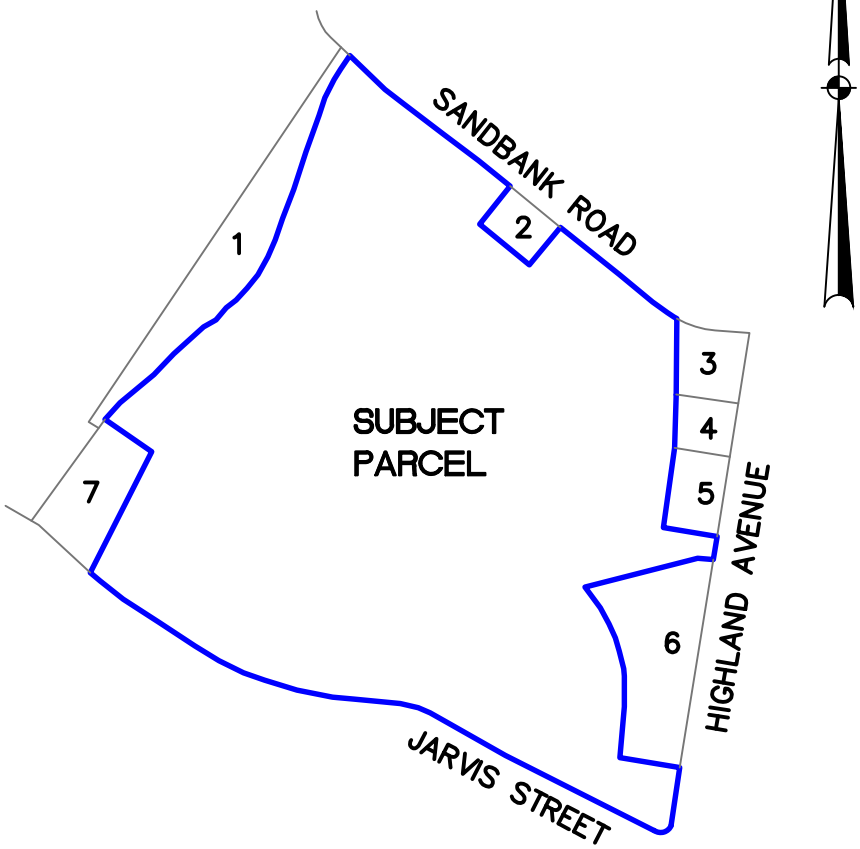
REVISIONS
BY: LF/TAC CHK: JEU

Connecticut Green Bank
Manson Youth Institution
42 Jarvis Street
Cheshire, Connecticut

Overall Plan

DATE
4-27-22
SCALE
1"=150'
JOB NUMBER
2021-040
SHEET
C-100

Lot#	Name & Address
1	Dee & Dee Inc. 116 South Rolling Acres Cheshire, CT 06410
	Ronald B. Sbordone 50 Bridges Lane Cheshire, CT 06410
	Camichello LLC P.O. Box 752 Milldale, CT 06467
	CNT Holding LLC 28 David Street Naugatuck, CT 06770
	L&N Assoc. of Cheshire LLC 35 Sandbank Rd. #B8
	Randall Raines 4420 Sharon Drive Cheshire, CT 06410
	Life Safety Service & Supply LLC 325 Sandbank Road #11 & 12 Cheshire, CT 06410
	SRD Enterprises LLC P.O. Box 546 Milldale, CT 06467
	Mobilio Estates LLC 30 Saddle Street Prospect, CT 06410
	Matthew & Thomas LLC 10 Abbe Court Cheshire, CT 06410
	Gary J. Zimmitti 321 Sandbank Road #A1 Cheshire, CT 06410
	DLS Properties LLC 250 Fenn Road Cheshire, CT 06410
	Mare Realty LLC 531 Blacks Road Cheshire, CT 06410
	Mare Realty II LLC 546 Blacks Road Cheshire, CT 06410
	327 Sandbank Road LLC 182 Sandbank Road Cheshire, CT 06410
	CAN-AM RE LLC 13000 South Tryon Street Charlotte, NC 28278
	BWTK-Watertown LLC 59 Lovley Drive Watertown, CT 06795



Lot#	Name & Address
2	The Cheshire Communtiy Food 175 Sandbank Road Cheshire, CT 06410
3 & 5	Marshall Enterprises LLC P.O. Box 416 Cheshire, CT 06410
4	IAT Insurance Group Inc. 4200 Six forks Road Raleigh, NC 27609
6 & 7	Town of Cheshire 84 South Main Street Cheshire, CT 06410

SOURCE:
CHESHIRE GIS

ABUTTERS MAP

CT GREEN BANK SOLAR
Manson Youth Institution

42 Jarvis Street
Cheshire, Connecticut

RUSSO
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www.jrrusso.com • info@jrrusso.com

DATE	2-8-2022
SCALE	1"=1,000'
JOB NUMBER	2021-040M
SHEET	EXHIBIT

EXHIBIT IX

NDDB PRELIMINARY REVIEW RESPONSE

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

July 13, 2020

Mr. Dean Gustafson
All-Points Technology Corporation, P.C.
567 Vauxhall Street Extension – Suite 311
Waterford, CT 06385
dgustafson@allpointstech.com

Project: CT Green Bank Sun Power Corporation Solar Installation at Department of Correction Manson Youth Institution Located at 176 Jarvis Street in Cheshire, Connecticut
NDDB Determination No.: 202007981

Dear Dean Gustafson,

I have re-reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed CT Green Bank Sun Power Corporation Solar Installation at Department of Correction Manson Youth Institution Located at 176 Jarvis Street in Cheshire, Connecticut. According to our records we have known extant populations of State Special Concern *Terrapene carolina carolina* (eastern box turtle) in the vicinity of the project site. I have included recommended protection strategies and best management practices for these state special concern turtles.

Eastern Box Turtle: Eastern box turtles inhabit old fields and deciduous forests, which can include power lines and logged woodlands. They are often found near small streams and ponds. The adults are completely terrestrial but the young may be semiaquatic, and hibernate on land by digging down in the soil from October to April. They have an extremely small home range and can usually be found in the same area year after year. Eastern box turtles have been negatively impacted by the loss of suitable habitat. Some turtles may be killed directly by construction activities, but many more are lost when important habitat areas for shelter, feeding, hibernation, or nesting are destroyed. As remaining habitat is fragmented into smaller pieces, turtle populations can become small and isolated. Reducing the frequency that motorized vehicles that enter box turtle habit**a**t would be beneficial in minimizing direct mortality of adults.

Recommended Protection Strategies for Turtles:

A qualified herpetologist should be hired to work on site with your construction crew during the project construction period to be sure that turtles will not be unintentionally killed during the moving of heavy equipment and tree clearing. This is especially important in May, June and July when turtles are choosing nest sites.

Work normally should occur when these turtles are active (April 1st to October 30th). Conducting work while the turtle is active will allow the animal to move out of harm's way and minimize mortality to hibernating individuals. I recommend the additional following protection strategies in order to protect these turtles:

- Exclusionary practices will be required to prevent any turtle access into construction areas. These measures will need to be installed at the limits of disturbance.
- Exclusionary fencing must be at least 20 in tall and must be secured to and remain in contact with the ground and be regularly maintained (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through. Do not use plastic or netted silt-fence.
- All staging and storage areas, outside of previously paved locations, regardless of the duration of time they will be utilized, must be reviewed to remove individuals and exclude them from re-entry.

- All construction personnel working within the turtle habitat must be apprised of the species description and the possible presence of a listed species, and instructed to relocate turtles found inside work areas or notify the appropriate authorities to relocate individuals.
- Any turtles encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and fencing should be inspected to identify and remove access point.
- In areas where silt fence is used for exclusion, it shall be removed as soon as the area is stable to allow for reptile and amphibian passage to resume.
- No heavy machinery or vehicles may be parked in any turtle habitat.
- Special precautions must be taken to avoid degradation of wetland habitats including any wet meadows and seasonal pools.
- The Contractor and consulting biologist must search the work area each morning prior to any work being done.
- Avoid and limit any equipment use within 50 feet of streams and brooks.
- If you must remove trees, please cut them to fall away from the waterway and do not drag trees across the waterway or remove stumps from banks.

- Any confirmed sightings of box, wood or spotted turtles should be reported and documented with the NDDB (nddbrequestdep@ct.gov) on the appropriate special animal form found at (http://www.ct.gov/deep/cwp/view.asp?a=2702&q=323460&depNav_GID=1641)

This determination is good for two years. Please re-submit an NDDB Request for Review if the scope of work changes or if work has not begun on this project by July 13, 2022.

Natural Diversity Data Base information includes all information regarding critical biological resources 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, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. 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 Data Base as it becomes available.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base. Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEEP for the proposed site.

Sincerely,

Dawn M. McKay

Dawn M. McKay
Environmental Analyst 3

EXHIBIT X

TURTLE PROTECTION STRATEGIES

CT DEEP Recommended Protection Strategies for Turtles

A qualified herpetologist should be hired to work on site with your construction crew during the project construction period to be sure that turtles will not be unintentionally killed during the moving of heavy equipment and tree clearing. This is especially important in May, June and July when turtles are choosing nest sites.

Work normally should occur when these turtles are active (April 1st to October 30th). Conducting work while the turtle is active will allow the animal to move out of harm's way and minimize mortality to hibernating individuals. I recommend the additional following protection strategies in order to protect these turtles:

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- Exclusionary fencing must be at least 20 in tall and must be secured to and remain in contact with the ground and be regularly maintained (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through. Do not use plastic or netted silt-fence.
- All staging and storage areas, outside of previously paved locations, regardless of the duration of time they will be utilized, must be reviewed to remove individuals and exclude them from re-entry.
- All construction personnel working within the turtle habitat must be apprised of the species description and the possible presence of a listed species, and instructed to relocate turtles found inside work areas or notify the appropriate authorities to relocate individuals.
- Any turtles encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and fencing should be inspected to identify and remove access point.
- In areas where silt fence is used for exclusion, it shall be removed as soon as the area is stable to allow for reptile and amphibian passage to resume.
- No heavy machinery or vehicles may be parked in any turtle habitat.
- Special precautions must be taken to avoid degradation of wetland habitats including any wet meadows and seasonal pools.
- The Contractor and consulting biologist must search the work area each morning prior to any work being done.
- Avoid and limit any equipment use within 50 feet of streams and brooks.
- If you must remove trees, please cut them to fall away from the waterway and do not drag trees across the waterway or remove stumps from banks.
- Any confirmed sightings of box, wood or spotted turtles should be reported and documented with the NDDB (nddbrequestdep@ct.gov) on the appropriate special animal form found at (http://www.ct.gov/deep/cwp/view.asp?a=2702&q=323460&depNav_GID=1641)

EXHIBIT XI

WETLAND REPORT

DAVISON ENVIRONMENTAL

10 Maple Street
Chester, CT 06412
860-803-0938
www.davisonenvironmental.com

Biodiversity Studies • Wetland Delineation & Assessment • Habitat Management • GIS Mapping • Permitting • Forestry

WETLANDS / WATERCOURSES DELINEATION REPORT

Date of Work: 10/7/2021 & 12/10/2021

Project Location: *176 Jarvis Street, Cheshire*

Client:
Tim Coon
J.R. Russ and Associates, LLC
1 Shoham Road
East Windsor, CT 06088

IDENTIFICATION OF WETLANDS AND WATERCOURSES RESOURCES

Wetlands and watercourses present on property? Yes ☒ No ☐

Wetlands:		Watercourses:		Identification Method:	
Inland Wetlands	☒	Perennial Streams	☐	Auger and Spade	☒
Tidal Wetlands	☐	Intermittent Watercourses	☐	Backhoe Pits	☐

Numbering Sequences:

WF 1/14 (closed loop)	
WF 1X/12X (closed loop)	
WF 1 – 9	

Wetland Plant Communities Present:

Forest ☐
Upland Streamside ☒
Wet Meadow ☐
Marsh ☒
Pond ☒

Definitions and methodology for identification of state regulated wetlands & watercourses

Wetlands and watercourses are regulated in the State of Connecticut General Statutes, Chapter 440, sections 22a-28 to 22a-45. The Statutes are divided into the Inland Wetlands and Watercourses Act (sections 22a-36 to 22a-45) and the Tidal Wetlands Act (sections 22a-28 to 22a-35). Inland Wetlands "means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the National Resources Conservation Service (NRCS) of the United States Department of Agriculture" section 22a-38(15). Watercourses "means 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 this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by 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" section 22a-38(16). Tidal Wetlands are defined as "those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and upon which may grow or be capable of growing some, but not necessarily all of the following" (includes plant list) section 22a-29(2).

Wetland Soils

Wetland soils consist of Aquents, and Catden and Freetown soils. Aquents is a miscellaneous land type used to denote man-made or man-disturbed areas that are wet. These soils have an aquic soil moisture regime and can be expected to support hydrophytic vegetation. Typically, these soils occur in places where less than 2 feet of earthen material have been placed over poorly or very poorly drained soils; areas where the natural soils have been mixed so that the natural soil layers are not identifiable; or where the soil materials have been excavated to the watertable.

The Catden series consists of very deep, very poorly drained soils formed in woody and herbaceous organic materials in depressions on lake plains, outwash plains, moraines, and flood plains. These soils have moderate or moderately rapid permeability. Slope ranges from 0 to 2 percent.

The Freetown series consists of very deep, very poorly drained organic soils formed in more than 51 inches of highly decomposed organic material. They are in depressions or on level areas on uplands and outwash plains. Permeability is moderate or moderately rapid.

Non-Wetland Soils

The non-wetland soils consist of the Manchester series, as well as Udorthents. The Manchester series consists of very deep, excessively drained soils formed in sandy and gravelly outwash and stratified drift. They are nearly level to steep soils on outwash plains, terraces, kames, deltas and eskers. Permeability is rapid in the surface layer, rapid or very rapid in the subsoil, and very rapid in the substratum.

Udorthents is a miscellaneous land type used to denote moderately well to excessively drained earthen material which has been so disturbed by cutting, filling, or grading that the original soil profile can no longer be discerned.

SUMMARY of FINDINGS

Attached is a sketch map illustrating the delineated wetlands. Three wetland areas were delineated, one in the vicinity of the proposed arrays and two in the vicinity of the utility interconnect. The wetland delineated southwest of the proposed arrays (WF 1-9) is a large emergent marsh predominantly vegetated with common reed. The two delineated wetlands proximate to the interconnect (WF 1/14 & 1X/12X) are both anthropogenically altered/created. The western wetland consists of a daylighted watercourse segment with a culvert outlet and inlet. The wetland boundary runs along a well-defined shoreline to each concrete culvert

abutment. The delineated area consists of a man-made pond, likely historically created to manage stormwater. The pond has a well-defined bank with no bordering wetlands.

If you have any questions regarding my findings, please feel free to contact me.

Eric Davison
Certified Professional Wetland Scientist
Registered Soil Scientist

Attachment: Wetland Sketch Map

WETLAND SKETCH MAP

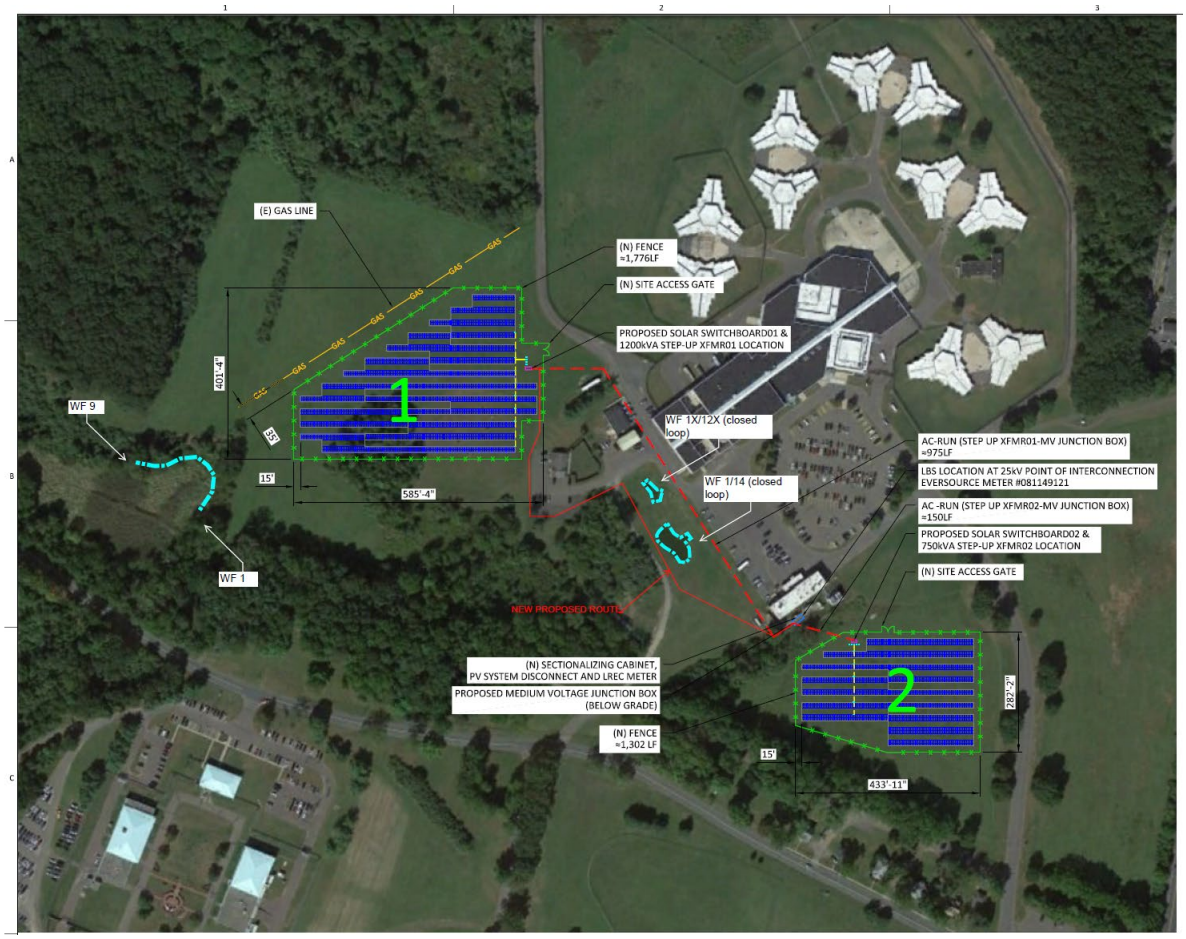


EXHIBIT XII

DRAINAGE REPORT

DRAINAGE REPORT
CT Green Bank
Department of Corrections Solar
Manson Youth Institution
42 Jarvis Street
Cheshire, CT

March 25, 2022

Prepared for:

CT Green Bank
75 Charter Oak Avenue, Suite 1-103
Hartford, CT 06106

Owner:

State of Connecticut
Manson Youth Institution
42 Jarvis Street
Cheshire, CT 06410

Project No. 2021-040

Prepared by:

J.R. Russo & Associates
Land Surveyors & Professional Engineers
P.O. Box 938
East Windsor, CT 06088
(860) 623-0569

I. INTRODUCTION

A. Project Description

The applicant is proposing to construct two solar arrays behind the meter to supplement the power supply at the Manson Youth Institution at 42 Jarvis Street in Cheshire. The first proposed solar array (Array 1) includes a fenced area of approximately 4.04 acres containing 2,880 solar panel modules. The second proposed solar array (Array 2) includes a fenced area of approximately 2.65 acres containing 1,800 solar panel modules. The arrays' transmission lines will be installed to a common interconnection point at an existing transformer. The development will include two stormwater management basins at Array 1 and one stormwater management basin at Array 2. The basins are designed to provide groundwater recharge and retention of stormwater to ensure no environmental or flooding impacts downstream. The development and stormwater management system have been designed in accordance with the CT Stormwater Quality Manual and Department of Energy & Environmental Protection's (DEEP's) Stormwater General Permit.

B. Existing Conditions

The project site consists of approximately 13 acres of the larger 167 acre parcel located at 42 Jarvis Street in Cheshire. The Project Site consist of two proposed arrays: Array 1 located to the southwest of the main facility buildings, and Array 2 located to the southeast of the main facility buildings adjacent to the west side of the main driveway. Both array areas are currently maintained as hayfield, with the exception of a small peninsula of trees located in the southern portion of the Array 1 area. The Array 1 area currently slopes northwesterly from an existing parking lot towards the center of the field. A ridge runs northwest and splits the runoff from the proposed array area. The northern portion of the field flows to the north once reaching the center of the field. The southern portion of the field flows to the southwest upon reaching the center of the field. Array 2 will be located in a field southwest of the facility buildings. This field slopes northerly towards a parking lot and the institution's driveway that wraps around the east side of the field. Here the driveway's drainage system collects the runoff in multiple catch basins.

Based on a review of the USDA Soil Survey, the soil in the Array 1 area are classified as Manchester gravelly sandy loam and the soils in the Array 2 area are classified as Cheshire fine sandy loam (See Soils Maps in Appendix 1). The USDA Soil Survey defines groups of soils into Hydrologic Soil Groups (HSG) according to their runoff-producing characteristics. Soils are assigned to four groups (A, B, C, and D Groups). In group A, are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They typically are deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a hardpan or clay layer at or near the surface, have a permanent high-water table, or

are shallow over nearly impervious bedrock or other nearly impervious material. The HSG classification of Manchester gravelly sandy loam is HSG A and Cheshire fine sandy loam is HSG B.

On February 9, 2022, a series of 7 test pits were performed in the areas of the proposed stormwater management basins to confirm the existing soil conditions. At Array 1, test pits 1-2 were located in the vicinity of the southern basin while test pits 3-4 were located in the vicinity of the northern basin. Test pits 5-7 were in the vicinity of the basin at the Array 2. Test pits were excavated to depths ranging from 84-96 inches. Soils encountered at Array 1 included 11-14 inches of sandy loam topsoil over red-brown fine to medium sand, overlying coarse sand with gravel. Soils encountered at Array 2 included 7-10 inches of sandy loam topsoil over firm red-brown silty sand & gravel till, overlying grey cemented fine to coarse sand. Soil mottling indicative of the seasonal high water table was encountered at a depth of 60- below the ground surface in test pits 1-4. There was no mottling or water in test pits 5-7. Test pit logs are provided on the Site Plans.

Soil samples were collected from all test pits from the material that will remain beneath the elevation of the stormwater basin bottoms. These samples were submitted to New England Materials Testing Lab, LLC for permeability testing by ASTM D2434. Calculated permeabilities for the northern basin at Array 1 were 9.054 in/hr for the sample collected in TP4 and 9.096 in/hr for the sample collected in TP3. Calculated permeabilities for the southern basin at Array 1 were 8.273 in/hr for the sample collected in TP1 and 10.313 in/hr for the sample collected in TP2. Calculated permeabilities at Array 2 ranged from 0.574 in/hr for the sample collected in TP7 to 1.235 in/hr for the sample collected in TP5. As a conservative measure, the slowest permeability rate at each basin was used as the basis for the design infiltration rate. These rates were further reduced by 50% to account for potential clogging resulting in final design infiltration rates of 4.527 inches/hour for the northern Array 1 basin, 4.140 inches/hour for the southern Array 1 basin, and 0.287 inches/hour for the array 2 basin. Permeability test results are provided in Appendix 4 and summarized on the Site Plans.

II. STORMWATER RUNOFF ANALYSIS

A. Methodology

Peak runoff flow rates were determined for pre- and post-development conditions using Applied Microcomputer System's HydroCAD™ Stormwater Modeling System. This computer software employs the SCS Technical Release 55 and 20 (TR-55 & TR-20) methodology. The potential stormwater impacts downstream were evaluated for the 2-yr, 10-yr, 25-yr, and 100-yr; 24-hour storm events. The rainfall for these storm events was taken from NOAA Atlas 14 provided in Appendix 2.

The two arrays were analyzed separately. Based on the present drainage patterns, runoff from the Array 1 development area is split by a ridge and sent either north and southwest. Due to this, the southwestern point where south of the ridge flows to and the northern point where north of the ridge flows to were selected as the two design points for Array 1. Based on the present drainage patterns, runoff from the Array 2 development area is collected in the driveway's drainage system. Thus, the drainage system in the driveway was selected as the design point for Array 2.

B. Pre-Development Hydrology

The pre-development area Array 1 was divided into two subcatchments as shown on the pre-development drainage area map in Appendix 3W. Subcatchment PRE1 includes the portion of the development area north of the ridge that sheet flows to the north. Subcatchment PRE2 includes the portion of the development area south of the ridge that sheet flows to the southwest. The pre-development runoff characteristics for the Array 1 contributing area are provided on the HydroCAD data sheets in Appendix 5W. The pre-development discharge rates from the site during the design storms are summarized in Tables 1-2.

The pre-development area for Array 2 was modeled as a single subcatchment as shown on the pre-development drainage area map in Appendix 3E. Subcatchment PRE includes the portion of the field, woods, yards, and driveways that sheet flows through the proposed development area and into the facility driveway's drainage system. The pre-development runoff characteristics of the Array 2 contributing area are provided on the HydroCAD data sheets in Appendix 5E. The pre-development discharge rates from the site during the design storms are summarized in Table 3.

C. Post-Development Hydrology

The proposed solar array will be installed at existing grades within the field. Thus, existing drainage patterns will be maintained and soil disturbance will essentially be limited to the construction of the stormwater management basins located downgradient of the arrays. The existing vegetation within the proposed array areas will be maintained throughout the project to provide stabilization of the underlying soils and prevent erosion and sedimentation. The proposed fixed panel solar arrays will be installed on elevated racks that provide adequate height above the ground to promote the continued growth of the existing vegetative cover and allow for infiltration. As a result, post construction, the areas containing the solar arrays can be considered pervious vegetated groundcover.

In accordance with Appendix I of the DEEP's General Permit, the hydrologic analysis is required to account for the compaction of soils that result from extensive machinery traffic over the course of the construction of the array. To account for this, the runoff curve

number must be increased by one full HSG category where grading within the array exceeds a 2-foot difference between existing and proposed grades and one half the difference between the on-site HSG and the next higher HSG for the remainder of the array. As discussed above, the proposed array at our site will utilize existing grades. Thus, to meet this requirement, the post construction runoff curve number for the area within the proposed fence was increased from the pre-development category of Meadow, HSG A (30) soils to Meadow, HSG A/B soils (44) for the Array 1 and Meadow, HSG B (58) soils to Meadow, HSG B/C soils (65) for Array 2.

The post-development Array 1 site was divided into 2 subcatchments as shown on the post-development drainage area map in Appendix 3W. Subcatchment POST1 includes the area that sheet flows into the northern stormwater management basin. Subcatchment POST2 includes the area that sheet flows into the southern stormwater management basin. The post development subcatchment characteristics are summarized in the attached HydroCAD data sheets in Appendix 6W.

The post-development Array 2 area was divided into 3 subcatchments as shown on the post-development drainage area map in Appendix 3E. Subcatchment 1 includes the area that sheet flows directly into the stormwater management basin. Subcatchment 2 includes the area that sheet flows along the west side of array to a proposed 15" culvert under the access driveway that discharges into the stormwater basin. Subcatchment 3 includes the area on the east side of the array that sheet flows directly into the facility driveway's drainage system and bypasses the proposed stormwater management basin. The post development subcatchment characteristics are summarized in the attached HydroCAD data sheets in Appendix 6E.

The stormwater management basins at Array 1 will both be equipped with 10-feet wide earthen berm spillways. The stormwater management basin at Array 2 will be equipped with an 18" flared end as a primary outlet and a 20-feet wide earthen berm spillway. The 18" flared end outlet will connect into a catch basin in the facility driveway to tie into the driveway's drainage system. Outlet protection for the basins' spillways will consist of 12" thick modified riprap slopes extended 5 feet beyond the toe of the slope. Additionally, the culvert into the western array's stormwater management basin will discharge onto Type A riprap apron.

Using the characteristics described above, the Post Development peak flow rates for the site were calculated for the 2, 25, 50, and 100-year 24-hour rainfall design storms. Refer to Appendices 5 and 6 for pre-development and post-development HydroCAD data sheets. Tables 1-3 compare the pre-development peak flows with the post-development peak flows at the design points. As shown, the resulting post-development peak flows are less than or equal to the pre-development peak flows.

TABLE 1 – COMPARISON OF PRE- & POST-DEVELOPMENT DISCHARGE RATES (CFS) TO DESIGN POINT
SOLAR ARRAY 1 (WEST) NORTH DESIGN POINT

	2-year	25-year	50-year	100-year
Pre-Development	0	0.67	1.39	2.50
Post Development	0	0	0	0.44

TABLE 2 – COMPARISON OF PRE- & POST-DEVELOPMENT DISCHARGE RATES (CFS) TO DESIGN POINT
SOLAR ARRAY 1 (WEST) SOUTHWEST DESIGN POINT

	2-year	25-year	50-year	100-year
Pre-Development	0	0.18	0.55	1.12
Post Development	0	0	0	0.48

TABLE 3 – COMPARISON OF PRE- & POST-DEVELOPMENT DISCHARGE RATES (CFS) TO DESIGN POINT
SOLAR ARRAY 2 (EAST) DESIGN POINT

	2-year	25-year	50-year	100-year
Pre-Development	1.96	11.33	14.58	18.29
Post Development	1.19	7.31	10.26	13.01

D. Stormwater Treatment

Appendix I of the DEEP Stormwater General Permit requires that all solar panels in the array be considered effective impervious cover for the purposes of calculating Water Quality Volume if the proposed post-construction slopes at a site are 15% or more or if slopes less than 15% do not meet the four listed conditions:

a) The vegetated area receiving runoff between rows of solar panels is equal to or greater than the average width of the row of solar panels draining to the vegetated area;
b) Overall site conditions and solar panel configuration within the array are designed so stormwater runoff remains as sheet flows across the entire site towards the intended stormwater management controls;
c) The following conditions are satisfied regarding the design of the post-construction slope of the site:
    i. Slopes less than or equal to 5%:

Appropriate vegetation shall be established that will ensure sheet flow conditions and that will provide sufficient ground cover throughout the site.

ii. Slopes between 5% and 10%:
Practices such as level spreaders, terraces, or berms shall be used to ensure long term sheet flow conditions.

iii. Slopes greater than or equal to 10% and less than 15%:
The plan must include specific engineered stormwater control measures with detailed specifications that are designed to provide permanent stabilization and non-erosive conveyance of runoff downgradient from the site.

iv. Slopes greater than or equal to 8%:
Erosion control blankets, stump grindings, erosion control mix mulch, or hydroseed with tackifier shall be applied within 72 hours of final grading, or when a rainfall of 0.5 inches or greater is predicted within 24 hours of final grading, whichever time period is less.

d) The solar panels shall be designed as to allow the growth of native vegetation beneath and between the panels.

The existing slope at the Array 1 is less than 5% at the top before is steepens to 5-10% further down. The existing slope at Array 2 is less than 5%. These slopes require that conditions (a)-(d) be met in order to avoid treating the panels as impervious area. To satisfy condition (a), the proposed row spacing of 16.65' will exceed the 13.85' width of the panels. To satisfy condition (b), the solar panels will be constructed utilizing the existing grades while maintaining the existing vegetation and sheet flow drainage patterns. Where tree clearing is proposed, the area will be seeded and mulched immediately to establish a vegetated cover. For condition (c), as discussed and agreed upon with personnel from DEEP's Stormwater section, because the existing vegetation will be maintained throughout construction, the need for additional erosion control measures to provide stabilization of the slopes are not necessary, and this condition is considered to be met. Finally, to satisfy condition (d), the proposed fixed panel solar arrays will be installed on elevated racks that provide adequate height above the ground to promote the continued growth of the existing vegetative cover and allow for infiltration.

As a result of satisfying the conditions above, the panels need not be considered as impervious coverage for the calculation of the WQV. Thus, the only proposed surfaces required to be included in the calculation of the WQV, are the access roads and equipment pads. These surfaces total 825 square feet for the northern stormwater management basin at Array 1 and 850 square feet for stormwater management basin at Array 2. The southern basin at Array 1 does not need to consider water quality volume as no proposed impervious surfaces flow to it. The resulting WQVs are 830 cubic feet for the northern basin at Array 1 and 1,374 cubic feet for the basin at Array 2. (see Appendix 7). The volume below the outlet in the Array 1 northern stormwater management basin is 6,606 cubic feet, which exceeds the required WQV. The volume below the outlet in the stormwater management basin at Array 2 is 5,934 cubic feet, which also exceeds the required WQV.

E. Summary of Results

The proposed design and analysis indicates that the proposed development will not result in negative flooding impacts downstream. In addition, the maintenance of existing grades, vegetation and sheet flow drainage patterns during and after construction will prevent any negative impacts downstream resulting from erosion or sedimentation.

Appendix 1W:
SOILS INFORMATION
SOLAR ARRAY 1 (WEST)

United States Department of Agriculture

NRCS

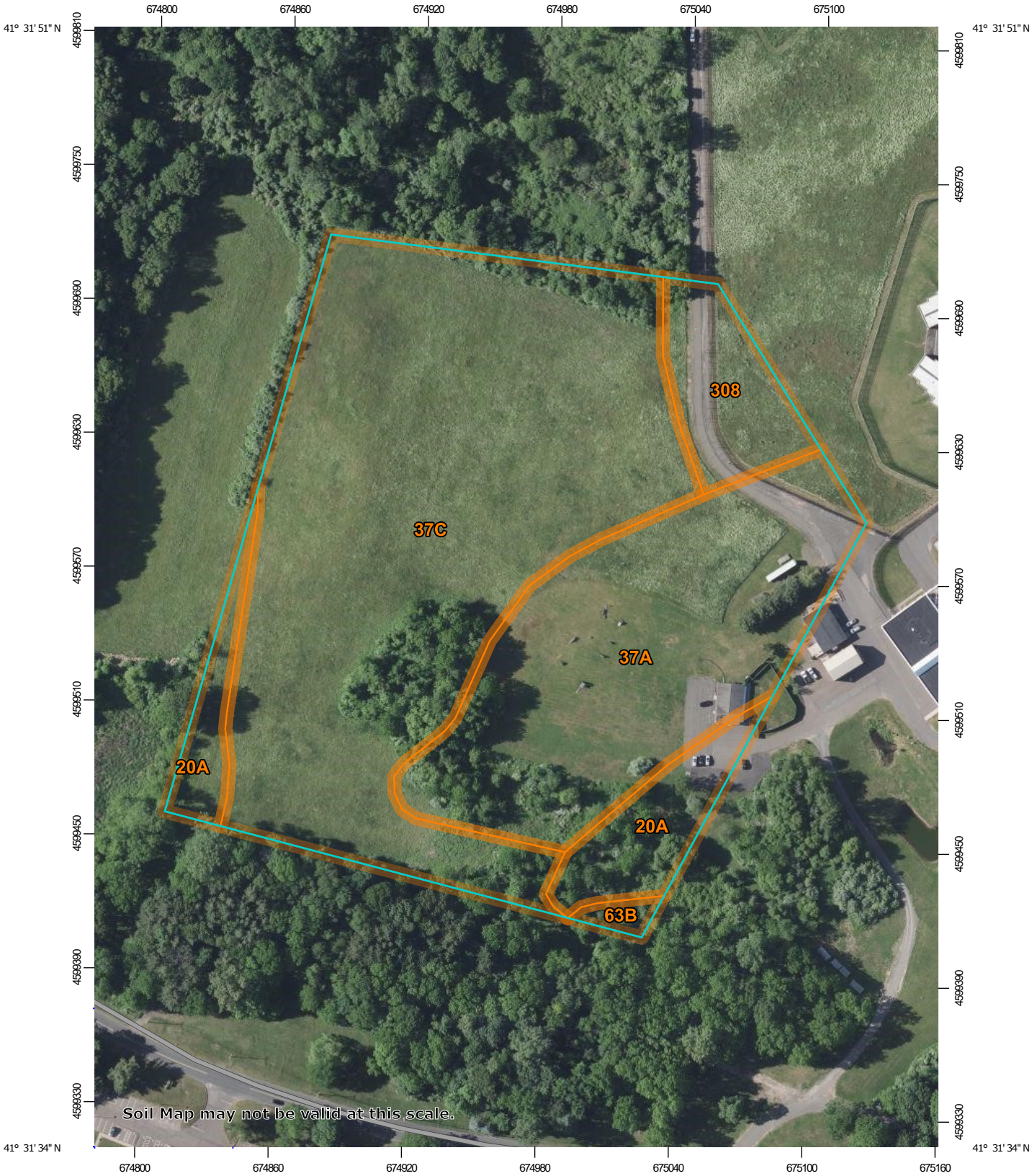
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

February 9, 2022

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,450 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
20A	Ellington silt loam, 0 to 5 percent slopes	1.3	7.9%
37A	Manchester gravelly sandy loam, 0 to 3 percent slopes	4.7	28.4%
37C	Manchester gravelly sandy loam, 3 to 15 percent slopes	9.6	57.2%
63B	Cheshire fine sandy loam, 3 to 8 percent slopes	0.1	0.7%
308	Udorthents, smoothed	1.0	5.9%
Totals for Area of Interest		**16.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

Raypol

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Raynham

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Branford

Percent of map unit: 5 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

37A—Manchester gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9ln5
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Manchester and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Manchester

Setting

Landform: Terraces, outwash plains, kames, eskers
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from sandstone and shale and/or basalt

Typical profile

Ap - 0 to 9 inches: gravelly sandy loam
Bw - 9 to 18 inches: gravelly loamy sand
C - 18 to 65 inches: stratified extremely gravelly coarse sand to very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Penwood

Percent of map unit: 5 percent
Landform: Terraces, outwash plains
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Hartford

Percent of map unit: 5 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Branford

Percent of map unit: 3 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ellington

Percent of map unit: 3 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, gravelly loamy sand surface

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, nongravelly surface

Percent of map unit: 2 percent
Hydric soil rating: No

37C—Manchester gravelly sandy loam, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9ln6
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Manchester and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Manchester

Setting

Landform: Terraces, outwash plains, kames, eskers
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from sandstone and shale and/or basalt

Typical profile

Ap - 0 to 9 inches: gravelly sandy loam
Bw - 9 to 18 inches: gravelly loamy sand
C - 18 to 65 inches: stratified extremely gravelly coarse sand to very gravelly loamy sand

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hartford
Percent of map unit: 5 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Penwood
Percent of map unit: 5 percent
Landform: Terraces, outwash plains
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Ellington
Percent of map unit: 3 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Branford
Percent of map unit: 3 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, nongravelly surface
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, gravelly loamy sand surface
Percent of map unit: 2 percent
Hydric soil rating: No

63B—Cheshire fine sandy loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9lpw
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Cheshire and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cheshire

Setting

Landform: Till plains, hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from basalt and/or sandstone and shale

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
C - 26 to 65 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Wilbraham

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Yalesville

Percent of map unit: 3 percent
Landform: Ridges, hills
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Wethersfield

Percent of map unit: 3 percent
Landform: Hills, drumlins
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Watchaug

Percent of map unit: 3 percent
Landform: Till plains, hills
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Menlo

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Unnamed, brown subsoil

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, less sloping

Percent of map unit: 2 percent
Hydric soil rating: No

308—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9lmj
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 35 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 24 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Udorthents, wet substratum

Percent of map unit: 7 percent
Hydric soil rating: No

Unnamed, undisturbed soils

Percent of map unit: 7 percent
Hydric soil rating: No

Urban land

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

Appendix 1E:
SOILS INFORMATION
SOLAR ARRAY 2 (EAST)

United States Department of Agriculture

NRCS

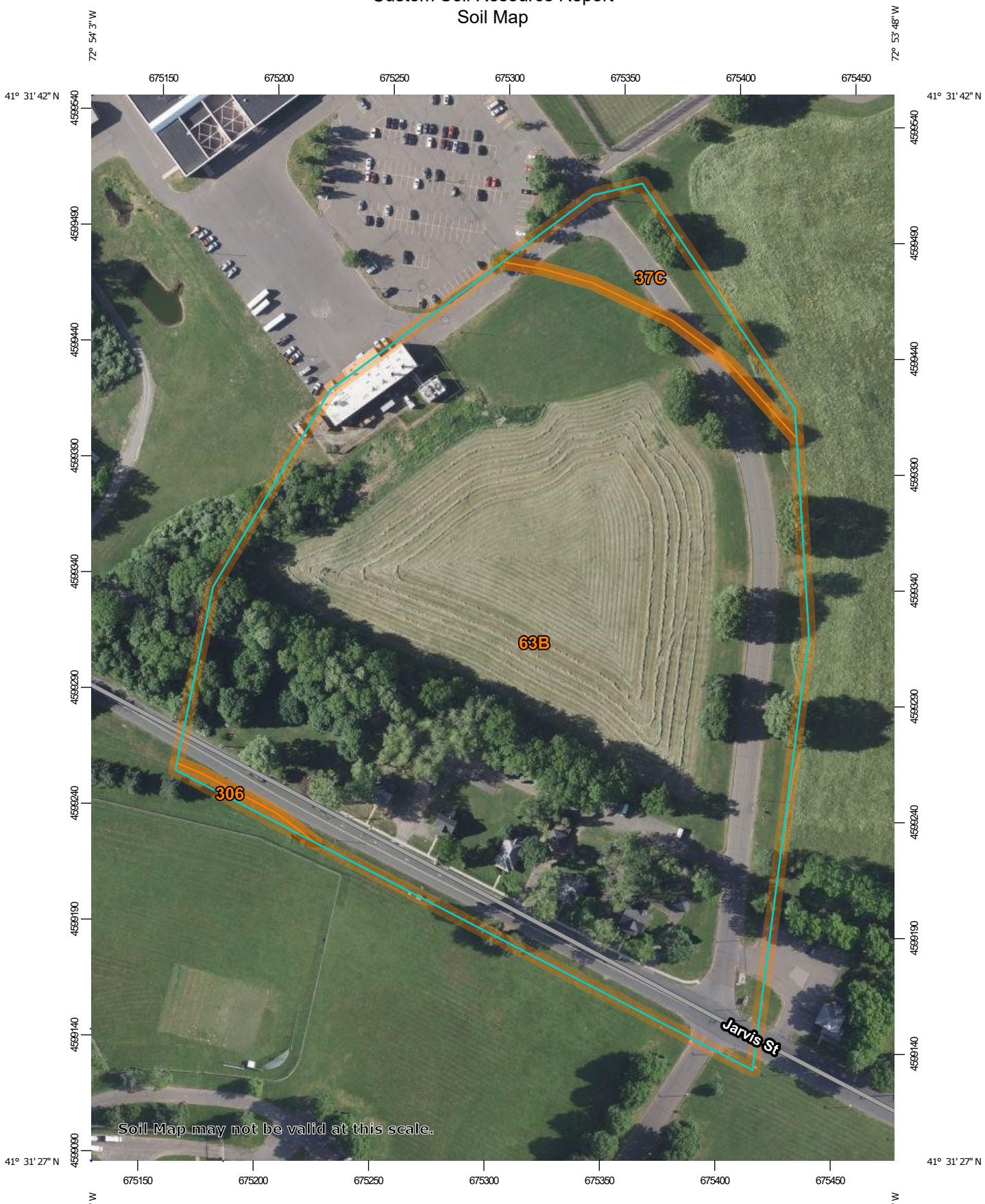
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

November 24, 2021

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,240 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
37C	Manchester gravelly sandy loam, 3 to 15 percent slopes	0.9	5.3%
63B	Cheshire fine sandy loam, 3 to 8 percent slopes	15.7	94.4%
306	Udorthents-Urban land complex	0.1	0.3%
Totals for Area of Interest		**16.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

State of Connecticut

37C—Manchester gravelly sandy loam, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9ln6
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Manchester and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Manchester

Setting

Landform: Terraces, outwash plains, kames, eskers
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from sandstone and shale and/or basalt

Typical profile

Ap - 0 to 9 inches: gravelly sandy loam
Bw - 9 to 18 inches: gravelly loamy sand
C - 18 to 65 inches: stratified extremely gravelly coarse sand to very gravelly loamy sand

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hartford

Percent of map unit: 5 percent
Landform: Terraces, outwash plains

Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Penwood

Percent of map unit: 5 percent
Landform: Terraces, outwash plains
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Ellington

Percent of map unit: 3 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Branford

Percent of map unit: 3 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, nongravelly surface

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, gravelly loamy sand surface

Percent of map unit: 2 percent
Hydric soil rating: No

63B—Cheshire fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9lpw
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cheshire and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cheshire

Setting

Landform: Till plains, hills

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from basalt and/or sandstone and shale

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
C - 26 to 65 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Wilbraham

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Yalesville

Percent of map unit: 3 percent
Landform: Ridges, hills
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Wethersfield

Percent of map unit: 3 percent
Landform: Hills, drumlins
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Watchaug

Percent of map unit: 3 percent
Landform: Till plains, hills
Down-slope shape: Linear
Across-slope shape: Concave

Hydric soil rating: No

Menlo

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Unnamed, brown subsoil

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, less sloping

Percent of map unit: 2 percent
Hydric soil rating: No

306—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)

Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 8 percent
Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 5 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

Appendix 2:
RAINFALL DATA

NOAA Atlas 14, Volume 10, Version 3
Location name: Cheshire, Connecticut, USA*
Latitude: 41.5286°, Longitude: -72.9027°
Elevation: 187.81 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.341** (0.267-0.429)	**0.412** (0.322-0.519)	**0.528** (0.412-0.667)	**0.625** (0.484-0.795)	**0.758** (0.567-1.01)	**0.858** (0.629-1.17)	**0.962** (0.685-1.37)	**1.08** (0.727-1.58)	**1.25** (0.808-1.89)	**1.38** (0.874-2.14)
10-min	**0.484** (0.378-0.608)	**0.584** (0.456-0.735)	**0.749** (0.583-0.946)	**0.886** (0.685-1.13)	**1.07** (0.804-1.43)	**1.22** (0.892-1.66)	**1.36** (0.970-1.94)	**1.53** (1.03-2.23)	**1.76** (1.14-2.68)	**1.96** (1.24-3.04)
15-min	**0.569** (0.445-0.715)	**0.687** (0.537-0.865)	**0.881** (0.686-1.11)	**1.04** (0.806-1.32)	**1.26** (0.946-1.69)	**1.43** (1.05-1.95)	**1.60** (1.14-2.28)	**1.80** (1.21-2.63)	**2.08** (1.35-3.15)	**2.30** (1.46-3.57)
30-min	**0.784** (0.613-0.986)	**0.944** (0.737-1.19)	**1.21** (0.938-1.52)	**1.42** (1.10-1.81)	**1.72** (1.29-2.30)	**1.94** (1.43-2.66)	**2.18** (1.55-3.10)	**2.44** (1.65-3.57)	**2.82** (1.83-4.28)	**3.13** (1.98-4.86)
60-min	**0.999** (0.782-1.26)	**1.20** (0.938-1.51)	**1.53** (1.19-1.93)	**1.80** (1.39-2.29)	**2.18** (1.63-2.91)	**2.46** (1.80-3.36)	**2.76** (1.96-3.92)	**3.09** (2.08-4.51)	**3.57** (2.31-5.42)	**3.96** (2.51-6.15)
2-hr	**1.31** (1.03-1.64)	**1.57** (1.23-1.96)	**1.98** (1.55-2.49)	**2.33** (1.81-2.94)	**2.80** (2.11-3.72)	**3.16** (2.33-4.29)	**3.53** (2.53-5.00)	**3.96** (2.68-5.74)	**4.56** (2.97-6.88)	**5.06** (3.21-7.81)
3-hr	**1.53** (1.21-1.90)	**1.82** (1.44-2.27)	**2.30** (1.81-2.88)	**2.70** (2.11-3.40)	**3.25** (2.46-4.30)	**3.66** (2.71-4.96)	**4.10** (2.95-5.78)	**4.59** (3.12-6.64)	**5.31** (3.46-7.97)	**5.89** (3.75-9.06)
6-hr	**1.94** (1.54-2.39)	**2.32** (1.85-2.88)	**2.95** (2.34-3.67)	**3.48** (2.74-4.35)	**4.20** (3.20-5.52)	**4.74** (3.53-6.38)	**5.31** (3.84-7.46)	**5.97** (4.07-8.58)	**6.95** (4.54-10.4)	**7.76** (4.95-11.9)
12-hr	**2.39** (1.91-2.94)	**2.90** (2.32-3.57)	**3.74** (2.98-4.61)	**4.43** (3.51-5.50)	**5.38** (4.12-7.04)	**6.09** (4.57-8.17)	**6.85** (5.00-9.62)	**7.76** (5.30-11.1)	**9.13** (5.99-13.6)	**10.3** (6.59-15.6)
24-hr	**2.81** (2.27-3.43)	**3.47** (2.79-4.23)	**4.54** (3.64-5.56)	**5.43** (4.33-6.69)	**6.65** (5.14-8.68)	**7.55** (5.72-10.1)	**8.54** (6.30-12.0)	**9.76** (6.69-13.9)	**11.7** (7.67-17.2)	**13.3** (8.55-20.1)
2-day	**3.17** (2.57-3.84)	**3.98** (3.22-4.82)	**5.29** (4.27-6.44)	**6.38** (5.12-7.82)	**7.89** (6.14-10.3)	**8.98** (6.87-12.0)	**10.2** (7.62-14.4)	**11.8** (8.10-16.6)	**14.3** (9.44-21.0)	**16.5** (10.7-24.8)
3-day	**3.44** (2.81-4.15)	**4.33** (3.52-5.23)	**5.78** (4.68-7.01)	**6.98** (5.62-8.52)	**8.64** (6.75-11.2)	**9.85** (7.55-13.1)	**11.2** (8.39-15.7)	**13.0** (8.92-18.2)	**15.8** (10.4-23.1)	**18.3** (11.8-27.3)
4-day	**3.69** (3.02-4.44)	**4.64** (3.78-5.59)	**6.18** (5.02-7.47)	**7.46** (6.03-9.08)	**9.22** (7.23-11.9)	**10.5** (8.08-14.0)	**11.9** (8.97-16.7)	**13.8** (9.53-19.4)	**16.8** (11.1-24.6)	**19.5** (12.6-29.1)
7-day	**4.40** (3.62-5.26)	**5.45** (4.47-6.53)	**7.17** (5.86-8.62)	**8.60** (6.98-10.4)	**10.6** (8.31-13.6)	**12.0** (9.25-15.8)	**13.6** (10.2-18.9)	**15.6** (10.8-21.8)	**18.9** (12.5-27.4)	**21.7** (14.0-32.1)
10-day	**5.11** (4.21-6.09)	**6.22** (5.12-7.42)	**8.03** (6.59-9.62)	**9.54** (7.77-11.5)	**11.6** (9.14-14.8)	**13.1** (10.1-17.2)	**14.8** (11.1-20.3)	**16.9** (11.7-23.5)	**20.1** (13.4-29.1)	**22.9** (14.9-33.9)
20-day	**7.33** (6.08-8.67)	**8.51** (7.05-10.1)	**10.4** (8.62-12.4)	**12.0** (9.88-14.4)	**14.3** (11.3-17.9)	**15.9** (12.3-20.5)	**17.7** (13.2-23.7)	**19.7** (13.8-27.1)	**22.6** (15.1-32.4)	**25.1** (16.3-36.7)
30-day	**9.18** (7.65-10.8)	**10.4** (8.65-12.3)	**12.4** (10.3-14.7)	**14.0** (11.6-16.7)	**16.3** (12.9-20.3)	**18.0** (13.9-23.0)	**19.8** (14.7-26.3)	**21.7** (15.3-29.8)	**24.4** (16.4-34.8)	**26.5** (17.3-38.7)
45-day	**11.5** (9.60-13.5)	**12.7** (10.6-15.0)	**14.8** (12.3-17.4)	**16.5** (13.6-19.6)	**18.8** (14.9-23.3)	**20.6** (15.9-26.1)	**22.4** (16.6-29.4)	**24.3** (17.1-33.1)	**26.6** (17.9-37.8)	**28.4** (18.5-41.3)
60-day	**13.4** (11.2-15.7)	**14.7** (12.3-17.2)	**16.8** (14.0-19.8)	**18.5** (15.4-22.0)	**21.0** (16.7-25.8)	**22.8** (17.7-28.7)	**24.7** (18.3-32.1)	**26.4** (18.7-35.9)	**28.6** (19.3-40.5)	**30.2** (19.7-43.8)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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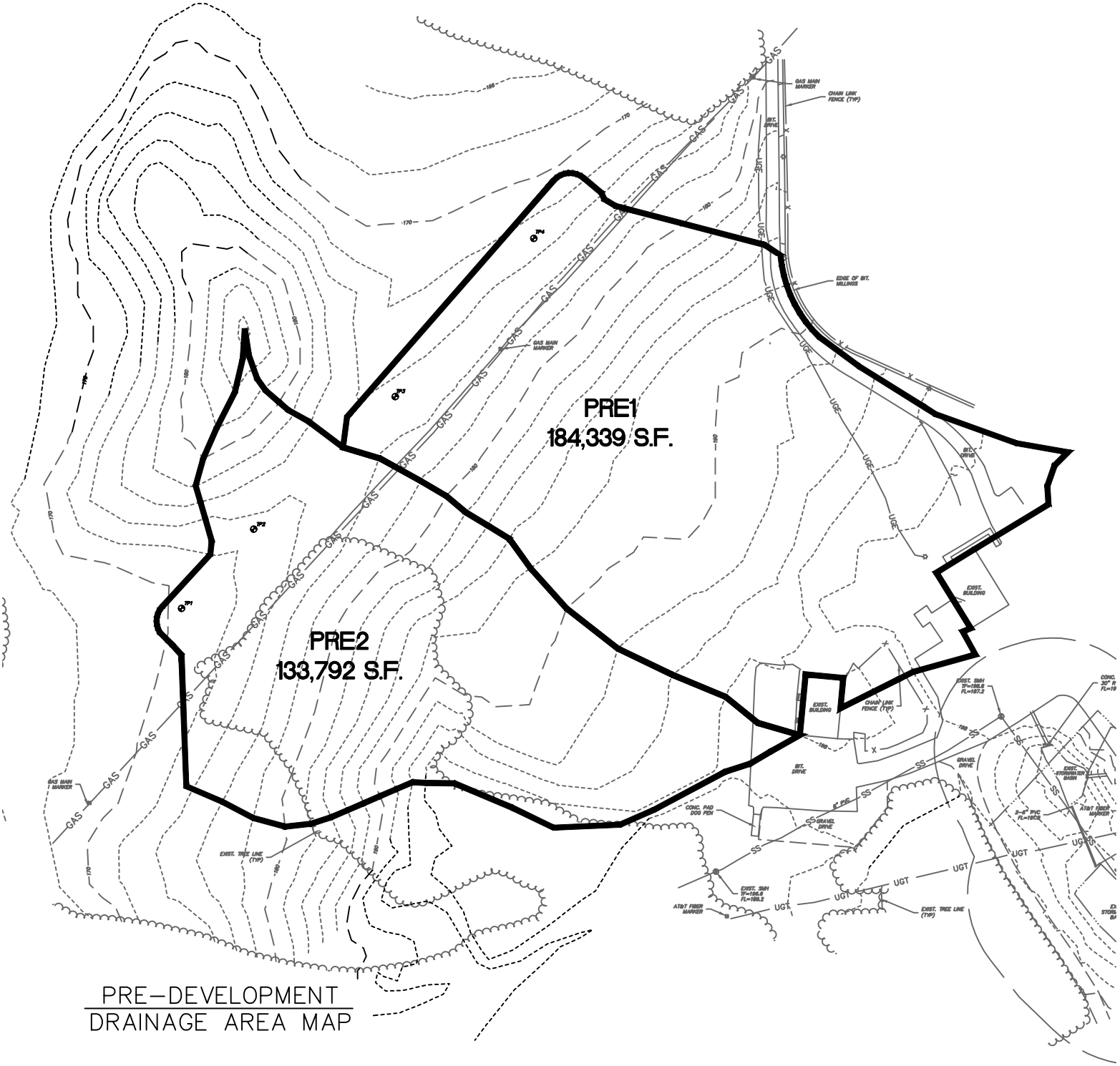
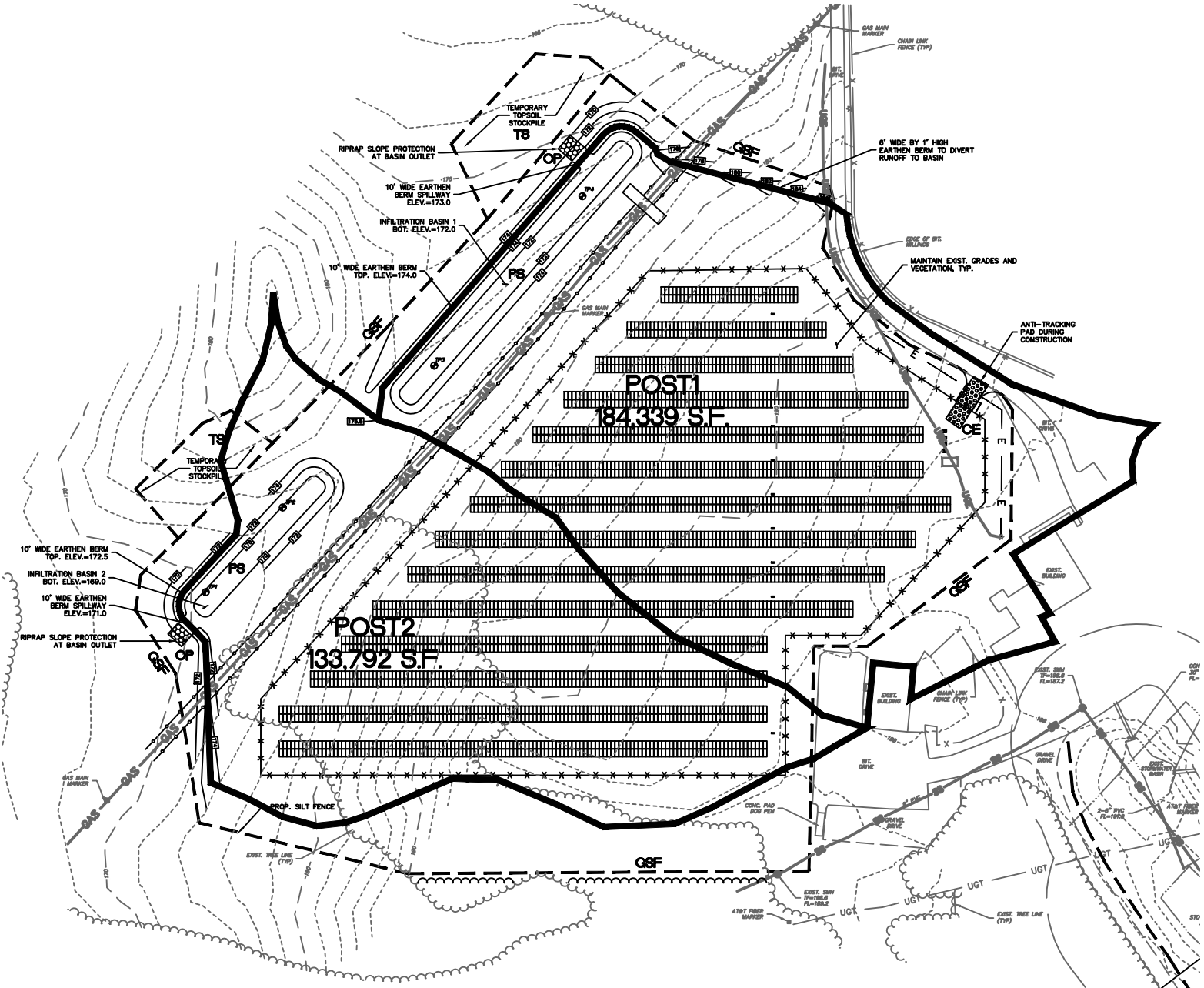
PF graphical

Appendix 3W:
DRAINAGE AREA MAPS
SOLAR ARRAY 1 (WEST)

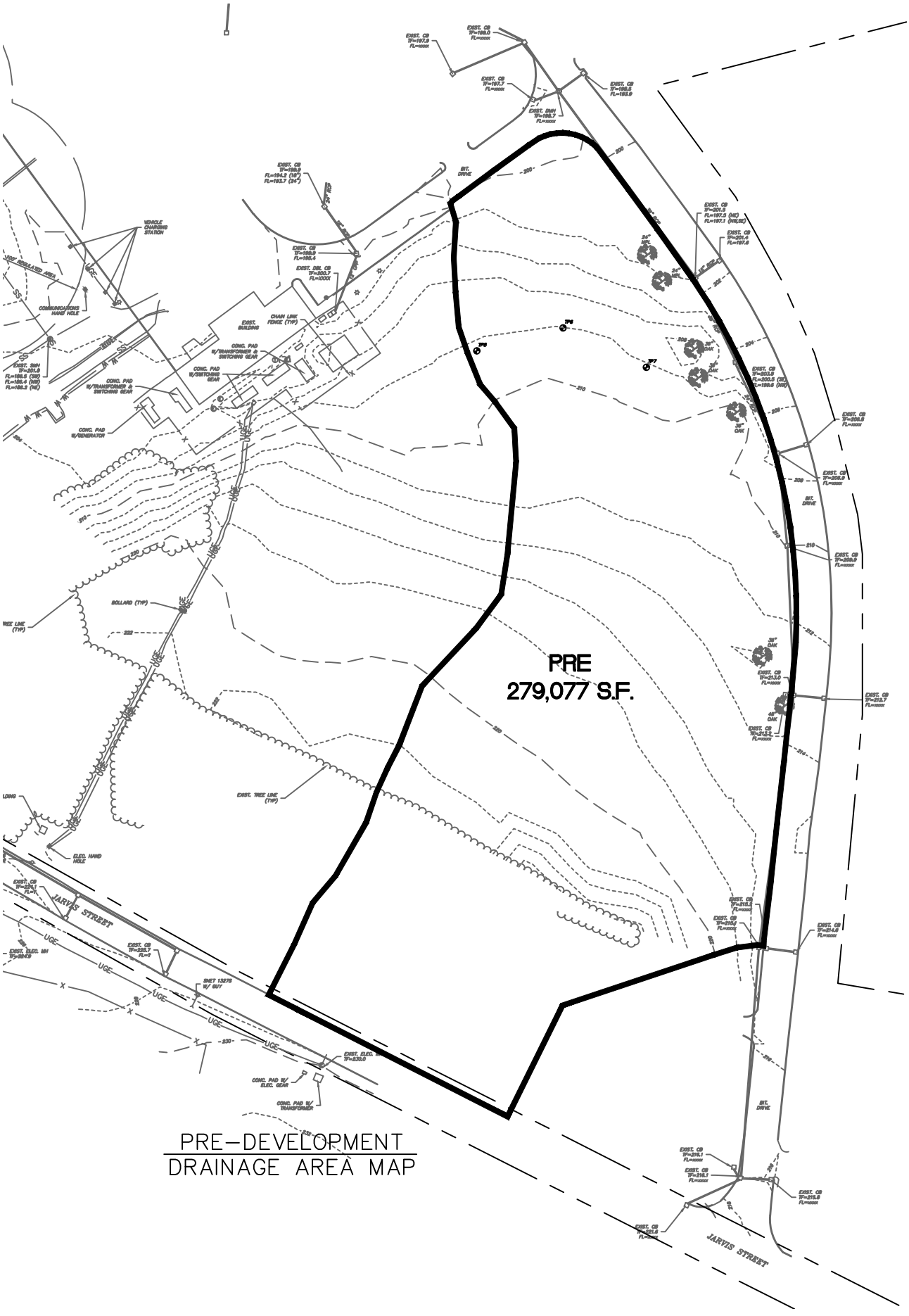


PRE-DEVELOPMENT
DRAINAGE AREA MAP

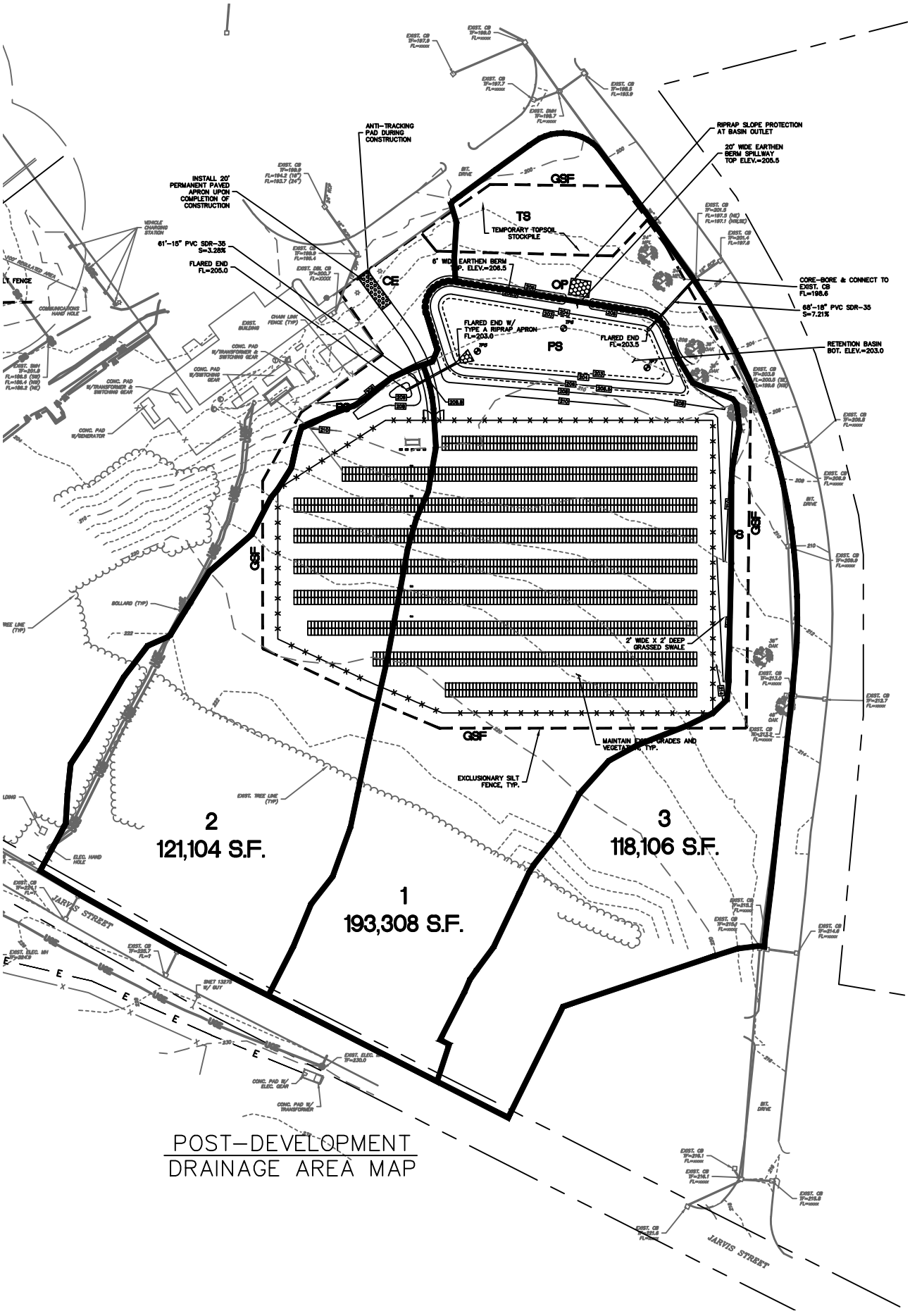


POST-DEVELOPMENT
DRAINAGE AREA MAP

Appendix 3E:
DRAINAGE AREA MAPS
SOLAR ARRAY 2 (EAST)



PRE–DEVELOPMENT
DRAINAGE AREA MAP



POST-DEVELOPMENT
DRAINAGE AREA MAP

Appendix 4:
TEST PIT LAB RESULTS

GRAIN SIZE DISTRIBUTION TEST DATA

2/24/2022

Client: JR Russo Surveyors & Engineers. Date: 02/24/2022

Project: Mason Youth Correctional Institution, Cheshire, CT.

Location: Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Depth: 18" - 24" **Sample Number:** 102-22 (MYI - TP1)

Material Description: Light brown fine sand, little fines.

Liquid Limit: N/A **Plastic Limit:** N/A

USCS Classification: N/A

Testing Remarks: ASTM C136, C117, Client id# MYI-TP1

Tested by: SZ **Checked by:** ZA

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 1106.60
Tare Wt. = 0.00
Minus #200 from wash = 11.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1249.90	0.00	0.00	1/4"	0.00	100	0
			#4	3.40	100	0
			#10	11.50	99	1
			#40	137.60	89	11
			#100	958.10	23	77
			#200	1102.80	12	88

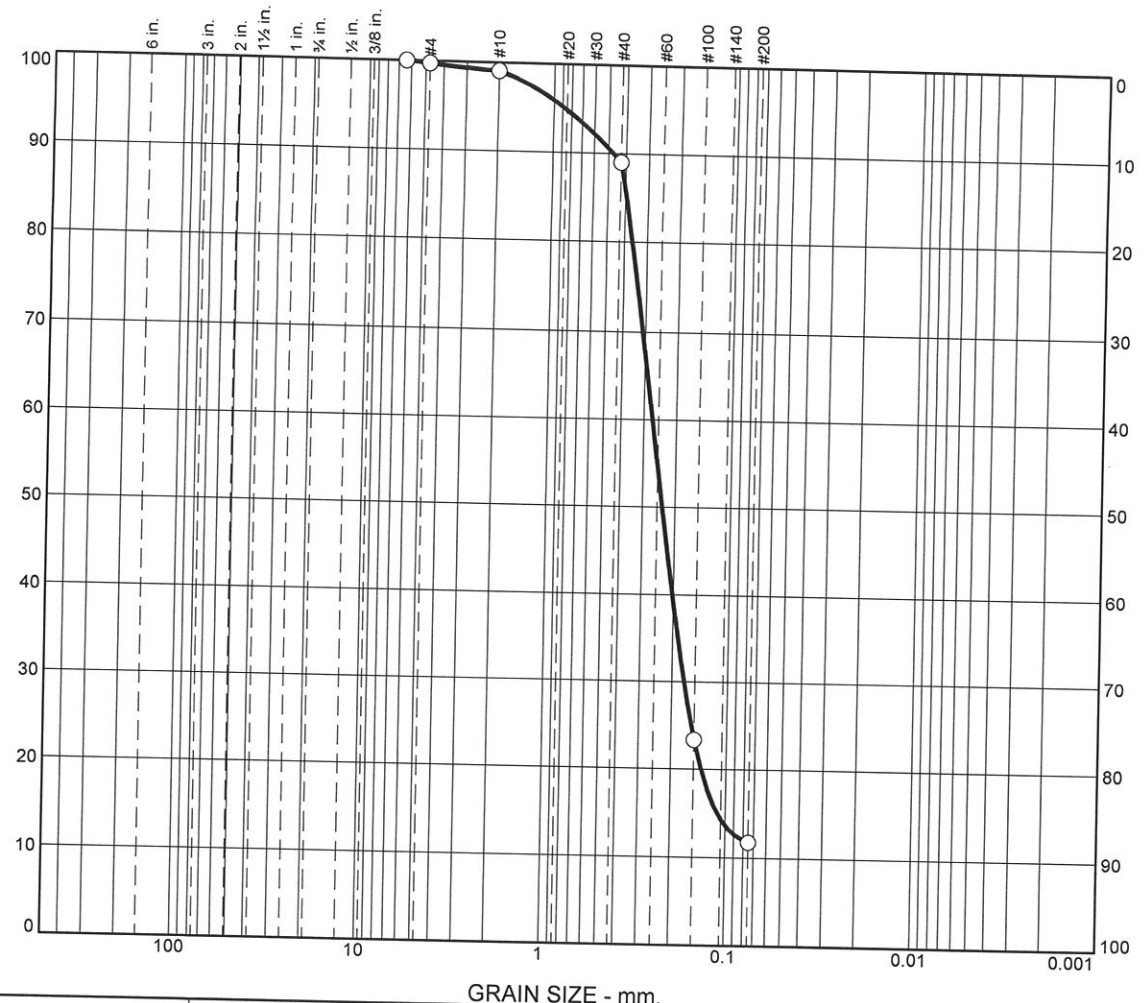
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	0	0	1	10	77	88			12

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.1112	0.1371	0.1720	0.2028	0.2347	0.2698	0.3617	0.3938	0.4703	0.8596

Fineness Modulus
1.21

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	0	1	10	77	12	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	0.3938	0.2698	0.2347	0.1720	0.1112			

	Material Description	USCS	AASHTO
○	Light brown fine sand, little fines.	N/A	

Project No. **Client:** JR Russo Surveyors & Engineers.

Project: Mason Youth Correctional Institution, Cheshire, CT.

○ **Source:** Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Remarks:

○ ASTM C136, C117, Client id# MYI-TP1

F.M.=1.21

Figure

Tested By: SZ **Checked By:** ZA

NEW ENGLAND MATERIALS TESTING LAB, LLC.
NEW ENGLAND REGIONAL OFFICE
72 Bissell Street Manchester, CT 06040 • Tel: 860-783-5830 • Fax: 860-783-5832

Client: JR Russo Surveyors & Engineers
P. O Box 938
East Windsor, CT. 06088

Report #: 001-22

Lab ID: 102-22

Project: Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.

Client ID: MYI, TP-1

Technician: Z. A

Date: 02/24/2022

LAB PERMEABILITY TEST

Sample description: Lt. br. fine sand, little fines.

Location: Onsite (Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.).

Sample depth: 18" to 24"

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	1000 cm^3
L = length of sample in centimeters	L =	15.24 cm
A = cross sectional area of specimen,	A =	43.10 cm^2
t = total time for discharge, in seconds	t =	960 sec
h = difference in head manometers,	h =	63.1 cm

k = 0.005837234 cm/sec.

k = 8.273 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

2/24/2022

Client: JR Russo Surveyors & Engineers. Date: 02/24/2022

Project: Mason Youth Correctional Institution, Cheshire, CT.

Location: Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Depth: 18" - 24" **Sample Number:** 103-22 (MYI - TP2)

Material Description: Light brown medium to fine sand, trace fines, trace gravel.

Liquid Limit: N/A **Plastic Limit:** N/A

USCS Classification: N/A

Testing Remarks: ASTM C136, C117, Client id# MYI-TP2

Tested by: SZ **Checked by:** ZA

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 1229.90
Tare Wt. = 0.00
Minus #200 from wash = 9.6%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1360.80	0.00	0.00	1/4"	0.00	100	0
			#4	24.30	98	2
			#10	79.10	94	6
			#40	472.80	65	35
			#100	1144.80	16	84
			#200	1225.90	10	90

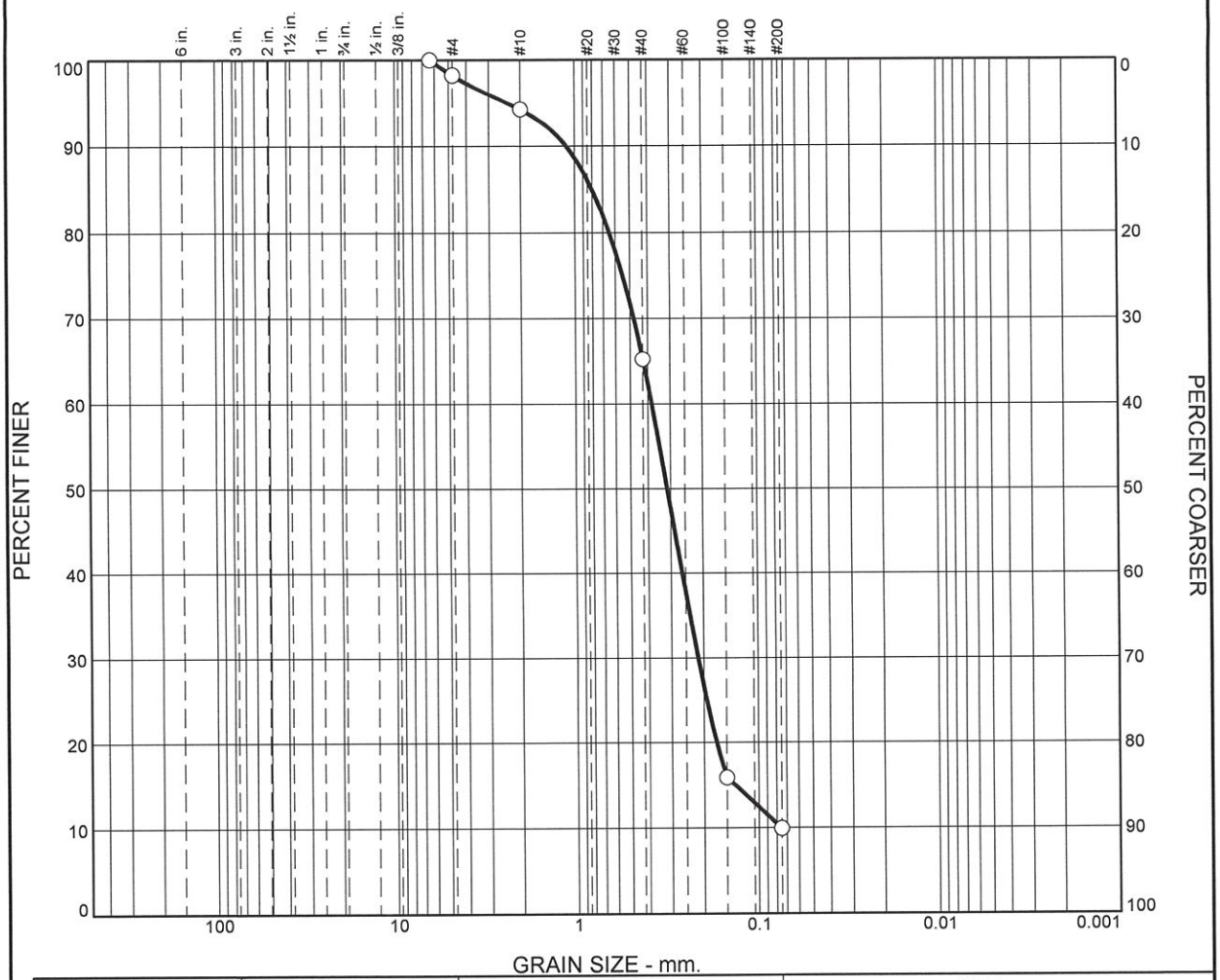
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	2	2	4	29	55	88			10

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0758	0.1355	0.1704	0.2146	0.2605	0.3135	0.3801	0.6456	0.8020	1.1149	2.3943

Fineness Modulus	C_u	C_c
1.75	5.02	1.60

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	2	4	29	55	10	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	0.8020	0.3801	0.3135	0.2146	0.1355	0.0758	1.60	5.02

Material Description	USCS	AASHTO
○ Light brown medium to fine sand, trace fines, trace gravel.	N/A	

Project No. **Client:** JR Russo Surveyors & Engineers.

Project: Mason Youth Correctional Institution, Cheshire, CT.

○ **Source:** Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Remarks:

○ ASTM C136, C117, Client id# MYI-TP2

F.M.=1.75

Figure

Tested By: SZ **Checked By:** ZA

NEW ENGLAND MATERIALS TESTING LAB, LLC.
NEW ENGLAND REGIONAL OFFICE
72 Bissell Street Manchester, CT 06040 • Tel: 860-783-5830 • Fax: 860-783-5832

Client: JR Russo Surveyors & Engineers
P. O Box 938
East Windsor, CT. 06088

Report #: 002-22

Lab ID: 103-22

Project: Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.

Client ID: MYI, TP-2

Technician: Z. A

Date: 02/24/2022

LAB PERMEABILITY TEST

Sample description: Lt. br. medium to fine sand, trace fines, trace gavel.

Location: Onsite (Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.).

Sample depth: 18" to 24"

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	1000 cm^3
L = length of sample in centimeters	L =	15.24 cm
A = cross sectional area of specimen,	A =	43.10 cm^2
t = total time for discharge, in seconds	t =	780.0 sec
h = difference in head manometers,	h =	62.3 cm

k = 0.007276542 cm/sec.

k = 10.313 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

2/24/2022

Client: JR Russo Surveyors & Engineers. Date: 02/24/2022

Project: Mason Youth Correctional Institution, Cheshire, CT.

Location: Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Depth: 18" - 24" **Sample Number:** 104-22 (MYI - TP3)

Material Description: Dark br. medium to fine sand, little fines, trace gravel, trace organic (roots).

Liquid Limit: N/A **Plastic Limit:** N/A

USCS Classification: N/A

Testing Remarks: ASTM C136, C117, Client id# MYI-TP3

Tested by: SZ **Checked by:** ZA

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 1198.20
Tare Wt. = 0.00
Minus #200 from wash = 14.4%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1400.00	0.00	0.00	3/4"	0.00	100	0
			1/4"	43.60	97	3
			#4	53.70	96	4
			#10	82.20	94	6
			#40	347.60	75	25
			#100	1056.00	25	75
			#200	1193.80	15	85

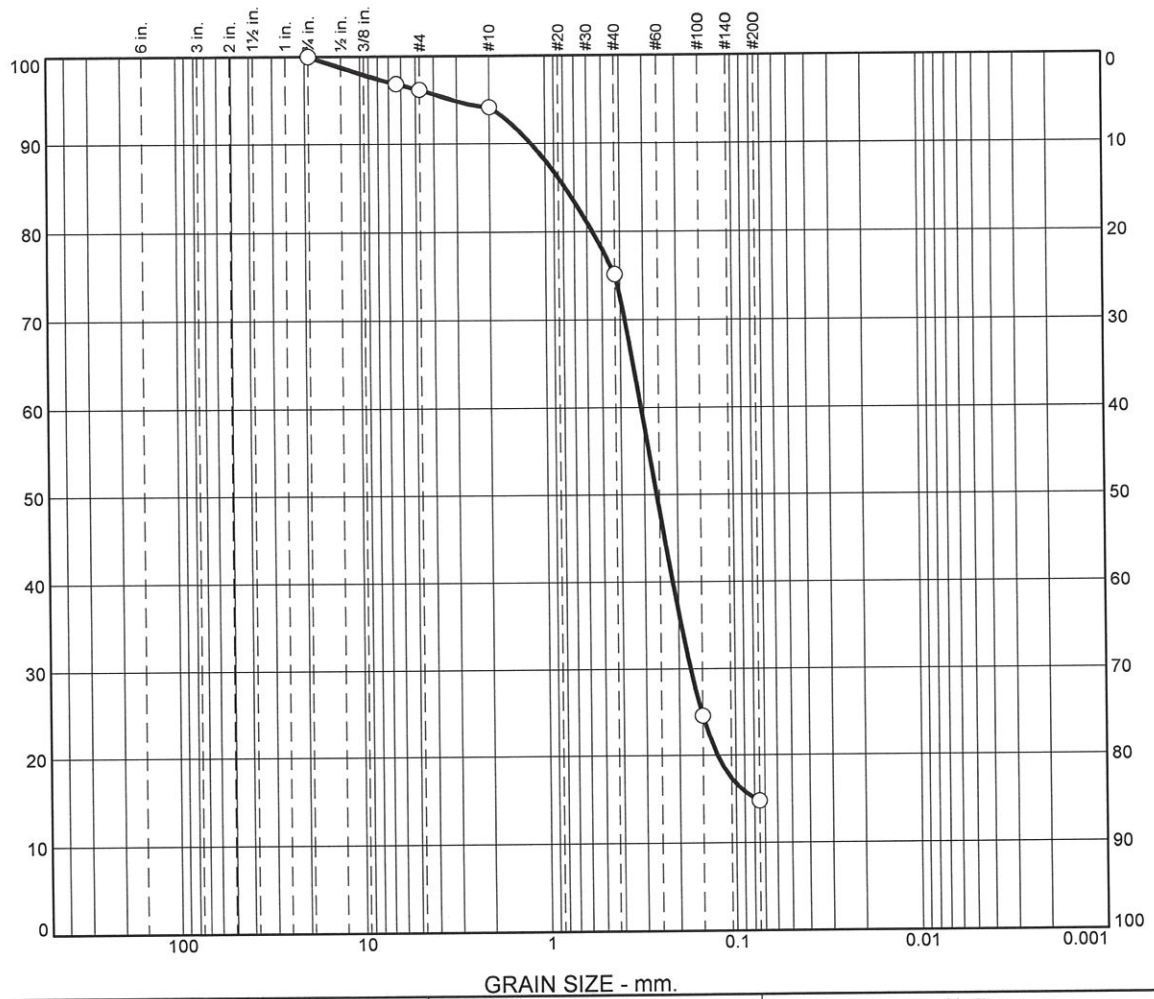
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	4	4	2	19	60	81			15

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0789	0.1257	0.1735	0.2145	0.2587	0.3108	0.5605	0.7831	1.1943	3.1727

Fineness Modulus
1.58

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	4	2	19	60	15	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	0.7831	0.3108	0.2587	0.1735	0.0789			

Material Description	USCS	AASHTO
○ Dark br. medium to fine sand, little fines, trace gravel, trace organic (roots).	N/A	

Project No. **Client:** JR Russo Surveyors & Engineers.

Project: Mason Youth Correctional Institution, Cheshire, CT.

○ **Source:** Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Remarks:

○ ASTM C136, C117, Client id# MYI-TP3

F.M.=1.58

Figure

Tested By: SZ **Checked By:** ZA

NEW ENGLAND MATERIALS TESTING LAB, LLC.
NEW ENGLAND REGIONAL OFFICE
72 Bissell Street Manchester, CT 06040 • Tel: 860-783-5830 • Fax: 860-783-5832

Client: JR Russo Surveyors & Engineers
P. O Box 938
East Windsor, CT. 06088

Report #: 003-22

Lab ID: 104-22

Project: Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.

Client ID: MYI, TP-3

Technician: Z. A

Date: 02/24/2022

LAB PERMEABILITY TEST

Sample description: Dark br. medium to fine sand, little fines, trace gavel, trace organic (roots).

Location: Onsite (Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.).

Sample depth: 18" to 24"

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	1000 cm^3
L = length of sample in centimeters	L =	15.26 cm
A = cross sectional area of specimen,	A =	43.10 cm^2
t = total time for discharge, in seconds	t =	900.0 sec
h = difference in head manometers,	h =	61.5 cm

k = 0.006417624 cm/sec.

k = 9.096 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

2/24/2022

Client: JR Russo Surveyors & Engineers. Date: 02/24/2022

Project: Mason Youth Correctional Institution, Cheshire, CT.

Location: Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Depth: 18" - 24" **Sample Number:** 105-22 (MYI - TP4)

Material Description: Light brown medium to fine sand, trace bankrun gravel, trace fines.

Liquid Limit: N/A **Plastic Limit:** N/A

USCS Classification: N/A

Testing Remarks: ASTM C136, C117, Client id# MYI-TP1

Tested by: SZ **Checked by:** ZA

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 1407.30
Tare Wt. = 0.00
Minus #200 from wash = 7.9%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1528.80	0.00	0.00	1"	0.00	100	0
			3/4"	32.60	98	2
			1/4"	132.50	91	9
			#4	153.40	90	10
			#10	267.50	83	17
			#40	821.40	46	54
			#100	1362.60	11	89
			#200	1401.50	8	92

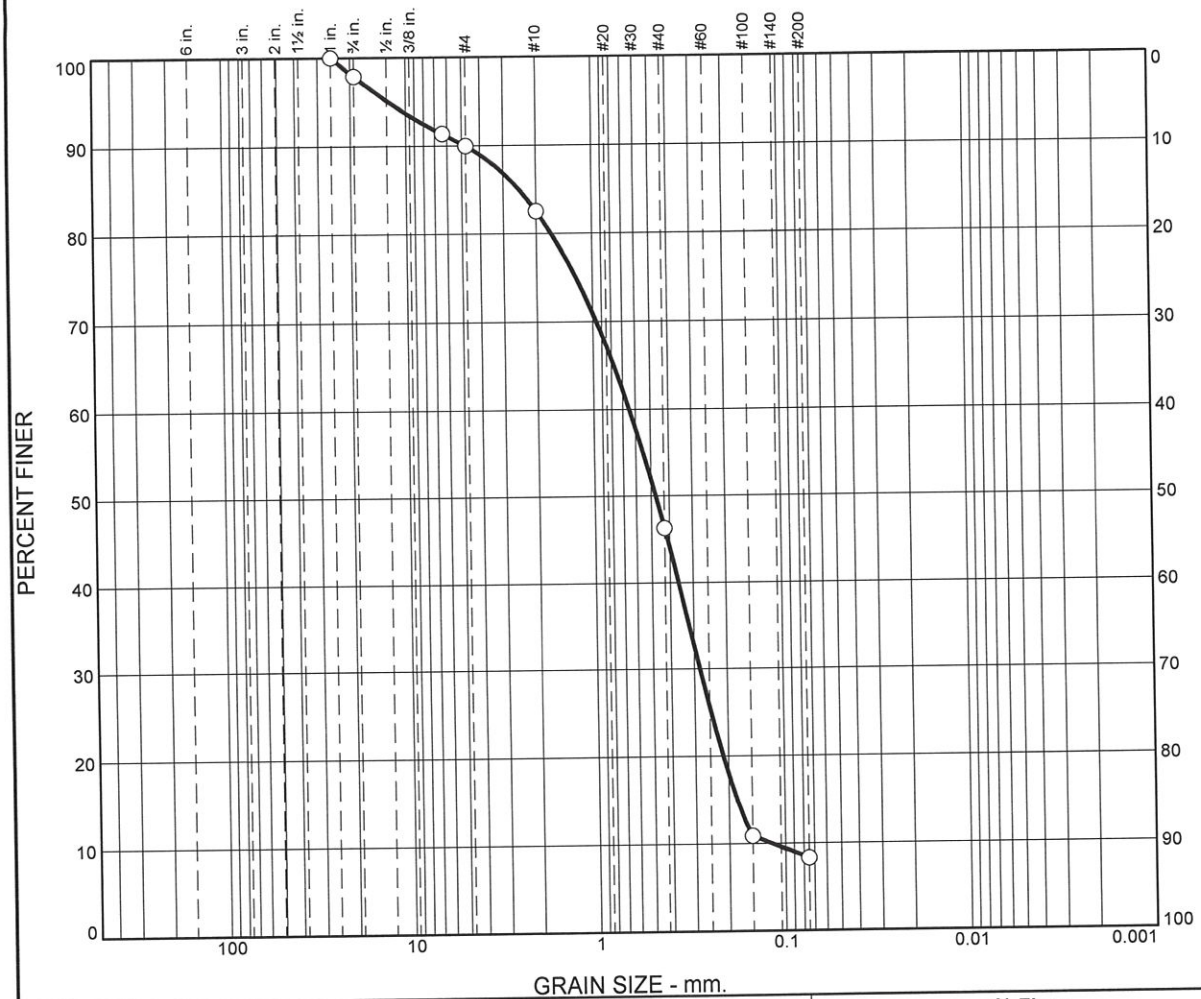
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	2	8	10	7	37	38	82			8

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.1183	0.1806	0.2131	0.2802	0.3608	0.4716	0.6466	1.6636	2.4856	4.7812	12.4413

Fineness Modulus	C_u	C_c
2.59	5.47	1.03

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	2	8	7	37	38	8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	2.4856	0.6466	0.4716	0.2802	0.1806	0.1183	1.03	5.47

Material Description	USCS	AASHTO
○ Light brown medium to fine sand, trace bankrun gravel, trace fines.	N/A	

Project No. **Client:** JR Russo Surveyors & Engineers.

Project: Mason Youth Correctional Institution, Cheshire, CT.

○ **Source:** Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Remarks:

○ ASTM C136, C117, Client id# MYI-TP1

F.M.=2.59

Figure

Tested By: SZ **Checked By:** ZA

NEW ENGLAND MATERIALS TESTING LAB, LLC.
NEW ENGLAND REGIONAL OFFICE
72 Bissell Street Manchester, CT 06040 • Tel: 860-783-5830 • Fax: 860-783-5832

Client: JR Russo Surveyors & Engineers
P. O Box 938
East Windsor, CT. 06088

Report #: 004-22

Lab ID: 105-22

Project: Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.

Client ID: MYI, TP-4

Technician: Z. A

Date: 02/24/2022

LAB PERMEABILITY TEST

Sample description: Lt. br. medium to fine sand, trace bank run gavel, trace fines.

Location: Onsite (Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.).

Sample depth: 18" to 24"

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	1000 cm^3
L = length of sample in centimeters	L =	15.24 cm
A = cross sectional area of specimen,	A =	43.10 cm^2
t = total time for discharge, in seconds	t =	900.0 sec
h = difference in head manometers,	h =	61.5 cm

k = 0.00638837 cm/sec.

k = 9.054 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

2/24/2022

Client: JR Russo Surveyors & Engineers. Date: 02/24/2022

Project: Mason Youth Correctional Institution, Cheshire, CT.

Location: Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Depth: N/A **Sample Number:** 106-22 (MYI - TP5)

Material Description: Reddish br. silty clayey medium to fine sand, little 3" minus recycled aggregate.

Liquid Limit: N/A **Plastic Limit:** N/A

USCS Classification: N/A

Testing Remarks: ASTM C136, C117, Client id# MYI-TP5

Tested by: SZ **Checked by:** ZA

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 1572.30
Tare Wt. = 0.00
Minus #200 from wash = 28.7%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
2205.70	0.00	0.00	2"	0.00	100	0
			1 1/2"	212.20	90	10
			1"	252.20	89	11
			3/4"	278.10	87	13
			1/4"	362.20	84	16
			#4	392.60	82	18
			#10	500.70	77	23
			#40	1009.40	54	46
			#100	1472.70	33	67
			#200	1568.90	29	71

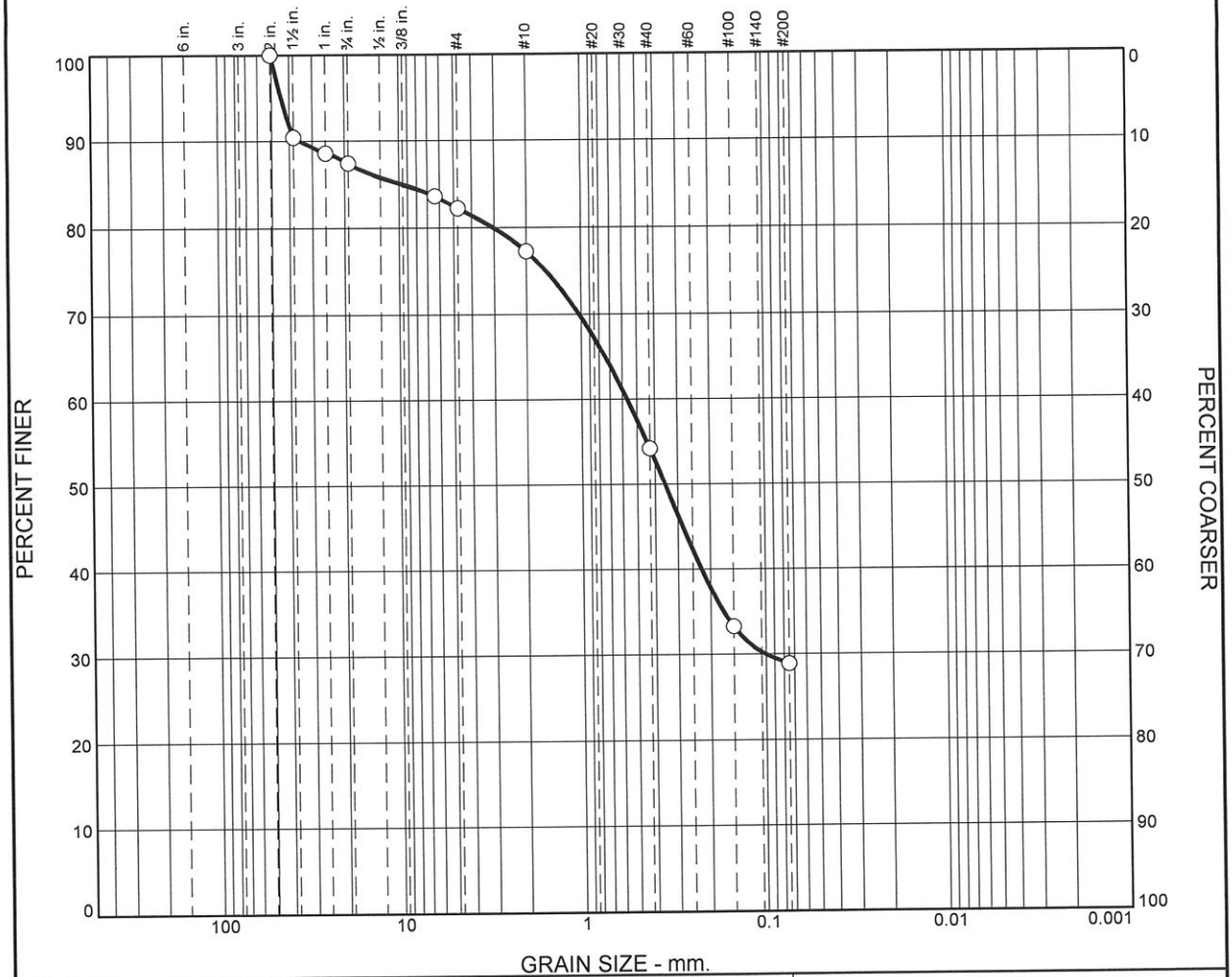
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	13	5	18	5	23	25	53			29

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1011	0.2240	0.3517	0.5629	3.0315	9.7174	35.1175	44.6412

Fineness Modulus
2.64

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	13	5	5	23	25	29	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	9.7174	0.5629	0.3517	0.1011				

Material Description	USCS	AASHTO
○ Reddish br. silty clayey medium to fine sand, little 3" minus recycled aggregate.	N/A	

Project No. **Client:** JR Russo Surveyors & Engineers.

Project: Mason Youth Correctional Institution, Cheshire, CT.

○ **Source:** Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Remarks:

○ ASTM C136, C117, Client id# MYI-TP5

F.M.=2.64

Figure

Tested By: SZ **Checked By:** ZA

NEW ENGLAND MATERIALS TESTING LAB, LLC.
NEW ENGLAND REGIONAL OFFICE
72 Bissell Street Manchester, CT 06040 • Tel: 860-783-5830 • Fax: 860-783-5832

Client: JR Russo Surveyors & Engineers
P. O Box 938
East Windsor, CT. 06088

Report #: 005-22

Lab ID: 106-22

Project: Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.

Client ID: MYI, TP-5

Technician: Z. A

Date: 02/22/2022

LAB PERMEABILITY TEST

Sample description: reddish br. silty clayey medium to fine sand, little 3" minus recycled aggregate.

Location: Onsite (Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.).

Sample depth: N/A

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability

Q = quantity of water discharged,	Q =	700.0 cm^3
L = length of sample in centimeters	L =	15.24 cm
A = cross sectional area of specimen,	A =	43.10 cm^2
t = total time for discharge, in seconds	t =	4620 sec
h = difference in head manometers,	h =	61.5 cm

k = 0.000871141 cm/sec.

k = 1.235 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

2/24/2022

Client: JR Russo Surveyors & Engineers. Date: 02/24/2022

Project: Mason Youth Correctional Institution, Cheshire, CT.

Location: Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Depth: N/A **Sample Number:** 107-22 (MYI - TP6)

Material Description: Reddish br. silty clayey sand, trace gravel.

Liquid Limit: N/A **Plastic Limit:** N/A

USCS Classification: N/A

Testing Remarks: ASTM C136, C117, Client id# MYI-TP6

Tested by: SZ **Checked by:** ZA

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 1225.50
Tare Wt. = 0.00
Minus #200 from wash = 39.8%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
2037.40	0.00	0.00	1"	0.00	100	0
			3/4"	22.60	99	1
			1/4"	83.40	96	4
			#4	103.00	95	5
			#10	183.70	91	9
			#40	626.80	69	31
			#100	1138.60	44	56
			#200	1225.10	40	60

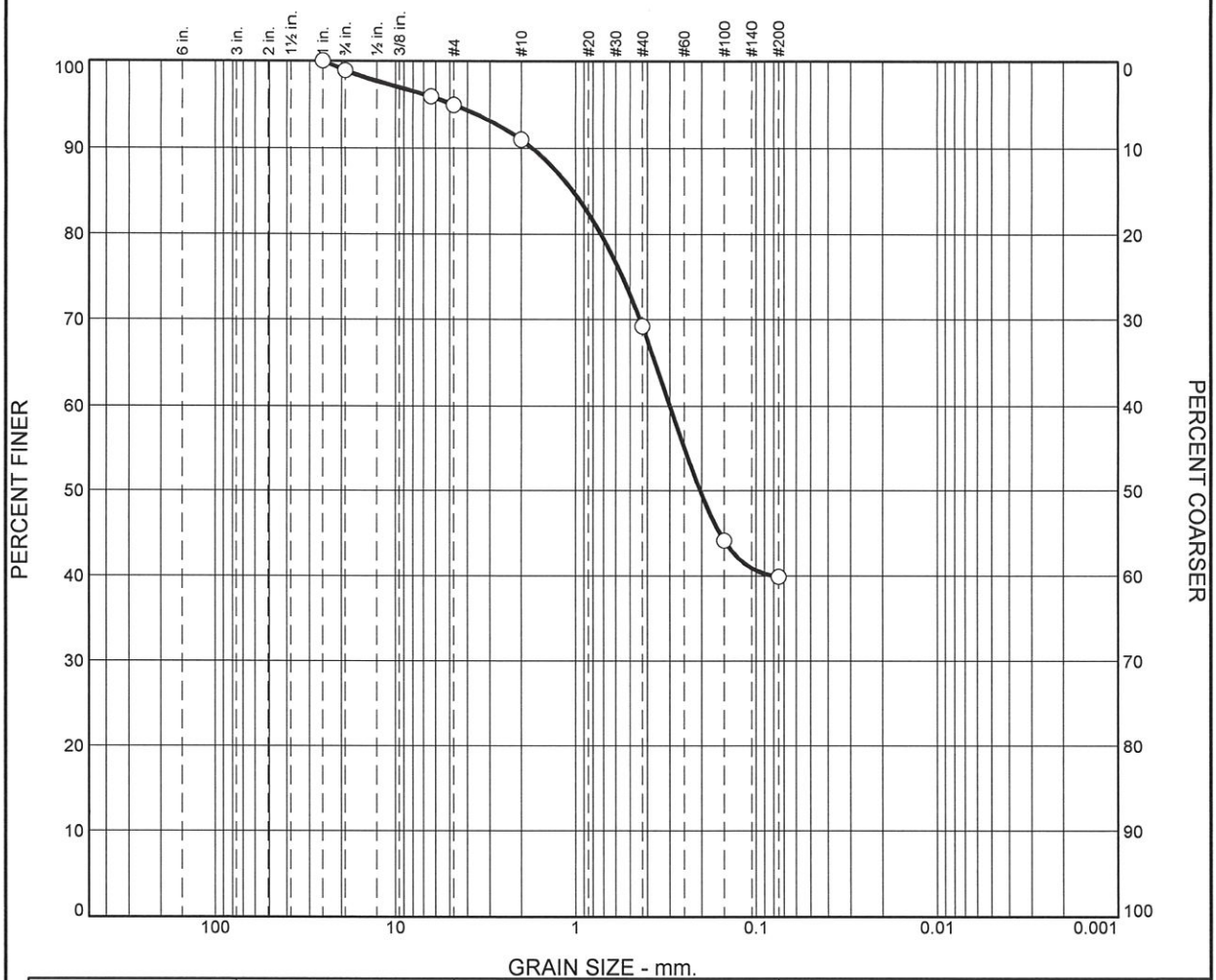
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	1	4	5	4	22	29	55			40

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0801	0.2036	0.2996	0.7231	1.0294	1.7346	4.8259

Fineness Modulus
1.50

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	1	4	4	22	29	40	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	1.0294	0.2996	0.2036					

Material Description	USCS	AASHTO
○ Reddish br. silty clayey sand, trace gravel.	N/A	

Project No. **Client:** JR Russo Surveyors & Engineers.

Project: Mason Youth Correctional Institution, Cheshire, CT.

○ **Source:** Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Remarks:

○ ASTM C136, C117, Client id# MYI-TP6

F.M.=1.50

Figure

Tested By: SZ **Checked By:** ZA

NEW ENGLAND MATERIALS TESTING LAB, LLC.
NEW ENGLAND REGIONAL OFFICE
72 Bissell Street Manchester, CT 06040 • Tel: 860-783-5830 • Fax: 860-783-5832

Client: JR Russo Surveyors & Engineers
P. O Box 938
East Windsor, CT. 06088

Report #: 006-22

Lab ID: 107-22

Project: Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.

Client ID: MYI, TP-6

Technician: Z. A

Date: 02/24/2022

LAB PERMEABILITY TEST

Sample description: reddish br. silty clayey sand, trace gavel.

Location: Onsite (Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.).

Sample depth: N/A

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	600.0 cm^3
L = length of sample in centimeters	L =	15.24 cm
A = cross sectional area of specimen,	A =	43.10 cm^2
t = total time for discharge, in seconds	t =	6120 sec
h = difference in head manometers,	h =	61.5 cm

k = 0.000564598 cm/sec.

k = 0.8002 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

2/24/2022

Client: JR Russo Surveyors & Engineers. Date: 02/24/2022

Project: Mason Youth Correctional Institution, Cheshire, CT.

Location: Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Depth: N/A **Sample Number:** 108-22 (MYI - TP7)

Material Description: Reddish br. silty sand, little gravel.

Liquid Limit: N/A **Plastic Limit:** N/A

USCS Classification: N/A

Testing Remarks: ASTM C136, C117, Client id# MYI-TP7

Tested by: SZ **Checked by:** ZA

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 1254.80
Tare Wt. = 0.00
Minus #200 from wash = 40.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
2107.80	0.00	0.00	1 1/2"	0.00	100	0
			1"	47.60	98	2
			3/4"	107.10	95	5
			1/4"	208.60	90	10
			#4	240.00	89	11
			#10	349.80	83	17
			#40	782.10	63	37
			#100	1176.20	44	56
			#200	1251.90	41	59

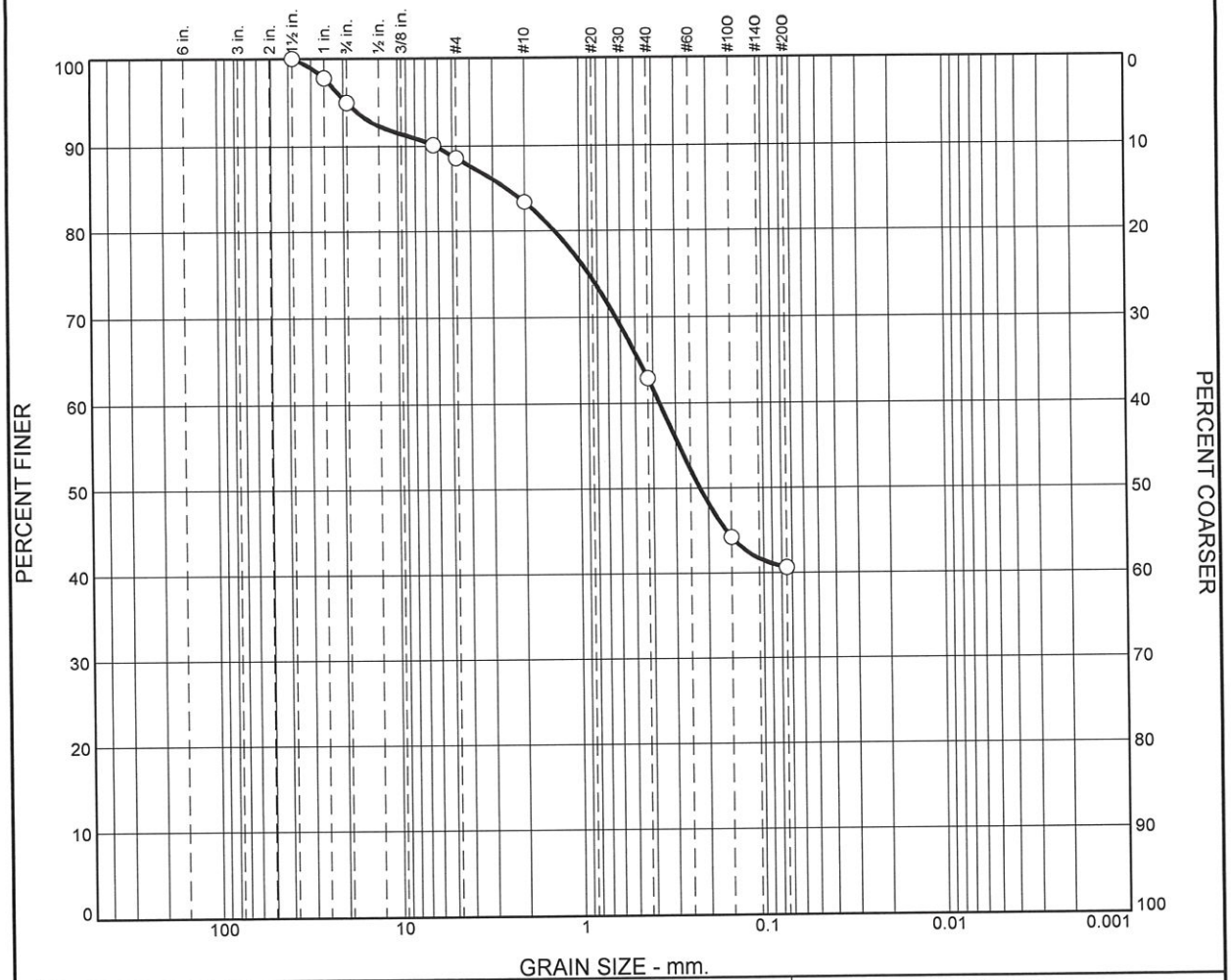
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	5	6	11	6	20	22	48			41

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.2216	0.3672	1.3685	2.5072	6.2041	19.2175

Fineness Modulus
1.93

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	5	6	6	20	22	41	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	2.5072	0.3672	0.2216					

Material Description	USCS	AASHTO
○ Reddish br. silty sand, little gravel.	N/A	

Project No. **Client:** JR Russo Surveyors & Engineers.

Project: Mason Youth Correctional Institution, Cheshire, CT.

○ **Source:** Onsite (Manson Youth Correctional Institution, 42 Jarvis Street Cheshire, CT.

Remarks:

○ ASTM C136, C117, Client id# MYI-TP7

F.M.=1.93

Figure

Tested By: SZ **Checked By:** ZA

NEW ENGLAND MATERIALS TESTING LAB, LLC.
NEW ENGLAND REGIONAL OFFICE
72 Bissell Street Manchester, CT 06040 • Tel: 860-783-5830 • Fax: 860-783-5832

Client: JR Russo Surveyors & Engineers
P. O Box 938
East Windsor, CT. 06088

Report #: 007-22

Lab ID: 108-22

Project: Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.

Client ID: MYI, TP-7

Technician: Z. A

Date: 02/24/2022

LAB PERMEABILITY TEST

Sample description: reddish br. silty sand, little gavel.

Location: Onsite (Mason Youth Correctional Institution
42 Jarvis Street Cheshire, CT.).

Sample depth: N/A

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	600.0 cm^3
L = length of sample in centimeters	L =	15.24 cm
A = cross sectional area of specimen,	A =	43.10 cm^2
t = total time for discharge, in seconds	t =	8520 sec
h = difference in head manometers,	h =	61.5 cm

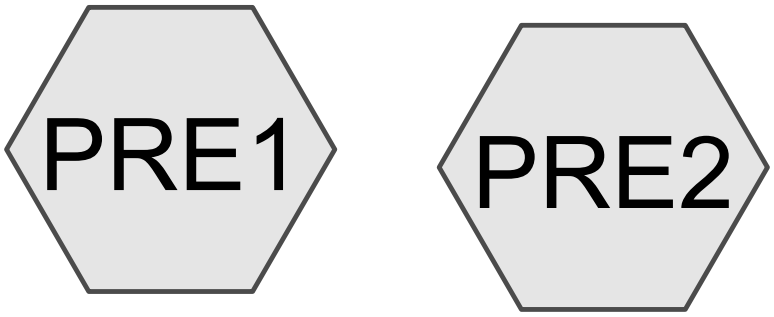
k = 0.000404897cm/sec.

k = 0.574 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

Appendix 5W:
PRE-DEVELOPMENT ANALYSIS
SOLAR ARRAY 1 (WEST)



PRE1

PRE2

Subcat Reach Pond Link

Routing Diagram for 2021-040 Manson W

Prepared by J.R. Russo & Associates LLC, Printed 3/29/2022

Summary for Subcatchment PRE1: PRE1

Runoff = 2.50 cfs @ 12.31 hrs, Volume= 0.389 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.57"

Area (sf)	CN	Adj	Description
13,789	98		Unconnected pavement, HSG A
112,002	30		Meadow, non-grazed, HSG A
58,548	39		>75% Grass cover, Good, HSG A
184,339	38	36	Weighted Average, UI Adjusted
170,550			92.52% Pervious Area
13,789			7.48% Impervious Area
13,789			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0204	0.18		**Sheet Flow, GR** Grass: Short n= 0.150 P2= 3.48"
5.0	460	0.0488	1.55		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
14.3	560	Total			

Summary for Subcatchment PRE2: PRE2

Runoff = 1.12 cfs @ 12.38 hrs, Volume= 0.210 af, Depth= 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.57"

Area (sf)	CN	Adj	Description
862	98		Unconnected pavement, HSG A
44,767	30		Meadow, non-grazed, HSG A
48,126	39		>75% Grass cover, Good, HSG A
40,037	30		Woods, Good, HSG A
133,792	34	33	Weighted Average, UI Adjusted
132,930			99.36% Pervious Area
862			0.64% Impervious Area
862			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	45	0.0267	1.37		**Sheet Flow, IM** Smooth surfaces n= 0.011 P2= 3.48"
4.8	55	0.0327	0.19		**Sheet Flow, GR** Grass: Short n= 0.150 P2= 3.48"
6.9	602	0.0427	1.45		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
12.2	702	Total			

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentPRE1: PRE1 Runoff Area=184,339 sf 7.48% Impervious Runoff Depth=0.00"
Flow Length=560' Tc=14.3 min UI Adjusted CN=36 Runoff=0.00 cfs 0.000 af

SubcatchmentPRE2: PRE2 Runoff Area=133,792 sf 0.64% Impervious Runoff Depth=0.00"
Flow Length=702' Tc=12.2 min UI Adjusted CN=33 Runoff=0.00 cfs 0.000 af

Total Runoff Area = 7.303 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
95.39% Pervious = 6.967 ac 4.61% Impervious = 0.336 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentPRE1: PRE1 Runoff Area=184,339 sf 7.48% Impervious Runoff Depth=0.46"
Flow Length=560' Tc=14.3 min UI Adjusted CN=36 Runoff=0.67 cfs 0.164 af

SubcatchmentPRE2: PRE2 Runoff Area=133,792 sf 0.64% Impervious Runoff Depth=0.30"
Flow Length=702' Tc=12.2 min UI Adjusted CN=33 Runoff=0.18 cfs 0.076 af

Total Runoff Area = 7.303 ac Runoff Volume = 0.240 af Average Runoff Depth = 0.39"
95.39% Pervious = 6.967 ac 4.61% Impervious = 0.336 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment PRE1: PRE1 Runoff Area=184,339 sf 7.48% Impervious Runoff Depth=0.74"
Flow Length=560' Tc=14.3 min UI Adjusted CN=36 Runoff=1.39 cfs 0.262 af

Subcatchment PRE2: PRE2 Runoff Area=133,792 sf 0.64% Impervious Runoff Depth=0.52"
Flow Length=702' Tc=12.2 min UI Adjusted CN=33 Runoff=0.55 cfs 0.133 af

Total Runoff Area = 7.303 ac Runoff Volume = 0.395 af Average Runoff Depth = 0.65"
95.39% Pervious = 6.967 ac 4.61% Impervious = 0.336 ac

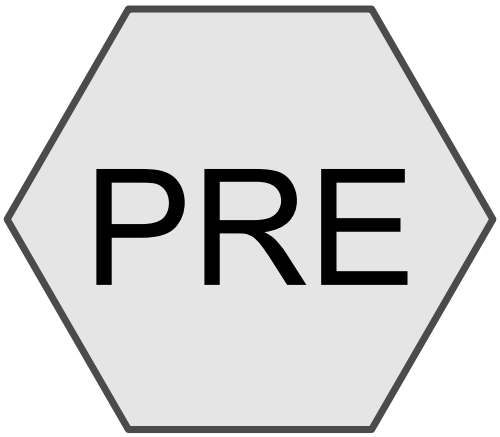
Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentPRE1: PRE1 Runoff Area=184,339 sf 7.48% Impervious Runoff Depth=1.10"
Flow Length=560' Tc=14.3 min UI Adjusted CN=36 Runoff=2.50 cfs 0.389 af

SubcatchmentPRE2: PRE2 Runoff Area=133,792 sf 0.64% Impervious Runoff Depth=0.82"
Flow Length=702' Tc=12.2 min UI Adjusted CN=33 Runoff=1.12 cfs 0.210 af

Total Runoff Area = 7.303 ac Runoff Volume = 0.599 af Average Runoff Depth = 0.98"
95.39% Pervious = 6.967 ac 4.61% Impervious = 0.336 ac

Appendix 5E:
PRE-DEVELOPMENT ANALYSIS
SOLAR ARRAY 2 (EAST)



Pre-Development Area

Subcat Reach Pond Link

Routing Diagram for 2021-040 Manson E
Prepared by J.R. Russo & Associates LLC, Printed 3/28/2022

Summary for Subcatchment PRE: Pre-Development Area

Runoff = 18.29 cfs @ 12.33 hrs, Volume= 2.074 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.57"

Area (sf)	CN	Adj	Description
17,569	98		Unconnected pavement, HSG B
7,811	55		Woods, Good, HSG B
130,829	58		Meadow, non-grazed, HSG B
122,868	61		>75% Grass cover, Good, HSG B
279,077	62	61	Weighted Average, UI Adjusted
261,508			93.70% Pervious Area
17,569			6.30% Impervious Area
17,569			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0139	0.15		**Sheet Flow, GR** Grass: Short n= 0.150 P2= 3.48"
1.7	82	0.0139	0.83		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
0.2	29	0.0154	2.52		**Shallow Concentrated Flow, IM** Paved Kv= 20.3 fps
0.2	13	0.0154	0.87		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
1.0	51	0.0313	0.88		**Shallow Concentrated Flow, W** Woodland Kv= 5.0 fps
9.0	704	0.0350	1.31		**Shallow Concentrated Flow, GR/MEAD** Short Grass Pasture Kv= 7.0 fps
23.0	979	Total			

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment PRE: Pre-Development Area Runoff Area=279,077 sf 6.30% Impervious Runoff Depth=0.56"
Flow Length=979' Tc=23.0 min UI Adjusted CN=61 Runoff=1.96 cfs 0.301 af

Total Runoff Area = 6.407 ac Runoff Volume = 0.301 af Average Runoff Depth = 0.56"
93.70% Pervious = 6.003 ac 6.30% Impervious = 0.403 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment PRE: Pre-Development Area Runoff Area=279,077 sf 6.30% Impervious Runoff Depth=2.47"
Flow Length=979' Tc=23.0 min UI Adjusted CN=61 Runoff=11.33 cfs 1.317 af

Total Runoff Area = 6.407 ac Runoff Volume = 1.317 af Average Runoff Depth = 2.47"
93.70% Pervious = 6.003 ac 6.30% Impervious = 0.403 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment PRE: Pre-Development Area Runoff Area=279,077 sf 6.30% Impervious Runoff Depth=3.13"
Flow Length=979' Tc=23.0 min UI Adjusted CN=61 Runoff=14.58 cfs 1.670 af

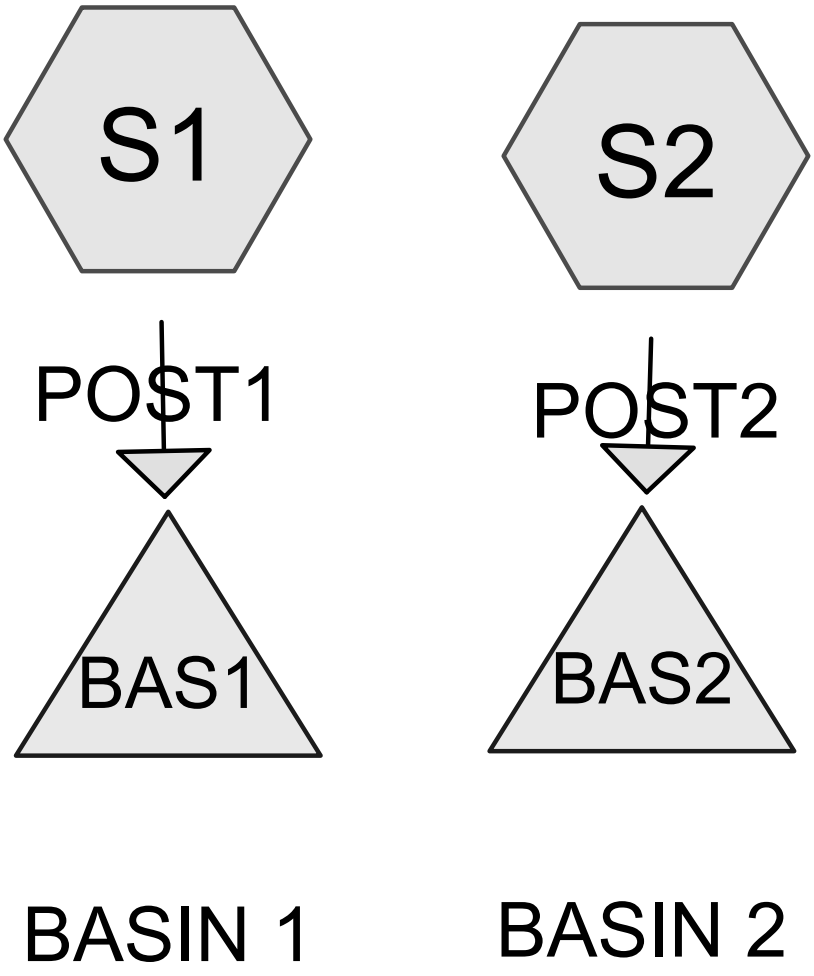
Total Runoff Area = 6.407 ac Runoff Volume = 1.670 af Average Runoff Depth = 3.13"
93.70% Pervious = 6.003 ac 6.30% Impervious = 0.403 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment PRE: Pre-Development Area Runoff Area=279,077 sf 6.30% Impervious Runoff Depth=3.88"
Flow Length=979' Tc=23.0 min UI Adjusted CN=61 Runoff=18.29 cfs 2.074 af

Total Runoff Area = 6.407 ac Runoff Volume = 2.074 af Average Runoff Depth = 3.88"
93.70% Pervious = 6.003 ac 6.30% Impervious = 0.403 ac

Appendix 6W:
POST-DEVELOPMENT ANALYSIS
SOLAR ARRAY 1 (WEST)



Subcat Reach Pond Link

Routing Diagram for 2021-040 Manson W
Prepared by J.R. Russo & Associates LLC, Printed 3/29/2022

Summary for Subcatchment S1: POST1

Runoff = 5.27 cfs @ 12.23 hrs, Volume= 0.606 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.57"

	Area (sf)	CN	Adj	Description
	14,309	98		Unconnected pavement, HSG A
	46,561	30		Meadow, non-grazed, HSG A
*	101,615	44		Meadow, HSG Adjusted
	21,854	39		>75% Grass cover, Good, HSG A
	184,339	44	42	Weighted Average, UI Adjusted
	170,030			92.24% Pervious Area
	14,309			7.76% Impervious Area
	14,309			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0204	0.18		**Sheet Flow, GR** Grass: Short n= 0.150 P2= 3.48"
4.4	412	0.0488	1.55		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
13.7	512	Total			

Summary for Subcatchment S2: POST2

Runoff = 3.06 cfs @ 12.18 hrs, Volume= 0.357 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.57"

	Area (sf)	CN	Description
	862	98	Unconnected pavement, HSG A
	47,162	30	Meadow, non-grazed, HSG A
*	75,006	44	Meadow, HSG Adjusted
	8,394	39	>75% Grass cover, Good, HSG A
	1,368	30	Woods, Good, HSG A
	132,792	39	Weighted Average
	131,930		99.35% Pervious Area
	862		0.65% Impervious Area
	862		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	45	0.0267	1.37		**Sheet Flow, IM** Smooth surfaces n= 0.011 P2= 3.48"
4.8	55	0.0327	0.19		**Sheet Flow, GR** Grass: Short n= 0.150 P2= 3.48"
4.5	425	0.0504	1.57		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
9.8	525	Total			

Summary for Pond BAS1: BASIN 1

Inflow Area = 4.232 ac, 7.76% Impervious, Inflow Depth = 1.72" for 100-Year event
Inflow = 5.27 cfs @ 12.23 hrs, Volume= 0.606 af
Outflow = 1.53 cfs @ 12.84 hrs, Volume= 0.659 af, Atten= 71%, Lag= 36.8 min
Discarded = 1.09 cfs @ 12.84 hrs, Volume= 0.641 af
Primary = 0.44 cfs @ 12.84 hrs, Volume= 0.018 af

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 173.06' @ 12.84 hrs Surf.Area= 8,061 sf Storage= 7,121 cf
Flood Elev= 174.00' Surf.Area= 10,473 sf Storage= 15,790 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 91.1 min (989.4 - 898.3)

Volume	Invert	Avail.Storage	Storage Description
#1	172.00'	15,790 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
172.00	5,317	0	0
174.00	10,473	15,790	15,790

Device	Routing	Invert	Outlet Devices
#1	Discarded	172.00'	**4.527 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 169.00'
#2	Primary	173.00'	**10.0' long x 16.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.09 cfs @ 12.84 hrs HW=173.06' (Free Discharge)
↑**1=Exfiltration** (Controls 1.09 cfs)

Primary OutFlow Max=0.44 cfs @ 12.84 hrs HW=173.06' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.44 cfs @ 0.68 fps)

Summary for Pond BAS2: BASIN 2

Inflow Area = 3.048 ac, 0.65% Impervious, Inflow Depth = 1.40" for 100-Year event
Inflow = 3.06 cfs @ 12.18 hrs, Volume= 0.357 af
Outflow = 1.02 cfs @ 12.70 hrs, Volume= 0.370 af, Atten= 67%, Lag= 31.3 min
Discarded = 0.54 cfs @ 12.70 hrs, Volume= 0.349 af
Primary = 0.48 cfs @ 12.70 hrs, Volume= 0.021 af

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 171.07' @ 12.70 hrs Surf.Area= 4,375 sf Storage= 3,839 cf
Flood Elev= 172.00' Surf.Area= 5,739 sf Storage= 8,549 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 83.4 min (990.8 - 907.4)

Volume	Invert	Avail.Storage	Storage Description
#1	170.00'	8,549 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
170.00	2,810	0	0
172.00	5,739	8,549	8,549

Device	Routing	Invert	Outlet Devices
#1	Discarded	170.00'	**4.140 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 167.00'
#2	Primary	171.00'	**10.0' long x 26.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.54 cfs @ 12.70 hrs HW=171.07' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.54 cfs)

Primary OutFlow Max=0.48 cfs @ 12.70 hrs HW=171.07' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.48 cfs @ 0.70 fps)

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentS1: POST1 Runoff Area=184,339 sf 7.76% Impervious Runoff Depth=0.04"
Flow Length=512' Tc=13.7 min UI Adjusted CN=42 Runoff=0.02 cfs 0.013 af

SubcatchmentS2: POST2 Runoff Area=132,792 sf 0.65% Impervious Runoff Depth=0.01"
Flow Length=525' Tc=9.8 min CN=39 Runoff=0.00 cfs 0.002 af

Pond BAS1: BASIN 1 Peak Elev=172.00' Storage=3 cf Inflow=0.02 cfs 0.013 af
Discarded=0.56 cfs 0.258 af Primary=0.00 cfs 0.000 af Outflow=0.56 cfs 0.258 af

Pond BAS2: BASIN 2 Peak Elev=170.00' Storage=1 cf Inflow=0.00 cfs 0.002 af
Discarded=0.27 cfs 0.090 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.090 af

Total Runoff Area = 7.280 ac Runoff Volume = 0.014 af Average Runoff Depth = 0.02"
95.22% Pervious = 6.932 ac 4.78% Impervious = 0.348 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentS1: POST1 Runoff Area=184,339 sf 7.76% Impervious Runoff Depth=0.86"
Flow Length=512' Tc=13.7 min UI Adjusted CN=42 Runoff=1.98 cfs 0.304 af

SubcatchmentS2: POST2 Runoff Area=132,792 sf 0.65% Impervious Runoff Depth=0.65"
Flow Length=525' Tc=9.8 min CN=39 Runoff=0.93 cfs 0.166 af

Pond BAS1: BASIN 1 Peak Elev=172.37' Storage=2,168 cf Inflow=1.98 cfs 0.304 af
Discarded=0.73 cfs 0.413 af Primary=0.00 cfs 0.000 af Outflow=0.73 cfs 0.413 af

Pond BAS2: BASIN 2 Peak Elev=170.33' Storage=1,010 cf Inflow=0.93 cfs 0.166 af
Discarded=0.35 cfs 0.205 af Primary=0.00 cfs 0.000 af Outflow=0.35 cfs 0.205 af

Total Runoff Area = 7.280 ac Runoff Volume = 0.470 af Average Runoff Depth = 0.77"
95.22% Pervious = 6.932 ac 4.78% Impervious = 0.348 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentS1: POST1 Runoff Area=184,339 sf 7.76% Impervious Runoff Depth=1.25"
Flow Length=512' Tc=13.7 min UI Adjusted CN=42 Runoff=3.42 cfs 0.439 af

SubcatchmentS2: POST2 Runoff Area=132,792 sf 0.65% Impervious Runoff Depth=0.99"
Flow Length=525' Tc=9.8 min CN=39 Runoff=1.79 cfs 0.251 af

Pond BAS1: BASIN 1 Peak Elev=172.71' Storage=4,433 cf Inflow=3.42 cfs 0.439 af
Discarded=0.90 cfs 0.517 af Primary=0.00 cfs 0.000 af Outflow=0.90 cfs 0.517 af

Pond BAS2: BASIN 2 Peak Elev=170.72' Storage=2,389 cf Inflow=1.79 cfs 0.251 af
Discarded=0.44 cfs 0.272 af Primary=0.00 cfs 0.000 af Outflow=0.44 cfs 0.272 af

Total Runoff Area = 7.280 ac Runoff Volume = 0.690 af Average Runoff Depth = 1.14"
95.22% Pervious = 6.932 ac 4.78% Impervious = 0.348 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentS1: POST1 Runoff Area=184,339 sf 7.76% Impervious Runoff Depth=1.72"
Flow Length=512' Tc=13.7 min UI Adjusted CN=42 Runoff=5.27 cfs 0.606 af

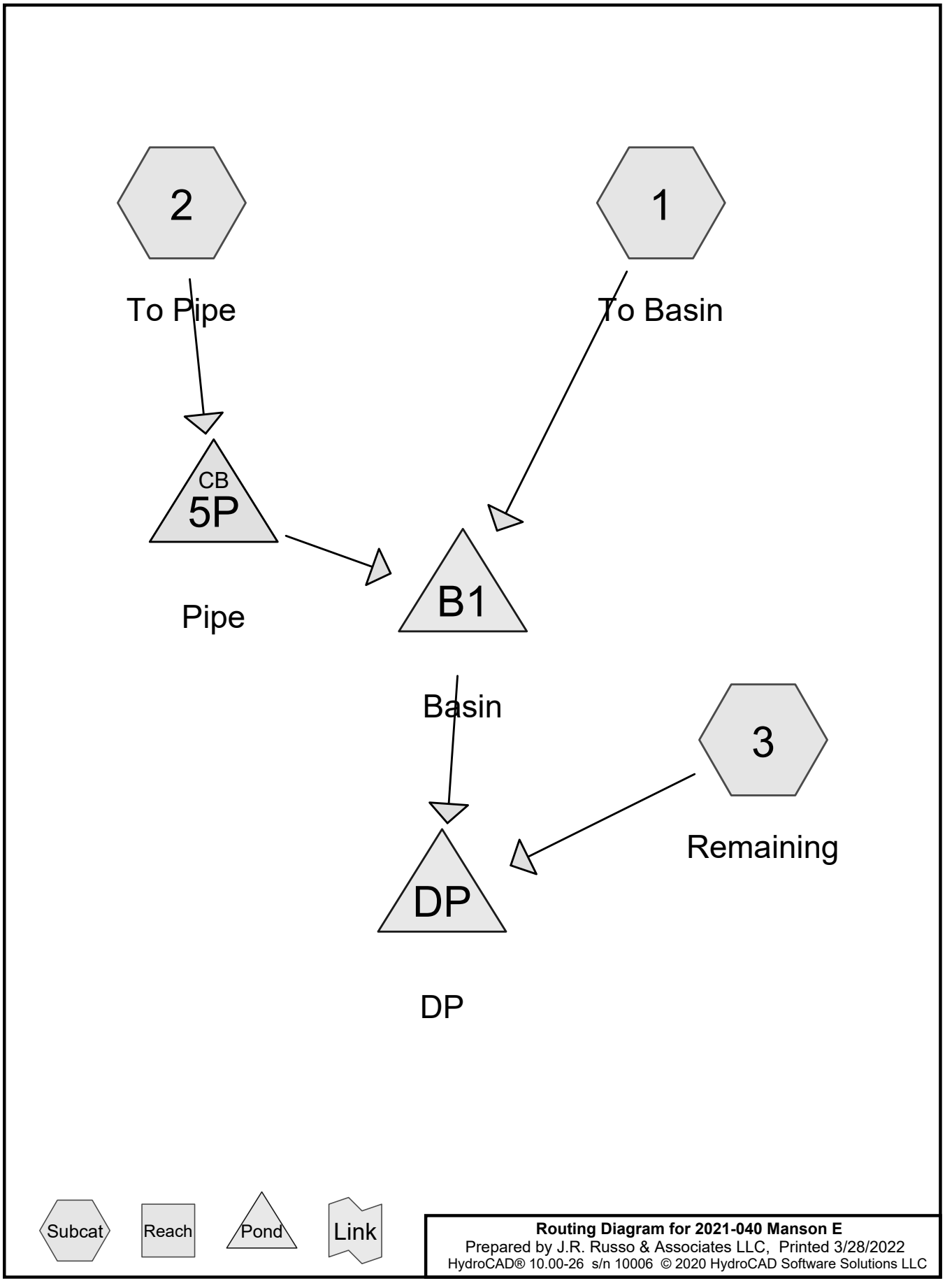
SubcatchmentS2: POST2 Runoff Area=132,792 sf 0.65% Impervious Runoff Depth=1.40"
Flow Length=525' Tc=9.8 min CN=39 Runoff=3.06 cfs 0.357 af

Pond BAS1: BASIN 1 Peak Elev=173.06' Storage=7,121 cf Inflow=5.27 cfs 0.606 af
Discarded=1.09 cfs 0.641 af Primary=0.44 cfs 0.018 af Outflow=1.53 cfs 0.659 af

Pond BAS2: BASIN 2 Peak Elev=171.07' Storage=3,839 cf Inflow=3.06 cfs 0.357 af
Discarded=0.54 cfs 0.349 af Primary=0.48 cfs 0.021 af Outflow=1.02 cfs 0.370 af

Total Runoff Area = 7.280 ac Runoff Volume = 0.963 af Average Runoff Depth = 1.59"
95.22% Pervious = 6.932 ac 4.78% Impervious = 0.348 ac

Appendix 6E:
POST-DEVELOPMENT ANALYSIS
SOLAR ARRAY 2 (EAST)



Routing Diagram for 2021-040 Manson E
Prepared by J.R. Russo & Associates LLC, Printed 3/28/2022

Summary for Subcatchment 1: To Basin

Runoff = 14.20 cfs @ 12.29 hrs, Volume= 1.524 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.57"

	Area (sf)	CN	Adj	Description
*	86,939	65		Meadow (adjusted CN)
	9,110	98		Unconnected pavement, HSG B
	6,382	55		Woods, Good, HSG B
	24,434	58		Meadow, non-grazed, HSG B
	66,443	61		>75% Grass cover, Good, HSG B
	193,308	64	63	Weighted Average, UI Adjusted
	184,198			95.29% Pervious Area
	9,110			4.71% Impervious Area
	9,110			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0139	0.15		**Sheet Flow, GR** Grass: Short n= 0.150 P2= 3.48"
1.7	82	0.0139	0.83		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
0.2	29	0.0154	2.52		**Shallow Concentrated Flow, IM** Paved Kv= 20.3 fps
0.2	13	0.0154	0.87		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
1.0	51	0.0313	0.88		**Shallow Concentrated Flow, W** Woodland Kv= 5.0 fps
6.4	478	0.0313	1.24		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
20.4	753	Total			

Summary for Subcatchment 2: To Pipe

Runoff = 8.34 cfs @ 12.29 hrs, Volume= 0.900 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.57"

	Area (sf)	CN	Adj	Description
*	28,460	65		Meadow (adjusted CN)
	22,039	58		Meadow, non-grazed, HSG B
	7,209	98		Unconnected pavement, HSG B
	24,662	55		Woods, Good, HSG B
	38,734	61		>75% Grass cover, Good, HSG B
	121,104	62	61	Weighted Average, UI Adjusted
	113,895			94.05% Pervious Area
	7,209			5.95% Impervious Area
	7,209			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0139	0.15		**Sheet Flow, GR** Grass: Short n= 0.150 P2= 3.48"
1.7	82	0.0139	0.83		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
0.2	29	0.0154	2.52		**Shallow Concentrated Flow, IM** Paved Kv= 20.3 fps
0.2	13	0.0154	0.87		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
1.0	51	0.0313	0.88		**Shallow Concentrated Flow, W** Woodland Kv= 5.0 fps
6.4	478	0.0313	1.24		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
20.4	753	Total			

Summary for Subcatchment 3: Remaining

Runoff = 10.59 cfs @ 12.16 hrs, Volume= 0.905 af, Depth= 4.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.57"

Area (sf)	CN	Adj	Description
8,628	98		Unconnected pavement, HSG B
2,280	55		Woods, Good, HSG B
24,548	58		Meadow, non-grazed, HSG B
82,650	61		>75% Grass cover, Good, HSG B
118,106	63	62	Weighted Average, UI Adjusted
109,478			92.69% Pervious Area
8,628			7.31% Impervious Area
8,628			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	75	0.0347	0.21		**Sheet Flow, GR** Grass: Short n= 0.150 P2= 3.48"
0.3	25	0.0276	1.24		**Sheet Flow, IM** Smooth surfaces n= 0.011 P2= 3.48"
0.4	80	0.0276	3.37		**Shallow Concentrated Flow, IM** Paved Kv= 20.3 fps
0.1	10	0.0323	1.26		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
0.3	16	0.0323	0.90		**Shallow Concentrated Flow, W** Woodland Kv= 5.0 fps
4.0	306	0.0327	1.27		**Shallow Concentrated Flow, GR** Short Grass Pasture Kv= 7.0 fps
11.1	512	Total			

Summary for Pond 5P: Pipe

Inflow Area = 2.780 ac, 5.95% Impervious, Inflow Depth = 3.88" for 100-Year event
Inflow = 8.34 cfs @ 12.29 hrs, Volume= 0.900 af
Outflow = 8.34 cfs @ 12.34 hrs, Volume= 0.900 af, Atten= 0%, Lag= 3.0 min
Primary = 8.34 cfs @ 12.34 hrs, Volume= 0.900 af

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 207.62' @ 12.34 hrs
Flood Elev= 208.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	205.00'	**15.0" Round Culvert** L= 61.0' Ke= 0.500 Inlet / Outlet Invert= 205.00' / 203.00' S= 0.0328 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=8.31 cfs @ 12.34 hrs HW=207.60' TW=204.80' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 8.31 cfs @ 6.77 fps)

Summary for Pond B1: Basin

Inflow Area = 7.218 ac, 5.19% Impervious, Inflow Depth = 4.03" for 100-Year event
Inflow = 22.38 cfs @ 12.31 hrs, Volume= 2.424 af
Outflow = 9.60 cfs @ 12.75 hrs, Volume= 2.426 af, Atten= 57%, Lag= 26.2 min
Discarded = 0.16 cfs @ 12.75 hrs, Volume= 0.311 af
Primary = 9.43 cfs @ 12.75 hrs, Volume= 2.115 af

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 205.48' @ 12.75 hrs Surf.Area= 17,691 sf Storage= 35,496 cf
Flood Elev= 206.50' Surf.Area= 19,477 sf Storage= 54,752 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 157.2 min (1,009.4 - 852.2)

Volume	Invert	Avail.Storage	Storage Description
#1	203.00'	54,752 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
203.00	11,318	0	0
204.00	13,515	12,417	12,417
206.00	19,161	32,676	45,093
206.50	19,477	9,660	54,752

Device	Routing	Invert	Outlet Devices
#1	Discarded	203.00'	**0.287 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 198.00'
#2	Primary	203.50'	**18.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 203.50' / 198.00' S= 0.0809 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#3	Primary	205.50'	**40.0' long x 12.0' breadth Broad-Crested Rectangular Weir X 2.00**

Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
Coef. (English)	2.57	2.62	2.70	2.67	2.66	2.67	2.66	2.64

Discarded OutFlow Max=0.16 cfs @ 12.75 hrs HW=205.48' (Free Discharge)
└**1=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=9.43 cfs @ 12.75 hrs HW=205.48' TW=0.00' (Dynamic Tailwater)
├**2=Culvert** (Inlet Controls 9.43 cfs @ 5.34 fps)
└**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond DP: DP

Inflow Area = 9.929 ac, 5.77% Impervious, Inflow Depth = 3.65" for 100-Year event
Inflow = 13.01 cfs @ 12.41 hrs, Volume= 3.019 af
Primary = 13.01 cfs @ 12.46 hrs, Volume= 3.019 af, Atten= 0%, Lag= 3.0 min

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1: To Basin Runoff Area=193,308 sf 4.71% Impervious Runoff Depth=0.65"
Flow Length=753' Tc=20.4 min UI Adjusted CN=63 Runoff=1.76 cfs 0.240 af

Subcatchment2: To Pipe Runoff Area=121,104 sf 5.95% Impervious Runoff Depth=0.56"
Flow Length=753' Tc=20.4 min UI Adjusted CN=61 Runoff=0.89 cfs 0.131 af

Subcatchment3: Remaining Runoff Area=118,106 sf 7.31% Impervious Runoff Depth=0.61"
Flow Length=512' Tc=11.1 min UI Adjusted CN=62 Runoff=1.19 cfs 0.137 af

Pond 5P: Pipe Peak Elev=205.44' Inflow=0.89 cfs 0.131 af
15.0" Round Culvert n=0.012 L=61.0' S=0.0328 '/' Outflow=0.89 cfs 0.131 af

Pond B1: Basin Peak Elev=203.70' Storage=8,504 cf Inflow=2.61 cfs 0.371 af
Discarded=0.10 cfs 0.256 af Primary=0.22 cfs 0.116 af Outflow=0.32 cfs 0.372 af

Pond DP: DP Inflow=1.19 cfs 0.253 af
Primary=1.19 cfs 0.253 af

Total Runoff Area = 9.929 ac Runoff Volume = 0.508 af Average Runoff Depth = 0.61"
94.23% Pervious = 9.357 ac 5.77% Impervious = 0.573 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1: To Basin Runoff Area=193,308 sf 4.71% Impervious Runoff Depth=2.66"
Flow Length=753' Tc=20.4 min UI Adjusted CN=63 Runoff=8.98 cfs 0.982 af

Subcatchment2: To Pipe Runoff Area=121,104 sf 5.95% Impervious Runoff Depth=2.47"
Flow Length=753' Tc=20.4 min UI Adjusted CN=61 Runoff=5.17 cfs 0.571 af

Subcatchment3: Remaining Runoff Area=118,106 sf 7.31% Impervious Runoff Depth=2.56"
Flow Length=512' Tc=11.1 min UI Adjusted CN=62 Runoff=6.63 cfs 0.579 af

Pond 5P: Pipe Peak Elev=206.39' Inflow=5.17 cfs 0.571 af
15.0" Round Culvert n=0.012 L=61.0' S=0.0328 '/' Outflow=5.17 cfs 0.571 af

Pond B1: Basin Peak Elev=204.73' Storage=22,969 cf Inflow=14.04 cfs 1.554 af
Discarded=0.13 cfs 0.295 af Primary=5.83 cfs 1.261 af Outflow=5.96 cfs 1.555 af

Pond DP: DP Inflow=7.31 cfs 1.839 af
Primary=7.31 cfs 1.839 af

Total Runoff Area = 9.929 ac Runoff Volume = 2.132 af Average Runoff Depth = 2.58"
94.23% Pervious = 9.357 ac 5.77% Impervious = 0.573 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1: To Basin Runoff Area=193,308 sf 4.71% Impervious Runoff Depth=3.34"
Flow Length=753' Tc=20.4 min UI Adjusted CN=63 Runoff=11.43 cfs 1.236 af

Subcatchment2: To Pipe Runoff Area=121,104 sf 5.95% Impervious Runoff Depth=3.13"
Flow Length=753' Tc=20.4 min UI Adjusted CN=61 Runoff=6.65 cfs 0.725 af

Subcatchment3: Remaining Runoff Area=118,106 sf 7.31% Impervious Runoff Depth=3.23"
Flow Length=512' Tc=11.1 min UI Adjusted CN=62 Runoff=8.49 cfs 0.731 af

Pond 5P: Pipe Peak Elev=206.89' Inflow=6.65 cfs 0.725 af
15.0" Round Culvert n=0.012 L=61.0' S=0.0328 '/' Outflow=6.65 cfs 0.725 af

Pond B1: Basin Peak Elev=205.07' Storage=28,523 cf Inflow=17.95 cfs 1.960 af
Discarded=0.15 cfs 0.303 af Primary=7.71 cfs 1.659 af Outflow=7.86 cfs 1.962 af

Pond DP: DP Inflow=10.26 cfs 2.390 af
Primary=10.26 cfs 2.390 af

Total Runoff Area = 9.929 ac Runoff Volume = 2.691 af Average Runoff Depth = 3.25"
94.23% Pervious = 9.357 ac 5.77% Impervious = 0.573 ac

Time span=1.00-72.00 hrs, dt=0.05 hrs, 1421 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1: To Basin Runoff Area=193,308 sf 4.71% Impervious Runoff Depth=4.12"
Flow Length=753' Tc=20.4 min UI Adjusted CN=63 Runoff=14.20 cfs 1.524 af

Subcatchment2: To Pipe Runoff Area=121,104 sf 5.95% Impervious Runoff Depth=3.88"
Flow Length=753' Tc=20.4 min UI Adjusted CN=61 Runoff=8.34 cfs 0.900 af

Subcatchment3: Remaining Runoff Area=118,106 sf 7.31% Impervious Runoff Depth=4.00"
Flow Length=512' Tc=11.1 min UI Adjusted CN=62 Runoff=10.59 cfs 0.905 af

Pond 5P: Pipe Peak Elev=207.62' Inflow=8.34 cfs 0.900 af
15.0" Round Culvert n=0.012 L=61.0' S=0.0328 '/' Outflow=8.34 cfs 0.900 af

Pond B1: Basin Peak Elev=205.48' Storage=35,496 cf Inflow=22.38 cfs 2.424 af
Discarded=0.16 cfs 0.311 af Primary=9.43 cfs 2.115 af Outflow=9.60 cfs 2.426 af

Pond DP: DP Inflow=13.01 cfs 3.019 af
Primary=13.01 cfs 3.019 af

Total Runoff Area = 9.929 ac Runoff Volume = 3.329 af Average Runoff Depth = 4.02"
94.23% Pervious = 9.357 ac 5.77% Impervious = 0.573 ac

Appendix 7:
MISCELLANEOUS CALCULATIONS

J.R. RUSSO & ASSOCIATES, LLC
Professional Engineers & Surveyors
SERVING CONNECTICUT & MASSACHUSETTS
1 Shoham Rd. • East Windsor, CT 06088
CONN (860) 623-0569 • MASS (413) 785-1158
www.jrrusso.com

JOB 2021-040 Manson
SHEET NO. 1 OF 1
CALCULATED BY CJC DATE 3-25-2022
CHECKED BY DATE
SCALE

Water Quality Volume (WQV) Calculations

$WQV = (1'')\,RA/12$
$R = 0.05 + 0.009I$

I = percent impervious coverage
R = volumetric runoff coefficient
A = contributing area

① Array 1 Northern Basin

A = 184,339 s.f.
$I = \frac{825 \text{ s.f. impervious}}{184,339 \text{ s.f. total}} = 0.45\%$
$R = 0.05 + 0.009(0.45) = 0.054$
$WQV = (1'')(0.054)(184,339)/12 = \boxed{830 \text{ c.f.}}$

② Array 2 Basin

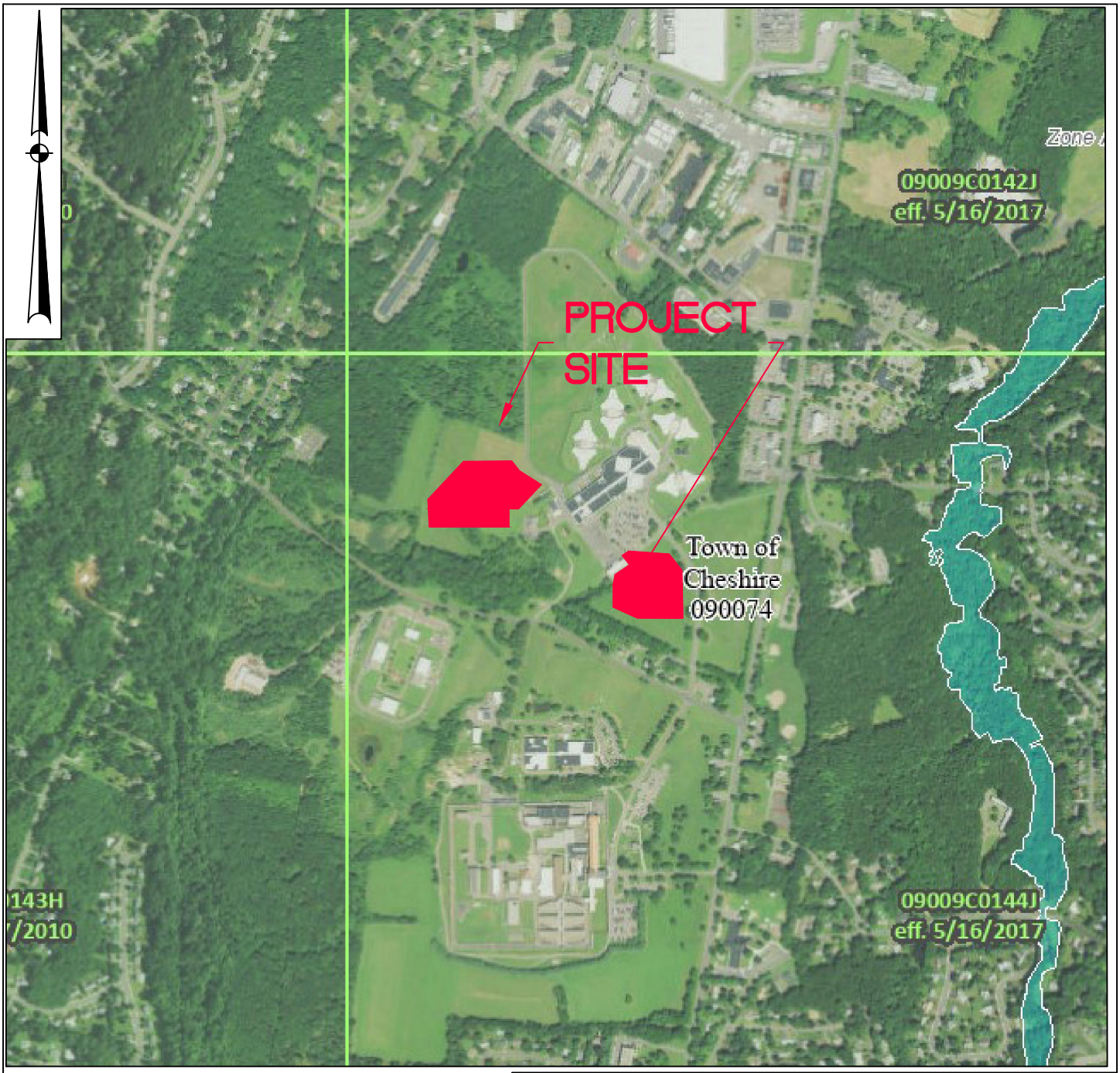
A = 314,412 s.f.
$I = \frac{850 \text{ s.f. impervious}}{314,412 \text{ s.f. total}} = 0.27\%$
$R = 0.05 + 0.009(0.27) = 0.052$
$WQV = (1'')(0.052)(314,412)/12 = \boxed{1,374 \text{ c.f.}}$

WQV Check:

Array 1 Northern Basin volume below outlet = 6,606 c.f.
Array 2 Basin volume below outlet = 5,934 c.f.

EXHIBIT XIII

FEMA FLOOD MAP



SOURCE:
FEMA MAP W/ NATIONAL
FLOOD HAZARD LAYER

FLOOD MAP

CT GREEN BANK SOLAR
Manson Youth Institution

42 Jarvis Street
Cheshire, Connecticut

RUSSO
SURVEYORS • ENGINEERS
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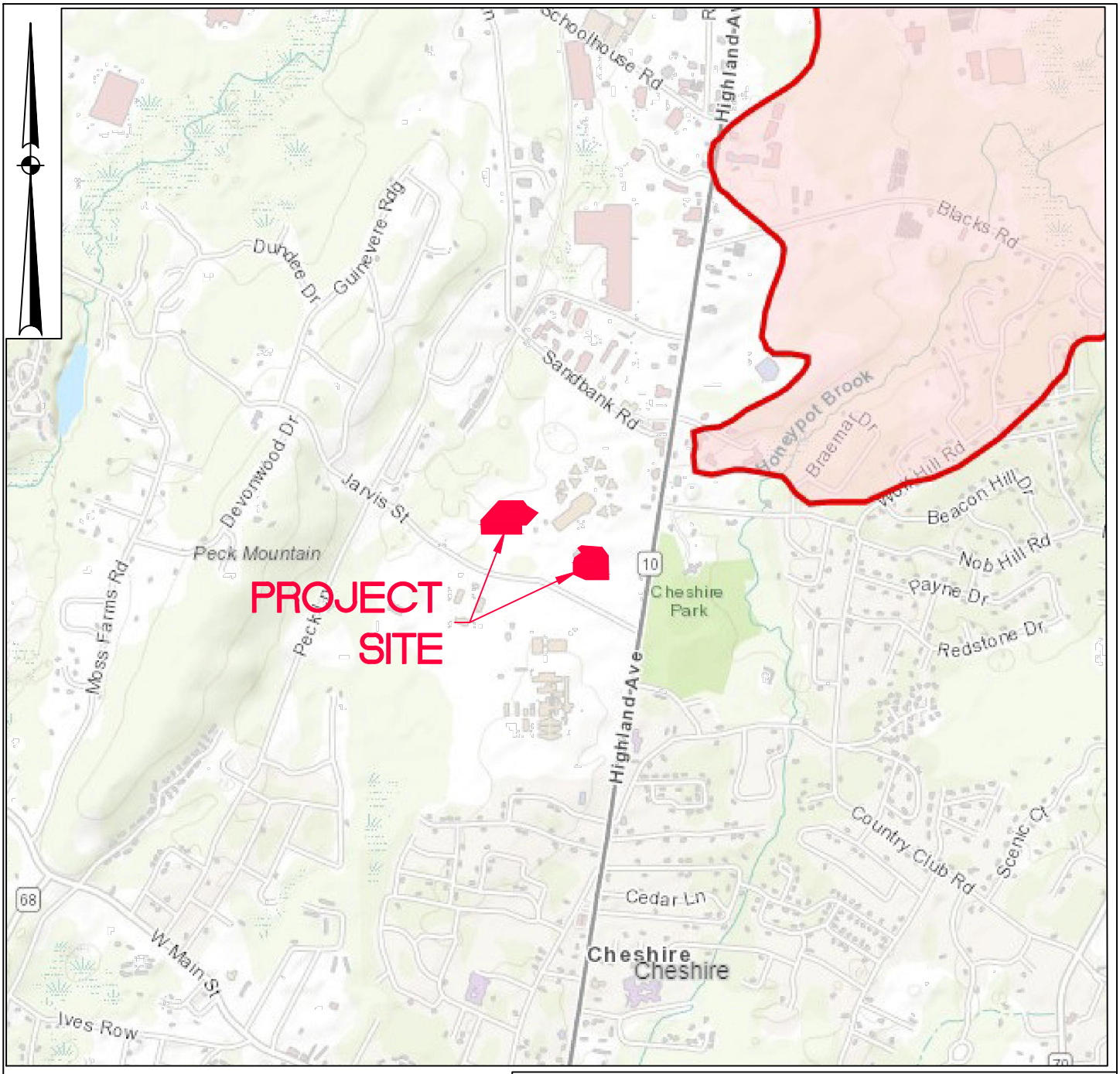
J.R. Russo & Associates, LLC
1 Shoham Rd East Windsor, CT 06088 • CT 860.623.0569 • MA 413.785.1158
www.jrrusso.com • info@jrrusso.com

DATE	4–27–2022
SCALE	1"=1000'
JOB NUMBER	2021–040M
SHEET	EXHIBIT XIII

EXHIBIT XIV

AQUIFER PROTECTION MAP



AQUIFER PROTECTION ZONE

CT GREEN BANK SOLAR
Manson Youth Institution

42 Jarvis Street
Cheshire, Connecticut

Final Adopted Aquifer Protection

SOURCE:
CT DEEP AQUIFER PROTECTION AREAS MAP

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www.jrrusso.com • info@jrrusso.com

DATE	4–27–2022
SCALE	1"=2000'
JOB NUMBER	2021–040M
SHEET	EXHIBIT XIV

EXHIBIT XV

STATE HISTORIC PRESERVATION OFFICE RESPONSE

February 7, 2022

Timothy Coon, P.E.
J.R. Russo & Associates, LLC
P.O. Box 938
East Windsor, CT 06088
(sent via email only to tcoon@jrrusso.com)

Subject: Department of Corrections Solar Projects
900 Highland Avenue in Cheshire, Connecticut
42 Jarvis Street in Cheshire, Connecticut
289 & 391 Shaker Road in Enfield, Connecticut
335 Bilton Road in Somers, Connecticut

Dear Mr. Coon:

The State Historic Preservation Office (SHPO) has reviewed the potential effects of the referenced projects on historic properties. SHPO understands that Connecticut Greenbank and the Connecticut Department of Corrections are working jointly to construct four ground-mounted solar facilities at the following locations:

- approximately 9.2 acres of undeveloped land located west of the Cheshire Correctional Institution at 900 Highland Avenue
- approximately 9.8 acres of total undeveloped land at two locations to the south and west of the Manson Youth Correctional Institution at 42 Jarvis Street
- approximately 6.5 acres of undeveloped land south of the Enfield Correctional Institution 289 & 391 Shaker Road
- approximately 8 acres of undeveloped land northwest of the Osborn Correctional Institution at 335 Bilton Road

As projects subject to review by the Connecticut Siting Council, they are subject to the provisions of the Connecticut Environmental Policy Act and a review by this office. In addition, the proposed projects will require a Stormwater Discharge permit issued by the Department of Energy and Environmental Protection through the authority of the Environmental Protection Agency; therefore, they are subject to review by this office pursuant to Section 106 of the National Historic Preservation Act.

The Enfield Shakers historic district, a property listed on the National Registers of Historic Places (NRHP) is situated adjacent to the proposed solar facility at the Enfield Correctional Institution, but there are no previously reported properties listed within or adjacent to the other three project locations. All of the proposed installations are located on gently sloping terrain with soils classified as sandy loams or loamy sands in proximity to sources of water. A review of readily available historic maps and aerials suggests that there have been some prior disturbances, but their

extent is not considered extensive. Based on the environmental characteristics of the project sites, it is SHPO's opinion that each of the proposed solar facilities has the potential to contain significant archaeological resources. Therefore, SHPO is requesting that a professional archaeological assessment and reconnaissance survey be completed prior to construction. Areas that will not be developed do not need to be tested. All work should be done in compliance with our *Environmental Review Primer for Connecticut's Archaeological Resources* and no construction or other project-related ground disturbance should be initiated until SHPO has had an opportunity to review and comment upon the requested survey. A list of qualified consultants is attached for your convenience.

SHPO appreciates the opportunity to comment upon this project and we look forward to continuing consultation. Do not hesitate to contact Catherine Labadia, Staff Archaeologist and Environmental Reviewer, for additional information at (860) 500-2329 or catherine.labadia@ct.gov.

Sincerely,

Jonathan Kinney
State Historic Preservation Officer

cc: Pustilnik, APG

EXHIBIT XVI

FAA DETERMINATION

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2022-ANE-1595-OE

Issued Date: 03/23/2022

Evan Mazzaglia
Sunpower Corporation
262 Washintong Street, Suite 700
Boston, MA 02108

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Solar Array
Location:	Cheshire, CT
Latitude:	41-31-36.00N NAD 83
Longitude:	72-53-55.00W
Heights:	216 feet site elevation (SE)
	12 feet above ground level (AGL)
	228 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 09/23/2023 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (816) 329-2525, or natalie.schmalbeck@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-ANE-1595-OE.

Signature Control No: 517047473-519605640 (DNE)
Natalie Schmalbeck
Technician

Attachment(s)
Map(s)

Verified Map for ASN 2022-ANE-1595-OE

EXHIBIT XVII

ACS ARCHAEOLOGICAL RECONNAISSANCE SURVEY INTERIM REPORT

Phase I Archaeological Reconnaissance Survey
Connecticut Department of Corrections Solar Projects
Towns of Cheshire, Enfield, and Somers, Connecticut

Interim Report

by

ACS

♦ ***Archaeological Consulting Services*** ♦
118 Whitfield Street
Guilford, Connecticut 06437
(203) 458-0550
www.acsarchaeology.com
acsinfo@yahoo.com

May 6, 2022

Introduction and Project Description

This interim report provides the preliminary results of a Phase I archaeological reconnaissance survey conducted on four Connecticut Department of Corrections properties in Cheshire, Enfield, and Somers. The project areas bear the addresses: 900 Highland Avenue, Cheshire; 42 Jarvis Street, Cheshire; 289-391 Shaker Road, Enfield; and 335 Bilton Road, Somers. The project areas are predominantly within sections of the properties that contain open, maintained grass lawns. The properties in Cheshire are located adjacent to each other on either side of Jarvis Street on the west side of Route 10 in central Cheshire, while the other two properties are also located close to each other on either side of Bilton Road and the town line in northeast Enfield and northwest Somers. Concept plans and survey maps drafted by J.R. Russo & Associates of East Windsor, Connecticut show the distribution of proposed solar panels and associated infrastructure at the sites.

In an initial review letter of the projects dated February 7, 2022, the Connecticut State Historic Preservation Office (SHPO) indicated,

...SHPO has reviewed the potential effects of the referenced projects on historic properties. SHPO understands that Connecticut Greenbank and the Connecticut Department of Corrections are working jointly to construct four ground-mounted solar facilities at the following locations:

Approximately 9.2 acres of undeveloped land located west of the Cheshire Correctional Institution at 900 Highland Avenue

Approximately 9.8 acres of total undeveloped land at two locations to the south and west of the Manson Youth Correction Institution at 42 Jarvis Street

Approximately 6.5 acres of undeveloped land south of the Enfield Correctional Institution, 289 & 391 Shaker Road

Approximately 8 acres of undeveloped land northwest of the Osborn Correctional Institution at 335 Bilton Road

As projects subject to review by the Connecticut Siting Council, they are subject to the provisions of the Connecticut Environmental Policy Act and a review by this office. In addition, the projects will require a Stormwater Discharge permit issued by the Department of Energy and Environmental Protection through the authority of the Environmental Protection Agency; therefore, they are subject to the review by this office pursuant to Section 106 of the National Historic Preservation Act.

The Enfield Shakers historic district, a property listed on the National Register of Historic Places (NRHP) is situated adjacent to the proposed solar facility at the Enfield Correctional Institution, but there are no previously reported properties listed within or adjacent to the other three project locations. All of the proposed installations are located on gently sloping terrain with soils classified as sandy loams or loamy sands in proximity to sources of water. A review of readily available historic maps and aerials suggests that there have been some prior disturbances, but their extent is not considered extensive. Based on the environmental characteristics of the project area, it is SHPO's opinion that each of the proposed solar facilities has the potential to contain significant archaeological resources. Therefore, SHPO is requesting that a professional archaeological assessment and reconnaissance survey be completed prior to construction…

Based on statistical prehistoric sensitivity for archaeological resources, but also because of variable subsurface conditions, ACS conducted a highly saturated, stratified-systematic subsurface testing strategy, in conjunction with a thorough background research effort and pedestrian surface survey to identify any and all prehistoric and/or historic cultural resources located within the four project areas. The surveys were performed in compliance with the *Environmental Review Primer for Connecticut's Archaeological Resources,* containing guidelines issued by SHPO for conducting cultural resource management surveys in Connecticut. ACS submitted the proposed research design to SHPO for its approval in advance of any fieldwork, with SHPO to serve as review agency for the final report.

Background

The Cheshire project areas lie within the South-Central Lowlands (IV-B) ecoregion of Connecticut. Underlying bedrock consists of New Haven Arkose (Trnh), a Triassic formation on the order of 250 to 215 million years old. The project areas include both hillslope landforms and surrounding stacked glacial meltwater sediments of sand and gravel overlying sand (sg/s). The dominant soils of the properties include well drained Cheshire fine sandy loam and excessively drained Manchester gravelly sandy loam, the latter particularly present at the northern Jarvis Street facility. Elevations vary at the gently sloping properties, at approximately 200 to 240 feet above mean sea level at Highland, and at 180 to 220 feet above mean sea level at Jarvis. No wetlands are to be impacted by the projects, with both areas lying within the Ten Mile River (#5202) drainage basin and just east of an unnamed tributary stream. Both are mostly maintained grass lawns, although the southern end of the western array at the Jarvis impact area is wooded.

The Enfield / Somers project areas lie within the North-Central Lowlands (III-B) ecoregion of Connecticut. Underlying bedrock consists of Portland Arkose (Jp), a Jurassic formation on the order of 215 to 145 million years old. Both are on glacial moraines with thick till deposits. Well drained Narragansett silt loam dominates the Enfield project area, while well drained Cheshire fine sandy loam occupies to the Somers project area. These properties are also gently sloping, at 260 to 290 feet above mean sea level at Enfield, and at about 270 to 310 feet above mean sea level at Somers. These project arrays also avoid wetlands, lying within the Scantic River (#4200) drainage basin and close to tributary streams. As with the Cheshire project areas, these sites also lie on undeveloped land with maintained grass lawns.

A statistical prehistoric landscape sensitivity model developed and utilized by ACS indicates that there is a range of likelihood for prehistoric sites being present across the project areas, with a high score of 34.1 out of a possible 100.0 at the Jarvis site in Cheshire, to a low of 11.2 out of a possible 100.0 at the Enfield site. For the Cheshire sites, there was an advantage for potential settlement in the presence of stacked glacial meltwater sediments of sand and gravel over sand at or adjacent to the project impact areas, while the Enfield and Somers sites were located on gentle hill slopes of moraine deposits. The latter sites held the advantage of being located within the higher stream rank of the Scantic River as compared with the lower stream rank of the Ten Mile River for the Cheshire sites, although the distance to nearest water source is relatively great for the Enfield site compared with the others. Site files of the Connecticut State Historic Preservation Office (SHPO) do not reveal any previously recorded prehistoric archaeological sites within one mile of the project areas, with the exception of the Jarvis Street Precontact Site (25-12), an undesignated site where quartzite and chert debitage was recorded several hundred feet west of the Jarvis project area closer to the nearest stream during a professional archaeological survey of a portion of the corrections department property proposed for use as a parking lot for the Farmington Canal Greenway project.

SHPO also revealed no previously recorded significant historic cultural resources within one mile of the Somers or Enfield sites, with the exception of the Enfield Shakers Historic District that lies just west of the Enfield facility along Taylor and Shaker Roads, where there are mid-19th century wood frame and brick agricultural buildings, a saw mill, and meetinghouse. Site 49-2 on the south side of Shaker Road at the western end of the district reportedly contains standing ruins of the Shaker district. At the northern end of the Enfield facility, a Shaker period dam (49-13) probably served to create an impoundment for milling, and later an ice pond. Historic maps show no developments in the direct vicinity of the project areas, with the possible exception of a Shaker house or outbuilding near the northwest corner of the Somers site outside the project impact area or slightly to the north, with historic homes concentrated along the roads fronting all four project sites.

Field Results

The four project areas were designated four-letter codes to identify each in all field and lab documentation: CRMS for the Jarvis Street (Manson) site; CRHA for the Highland Avenue site; EFSR for the Enfield site; and SMBR for the Somers site. Each project site contained one succinct project area, with the exception of Jarvis Street where there were two distinct project impact areas. Fieldwork for the projects was conducted in March and April, 2022, with no snow cover.

CRMS West

The test area consisted of a gently sloping, grass-covered field, with a slope down to the west towards a natural gas pipeline that formed the western border of the testing area. The remainder of the testing area was defined by an access road to the north, a parking lot associated with the prison's K-9 facility to the east, and woods to the south. The 0N/0E point was a lightpost along the western fenceline of the prison at the bend of the access road. Shovel tests were spaced 50' apart on a grid pattern, with testing extending a maximum of 400' northeast to

southwest and 200' southeast to northwest. Dump piles were encountered at the southern end of the testing area in a wooded portion, and no further testing was conducted in this direction.

A total of 39 shovel tests were excavated with one main soil profile being encountered. The profile consisted of an average of 9-12" of dark brown (7.5YR3/2) gravelly sandy loam A / plowzone that overlaid 3-8" of reddish brown (5YR4/3) loamy sand B horizon that was absent in some tests (presumably having been incorporated into the plowzone). The B horizon in turn overlaid a reddish brown (5YR4/4) loamy sand C horizon that terminated between 22 and 32" below surface. These soils were consistent with the expected profile for Manchester series soils.

Five historic artifacts, probably reflecting recent refuse disposal activities at the site, were recovered from four shovel tests. These consisted of two pieces of clear machine-made bottle glass, an iron nut, a quahog shell fragment, and a machine-cut nail.

CRMS East

The test area consisted of a gently sloping, grass-covered field, with a slope down to the northwest towards the prison's physical plant at the northern border of the testing area. The remainder was defined by an access road to the east and fields to the south and west. The 0N/0E point was the southeastern corner of the chain-link fence surrounding the physical plant. Testing began 200' south of the 0N/0E point and extended to the south and west. Shovel tests were spaced 50' apart on a grid pattern, with testing extending a maximum of 200' south and 200' west. The area was covered with grass, and no modern disturbance was observed.

A total of 16 shovel tests were excavated, with one main soil profile being encountered. The profile consisted of an average of 10-13" of dark brown (7.5YR3/2) gravelly sandy loam A /plowzone that overlaid 9-12" of reddish brown (5YR4/3) loamy sand B horizon. The B horizon in turn overlaid a reddish brown (5YR4/4) loamy sand C horizon that terminated between 24 and 39" below surface. These soils were consistent with a profile for Manchester series soils, although the soil maps indicated that this area should include Cheshire soil series.

Two historic artifacts, probably reflecting recent refuse disposal activities at the site, were recovered from two shovel tests. These consisted of two pieces of quahog shell.

CRHA

The test area consisted of a gently sloping, grass-covered field, with a slope down to the west towards the woods that formed the western border of the testing area. The remainder of the testing area was defined by an access road to the east, woods to the north, and open fields to the south. The 0N/0E point was at the eastern end of a strip of woods serving as a windbreak that separated the northern and southern portions of the testing area. Shovel tests were spaced 50' apart on a grid pattern, with testing extending a maximum of 800' north to south and 200' east to west. A linear feature that represented either a wide plowing berm or erosion control terracing was present in the western half of the southern field.

A total of 80 shovel tests were excavated, with one main soil profile being encountered. The profile consisted of an average of 10-18" of brown (7.5YR4/2) fine sandy loam A /plowzone that overlaid 6-12" of reddish brown (5YR4/4) fine sandy loam B horizon that was absent in some tests (presumably having been incorporated into the plowzone). The B horizon in turn overlaid a reddish brown (2.55YR4/4) gravelly sandy loam C horizon that terminated between 21 and 38" below surface. These soils were consistent with the expected profile for Cheshire series soils.

Seven historic artifacts, probably reflecting recent refuse disposal activities at the site, were recovered from seven shovel tests. These consisted of two pieces of clear modern flat glass, a wire nail, a single piece of modern undecorated whiteware, and a single piece each of concrete, sewer pipe, and slag.

EFSR

The test area consisted of a grass-covered field with a slope down to the south towards Shaker Road, which formed the southern border of the testing area. The remainder of the testing area was defined by an access road to the east, a parking lot associated with the prison to the north, and open fields to the south and west. The 0N/0E point was a tree along the access road to the prison at a point 650' north of the intersection of the access road and Shaker Road. Shovel tests were spaced 50' apart on a grid pattern with testing extending a maximum of 500' east to west and 200' north to south. A series of east to west running terraces, presumably for erosion control along the hill slope, were located in the field.

A total of 36 shovel tests were excavated with one dominant and two subordinate soil profiles being encountered. The dominant profile consisted of an average of 10-14" of dark brown (10YR3/3) silty loam A / plowzone that overlaid 5-9" of dark yellowish brown (10YR4/6) silty loam B1 horizon that was absent in some tests (presumably having been incorporated into the plowzone). The B1 horizon in turn overlaid a reddish brown (10YR5/6) silty loam B2 horizon that averaged 10" deep before encountering a reddish brown (5YR4/4) gravelly silty loam C horizon that terminated at between 26 and 36" below surface. These soils were consistent with the expected profile for Narragansett series soils. This profile was capped by two layers of silty loam fill in test 0N-8W, the upper layer being dark brown (10YR3/3) and extending to 5", with the next layer being reddish brown (5YR5/6) and extending to 13". The profile beneath these fill layers was consistent with the dominant soil profile previously described. Three other tests contained profiles that were anomalous to the dominant profile. Test 2S-6W contained 11" of a dark brown (10YR3/3) silty loam A / plowzone over 5" of a strong brown (7.5YR4/6) silty loam B1 horizon. The strong brown B1 horizon overlaid 4" of brown (7.5YR4/4) silty loam B2 horizon, which was over the reddish brown (5YR4/4) sandy loam C1 horizon. The C1 horizon was terminated at 36" below surface. The other anomalous profile was present in tests 1S-9W and 1S-10W. In these tests a dark grayish brown (2.5Y4/2) silty loam A / plowzone extended to between 10 and 13" and overlaid an olive yellow (2.5Y6/6) silty loam B horizon to between 16 and 17", at which point water was encountered. A grayish brown (2.5Y5/2) silty loam C horizon extended below the water line. All layers contained little gravel and appear to represent wetland soils.

Six historic artifacts, probably reflecting recent refuse disposal activities at the site, were recovered from two shovel tests. The artifacts consisted of one wire nail from one test and two fragments of charcoal, a piece of rusted iron, and two pieces of caulking from the second test.

SMBR

The test area consisted of a grass-covered field with a slope down to the west towards Bilton Road that formed the western border of the testing area. The remainder of the testing area was defined by an access road to the north and east and woods to the south. The 0N/0E point was at the southeast corner of a landscaped fieldstone box containing the entrance sign at northwest corner of the test area. Shovel tests were spaced 50' apart on a grid pattern, with testing extending a maximum of 750' north to south and 300' east to west. A series of north to

south running terraces, presumably for erosion control along the hill slope, were located in the field. Two buried utility lines and a surficial pump head extending above the field were present in the testing area as well.

A total of 74 shovel tests were excavated, with one main soil profile being encountered. The profile consisted of an average of 8-12" of dark brown (7.5YR3/2) fine sandy loam A / plowzone that overlaid 4-7" of reddish brown (5YR5/4) fine sandy loam B horizon that was absent in some tests (presumably having been incorporated into the plowzone). The B horizon in turn overlaid a reddish brown (5YR4/4) gravelly sandy loam C horizon that terminated between 12 and 36" below surface. These soils were consistent with the expected profile for Cheshire series soils.

Eight historic artifacts, probably reflecting recent refuse disposal activities at the site, were recovered from six shovel tests. These consisted of six pieces of plastic plant labels, 1 wire nail, 1 machine-cut nail, and a piece of willow pattern transfer-print decorated whiteware.

Recommendations

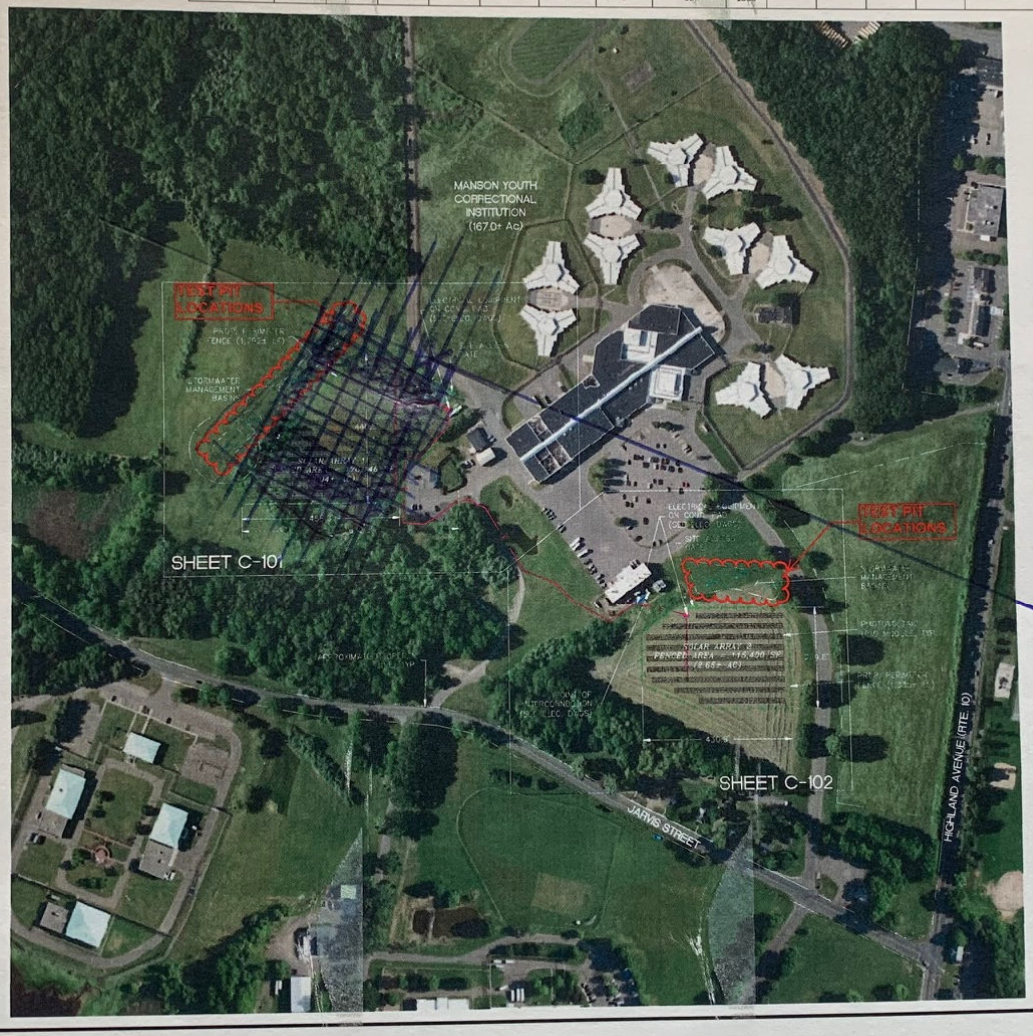
ACS recommends no further archaeological conservation efforts for any of the project areas as currently defined. There were no positively identified prehistoric feature contexts or artifacts identified during the survey. Historic artifacts were mostly limited to modern incidental trash and debris likely scattered through late historic agricultural efforts and/or landscaping associated with the construction and maintenance of the correctional facilities. One piece of transfer-printed whiteware recovered at the Somers property may be associated with a Shaker house or outbuilding formerly located on the east side of Bilton Road, although there were no associated concentrations of feature contexts or historic artifacts. Similarly, the several fragments of quahog shell recovered from the Jarvis Street project areas in Cheshire could be associated with site 25-12 located several hundred feet of the western project area, possibly introduced into the project area by historic farming or correctional facility construction or landscaping efforts. In turn, should site plans change to include impacts closer to Jarvis Street or 25-12 at the Cheshire sites, or closer to Shaker or Taylor Roads at the Enfield facility, further archaeological evaluation may be necessary as determined by the Connecticut State Historic Preservation Office (SHPO).

Gregory F. Walwer, Ph.D
ACS Director and Principal Investigator

May 6, 2022

42 JARVIS ST, CHESHIRE MANSON (CRMS)

SOLAR SWITCHBOARD	BLOCK	# MODULE	#STRING	KW (DC)	18 INPUT CB (14 STR)	18 INPUT CB (13 STR)	18 INPUT CB (12 STR)	SHP_150_US_20	KW (AC)	TILT (°)	GCR	CSI AZIMUTH (°)	SPWR AZIMUTH (°)	DC RUN (CB-INV)
SSB01	1	2820	94	1325.4	5		2	7	1050	25	0.50	180	0	175, 205, 260, 345, 400, 485, 540
	2	2010	67	944.7	3	1	1	5	750					125, 180, 180, 765, 320
	TOTAL	4830	161	2270.1	8	1	3	12	1800					



GRAPHIC SCALE
(IN FEET)
1 inch = 150

50% PROGRESS PRINT 1-19-22

RUSSO SURVEYORS ENGINEERS
J.R. Russo & Associates, LLC

Alternative Power Generation Inc.

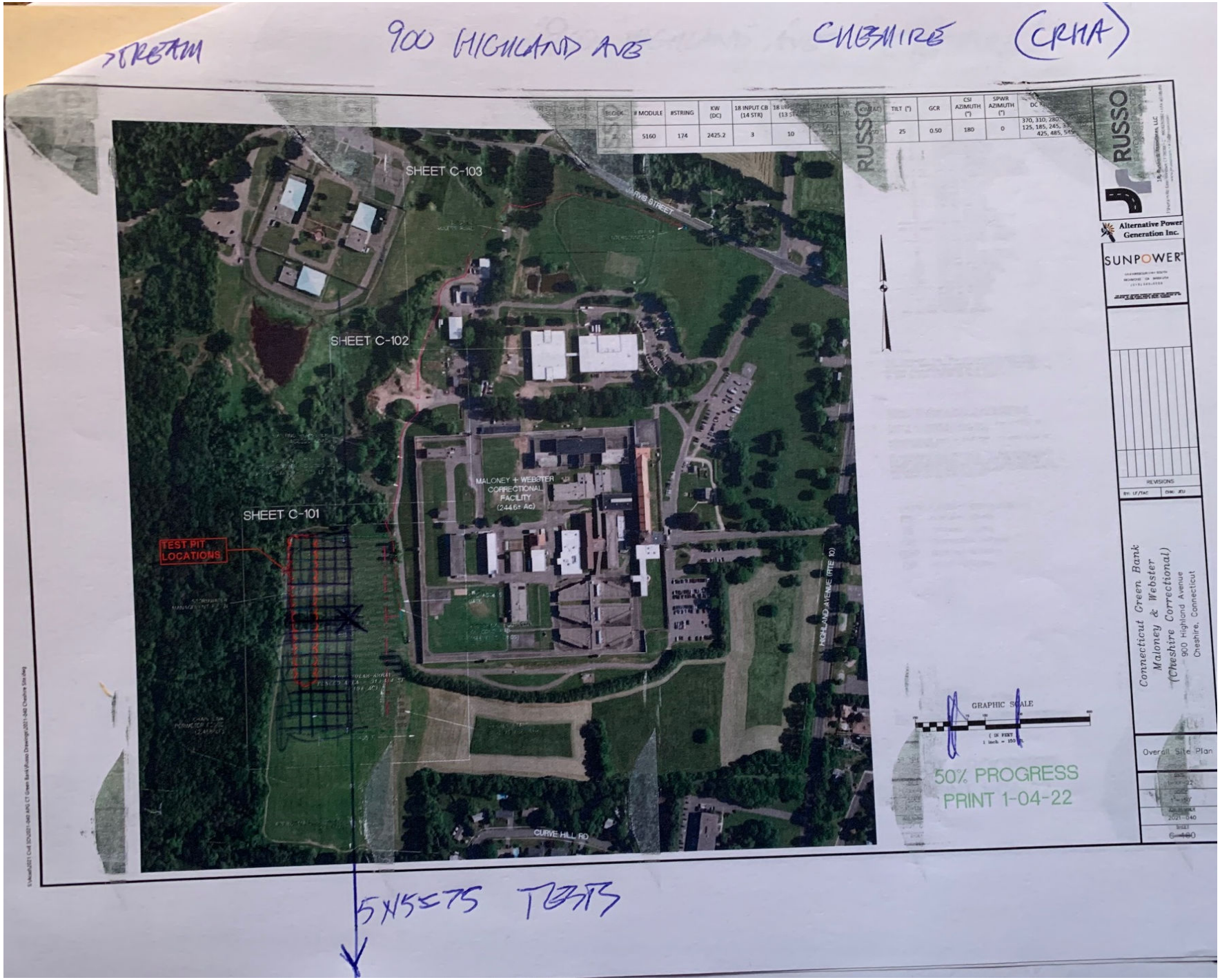
SUNPOWER

REVISIONS

Connecticut Green Bank
Manson Youth Correctional Institute
42 Jarvis Street
Cheshire, Connecticut

Overall Plan

DATE: XX-XX-22
SCALE: 1"=150'
JOB NUMBER: 2021-040
SHEET: C-100


STREAM
900 HIGHLAND AVE
CHESHIRE
(CRMA)
SHEET C-103
SHEET C-102
SHEET C-101
TEST PIT LOCATIONS
MALONEY + WEBSTER CORRECTIONAL FACILITY (244.6± AC)
CURVE HILL RD
HIGHLAND AVENUE (RTE 10)
GRAPHIC SCALE
50% PROGRESS
PRINT 1-04-22
RUSSO
Alternative Power Generation Inc.
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REVISIONS
Connecticut Green Bank
Maloney & Webster
(Cheshire Correctional)
900 Highland Avenue
Cheshire, Connecticut
Overall Site Plan
5 SHEETS TOTAL

BLOCK	# MODULE	#STRING	KW (DC)	M27_121 (6 STR)	M60_121 (11 STR)	M36_121 (5 STR)	KW (AC)	TILT (°)	GCR	CSI AZIMUTH (°)	SPWR AZIMUTH (°)	AC BLIN (INV-SPB)
RA	240	12	112.8	2			92	25	0.50	180	0	30, 30
RB	560	28	263.2			1	212	25	0.50	180	0	30, 35, 100
E	540	27	253.8			1	205.6	25	0.50	180	0	30, 65, 105
W	240	12	112.8	2			92	25	0.50	180	0	30,30

60+4]

335 BILTON RD, SOMERS, OSBORN

DATUM @ NW SIGN, 0° BEARING SOUTH + PARALLEL TO ROAD

GATE

STREAM

STEEP

64 PETS

GRAPHIC SCALE
(IN FEET)
1 inch = 100

SOLAR SWITCHBOARD	BLOCK	# MODULE	#STRING	KW (DC)	18 INPUT CB (14 STR)	18 INPUT CB (13 STR)	18 INPUT CB (12 STR)	SHP_150_US_20	KW (AC)	TILT (°)	GCR	CSI AZIMUTH (°)	SPWR AZIMUTH (°)	DC RUN (CB-INV)
SSB01	1	2820	94	1325.4	5		2	7	1050	25	0.50	180	0	175, 205, 260, 345, 400, 485, 540
	2	2010	67	944.7	3	1	1	5	750					125, 180, 180, 265, 320
	TOTAL	4830	161	2270.1	8	1	3	12	1800					

PROGRESS PRINT xx-xx-xx

RUSSO SURVEYORS-ENGINEERS
J.R. Russo & Associates, LLC

Alternative Power Generation Inc.

SUNPOWER®

REVISIONS

Prepared for
CT Green Bank
335 Bilton Road
Somers, Connecticut

Overall Plan

DATE 10-12-2021
SCALE 1"=100'
JOB NUMBER 2021-040
SHEET C-100