Connecticut Green Bank
CEFIA Holdings LLC

PETITION OF CONNECTICUT GREEN BANK AND CEFIA HOLDINGS LLC FOR A DECLARATORY RULING THAT A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED IS NOT REQUIRED FOR THE CONSTRUCTION, OPERATION, AND MAINTENANCE OF A 1.8 MEGA WATT (AC) SOLAR PHOTOVOLTAIC POWER GENERATION FACILITY AT THE OSBORN CORRECTIONAL INSTITUTIONS, 335 BILTON ROAD IN SOMERS,CONNECTICUT

May 17, 2022

Prepared for:

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Project No. 2021-040:OSB

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I. INTRODUCTION

Pursuant to Conn. Gen. Stat.§§ 4-176(a) and 16-50k(a) and Conn. Agencies Regs.§ 16- 50j-38 *et seq.,* the Connecticut Green Bank, a Connecticut quasi-public agency (the "Green Bank") and CEFIA Holdings LLC, a Connecticut limited liability company and subsidiary of Green Bank (together with Green Bank being 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 7.43 acres of solar panels to beconstructed at the Osborn Correctional Institutions at 335 Bilton Road in Somers, 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, andmaintenance 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. § l6-245. As the nation's first full-scale green bank, it is leading the cleanenergy finance movement by leveraging public and private funds to scale-up renewable energydeployment 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 solarphotovoltaic (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. SunPower is 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
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Evan.Mazzaglia@sunpower.com

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

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Principal Engineer
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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 ExecutiveBranch being 100% zero carbon by 2030, and (ii) deploying an average of 10,000 kW DC of newsolar capacity annually for the next 10 years, primarily through new projects sited on state buildingsor 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 anddesign 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 7.4 acres of undeveloped land, part of a larger 405-acre parcel located at 335 Bilton Road in Somers, Connecticut. A Vicinity Map is provided as Exhibit I. The property is owned by the State and is the current location of the Osborn Correctional Institutions operated by the DOC. The property is bounded to the west across Bilton Road by other land of the State also utilized by the DOC and to the north, east and south by residential properties. However, the majority of the northern, eastern and southern portions of the property consist of undeveloped woodland which provide a buffer between the Project Site and the adjacent residences. The central portion of the property is improved with several buildings associated with the Osborn Correctional Institution. The Osborn facility is accessed via a driveway off of Bilton Road. Exhibit II includes an aerial map which depicts the surrounding land uses within one-half mile of the property.

The Project Site consists of a 7.14-acre array located northwest of the Osborn Correctional Institution on the east side of Bilton Road approximately 1,300 feet east of the Somers-Enfield town line. The facility driveway wraps around the north and east of the Project

Site. The area is currently maintained as a hay field. The northern half of the Project Site is classified by the Natural Resource Conservation Service (NRCS) as Farmland of Statewide Importance (Exhibit III). The southern half has no special designation for farm soils.

D. PROJECT DESCRIPTION

The proposed solar array is anticipated to include 4,830 PV modules within a 7.14 acrefenced area. Construction activities will include 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 lines; and installation of security fencing. The array will be completely enclosed with a 7-foot chain-link security fence with gated accesselevated 8" off the ground to allow for small animal movement into and out of the array areas. Detailed Site Plans are provided in Exhibit IV.

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 14.11 feet. A specification sheet for the anticipated PV module is included as Exhibit V. However, the PV module is subject to change as additional optimization and market conditions may dictate.

The panels will be installed at existing grades. Thus, excavation and grading will be limited to the construction of the stormwater management basins,equipment pads and trenching for conduit installation. Minor soil disturbance will also berequired 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 1,800 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 VI. At that point, the land can be reverted back to its current use as a hay field.

E. INTERCONNECTION

The Petitioner proposes interconnecting the Project to a 23 kV overhead pole line located on the property. The interconnection will require the installation of new underground MV conduits in trench from the proposed ground mounted PV array location to the pole line. A riser pole and 25 kV pole mounted recloser will be installed at the location of the interconnection. A 25 kV rated metal enclosed switch, pad mounted transformer, 480 V AC metering enclosure and 480 V AC switchgear will be installed at the location of the PV array tostep-up the native voltage of the inverters from 480 V AC to 23 kV. The interconnection pointswill 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 Somers, 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 March and attended the Somers Zoning Commission (PZC) meeting on March 7, 2022 to present the site plan and solicit feedback. The project was well received, and the Zoning Commission issued a letter in support of the Project (Exhibit XV). A

copy of the final Site Plans will be provided to the Town of Somers Planning Department at the time of the submission 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 VII, 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 generated by displacing other fossil fuel burning energy sources.

B. BIOLOGICAL RESOURCES

A review of the Natural Diversity Database (NDDB) map for Somers, Connecticut dated December 2021 shows that the Project Site is not located within any potential locations of State and Federal Listed Species and Critical Habitats (See Exhibit VIII). Based on the results of the preliminary screening, no further investigation into the presence of endangered species was conducted.

C. WETLANDS

The vicinity of the Project Site was investigated for state and federal wetlands by Davison Environmental on October 6, 2021. The investigations identified no wetlands in the vicinity of the array. Davison's Wetland Delineation reports are provided in Exhibit IX.

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 array will be installed at existing grades and maintaining existing vegetation. However, the orientation of the panels will be perpendicular to the existing contours, which could result in a tendency for the runoff from the panels to channelize along the drip line. To prevent the potential for erosion from channelized flow, curtain drains will be installed at the drip lines of the panels to collect and convey water to the stormwater management basins. As a result, the collection and conveyance of runoff from the panels to the stormwater basins, the panel area was calculated as impervious area for the purpose of the hydrologic analysis.

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. Thus, the areas between and surrounding the panels were analyzed as pervious vegetated cover. Two stormwater management basins will be constructed downgradient of the array 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 the DEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ("General Permit").

A detailed Drainage Report has been prepared by J.R. Russo & Associates, LLC (Exhibit X). As detailed in the report, the development of the site is anticipated to result in a 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 withthe requirements and timelines established by the General Permit.

E. FLOODPLAINS

The attached Federal Emergency Management Agency (FEMA) Flood Map (Exhibit XI) 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 existing building located just south of the gated entrance to the array is the location of a pump and well that provides water service on-site for the nearby prison facilities. However, 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 XII) indicates that the Project is not located within an area identified as an Aquifer Protection Area. The nearest Aquifer Protection Area is located approximately over two (2) miles to the west 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 XIII. 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 land surrounding the Project Site consist State owned land utilized for correctional facilities. The nearest residence is approximately 2,500 feet north of the Project Site. Furthermore, as shown on the Land Use Plan in Exhibit II, all nearby residences appear to be adequately screened from the Project Site by the existing forest surrounding the Project Site. As a result, there are no sensitive visual receptors in the vicinity of the Project. Thus, the Project is not anticipated to have any adverse visual impacts. 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 bea 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, and marking and lighting are not necessary for aviation safety. 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.

Respectfully submitted,

Connecticut Green Bank

By: 

Brian Farnen
General Counsel and Chief Legal Officer

CEFIA Holdings LLC

By Connecticut Green

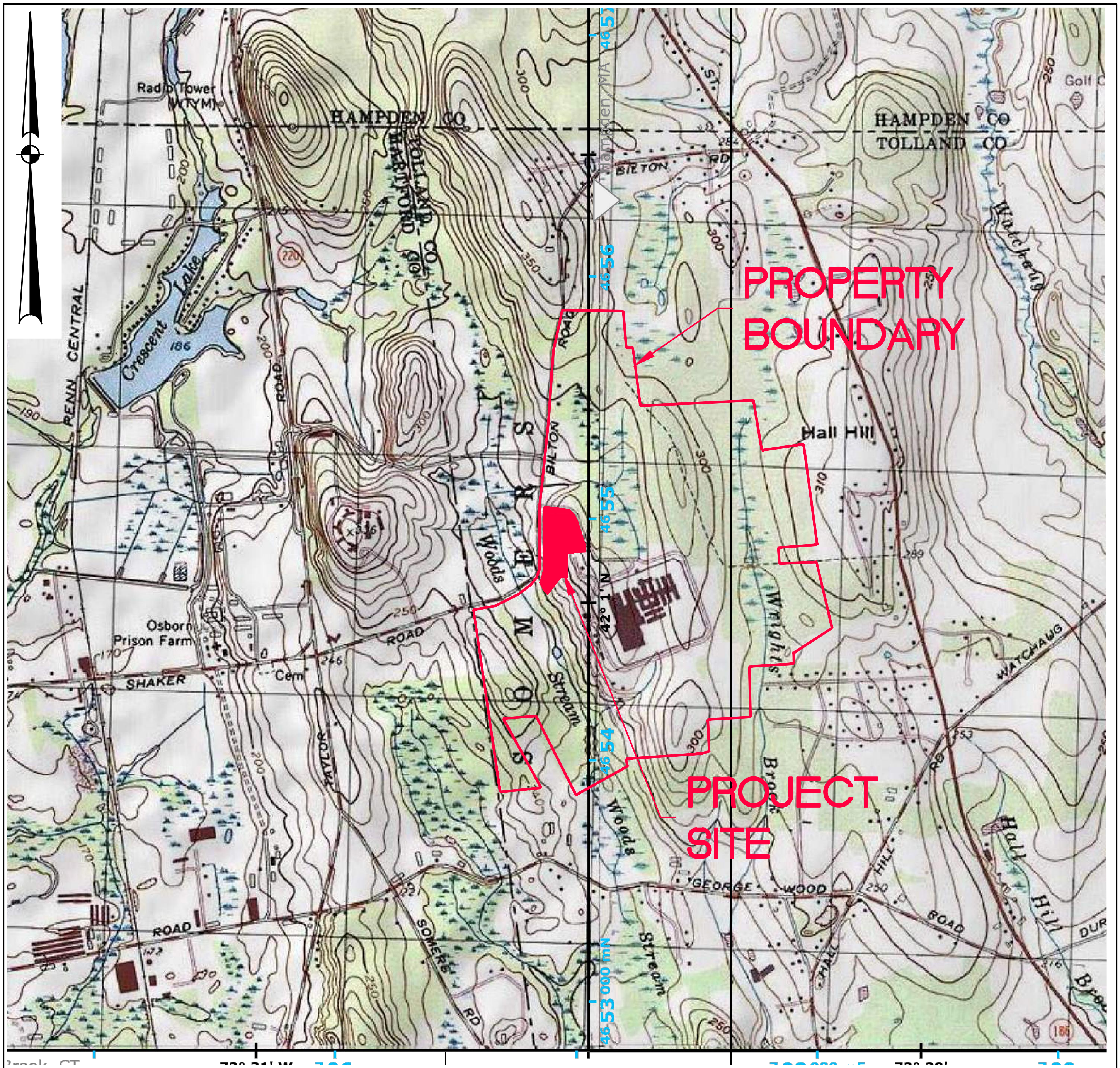
Bank, its Manager

By: 

Brian Farnen
General Counsel and Chief Legal Officer

EXHIBIT I

VICINITY MAP



VICINITY MAP

CT GREEN BANK SOLAR
Osborn Facility

335 Bilton Road
Somers, Connecticut

SOURCE:
SPRINGFIELD SOUTH (1997) & HAMPDEN (1979), MA USGS QUADRANGLES
NATIONAL GEOGRAPHIC

RUSSO
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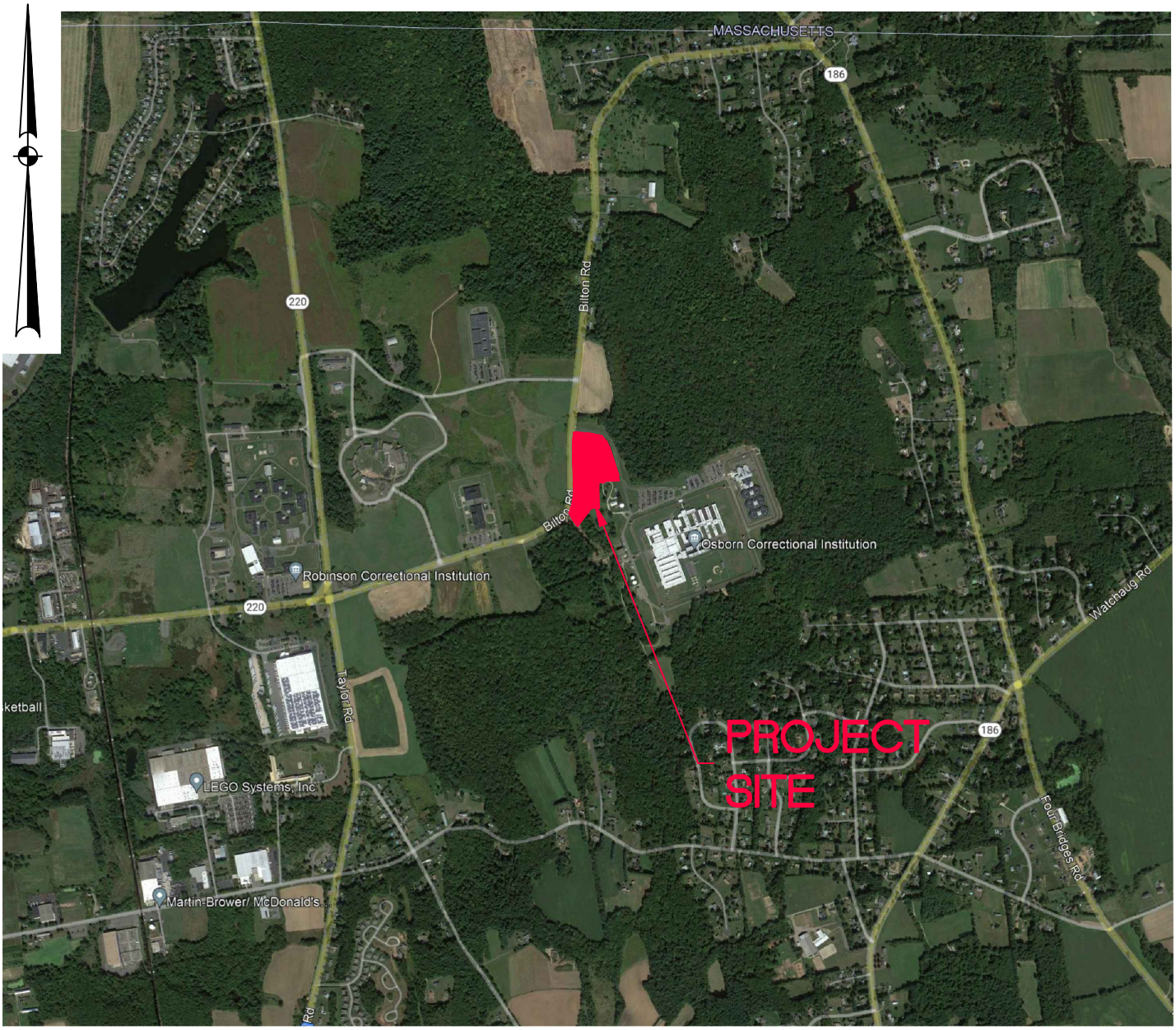
DATE	4–04–2022
SCALE	1"=2,000'
JOB NUMBER	2021–040SB
SHEET	EXHIBIT 1

EXHIBIT II

LAND USE MAP



LAND USE MAP

CT GREEN BANK SOLAR
Osborn Facility

335 Bilton Road
Somers, Connecticut

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SHEET	EXHIBIT II

SOURCE: GOOGLE EARTH

EXHIBIT III

FARMLAND CLASSIFICATION

Farmland Classification—State of Connecticut
(Osborn Farmland Classification)

72° 30' 13" W
72° 29' 59" W
42° 1' 14" N
42° 1' 0" N

Map Scale: 1:2,070 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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

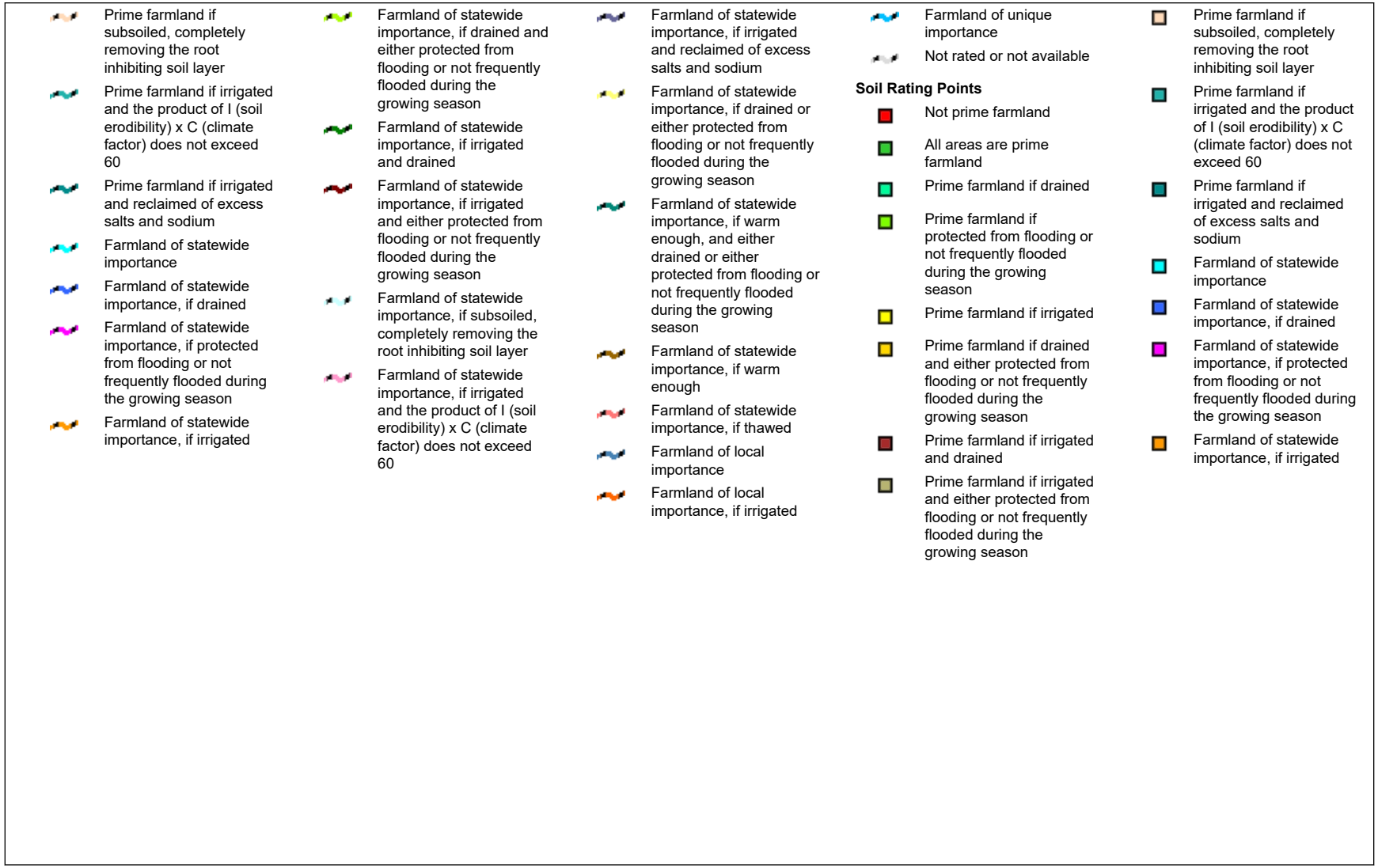
Soil Rating Polygons

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

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Farmland Classification—State of Connecticut
(Osborn Farmland Classification)



- 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: Aug 27, 2016—Oct 30, 2017

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
53B	Wapping very fine sandy loam, 3 to 8 percent slopes	All areas are prime farmland	0.3	3.2%
63C	Cheshire fine sandy loam, 8 to 15 percent slopes	Farmland of statewide importance	4.1	42.4%
63D	Cheshire fine sandy loam, 15 to 25 percent slopes	Not prime farmland	3.5	36.4%
306	Udorthents-Urban land complex	Not prime farmland	1.7	18.0%
Totals for Area of Interest			**9.6**	**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

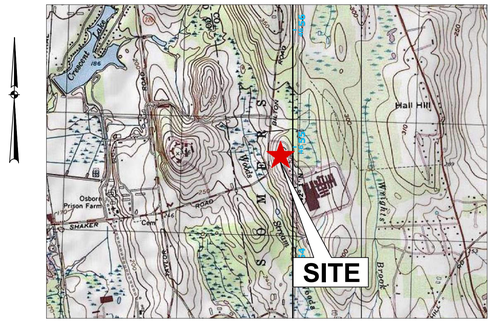
Tie-break Rule: Lower

EXHIBIT IV

SITE PLANS

CT Green Bank
Department of Corrections Solar

Osborn Correctional Institution
335 Bilton Road
Somers, Connecticut



VICINITY MAP
1"=2,000'

LATITUDE: 42.0019375°
LONGITUDE: -72.501380°

Applicant

CT Green Bank
75 Charter Oak Ave., Suite 1–103
Hartford, CT 06106

Owner

State of Connecticut
Osborn Medium Security Prison
335 Bilton Road
Somers, CT 06071

Prepared By

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

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Alternative Power Generation Inc.

PERMIT PLANS

DRAWING INDEX

SHEET TITLE	SHEET NO.	LATEST REVISION
CIVIL		
COVER SHEET	C–000	4–21–22
OVERALL SITE PLAN	C–100	4–21–22
SITE PLAN (40–SCALE)	C–101	4–21–22
SITE PLAN (40–SCALE)	C–102	4–21–22
EROSION & SEDIMENT CONTROL NOTES	C–201	4–21–22
DETAILS	C–202	4–21–22

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GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SOLAR SWITCHBOARD	BLOCK	# MODULE	#STRING	KW (DC)	18 INPUT CB (W/ 14STR)	18 INPUT CB (W/ 13STR)	18 INPUT CB (W/ 12STR)	SHP_150_US_20	KW (AC)	TILT (°)	GCR	CSI AZIMUTH (°)	SPWR AZIMUTH (°)	DC RUN (CB-INV)
SSB01	1	2490	83	1170.3	5		2	7	1050.00	25	0.50	180	0	175, 205, 260, 345, 400, 485, 540
	2	2340	78	1099.8	3	1	1	5	750.00					320, 180, 125, 180, 265
	TOTAL	4830	161	2270.1	8	1	3	12	1800.00					

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REVISIONS

BY: LF/TAC	CHK: JEU

Connecticut Green Bank
Osborn Correctional Institution
335 Bilton Road
Somers, Connecticut

Overall Plan

DATE
4-21-22

SCALE
1"=100'

JOB NUMBER
2021-040

SHEET
C-100

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Test Pit Data:
Observed by J.R. Russo & Associates
on 2-14-22 & 2-15-22

TP 7
0"-12" Sandy Loam Topsoil
12"-32" Lt. Brown Fine Sandy Loam
32"-64" Lt. Brown Loamy Sand
64"-96" Red/Brown Loamy Sand w/ Gravel
Seeps @ 38", No Ledge, Mottles @ 36"

TP 8
0"-16" Sandy Loam Topsoil
16"-32" Lt. Brown Fine Sandy Loam
32"-72" Red/Brown Sandy Loam w/ Gravel
Seeps @ 28", No Ledge, Mottles @ 24"

TP 9
0"-9" Sandy Loam Topsoil
9"-31" Lt. Brown Fine Sandy Loam
28"-84" Red/Brown Loamy Sand w/ Gravel, Firm
No Water, No Ledge, No Mottles

TP 10
0"-9" Sandy Loam Topsoil
9"-32" Lt. Brown Fine Sandy Loam w/ Gravel
32"-86" Red/Brown Loamy Sand w/ Gravel, Firm
Seeps @ 50", No Ledge, No Mottles

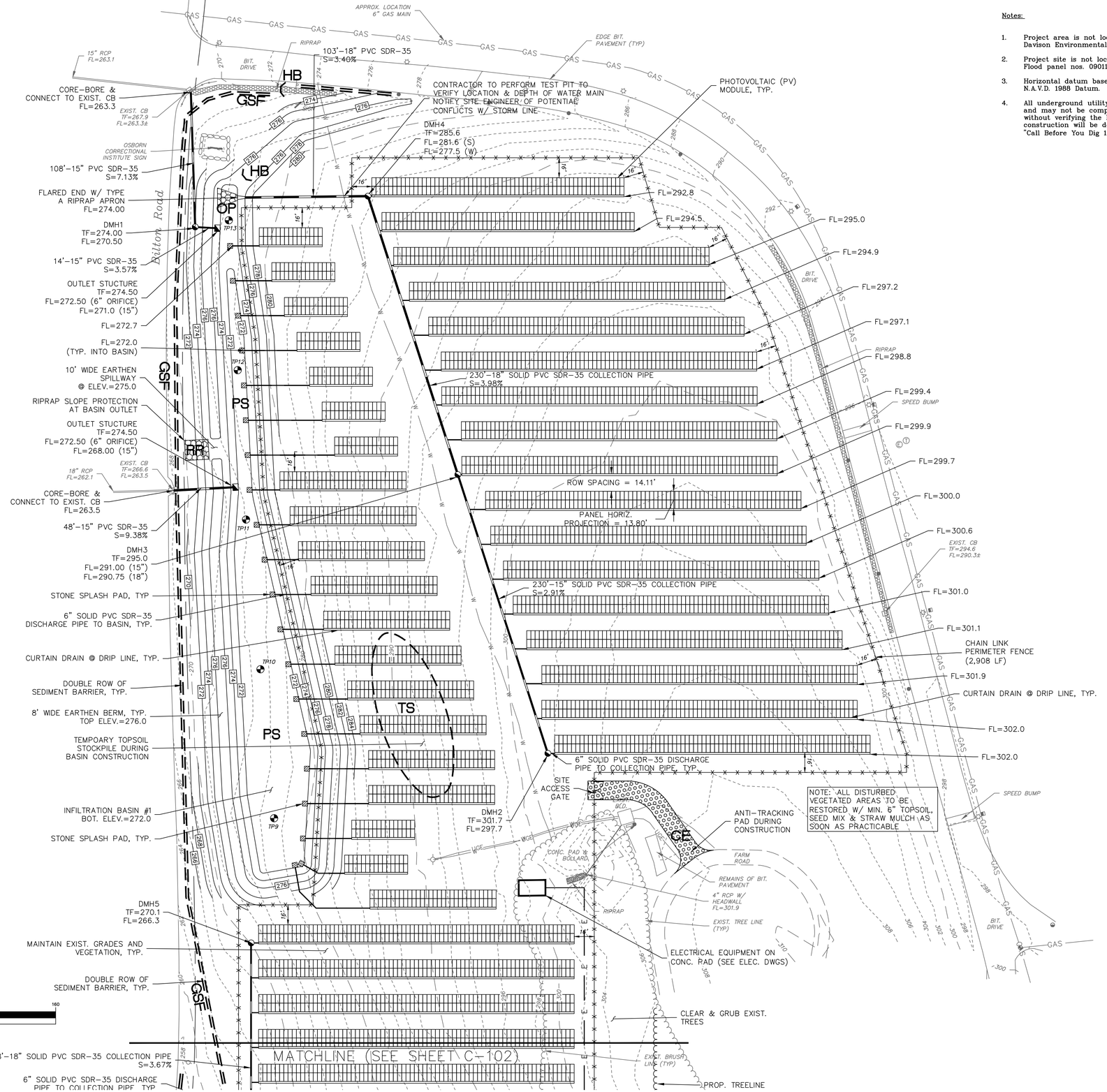
TP 11
0"-9" Sandy Loam Topsoil
9"-35" Lt. Brown Fine Sandy Loam
35"-86" Red/Brown Very Fine Sandy Loam w/ Gravel
No Water, No Ledge, No Mottles

TP 12
0"-8" Sandy Loam Topsoil
8"-20" Lt. Brown Fine Sandy Loam
20"-44" Lt. Brown Firm Fine Sandy Loam
44"-86" Red/Brown Sandy Loam w/ Gravel
No Water, No Ledge, No Mottles

TP 13
0"-8" Sandy Loam Topsoil
8"-30" Lt. Brown Fine Sandy Loam
30"-86" Red/Brown Loamy Sand w/ Gravel, Firm
No Water, No Ledge, No Mottles

Permeability Results:

TP7/20"-24":	1.127 in/hr
TP8/20"-24":	0.659 in/hr
TP9/20"-36":	1.323 in/hr
TP10/24"-36":	1.887 in/hr
TP11/50":	2.662 in/hr
TP12/50":	2.122 in/hr
TP10/50":	2.972 in/hr



GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

Notes:

1. Project area is not located in inland wetlands as delineated by Davison Environmental in October 2021.
2. Project site is not located in a flood hazard zone per FEMA Flood panel nos. 0901120006D.
3. Horizontal datum based on N.A.D. 1983. Elevations based on N.A.V.D. 1988 Datum.
4. All underground utility locations on this plan are approximate and may not be complete. Anyone using this information without verifying the locations does so at their own risk. No construction will be done on this site prior to utility mark out. "Call Before You Dig 1-800-922-4455".

LEGEND

	EXISTING UTILITY HANDHOLE
	EXISTING ELECTRIC HANDHOLE
E	EXISTING ELECTRIC MANHOLE
T	EXISTING TELECOMMUNICATIONS MANHOLE
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
OH	EXISTING OVERHEAD UTILITIES
OH	PROPOSED OVERHEAD UTILITIES
UGE	EXISTING UNDERGROUND ELECTRIC
UGT	EXISTING UNDERGROUND TELECOMM
E	PROPOSED UNDERGROUND ELECTRIC
	EXISTING WATER GATE
	EXISTING HYDRANT
W	EXISTING WATER
	EXISTING GAS GATE
GAS	EXISTING GAS LINE
	EXISTING CATCH BASIN
D	EXISTING DRAINAGE MANHOLE
	EXISTING STORM SEWER
	PROPOSED STORM SEWER
S	EXISTING SANITARY MANHOLE
SS	EXISTING SANITARY SEWER
	EXISTING SIGN
	EXISTING IRON PIN (FOUND)
	EXISTING MONUMENT (FOUND)
1.35x5	EXISTING SPOT GRADE
135.5	PROPOSED SPOT GRADE
136	EXISTING CONTOUR
136	PROPOSED CONTOUR
	EXISTING TREELINE
	LIMIT OF WETLANDS
	PROPERTY LINE
	EASEMENT LINE
	SEDIMENT BARRIER

EROSION & SEDIMENT CONTROL PLAN KEY

PS	PERMANENT SEEDING
TS	TEMPORARY SEEDING
CE	CONSTRUCTION ENTRANCE
GSF	GEOTEXTILE SILT FENCE
OP	OUTLET PROTECTION
HB	HAYBALE CHECKDAM

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REVISIONS

BY: LF/TAC	CHK: JEU

Connecticut Green Bank
Osborn Correctional Institution
335 Bilton Road
Somers, Connecticut

Site Plan

DATE
4-21-22
SCALE
1"=40'
JOB NUMBER
2021-040
SHEET
C-101

S:\Acad\2021 Civil 3D\2021-040 APG CT Green Bank\Russo Drawings\2021-040 Enfield Site.dwg

Test Pit Data:
Observed by J.R. Russo & Associates
on 2-14-22 & 2-15-22

TP 7
0"–12" Sandy Loam Topsoil
12"–32" Lt. Brown Fine Sandy Loam
32"–64" Lt. Brown Loamy Sand
64"–96" Red/Brown Loamy Sand w/ Gravel
Seeps @ 38", No Ledge, Mottles @ 36"

TP 8
0"–16" Sandy Loam Topsoil
16"–32" Lt. Brown Fine Sandy Loam
32"–72" Red/Brown Sandy Loam w/ Gravel
Seeps @ 28", No Ledge, Mottles @ 24"

TP 9
0"–9" Sandy Loam Topsoil
9"–31" Lt. Brown Fine Sandy Loam
28"–84" Red/Brown Loamy Sand w/ Gravel, Firm
No Water, No Ledge, No Mottles

TP 10
0"–9" Sandy Loam Topsoil
9"–32" Lt. Brown Fine Sandy Loam w/ Gravel
32"–86" Red/Brown Loamy Sand w/ Gravel, Firm
Seeps @ 50", No Ledge, No Mottles

TP 11
0"–9" Sandy Loam Topsoil
9"–35" Lt. Brown Fine Sandy Loam
35"–86" Red/Brown Very Fine Sandy Loam w/ Gravel
No Water, No Ledge, No Mottles

TP 12
0"–8" Sandy Loam Topsoil
8"–20" Lt. Brown Fine Sandy Loam
20"–44" Lt. Brown Firm Fine Sandy Loam
44"–86" Red/Brown Sandy Loam w/ Gravel
No Water, No Ledge, No Mottles

TP 13
0"–8" Sandy Loam Topsoil
8"–30" Lt. Brown Fine Sandy Loam
30"–86" Red/Brown Loamy Sand w/ Gravel, Firm
No Water, No Ledge, No Mottles

Permeability Results:

TP7/20"–24":	1.127 in/hr
TP8/20"–24":	0.659 in/hr
TP9/20"–36":	1.323 in/hr
TP10/24"–36":	1.887 in/hr
TP11/50":	2.662 in/hr
TP12/50":	2.122 in/hr
TP10/50":	2.972 in/hr

6" SOLID PVC SDR-35 DISCHARGE PIPE TO BASIN, TYP.
CURTAIN DRAIN @ DRIP LINE, TYP.
DOUBLE ROW OF SEDIMENT BARRIER, TYP.
8' WIDE EARTHEN BERM, TYP. TOP ELEV.=276.0
TEMPOARY TOPSOIL STOCKPILE DURING BASIN CONSTRUCTION
INFILTRATION BASIN #1 BOT. ELEV.=272.0
STONE SPLASH PAD, TYP.
DMH5 TF=270.1 FL=266.3
MAINTAIN EXIST. GRADES AND VEGETATION, TYP.
DOUBLE ROW OF SEDIMENT BARRIER, TYP.
218'–18" SOLID PVC SDR-35 COLLECTION PIPE S=3.67%
6" SOLID PVC SDR-35 DISCHARGE PIPE TO COLLECTION PIPE, TYP.
DMH6 TF=262.1 FL=258.30
82'–18" PVC SDR-35 S=6.25%
CONTRACTOR TO PERFORM TEST PIT TO VERIFY LOCATION & DEPTH OF WATER MAIN NOTIFY SITE ENGINEER OF POTENTIAL CONFLICTS W/ STORM LINE
10' WIDE EARTHEN SPILLWAY @ ELEV.=258.0
RIPRAP SLOPE PROTECTION AT BASIN OUTLET
NEW CUSTOMER POLE #1 RECLOSER & RISER POLE
CORE-BORE & CONNECT TO EXIST. CB FL=238.8
SOLAR PANEL W/TRANSFORMER
NEW CUSTOMER POLE #2 GOAB
POINT OF INTERCONNECTION (SEE ELEC. DWGS)
86'–18" PVC SDR-35 S=13.02%
OUTLET STRUCTURE TF=257.30 FL=255.50 (6" ORIFICE) FL=250.00 (15")
MATCHLINE (SEE SHEET C-101)
6" SOLID PVC SDR-35 DISCHARGE PIPE TO COLLECTION PIPE, TYP.
DMH2 TF=301.7 FL=297.7
SITE ACCESS GATE
ANTI-TRACKING PAD DURING CONSTRUCTION
CONC. PAD & BOLLARD
FARM ROAD
REMAINS OF BIT. PAVEMENT
4" RCP W/ HEADWALL FL=301.9
RIPRAP
EXIST. TREE LINE (TYP)
ELECTRICAL EQUIPMENT ON CONC. PAD (SEE ELEC. DWGS)
CLEAR & GRUB EXIST. TREES
EXIST. BRUSH LINE (TYP)
PROP. TREELINE
CURTAIN DRAIN @ DRIP LINE, TYP.
TEMPOARY TOPSOIL STOCKPILE DURING BASIN CONSTRUCTION
FLARED END W/ TYPE A RIPRAP APPRON FL=257.80
CLEAR & CRUB EXIST. ISLAND OF TREES
PROP. TREELINE, TYP.
INFILTRATION BASIN #2 BOT. ELEV.=255.0
8' WIDE EARTHEN BERM, TYP. TOP ELEV.=259.0
EXIST. TREE LINE (TYP)
CONC. PAD W/TRANSFORMER
FL=301.1
CHAIN LINK PERIMETER FENCE (2,908 LF)
FL=301.9
CURTAIN DRAIN @ DRIP
FL=302.0
FL=302.0
NOTE: ALL DISTURBED VEGETATED AREAS TO BE RESTORED W/ MIN. 6" TOPSOIL, SEED MIX & STRAW MULCH AS SOON AS PRACTICABLE
SPEED BUMP
BIT. DRIVE
CONC. PAD W/TRANSFORMER
Bilton Road
TP10
TP9
TP8
TP7
TS
PS
OP
CE
GSF
RIP RAP
16' MILLINGS

LEGEND

	EXISTING UTILITY HANDHOLE
	EXISTING ELECTRIC HANDHOLE
E	EXISTING ELECTRIC MANHOLE
T	EXISTING TELECOMMUNICATIONS MANHOLE
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
OH	EXISTING OVERHEAD UTILITIES
OH	PROPOSED OVERHEAD UTILITIES
UGE	EXISTING UNDERGROUND ELECTRIC
UGT	EXISTING UNDERGROUND TELECOMM
E	PROPOSED UNDERGROUND ELECTRIC
	EXISTING WATER GATE
	EXISTING HYDRANT
W	EXISTING WATER
	EXISTING GAS GATE
GAS	EXISTING GAS LINE
	EXISTING CATCH BASIN
D	EXISTING DRAINAGE MANHOLE
	EXISTING STORM SEWER
	PROPOSED STORM SEWER
S	EXISTING SANITARY MANHOLE
SS	EXISTING SANITARY SEWER
	EXISTING SIGN
	EXISTING IRON PIN (FOUND)
	EXISTING MONUMENT (FOUND)
1.35x5	EXISTING SPOT GRADE
135.5	PROPOSED SPOT GRADE
136	EXISTING CONTOUR
136	PROPOSED CONTOUR
	EXISTING TREELINE
	LIMIT OF WETLANDS
	PROPERTY LINE
	EASEMENT LINE
	SEDIMENT BARRIER

EROSION & SEDIMENT CONTROL PLAN KEY

PS	PERMANENT SEEDING
TS	TEMPORARY SEEDING
CE	CONSTRUCTION ENTRANCE
GSF	GEOTEXTILE SILT FENCE
OP	OUTLET PROTECTION
HB	HAYBALE CHECKDAM

Notes:

1. Project area is not located in inland wetlands as delineated by Davison Environmental in October 2021.
2. Project site is not located in a flood hazard zone per FEMA Flood panel nos. 09011200006D.
3. Horizontal datum based on N.A.D. 1983. Elevations based on N.A.V.D. 1988 Datum.
4. All underground utility locations on this plan are approximate and may not be complete. Anyone using this information without verifying the locations does so at their own risk. No construction will be done on this site prior to utility mark out. "Call Before You Dig 1-800-922-4455".

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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REVISIONS

BY: LF/TAC	CHK: JEU

Connecticut Green Bank
Osborn Correctional Institution
335 Bilton Road
Somers, Connecticut

Site Plan

DATE 4-21-22
SCALE 1"=40'
JOB NUMBER 2021-040
SHEET C-102

S:\Acad\2021 Civil 3D\2021-040 APG CT Green Bank\Russo Drawings\2021-040 Enfield Site.dwg

PERMANENT SEEDING (PS)

SPECIFICATIONS

Time Of Year

Seeding dates in Connecticut are normally April 1 through June 15 and August 15 through October 1. Spring seedings give the best results and spring seedings of all mixes with legumes is recommended. There are two exceptions to the above dates. The first exception is when seedings will be made in the areas of Connecticut known as the Coastal Slope and the Connecticut River Valley. The Coastal Slope includes the coastal towns of New London, Middlesex, New Haven, and Fairfield counties. In these areas, with the exception of crown vetch (when crown vetch is seeded in late summer, at least 35% of the seed should be hard seed (unscarified), the final fall seeding dates can be extended and additional 15 days. The second exception is frost crack or dormant seeding, the seed is applied during the time of year when no germination can be expected, normally November through February. Germination will take place when weather conditions improve, mulching is extremely important to protect the seed from wind and surface erosion and to provide erosion protection until the seeding becomes established.

Site Preparation

Grade in accordance with the Land Grading measure which is in the Connecticut Guidelines For Soil Erosion and Sediment Control latest edition.

Install all necessary surface water controls.

For areas to be mowed remove all surface stones 2 inches or larger. Remove all other debris such as wire, cable tree roots, pieces of concrete, clods, lumps, or other unsuitable material.

Seed Selection

Lawn Areas: Premium Seed Mix for Sun and Shade.
Field Areas: Companion Seed Mix by Kings Agricseed Inc. or approved equal.
Stormwater Basin: New England Erosion Control/Restoration Mix by New England Wetland Plants, Inc. or approved equal.

Seedbed Preparation

Apply topsoil, if necessary, in accordance with the Topsoiling measure which is in the Connecticut Guidelines For Soil Erosion and Sediment Control latest edition.

Apply ground limestone and fertilizer according to soil test recommendations (such as those offered by the University of Connecticut Soil Testing Laboratory or other reliable source).

Where soil testing is not feasible on small or variable sites, or where timing is critical, fertilizer may be applied at the rate of 300 pounds per acre or 7.5 pounds per 1,000 square feet of 10-10-10 or equivalent and limestone at 4 tons per acre or 200 pounds per 1,000 square feet.

Work lime and fertilizer into the soil to a depth of 3 to 4 inches with a disc or other suitable equipment.

Inspect seedbed just before seeding. If the soil is compacted, crusted or hardened, scarify the area prior to seeding.

Seed Application

Apply selected seed at rates per manufacturer's recommendations uniformly by hand, cyclone seeder, drill, cultipacker type seeder or hydroseeder (slurry including seed, fertilizer). Normal seeding depth is from 0.25 to 0.5 inch. Increase seeding rates by 10% when hydroseeding or frost crack seeding. Seed warm season grasses during the spring period only.

Mulching

See guidelines in the Mulch For Seed measures.

MAINTENANCE

Inspect temporary soil protection area at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inch or greater during the first growing season.

Where seed has been moved or where soil erosion has occurred, determine the cause of the failure and repair as needed.

TEMPORARY SEEDING (TS)

SPECIFICATIONS

Site Preparation

Install needed erosion control measures such as diversions, grade stabilization structures, sedimentation basins and grassed waterways in accordance with the approved plan.

Grade according to plans and allow for the use of appropriate equipment for seedbed preparation, seeding, mulch application and mulch anchoring.

Seedbed Preparation

Loosen the soil to a depth of 3-4 inches with a slightly roughened surface. If the area has been recently loosened or disturbed, no further roughening is required. Soil preparation can be accomplished by tracking with a bulldozer, discing harrowing, raking or dragging with a section of chain link fence.

Apply ground limestone and fertilizer according to soil test recommendations (such as those offered by the University of Connecticut Soil Testing Laboratory or other reliable source).

If soil testing is not feasible on small or variable sites, or where timing is critical, fertilizer may be applied at the rate of 300 pounds per acre or 7.5 pounds per 1,000 square feet of 10-10-10 or equivalent.

Seeding

Apply seed uniformly by hand, cyclone seeder, drill, cultipacker type seeder or hydroseeder. The temporary seed shall be Rye (grain) applied at a rate of 120 pounds per acre. Increase seeding rates by 10% when hydroseeding.

Mulching

See guidelines in the Mulch For Seed measures.

MAINTENANCE

Inspect temporary seeding area at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inch or greater for seed and mulch movement and rill erosion.

Where seed has been moved or where soil erosion has occurred, determine the cause of the failure and repair as needed.

MULCH FOR SEED (MS)

SPECIFICATIONS

Materials

***Types of Mulches** within this specification include, but are not limited to:*

***1. Hay:** The dried stems and leafy parts of plants cut and harvested, such as alfalfa, clovers, other forage legumes and the finer stemmed, leafy grasses. The average stem length should not be less than 4 inches. Hay that can be windblown should be anchored to hold it in place.*

***2. Straw:** Cut and dried stems of herbaceous plants, such as wheat, barley, cereal rye, or brome. The average stem length should not be less than 4 inches. Straw that can be windblown should be anchored to hold it in place.*

***3. Cellulose Fiber:** Fiber origin is either virgin wood, post-industrial/pre-consumer wood or post consumer wood complying with materials specification (collectively referred to as "wood fiber"), newspaper, kraft paper, cardboard (collectively referred to as "paper fiber") or a combination of wood and paper fiber. Paper fiber, in particular, shall not contain boron, which inhibits seed germination. The cellulose fiber must be manufactured in such a manner that after the addition to and agitation in slurry tanks with water, the fibers in the slurry become uniformly suspended to form a homogeneous product. Subsequent to hydraulic spraying on the ground, the mulch shall allow for the absorption and percolation of moisture and shall not form a tough crust such that it interferes with seed germination or growth. Generally applied with tackifier and fertilizer. Refer to manufacturer's specifications for application rates needed to attain 80%-95% coverage without interfering with seed germination or plant growth. Not recommended as a mulch for use when seeding occurs outside of the recommended seeding dates.*

Tackifiers** within this specification include, but are not limited to: Water soluble materials that cause mulch particles to adhere to one another, generally consisting of either a natural vegetable gum blended with gelling and hardening agents or a blend of hydrophilic polymers, resins, viscosifiers, sticking aids and gums. Good for areas intended to be mowed. Cellulose fiber mulch may be applied as a tackifier to other mulches, provided the application is sufficient to cause the other mulches to adhere to one another.* ***Emulsified asphalts are specifically prohibited for use as tackifiers due to their potential for causing water pollution following its application.

***Nettings** within this specification include, but are not limited to: Prefabricated openwork fabrics made of cellulose cords, ropes, threads, or biodegradable synthetic material that is woven, knotted or molded in such a manner that it holds mulch in place until vegetation growth is sufficient to stabilize the soil. Generally used in areas where no mowing is planned.*

Site Preparation

Grade according to plans and allow for the use of appropriate equipment for seedbed preparation, seeding, mulch application and mulch anchoring.

Application

***Timing:** Applied immediately following seeding. Some cellulose fiber may be applied with seed to assist in marking where seed has been sprayed, but expect to apply a second application of cellulose fiber to meet the requirements of **Mulch For Seed** in the Connecticut Guidelines For Soil Erosion and Sediment Control latest edition.*

***Spreading:** Mulch material shall be spread uniformly by hand or machine resulting in 80%-95% coverage of the disturbed soil when seeding within the recommended seeding dates. Applications that are uneven can result in excessive mulch smothering the germinating seeds. For hay or straw anticipate an application rate of 2 tons per acre. For cellulose fiber follow manufacture's recommended application rates to provided 80%-95% coverage.*

When seeding outside the recommended seeding dates, increase mulch application rate to provide between 95%-100% coverage of the disturbed soil. For hay or straw anticipate an application rate to 2.5 to 3 tons per acre.

When spreading hay mulch by hand, divide the area to be mulched into approximately 1,000 square feet and place 1.5-2 bales of hay in each section to facilitate uniform distribution.

For cellulose fiber mulch, expect several spray passes to attain adequate coverage, to eliminate shadowing, and to avoid slippage.

***Anchoring:** Expect the need for mulch anchoring along the shoulders of actively traveled roads, hill tops and long open slopes not protected by wind breaks.*

When using netting, the most critical aspect is to ensure that the netting maintains substantial contact with the underlying mulch and the mulch, in turn, maintains continuos contact with the soil surface. Without such contact, the material is useless and erosion can be expected to occur.

MAINTENANCE

Inspect mulch for seed area at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inch or greater until the grass has germinated to determine maintenance needs.

Where mulch has been moved or where soil erosion has occurred, determine the cause of the failure and repair as needed.

TEMPORARY SEEDING (TS)

SPECIFICATIONS

Site Preparation

Install needed erosion control measures such as diversions, grade stabilization structures, sedimentation basins and grassed waterways in accordance with the approved plan.

Grade according to plans and allow for the use of appropriate equipment for seedbed preparation, seeding, mulch application and mulch anchoring.

Seedbed Preparation

Loosen the soil to a depth of 3-4 inches with a slightly roughened surface. If the area has been recently loosened or disturbed, no further roughening is required. Soil preparation can be accomplished by tracking with a bulldozer, discing harrowing, raking or dragging with a section of chain link fence.

Apply ground limestone and fertilizer according to soil test recommendations (such as those offered by the University of Connecticut Soil Testing Laboratory or other reliable source).

If soil testing is not feasible on small or variable sites, or where timing is critical, fertilizer may be applied at the rate of 300 pounds per acre or 7.5 pounds per 1,000 square feet of 10-10-10 or equivalent.

Seeding

Apply seed uniformly by hand, cyclone seeder, drill, cultipacker type seeder or hydroseeder. The temporary seed shall be Rye (grain) applied at a rate of 120 pounds per acre. Increase seeding rates by 10% when hydroseeding.

Mulching

See guidelines in the Mulch For Seed measures.

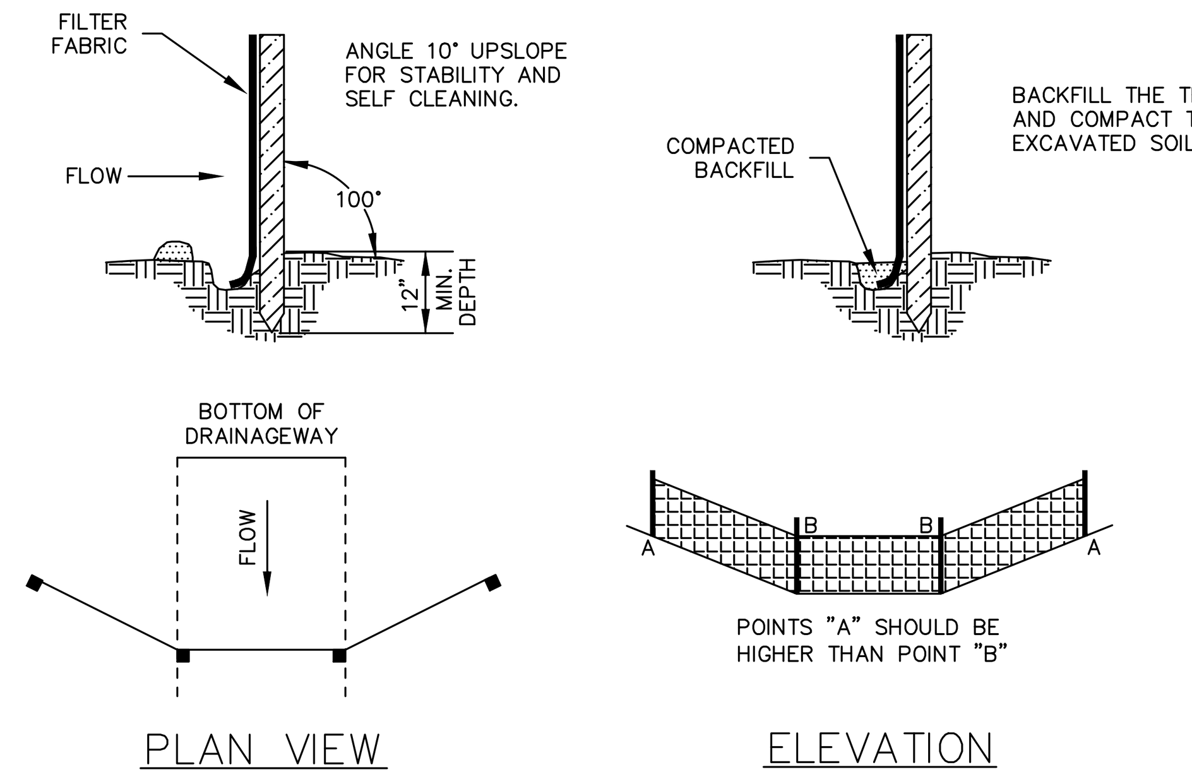
MAINTENANCE

Inspect temporary seeding area at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inch or greater for seed and mulch movement and rill erosion.

Where seed has been moved or where soil erosion has occurred, determine the cause of the failure and repair as needed.

SOIL EROSION & SEDIMENT CONTROL NOTES

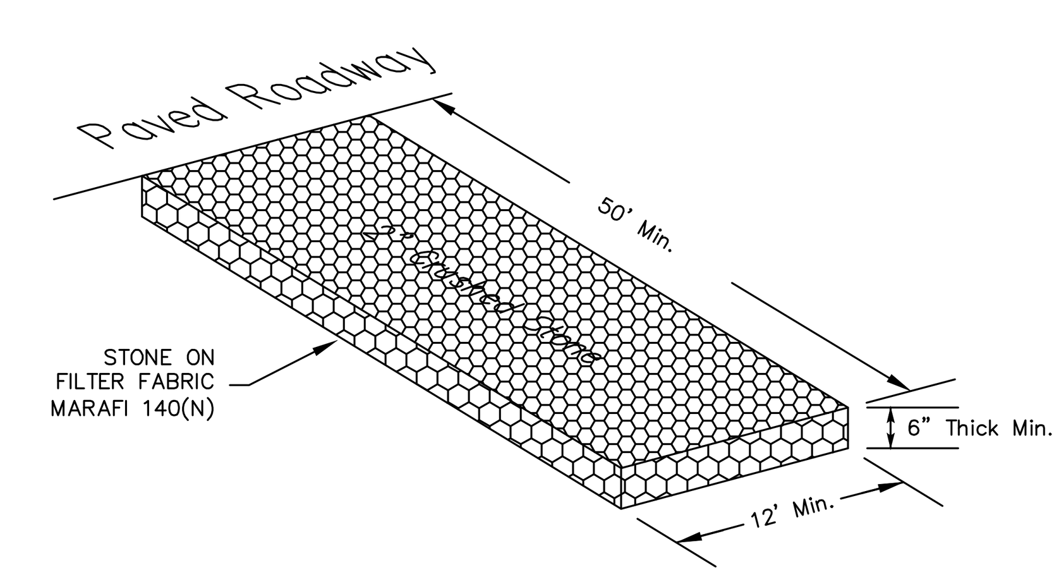
1. *All soil erosion and sediment control work shall be done in strict accordance with the Connecticut Guidelines For Soil Erosion and Sediment Control latest edition.*
2. *Any additional erosion/sediment control deemed necessary by the engineer during construction, shall be installed by the developer. In addition, the developer shall be responsible for the repair/replacement and/or maintenance of all erosion control measures until all disturbed areas are stabilized to the satisfaction of the town staff.*
3. *All soil erosion and sediment control operations shall be in place prior to any grading operations and installation of proposed structures or utilities and shall be left in place until construction is completed and/or area is stabilized.*
4. *In all areas, removal of trees, bushes and other vegetation as well as disturbance of the soil is to be kept to an absolute minimum while allowing proper development of the site. During construction, expose as small an area of soil as possible for as short a time as possible.*
5. *The developer shall practice effective dust control per the soil conservation service handbook during construction and until all areas are stabilized or surface treated. The developer shall be responsible for the cleaning of nearby streets, as ordered by the town, of any debris from these construction activities.*
6. *All fill areas shall be compacted sufficiently for their intended purpose and as required to reduce slipping, erosion or excess saturation. Fill intended to support buildings, structures, conduits, etc., shall be compacted in accordance with local requirements or codes.*
7. *Topsoil is to be stripped and stockpiled in amounts necessary to complete finished grading of all exposed areas requiring topsoil. The stockpiled topsoil is to be located as designated on the plans. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading or proposed sodding or seeding.*
8. *Any and all fill material is to be free of brush, rubbish, timber, logs vegetative matter and stumps in amounts that will be detrimental to constructing stable fills. Maximum side slopes of exposed surfaces of earth to be 3:1 or as otherwise specified by local authorities.*
9. *Soil stabilization should be completed within 5 days of clearing or inactivity in construction.*
10. *Waste Materials - All waste materials (including wastewater) shall be disposed of in accordance with local, state and federal law. Litter shall be picked up at the end of each work day.*
11. *The Contractor shall maintain on-site additional erosion control materials as a contingency in the event of a failure or when required to shore up existing BMPs. At a minimum, the on-site contingency materials should include 30 feet of silt fence and 5 straw haybales with 10 stakes.*



SOURCE: U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, STORRS, CONNECTICUT

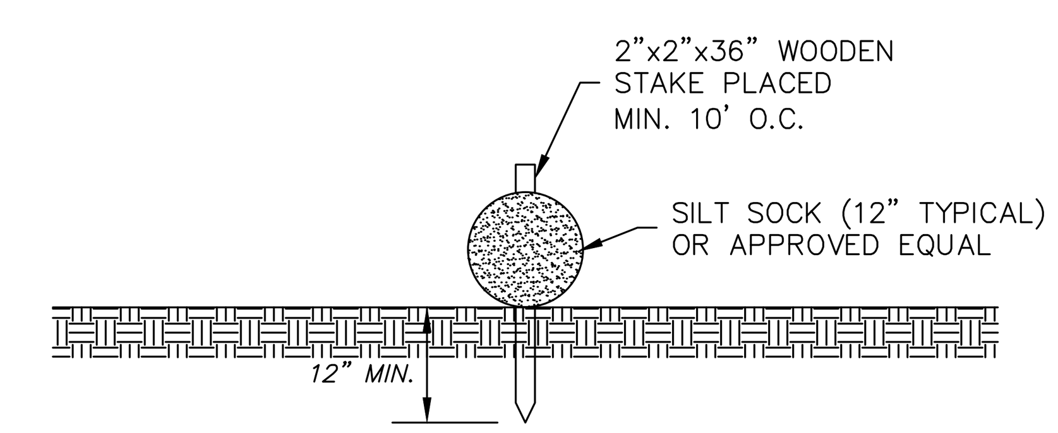
GEOTEXTILE SILT FENCE (GSF)

NOT TO SCALE



DRIVEWAY/ANTI-TRACKING PAD DETAIL (CE)

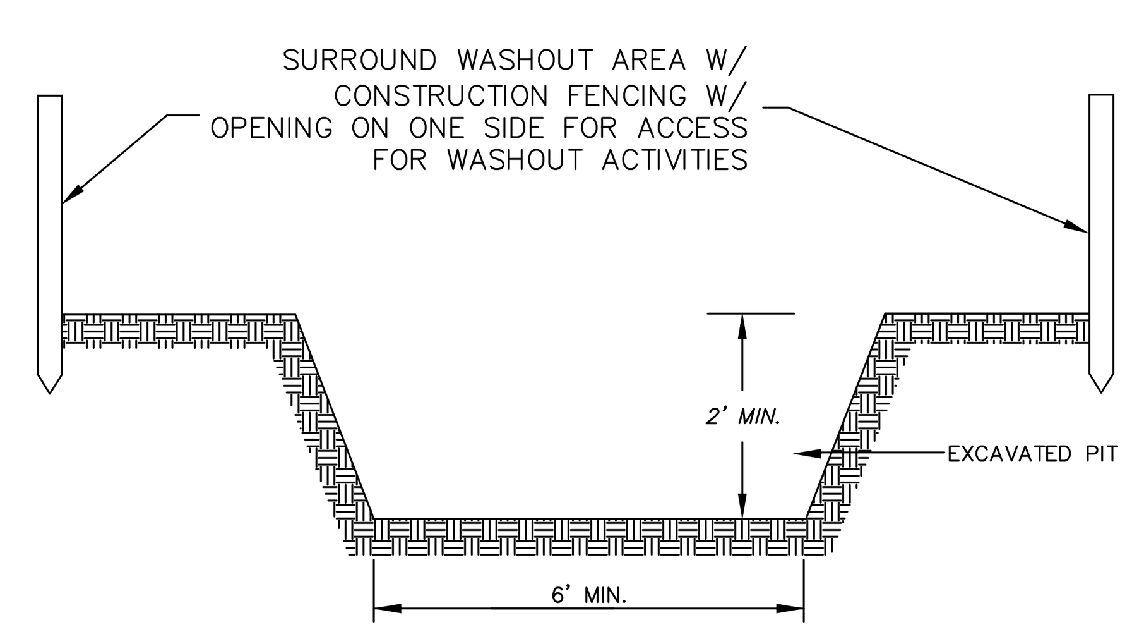
NOT TO SCALE



NOTE: MAY BE USED AS ALTERNATIVE TO GEOTEXTILE SILT FENCE.

PERIMETER SEDIMENT BARRIER

NOT TO SCALE



CEMENT TRUCK WASHOUT AREA

NOT TO SCALE

CHECKLIST FOR EROSION CONTROL PLAN

PROJECT: CT Green Bank Solar Osborn Correctional Institution

LOCATION: 335 Bilton Road, Somers, CT

PROJECT DESCRIPTION: Construction of Photovoltaic Solar Arrays

PARCEL AREA: 405± acres

RESPONSIBLE PERSONNEL: Ed Pastulnik, Alternate Power Generation, Inc. (APG); 847-477-7455

EROSION AND SEDIMENT CONTROL PLAN PREPARER: J.R. Russo & Associates, LLC

CHECKLIST:

Work Description Erosion & Sediment Control Measures	Location	Date Installed	Initials	Date Removed	Initials
Install construction entrance	As shown on plan.				
Install perimeter sediment barriers	As shown on plan.				

MAINTENANCE OF MEASURES:

Location	Description or Number	Date	Initials

Project Dates: ______

Date of groundbreaking for project: ______

Date of final stabilization: ______

PROJECT NARRATIVE AND CONSTRUCTION SEQUENCE

This project is located at the Connecticut Department of Corrections Osborn Correctional Institution at 335 Bilton Road in Somers, Connecticut. The proposed activity is the construction of photovoltaic solar array. The suggested schedule of construction is as follows:

1. Conduct a pre-construction meeting on-site with the contractor to review the design and requirements of the Stormwater Pollution Control Plan.
2. Install anti-tracking pad (CE).
3. Install sediment barriers (GSF) at project perimeters.
4. Clear trees & grub stumps in areas as shown on Plans. All debris to be removed from the site.
5. Strip topsoil in the vicinity of the proposed stormwater management basins. Stockpile suitable amount of topsoil for reuse on-site in areas shown. Stockpiles shall be surrounded by sediment barriers (GSF).
6. Construct stormwater management basins. Seed and mulch to establish vegetation as soon as practicable.
7. Install foundations and solar panels.
8. Install curtain drains and stormwater collection/conveyance system.
9. Install electrical equipment and distribution lines.
10. Install security fence.
11. Restore all disturbed areas with topsoil, seed mix and mulch as soon as practicable.
12. Remove sediment barriers after site is fully stabilized.

Construction of this site is anticipated to begin in the spring of 2022 and be complete by January 2023, pending approvals. Temporary erosion control measures shall be installed prior to any soil disturbance and maintained throughout construction until soils have been stabilized with permanent vegetation.

The Contractor shall keep the area of disturbance to a minimum and establish vegetative cover on exposed soils as soon as practical. All soil and erosion control measures shall be installed and maintained in accordance with these plans and the "Connecticut DEP Guidelines for Soil Erosion and Sediment Control", as amended. The Contractor shall verify all conditions noted on the plans and shall immediately notify the Engineer of any discrepancies.

The developer shall be responsible for the repair/replacement/maintenance of all erosion control measures until all disturbed areas are stabilized. Accumulated sediment shall be removed as required to keep silt fence functional. In all cases, deposits shall be removed when the accumulated sediment has reached one-half above the ground height of the silt fence. This material is to be spread and stabilized in areas not subject to erosion, or to be used in areas which are not to be paved or built on. Silt fence (GSF) is to be replaced as necessary to maintain proper filtering action. Silt fence (GSF) are to remain in place and shall be maintained to insure efficient sediment capture until all areas above the erosion checks are stabilized and vegetation has been established.

POST CONSTRUCTION MAINTENANCE NOTES:

The property owner shall be responsible for performing the following post construction maintenance schedule:

1. Maintain lawn & landscape areas with minimal pesticides.
2. Sweep parking lot and paved areas at least once per year in the spring.
3. Inspect catch basins and storm manholes at least twice per year, including after sweeping. Clean at least once per year in April and as necessary to prevent the discharge of pollutants from structures. Remove accumulated oil, trash and excessive sediment with vac-truck. Check condition of hoods (if applicable).
4. Inspect infiltration basin annually for evidence of hydrocarbons and remove by vac-truck. Repair eroded areas and replace riprap and vegetation as required. Dredge bottom to remove accumulated sediment every 10 years or when significant volume reduction is observed. Mow infiltration basin on a regular basis to maintain as lawn area for filtering of pollutants.

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1414 HARBOUR WAY SOUTH
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(510) 540-0550

REVISIONS

BY: LF/TAC CHK: JEU

Connecticut Green Bank
Osborn Correctional Institution
335 Bilton Road
Somers, Connecticut

Erosion & Sediment Control Notes & Details

DATE: 4-21-22
SCALE: AS SHOWN
JOB NUMBER: 2021-040
SHEET: C-201

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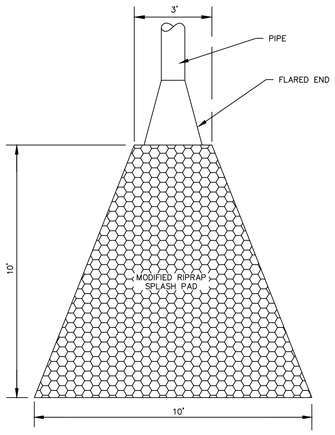
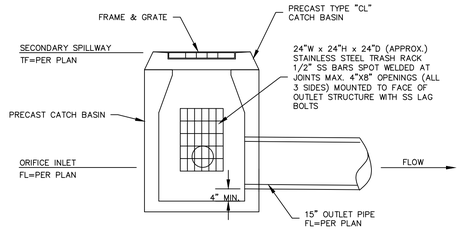


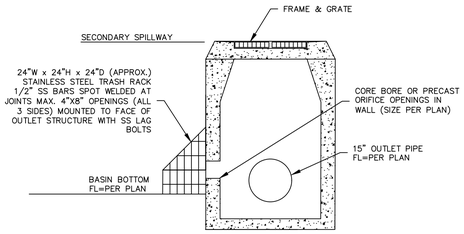
NOTE:
MODIFIED RIPRAP APRON (12" THICK) ON 6" GRANULAR BASE (M.02.01) ON MIRAFI 140N FABRIC OR EQUAL

TYPE A RIPRAP APRON (OP)

N.T.S.



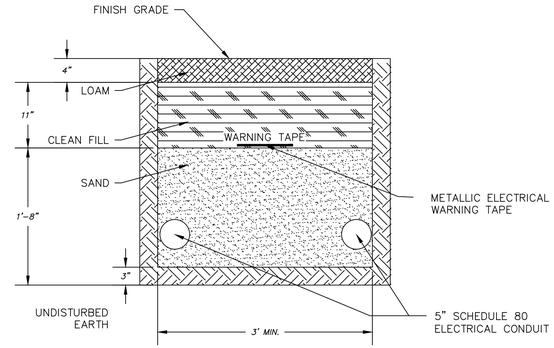
FRONT VIEW



SIDE SECTION VIEW

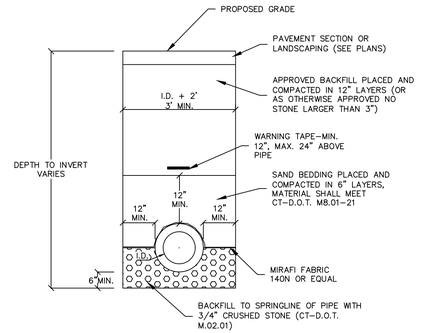
BASIN OUTLET STRUCTURE

NOT TO SCALE



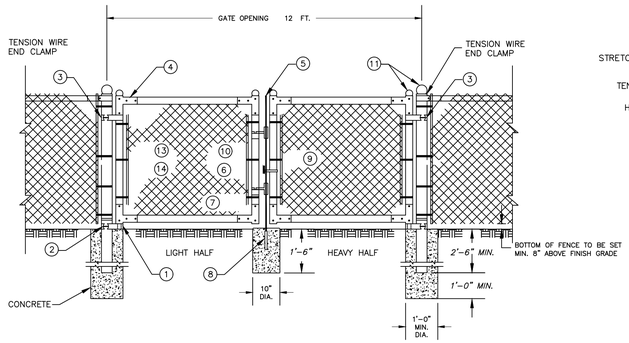
MEDIUM VOLTAGE CABLE TRENCH DETAIL (MV)

NOT TO SCALE



STANDARD STORM DRAIN DETAIL

NOT TO SCALE

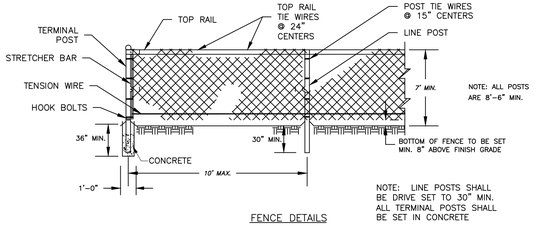


GATE DETAIL

LEGEND

PART NO.	DESCRIPTION	QUANTITY
1	STRAIGHT PLUG	2
2	BOTTOM HINGE	2
3	TOP HINGE	2
4	CORNER ELBOW	8
5	PLUNGER ROD	1
6	LATCH FORK	2
7	FORK CATCH	2
8	PLUNGER ROD CATCH	1
9	LOCK KEEPER GUIDE	1
10	LOCK KEEPER	1
11	ORNAMENTAL TOPS	6
12	TRUSS RODS	4
13	STRETCHER BAR	4
14	HOOK BOLTS	12

NOTE:
THE FENCING SHALL BE #9 GAGE FENCE FABRIC, STANDARD 2-INCH CHAIN LINK DIAMOND MESH.



FENCE DETAILS

NOTE: LINE POSTS SHALL BE DRIVE SET TO 30" MIN. ALL TERMINAL POSTS SHALL BE SET IN CONCRETE

SHAPE, SIZE AND WEIGHT REQUIREMENTS FOR FENCE POSTS AND RAILS			
ITEM	SHAPE	OUTSIDE DIMENSIONS INCHES	WEIGHT LBS./LIN. FT.
** TERMINAL POSTS	ROUND	2.375	3.65
	*ROUND	2.375	3.12
LINE POSTS	ROUND	1.90	2.72
	*ROUND	1.90	2.28
TOP & BRACE RAILS	ROUND	1.66	2.27
	*ROUND	1.66	1.84
* GRADE B HIGH STRENGTH STEEL ** INCLUDES END, CORNER, ANGLE, INTERSECTION AND INTERMEDIATE BRACED POSTS			

GATE FRAME MEMBERS SIZE AND WEIGHT		
GATE FRAME	OUTSIDE DIMENSIONS INCHES	WEIGHT LBS./LIN. FT.
ROUND	1.66	2.27
*ROUND	1.66	1.84
* GRADE B HIGH STRENGTH STEEL		

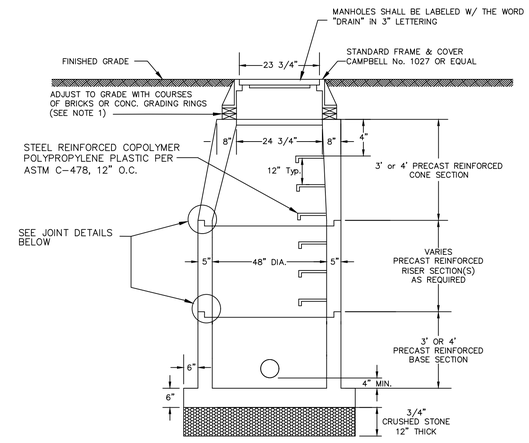
GATE POST SIZE AND WEIGHT		
GATE LEAF WIDTH OF 6 FT. OR LESS	OUTSIDE DIMENSIONS INCHES	WEIGHT LBS./LIN. FT.
ROUND	2.875	5.79
*ROUND	2.875	4.64
* GRADE B HIGH STRENGTH STEEL		

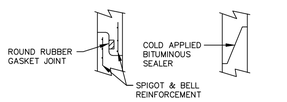
CONSTRUCTION NOTES

1. MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE MANUFACTURER'S SPECIFICATIONS.
2. ALL POSTS SHALL BE INSTALLED VERTICALLY. WHERE POSTS ARE INSTALLED ON AN INCLINED SURFACE, THE ANGLE OF THE POST SHALL BE ADJUSTED SO THAT THE POST WILL BE VERTICAL.
3. THE FENCING SHALL BE #9 GAGE FENCE FABRIC, STANDARD 2-INCH CHAIN LINK DIAMOND MESH.

CHAIN LINK FENCE DETAIL

NOT TO SCALE





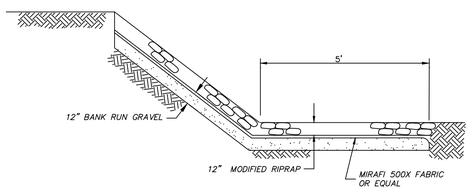
GASKET JOINT N.T.S. ALTERNATE JOINT N.T.S.

NOTES:

1. *MINIMUM COVER OVER TOP OF PIPE SHALL BE 2'-0" UNLESS OTHERWISE APPROVED BY THE ENGINEER.*
2. *TOP STEP TO BE A MAXIMUM OF 24" BELOW TOP OF MANHOLE FRAME & COVER.*
3. *WALL THICKNESS SHALL BE SUFFICIENT TO MEET HS 20 LOADING.*
4. *MANHOLE INSIDE DIAMETER MAY BE INCREASED AS DIRECTED BY THE ENGINEER TO ACCOMMODATE SIZE AND NUMBER OF PIPES. INCREASE WALL THICKNESS 1" FOR EACH 1 FT. OF INSIDE DIAMETER INCREASE.*
5. *FOR SHALLOW STRUCTURES, USE 8" SLAB IN PLACE OF CONE SECTION.*
6. *ALL PIPES SHALL BE CUT FLUSH WITH INSIDE WALLS.*
7. *FILL LIFTING HOLES WITH MORTAR.*

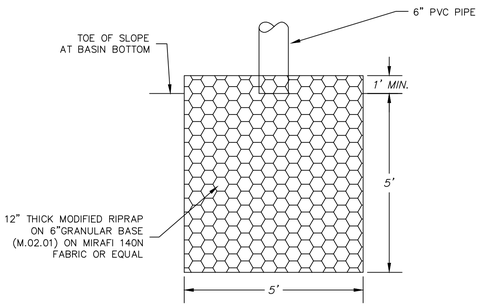
PRECAST CONCRETE MANHOLE

NOT TO SCALE



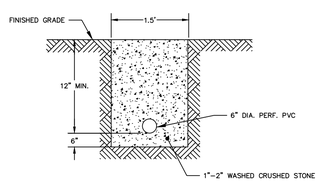
RIPRAP SLOPE PROTECTION AT SPILLWAY

NOT TO SCALE



DISCHARGE TO BASIN

NOT TO SCALE



NOTE: UPSTREAM END OF PIPE TO BE SET AT 12" BELOW FINISH GRADE. BOTTOM OF CURTAIN DRAIN AND PIPE TO BE LAID FLAT OR AT POSITIVE SLOPE TOWARD THE OUTLET

CURTAIN DRAIN

NOT TO SCALE

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REVISIONS

BY: LF/TAC	CHK: JEU

Connecticut Green Bank
Osborn Correctional Institution
335 Bilton Road
Somers, Connecticut

Details

DATE 4-21-22
SCALE AS SHOWN
JOB NUMBER 2021-040
SHEET C-202

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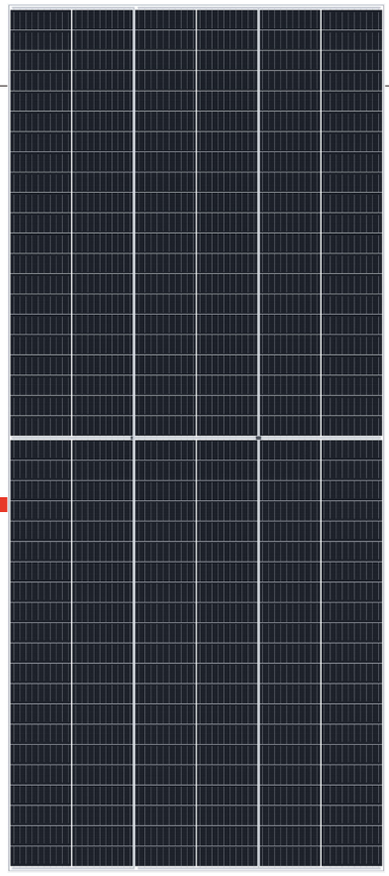
EXHIBIT V

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

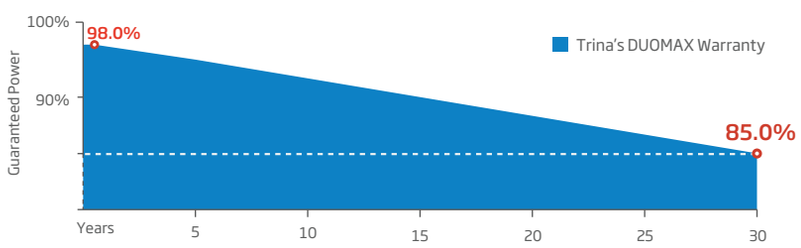
High energy generation

- 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

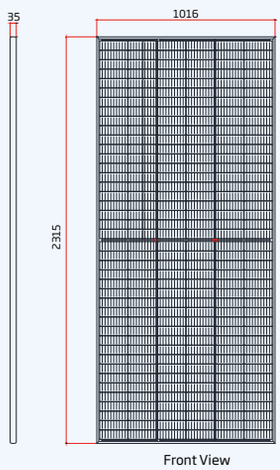


Trinasolar

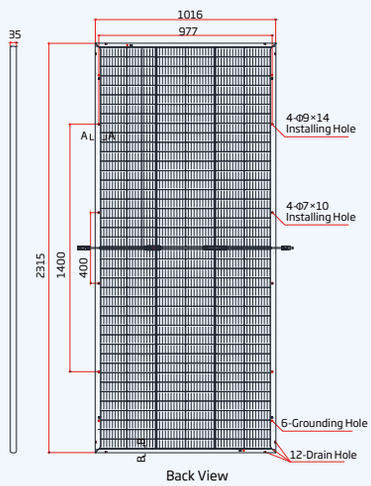
DUOMAX twin

BIFACIAL DUAL GLASS 252 LAYOUT MODULE

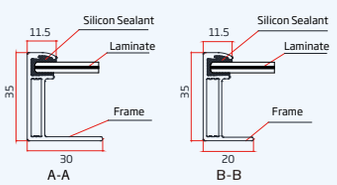
DIMENSIONS OF PV MODULE(mm)



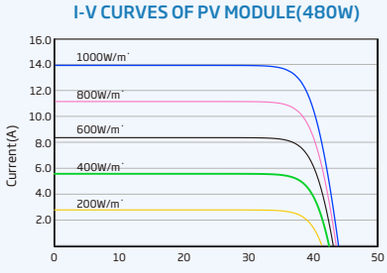
Front View



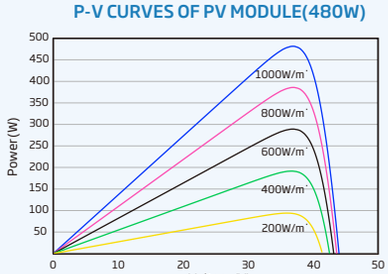
Back View



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 VI

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 VII

NOTICE TO TOWN AND STATE OFFICIALS AND ABUTTERS AND ABUTTERS MAP

CERTIFICATION OF SREVICE

I hereby certify that on this 11th 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:

Somers Town Officials:
Tim Keeney, First Selectman
Town of Somers
600 Main Street
Somers, CT 06071

Joan Formeister, Chairman
Somers Conservation Commission
600 Main Street
Somers, CT 06071

Jill Conklin, Chairperson
Somers Zoning Commission
600 Main Street
Somers, CT 06071

East Longmeadow Chief Executive Officer:
Michael Kane, President
East Longmeadow Town Council
60 Center Square
East Longmeadow, MA 01028

Enfield Chief Executive Office:
Robert Cressotti, Mayor
Town of Enfield
820 Enfield Street
Enfield, CT 06082

Regional Council of Governments:
Capitol Region Council of Governments (CRCOG)
241 Main Street
Hartford, CT 06106-5310

State Officials:
Kurt Vail
Representative – 52th District
Legislative Office Building
300 Capitol Avenue, Room 4200
Hartford, CT 06106

John Kissel
Senator – 7th District
Legislative Office Building
300 Capitol Avenue, Room
Hartford, CT 06106-1591

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

Abutting Property Owners

Oliver & Georgianna H. Eastwood
278 George Wood Road
Somers, CT 06071

Steven W. Camerota
312 North Main Street
Enfield, CT 06082

Salvatore Camerota, et al
272 George Wood Road
Somers, CT 06071

Karin Lawlor
82 Rye Hill Circle
Somers, CT 06071

David & Nedra W. Mortimer
76 Rye Hill Circle
Somers, CT 06071

Michael D. & Susan Marinaccio
68 Rye Hill Circle
Somers, CT 06071

Thomas A. Ricci
62 Rye Hill Circle
Somers, CT 06071

Judith C. Napolitano
55 White Birch Circle
Somers, CT 06071

Michael J. Pinette
216 Wrights Brook Drive
Somers, CT 06071

Joseph K. & Mary K. Kane
210 Wrights Brook Drive
Somers, CT 06071

Nathan F. & Megan B. Champion
95 Loubier Drive
Somers, CT 06071

Elalaine Crescini Bacabac
94 Loubier Drive
Somers, CT 06071

Philip E. Prior & Ava M. Zils
95 Blue Ridge Drive
Somers, CT 06071

James J. Bendak
98 Blue Ridge Drive
Somers, CT 06071

Judith F. & Ronald J. Trevena
84 Blue Ridge Drive
Somers, CT 06071

Robert A. & Karen E. Sikoski
76 Blue Ridge Drive
Somers, CT 06071

Paul J. Oliver
455 Hall Hill Road
Somers, CT 06071

Lise B. Waldman
58 Bridle Path Drive
Somers, CT 06071

Dawn M. & Marc K. Whalen
46 Bridle Path Drive
Somers, CT 06071

Alan & Bonnie Wexelman
38 Bridle Path Drive
Somers, CT 06071

John & Lynn Papale
22 Bridle Path Drive
Somers, CT 06071

Stephen J. & Donna M. Lewkowicz
18 Bridle Path Drive
Somers, CT 06071

Joshua & Elizabeth N. Eldridge
14 Bridle Path Drive
Somers, CT 06071

Michael Disibio
11 Sugar Bush Lane
Tolland, CT 06084

Filipe & Kari Helder Nunes
96 White Oak Road
Somers, CT 06071

Kenneth R. & Anicia B. Young
163 Bilton Road
Somers, CT 06071

Osborn State Prison Farm
531 Taylor Road
Enfield, CT 06082

Ridderkerk Real Estate LLC
164 Hampden Road
Somers, CT 06071

May 11, 2022

Via Certificate of Mailing

<Name and Address>

Re: Connecticut Green Bank – Notice of Intent to File a Petition for Declaratory Ruling for the Construction, Operation and Maintenance of a 1.8 MW(ac) Solar Photovoltaic Electric Generating Facility at the State of Connecticut Department of Corrections Osborn Correctional Institution located at 335 Bilton Road in Somers, 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 11, 2022, seeking approval of the construction, operation and maintenance of a 1.8 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 Osborn Correctional Institutions operated by the Department of Corrections (DOC). The Project will include an approximate 7.4 acre solar array just south of the driveway and east of Bilton Road. 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.

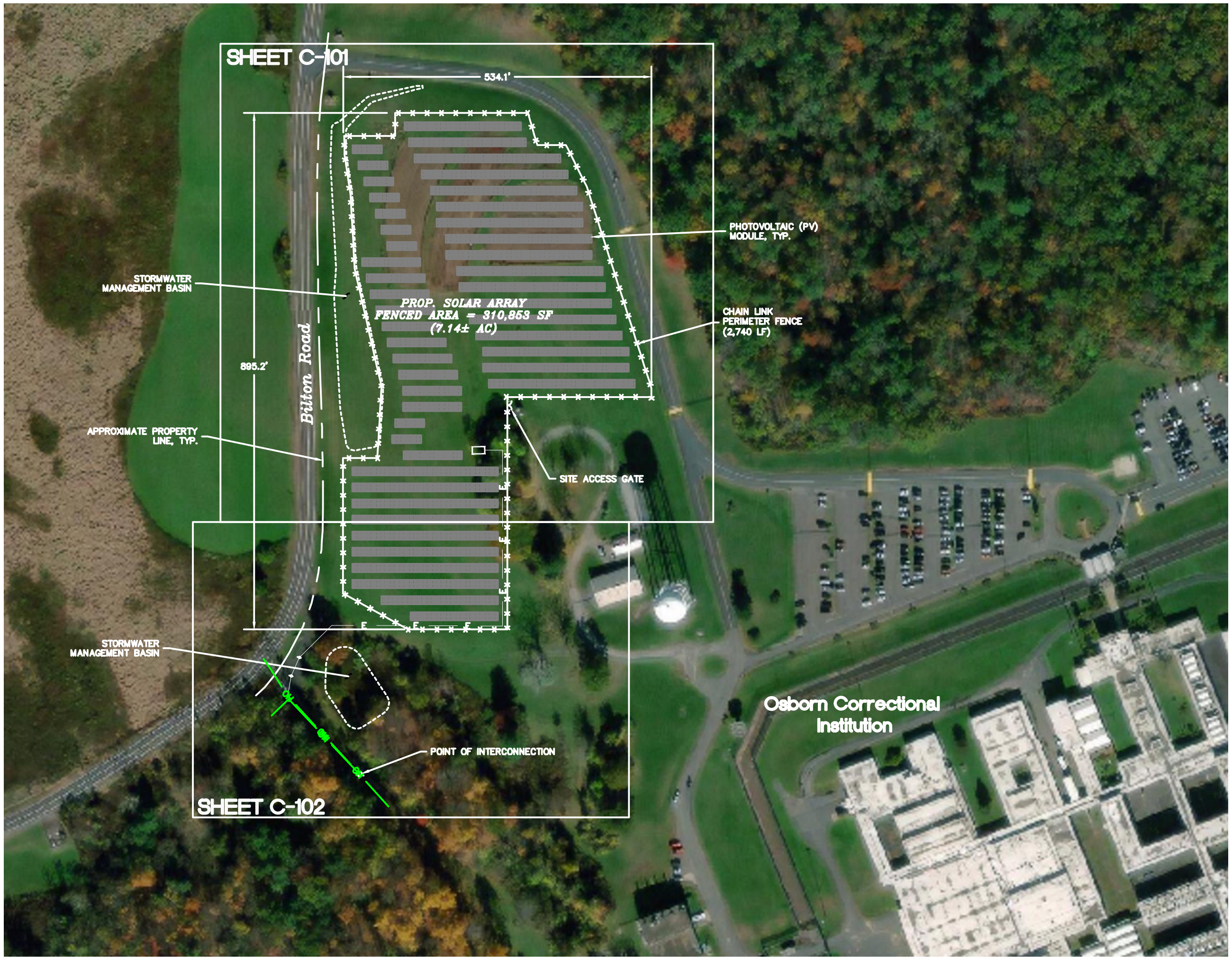
Pursuant to the provisions of the Connecticut General Statutes §16-50g et seq., the location of certain project features may change as this Petition proceeds through the Council's regulatory review process.

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 = 100 ft.

SOLAR SWITCHBOARD	BLOCK	# MODULE	#STRING	KW (DC)	18 INPUT CB (W/ 14STR)	18 INPUT CB (W/ 13STR)	18 INPUT CB (W/ 12STR)	SHP_150_US_20	KW (AC)	TILT (°)	GCR	CSI AZIMUTH (°)	SPWR AZIMUTH (°)	DC RUN (CB-INV)
SSB01	1	2490	83	1170.3	5		2	7	1050.00	25	0.50	180	0	175, 205, 260, 345, 400, 485, 540
	2	2340	78	1099.8	3	1	1	5	750.00					320, 180, 125, 180, 265
	TOTAL	4830	161	2270.1	8	1	3	12	1800.00					

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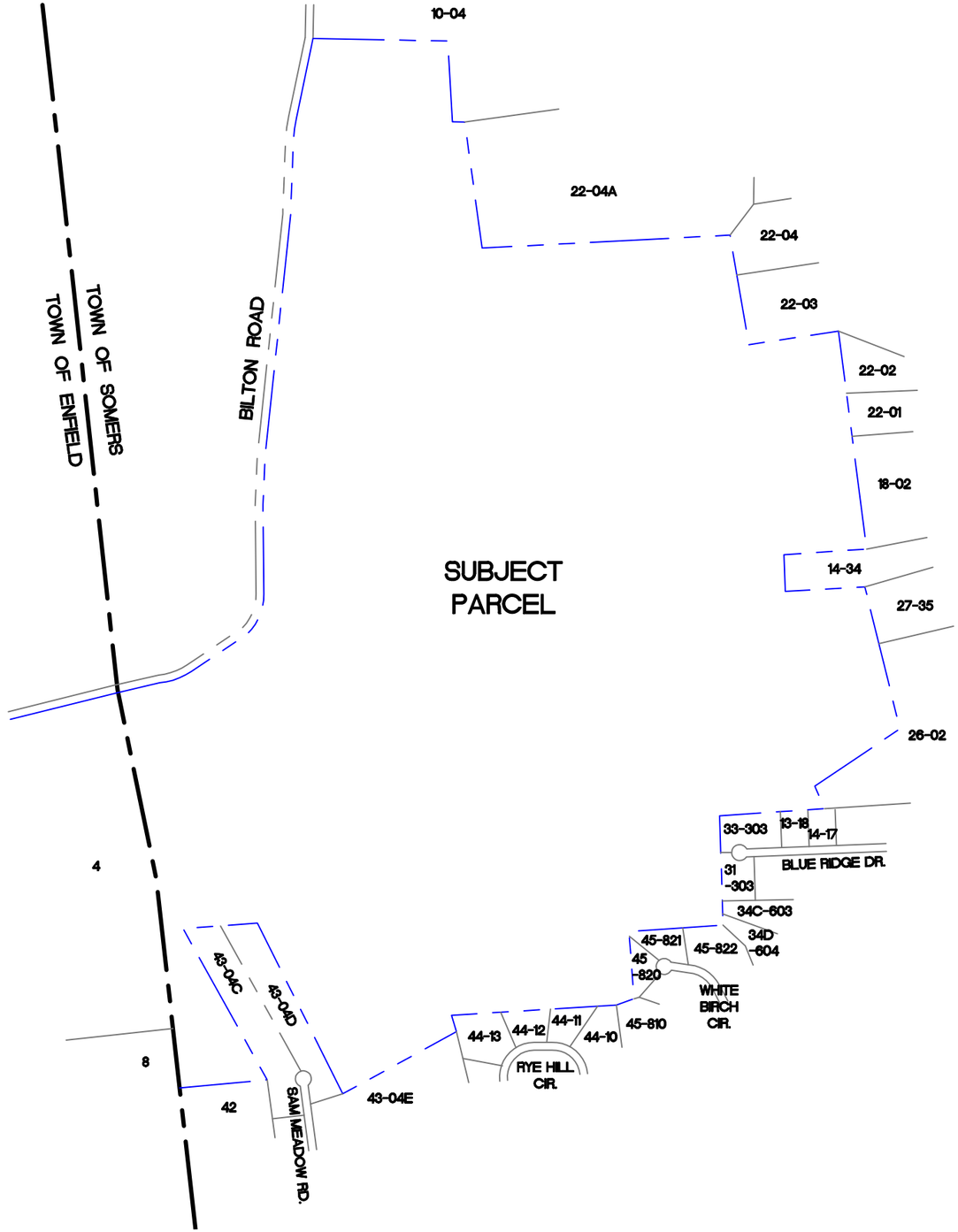
RICHMOND, CA 94804 USA
(510) 540-0550

REVISIONS
BY: LF/TAC | CHK: JEU

Connecticut Green Bank
Osborn Correctional Institution
335 Bilton Road
Somers, Connecticut

Overall Plan

DATE
4-21-22
SCALE
1"=100'
JOB NUMBER
2021-040
SHEET
C-100



Lot#	Name & Address
4	Osborn State Prison Farm 531 Taylor Road Enfield, CT 06082
8	Oliver & Georgianna H. Eastwood 278 George Wood Road Somers, CT 06071
10-04	Kenneth R. & Anicia B. Young 183 Bilton Road Somers, CT 06071
13-18	Judith F. & Ronald J. Trevena 84 Blue Ridge Drive Somers, CT 06071
14-17	Robert A. & Karen E. Sikoski 76 Blue Ridge Drive Somers, CT 06071
14-34	Dawn M. & Marc K. Whalen 46 Blue Ridge Drive Somers, CT 06071
18-02	Alan & Bonnie Wexelman 38 Blue Ridge Drive Somers, CT 06071
22-01	John & Lyn Papale 22 Bridle Path Drive Somers, CT 06071
22-02	Stephan J. & Donna M. Lewkowicz 18 Bridle Path Drive Somers, CT 06071
22-03	Joshua & Elizabeth N. Eldridge 14 Bridle Path Drive Somers, CT 06071
22-04	Michael Disibio 11 Sugar Bush Lane Tolland, CT 06084
22-04A	Filipe & Kari Helder Nunes 96 White Oak Road Somers, CT 06071
26-02	Paul J. Oliver 455 Hall Hill Road Somers, CT 06071
27-35	Lise B. Waldman 58 Bridle Path Drive Somers, CT 06071
31-303	Philip E. Prior & Ava M. Zils 95 Blue Ridge Drive Somers, CT 06071
33-302	James J. Bendak 98 Blue Ridge Drive Somers, CT 06071
34C-603	Elaiaine Crescini Bacabac 94 Loubier Drive Somers, CT 06071
34D-604	Nathan F. & Megan B. Champion 95 Loubier Drive Somers, CT 06071
42	Oliver & Georgianna H. Eastwood 278 George Wood Road Somers, CT 06071
43-04C	Steven W. Camerota 312 North Main Street Enfield, CT 06082
43-04D	Salvatore Camerota, et al 272 George Wood Road Somers, CT 06071
43-04E	- - -
44-10	Thomas A. Ricci 62 Rye Hill Circle Somers, CT 06071
44-11	Michael D. & Susan Marinaccio 68 Rye Hill Circle Somers, CT 06071
44-12	David & Nedra W. Mortimer 76 Rye Hill Circle Somers, CT 06071
44-13	Karin Lawlor 82 Rye Hill Circle Somers, CT 06071
45-810	Judith C. Napolitano 55 White Birch Circle Somers, CT 06071
45-820	Michael J. Pinette 216 Wrights Brook Drive Somers, CT 06071
45-821	Joseph K. & Mary K. Kane 210 Wrights Brook Drive Somers, CT 06071
45-822	Ridderkerk Real Estate LLC 164 Hampden Road Somers, CT 06071

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)

1 inch = 400 ft.

THIS PLAN WAS COMPILED FROM OTHER MAPS, RECORD RESEARCH AND/OR OTHER SOURCES OF INFORMATION. IT IS NOT TO BE CONSTRUED AS HAVING BEEN OBTAINED AS THE RESULT OF A FIELD SURVEY, AND IS SUBJECT TO SUCH CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. IT CONFORMS TO THE CLASS "D" REQUIREMENTS OF THE "CODE OF RECOMMENDED PRACTICE FOR STANDARDS OF ACCURACY OF MAPS" OF THE CONNECTICUT TECHNICAL COUNCIL, INC.

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(510) 540-0550

REVISIONS

BY: LF/TAC	CHK: JEU

Connecticut Green Bank
Osborn Correctional Institution
335 Bilton Road
Somers, Connecticut

Key Map

DATE
3-31-22

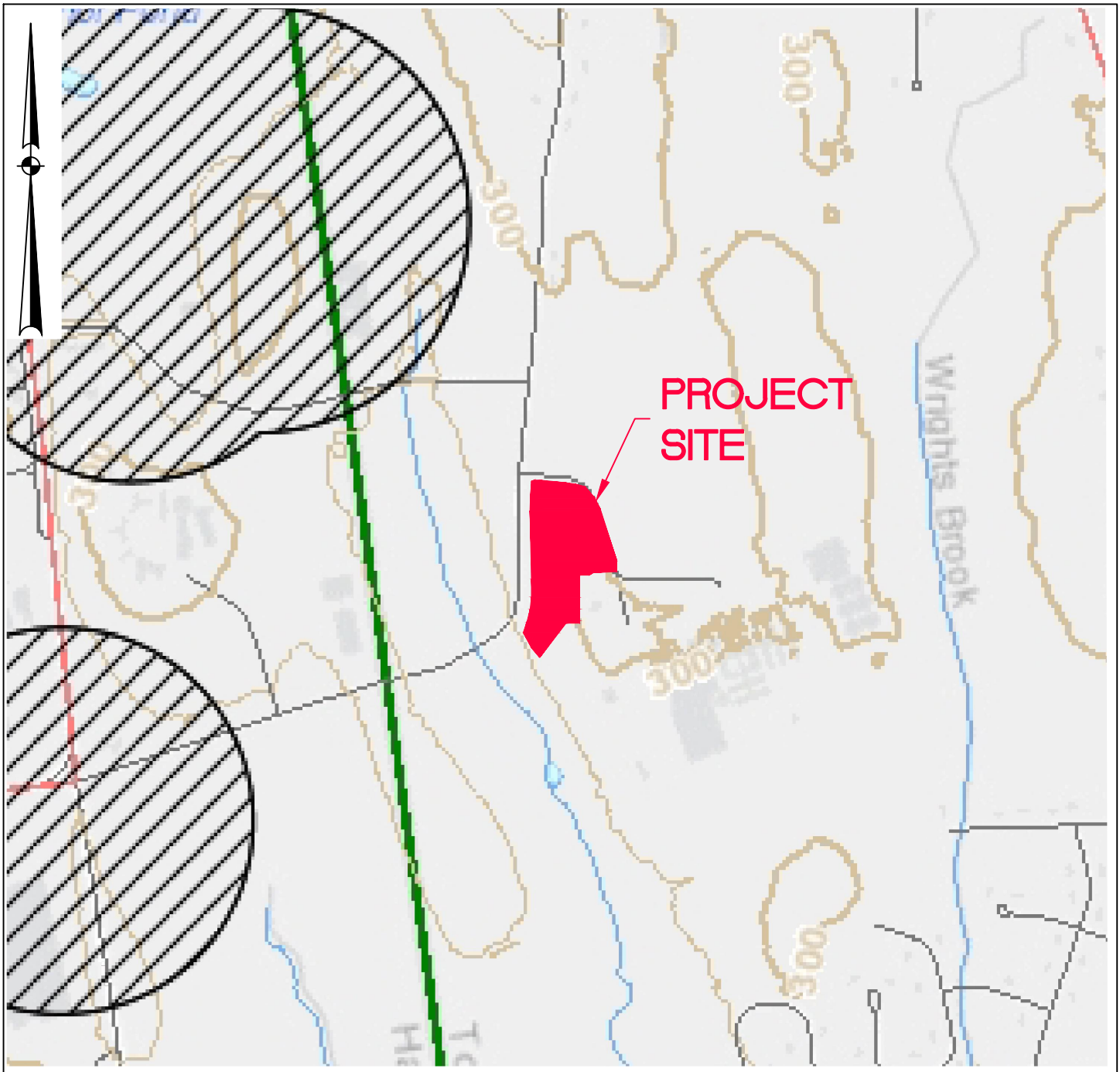
SCALE
1"=400'

JOB NUMBER
2021-040

SHEET
1 of 1

EXHIBIT VIII

NATURAL DIVERSITY DATABASE MAP



NATURAL DIVERSITY DATABASE AREA

SOURCE:
CT ENVIRONMENTAL CONDITIONS ONLINE
NDDB MAP DECEMBER 2021

ENDANGERED SPECIES MAP

CT GREEN BANK SOLAR
Osborn Facility

335 Bilton Road
Somers, Connecticut

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www.jrrusso.com • info@jrrusso.com

DATE	4–04–2022
SCALE	1"=1,000'
JOB NUMBER	2021–040SB
SHEET	EXHIBIT VIII

EXHIBIT IX

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: *10/6/2021*

Project Location: *Osborn*
100 Bilton Rd, Somers

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:

No wetlands present

Wetland Plant Communities Present:

Forest ☐
Sapling/Shrub ☐
Wet Meadow ☐
Marsh ☐
Upland/Streamside ☐

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

No wetland soils present.

Non-Wetland Soils

The non-wetland soils consist of the Wapping series, the Chesire series, and Udorthents. The Wapping series consists of very deep, moderately well drained loamy soils formed in silty mantled friable or firm till on uplands. They are nearly level to gently sloping soils on till plains, low ridges and hills, typically on lower slopes and in slight depressions. Permeability is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum.

The Cheshire series consists of very deep, well drained loamy soils formed in supraglacial till on uplands. They are nearly level to very steep soils on till plains and hills. The soils formed in acid glacial till derived mostly from reddish sandstone, shale, and conglomerate with some basalt.

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

No wetlands are present on the site. The central hilltop consists of well drained Cheshire soils, along with historically modified Cheshire soils now classified as Udorthents. The lower southern slope where the transmission line is proposed consists of moderately well drained Wapping soils.

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

Eric Davison
Certified Professional Wetland Scientist
Registered Soil Scientist

EXHIBIT X

DRAINAGE REPORT

DRAINAGE REPORT
CT Green Bank
Department of Corrections Solar
Osborn Correctional Institution
335 Bilton Road
Somers, CT

March 25, 2022

Prepared for:

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

Owner:

State of Connecticut
Osborn Medium Security Prison
335 Bilton Road
Somers, CT 06071

Project No. 2021-040 OSB

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 a solar array behind the meter to supplement the power supply at the Osborn Correctional Institution at 335 Bilton Road in Somers. The proposed project includes a fenced area of approximately 7.43 acres containing 4,830 solar panel modules. The array's transmission line will be installed to an interconnection point at an existing utility pole south of the array approximately 50 feet from Bilton Road. The development will include two stormwater management basins 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 an existing field located northwest of the Osborn Correctional Institution at 335 Bilton Road in Somers. The site is located on the east side of Bilton Road approximately 1,300 feet east of the Somers-Enfield town line. The facility driveway wraps around the north and east of the site. A ridge runs north-south towards the eastern side of the field. The majority of field slopes westerly from the ridge lot towards Bilton Road with a small portion sloping towards the facility driveway. The runoff that slopes westerly towards Bilton Road is collected by three catch basins on the east side of Bilton Road that discharge via cross culverts to a field on the west side of the road. Runoff that slopes northerly and easterly towards the driveway is collected by a swale that runs north and then west along the driveway. An intermediate catch basin in the swale collects runoff from the southeast of the field and discharges east across the driveway into the woods. The remaining area swales to a catch basin at the northwest corner of the field at the bottom of the driveway.

Based on a review of the USDA Soil Survey, the soil in the area of the proposed development is classified as Cheshire fine sandy loam (See Soils Map 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 Cheshire fine sandy loam is HSG B.

On February 14 & 15, 2022, a series of 7 test pits were performed in the area of the proposed stormwater management basins to confirm the existing soil conditions. Test pits 9-13 were in the vicinity of the northern basin while test pits 7-8 were in the vicinity of the southern basin. Test pits were excavated to depths ranging from 72-96 inches. Soils encountered included 8-16 inches of sandy loam topsoil over light brown fine sandy loam subsoils, overlying red-brown loamy sand with gravel. Soil mottling indicative of the seasonal high water table was encountered at 36 inches and 24 inches below the ground surface in test pits 7 and 8. No mottling or water was encountered in test pits 9-13. Test pit logs are provided on the Site Plans.

Soil samples were collected from all test pits from the fine loamy sand 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 southern basin were 1.127 in/hr for the sample collected in TP7 and 0.659 in/hr for the sample collected in TP8. Calculated permeabilities for the northern basin ranged from 1.323 in/hr for the sample collected in TP9 to 2.927 in/hr for the sample collected in TP13. As a conservative measure, the slowest permeability rate at each basin was used as the basis for the design infiltration rate, 0.659 in/hr for the southern basin and 1.323 in/hr for the northern basin. These rates were further reduced by 50% to account for potential clogging resulting in final design infiltration rates for the infiltration basins of 0.330 inches/hour for the northern basin and 0.660 inches/hour for the southern 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.

Based on the present drainage patterns, runoff from the proposed development area is collected by four catch basins along Bilton Road and the driveway. As the catch basins are not connected and each outlet at different locations, each of the four catch basins were selected as a design point.

B. Pre-Development Hydrology

The pre-development site was divided into four subcatchments as shown on the pre-development drainage area map in Appendix 3. Subcatchment EX CB SW includes the portion of the field and driveway at the top of the hill that is collected by a catch basin in a pull-off off of Bilton Road at the southwestern corner of the project site. Subcatchment EX CB W includes the portion of the field that is collected by a catch basin on Bilton Road on the western edge of the project site. Subcatchment EX CB NW includes the portion of the field that is collected by a catch basin at the driveway entrance at the northwestern corner of the project site. Subcatchment EX CB E includes the portion of the field and driveway at the top of the hill that is collected by a catch basin along the driveway on the eastern edge of the project site. The pre-development runoff characteristics of the contributing area is provided on the HydroCAD data sheets in Appendix 5. The pre-development discharge rates from the site during the design storms are summarized in Tables 1-4.

C. Post-Development Hydrology

The proposed solar array will be installed at existing grades within the field. The existing drainage patterns will be maintained and soil disturbance will essentially be limited ot the construction of the stormwater management basins and access drive. The existing vegetation within the proposed array area will be maintained throughout the project to provide a 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.

The proposed solar array will be installed perpendicular to existing grades, resulting in runoff tending to channelize at the drip lines of the panels. To prevent erosion from concentrated flow, curtain drains will be installed along the drip lines of the panels to collect and convey runoff directly to the stormwater management basins. Although the area beneath the solar panels will be maintained as pervious vegetated groundcover, the panels were considered impervious for the hydrologic analysis due to the curtain drains directly collecting the runoff from the panels.

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 surrounding

the panels within the proposed fence was increased from the pre-development category of Meadow, HSG B (58) soils to Meadow, HSG B/C soils (65).

The post-development site was divided into 9 subcatchments as shown on the post-development drainage area map in Appendix 3. Subcatchment 1 includes the area along the western edge of the site than sheet flows directly to the catch basin at the southwest corner. Subcatchment 2 includes the area that directly sheet flows into the southern stormwater management basin. Subcatchments 3 and 3P include the area collected by the curtain drains and outlet to the southern basin through a collection pipe. Subcatchment 3P includes the panels that have a short time of concentration and Subcatchment 3 includes the remaining area uphill from the curtain drains that sheet flow into them with a longer time of concentration. Subcatchment 4 includes the area that sheet flows directly to the catch basin at the northwest corner. Subcatchment 5 includes the area that sheet flows directly to the catch basin along the western edge of the site. Subcatchment 6 includes the area that sheet flows into the swale along the driveway below the eastern catch basin. This swale used to discharge at the northwestern catch basin but will now be intercepted by a proposed swale that directs it into the northern stormwater management basin. Subcatchments 7 and 7P include the area around the western panels that either directly sheet flows into the northern basin or is collected by the curtain drains and piped directly to the bottom of the basin at stone splash pads. Again, Subcatchment 7P includes only the panels with their shorter time of concentration. Subcatchment 7 includes the area uphill from the curtain drains that sheet flow into them or into the basin with a longer time of concentration. Subcatchments 8 and 8P include the area around the eastern panels farther up the hill collected by the curtain drains and outlet to the northern basin through a collection pipe. Subcatchment 8P includes specifically the panels that have a short time of concentration and Subcatchment 8 includes the area uphill from the curtain drains that sheet flow into them with a longer time of concentration. Subcatchment 9 includes the area that sheet flows easterly directly and swales to the eastern catch basin. The post development subcatchment characteristics are summarized in the attached HydroCAD data sheets in Appendix 6.

The northern stormwater management basin (BASIN 1) will be equipped with two multi-stage outlet structures constructed from standard Type CL catch basins. Both outlet structures will have a primary outlet consisting of a 6” orifice set at the same elevation and a secondary outlet consisting of the frame and grate to be set at the same higher elevation. The northern structure will connect into the northwestern catch basin design point via a 15” outlet pipe. The southern outlet structure will connect into the western catch basin via a 15” outlet pipe. Additionally, the northern basin will have a 10-feet wide emergency earthen berm spillway.

The southern stormwater management basin (BASIN 2) will be equipped with a multi-stage outlet structure constructed from standard Type CL catch basins. The outlet structure will have a primary outlet consisting of a 6” orifice and a secondary outlet consisting of

the frame and grate. The outlet structure will connect into the southwestern catch basin via a 15" outlet pipe. Additionally, the southern basin will have a 10-feet wide emergency earthen berm spillway.

For outlet protection, the two collection pipes from the curtain drains into each stormwater management basin will discharge onto Type A riprap aprons while the individual curtain drains into the bottom of the northern basin will discharge onto stone splash pads. Outlet protection for the basins' emergency spillways will consist of 12" thick modified riprap slopes extended 5 feet beyond the toe of the slope.

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 1-4 compare the pre-development peak flows with the post-development peak flows at the design points. The resulting post-development peak flows are less than the pre-development peak flows.

TABLE 1 – COMPARISON OF PRE- & POST-DEVELOPMENT DISCHARGE RATES (CFS) TO DESIGN POINT SOUTHWEST CATCH BASIN

	2-year	25-year	50-year	100-year
Pre-Development	1.40	11.72	15.38	19.71
Post Development	1.30	9.48	13.80	19.17

TABLE 2 – COMPARISON OF PRE- & POST-DEVELOPMENT DISCHARGE RATES (CFS) TO DESIGN POINT WEST CATCH BASIN

	2-year	25-year	50-year	100-year
Pre-Development	0.44	3.90	5.12	6.55
Post Development	0.39	1.89	2.95	6.44

TABLE 3 – COMPARISON OF PRE- & POST-DEVELOPMENT DISCHARGE RATES (CFS) TO DESIGN POINT NORTHWEST CATCH BASIN

	2-year	25-year	50-year	100-year
Pre-Development	0.68	4.80	6.21	7.87
Post Development	0.38	1.53	2.87	6.26

TABLE 4 – COMPARISON OF PRE- & POST-DEVELOPMENT DISCHARGE RATES (CFS) TO DESIGN POINT EAST CATCH BASIN

	2-year	25-year	50-year	100-year
Pre-Development	0.98	5.03	6.35	7.88
Post Development	0.91	4.13	5.16	6.34

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 site ranges between 10 to 15% in the steepest areas, which requires 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 14.11' will exceed the 13.80' width of the panels. To satisfy condition (b), the solar panels will be constructed utilizing the existing grades while maintaining the existing vegetation Flow over all areas will be via sheet flow into the curtain drains installed at the panel drip lines. The curtain drains will collect the runoff and pipe it to the basin directly. Thus, all runoff to the basins will be clean runoff collected directly from the panels or via sheet flow from the surrounding vegetated areas. 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, all runoff will be clean runoff and 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 road and equipment pads. These surfaces total 1,520 square feet for the northern stormwater management basin and 285 square feet for southern stormwater management basin. The resulting WQVs are 1,402 cubic feet for the northern basin and 786 cubic feet for the southern basin (see Appendix 7). The volume below the outlet in the northern stormwater management basin is 7,006 cubic feet, which exceeds the required WQV. The volume below the outlet in the southern stormwater management basin is 1,973 cubic feet, which 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 and vegetation and installation of curtain drains will prevent any negative impacts downstream resulting from erosion or sedimentation during and after construction.

Appendix 1:
SOILS INFORMATION

United States Department of Agriculture

NRCS

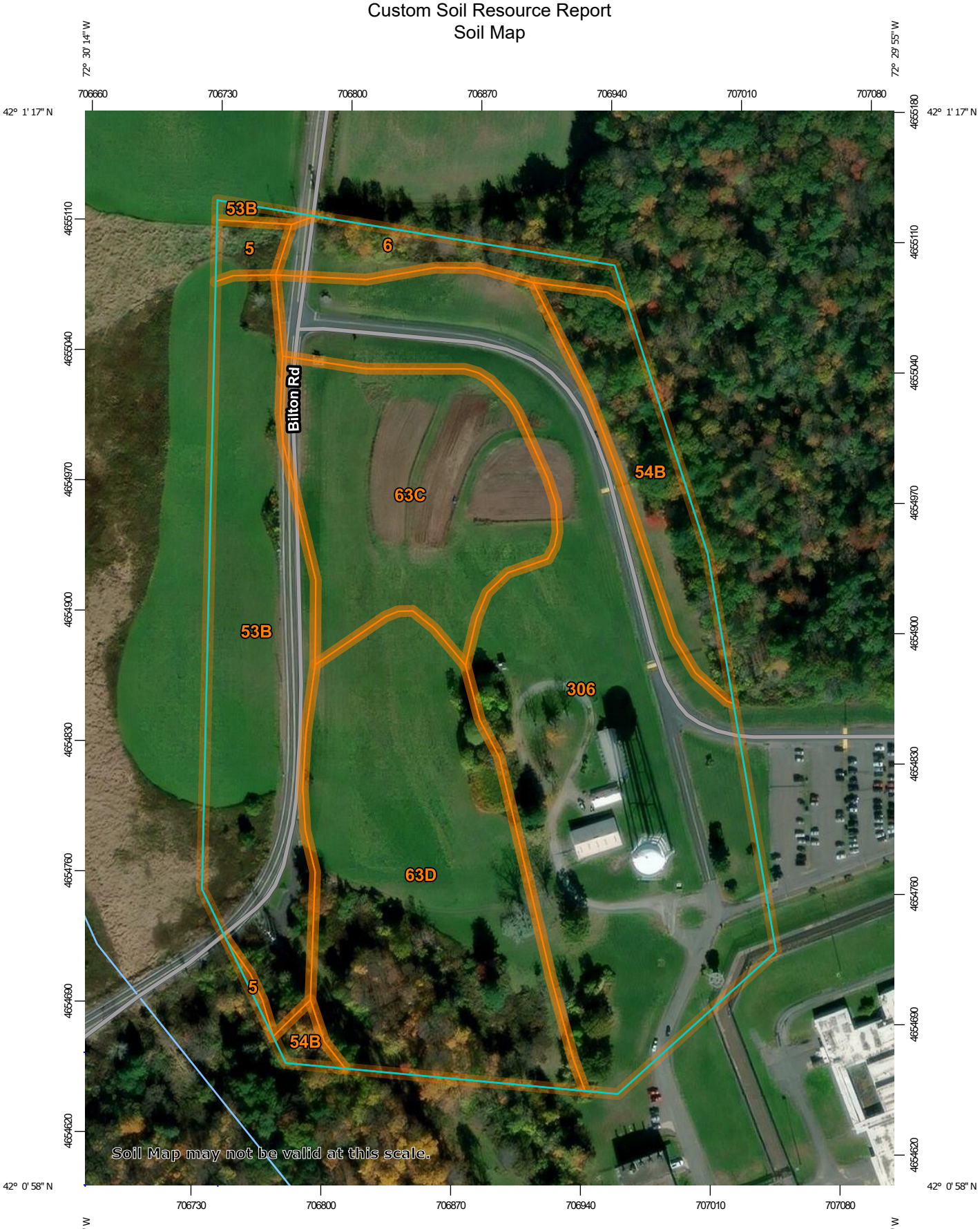
Natural Resources Conservation Service

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

December 20, 2021

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,810 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

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
5	Wilbraham silt loam, 0 to 3 percent slopes	0.3	1.0%
6	Wilbraham and Menlo soils, 0 to 8 percent slopes, extremely stony	0.9	3.2%
53B	Wapping very fine sandy loam, 3 to 8 percent slopes	4.8	16.2%
54B	Wapping very fine sandy loam, 2 to 8 percent slopes, very stony	2.0	6.6%
63C	Cheshire fine sandy loam, 8 to 15 percent slopes	4.3	14.6%
63D	Cheshire fine sandy loam, 15 to 25 percent slopes	6.7	22.5%
306	Udorthents-Urban land complex	10.6	35.8%
Totals for Area of Interest		**29.5**	**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

63C—Cheshire fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9lpx
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

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: 8 to 15 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): 3e
Hydrologic Soil Group: B
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Yalesville
Percent of map unit: 5 percent
Landform: Ridges, hills
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

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

Wethersfield
Percent of map unit: 5 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

63D—Cheshire fine sandy loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 9lpy
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: Not 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: 15 to 25 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): 4e
Hydrologic Soil Group: B
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Wethersfield

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

Yalesville

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

Wilbraham

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

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

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: Town of Somers, Connecticut, USA*
Latitude: 42.0194°, Longitude: -72.501°
Elevation: 301.48 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	**0.335** (0.259-0.433)	**0.404** (0.311-0.522)	**0.516** (0.397-0.670)	**0.608** (0.465-0.794)	**0.735** (0.545-1.00)	**0.832** (0.605-1.16)	**0.932** (0.658-1.35)	**1.04** (0.701-1.55)	**1.20** (0.777-1.86)	**1.33** (0.840-2.10)
10-min	**0.475** (0.367-0.614)	**0.572** (0.441-0.740)	**0.730** (0.561-0.948)	**0.862** (0.659-1.13)	**1.04** (0.772-1.42)	**1.18** (0.856-1.65)	**1.32** (0.933-1.92)	**1.48** (0.992-2.20)	**1.70** (1.10-2.63)	**1.88** (1.19-2.97)
15-min	**0.559** (0.432-0.722)	**0.673** (0.519-0.870)	**0.859** (0.660-1.12)	**1.01** (0.775-1.32)	**1.23** (0.909-1.68)	**1.39** (1.01-1.94)	**1.55** (1.10-2.26)	**1.74** (1.17-2.59)	**2.00** (1.30-3.09)	**2.21** (1.40-3.50)
30-min	**0.755** (0.583-0.976)	**0.910** (0.702-1.18)	**1.16** (0.894-1.51)	**1.37** (1.05-1.79)	**1.66** (1.23-2.27)	**1.88** (1.37-2.63)	**2.11** (1.49-3.06)	**2.36** (1.59-3.52)	**2.72** (1.76-4.20)	**3.00** (1.90-4.75)
60-min	**0.951** (0.735-1.23)	**1.15** (0.885-1.48)	**1.47** (1.13-1.91)	**1.73** (1.33-2.27)	**2.10** (1.56-2.87)	**2.37** (1.73-3.32)	**2.66** (1.88-3.87)	**2.98** (2.00-4.44)	**3.43** (2.22-5.31)	**3.80** (2.40-6.00)
2-hr	**1.21** (0.943-1.56)	**1.46** (1.13-1.87)	**1.85** (1.43-2.39)	**2.18** (1.68-2.83)	**2.63** (1.97-3.59)	**2.97** (2.18-4.15)	**3.33** (2.38-4.85)	**3.75** (2.53-5.57)	**4.38** (2.84-6.74)	**4.91** (3.12-7.71)
3-hr	**1.39** (1.09-1.78)	**1.67** (1.30-2.14)	**2.13** (1.65-2.74)	**2.51** (1.93-3.25)	**3.03** (2.27-4.12)	**3.41** (2.52-4.77)	**3.83** (2.76-5.59)	**4.34** (2.93-6.41)	**5.10** (3.32-7.83)	**5.76** (3.67-9.02)
6-hr	**1.75** (1.37-2.22)	**2.12** (1.66-2.70)	**2.72** (2.12-3.48)	**3.22** (2.50-4.14)	**3.91** (2.95-5.30)	**4.41** (3.28-6.15)	**4.97** (3.61-7.25)	**5.66** (3.84-8.34)	**6.76** (4.41-10.3)	**7.71** (4.92-12.0)
12-hr	**2.15** (1.70-2.73)	**2.65** (2.09-3.36)	**3.46** (2.72-4.40)	**4.13** (3.22-5.28)	**5.05** (3.84-6.84)	**5.73** (4.28-7.96)	**6.48** (4.74-9.44)	**7.43** (5.05-10.9)	**8.95** (5.86-13.6)	**10.3** (6.58-15.9)
24-hr	**2.54** (2.01-3.19)	**3.17** (2.51-3.99)	**4.19** (3.31-5.30)	**5.04** (3.96-6.41)	**6.22** (4.76-8.37)	**7.07** (5.32-9.79)	**8.02** (5.92-11.7)	**9.26** (6.31-13.5)	**11.2** (7.38-17.0)	**13.0** (8.34-20.0)
2-day	**2.87** (2.29-3.59)	**3.61** (2.88-4.52)	**4.82** (3.83-6.06)	**5.83** (4.60-7.37)	**7.21** (5.55-9.68)	**8.22** (6.22-11.3)	**9.34** (6.94-13.6)	**10.8** (7.41-15.7)	**13.3** (8.72-19.9)	**15.4** (9.92-23.6)
3-day	**3.13** (2.51-3.90)	**3.94** (3.15-4.91)	**5.26** (4.19-6.58)	**6.35** (5.03-8.00)	**7.85** (6.07-10.5)	**8.95** (6.80-12.3)	**10.2** (7.58-14.7)	**11.8** (8.09-17.0)	**14.5** (9.53-21.6)	**16.8** (10.9-25.7)
4-day	**3.37** (2.70-4.18)	**4.22** (3.39-5.26)	**5.63** (4.50-7.02)	**6.79** (5.39-8.53)	**8.39** (6.49-11.2)	**9.55** (7.27-13.1)	**10.9** (8.10-15.7)	**12.6** (8.64-18.1)	**15.4** (10.2-23.0)	**17.9** (11.6-27.3)
7-day	**4.02** (3.24-4.97)	**4.98** (4.02-6.17)	**6.56** (5.27-8.15)	**7.87** (6.28-9.84)	**9.67** (7.51-12.8)	**11.0** (8.38-15.0)	**12.4** (9.30-17.8)	**14.4** (9.90-20.6)	**17.4** (11.6-25.9)	**20.2** (13.1-30.6)
10-day	**4.67** (3.78-5.76)	**5.70** (4.60-7.03)	**7.37** (5.94-9.13)	**8.76** (7.01-10.9)	**10.7** (8.30-14.1)	**12.1** (9.22-16.3)	**13.6** (10.2-19.3)	**15.6** (10.8-22.3)	**18.7** (12.4-27.8)	**21.5** (13.9-32.5)
20-day	**6.71** (5.47-8.22)	**7.81** (6.35-9.57)	**9.59** (7.77-11.8)	**11.1** (8.92-13.7)	**13.1** (10.2-17.0)	**14.6** (11.2-19.5)	**16.3** (12.0-22.6)	**18.2** (12.6-25.8)	**21.0** (14.0-30.9)	**23.5** (15.3-35.2)
30-day	**8.43** (6.89-10.3)	**9.56** (7.80-11.7)	**11.4** (9.27-14.0)	**12.9** (10.4-15.9)	**15.0** (11.7-19.3)	**16.6** (12.7-21.9)	**18.2** (13.4-25.0)	**20.1** (14.0-28.3)	**22.6** (15.1-33.1)	**24.7** (16.1-36.9)
45-day	**10.6** (8.68-12.9)	**11.7** (9.61-14.3)	**13.6** (11.1-16.7)	**15.2** (12.3-18.7)	**17.4** (13.6-22.2)	**19.0** (14.5-24.8)	**20.7** (15.2-27.9)	**22.4** (15.7-31.4)	**24.6** (16.5-35.8)	**26.2** (17.1-39.2)
60-day	**12.4** (10.2-15.0)	**13.6** (11.1-16.5)	**15.5** (12.7-18.9)	**17.1** (13.9-21.0)	**19.4** (15.2-24.6)	**21.1** (16.1-27.4)	**22.8** (16.7-30.5)	**24.4** (17.1-34.1)	**26.4** (17.8-38.3)	**27.8** (18.2-41.4)

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

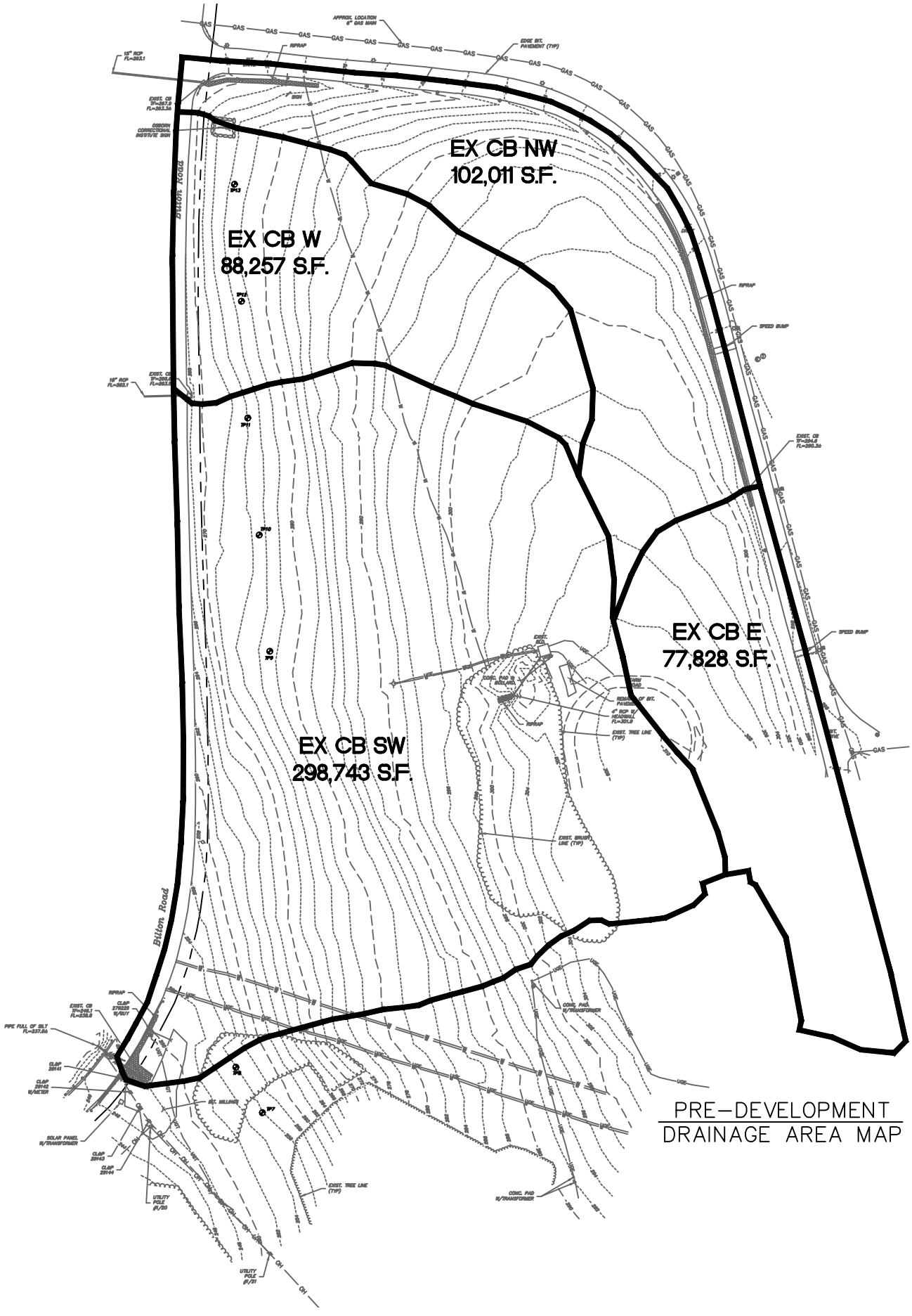
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper 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.

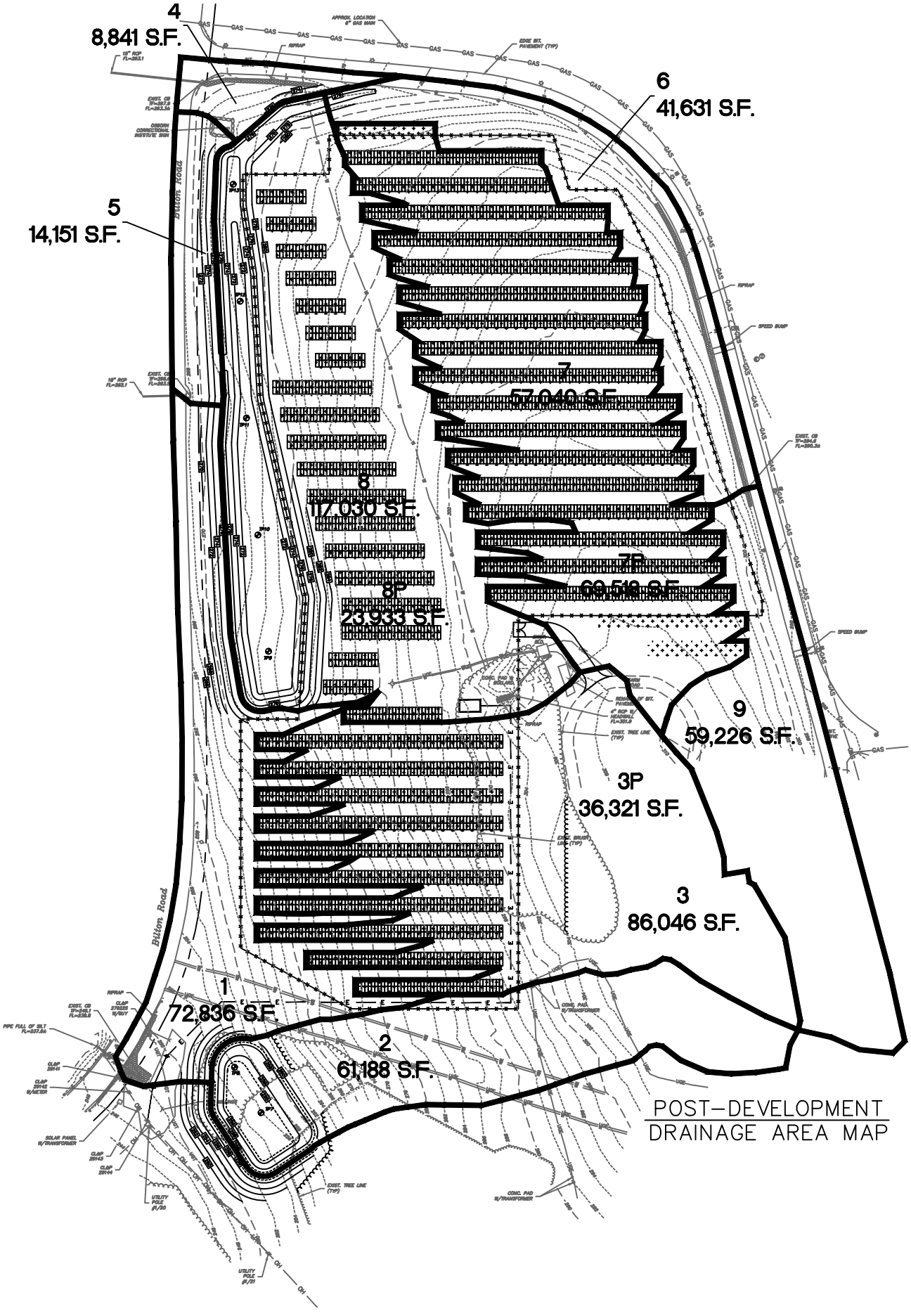
Back to Top

PF graphical

Appendix 3:
DRAINAGE AREA MAPS



PRE-DEVELOPMENT
DRAINAGE AREA MAP


4
8,841 S.F.
6
41,631 S.F.
5
14,151 S.F.
7
57,040 S.F.
8
117,030 S.F.
7P
69,518 S.F.
8P
23,933 S.F.
9
59,226 S.F.
3P
36,321 S.F.
3
86,046 S.F.
1
72,836 S.F.
2
61,188 S.F.
Bitton Road
POST-DEVELOPMENT
DRAINAGE AREA MAP

Appendix 4:
TEST PIT LAB RESULTS

GRAIN SIZE DISTRIBUTION TEST DATA

3/2/2022

Client: JR Russo Surveyors & Engineers Date: 03/02/2022

Project: Osborn Correctional Institution Enfield, CT.

Location: Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Depth: 20" - 24" **Sample Number:** 119-22 (OSB, TP7)

Material Description: Reddish br. silty sand.

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

USCS Classification: N/A

Testing Remarks: ASTM C136, C117 Client id# OSB, TP7

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

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 1180.30
Tare Wt. = 0.00
Minus #200 from wash = 47.6%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
2251.60	0.00	0.00	3/4"	0.00	100	0
			1/4"	24.10	99	1
			#4	48.70	98	2
			#10	131.70	94	6
			#40	363.20	84	16
			#100	961.00	57	43
			#200	1177.40	48	52

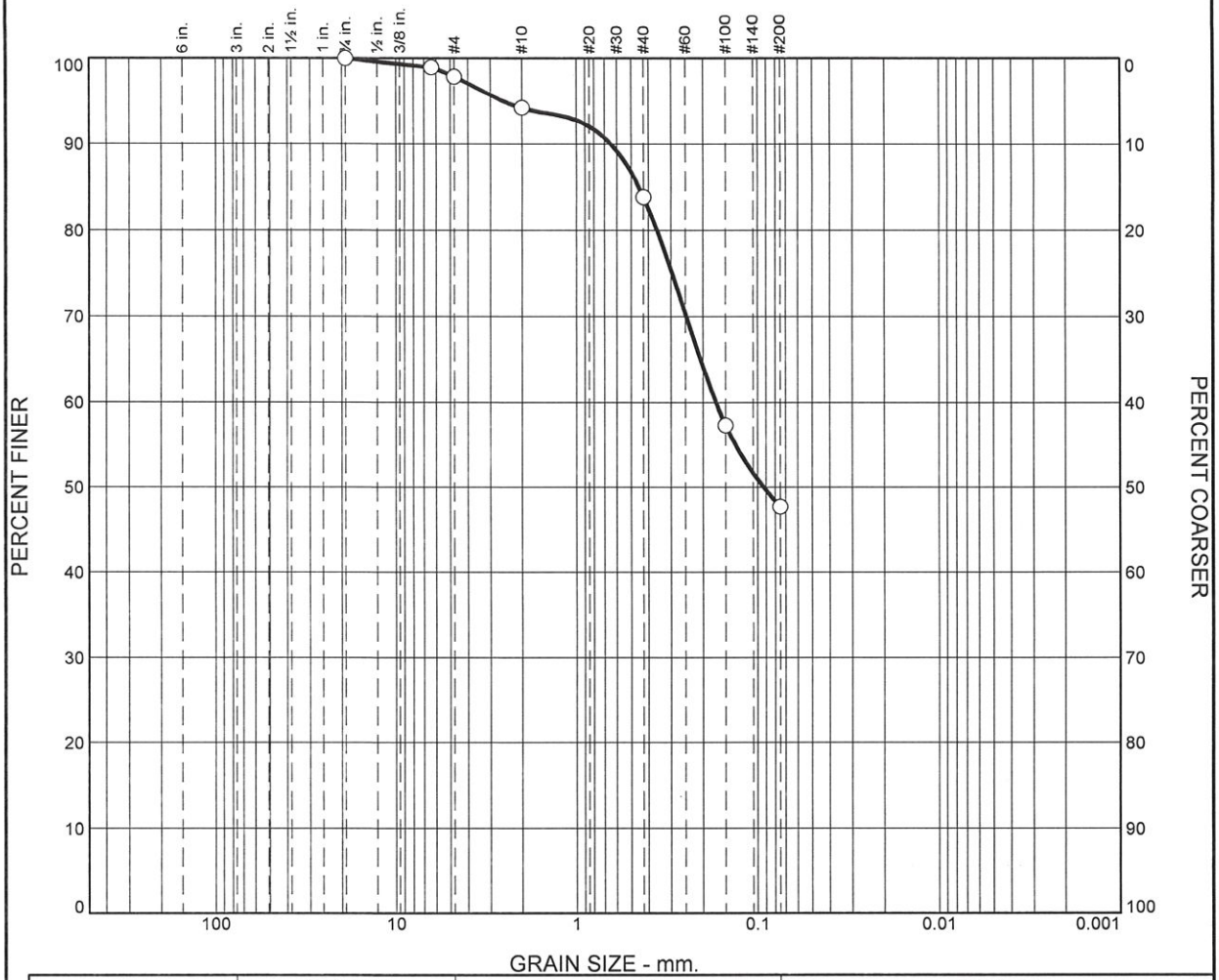
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	2	2	4	10	36	50			48

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.0927	0.1693	0.3578	0.4506	0.6462	2.5627

Fineness Modulus
0.93

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	2	4	10	36	48	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	0.4506	0.1693	0.0927					

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

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

Project: Osborn Correctional Institution Enfield, CT.

○ **Source:** Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Remarks:

○ ASTM C136, C117 Client id# OSB, TP7

F.M.=0.93

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 #: 005-22

Lab ID: 119-22

Project: Osborn Correctional Institution
335 Bilton Road Enfield, CT.

Client ID: OSB, TP-7

Technician: Z. A

Date: 03/01/2022

LAB PERMEABILITY TEST

Sample description: Reddish br. silty sand.

Location: Onsite (Osborn Correctional Institution
335 Bilton Rd. Somer, CT.).

Sample depth: 20" to 24"

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	700 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 =	4980 sec
h = difference in head manometers,	h =	62.5 cm

k = 0.000795237 cm/sec.

k = 1.127 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

3/2/2022

Client: JR Russo Surveyors & Engineers — Date: 03/02/2022

Project: Osborn Correctional Institution Enfield, CT.

Location: Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Depth: 20" - 24" — **Sample Number:** 120-22 (OSB, TP8)

Material Description: Gray silt clay, some sand, trace gravel.

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

USCS Classification: N/A

Testing Remarks: ASTM C136, C117 Client id# OSB, TP8

Tested by: SZ — **Checked by:** ZA

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 871.50
Tare Wt. = 0.00
Minus #200 from wash = 61.8%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
2282.40	0.00	0.00	2"	0.00	100	0
			1 1/2"	68.10	97	3
			1"	124.40	95	5
			3/4"	135.60	94	6
			1/4"	180.80	92	8
			#4	205.70	91	9
			#10	243.10	89	11
			#40	349.90	85	15
			#100	721.30	68	32
			#200	867.40	62	38

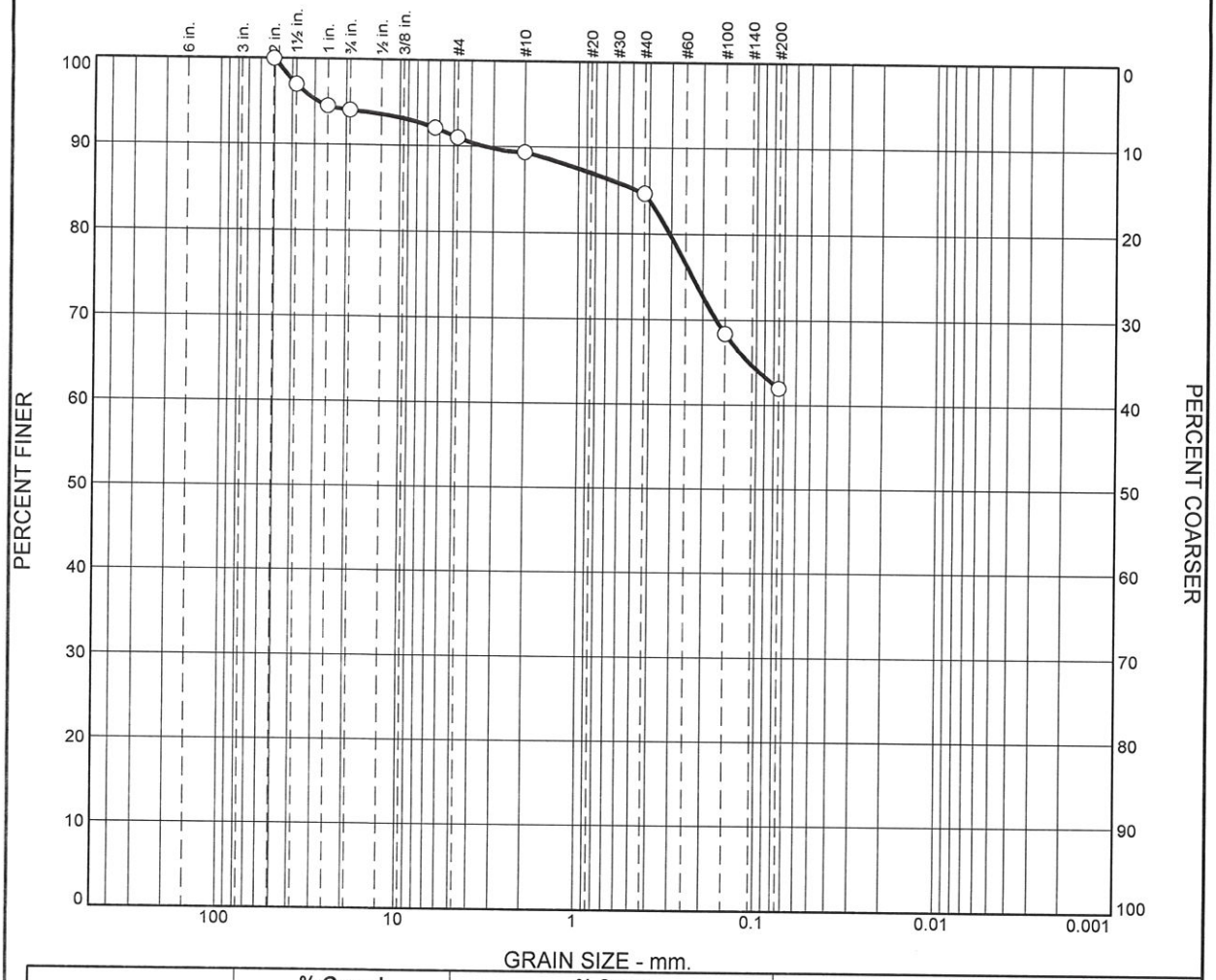
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	6	3	9	2	4	23	29			62

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
								0.3072	0.4647	3.3979	28.4576

Fineness Modulus
1.13

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	6	3	2	4	23	62	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	0.4647							

Material Description	USCS	AASHTO
○ Gray silt clay, some sand, trace gravel.	N/A	

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

Project: Osborn Correctional Institution Enfield, CT.

○ **Source:** Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Remarks:

○ ASTM C136, C117 Client id# OSB, TP8

F.M.=1.13

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: 120-22

Project: Osborn Correctional Institution
335 Bilton Road Enfield, CT.

Client ID: OSB, TP-8

Technician: Z. A

Date: 03/01/2022

LAB PERMEABILITY TEST

Sample description: Gray silt clay, some sand, trace gravel.

Location: Onsite (Osborn Correctional Institution
335 Bilton Rd. Somer, CT.).

Sample depth: 20" to 24"

Method: Permeability by ASTM D2434 (Constant Head Method)

k = QL/ath

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	600 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 =	7380 sec
h = difference in head manometers,	h =	61.8 cm

k = 0.000465173 cm/sec.

k = 0.659 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

3/2/2022

Client: JR Russo Surveyors & Engineers Date: 03/02/2022

Project: Osborn Correctional Institution Enfield, CT.

Location: Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Depth: 20" - 36" **Sample Number:** 121-22 (OSB, TP9)

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

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

USCS Classification: N/A

Testing Remarks: ASTM C136, C117 Client id# OSB, TP9

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

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 762.30
Tare Wt. = 0.00
Minus #200 from wash = 53.6%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1643.20	0.00	0.00	1 1/2"	0.00	100	0
			1"	21.50	99	1
			3/4"	33.60	98	2
			1/4"	68.50	96	4
			#4	80.40	95	5
			#10	116.00	93	7
			#40	245.90	85	15
			#100	621.10	62	38
			#200	758.90	54	46

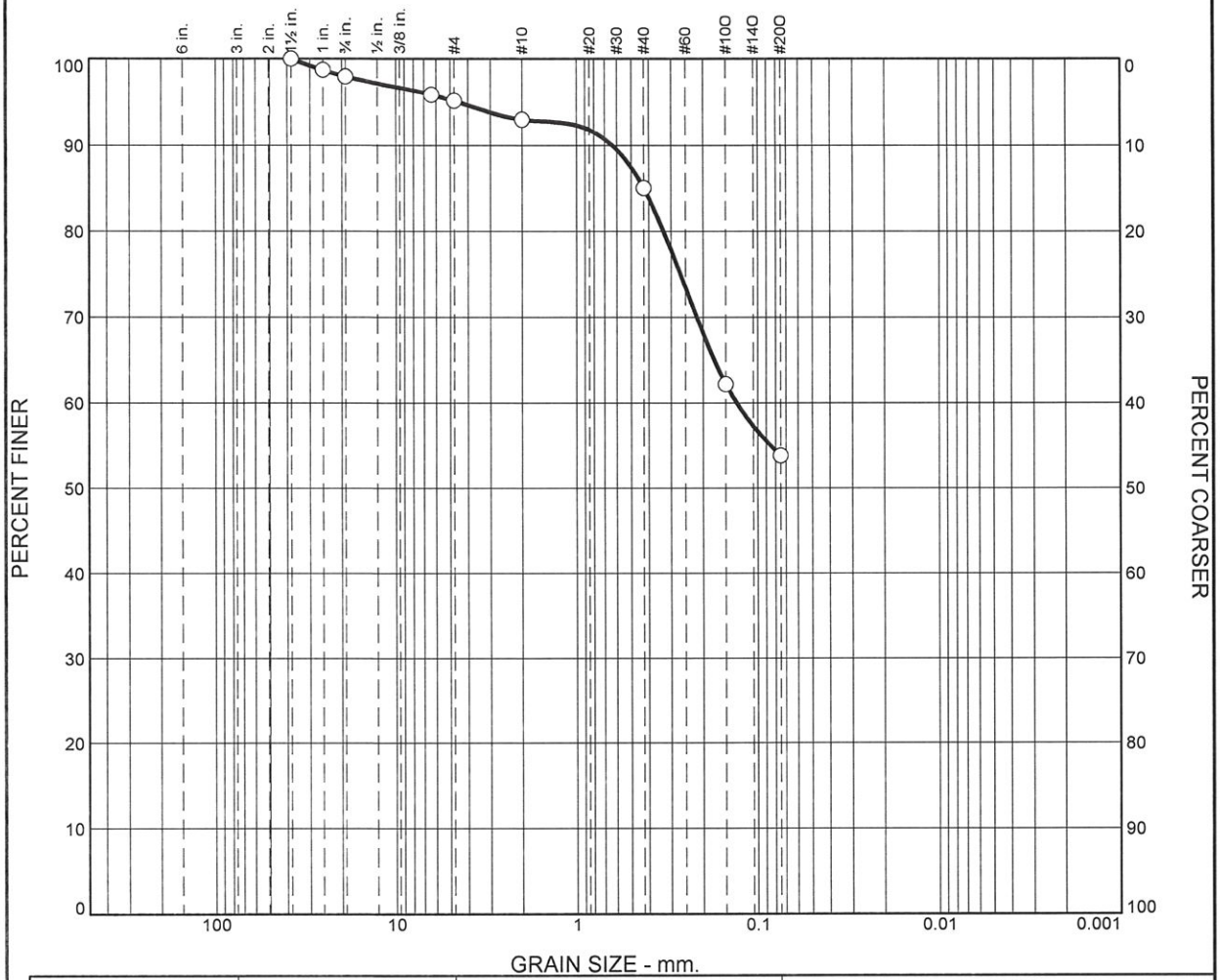
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	2	3	5	2	8	31	41			54

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
							0.1310	0.3302	0.4241	0.6316	4.5712

Fineness Modulus
0.95

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	2	3	2	8	31	54	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	0.4241	0.1310						

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

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

Project: Osborn Correctional Institution Enfield, CT.

○ **Source:** Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Remarks:

○ ASTM C136, C117 Client id# OSB, TP9

F.M.=0.95

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: 121-22

Project: Osborn Correctional Institution
335 Bilton Road Enfield, CT.

Client ID: OSB, TP-9

Technician: Z. A

Date: 03/01/2022

LAB PERMEABILITY TEST

Sample description: Reddish br. silty sand, trace gravel.

Location: Onsite (Osborn Correctional Institution
335 Bilton Rd. Somer, CT.).

Sample depth: 20" to 36"

Method: Permeability by ASTM D2434 (Constant Head Method)

k = QL/ath

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	700 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 =	4320 sec
h = difference in head manometers,	h =	61.4 cm

k = 0.000933155 cm/sec.

k = 1.323 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

3/2/2022

Client: JR Russo Surveyors & Engineers Date: 03/02/2022

Project: Osborn Correctional Institution Enfield, CT.

Location: Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Depth: 24" - 36" **Sample Number:** 122-22 (OSB, TP10)

Material Description: Reddish br. silty clayey fine sand, mixed trace organic (roots).

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

USCS Classification: N/A

Testing Remarks: ASTM C136, C117 Client id# OSB, TP10

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

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 854.50
Tare Wt. = 0.00
Minus #200 from wash = 37.7%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1371.70	0.00	0.00	3/4"	0.00	100	0
			1/4"	25.40	98	2
			#4	32.50	98	2
			#10	63.00	95	5
			#40	181.30	87	13
			#100	693.10	49	51
			#200	851.60	38	62

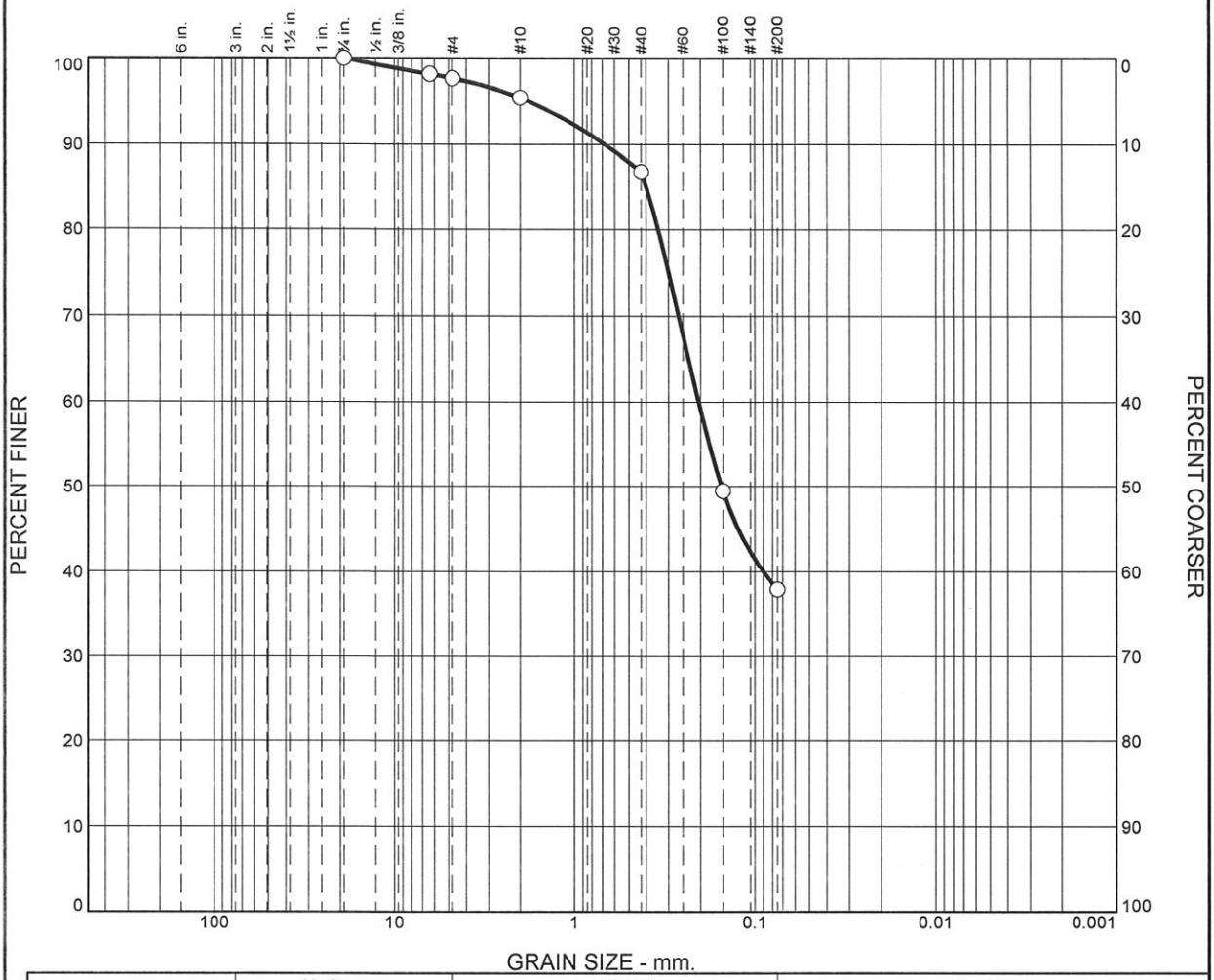
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	2	2	3	8	49	60			38

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0898	0.1528	0.2051	0.3432	0.3994	0.6768	1.7957

Fineness Modulus
1.01

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	2	3	8	49	38	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	0.3994	0.2051	0.1528					

Material Description	USCS	AASHTO
○ Reddish br. silty clayey fine sand, mixed trace organic (roots).	N/A	

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

Project: Osborn Correctional Institution Enfield, CT.

○ **Source:** Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Remarks:

○ ASTM C136, C117 Client id# OSB, TP10

F.M.=1.01

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 #: 008-22

Lab ID: 122-22

Project: Osborn Correctional Institution
335 Bilton Road Enfield, CT.

Client ID: OSB, TP-10

Technician: Z. A

Date: 03/01/2022

LAB PERMEABILITY TEST

Sample description: Reddish br. silty clayey fine sand, mixed trace organic (roots).

Location: Onsite (Osborn Correctional Institution
335 Bilton Rd. Somer, CT.).

Sample depth: 24" to 36"

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	800 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 =	3420 sec
h = difference in head manometers,	h =	62.1 cm

k = 0.00133192 cm/sec.

k = 1.887 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

3/2/2022

Client: JR Russo Surveyors & Engineers Date: 03/02/2022

Project: Osborn Correctional Institution Enfield, CT.

Location: Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Depth: 50" **Sample Number:** 123-22 (OSB, TP11)

Material Description: Reddish br. silty clayey medium to fine sand, little gravel.

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

USCS Classification: N/A

Testing Remarks: ASTM C136, C117 Client id# OSB, TP11

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

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 903.20
Tare Wt. = 0.00
Minus #200 from wash = 35.0%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1390.40	0.00	0.00	2"	0.00	100	0
			1 1/2"	72.50	95	5
			1"	96.40	93	7
			3/4"	121.30	91	9
			1/4"	209.30	85	15
			#4	231.30	83	17
			#10	311.40	78	22
			#40	480.90	65	35
			#100	755.20	46	54
			#200	898.90	35	65

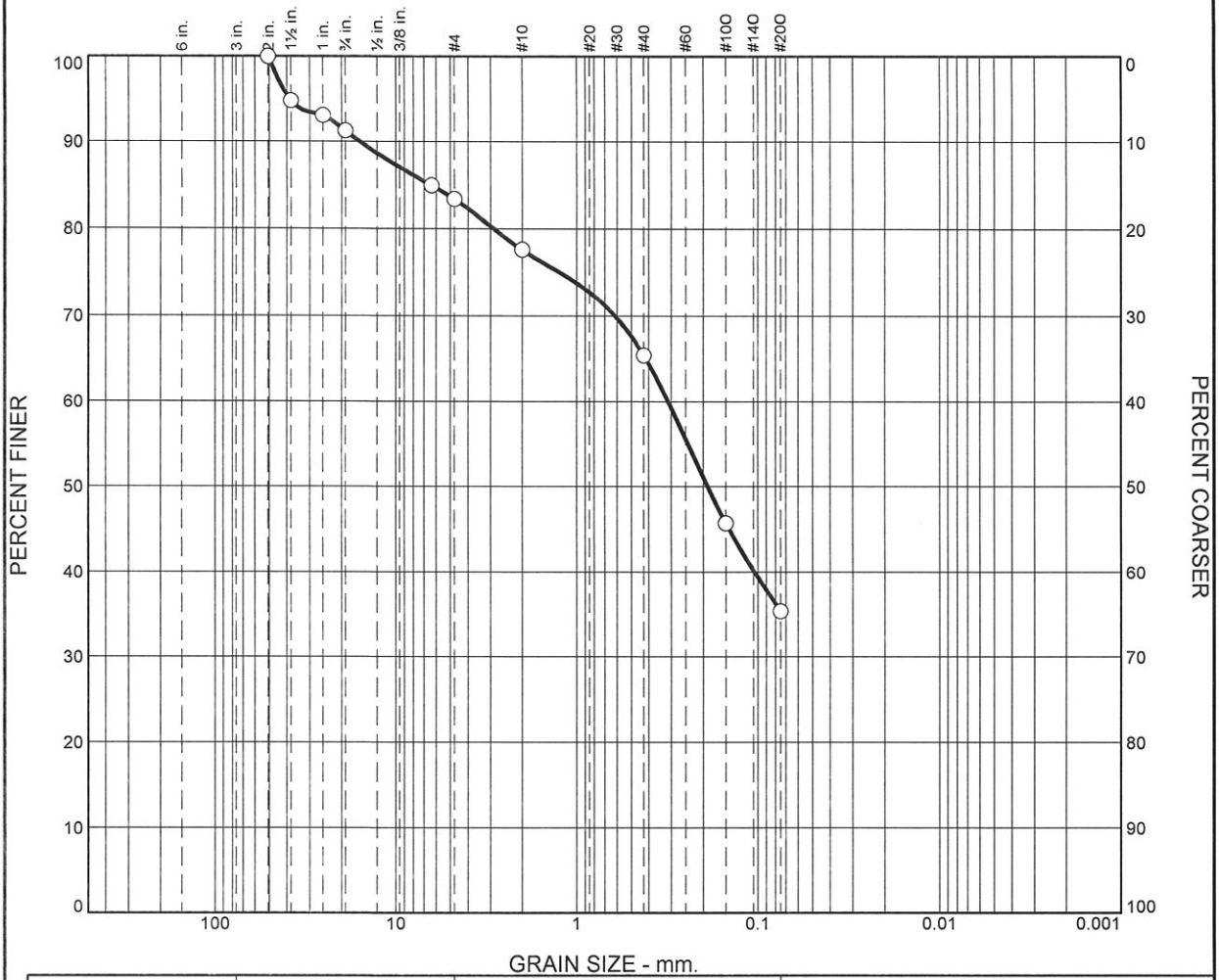
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	9	8	17	5	13	30	48			35

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.1049	0.1887	0.3113	2.8736	6.4158	15.8172	38.7793

Fineness Modulus
2.15

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	9	8	5	13	30	35	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	6.4158	0.3113	0.1887					

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

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

Project: Osborn Correctional Institution Enfield, CT.

○ **Source:** Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Remarks:

○ ASTM C136, C117 Client id# OSB, TP11

F.M.=2.15

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 #: 009-22

Lab ID: 123-22

Project: Osborn Correctional Institution
335 Bilton Road Enfield, CT.

Client ID: OSB, TP-11

Technician: Z. A

Date: 03/01/2022

LAB PERMEABILITY TEST

Sample description: Reddish br. silty clayey medium to fine sand, little gravel.

Location: Onsite (Osborn Correctional Institution
335 Bilton Rd. Somer, CT.).

Sample depth: 50"

Method: Permeability by ASTM D2434 (Constant Head Method)

k = QL/ath

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	900 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 =	2760 sec
h = difference in head manometers,	h =	61.4 cm

k = 0.001877901 cm/sec.

k = 2.662 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

3/2/2022

Client: JR Russo Surveyors & Engineers Date: 03/02/2022

Project: Osborn Correctional Institution Enfield, CT.

Location: Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Depth: 24" - 36" **Sample Number:** 124-22 (OSB, TP12)

Material Description: Yellowish silty clayey fine sand, trace organic (roots).

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

USCS Classification: N/A

Testing Remarks: ASTM C136, C117 Client id# OSB, TP12

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

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 708.80
Tare Wt. = 0.00
Minus #200 from wash = 50.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1432.30	0.00	0.00	1/4"	0.00	100	0
			#4	0.80	100	0
			#10	6.90	100	0
			#40	92.20	94	6
			#100	546.90	62	38
			#200	704.30	51	49

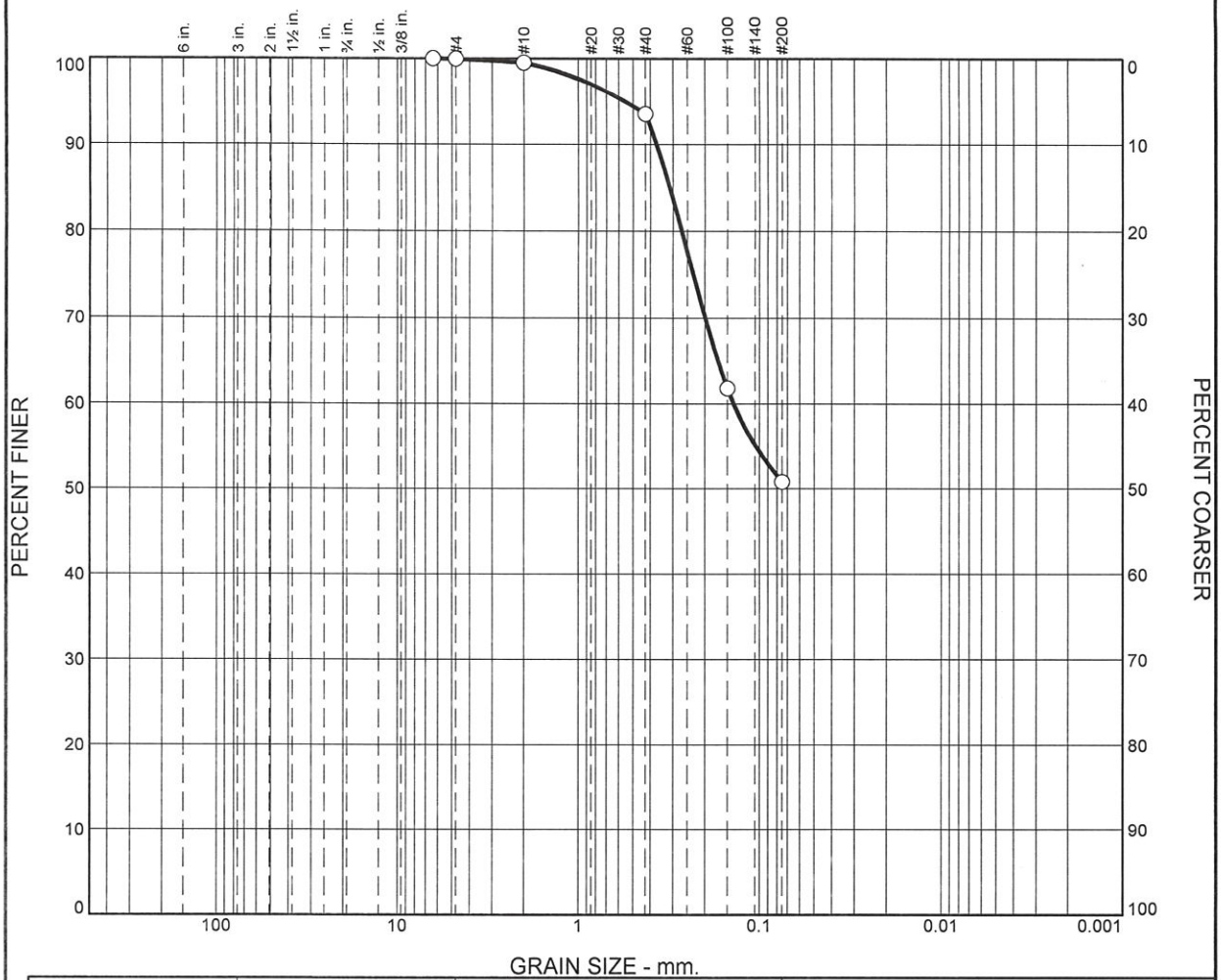
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	0	0	0	6	43	49			51

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
							0.1387	0.2684	0.3124	0.3692	0.5483

Fineness Modulus
0.61

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	0	0	6	43	51	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	0.3124	0.1387						

Material Description	USCS	AASHTO
○ Yellowish silty clayey fine sand, trace organic (roots).	N/A	

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

Project: Osborn Correctional Institution Enfield, CT.

○ **Source:** Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Remarks:

○ ASTM C136, C117 Client id# OSB, TP12

F.M.=0.61

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 #: 010-22

Lab ID: 124-22

Project: Osborn Correctional Institution
335 Bilton Rd. Somer, CT.

Client ID: OSB, TP-12

Technician: Z. A

Date: 03/01/2022

LAB PERMEABILITY TEST

Sample description: Yellowish silty clayey fine sand, trace organic (roots).

Location: Onsite (Osborn Correctional Institution
335 Bilton Rd. Somer, CT.).

Sample depth: 50"

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 =	3840 sec
h = difference in head manometers,	h =	61.5 cm

k = 0.001497274 cm/sec.

k = 2.122 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

GRAIN SIZE DISTRIBUTION TEST DATA

3/2/2022

Client: JR Russo Surveyors & Engineers Date: 03/02/2022

Project: Osborn Correctional Institution Enfield, CT.

Location: Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Depth: 50" **Sample Number:** 125-22 (OSB, TP13)

Material Description: 3 1/2" minus reddish br. medium to fine sand gravel, some fines.

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

USCS Classification: N/A

Testing Remarks: ASTM C136, C117 Client id# OSB, TP13

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

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 1329.90
Tare Wt. = 0.00
Minus #200 from wash = 23.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1738.70	0.00	0.00	3 1/2"	0.00	100	0
			2 1/2"	389.80	78	22
			1 1/2"	471.60	73	27
			1"	504.30	71	29
			3/4"	548.10	68	32
			1/4"	632.50	64	36
			#4	659.00	62	38
			#10	745.60	57	43
			#40	959.20	45	55
			#100	1207.60	31	69
			#200	1326.40	24	76

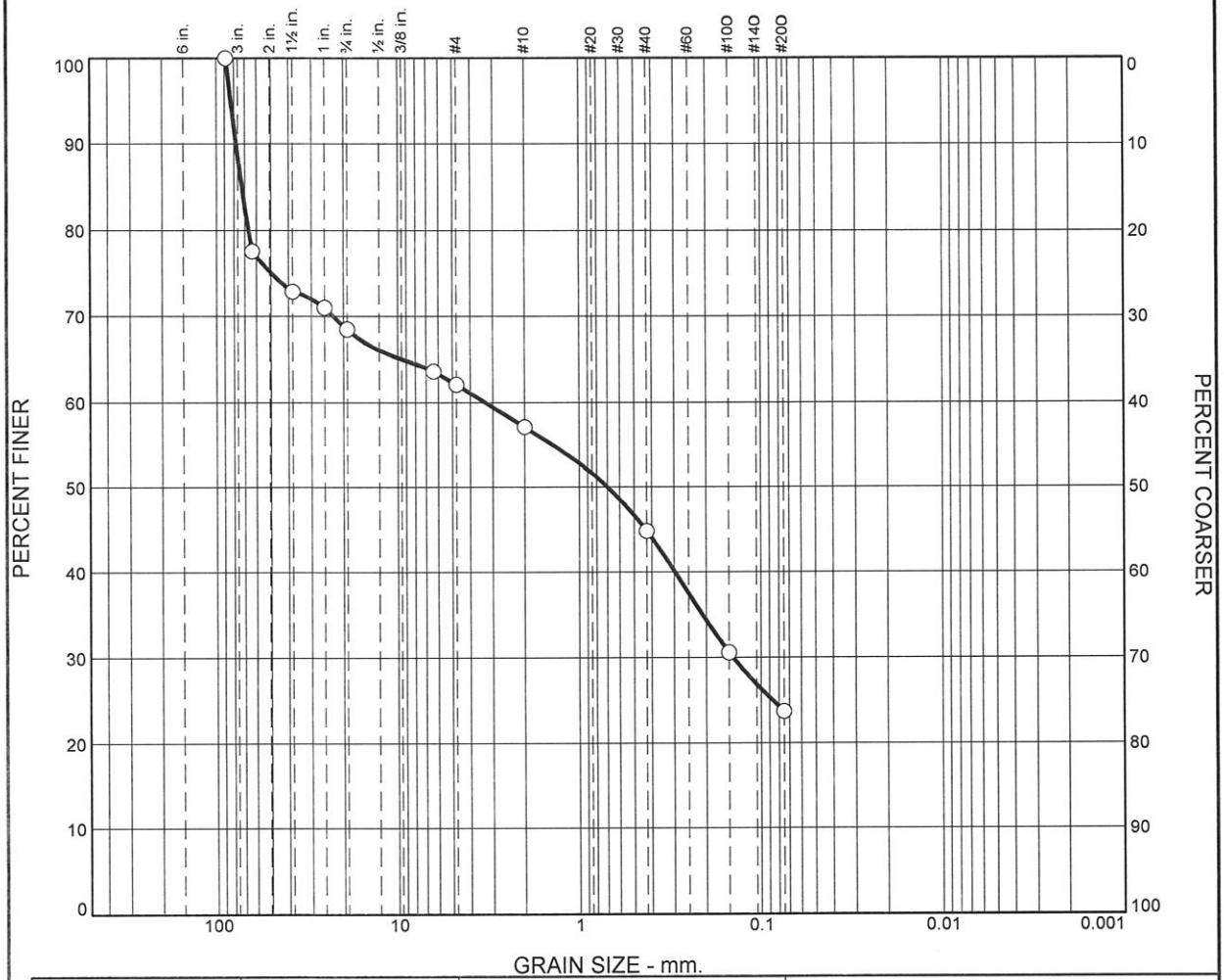
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
12	20	6	26	5	12	21	38			24

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1432	0.2972	0.6973	3.2891	66.8121	72.6702	78.0673	83.4027

Fineness Modulus
4.12

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	12	20	6	5	12	21	24	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	N/A	N/A	72.6702	3.2891	0.6973	0.1432				

Material Description	USCS	AASHTO
○ 3 1/2" minus reddish br. medium to fine sand gravel, some fines.	N/A	

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

Project: Osborn Correctional Institution Enfield, CT.

○ **Source:** Onsite (Osborn Correctional Institution 335 Bilton Road Somer, CT.).

Remarks:

○ ASTM C136, C117 Client id# OSB, TP13

F.M.=4.12

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 #: 011-22

Lab ID: 125-22

Project: Osborn Correctional Institution
335 Bilton Rd. Somer, CT.

Client ID: OSB, TP-13

Technician: Z. A

Date: 03/01/2022

LAB PERMEABILITY TEST

Sample description: 3 ½" minus reddish br. medium to fine sand gravel, some fines.

Location: Onsite (Osborn Correctional Institution
335 Bilton Rd. Somer, CT.).

Sample depth: 50"

Method: Permeability by ASTM D2434 (Constant Head Method)

$k = QL/ath$

Where k = coefficient of permeability,

Q = quantity of water discharged,	Q =	800 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 =	2220 sec
h = difference in head manometers,	h =	61.7 cm

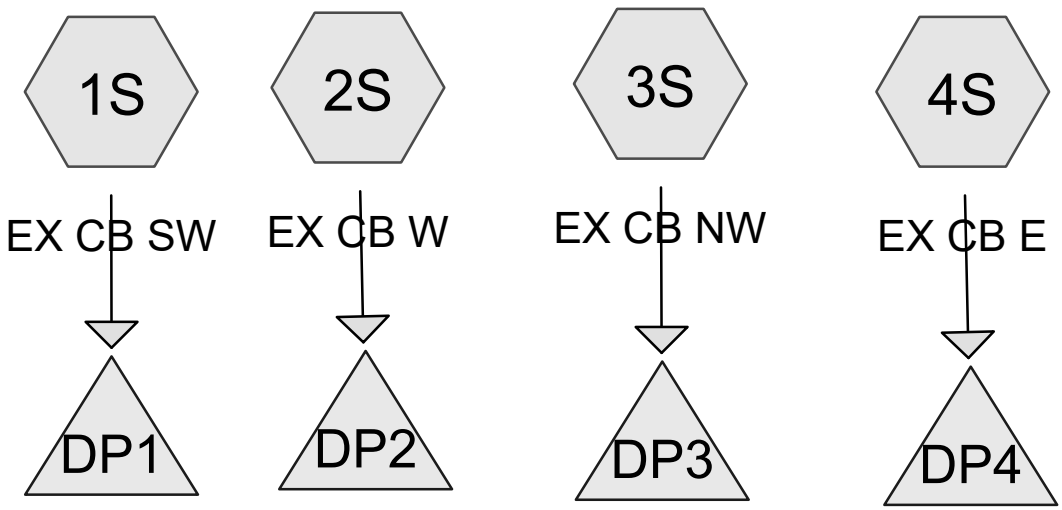
k = 0.002065188 cm/sec.

k = 2.927 inch/hour

Reported To: JR Russo Surveyors & Engineers

Submitted By: New England Materials Testing Lab, LLC.

Appendix 5:
PRE-DEVELOPMENT ANALYSIS



Subcat Reach Pond Link

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

Summary for Subcatchment 1S: EX CB SW

Runoff = 19.71 cfs @ 12.22 hrs, Volume= 1.914 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
256,109	58	Meadow, non-grazed, HSG B
18,953	98	Paved parking, HSG B
23,681	55	Woods, Good, HSG B
298,743	60	Weighted Average
279,790		93.66% Pervious Area
18,953		6.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0229	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
3.1	400	0.0934	2.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.7	551	0.0278	3.38		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	100	0.0580	2.01	0.26	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=0.10' Z= 3.0 '/' Top.W=1.60' n= 0.033 Riprap, 1-inch
15.5	1,151	Total			

Summary for Subcatchment 2S: EX CB W

Runoff = 6.55 cfs @ 12.16 hrs, Volume= 0.565 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
84,011	58	Meadow, non-grazed, HSG B
4,246	98	Paved parking, HSG B
88,257	60	Weighted Average
84,011		95.19% Pervious Area
4,246		4.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0377	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
3.3	399	0.0835	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	96	0.0124	2.26		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.3	595	Total			

Summary for Subcatchment 3S: EX CB NW

Runoff = 7.87 cfs @ 12.17 hrs, Volume= 0.697 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
91,325	58	Meadow, non-grazed, HSG B
10,686	98	Paved parking, HSG B
102,011	62	Weighted Average
91,325		89.52% Pervious Area
10,686		10.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0314	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
0.7	87	0.0853	2.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.9	746	0.0368	3.21	1.83	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=0.30' Z= 3.0 '/' Top.W=2.80' n= 0.030 Earth, grassed & winding
12.4	933	Total			

Summary for Subcatchment 4S: EX CB E

Runoff = 7.88 cfs @ 12.12 hrs, Volume= 0.599 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
62,527	58	Meadow, non-grazed, HSG B
15,301	98	Paved parking, HSG B
77,828	66	Weighted Average
62,527		80.34% Pervious Area
15,301		19.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	18	0.0300	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.48"
4.2	72	0.0778	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
3.4	531	0.0237	2.58	1.47	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=0.30' Z= 3.0 '/' Top.W=2.80' n= 0.030 Earth, grassed & winding
7.9	621	Total			

Summary for Pond DP1:

Inflow Area = 6.858 ac, 6.34% Impervious, Inflow Depth = 3.35" for 100-Year event
Inflow = 19.71 cfs @ 12.22 hrs, Volume= 1.914 af
Primary = 19.71 cfs @ 12.23 hrs, Volume= 1.914 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP2:

Inflow Area = 2.026 ac, 4.81% Impervious, Inflow Depth = 3.35" for 100-Year event
Inflow = 6.55 cfs @ 12.16 hrs, Volume= 0.565 af
Primary = 6.55 cfs @ 12.17 hrs, Volume= 0.565 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP3:

Inflow Area = 2.342 ac, 10.48% Impervious, Inflow Depth = 3.57" for 100-Year event
Inflow = 7.87 cfs @ 12.17 hrs, Volume= 0.697 af
Primary = 7.87 cfs @ 12.18 hrs, Volume= 0.697 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP4:

Inflow Area = 1.787 ac, 19.66% Impervious, Inflow Depth = 4.02" for 100-Year event
Inflow = 7.88 cfs @ 12.12 hrs, Volume= 0.599 af
Primary = 7.88 cfs @ 12.13 hrs, Volume= 0.599 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1S: EX CB SW Runoff Area=298,743 sf 6.34% Impervious Runoff Depth=0.40"
Flow Length=1,151' Tc=15.5 min CN=60 Runoff=1.40 cfs 0.227 af

Subcatchment2S: EX CB W Runoff Area=88,257 sf 4.81% Impervious Runoff Depth=0.40"
Flow Length=595' Tc=11.3 min CN=60 Runoff=0.44 cfs 0.067 af

Subcatchment3S: EX CB NW Runoff Area=102,011 sf 10.48% Impervious Runoff Depth=0.47"
Flow Length=933' Tc=12.4 min CN=62 Runoff=0.68 cfs 0.091 af

Subcatchment4S: EX CB E Runoff Area=77,828 sf 19.66% Impervious Runoff Depth=0.63"
Flow Length=621' Tc=7.9 min CN=66 Runoff=0.98 cfs 0.093 af

Pond DP1: Inflow=1.40 cfs 0.227 af
Primary=1.40 cfs 0.227 af

Pond DP2: Inflow=0.44 cfs 0.067 af
Primary=0.44 cfs 0.067 af

Pond DP3: Inflow=0.68 cfs 0.091 af
Primary=0.68 cfs 0.091 af

Pond DP4: Inflow=0.98 cfs 0.093 af
Primary=0.98 cfs 0.093 af

Total Runoff Area = 13.013 ac Runoff Volume = 0.479 af Average Runoff Depth = 0.44"
91.32% Pervious = 11.884 ac 8.68% Impervious = 1.129 ac

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1S: EX CB SW Runoff Area=298,743 sf 6.34% Impervious Runoff Depth=2.07"
Flow Length=1,151' Tc=15.5 min CN=60 Runoff=11.72 cfs 1.181 af

Subcatchment2S: EX CB W Runoff Area=88,257 sf 4.81% Impervious Runoff Depth=2.07"
Flow Length=595' Tc=11.3 min CN=60 Runoff=3.90 cfs 0.349 af

Subcatchment3S: EX CB NW Runoff Area=102,011 sf 10.48% Impervious Runoff Depth=2.24"
Flow Length=933' Tc=12.4 min CN=62 Runoff=4.80 cfs 0.438 af

Subcatchment4S: EX CB E Runoff Area=77,828 sf 19.66% Impervious Runoff Depth=2.60"
Flow Length=621' Tc=7.9 min CN=66 Runoff=5.03 cfs 0.388 af

Pond DP1: Inflow=11.72 cfs 1.181 af
Primary=11.72 cfs 1.181 af

Pond DP2: Inflow=3.90 cfs 0.349 af
Primary=3.90 cfs 0.349 af

Pond DP3: Inflow=4.80 cfs 0.438 af
Primary=4.80 cfs 0.438 af

Pond DP4: Inflow=5.03 cfs 0.388 af
Primary=5.03 cfs 0.388 af

Total Runoff Area = 13.013 ac Runoff Volume = 2.356 af Average Runoff Depth = 2.17"
91.32% Pervious = 11.884 ac 8.68% Impervious = 1.129 ac

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1S: EX CB SW Runoff Area=298,743 sf 6.34% Impervious Runoff Depth=2.65"
Flow Length=1,151' Tc=15.5 min CN=60 Runoff=15.38 cfs 1.516 af

Subcatchment2S: EX CB W Runoff Area=88,257 sf 4.81% Impervious Runoff Depth=2.65"
Flow Length=595' Tc=11.3 min CN=60 Runoff=5.12 cfs 0.448 af

Subcatchment3S: EX CB NW Runoff Area=102,011 sf 10.48% Impervious Runoff Depth=2.85"
Flow Length=933' Tc=12.4 min CN=62 Runoff=6.21 cfs 0.557 af

Subcatchment4S: EX CB E Runoff Area=77,828 sf 19.66% Impervious Runoff Depth=3.26"
Flow Length=621' Tc=7.9 min CN=66 Runoff=6.35 cfs 0.485 af

Pond DP1: Inflow=15.38 cfs 1.516 af
Primary=15.38 cfs 1.516 af

Pond DP2: Inflow=5.12 cfs 0.448 af
Primary=5.12 cfs 0.448 af

Pond DP3: Inflow=6.21 cfs 0.557 af
Primary=6.21 cfs 0.557 af

Pond DP4: Inflow=6.35 cfs 0.485 af
Primary=6.35 cfs 0.485 af

Total Runoff Area = 13.013 ac Runoff Volume = 3.006 af Average Runoff Depth = 2.77"
91.32% Pervious = 11.884 ac 8.68% Impervious = 1.129 ac

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1S: EX CB SW Runoff Area=298,743 sf 6.34% Impervious Runoff Depth=3.35"
Flow Length=1,151' Tc=15.5 min CN=60 Runoff=19.71 cfs 1.914 af

Subcatchment2S: EX CB W Runoff Area=88,257 sf 4.81% Impervious Runoff Depth=3.35"
Flow Length=595' Tc=11.3 min CN=60 Runoff=6.55 cfs 0.565 af

Subcatchment3S: EX CB NW Runoff Area=102,011 sf 10.48% Impervious Runoff Depth=3.57"
Flow Length=933' Tc=12.4 min CN=62 Runoff=7.87 cfs 0.697 af

Subcatchment4S: EX CB E Runoff Area=77,828 sf 19.66% Impervious Runoff Depth=4.02"
Flow Length=621' Tc=7.9 min CN=66 Runoff=7.88 cfs 0.599 af

Pond DP1: Inflow=19.71 cfs 1.914 af
Primary=19.71 cfs 1.914 af

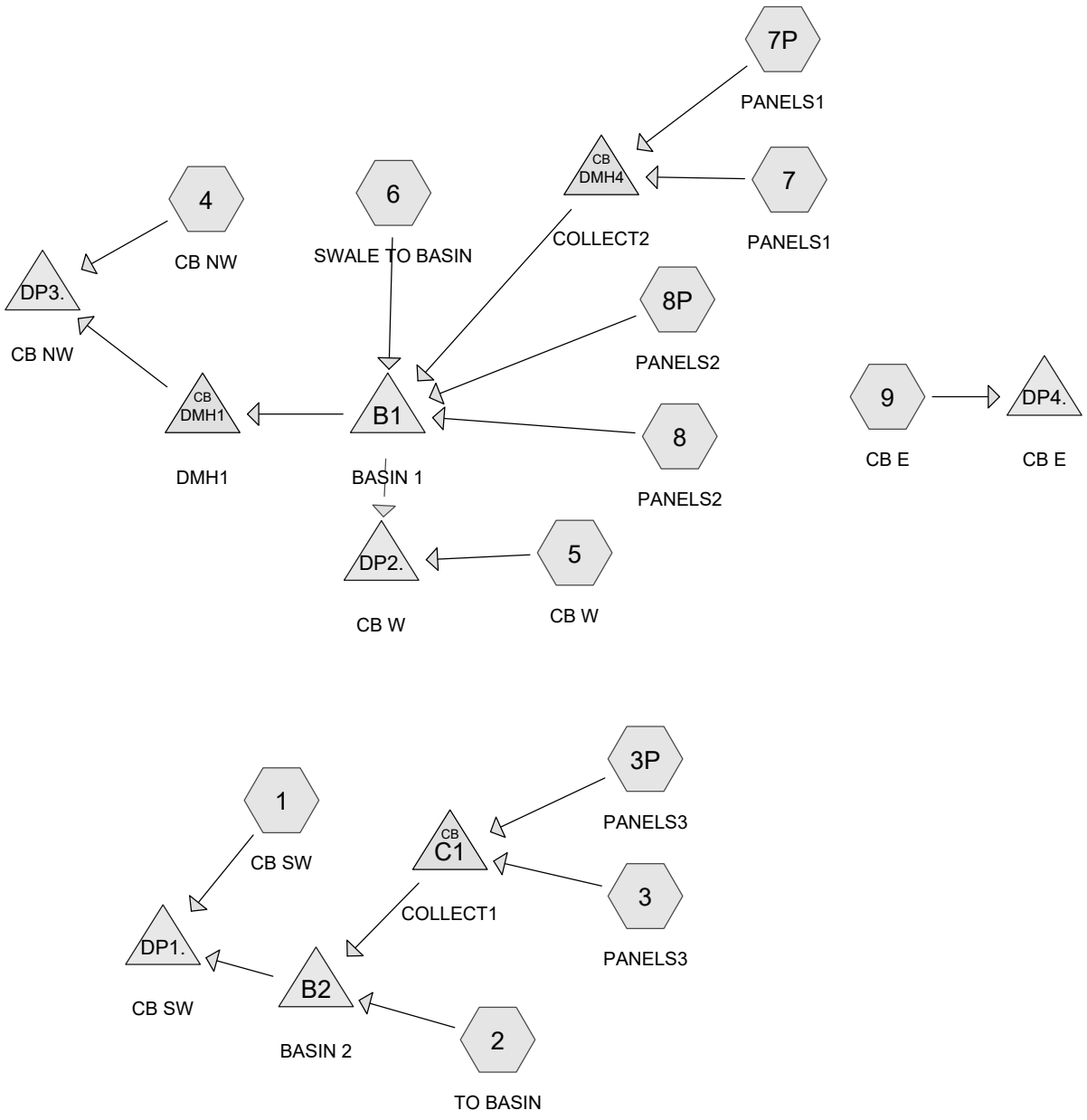
Pond DP2: Inflow=6.55 cfs 0.565 af
Primary=6.55 cfs 0.565 af

Pond DP3: Inflow=7.87 cfs 0.697 af
Primary=7.87 cfs 0.697 af

Pond DP4: Inflow=7.88 cfs 0.599 af
Primary=7.88 cfs 0.599 af

Total Runoff Area = 13.013 ac Runoff Volume = 3.775 af Average Runoff Depth = 3.48"
91.32% Pervious = 11.884 ac 8.68% Impervious = 1.129 ac

Appendix 6:
POST-DEVELOPMENT ANALYSIS



Subcat Reach Pond Link

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

Summary for Subcatchment 1: CB SW

Runoff = 7.82 cfs @ 12.09 hrs, Volume= 0.561 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
	41,846	58	Meadow, non-grazed, HSG B
*	20,756	65	Meadow, HSG Adjusted
	10,234	98	Paved parking, HSG B
	72,836	66	Weighted Average
	62,602		85.95% Pervious Area
	10,234		14.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	38	0.2289	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
0.8	62	0.0213	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.48"
3.0	541	0.0213	2.96		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	100	0.0580	2.01	0.26	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=0.10' Z= 3.0 '/' Top.W=1.60' n= 0.033 Riprap, 1-inch
6.2	741	Total			

Summary for Subcatchment 2: TO BASIN

Runoff = 5.36 cfs @ 12.11 hrs, Volume= 0.405 af, Depth= 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
	51,237	58	Meadow, non-grazed, HSG B
*	1,503	65	Meadow, HSG Adjusted
	4,181	98	Paved parking, HSG B
	4,267	55	Woods, Good, HSG B
	61,188	61	Weighted Average
	57,007		93.17% Pervious Area
	4,181		6.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	29	0.1897	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
0.1	17	0.1176	2.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.48"
3.7	54	0.0611	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	342	0.1389	2.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.4	442	Total			

Summary for Subcatchment 3: PANELS3

Runoff = 7.30 cfs @ 12.19 hrs, Volume= 0.662 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
	13,706	98	Paved parking, HSG B
*	22,829	65	Meadow, HSG Adjusted
	49,511	58	Meadow, non-grazed, HSG B
	86,046	66	Weighted Average
	72,340		84.07% Pervious Area
	13,706		15.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	100	0.0300	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
1.5	200	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	260	0.1200	11.70	2.30	**Pipe Channel,** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.011
0.1	72	0.0600	15.77	27.87	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
13.6	632	Total			

Summary for Subcatchment 3P: PANELS3

Runoff = 6.80 cfs @ 12.07 hrs, Volume= 0.540 af, Depth> 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
*	36,321	98	Panels, HSG B
	36,321		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 4: CB NW

Runoff = 1.22 cfs @ 12.07 hrs, Volume= 0.084 af, Depth= 4.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
5,326	58	Meadow, non-grazed, HSG B
3,515	98	Paved parking, HSG B
8,841	74	Weighted Average
5,326		60.24% Pervious Area
3,515		39.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 5: CB W

Runoff = 1.77 cfs @ 12.07 hrs, Volume= 0.121 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
9,998	58	Meadow, non-grazed, HSG B
4,153	98	Paved parking, HSG B
14,151	70	Weighted Average
9,998		70.65% Pervious Area
4,153		29.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 6: SWALE TO BASIN

Runoff = 4.23 cfs @ 12.12 hrs, Volume= 0.330 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
	19,996	58	Meadow, non-grazed, HSG B
*	14,370	65	Meadow, HSG Adjusted
	7,265	98	Paved parking, HSG B
	41,631	67	Weighted Average
	34,366		82.55% Pervious Area
	7,265		17.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0946	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
0.1	8	0.0850	2.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.5	620	0.0310	2.95	1.68	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=0.30' Z= 3.0 '/' Top.W=2.80' n= 0.030
8.6	728	Total			

Summary for Subcatchment 7: PANELS1

Runoff = 4.63 cfs @ 12.20 hrs, Volume= 0.427 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
*	51,297	65	Meadow, HSG Adjusted
	5,047	58	Meadow, non-grazed, HSG B
	696	98	Paved parking, HSG B
	57,040	65	Weighted Average
	56,344		98.78% Pervious Area
	696		1.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	77	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
0.2	13	0.0200	0.95		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.48"
2.0	140	0.0290	1.19		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	614	0.0369	12.37	21.86	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
14.1	844	Total			

Summary for Subcatchment 7P: PANELS1

Runoff = 13.02 cfs @ 12.07 hrs, Volume= 1.034 af, Depth> 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
*	69,518	98	Panels, HSG B
	69,518		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8: PANELS2

Runoff = 10.25 cfs @ 12.13 hrs, Volume= 0.825 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
	310	98	Paved parking, HSG B
	38,183	58	Meadow, non-grazed, HSG B
*	78,537	65	Meadow, HSG Adjusted
	117,030	63	Weighted Average
	116,720		99.74% Pervious Area
	310		0.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0600	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
0.4	50	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	150	0.1000	10.68	2.10	**Pipe Channel,** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.011
9.4	300	Total			

Summary for Subcatchment 8P: PANELS2

Runoff = 4.48 cfs @ 12.07 hrs, Volume= 0.356 af, Depth> 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
*	23,933	98	Panels, HSG B
	23,933		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9: CB E

Runoff = 6.34 cfs @ 12.11 hrs, Volume= 0.482 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
	39,956	58	Meadow, non-grazed, HSG B
*	4,656	65	Meadow, HSG Adjusted
	14,614	98	Paved parking, HSG B
	59,226	68	Weighted Average
	44,612		75.33% Pervious Area
	14,614		24.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	18	0.0300	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.48"
4.2	72	0.0778	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
3.4	531	0.0237	2.58	1.47	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=0.30' Z= 3.0 '/' Top.W=2.80' n= 0.030 Earth, grassed & winding

7.9 621 Total

Summary for Pond B1: BASIN 1

Inflow Area = 7.097 ac, 32.90% Impervious, Inflow Depth > 5.02" for 100-Year event
Inflow = 33.69 cfs @ 12.10 hrs, Volume= 2.971 af
Outflow = 12.94 cfs @ 12.44 hrs, Volume= 2.975 af, Atten= 62%, Lag= 20.5 min
Discarded = 1.04 cfs @ 12.44 hrs, Volume= 1.064 af
Primary = 5.95 cfs @ 12.44 hrs, Volume= 0.955 af
Secondary = 5.95 cfs @ 12.44 hrs, Volume= 0.955 af

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 274.81' @ 12.44 hrs Surf.Area= 23,068 sf Storage= 50,897 cf
Flood Elev= 276.00' Surf.Area= 27,286 sf Storage= 80,768 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 171.2 min (965.4 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	80,768 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.00	13,132	0	0
274.00	20,175	33,307	33,307
276.00	27,286	47,461	80,768

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.00'	**0.660 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 271.00'
#2	Primary	271.00'	**15.0" Round Culvert NW** L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 271.00' / 270.50' S= 0.0357 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Device 2	272.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	274.50'	**16.0" x 32.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	268.00'	**15.0" Round Culvert W** L= 48.0' Ke= 0.500 Inlet / Outlet Invert= 268.00' / 263.50' S= 0.0938 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#6	Device 5	272.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#7	Device 5	274.50'	**16.0" x 32.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.04 cfs @ 12.44 hrs HW=274.81' (Free Discharge)
└**1=Exfiltration** (Controls 1.04 cfs)

Primary OutFlow Max=5.95 cfs @ 12.44 hrs HW=274.81' TW=272.64' (Dynamic Tailwater)
└**2=Culvert NW** (Passes 5.95 cfs of 8.72 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.36 cfs @ 6.92 fps)
  └**4=Orifice/Grate** (Weir Controls 4.59 cfs @ 1.83 fps)

Secondary OutFlow Max=5.95 cfs @ 12.44 hrs HW=274.81' TW=0.00' (Dynamic Tailwater)
└**5=Culvert W** (Passes 5.95 cfs of 14.70 cfs potential flow)
  ├**6=Orifice/Grate** (Orifice Controls 1.36 cfs @ 6.92 fps)
  └**7=Orifice/Grate** (Weir Controls 4.59 cfs @ 1.83 fps)

Summary for Pond B2: BASIN 2

Inflow Area = 4.214 ac, 29.53% Impervious, Inflow Depth > 4.58" for 100-Year event
Inflow = 17.28 cfs @ 12.11 hrs, Volume= 1.608 af
Outflow = 14.34 cfs @ 12.21 hrs, Volume= 1.608 af, Atten= 17%, Lag= 6.1 min
Discarded = 0.16 cfs @ 12.21 hrs, Volume= 0.196 af
Primary = 14.18 cfs @ 12.21 hrs, Volume= 1.412 af

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 257.92' @ 12.21 hrs Surf.Area= 7,642 sf Storage= 16,291 cf
Flood Elev= 259.00' Surf.Area= 8,811 sf Storage= 25,188 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 112.6 min (921.1 - 808.4)

Volume	Invert	Avail.Storage	Storage Description
#1	255.00'	25,188 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
255.00	3,632	0	0
256.00	4,888	4,260	4,260
258.00	7,756	12,644	16,904
259.00	8,811	8,284	25,188

Device	Routing	Invert	Outlet Devices
#1	Discarded	255.00'	**0.330 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 254.00'
#2	Primary	250.00'	**15.0" Round Culvert SW** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 250.00' / 238.80' S= 0.1302 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Device 2	255.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	257.30'	**16.0" x 32.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.16 cfs @ 12.21 hrs HW=257.92' (Free Discharge)
└**1=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=14.17 cfs @ 12.21 hrs HW=257.92' TW=0.00' (Dynamic Tailwater)
└**2=Culvert SW** (Passes 14.17 cfs of 15.96 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 1.39 cfs @ 7.09 fps)
  └**4=Orifice/Grate** (Weir Controls 12.78 cfs @ 2.58 fps)

Summary for Pond C1: COLLECT1

Inflow Area = 2.809 ac, 40.88% Impervious, Inflow Depth > 5.14" for 100-Year event
Inflow = 11.92 cfs @ 12.11 hrs, Volume= 1.203 af
Outflow = 11.92 cfs @ 12.12 hrs, Volume= 1.203 af, Atten= 0%, Lag= 0.6 min
Primary = 11.92 cfs @ 12.12 hrs, Volume= 1.203 af

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 261.26' @ 12.12 hrs
Flood Elev= 262.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	258.30'	**18.0" Round Culvert** L= 82.0' Ke= 0.500 Inlet / Outlet Invert= 258.30' / 257.80' S= 0.0061 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=11.92 cfs @ 12.12 hrs HW=261.26' TW=257.76' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 11.92 cfs @ 6.74 fps)

Summary for Pond DMH1: DMH1

Inflow Area = 7.097 ac, 32.90% Impervious, Inflow Depth = 1.62" for 100-Year event
Inflow = 5.95 cfs @ 12.44 hrs, Volume= 0.955 af
Outflow = 5.95 cfs @ 12.45 hrs, Volume= 0.955 af, Atten= 0%, Lag= 0.6 min
Primary = 5.95 cfs @ 12.45 hrs, Volume= 0.955 af

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 272.64' @ 12.45 hrs
Flood Elev= 274.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.00'	**15.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 271.00' / 263.30' S= 0.0713 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.95 cfs @ 12.45 hrs HW=272.64' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 5.95 cfs @ 4.85 fps)

Summary for Pond DMH4: COLLECT2

Inflow Area = 2.905 ac, 55.48% Impervious, Inflow Depth > 6.03" for 100-Year event
Inflow = 15.95 cfs @ 12.08 hrs, Volume= 1.461 af
Outflow = 15.95 cfs @ 12.09 hrs, Volume= 1.461 af, Atten= 0%, Lag= 0.6 min
Primary = 15.95 cfs @ 12.09 hrs, Volume= 1.461 af

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 282.96' @ 12.09 hrs
Flood Elev= 283.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	278.70'	**18.0" Round Culvert** L= 96.0' Ke= 0.500 Inlet / Outlet Invert= 278.70' / 274.00' S= 0.0490 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=15.94 cfs @ 12.09 hrs HW=282.96' TW=273.90' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 15.94 cfs @ 9.02 fps)

Summary for Pond DP1.: CB SW

Inflow Area = 5.886 ac, 25.13% Impervious, Inflow Depth = 4.02" for 100-Year event
Inflow = 19.17 cfs @ 12.17 hrs, Volume= 1.972 af
Primary = 19.17 cfs @ 12.18 hrs, Volume= 1.972 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP2.: CB W

Inflow Area = 0.325 ac, 29.35% Impervious, Inflow Depth = 39.77" for 100-Year event
Inflow = 6.44 cfs @ 12.43 hrs, Volume= 1.077 af
Primary = 6.44 cfs @ 12.44 hrs, Volume= 1.077 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP3.: CB NW

Inflow Area = 7.300 ac, 33.09% Impervious, Inflow Depth = 1.71" for 100-Year event
Inflow = 6.26 cfs @ 12.45 hrs, Volume= 1.039 af
Primary = 6.26 cfs @ 12.46 hrs, Volume= 1.039 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP4.: CB E

Inflow Area = 1.360 ac, 24.67% Impervious, Inflow Depth = 4.25" for 100-Year event
Inflow = 6.34 cfs @ 12.11 hrs, Volume= 0.482 af
Primary = 6.34 cfs @ 12.12 hrs, Volume= 0.482 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1: CB SW Runoff Area=72,836 sf 14.05% Impervious Runoff Depth=0.63"
Flow Length=741' Tc=6.2 min CN=66 Runoff=0.98 cfs 0.087 af

Subcatchment2: TO BASIN Runoff Area=61,188 sf 6.83% Impervious Runoff Depth=0.43"
Flow Length=442' Tc=7.4 min CN=61 Runoff=0.41 cfs 0.051 af

Subcatchment3: PANELS3 Runoff Area=86,046 sf 15.93% Impervious Runoff Depth=0.63"
Flow Length=632' Tc=13.6 min CN=66 Runoff=0.90 cfs 0.103 af

Subcatchment3P: PANELS3 Runoff Area=36,321 sf 100.00% Impervious Runoff Depth=2.94"
Tc=5.0 min CN=98 Runoff=2.66 cfs 0.204 af

Subcatchment4: CB NW Runoff Area=8,841 sf 39.76% Impervious Runoff Depth=1.02"
Tc=5.0 min CN=74 Runoff=0.24 cfs 0.017 af

Subcatchment5: CB W Runoff Area=14,151 sf 29.35% Impervious Runoff Depth=0.81"
Tc=5.0 min CN=70 Runoff=0.29 cfs 0.022 af

Subcatchment6: SWALE TO BASIN Runoff Area=41,631 sf 17.45% Impervious Runoff Depth=0.67"
Flow Length=728' Tc=8.6 min CN=67 Runoff=0.57 cfs 0.053 af

Subcatchment7: PANELS1 Runoff Area=57,040 sf 1.22% Impervious Runoff Depth=0.59"
Flow Length=844' Tc=14.1 min CN=65 Runoff=0.53 cfs 0.064 af

Subcatchment7P: PANELS1 Runoff Area=69,518 sf 100.00% Impervious Runoff Depth=2.94"
Tc=5.0 min CN=98 Runoff=5.09 cfs 0.391 af

Subcatchment8: PANELS2 Runoff Area=117,030 sf 0.26% Impervious Runoff Depth=0.51"
Flow Length=300' Tc=9.4 min CN=63 Runoff=0.99 cfs 0.113 af

Subcatchment8P: PANELS2 Runoff Area=23,933 sf 100.00% Impervious Runoff Depth=2.94"
Tc=5.0 min CN=98 Runoff=1.75 cfs 0.134 af

Subcatchment9: CB E Runoff Area=59,226 sf 24.67% Impervious Runoff Depth=0.72"
Flow Length=621' Tc=7.9 min CN=68 Runoff=0.91 cfs 0.081 af

Pond B1: BASIN 1 Peak Elev=272.89' Storage=13,042 cf Inflow=8.13 cfs 0.756 af
Discarded=0.44 cfs 0.605 af Primary=0.35 cfs 0.089 af Secondary=0.35 cfs 0.089 af Outflow=1.13 cfs 0.782 af

Pond B2: BASIN 2 Peak Elev=256.32' Storage=5,889 cf Inflow=3.40 cfs 0.358 af
Discarded=0.08 cfs 0.137 af Primary=0.71 cfs 0.222 af Outflow=0.80 cfs 0.359 af

Pond C1: COLLECT1 Peak Elev=259.20' Inflow=3.07 cfs 0.307 af
18.0" Round Culvert n=0.012 L=82.0' S=0.0061 '/' Outflow=3.07 cfs 0.307 af

Pond DMH1: DMH1 Peak Elev=271.27' Inflow=0.35 cfs 0.089 af
15.0" Round Culvert n=0.012 L=108.0' S=0.0713 '/' Outflow=0.35 cfs 0.089 af

Pond DMH4: COLLECT2 Peak Elev=279.85' Inflow=5.29 cfs 0.455 af
18.0" Round Culvert n=0.012 L=96.0' S=0.0490 '/' Outflow=5.29 cfs 0.455 af

Pond DP1.: CB SW Inflow=1.30 cfs 0.310 af
Primary=1.30 cfs 0.310 af

Pond DP2.: CB W Inflow=0.39 cfs 0.110 af
Primary=0.39 cfs 0.110 af

Pond DP3.: CB NW Inflow=0.38 cfs 0.106 af
Primary=0.38 cfs 0.106 af

Pond DP4.: CB E Inflow=0.91 cfs 0.081 af
Primary=0.91 cfs 0.081 af

Total Runoff Area = 14.871 ac Runoff Volume = 1.322 af Average Runoff Depth = 1.07"
70.91% Pervious = 10.544 ac 29.09% Impervious = 4.326 ac

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1: CB SW Runoff Area=72,836 sf 14.05% Impervious Runoff Depth=2.60"
Flow Length=741' Tc=6.2 min CN=66 Runoff=5.00 cfs 0.363 af

Subcatchment2: TO BASIN Runoff Area=61,188 sf 6.83% Impervious Runoff Depth=2.15"
Flow Length=442' Tc=7.4 min CN=61 Runoff=3.24 cfs 0.252 af

Subcatchment3: PANELS3 Runoff Area=86,046 sf 15.93% Impervious Runoff Depth=2.60"
Flow Length=632' Tc=13.6 min CN=66 Runoff=4.65 cfs 0.429 af

Subcatchment3P: PANELS3 Runoff Area=36,321 sf 100.00% Impervious Runoff Depth>5.98"
Tc=5.0 min CN=98 Runoff=5.27 cfs 0.416 af

Subcatchment4: CB NW Runoff Area=8,841 sf 39.76% Impervious Runoff Depth=3.37"
Tc=5.0 min CN=74 Runoff=0.83 cfs 0.057 af

Subcatchment5: CB W Runoff Area=14,151 sf 29.35% Impervious Runoff Depth=2.98"
Tc=5.0 min CN=70 Runoff=1.17 cfs 0.081 af

Subcatchment6: SWALE TO BASIN Runoff Area=41,631 sf 17.45% Impervious Runoff Depth=2.70"
Flow Length=728' Tc=8.6 min CN=67 Runoff=2.73 cfs 0.215 af

Subcatchment7: PANELS1 Runoff Area=57,040 sf 1.22% Impervious Runoff Depth=2.51"
Flow Length=844' Tc=14.1 min CN=65 Runoff=2.92 cfs 0.274 af

Subcatchment7P: PANELS1 Runoff Area=69,518 sf 100.00% Impervious Runoff Depth>5.98"
Tc=5.0 min CN=98 Runoff=10.08 cfs 0.795 af

Subcatchment8: PANELS2 Runoff Area=117,030 sf 0.26% Impervious Runoff Depth=2.33"
Flow Length=300' Tc=9.4 min CN=63 Runoff=6.33 cfs 0.522 af

Subcatchment8P: PANELS2 Runoff Area=23,933 sf 100.00% Impervious Runoff Depth>5.98"
Tc=5.0 min CN=98 Runoff=3.47 cfs 0.274 af

Subcatchment9: CB E Runoff Area=59,226 sf 24.67% Impervious Runoff Depth=2.79"
Flow Length=621' Tc=7.9 min CN=68 Runoff=4.13 cfs 0.316 af

Pond B1: BASIN 1 Peak Elev=274.32' Storage=40,015 cf Inflow=23.40 cfs 2.080 af
Discarded=0.88 cfs 0.933 af Primary=1.19 cfs 0.578 af Secondary=1.19 cfs 0.578 af Outflow=3.25 cfs 2.089 af

Pond B2: BASIN 2 Peak Elev=257.67' Storage=14,414 cf Inflow=11.60 cfs 1.096 af
Discarded=0.15 cfs 0.181 af Primary=7.17 cfs 0.916 af Outflow=7.32 cfs 1.097 af

Pond C1: COLLECT1 Peak Elev=260.13' Inflow=8.36 cfs 0.844 af
18.0" Round Culvert n=0.012 L=82.0' S=0.0061 '/' Outflow=8.36 cfs 0.844 af

Pond DMH1: DMH1 Peak Elev=271.52' Inflow=1.19 cfs 0.578 af
15.0" Round Culvert n=0.012 L=108.0' S=0.0713 '/' Outflow=1.19 cfs 0.578 af

Pond DMH4: COLLECT2 Peak Elev=281.39' Inflow=11.84 cfs 1.070 af
18.0" Round Culvert n=0.012 L=96.0' S=0.0490 '/' Outflow=11.84 cfs 1.070 af

Pond DP1.: CB SW Inflow=9.48 cfs 1.279 af
Primary=9.48 cfs 1.279 af

Pond DP2.: CB W Inflow=1.89 cfs 0.658 af
Primary=1.89 cfs 0.658 af

Pond DP3.: CB NW Inflow=1.53 cfs 0.635 af
Primary=1.53 cfs 0.635 af

Pond DP4.: CB E Inflow=4.13 cfs 0.316 af
Primary=4.13 cfs 0.316 af

Total Runoff Area = 14.871 ac Runoff Volume = 3.993 af Average Runoff Depth = 3.22"
70.91% Pervious = 10.544 ac 29.09% Impervious = 4.326 ac

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1: CB SW Runoff Area=72,836 sf 14.05% Impervious Runoff Depth=3.26"
Flow Length=741' Tc=6.2 min CN=66 Runoff=6.31 cfs 0.454 af

Subcatchment2: TO BASIN Runoff Area=61,188 sf 6.83% Impervious Runoff Depth=2.75"
Flow Length=442' Tc=7.4 min CN=61 Runoff=4.21 cfs 0.322 af

Subcatchment3: PANELS3 Runoff Area=86,046 sf 15.93% Impervious Runoff Depth=3.26"
Flow Length=632' Tc=13.6 min CN=66 Runoff=5.88 cfs 0.537 af

Subcatchment3P: PANELS3 Runoff Area=36,321 sf 100.00% Impervious Runoff Depth>6.83"
Tc=5.0 min CN=98 Runoff=5.99 cfs 0.474 af

Subcatchment4: CB NW Runoff Area=8,841 sf 39.76% Impervious Runoff Depth=4.10"
Tc=5.0 min CN=74 Runoff=1.01 cfs 0.069 af

Subcatchment5: CB W Runoff Area=14,151 sf 29.35% Impervious Runoff Depth=3.68"
Tc=5.0 min CN=70 Runoff=1.45 cfs 0.100 af

Subcatchment6: SWALE TO BASIN Runoff Area=41,631 sf 17.45% Impervious Runoff Depth=3.36"
Flow Length=728' Tc=8.6 min CN=67 Runoff=3.43 cfs 0.268 af

Subcatchment7: PANELS1 Runoff Area=57,040 sf 1.22% Impervious Runoff Depth=3.16"
Flow Length=844' Tc=14.1 min CN=65 Runoff=3.71 cfs 0.344 af

Subcatchment7P: PANELS1 Runoff Area=69,518 sf 100.00% Impervious Runoff Depth>6.83"
Tc=5.0 min CN=98 Runoff=11.47 cfs 0.908 af

Subcatchment8: PANELS2 Runoff Area=117,030 sf 0.26% Impervious Runoff Depth=2.95"
Flow Length=300' Tc=9.4 min CN=63 Runoff=8.14 cfs 0.661 af

Subcatchment8P: PANELS2 Runoff Area=23,933 sf 100.00% Impervious Runoff Depth>6.83"
Tc=5.0 min CN=98 Runoff=3.95 cfs 0.313 af

Subcatchment9: CB E Runoff Area=59,226 sf 24.67% Impervious Runoff Depth=3.47"
Flow Length=621' Tc=7.9 min CN=68 Runoff=5.16 cfs 0.393 af

Pond B1: BASIN 1 Peak Elev=274.64' Storage=47,029 cf Inflow=28.19 cfs 2.494 af
Discarded=0.98 cfs 1.011 af Primary=2.73 cfs 0.744 af Secondary=2.73 cfs 0.744 af Outflow=6.43 cfs 2.500 af

Pond B2: BASIN 2 Peak Elev=257.79' Storage=15,337 cf Inflow=14.23 cfs 1.333 af
Discarded=0.16 cfs 0.188 af Primary=10.44 cfs 1.145 af Outflow=10.59 cfs 1.333 af

Pond C1: COLLECT1 Peak Elev=260.69' Inflow=10.02 cfs 1.011 af
18.0" Round Culvert n=0.012 L=82.0' S=0.0061 '/' Outflow=10.02 cfs 1.011 af

Pond DMH1: DMH1 Peak Elev=271.84' Inflow=2.73 cfs 0.744 af
15.0" Round Culvert n=0.012 L=108.0' S=0.0713 '/' Outflow=2.73 cfs 0.744 af

Pond DMH4: COLLECT2 Peak Elev=282.07' Inflow=13.76 cfs 1.253 af
18.0" Round Culvert n=0.012 L=96.0' S=0.0490 '/' Outflow=13.76 cfs 1.253 af

Pond DP1.: CB SW Inflow=13.80 cfs 1.599 af
Primary=13.80 cfs 1.599 af

Pond DP2.: CB W Inflow=2.95 cfs 0.844 af
Primary=2.95 cfs 0.844 af

Pond DP3.: CB NW Inflow=2.87 cfs 0.814 af
Primary=2.87 cfs 0.814 af

Pond DP4.: CB E Inflow=5.16 cfs 0.393 af
Primary=5.16 cfs 0.393 af

Total Runoff Area = 14.871 ac Runoff Volume = 4.843 af Average Runoff Depth = 3.91"
70.91% Pervious = 10.544 ac 29.09% Impervious = 4.326 ac

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment1: CB SW Runoff Area=72,836 sf 14.05% Impervious Runoff Depth=4.02"
Flow Length=741' Tc=6.2 min CN=66 Runoff=7.82 cfs 0.561 af

Subcatchment2: TO BASIN Runoff Area=61,188 sf 6.83% Impervious Runoff Depth=3.46"
Flow Length=442' Tc=7.4 min CN=61 Runoff=5.36 cfs 0.405 af

Subcatchment3: PANELS3 Runoff Area=86,046 sf 15.93% Impervious Runoff Depth=4.02"
Flow Length=632' Tc=13.6 min CN=66 Runoff=7.30 cfs 0.662 af

Subcatchment3P: PANELS3 Runoff Area=36,321 sf 100.00% Impervious Runoff Depth>7.78"
Tc=5.0 min CN=98 Runoff=6.80 cfs 0.540 af

Subcatchment4: CB NW Runoff Area=8,841 sf 39.76% Impervious Runoff Depth=4.94"
Tc=5.0 min CN=74 Runoff=1.22 cfs 0.084 af

Subcatchment5: CB W Runoff Area=14,151 sf 29.35% Impervious Runoff Depth=4.48"
Tc=5.0 min CN=70 Runoff=1.77 cfs 0.121 af

Subcatchment6: SWALE TO BASIN Runoff Area=41,631 sf 17.45% Impervious Runoff Depth=4.14"
Flow Length=728' Tc=8.6 min CN=67 Runoff=4.23 cfs 0.330 af

Subcatchment7: PANELS1 Runoff Area=57,040 sf 1.22% Impervious Runoff Depth=3.91"
Flow Length=844' Tc=14.1 min CN=65 Runoff=4.63 cfs 0.427 af

Subcatchment7P: PANELS1 Runoff Area=69,518 sf 100.00% Impervious Runoff Depth>7.78"
Tc=5.0 min CN=98 Runoff=13.02 cfs 1.034 af

Subcatchment8: PANELS2 Runoff Area=117,030 sf 0.26% Impervious Runoff Depth=3.68"
Flow Length=300' Tc=9.4 min CN=63 Runoff=10.25 cfs 0.825 af

Subcatchment8P: PANELS2 Runoff Area=23,933 sf 100.00% Impervious Runoff Depth>7.78"
Tc=5.0 min CN=98 Runoff=4.48 cfs 0.356 af

Subcatchment9: CB E Runoff Area=59,226 sf 24.67% Impervious Runoff Depth=4.25"
Flow Length=621' Tc=7.9 min CN=68 Runoff=6.34 cfs 0.482 af

Pond B1: BASIN 1 Peak Elev=274.81' Storage=50,897 cf Inflow=33.69 cfs 2.971 af
Discarded=1.04 cfs 1.064 af Primary=5.95 cfs 0.955 af Secondary=5.95 cfs 0.955 af Outflow=12.94 cfs 2.975 af

Pond B2: BASIN 2 Peak Elev=257.92' Storage=16,291 cf Inflow=17.28 cfs 1.608 af
Discarded=0.16 cfs 0.196 af Primary=14.18 cfs 1.412 af Outflow=14.34 cfs 1.608 af

Pond C1: COLLECT1 Peak Elev=261.26' Inflow=11.92 cfs 1.203 af
18.0" Round Culvert n=0.012 L=82.0' S=0.0061 '/' Outflow=11.92 cfs 1.203 af

Pond DMH1: DMH1 Peak Elev=272.64' Inflow=5.95 cfs 0.955 af
15.0" Round Culvert n=0.012 L=108.0' S=0.0713 '/' Outflow=5.95 cfs 0.955 af

Pond DMH4: COLLECT2 Peak Elev=282.96' Inflow=15.95 cfs 1.461 af
18.0" Round Culvert n=0.012 L=96.0' S=0.0490 '/' Outflow=15.95 cfs 1.461 af

Pond DP1.: CB SW Inflow=19.17 cfs 1.972 af
Primary=19.17 cfs 1.972 af

Pond DP2.: CB W Inflow=6.44 cfs 1.077 af
Primary=6.44 cfs 1.077 af

Pond DP3.: CB NW Inflow=6.26 cfs 1.039 af
Primary=6.26 cfs 1.039 af

Pond DP4.: CB E Inflow=6.34 cfs 0.482 af
Primary=6.34 cfs 0.482 af

Total Runoff Area = 14.871 ac Runoff Volume = 5.826 af Average Runoff Depth = 4.70"
70.91% Pervious = 10.544 ac 29.09% Impervious = 4.326 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 Osborn
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 Basin 1: (north)
$A = 309,152$ s.f.
$I = \frac{1520 \text{ s.f. impervious}}{309,152 \text{ s.f. total}} = 0.49\%$
$R = 0.05 + 0.009(0.49) = 0.054$
$WQV = (1'')(0.054)(309,152)/12 = \boxed{1402 \text{ c.f.}}$

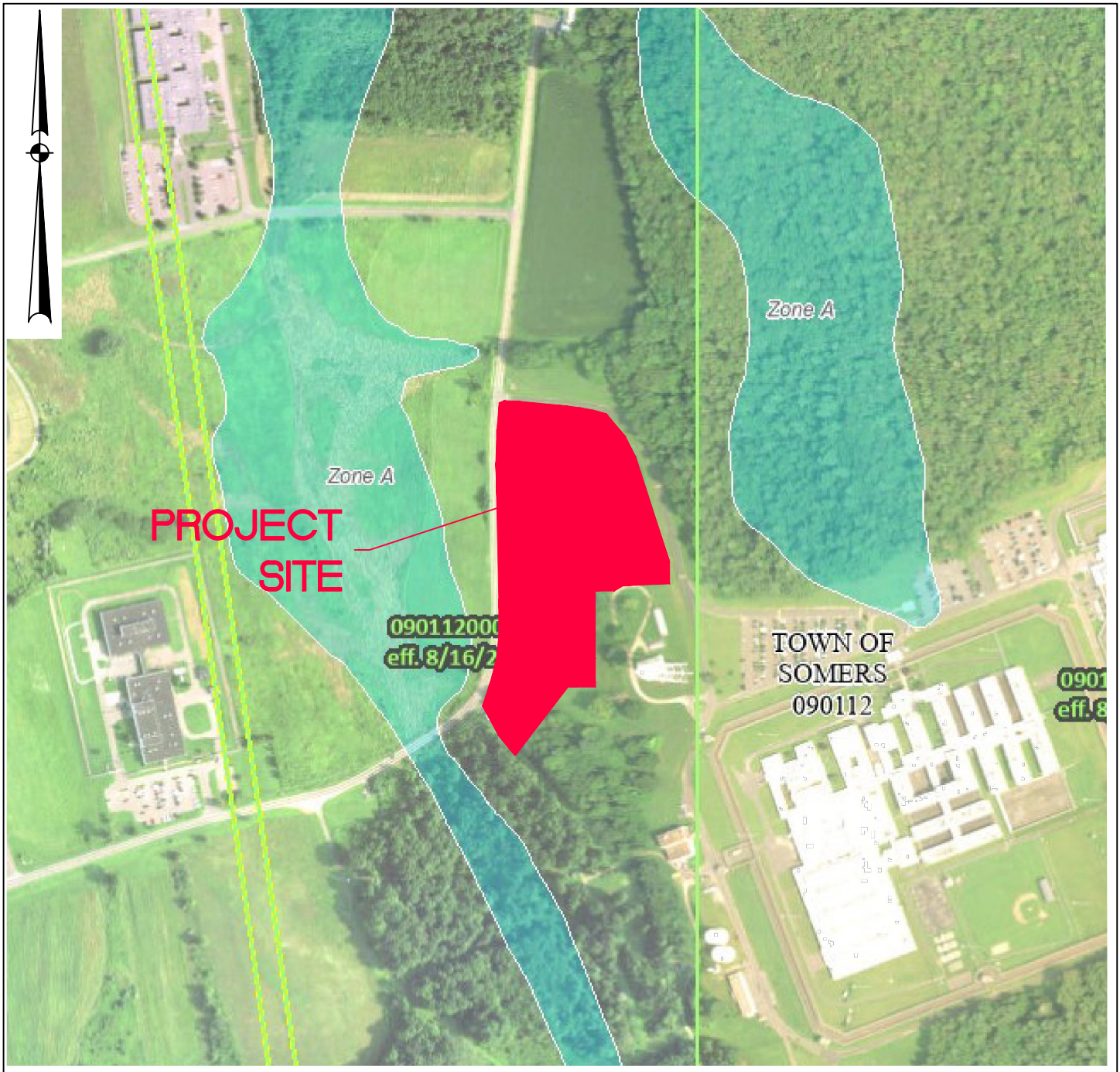
② Basin 2: (south)
$A = 183,555$ s.f
$I = \frac{285 \text{ s.f. impervious}}{183,555 \text{ s.f. total}} = 0.16\%$
$R = 0.05 + 0.009(0.16) = 0.051$
$WQV = (1'')(0.051)(183,555)/12 = \boxed{786 \text{ c.f.}}$

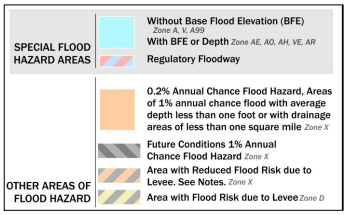
WQV Check:

Basin 1 volume below outlet = 7,006 c.f.
Basin 2 volume below outlet = 1,973 c.f.

EXHIBIT XI

FEMA FLOOD MAP





SOURCE:
FEMA MAP W/ NATIONAL FLOOD HAZARD LAYER

FLOOD MAP

CT GREEN BANK SOLAR
Osborn Facility

335 Bilton Road
Somers, Connecticut

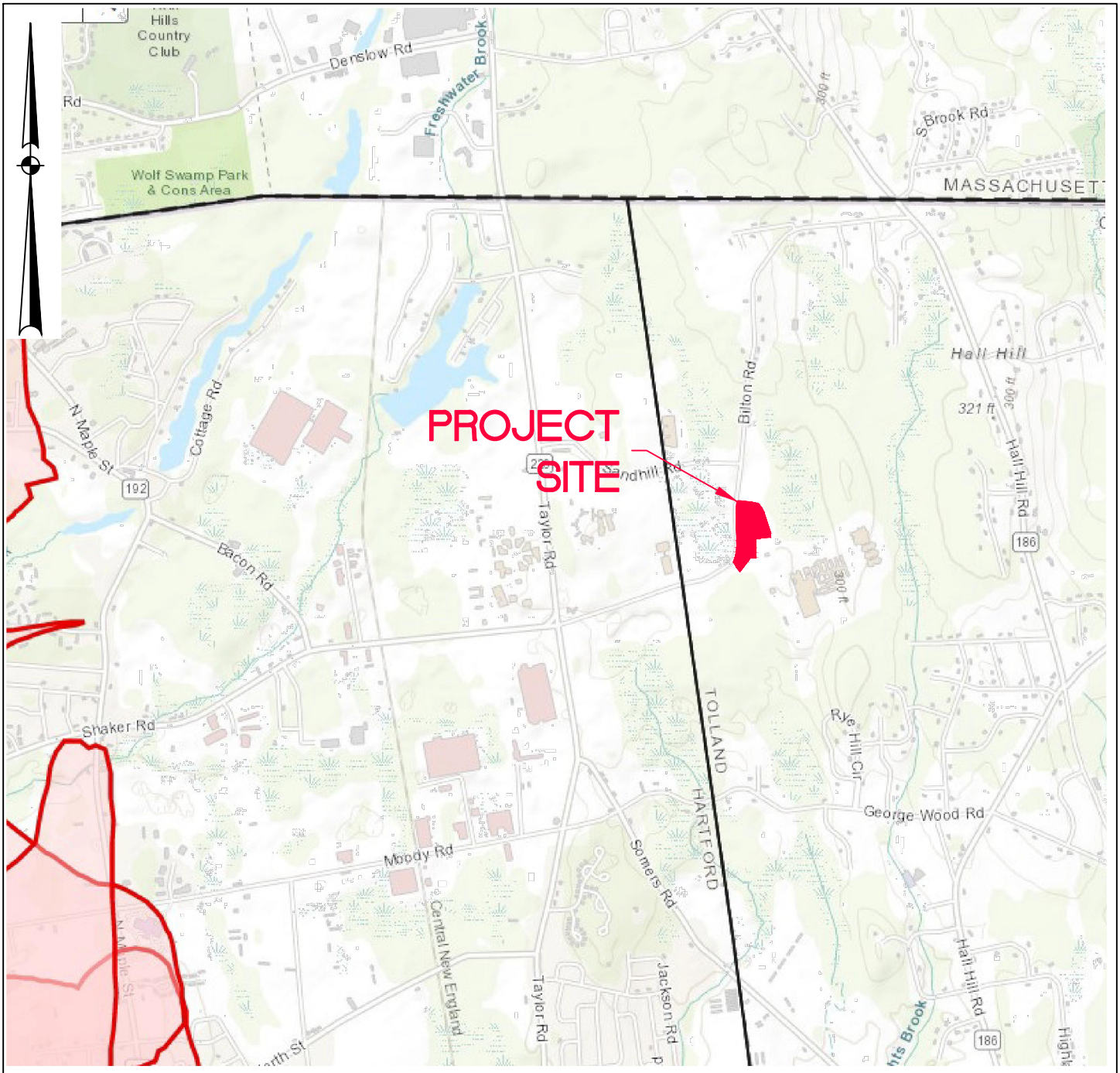
RUSSO
SURVEYORS • ENGINEERS
SERVING CT & MA

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	4–04–2022
SCALE	1"=500'
JOB NUMBER	2021–040SB
SHEET	EXHIBIT XI

EXHIBIT XII

AQUIFER PROTECTION MAP



Final Adopted Aquifer Protection

SOURCE:
CT DEEP AQUIFER PROTECTION AREAS MAP

AQUIFER MAP

CT GREEN BANK SOLAR
Osborn Facility

335 Bilton Road
Somers, Connecticut

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SURVEYORS · ENGINEERS
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1 Shoham Rd East Windsor, CT 06088 · CT 860.623.0569 · MA 413.785.1158
www.jrrusso.com · info@jrrusso.com

DATE	4–04–2022
SCALE	1"=2500'
JOB NUMBER	2021–040SB
SHEET	EXHIBIT XII

EXHIBIT XIII

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 XIV

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-1593-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:	Somers, CT
Latitude:	42-01-09.00N NAD 83
Longitude:	72-30-04.00W
Heights:	302 feet site elevation (SE) 12 feet above ground level (AGL) 314 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:

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-1593-OE.

Signature Control No: 517042193-519605862 (DNE)
Natalie Schmalbeck
Technician

Attachment(s)
Map(s)

Verified Map for ASN 2022-ANE-1593-OE

EXHIBIT XV

LETTER OF SUPPORT FROM SOMERS ZONING COMMISSION

TOWN OF SOMERS

Zoning Commission
600 Main Street
Somers, CT 06071

March 10, 2022

Attn: Mackey Dykes
CT Green Bank
75 Charter Oak Ave, Suite 1-103
Hartford, CT 06106

Dear Mr. Dykes:

At its regular meeting, Monday, March 7, 2022, the Somers Zoning Commission was given a presentation on a proposed solar array/facility being proposed at Osborn Correctional Facility, 335 Bilton Road, Somers, CT.

The Zoning Commission unanimously agreed to return a favorable referral to the Connecticut Siting Council, for the solar array, as presented.

If you should have any questions or require anything further, please contact Jennifer Roy, Zoning Enforcement Officer, in the Land Use Office at 860-763-8220 or email jroy@somersct.gov.

Very truly yours,

W. Karl Walton
Chairman, Somers Zoning Commission

WKW/jr

EXHIBIT XVI

ACS ARCHAEOLOGICAL RECONNAISSANCE SURVEY
INTERIM REPORT
EPORT

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

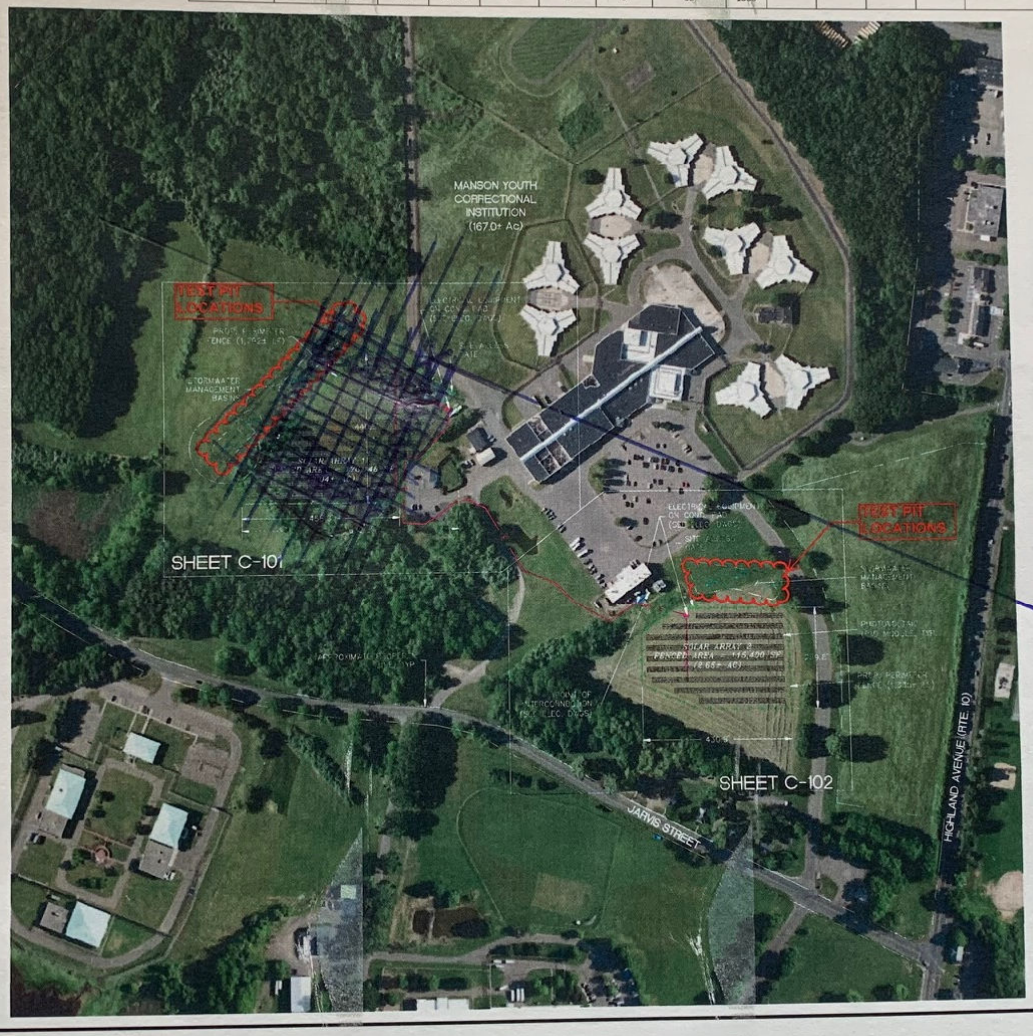
ACS recommends no further archaeological conservation efforts for any of the project areas as currently defined. There were no positively identified prehistoric feature contexts or artifacts identified during the survey. Historic artifacts were mostly limited to modern incidental trash and debris likely 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.

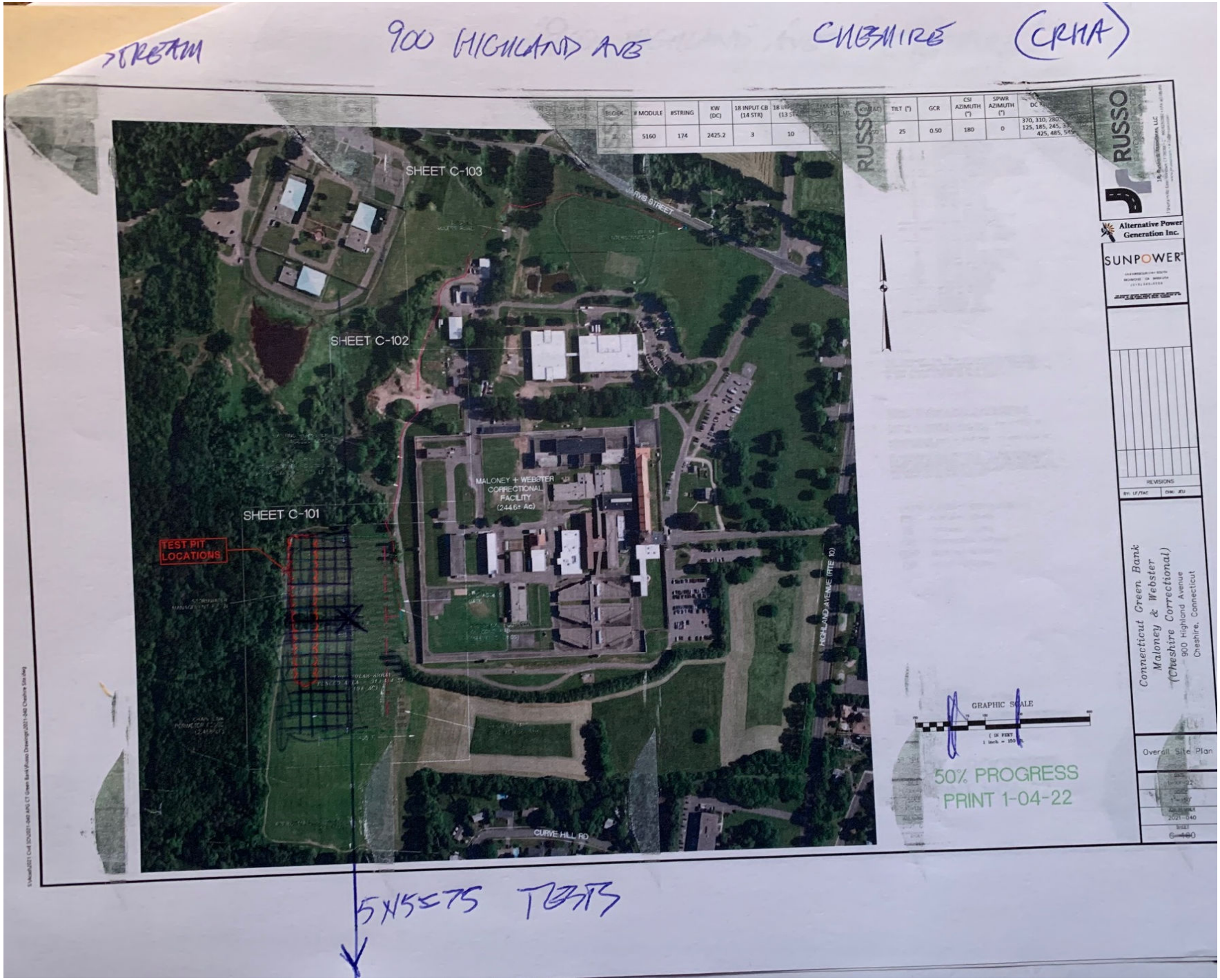
SUNPOWER

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.
SUNPOWER
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					

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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