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August 25, 2015

VIA HAND-DELIVERY

Mr. Robert Stein, Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: *Petition of SolarCity Corporation for a Declaratory Ruling for the Location and Construction of an Approximately 4.93 Megawatt Solar Electric Generating Facility on 9 Stott Ave. & 292 Plain Hill Rd., Norwich, Connecticut*

Dear Chairman Stein:

On behalf of SolarCity Corporation ("SolarCity"), we are submitting an original and fifteen (15) copies of the above-captioned Petition of SolarCity Corporation for a Declaratory Ruling ("Petition"), together with a filing fee of $625.

In the Petition, SolarCity requests that the Connecticut Siting Council approve the location and construction of an approximately 4.93 megawatt solar electric generating facility to be located at 9 Stott Avenue and 292 Plain Hill Road in Norwich, Connecticut. One copy of Exhibit 6, the Stormwater Management Plan, is being bulk filed. We have also enclosed a disk with an electronic copy of the filing. Please contact me at 860-509-6575 with any questions or if you need additional information.

Very truly yours,

BROWN RUDNICK LLP

By: Philip M. Small / cm
Philip M. Small
Counsel for SolarCity Corporation

Enclosures

62035582 v1-WorkSiteUS-031819/0001

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

PETITION OF SOLARCITY CORPORATION FOR A DECLARATORY RULING FOR THE LOCATION AND CONSTRUCTION OF AN APPROXIMATELY 4.93 MEGAWATT SOLAR ELECTRIC GENERATING FACILITY ON STOTT AVENUE AND PLAIN HILL ROAD, NORWICH, CONNECTICUT	:	PETITION NO. ____ AUGUST 25, 2015

PETITION OF SOLARCITY CORPORATION
FOR A DECLARATORY RULING

Pursuant to Conn. Gen. Stat. §§ 4-176 and 16-50k(a) and Conn. Agencies Regs. § 16-50j-38 *et seq.*, SolarCity Corporation ("SolarCity") requests that the Connecticut Siting Council ("Council") approve by declaratory ruling SolarCity's location and construction of an approximately 4.93 megawatt ("MW") solar electric generating facility (the "Facility"), located across two adjacent parcels at 9 Stott Avenue and 292 Plain Hill Road in Norwich, Connecticut (collectively referred to as the "Site").

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

> "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… (B) the construction or location … of any customer-side distributed resources project or facility or grid-side distributed resources project or facility with a capacity of not more than sixty-five megawatts, as long as such project meets air and water quality standards of the Department of Energy and Environmental Protection…."

As discussed fully in this petition, the Facility will be a "grid-side distributed resources" facility, as defined in Conn. Gen. Stat. §16-1(a)(38) (revised to January 1, 2015),[1] under 65 MW that complies with the air and water quality standards of the Connecticut Department of Energy and Environmental Protection ("DEEP"). Additionally, the Facility will not have a substantial adverse environmental effect in the State of Connecticut.

I. COMMUNICATIONS

Correspondence and other communication regarding this petition should be directed to the following parties:

Philip M. Small
Brown Rudnick LLP
185 Asylum Street, 38th Floor
Hartford, CT 06103
Telephone: (860) 509-6500
Fax: (860) 509-6501
Email: psmall@brownrudnick.com

Robert Miller
SolarCity Corporation
714 Brook Street
Rocky Hill, CT 06067
Telephone: (914) 584-6894
Fax: (866) 270-6397
Email: rmiller@solarcity.com

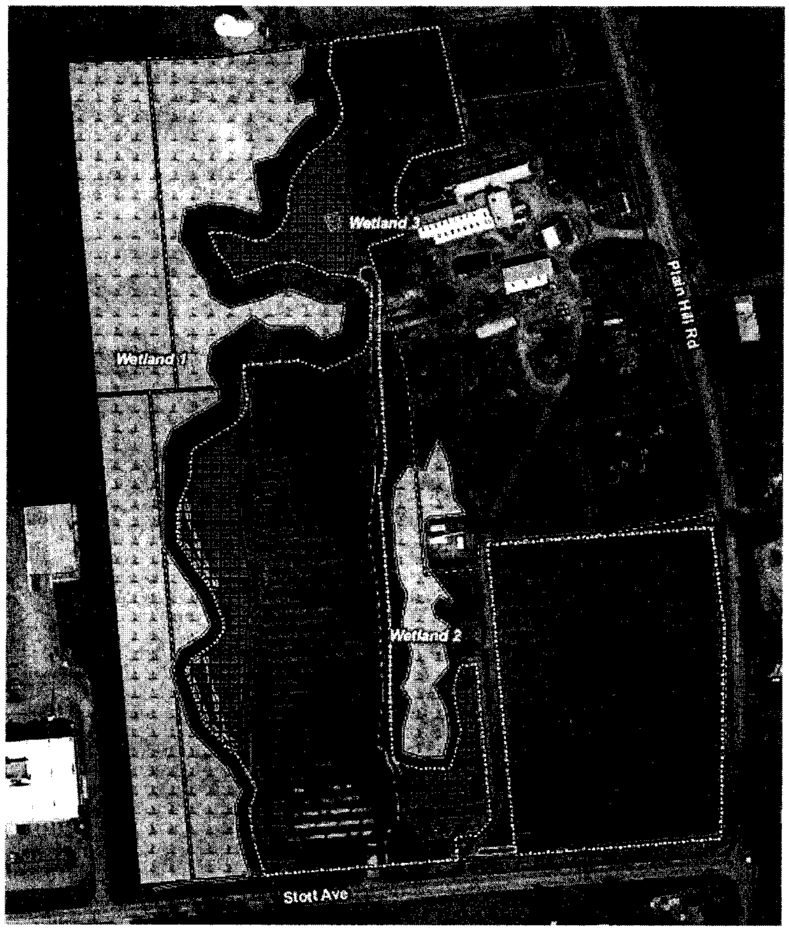
II. DISCUSSION

A. Background

SolarCity's proposed solar array will consist of approximately 15,912 Trina Solar 310 Watt panels and six inverters with a total output of approximately 4.93 MW (see Site Plan,

[1] Formerly Conn. Gen. Stat. § 16-1(a)(43).

Exhibit 1). The solar array will occupy approximately 15 acres (the "Project Area") of the total 27.41 acre Site (9 Stott Avenue and 292 Plain Hill Road). The Project Area is spread over all but the northeastern portion of the Site.



Source: Environmental Assessment, p. 22 (**Exhibit 2**).

SolarCity, Norwich Public Utilities ("NPU") and the Connecticut Municipal Electric Energy Cooperative ("CMEEC") have partnered together to lease a portion of the former Mountain View Dairy Farm and redevelop it into an approximately 4.93 MW community shared solar facility. Once the Facility is completed, solar power will be available to every

NPU customer without any premium charge. An estimated 80% of NPU customers cannot own or lease solar systems because their roofs are physically unsuitable due to shading or because they do not control them (e.g., renters and people living in large apartment buildings). The Facility will offer a way for every NPU customer to have access to "green energy" without incurring a premium cost or having complex equipment installed on their roofs. Additionally, the Facility will benefit the community at large by improving electrical service for existing and future development in Norwich through enhanced capacity.

Prior to filing this petition, Brightfields Development, LLC ("Brightfields", development partners with SolarCity) met with the City of Norwich's Mayor, Deb Hinchey, on Friday, July 25, 2014 at City Hall in Norwich, Connecticut to introduce the project team and concept. Also present at that meeting were Alan Bergren, (City Manager at the time) and John Bilda (General Manager of Norwich Public Utilities[2]). On August 4, 2014, John Hanselman (Managing Principal, Brightfields) and Mike Singer (Principal, Brightfields) gave a general presentation to the Norwich City Council to discuss the company's experience, community shared solar facilities, and its partnership with CMEEC. Brightfields has also planned a meeting on August 25, 2015 to have further discussions with Peter Davis, Norwich City Planner, regarding the specifics of this Site[3].

Although this Facility is not subject to Norwich's land use application processes, SolarCity has designed the Facility to meet the intent of the City of Norwich Zoning

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[2] John Bilda is now Acting Norwich City Manager.

[3] Correspondence between Brightfields and John Bilda (General Manager of Norwich Public Utilities / Acting Norwich City Manager) dated August 19, 2015 indicates that Mr. Davis (Norwich City Planner) is aware of the proposed Facility.

Ordinances' performance standards[4] for dust (construction dust will be addressed by watering the disturbed areas of the Site during construction in accordance with the erosion and sedimentation control plan), odors (no odors, gases or fumes will be produced by the solar installation), noise (the only anticipated noise source following construction will be from the electrical equipment used for power processing and none of the power production equipment is closer than 175 feet to a residence), vibration (the Facility will not produce any vibration), glare and heat (the solar panels should not result in an increase in heat outside of the Site boundaries and the glare from the solar panels - which is less than that of typical glare from water or steel - will be mitigated with the vegetated buffer between the Facility and neighboring residences), fire and explosion hazards (the Facility will comply with all applicable fire safety codes), ionizing radiation and radioactive materials (there are no sources of radiation or radioactive materials at the Facility) electromagnetic interference (there will be no sources of electromagnetic interference at the Facility) or the production of injurious wastes (there will be no production of injurious wastes at the Facility). Finally, notice of this filing has been provided to the City (see Notice List, **Exhibit 3**).

[4] Specifically, Sections 3.17.1-3.17.9 of City of Norwich Zoning Ordinances.

B. Description of the Site and the Facility

1. The Site

The proposed Facility will span two adjacent parcels - 9 Stott Avenue and 292 Plain Hill Road - in Norwich, Connecticut. The 9 Stott Avenue parcel is a 10.96 acre parcel identified as Map 28, Block 1, Lot 10 by the Norwich Assessor's Office and lies within a BP (business park) zone[5]. The 292 Plain Hill Road parcel is a 16.45 acre parcel identified as Map 28, Block 1, Lot 13 by the Norwich Assessor's Office and lies within an R40 (residential) zone (**Exhibit 1**). Both parcels are owned by the same family, with the 9 Stott Avenue parcel owned by Kelvin H. Stott and the 292 Plain Hill Road parcel owned by Kelvin H. & Francis S. Stott.

The Site is located directly adjacent to an industrial business park with commercial development to the west and south (including Dodd Stadium) and agricultural land and sparse residential development to the north and east. The 9 Stott Avenue parcel has a large amount of undeveloped, agricultural/cultivated land (cornfields) with a building and batting cages at the southern end. The 292 Plain Hill Road parcel also has a significant amount of undeveloped, agricultural/cultivated land (cornfields) with a telecommunications tower (and associated ground equipment) on the western side of the parcel, while in the northeast section of the parcel there are a number of farm buildings associated with the former Mountain Ash Dairy

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[5] The Norwich Tax Assessor's field card lists this parcel within a "BP" Zone (Business Park) but the current City of Norwich Zoning Map (available online at http://ct-norwich.civicplus.com/DocumentCenter/View/185) depicts this parcel within a Residential (R40) Zone.

Farm. The proposed solar arrays will cover approximately 15 acres (spanning both parcels) that are now mostly used as seasonal cornfields. **Exhibit 1**.

The majority of the Site is comprised of upland areas but there are three identified wetland areas (see Environmental Assessment ("EA"), **Exhibit 2**). Wetland 1 is located on the western edge of the Site and consists in part of forested area with a scrub/shrub hillside seep wetland system area on the western facing hillside near the area historically cleared for farming. There are two interior intermittent streams in Wetland 1. Wetland 2 is located next to the telecommunications tower in the center of the Site, and is woodland dominant with large canopy gaps. Wetland 2 lies between two agricultural fields with a stone wall marking/defining its western boundary. Wetland 3 is a small (approximately 415 square feet), isolated, depressional-pocket wetland west of the dairy farm buildings created by a historical excavation pit that now retains approximately one to three inches of water. **Exhibit 2**.

There are no public water supply wells proximate to the Site and the Site is not located within an Aquifer Protection Area. The Site also lies in a minimal flooding area according to the United States Federal Emergency Management Agency's mapping. Based on the DEEP's Natural Diversity Database mapping (and confirmed during consultations), no threatened, endangered, or special concern species or critical habitats are located at, or in the vicinity of, the Site (see Appendix C to the EA, **Exhibit 2**). In addition, no historic districts, features or structures exist at the Site or in the vicinity of the Site. The State Historic Preservation Office ("SHPO") was contacted for comment on the proposed Facility. SHPO's response will be forwarded to the Council upon receipt.

2. The Facility

The proposed solar array will consist of approximately 15,912 Trina Solar 310 Watt solar panels, each measuring approximately 64.95 inches by 39.05 inches by 1.37 inches. Collectively, the solar panels will generate approximately 4.93 MW and will cover approximately 15 acres. The panels will have an RBI Solar post-driven mounting system and individual panels will be placed at fixed 25° tilt to the south. The mounting assemblies holding the modules are built on I-beam foundations that are pounded into the ground with a pile driving machine and then the rack is constructed on the posts. Once the rack is complete, the modules are bolted on to the rack. The wires for each module are plugged together in groups or "strings" of 19 panels. The strings of modules are combined in the DC combiner box which is then wired to the inverter. **Exhibit 1; Exhibit 4**.

The Facility will include six Solectria SGI utility scale inverters ((4) 500 KW and (2) 750 KW). The inverters convert the DC power supplied by the panels into AC power that can be connected to the electric grid. The inverters will be mounted on four, small concrete pads with transformers which are connected to the grid via switch gear (two pads will have one inverter and one transformer and two pads will have two inverters and one transformer). Details on the equipment are provided on the Equipment Plan attached as **Exhibit 4**.

In addition to the four small concrete pads for the inverters, there will be one concrete pad on the southern side of the Site that will hold 3 equipment cabinets, one of which will be for the batteries. The Facility's battery system will be a self-contained unit that will use sealed, rechargeable, lithium-ion battery cells. The battery system has its own transformer and will share the same interconnection switch gear as the proposed solar arrays. **Exhibit 1**; **Exhibit 4**.

Access to the Site will be via two, 12-foot wide gravel access drives originating from an existing gravel drive entrance (also the entrance for the telecommunications tower) located off of Stott Avenue. The first access drive is less than 80 feet long, is immediately off of the Stott Avenue entrance and runs parallel to Stott Avenue. It will provide access to the southeastern section of panels at the Site. The other access drive will be a long road that runs three-quarters of the way up the center of the Site providing access to the western and northern sections of panels. A small portion of stone wall will need to be removed at the beginning and end of the proposed road but otherwise, the access road will run parallel to an existing stone wall which will not be disturbed. **Exhibit 1**.

The existing gravel parking area in front of the batting cage building will be utilized for staging, laydown and processing/loading of boulders during construction. The existing access driveway will be used as a temporary construction entrance. An anti-tracking pad will be installed at that temporary construction entrance. There will also be a 10' x 10' area within this existing gravel parking area designated for concrete truck washout. After the completion of construction activities, the area will be loamed, seeded and mulched. **Exhibit 1**.

The existing utilities for the batting cages will be abandoned and capped. The utilities to the Facility will be a mix of aboveground and underground. Details regarding the utilities are provided in **Exhibit 4**.

A six-foot tall chain link fence will surround the Project Area (one 1,900' surrounding the southeastern portion, and one 5,025' surrounding the northern and western portions). Due to the surrounding topography and existing/proposed vegetation, a large part of the Facility will be shielded from public view. Moreover, only a small percentage of incidental light will reflect off the panels (less than typically reflects off of common materials such as steel and water). **Exhibit 1**; **Exhibit 2**.

The Facility will not consume any raw materials, will not produce any byproducts and will not be staffed during normal operating conditions. In addition, the Facility has been designed to meet the intent and performance standards of local land use regulations where possible as detailed above. A construction schedule for the Facility is included as Appendix E to the EA (**Exhibit 2**). SolarCity plans to work 7 days a week, 7:00am – 7:00pm to complete installation of the Facility. The work hours may be modified based on discussions with the City of Norwich.

C. The Facility Complies with DEEP's Air and Water Quality Standards and Will Not Have a Substantial Adverse Environmental Effect

The construction and operation of the Facility will comply with DEEP's air and water quality standards and will not have a substantial adverse environmental effect. Furthermore, the Facility will not have any air emission sources and therefore, will not have any effect on air quality.

There are no public water supply wells located in the vicinity of the Site and no liquid fuels are associated with the operations of the Facility. The sealed, rechargeable, lithium-ion battery cells used at the Facility are individual, hermetically sealed cylinders, each containing lithium-ion electrodes and electrolyte, similar to what is found in many consumer electronic products. The cells and batteries do not contain metallic lithium. A mixture of equal parts ethylene glycol and water is used as liquid coolant. The electrolyte includes a volatile hydrocarbon-based liquid and a dissolved lithium salt (which is a source of lithium ions) such as lithium hexofluorophosphate. The electrolyte is largely absorbed in electrodes within individual sealed cells. In the unlikely event of a release, the electrolyte liquid would evaporate rapidly leaving a white salt residue. Evaporated electrolyte is flammable and will contain alkyl-carbonate compounds. Cleanup of a spill would use a dry absorbent material. Therefore, the Facility would have no adverse environmental effect on water resources. A manufacturer's Emergency Response Guide for the lithium-ion batteries is provided in Appendix D to the EA (**Exhibit 2**).

The solar panels will be located across both parcels in 3 areas, collectively comprising approximately 15 acres. Most of the Project Area is comprised of cornfields, however approximately 1.9 acres will require clearing and approximately 3.9 acres will require new soil disturbance. No significant cuts or fills will be required because the Site has relatively moderate slopes. The batting cage operation in the southern part of the Site will be removed as part of it falls within the Project Area. Its components will be properly disposed of or recycled. No other existing structures on the Site will be affected. **Exhibit 1**; **Exhibit 2**.

SolarCity commissioned a Carbon Debt Analysis to determine whether the 1.9 acres of clearing will produce a net improvement in carbon reduction compared to the loss of the woodlands. The analysis accounted for the loss of trees, the carbon associated with the manufacture of the solar panels, and the carbon associated with the installation activity. The clearing will require the removal of 49 trees. All of the tree stumps within the Project Area will be removed and the disturbed areas regraded and vegetated. The trees will be chipped for use as sediment and erosion control berms. The Carbon Debt Analysis determined that the Facility would begin to have a measurable net improvement in carbon reduction in less than three years. The Carbon Debt Analysis is attached as **Exhibit 5**.

Of the three wetlands at the Site, only one will be directly impacted by the proposed Facility, Wetland 3, which will be completely filled and removed. As previously mentioned, Wetland 3 is a small, isolated, man-made wetland serving little or no function and having little or no value. That said, the filling of Wetland 3 is still regulated by the Army Corps of Engineering. Due to its small size, the filling appears eligible under DEEP's Connecticut General Permit as a Category 1A Self-Certification (no application to the Army Corps of Engineers would be necessary). The Connecticut General Permit would be secured prior to the start of construction. **Exhibit 2.**

There will be no direct impact to Wetlands 1 or 2 from the Facility. Clearing limits will be in close proximity to, but not within, Wetlands 1 or 2. Moreover, 25-foot (minimum) buffers have been established for both Wetlands 1 and 2 for areas proximate to the agricultural areas of development and 50 feet for the areas bordering vegetated areas. **Exhibit 2.**

There will be minor short term, temporary impacts associated with the construction activities at the Site due to the proximity to wetland and watercourse resources. A proposed Wetland Protection Plan is included as Appendix G to the EA (**Exhibit 2**) which will provide additional measures to avoid temporary wetland impacts. Any long term secondary impacts to wetland resources possibly associated with operation of the Facility will be minimized by the fact that the Facility is unstaffed and generates minimal traffic. SolarCity will minimize the creation of impervious surfaces with the use of a gravel access drive and with the majority of the surface treatment around the solar installation consisting of native grasses/vegetation. A Stormwater Management Report is included as **Exhibit 6**[6]. The stormwater will be handled in accordance with the 2004 *Connecticut Stormwater Quality Manual.*

Within 750 feet of the Project Area no areas were found to support vernal pool habitat. In addition, there are not sufficient areas on the Site to support habitat-specialized wildlife. According to the DEEP, the Facility will not have a negative impact on State-listed rare species as no Threatened, Endangered, or Special Concern species or critical habitats are known to occur at or in the general vicinity of the Site (see Appendix C to the EA, **Exhibit 2**).

The EA found that the most likely impact from the Facility will be on birds and therefore a breeding bird assessment was conducted in July 2015 which focused on high conservation priority species (see Breeding Bird Inventory Table, Appendix B to the EA, **Exhibit 2**). If the Council approves the Facility, a construction schedule will be determined, and SolarCity will evaluate whether the potential exists for nest disturbance and plan

[6] Due to its size, one copy of the Stormwater Management Report has been bulk filed.

accordingly. To avoid potential disturbance during periods of high bird activity, SolarCity will use the following schedule as a general guideline. If construction activities should occur during the peak nesting period of May 1st through August 15th, efforts would be taken to complete vegetation clearing work prior to May 1st; or, if tree clearing has not been completed by May 1st, an avian survey may be conducted to determine if breeding birds would be disturbed. If the avian survey concludes that breeding birds would be disturbed, vegetation clearing activities may be restricted through the peak nesting period (or a modified time frame based on the specific findings of the survey).

Traffic to the site after construction is complete will be minimal. Four times per year the site will be mowed. Annual maintenance of the electrical equipment will occur once per year. Any equipment that breaks down will be repaired on an as needed basis. Annual maintenance will typically be two technicians for a day.

SolarCity has developed a Decommissioning Plan to prepare for the eventual permanent closure of the Facility. The Decommissioning Plan describes the process for removal and disposal or recycling of the equipment and anticipated land-restoration activities. The Decommissioning Plan is attached as **Exhibit 7**.

III. NOTICE

SolarCity has provided notice of this petition to all persons and appropriate municipal officials and governmental agencies to whom notice is required to be given pursuant to Conn. Agencies Regs. § 16-50j-40(a).[7] A copy of the notice letter and the list of recipients are attached as **Exhibit 3**.

IV. BASIS FOR GRANTING OF THE PETITION

Under Conn. Gen. Stat. § 16-50k(a), the Council is required to approve by declaratory ruling the construction or location of a grid-side distributed resources project or facility with a capacity of not more than 65 MW, as long as the facility meets DEEP air and water quality standards. The proposed Facility meets both of these criteria. First, the Facility is a "grid-side distributed resources" project, as defined in Conn. Gen. Stat. § 16-1(a)(38), because the Facility is "a unit with a rating of not more than sixty-five megawatts that is connected to the transmission or distribution system…." Second, as demonstrated above and in the EA, the Facility will meet DEEP air and water quality standards. In addition, as demonstrated above, the construction and operation of the Facility will not have a substantial adverse environmental effect in the State of Connecticut.

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[7] Conn. Agencies Regs. § 16-50j-40(a) requires that "[p]rior to submitting a petition for a declaratory ruling to the Council, the petitioner shall, where applicable, provide notice to each person other than the petitioner appearing of record as an owner of property which abuts the proposed primary or alternative sites of the proposed facility, each person appearing of record as an owner of the property or properties on which the primary or alternative proposed facility is to be located, and the appropriate municipal officials and government agencies [listed in Section 16-50*l* of the Connecticut General Statutes]."

V. CONCLUSION

For the reasons stated above, SolarCity respectfully requests that the Council approve the location and construction of the Facility by declaratory ruling.

Respectfully submitted,

SolarCity Corporation

By: Philip M. Small / cm

Philip M. Small, Esq.
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185 Asylum Street, 38th Floor
Hartford, CT 06103
Telephone: (860) 509-6500
Facsimile: (860) 509-6501
Electronic Mail: psmall@brownrudnick.com

EXHIBITS

Exhibit 1 – Site Plan

Exhibit 2 – Environmental Assessment

Exhibit 3 – Notice

Exhibit 4 – Equipment Plan

Exhibit 5 – Carbon Debt Analysis

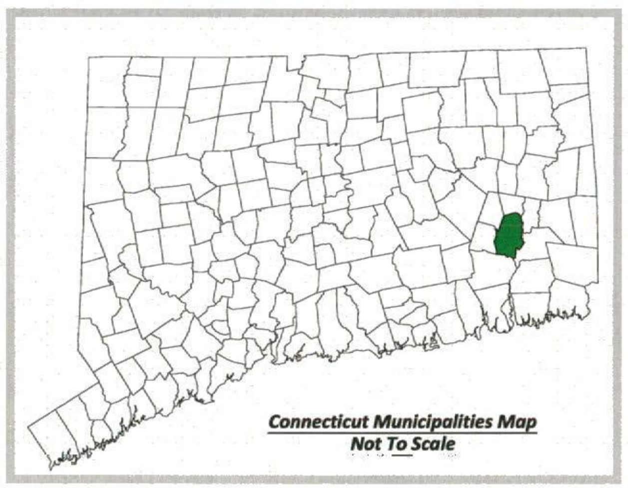
Exhibit 6 – Stormwater Management Report (1 copy, bulk filed)

Exhibit 7 – Decommissioning Plan

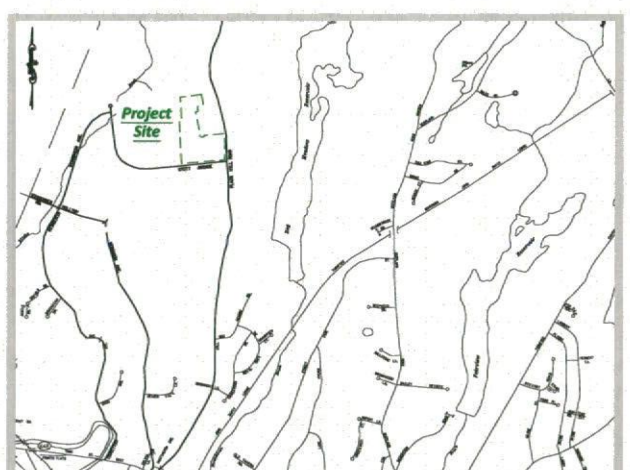
62002322-WorkSiteUS

EXHIBIT 1

STOTT AVENUE SOLAR PROJECT
SOLAR PHOTOVOLTAIC (PV) SYSTEM
SolarCity Corporation
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
August 2015



Connecticut Municipalities Map
Not To Scale



Site Location Map
Scale: 1"=2000'

Site Location Aerial View
Not To Scale

Project Information

Developed By:
Brightfields Development, LLC
41 Walnut Street, Suite 301
Wellesley, MA 02481

SolarCity Corporation
714 Brook Street
Rocky Hill, CT 06067

Civil Engineer:
Boundaries LLC
179 Pachaug River Drive
Griswold, CT 06351

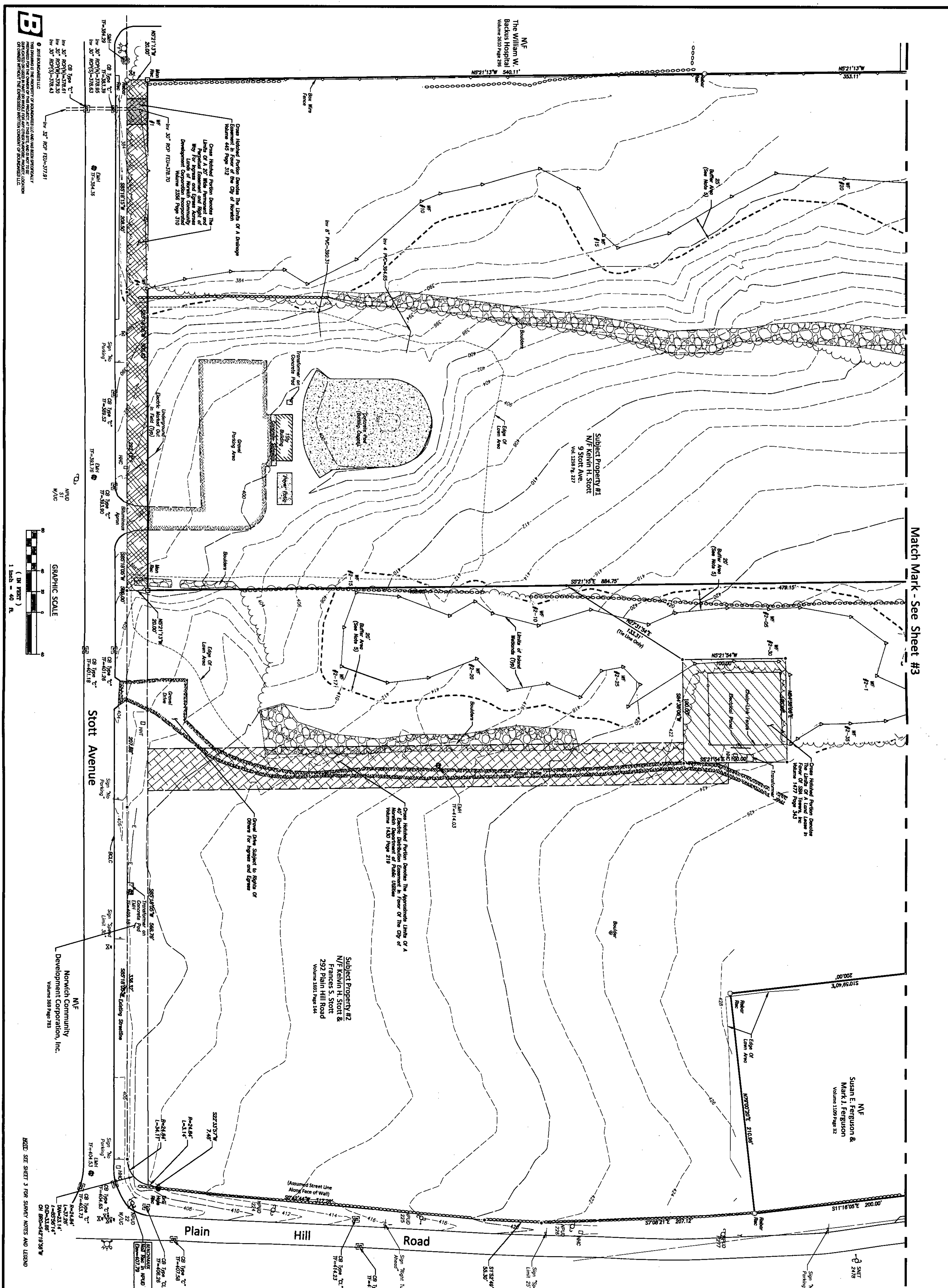
Electrical Engineer:
SolarCity Corporation
714 Brook Street
Rocky Hill, CT 06067

Host:
Kelvin H. Stott & Frances S. Stott
9 Stott Avenue
292 Plain Hill Road
Norwich, CT 06360

Utility:
Connecticut Municipal Electric Energy Cooperative
30 Stott Avenue
Norwich, CT 06360

Index To Drawings

Sheet	Sheet Title
1	Cover Sheet
2-3	Topographic Survey-Existing Conditions
4	Lease Plan
5-6	Site Preparation and Demolition Plan
7-8	Site Development Plan Solar Modules and Infrastructure
9	Erosion & Sediment Control Narrative and Details
10	Site Details



SCALE: 1"=40'	DATE: August 2015	JOB I.D. NO. 15-2327

Revisions

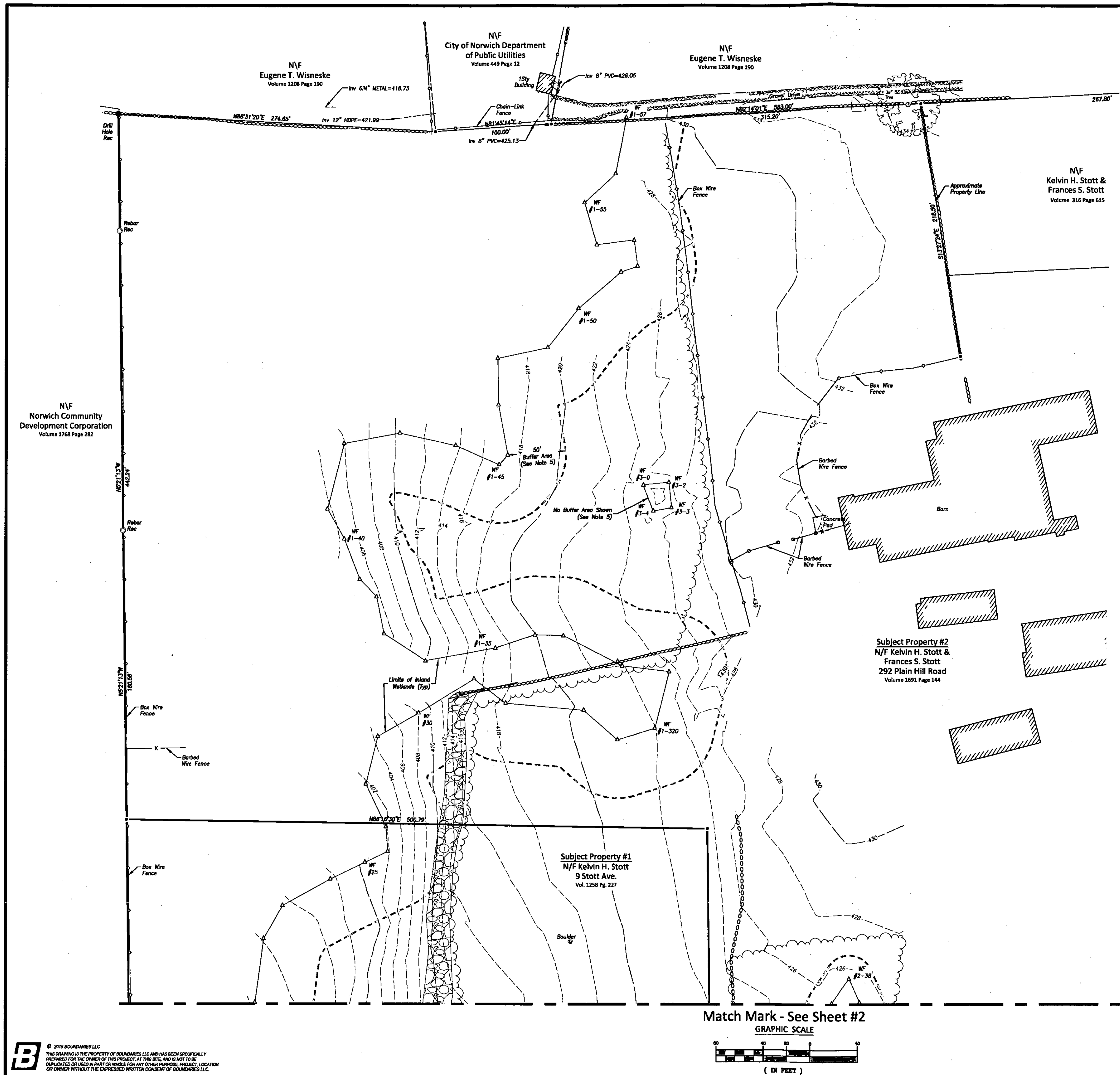
SHEET NO. 2 / 10

SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Topographic Survey-Existing Conditions

SolarCity
714 Brook Street
Rocky Hill, CT 06067
www.solarcity.com

BRIGHTFIELDS
DEVELOPMENT LLC
40 Walnut Street Suite 301
Wellesley, MA 02481
www.solarbrownfields.com

CIVIL ENGINEERING LAND SURVEYING LAND USE PLANNING SOIL SCIENCE
BOUNDARIES
Boundaries LLC
179 Pachaug River Drive, Griswold, CT 06351
T 860.376.2006 | www.boundariesllc.net



Match Mark - See Sheet #2

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

LEGEND & ABBREVIATIONS

±	MORE OR LESS		TREELINE
TYP	TYPICAL		STONEWALL
PVC	POLYVINYL CHLORIDE		STONEWALL REMAINS
RCP	REINFORCED CONCRETE PIPE	•	ANGLE POINT
HDPE	HIGH DENSITY POLYETHYLENE PIPE	○	IRON PIN
S.F.	SQUARE FEET	●	DRILL HOLE
SMH	SANITARY MANHOLE	⊡	MONUMENT
CB	CATCH BASIN	○	FENCE POST
TF	TOP OF FRAME		UTILITY POLE
INV	INVERT		UTILITY POLE WITH LIGHT
WV	WATER VALVE		GUY WIRE
HH	HANDHOLE		CATCH BASIN
WF #1	WETLAND FLAG		SANITARY MANHOLE
MON	MONUMENT		ELECTRIC MANHOLE
REC	RECOVERED	⋈	WATER VALVE
NPUD	NORWICH PUBLIC UTILITIES		SIGN
N/F	NOW OR FORMERLY	△	WETLAND FLAG
— 320 —	EXISTING CONTOUR		

REFERENCE MAPS

A. RESUBDIVISION SURVEY PROPERTY OF KELVIN H. STOTT, PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED FEBRUARY 1996, SCALE: 1"= 100', PREPARED BY CLA ENGINEERS, INC.

B. LOT LINE RECONFIGURATION PROPERTY OF HILLTOP INVESTMENTS, LLC, #11 STOTT AVENUE NORWICH, CONNECTICUT, DATED 1/15/03, SCALE: 1"= 50', PREPARED BY CLA ENGINEERS, INC.

C. LOT LINE REVISION OF 292 PLAIN HILL ROAD, NORWICH, CONNECTICUT, PREPARED FOR KELVIN H. STOTT DECEMBER 16, 1998, SCALE: 1"= 100', PREPARED BY GESICK & ASSOCIATES P.C.

D. BOUNDARY SURVEY PROPERTY TO BE CONVEYED TO THE WM. W. BACKUS HOSPITAL, #11 STOTT AVENUE, NORWICH, CONNECTICUT, DATED APRIL 2010, SCALE 1"= 40' PREPARED BY CLA ENGINEERS, INC.

E. EXISTING CONDITIONS OF PROPOSED LEASE PARCEL, 292 PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED DECEMBER 17, 1998, SCALE: 1"= 50', SBA, INC., PREPARED BY GESICK & ASSOCIATES P.C.

F. COMPREHENSIVE SITE PLAN SBA SITE #8618/NORWICH, 292 PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED 3/19/99, SCALE: 1"= 50', SBA, INC., PREPARED BY GESICK & ASSOCIATES P.C.

G. KELVIN STOTT BASEBALL BATTING RANGE SITE PLAN, 292 PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED JANUARY 1996, REVISED 2/13/96, SCALE: 1"= 20', PREPARED BY CLA ENGINEERS, INC.

H. SUBDIVISION PLAN #313 PROPERTY OF KELVIN H. STOTT, PLAIN HILL ROAD, NORWICH, CT., DATED 6/24/92, SCALE: 1"=40', PREPARED BY CLA ENGINEERS, INC.

I. CITY OF NORWICH, CONNECTICUT, NORWICH INDUSTRIAL PARK PLAN OF ROADS TO BE CONVEYED BY THE NORWICH COMMUNITY DEVELOPMENT CORPORATION, INC. TO THE CITY OF NORWICH, STOTT AVENUE, DATED JANUARY 1976, SCALE: 1"= 40', SHEETS 1 AND 2 OF 7, PREPARED BY CE MAGUIRE, INC.

J. LAND TO BE CONVEYED BY MICHAEL AND BLANCHE WISNESKE TO THE NORWICH COMMUNITY DEVELOPMENT CORPORATION INCORPORATED, CITY OF NORWICH, CONNECTICUT, SCALE: 1"= 20', REVISED 6/9/72, PREPARED BY C.E. MAGUIRE, INC.

K. MONUMENTED PROPERTY SURVEY PLAN PREPARED FOR STATE OF CONNECTICUT DEPARTMENT OF AGRICULTURE FARMLAND PRESERVATION PROGRAM, PROPERTY OF EUGENE WISNESKE, PLAIN HILL ROAD, DATED 03-11-08, SCALE: 1"= 100', SHEET 4 OF 4, PREPARED BY F.A. HESKETH & ASSOCIATES, INC.

SURVEY NOTES

1. THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THROUGH 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES AND "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED FOR USE BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996. IT IS A PROPERTY AND TOPOGRAPHIC SURVEY BASED ON RESURVEY AND CONFORMS TO HORIZONTAL CLASS A-2 AND TOPOGRAPHIC CLASS T-2 ACCURACY STANDARDS. IT IS INTENDED TO DEPICT EXISTING SITE CONDITIONS FOR THE BASIS OF FUTURE DEVELOPMENT.

2. ACTUAL FIELD SURVEY WAS COMPLETED ON APRIL 23, 2015. LAND RECORDS RESEARCH WAS COMPLETED ON FEBRUARY 18, 2015.

3. NORTH ORIENTATION DEPICTED HEREON IS BASED ON APPROXIMATE CONNECTICUT GRID NORTH, NAD 1983, VERTICAL DATUM IS BASED ON NGVD 1988 DERIVED FROM GLOBAL POSITIONING OBSERVATIONS TAKEN FEBRUARY 2014.

4. THE SUBJECT PROPERTIES ARE IDENTIFIED AS 9 STOTT AVENUE AND 292 PLAIN HILL ROAD, NORWICH, CONNECTICUT. FURTHER REFERENCE MAY BE MADE TO ASSESSORS MAP 28, BLOCK 1, LOTS 10 AND 13.

5. LIMITS OF INLAND WETLANDS DEPICTED HEREON WERE DELINEATED BY DEAN E. GUSTAFSON P.S.S., ALL POINTS TECHNOLOGY CORPORATION. 20' TO 50' BUFFER AREAS DEPICTED HEREON ARE PREDICATED ON RECOMMENDED SETBACKS PROVIDED BY ALL POINTS TECHNOLOGY CORPORATION BASED FIELD EVALUATION OF SAID INLAND WETLANDS. THE CITY OF NORWICH INLAND WETLAND REGULATIONS REQUIRES AN UPLAND REGULATED AREA OF 100'.

"TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

JOHN U. FAULISE JR. L.S. | 70016 LICENSE NO. | DATE

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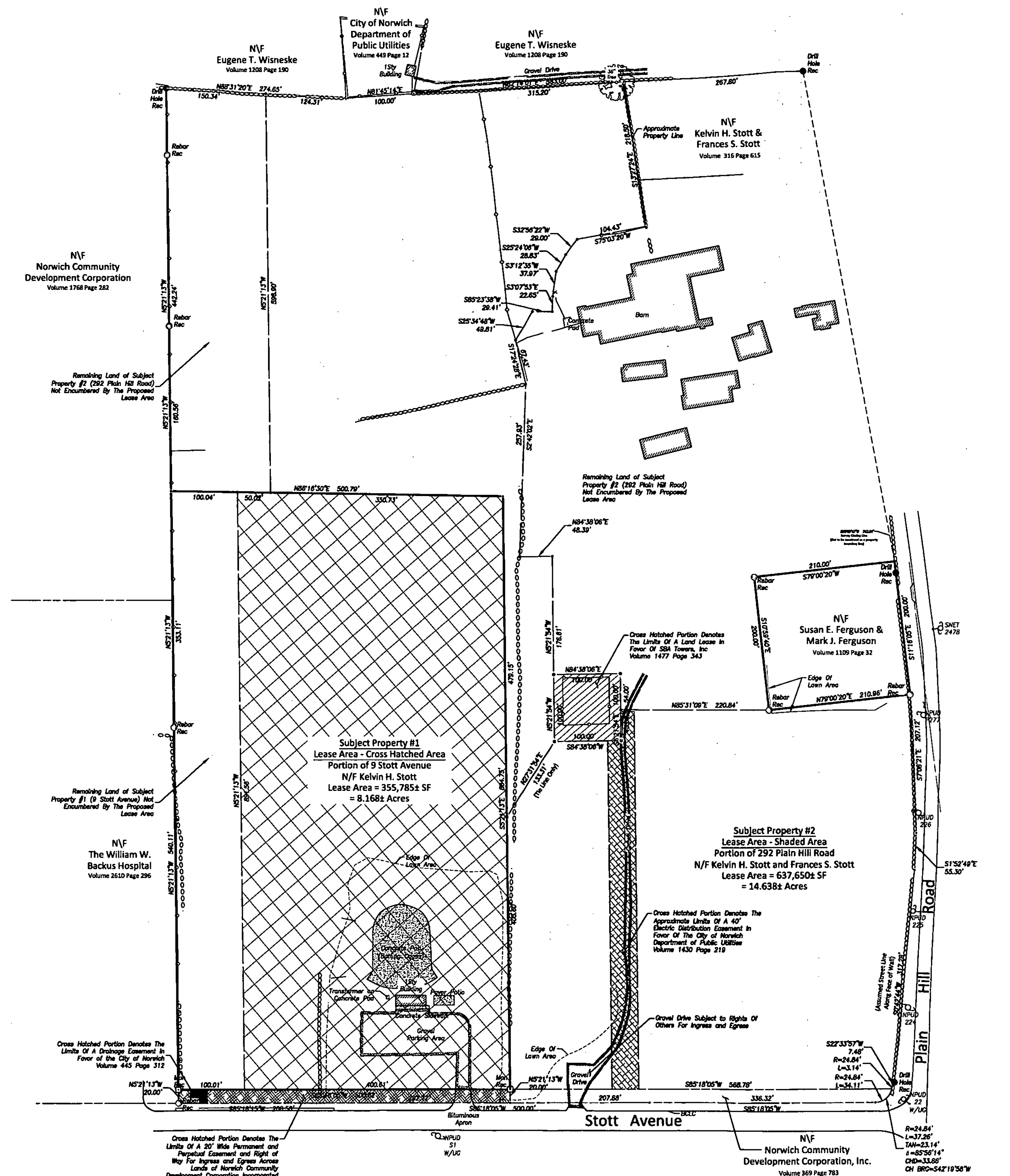
SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Topographic Survey-Existing Conditions

SCALE: 1"=40'
DATE: August 2015
JOB I.D. NO. 15-2327
Revisions

SHEET NO.
3 / 10



REFERENCE MAPS

A. RESUBDIVISION SURVEY PROPERTY OF KELVIN H. STOTT, PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED FEBRUARY 1996, SCALE: 1"= 100', PREPARED BY CLA ENGINEERS, INC.

B. LOT LINE RECONFIGURATION PROPERTY OF HILLTOP INVESTMENTS, LLC, #11 STOTT AVENUE NORWICH, CONNECTICUT, DATED 1/15/03, SCALE: 1"= 50', PREPARED BY CLA ENGINEERS, INC.

C. LOT LINE REVISION OF 292 PLAIN HILL ROAD, NORWICH, CONNECTICUT, PREPARED FOR KELVIN H. STOTT DECEMBER 16, 1998, SCALE: 1"= 100', PREPARED BY GESICK & ASSOCIATES P.C.

D. BOUNDARY SURVEY PROPERTY TO BE CONVEYED TO THE WM. W. BACKUS HOSPITAL, #11 STOTT AVENUE, NORWICH, CONNECTICUT, DATED APRIL 2010, SCALE 1"= 40' PREPARED BY CLA ENGINEERS, INC.

E. EXISTING CONDITIONS OF PROPOSED LEASE PARCEL, 292 PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED DECEMBER 17, 1998, SCALE: 1"= 50', SBA, INC., PREPARED BY GESICK & ASSOCIATES P.C.

F. COMPREHENSIVE SITE PLAN SBA SITE #8618/NORWICH, 292 PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED 3/19/99, SCALE: 1"= 50', SBA, INC., PREPARED BY GESICK & ASSOCIATES P.C.

G. KELVIN STOTT BASEBALL BATTING RANGE SITE PLAN, 292 PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED JANUARY 1996, REVISED 2/13/96, SCALE: 1"= 20', PREPARED BY CLA ENGINEERS, INC.

H. SUBDIVISION PLAN #313 PROPERTY OF KELVIN H. STOTT, PLAIN HILL ROAD, NORWICH, CT., DATED 6/24/92, SCALE: 1"=40', PREPARED BY CLA ENGINEERS, INC.

I. CITY OF NORWICH, CONNECTICUT, NORWICH INDUSTRIAL PARK PLAN OF ROADS TO BE CONVEYED BY THE NORWICH COMMUNITY DEVELOPMENT CORPORATION, INC. TO THE CITY OF NORWICH, STOTT AVENUE, DATED JANUARY 1976, SCALE: 1"= 40', SHEETS 1 AND 2 OF 7, PREPARED BY CE MAGUIRE, INC.

J. LAND TO BE CONVEYED BY MICHAEL AND BLANCHE WISNESKE TO THE NORWICH COMMUNITY DEVELOPMENT CORPORATION INCORPORATED, CITY OF NORWICH, CONNECTICUT, SCALE: 1"= 20', REVISED 6/9/72, PREPARED BY C.E. MAGUIRE, INC.

K. MONUMENTED PROPERTY SURVEY PLAN PREPARED FOR STATE OF CONNECTICUT DEPARTMENT OF AGRICULTURE FARMLAND PRESERVATION PROGRAM, PROPERTY OF EUGENE WISNESKE, PLAIN HILL ROAD, DATED 03-11-08, SCALE: 1"= 100', SHEET 4 OF 4, PREPARED BY F.A. HESKETH & ASSOCIATES, INC.

SURVEY NOTES

1. THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THROUGH 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES AND "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED FOR USE BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996. IT IS A PROPERTY AND TOPOGRAPHIC SURVEY BASED ON RESURVEY AND CONFORMS TO HORIZONTAL CLASS A-2 AND TOPOGRAPHIC CLASS T-2 ACCURACY STANDARDS. IT IS INTENDED TO DEPICT EXISTING SITE CONDITIONS FOR THE BASIS OF FUTURE DEVELOPMENT.
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LEGEND & ABBREVIATIONS

±	MORE OR LESS
TYP	TYPICAL
S.F.	SQUARE FEET
MON	MONUMENT
REC	RECOVERED
NPUD	NORWICH PUBLIC UTILITIES
N/F	NOW OR FORMERLY
	STONEWALL
	STONEWALL REMAINS
•	ANGLE POINT
○	IRON PIN
●	DRILL HOLE
⊡	MONUMENT
○	FENCE POST
	UTILITY POLE
	UTILITY POLE WITH LIGHT
	GUY WIRE

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

"TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

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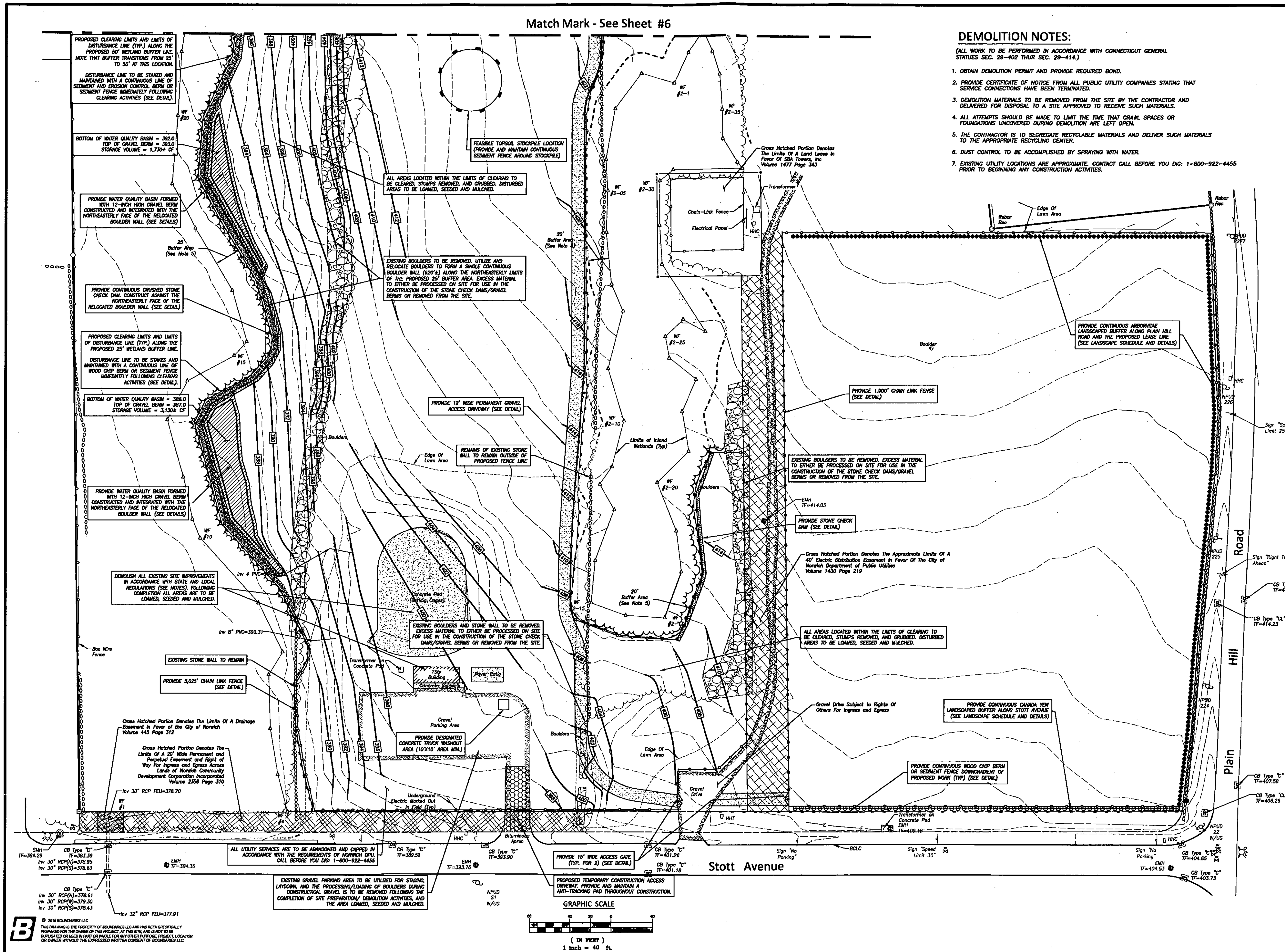
SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Lease Plan

SCALE: 1"=80'
DATE: August 2015
JOB I.D. NO. 15-2327
Revisions

SHEET NO. 4 / 10



DEMOLITION NOTES:

(ALL WORK TO BE PERFORMED IN ACCORDANCE WITH CONNECTICUT GENERAL STATUES SEC. 29-402 THUR SEC. 29-414.)

1. OBTAIN DEMOLITION PERMIT AND PROVIDE REQUIRED BOND.
2. PROVIDE CERTIFICATE OF NOTICE FROM ALL PUBLIC UTILITY COMPANIES STATING THAT SERVICE CONNECTIONS HAVE BEEN TERMINATED.
3. DEMOLITION MATERIALS TO BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DELIVERED FOR DISPOSAL TO A SITE APPROVED TO RECEIVE SUCH MATERIALS.
4. ALL ATTEMPTS SHOULD BE MADE TO LIMIT THE TIME THAT CRAWL SPACES OR FOUNDATIONS UNCOVERED DURING DEMOLITION ARE LEFT OPEN.
5. THE CONTRACTOR IS TO SEGREGATE RECYCLABLE MATERIALS AND DELIVER SUCH MATERIALS TO THE APPROPRIATE RECYCLING CENTER.
6. DUST CONTROL TO BE ACCOMPLISHED BY SPRAYING WITH WATER.
7. EXISTING UTILITY LOCATIONS ARE APPROXIMATE. CONTACT CALL BEFORE YOU DIG: 1-800-922-4455 PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES.

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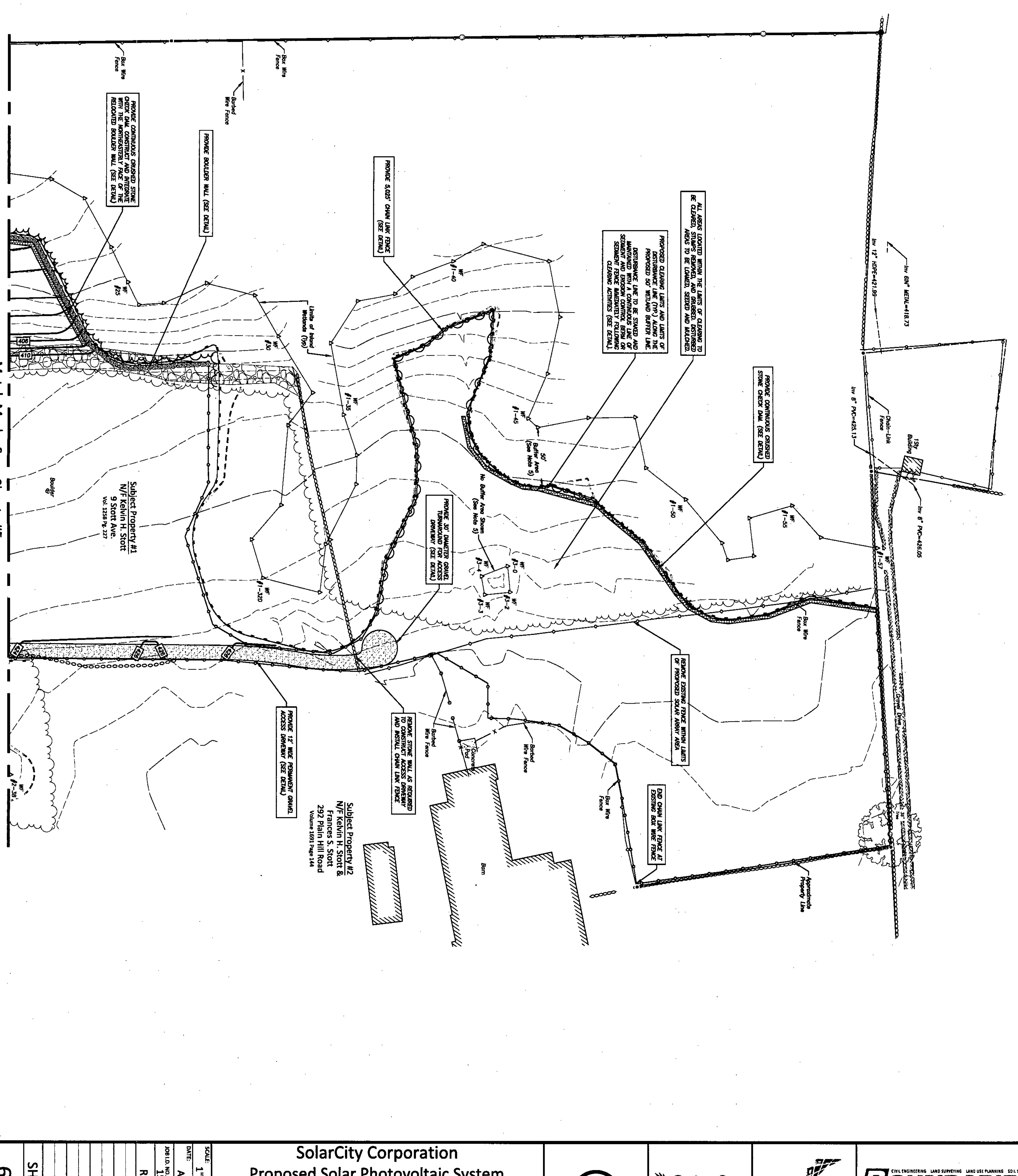
SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Site Preparation and Demolition Plan

SCALE: 1"=40'
DATE: August 2015
JOB I.D. NO. 15-2327
Revisions

SHEET NO.
5 / 10



SHEET NO. 9 / 10	Revisions	SCALE: 1"=40' DATE: August 2015 JOB I.D. NO. 15-2327

SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Site Preparation and Demolition Plan

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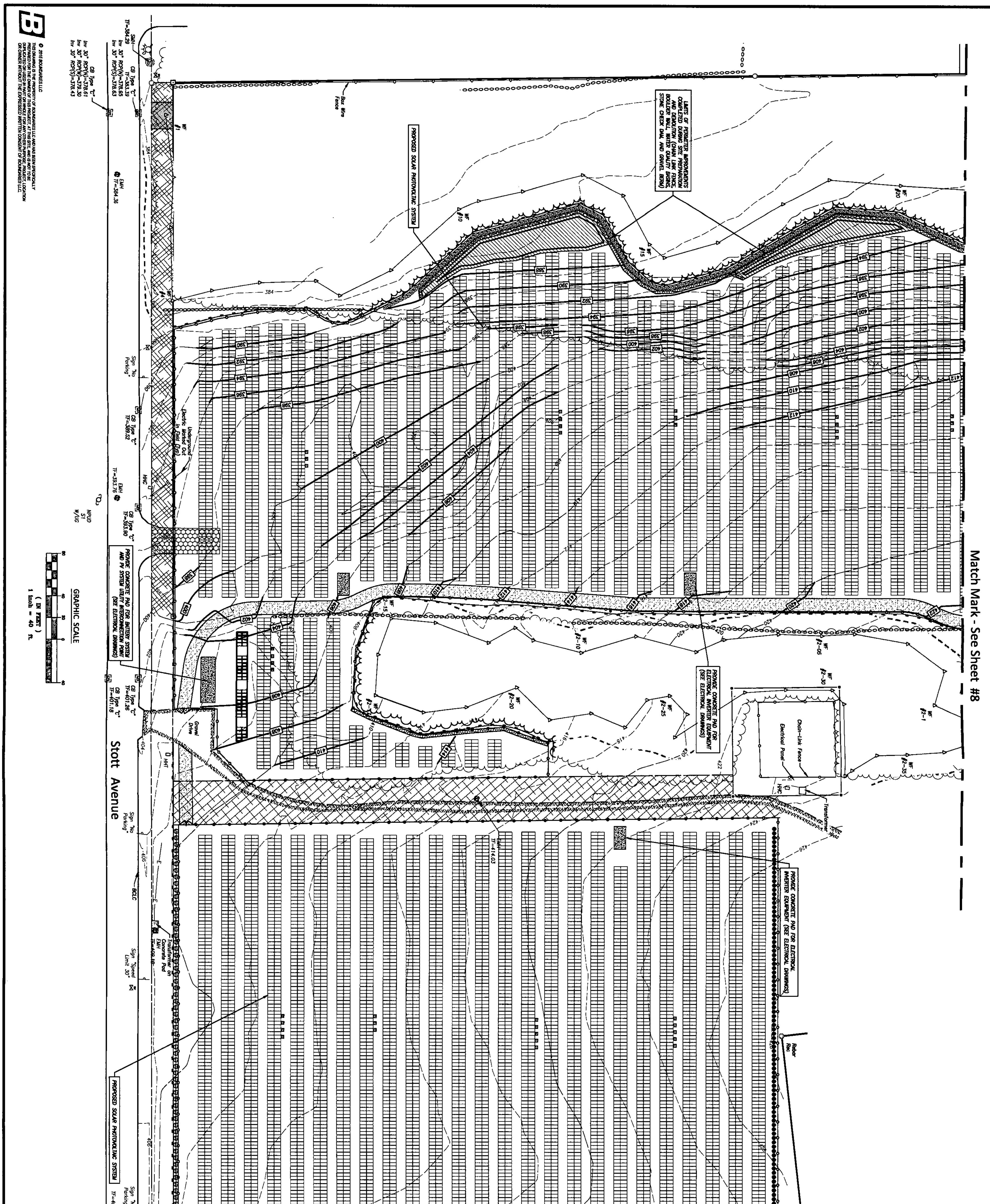

SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Site Development Plan Solar Modules and Infrastructure

SCALE: 1"=40'
DATE: August 2015
JOB I.D. NO. 15-2327
Revisions

SHEET NO. 7 / 10

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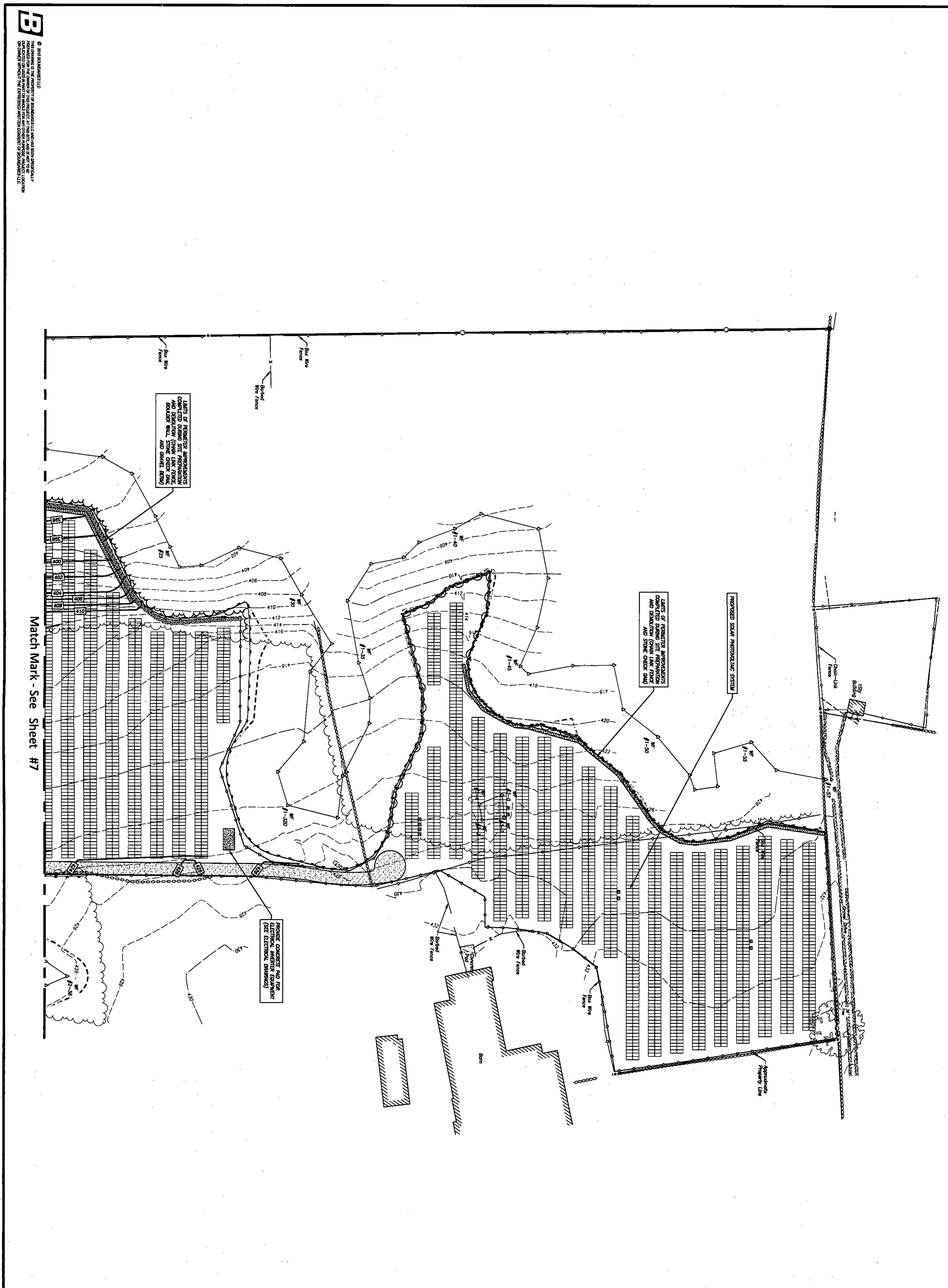

SCALE: 1"=40'	DATE: August 2015	JOB I.D. NO. 15-2327

Revisions

SHEET NO. 8 / 10

SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Site Preparation and Demolition Plan

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Reference Is Made To:

1. Connecticut Guidelines For Soil Erosion and Sediment Control, MAY 2002.
2. Soil Survey Of New London County Connecticut, U.S.D.A. Soil Conservation Service.

Development Schedule:

Prior to the start of construction, the contractor is to schedule a mandatory preconstruction meeting on site to discuss issues as they relate to the proposed project. These issues will include but not be limited to:

1. Resource Protection.
2. Construction Vehicle Access and Parking.
3. Construction Methods and Scheduling.
4. Existing site utilities and mark-out coordination.
5. Material delivery and stockpiling.
6. Site inspection procedures and As-Built drawings.

General Sequence of Construction:

1. Secure all necessary local, state, and federal permits. Register for all applicable state and federal permits as required.
2. Install anti-tracking pad at construction entrance and sediment fence in vicinity of proposed access drive.
3. Rough grade (cut and fill as required) access drive. Place and compact driveway base and install traffic bound gravel surface for access drive. Stabilize all side slopes as soon as completed by loaming all disturbed areas (4" minimum), seed with grass/hydroseed and mulch.
4. Clear and remove all trees within the proposed clearing limits. Chip trees for use as sediment and erosion control berms.
5. Install sediment and erosion control berms or sediment fence as shown down gradient of proposed development area prior to grubbing operations.
6. Install chain link security fence along entire perimeter of development area and access road.
7. Grub stumps and strip topsoil in cleared areas and proposed grading areas stockpile all topsoil at the locations indicated or other approved location. Seed these stockpiles with ryegrass and surround with sediment fence or sediment and erosion control berm. All stumps are to be ground or disposed of off-site.
8. Install boulder barriers, stormwater basins/temporary sediment traps, and crushed stone check dams, and grade as shown within the cleared areas (13% maximum within the solar array area and 3H:1V maximum in other areas), place 4" of topsoil (minimum), seed and mulch disturbed areas.
9. Demolish existing structures in accordance with local, state, and federal requirements.
10. Grade remainder of site to the grades shown (13% maximum within the solar array area and 3H:1V maximum in other areas), place 4" of topsoil (minimum), seed and mulch disturbed areas.
11. Install final landscaping improvements and proposed solar array system. Install conduit, concrete utility pads and electrical equipment as required for harvesting power.
12. After all areas have been permanently stabilized, remove erosion control measures. Sediment and erosion control berms may be left in place at the option of the

Soil Disturbance Phasing:

The project results in an estimated total soil disturbance of 5.3 acres as a result of the following activities:

1. Access drive construction and grading – 0.8 acres
2. Clearing, grubbing, and grading of cleared areas – 3.2 acres
3. Existing structure demolition and grading – 1.2 acres
4. Miscellaneous site improvements (landscaping, utilities, etc.) – 0.1 acres

Each of the soil disturbing activities referenced above will be completed and disturbed areas stabilized prior to beginning the next activity to insure that the total disturbed area on site does not exceed 5.0 acres at any given time.

Construction Notes:

1. The Contractor shall Call Before You Dig at 811 or 1-800-922-4455 at least 72 hours, Saturdays, Sundays, and holidays excluded, prior to excavation at any location. A copy of the Call Before You Dig project reference number(s) shall be given to the Owner prior to excavation.
2. Locations of existing pipes, conduits, utilities, foundations and other underground objects are not warranted to be correct and the Contractor shall have no claim on that account should they be other than that shown.
3. Stone walls, fences, curbs, etc. shall be removed and replaced as necessary to perform the work. Unless otherwise indicated, all such work shall be incidental to construction of the project.
4. All other areas disturbed by the Contractor beyond payment limits shall be restored at no additional cost to the Owner.
5. The wetland buffer line shall be staked out in the field prior to any clearing operations.
6. All work shall be done in accordance with OSHA requirements and the contractor is responsible for compliance with these requirements. In addition, it shall be the responsibility of the Contractor to provide any excavation safeguards, necessary barricades, flagmen, etc. for traffic control and site safety.
7. All erosion & sedimentation control measures shall be installed prior to the start of construction.
8. All fuel, oil, paint or other hazardous materials used during construction should be stored in a secondary container and removed to a locked indoor area with an impervious floor during non-work hours.
9. No waste materials (such as stumps) are allowed to be buried on site. All waste materials shall be disposed of off-site at an appropriate location in accordance with all local, state, and federal regulations.

Erosion Control Operation & Maintenance:

The applicant shall be responsible for the installation and maintenance of erosion and sediment control measures throughout the project. No construction shall proceed until proper sedimentation and erosion control methods have been installed as the sequence of construction necessitates.

Every precaution shall be used during construction to prevent and minimize the degradation of the existing water quality from stormwater runoff during construction. All activities shall be in conformance to and consistent with all applicable water quality standards and management practices as set forth by local, state and federal agencies.

The applicant shall appoint an onsite agent who shall be personally responsible for implementing this erosion and sediment control plan and enforcing the prescribed safeguards during the excavation and operation period.

This responsibility includes the installation and maintenance of control measures throughout the project, informing all parties engaged on site of the requirements and objectives of the plan, notifying the proper agency and officials of any transfer of this responsibility.

All erosion and sediment control measures shall be repaired, cleaned and/or replaced as necessary throughout the project in order to maintain complete and integral erosion and sediment control protection. Once in place, all erosion and sediment control measures are to remain in place in proper condition and be continuously maintained until final site restoration has been completed. Following such permanent stabilization, the erosion and sediment control measures shall be dismantled, removed, and disposed of in an approved manner. Additional erosion and sediment control measures beyond those shown on the plans or prescribed herein shall be put in place, whenever necessary, to address field conditions and/or as ordered by the engineer.

Qualified personnel provided by the applicant shall inspect disturbed areas and the locations where vehicles enter and leave the site. These areas shall be inspected at least once every seven calendar days and within twenty-four hours at the end of a storm that is 0.5 inches or greater. Additional measures beyond those indicated and/or shown on this plan set or prescribed herein shall be put in place, whenever necessary, To address field conditions and/or as ordered by the engineer. where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three consecutive months.

No soil, fill or other materials shall be deposited in surrounding inland wetlands.

All temporary storage and/or stockpile areas shall be properly stabilized to prevent erosion and suitably contained to prevent turbid runoff.

Dumping of oil or other deleterious materials on the ground is forbidden. The applicant shall provide a means of catching, retaining and properly disposing of drained oil, removed oil filters, or other deleterious material from equipment used on site. Vehicle maintenance shall be completed off site. All oil spills shall be immediately reported to the department of energy and environmental protection/hazardous materials office. Failure to do so may result in the imposition of fines under the applicable Connecticut General Statutes.

During construction, the applicant shall be responsible for site inspection and maintenance to assure proper performance of erosion control measures. Inspection and maintenance shall include, at a minimum, the following:

- Inspect all sediment fence, sediment and erosion control berms and other erosion control measures. Repair or replace any damaged portion in order to insure its proper and effective operation. Remove accumulated sediment if required (greater than 4" depth).
- Inspect all stockpiles. Repair or replace any damaged portion of erosion control measures surrounding these areas in order to prevent sedimentation downgradient.
- Inspect grass restored areas. Revegetate any eroded or disturbed areas to provide permanent stabilization. Reseed and/or revegetate any areas that do not have a suitable stand of grass or any scoured areas to provide permanent stabilization.
- Inspect anti-tracking pad. Remove and dispose of pad and replace if pad is no longer functioning efficiently or accumulated sediment is to a depth of 2" below the stone surface.
- Inspect all stone check dams. Remove accumulated sediment if required (blocking more than 3" depth of flow).
- Inspect all temporary and permanent stormwater basins. Remove accumulated sediment if required (greater than 6" depth), revegetate if necessary to provide stabilization.
- Inspect downgradient areas of all outlets and solar arrays. Stabilize any eroded areas if found.

Erosion and Sediment Control Best Management Practices (BMP'S)

Minimize Disturbed Area and Protect Natural Features and Soil:

Topsoil:

Topsoil will be removed and stockpiled on site and utilized for final grading. Additional topsoil, if required will be supplied from an off-site source. Excess materials resulting from "cut slopes" in the areas of the proposed construction that are not intended for reuse will be immediately removed from the site. When soil is stockpiled, the slope of the stockpile will not exceed 2 horizontal to 1 vertical.

Installation Schedule: As noted, excavated topsoil will be stockpiled on site. Sediment fence will be placed around any stockpiles that are not immediately removed from the site to protect the existing drainage ditches and off site areas.

Maintenance and Inspection: The cut and fill areas will be inspected weekly for erosion. These areas will be stabilized immediately with erosion controls or graded to avoid possible disturbance to the existing drainage ditches or off site areas. See also maintenance and inspection procedures for silt fence.

Control Stormwater Flowing Onto and Through the Project:

Area for Silt to accumulate:

BMP/Installation Schedule: Before any grading operations begin, a sediment and erosion control berm or sediment fence will be installed adjacent to the areas under construction just outside the limits of disturbance.

Other adjacent off site areas will always be protected by a sediment fence or another BMP until final stabilization is achieved.

Maintenance and Inspection: The graded areas and sediment fence will be inspected weekly to ensure that there are no structural failures and immediately after rain events.

Construction Specifications

Sediment and Erosion Control Berm

1. The material for sediment and erosion control berms will be acquired in conjunction with the removal and chipping of trees located within the project area.

Installation

Erect sediment and erosion control berm in a continuous fashion at the specified height and width.

Maintenance:

1. Sediment should be removed once it has accumulated to a depth of 4".
2. Berm should be repaired if it has been breached.
3. Berm can be left in place permanently and left to deteriorate.
4. All sediment accumulated at the berm should be removed and properly disposed of if the berm is to be removed.

Sediment Fence

1. The material for sediment fences should be a pervious sheet of synthetic fabric such as polypropylene, nylon, polyester, or polyethylene yarn.
2. The stakes used to anchor the filter fabric should be wood or metal. Wooden stakes should be at least 3 feet long and have a minimum diameter of 2 inches if a hardwood like oak is used. Stakes from soft woods like pine should be at least 4 inches in diameter.
3. Erect sediment fence in a continuous fashion from a single roll of fabric to eliminate gaps in the fence. If a continuous roll of fabric is not available, overlap the fabric from both directions only at stakes or posts. Overlap at least 6 inches. Excavate a trench to bury the bottom of the fabric fence at least 6 inches below the ground surface. This helps to prevent gaps from forming near the ground surface. Gaps would make the fencing useless as a sediment barrier.
4. The height of the fence posts should be 16 to 34 inches above the original ground surface. Space the posts no more than 10 feet apart.
5. The fence should be designed to withstand the runoff from a 10-year peak storm event. Once installed, it should remain in place until all areas upslope have been permanently stabilized by vegetation or other means.

Installation:

1. Dig a 6" deep trench on the uphill side of the proposed barrier location.
2. Position the posts on the downhill side of the fabric barrier and drive the post 1.5 feet into the ground.
3. Lay the bottom 6" of the fabric barrier in the trench to prevent undermining and backfill.

Maintenance:

1. Sediment should be removed once it has accumulated to 4" depth.
2. Filter fabric should be replaced whenever it has deteriorated to such an extent that the effectiveness of the fabric is reduced (approximately six months).
3. Sediment fence should remain in place until disturbed areas have been permanently stabilized.
4. All sediment accumulated at the fence should be removed and properly disposed of before the fence is removed.

Inspection:

1. Inspect sediment fence before anticipated storm events (or series of storm events such as intermittent showers over one or more days) and within 24 hours after the end of a storm event of 0.5 inches or greater, and at least once every seven calendar days, at least 72 hours apart.
2. Where sites have been finally or temporarily stabilized, such inspections may be conducted once per month.

Straw Bale Barrier

Installation

1. Excavate trench 4" and place material upslope of trench.
2. Place bales in a single row in the trench, lengthwise, with ends of adjacent bales tightly abutting one another and the bindings oriented around the sides rather than along the tops and bottoms of the bales (to avoid premature rotting of the bindings).
3. Anchor each bale with at least 2 stakes, driving the first stake in each bale toward the previously laid bale to force the bales together. Stakes must be driven a minimum of 18 inches into the ground. Fill any gaps between the bales with straw to prevent water from escaping between the bales.
4. Backfill the bales with the excavated trench material to a minimum depth of 4 inches on the uphill side of the bales. Tamp by hand or machine and compact the soil. Loose straw scattered over the disturbed area immediately uphill from the hay bale barrier tends to increase barrier efficiency.

Maintenance

1. Inspect the straw bale barrier 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 to determine maintenance needs. For dewatering operations, inspect frequently before, during, and after pumping operations. Remove the sediment deposits when sediment deposits reach approximately one half the height of the barrier.
2. Replace or repair the barrier within 24 hours of observed failure. Failure of the barrier has occurred when sediment fails to be retained by the barrier because:
   (a) the barrier has been overtopped, undercut or bypassed by runoff water,
   (b) the barrier has been moved out of position, or
   (c) the straw bales have deteriorated or been damaged.
3. When repetitive failures occur at the same location, review conditions and limitations for use and determine if additional controls are needed to reduce failure rate or replace straw bale barrier.
4. Maintain the straw bale barrier until the contributing area is stabilized. After the upslope areas have been permanently stabilized, pull the stakes out of the hay bales. Remove sediment.

Dust Control:

Dust from the site will be controlled by using a mobile pressure-type distributor truck that will apply potable water at rate of 300 gallons per acre and minimized as needed to avoid ponding.

Installation Schedule: Dust control will be implemented as needed once site grading has been initiated, and during windy conditions exceeding 20mph, while site grading is occurring. Spraying of potable water will be performed once per day during the months of March through May and no more than three times per day from June to September or whenever dryness of soil warrants it.

Maintenance Schedule: At least one mobile unit will be available at all times during construction to apply potable water. Each mobile unit shall be equipped with a positive shutoff valve to prevent over watering of disturbed areas.

Soil Stabilization:

Temporary Stabilization:

BMP Description: Hydromulching will be used on slopes where construction will cease for more than 14 days and over the winter months to stabilize erodible materials. Straw mulch and wood fiber will be mixed with a tackifier and applied uniformly by machine with an application rate of 2 tons (100-200 bales) per acre. The contractor will use crimping equipment to bind the mulch to the soil if the tackifier is not effective. Netting will be used on small areas with steep slopes. In areas where hydromulching is inaccessible, straw mulch will be applied by hand at the same application rate.

Temporary Seeding will be used on any area where construction activity is suspended for more than twenty-one days to stabilize erodible materials. Refer to the Erosion Control Plan for guidance on seeding mixtures, rates, and acceptable planting dates for temporary seeding.

Installation Schedule: Portions of the site where construction activities will temporarily cease for more than 14 days will be stabilized with mulch. Where construction activities will temporarily cease for more than 21 days it will be temporarily seeded. Winter stabilization will be provided between December 25 and March 30.

Maintenance and Inspection: Mulched areas will be inspected weekly to ensure that adequate coverage is provided. Repairs will be conducted as needed.

Seed Mixture For Temporary Seeding

	LBS./ACRE	LBS./1000 S.F.
Annual Ryegrass	40	1.0

See Figure TS-2 in the 2002 Guidelines for additional temporary seed mixes.

Final Stabilization:

Permanent seeding should be applied immediately after the final design grades are achieved at the site but no later than 14 days after construction activities have permanently ceased. After the entire site is stabilized, any sediment that has accumulated will be removed and hauled off site to a licensed landfill facility. Construction debris, trash, and temporary BMP's will also be removed and any areas disturbed during removal will be seeded immediately.

Seedbed Preparation:

1. Topsoil will be spread over final graded areas at a minimum depth of four inches. Topsoil shall inclusively mean a soil meeting one of the following soil textural classes established by the United States Department of Agriculture classification system based upon the proportion of sand, silt, and clay size particles after passing a 2 millimeter sieve and subjected to a particle size analysis:
   1.1. Loamy sand, including coarse, loamy fine, and loamy very fine sand, sandy loam, including coarse, fine and very fine sandy loam, loam, or silt loam with not more than 60% silt;
   1.2. Containing not less than 6% and not more than 20% organic matter as determined by loss-on-ignition of oven dried samples dried at 105 degrees centigrade;
   1.3. Possessing a ph range of 6.0-7.5, except if the vegetative practice being used specifically requires a lower ph, then ph may be adjusted accordingly;
   1.4. Having soluble salts not exceeding 500 ppm;
   1.5. And that is loose and friable and free from refuse, stumps, roots, brush, weeds, frozen particles, rocks, and stones over 1.25 inches in diameter, and any material that will prevent the formation of a suitable seedbed or prevent seed germination and plant growth.
2. Fertilizer will be applied to the seedbed as needed. Fertilizers will be commercial type of uniform composition, free-flowing and conforming to the applicable State and Federal laws. Choose native species that are adapted to local weather and soil conditions wherever possible to reduce water and fertilizer inputs and lower maintenance overall.
3. Topsoil will be loosened by raking, tilling or other suitable methods.

Final stabilization should be installed on portions of the site where construction activities have permanently ceased but no later than 14 days after construction ceases.

All seeded areas will be inspected weekly during construction activities for failure until a dense cover of vegetation has been established. If failure is noticed on the seeded area, the area will be reseeded, fertilized and mulched immediately. After construction is complete at the site permanent stabilization measures will be monitored until final stabilization is reached.

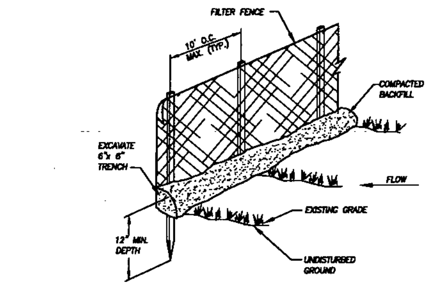
Seed Mixture For Upland Areas

	LBS./ACRE	LBS./1000 S.F.
Kentucky Bluegrass	20	0.45
Creeping Red Fescue	20	0.45
Perennial Ryegrass	5	0.10
	45	1.00

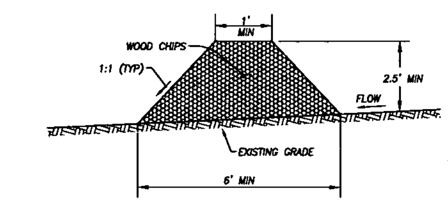
The recommended seeding dates are: April 1–June 15 and August 1–September 15

Planting Specifications:

1. All materials and construction methods shall conform to the requirements of the Connecticut Association of Landscape Contractors Specification. All plants shall be nursery grown and conform to the latest edition of ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK and also the minimum guidelines established for nursery stock published by the American Association of Nurserymen, Inc.
2. No substitution of plant materials will be allowed without the prior written consent of the Project Owner. Where a plant size range is provided at least 50% of the plants shall be of the larger size.
3. All lawn and planting area soil preparation shall be fertilized and amended according to recommendations of a soil analysis provided by an approved soil testing laboratory.
4. All exterior ground areas disturbed by construction and not covered by buildings, structures, paving, continuous planting beds or other site improvements shall be graded, topsoiled to a minimum depth of 4" and grass seeded. Provide lawn development in all areas of selective clearing as directed.
5. All plant pits must be free draining. Break up the bottom of the hole by fork if necessary to ensure plant has proper drainage.
6. Set all plants in center of plant pits, plumb and straight and as detailed on the drawing. All plant material shall bear the same relationship to finished grade as to original planting grade prior to digging. Trees shall be planted with the junction of roots and stem level with finished grade.
7. Handle balled and burlapped plants from the ball only. Once positioned in the hole, remove the top 1/3 of the burlap from the root ball without disturbing the roots.
8. Face each plant to give the best appearance. Final location of plant material should be approved by the Project Owner in the field.
9. Fill plant pits 2/3 their depth with prepared planting mixture, water thoroughly and allow to settle. Complete back-filling, water thoroughly to eliminate any voids and air pockets. Provide additional back-fill as necessary to conform to required elevation and as detailed.
10. Form saucer and install mulch over entire plant pit and saucer area as detailed.
11. All tree staking or guying shall be completed immediately after planting, but in no instance more than 24 hours after planting. See staking/guying detail. At the completion of the maintenance period remove all stakes, flogs, guys, tree wrap, and anchors.
12. Mulch all new shrub beds and plant pits to achieve a 3" depth after settlement. Mulch all ground cover beds to achieve a 2" depth after settlement. Mulch for saucers and planting areas to be a double shredded bark mulch.
13. All plants shall be guaranteed for a period of one full year after inspection and acceptance by the Owner's representative, and shall have at least 80% healthy growth at the end of the guarantee period.
14. Landscape planting materials as proposed by this plan are Connecticut native and/or non-invasive species. This landscape plan has been designed to incorporate species which are prolific in USDA plant hardiness zone 6b and which require minimal energy input for upkeep and maintenance. References utilized for Connecticut native and non-invasive species selection include the Connecticut Botanical Society, the Connecticut agricultural experiment station, the U.S. Department of Transportation Federal Highway Administration, 2004 Connecticut Stormwater Quality Manual, New England Wetland Plants, Inc., and other sources.



SEDIMENT FENCE DETAIL
NOT TO SCALE



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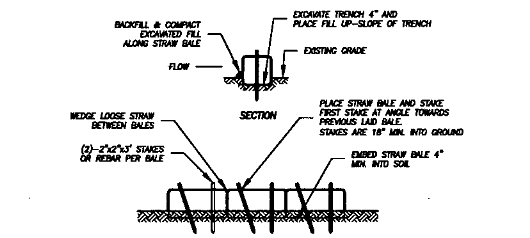

STRAW BALE BARRIER DETAIL
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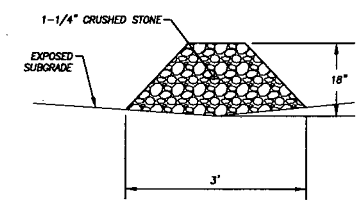

STONE CHECK DAM SECTION
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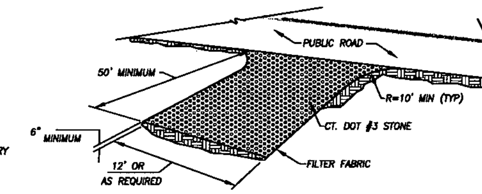

ANTI-TRACKING PAD
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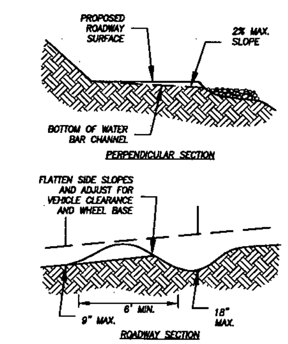

WATER BAR DETAIL
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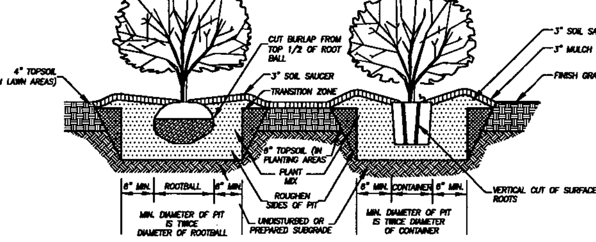

NOTES:
1. SET CROWN OF ROOTBALL 2" ABOVE FINISH GRADE.
2. FOR CONTAINER GROWN STOCK USE FINGERS OR A SHARP KNIFE TO LOOSEN ROOTS OUT OF THE OUTER LAYER OF POTTING SOIL: THEN CUT OR PULL APART ANY ROOTS CIRCLING THE PERIMETER OF THE CONTAINER.
3. AT PLANTING THOROUGHLY SOAK THE ROOT MASS AND ADJACENT SOIL. REPEAT SEVERAL TIMES DURING THE FIRST MONTH AND THROUGHOUT THE FOLLOWING TWO SUMMERS.

SHRUB PLANTING DETAIL
NOT TO SCALE

LANDSCAPE SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY	COMMENT
TREES AND SHRUBS					
THOC2	Thuja Occidentalis	"Emerald Green" Arborvitae	5' Height	238	C.G.
TACA7	Taxus Canadensis	Canada Yew	2–3' Height	62	C.G.

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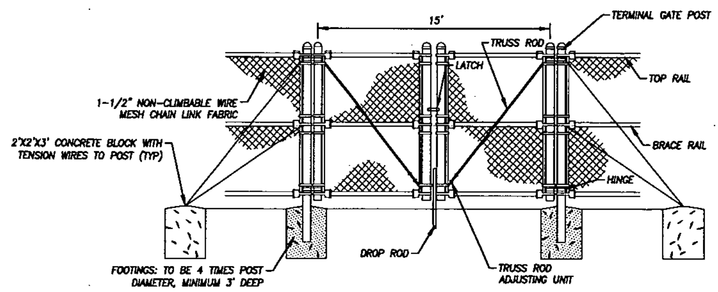
SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Erosion and Sediment Control Narrative & Details

SCALE: As Noted
DATE: August 2015
JOB I.D. NO. 15-2327
Revisions

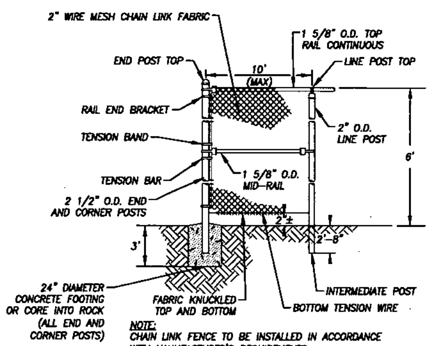
SHEET NO.
9 / 10



NOTE:
SWING GATES TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

6' HIGH GALVANIZED SWING GATE DETAIL

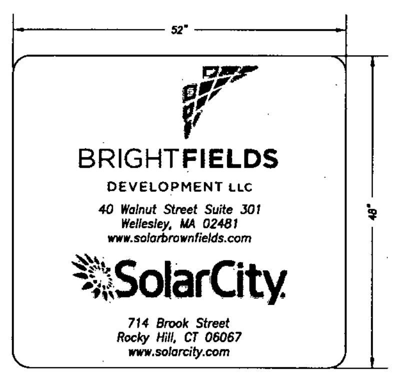
NOT TO SCALE



NOTE:
CHAIN LINK FENCE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

GALVANIZED CHAIN LINK FENCE DETAIL

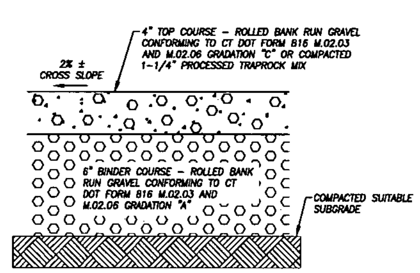
NOT TO SCALE



NOTE:
1. SIGNS MOUNTED ON GATES AT ALL ENTRANCES.
2. SIGNS TO BE RATED FOR OUTDOOR ENVIRONMENTS.

IDENTIFICATION SIGNAGE

NOT TO SCALE



TRAFFIC BOUND GRAVEL SURFACE

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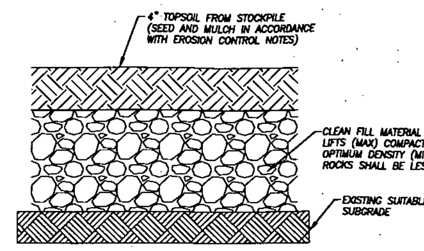

FILL PLACEMENT DETAIL

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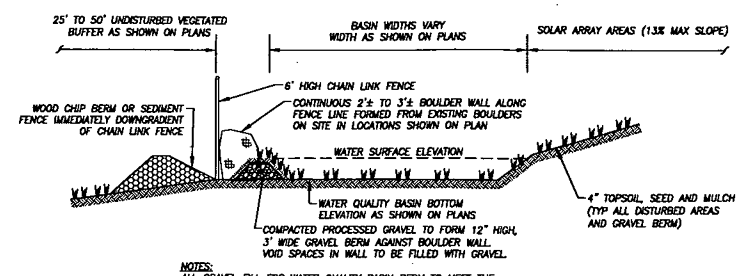
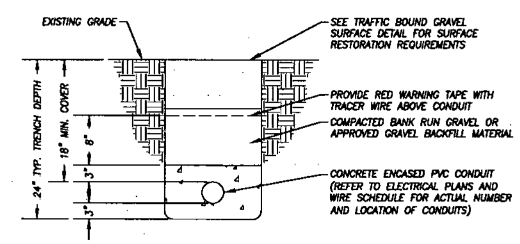


NOTES:
ALL GRAVEL FILL FOR WATER QUALITY BASIN BERM TO MEET THE REQUIREMENTS OF CT DOT FORM 816 M.02.06 GRADATION A.

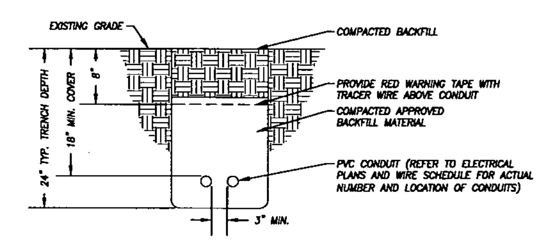
WATER QUALITY BASIN DETAIL

NOT TO SCALE



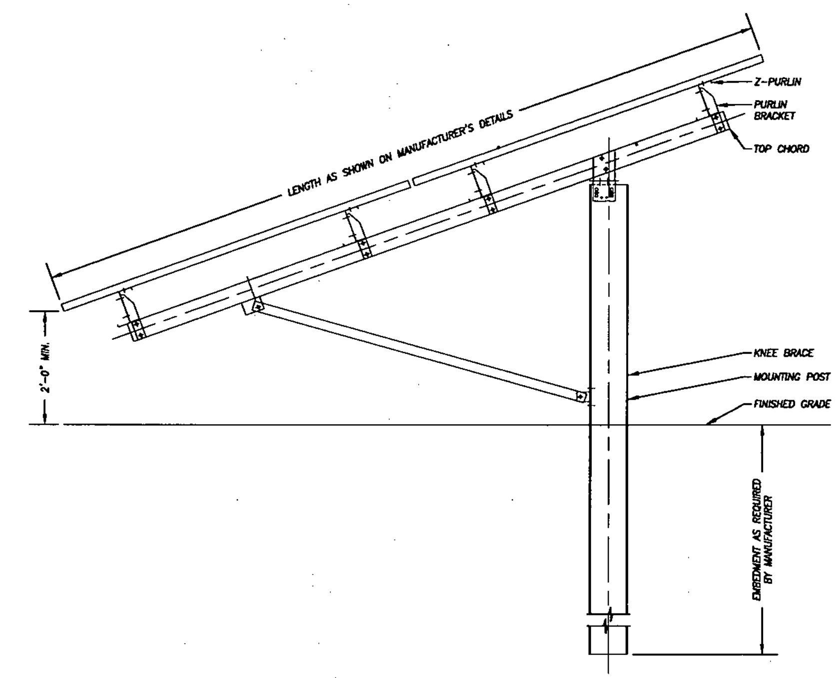
CONDUIT TRENCH THROUGH GRAVEL DRIVE DETAIL

NOT TO SCALE



NON-TRAFFIC CONDUIT TRENCH DETAIL

NOT TO SCALE



NOTES:
SEE MANUFACTURER'S DETAIL SHEETS FOR ADDITIONAL INFORMATION REGARDING RACKING SYSTEM REQUIREMENTS AND INSTALLATION PROCEDURES. RACKING SYSTEM TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

TYPICAL POST MOUNTED RACKING SYSTEM DETAIL

NOT TO SCALE

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SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Site Details

SCALE: As Noted
DATE: August 2015
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Revisions

SHEET NO.
10 / 10

EXHIBIT 2

ENVIRONMENTAL ASSESSMENT

SOLAR FACILITY INSTALLATION

9 STOTT AVENUE AND 292 PLAIN HILL ROAD

NORWICH, CONNECTICUT

NEW LONDON COUNTY

Prepared for:

SolarCity Corporation
c/o Brightfields Development, LLC
40 Walnut Street, Suite 301
Wellesley, MA 02481

Prepared by:

All-Points Technology Corporation, P.C.
3 Saddlebrook Drive
Killingworth, CT 06419

August 2015

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APPENDIX B	Breeding Bird Inventory Table
APPENDIX C	CTDEEP NDDB Letter
APPENDIX D	Emergency Response Guide
APPENDIX E	Construction Schedule
APPENDIX F	Construction Work Hours/Days Letter
APPENDIX G	Wetland Protection Plan
APPENDIX H	Noise Evaluation Report
APPENDIX I	Photo-Simulations

Project Introduction

All-Points Technology Corporation, P.C. ("APT") prepared this Environmental Assessment ("EA") on behalf of SolarCity Corporation ("SolarCity") c/o Brightfields Development, LLC for the proposed installation of a 4.93 megawatt ("MW") solar-based electric generating facility in the City of Norwich, Connecticut (the "Project").

This EA has been completed to support SolarCity's submission of a petition for declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the construction, maintenance, and operation of the Project.

The Project would be located at 9 Stott Avenue and 292 Plain Hill Road ("Site"). Combined, these two (2) parcels encompass approximately 27.41 acres. Figure 1, *Project Location Map,* depicts the location of the Site and surrounding area.

The Site lies at the northeast end of an industrial business park and is bounded to west and south by commercial development, including Dodd Stadium across Stott Avenue to the south. Agricultural land and sparse residential development lies to the north and east of the Site.

The proposed solar array ("facility") would be comprised of approximately 15,912 Trina 310 watt modules and six (6) Solectria SGI inverters. The facility would utilize an RBI Solar post-driven mounting system with individual panels placed at a 25° tilt to the south. The Project would occupy approximately 15 acres of the Site ("Project Area"), a majority of which is cultivated field.

C:\GIS\Projects\Brightfields Development LLC\Norwich\mxd\Figure 1 Project Location Map.mxd

Legend

- Project Area (+/-15.03 acres)
- Proposed Lease Area (+/-22.80 acres)
- Site Property Boundary

Map Notes:
Base Map Source: USGS 7.5 Minute Topographic Quadrangle Map, Norwich (1983), CT
Map Scale: 1:24,000
Map Date: July 2015

N W E S

1,000 500 0 1,000 Feet

Figure 1
Project Location Map

Proposed Solar Facility
9 Stott Avenue
Norwich, Connecticut

BRIGHTFIELDS DEVELOPMENT LLC

ALL-POINTS TECHNOLOGY CORPORATION

Existing Conditions

The purpose of this section is to describe current conditions on the Site. A detailed discussion of the proposed Project's effects on the environment is provided in the following section of this document.

Project Location

The Project would be located at 9 Stott Avenue and 292 Plain Hill Road ("Site"). Combined, these two (2) parcels encompass approximately 27.41 acres. The parcels are identified in City of Norwich Tax Assessor records as:

- 9 Stott Avenue – Map 28, Block 1, Lot 10 (10.96 acres in size) located within a Business Park Zone[1]; and,
- 292 Plain Hill Road – Map 28, Block, Lot 13 (16.45 acres) located within an R40 (residential) Zone.

A large part of the Site is currently undeveloped, agricultural land. The Site does house a number of structures. Farm buildings associated with the Mountain Ash Dairy Farm are located in the northeast portion adjacent to Plain Hill Road northeast corner of the Site, fronting Plain Hill Road. A 180-foot tall communications tower and associated ground equipment compound are centrally located on the Site. The southwestern portion of the Site, adjacent to Stott Avenue, is developed with a batting cage operation. Land use in the area of the Site consists of an industrial business park, large wooded tracts, agricultural fields, and sparse residential development. Site topography in the area proposed for development is generally level, with a slight slope down towards the west.

The Project Area encompasses approximately 15 acres in the western and southeast portions of the Site, a majority of which is cultivated field. The batting cage operation would be removed to accommodate the Project. No other structures will be affected.

---

[1] Tax Assessor's Field Card lists this parcel within a "BP" Zone (Business Park); the current City of Norwich Zoning Map (available online at http://ct-norwich.civicplus.com/DocumentCenter/View/185) depicts this parcel within a Residential (R40) Zone.

Site Access

Existing access to the Project Area can be gained via driveways originating off Stott Avenue in the southern portion of the Site. The residence and outbuildings occupying the Site can also be access from Plain Hill Road.

Figure 2, *Existing Conditions Map*, depicts current conditions on the Site, its access, abutting properties, and several key features discussed herein.

Wetlands and Watercourses

Three (3) wetland areas are located within and bordering the Site. These resources (referred to herein as Wetland 1, 2, and 3) consist primarily of a large forested wetland with interior intermittent stream and bordering hillside seep scrub/shrub habitat; a small, perched, wooded wetland system (formed in either flat or moderately sloping, dense glacial till); and, a small isolated artificially constructed wetland 'pit'. The vast majority of the Site is comprised of upland areas.

Matthew Gustafson, a Connecticut-registered Soil Scientists with APT, conducted inspections and delineations of wetlands present at the Site on January 22, 23 and April 8, 2015.

A copy of the APT *Inland Wetland & Watercourse Report* prepared by Mr. Gustafson is included as Appendix A.

Wetlands 1, 2, and 3 are summarized below and depicted on the *Existing Conditions Map* provided as Figure 2.

Wetland 1 is located along the western edge of the Site and consists of complexes of forested and scrub/shrub hillside seep wetland systems and interior intermittent stream systems generally draining west and south. This wetland system extends to the west, north, and south, eventually draining south under Stott Avenue via a 24-inch reinforced concrete pipe culvert. Forested wetland areas are focused along the western edge of the Site boundary, while scrub/shrub habitats are concentrated along west facing hillside seep areas historically cleared for farming activities. Two interior intermittent streams are present, with one draining east to west across the northern extent of the Site, and the second draining north to south along the western Site boundary.

C:\GIS\Projects\Brightfields Development LLC\Norwich\mxd\Figure 2 Existing Conditions Map.mxd

Legend

- Project Area (+/-15.03 acres)
- Proposed Lease Area (+/-22.80 acres)
- Site Property Boundary
- Start/End Wetland Flag
- Wetland Boundary
- Wetland Area

Figure 2
Existing Conditions Map

Proposed Solar Facility
9 Stott Avenue
Norwich, Connecticut

BRIGHTFIELDS DEVELOPMENT LLC

Map Notes:
Base Map Source. 2012 Aerial Photograph (CTECO)
Map Scale: 1 inch = 250 feet
Map Date: July 2015

250 125 0 250 Feet

N W E S

ALL-POINTS TECHNOLOGY CORPORATION

Both intermittent stream systems contain areas of seasonal open water areas/emergent habitats within depressions. Evidence of historic anthropogenic influence is readily apparent through much of Wetland 1 consisting of old access roads, stone walls, scrub/shrub habitats dominated by multiflora monocultures, and understory forested wetland areas dominated by Japanese barberry monocultures. A portion of this wetland system extends eastward into an adjacent agricultural field.

The dominant vegetation types of this wetland are characterized as forested and scrub/shrub with some periphery areas of emergent vegetation. A small edge forest block dominates much of the wetland system, consisting of red maple (*Acer rubrum*) overstory with an understory of spicebush (*Lindera benzoin*), Japanese barberry (*Berberis thungergii*), skunk cabbage (*Symplocarpus foetidus*), and cinnamon fern (*Osmundastrum cinnamomeum*). Non-forested areas consist primarily of multiflora rose (*Rosa multiflora*) dominant scrub/shrub habitats (old field successional) with some edge emergent areas dominated by reed canary grass (*Phalaris arundinacea*) and goldenrod species (*Solidago spp.*).

Wetland 2 is located next to the telecommunication tower, in between two agricultural fields, with a stone wall generally confining the western boundary of the wetland system. Western edges of the wetland area are dominated by forest (red maple), while eastern portions are primarily scrub/shrub dominant (multiflora rose). Wetland 2 is formed as a perched system in dense glacial till generally draining north to south. Narrow diffuse/inconspicuous intermittent stream channels were noted during the inspection. Based on time of year field conditions, it was not readily apparent if these flow paths were consistent with a regulated intermittent stream or a result of stormwater runoff.

Wetland 2 is characterized as woodland dominant with large canopy gaps allowing for interspersed forested and scrub shrub areas. Species typical of either habitat are consistent with those found in Wetland 1.

Wetland 3 is a small, isolated, depressional pocket wetland. This wetland was historically created through a small excavation pit that now retains water as a result of the underlying dense glacial till. Water depth at the time of the second inspection was recorded at 1-3 inches. Hydrology is not significant enough, or sufficiently persistent to support vernal pool breeding habitat.

Dominant vegetation identified within Wetland 3 consists of emergent species including reed canary grass (*Phalaris arundinacea*) and broadleaf cattail (*Typha latifolia*).

Soils encompassing the Project Area were field classified predominantly as upland soil units consisting of the following: Canton and Charlton soils, Charlton-Chatfield complex, Sutton fine sandy loam, and Woodbridge fine sandy loam. Wetland soils identified within the wetland resources at the Site consist of Ridgebury, Leicester, and Whitman soils. Identified soils are generally consistent with digitally available soil survey information obtained from the Natural Resources Conservation Service ("NRCS")[2].

Vernal Pools

Calhoun and Klemens (2002) provide the following operational definition of vernal pools:

> *Vernal pools are seasonal bodies of water that attain maximum depths in the spring or fall, and lack permanent surface water connections with other wetlands or water bodies. Pools fill with snowmelt or runoff in the spring, although some may be fed primarily by groundwater sources. The duration of surface flooding, known as hydroperiod, varies depending upon the pool and the year; vernal pool hydroperiods range along a continuum from less than 30 days to more than one year. Pools are generally small in size (<2 acres), with the extent of vegetation varying widely. They lack established fish populations, usually as a result of periodic drying, and support communities dominated by animals adapted to living in temporary, fishless pools. In the region, they provide essential breeding habitat for one or more wildlife species including Ambystomid salamanders (Ambystoma spp., called "mole salamanders" because they live in burrows), wood frogs (Rana sylvatica), and fairy shrimp (Eubranchipus spp.).*

A vernal pool habitat survey was performed in parallel with other wetland and biological surveys. Areas within 750 feet[3] of the Site were inspected for the potential of supporting vernal pool breeding habitat. No areas potentially supporting vernal pool habitat are located within 750 feet of the Site. All identified wetland areas (Wetlands 1, 2, and 3) at the Site were found to not contain sufficient or persistent hydrology to support vernal pool habitat.

---

[2] NRCS Web Soil Survey, http://websoilsurvey.nrcs.usda.gov/app/, accessed on July 6, 2015.

[3] Consistent with the extent of the *Critical Terrestrial Habitat* (750 feet) conservation zone surrounding vernal pools as established by Calhoun and Klemens.

Vegetation and Wildlife

The following is a discussion of habitat community types present on the Site and the associated wildlife observed and likely to be utilizing these areas. All of the Site's habitat types are not of significant block sizes to support the more habitat-specialized wildlife (including mammalian, avian, and herpetofauna etc. species). As such, a focus has been made to discuss the avian species that are most likely to be associated with these habitat types.

Bird Inventory

Davison Environmental, LLC conducted a breeding bird assessment of the Site on behalf of APT, Inc. on July 15, 2015. This assessment focuses on species considered to be of high conservation priority in Connecticut as designated in the 2015 Connecticut Wildlife Action Plan[4] ("WAP", hereinafter). The WAP was created to establish a framework for proactively conserving Connecticut's fish and wildlife, including their habitats. The WAP identifies Species of Greatest Conservation Need ("SGCN") that fall into three categories in descending order of significance from *Most Important* to *Very Important* and finally *Important*. The WAP also identifies 10 key habitat types that support all of the State's SGCN.

Methodology

A Breeding Bird Inventory was developed that represents a list of birds that potentially breed on the Site, based on the presence of suitable habitat and available data sources. This list was generated from a database that was developed by reviewing information on the habitat utilization of Connecticut's breeding birds. The primarily resource for habitat utilization data was Bevier (Ed., 1994), with A. Poole (1995) and DeGraaf and Yamasaki (2001) utilized as secondary resources. The initial inventory, generated solely based the presence of suitable habitat, was refined by considering such factors as bio-geographical distribution, the presence or absence of critical habitat features and minimum patch size requirements. The inventory is subdivided by habitat type. A species is listed under the habitat(s) which occupy the species typical home range. However, given that habitats are generally connected by transitional

[4] The Wildlife Action Plan, formerly Connecticut's Comprehensive Wildlife Conservation Strategy (2005) is currently in preparation by DEEP for release in 2015.

ecotones, a species should be considered to be potentially present within the ecotones associated with their primary habitat(s).

All birds seen or heard during the July Site assessment were noted as observed in the *Breeding Bird Inventory Table* provided in Appendix B. While these bird observations do not constitute a detailed breeding bird survey, these species were observed within the typical breeding season for the majority of Connecticut's birds (i.e., April through August) and are therefore considered possible Site breeders as defined by Bevier (1994)[5].

Habitat Types

Six (6) habitat types are present in the Project Area, these include: (1) agricultural (cornfield); (2) developed; (3) woodland/shrubland; (4) old field (including hedgerows); (5) upland forest; and, (6) forested wetland. These habitat types are depicted on Figure 3, *Habitat Cover Map*. All but one of these Site habitats (developed) meet the characteristics of a WAP key habitat.[6]

Agricultural (active cornfield)

The Site contains two active cornfields totaling approximately 10 acres. Cornfields offer suitable habitat for species that utilize scarified croplands subject to frequent disturbance. These fields are frequently used as a feeding site by aerial insectivores such as the tree swallow, as well as ground feeders that feed on insects within the exposed soils, such as the American robin.

Developed

The Site includes a number of structures, including farm buildings associated with the Mountain Ash Dairy Farm, batting cages and a telecommunications tower with associated ground structures. As a result, several classic farm-associated species that nest in structures and feed in the adjacent open agricultural areas were present, such as the house finch, barn swallow and phoebe.

[5] A "possible" breeder as defined by Bevier (1994) includes observation of bird (male, female or singing male) within suitable habitat during the breeding season. The majority of observed birds were singing males.

[6] A description of WAP key habitat types can be found at: http://www.ct.gov/deep/lib/deep/wildlife/pdf_files/nongame/ctwap/CTWAP-Chapter4.pdf

C:\GIS\Projects\Brightfields Development LLC\Norwich\mxd\Figure 3 Habitat Cover Map.mxd

Legend

- Project Area (+/-15.03 acres)
- Proposed Lease Area (+/-22.80 acres)
- Site Property Boundary
- Wetland Boundary
- Wetland Area

Habitat Cover Type (totals noted are within proposed lease area)

- Agriculture - Corn Field (+/-9.18 acres)
- Developed (+/-2.31 acres)
- Forested (+/-1.92 acres)
- Forested Wetland (+/-1.56 acres)
- Old Field-Hedgerow (+/-5.69 acres)
- Woodland/Shrubland (+/-2.14 acres)

Map Notes:
Base Map Source: 2012 Aerial Photograph (CTECO)
Map Scale: 1 inch = 250 feet
Map Date: July 2015

250 125 0 250 Feet

N S E W

Figure 3
Habitat Cover Map

Proposed Solar Facility
9 Stott Avenue
Norwich, Connecticut

BRIGHTFIELDS DEVELOPMENT LLC

ALL-POINTS TECHNOLOGY CORPORATION

The telecommunications tower provides a perching site for raptors, vultures, crows and other high-perching species. Overall the developed portions of the Site offer little habitat for birds with the exception of urbanized, disturbance tolerant species. Note that the batting cages represent the only developed portions of the Site within the Project Area.

Woodland/Shrubland

The central wooded "island" that separates the two cornfields consists of woodland interspersed with pockets of shrubland habitat, totaling approximately 1.5 acres. The area contains a dense understory, midstory and vine layer that provides ample cover and nesting habitat for a number of edge species (e.g., gray catbird) and offers high-quality migratory cover habitat.

The woodland/shrubland habitat area is identified as a red maple seasonally flooded cover type. This habitat type is comprised of red maple (within wetland areas) and white ash/red oak/white oak (edge upland areas) dominant overstory with a dominance of multiflora rose, Asiatic bittersweet, spicebush, poison ivy, and Virginia creeper understory. Due to the dense glacial till and perched seasonal water table, the overstory canopy has large gaps allowing for dense scrub/shrub dominance.

Old Field (including hedgerows)

The Site contains a complex of old field, hedgerows and low herbaceous areas collectively referred to as shrublands. These areas offer habitat for a number of early-successional bird species. Due to the small patch size (ca. three acres), the old field habitat does not represent significant habitat for shrubland specialists such as the prairie warbler, but does offer habitat for successional generalists as well as edge species, such as the song sparrow and northern mockingbird. The area west of the cow barn contains a dense growth of agricultural weed species which offers high-quality migratory habitat, particularly for sparrows, due to the abundance of seeds along with low, dense herbaceous cover.

This habitat cover type is primarily located in the northern central portion of the Site. These areas were historically cleared and have been allowed to revegetate. As such, they are now dominated by complexes of early successional scrub/shrub species intermixed with open meadow and field habitats. Scrub/shrub areas compose a large percentage of this habitat cover type, with open meadows primarily being located in the eastern extents of the area. The scrub/shrub habitat is dominated by multiflora rose (*Rosa multiflora*) with intermixed pin cherry

(*Prunus pensylvanica*) and white ash (*Fraxinus americana*) saplings and small trees. Additional aerial coverage is comprised of vine species including Virginia creeper (*Parthenocissus quinquefolia*) and Asiatic bittersweet (*Celastrus orbiculatus*). Open meadow areas are dominated by a complex of goldenrods (*Solidago spp.*), stinging nettle (*Urtica dioica*), quackgrass (*Elymus repens*), Japanese hops (*Humulus japonicus*), and greater burdock (*Arctium lappa*). Hydrology ranges from wetland complexes including wet and dry hillsides, and dry flat topographic areas. This results in the greater diversity of species, and vertical strata.

Mixed Hardwood Forest

The Site contains approximately 5.27 acres of upland mixed hardwood forest. This habitat type comprises the second largest vegetation community type area on the Site, located in a majority of the western portions of the property and extending off-Site to the west and north. The Project Area includes approximately 1.92 acres of this habitat. This forest habitat is dominated by an American Beech-White Oak-Northern Red Oak-Tuliptree community. This forested community type is characterized by an overstory dominated by northern red oak (*Quercus rubra*) and white oak (*Quercus alba*) with an understory of mapleleaf viburnum (*Viburnum acerifolium*) spicebush (*Lindera benzoin*), and Japanese barberry (*Berberis thunbergii*). This forest type is classified as even-aged forest with closed canopy and little advanced regeneration present (i.e. within a stem exclusionary successional phase).

Forested Wetland

The forested wetlands on the Site include well-developed herbaceous, shrub and midstory vegetative layers which include high stem and foliage densities. Such vegetative structure offers suitable nesting habitat for forest-dwelling birds that favor moist conditions, including the veery, brown creeper and hermit thrush. However, the fragmented nature of the forested habitat within the local landscape (both upland and wetland forest) is a limiting factor for forest-dwelling wildlife. Regarding birds that are forested wetland specialists, only two species were identified as potential users – the brown creeper and the northern waterthrush. A Red Maple/Northern Spicebush community occurs within forested wetland areas and is dominated by red maple (*Acer rubrum*), spicebush (*Lindera benzoin*), and Japanese barberry (*Berberis thunbergii*).

Forest Metric Data

Forest metric data was collected for both cover types found at the Site, including average tree height, species diversity, and trees per acre. Average tree height was recorded at 75 to 85 feet. Average diameter at breast height was recorded in the ranges of 10 to 16 inches. The number of trees per acre was calculated at 86 trees per acre between both the upland and wetland forested areas.

Results

A total of 71 birds are identified in the *Breeding Bird Inventory Table* (see Appendix B), with 18 confirmed and another 53 listed as potential breeders based on the presence of suitable habitat. This list includes 24 SGCN (34%): eleven (11) *Important* species; ten (10) *Very Important* species; and, three (3) *Most Important* species.

The inventory includes two state-listed species as potentially present (although not observed at the Site): the brown thrasher and broad-winged hawk. Brown thrasher typically inhabit thickets, brushy hillsides and woodland edges in suburban and rural areas (Bevier, 1994). Maturation of forest and other factors causing loss of early successional habitat are driving the decline in this species. Although more information is needed to adequately assess the population trend of this species in Connecticut, state-wide breeding bird survey data shows a steady decline of 3.5% annually over the last four decades. The Site's old field represents suitable breeding habitat for thrasher. However, due to the small size of the old field habitat available (<3 acres) the Site would be capable of supporting only a small number of thrasher pairs, as the average territory size is 1.6 acres (DeGraaf and Yamasaki, 2001).

The Broad-winged Hawk is considered a habitat generalist, inhabiting deciduous or mixed forest types often near a lake, pond or wetland. Bevier (1994:102) noted that "the Broad-winged Hawk exhibits a diversified nest site habitat selection". Due to the non-specific nature of the habitat requirements for this species, it is commonly listed in a habitat-based based bird inventory. The Site's forest edges coupled with a large forested wetland represent suitable habitat for this species.

Assessment Key Habitats

The Site contains five (5) WAP key habitats: (1) mixed hardwood forest; (2) old field; (3) woodland/shrubland; (4) agricultural; and (5) forested wetlands. The greatest potential for negative effects on upland forest SGCN is to those birds that are considered forest-interior birds (e.g., wood thrush). Forest interior birds have become the focus of conservation efforts region-wide due to long-term population declines of many of these species due to forest fragmentation.

Forest-interior birds favor the interior of the forest or *forest core* away from non-forested *edge* habitat. Forest interior birds generally avoid edge habitat for nesting as it creates conditions favorable to predators such as raccoons and nest parasites such as brown-headed cowbird. As discussed, the Site's forest habitat is highly fragmented, and is not part of a large contiguous or core forest. Therefore, the habitat value for target species (i.e., forest-interior birds) is low due to the fact the forest present lacks forest-interior habitat.

The Site contains approximately three acres of old field or shrubland. Early-successional (i.e., non-forested) habitats such as shrublands have the potential to support shrubland-dependent SGCN, which are some of the rarest birds in the State. However, when considering two critical factors used to assess the value of such habitats - patch size and configuration, the Site is sub-optimal. This is due to the following factors:

1. Many shrubland specialists require a minimum patch size of 10 acres. Smaller habitat patches generally do not attract shrubland specialists;
2. If present, the small amount of habitat available is not capable of supporting significant populations of shrubland specialists; and
3. The configuration and distribution of shrubland is irregular which increases habitat edge and decreases habitat interior.

Therefore, the shrublands present are not well-suited for many shrubland specialists. They are capable of supporting shrubland birds that do not require a large patch size, such as the song sparrow, northern mockingbird or indigo bunting.

While cornfields are technically classified as a WAP key habitat type because they are anthropogenic agricultural lands, they offer little habitat for birds due to the intensive land-use.

The frequent disturbance (i.e., planting, tilling, harvesting) and the lack of cover offers little to no nesting habitat. A single species, the killdeer, is listed as a potential nester. However, these fields do offer feeding habitat for aerial and ground-feeding insectivores.

Forested wetlands are also present on the Site and considered a WAP key habitat type. However, their designation as a WAP key habitat is largely due to their importance for other suites of wildlife rather than birds.

Rare Species

The Connecticut Department of Energy and Environmental Protection ("CTDEEP") Natural Diversity Data Base ("NDDB") program performs hundreds of environmental reviews each year to determine the impact of proposed development projects on state listed species and to help landowners conserve the state's biodiversity. State agencies are required to ensure that any activity authorized, funded or performed by a state agency does not threaten the continued existence of endangered or threatened species. Maps have been developed to serve as a pre-screening tool to help applicants determine if there is a potential impact to state listed species.

The NDDB maps represent approximate locations of endangered, threatened and special concern species and significant natural communities in Connecticut. The locations of species and natural communities depicted on the maps are based on data collected over the years by CTDEEP staff, scientists, conservation groups, and landowners. In some cases an occurrence represents a location derived from literature, museum records and/or specimens. These data are compiled and maintained in the NDDB. The general locations of species and communities are symbolized as shaded (or cross-hatched) areas on the maps. Exact locations have been masked to protect sensitive species from collection and disturbance and to protect landowner's rights whenever species occur on private property.

APT reviewed the most recent CTDEEP NDDB mapping (December 2014) to determine if any such species or habitats occur within the vicinity of the Site. Based on the NDDB mapping, no Threatened, Endangered, or Special Concern species or critical habitats are known to occur at or in the general vicinity of the Site.

APT also submitted a review request to the CTDEEP NDDB with respect to this Project to confirm no Threatened, Endangered, or Special Concern species or critical habitats exist at the

Site. The CTDEEP responded in writing (letter dated July 29, 2015) that the agency does "not anticipate negative impacts to State-listed species (RCSA Sec. 26-306) resulting from your proposed activity at the site". See Appendix C, *CTDEEP NDDB Letter*.

Water Supply Areas

There are no public water supply wells proximate to the Site. The Site is not located within an Aquifer Protection Area.

Water Quality

Groundwater beneath the Site is classified by CTDEEP as "GA". A "GA" classification indicates groundwater within the area is presumed to be suitable for human consumption without treatment. Designated uses in GA-classified areas include existing private and potential public or private supplies of drinking water and base flow for hydraulically-connected surface water bodies.

The Site is located within the Thames River Major Drainage Basin. The southern portion of the Site is located within the Yantic River Regional and Sub-regional Drainage Basins. The northern portion of the Site is located within the Shetucket River Regional Drainage Basin and the Beaver Brook Sub-regional Drainage Basin 3804.

A small unnamed stream is located on the northwestern portion of the Site. The unnamed stream is a tributary that flows into Elisha Brook which is located approximately 1,000' west and downgradient of the Site. The unnamed stream and the Elisha Brook are classified by the CTDEEP as Class A surface water bodies. Designated uses for Class A surface water bodies include habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; and water supply for industry and agriculture.

Scenic Areas

No State or locally-designated scenic roads are located proximate to the Site.

Historic and Archaeological Resources

APT reviewed relevant historic and archaeological information to determine whether the Site holds potential cultural resource significance. No reported historical resources or archaeological sites exist at the Site. There are no districts, features or structures listed on the National Register of Historic Places proximate to the Site. APT submitted Project information to the State Historic Preservation Office ("SHPO") for agency review and comment. The SHPO has not responded to date. The agency's letter will be provided to the Council upon receipt by APT.

Geology and Soils

Surficial materials on the Site are comprised of deposits of glacial till. The western portion of the Site is overlain with deposits of thin glacial till while the eastern portion of the Site (along Plain Hill Road) is overlain with deposits of thick glacial till. Soils located on the Site are identified as Woodbridge fine sandy loam.

Bedrock geology beneath the Site is identified as the Yantic Member of the Tatnic Hill Formation of the Upper and/or Middle Ordovician. Yantic Member of the Tatnic Hill Formation is described as a medium to dark-gray, fine to medium-grained schist, composed of quartz, oligoclase, biotite, and muscovite, some layers with garnet, staurolite, and kyanite or garnet and sillimanite, local epidote, or K-feldspar with some layers of rusty-weathering graphitic, pyrrhotitic, two-mica schist.

Floodplain Areas

APT reviewed the United States Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") for the Site. A FIRM is the official map of a community on which FEMA has delineated both the special hazard areas and risk premium zones applicable to the community. The area of the Site is mapped on FIRM PANEL #09011 C0203 G, dated July 18, 2011. Based upon the reviewed FIRM Map, the Site falls within an area designated as Zone X, which is defined as an area of minimal flooding.

Recreational Areas

The nearest recreational area is the Salt Rock State Campground, located approximately 1.7 miles to the northwest.

Noise

A Noise Evaluation Study was prepared for the Project by HMB Acoustics LLC of Avon, Connecticut[7]. Based on sound measurements obtained at the Site and adjacent locations, the average levels are between 25 and 30 dBA[8].

Lighting

The residence and barn have electricity and lighting.

Coastal Zone Management Areas

The City of Norwich is not located within the Coastal Area or Coastal Boundary, as defined by the Coastal Management Act, CGS § 22a-94(a).

Other Surrounding Features

The locations of non-residential development and other resources within two miles of the Site are listed in the following table. Figure 4, *Surrounding Features Map* depicts these locations relative to the Site.

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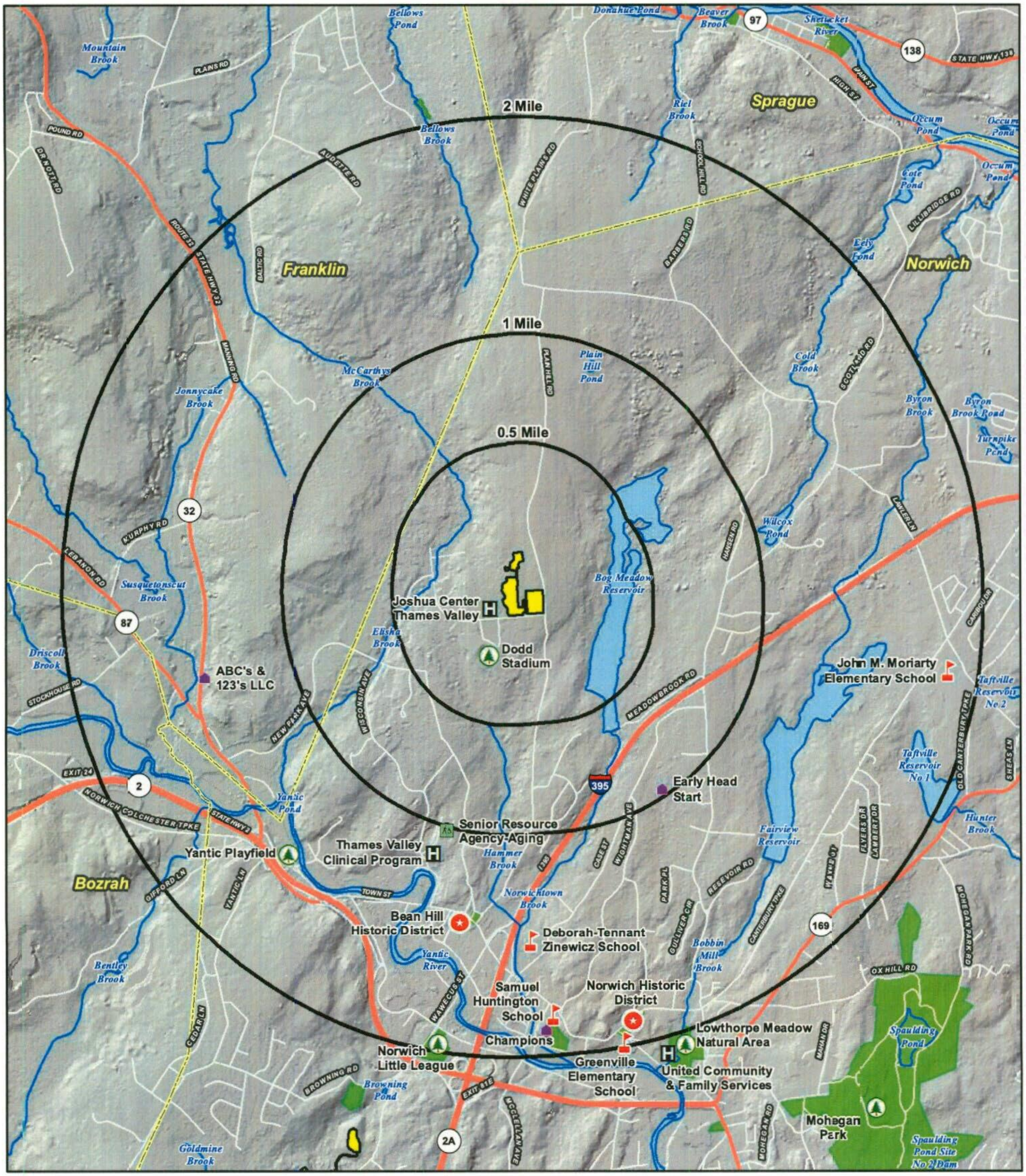
[7] The HMB report is provided in Appendix H. See also the Noise discussion in Effects on Environment section of this document

[8] Sound measurements obtained on July 10, 2015 by HMB Acoustics LLC, of Avon, Connecticut.

Non-Residential Features within Two Miles of the Site

Type	Name	Address	Town	Distance to Site
Recreational/Park	Dodd Stadium	14 Stott Avenue	Norwich	840-feet SW
	Lowthorpe Meadow Natural Area	Off Washington Street	Norwich	2 miles S
	Norwich Little League	170 Otrobando Avenue	Norwich	1.9 miles S
	Yantic Playfield	147 Yantic Road	Norwich	1.4 miles SW
Youth Camp	None within 2 miles of the Site			
Hospitals	Joshua Center Thames Valley	11 Stott Avenue	Norwich	200-feet W
	Thames Valley Clinical Program	1 Ohio Avenue	Norwich	1.1 miles SW
Child Day Care	Early Head Start	Not Available	Norwich	.96 mile SE
	ABC's & 123's LLC	79 CT-32	Franklin	1.4 miles SW
	Champions	80 West Town Street	Norwich	1.8 miles S
Community Center	None within 2 miles of the Site			
Senior Facility	Senior Resource Agency-Aging	19 Ohio Avenue	Norwich	1 mile SW
Schools	Deborah-Tennant Zinewicz School	30 Case Street	Norwich	1.5 miles S
	Samuel Huntington School	80 West Town Street	Norwich	1.8 miles S
	John M. Moriarty Elementary School	20 Lawler Lane	Norwich	1.8 miles SE
	Greenville Elementary School	147 Yantic Road	Norwich	2 miles S
National Register of Historic Places	Bean Hill Historic District		Norwich	1.4 miles S
	Norwich Historic District		Norwich	1.9 miles S



Legend

- Project Area
- 0.5-2-Mile Radii
- Municipal and Private Open Space
- Open Water

Surrounding Features

- Licensed Child Day Care
- Hospital
- National Register of Historic Places
- Public School
- Recreation / Park
- Senior Facility

Figure 4
Surrounding Features Map

Proposed Solar Facility
9 Stott Avenue
Norwich, Connecticut

1,000 500 0 1,000 Feet

N W E S

BRIGHTFIELDS DEVELOPMENT LLC

ALL-POINTS TECHNOLOGY CORPORATION

Base Map Source: ESRI & CTECO Shaded Relief
Map Date: July 2015

Effects on the Environment

The Project would not have any significant adverse effects on the existing environment and ecology, nor would it affect the scenic, historic and recreational resources of the vicinity. A *Proposed Conditions Map* is included as Figure 5.

Proposed Project Development

The Project Area would be enclosed within a fenced area encompassing 15± acres. The majority of the Project Area is cultivated field. Approximately 1.9 acres would require clearing and grubbing and approximately 3.9 acres will require new soil disturbance to facilitate the installation of the solar arrays and associated equipment. The Project Area includes relatively moderate slopes and areas where regrading can be generally accomplished without significant cuts and fills.

The proposed solar array ("facility") would be comprised of approximately 15,912 Trina 310 watt modules and six (6) Solectria SGI inverters (including 4 500-KW and 2 750KW units). The facility would utilize an RBI Solar post-driven mounting system with individual panels placed at a fixed 25° tilt to the south. Wiring runs within the facility would be a mix of underground and above ground.

System installation will begin with site preparation as detailed on the Site plans (please see Exhibit 1 of the Petition). The racking assemblies that will hold the modules are built on I-beam foundations that are pounded into the ground with a pile driving machine. Then the rack is constructed on the posts. Once the rack is complete, the modules are bolted on to the rack. The wires for each module are plugged together in groups or "strings" of 19 panels. These strings are combined in the DC combiner, and the combiner is wired to the inverter. Inverters are installed on concrete pads with transformers. Transformers are connected via switch gear to the grid.

The facility's battery system is a self-contained unit. It is installed on a concrete pad near the entrance to the Site. The battery system has its own transformer and will share the same interconnection switch gear as the solar arrays.

C:\GIS\Projects\Brightfields Development LLC\Norwich\mxd\Figure 5 Proposed Conditions Map.mxd

Legend

- Project Area (+/-15.03 acres)
- Proposed Lease Area (+/-22.80 acres)
- Site Property Boundary
- Proposed Fence
- Proposed Silt Fence
- Proposed Solar Modules
- Proposed Equipment
- Proposed Stormwater Basin Limits
- Proposed Access Drive Installation
- Proposed Additional Grading Area
- Area of Boulders to be Relocated
- Proposed Clearing and Grubbing Area
- Proposed Demolition Area
- Proposed Site Improvement Area
- Wetland Boundary
- Wetland Area

Map Notes:
Base Map Source: 2012 Aerial Photograph (CTECO)
Map Scale: 1 inch = 250 feet
Map Date: July 2015

250 125 0 250 Feet

N E S W

Figure 5
Proposed Conditions Map

Proposed Solar Facility
9 Stott Avenue
Norwich, Connecticut

BRIGHTFIELDS DEVELOPMENT LLC

ALL-POINTS TECHNOLOGY CORPORATION

Tree stumps would be removed from those areas within the Project Area. These disturbed areas will be regraded with existing or imported soil/topsoil and vegetated using native grasses and maintained (occasional mowing) to suppress tree growth. A gravel access drive will originate off Stott Avenue in the south central portion of the Site and extend northward into the facility. The facility will be surrounded by a six-foot tall chain link fence.

Public Health and Safety

The Project would be designed to applicable industry, State, and local codes and standards and would not pose a safety concern or create undue hazard to the general public. The facility would not consume any raw materials, would not produce any by-products and would be unstaffed during normal operating conditions. The facility will be enclosed by a six-foot tall chain link fence.

Sealed rechargeable lithium-ion battery cells are proposed for use at this facility. These battery cells are individually, hermetically sealed cylinders, each containing lithium-ion electrodes and electrolyte, similar to what is found in many consumer electronic products. The cells and batteries do not contain metallic lithium. A mixture of equal parts ethylene glycol and water is used as liquid coolant. The electrolyte includes a volatile hydrocarbon-based liquid and a dissolved lithium salt (which is a source of lithium ions) such as lithium hexofluorophosphate. The electrolyte is largely absorbed in electrodes within individual sealed cells. In the unlikely event of a release, the electrolyte liquid would evaporate rapidly leaving a white salt residue. Evaporated electrolyte is flammable and will contain alkyl-carbonate compounds. Cleanup of a spill would use a dry absorbent material. A manufacturer's *Emergency Response Guide* for the lithium-ion batteries is provided in Appendix D.

Overall, the Project will meet or exceed all health and safety requirements applicable to electric power generation. Each employee working on 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 while on the Site;
- 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 will be required to access the Site during normal working hours. Please refer to the *Construction Schedule* and *Construction Work Hours/Days Letter* provided in Appendix E and Appendix F, respectively. After construction is complete and the facility (unstaffed) is operable, traffic at the Site will be minimal. Four times per year the site will be mowed. Annual maintenance of the electrical equipment will occur once per year. Any equipment that breaks down will be repaired on an as needed basis. Annual maintenance will typically be two technicians for a day. The solar modules are designed to absorb incoming solar radiation and minimize reflectivity, such that 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, or the surface of smooth water. In addition, a large portion of the Project will be shielded from view due to existing vegetation, proposed landscaping and existing topographical conditions. The panels will be tilted up toward the southern sky at a fixed angle of 25 degrees, further reducing reflectivity.

Local, State and Federal Land Use Plans

The Project is consistent with local, State, and Federal land use plans, including the Southeast Connecticut Council of Government's 2007 Regional Plan of Conservation and Development, which outlines the need for utility infrastructure to support the region's development. The Project also supports the State's energy policy by developing a renewable energy resource while not having a substantial adverse environmental effect. Although local land use jurisdiction over the Project is preempted by the Siting Council, the Project has been designed to meet the intent of local land use regulations to the extent feasible.

Existing and Future Development

SolarCity, Norwich Public Utilities ("NPU") and Connecticut Municipal Electric Energy Cooperative ("CMEEC") have partnered together to redevelop the former dairy farm into a 4.93 MW DC Community Shared Solar facility. Once the Project is completed, solar power will be available to every NPU customer without any premium charge. The Community Shared Solar Project will provide power to the estimated 85 percent of NPU customers who can neither own nor lease systems because their roofs are physically unsuitable for solar or because of shading or due to the fact that they do not control them — like renters and people living in large apartment buildings. The Project will offer a way for every NPU Customer to have access to "green energy" without incurring a premium cost or having complex equipment installed on their roofs. Additionally, the Project would benefit the community by improving electrical service for existing and future development in the City through enhanced capacity.

Roads

A gravel access drive will originate off Stott Avenue in the southern portion of the Site and extend northward into the facility.

Wetlands

One wetland area (Wetland 3) will be directly impacted by the Project. The Project will result in the complete fill and removal of Wetland 3. As previously noted, Wetland 3 is of anthropogenic origin likely constructed as a result of excavation that intercepted the seasonal high groundwater table. Wetland 3 consists of a small (415 square feet), isolated, depression dominated by invasive species. Hydrology is neither substantial enough, nor persists long enough to support vernal pool habitat. While wetlands of artificial construction occasionally provide principle or secondary functions and values (as identified by the Army Corps of Engineers), Wetland 3 does not currently provide functions or values at either level. Therefore, the proposed filling of Wetland 3 is not considered to likely have a significant adverse effect on the existing environment and/or ecology. The filling of this wetland resource is regulated by the Army Corps of Engineers. Due to the small area of wetland filling, the project appears eligible under the Connecticut General Permit as a Category 1 Permit Review Category, which would only require filing a Category 1A Self-Certification Form (an application to the Army Corps of Engineers would not be required). This permit would be secured prior to start of construction.

The Project's clearing limits come in close proximity to other wetland resources, but NOT within these wetlands. Minimum buffers of 25 feet have been established in proximities to Wetlands 1 and 2 for those areas adjacent to existing agricultural fields and development. This protective buffer extends to 50 feet for those areas bordering vegetated community types.

Short term temporary impacts will be associated with the Project's construction activities due to the close proximity to wetland and watercourse resources. Provided sedimentation and erosion controls are designed, installed and maintained during construction activities in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*, temporary impacts will be minimized. However, due to the close proximity of the proposed development to nearby wetlands, SolarCity is committed to implementing a wetland protection plan during construction to provide additional measures to avoid temporary wetland impacts. A proposed *Wetland Protection Plan* is included in Appendix G. Long term secondary impacts to wetland resources possibly associated with the operation of this facility are minimized by the fact the development is unmanned, it minimizes the creation of impervious surfaces with the use of a gravel access drive with the majority of the surface treatment around the solar installation consisting of native grass/vegetation and it generates minimal traffic. Based on a review of the Project plans, engineering documents, and the Stormwater Management Report (please see Exhibit 2 of the Petition), the stormwater generated by the proposed development will be properly handled and treated in accordance with the 2004 *Connecticut Stormwater Quality Manual*. Provided these protective measures are implemented, the proposed Project development will not result in an adverse impact to wetland or intermittent watercourse resources.

Vernal Pool

No vernal pool habitat was identified on or near (within 750 feet) of the Site. Therefore, no impacts to vernal pool resources will result from the proposed Project.

Vegetation and Wildlife

The proposed Project will consist of approximately 15 acres of development, the majority of which is currently cleared and cultivated, resulting in minimal new ground disturbances. The solar arrays and gravel and grass surfaces associated with the construction of the Project will alter the habitat types present on the Site. Provided below is an analysis of impact to the Site habitats.

Agricultural Land Impact Analysis

Agricultural lands present on the Site consist of two active cornfields. The majority of proposed development activities will be located within these fields. While technically agricultural land, and therefore classified as a WAP key habitat type, the active cornfields at the Site provide little habitat for wildlife due to a lack of cover and frequent human disturbance. Therefore, the loss of these fields will not significantly affect avian diversity on the Site. The primary users of this habitat type, aerial insectivores, will likely continue to utilize the solar array fields as feeding sites post-development.

Developed Land Impact Analysis

The developed land habitat type may support some urban wildlife animal communities that have adapted to tolerate greater level of human disturbance. These urban species are typically habitat generalists that utilize human development for food sources and artificial structures for cover. Some species that typically utilize this habitat type include certain dove species, raccoons, coyotes, sparrow species, and house mice. Removal of the batting cages and restaurant will not likely impact these species that may be utilizing this habitat type as it will be replaced by a developed habitat type that experiences less human activity.

Woodland/Shrubland Habitat and Old Field Habitat Impact Analysis

The Woodland/Shrubland and Old Field Habitat Cover type's impact analysis have been combined in this discussion. This was done because a number of the species that utilize these habitats are similar and can be assessed in the same manner. These types of successional (i.e., non-forested) habitats have the potential to support some of Connecticut's rarest bird species. However, as described in previous sections, the Site's woodland/shrubland and old field habitat units are not well-suited for those rare or notable habitat specialists due to the small size and fragmented configuration. To support habitat specialists, these habitats typically need to be a minimum patch size of 10 acres. However, these early-successional are capable of supporting habitat specialists that do not require a large patch size. These are species often associated with the brushy and infrequently maintained field edges that often develop on small farms. Such species include the song sparrow, northern mockingbird or indigo bunting. This habitat type, which is primarily located on the northern portions of the Site in the vicinity of Wetland 3, will be effectively lost as a result of the Project as the remaining habitat will likely be too small to support such species. Mitigation of impact to this habitat type, in the form of edge habitat management adjacent to the proposed perimeter, is proposed to minimize this habitat loss (see Wildlife Impact Mitigation Measures presented below).

Upland Forest Habitat Impact Analysis

The Project Area encompasses approximately 1.92 acres of the Site's 5.27 acres of upland forest. While this forest is contiguous with offsite forest habitat (and forested wetlands) to the west, overall the contiguous forest habitat on and adjacent to the Site is highly fragmented. Review of the Center for Land Use Education and Research's ("CLEAR") Forest Fragmentation Study[9] mapping for the Town of Norwich confirms this fact, illustrating that the Site lies within an area mapped as non-forest and patch forest cover types. Without the presence of "interior forest"[10] the Site's forest habitat is more suitable for generalist species associated with edge forest or deciduous tree cover, as opposed to forest-interior specialists. While several forest-interior birds are listed in the inventory (e.g., wood thrush) as they may be present, the Site's represent sub-optimal habitat and potentially a population "sink".

Forested Wetlands Habitat Impact Analysis

Homogenous red maple-dominated forested wetlands generally support a low-diversity of wetland habitat specialists. Only two (potential) bird species were associated with this habitat type at the Site, the brown creeper and northern waterthrush. The suitability of this habitat for birds is expected to be unaffected by the Project. This is due to the proposed disturbance setback, which will not directly affect the habitat or the ecotone associated with the habitat.

Wildlife Impact Mitigation Measures

Habitat Enhancement Measures

Once the perimeter fence has been installed, a narrow strip of land (generally 25 feet in most areas with an expansion to 50 feet for developed areas for areas bordering vegetated community types) between the perimeter fence and the newly-created forest edge will need to remain clear (non-forested) to prevent shading of the solar arrays. This area can be managed for wildlife by restricting mowing on a rotation basis every 4 to 7 years. This will allow the area to revert to late old field and create a "soft" ecotone that will provide cover and habitat for a number of "edge" nesting birds.

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[9] CLEAR's Forest Fragmentation Study can be found at: http://clear.uconn.edu/projects/landscape/forestfrag/forestfrag_public%20summary.pdf

[10] Interior or core forest is defined as forest that is located 300 feet from non-forested habitats.

General Breeding Bird Protection Measures

The proposed construction activities will result in the clearing of trees, shrubs and mature vegetation that has the potential to support breeding birds. Once a construction schedule is determined, SolarCity will evaluate whether the potential exists for nest disturbance and plan accordingly. To avoid potential disturbance during periods of high bird activity, SolarCity will use the following schedule as a general guideline. If construction activities should occur during the peak nesting period of May 1st through August 15th, efforts would be taken to complete vegetation clearing work prior to May 1st; or, if tree clearing has not been completed by May 1st, an avian survey may be conducted to determine if breeding birds would be disturbed. If the avian survey concludes that breeding birds would be disturbed, vegetation clearing activities may be restricted through the peak nesting period (or a modified time frame based on the specific findings of the survey).

Northern Long–Eared Bat

Although no hibernaculum or breeding/roosting habitat is known to exist in the vicinity of the Site, depending on the type and timing of forest management activities there is potential for mortality and temporary removal or degradation of roosting and foraging habitat. To avoid killing or injuring northern long-eared bat, the following conservation measures are to be adhered to under Interim 4(d) Rule (April 2, 2015) of the federal Endangered Species Act for this species:

I. No activities are to occur within 0.25 mile of a known, occupied hibernacula[11]

II. Avoid cutting or destroying of known, occupied roost trees during the pup season of June 1st to July 31st

III. Avoid clear-cutting (or similar harvesting methods) within 0.25 mile of known, occupied roost trees during the pup season of June 1st to July 31st

[11] Locations of hibernacula are identified by CTDEEP NDDB during the state rare species consultation process. No hibernacula are known to exist in the Site vicinity.

Rare Species

Based on APT's Site evaluation and the CTDEEP's July 29, 2015 letter, the Project would not have a negative impact on State-listed species. The *CTDEEP NDDB Letter* is provided in Appendix C.

Water Supply Areas

There are no public water supply wells located in the vicinity of the Site. No liquid fuels are associated with the operations of the Project. Therefore, the Project would have no adverse environmental effect on water resources.

Water Quality

The facility will be unstaffed and no potable water uses or sanitary discharges are planned.

The facility and areas generally within 30 feet of the fence line will be regraded with existing or imported soil covered with native grasses and vegetation. Because the solar arrays will be installed on driven or screwed foundations (i.e., I-beams), impervious areas are substantially minimized.

It is anticipated that a stormwater management system design will be completed as part of the D&M Plan, should it be required by the Siting Council, in conformance with the guidelines set forth in the 2004 Connecticut Stormwater Quality Manual.

Air Quality

No emission sources are associated with the operations of the Project. Therefore, no impacts to air quality are anticipated as part of the proposed Project.

Scenic Areas

No scenic areas would be physically or visually impacted by development of the solar Project.

Historic and Archaeological Resources

APT consulted with the SHPO for concurrence that no historic or archaeological resources would be affected by the Project. The SHPO has not responded in writing as of the date of filing this Petition. A copy of the SHPO letter will be provided to the Council upon receipt.

Geology and Soils

No adverse effects are anticipated on natural resources occurring at and/or nearby the Site. Limited vegetative clearing and earthwork is required for construction of the Project. However, no impacts to wetlands, water courses or significant habitat would occur.

Floodplain Areas

The Site is located entirely outside of the 100-year and 500-year floodplains. Therefore, no special design elements are necessary with respect to flooding concerns. In addition, no impacts to floodplains are associated with the proposed Project.

Recreational Areas

No recreational areas would be impacted by the Project.

Noise

The only equipment proposed for the Project that would generate noise consists of the fans associated with the inverters, which will be centrally located in the southern portion of the Project Area, near Stott Avenue. The Noise Evaluation Study prepared by HMB Acoustics LLC of Avon, Connecticut, determined that after the Project is constructed and in service, the combined noise levels will comply with CTDEEP criteria for Commercial Emitter and both Commercial and Residential Receiver Zones. After the Project is constructed and in service, the highest noise levels at adjacent properties are anticipated to be 35 dBA, which is well below the most conservative criteria of 45 dBA for nighttime and 62 dBA for daytime, as established by the State of Connecticut Noise Control regulations (CGS *22a/22a-69-1 through 7*). The inverters are inactive at night. During those times the inverters are operative, noise levels at nearby property lines and/or residences would be well below applicable criteria.

Please refer to the *Noise Evaluation Report* provided in Appendix H.

Lighting

No lighting is planned for the facility.

Coastal Zone Management Areas

No Coastal Zone Management Areas would be affected by the Project.

Other Surrounding Features

No adverse effects are anticipated to the facilities identified in Figure 4, primarily because of their sufficient distance from the Project.

Visibility

Once completed, the Project would not be highly visible from locations beyond those areas adjacent to Stott Avenue and Plain Hill Road proximate to the Site. The Project would generally be consistent with land uses in the area, which is primarily commercial to the south and west and agricultural to the east and north. Those locations to the south and east will benefit from landscaping planted within the fence line of the Project.

Four (4) photo simulations of the Project are presented in Appendix I.

Conclusion

As demonstrated in this EA, the Project will comply with CTDEEP air and water quality standards and will not have a substantial adverse effect on the environment.

APPENDIX A Inland Wetland & Watercourse Report

ALL-POINTS
TECHNOLOGY CORPORATION

WETLAND INVESTIGATION

August 10, 2015

Brightfields Development, LLC
40 Walnut Street, Suite 301
Wellesley, MA 02481

APT Project No.: CT443100

Attn: Michael Singer

Re: Proposed 4.93 MW Solar Array Project
9 Stott Avenue and 292 Plain Hill Road
Norwich, Connecticut

To Mr. Singer,

All-Points Technology Corporation, P.C. ("APT") understands that a solar array project ("Project") is proposed by Brightfields Development, LLC ("Brightfields") at 9 Stott Avenue and 292 Plain Hill Road in Norwich, Connecticut ("Subject Property"). At your request, Matthew Gustafson, a Connecticut registered Soil Scientist with APT conducted inspections of the Subject Property on January 22 and 23, 2015 to determine the presence or absence of wetlands and watercourses within approximately 200 feet of proposed development activities ("Study Area"). A follow-up inspection was performed to confirm the wetland boundary on April 8, 2015. The delineation methodology followed was consistent with both the Connecticut Inland Wetlands and Watercourses Act (IWWA) and the *Corps of Engineers Wetland Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, Version 2.0 (January 2012). The results of this wetland investigation are provided below.

Site and Project Description

The Subject Property consists of 2 parcels identified as 9 Stott Avenue and 292 Plain Hill Road totaling approximately 27.41-acres. The 9 Stott Avenue parcel (west) hosts an outdoor batting cages facility along the frontage of Stott Avenue, a large open agricultural field (cultivated in corn last season) to the north, and forested wetland and upland areas to the west. The 292 Plain Hill Road property (east) primarily consists of open agricultural fields (cultivated in corn last season) and associated barns, a residency, and forested wetland and upland complexes to the west.

Based on site plan information provided by Brightfields to APT (SolarCity Layout, dated 6/26/15), the area proposed for the Project is generally within existing open agricultural fields to the south and historically cleared scrub/shrub west facing hillsides to the north. Access to the Project is proposed to be gained from Stott Avenue via existing disturbed travel ways. The Study Area is dominated by complexes of upland forested and scrub/shrub habitats, bordering hillside seep wetland areas with interior intermittent stream systems, open agricultural fields, associated agricultural infrastructure, the batting cages, and residential development. The surrounding land use generally consists of residential development to the south and east, agricultural fields to the north, south, and east, narrow forested wetlands to the west adjacent to commercial development, and Dodd Stadium parking areas to the southwest.

Three wetland areas were delineated within the Study Area consisting of bordering forested and scrub/shrub hillside seep wetland systems with interior intermittent stream systems to the north and west, a depressional, perched scrub/shrub wetland area located along the east/west property boundary between the two identified parcels, and a small, isolated, artificially constructed wetland 'pit'. Please refer to the enclosed Wetland Delineation Map for the approximate locations of the identified wetland resource areas. Wetlands were marked with pink and blue plastic flagging tape numbered with the following sequence: WF 1-01 to 1-1-67 and WF 2-01 to 2-18. General weather conditions encountered during the January inspections ranged from low to high 30° F temperatures with partly cloudy skies.

Regulation of Wetlands

Wetlands and watercourses are regulated by local, state and federal regulations, with each regulatory agency differing slightly in their definition and regulatory authority of resource areas, as discussed below. Siting approval of the proposed Facility is under the exclusive jurisdiction of the State of Connecticut Siting Council and therefore exempt from local regulation, although local wetland regulations are considered by the Siting Council. If wetlands are identified on the Subject Property and direct impact is proposed, those wetlands may be considered Waters of the United States and therefore the activity may also be subject to jurisdiction by the U.S. Army Corps of Engineers ("ACOE") New England District.

City of Norwich	The City of Norwich regulates activities within wetlands and watercourses and within 100 feet of wetlands and watercourses through administration of the Connecticut Inland Wetlands and Watercourses Act (IWWA).
State of Connecticut	**Freshwater Wetlands:** The IWWA requires the regulation of activities affecting or having the potential to affect wetlands under Sec. 22a-36 through 22a-45 of the Connecticut General Statutes. The IWWA is administered through local municipalities. The IWWA defines wetlands as areas of poorly drained, very poorly drained, floodplain, and alluvial soils, as delineated by a soil scientist. Watercourses are defined as bogs, swamps, or marshes, as well as lakes, ponds, rivers, streams, etc., whether natural or man-made, permanent or intermittent. Intermittent watercourse determinations are based on the presence of a defined permanent channel and bank, and two of the following characteristics: (1) evidence of scour or deposits of recent alluvium or detritus; (2) the presence of standing or flowing water for a duration longer than a particular storm incident; and (3) the presence of hydrophytic vegetation.
ACOE	The U.S. Army Corps of Engineers regulates the discharge of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act. Waters of the United States are navigable waters, tributaries to navigable waters, wetlands adjacent to those waters, and/or isolated wetlands that have a demonstrated interstate commerce connection. The ACOE Wetlands Delineation Manual defines wetlands as "[t]hose areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) prohibits the unauthorized obstruction or alteration of any navigable water of the United States. This section provides that the construction of any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters is unlawful unless the work has been approved by the ACOE.

Soil Description

Soil types encountered throughout the Study Area were generally consistent with digitally available soil survey information obtained from the Natural Resources Conservation Service ("NRCS")[1]. Wetland soils field identified consist of Ridgebury, Leicester, and Whitman soils. The non-wetland soils were examined along the wetland boundary and more distant upland areas during the delineation, including the proposed Facility location. They are dominated by Woodbridge fine sandy loam and Paxton and Montauk fine sandy loams. Detailed descriptions of wetland and upland soil types are provided below.

Wetland Soils

The **Leicester** series consists of very deep, poorly drained loamy soils formed in friable till. They are nearly level or gently sloping soils in drainageways and low-lying positions on hills. Depth to bedrock is commonly more than 6 feet. Rock fragments range from 5 to 35 percent by volume to a depth of 40 inches and up to 50 percent below 40 inches. Leicester soils have a water table at or near the surface much of the year.

The **Ridgebury** series consists of very deep, somewhat poorly and poorly drained soils formed in glacial till derived mainly from granite, gneiss and schist. They are nearly level to gently sloping soils in low areas in uplands. This series includes phases that are poorly drained and the wetter part of somewhat poorly drained. A perched, fluctuating water table above the dense till saturates the solum[2] to or near the surface for 7 to 9 months of the year.

The **Whitman** series consists of very deep, very poorly drained soils formed in glacial till derived mainly from granite, gneiss, and schist. They are nearly level or gently sloping soils in depressions and drainageways on uplands. Depth to dense till is 12 to 30 inches. Some pedons[3] have organic horizons overlying the A horizon. They are fibric hemic or sapric material (peat-like), and are up to 5 inches thick. Whitman soils are found on nearly level and gently sloping soils in depressions and in drainage ways of glacial uplands. Slopes are typically 0 to 2 percent but range up to 8 percent where wetness is due to seepage water. This soil is very poorly drained. A perched water table, or excess seepage water, is at or near the surface for about 9 months of the year.

Upland Soils

The **Woodbridge** series consists of moderately well drained loamy soils formed in compact, subglacial till. They are very deep to bedrock. They are nearly level to moderately steep soils on till plains, hills, and drumlins. Depth to the compact layer (hardpan) is 18 to 40 inches. Depth to bedrock is commonly more than 6 feet. Woodbridge soils have a seasonal high water table on top of the compact layer (18-40") from fall through late spring.

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[1] NRCS Web Soil Survey, http://websoilsurvey.nrcs.usda.gov/app/, accessed on March 17, 2015.

[2] The solum in soil science consists of the surface and subsoil layers that have undergone the same soil forming conditions. The base of the solum is the relatively unweathered parent material. Solum and soils are not synonymous. Some soils include layers that are not affected by soil formation.

[3] a three-dimensional sample of a soil just large enough to show the characteristics of all its horizons.

Wetlands Discussion

Wetland 1 Classification Summary

Wetland 1[4]	System	Subsystem	Class	Subclass	Water Regime	Special Modifier
(WF 1-01 to 1-67)	Palustrine		Forested/Scrub Shrub	Broad-leaved Deciduous	Temporarily Flooded	Farmed

Watercourse Type	Perennial	Intermittent	Tidal	Special Aquatic Habitat	Vernal Pool	Other
(unnamed)	☐	☒	☐	(None)	☐	☐

Wetland 1 Description

Wetland 1 is located along the western edge of the Subject Property consisting of complexes of forested and scrub/shrub hillside seep wetland systems and interior intermittent stream systems generally draining west and south. This wetland system extends off the Subject Property to the west, north, and south, eventually draining south under Stott Avenue via a 24-inch reinforced concrete pipe culvert. Forested wetland areas are focused along the western Subject Property boundary, while scrub/shrub habitats are concentrated along west facing hillside seep areas historically cleared for farming activities. Two interior intermittent streams are identified with one draining east to west across the northern extent of the Subject Property, and a second draining north to south along the western Subject Property boundary. Both intermittent stream systems contain areas of seasonal open water areas/emergent habitats within depressions. Evidence of historic anthropogenic influences is readily apparent through much of Wetland 1 consisting of old access roads, stone walls, scrub/shrub habitats dominated by multiflora monocultures, and understory forested wetland areas dominated by Japanese barberry monocultures. . Eastern portions of this wetland system extend into the northeast corner of an existing agricultural field.

Wetland 1 Dominant Vegetation

Dominant Wetland Species Common Name (Latin Name)	**Dominant Adjacent Upland Species** Common Name (Latin Name)
Red Maple (Acer rubrum)	Red Maple (Acer rubrum)
Reed Canarygrass* (Phalaris arundinacea)	Spicebush (Lindera benzoin)
Spicebush (Lindera benzoin)	Japanese Barberry* (Berberis thunbergii)
Sweet Pepperbush (Clethera alnifolia)	Yellow Birch (Betula alleghaniensis)
Sensitive Fern (Onoclea sensibilis)	Black Birch (Betula lenta)
Multiflora Rose* (Rosa multiflora)	Goldenrod (Solidago spp.)
Japanese Barberry* (Berberis thunbergii)	Multiflora Rose* (Rosa multiflora)
Sphagnum moss (Sphagnum sp.)	Raspberry (Rubus sp.)
Asiatic Bittersweet* (Celastrus orbiculatus)	
Soft Rush (Juncus effuses)	
Fox Grape (Vitis labrusca)	

* denotes Connecticut Invasive Plants Council invasive species

[4] Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/wetlands/classwet/index.htm - contents.

Wetland 2 Classification Summary

Wetland 2 (WF 2-01 to 2-18)	System	Subsystem	Class	Subclass	Water Regime	Special Modifier
(WF 2-01 to 2-18)	Palustrine		Forested & Scrub/Shrub	Broad-leaved Deciduous	Saturated	Farmed
Watercourse Type (unnamed)	Perennial ☐	Intermittent ☒	Tidal ☐	**Special Aquatic Habitat** (None)	Vernal Pool ☐	Other ☐

Wetland 2 Description

Wetland 2 is located in between two agricultural fields with a stone wall generally confining the western boundary of the wetland system. Western edges of the wetland area are dominated by forest (red maple), while eastern portions are primarily scrub/shrub dominant (multiflora rose). Wetland 2 is formed as a perched system in dense glacial till generally draining north to south. Narrow diffuse/inconspicuous intermittent stream channels were noted during the inspection. Based on time of year field conditions, it was not readily apparent if these flow paths were consistent with a regulated intermittent stream or a result stormwater runoff.

Wetland 2 Dominant Vegetation

Dominant Wetland Species Common Name (Latin Name)	**Dominant Adjacent Upland Species** Common Name (Latin Name)
Multiflora Rose* (Rosa multiflora)	Red Maple (Acer rubrum)
Asiatic Bittersweet* (Celastrus orbiculatus)	Spicebush (Lindera benzoin)
Fox Grape (Vitis labrusca)	Japanese Barberry* (Berberis thunbergii)
Red Maple (Acer rubrum)	Yellow Birch (Betula alleghaniensis)
Raspberry (Rubus sp.)	Black Birch (Betula lenta)
Sphagnum moss (Sphagnum sp.)	Goldenrod (Solidago spp.)
	Multiflora Rose* (Rosa multiflora)
	Raspberry (Rubus sp.)

* denotes Connecticut Invasive Plants Council invasive species

Wetland 3 Classification Summary

Wetland 1[5]	System	Subsystem	Class	Subclass	Water Regime	Special Modifier
(WF 3-01 to 3-05)	Palustrine		Emergent	Persistent	Artificially Flooded	Artifical
Watercourse Type (None)	Perennial ☐	Intermittent ☐	Tidal ☐	**Special Aquatic Habitat** (None)	Vernal Pool ☐	Other ☐

Wetland 3 Description

Wetland 3 is a small, isolated, depressional pocket wetland. This wetland was historically created through a small excavation pit that now retains water as a result of the underlying dense glacial till. Water depth at the time of the second inspection was recorded at 1-3 inches. Hydrology is not significant enough, or persists long enough to support vernal pool breeding habitat.

Wetland 3 Dominant Vegetation

Dominant Wetland Species Common Name (Latin Name)	**Dominant Adjacent Upland Species** Common Name (Latin Name)
Broad-Leaf Cattail (Typha latifolia)	Asiatic Bittersweet* (Celastrus orbiculatus)
Reed Canarygrass* (Phalaris arundinacea)	Fox Grape (Vitis labrusca)
	Japanese Barberry* (Berberis thunbergii)
	Virginia Creeper (Parthenosisus quinquefolia)
	Spicebush (Lindera benzoin)
	Goldenrod (Solidago spp.)
	Multiflora Rose* (Rosa multiflora)
	Raspberry (Rubus sp.)

* denotes Connecticut Invasive Plants Council invasive species

[5] Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/wetlands/classwet/index.htm - contents.

Summary

Based on APT's understanding of the proposed Brightfields' development, direct impact to wetlands will result from the proposed activity consisting of the filling of Wetland 3. As a result, an Army Corp of Engineers, Connecticut General Permit Category 1A Inland Self-Certification, will be filed and secured prior to start of construction. In addition, the proposed development will be in close proximity to Wetlands 1 and 2. APT has provided an evaluation of the project's wetland impacts under separate cover (Environmental Assessment).

If you have any questions regarding the above-referenced information, please feel free to contact me by telephone at (860) 663-1697 ext. 202 or via email at mgustafson@allpointstech.com.

Sincerely,

All-Points Technology Corporation, P.C.

Delineation Performed by:

Matthew Gustafson

Matthew Gustafson
Registered Soil Scientist

Enclosure

C:\GIS\Projects\Brightfields Development LLC\Norwich\mxd\Wetland Inspection Map.mxd

Legend

- Project Area (+/-15.03 acres)
- Proposed Lease Area (+/-22.80 acres)
- Site Property Boundary
- Start/End Wetland Flag
- Wetland Boundary
- Wetland Area

Wetland Inspection Map

Proposed Solar Facility
9 Stott Avenue
Norwich, Connecticut

BRIGHTFIELDS DEVELOPMENT LLC

Map Notes:
Base Map Source: 2012 Aerial Photograph (CTECO)
Map Scale: 1 inch = 250 feet
Map Date: July 2015

250 125 0 250 Feet

N W E S

ALL-POINTS TECHNOLOGY CORPORATION

APPENDIX B Breeding Bird Inventory Table

Breeding Bird Inventory Table

Common Name	Scientific Name	Observed	Status	Habitat Type
American Crow	*Corvus brachyrhynchos*	OB		MHF, FW, CF, OF, WS
American Goldfinch	*Carduelis tristis*	OB		CF, OF, WS
American Redstart	*Setophaga ruticilla*			MHF, WS
American Robin	*Turdus migratorius*			MHF, OF, WS
American Woodcock	*Scolopax minor*		MI	OF
Barn Swallow	*Hirundo rustica*	OB		OF, CF
Barred Owl	*Strix varia*			MHF, CF, OF
Black-and-white Warbler	*Mniotilta varia*		I	MHF
Black-billed Cuckoo	*Coccyzus erythropthalmus*		VI	OF, MHF, WS
Black-capped Chickadee	*Parus atricapillus*			MHF, OF, WS
Blue Jay	*Cyanocitta cristata*			MHF, FW, CF, OF, WS
Blue-gray Gnatcatcher	*Polioptila caerulea*			OF, WS
Blue-winged Warbler	*Vermivora pinus*		MI	OF
Broad-winged Hawk	*Buteo platypterus*		VI	MHF, OF
Brown Creeper	*Certhia americana*		I	FW
Brown Thrasher	*Toxostoma rufum*		SC, VI	OF
Brown-headed Cowbird	*Molothrus ater*			MHF, OF, WS
Carolina Wren	*Thryothorus ludovicianus*			OF, WS
Chestnut-sided Warbler	*Dendroica pensylvanica*		VI	OF
Chimney Swift	*Chaetura pelagica*		VI	CF, OF
Chipping Sparrow	*Spizella passerina*	OB		OF, WS
Common Grackle	*Quiscalus quiscula*			OF, CF
Common Yellowthroat	*Geothlypis trichas*	OB		OF
Downy Woodpecker	*Picoides pubescens*			MHF
Eastern Kingbird	*Tyrannus tyrannus*		I	OF
Eastern Phoebe	*Sayornis phoebe*	OB		OF
Eastern Wood-Pewee	*Contopus virens*		I	MHF
European Starling	*Sturnus vulgaris*	OB		OF, CF
Field Sparrow	*Spizella pusilla*		VI	OF
Gray Catbird	*Dumetella carolinensis*	OB		OF, WS
Great Crested Flycatcher	*Myiarchus crinitus*			OF, WS, MHF
Great Horned Owl	*Bubo virginianus*			MHF, OF, CF
Hairy Woodpecker	*Picoides villosus*			MHF
Hermit Thrush	*Catharus guttatus*			MHF, FW
Hooded Warbler	*Wilsonia citrina*			MHF
House Finch	*Carpodacus mexicanus*	OB		OF, CF
House Sparrow	*Passer domesticus*			OF, CF
House Wren	*Troglodytes aedon*			OF, CF, WS
Indigo Bunting	*Passerina cyanea*	OB	VI	OF
Killdeer	*Charadrius vociferus*			CF

Common Name	Scientific Name	Observed	Status	Habitat Type
Mourning Dove	*Zenaida macroura*	OB		MHF, CF, OF, WS
Northern Bobwhite	*Colinus virginianus*			OF, CF
Northern Cardinal	*Cardinalis cardinalis*	OB		WS, MHF
Northern Flicker	*Colaptes auratus*		VI	OF, WS
Northern Mockingbird	*Mimus polyglottos*	OB		OF, WS
Northern Oriole	*Icterus galbula*		I	OF, MHF, WS
Northern Waterthrush	*Seiurus noveboracensis*		I	FW
Ovenbird	*Seiurus aurocapillus*		I	MHF, FW
Pileated Woodpecker	*Dryocopus pileatus*	OB		MHF
Red-bellied Woodpecker	*Melanerpes carolinus*			MHF, FW
Red-eyed Vireo	*Vireo olivaceus*			MHF, FW
Red-shouldered Hawk	*Buteo lineatus*			OF, CF
Red-tailed Hawk	*Buteo jamaicensis*			OF, CF
Red-winged Blackbird	*Agelaius phoeniceus*			OF
Rock Dove	*Columba livia*	OB		DV
Rose-breasted Grosbeak	*Pheucticus ludovicianus*		I	MHF, WS
Ruby-throated Hummingbird	*Archilochus colubris*			OF
Rufous-sided Towhee	*Pipilo erythrophthalmus*		VI	OF, WS
Song Sparrow	*Melospiza Melodia*	OB		OF
Tree Swallow	*Tachycineta bicolor*	OB		OF, CF
Tufted Titmouse	*Parus bicolor*			MHF, WS
Turkey Vulture	*Cathartes aura*	OB		OF, CF, DV
Veery	*Catharus fuscescens*		I	MHF, FW
White-breasted Nuthatch	*Sitta carolinensis*			MHF
White-eyed Vireo	*Vireo griseus*		I	MHF
Wild Turkey	*Meleagris gallopavo*			OF, MHF
Willow Flycatcher	*Empidonax traillii*		I	OF
Wood Thrush	*Hylocichla mustelina*		MI	MHF
Yellow Warbler	*Dendroica petechia*			OF
Yellow-billed Cuckoo	*Coccyzus americanus*		VI	OF, WS
Yellow-throated Vireo	*Vireo flavifrons*			OF, MHF

KEY
OB – species was observed on the site on 7-14-15
OH – species was observed soaring overhead
WAP Conservation Status: IM – Important; VI – Very Important; MI – Most Important
SC – State-listed species of special concern
Habitat Types (observed and potential use): MHF – mixed hardwood forest; FW – forested wetland; CF - cornfield; OF – old field (post-agricultural); WS - woodland/shrubland; DV - developed

APPENDIX C CTDEEP NDDB Letter

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

July 29, 2015

Dean Gustafson
All-Points Technology Corporation, P.C.
3 Saddlebrook Dr
Killingworth, CT 06419
dgustafson@allpointstech.com

Project: Construction of 5.02 MW Solar Facility located at 9 Stott Ave in Norwich
NDDB Determination No.: 201504771

Dear Dean Gustafson,

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding the area delineated on the map provided for the proposed Construction of 5.02 MW Solar Facility located at 9 Stott Ave in Norwich, Connecticut. I do not anticipate negative impacts to State-listed species (RCSA Sec. 26-306) resulting from your proposed activity at the site based upon the information contained within the NDDB. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits. This determination is good for one year. Please re-submit an NDDB Request for Review if the scope of work changes or if work has not begun on this project by July 29, 2016.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base.

Sincerely,

Dawn M. McKay

Dawn M. McKay
Environmental Analyst 3

APPENDIX D Emergency Response Guide

Version	**Date**	**Description**
01	**14-July-2015**	**ERG for Powerwall and Powerpack**

Rechargeable Lithium Ion Batteries: Tesla Energy Products

The products referenced herein are exempt articles and are not subject to OSHA's Hazard Communication Standard requirements for preparation of material safety data sheets (MSDS).

MSDS

Material Safety Data Sheets (MSDS) are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". OSHA has defined "article" as a manufactured item other than a fluid or particle; (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities (e.g. minute or trace amounts) of a hazardous chemical, and does not pose a physical hazard or health risk to employees.

Tesla Energy Products meet the OSHA definition of "articles". Thus, they are exempt from the requirements of the Hazardous Communication Standard, and an MSDS is not required.

2. IDENTIFICATION OF PRODUCTS AND COMPANY				
Product	Rechargeable lithium-ion Powerwall and Powerpack systems for residential, commercial, and industrial Tesla Energy applications, and modules and sub-assemblies that can be installed in Powerwall and Powerpack systems (Tesla Energy Products). Specific part numbers are listed below.			
Locations	**Headquarters**	**Europe**	**Asia/ Pacific**	**Manufacturer**
	Tesla Motors, Inc. (USA) 3500 Deer Creek Road Palo Alto, CA 94304 Tel. No. (650) 681-5000	**Tesla Europe** Burgemeester Stramanweg 122 1101EN Amsterdam The Netherlands Tel. No. +31 20 258 3916	**Tesla Asia / Pacific** 2-23-8, Minami Aoyama Tokyo, Japan Tel: +81 3 6890 7700	**Tesla Motors, Inc.** (USA) 3500 Deer Creek Road Palo Alto, CA 94304 Tel. No. (650) 681-5000
Emergency Contacts	CHEMTREC	For Hazardous Materials [or Dangerous Goods] Incidents: Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300 Contract Number: CCN204273 Outside USA and Canada: +1 703-527-3887 (collect calls accepted)		

Tesla Energy Powerwall and Powerpack systems contain battery subassemblies made up of rechargeable lithium-ion cells. Tesla Energy Powerwall and Powerpack systems and their respective subassemblies are covered by this document (Tesla Energy Products).

Tesla Energy Powerwall, Powerpack, and their battery subassemblies contain sealed lithium-ion battery cells (cells) that are similar to rechargeable batteries in many consumer electronic products. Cells are individually, hermetically sealed cylinders approximately 18 mm in diameter and 65 mm in length. These cylinders each contain lithium-ion electrodes and electrolyte (approximate composition listed below). THE CELLS AND BATTERIES DO NOT CONTAIN METALLIC LITHIUM. Individual cells have nominal voltages of approximately 3.6 V.

Materials/Ingredients of Battery Cells	**Approx. % by wt.**
The lithium-ion cell positive electrodes can be composed of: Lithium Nickel Cobalt Aluminum Oxide (NCA material), $LiNi_xCo_yAl_zO_2$; Lithium Nickle, Manganese, Cobalt Oxide (NMC material) $LiNi_xMn_yCo_zO_2$; Lithim Nickle, Manganese Oxide (NMO material), $LiNi_xMn_yO_2$ Lithium Cobalt Oxide, $LiCoO_2$; or a mixture of these compounds	33
Carbon	21
Iron	12
Copper	7
Aluminum	5
Nickel	<1
Organic electrolyte (mainly composed of alkyl carbonate)*	10
Polypropylene	3
Polyethylene Terephthalate	<1
Other	8

*An acceptable exposure concentration of electrolyte has not been identified by the American Council of Governmental Industrial Hygienists (ACGIH). In case of electrolyte leakage from the battery, the oral (rat) LD50 is greater than 2 g/kg (estimated).

Powerwall and Powerpack systems also include sealed thermal management systems containing coolants and refrigerants.

Non-Cell Materials found in Powerwall and Powerpack Systems	**Approximate Quantity**
Ethylene glycol 50/50 mixture with water	Powerwall: 1.6 L of 50/50 mixture Powerpack: 26L of 50/50 mixture
R134a: 1,1,1,2-Tetrafluoroethane refrigerant	Powerwall: none Powerpack: 400g

Individual lithium-ion cells are connected to form modules. Modules are connected to form pods. Pods are installed in a Powerwall or Powerpack. Approximate specifications of lithium-ion based modules, pods, Powerwalls, and Powerpacks are listed below. Modules and pods are battery sub-assemblies.

Part Number	Description	Nominal Voltage (V)	Max Voltage (V)	Weight (kg)	Height (cm)	Width (cm)	Depth (cm)
	Powerwall Versions						
1050100-0x*-y*	POWERWALL, 2KW, 7KWH	400	450	100 (220 lb)	130 (51 in)	86 (34 in)	18 (7 in)
1067000-0x*-y*	POWERWALL, 3.3KW, 7KWH	400	450	100 (220 lb)	130 (51 in)	86 (34 in)	18 (7 in)
1068000-0x*-y*	POWERWALL, 6.6KW, 10KWH	400	450	100 (220 lb)	130 (51 in)	86 (34 in)	18 (7 in)
	Powerpack Versions						
1047404-0x*-y*	POWERPACK (2hr continuous net discharge)	450	600	1720 (3800 lb)	219	97	132
1060119-0x*-y*	POWERPACK (4hr continuous net discharge)	450	600	1720 (3800 lb)	219 (86 in)	97 (38 in)	132 (52 in)
	Powerwall and Powerpack Sub-Assemblies						
1055000-0x*-y*	POD, 2KW	40	50	75 (165 lb)	99 (39 in)	75 (30 in)	12 (5 in)
1073000-0x*-y*	POD, 3.3KW	40	50	75 (165 lb)	99 (39 in)	75 (30 in)	12 (5 in)
1066000-0x*-y*	POD, 6.6KW	40	50	75 (165 lb)	99 (39 in)	75 (30 in)	12 (5 in)
1047816-0x*-y*	ASY,HVBAT, MODULE, BB	20	25	25 (55 lb)	70 (28 in)	30 (12 in)	8 (3 in)
1063198-0x*-y*	ASY,HVBAT,MODULE, 22V	20	25	25 (55 lb)	70 (28 in)	30 (12 in)	8 (3 in)

* Note that the 9th digit could be any number or letter and the 10th digit could be any letter.

2. HANDLING AND USE PRECAUTIONS/IDENTIFICATION OF HAZARDS

The products described by this document are dangerous if mishandled. Injury to property or person, including loss of life is possible if mishandled.

Tesla Energy Products contain lithium-ion batteries. **A battery is a source of energy**. Do not short circuit, puncture, incinerate, crush, immerse, force discharge or expose to temperatures above the declared operating temperature range of the product. An internal- or external-short circuit can cause significant overheating and provide an ignition source resulting in fire, including surrounding materials or materials within the cell or battery. Under normal conditions of use, the electrode materials and electrolyte they contain are not exposed, provided the battery integrity is maintained and seals remain intact. Risk of exposure may occur only in cases of abuse (mechanical, thermal, electrical).

2A. HIGH VOLTAGE HAZARDS

Under normal conditions of use, provided that a Tesla Energy Product enclosure remains closed, handling the product does not pose an electrical hazard. Numerous safeguards have been designed into Tesla Energy Products to help ensure that the high-voltage-battery is kept safe and secure as a result of a number of expected abuse conditions. All of the constituent component battery cells are sealed within the pack as sub-groups in metal enclosures (Pods). The exterior of each Pod is isolated from internal components and connectors are touch-safe. Pods are then installed in a rigid metal enclosure, which is isolated from high voltage.

A Tesla Energy Product may pose a significant high voltage and electrocution risk if the outer enclosure, Pod enclosures, and/or safety circuits have been compromised or have been significantly damaged. **A battery pack, even in a normally discharged condition is likely to contain substantial electrical charge and can cause injury or death if mishandled.** If a Tesla Energy Product has been significantly visibly damaged or its enclosure compromised, then practice appropriate high-voltage preventative measures until the danger has been assessed (and dissipated if necessary).

WARNING: NEVER CUT INTO A SEALED TESLA ENERGY PRODUCT ENCLOSURE due to the high voltage and electrocution risks.

For proper installation / removal instructions please contact Tesla Motors at (650) 681-5000.

2B. HAZARDS ASSOCIATED WITH MECHANICAL DAMAGE

Mechanical damage to Tesla Energy Products can result in a number of hazardous conditions (discussed below) including:

- Leaked battery pack coolant (See Section 2D)
- Leaked refrigerant (Powerpack systems only See Section 2E)
- Leaked cell electrolyte (See Section 2F)
- Rapid heating of individual cells due to exothermic reaction of constituent materials (cell thermal runaway), venting of cells, and propagation of self-heating and thermal runaway reactions to neighboring cells.
- Fire

To prevent mechanical damage to Tesla Energy Products, these items should be stored in their original packaging when not in use or prior to being installed. (See Section 6 below).

2C. HAZARDS ASSOCIATED WITH ELEVATED TEMPERATURE EXPOSURE

The Tesla Energy Powerwall is designed to withstand operating temperatures up to 43°C (110°F) and 95% non-condensing humidity.

The Tesla Energy Powerpack is designed to withstand operating temperatures up to 50°C (122°F) and 95% non-condensing humidity.

Exposure of Tesla Energy Products to elevated temperatures can drive battery cells into thermal runaway and result in a fire.

- Storage for more than 24 hours at temperatures above approximately 80°C (176 °F) could result in cell thermal runaway reactions and should be avoided.
- Storage for more than a few minutes at temperatures above approximately 150°C (302°F) could result in cell thermal runaway reactions and should be avoided.
- Exposure of battery packs to localized heat sources such as flames could result in cell thermal runaway reactions and should be avoided.

2D. HAZARDS ASSOCIATES WITH LEAKED COOLANT

Powerpack and Powerwall thermal management is achieved via liquid cooling using a 50/50 mixture of ethylene glycol and water. A typical Powerpack system includes about 26L of coolant. A typical Powerwall system includes about 1.6 L of coolant. Mechanical damage of a Tesla Energy Product that has been installed could result in leakage of the coolant. The fluid is blue in color and does not emit a strong odor.

For information regarding the toxicological hazards associated with ethylene glycol, as well as ecological effects and disposal considerations, refer to the specific Material Safety Data Sheet (MSDS) for battery coolant.

Extended exposure of a Tesla Energy Product to leaked coolant could cause additional damage to product such as corrosion and compromise of protection electronics.

2E. HAZARDS ASSOCIATES WITH LEAKED REFRIGERANT (POWERPACK ONLY)

The Powerpack thermal management system includes 400g of R134a: 1,1,1,2-Tetrafluoroethane refrigerant in a sealed system. Mechanical damage of a Powerpack could result in a release of the refrigerant. Such a release would appear similar to the emission of smoke.

For information regarding the toxicological hazards associated with R134a, as well as ecological effects and disposal considerations, refer to the specific Safety Data Sheet (SDS) for R134a.

2F. HAZARDS ASSOCIATED WITH LEAKED ELECTROLYTE

The electrolyte within constituent cells includes a volatile hydrocarbon-based liquid and a dissolved lithium salt (which is a source of lithium ions) such as lithium hexofluorophosphate. The electrolyte is largely absorbed in electrodes within individual sealed cells. Under normal usage conditions battery electrolyte should not be encountered by anyone handling a Tesla Energy Product.

Severe mechanical damaged (e.g. severe crushing) can cause a small quantity of electrolyte (up to approximately 1 g) to leak out of a cell. For the electrolyte liquid to come into contact with a user of a Tesla Energy Product, the Powerwall or Powerpack external enclosure, the Pod enclosure, and the cell would have to be mechanically damaged.

Any released electrolyte liquid is likely to evaporate rapidly leaving a white salt residue. Evaporated electrolyte is flammable and will contain alkyl-carbonate compounds. Leaked electrolyte is colorless and characterized by a sweet odor. If an odor is obvious, evacuate or clear the surrounding area and ventilate the area. **WARNING: AVOID CONTACT WITH ELECTROLYTE.**

Leaked electrolyte solution is flammable and corrosive / irritating to the eyes and skin. If a liquid is observed that is suspected electrolyte, ventilate the area and avoid contact with the liquid until a positive identification can be made and sufficient protective equipment can be obtained (eye, skin, and respiratory protection). Chemical classifier strips can be used to identify the spilled liquid (electrolyte will contain petroleum/organic solvent and fluoride compounds.

In case of an electrolyte leak, the following protective equipment is recommended: an air purifying respirator with organic vapor/acid gas cartridges, safety goggles or a full face respirator, and safety gloves (Butyl rubber or laminated film (Silver Shield)). Protective clothing should be worn. Use a dry absorbent material to clean up a spill.

2G. HAZARDS ASSOCIATED WITH VENTED ELECTROLYTE

Lithium-ion cells are sealed units, and thus under normal usage conditions, venting of electrolyte should not occur. If subjected to abnormal heating or other abuse conditions, electrolyte and electrolyte decomposition products can vaporize and be vented from cells. Accumulation of liquid electrolyte is unlikely in the case of abnormal heating. Vented gases are a common early indicator of a thermal runaway reaction – an abnormal and hazardous condition.

If gases or smoke are observed escaping from a Tesla Energy Product, evacuate the area and notify a first responder team and/or the local fire department. Gases or smoke exiting a lithium-ion battery pack are likely flammable and could ignite unexpectedly as the condition that led to cell venting may also cause ignition of the vent gases. A venting Tesla Energy Product should only be approached with extreme caution by trained first responders equipped with appropriate personal protective equipment (PPE) (discussed in Section 3).

Cell vent gas composition will depend upon a number of factors, including cell composition, cell state of charge, and the cause of cell venting. Vent gases may include volatile organic compounds (VOCs) (such as alkyl-carbonates, methane, ethylene, and ethane), hydrogen gas, carbon dioxide, carbon monoxide, soot, and particulates containing oxides of nickel, aluminum, lithium, copper, and cobalt. Additionally, phosphorus pentafluoride, POF_3 and HF vapors may form.

WARNING: AVOID CONTACT WITH VENTED GASES. Vented gases may irritate the eyes, skin, and throat. Cell vent gases are typically hot: upon exit from a cell, vent gas temperatures can exceed 600 °C (1,110 °F). Contact with hot gases can cause thermal burns. Vented electrolyte is flammable, and may ignite on contact with a competent ignition source such as an open flame, spark, or a sufficiently heated surface. Vented electrolyte may also ignite on contact with cells undergoing a thermal runaway reaction.

3. FIREFIGHTING MEASURES

Responding to a Venting Tesla Energy Product. Smoke emanating from a Tesla Energy Product is an indication of an abnormal and hazardous condition. The smoke is likely flammable and may ignite at any time. If fire or smoke is observed emanating from a Tesla Energy Product at any time, evacuate the area, and notify appropriately trained first responders and the local fire department.

A trained first responder team or the local fire department should shut off power to the Tesla Energy Product, to prevent charging of the battery. However, shutting off power to the Tesla Energy Product does not de-energized the battery, and thus a shock hazard may still be present. The Tesla Energy Product should then be monitored for evidence of continued smoke evolution. Application of high volumes of water from a safe distance to cool the battery pack may prevent further reaction and prevent a fire from developing.

If a fire develops, the Incident Commander should determine whether an attempt will be made to suppress the fire (aggressive firefighting) or allow the battery to burn until it self-extinguishes, while protecting surrounding materials (defensive firefighting).

Virtually all fires involving lithium-ion batteries can be controlled with water. To date, water has been found to be the most effective agent for controlling lithium-ion battery fires. Water will suppress flames and can cool cells, limiting propagation of thermal runaway reactions. If water is used, electrolysis of water (splitting of water into hydrogen and oxygen) may contribute to the flammable gas mixture formed by venting cells, burning plastic, and burning of other combustibles. Thus copious volumes of water should be used to fight a lithium-ion battery fire.

Gaseous agents such as CO_2 or Halon, or dry chemical suppressants may temporarily suppress flaming of lithium-ion battery packs, but they will not cool lithium-ion batteries and will not limit the propagation of cell thermal runaway reactions. Metal fire suppressants such as LITH-X, graphite powder, or copper powder are not appropriate agents for suppressing fires involving lithium-ion battery packs as they are unlikely to be effective.

A battery fire may continue for several hours and it may take 24 hours or longer for the battery pack to cool. A lithium-ion battery fire that has been extinguished can re-ignite due to the exothermic reaction of constituent materials from broken or damaged cells. To avoid this, remove sources of ignition and cool the burned mass by flooding with water.

Aggressive Firefighting: If a decision is made to aggressively fight a fire involving a Tesla Energy Product, then copious amounts of water should be applied from a safe distance. The water may not suppress all cell thermal runaway reactions within the battery pack, but it may cool cells and control the spread of the fire. If possible, direct the application of water towards openings in the battery pack enclosure, if any have formed, with the intent of flooding the pack enclosure. The object is to contact the surfaces of the affected and surrounding individual battery cells with water.

Defensive Firefighting If a decision is made to fight a Tesla Energy Product fire defensively, then the fire crew should pull back a safe distance and allow the battery to burn itself out. Fire crews may choose to utilize a water stream or fog pattern to protect exposures or control the path of smoke. A battery fire may continue for several hours and may result in multiple re-ignition events. It may take 24 hours or longer for the battery pack to cool.

Firefighter PPE. Firefighters should wear self-contained breathing apparatus (SCBA) and fire protective turnout gear. Cells or batteries may flame or leak potentially hazardous organic vapors if exposed to excessive heat, fire or over voltage conditions. These vapors may include volatile organic compounds (VOCs), hydrogen gas, carbon dioxide, carbon monoxide, soot, and particulates containing oxides of nickel, aluminum, lithium, copper, and cobalt. Additionally, phosphorus pentafluoride, POF_3 and HF vapors may form

4. FIRST AID MEASURES

Electric Shock / Electrocution: Seek immediate medical assistance if an electrical shock or electrocution has occurred (or is suspected).

Contact with Leaked Electrolyte: The constituent battery cells are sealed. Contents of an open (broken) constituent battery cell can cause skin irritation and/or chemical burns. If materials from a ruptured or otherwise damaged cell or battery contact skin, flush immediately with water and wash affected area with soap and water. If a chemical burn occurs or if irritation persists, seek medical assistance.

For eye contact, flush with significant amounts of water for 15 minutes without rubbing and see physician at once.

Inhalation of Electrolyte Vapors: If inhalation of electrolyte vapors occurs, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

Vent Gas Inhalation: The constituent battery cells are sealed and venting of cells should not occur during normal use. If inhalation of vent gases occurs, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

5. STORAGE PRECAUTIONS

Powerwalls, Powerpacks, and battery subassemblies should be stored upright in approved packaging prior to installation.

Do not store Tesla Energy Products in a manner that allows terminals to short circuit (do not allow the formation of an electrically-conductive path).

Elevated temperatures can result in reduced battery service life. Powerwall and Powerpack systems can withstand temperatures of -30°C to 60°C for up to 24 hours. However, Tesla Energy products stored for longer than one month should be stored at temperatures between -20°C and 30°C (-4 °F and 86 °F), at humidity <70%, and protected from condensation. Extended storage (more than a month) at temperatures outside the recommended range can result in degradation of product lifetime. Storage in areas where temperatures routinely approach or exceed 80°C (176°F) could result in a hazardous condition. Do not store Tesla Energy Products near heating equipment.

Ideally, a Tesla Energy Product should be stored at 50% state of charge (SOC) or less. Tesla Energy Products should not be stored for extended periods either at a full state of charge (SOC) or completely discharged since both conditions adversely impact battery life. Tesla Energy Products should not be stored untended longer than twelve (12) months since battery service life likely will be adversely impacted.

The storage area should be protected from flooding.

Extended storage areas should be compliant with the appropriate local fire code requirements.

Acceptable storage density of battery packs and storage height of battery packs will be defined by the local authority having jurisdiction. Requirements and limits will be based upon a number of factors including the structural and fire protection characteristics of the storage area and recommendations for fire protection promulgated by the National Fire Protection Association (NFPA) and similar organizations. At the time of this writing, no Commodity Classification has been defined for lithium-ion cells or battery packs (See NFPA – 13 Standard for the Installation of Sprinkler Systems). Until a Commodity Classification has been defined based on testing by NFPA or a similar organization, Tesla recommends treating lithium-ion cells and batteries as equivalent to a Group A Plastic Commodity.

6. INSTALLATION PRECAUTIONS

Elevated temperatures can result in reduced battery service life, or a hazardous condition.

The desired installation temperature for Tesla Energy Powerwall is between -20 °C and 43 °C (-4 °F and 110 °F). Installation in areas with ambient temperatures over 43°C (110°F) is not recommended as this can result in degradation of product lifetime or a hazardous condition.

The desired installation temperature for Tesla Energy Powerpack is between -20 °C and 50°C (-4 °F and 122 °F). Installation in areas with ambient temperatures over 50°C (122°F) is not recommended as this can result in degradation of product lifetime or a hazardous condition.

Installation in areas where temperatures routinely approach or exceed 80 °C (176 °F) could result in a hazardous condition. Do not install batteries near heating equipment.

The installation area should be protected from flooding.

Installation areas should be compliant with the appropriate local fire code requirements.

7. HANDLING, STORAGE, & TRANSPORTATION OF DAMAGED TESLA ENERGY PRODUCTS

If a Tesla Energy Product has been damaged (battery enclosure has been dented or compromised), it is possible that heating is occurring that may eventually lead to a fire. Damaged or opened cells/batteries can result in rapid heating (due to exothermic reaction of constituent materials), the release of flammable vapors, and propagation of self-heating and thermal runaway reactions to neighboring cells.

Before handling or transporting a damaged Tesla Energy Product, wait at least 1 hour. Smoke may be an indication that a thermal reaction is in progress. If no smoke, flame, leakage of electrolyte, leakage of coolant, or signs of heat has been observed for 1 hour, the Tesla Energy Product may be disconnected and moved into a safe location. Please contact Tesla (650) 681-5000 to obtain specific instructions for evaluating, disconnecting, and preparing a damaged Tesla Energy Product for transport.

A damaged Tesla Energy Product should be monitored during storage for evidence of smoke, flame, leakage of electrolyte, leakage of coolant, or signs of heat. If full-time monitoring of the Product is not possible (for example during extended storage), the Product should be moved to a safe storage location.

A safe storage location for a damaged battery will be free of flammable materials, accessible only by trained professionals, and 50 feet downwind of occupied structures. For example, a fenced, open yard may be an appropriate safe location. **DO NOT STORE DAMAGED TESLA ENERGY PRODUCTS ADJACENT TO UNDAMAGED TESLA ENERGY PRODUCTS.** It is possible that a damaged battery may sustain further damage during transportation that may lead to a fire. To further reduce this risk, handle the damaged battery with extreme caution.

8. DISPOSAL PROCEDURES

Tesla Energy lithium-ion batteries do not contain heavy metals such as lead, cadmium, or mercury.

Tesla Energy Products should be disposed of or recycled in accordance with local, state, and federal regulations. Note that regulations regarding disposal of batteries vary by jurisdiction. In the United States batteries are classified as Universal Waste, and in addition, many individual states have specific regulations regarding disposal of battery packs. For example, in California, all batteries must be taken to a Universal Waste handler or authorized recycling facility.

Tesla Energy Products contain recyclable materials. Tesla strongly encourages recycling. For more information on the recycling of Tesla Energy Products, please contact Tesla (650) 681-5000.

If disposing without return to Tesla, please consult with local, state and /or federal authorities on the appropriate methods for disposal and recycling.

9. TRANSPORT INFORMATION

Lithium-ion batteries are regulated as Class 9 Miscellaneous dangerous goods (also known as "hazardous materials") pursuant to the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air, International Air Transport Association (IATA) Dangerous Goods Regulations, the International Maritime Dangerous Goods (IMDG) Code, European Agreements concerning the International Carriage of Dangerous Goods by Rail (RID) and Road (ADR), and applicable national regulations such as the USA's hazardous materials regulations (see 49 CFR 173.185). These regulations contain very specific packaging, labeling, marking, and documentation requirements. The regulations also require that individuals involved in the preparation of dangerous goods for transport be trained on how to properly package, label, mark and prepare shipping documents.

UN Number	3480
Proper Shipping Name	Lithium ion batteries
Hazard Classification	Class 9 Miscellaneous
Packing Group	II (depending on mode of transport and international location)

UN Number	3481
Proper Shipping Name	Lithium ion battery contained in equipment or lithium ion battery packed with equipment
Hazard Classification	Class 9 Miscellaneous
Packing Group	II (depending on mode of transport and international location)

Notice: The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. TESLA MOTORS, INC. makes no warranty, expressed or implied, with respect to this information.

APPENDIX E Construction Schedule

Construction Schedule for Solar Array
9 Stott Ave and 292 Plain Hill Road, Norwich, CT

Activity	Prerequisites to construction start	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18
Siting Council approval	x																		
Norwich Building Permit	x																		
Norwich Demolition permit	x																		
State Permits	x																		
Utility disconnect from exisitng building		x																	
Demolition of Batting cage and 1 existing building			x	x															
Tree and brush removal			x	x															
Install wood chip berms and erosion control				x	x														
Install chain link fence					x	x	x	x	x	x									
Install access drive, gravel berm and water quality basins						x	x	x											
Grade Phase 1 area (corner of Stott and Plain Rd.							x	x											
Install racking system and PV modules phase 1 area								x	x	x	x								
Grade Phase 2 area (from Stott Ave North)									x	x	x	x	x						
Install racking system and PV modules phase 2 area												x	x	x	x	x	x		
Battery Installation															x	x	x		
Utility equipment installation																x	x	x	x
Final landscaping																		x	x

APPENDIX F Construction Work Hours/Days Letter

SolarCity

8-11-2015

Connecticut Siting Council
10 Franklin Sq.
New Britain, CT 06051

RE: SolarCity Corp.'s Petition to the Connecticut Siting Council for Declaratory Ruling: Work Hours on Site

To whom it may concern:

For the construction of the solar array at 9 Stott Ave and 292 Plain Hill Road, Norwich, CT, we plan to use the following work schedule:

- 7am to 7pm;
- 7 days per week.

Best regards,

Robert Miller
Project Manager
SolarCity Corporation

APPENDIX G Wetland Protection Plan

ALL-POINTS
TECHNOLOGY CORPORATION

WETLAND PROTECTION PROGRAM

Portions of the proposed Project are located in close proximity to wetlands. As a result, the following protective measures shall be followed to help avoid degradation of the nearby wetland system.

It is of the utmost importance that the Contractor complies with the requirement for the installation of protective measures and the education of its employees and subcontractors performing work on the project site. These measures will also provide protection to a nearby wetland system. This protection program shall be implemented regardless of time of year the construction activities occur. All-Points Technology Corporation, P.C. ("APT") will serve as the Environmental Monitor for this project to ensure that wetland protection measures are implemented properly. The Contractor shall contact Dean Gustafson, Senior Environmental Scientist at APT, at least 5 business days prior to the pre-construction meeting. Mr. Gustafson can be reached by telephone at (860) 663-1697 ext. 201 or via email at dgustafson@allpointstech.com.

The wetland protection program consists of several components: use of appropriate erosion control measures to control and contain erosion while avoiding/minimizing wildlife entanglement; periodic inspection and maintenance of isolation structures and erosion control measures; education of all contractors and sub-contractors prior to initiation of work on the site; protective measures; and, reporting.

1. **Erosion and Sedimentation Controls**

    a. Plastic netting used in a variety of erosion control products (i.e., erosion control blankets, fiber rolls [wattles], reinforced silt fence) has been found to entangle wildlife, including reptiles, amphibians, birds and small mammals. No permanent erosion control products or reinforced silt fence will be used on the project. Temporary Erosion control products will use either erosion control blankets and fiber rolls composed of processed fibers mechanically bound together to form a continuous matrix (net less) or netting composed of planar woven natural biodegradable fiber to avoid/minimize wildlife entanglement.

    b. Installation of erosion control measures shall be performed by the Contractor prior to any earthwork. The Environmental Monitor will inspect the work zone area prior to and following barrier installation to ensure erosion controls are properly installed.

    c. In addition to required daily inspection by the Contractor, the fencing will be inspected for tears or breeches in the fabric following installation periodically by the Environmental Monitor throughout the course of the construction project.

    d. The extent of the erosion controls will be as shown on the site plans. The Contractor shall have additional erosion control materials should field conditions warrant extending the fencing as directed by the Environmental Monitor.

    e. All silt fencing and other erosion control devices shall be removed within 30 days of completion of work and permanent stabilization of site soils. If fiber rolls/wattles, straw bales, or other natural material erosion control products are used, such devices will not be left in place to biodegrade and shall be promptly removed after soils are stable so as not to create a barrier to migrating wildlife. Seed from seeding of soils should not spread over fiber rolls/wattles as it makes them harder to remove once soils are stabilized by vegetation.

ALL-POINTS TECHNOLOGY CORPORATION, P.C.
☒ 3 SADDLEBROOK DRIVE · KILLINGWORTH, CT 06419 · PHONE 860-663-1697 · FAX 860-663-0935
☐ P.O. BOX 504 · 116 GRANDVIEW ROAD · CONWAY, NH 03818 · PHONE 603-496-5853 · FAX 603-447-2124

2. **Contractor Education**

   a. Prior to work on site, the Contractor shall attend an educational session at the pre-construction meeting with the Environmental Monitor. This orientation and educational session will consist of an introductory meeting with the Environmental Monitor to understand the environmentally sensitive nature of the development site and the need to follow these protective measures.

3. **Petroleum Materials Storage and Spill Prevention**

   a. Certain precautions are necessary to store petroleum materials, refuel and contain and properly clean up any inadvertent fuel or petroleum (i.e., oil, hydraulic fluid, etc.) spill due to the project's location in proximity to sensitive wetlands.

   b. A spill containment kit consisting of a sufficient supply of absorbent pads and absorbent material will be maintained by the Contractor at the construction site throughout the duration of the project. In addition, a waste drum will be kept on site to contain any used absorbent pads/material for proper and timely disposal off site in accordance with applicable local, state and federal laws.

   c. The following petroleum and hazardous materials storage and refueling restrictions and spill response procedures will be adhered to by the Contractor.

      i. Petroleum and Hazardous Materials Storage and Refueling

         1. Refueling of vehicles or machinery shall occur a minimum of 100 feet from wetlands or watercourses and shall take place on an impervious pad with secondary containment designed to contain fuels.

         2. Any fuel or hazardous materials that must be kept on site shall be stored on an impervious surface utilizing secondary containment a minimum of 100 feet from wetlands or watercourses.

      ii. Initial Spill Response Procedures

         1. Stop operations and shut off equipment.

         2. Remove any sources of spark or flame.

         3. Contain the source of the spill.

         4. Determine the approximate volume of the spill.

         5. Identify the location of natural flow paths to prevent the release of the spill to sensitive nearby waterways or wetlands.

         6. Ensure that fellow workers are notified of the spill.

      iii. Spill Clean Up & Containment

         1. Obtain spill response materials from the on-site spill response kit. Place absorbent materials directly on the release area.

         2. Limit the spread of the spill by placing absorbent materials around the perimeter of the spill.

         3. Isolate and eliminate the spill source.

4. Contact appropriate local, state and/or federal agencies, as necessary.

5. Contact a disposal company to properly dispose of contaminated materials.

iv. Reporting

1. Complete an incident report.

2. Submit a completed incident report to appropriate local, state and/or federal agencies, as necessary.

4. Herbicide and Pesticide Restrictions

a. In the event herbicides and/or pesticides are required at the proposed facility, their use will be used in accordance with Integrated Pest Management ("IPM") principles with particular attention to minimize applications within 100 feet of wetland or watercourse resources. No applications of herbicides or pesticides are allowed within actual wetland or watercourse resources.

5. Reporting

a. Any incidents of sediment release into the nearby wetland will be reported to the Connecticut Siting Council.

APPENDIX H Noise Evaluation Report

HMB

HMB Acoustics LLC 3 Cherry Tree Lane, Avon, CT 06001 860-677-5955

Noise Evaluation Report

Proposed Solar Farm Facility
9 Stott Avenue
Norwich, CT

July 16, 2015

Prepared For:
All-Points Technology Corporation
3 Saddlebrook Drive
Killingworth, CT 06419

Prepared By:
Allan Smardin
HMB Acoustics LLC
3 Cherry Tree Lane
Avon, CT 06001

Introduction

Using the data provided, I have reviewed site plans and specifications for the Inverters that are being proposed for the Solar Farm. This Solar Farm is to be located at 9 Stott Avenue, Norwich, CT. The site location is mixed commercial and residential in nature. On July 10, 2015, existing background noise measurements were taken at the proposed site and in adjacent areas. The average levels were between 25-30 dBA.

The purpose of this noise evaluation is to determine whether the Inverters with the fans on will comply with the State of CT Noise Regulations. This report and the noise regulations utilize a dBA scale. This scale is used because it closely approximates the response characteristic of the human ear to loudness, and is the scale most commonly used in the measurement of community noise.

Noise Regulations

The State of CT has enacted regulations which limit the amount of noise which may be transferred from one property to another. In pertinent part, the Regulations provide as follows:

Daytime Hours - The hours between 7 a.m. and 10 p.m. local time.
Nighttime Hours - The hours between 10 p.m. and 7 a.m. local time.
(Sec. 22a-69-1.1 (h) and (n)).

The allowable noise level from a Class "B" Commercial Zone Emitter to a Class "B" Commercial Zone Receptor's property line is 62 dBA (day and night).
(Sec. 22a-69-3.5 (b)).
The allowable level from a Class "B" Commercial Zone Emitter to a Class "A" Residential Receptor's property line is 55 dBA (day) and 45 dBA (night).
(Sec. 22a-69-3.5 (b)).

Noise Evaluation

The noise levels listed in TABLE 1 take into account the effect of acoustical shielding provided by other structures on the property. The noise levels have been projected to the nearest commercial and residential property lines in the directions listed.

TABLE 1

Combined acoustical effect of Inverters projected to the nearest Commercial and Residential property lines.

Direction	Property Line	dBA Level
North	Residence	28
Northeast	Farm and Residence	35
East	Residence	31
South	Residence	34
West	Nachaug Hospital (Stott Avenue)	27
	Levine Distributing Company (Stott Avenue)	22

Noise Evaluation Results

The noise level data shown in TABLE 1 demonstrates that the noise levels meet the conditions for compliance as set forth in the State of CT Noise Regulations at all commercial and residential property lines.

APPENDIX I Photo-Simulations

PHOTO LOG

Legend

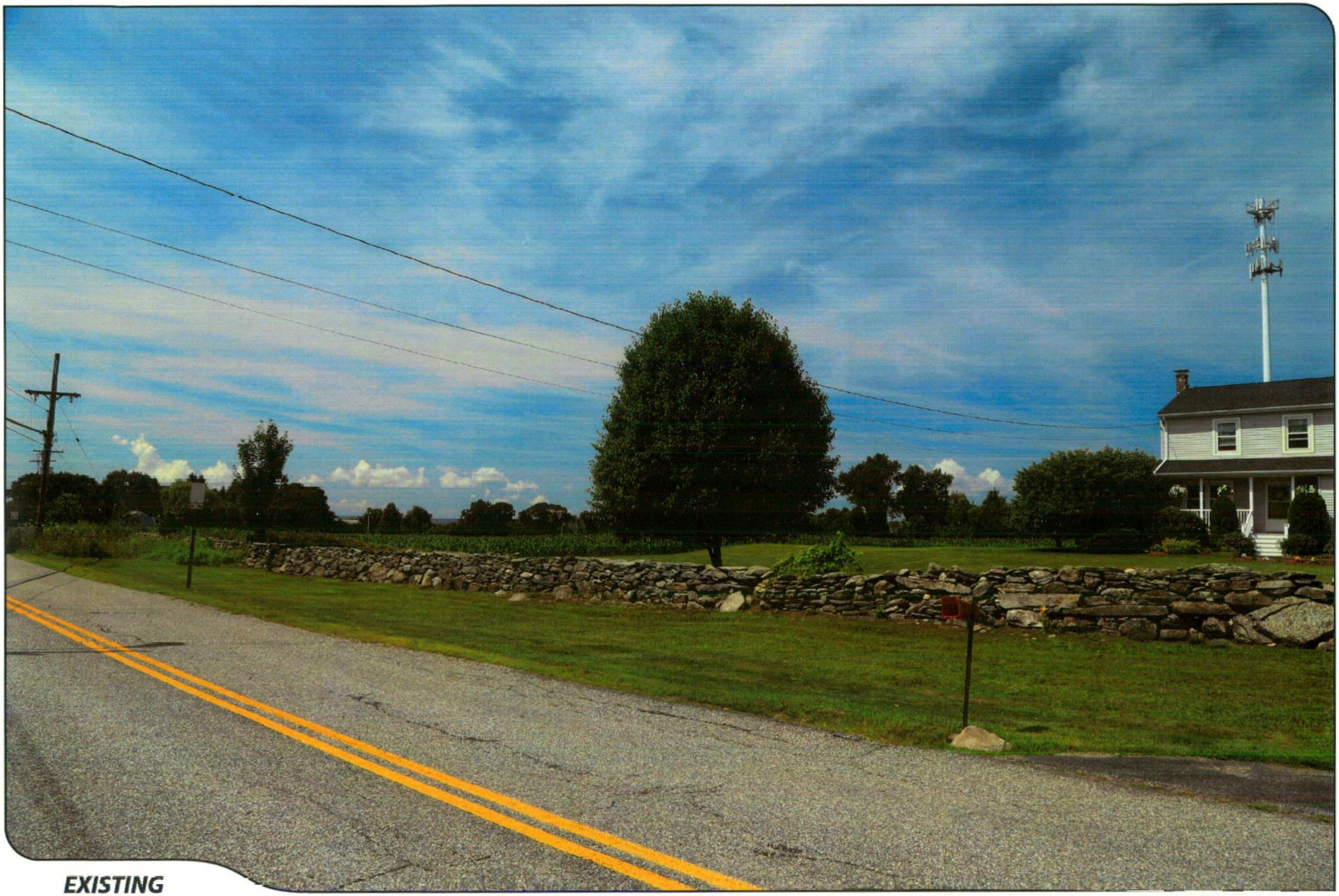
- ● Photo Location
- Proposed Lease Area (+/-22.80 acres)
- Project Area (+/-15.03 acres)
- Site Property Boundary

1 inch = 350 feet

350 175 0 350 Feet

ALL-POINTS TECHNOLOGY CORPORATION

BRIGHTFIELDS DEVELOPMENT LLC



EXISTING

PHOTO	LOCATION	ORIENTATION
1	**PLAIN HILL ROAD**	**SOUTHWEST**

ALL-POINTS TECHNOLOGY CORPORATION

BRIGHTFIELDS DEVELOPMENT LLC

PROPOSED

PHOTO	LOCATION	ORIENTATION
1	**PLAIN HILL ROAD**	**SOUTHWEST**

ALL-POINTS TECHNOLOGY CORPORATION

BRIGHTFIELDS DEVELOPMENT LLC

EXISTING

PHOTO	LOCATION	ORIENTATION
2	STOTT AVENUE	NORTHWEST

ALL-POINTS TECHNOLOGY CORPORATION

BRIGHTFIELDS DEVELOPMENT LLC

PROPOSED

PHOTO	LOCATION	ORIENTATION
2	STOTT AVENUE	NORTHWEST

ALL-POINTS TECHNOLOGY CORPORATION

BRIGHTFIELDS DEVELOPMENT LLC

EXISTING

PHOTO	LOCATION	ORIENTATION
3	STOTT AVENUE	NORTHWEST

ALL-POINTS TECHNOLOGY CORPORATION

BRIGHTFIELDS DEVELOPMENT LLC

PROPOSED

PHOTO	LOCATION	ORIENTATION
3	STOTT AVENUE	NORTHWEST

ALL-POINTS TECHNOLOGY CORPORATION

BRIGHTFIELDS DEVELOPMENT LLC

EXISTING

PHOTO	LOCATION	ORIENTATION
4	**STOTT AVENUE**	**NORTHEAST**

ALL-POINTS TECHNOLOGY CORPORATION

BRIGHTFIELDS DEVELOPMENT LLC

PROPOSED

PHOTO	LOCATION	ORIENTATION
4	**STOTT AVENUE**	**NORTHEAST**

ALL-POINTS TECHNOLOGY CORPORATION

BRIGHTFIELDS DEVELOPMENT LLC

EXHIBIT 3

BROWNRUDNICK

185 Asylum Street
Hartford
Connecticut
06103
tel 860.509.6500
fax 860.509.6501

PHILIP M. SMALL
direct dial: (860) 509-6575
psmall@brownrudnick.com

August 24, 2015

VIA FIRST CLASS MAIL

Notice List Recipients

RE: SolarCity Corp.'s Petition to the Connecticut Siting Council for Declaratory Ruling

Dear Sir/Madam:

Pursuant to Section 16-50j-40 of the Connecticut Siting Council's (the "Council") regulations, we are notifying you that SolarCity Corporation intends to file on or shortly after August 25, 2015, a Petition for Declaratory Ruling with the Council. The petition will request the Council's approval of the location and construction of an approximately 4.93 megawatt ("MW") solar-based electric generating facility (the "Facility"). The Facility will be located at 9 Stott Avenue and 292 Plain Hill Road in Norwich, Connecticut (the "Site"). The Facility will be a "grid-side distributed resources" facility (as defined in Connecticut General Statute Section 16-1(a)(37)), under 65 megawatts ("MW") that complies with the air and water quality standards of the Connecticut Department of Energy and Environmental Protection ("DEEP"). Electricity generated by the Facility will be exported to the electric grid.

If you have any questions regarding the proposed Facility, please contact any of the following:

Robert Miller
SolarCity Corporation
714 Brook Street
Rocky Hill, CT 06067
Tel: (914) 584-6894
Fax: (866) 270-6397
E-mail: rmiller@solarcity.com

Philip M. Small, Esq.
Brown Rudnick LLP
185 Asylum Street, 38th Floor
Hartford, CT 06103
Tel: (860) 509-6575
Fax: (860) 509-6501
E-mail:
psmall@brownrudnick.com

Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051
Tel: (860) 827-2935
Fax: (860) 827-2950
E-mail: siting.council@ct.gov

Sincerely,

BROWN RUDNICK LLP

Philip M. Small /s/ CT

Philip M. Small

61994685

<u>NOTICE LIST</u>

This is to certify that on the 24th day of August 2015, the foregoing notice was sent via first class mail to the following:

MUNICIPAL OFFICIAL/AGENCY	*NAME/ADDRESS*
Norwich Chief Executive Officer Plan of Conservation & Development Committee (Ms. Hinchey is member)	Deb Hinchey, Mayor Norwich City Hall 100 Broadway Norwich, CT 06360
Norwich City Manager	John Bilda, Acting City Manager Norwich City Hall 100 Broadway Norwich, CT 06360
Norwich Planning Commission	Ralph Page, Chairman Commission of the City Plan City of Norwich 23 Union Street Norwich, CT 06360
Norwich Planning Commission	Peter Davis, Director Planning & Neighborhood Services City of Norwich 23 Union Street Norwich, CT 06360
Norwich Inland Wetlands, Water Courses & Conservation Commission	Richard Morell, Chairman Inland Wetlands, Water Courses & Conservation Commission City of Norwich 23 Union Street Norwich, CT 06360
Norwich & Franklin Regional Planning Agency	James S. Butler, Executive Director Southeastern Connecticut Council of Government 5 Connecticut Avenue Norwich, Connecticut 06360
Franklin Chief Executive Officer	Richard Matters, First Selectman Franklin Town Hall 7 Meetinghouse Hill Road Franklin, CT 06254

MUNICIPAL OFFICIAL/AGENCY	*NAME/ADDRESS*
Franklin Planning & Zoning Commission	John McGuire, Chairman Planning & Zoning Commission Franklin Town Hall 7 Meetinghouse Hill Road Franklin, CT 06524
Franklin Zoning Enforcement Officer	Ronald Chalecki, ZEO Franklin Town Hall 7 Meetinghouse Hill Road Franklin, CT 06524
Franklin Inland Wetlands Watercourses Commission	Calli Carboni, Chairman Inland Wetlands Watercourses Commission Franklin Town Hall 7 Meetinghouse Hill Road Franklin, CT 06524
Franklin Agriculture and Conservation Commission	Susan Allen, Chairman Agriculture and Conservation Commission Franklin Town Hall 7 Meetinghouse Hill Road Franklin, CT 06524
Norwich & Franklin State Senator – 19th District	Cathy Osten, State Senator Legislative Office Building, Room 2100 300 Capitol Avenue Hartford, CT 06106
Norwich State Representative – 46th District	Emmett D. Riley, State Representative Legislative Office Building, Room 4037 300 Capitol Avenue Hartford, CT 06106
Norwich & Franklin State Representative – 47th District	Doug Dubitsky, State Representative Legislative Office Building, Room 4200 300 Capitol Avenue Hartford, CT 06106
Norwich State Representative – 139th District	Kevin Ryan, State Representative Legislative Office Building, Room 4012ct 300 Capitol Avenue Hartford, CT 06106

MUNICIPAL OFFICIAL/AGENCY	*NAME/ADDRESS*
Connecticut Attorney General	George Jepsen, Attorney General Office of the Attorney General 55 Elm Street Hartford, CT 06106
State Department of Energy and Environmental Protection	Rob Klee, Commissioner Department of Energy and Environmental Protection 79 Elm Street Hartford, CT 06106-5127
State Public Utilities Regulatory Authority	Arthur House, Chairman Public Utilities Regulatory Authority Department of Energy and Environmental Protection 10 Franklin Square New Britain, CT 06051
State Department of Public Health	Dr. Jewel Mullen, Commissioner Department of Public Health 410 Capitol Avenue P.O. Box 340308 Hartford, CT 06134
State Council on Environmental Quality	Susan D. Merrow, Chair Council on Environmental Quality 79 Elm Street Hartford, CT 06106
State Department of Agriculture	Steven K. Reviczky, Commissioner Department of Agriculture 165 Capitol Avenue Hartford, CT 06106
Office of Policy & Management	Benjamin Barnes, Secretary Office of Policy and Management 450 Capitol Avenue Hartford, CT 06106
State Department of Economic & Community Development	Catherine Smith, Commissioner Department of Economic and Community Development 505 Hudson Street Hartford, CT 06106

MUNICIPAL OFFICIAL/AGENCY	*NAME/ADDRESS*
State Department of Transportation	James P. Redeker, Commissioner Department of Transportation 2800 Berlin Turnpike Newington, CT 06111
Any Federal Agencies with Jurisdiction Over the Site	None

ABUTTERS LIST	
Kelvin H. Stott 300 Plain Hill Road Norwich, CT 06360 Prop.: subject parcel (9 Stott Ave.) 28/1/10	Kelvin H. & Frances S. Stott 300 Plain Hill Road Norwich, CT 06360 Prop.: subject parcel (292 Plain Hill Rd.) 28/1/13 28/1/2
Rodney C. & Elizabeth P. Stott 303 Plain Hill Road Norwich, CT 06360 Prop.: 28/1/1	Robert E. Jr. & Myra B. Crowell 267 Plain Hill Road Norwich, CT 06360 Prop.: 28/1/7
Alan G. Evanuk 275 Plain Hill Road Norwich, CT 06360 Prop.: 28/1/6	William T. & Jeannine Pestey 259 Plain Hill Road Norwich, CT 06360 Prop.: 28/1/9
Eugene T. Wisneske 320 Plain Hill Road Norwich, CT 06360 Prop.: 28/1/8 & 27/1/3	Skelmorlie LLC 705 N. Mountain Road Newington, CT 06111 Prop.: 35/1/3
Edward P. & Emma L. Tremblay 4 Stott Avenue Norwich, CT 06360 Prop.: 35/1/2	Norwich Community Development Corp. 77 Main Street Norwich, CT 06360 Prop.: 27/1/5-2
City of Norwich Department of Public Utilities 16 S. Golden Street Norwich, CT 06360 Prop.: 27/1/4	City of Norwich 100 Broadway Norwich, CT 06360 Prop.: 34/1/7

ABUTTERS LIST	
William W. Backus Hospital 326 Washington Street Norwich, CT 06360 Prop.: 27/1/5-1 & 27/1/5-A1	Agnl Laundry LLC c/o Angelo Gordon & Co. 245 Park Ave. , 26th Floor New York, NY 10167 Prop.: 27/1/14
Susan E. Ferguson & Mark J. Ferguson 280 Plain Hill Road Norwich, CT 06360	Gregory Stott 284 Plain Hill Road Norwich, CT 06360

By: Philip M. Small /s/ct
Philip M. Small

61992111 v1-031819/0001

EXHIBIT 4

4932.72 KW SOLAR PV SYSTEM FOR

Connecticut Municipal Electric Energy Cooperative - Norwich (Stott Ave)

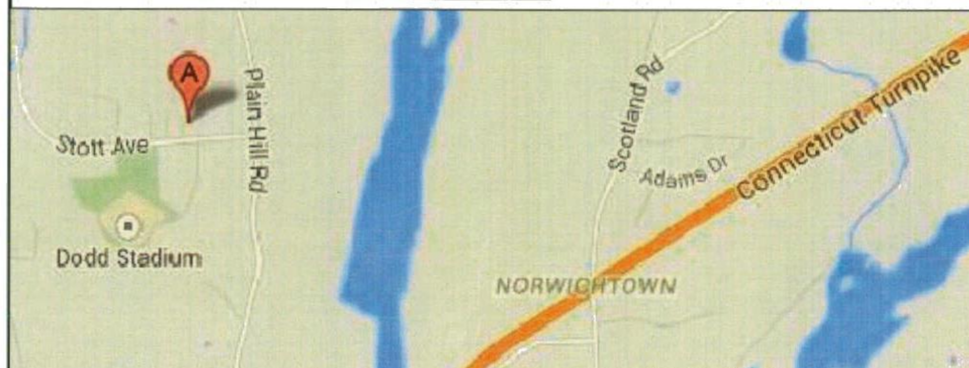
PROJECT TEAM

DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE:
ARMANDO GRIJALVA VALENCIA
SOLARCITY, INC.
5401 SOUTH 37TH STREET
PHOENIX, AZ 85040
TEL:(888) 765-2489 x58119
AGRIJALVAVALENCIA@SOLARCITY.COM

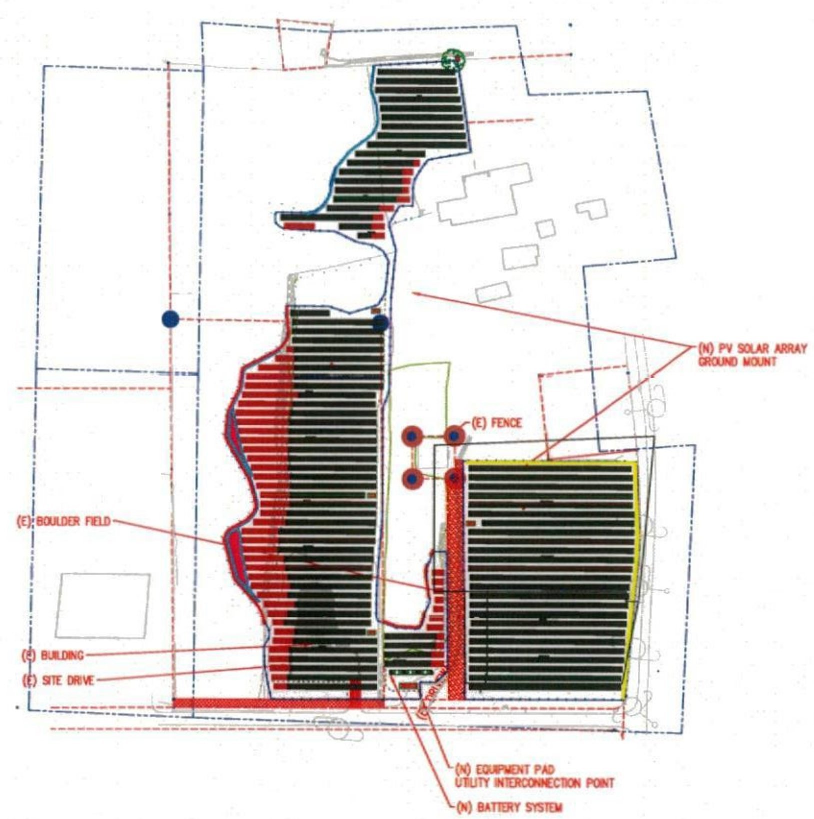
ELECTRICAL ENGINEER:
ANN D'ALESSANDRO
PLUMP ENGINEERING, INC.
914 E KATELLA AVE
ANAHEIM, CA 92805
TEL: (518) 796-1030
FAX: (518) 729-3473
ANN@PEICA.COM

CIVIL/STRUCTURAL:
ABE DEVERA
6334 ARIZONA PLACE
LOS ANGELES, CA 90045
TEL:(888) 765-2489 X7526
ADEVERA@SOLARCITY.COM

VICINITY MAP



AERIAL MAP



PROPERTY PLAN

1"=200'-0"

0 100' 200'

N W E S 180°

GENERAL NOTES

ALL WORK SHALL COMPLY WITH ALL STATE AND LOCAL CODES AND ANY OTHER REGULATING AUTHORITIES WHICH HAVE AUTHORITY OVER ANY PORTION OF THE WORK.

DRAWINGS HAVE BEEN DETAILED IN COMPLIANCE WITH UL LISTING REQUIREMENTS, OSFM SOLAR PHOTOVOLTAIC INSTALLATION REQUIREMENTS, AND BUILDING CODES FOR THE MATERIALS SPECIFIED.

PRIOR TO COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND NOTIFY THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE FROM SOLARCITY OF ANY DISCREPANCIES. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED AT THE SUBCONTRACTORS SOLE EXPENSE.

SUBCONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO SOLARCITY FOR APPROVAL BEFORE MAKING ANY CHANGES. DEVIATION FROM PLANS BEFORE WRITTEN APPROVAL FROM SOLARCITY PLACES LIABILITY ON THE SUBCONTRACTOR.

ALL EQUIPMENT SHALL BE MOUNTED AS SHOWN. WHERE DETAILS ARE NOT PROVIDED, CONTRACTOR SHALL USE STANDARD CONSTRUCTION PRACTICES.

ALL SURFACES SHALL BE PATCHED AND PAINTED AROUND NEW DEVICES AND EQUIPMENT TO MATCH EXISTING FINISHES.

ANY METAL SHAVINGS FROM SITE WORK SHALL BE CLEANED FROM ALL SURFACES WHERE OXIDIZED OR CONDUCTIVE METAL SHAVINGS MY CAUSE RUST, ELECTRICAL SHORT CIRCUITS, OR OTHER DAMAGE.

BEAMS OR PURLINS SHALL NOT BE DRILLED UNLESS AUTHORIZED BY SOLARCITY OR SHOWN IN THE DRAWINGS.

APPROVALS FROM BUILDING INSPECTORS SHALL NOT CONSTITUTE AUTHORITY TO DEVIATE FROM THE DRAWINGS.

ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
ADA	AMERICANS WITH DISABILITIES ACT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BLDG	BUILDING
CLR	CLEAR
CONC	CONCRETE
DC	DIRECT CURRENT
DIA	DIAMETER
DIST	DISTANCE
EQ	EQUAL
EGC	EQUIPMENT GROUNDING CONDUCTOR
(E)	EXISTING
EA.	EACH
EMT	ELECTRICAL METALLIC TUBING
GALV	GALVANIZED
GEC	GROUNDING ELECTRODE CONDUCTOR
GND	GROUND
HDG	HOT DIPPED GALVANIZED
I	CURRENT
Imp	CURRENT AT MAX POWER
INVS	INVERTERS
Isc	SHORT CIRCUIT CURRENT
kVA	KILOVOLT AMPERE
kW	KILOWATT
kWh	KILOWATT-HOUR
LBW	LOAD BEARING WALL
MAX	MAXIMUM
MIN	MINIMUM
(N)	NEW
NEC	NATIONAL ELECTRIC CODE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OCP	OVERCURRENT PROTECTION
PL	PROPERTY LINES
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
SCH	SCHEDULE
SQ. IN.	SQUARE INCHES
SS	STAINLESS STEEL
SSD	SEE STRUCTURAL DRAWINGS
STC	STANDARD TESTING CONDITIONS
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
VIF	VERIFY IN FIELD
V	VOLT
Vmp	VOLTAGE AT MAX POWER
Voc	VOLTAGE AT OPEN CIRCUIT
W	WATT
3R	NEMA 3R, RAINTIGHT

SYSTEM SUMMARY

MODULE: (19422) TRINA SOLAR # TSM-310PD14

INVERTER: (163) SOLECTRIA #PVI28TL-480

RACK TYPE:
ARRAY TILT: 15°
AZIMUTH: 180°

DESIGN CRITERIA

BUILDING HEIGHT: N/A

GROSS BUILDING AREA:

WIND SPEED:

EXPOSURE:

SNOW LOAD:

CODE SUMMARY

BUILDING CODE
ALL WORK SHALL COMPLY WITH THE 2012 INTERNATIONAL BUILDING CODE.

ELECTRICAL CODE
ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2011 NATIONAL ELECTRIC CODE.

INDEX

SolarCity

3055 Clearview Way, San Mateo, CA 94402
T:(650) 638-1028 | F:(650) 638-1029
(888)-SOL-CITY (765-2489) | www.solarcity.com

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE
GROUND MOUNT PV SYSTEM

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE
9 STOTT AVE
NORWICH, CT 06360
860-889-4088

REVISIONS

REV	BY	DATE	COMMENTS

JOB DETAILS

MODULES: (15912) TRINA SOLAR # TSM-310PD14

MOUNTING SYSTEM: *

INVERTER: Multiple Inverters

DESIGN: *

CHECKED BY: *

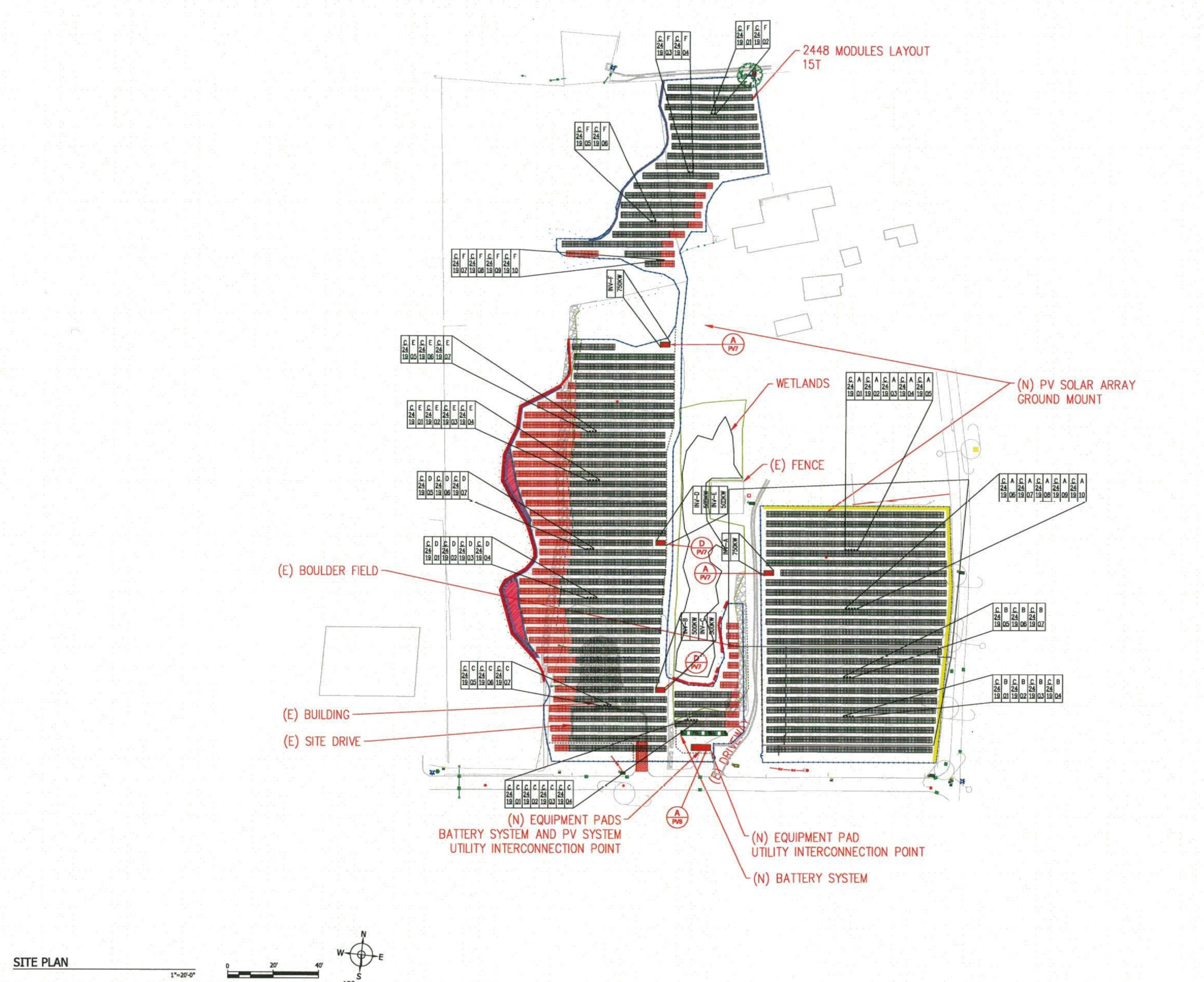
MARKET: * PROJECT MANAGER: *

DATE: 1/21/2015 PAYMENT TYPE: PPA

SHEET NAME: COVER SHEET

JOB NUMBER: JB-0631941-00

SHEET: PV 1 REV: 00



SITE PLAN

1"=20'-0"

SHEET NOTES

A. SEE PVX FOR WARNING LABEL DETAILS.
B.

LEGEND

(N) GROUND-MOUNTED SOLAR PV MODULES (ELECTRICALLY CONNECTED)

DOWN SLOPE

(N) DC COMBINER BOX

FIRE ACCESS PATH

(E) FENCE

(N) FENCE

KEYED NOTES

1. (E) MAIN SWITCHGEAR AND (N) POINT OF AC INTERCONNECTION. WARNING LABEL DETAIL 1/PVX.
2. (E) UTILITY LOAD METER.
3. (N) PV SYSTEM UTILITY AC DISCONNECT, ACDS-1. WARNING LABEL DETAIL 2/PVX.
4. (N) UTILITY OWNED DEDICATED PV PRODUCTION kWh METER.
5. (N) PV INVERTER. WARNING LABEL DETAIL 8/PVX.
6. (N) DC DISCONNECT SWITCH(ES) LOCATED AT INVERTER. WARNING LABEL DETAIL 3/PVX.
7. (N) PV SOURCE CIRCUIT DC COMBINER BOXES WITH INTEGRATED LOAD-BREAK DISCONNECT SWITCH. WARNING LABEL DETAIL 4/PVX.
8. (N) CONDUIT IN TRENCH. SEE DETAIL X/PVX.
9. (N) CONDUIT ON WALL. SEE DETAIL X/PVX.
10. (N) CONDUIT ON ROOF. SEE DETAIL X/PVX.
11. (N) DC CONDUIT IN INTERIOR, WARNING LABEL EVERY 10'. WARNING LABEL DETAIL 13/PVX.
12. (N) MONITORING EQUIPMENT, SOLARGUARD GATEWAY.
13. (N) MONITORING EQUIPMENT, SOLARGUARD PV PRODUCTION kWh METER.
14. (N) MONITORING EQUIPMENT, POWERGUIDE LOAD kWh METER.
15. (N) AC COMBINER PANEL WARNING LABEL DETAILS 6-7/PVX.
16. (N) STEP DOWN TRANSFORMER
17. (E) UTILITY TRANSFORMER

COMBINER BOX NUMBERING SYSTEM

COMBINER BOX TYPE C=COMBINER — C A — INVERTER
MAX STRINGS PER BOX — 24
STRINGS USED PER BOX — 19 01 — COMBINER NUMBER

SolarCity

3055 Clearview Way, San Mateo, CA 94402
T:(650) 638-1028 | F:(650) 638-1029
(888)-SOL-CITY (765-2489) | www.solarcity.com

CONFIDENTIAL – THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT SOLARCITY INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE SOLARCITY EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF SOLARCITY INC.

CUSTOMER: CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE
GROUND MOUNT PV SYSTEM

OWNER: CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE
9 STOTT AVE
NORWICH, CT 06360
860-889-4088

REVISIONS

REV	BY	DATE	COMMENTS

JOB DETAILS

MODULES: (15912) TRINA SOLAR # TSM-310PD14

MOUNTING SYSTEM:

INVERTER: Multiple Inverters

DESIGN:

CHECKED BY:

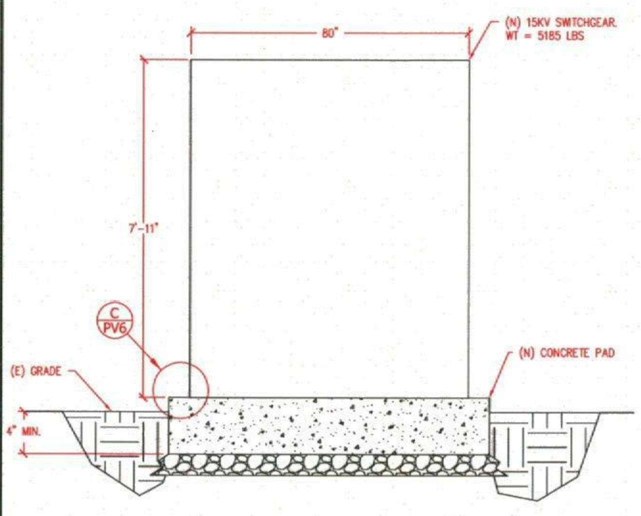
MARKET: | PROJECT MANAGER:

DATE: 1/21/2015 | PAYMENT TYPE: PPA

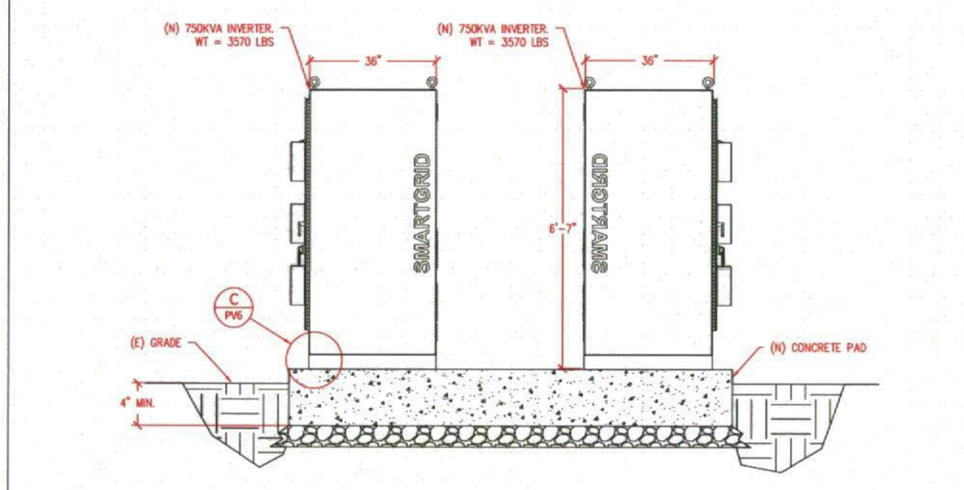
SHEET NAME: SITE PLAN

JOB NUMBER: JB-0631941-00

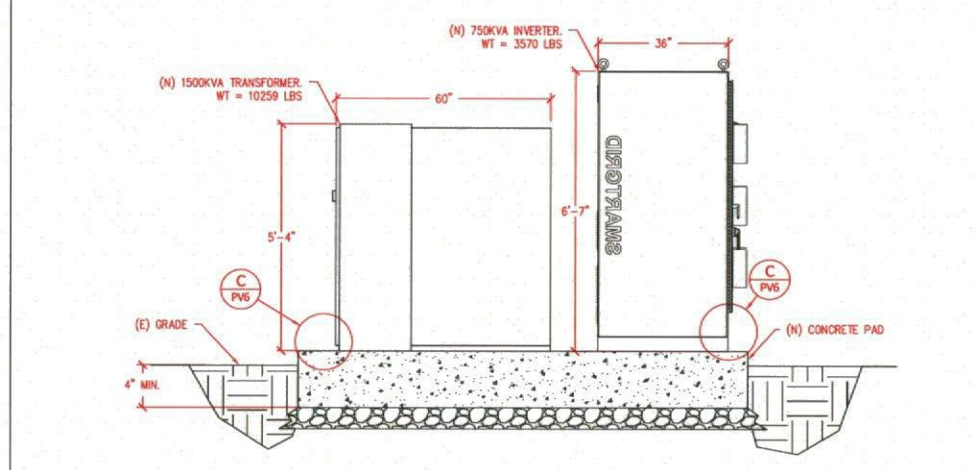
SHEET: PV 2 | REV: 00



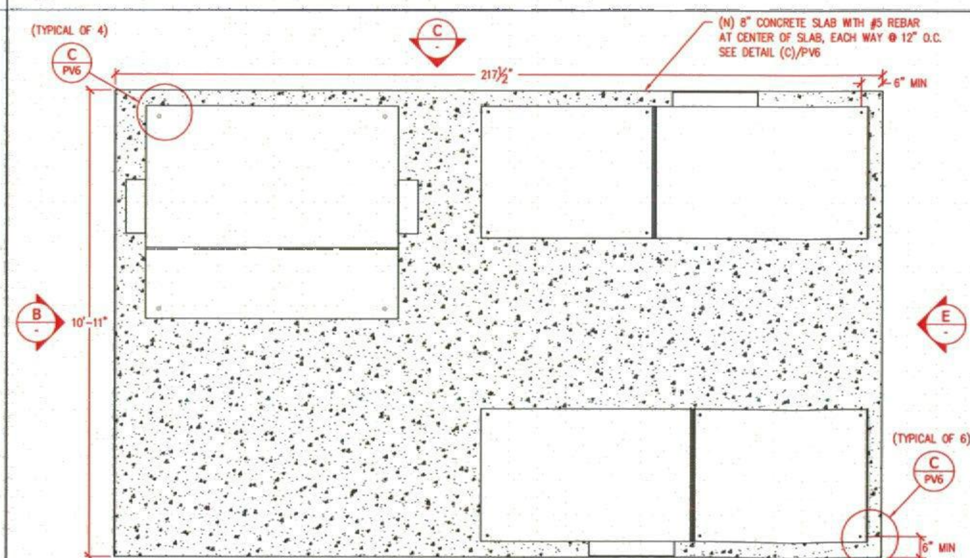
G 15 KV SWITCHGEAR CONCRETE PAD (SIDE VIEW) 1/2"=1'-0"



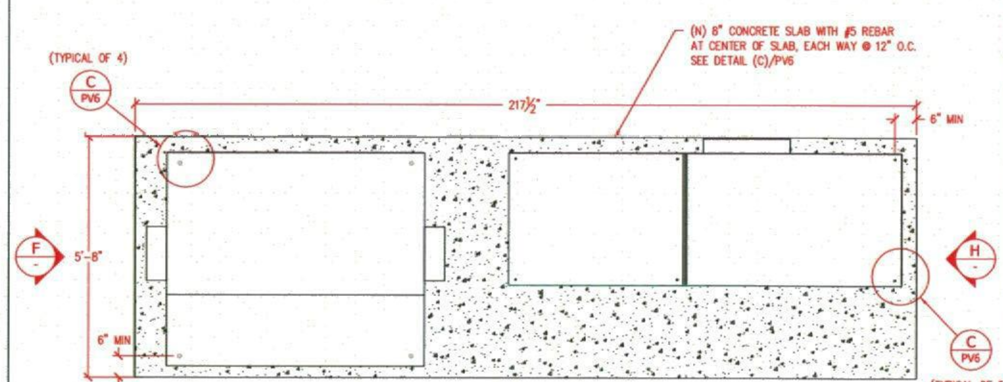
E EQUIPMENT CONCRETE PAD (SIDE VIEW) 1/2"=1'-0"



B EQUIPMENT CONCRETE PAD (SIDE VIEW) 1/2"=1'-0"



D EQUIPMENT CONCRETE PAD (PLAN) 1/2"=1'-0"



A EQUIPMENT CONCRETE PAD (PLAN) 1/2"=1'-0"

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GROUND MOUNT PV SYSTEM

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE – NORWICH
9 STOTT AVE
NORWICH, CT 06360
860-889-4088

REVISIONS

REV	BY	DATE	COMMENTS

JOB DETAILS

MODULES: (19422) CANADIAN SOLAR CS6X-305-P
MOUNTING SYSTEM: *
INVERTER: (163) SOLECTRIA #PVI28TL-480
DESIGN: *
CHECKED BY: *
MARKET: *
PROJECT MANAGER: *
DATE: 1/21/2015
PAYMENT TYPE: *
SHEET NAME: STRUCTURAL DETAILS & INVERTER PADS
JOB NUMBER: JB-0631941-00
SHEET: PV 8
REV:

EXTERNAL TRANSFORMER REQUIREMENTS FOR SOLECTRIA XTM INVERTER

1. TRANSFORMER TYPE

THE TRANSFORMER SHALL BE THREE PHASE, SELF-COOLED, AND DESIGNED FOR STEP-UP OPERATION. TRANSFORMER SHALL BE UL LISTED. PAD MOUNT, DISTRIBUTION TYPE TRANSFORMERS SHALL COMPLY WITH THE LATEST ISSUE OF IEEE/ANSI C57.12.34. TRANSFORMER SHALL OPERATE AT 60HZ NOMINAL AND SHALL BE TOLERANT OF CONTINUOUS FREQUENCIES BETWEEN 54.0HZ AND 60.5HZ. TRANSFORMER SHALL BE CAPABLE OF OPERATING AT 1.1P.U. VOLTAGE AT FULL LOAD WITHOUT SATURATION FOR PERIODS OF TIME TYPICAL OF THE EXPECTED GENERATION PROFILE. DIFFERENT FREQUENCY AND VOLTAGE REQUIREMENTS MAY BE NECESSARY FOR PROJECTS WITH VOLTAGE OR FREQUENCY RIDE THROUGH REQUIREMENTS OTHER THAN THOSE DEFINED IN IEEE 1547-2003. REQUIREMENTS OUTSIDE OF THIS STANDARD RANGE MUST BE REVIEWED AND APPROVED BY SOLECTRIA.

2. TRANSFORMER RATING

A SINGLE INVERTER ISOLATED BY ONE TRANSFORMER SHALL HAVE ONE PRIMARY WINDING AND ONE SECONDARY WINDING. THE KVA RATING OF THE TRANSFORMER MUST AT LEAST BE EQUAL TO THE KVA RATING OF THE INVERTER. TWO INVERTERS ISOLATED BY ONE TRANSFORMER SHALL HAVE THREE WINDINGS TOTAL; ONE SECONDARY WINDING AND TWO PRIMARY WINDINGS. EACH PRIMARY WINDING MUST HAVE A KVA RATING AT LEAST BE EQUAL TO THE KVA RATING FOR THE INVERTER THIS WINDING ISOLATES. THE SECONDARY WINDING MUST HAVE A KVA RATING AT LEAST BE EQUAL TO THE SUM OF THE KVA RATING FOR THE TWO INVERTERS CONNECTED TO THE TRANSFORMER. THE TWO PRIMARY WINDINGS SHALL HAVE THE SAME VOLTAGE, WINDING CONFIGURATION AND BIL. THE THREE WINDINGS SHALL BE CONSTRUCTED IN A LOW-HIGH-LOW CONFIGURATION.

3. TRANSFORMER IMPEDANCE

FOR TRANSFORMERS WITH THREE WINDINGS, THE PERCENT IMPEDANCE BETWEEN BOTH LOW VOLTAGE PRIMARY WINDINGS MUST BE GREATER THAN 7%. THE PERCENT IMPEDANCE BETWEEN LOW VOLTAGE WINDING #1 AND THE HIGH VOLTAGE WINDING AS WELL AS PERCENT IMPEDANCE BETWEEN LOW VOLTAGE WINDING #2 AND THE HIGH VOLTAGE WINDING MUST SATISFY THE MINIMUM IMPEDANCE REQUIREMENTS IN TABLE 1 ON THE FOLLOWING PAGE. FOR STANDARD TWO WINDING TRANSFORMERS, THE TRANSFORMER IMPEDANCE VOLTAGE Z(%) MUST SATISFY THE CONDITIONS IN TABLE 1.

Number of 380V Windings (Inverters)	Impedance (Absolute Minimum)
1	1.80%
2	High-Low#1 4%
	High-Low #2 4%
	Low#1-Low#2 7%
Table 1 – Percent Impedance %Z	

4. PRIMARY CONFIGURATION

THE PRIMARY WINDING(S) SHALL BE COMPLETELY FLOATING OR GROUNDED THROUGH A HIGH IMPEDANCE (>1MOHMS).

380V NOMINAL DELTA

OR

380V NOMINAL WYE WITH THE NEUTRAL FULLY INSULATED FROM GROUND AND CONSTRUCTED SUCH THAT THE NEUTRAL TERMINAL IS NOT ACCESSIBLE

5. TAPS

THE TRANSFORMER SHALL BE FURNISHED WITH SECONDARY CAPACITY HIGH-VOLTAGE TAPS WITH A MINIMUM OF TWO - 2½% TAPS ABOVE AND BELOW THE RATED NAMEPLATE VOLTAGE.

6. SECONDARY CONFIGURATION

THE SECONDARY WINDING CONFIGURATION SHALL BE EITHER:

DELTA

OR

FLOATING WYE

OR

GROUNDED WYE

NOTE FOR GROUNDED WYE CONFIGURATION: A TRANSFORMER CONFIGURATION OF SOLIDLY GROUNDED WYE ON THE SECONDARY AND DELTA ON THE PRIMARY INDUCES NEUTRAL CURRENT TO THE TRANSFORMER AND THROUGH THREE-PHASE OVER CURRENT PROTECTION DEVICES ON THE SECONDARY SIDE OF THE TRANSFORMER. THE ADDITIONAL CURRENT COULD LEAD TO UNINTENDED ACTIVATION OF THE OVER CURRENT PROTECTION. IT MAY ALSO REDUCE THE INVERTER'S ABILITY TO DETECT A SINGLE OPEN PHASE CONDITION. FOR THIS TRANSFORMER CONFIGURATION, THE CUSTOMER MUST PROVIDE SUPPLEMENTAL SINGLE OPEN PHASE DETECTION.

7. ELECTROSTATIC SHIELD

TRANSFORMERS WITH THREE WINDINGS SHALL INCLUDE ELECTROSTATIC SHIELDING BETWEEN THE LOW AND HIGH VOLTAGE WINDINGS. THE SHIELDING MUST BE GROUNDED TO THE TRANSFORMER TANK OR ENCLOSURE.

8. LOW VOLTAGE BUSHINGS AND TERMINALS

THE MINIMUM QUANTITY OF CONNECTION HOLES MUST ACCOMMODATE THE TOTAL NUMBER OF CONDUCTOR TERMINATIONS PER PHASE. PAD MOUNT DISTRIBUTION TRANSFORMERS SHALL BE PROVIDED WITH SPADE-TYPE BUSHINGS.

9. TANK GROUNDING

CLAMP-TYPE TANK GROUNDING CONNECTIONS SHALL BE PROVIDED FOR PAD MOUNT DISTRIBUTION TRANSFORMERS IN ACCORDANCE WITH ANSI C57.12.34

10. SUBMITTAL DRAWINGS

FINAL TRANSFORMER SUBMITTAL DRAWINGS MUST BE RECEIVED AND REVIEWED BY SOLECTRIA PRIOR TO INVERTER SHIP DATE.

ELECTRICAL NOTES

GENERAL NOTES

1. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2011 NATIONAL ELECTRIC CODE AS AMENDED BY APPLICABLE STATE AND LOCAL CODES.
2. EACH UNGROUNDED CONDUCTOR OF THE MULTIWIRE BRANCH CIRCUIT WILL BE IDENTIFIED BY PHASE AND SYSTEM PER ART 210.5.
3. ALL EQUIPMENT SHALL BE LISTED BY A NRTL IN COMPLIANCE WITH ART 110.3.
4. DC CONDUCTORS INSIDE BUILDING SHALL BE IN METALLIC RACEWAY PER ART 690.31(E).
5. ALL WIRES SHALL BE PROVIDED WITH STRAIN RELIEF AT ALL ENTRY INTO BOXES AS REQUIRED BY NRTL LISTING.
6. INSTALL PARALLEL CONDUCTORS PER ART 310.10(H)
7. ALL VALUES FOR IMP AND ISC AND VMP ARE MANUFACTURER'S LISTED DATA UNCORRECTED BY NEC.
8. REFER TO CURRENT MANUFACTURER'S PLANNING AND INSTALLATION MANUAL FOR TORQUE SPECS FOR ALL BOLTS AND TERMINAL CONNECTIONS.
9. DC STRING CIRCUITS SHALL BE RUN IN OUTDOOR ROOFTOP AMBIENT CONDITIONS.
10. DC BRANCH CIRCUITS RUN IN OUTDOOR ROOFTOP AMBIENT CONDITIONS SHALL BE INSTALLED > 3.5 INCHES ABOVE ROOF SURFACE UON.
11. PV INVERTER CONTAINS INTEGRATED AC AND DC DISCONNECTS.
12. BURIED CONDUCTORS SHALL BE BURIED TO THE MINIMUM DEPTH SPECIFIED IN ART. 300.5 FOR CIRCUITS 600V AND UNDER AND ART. 300.50 FOR CIRCUITS ABOVE 600V.
13. ALL CONDUCTORS ARE COPPER UON.
14. USE NON-METALLIC UV RATED TIE WRAPS FOR BUNDLED PV WIRE.
15. ALL LINE SIDE AND LOAD SIDE TERMINATIONS OF ALUMINUM AND COPPER CONDUCTORS SHAL BE MADE WITH HIGH PRESS CRIMP LUGS ON BUSSING UNLESS OTHERWISE NOTED.
16. ALL TERMINATIONS OF ALUMINUM CONDUCTORS SHALL BE PROPERLY INSTALLED WITH BEST PRACTICE PROCEDURES THAT INCLUDE BUT NOT LIMITED TO: USE OF TERMINATION EQUIPMENT RATED FOR ALUMINUM AT THE CONDUCTOR TEMPERATURE, CURRENT, AND VOLTAGE; ALLOWANCE FOR MOVEMENT DUE TO THERMAL EXPANSION/CONTRACTION; EXPOSED ALUMINUM SHALL BE PROPERLY COATED WITH ANTI-OXIDIZATION COMPOUND; TERMINALS ARE TORQUE AND MARKED TO REQUIRED SETTINGS WITH CALIBRATED DEVICES.

GROUNDING NOTES

1. SINGLE-CONDUCTOR CABLE USED AS A GROUNDED CONDUCTOR IN PHOTOVOLTAIC POWER SYSTEMS SHALL BE IDENTIFIED AT THE TIME OF INSTALLATION BY DISTINCTIVE WHITE MARKING AT ALL TERMINATIONS PER ART 200.6.
2. THE AC & DC GEC SHALL BE CONTINUOUS FROM THE INVERTER GROUND BUSBAR TO THE MAIN ELECTRICAL SERVICE GROUNDING ELECTRODE SYSTEM. THE DC GEC SHALL BE ATTACHED TO THE GROUND ELECTRODE USING AN IRREVERSIBLE MEANS AS CALLED OUT IN ART 250.64 AND 690.47.
3. PV INVERTER CONTAINS AN INTEGRATED GFDI CIRCUIT. DO NOT BOND THE GROUNDED DC CONDUCTOR TO GROUND EXCEPT THROUGH THE INVERTER GFDI.
4. ALL EXPOSED METAL PARTS (MODULE FRAMES, RAIL, PIPE, BOXES, ETC) SHALL BE GROUNDED USING TIN-PLATED COPPER LAY-IN LUGS OR GROUNDING CLIPS LISTED FOR THE PURPOSE. RAIL CLAMPS SHALL BE MADE ELECTRICALLY CONTINUOUS WITH ATTACHED RAIL.
5. RB1 RACKING SYSTEMS SHALL BE BONDED PER MANUFACTURER'S UL 2703 INSTRUCTIONS.
6. MIN #10 BARE COPPER EGC AT SOURCE CIRCUITS SHALL BE ROUTED SECURELY TO MOUNTING HARDWARE IN A MANNER THAT PROTECTS FROM PHYSICAL HARM. #6 BARE COPPER EGC FOR AREAS SUBJECT TO PHYSICAL DAMAGE.
7. MODULE FRAMES SHALL BE GROUNDED AT THE LISTED LOCATION PROVIDED BY THE MANUFACTURER OR USING LISTED THIRD-PARTY HARDWARE ONLY IF SPECIFICALLY REFERRED TO IN MANUFACTURE'S INSTRUCTIONS PER UL 1703.
8. BOTH ENDS OF ALL METALLIC CONDUIT CONTAINING GROUNDING ELECTRODE CONDUCTORS SHALL BE BONDED PER ART 250.64(E).
9. GROUNDING ELECTRODE CONDUCTOR TO BE BONDED TO (E) GROUNDING ELECTRODE PER ART 250.68.
10. GROUNDING ELECTRODE CONDUCTOR SIZED PER ART 690.47(C).
11. INCREASES IN EQUIPMENT GROUNDING CONDUCTOR SIZE TO ADDRESS VOLTAGE CONSIDERATIONS SHALL NOT BE REQUIRED PER ART 690.45(A).
12. INSTALLATION SHALL COMPLY WITH ART 250.52, 250.53.
13. CIRCUITS OVER 250V TO GROUND SHALL COMPLY WITH ART 250.97, 250.92(B)

MARKING AND SIGNAGE

14. SEE SHEET PVXX FOR MARKING AND SIGNAGE PLAN.

INTERCONNECTION NOTES

1. LOAD SIDE INTERCONNECTIONS SHALL COMPLY WITH ART. 705.12(D) AND ART 230 FOR THE INSTALLATION OF AN ADDITIONAL SERVICE ENTRANCE
2. LOAD SIDE INTERCONNECTIONS SHALL BE MADE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S INSTRUCTIONS AND SHALL NOT INVALIDATE THE NRTL LISTING OF THE EQUIPMENT.
3. EMT OR SCH 40 PVC TYPE CONDUIT SHALL BE USED TO ENCLOSE CONDUCTORS BETWEEN A LOAD SIDE INTERCONNECTION AND THE FIRST OCP IN THE INVERTER OUTPUT CIRCUIT.

MODULE SPECIFICATIONS AND MAXIMUM SYSTEM VOLTAGE CALCULATION

Photovoltaic Module Electrical Specifications: Model: Trina TSM-310PD14.18

Voc=	45.5 V at STC
Vmp=	37 V at STC
Isc=	8.85 A at STC
Imp=	8.38 A at STC
Tvoc=	-0.1456 V/deg C
Tisc=	4.425 mA/deg C
Tvmp=	-0.1517 V/deg C

Temperature Data

ASHRAE Mean Low Temp	-28 deg C
ASHRAE 2% Dry Bulb Temp	40 deg C

Sample Calculation #1: Maximum System DC Voltage per art 690.7

Vmax= # of series connected modules x (Voc at STC - (25 deg C - Low Temp) x Tvoc V/deg C)
=18 x (45.5V - (25 - -28) deg C x -0.1456 V/deg C)
=958V

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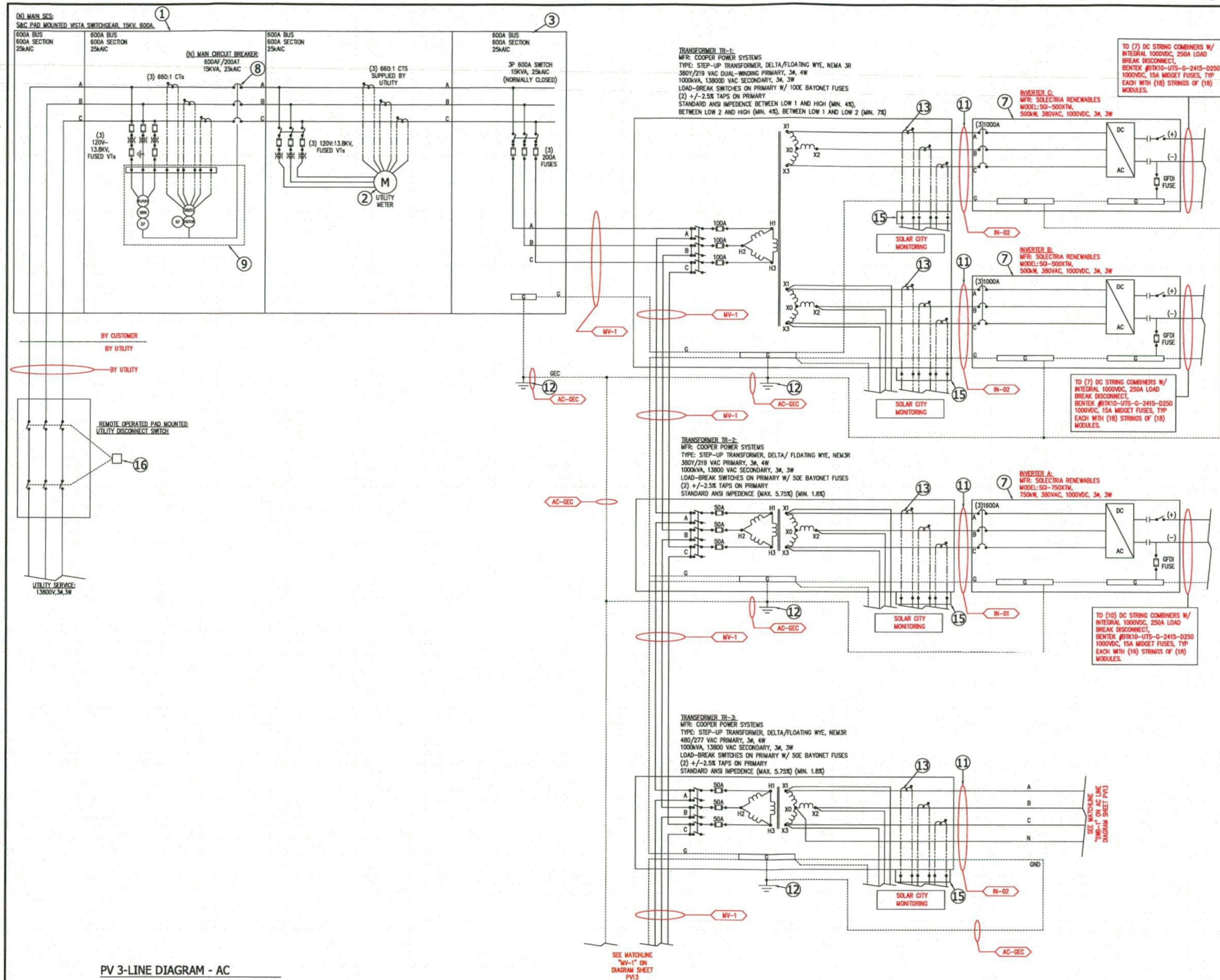
860-889-4088

REVISIONS			
REV	BY	DATE	COMMENTS

JOB DETAILS

MODULES: (15912) TRINA SOLAR # TSM-310PD14
MOUNTING SYSTEM: *
INVERTER: Multiple Inverters
DESIGN: *
CHECKED BY: *
MANAGER: * PROJECT MANAGER: *
DATE: 1/21/2015 PAYMENT TYPE: PPA
SHEET NAME: ELECTRICAL SYMBOLS & NOTES
JOB NUMBER: JB-0631941-00
SHEET: PV 11 REV: 00



PV 3-LINE DIAGRAM - AC

NTS

KEYED NOTES

1. (N) MAIN SWITCHGEAR AND (N) POINT OF AC INTERCONNECTION. ALL CONNECTIONS MADE INSIDE (N) SWITCHGEAR AT OTHER THAN CIRCUIT BREAKERS OR FUSED SWITCHES LISTED FOR USE WITH THAT SWITCHGEAR SHALL BE PERFORMED FOLLOWING MANUFACTURERS INSTRUCTIONS OR BE RE-LISTED BY A NRTL. ALL TERMINATIONS OF ALUMINUM CONDUCTORS SHALL BE WITH HIGH PRESS CRIMP LUGS ONLY. WARNING LABEL DETAIL 1/PV20.
2. (N) UTILITY LOAD METER.
3. (N) PV SYSTEM UTILITY AC DISCONNECT "ACDS-1". WARNING LABEL DETAIL 2/PV17.
4. NOT USED.
5. NOT USED.
6. NOT USED.
7. (N) GRID-INTERACTIVE PV INVERTER LISTED TO UL 1741 WITH GROUND FAULT DETECTION & INTERRUPTION. WARNING LABEL DETAIL 8/PV20.
8. MEDIUM VOLTAGE BREAKER IS SHUNT TRIP OPERATED IN CONJUCTION WITH OVERCURRENT AND OVER/UNDER VOLTAGE/FREQUENCY RELAYS. 600A FRAME WITH 200A TRIP UNIT.
9. DISTRIBUTED PROTECTION RELAY (SEL-351A) USED TO CONTROL THE MAIN OVERCURRENT PROTECTION DEVICE.
10. NOT USED.
11. CONDUCTORS RUN IN PARALLEL SHALL BE INSTALLED PER ART 310.4/310.10(H) AND 250.122 (F)
12. INSTALL 5/8"x8' CU AUX GND ROD FOR LIGHTNING PROTECTION PER ART 250.54. CONNECT TO EQUIPMENT GROUND BAR WITH #6 BARE CU.
13. (N) SOLID CORE CURRENT TRANSFORMERS:
    - H1 LABEL FACES TOWARD SOURCE
    - WHITE WIRES TO I1l, I2l, I3l TERMINALS IN SG METER
    - BLACK WIRES TO I1h, I2h, I3h TERMINALS IN SG METER
14. NOT USED.
15. (N) SHORTING TERMINAL BLOCK - 600V, 50A, 6 POLE; GE #1KU6SC
16. DIRECT TRANSFER TRIP RELAY CONTROL UNIT TO INTERFACE WITH UTILITY.

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GROUND MOUNT PV SYSTEM

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NORWICH, CT 06360
860-889-4088

REVISIONS

REV	BY	DATE	COMMENTS

JOB DETAILS

MODULES: (15912) TRINA SOLAR # TSM-310PD14

INVERTER: Multiple Inverters

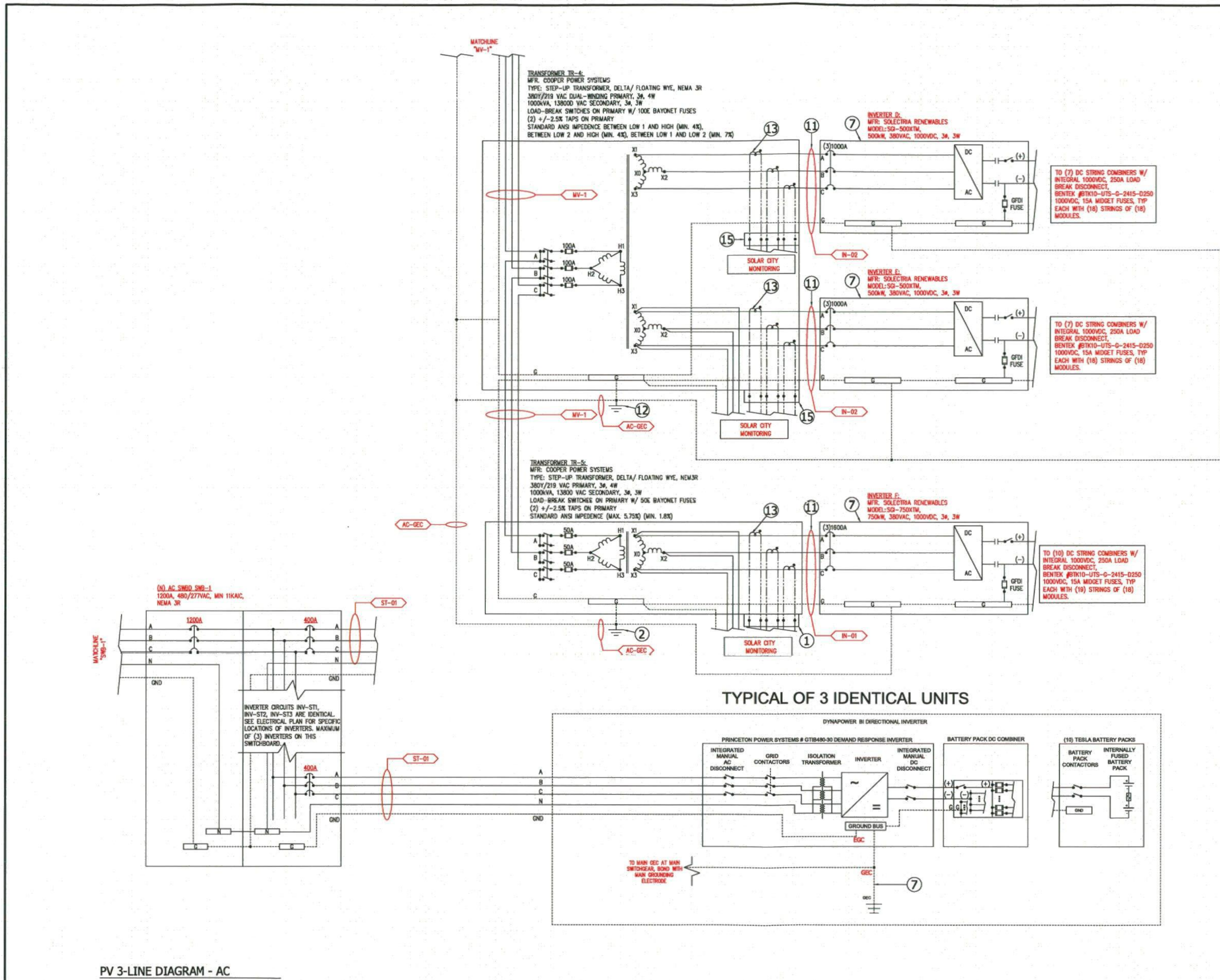
DATE: 1/21/2015

PAYMENT TYPE: PPA

SHEET NAME: LINE DIAGRAM

JOB NUMBER: JB-0631941-00

SHEET: PV 12 REV: 00



PV 3-LINE DIAGRAM - AC

NTS

KEYED NOTES

1. (N)SHORTING TERMINAL BLOCK - 600V, 50A, 6 POLE; GE #1KU6SC
2. INSTALL 5/8"x8' CU AUX GND ROD FOR LIGHTNING PROTECTION PER ART 250.54. CONNECT TO EQUIPMENT GROUND BAR WITH #6 BARE CU.
3. NOT USED.
4. NOT USED
5. NOT USED.
6. NOT USED.
7. (N) GRID-INTERACTIVE PV INVERTER LISTED TO UL 1741 WITH GROUND FAULT DETECTION & INTERRUPTION. WARNING LABEL DETAIL 8/PV20.
8. MEDIUM VOLTAGE BREAKER IS SHUNT TRIP OPERATED IN CONJUCTION WITH OVERCURRENT AND OVER/UNDER VOLTAGE/FREQUENCY RELAYS. 600A FRAME WITH 200A TRIP UNIT.
9. DISTRIBUTED PROTECTION RELAY (SEL-351A) USED TO CONTROL THE MAIN OVERCURRENT PROTECTION DEVICE.
10. NOT USED.
11. CONDUCTORS RUN IN PARALLEL SHALL BE INSTALLED PER ART 310.4/310.10(H) AND 250.122 (F)
12. NOT USED
13. (N) SOLID CORE CURRENT TRANSFORMERS:
   - H1 LABEL FACES TOWARD SOURCE
   - WHITE WIRES TO I_{1L}, I_{2L}, I_{3L} TERMINALS IN SG METER
   - BLACK WIRES TO I_{1S}, I_{2S}, I_{3S} TERMINALS IN SG METER

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860-889-4088

REVISIONS

REV	BY	DATE	COMMENTS

JOB DETAILS

MODULES: (15912) TRINA SOLAR # TSM-310PD14

INVERTER: Multiple Inverters

DATE: 1/21/2015 | PAYMENT TYPE: PPA

SHEET NAME: LINE DIAGRAM

JOB NUMBER: JB-0631941-00

SHEET: PV 13 | REV: 00

EXHIBIT 5

ALL-POINTS TECHNOLOGY CORPORATION

CARBON DEBT ANALYSIS

August 5, 2015

SolarCity Corporation
c/o Brightfields Development, LLC
40 Walnut Street, Suite 301
Wellesley, MA 02481

APT Project No.: CT443110

Re: Proposed 2 Megawatt Solar Facility
9 Stott Avenue and 292 Plain Hill Road
Norwich, Connecticut

On behalf of SolarCity c/o Brightfields Development, LLC All-Points Technology Corporation, P.C. ("APT") performed an analysis to determine whether the proposed solar array installation ("Project") at the referenced site ("Subject Property") has the ability to produce a net improvement in carbon reduction compared to the loss of approximately 1.9 acres of forests/woodland. This analysis accounts for the loss of the trees, the carbon associated with the manufacture of the solar panels, and the carbon associated with the installation activity.

The Project requires the removal of 49 trees within an American Beech-White Oak-Northern Red Oak-Tuliptree forest, which includes a strong component of red maple. The results of this analysis demonstrate that the Project would begin to have a measurable net improvement in carbon reduction in less than three years. Consider the accounting of "carbon debt" in the following table - which includes the energy used and CO2 released in the manufacture and installation of the solar arrays as well as the existing and future carbon reduction derived from the trees to be displaced by the solar array[1] - and the subsequent payback analysis[2].

[1] The calculations used in determining amount of energy used and CO2e created in manufacture and installation of solar array uses industry standard data sourced from: The Environmental Protection Agency (EPA) CO2 emissions calculator; Franklin Life Cycle Analysis Database; NREL US Life Cycle Inventory; Aluminum Association Life Cycle Inventory; Ecoinvent Life Cycle Inventory; Annual Energy Review, EIA; DOE Life Cycle Inventory.

[2] Tree CO2E calcs are based off volumetric equations by McClure, J. and Cost, N. (2010) and the component ratio method by Health et al. 2009. This estimation method is adopted by US Forest Service Forest Inventory Analysis (FIA) program and California's pre-compliance market (AB 32), is peer-reviewed and widely considered to be the standard methodology for calculating carbon sequestration. USDA/Forestry Service/ Northern Research Station: "Measurement guidelines for the sequestration of forest carbon." Pearson, Timothy R.H. Brown, Sandra L. Birdsey, Richard A. 2007.

Brightfields Norwich Stott Avenue Solar Facility Debt Analysis Table[3]	
Carbon Debt & Payback of Solar Array	CO^2e (Metric Tons)
PV Modules	7634
Racking	470
Module Interconnection	8
Junction Boxes	20
Conduits and Fittings	101
Wire and Grounding Devices	174
Inverters and Transformers	276
Grid Connections	24
Office Facilities Concrete	41
Concrete	49
Trees Removed (Current Stock2)	48
Trees (Future Lost Carbon Reduction - 20 Years)	110
Total CO^2e to Payback	8955
Annual PV Production Benefits (- CO^2e)	4034
Carbon Payback of Solar Array (Yrs)	**2.220**

System Size (W)	**5000000**
System Size (MW)	**5**
Acres Cleared (Estimated)	**1.9**

[3] Data and calculations provided by SolarCity on August 1, 2015.

EXHIBIT 6

Stormwater Management Report

Bulk Filed

John U. Faulise Jr. L.S.
James McNally, Jr., L.S.

David C. McKay, P.E.
Demian A. Sorrentino AICP, C.S.S.

CIVIL ENGINEERING LAND SURVEYING LAND USE PLANNING SOIL SCIENCE

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STORMWATER MANAGEMENT REPORT

PREPARED FOR:

SOLARCITY CORPORATION
DEVELOPMENT AND MANAGEMENT PLAN
STOTT AVENUE SOLAR PROJECT
9 STOTT AVENUE AND 292 PLAIN HILL ROAD
NORWICH, CONNECTICUT

AUGUST 2015

PREPARED BY:

BOUNDARIES LLC

PROJECT I.D. NO. 15-2327

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Introduction

On behalf of SolarCity Corporation, Boundaries LLC has prepared the following stormwater management report for the proposed solar photovoltaic development to be located at 9 Stott Avenue and 292 Plain Hill Road in Norwich. The stormwater management system has been designed to meet the recommendations of the Connecticut Department of Energy and Environmental Protection (CT DEEP) Stormwater Quality Manual and make use of low impact development techniques. The proposed development consists of an approximately 5 MW DC solar photovoltaic development on two lots. The stormwater management system has been designed to provide peak flow control, pollution prevention, and groundwater recharge. This stormwater analysis includes the areas that contribute runoff to the project area, but are not affected by the proposed project. Of the approximately 25.5 acres that contribute runoff to the project area, approximately 14.8 acres are included in the proposed development.

The new construction includes solar panels mounted on posts driven approximately 8 feet into the ground, electrical equipment installed on concrete pads, and the construction of a 12-foot wide gravel driveway for maintenance access. The proposed development will be enclosed within a 6-foot high chain link fence. The location of the proposed project is shown on the Location Map included as Figure 1.

There are three regulated inland wetlands resource areas on site, as determined by Matthew Gustafson, a registered soil scientist with All Points Technology Corporation. Wetland series 1 forms the western boundary of the project area, wetland series 2 is an isolated wetland located in a wooded area between the two properties, and wetland series 3 is a small isolated wetland that has formed in the middle of the existing agricultural field to the north as a result of the agricultural operations. According to the Natural Resources Conservation Service (NRCS) Web Soil Survey the soils on the site consist of Woodbridge fine sandy loam, 0 to 3% slopes, Woodbridge fine sandy loam, 3 to 8% slopes, and Woodbridge fine sandy loam, 2 to 15% slopes, extremely stony. Woodbridge soils are classified as Hydrologic Soil Group C/D. The Soils Report is provided in Appendix A.

Existing and post-development conditions hydrographs were estimated using the hydrologic modeling program HydroCAD. The methodology selected was NRCS TR-20. Times of concentration were estimated using multiple segment flow paths as described in the NRCS TR-55 manual. The Type III 24-hour storm was analyzed under antecedent moisture condition two. HydroCAD modeling results are presented in Appendix B. Stormwater quality calculations are included in Appendix C.

The proposed site development plans are included in Appendix D.

Existing Conditions

The proposed project area consists of approximately 14.8 acres of the total 27.4 acres of 9 Stott Avenue and 292 Plain Hill Road. 9 Stott Avenue is zoned BP and 292 Plain Hill Road is zoned R-40. 9 Stott Avenue is currently developed as a batting cage facility, with the rear portion of the lot still being used in the agricultural operation. 292 Plain Hill Road is an active agricultural development with fields, barns and other outbuildings, and the farm house. 9 Stott Avenue is adjacent to a medical facility, 292 Plain Hill Road, and is across the street from a parking lot and baseball stadium. 292 Plain Hill Road is adjacent to single family residential lots, agricultural uses, and a water tower and cellular communications tower. During storms, runoff sheet flows off the site to the wetlands system at the western limit of the project area or to the formal drainage system located in Stott Avenue. The northern portion of the wetlands systems flows to the north behind the medical facility and the southern portion of the wetlands system flows to the south through a culvert under Stott Avenue. Existing conditions of the property are shown below.

Aerial Photograph of Project Area

Existing conditions sub-watersheds are shown on Figure 2. Existing conditions sub-watersheds were delineated using topographic survey data supplemented with aerial topographic survey from the City of Norwich's GIS mapping for areas outside of the detailed survey limits. Land uses were estimated using aerial photography and survey data. Runoff Curve Numbers (CN) used for the existing conditions analysis are as follows: 65 (brush) for dense brush areas, 74 (>75% grass cover/pasture) for lawns and grazing areas, 70 (woods) for wooded areas with dense vegetation, 77 (woods) for wooded areas with sparse vegetation due to the boulder piles, 77 (small grain crops) for agricultural fields, 82 (farmsteads) for the active operation areas of the farm, 86 (<50% grass cover) for boulder piles outside of wooded areas, 87 (dirt roads) for existing unpaved access drives, and 98 (impervious) for concrete pads, existing buildings, and paved areas.

The existing conditions sub-watersheds are described further below:

<u>Drainage Area #1A (DA #1A)</u>
This 5.3± acre drainage area encompasses the northwestern portion of 292 Plain Hill Road, west of the barn and outbuildings. The drainage area is comprised of approximately 2.0 acres of agricultural pasture and approximately 0.5 acres of dense brush. The remaining approximately 2.8 acres consists of buildings, maintained lawns, and dirt and gravel driveways and is outside of the project area. The weighted CN of the drainage area is 77. This area drains generally westerly via overland flow and eventually flows offsite to the north via wetlands series 1.

<u>Drainage Area #1B (DA #1B)</u>
This 1.9± acre drainage area encompasses the western portion of 292 Plain Hill Road and the northern portion of 9 Stott Avenue, west of the barn and outbuildings. The drainage area is comprised of approximately 1.0 acres of agricultural fields and approximately 0.3 acres of woods. The remaining approximately 0.6 acres consists of lands used for agricultural operations and is outside of the project area. The weighted CN of the drainage area is 78. This area drains generally westerly via overland flow and eventually flows offsite to the north via wetlands series 1.

<u>Drainage Area #2 (DA #2)</u>
This 9.2± acre drainage area encompasses the central portion of 292 Plain Hill Road and the southwestern portion of 9 Stott Avenue. The drainage area is comprised of approximately 3.6 acres of agricultural fields, approximately 2.4 acres of woods, approximately 1.1 acres of maintained lawn, and approximately 0.3 acres of buildings, concrete pad, and parking area associated with the batting cages. The remaining approximately 2.8 acres consists of lands used for agricultural operations, the cellular tower, and a portion of wetland series 2, and is outside of the project area. The weighted CN of the drainage area is 77. This area drains generally westerly via overland flow and eventually flows offsite to the south via wetlands series 1 through the culvert crossing Stott Avenue.

<u>Drainage Area #3 (DA #3)</u>
This 9.1± acre drainage area encompasses the southern portion of 292 Plain Hill Road and the southeastern portion of 9 Stott Avenue. The drainage area is comprised of approximately 5.7 acres of agricultural fields, approximately 0.9 acres of woods, approximately 1.4 acres of maintained lawn, and approximately 0.3 acres of buildings and parking area associated with the batting cages. The remaining approximately 0.8 acres consists of agricultural fields and a residential lot, and is outside of the project area. The weighted CN of the drainage area is 77. This area drains generally southerly via overland flow and eventually flows offsite to the drainage system in Stott Avenue.

Existing conditions peak flow rates were analyzed at the three (3) existing discharge locations; the wetlands system flowing north, the wetlands system flowing south, and the formal drainage system in Stott Avenue. Peak flow rates for existing conditions are summarized below in Table 1.

Table 1
Peak Runoff Rates – Existing Conditions

Storm Event	Peak Runoff Rate to Northwest – Link 6L (CFS)	Peak Runoff Rate to Southwest – Link 2L (CFS)	Peak Runoff Rate to Stott Avenue – Link 5L (CFS)
2-Year	7.2	8.2	9.5
5-Year	11.2	12.7	14.6
10-Year	14.4	16.3	18.8
25-Year	17.8	20.0	23.2
50-Year	20.8	23.3	27.0
100-Year	24.8	27.6	32.1

Proposed Conditions

The proposed improvements to the site include the installation of solar panels mounted on posts driven approximately 8 feet into the ground, a 12-foot wide, 1,140± foot long gravel surface access drive, various concrete pads for electrical equipment, and installation of a 6 foot high chain link security fence surrounding the entire perimeter of the solar arrays. Additionally the site will be improved with a stormwater management system consisting of a crushed stone check dam/filtration berm backed by boulders, and water quality basins formed with gravel berms backed by boulders. The site plan has been developed to maintain existing flow patterns. The stormwater management system has been sized to maintain existing runoff rates from the site and provide groundwater recharge and treatment as recommend by the CT DEEP Stormwater Quality Manual.

Installation of the solar arrays will consist of clearing and removing all woody vegetation within the proposed clearing limits, grubbing and disposing of stumps, regrading approximately 4.4 acres of the 14.8 acre array areas to a maximum of a 13% slope and associated side slopes not greater than 3:1, demolishing the existing batting cage facility and appurtenances, importing or processing fill material as required to accomplish regrading, placing and compacting fill as required, installing stormwater management system, placing proposed racking posts, installing and anchoring the solar array panels to the racking system, and installing the necessary electrical equipment for harvesting power.

Maintaining existing flow patterns, water quality, and controlling peak runoff rates were critical components in the design of the proposed stormwater management system for this project. The design incorporates measures for limiting disturbed areas and controlling/capturing potential erosion and sedimentation during construction through erosion control measures. Peak post-development stormwater flows are regulated so they do not exceed pre-developed peak stormwater flows to the receiving wetlands or existing stormwater system. Peak runoff rate control measures include reducing the grades of the site in steep areas and installing crushed stone check dams at the limit of the development to slow down the overland flow of runoff and lengthen the travel time. Water quality will be maintained by retaining the water quality volume on site in shallow basins at the limit of the development. Runoff into the basins will be treated by the approximately 300 feet of grass between the basins and the proposed gravel access drive.

The solar array areas will be regraded with existing or imported soil covered with a minimum of 4 inches of seeded topsoil. The existing piles of boulders on the site will be processed on site to create fill material and the crushed stone for the check dams and berms to be used in the construction of the stormwater management system.

Proposed impervious areas are limited to the steel posts for the proposed racking system, the proposed electrical equipment pads, and the proposed gravel access drive. The W8X10 steel post each cover 2.96 square inches (0.02 square feet) and they are spaced approximately 16 feet along each row of solar arrays. The increase in impervious area and change in CN value in each drainage area due to the proposed development are presented below in Table 2 – Impervious Area Summary. Decreases in CN value are due to the change in use from active agricultural fields to grassed areas for the solar arrays, and the demolition of the existing batting cage facility and associated improvements.

Table 2
Impervious Area Summary

Drainage Area	Proposed Gravel Access Drive (SF)	Proposed W8X10 Racking Posts (SF)	Proposed Concrete Pads (SF)	Total Proposed Impervious Area (SF)	Total Watershed Area (SF)	CN (Pre)	CN (Post)
DA-1A	1,214	5	114	1,333	231,783	77	79
DA-1B	2,983	3	0	2,986	84,376	78	77
DA-2A	1,991	4	228	2,223	144,663	77	78
DA-2B	3,603	6	0	3,609	256,002	77	76
DA-3	4,558	14	2,015	6,587	395,568	77	74
TOTAL	14,349	32	2,357	16,738	1,112,392	77	76

Proposed conditions sub-watersheds are shown on Figure 3. Proposed conditions sub-watersheds were delineated using topographic survey data supplemented with aerial topographic survey from the City of Norwich's GIS mapping for areas outside of the detailed survey limits. Land uses were estimated using the proposed site development plan. Runoff Curve Numbers (CN) used for the proposed conditions analysis are as follows: 74 (>75% grass cover/pasture) for the proposed solar array areas, 87 (dirt roads) for proposed gravel access drives, and 98 (impervious) for proposed concrete equipment pads.

The proposed conditions sub-watersheds are described further below:

<u>Drainage Area #1A (DA #1A)</u>
Of the existing 5.3± acre drainage area approximately 2.3 acres are proposed to be used for the solar arrays. To prepare the site for the solar arrays approximately 0.5 acres of dense brush will be cleared and the disturbed area seeded with grass and 1.8 acres of pasture will be mowed. The remaining approximately 3.0 acres consists of buildings, maintained lawns, and dirt and gravel driveways and is outside of the project area. The post-development weighted CN of the drainage area is 79. This area drains generally westerly via overland flow and eventually flows offsite to the north via wetlands series 1. A crushed stone check dam/filtration berm will be installed at the downgradient limit of work to disrupt concentrated flows and increase the runoff travel time.

<u>Drainage Area #1B (DA #1B)</u>
Of the existing 1.9± acre drainage area approximately 1.3 acres are proposed to be used for the solar arrays. To prepare the site for the solar arrays approximately 0.3 acres of woods will be cleared and the disturbed area graded and seeded with grass and the 1.0 acre area of row crops will be seeded with grass. The remaining approximately 0.6 acres consists of lands used for agricultural operations and is outside of the project area. The post-development weighted CN of the drainage area is 77. This area drains generally westerly via overland flow and eventually flows offsite to the north via

wetlands series 1. A crushed stone check dam/filtration berm backed by boulders will be installed at the downgradient limit of work to disrupt concentrated flows and increase the runoff travel time.

Drainage Area #2A (DA #2A)

This 3.3± acre drainage area encompasses the northern portion of existing conditions DA #2 described in the Existing Conditions section of the report. Of the existing 3.3± acre drainage area approximately 1.9 acres are proposed to be used for the solar arrays. To prepare the site for the solar arrays approximately 0.7 acres of woods will be cleared and the disturbed area graded and seeded with grass and the 1.2 acre area of row crops will be seeded with grass. The remaining approximately 1.4 acres consists of lands used for agricultural operations and a portion of wetland series 2, and is outside of the project area. The post-development weighted CN of the drainage area is 78. This area drains generally westerly via overland flow and eventually flows offsite to the south via wetlands series 1 through the culvert crossing Stott Avenue. A crushed stone check dam/filtration berm backed by boulders will be installed at the downgradient limit of work to disrupt concentrated flows and increase the runoff travel time. Water Quality Basin #1 will be constructed at the low point of the drainage area and consists of a gravel berm backed by boulders. The basin will retain water on site for groundwater recharge and pollution reduction.

Drainage Area #2B (DA #2B)

This 5.9± acre drainage area encompasses the southern portion of existing conditions DA #2 described in the Existing Conditions section of the report. Of the existing 5.9± acre drainage area approximately 2.8 acres are proposed to be used for the solar arrays. To prepare the site for the solar arrays approximately 0.5 acres of woods will be cleared and the disturbed area graded and seeded with grass, approximately 0.9 acres of the existing batting cages and associated improvements will be demolished and the area regraded, and the 1.1 acre area of row crops will be seeded with grass. Approximately 0.3 acres of existing grassed area will not be disturbed. The remaining approximately 3.1 acres consists of lands used for agricultural operations, the cellular tower, and a portion of wetland series 2, and is outside of the project area. The post-development weighted CN of the drainage area is 76. This area drains generally westerly via overland flow and eventually flows offsite to the south via wetlands series 1 through the culvert crossing Stott Avenue. A crushed stone check dam will be installed at the downgradient limit of work to disrupt concentrated flows and increase the runoff travel time. Water Quality Basin #2 will be constructed at the low point of the drainage area and consists of a gravel berm backed by boulders. The basin will retain water on site for groundwater recharge and pollution reduction.

Drainage Area #3 (DA #3)

Of the existing 9.1± acre drainage area approximately 7.3 acres are proposed to be used for the solar arrays. To prepare the site for the solar arrays approximately 0.4 acres of woods will be cleared and the disturbed area graded and seeded with grass, approximately 0.3 acres of the existing batting cages and associated improvements will be demolished and the area regraded, and the 5.2 acre area of row crops will be seeded with grass. Approximately 1.4 acres of existing grassed area will not be disturbed. The remaining approximately 1.8 acres consists of agricultural fields and a residential lot, and is outside of the project area. The post-development weighted CN of the drainage area is 74. This area drains generally southerly via overland flow and eventually flows offsite to the drainage system in Stott Avenue.

Proposed conditions peak flow rates were analyzed at the three (3) existing discharge locations; the wetlands system flowing north, the wetlands system flowing south, and the formal drainage system in Stott Avenue. The peak runoff rates are summarized below in Tables 3, 4, and 5.

Table 3
Peak Runoff Rates – Link 6L Proposed Conditions vs. Existing Conditions

Storm Event	Proposed Conditions Peak Runoff Rate to Northwest – Link 6L (CFS)	Existing Conditions Peak Runoff Rate to Northwest – Link 6L (CFS)	Change in Peak Runoff Rate (CFS)
2-Year	6.6	7.2	-0.6
5-Year	10.2	11.2	-1.0
10-Year	13.0	14.4	-1.4
25-Year	16.0	17.8	-1.8
50-Year	18.6	20.8	-1.2
100-Year	22.1	24.8	-2.7

Table 4
Peak Runoff Rates – Link 2L Proposed Conditions vs. Existing Conditions

Storm Event	Proposed Conditions Peak Runoff Rate to Southwest – Link 2L (CFS)	Existing Conditions Peak Runoff Rate to Southwest – Link 2L (CFS)	Change in Peak Runoff Rate (CFS)
2-Year	7.7	8.2	-0.5
5-Year	12.0	12.7	-0.7
10-Year	15.5	16.3	-0.8
25-Year	19.2	20.0	-0.8
50-Year	22.3	23.3	-1.0
100-Year	26.6	27.6	-1.0

Table 5
Peak Runoff Rates – Link 5L Proposed Conditions vs. Existing Conditions

Storm Event	Proposed Conditions Peak Runoff Rate to Stott Avenue – Link 5L (CFS)	Existing Conditions Peak Runoff Rate to Stott Avenue – Link 5L (CFS)	Change in Peak Runoff Rate (CFS)
2-Year	7.7	9.5	-1.8
5-Year	12.3	14.6	-2.3
10-Year	16.2	18.8	-2.6
25-Year	20.2	23.2	-3.0
50-Year	23.7	27.0	-3.3
100-Year	28.5	32.1	-3.6

As demonstrated above, the proposed low impact development and stormwater management system provides peak runoff rate control for all of the modeled storm events.

Due to the shallow depth of the proposed water quality basins are intended to overtop during all of the modeled storm events and sheet flow through the undisturbed vegetated buffer prior to entering the wetland area. Each of the stormwater management components has been evaluated for the potential for erosion during overtopping conditions. The modeled velocities of the 100-year discharges as compared to typical allowable velocities for the proposed surfaces are presented in Table 6 below.

Table 6
100-year Overflow Erosion Potential Evaluation

Stormwater Management Component	100-year Overflow Velocity (FPS)	Proposed Surface Treatment	Typical Maximum Allowable Velocity (FPS)
Water Quality Basin 1	0.75	Grassed berm	2.0 to 2.5 (per DEEP SESC Guidelines)
Water Quality Basin 2	0.81	Grassed berm	2.0 to 2.5 (per DEEP SESC Guidelines)

As demonstrated above, the proposed stormwater management system components will be adequately protected from erosion due to modeled overflows during the 100-year storm event.

The stormwater management system is also required to treat the runoff from the proposed impervious areas, as presented above in Table 2. The water quality basins have sufficient storage capacity to meet the requirements for both the water quality volume for pollutant reduction as well as groundwater recharge. The volumes retained/treated by the proposed basins were determined using the HydroCAD stage-storage results included in Appendix B. The calculations to determine the required volumes are included in Appendix C. The treatment volumes required and provided are presented below in Table 7.

Table 7
Runoff Treatment Sizing Criteria

	Groundwater Recharge Volume Required (CF)	Water Quality Volume Required (CF)	Treatment Volume Required (CF)	Treatment Volume Provided (CF)
Volume (CF)	139.5	1,524.0	1,524.0	4,857

As demonstrated above, the proposed stormwater management system provides adequate capacity for the required groundwater recharge volume and water quality volume. Additionally, the runoff will be treated prior to entering the basins by the 300 feet of grassed solar array areas between the proposed gravel access drive and the water quality basins.

Summary

The proposed stormwater management system has been designed in accordance with the CT DEEP Stormwater Quality Manual. The system provides the peak flow control, runoff treatment, and groundwater recharge as required.

The proposed improvements are shown on plans titled "Stott Avenue Solar Project, Prepared for SolarCity Corporation, 9 Stott Avenue & 292 Plain Hill Road, Norwich, Connecticut, August 2015, Job I.D. No. 15-2327, Cover Sheet through Sheet 10 of 10" prepared by Boundaries LLC.

Figures

CIVIL ENGINEERING LAND SURVEYING LAND USE PLANNING SOIL SCIENCE

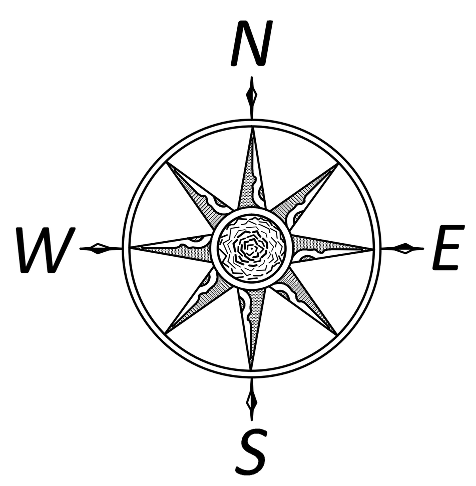
BOUNDARIES

Boundaries LLC
179 Pachaug River Drive, Griswold, CT 06351
1 860.376.2006 | www.boundariesllc.net

N

Location Map
(Norwich Quad)
Brightfields Development, LLC
9 Stott Avenue & 292 Plain Hill Road, Norwich, CT

SCALE:	1"=2,000'
DATE:	July 2015
JOB NO.	15–2327
FIGURE 1	



Drainage Area Summary			
NAME	AREA (Acres)	Weighted CN Value	Tc Time (Minutes)
DA #1A	5.321	77	19.9
DA #1B	1.937	78	7
DA #2	9.198	77	28.6
DA #3	9.081	77	19.7
TOTAL	25.537	77	--

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

BOUNDARIES
CIVIL ENGINEERING LAND SURVEYING LAND USE PLANNING SOIL SCIENCE
Boundaries LLC
179 Pachaug River Drive, Griswold, CT 06351
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Figure 2
"Pre-Development Conditions Watershed Map"
Prepared for
SolarCity Corporation
Stott Avenue, Norwich, Connecticut

SCALE: 1" = 80'

DATE: June 2015

JOB I.D. NO. 15-2327

Revisions

SHEET NO.
1 / 2

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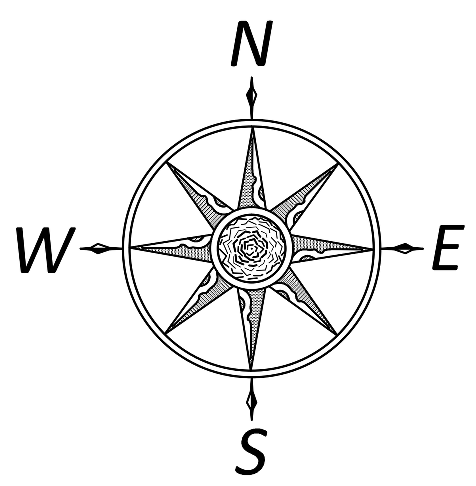

Drainage Area Summary			
NAME	AREA (Acres)	Weighted CN Value	Tc Time (Minutes)
DA #1A	5.321	79	24.8
DA #1B	1.937	77	7
DA #2A	3.321	78	21
DA #2B	5.877	76	31.7
DA #3	9.081	74	22.1
TOTAL	25.537	76	--

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

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Figure 3
"Post-Development Conditions Watershed Map"
Prepared for
SolarCity Corporation
Stott Avenue, Norwich, Connecticut

SCALE: 1" = 80'
DATE: June 2015
JOB I.D. NO. 15-2327

Revisions

SHEET NO.
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Appendix A
NRCS Web Soil Survey Soils Report

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

Stott Avenue Solar Field

June 5, 2015

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

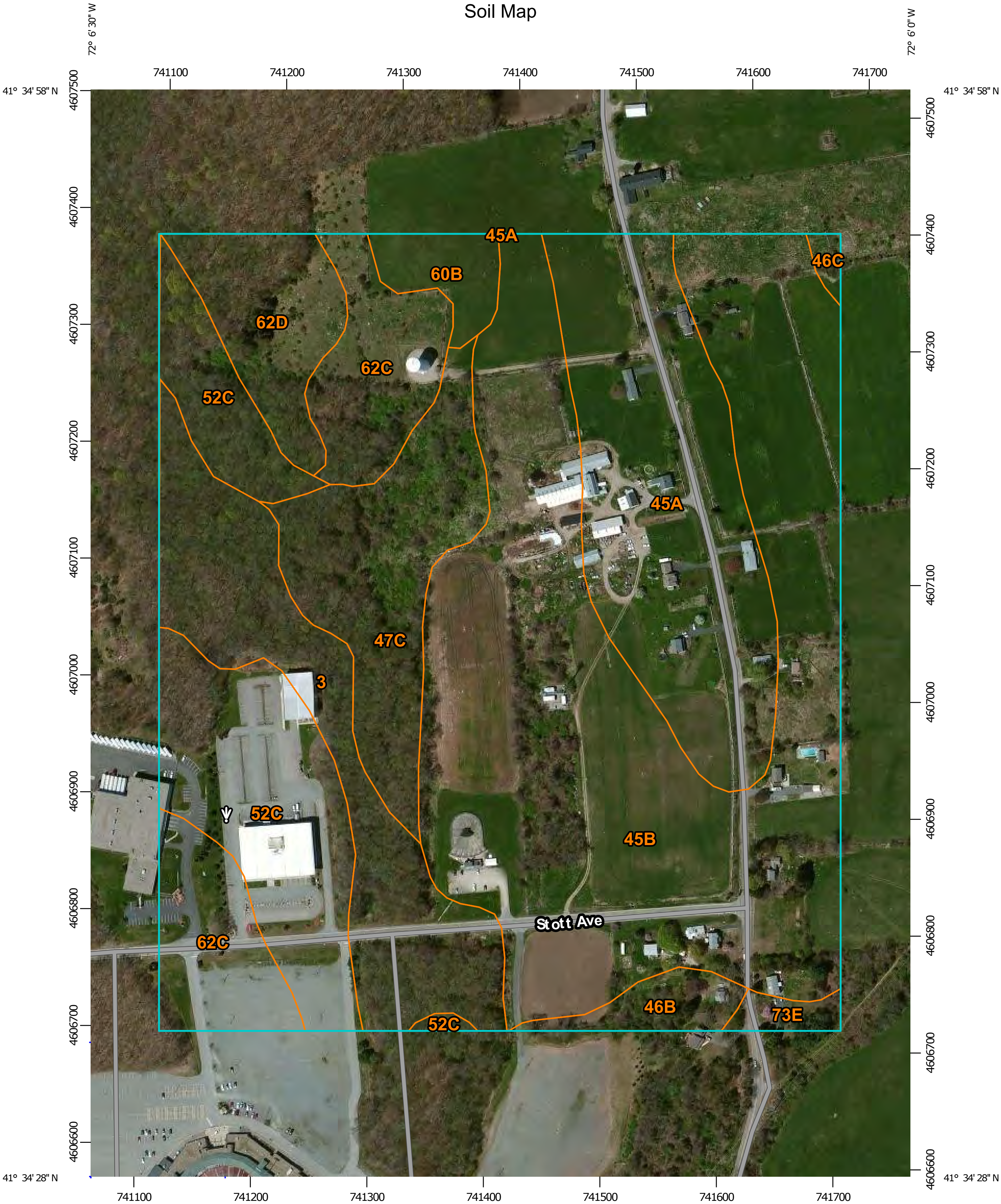
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

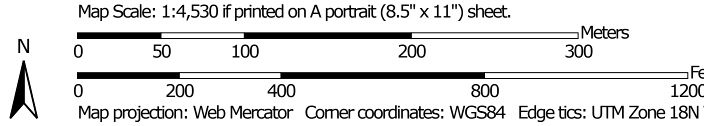
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map



Map Scale: 1:4,530 if printed on A portrait (8.5" x 11") sheet.



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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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: http://websoilsurvey.nrcs.usda.gov
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 13, Oct 28, 2014

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

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

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

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	10.3	10.4%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	14.5	14.7%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	38.3	38.7%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	1.5	1.5%
46C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	0.3	0.3%
47C	Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	8.0	8.1%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	11.6	11.7%
60B	Canton and Charlton soils, 3 to 8 percent slopes	1.7	1.7%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	8.0	8.1%
62D	Canton and Charlton soils, 15 to 35 percent slopes, extremely stony	4.3	4.3%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	0.7	0.7%
Totals for Area of Interest		**99.0**	**100.0%**

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut

3—Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2t2qt
Elevation: 0 to 1,480 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury, extremely stony, and similar soils: 40 percent
Leicester, extremely stony, and similar soils: 35 percent
Whitman, extremely stony, and similar soils: 20 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury, Extremely Stony

Setting

Landform: Drainageways, depressions, hills, ground moraines
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, base slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

A - 0 to 5 inches: fine sandy loam
Bw - 5 to 9 inches: sandy loam
Bg - 9 to 18 inches: gravelly sandy loam
Cd - 18 to 65 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 14 to 32 inches to densic material
Natural drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D

Description of Leicester, Extremely Stony

Setting

Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope, footslope, backslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Coarse-loamy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 7 inches: fine sandy loam
Bg1 - 7 to 10 inches: fine sandy loam
Bg2 - 10 to 18 inches: fine sandy loam
BC - 18 to 24 inches: fine sandy loam
C1 - 24 to 43 inches: gravelly fine sandy loam
C2 - 43 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very 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: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B/D

Description of Whitman, Extremely Stony

Setting

Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope, footslope, backslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 9 inches: fine sandy loam
Bg - 9 to 16 inches: fine sandy loam
Cdg1 - 16 to 22 inches: fine sandy loam
Cdg2 - 22 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 12 to 20 inches to densic material
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D

Minor Components

Woodbridge, extremely stony

Percent of map unit: 3 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear

Swansea

Percent of map unit: 2 percent
Landform: Swamps, bogs
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

45A—Woodbridge fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9lnq
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodbridge and similar soils: 80 percent

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

Description of Woodbridge

Setting

Landform: Drumlins, hills
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 26 inches: fine sandy loam
Bw3 - 26 to 30 inches: fine sandy loam
Cd1 - 30 to 43 inches: gravelly fine sandy loam
Cd2 - 43 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C

Minor Components

Paxton

Percent of map unit: 5 percent
Landform: Drumlins, hills, till plains
Down-slope shape: Linear
Across-slope shape: Convex

Montauk

Percent of map unit: 3 percent
Landform: Drumlins, hills
Down-slope shape: Convex
Across-slope shape: Linear

Ridgebury

Percent of map unit: 3 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

Leicester

Percent of map unit: 2 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave

Sutton

Percent of map unit: 2 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Linear

Unnamed, loamy substratum

Percent of map unit: 2 percent
Landform: Drumlins

Stockbridge

Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Concave
Across-slope shape: Linear

Whitman

Percent of map unit: 1 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

Georgia

Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

45B—Woodbridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2ql
Elevation: 0 to 1,470 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodbridge, fine sandy loam, and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Fine Sandy Loam

Setting

Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 30 inches: fine sandy loam
Cd - 30 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D

Minor Components

Paxton

Percent of map unit: 10 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex

Ridgebury

Percent of map unit: 8 percent
Landform: Drainageways, hills, ground moraines, depressions
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, base slope, dip
Down-slope shape: Concave
Across-slope shape: Concave

46B—Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2t2qr
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Woodbridge, very stony, and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Very Stony

Setting

Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 30 inches: fine sandy loam
Cd - 30 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C/D

Minor Components

Paxton, very stony

Percent of map unit: 10 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex

Ridgebury, very stony

Percent of map unit: 8 percent
Landform: Drainageways, hills, ground moraines, depressions
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, base slope, dip
Down-slope shape: Concave
Across-slope shape: Concave

46C—Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 9lnv
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 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

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

Description of Woodbridge

Setting

Landform: Drumlins, hills
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from granite and/or schist and/or gneiss

Typical profile

A - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 26 inches: fine sandy loam
Bw3 - 26 to 30 inches: fine sandy loam
Cd1 - 30 to 43 inches: gravelly fine sandy loam
Cd2 - 43 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Minor Components

Paxton

Percent of map unit: 5 percent
Landform: Drumlins, hills, till plains
Down-slope shape: Linear
Across-slope shape: Convex

Ridgebury

Percent of map unit: 3 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

Montauk

Percent of map unit: 3 percent
Landform: Drumlins, hills
Down-slope shape: Convex
Across-slope shape: Linear

Leicester

Percent of map unit: 2 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave

Unnamed, loamy substratum

Percent of map unit: 2 percent

Sutton

Percent of map unit: 2 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Linear

Whitman

Percent of map unit: 1 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

Stockbridge

Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Concave
Across-slope shape: Linear

Georgia

Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

47C—Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 9lnw
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 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

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

Description of Woodbridge

Setting

Landform: Drumlins, hills
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from granite and/or schist and/or gneiss

Typical profile

A - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 26 inches: fine sandy loam
Bw3 - 26 to 30 inches: fine sandy loam
Cd1 - 30 to 43 inches: gravelly fine sandy loam
Cd2 - 43 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 2 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Natural drainage class: Moderately well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C

Minor Components

Paxton
Percent of map unit: 5 percent
Landform: Drumlins, hills, till plains
Down-slope shape: Linear
Across-slope shape: Convex

Ridgebury
Percent of map unit: 3 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

Montauk
Percent of map unit: 3 percent
Landform: Drumlins, hills
Down-slope shape: Convex
Across-slope shape: Linear

Unnamed, loamy substratum
Percent of map unit: 2 percent

Sutton
Percent of map unit: 2 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Linear

Leicester
Percent of map unit: 2 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave

Georgia
Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Whitman
Percent of map unit: 1 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

Stockbridge

Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Concave
Across-slope shape: Linear

52C—Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 9lp5
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 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

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

Description of Sutton

Setting

Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 6 inches: fine sandy loam
Bw1 - 6 to 12 inches: fine sandy loam
Bw2 - 12 to 24 inches: fine sandy loam
Bw3 - 24 to 28 inches: fine sandy loam
C1 - 28 to 36 inches: gravelly fine sandy loam
C2 - 36 to 65 inches: gravelly sandy loam

Properties and qualities

Slope: 2 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately 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: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Canton

Percent of map unit: 4 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Convex

Paxton

Percent of map unit: 3 percent
Landform: Drumlins, hills, till plains
Down-slope shape: Linear
Across-slope shape: Convex

Leicester

Percent of map unit: 3 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave

Rainbow

Percent of map unit: 2 percent
Landform: Drumlins, hills
Down-slope shape: Linear
Across-slope shape: Concave

Woodbridge

Percent of map unit: 2 percent
Landform: Drumlins, hills
Down-slope shape: Concave
Across-slope shape: Linear

Narragansett

Percent of map unit: 1 percent
Landform: Hills, till plains
Down-slope shape: Linear
Across-slope shape: Convex

60B—Canton and Charlton soils, 3 to 8 percent slopes

Map Unit Setting

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

Map Unit Composition

Canton and similar soils: 45 percent
Charlton and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: gravelly fine sandy loam
Bw1 - 3 to 15 inches: gravelly loam
Bw2 - 15 to 24 inches: gravelly loam
Bw3 - 24 to 30 inches: gravelly loam
2C - 30 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural 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 storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Description of Charlton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 7 inches: fine sandy loam
Bw2 - 7 to 19 inches: fine sandy loam
Bw3 - 19 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural 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 storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Chatfield

Percent of map unit: 5 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Linear

Sutton

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Linear

Leicester

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave

Hollis

Percent of map unit: 3 percent
Landform: Hills, ridges
Down-slope shape: Convex

Across-slope shape: Convex

Unnamed, silt loam surface

Percent of map unit: 2 percent

62C—Canton and Charlton soils, 3 to 15 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 9lpt
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

Canton and similar soils: 45 percent
Charlton and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: gravelly fine sandy loam
Bw1 - 3 to 15 inches: gravelly loam
Bw2 - 15 to 24 inches: gravelly loam
Bw3 - 24 to 30 inches: gravelly loam
2C - 30 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 3 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: More than 80 inches
Natural 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 storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Description of Charlton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 7 inches: fine sandy loam
Bw2 - 7 to 19 inches: fine sandy loam
Bw3 - 19 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: More than 80 inches
Natural 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 storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Hollis

Percent of map unit: 5 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Convex

Leicester

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave

Chatfield

Percent of map unit: 5 percent
Landform: Hills, ridges
Down-slope shape: Convex

Across-slope shape: Linear

Sutton

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Linear

62D—Canton and Charlton soils, 15 to 35 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 9lpv
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

Canton and similar soils: 45 percent
Charlton and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: gravelly fine sandy loam
Bw1 - 3 to 15 inches: gravelly loam
Bw2 - 15 to 24 inches: gravelly loam
Bw3 - 24 to 30 inches: gravelly loam
2C - 30 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 15 to 35 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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 storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Description of Charlton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 7 inches: fine sandy loam
Bw2 - 7 to 19 inches: fine sandy loam
Bw3 - 19 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 35 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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 storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Sutton

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Linear

Hollis

Percent of map unit: 5 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Convex

Chatfield

Percent of map unit: 5 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Linear

Leicester

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave

73E—Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 9lql
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 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

Charlton and similar soils: 45 percent
Chatfield and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 7 inches: fine sandy loam
Bw2 - 7 to 19 inches: fine sandy loam
Bw3 - 19 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 45 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Runoff class: High
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 storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Description of Chatfield

Setting

Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material
A - 1 to 6 inches: gravelly fine sandy loam
Bw1 - 6 to 15 inches: gravelly fine sandy loam
Bw2 - 15 to 29 inches: gravelly fine sandy loam
2R - 29 to 80 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Rock outcrop

Percent of map unit: 10 percent

Leicester

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave

Sutton

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Linear

Hollis

Percent of map unit: 3 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Convex

Unnamed, sandy subsoil

Percent of map unit: 1 percent

Unnamed, red parent material

Percent of map unit: 1 percent

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

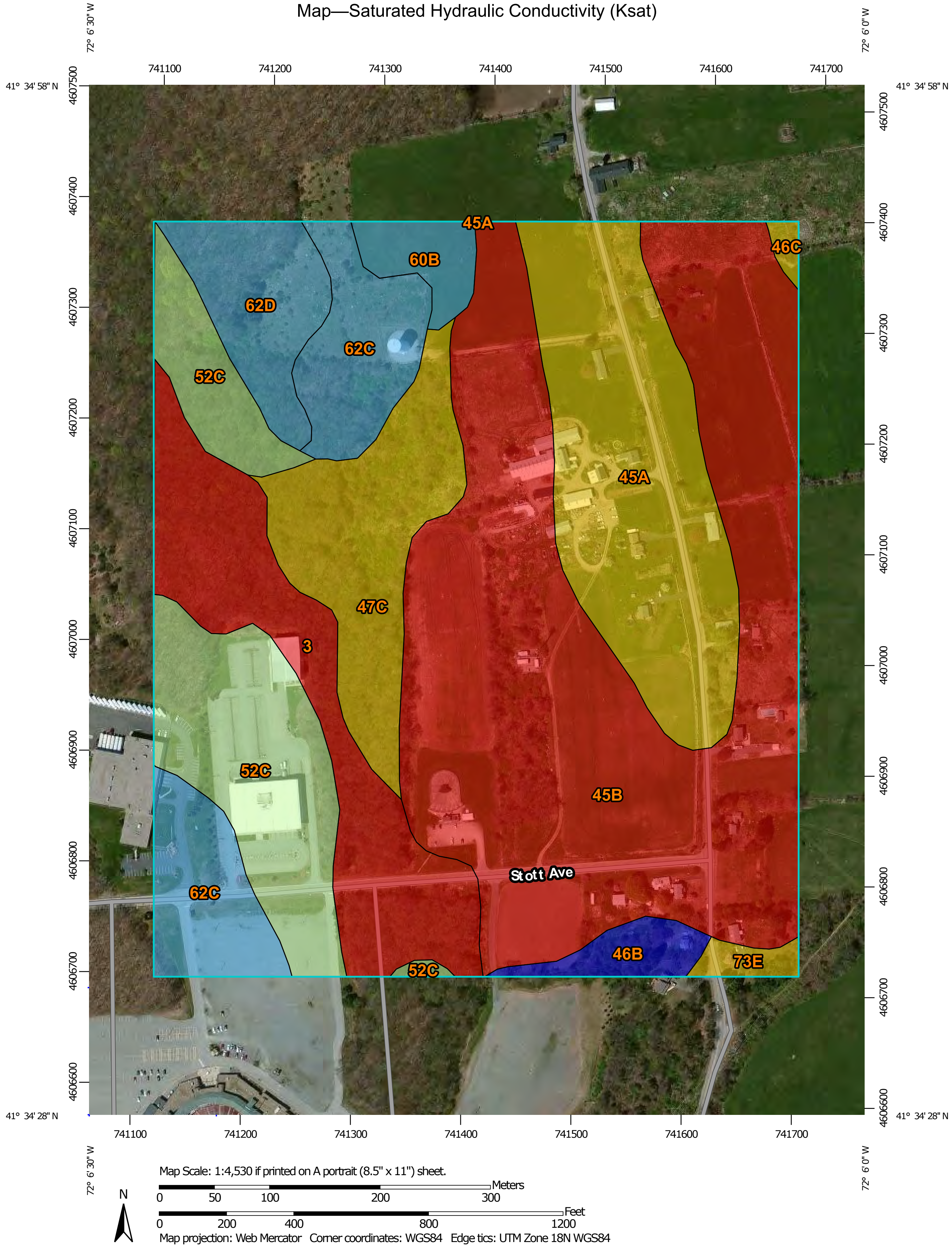
Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Map—Saturated Hydraulic Conductivity (Ksat)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

<= 5.5000

> 5.5000 and <= 10.0000

> 10.0000 and <= 28.0000

> 28.0000 and <= 92.0000

> 92.0000 and <= 120.0000

Not rated or not available

Soil Rating Lines

<= 5.5000

> 5.5000 and <= 10.0000

> 10.0000 and <= 28.0000

> 28.0000 and <= 92.0000

> 92.0000 and <= 120.0000

Not rated or not available

Soil Rating Points

<= 5.5000

> 5.5000 and <= 10.0000

> 10.0000 and <= 28.0000

> 28.0000 and <= 92.0000

> 92.0000 and <= 120.0000

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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: http://websoilsurvey.nrcs.usda.gov
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 13, Oct 28, 2014

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

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

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.

Table—Saturated Hydraulic Conductivity (Ksat)

Saturated Hydraulic Conductivity (Ksat)— Summary by Map Unit — State of Connecticut (CT600)				
Map unit symbol	**Map unit name**	**Rating (micrometers per second)**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	5.5000	10.3	10.4%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	9.0000	14.5	14.7%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	5.5000	38.3	38.7%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	120.0000	1.5	1.5%
46C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	9.0000	0.3	0.3%
47C	Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	9.0000	8.0	8.1%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	28.0000	11.6	11.7%
60B	Canton and Charlton soils, 3 to 8 percent slopes	92.0000	1.7	1.7%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	92.0000	8.0	8.1%
62D	Canton and Charlton soils, 15 to 35 percent slopes, extremely stony	92.0000	4.3	4.3%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	10.0000	0.7	0.7%
Totals for Area of Interest			**99.0**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

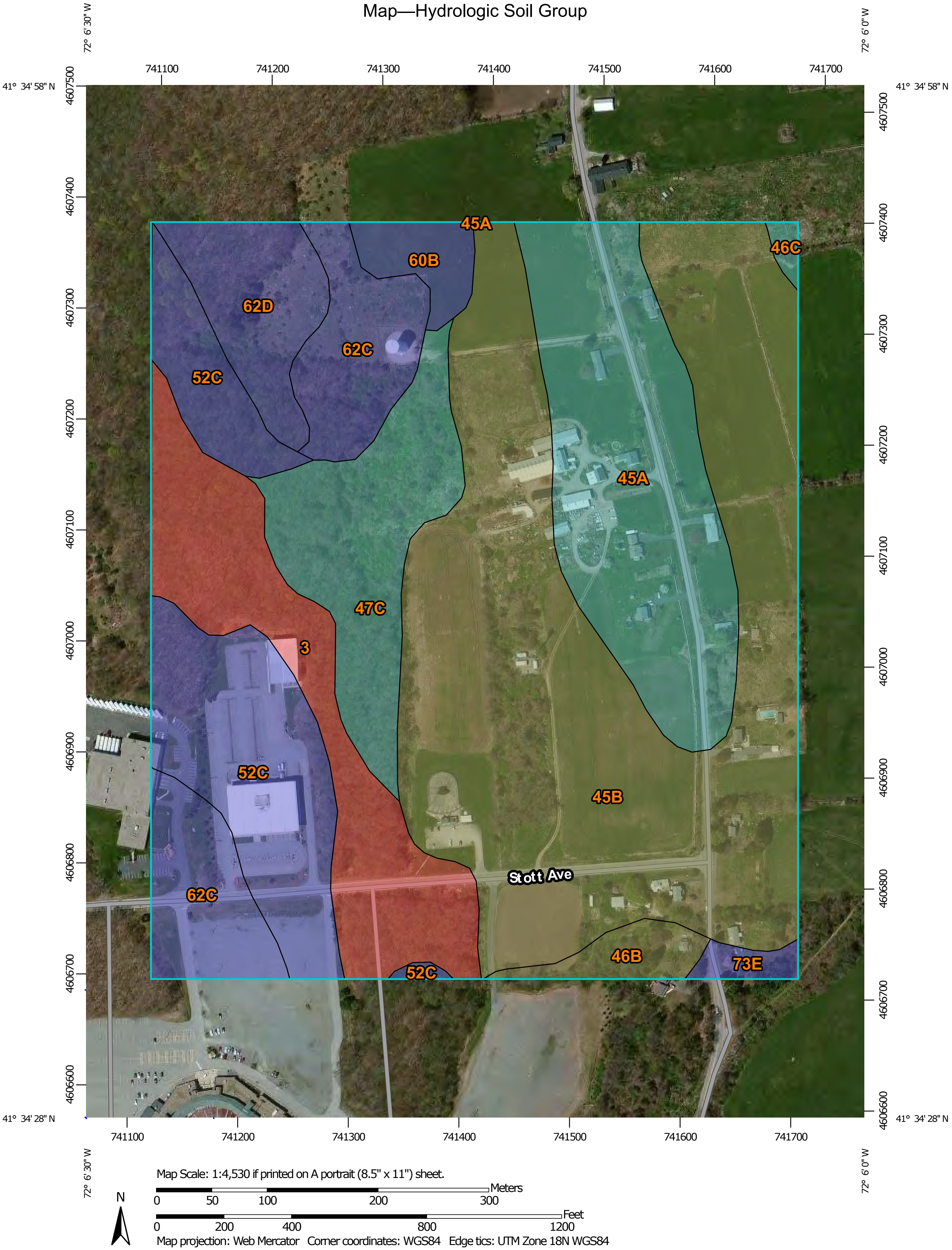
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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: http://websoilsurvey.nrcs.usda.gov
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 13, Oct 28, 2014

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

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

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.

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — State of Connecticut (CT600)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	10.3	10.4%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	C	14.5	14.7%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	38.3	38.7%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	C/D	1.5	1.5%
46C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	C	0.3	0.3%
47C	Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	C	8.0	8.1%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	B	11.6	11.7%
60B	Canton and Charlton soils, 3 to 8 percent slopes	B	1.7	1.7%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	B	8.0	8.1%
62D	Canton and Charlton soils, 15 to 35 percent slopes, extremely stony	B	4.3	4.3%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	B	0.7	0.7%
Totals for Area of Interest			**99.0**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Features

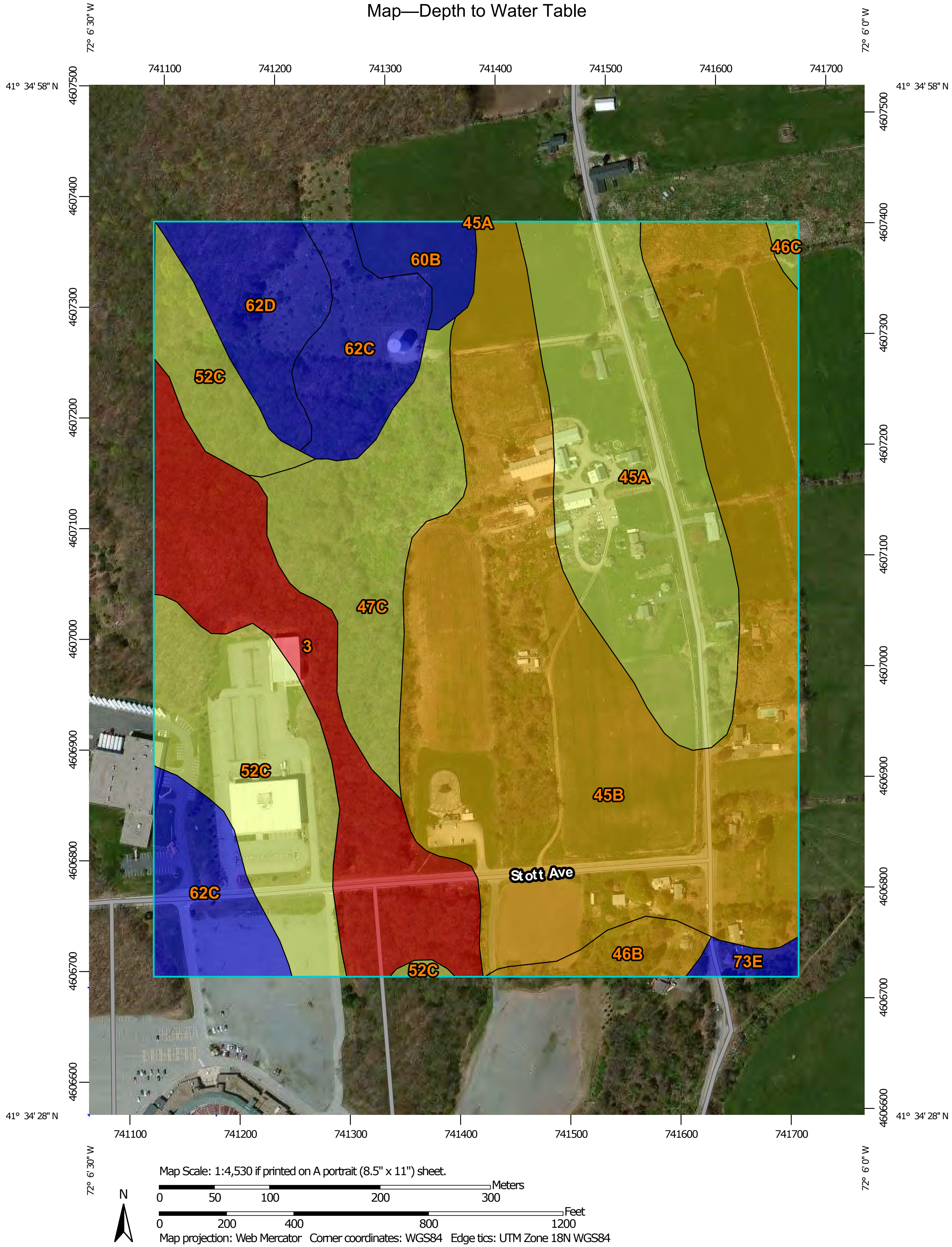
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Map—Depth to Water Table



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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 13, Oct 28, 2014

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

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

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.

Table—Depth to Water Table

Depth to Water Table— Summary by Map Unit — State of Connecticut (CT600)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	8	10.3	10.4%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	61	14.5	14.7%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	46	38.3	38.7%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	46	1.5	1.5%
46C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	61	0.3	0.3%
47C	Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	61	8.0	8.1%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	61	11.6	11.7%
60B	Canton and Charlton soils, 3 to 8 percent slopes	>200	1.7	1.7%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	>200	8.0	8.1%
62D	Canton and Charlton soils, 15 to 35 percent slopes, extremely stony	>200	4.3	4.3%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	>200	0.7	0.7%
Totals for Area of Interest			**99.0**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

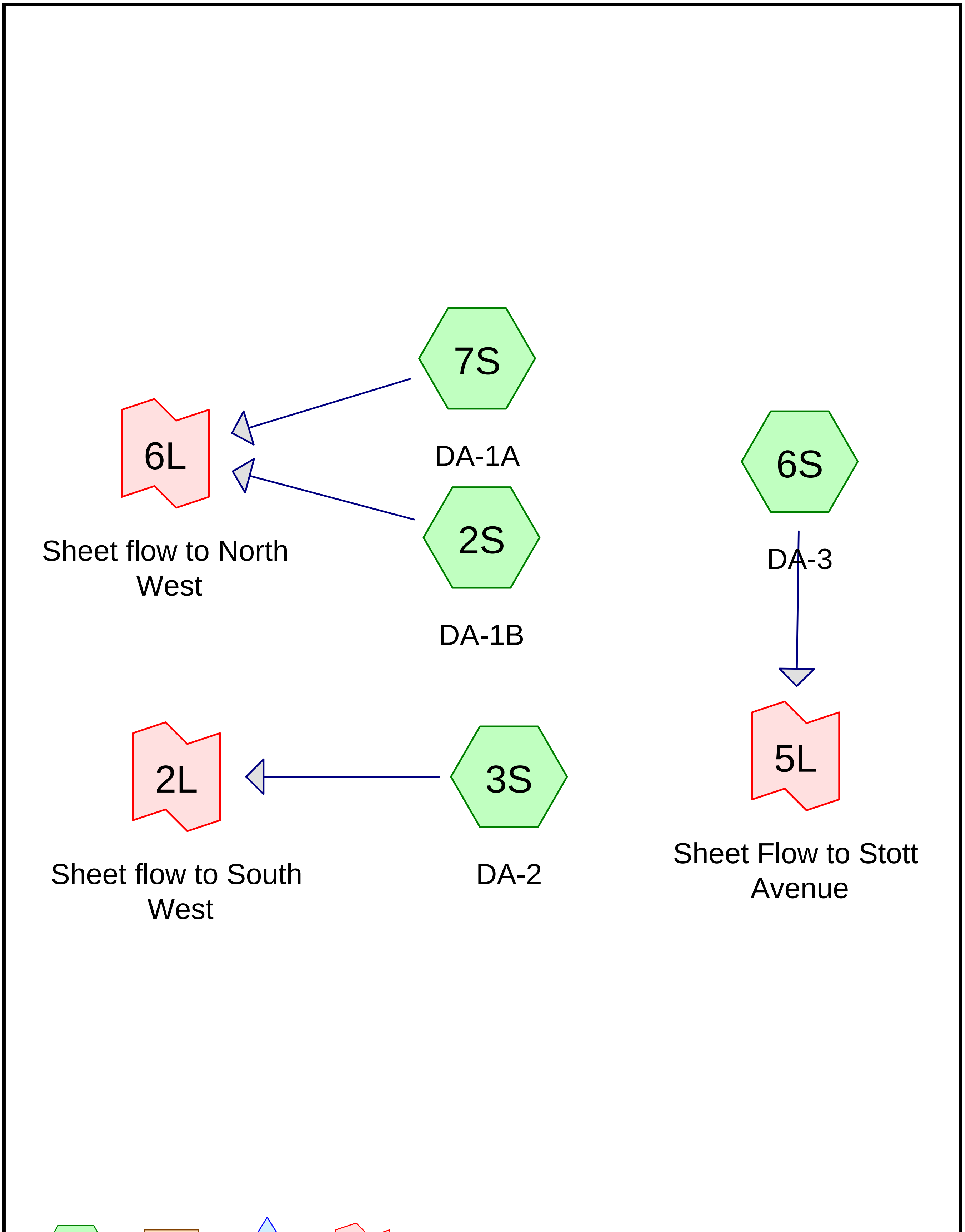
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix B
HydroCAD Modeling Results

Existing Conditions Results



Routing Diagram for Stott Ave Existing Conditions
Prepared by Boundaries LLC - DCM, Printed 8/3/2015
HydroCAD® 10.00-13 s/n 04031 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.070	86	<50% Grass cover, Poor, HSG C (6S)
3.878	74	>75% Grass cover, Good, HSG C (3S, 6S, 7S)
0.580	65	Brush, Good, HSG C (7S)
2.006	87	Dirt roads, HSG C (2S, 3S, 6S, 7S)
2.153	82	Farmsteads, HSG C (2S, 3S, 6S)
2.019	74	Pasture/grassland/range, Good, HSG C (7S)
10.213	77	Small grain, C&T + CR, Good, HSG C (2S, 3S, 6S)
0.973	98	Unconnected roofs, HSG C (3S, 6S, 7S)
3.259	70	Woods, Good, HSG C (2S, 3S, 6S)
0.386	77	Woods, Poor, HSG C (2S, 3S, 6S)
25.537	**77**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
25.537	HSG C	2S, 3S, 6S, 7S
0.000	HSG D	
0.000	Other	
25.537		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.070	0.000	0.000	0.070	<50% Grass cover, Poor	6S
0.000	0.000	3.878	0.000	0.000	3.878	>75% Grass cover, Good	3S, 6S, 7S
0.000	0.000	0.580	0.000	0.000	0.580	Brush, Good	7S
0.000	0.000	2.006	0.000	0.000	2.006	Dirt roads	2S, 3S, 6S, 7S
0.000	0.000	2.153	0.000	0.000	2.153	Farmsteads	2S, 3S, 6S
0.000	0.000	2.019	0.000	0.000	2.019	Pasture/grassland/range, Good	7S
0.000	0.000	10.213	0.000	0.000	10.213	Small grain, C&T + CR, Good	2S, 3S, 6S
0.000	0.000	0.973	0.000	0.000	0.973	Unconnected roofs	3S, 6S, 7S
0.000	0.000	3.259	0.000	0.000	3.259	Woods, Good	2S, 3S, 6S
0.000	0.000	0.386	0.000	0.000	0.386	Woods, Poor	2S, 3S, 6S
0.000	**0.000**	**25.537**	**0.000**	**0.000**	**25.537**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.050 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>1.42"
Flow Length=712' Tc=10.0 min CN=78 Runoff=2.7 cfs 0.229 af

Subcatchment 3S: DA-2 Runoff Area=9.198 ac 4.37% Impervious Runoff Depth>1.35"
Flow Length=1,274' Tc=28.6 min CN=77 Runoff=8.2 cfs 1.033 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 0.65% Impervious Runoff Depth>1.35"
Flow Length=900' Tc=19.7 min CN=77 Runoff=9.5 cfs 1.022 af

Subcatchment 7S: DA-1A Runoff Area=5.321 ac 9.62% Impervious Runoff Depth>1.29"
Flow Length=552' Tc=19.9 min UI Adjusted CN=76 Runoff=5.3 cfs 0.571 af

Link 2L: Sheet flow to South West Inflow=8.2 cfs 1.033 af
Primary=8.2 cfs 1.033 af

Link 5L: Sheet Flow to Stott Avenue Inflow=9.5 cfs 1.022 af
Primary=9.5 cfs 1.022 af

Link 6L: Sheet flow to North West Inflow=7.2 cfs 0.800 af
Primary=7.2 cfs 0.800 af

Total Runoff Area = 25.537 ac Runoff Volume = 2.855 af Average Runoff Depth = 1.34"
96.19% Pervious = 24.564 ac 3.81% Impervious = 0.973 ac

Summary for Subcatchment 2S: DA-1B

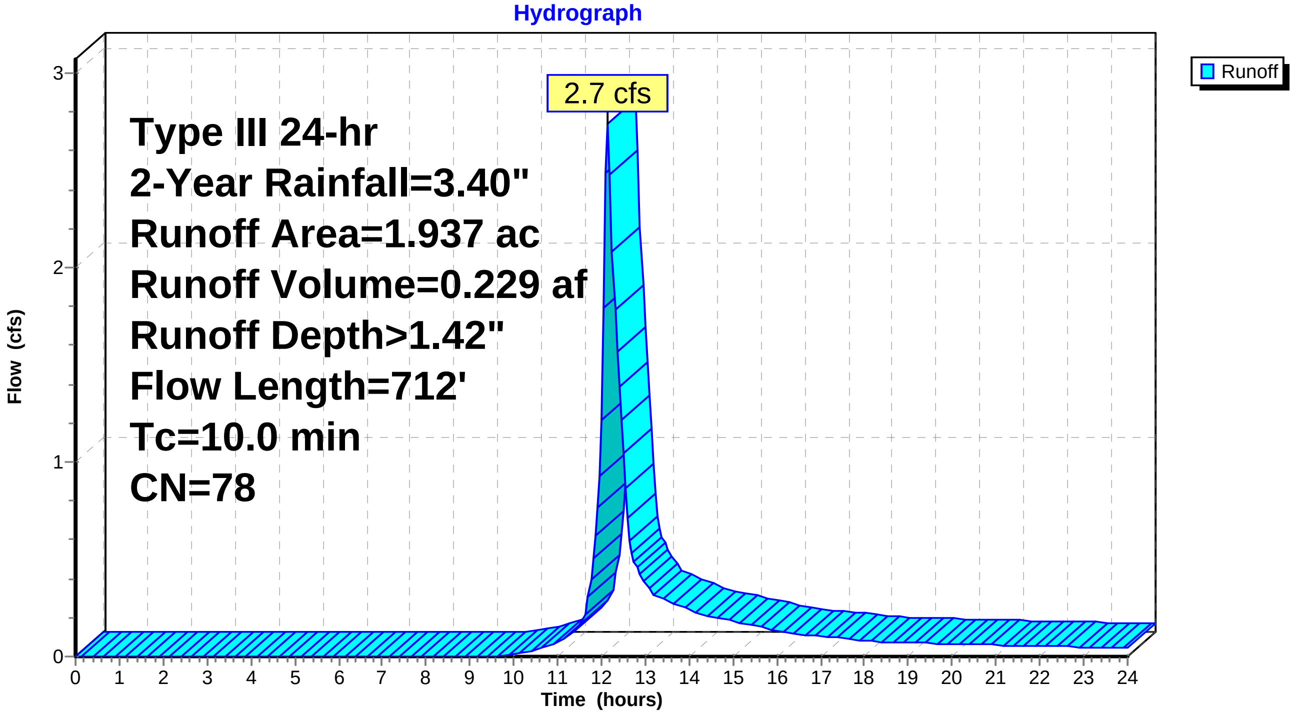
Runoff = 2.7 cfs @ 12.15 hrs, Volume= 0.229 af, Depth> 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.928	77	Small grain, C&T + CR, Good, HSG C
0.601	82	Farmsteads, HSG C
0.107	87	Dirt roads, HSG C
0.200	70	Woods, Good, HSG C
0.101	77	Woods, Poor, HSG C
1.937	78	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2

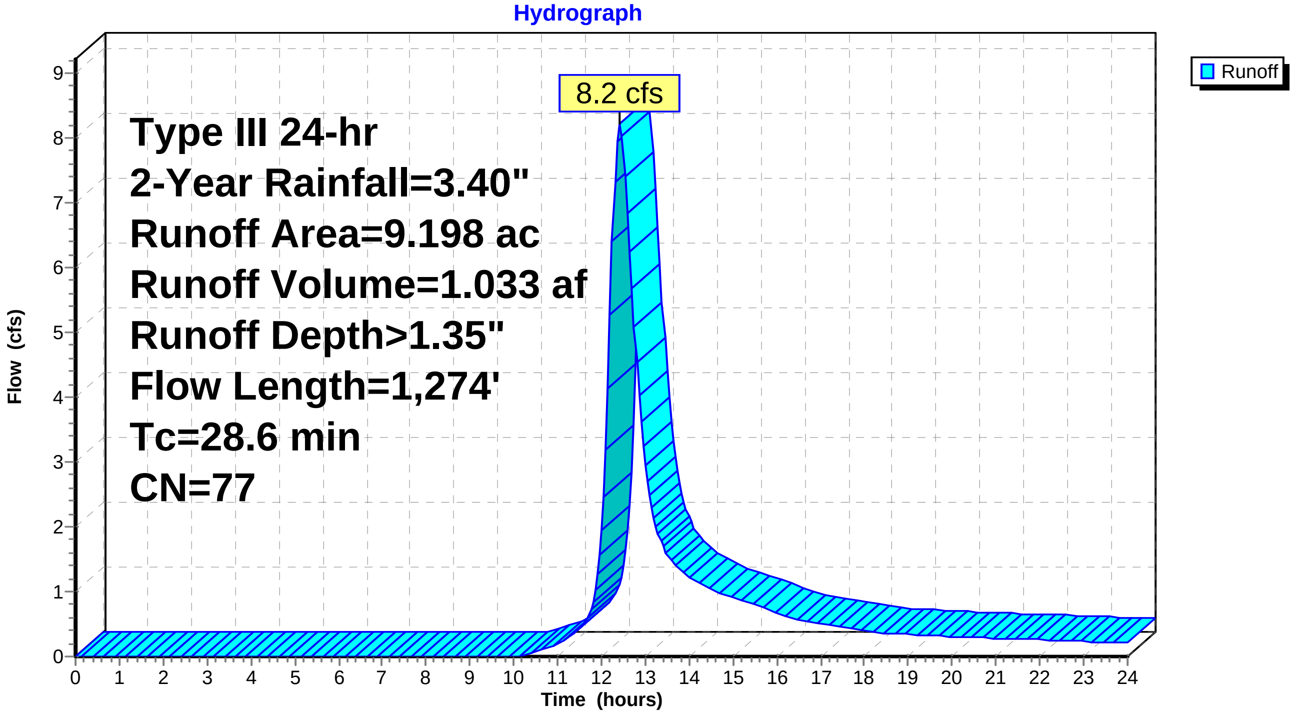
Runoff = 8.2 cfs @ 12.42 hrs, Volume= 1.033 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.402	98	Unconnected roofs, HSG C
3.610	77	Small grain, C&T + CR, Good, HSG C
2.233	70	Woods, Good, HSG C
0.206	77	Woods, Poor, HSG C
0.989	82	Farmsteads, HSG C
1.099	74	>75% Grass cover, Good, HSG C
0.659	87	Dirt roads, HSG C
9.198	77	Weighted Average
8.796		95.63% Pervious Area
0.402		4.37% Impervious Area
0.402		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
3.8	367	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.9	106	0.0472	1.96		**Shallow Concentrated Flow, Fields** Cultivated Straight Rows Kv= 9.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
0.4	47	0.1277	1.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
28.6	1,274	Total			

Subcatchment 3S: DA-2



Summary for Subcatchment 6S: DA-3

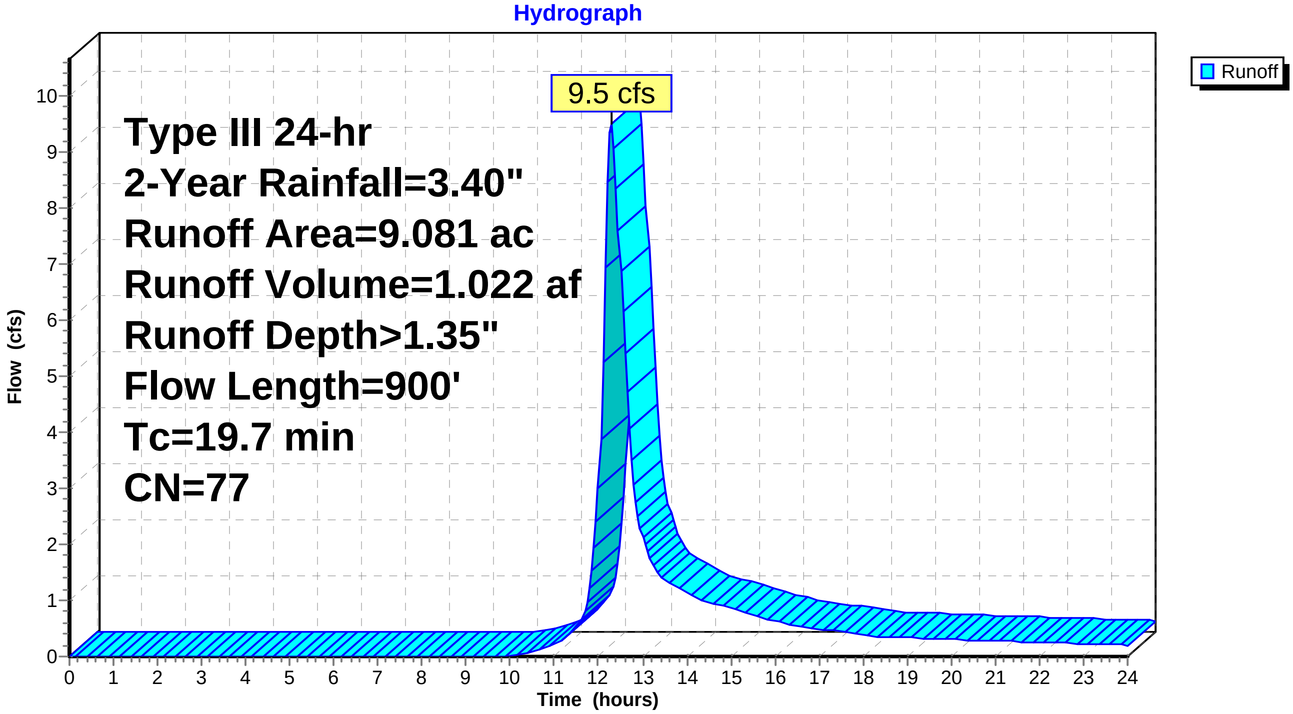
Runoff = 9.5 cfs @ 12.29 hrs, Volume= 1.022 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.059	98	Unconnected roofs, HSG C
0.826	70	Woods, Good, HSG C
0.079	77	Woods, Poor, HSG C
1.439	74	>75% Grass cover, Good, HSG C
0.070	86	<50% Grass cover, Poor, HSG C
0.563	82	Farmsteads, HSG C
0.370	87	Dirt roads, HSG C
5.675	77	Small grain, C&T + CR, Good, HSG C
9.081	77	Weighted Average
9.022		99.35% Pervious Area
0.059		0.65% Impervious Area
0.059		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
8.4	800	0.0312	1.59		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
19.7	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 7S: DA-1A

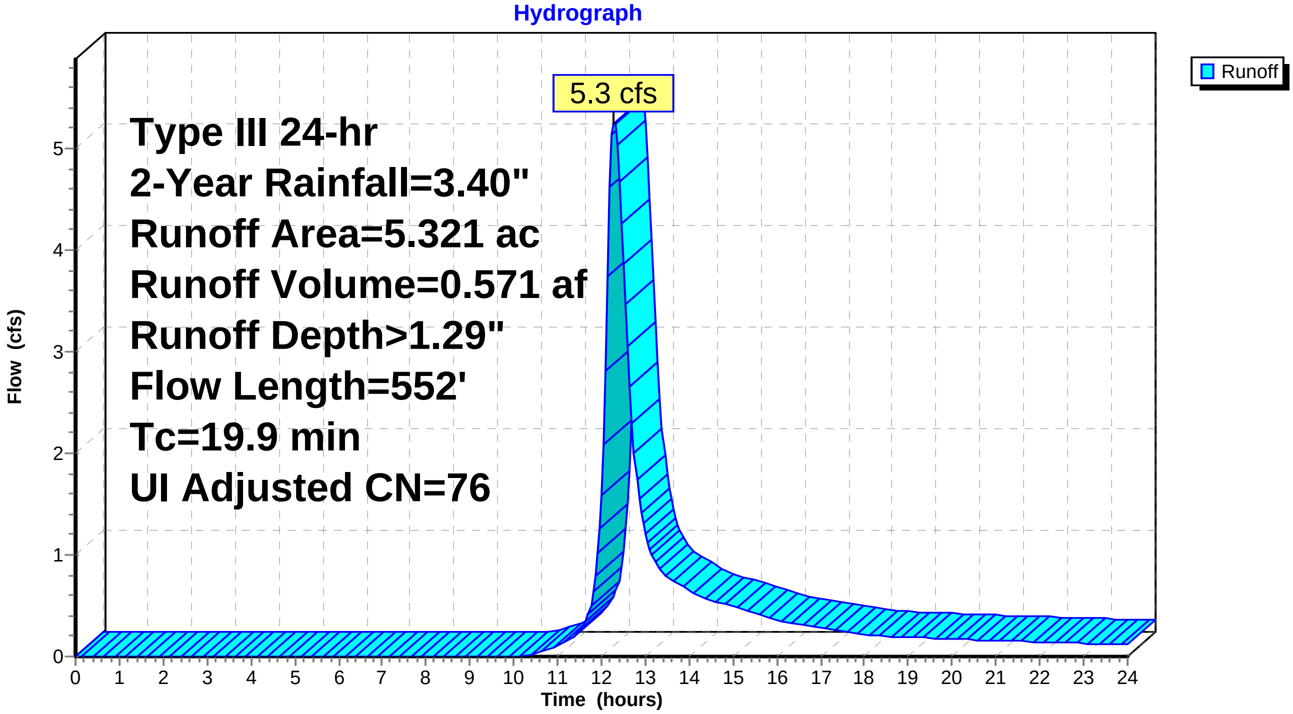
Runoff = 5.3 cfs @ 12.29 hrs, Volume= 0.571 af, Depth> 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Adj	Description
0.512	98		Unconnected roofs, HSG C
1.340	74		>75% Grass cover, Good, HSG C
2.019	74		Pasture/grassland/range, Good, HSG C
0.870	87		Dirt roads, HSG C
0.580	65		Brush, Good, HSG C
5.321	77	76	Weighted Average, UI Adjusted
4.809			90.38% Pervious Area
0.512			9.62% Impervious Area
0.512			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
19.9	552	Total			

Subcatchment 7S: DA-1A

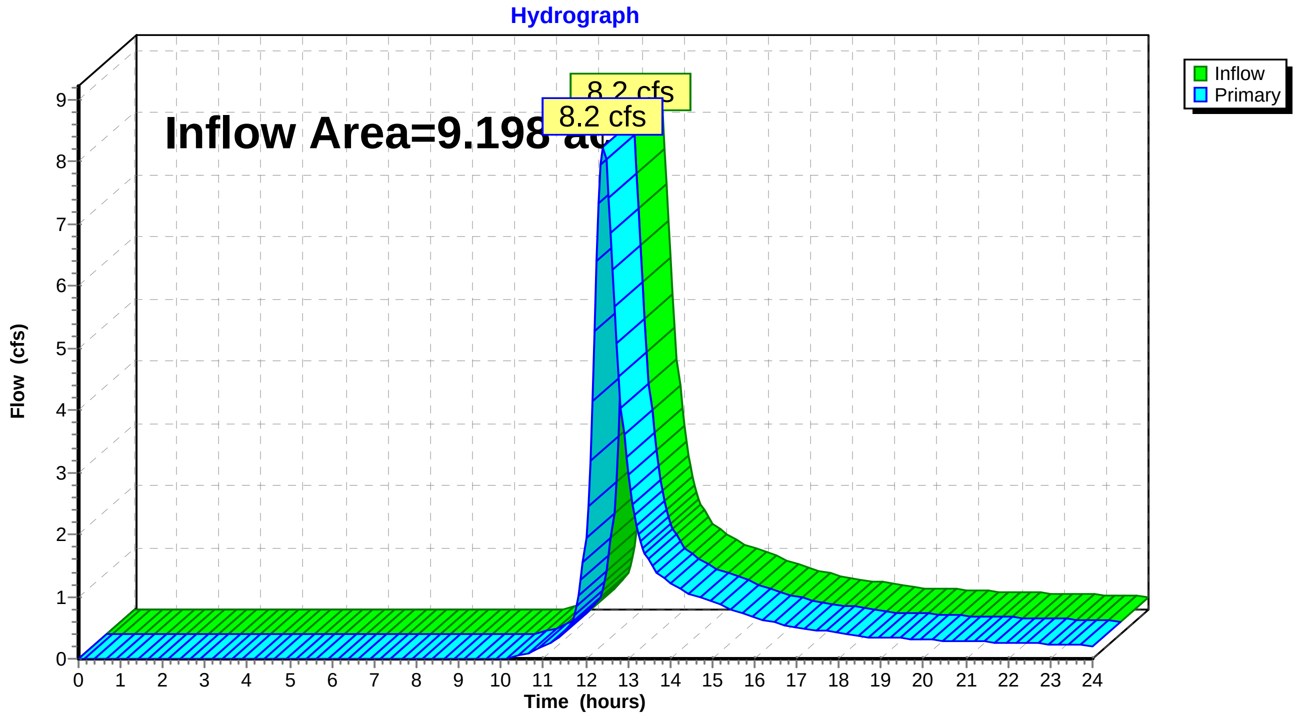


Summary for Link 2L: Sheet flow to South West

Inflow Area =	9.198 ac,	4.37% Impervious,	Inflow Depth > 1.35"	for 2-Year event
Inflow =	8.2 cfs @	12.42 hrs, Volume=	1.033 af	
Primary =	8.2 cfs @	12.42 hrs, Volume=	1.033 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 2L: Sheet flow to South West

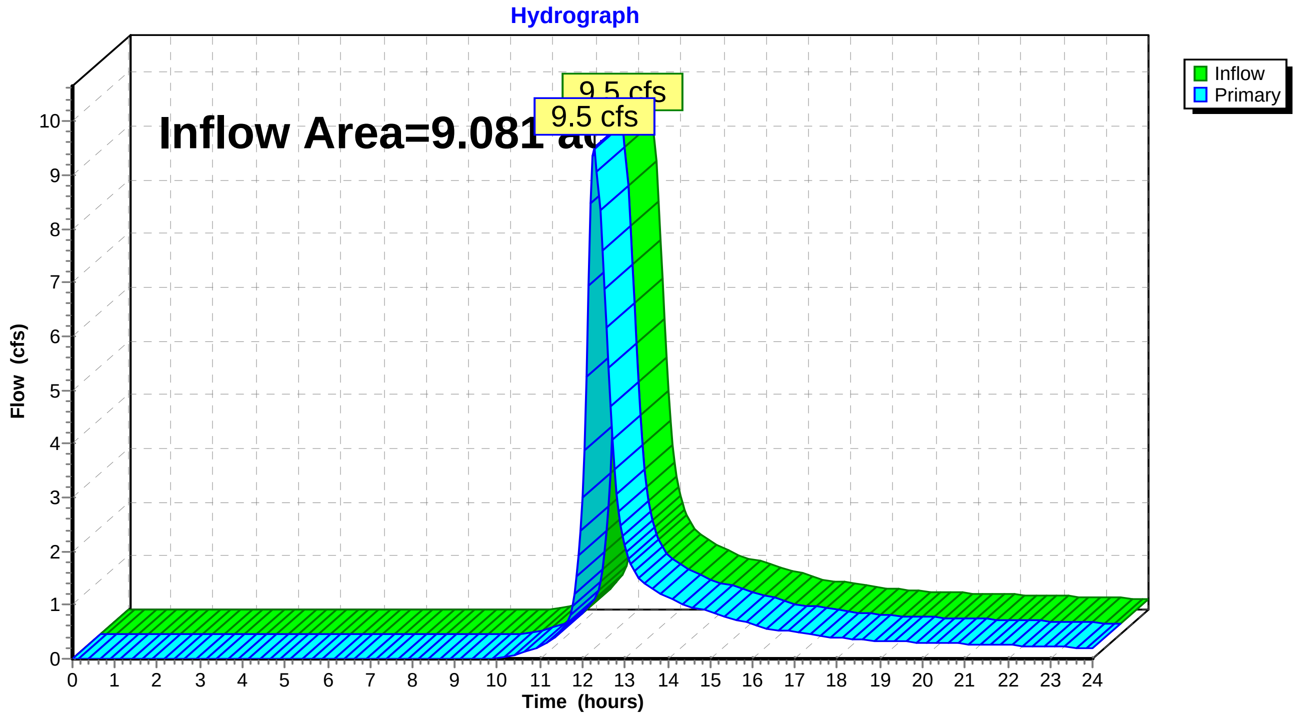


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	0.65% Impervious, Inflow Depth > 1.35"	for 2-Year event
Inflow =	9.5 cfs @	12.29 hrs, Volume=	1.022 af
Primary =	9.5 cfs @	12.29 hrs, Volume=	1.022 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 5L: Sheet Flow to Stott Avenue

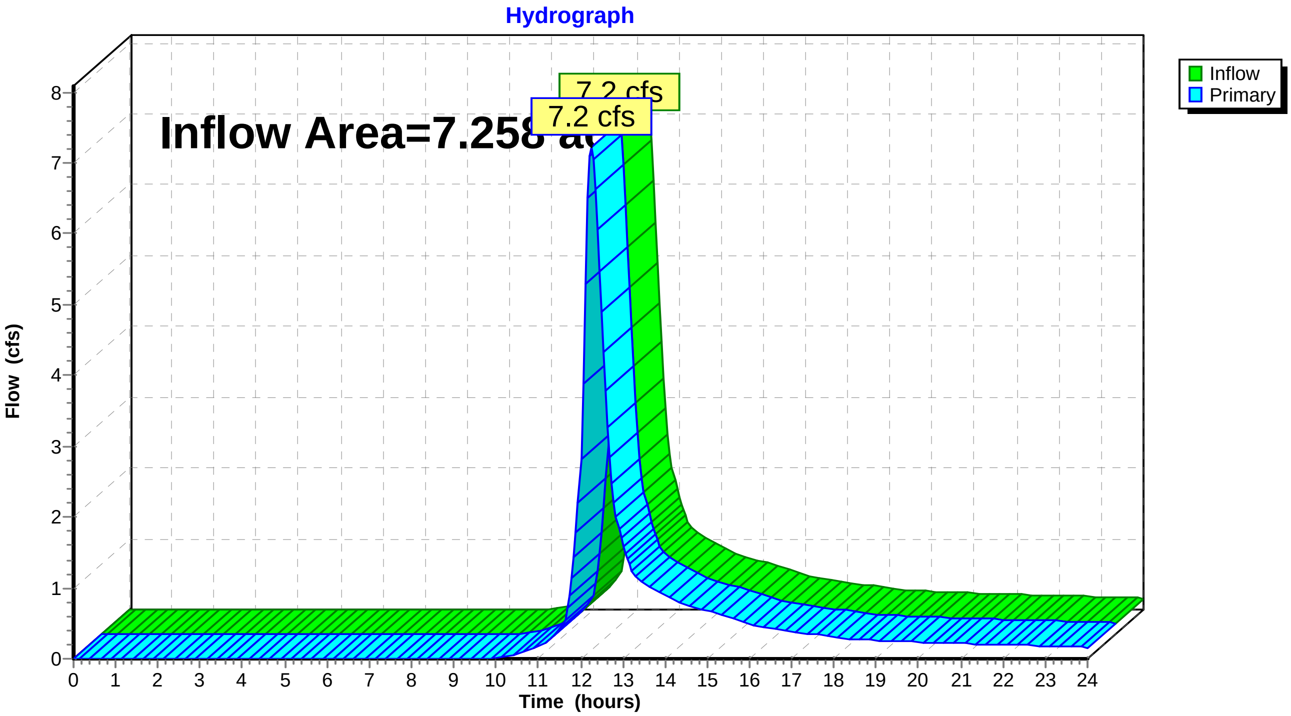


Summary for Link 6L: Sheet flow to North West

Inflow Area = 7.258 ac, 7.05% Impervious, Inflow Depth > 1.32" for 2-Year event
Inflow = 7.2 cfs @ 12.25 hrs, Volume= 0.800 af
Primary = 7.2 cfs @ 12.25 hrs, Volume= 0.800 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.050 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>2.12"
Flow Length=712' Tc=10.0 min CN=78 Runoff=4.2 cfs 0.343 af

Subcatchment 3S: DA-2 Runoff Area=9.198 ac 4.37% Impervious Runoff Depth>2.04"
Flow Length=1,274' Tc=28.6 min CN=77 Runoff=12.7 cfs 1.561 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 0.65% Impervious Runoff Depth>2.04"
Flow Length=900' Tc=19.7 min CN=77 Runoff=14.6 cfs 1.545 af

Subcatchment 7S: DA-1A Runoff Area=5.321 ac 9.62% Impervious Runoff Depth>1.96"
Flow Length=552' Tc=19.9 min UI Adjusted CN=76 Runoff=8.2 cfs 0.870 af

Link 2L: Sheet flow to South West Inflow=12.7 cfs 1.561 af
Primary=12.7 cfs 1.561 af

Link 5L: Sheet Flow to Stott Avenue Inflow=14.6 cfs 1.545 af
Primary=14.6 cfs 1.545 af

Link 6L: Sheet flow to North West Inflow=11.2 cfs 1.213 af
Primary=11.2 cfs 1.213 af

Total Runoff Area = 25.537 ac Runoff Volume = 4.319 af Average Runoff Depth = 2.03"
96.19% Pervious = 24.564 ac 3.81% Impervious = 0.973 ac

Summary for Subcatchment 2S: DA-1B

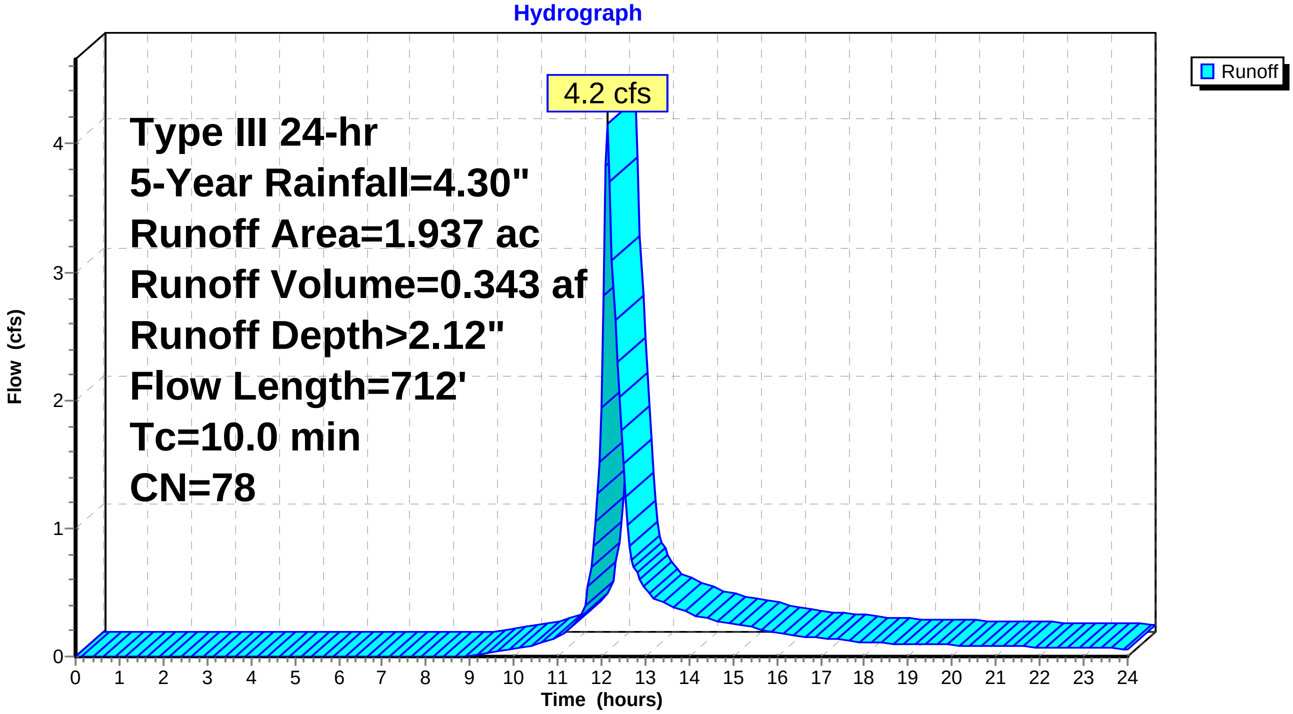
Runoff = 4.2 cfs @ 12.15 hrs, Volume= 0.343 af, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 5-Year Rainfall=4.30"

Area (ac)	CN	Description
0.928	77	Small grain, C&T + CR, Good, HSG C
0.601	82	Farmsteads, HSG C
0.107	87	Dirt roads, HSG C
0.200	70	Woods, Good, HSG C
0.101	77	Woods, Poor, HSG C
1.937	78	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2

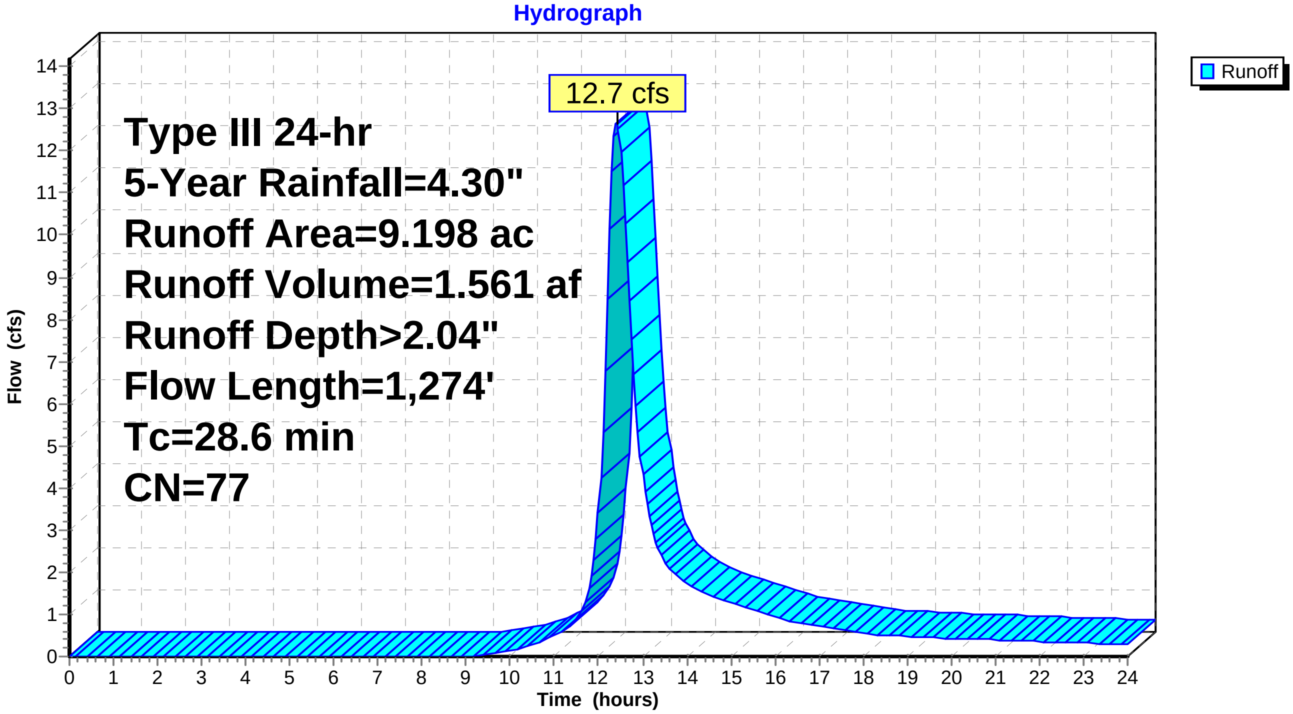
Runoff = 12.7 cfs @ 12.41 hrs, Volume= 1.561 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 5-Year Rainfall=4.30"

Area (ac)	CN	Description
0.402	98	Unconnected roofs, HSG C
3.610	77	Small grain, C&T + CR, Good, HSG C
2.233	70	Woods, Good, HSG C
0.206	77	Woods, Poor, HSG C
0.989	82	Farmsteads, HSG C
1.099	74	>75% Grass cover, Good, HSG C
0.659	87	Dirt roads, HSG C
9.198	77	Weighted Average
8.796		95.63% Pervious Area
0.402		4.37% Impervious Area
0.402		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
3.8	367	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.9	106	0.0472	1.96		**Shallow Concentrated Flow, Fields** Cultivated Straight Rows Kv= 9.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
0.4	47	0.1277	1.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
28.6	1,274	Total			

Subcatchment 3S: DA-2



Summary for Subcatchment 6S: DA-3

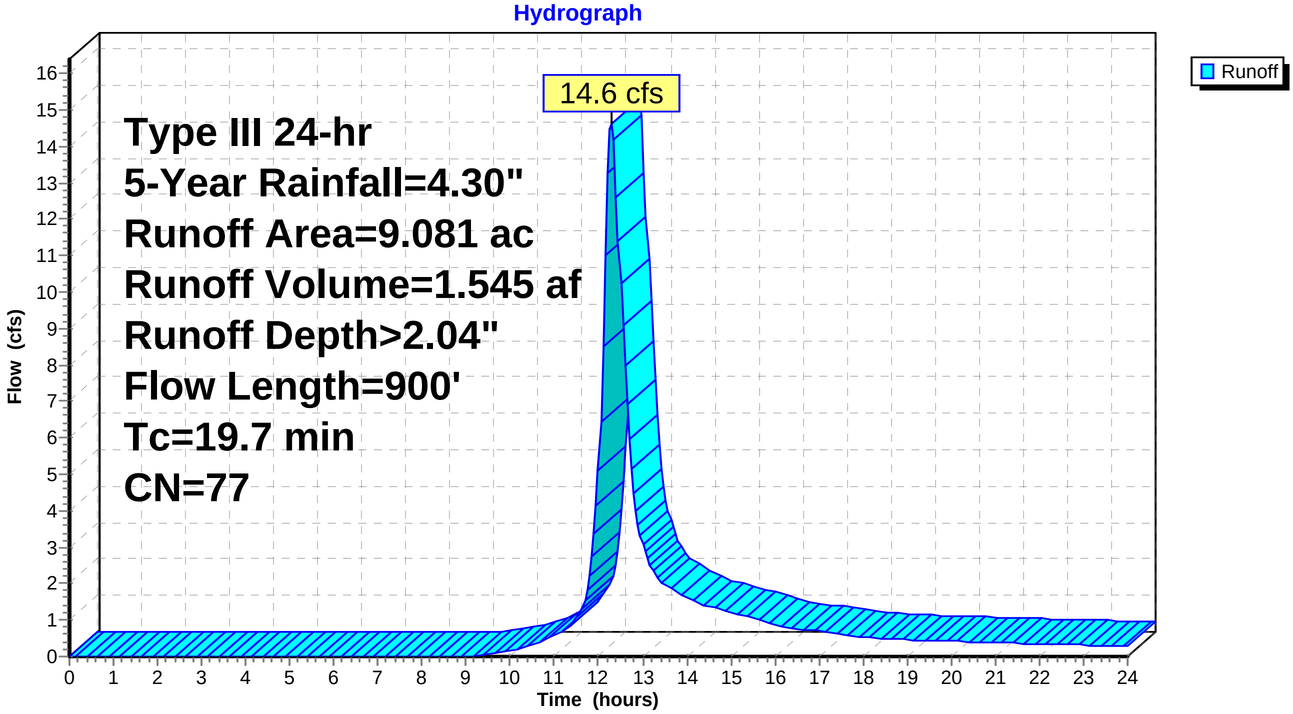
Runoff = 14.6 cfs @ 12.28 hrs, Volume= 1.545 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 5-Year Rainfall=4.30"

Area (ac)	CN	Description
0.059	98	Unconnected roofs, HSG C
0.826	70	Woods, Good, HSG C
0.079	77	Woods, Poor, HSG C
1.439	74	>75% Grass cover, Good, HSG C
0.070	86	<50% Grass cover, Poor, HSG C
0.563	82	Farmsteads, HSG C
0.370	87	Dirt roads, HSG C
5.675	77	Small grain, C&T + CR, Good, HSG C
9.081	77	Weighted Average
9.022		99.35% Pervious Area
0.059		0.65% Impervious Area
0.059		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
8.4	800	0.0312	1.59		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
19.7	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 7S: DA-1A

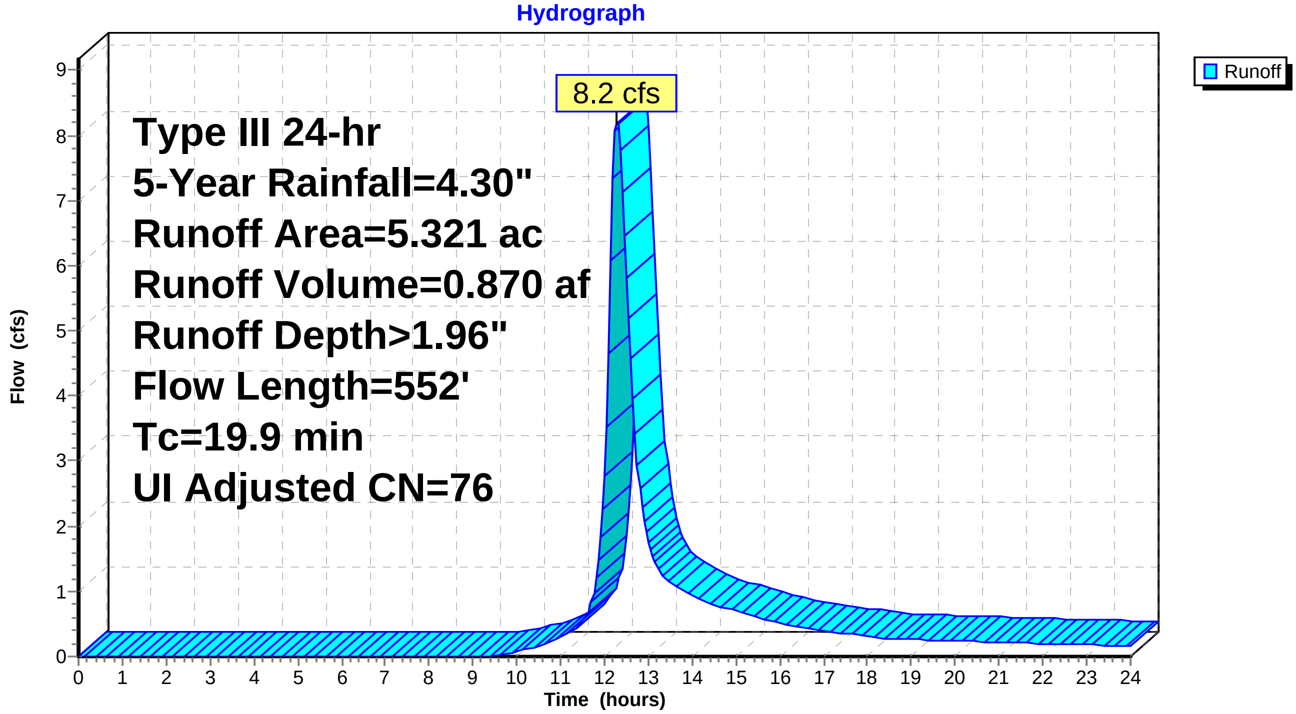
Runoff = 8.2 cfs @ 12.28 hrs, Volume= 0.870 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 5-Year Rainfall=4.30"

Area (ac)	CN	Adj	Description
0.512	98		Unconnected roofs, HSG C
1.340	74		>75% Grass cover, Good, HSG C
2.019	74		Pasture/grassland/range, Good, HSG C
0.870	87		Dirt roads, HSG C
0.580	65		Brush, Good, HSG C
5.321	77	76	Weighted Average, UI Adjusted
4.809			90.38% Pervious Area
0.512			9.62% Impervious Area
0.512			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
19.9	552	Total			

Subcatchment 7S: DA-1A

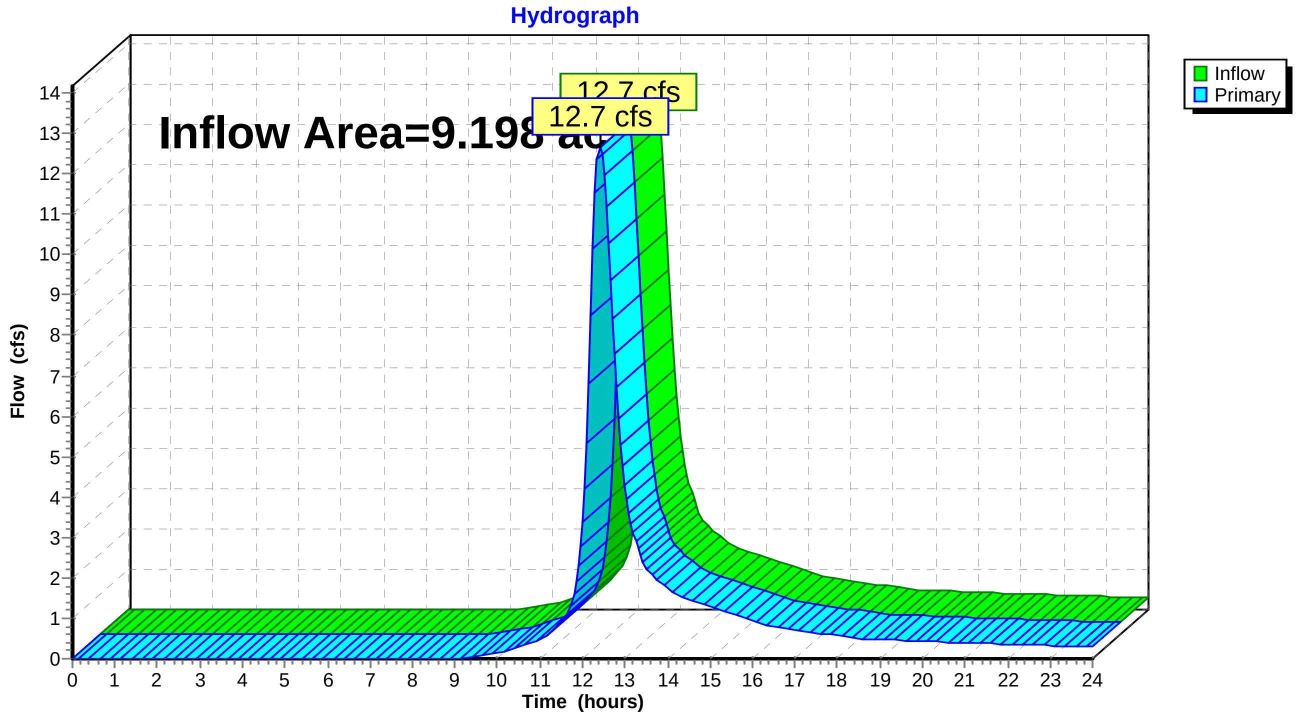


Summary for Link 2L: Sheet flow to South West

Inflow Area =	9.198 ac,	4.37% Impervious,	Inflow Depth > 2.04"	for 5-Year event	
Inflow =	12.7 cfs @	12.41 hrs,	Volume=	1.561 af	
Primary =	12.7 cfs @	12.41 hrs,	Volume=	1.561 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 2L: Sheet flow to South West

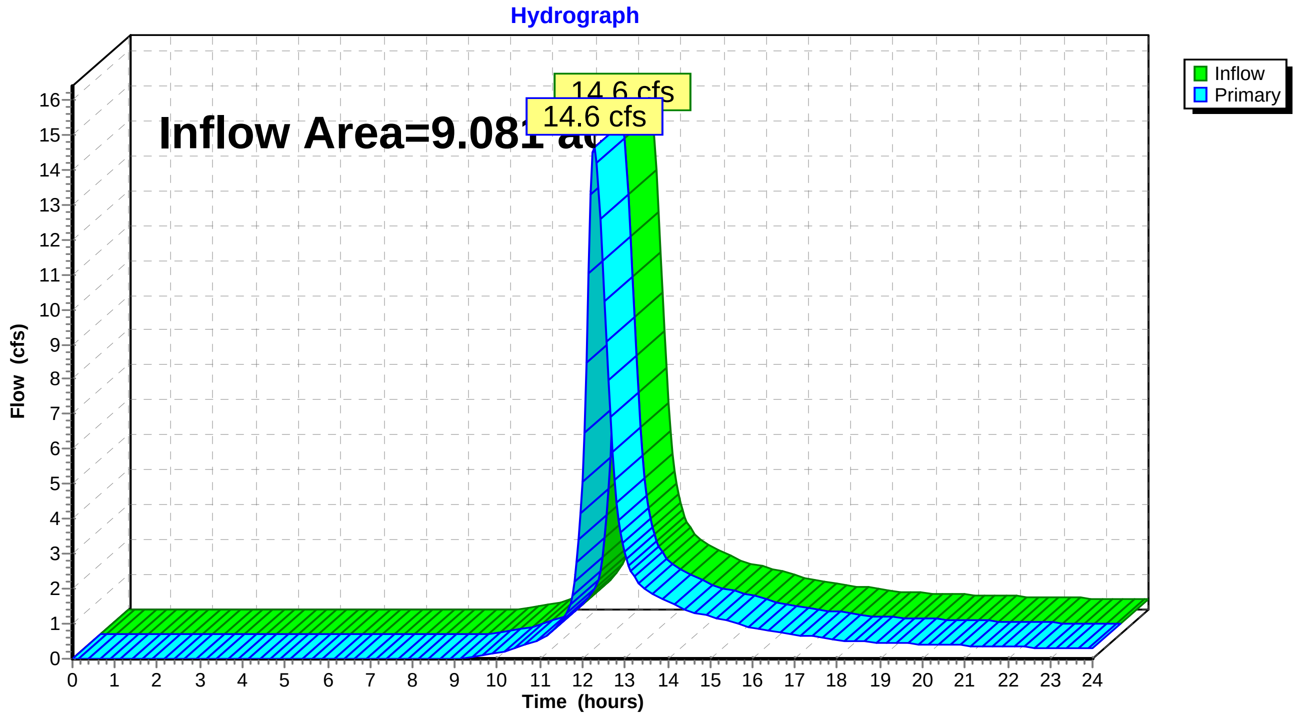


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	0.65% Impervious, Inflow Depth > 2.04"		for 5-Year event
Inflow =	14.6 cfs @	12.28 hrs, Volume=	1.545 af	
Primary =	14.6 cfs @	12.28 hrs, Volume=	1.545 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 5L: Sheet Flow to Stott Avenue

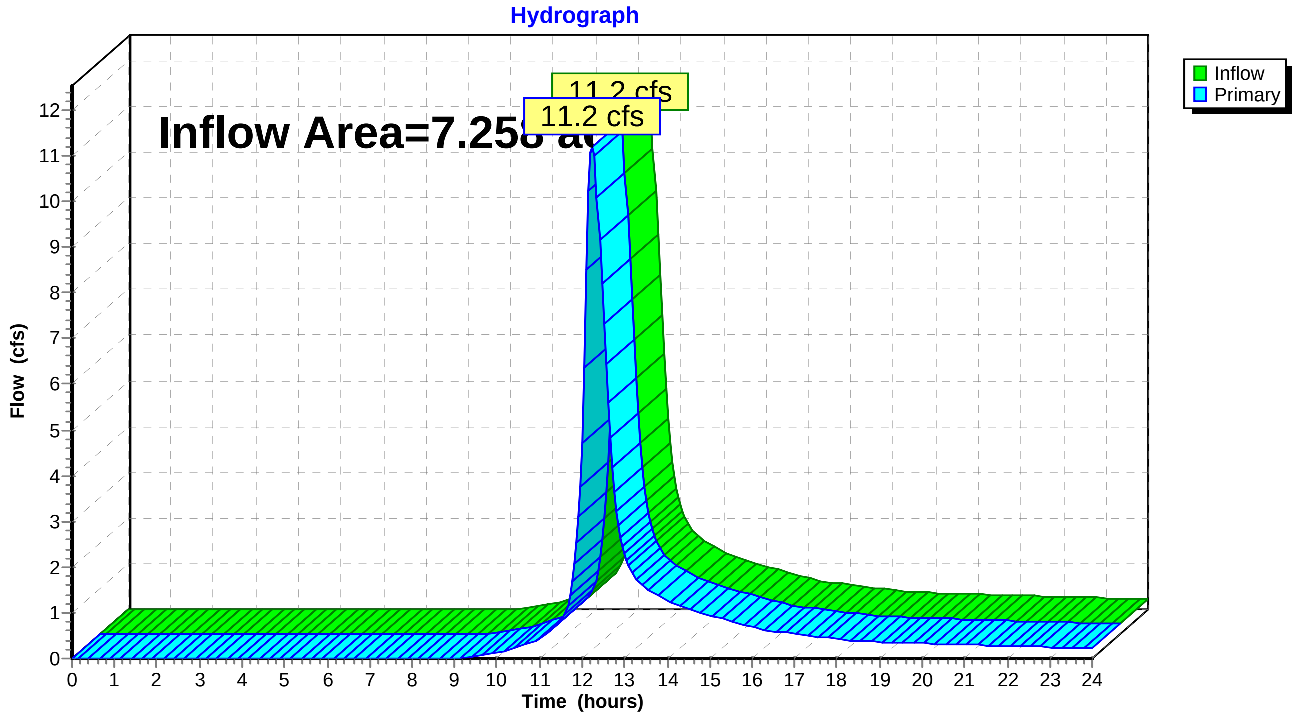


Summary for Link 6L: Sheet flow to North West

Inflow Area = 7.258 ac, 7.05% Impervious, Inflow Depth > 2.01" for 5-Year event
Inflow = 11.2 cfs @ 12.24 hrs, Volume= 1.213 af
Primary = 11.2 cfs @ 12.24 hrs, Volume= 1.213 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.050 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>2.71"
Flow Length=712' Tc=10.0 min CN=78 Runoff=5.3 cfs 0.437 af

Subcatchment 3S: DA-2 Runoff Area=9.198 ac 4.37% Impervious Runoff Depth>2.61"
Flow Length=1,274' Tc=28.6 min CN=77 Runoff=16.3 cfs 1.999 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 0.65% Impervious Runoff Depth>2.61"
Flow Length=900' Tc=19.7 min CN=77 Runoff=18.8 cfs 1.977 af

Subcatchment 7S: DA-1A Runoff Area=5.321 ac 9.62% Impervious Runoff Depth>2.53"
Flow Length=552' Tc=19.9 min UI Adjusted CN=76 Runoff=10.6 cfs 1.120 af

Link 2L: Sheet flow to South West Inflow=16.3 cfs 1.999 af
Primary=16.3 cfs 1.999 af

Link 5L: Sheet Flow to Stott Avenue Inflow=18.8 cfs 1.977 af
Primary=18.8 cfs 1.977 af

Link 6L: Sheet flow to North West Inflow=14.4 cfs 1.557 af
Primary=14.4 cfs 1.557 af

Total Runoff Area = 25.537 ac Runoff Volume = 5.533 af Average Runoff Depth = 2.60"
96.19% Pervious = 24.564 ac 3.81% Impervious = 0.973 ac

Summary for Subcatchment 2S: DA-1B

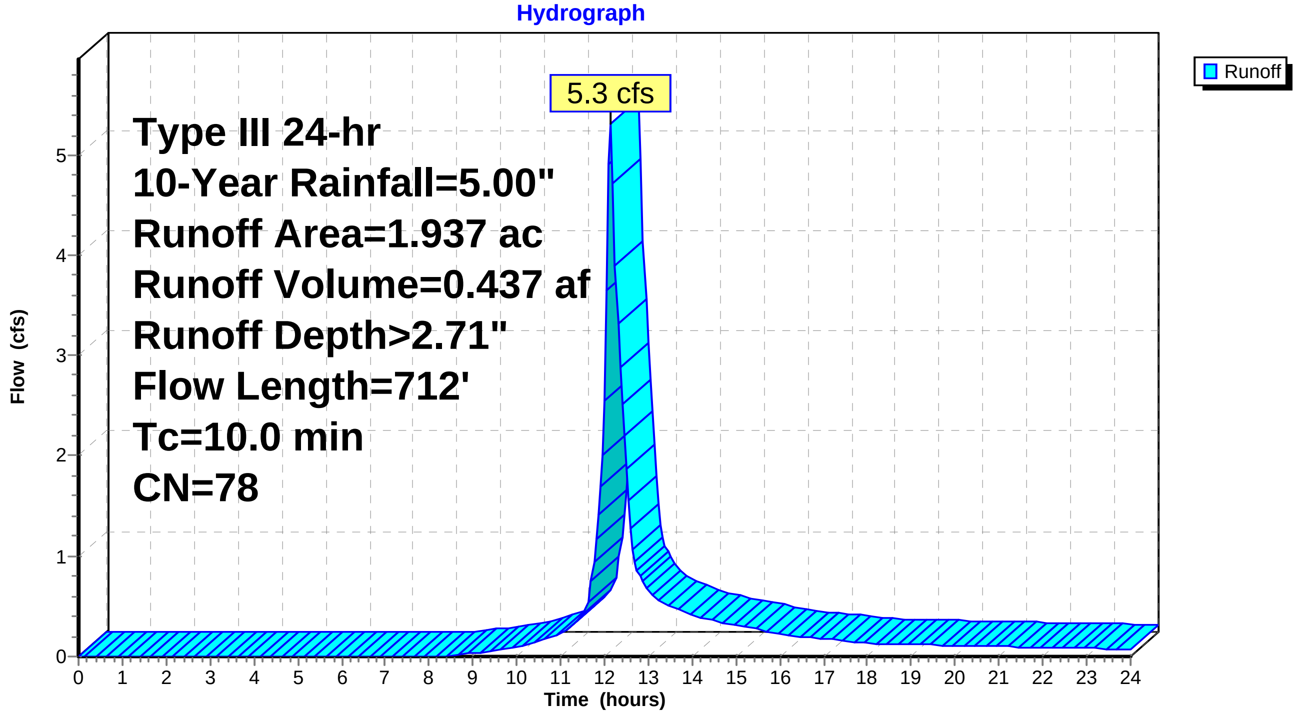
Runoff = 5.3 cfs @ 12.14 hrs, Volume= 0.437 af, Depth> 2.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (ac)	CN	Description
0.928	77	Small grain, C&T + CR, Good, HSG C
0.601	82	Farmsteads, HSG C
0.107	87	Dirt roads, HSG C
0.200	70	Woods, Good, HSG C
0.101	77	Woods, Poor, HSG C
1.937	78	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2

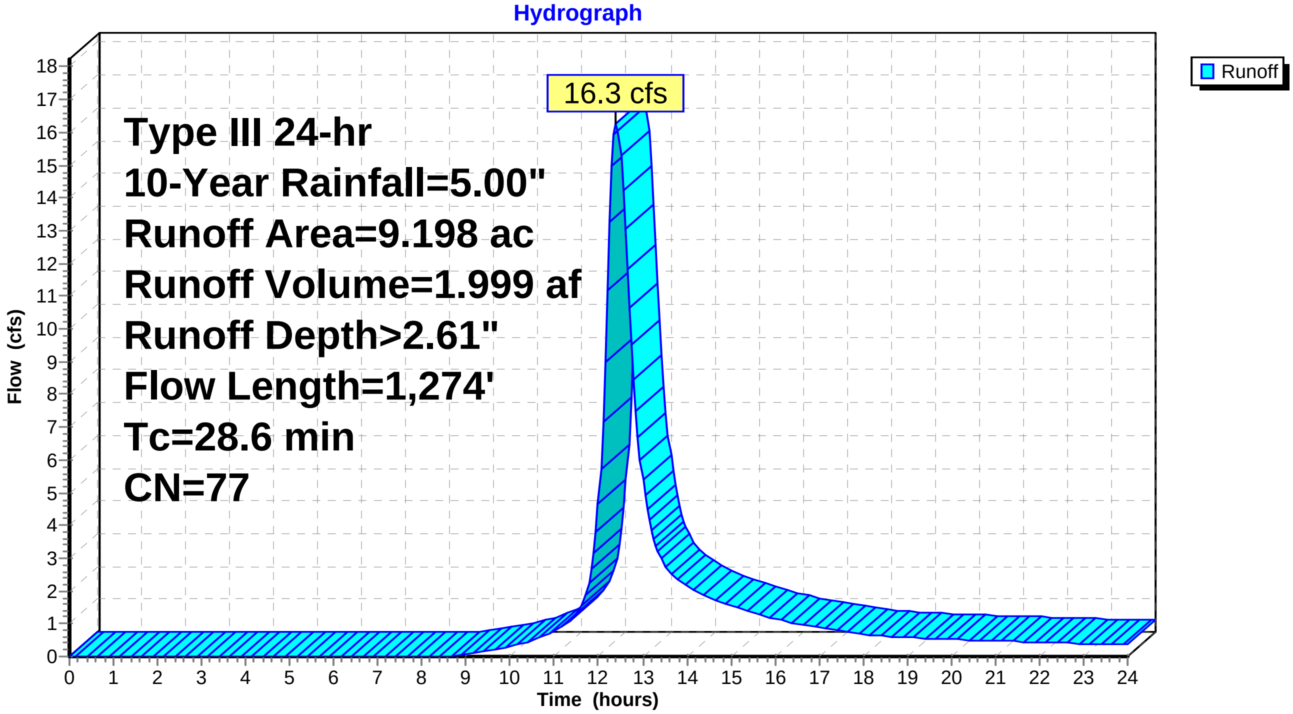
Runoff = 16.3 cfs @ 12.40 hrs, Volume= 1.999 af, Depth> 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (ac)	CN	Description
0.402	98	Unconnected roofs, HSG C
3.610	77	Small grain, C&T + CR, Good, HSG C
2.233	70	Woods, Good, HSG C
0.206	77	Woods, Poor, HSG C
0.989	82	Farmsteads, HSG C
1.099	74	>75% Grass cover, Good, HSG C
0.659	87	Dirt roads, HSG C
9.198	77	Weighted Average
8.796		95.63% Pervious Area
0.402		4.37% Impervious Area
0.402		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
3.8	367	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.9	106	0.0472	1.96		**Shallow Concentrated Flow, Fields** Cultivated Straight Rows Kv= 9.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
0.4	47	0.1277	1.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
28.6	1,274	Total			

Subcatchment 3S: DA-2



Summary for Subcatchment 6S: DA-3

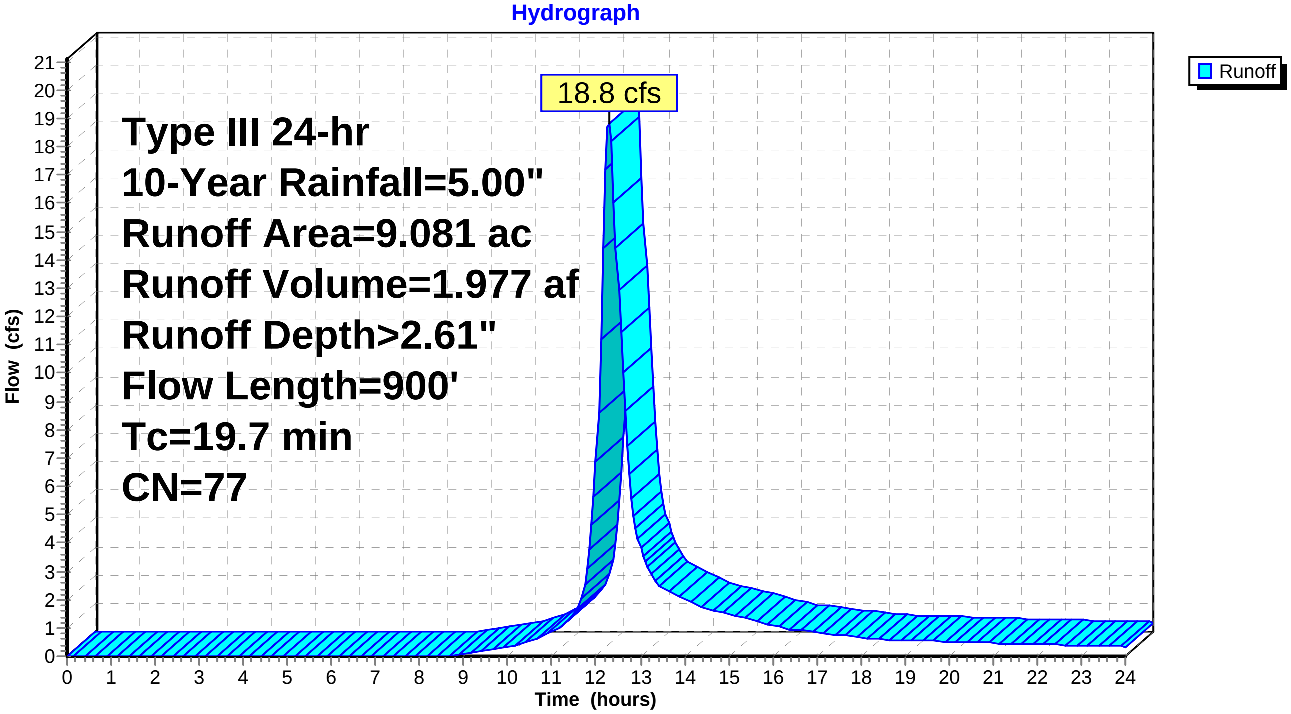
Runoff = 18.8 cfs @ 12.28 hrs, Volume= 1.977 af, Depth> 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (ac)	CN	Description
0.059	98	Unconnected roofs, HSG C
0.826	70	Woods, Good, HSG C
0.079	77	Woods, Poor, HSG C
1.439	74	>75% Grass cover, Good, HSG C
0.070	86	<50% Grass cover, Poor, HSG C
0.563	82	Farmsteads, HSG C
0.370	87	Dirt roads, HSG C
5.675	77	Small grain, C&T + CR, Good, HSG C
9.081	77	Weighted Average
9.022		99.35% Pervious Area
0.059		0.65% Impervious Area
0.059		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
8.4	800	0.0312	1.59		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
19.7	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 7S: DA-1A

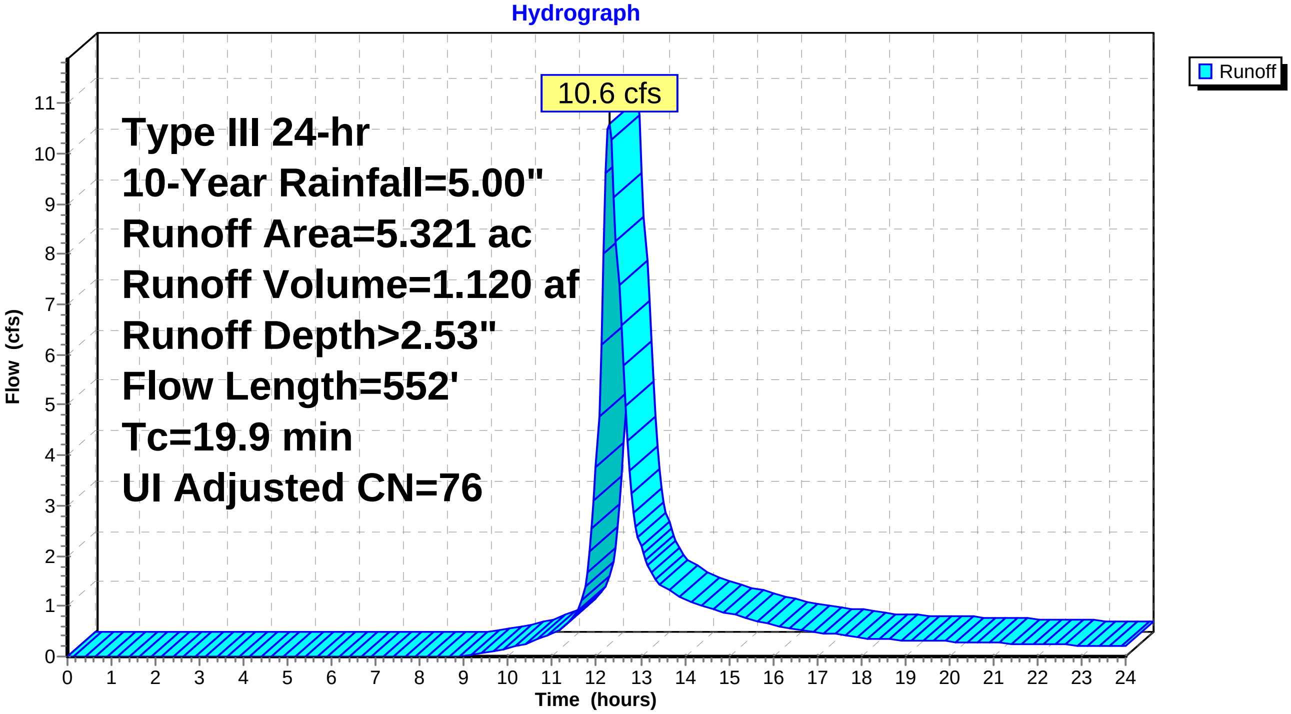
Runoff = 10.6 cfs @ 12.28 hrs, Volume= 1.120 af, Depth> 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (ac)	CN	Adj	Description
0.512	98		Unconnected roofs, HSG C
1.340	74		>75% Grass cover, Good, HSG C
2.019	74		Pasture/grassland/range, Good, HSG C
0.870	87		Dirt roads, HSG C
0.580	65		Brush, Good, HSG C
5.321	77	76	Weighted Average, UI Adjusted
4.809			90.38% Pervious Area
0.512			9.62% Impervious Area
0.512			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
19.9	552	Total			

Subcatchment 7S: DA-1A

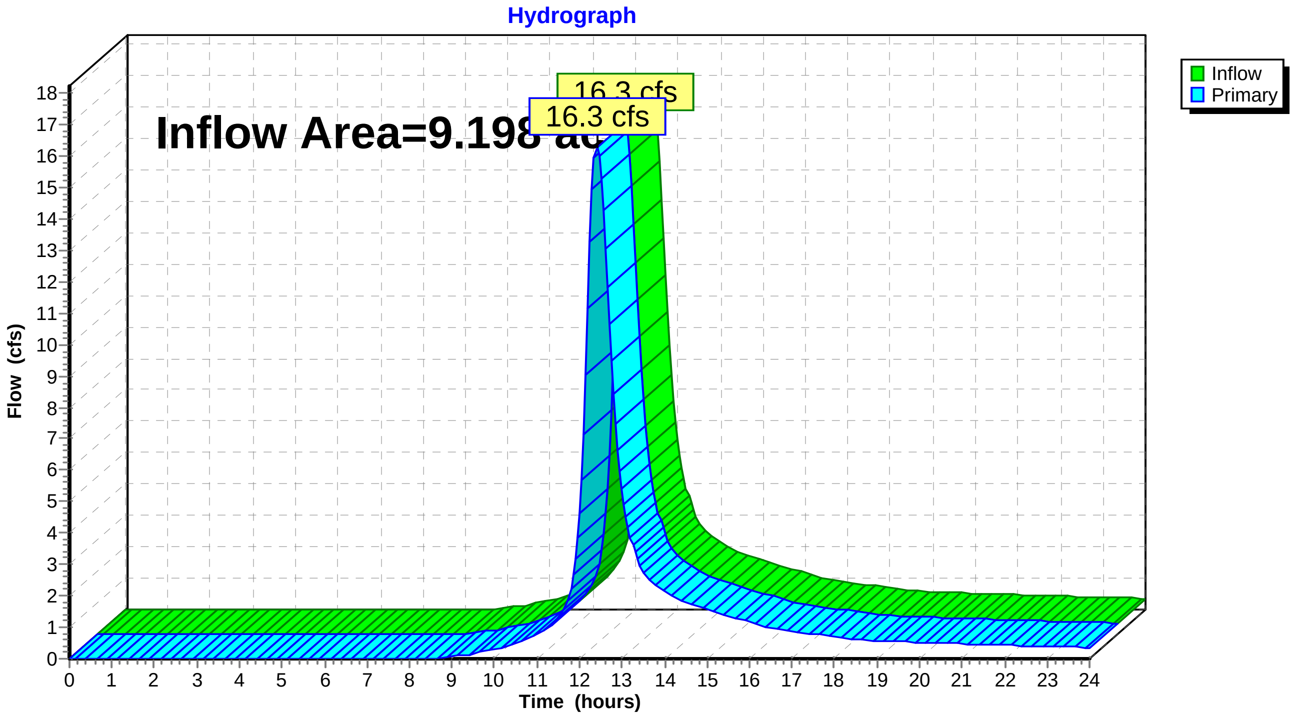


Summary for Link 2L: Sheet flow to South West

Inflow Area =	9.198 ac,	4.37% Impervious,	Inflow Depth > 2.61"	for 10-Year event	
Inflow =	16.3 cfs @	12.40 hrs,	Volume=	1.999 af	
Primary =	16.3 cfs @	12.40 hrs,	Volume=	1.999 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 2L: Sheet flow to South West

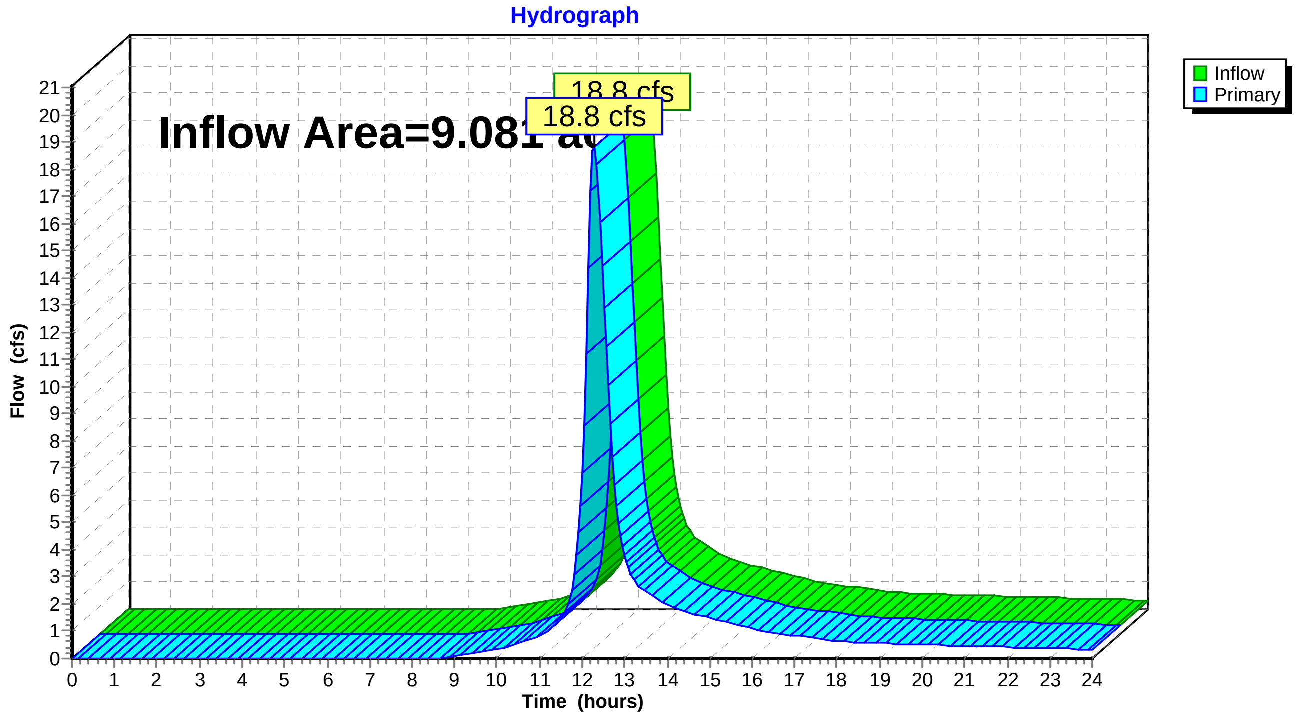


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	0.65% Impervious, Inflow Depth > 2.61"	for 10-Year event	
Inflow =	18.8 cfs @	12.28 hrs, Volume=	1.977 af	
Primary =	18.8 cfs @	12.28 hrs, Volume=	1.977 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 5L: Sheet Flow to Stott Avenue

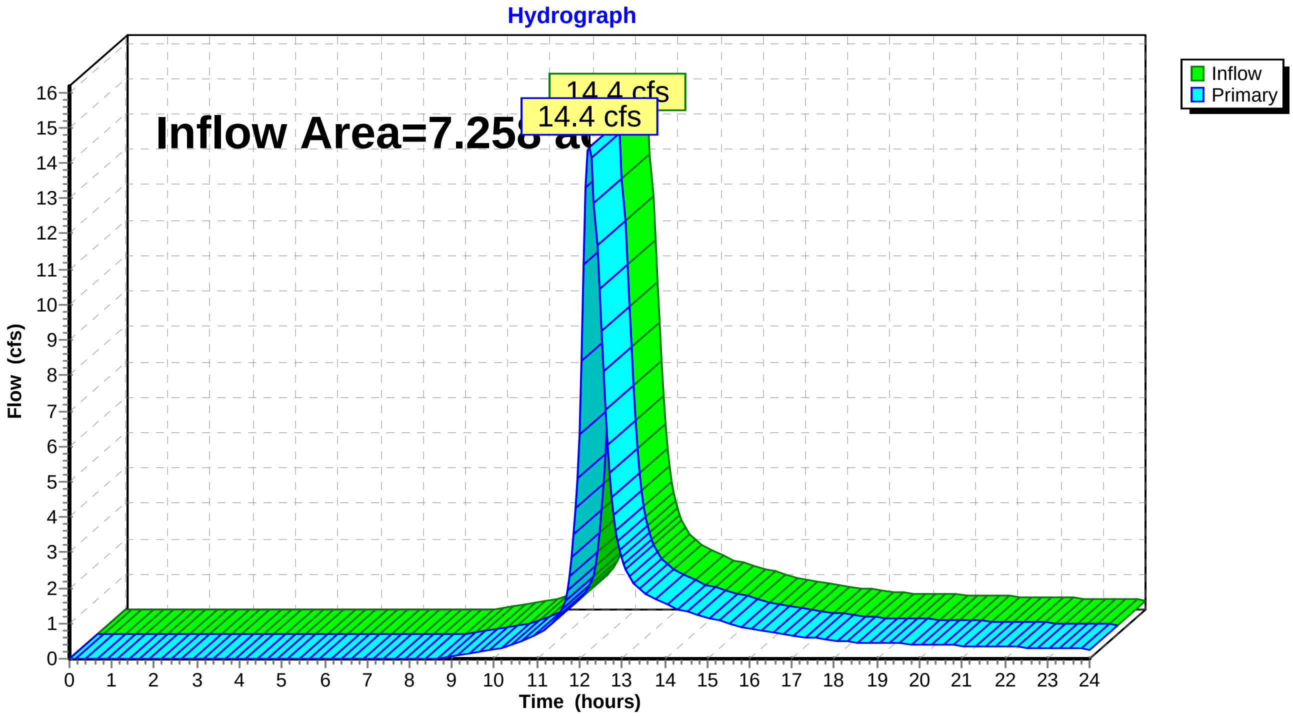


Summary for Link 6L: Sheet flow to North West

Inflow Area =	7.258 ac,	7.05% Impervious, Inflow Depth > 2.57"	for 10-Year event
Inflow =	14.4 cfs @	12.23 hrs, Volume=	1.557 af
Primary =	14.4 cfs @	12.23 hrs, Volume=	1.557 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.050 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>3.31"
Flow Length=712' Tc=10.0 min CN=78 Runoff=6.5 cfs 0.534 af

Subcatchment 3S: DA-2 Runoff Area=9.198 ac 4.37% Impervious Runoff Depth>3.20"
Flow Length=1,274' Tc=28.6 min CN=77 Runoff=20.0 cfs 2.453 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 0.65% Impervious Runoff Depth>3.21"
Flow Length=900' Tc=19.7 min CN=77 Runoff=23.2 cfs 2.427 af

Subcatchment 7S: DA-1A Runoff Area=5.321 ac 9.62% Impervious Runoff Depth>3.11"
Flow Length=552' Tc=19.9 min UI Adjusted CN=76 Runoff=13.1 cfs 1.379 af

Link 2L: Sheet flow to South West Inflow=20.0 cfs 2.453 af
Primary=20.0 cfs 2.453 af

Link 5L: Sheet Flow to Stott Avenue Inflow=23.2 cfs 2.427 af
Primary=23.2 cfs 2.427 af

Link 6L: Sheet flow to North West Inflow=17.8 cfs 1.914 af
Primary=17.8 cfs 1.914 af

Total Runoff Area = 25.537 ac Runoff Volume = 6.793 af Average Runoff Depth = 3.19"
96.19% Pervious = 24.564 ac 3.81% Impervious = 0.973 ac

Summary for Subcatchment 2S: DA-1B

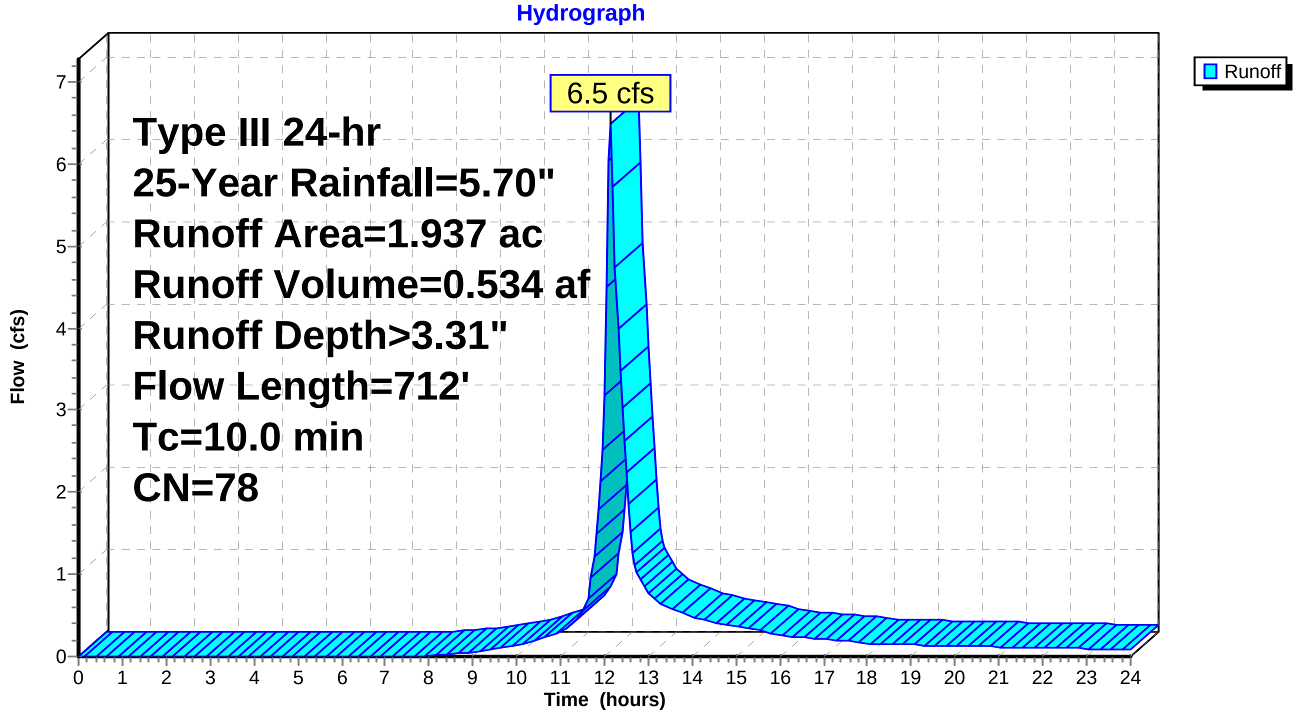
Runoff = 6.5 cfs @ 12.14 hrs, Volume= 0.534 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (ac)	CN	Description
0.928	77	Small grain, C&T + CR, Good, HSG C
0.601	82	Farmsteads, HSG C
0.107	87	Dirt roads, HSG C
0.200	70	Woods, Good, HSG C
0.101	77	Woods, Poor, HSG C
1.937	78	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2

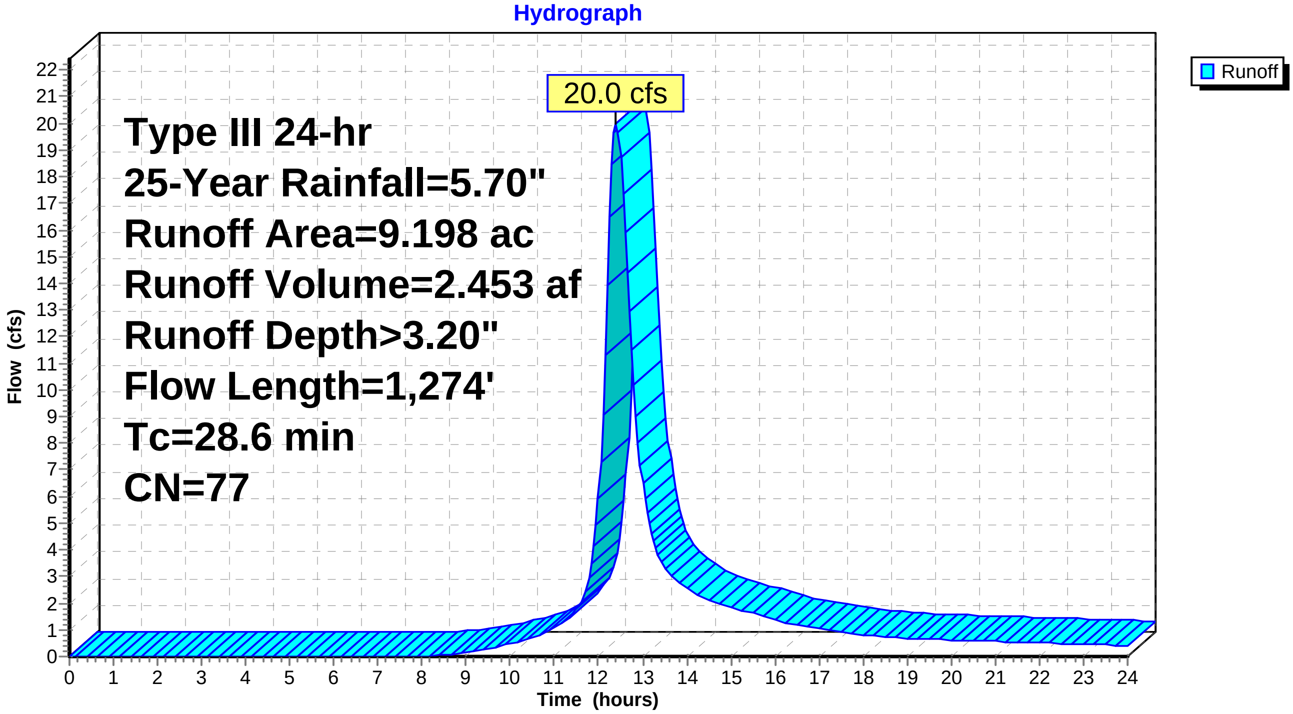
Runoff = 20.0 cfs @ 12.40 hrs, Volume= 2.453 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (ac)	CN	Description
0.402	98	Unconnected roofs, HSG C
3.610	77	Small grain, C&T + CR, Good, HSG C
2.233	70	Woods, Good, HSG C
0.206	77	Woods, Poor, HSG C
0.989	82	Farmsteads, HSG C
1.099	74	>75% Grass cover, Good, HSG C
0.659	87	Dirt roads, HSG C
9.198	77	Weighted Average
8.796		95.63% Pervious Area
0.402		4.37% Impervious Area
0.402		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
3.8	367	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.9	106	0.0472	1.96		**Shallow Concentrated Flow, Fields** Cultivated Straight Rows Kv= 9.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
0.4	47	0.1277	1.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
28.6	1,274	Total			

Subcatchment 3S: DA-2



Summary for Subcatchment 6S: DA-3

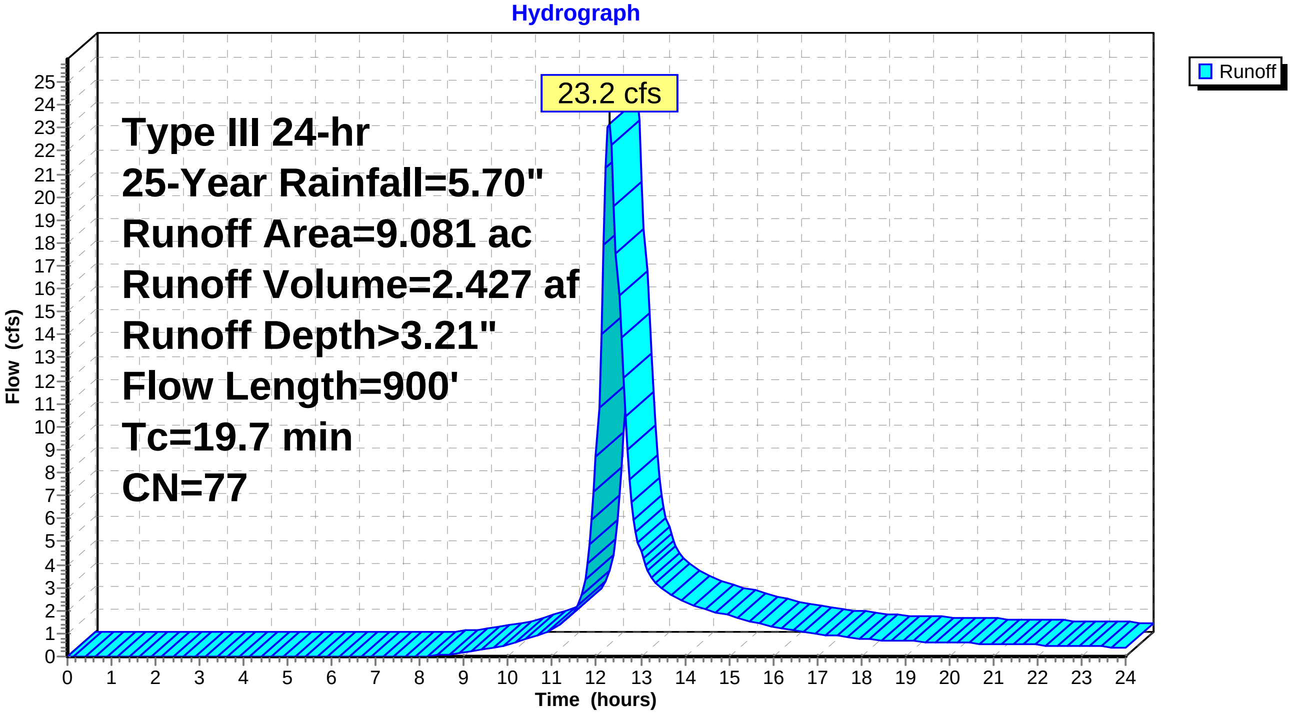
Runoff = 23.2 cfs @ 12.27 hrs, Volume= 2.427 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (ac)	CN	Description
0.059	98	Unconnected roofs, HSG C
0.826	70	Woods, Good, HSG C
0.079	77	Woods, Poor, HSG C
1.439	74	>75% Grass cover, Good, HSG C
0.070	86	<50% Grass cover, Poor, HSG C
0.563	82	Farmsteads, HSG C
0.370	87	Dirt roads, HSG C
5.675	77	Small grain, C&T + CR, Good, HSG C
9.081	77	Weighted Average
9.022		99.35% Pervious Area
0.059		0.65% Impervious Area
0.059		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
8.4	800	0.0312	1.59		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
19.7	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 7S: DA-1A

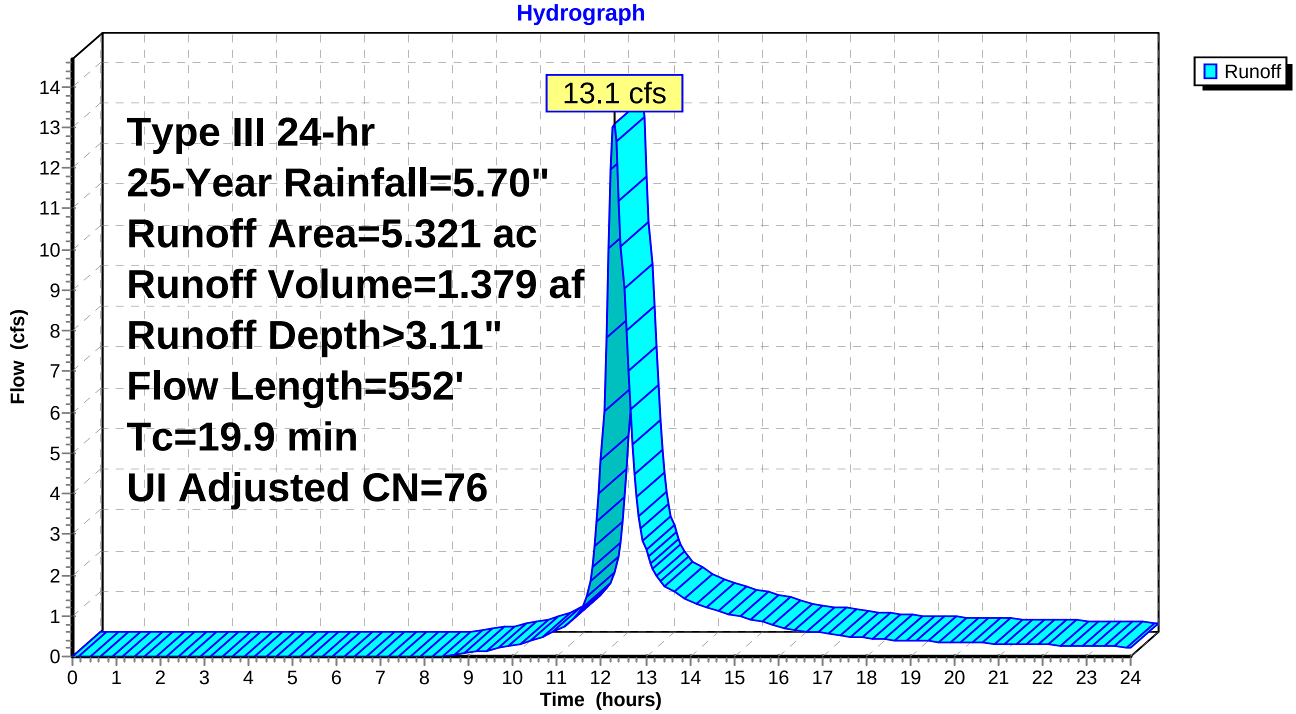
Runoff = 13.1 cfs @ 12.28 hrs, Volume= 1.379 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (ac)	CN	Adj	Description
0.512	98		Unconnected roofs, HSG C
1.340	74		>75% Grass cover, Good, HSG C
2.019	74		Pasture/grassland/range, Good, HSG C
0.870	87		Dirt roads, HSG C
0.580	65		Brush, Good, HSG C
5.321	77	76	Weighted Average, UI Adjusted
4.809			90.38% Pervious Area
0.512			9.62% Impervious Area
0.512			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
19.9	552	Total			

Subcatchment 7S: DA-1A

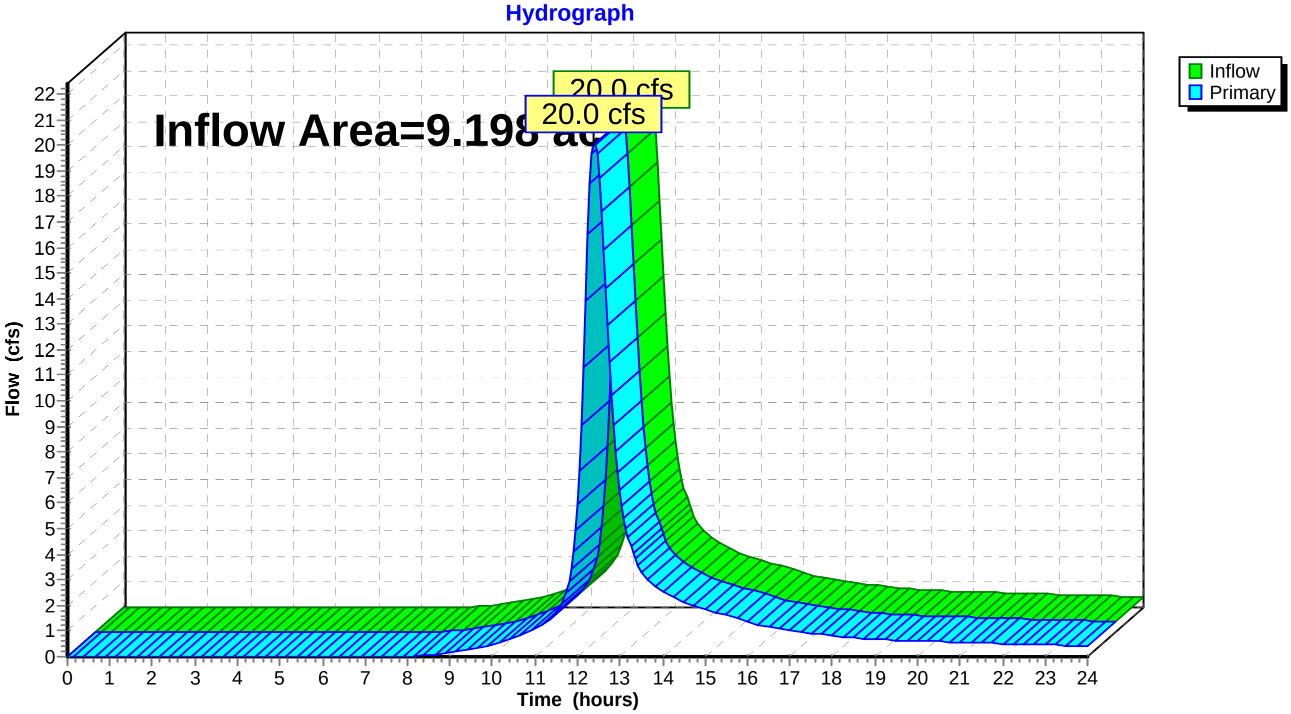


Summary for Link 2L: Sheet flow to South West

Inflow Area =	9.198 ac,	4.37% Impervious, Inflow Depth > 3.20"	for 25-Year event	
Inflow =	20.0 cfs @	12.40 hrs, Volume=	2.453 af	
Primary =	20.0 cfs @	12.40 hrs, Volume=	2.453 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

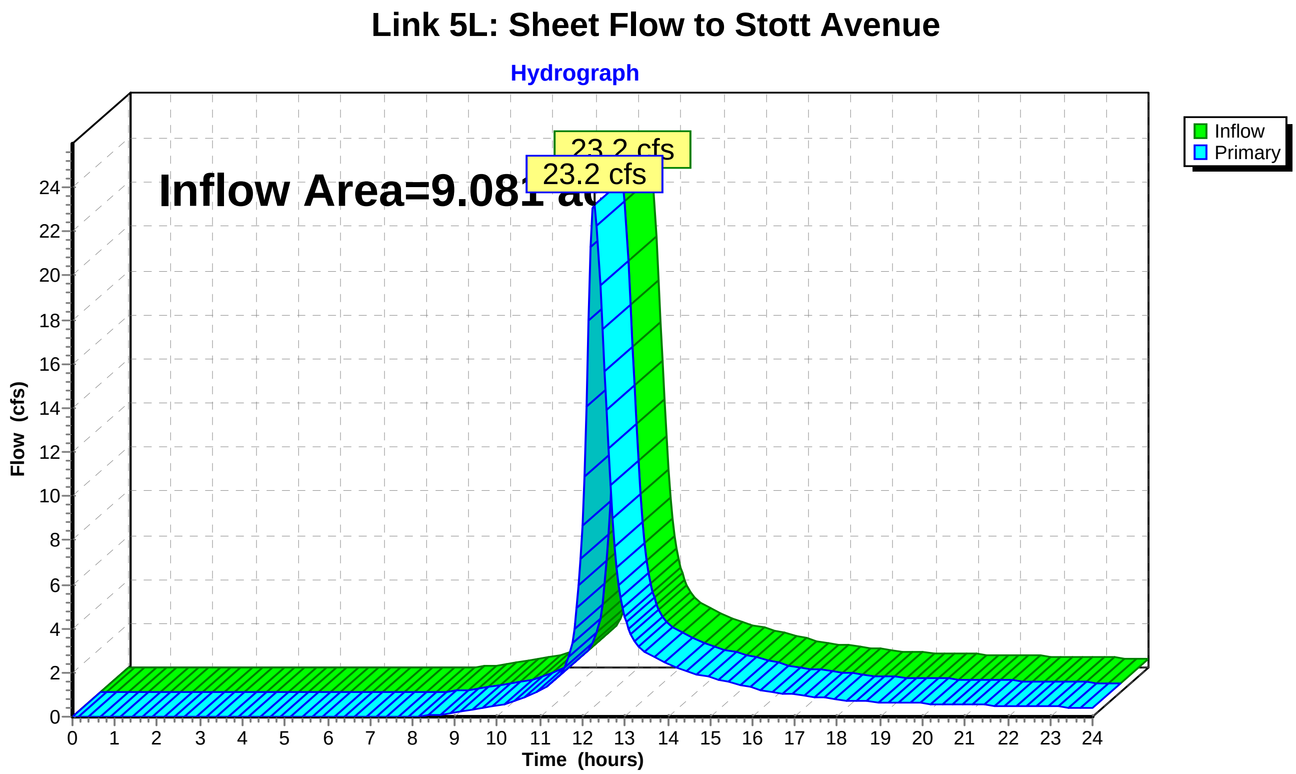
Link 2L: Sheet flow to South West



Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	0.65% Impervious,	Inflow Depth > 3.21"	for 25-Year event	
Inflow =	23.2 cfs @	12.27 hrs,	Volume=	2.427 af	
Primary =	23.2 cfs @	12.27 hrs,	Volume=	2.427 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

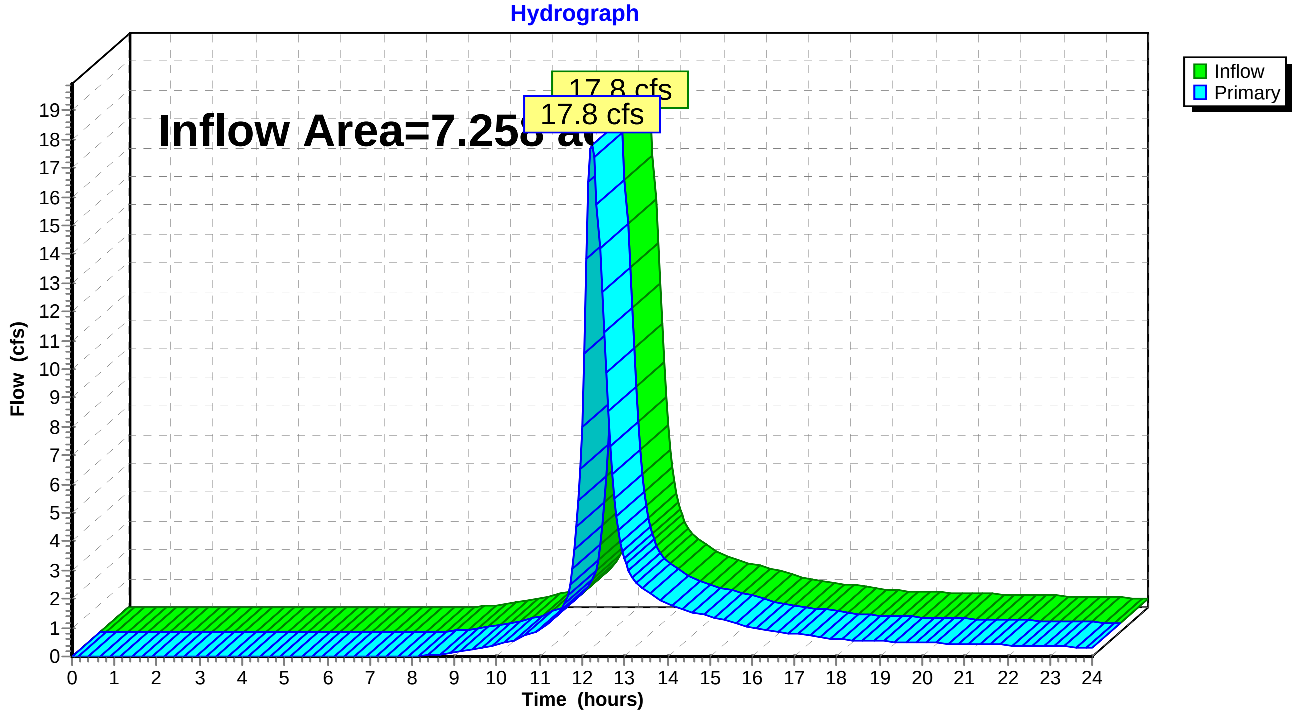


Summary for Link 6L: Sheet flow to North West

Inflow Area = 7.258 ac, 7.05% Impervious, Inflow Depth > 3.16" for 25-Year event
Inflow = 17.8 cfs @ 12.23 hrs, Volume= 1.914 af
Primary = 17.8 cfs @ 12.23 hrs, Volume= 1.914 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.050 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>3.84"
Flow Length=712' Tc=10.0 min CN=78 Runoff=7.5 cfs 0.620 af

Subcatchment 3S: DA-2 Runoff Area=9.198 ac 4.37% Impervious Runoff Depth>3.72"
Flow Length=1,274' Tc=28.6 min CN=77 Runoff=23.3 cfs 2.853 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 0.65% Impervious Runoff Depth>3.73"
Flow Length=900' Tc=19.7 min CN=77 Runoff=27.0 cfs 2.822 af

Subcatchment 7S: DA-1A Runoff Area=5.321 ac 9.62% Impervious Runoff Depth>3.63"
Flow Length=552' Tc=19.9 min UI Adjusted CN=76 Runoff=15.3 cfs 1.608 af

Link 2L: Sheet flow to South West Inflow=23.3 cfs 2.853 af
Primary=23.3 cfs 2.853 af

Link 5L: Sheet Flow to Stott Avenue Inflow=27.0 cfs 2.822 af
Primary=27.0 cfs 2.822 af

Link 6L: Sheet flow to North West Inflow=20.8 cfs 2.228 af
Primary=20.8 cfs 2.228 af

Total Runoff Area = 25.537 ac Runoff Volume = 7.903 af Average Runoff Depth = 3.71"
96.19% Pervious = 24.564 ac 3.81% Impervious = 0.973 ac

Summary for Subcatchment 2S: DA-1B

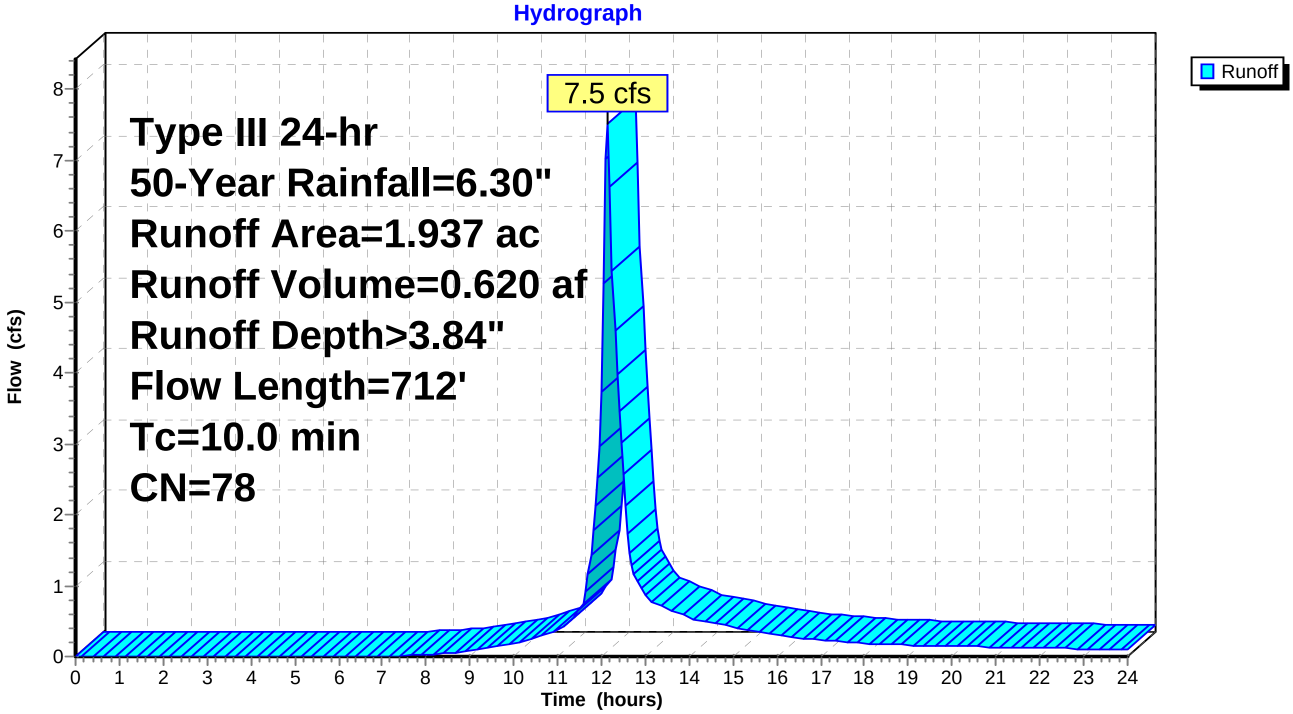
Runoff = 7.5 cfs @ 12.14 hrs, Volume= 0.620 af, Depth> 3.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (ac)	CN	Description
0.928	77	Small grain, C&T + CR, Good, HSG C
0.601	82	Farmsteads, HSG C
0.107	87	Dirt roads, HSG C
0.200	70	Woods, Good, HSG C
0.101	77	Woods, Poor, HSG C
1.937	78	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2

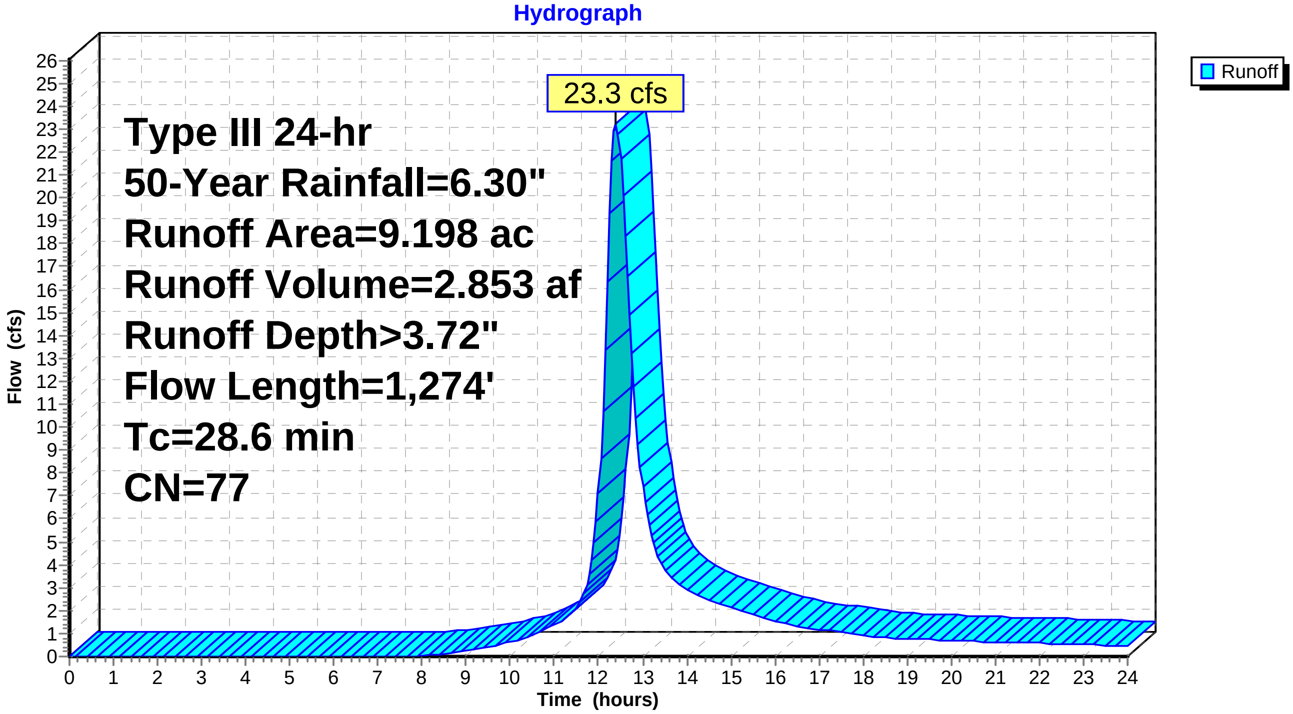
Runoff = 23.3 cfs @ 12.40 hrs, Volume= 2.853 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (ac)	CN	Description
0.402	98	Unconnected roofs, HSG C
3.610	77	Small grain, C&T + CR, Good, HSG C
2.233	70	Woods, Good, HSG C
0.206	77	Woods, Poor, HSG C
0.989	82	Farmsteads, HSG C
1.099	74	>75% Grass cover, Good, HSG C
0.659	87	Dirt roads, HSG C
9.198	77	Weighted Average
8.796		95.63% Pervious Area
0.402		4.37% Impervious Area
0.402		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
3.8	367	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.9	106	0.0472	1.96		**Shallow Concentrated Flow, Fields** Cultivated Straight Rows Kv= 9.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
0.4	47	0.1277	1.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
28.6	1,274	Total			

Subcatchment 3S: DA-2



Summary for Subcatchment 6S: DA-3

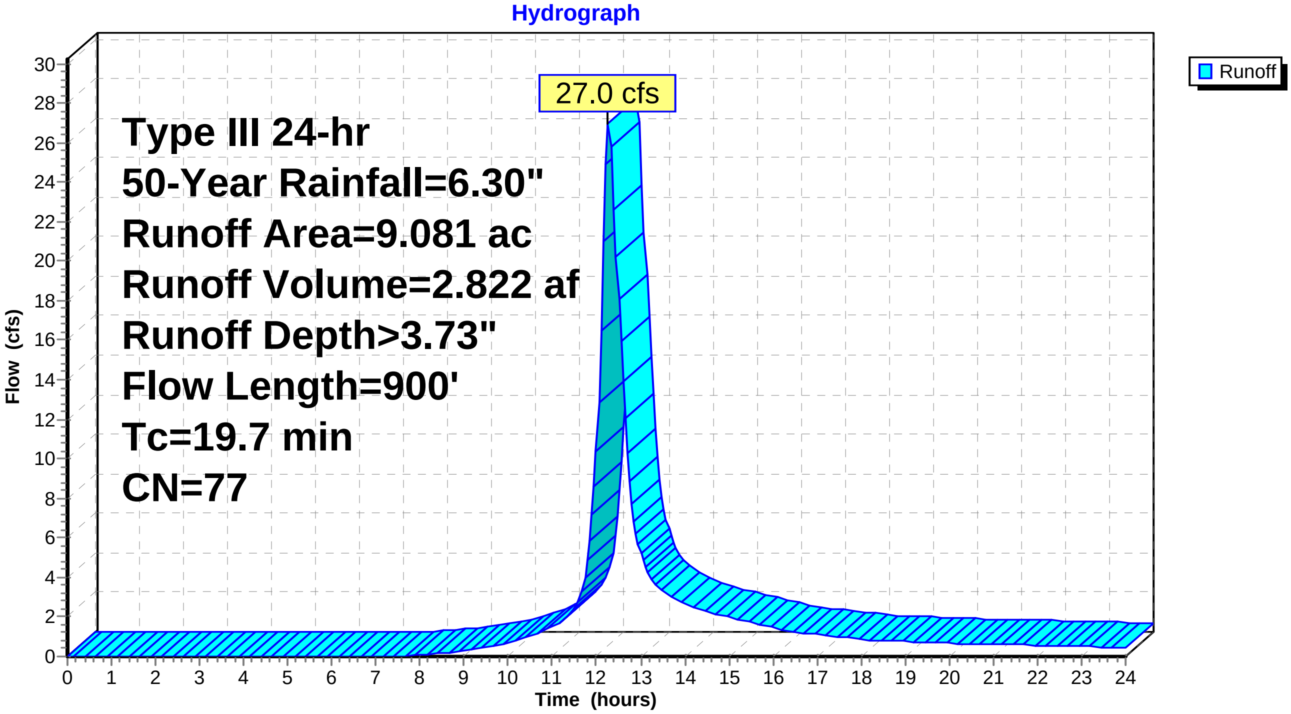
Runoff = 27.0 cfs @ 12.27 hrs, Volume= 2.822 af, Depth> 3.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (ac)	CN	Description
0.059	98	Unconnected roofs, HSG C
0.826	70	Woods, Good, HSG C
0.079	77	Woods, Poor, HSG C
1.439	74	>75% Grass cover, Good, HSG C
0.070	86	<50% Grass cover, Poor, HSG C
0.563	82	Farmsteads, HSG C
0.370	87	Dirt roads, HSG C
5.675	77	Small grain, C&T + CR, Good, HSG C
9.081	77	Weighted Average
9.022		99.35% Pervious Area
0.059		0.65% Impervious Area
0.059		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
8.4	800	0.0312	1.59		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
19.7	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 7S: DA-1A

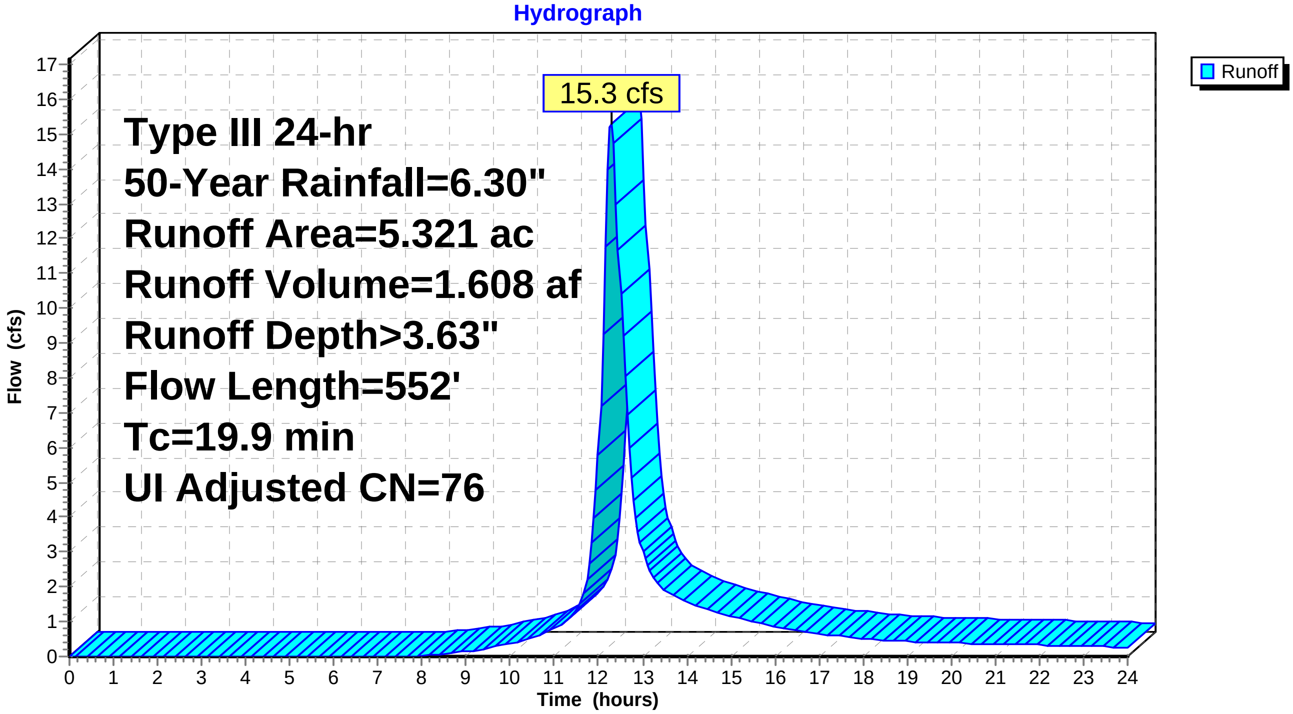
Runoff = 15.3 cfs @ 12.27 hrs, Volume= 1.608 af, Depth> 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (ac)	CN	Adj	Description
0.512	98		Unconnected roofs, HSG C
1.340	74		>75% Grass cover, Good, HSG C
2.019	74		Pasture/grassland/range, Good, HSG C
0.870	87		Dirt roads, HSG C
0.580	65		Brush, Good, HSG C
5.321	77	76	Weighted Average, UI Adjusted
4.809			90.38% Pervious Area
0.512			9.62% Impervious Area
0.512			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
19.9	552	Total			

Subcatchment 7S: DA-1A

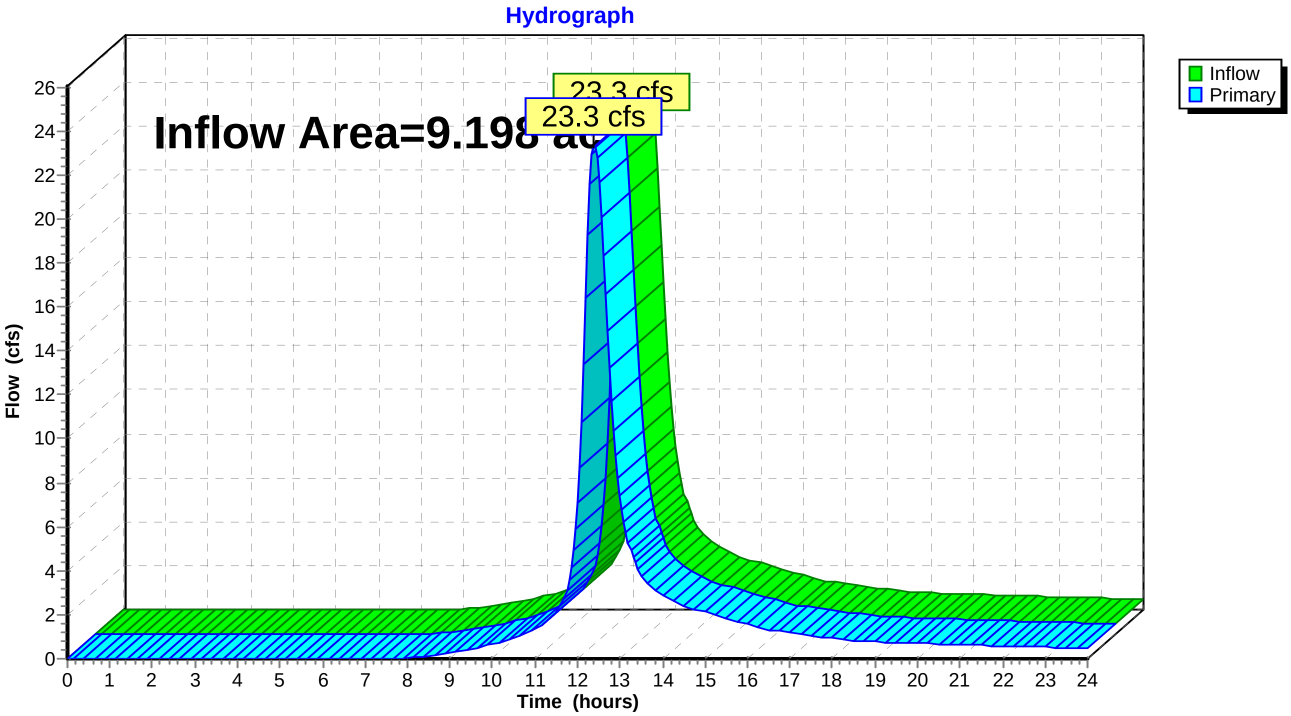


Summary for Link 2L: Sheet flow to South West

Inflow Area =	9.198 ac,	4.37% Impervious, Inflow Depth > 3.72"	for 50-Year event	
Inflow =	23.3 cfs @	12.40 hrs, Volume=	2.853 af	
Primary =	23.3 cfs @	12.40 hrs, Volume=	2.853 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 2L: Sheet flow to South West

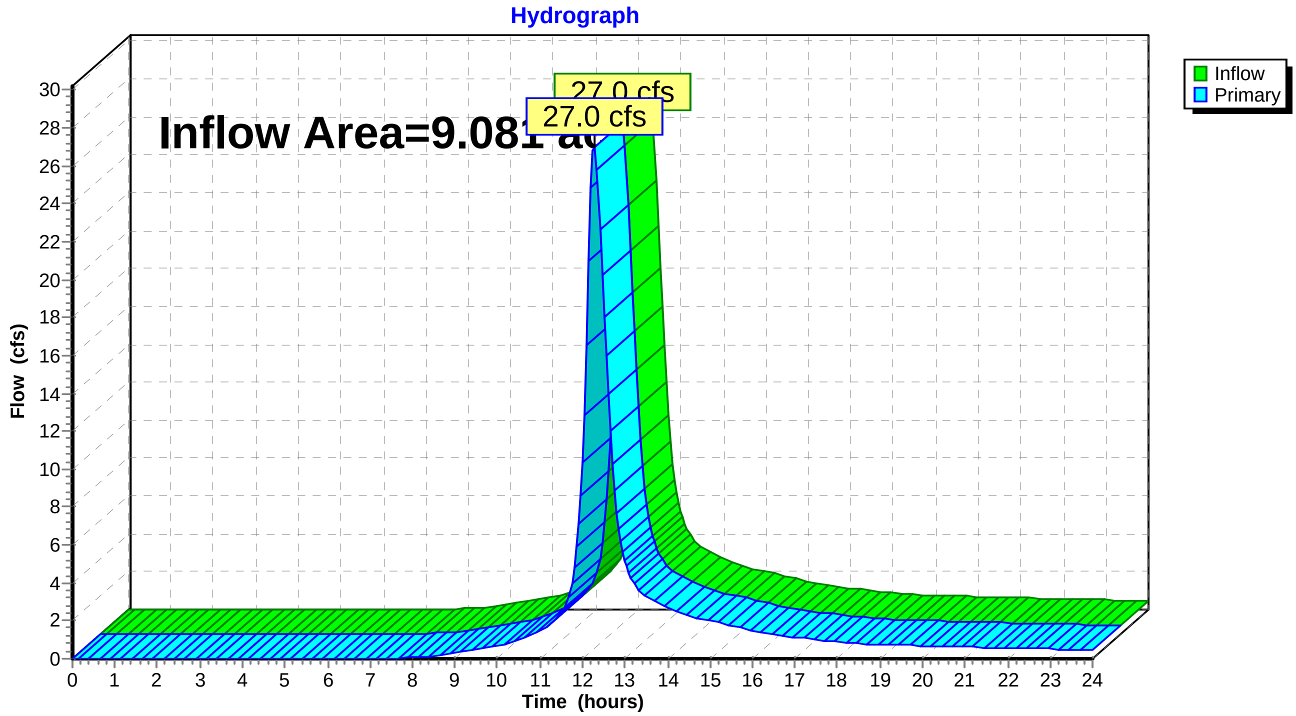


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	0.65% Impervious, Inflow Depth > 3.73"	for 50-Year event	
Inflow =	27.0 cfs @	12.27 hrs, Volume=	2.822 af	
Primary =	27.0 cfs @	12.27 hrs, Volume=	2.822 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 5L: Sheet Flow to Stott Avenue

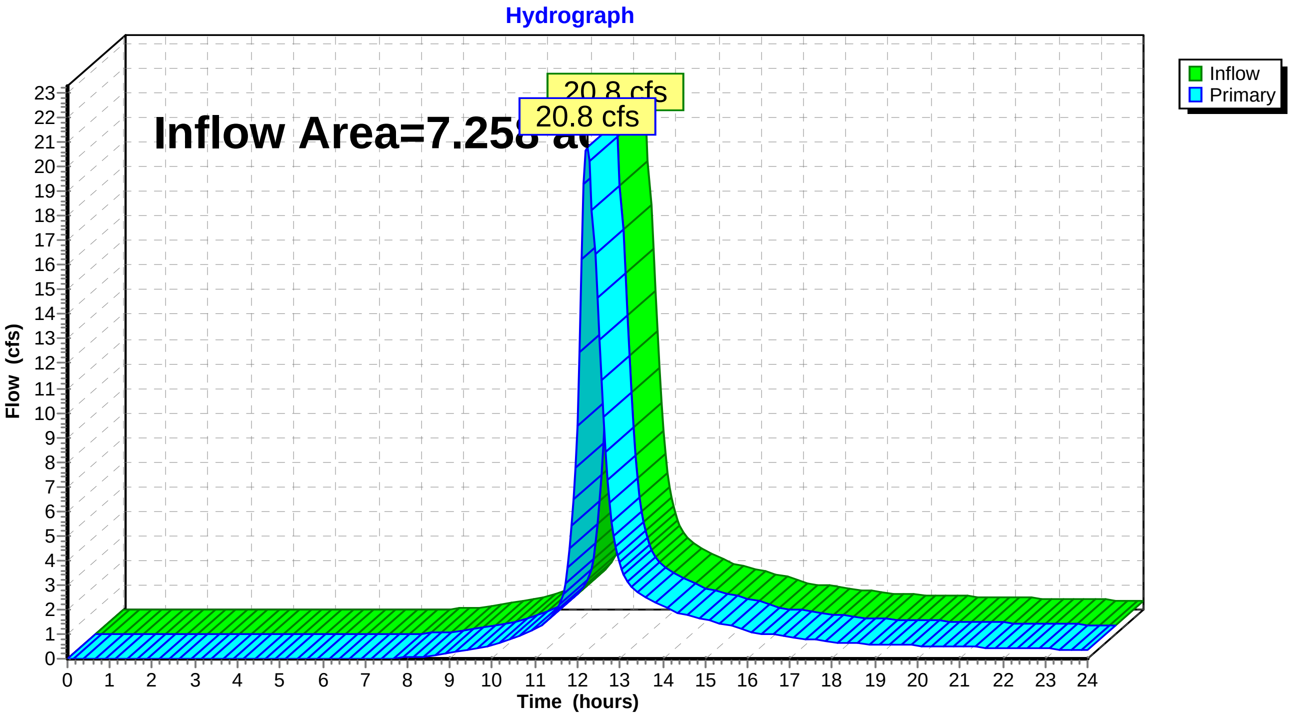


Summary for Link 6L: Sheet flow to North West

Inflow Area =	7.258 ac,	7.05% Impervious, Inflow Depth > 3.68"	for 50-Year event	
Inflow =	20.8 cfs @	12.22 hrs, Volume=	2.228 af	
Primary =	20.8 cfs @	12.22 hrs, Volume=	2.228 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.050 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>4.56"
Flow Length=712' Tc=10.0 min CN=78 Runoff=8.9 cfs 0.736 af

Subcatchment 3S: DA-2 Runoff Area=9.198 ac 4.37% Impervious Runoff Depth>4.43"
Flow Length=1,274' Tc=28.6 min CN=77 Runoff=27.6 cfs 3.397 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 0.65% Impervious Runoff Depth>4.44"
Flow Length=900' Tc=19.7 min CN=77 Runoff=32.1 cfs 3.360 af

Subcatchment 7S: DA-1A Runoff Area=5.321 ac 9.62% Impervious Runoff Depth>4.33"
Flow Length=552' Tc=19.9 min UI Adjusted CN=76 Runoff=18.3 cfs 1.920 af

Link 2L: Sheet flow to South West Inflow=27.6 cfs 3.397 af
Primary=27.6 cfs 3.397 af

Link 5L: Sheet Flow to Stott Avenue Inflow=32.1 cfs 3.360 af
Primary=32.1 cfs 3.360 af

Link 6L: Sheet flow to North West Inflow=24.8 cfs 2.656 af
Primary=24.8 cfs 2.656 af

Total Runoff Area = 25.537 ac Runoff Volume = 9.414 af Average Runoff Depth = 4.42"
96.19% Pervious = 24.564 ac 3.81% Impervious = 0.973 ac

Summary for Subcatchment 2S: DA-1B

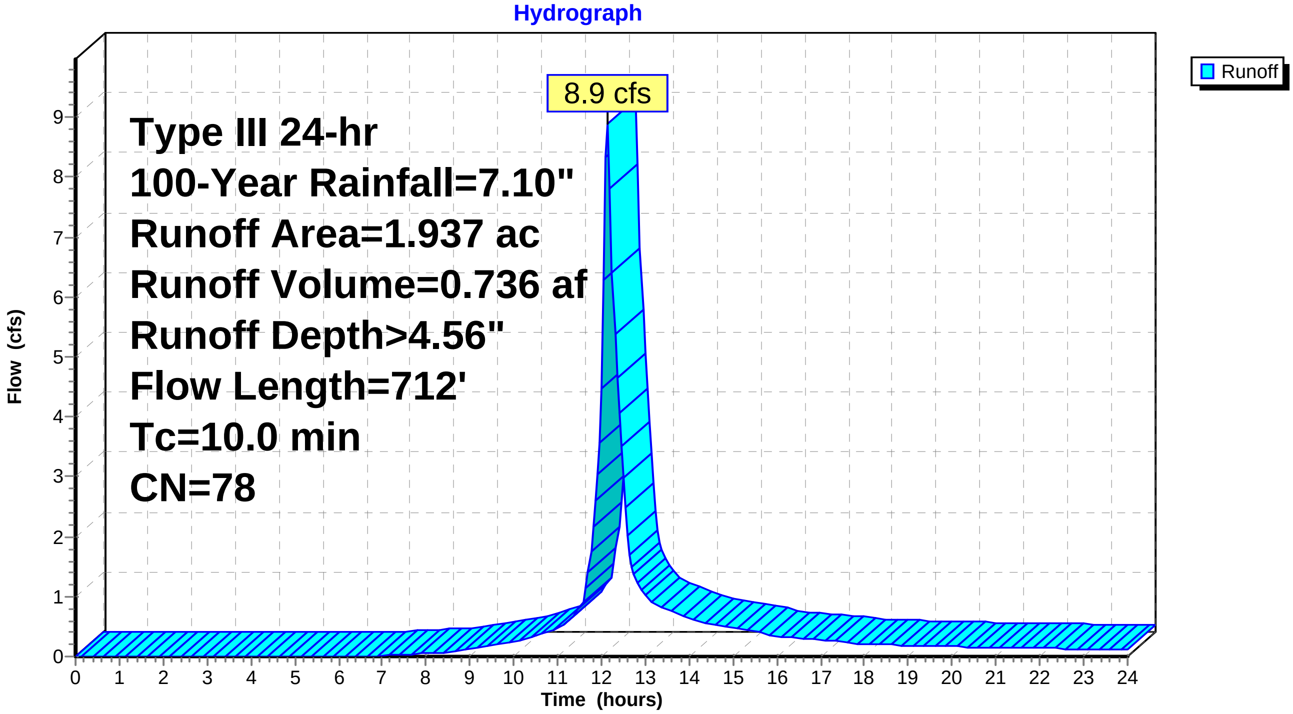
Runoff = 8.9 cfs @ 12.14 hrs, Volume= 0.736 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (ac)	CN	Description
0.928	77	Small grain, C&T + CR, Good, HSG C
0.601	82	Farmsteads, HSG C
0.107	87	Dirt roads, HSG C
0.200	70	Woods, Good, HSG C
0.101	77	Woods, Poor, HSG C
1.937	78	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2

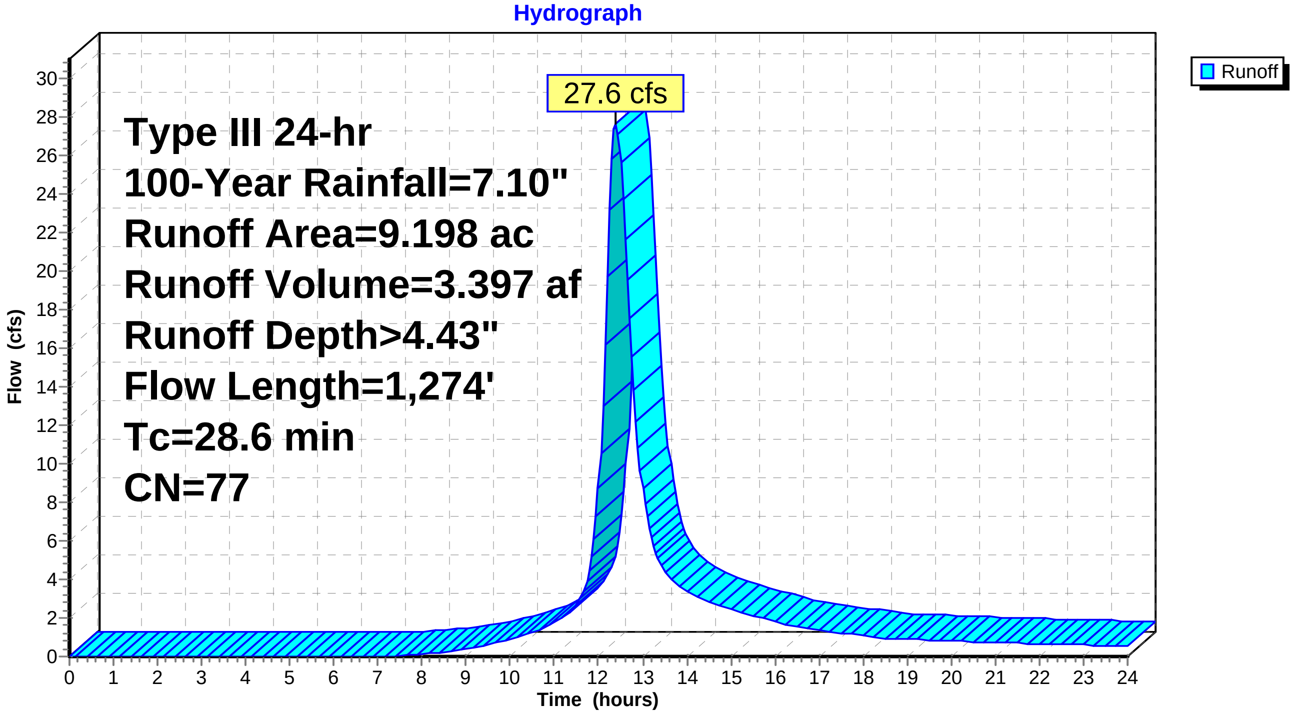
Runoff = 27.6 cfs @ 12.39 hrs, Volume= 3.397 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (ac)	CN	Description
0.402	98	Unconnected roofs, HSG C
3.610	77	Small grain, C&T + CR, Good, HSG C
2.233	70	Woods, Good, HSG C
0.206	77	Woods, Poor, HSG C
0.989	82	Farmsteads, HSG C
1.099	74	>75% Grass cover, Good, HSG C
0.659	87	Dirt roads, HSG C
9.198	77	Weighted Average
8.796		95.63% Pervious Area
0.402		4.37% Impervious Area
0.402		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
3.8	367	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.9	106	0.0472	1.96		**Shallow Concentrated Flow, Fields** Cultivated Straight Rows Kv= 9.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
0.4	47	0.1277	1.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
28.6	1,274	Total			

Subcatchment 3S: DA-2



Summary for Subcatchment 6S: DA-3

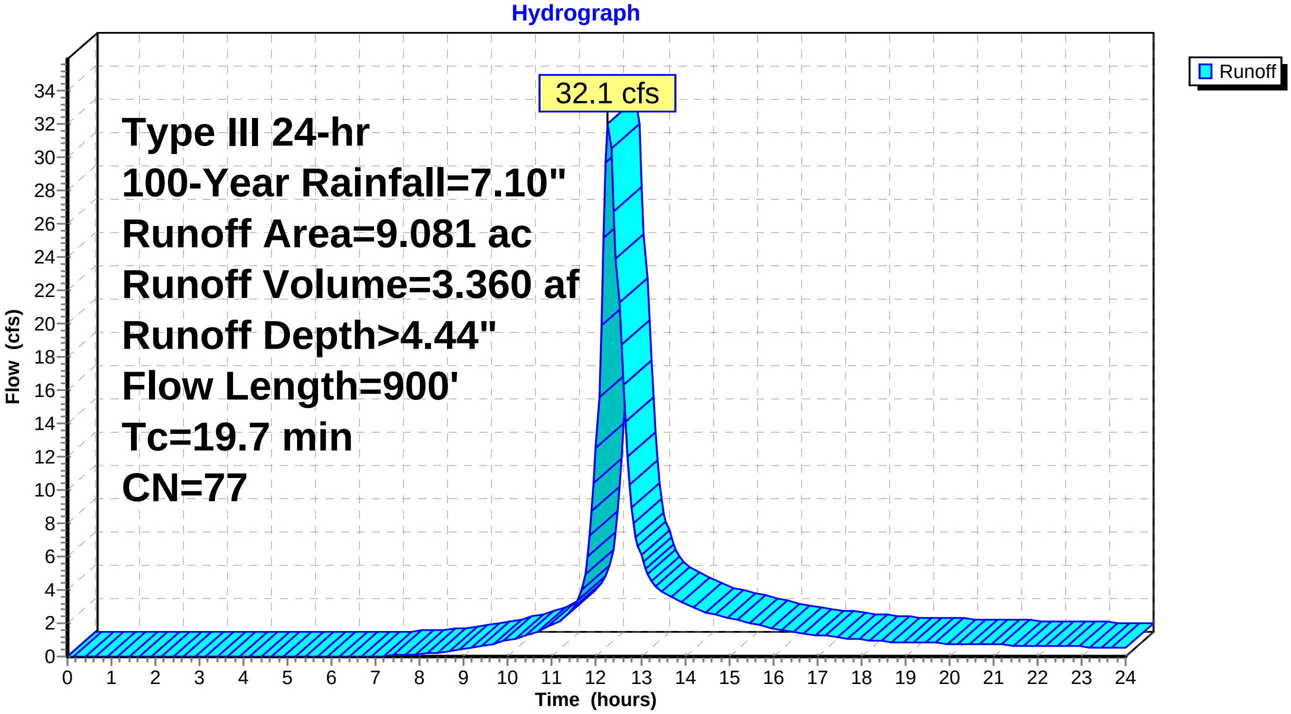
Runoff = 32.1 cfs @ 12.27 hrs, Volume= 3.360 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (ac)	CN	Description
0.059	98	Unconnected roofs, HSG C
0.826	70	Woods, Good, HSG C
0.079	77	Woods, Poor, HSG C
1.439	74	>75% Grass cover, Good, HSG C
0.070	86	<50% Grass cover, Poor, HSG C
0.563	82	Farmsteads, HSG C
0.370	87	Dirt roads, HSG C
5.675	77	Small grain, C&T + CR, Good, HSG C
9.081	77	Weighted Average
9.022		99.35% Pervious Area
0.059		0.65% Impervious Area
0.059		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
8.4	800	0.0312	1.59		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
19.7	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 7S: DA-1A

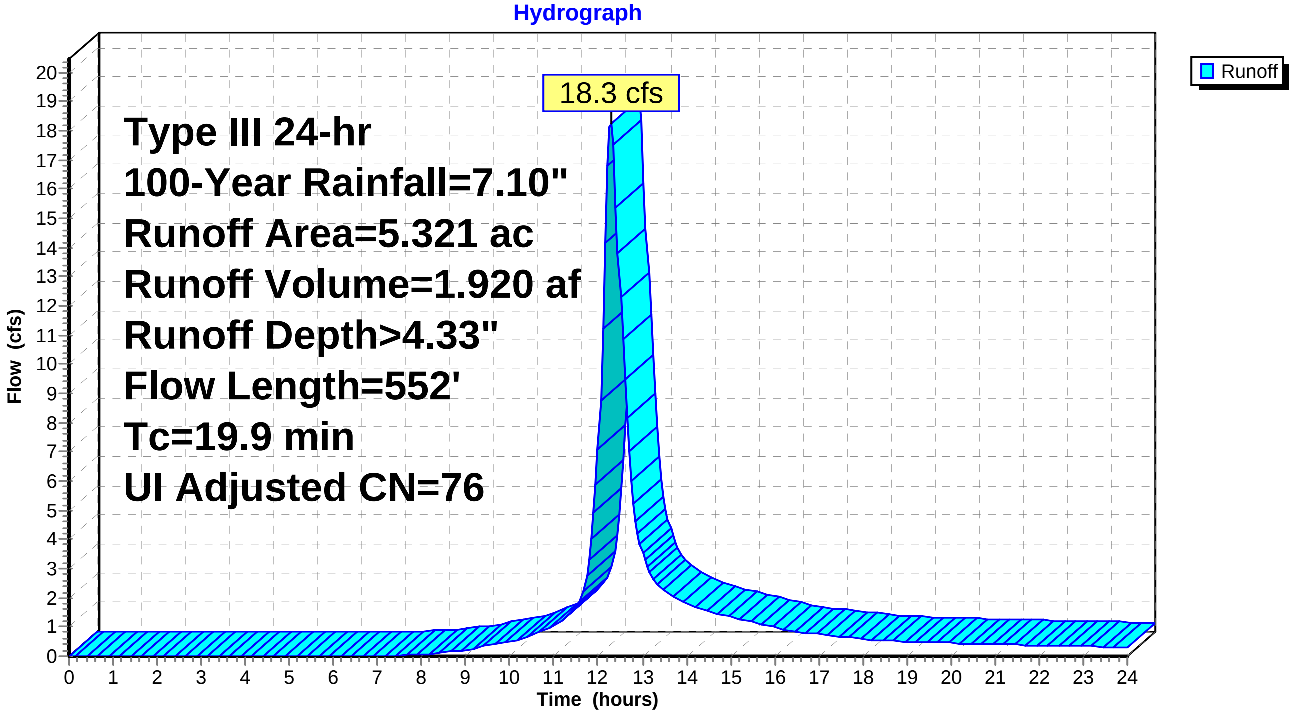
Runoff = 18.3 cfs @ 12.27 hrs, Volume= 1.920 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (ac)	CN	Adj	Description
0.512	98		Unconnected roofs, HSG C
1.340	74		>75% Grass cover, Good, HSG C
2.019	74		Pasture/grassland/range, Good, HSG C
0.870	87		Dirt roads, HSG C
0.580	65		Brush, Good, HSG C
5.321	77	76	Weighted Average, UI Adjusted
4.809			90.38% Pervious Area
0.512			9.62% Impervious Area
0.512			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
19.9	552	Total			

Subcatchment 7S: DA-1A

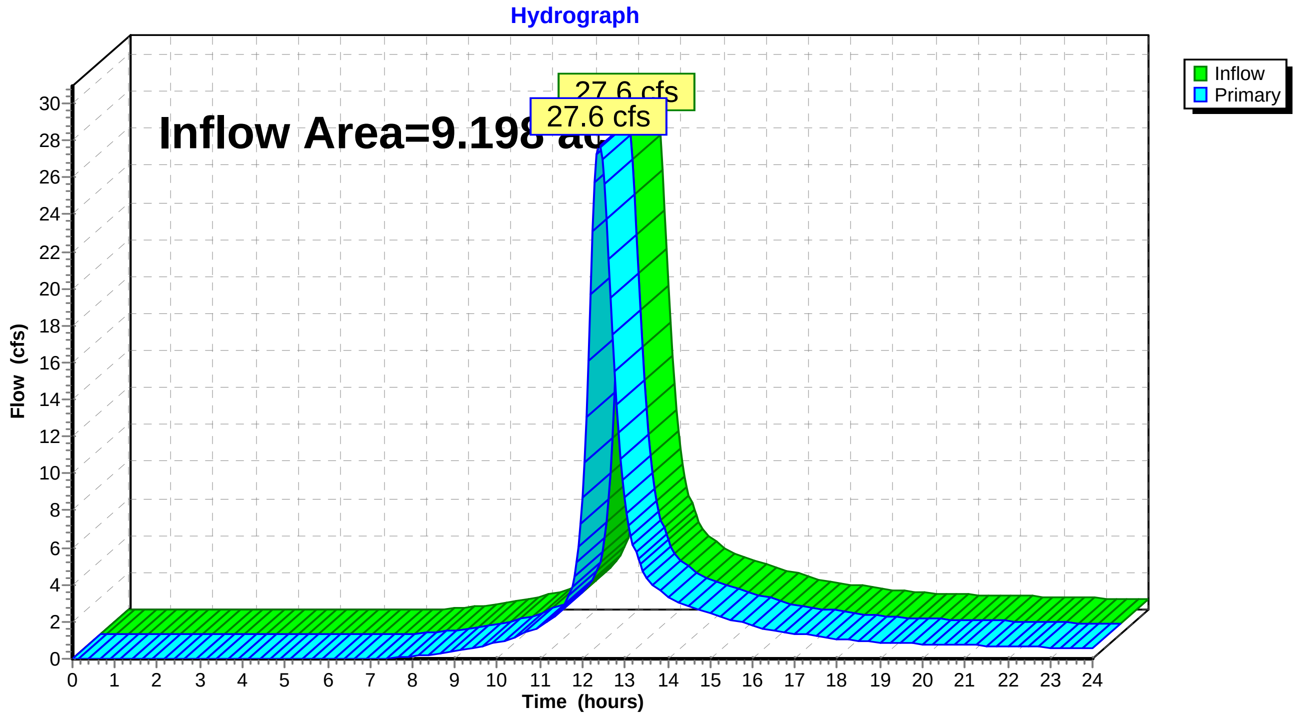


Summary for Link 2L: Sheet flow to South West

Inflow Area =	9.198 ac,	4.37% Impervious, Inflow Depth > 4.43"	for 100-Year event	
Inflow =	27.6 cfs @	12.39 hrs, Volume=	3.397 af	
Primary =	27.6 cfs @	12.39 hrs, Volume=	3.397 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 2L: Sheet flow to South West

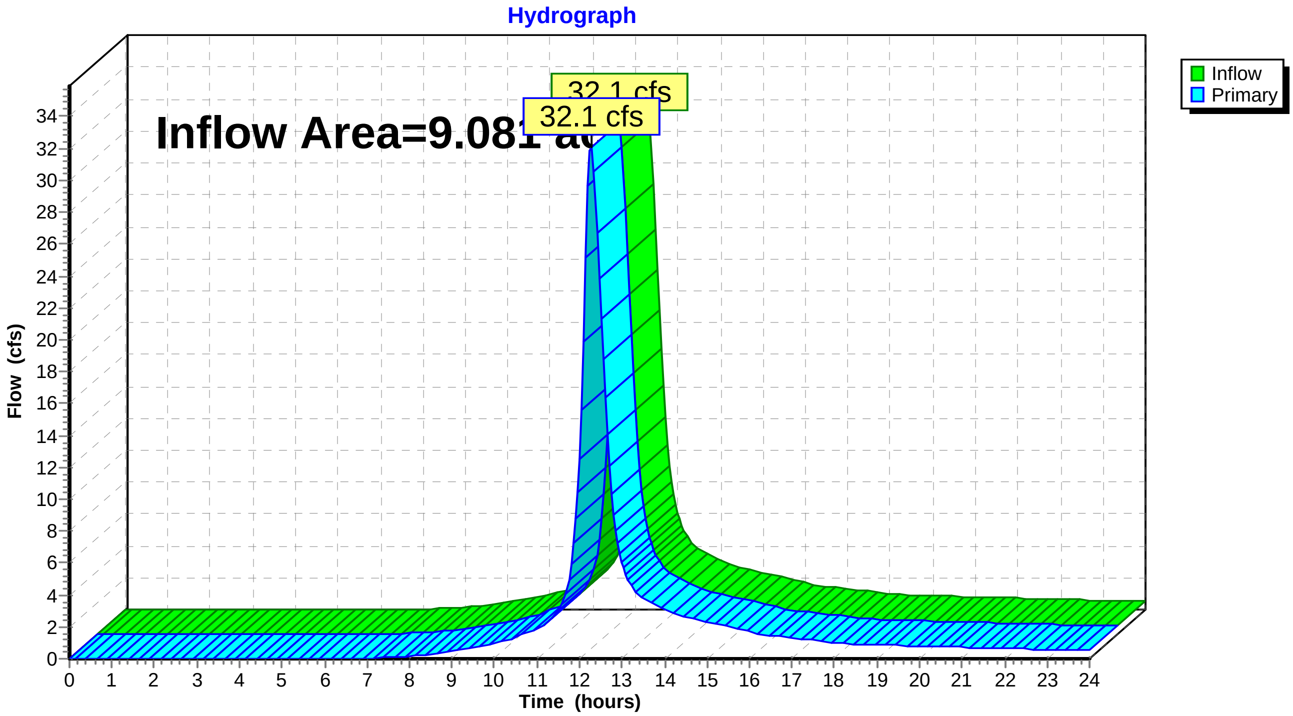


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	0.65% Impervious,	Inflow Depth > 4.44"	for 100-Year event	
Inflow =	32.1 cfs @	12.27 hrs,	Volume=	3.360 af	
Primary =	32.1 cfs @	12.27 hrs,	Volume=	3.360 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 5L: Sheet Flow to Stott Avenue

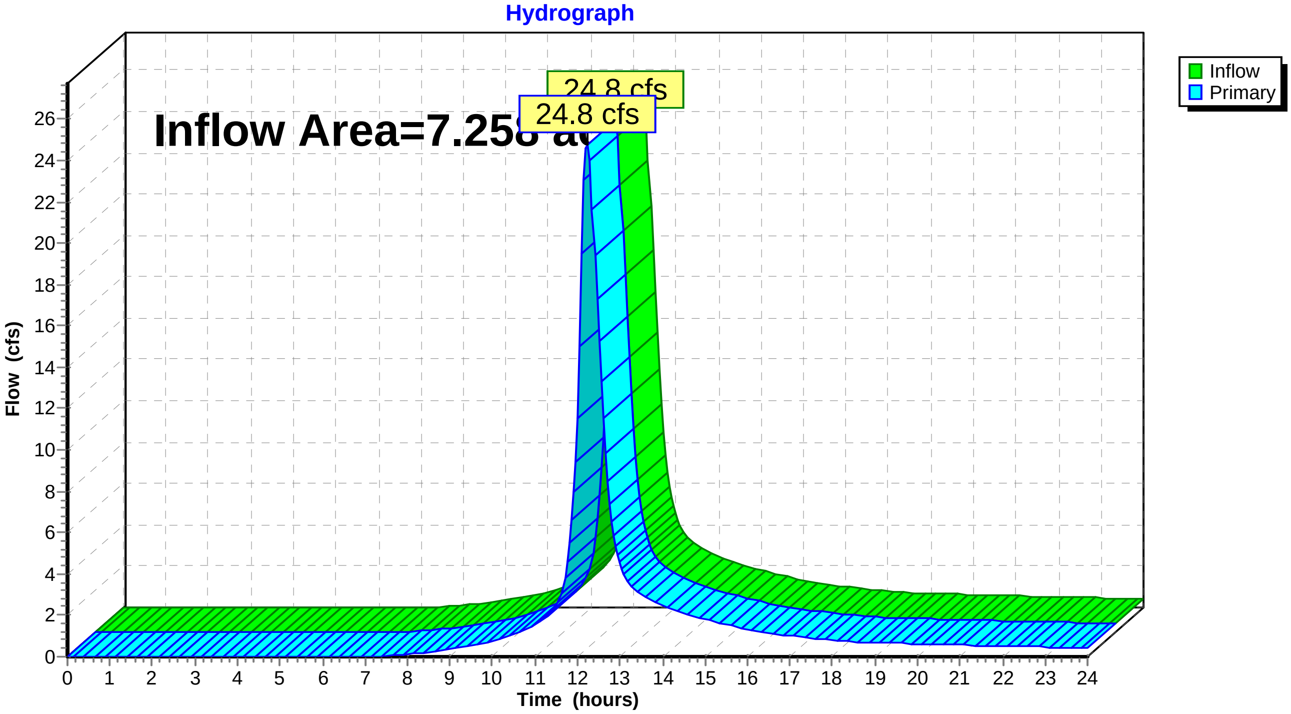


Summary for Link 6L: Sheet flow to North West

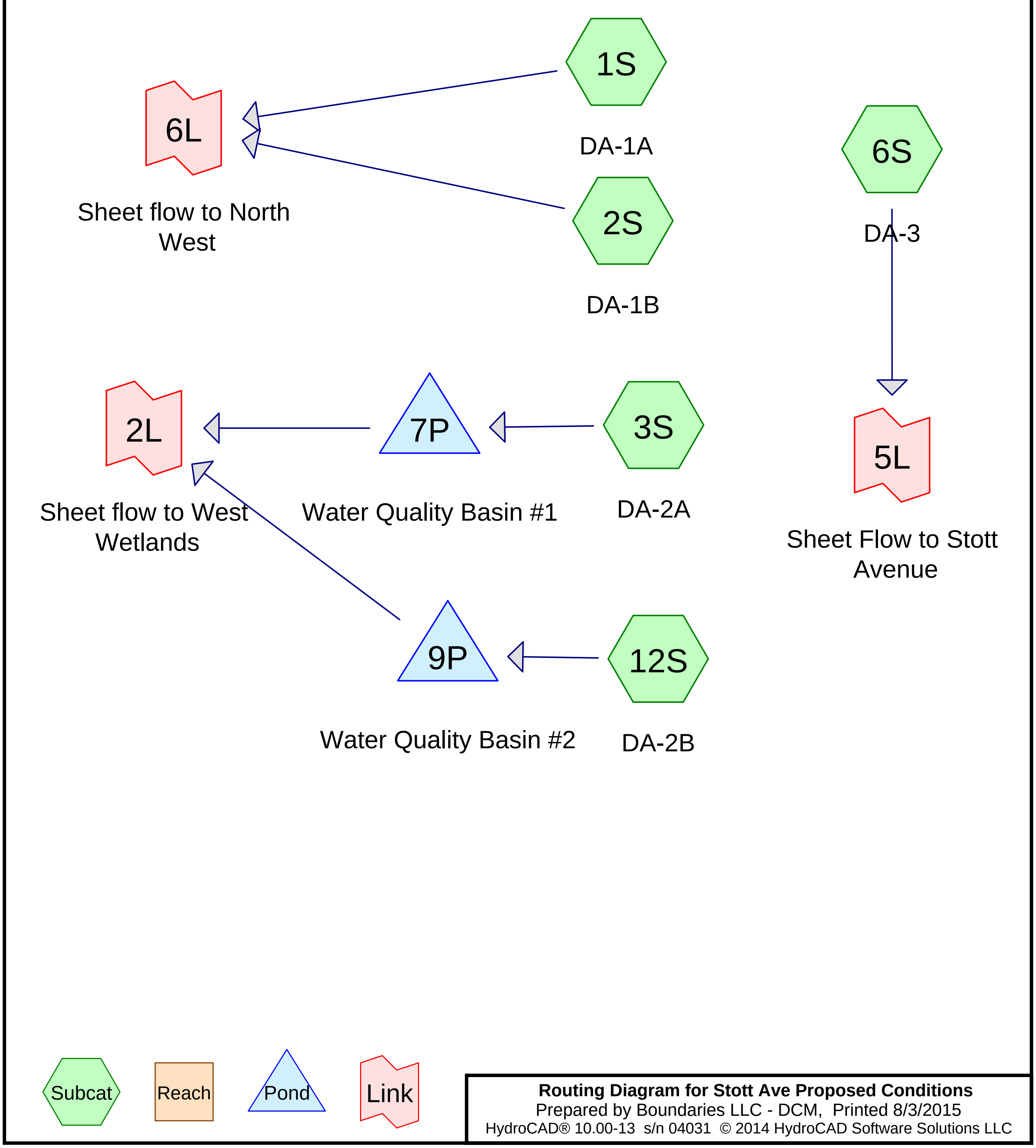
Inflow Area =	7.258 ac,	7.05% Impervious, Inflow Depth > 4.39"	for 100-Year event
Inflow =	24.8 cfs @	12.22 hrs, Volume=	2.656 af
Primary =	24.8 cfs @	12.22 hrs, Volume=	2.656 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs

Link 6L: Sheet flow to North West



Proposed Conditions Results



Routing Diagram for Stott Ave Proposed Conditions
Prepared by Boundaries LLC - DCM, Printed 8/3/2015
HydroCAD® 10.00-13 s/n 04031 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.700	74	>75% Grass cover, Good, HSG C (1S, 2S, 6S, 12S)
1.969	87	Dirt roads, HSG C (1S, 2S, 3S, 6S, 12S)
1.520	82	Farmsteads, HSG C (2S, 3S, 12S)
0.331	74	Pasture/grassland/range, Good, HSG C (1S)
1.131	81	Row crops, C + CR, Good, HSG C (12S)
14.366	74	Solar Arrays, >75% Grass cover, Good, HSG C (1S, 3S, 6S, 12S)
0.784	98	Unconnected roofs, HSG C (1S, 3S, 6S, 12S)
1.736	70	Woods, Good, HSG C (3S, 6S, 12S)
25.537	**76**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
25.537	HSG C	1S, 2S, 3S, 6S, 12S
0.000	HSG D	
0.000	Other	
25.537		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatch Numbers
0.000	0.000	3.700	0.000	0.000	3.700	>75% Grass cover, Good	
0.000	0.000	1.969	0.000	0.000	1.969	Dirt roads	
0.000	0.000	1.520	0.000	0.000	1.520	Farmsteads	
0.000	0.000	0.331	0.000	0.000	0.331	Pasture/grassland/range, Good	
0.000	0.000	1.131	0.000	0.000	1.131	Row crops, C + CR, Good	
0.000	0.000	14.366	0.000	0.000	14.366	Solar Arrays, >75% Grass cover, Good	
0.000	0.000	0.784	0.000	0.000	0.784	Unconnected roofs	
0.000	0.000	1.736	0.000	0.000	1.736	Woods, Good	
0.000	**0.000**	**25.537**	**0.000**	**0.000**	**25.537**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.010 hrs, 2401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA-1A Runoff Area=5.321 ac 9.74% Impervious Runoff Depth>1.35"
Flow Length=943' Tc=24.8 min UI Adjusted CN=77 Runoff=5.1 cfs 0.598 af

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>1.35"
Flow Length=712' Tc=10.0 min CN=77 Runoff=2.6 cfs 0.218 af

Subcatchment 3S: DA-2A Runoff Area=3.321 ac 4.03% Impervious Runoff Depth>1.35"
Flow Length=993' Tc=21.0 min UI Adjusted CN=77 Runoff=3.4 cfs 0.374 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 1.16% Impervious Runoff Depth>1.16"
Flow Length=900' Tc=22.1 min CN=74 Runoff=7.7 cfs 0.881 af

Subcatchment 12S: DA-2B Runoff Area=5.877 ac 0.46% Impervious Runoff Depth>1.28"
Flow Length=1,409' Tc=31.7 min CN=76 Runoff=4.8 cfs 0.628 af

Pond 7P: Water Quality Basin #1 Peak Elev=393.05' Storage=1,824 cf Inflow=3.4 cfs 0.374 af
Outflow=3.4 cfs 0.334 af

Pond 9P: Water Quality Basin #2 Peak Elev=387.05' Storage=3,306 cf Inflow=4.8 cfs 0.628 af
Outflow=4.8 cfs 0.556 af

Link 2L: Sheet flow to West Wetlands Inflow=7.7 cfs 0.890 af
Primary=7.7 cfs 0.890 af

Link 5L: Sheet Flow to Stott Avenue Inflow=7.7 cfs 0.881 af
Primary=7.7 cfs 0.881 af

Link 6L: Sheet flow to North West Inflow=6.6 cfs 0.816 af
Primary=6.6 cfs 0.816 af

Total Runoff Area = 25.537 ac Runoff Volume = 2.699 af Average Runoff Depth = 1.27"
96.93% Pervious = 24.753 ac 3.07% Impervious = 0.784 ac

Summary for Subcatchment 1S: DA-1A

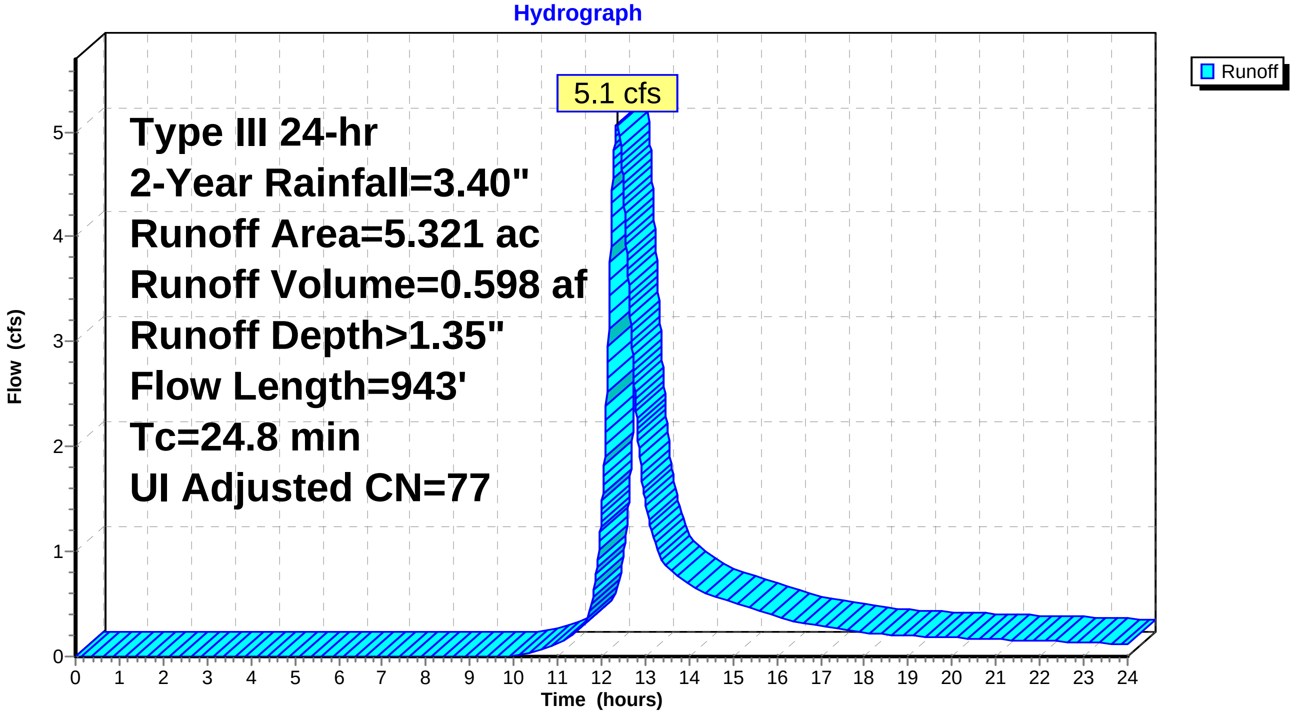
Runoff = 5.1 cfs @ 12.37 hrs, Volume= 0.598 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (ac)	CN	Adj	Description
	0.518	98		Unconnected roofs, HSG C
	1.337	74		>75% Grass cover, Good, HSG C
*	2.240	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.331	74		Pasture/grassland/range, Good, HSG C
	0.895	87		Dirt roads, HSG C
	5.321	79	77	Weighted Average, UI Adjusted
	4.803			90.26% Pervious Area
	0.518			9.74% Impervious Area
	0.518			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
4.0	281	0.0285	1.18		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
0.9	110	0.0909	2.11		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
24.8	943	Total			

Subcatchment 1S: DA-1A



Summary for Subcatchment 2S: DA-1B

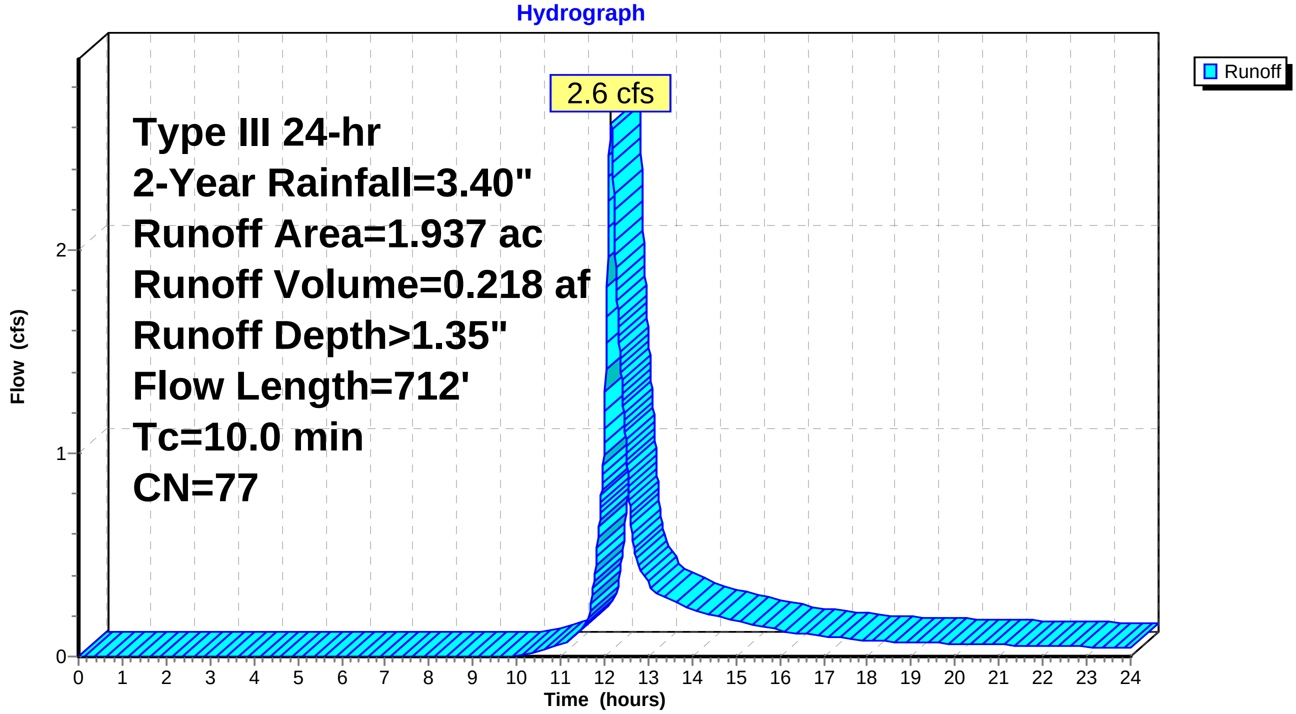
Runoff = 2.6 cfs @ 12.15 hrs, Volume= 0.218 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
1.231	74	>75% Grass cover, Good, HSG C
0.531	82	Farmsteads, HSG C
0.175	87	Dirt roads, HSG C
1.937	77	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2A

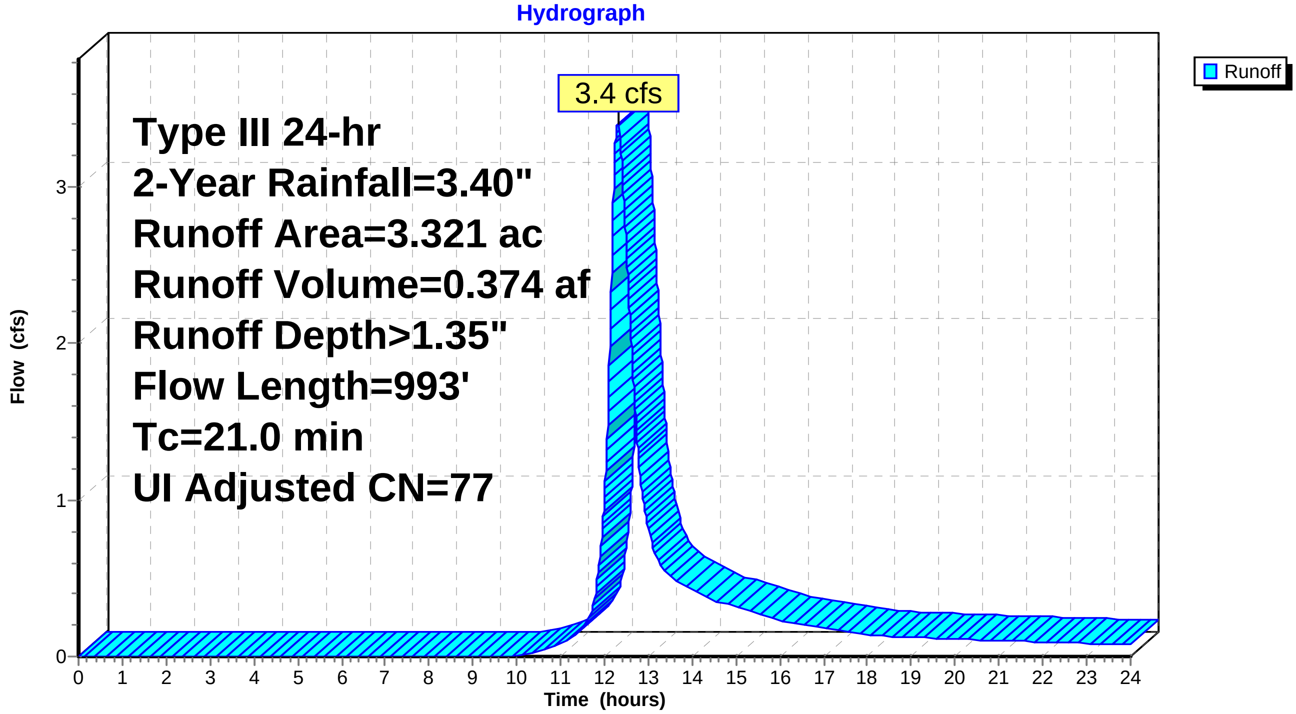
Runoff = 3.4 cfs @ 12.30 hrs, Volume= 0.374 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (ac)	CN	Adj	Description
	0.229	70		Woods, Good, HSG C
	0.134	98		Unconnected roofs, HSG C
	0.720	82		Farmsteads, HSG C
*	1.865	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.373	87		Dirt roads, HSG C
	3.321	78	77	Weighted Average, UI Adjusted
	3.187			95.97% Pervious Area
	0.134			4.03% Impervious Area
	0.134			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	66	0.0189	0.11		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
0.4	34	0.0267	1.28		**Sheet Flow, Dirt** Smooth surfaces n= 0.011 P2= 3.40"
0.5	109	0.0619	4.01		**Shallow Concentrated Flow, Dirt** Unpaved Kv= 16.1 fps
3.9	252	0.0238	1.08		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.0	114	0.0351	0.94		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.2	296	0.0473	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.8	122	0.1475	2.69		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
21.0	993	Total			

Subcatchment 3S: DA-2A



Summary for Subcatchment 6S: DA-3

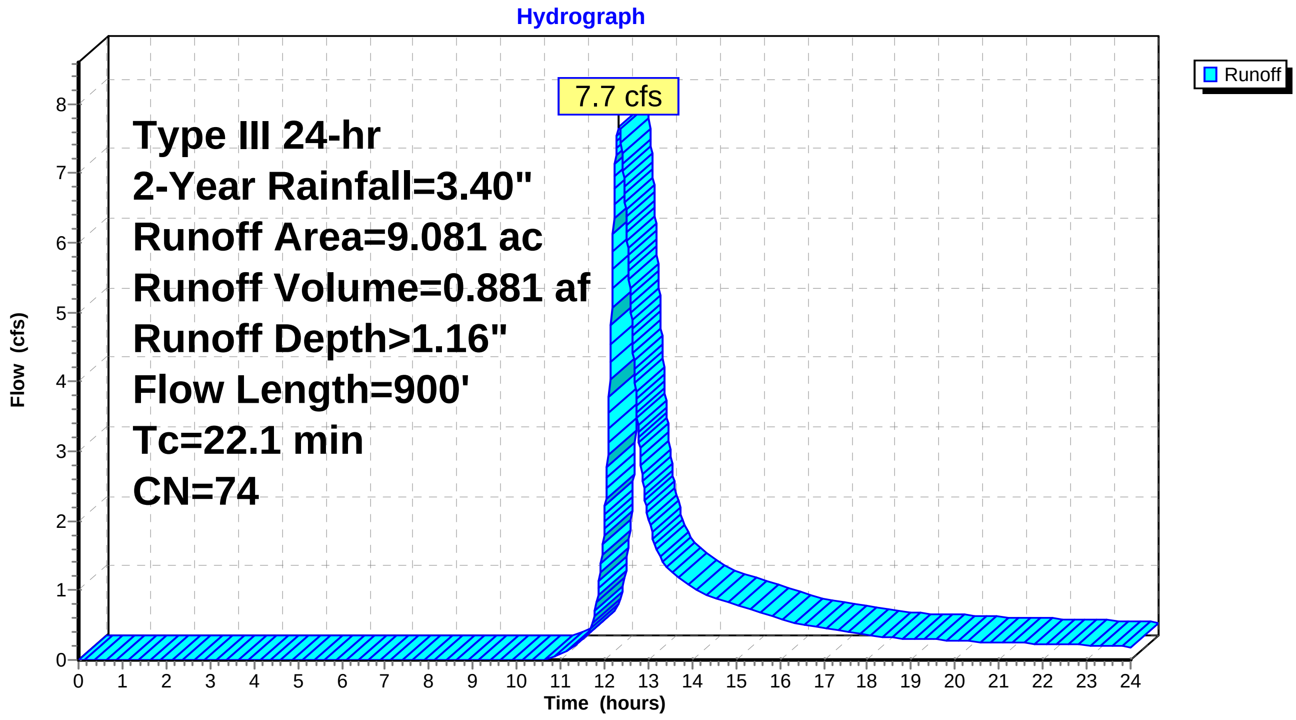
Runoff = 7.7 cfs @ 12.33 hrs, Volume= 0.881 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (ac)	CN	Description
	0.105	98	Unconnected roofs, HSG C
	0.523	70	Woods, Good, HSG C
	0.958	74	>75% Grass cover, Good, HSG C
	0.240	87	Dirt roads, HSG C
*	7.255	74	Solar Arrays, >75% Grass cover, Good, HSG C
	9.081	74	Weighted Average
	8.976		98.84% Pervious Area
	0.105		1.16% Impervious Area
	0.105		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
10.8	800	0.0312	1.24		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
22.1	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 12S: DA-2B

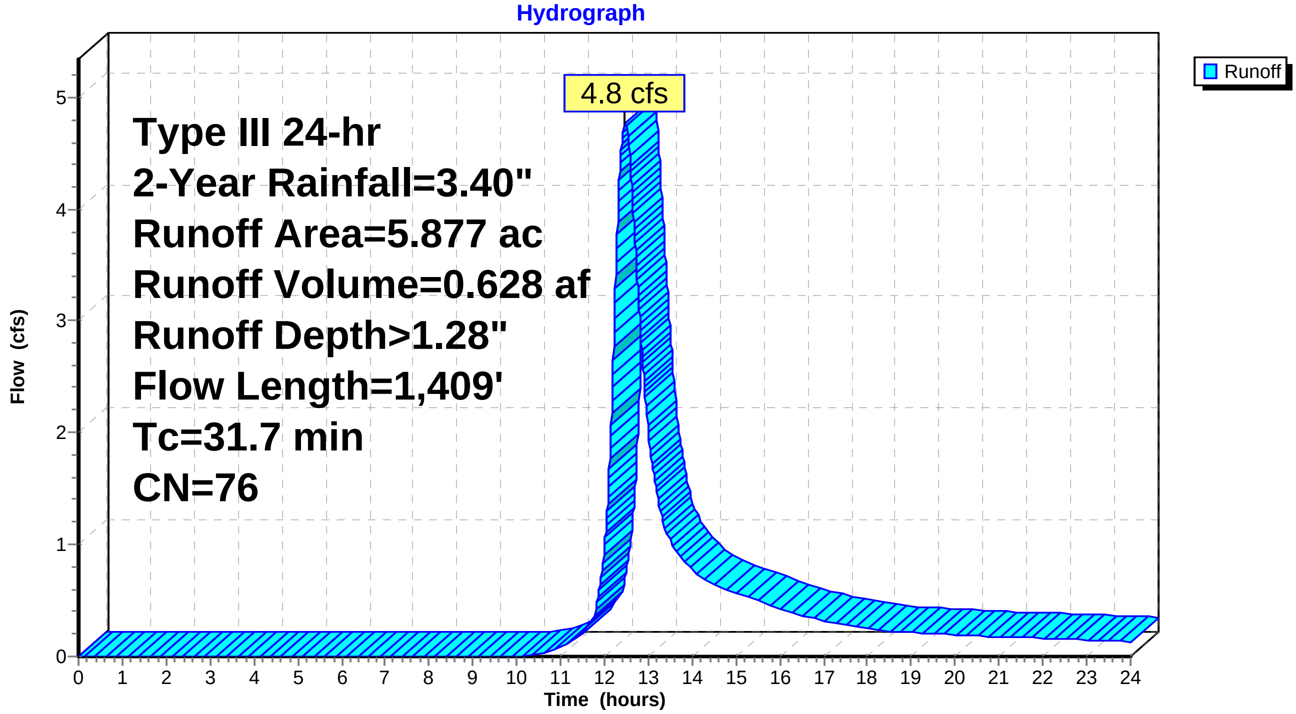
Runoff = 4.8 cfs @ 12.47 hrs, Volume= 0.628 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (ac)	CN	Description
	0.984	70	Woods, Good, HSG C
	0.027	98	Unconnected roofs, HSG C
	0.269	82	Farmsteads, HSG C
	1.131	81	Row crops, C + CR, Good, HSG C
	0.174	74	>75% Grass cover, Good, HSG C
*	3.006	74	Solar Arrays, >75% Grass cover, Good, HSG C
	0.286	87	Dirt roads, HSG C
	5.877	76	Weighted Average
	5.850		99.54% Pervious Area
	0.027		0.46% Impervious Area
	0.027		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.4	233	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
2.1	151	0.0281	1.17		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
1.2	106	0.0472	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.3	47	0.1277	2.50		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
2.2	118	0.0169	0.91		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
31.7	1,409	Total			

Subcatchment 12S: DA-2B



Summary for Pond 7P: Water Quality Basin #1

Inflow Area = 3.321 ac, 4.03% Impervious, Inflow Depth > 1.35" for 2-Year event
Inflow = 3.4 cfs @ 12.30 hrs, Volume= 0.374 af
Outflow = 3.4 cfs @ 12.31 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.4 min
Primary = 3.4 cfs @ 12.31 hrs, Volume= 0.334 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 393.05' @ 12.31 hrs Surf.Area= 2,098 sf Storage= 1,824 cf

Plug-Flow detention time= 68.9 min calculated for 0.334 af (89% of inflow)
Center-of-Mass det. time= 18.9 min (878.8 - 859.9)

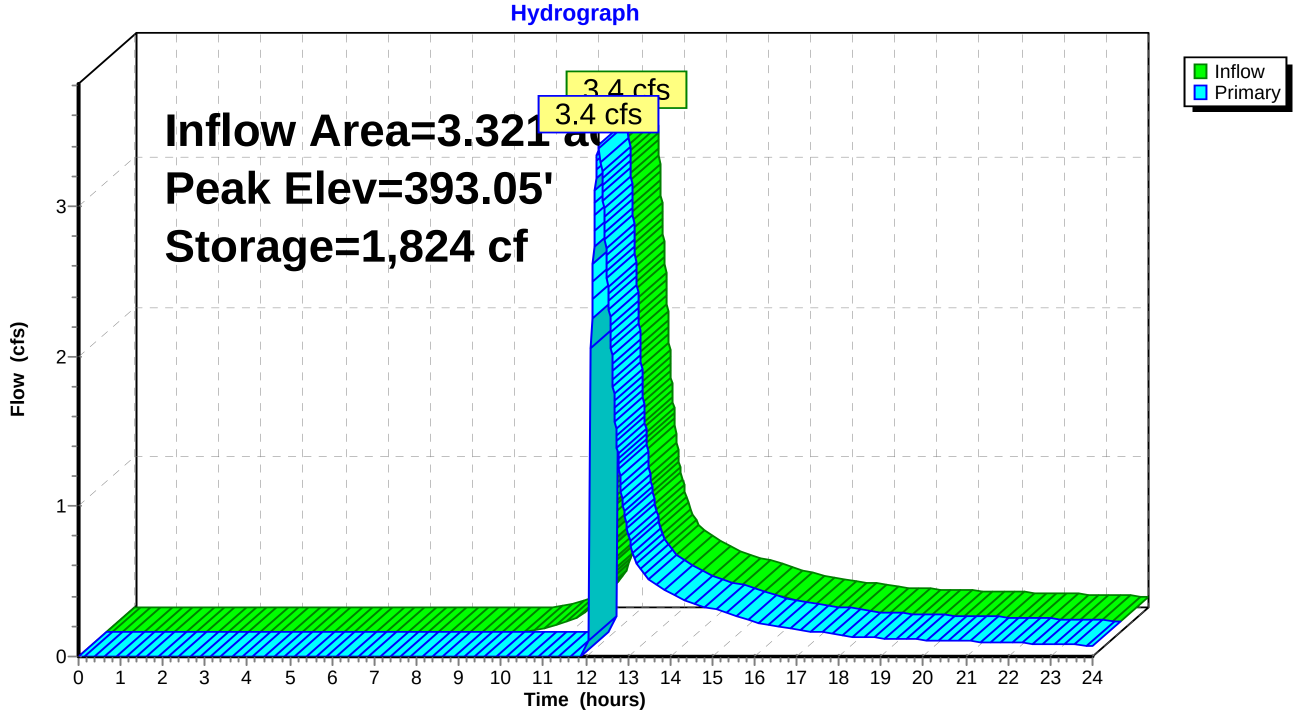
Volume	Invert	Avail.Storage	Storage Description
#1	392.00'	2,848 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
392.00	1,392	0	0
393.50	2,405	2,848	2,848

Device	Routing	Invert	Outlet Devices
#1	Primary	393.00'	**150.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=3.4 cfs @ 12.31 hrs HW=393.05' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 3.4 cfs @ 0.50 fps)

Pond 7P: Water Quality Basin #1



Stage-Area-Storage for Pond 7P: Water Quality Basin #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
392.00	1,392	0	393.06	2,108	1,855
392.02	1,406	28	393.08	2,121	1,897
392.04	1,419	56	393.10	2,135	1,940
392.06	1,433	85	393.12	2,148	1,983
392.08	1,446	114	393.14	2,162	2,026
392.10	1,460	143	393.16	2,175	2,069
392.12	1,473	172	393.18	2,189	2,113
392.14	1,487	201	393.20	2,202	2,157
392.16	1,500	231	393.22	2,216	2,201
392.18	1,514	262	393.24	2,229	2,245
392.20	1,527	292	393.26	2,243	2,290
392.22	1,541	323	393.28	2,256	2,335
392.24	1,554	354	393.30	2,270	2,380
392.26	1,568	385	393.32	2,283	2,426
392.28	1,581	416	393.34	2,297	2,472
392.30	1,595	448	393.36	2,310	2,518
392.32	1,608	480	393.38	2,324	2,564
392.34	1,622	512	393.40	2,337	2,611
392.36	1,635	545	393.42	2,351	2,658
392.38	1,649	578	393.44	2,364	2,705
392.40	1,662	611	393.46	2,378	2,752
392.42	1,676	644	393.48	2,391	2,800
392.44	1,689	678	393.50	**2,405**	**2,848**
392.46	1,703	712			
392.48	1,716	746			
392.50	1,730	780			
392.52	1,743	815			
392.54	1,757	850			
392.56	1,770	885			
392.58	1,784	921			
392.60	1,797	957			
392.62	1,811	993			
392.64	1,824	1,029			
392.66	1,838	1,066			
392.68	1,851	1,103			
392.70	1,865	1,140			
392.72	1,878	1,177			
392.74	1,892	1,215			
392.76	1,905	1,253			
392.78	1,919	1,291			
392.80	1,932	1,330			
392.82	1,946	1,368			
392.84	1,959	1,408			
392.86	1,973	1,447			
392.88	1,986	1,486			
392.90	2,000	1,526			
392.92	2,013	1,566			
392.94	2,027	1,607			
392.96	2,040	1,648			
392.98	2,054	1,688			
393.00	2,067	1,730			
393.02	2,081	1,771			
393.04	2,094	1,813			

Summary for Pond 9P: Water Quality Basin #2

Inflow Area = 5.877 ac, 0.46% Impervious, Inflow Depth > 1.28" for 2-Year event
Inflow = 4.8 cfs @ 12.47 hrs, Volume= 0.628 af
Outflow = 4.8 cfs @ 12.47 hrs, Volume= 0.556 af, Atten= 0%, Lag= 0.3 min
Primary = 4.8 cfs @ 12.47 hrs, Volume= 0.556 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 387.05' @ 12.47 hrs Surf.Area= 3,551 sf Storage= 3,306 cf

Plug-Flow detention time= 72.7 min calculated for 0.556 af (88% of inflow)
Center-of-Mass det. time= 20.5 min (891.7 - 871.2)

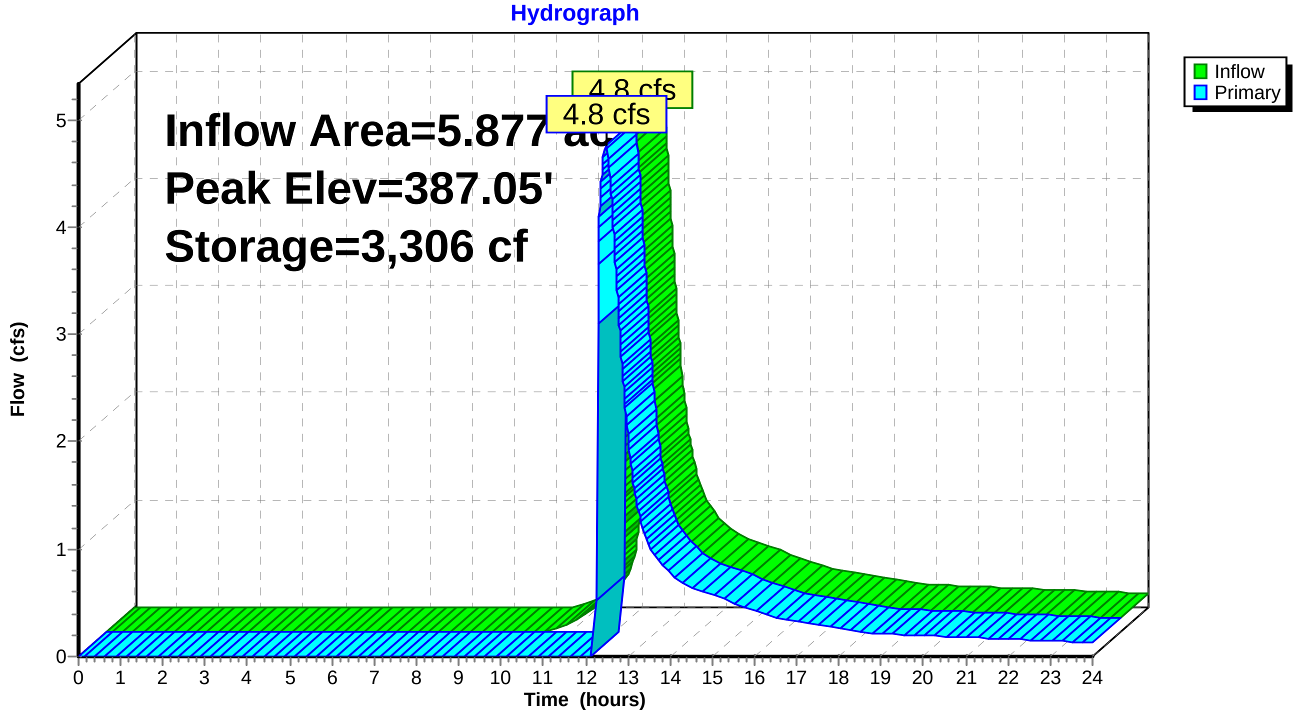
Volume	Invert	Avail.Storage	Storage Description
#1	386.00'	4,979 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
386.00	2,742	0	0
387.50	3,896	4,979	4,979

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	**175.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=4.8 cfs @ 12.47 hrs HW=387.05' TW=0.00' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 4.8 cfs @ 0.53 fps)

Pond 9P: Water Quality Basin #2



Stage-Area-Storage for Pond 9P: Water Quality Basin #2

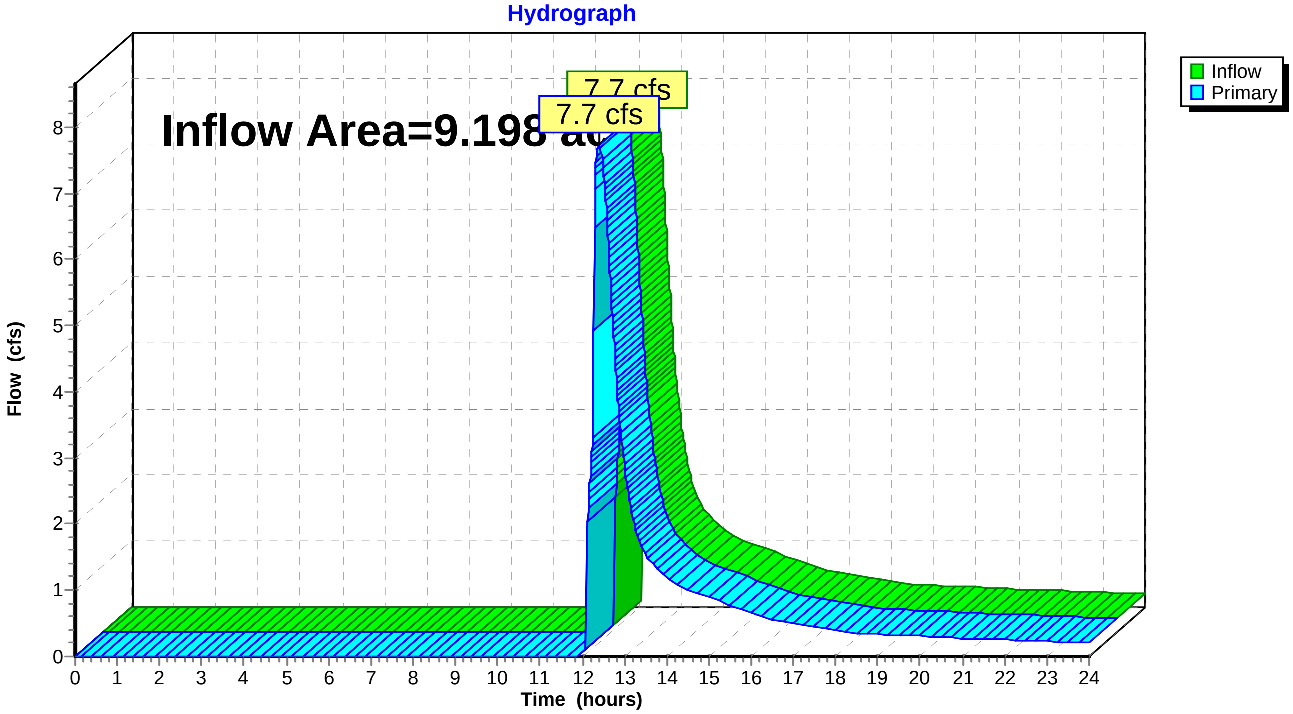
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
386.00	2,742	0
386.02	2,757	55
386.04	2,773	110
386.06	2,788	166
386.08	2,804	222
386.10	2,819	278
386.12	2,834	335
386.14	2,850	391
386.16	2,865	449
386.18	2,880	506
386.20	2,896	564
386.22	2,911	622
386.24	2,927	680
386.26	2,942	739
386.28	2,957	798
386.30	2,973	857
386.32	2,988	917
386.34	3,004	977
386.36	3,019	1,037
386.38	3,034	1,098
386.40	3,050	1,158
386.42	3,065	1,219
386.44	3,081	1,281
386.46	3,096	1,343
386.48	3,111	1,405
386.50	3,127	1,467
386.52	3,142	1,530
386.54	3,157	1,593
386.56	3,173	1,656
386.58	3,188	1,720
386.60	3,204	1,784
386.62	3,219	1,848
386.64	3,234	1,912
386.66	3,250	1,977
386.68	3,265	2,042
386.70	3,281	2,108
386.72	3,296	2,174
386.74	3,311	2,240
386.76	3,327	2,306
386.78	3,342	2,373
386.80	3,357	2,440
386.82	3,373	2,507
386.84	3,388	2,575
386.86	3,404	2,643
386.88	3,419	2,711
386.90	3,434	2,779
386.92	3,450	2,848
386.94	3,465	2,917
386.96	3,481	2,987
386.98	3,496	3,057
387.00	3,511	3,127
387.02	3,527	3,197
387.04	3,542	3,268
387.06	3,557	3,339
387.08	3,573	3,410
387.10	3,588	3,482
387.12	3,604	3,554
387.14	3,619	3,626
387.16	3,634	3,698
387.18	3,650	3,771
387.20	3,665	3,844
387.22	3,681	3,918
387.24	3,696	3,992
387.26	3,711	4,066
387.28	3,727	4,140
387.30	3,742	4,215
387.32	3,758	4,290
387.34	3,773	4,365
387.36	3,788	4,441
387.38	3,804	4,517
387.40	3,819	4,593
387.42	3,834	4,669
387.44	3,850	4,746
387.46	3,865	4,823
387.48	3,881	4,901
387.50	**3,896**	**4,979**

Summary for Link 2L: Sheet flow to West Wetlands

Inflow Area =	9.198 ac,	1.75% Impervious, Inflow Depth > 1.16"	for 2-Year event
Inflow =	7.7 cfs @	12.40 hrs, Volume=	0.890 af
Primary =	7.7 cfs @	12.40 hrs, Volume=	0.890 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 2L: Sheet flow to West Wetlands

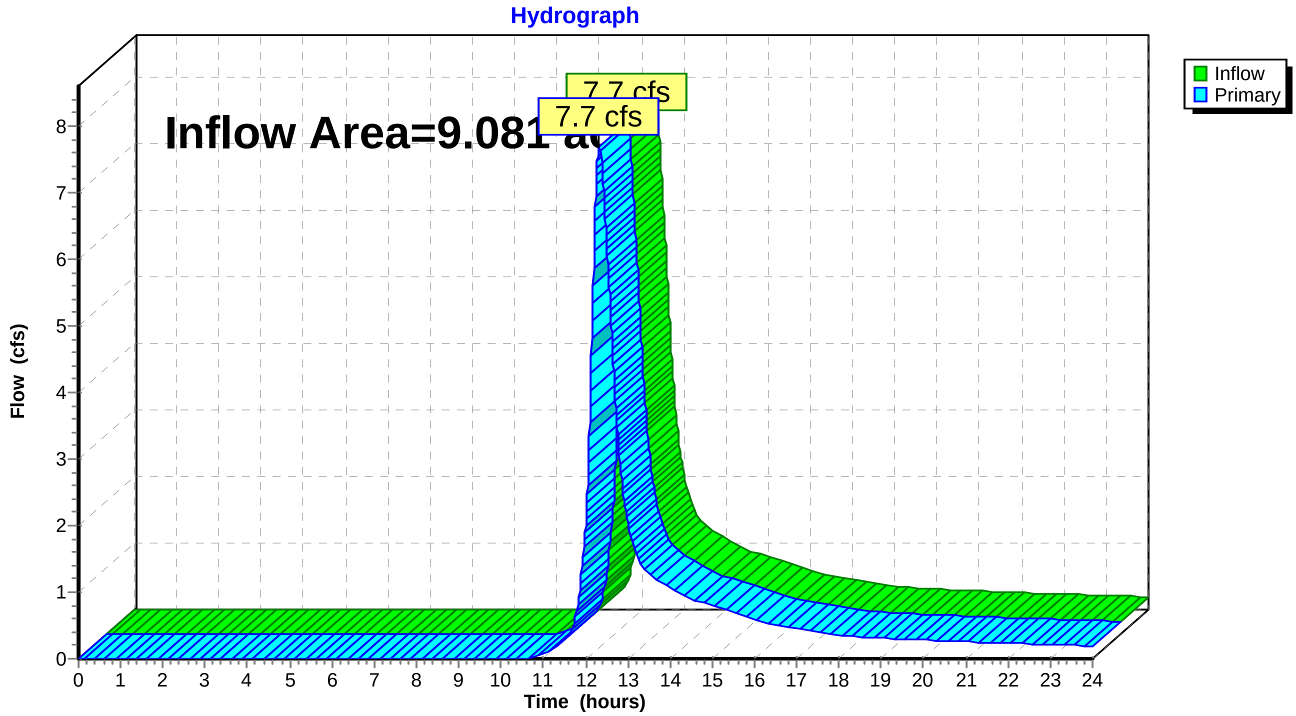


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	1.16% Impervious, Inflow Depth > 1.16"	for 2-Year event	
Inflow =	7.7 cfs @	12.33 hrs, Volume=	0.881 af	
Primary =	7.7 cfs @	12.33 hrs, Volume=	0.881 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 5L: Sheet Flow to Stott Avenue

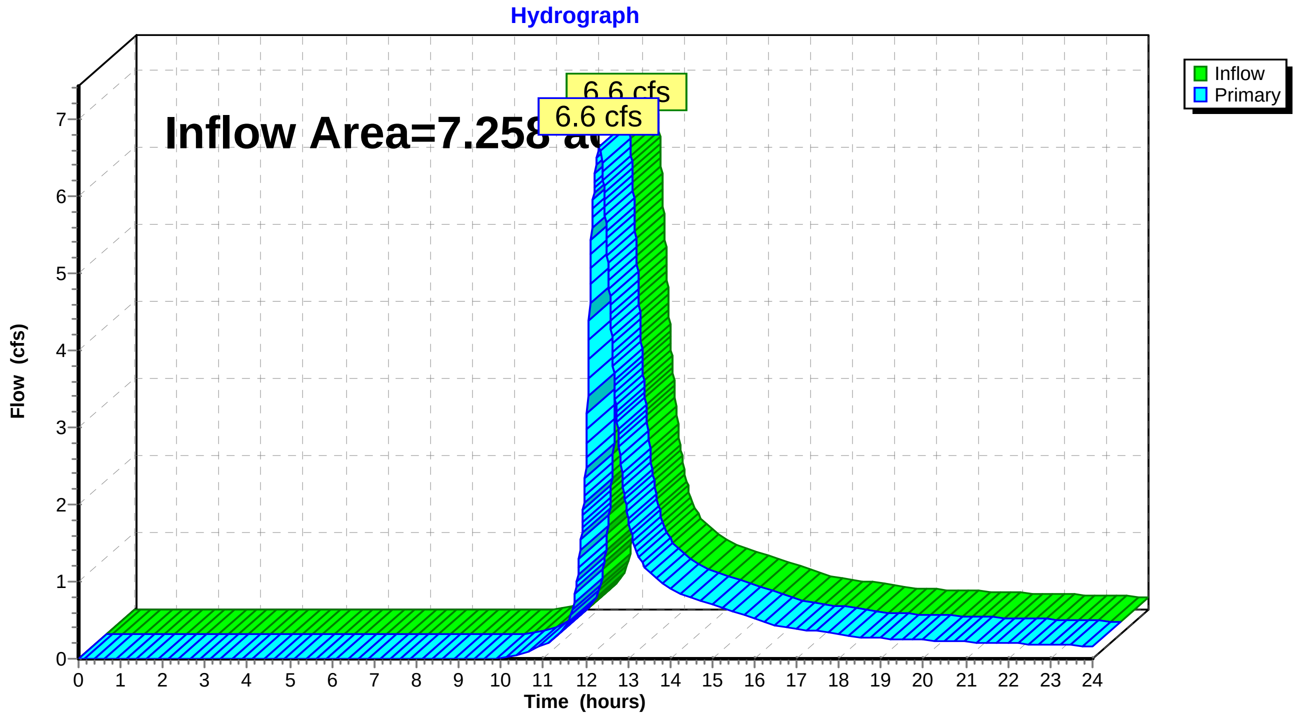


Summary for Link 6L: Sheet flow to North West

Inflow Area =	7.258 ac,	7.14% Impervious, Inflow Depth > 1.35"		for 2-Year event
Inflow =	6.6 cfs @	12.32 hrs, Volume=	0.816 af	
Primary =	6.6 cfs @	12.32 hrs, Volume=	0.816 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.010 hrs, 2401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA-1A Runoff Area=5.321 ac 9.74% Impervious Runoff Depth>2.04"
Flow Length=943' Tc=24.8 min UI Adjusted CN=77 Runoff=7.8 cfs 0.904 af

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>2.04"
Flow Length=712' Tc=10.0 min CN=77 Runoff=4.0 cfs 0.330 af

Subcatchment 3S: DA-2A Runoff Area=3.321 ac 4.03% Impervious Runoff Depth>2.04"
Flow Length=993' Tc=21.0 min UI Adjusted CN=77 Runoff=5.2 cfs 0.564 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 1.16% Impervious Runoff Depth>1.81"
Flow Length=900' Tc=22.1 min CN=74 Runoff=12.3 cfs 1.370 af

Subcatchment 12S: DA-2B Runoff Area=5.877 ac 0.46% Impervious Runoff Depth>1.96"
Flow Length=1,409' Tc=31.7 min CN=76 Runoff=7.4 cfs 0.958 af

Pond 7P: Water Quality Basin #1 Peak Elev=393.06' Storage=1,855 cf Inflow=5.2 cfs 0.564 af
Outflow=5.2 cfs 0.525 af

Pond 9P: Water Quality Basin #2 Peak Elev=387.07' Storage=3,369 cf Inflow=7.4 cfs 0.958 af
Outflow=7.4 cfs 0.886 af

Link 2L: Sheet flow to West Wetlands Inflow=12.0 cfs 1.411 af
Primary=12.0 cfs 1.411 af

Link 5L: Sheet Flow to Stott Avenue Inflow=12.3 cfs 1.370 af
Primary=12.3 cfs 1.370 af

Link 6L: Sheet flow to North West Inflow=10.2 cfs 1.234 af
Primary=10.2 cfs 1.234 af

Total Runoff Area = 25.537 ac Runoff Volume = 4.127 af Average Runoff Depth = 1.94"
96.93% Pervious = 24.753 ac 3.07% Impervious = 0.784 ac

Summary for Subcatchment 1S: DA-1A

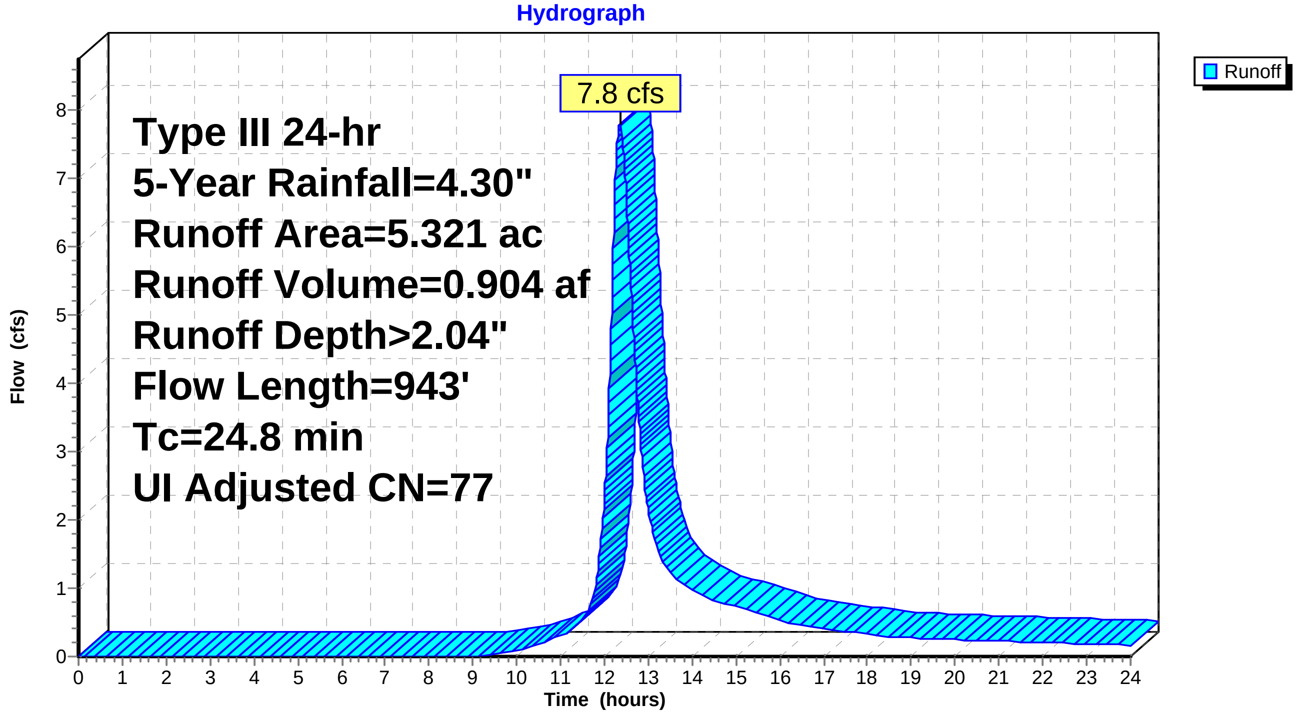
Runoff = 7.8 cfs @ 12.35 hrs, Volume= 0.904 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 5-Year Rainfall=4.30"

	Area (ac)	CN	Adj	Description
	0.518	98		Unconnected roofs, HSG C
	1.337	74		>75% Grass cover, Good, HSG C
*	2.240	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.331	74		Pasture/grassland/range, Good, HSG C
	0.895	87		Dirt roads, HSG C
	5.321	79	77	Weighted Average, UI Adjusted
	4.803			90.26% Pervious Area
	0.518			9.74% Impervious Area
	0.518			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
4.0	281	0.0285	1.18		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
0.9	110	0.0909	2.11		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
24.8	943	Total			

Subcatchment 1S: DA-1A



Summary for Subcatchment 2S: DA-1B

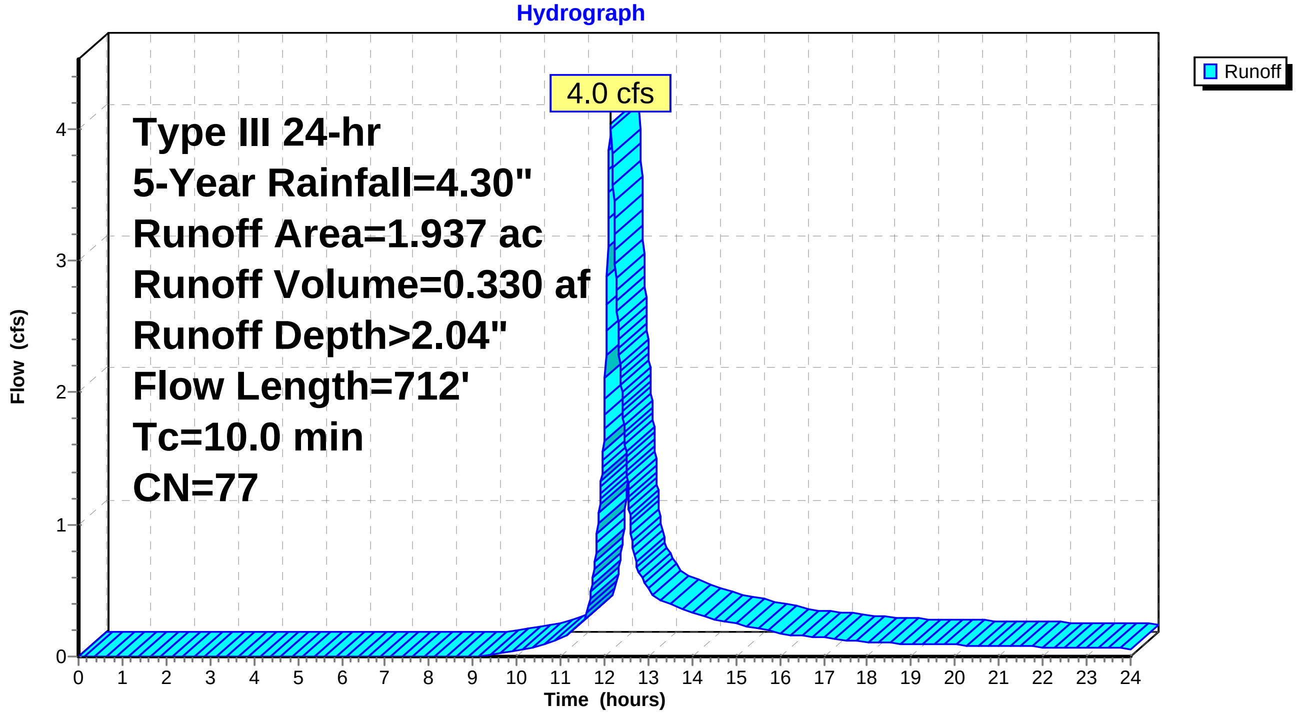
Runoff = 4.0 cfs @ 12.14 hrs, Volume= 0.330 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 5-Year Rainfall=4.30"

Area (ac)	CN	Description
1.231	74	>75% Grass cover, Good, HSG C
0.531	82	Farmsteads, HSG C
0.175	87	Dirt roads, HSG C
1.937	77	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2A

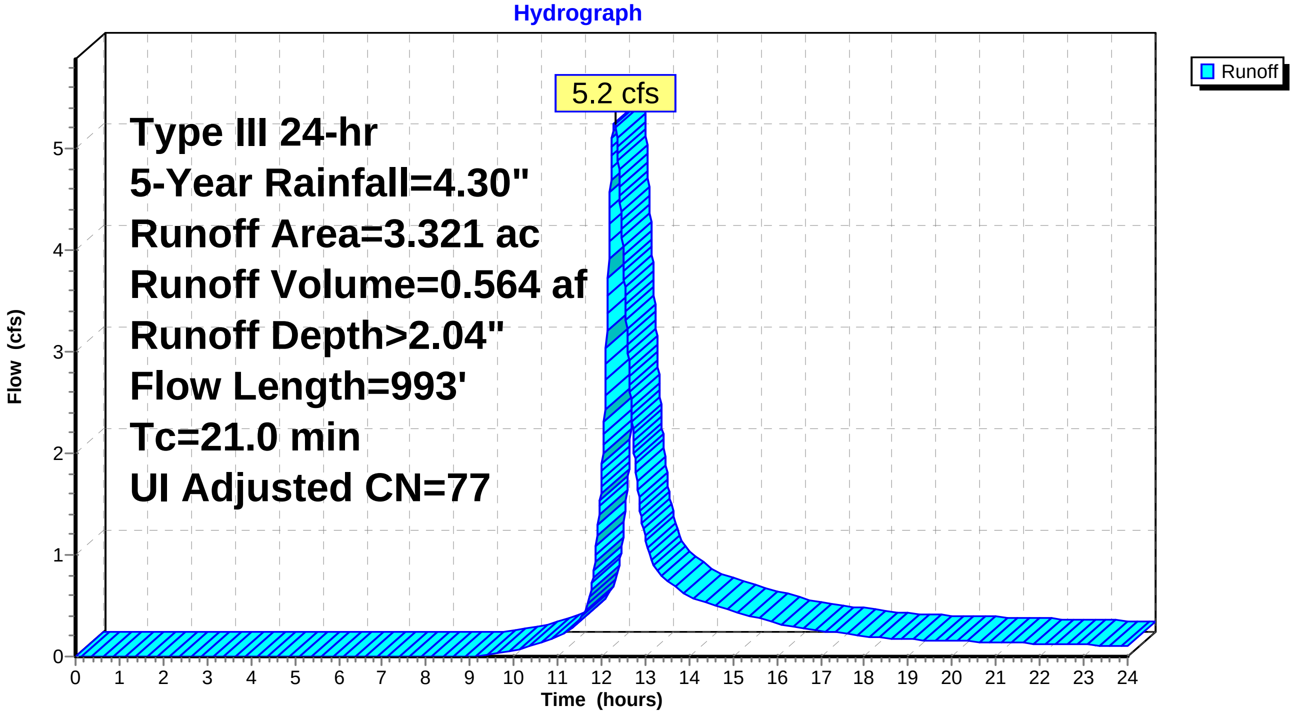
Runoff = 5.2 cfs @ 12.30 hrs, Volume= 0.564 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 5-Year Rainfall=4.30"

	Area (ac)	CN	Adj	Description
	0.229	70		Woods, Good, HSG C
	0.134	98		Unconnected roofs, HSG C
	0.720	82		Farmsteads, HSG C
*	1.865	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.373	87		Dirt roads, HSG C
	3.321	78	77	Weighted Average, UI Adjusted
	3.187			95.97% Pervious Area
	0.134			4.03% Impervious Area
	0.134			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	66	0.0189	0.11		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
0.4	34	0.0267	1.28		**Sheet Flow, Dirt** Smooth surfaces n= 0.011 P2= 3.40"
0.5	109	0.0619	4.01		**Shallow Concentrated Flow, Dirt** Unpaved Kv= 16.1 fps
3.9	252	0.0238	1.08		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.0	114	0.0351	0.94		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.2	296	0.0473	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.8	122	0.1475	2.69		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
21.0	993	Total			

Subcatchment 3S: DA-2A



Summary for Subcatchment 6S: DA-3

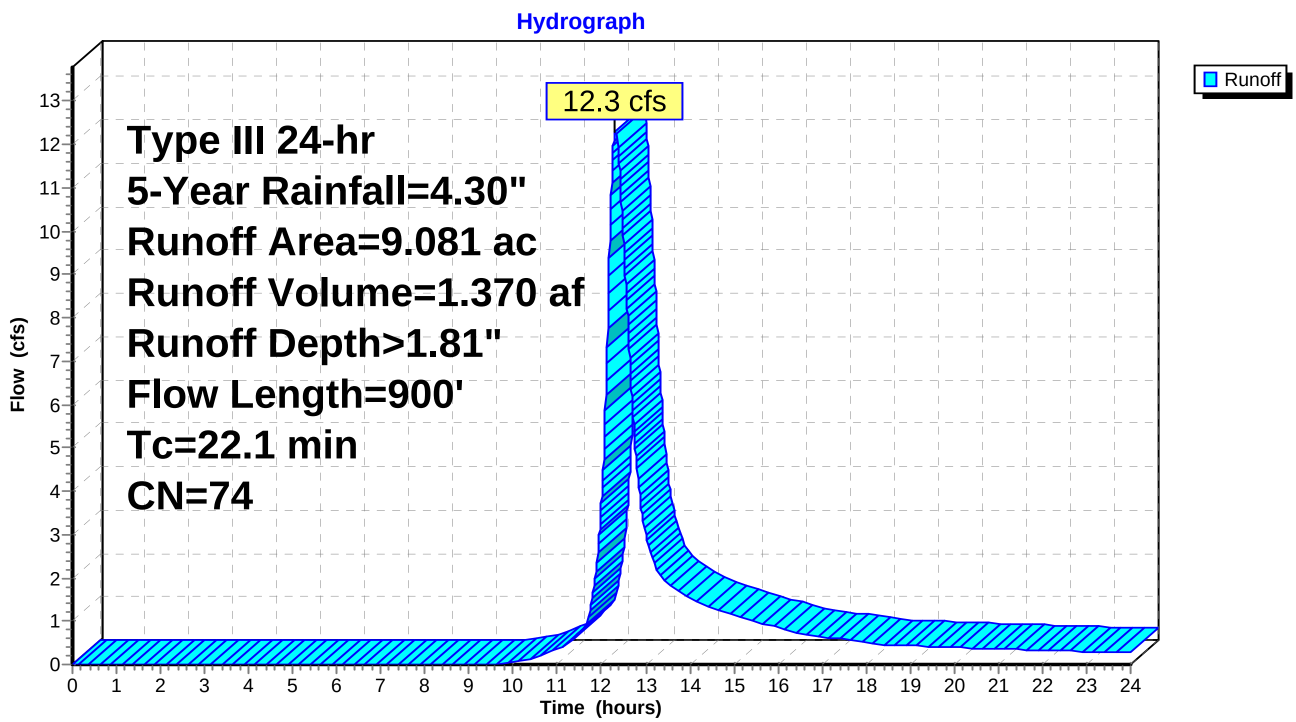
Runoff = 12.3 cfs @ 12.31 hrs, Volume= 1.370 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 5-Year Rainfall=4.30"

	Area (ac)	CN	Description
	0.105	98	Unconnected roofs, HSG C
	0.523	70	Woods, Good, HSG C
	0.958	74	>75% Grass cover, Good, HSG C
	0.240	87	Dirt roads, HSG C
*	7.255	74	Solar Arrays, >75% Grass cover, Good, HSG C
	9.081	74	Weighted Average
	8.976		98.84% Pervious Area
	0.105		1.16% Impervious Area
	0.105		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
10.8	800	0.0312	1.24		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
22.1	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 12S: DA-2B

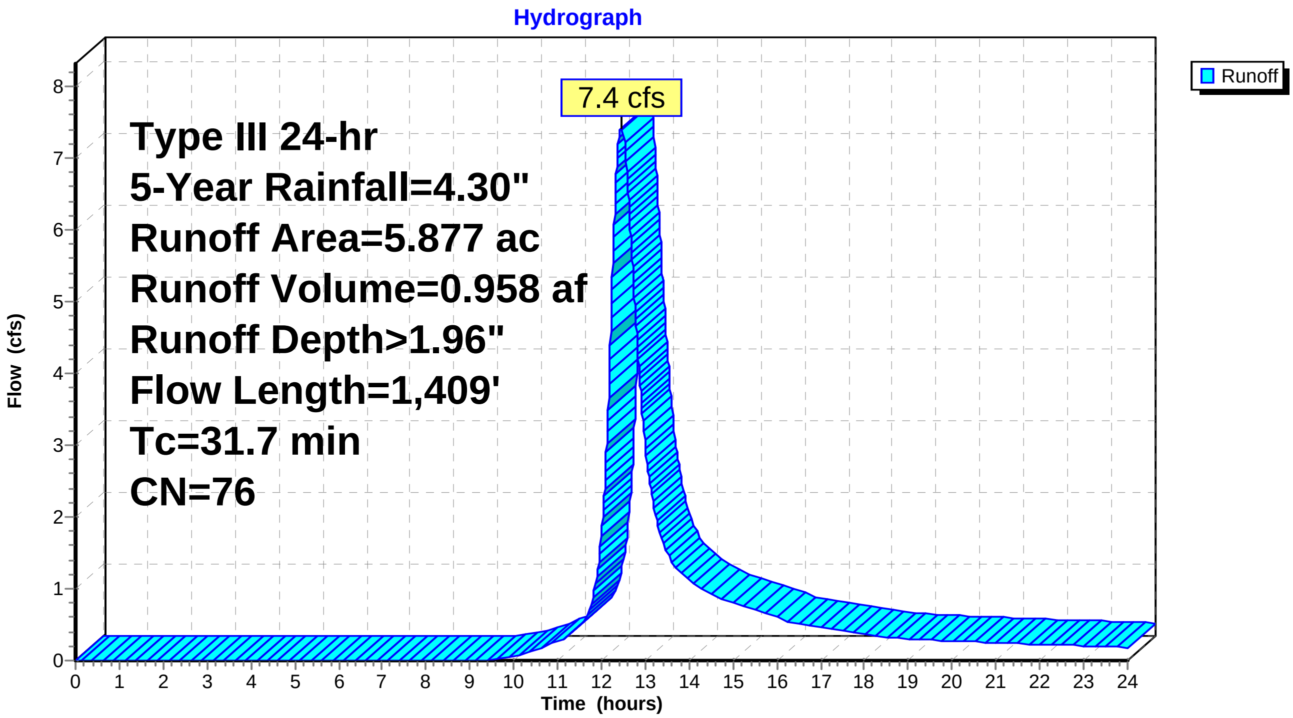
Runoff = 7.4 cfs @ 12.44 hrs, Volume= 0.958 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 5-Year Rainfall=4.30"

	Area (ac)	CN	Description
	0.984	70	Woods, Good, HSG C
	0.027	98	Unconnected roofs, HSG C
	0.269	82	Farmsteads, HSG C
	1.131	81	Row crops, C + CR, Good, HSG C
	0.174	74	>75% Grass cover, Good, HSG C
*	3.006	74	Solar Arrays, >75% Grass cover, Good, HSG C
	0.286	87	Dirt roads, HSG C
	5.877	76	Weighted Average
	5.850		99.54% Pervious Area
	0.027		0.46% Impervious Area
	0.027		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.4	233	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
2.1	151	0.0281	1.17		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
1.2	106	0.0472	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.3	47	0.1277	2.50		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
2.2	118	0.0169	0.91		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
31.7	1,409	Total			

Subcatchment 12S: DA-2B



Summary for Pond 7P: Water Quality Basin #1

Inflow Area = 3.321 ac, 4.03% Impervious, Inflow Depth > 2.04" for 5-Year event
Inflow = 5.2 cfs @ 12.30 hrs, Volume= 0.564 af
Outflow = 5.2 cfs @ 12.30 hrs, Volume= 0.525 af, Atten= 0%, Lag= 0.2 min
Primary = 5.2 cfs @ 12.30 hrs, Volume= 0.525 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 393.06' @ 12.30 hrs Surf.Area= 2,108 sf Storage= 1,855 cf

Plug-Flow detention time= 49.5 min calculated for 0.524 af (93% of inflow)
Center-of-Mass det. time= 13.8 min (861.8 - 848.0)

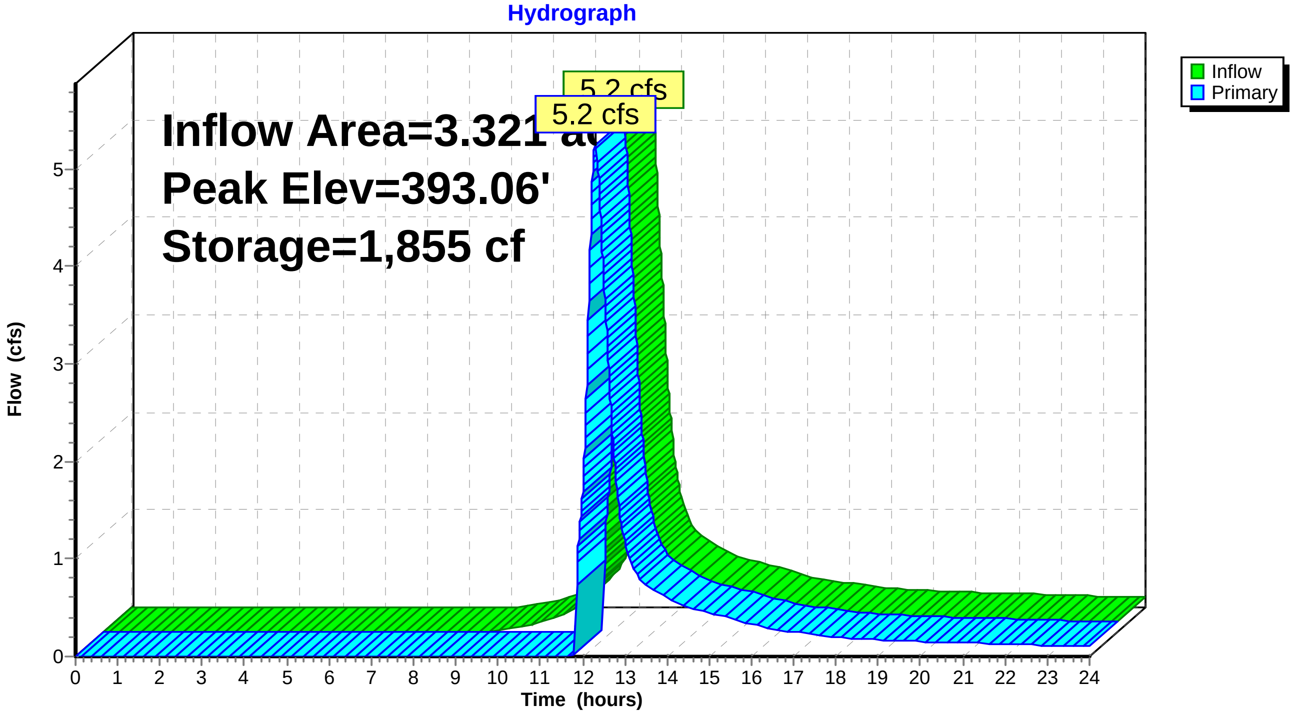
Volume	Invert	Avail.Storage	Storage Description
#1	392.00'	2,848 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
392.00	1,392	0	0
393.50	2,405	2,848	2,848

Device	Routing	Invert	Outlet Devices
#1	Primary	393.00'	**150.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=5.2 cfs @ 12.30 hrs HW=393.06' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 5.2 cfs @ 0.58 fps)

Pond 7P: Water Quality Basin #1



Stage-Area-Storage for Pond 7P: Water Quality Basin #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
392.00	1,392	0	393.06	2,108	1,855
392.02	1,406	28	393.08	2,121	1,897
392.04	1,419	56	393.10	2,135	1,940
392.06	1,433	85	393.12	2,148	1,983
392.08	1,446	114	393.14	2,162	2,026
392.10	1,460	143	393.16	2,175	2,069
392.12	1,473	172	393.18	2,189	2,113
392.14	1,487	201	393.20	2,202	2,157
392.16	1,500	231	393.22	2,216	2,201
392.18	1,514	262	393.24	2,229	2,245
392.20	1,527	292	393.26	2,243	2,290
392.22	1,541	323	393.28	2,256	2,335
392.24	1,554	354	393.30	2,270	2,380
392.26	1,568	385	393.32	2,283	2,426
392.28	1,581	416	393.34	2,297	2,472
392.30	1,595	448	393.36	2,310	2,518
392.32	1,608	480	393.38	2,324	2,564
392.34	1,622	512	393.40	2,337	2,611
392.36	1,635	545	393.42	2,351	2,658
392.38	1,649	578	393.44	2,364	2,705
392.40	1,662	611	393.46	2,378	2,752
392.42	1,676	644	393.48	2,391	2,800
392.44	1,689	678	393.50	**2,405**	**2,848**
392.46	1,703	712			
392.48	1,716	746			
392.50	1,730	780			
392.52	1,743	815			
392.54	1,757	850			
392.56	1,770	885			
392.58	1,784	921			
392.60	1,797	957			
392.62	1,811	993			
392.64	1,824	1,029			
392.66	1,838	1,066			
392.68	1,851	1,103			
392.70	1,865	1,140			
392.72	1,878	1,177			
392.74	1,892	1,215			
392.76	1,905	1,253			
392.78	1,919	1,291			
392.80	1,932	1,330			
392.82	1,946	1,368			
392.84	1,959	1,408			
392.86	1,973	1,447			
392.88	1,986	1,486			
392.90	2,000	1,526			
392.92	2,013	1,566			
392.94	2,027	1,607			
392.96	2,040	1,648			
392.98	2,054	1,688			
393.00	2,067	1,730			
393.02	2,081	1,771			
393.04	2,094	1,813			

Summary for Pond 9P: Water Quality Basin #2

Inflow Area = 5.877 ac, 0.46% Impervious, Inflow Depth > 1.96" for 5-Year event
Inflow = 7.4 cfs @ 12.44 hrs, Volume= 0.958 af
Outflow = 7.4 cfs @ 12.45 hrs, Volume= 0.886 af, Atten= 0%, Lag= 0.6 min
Primary = 7.4 cfs @ 12.45 hrs, Volume= 0.886 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 387.07' @ 12.45 hrs Surf.Area= 3,564 sf Storage= 3,369 cf

Plug-Flow detention time= 51.6 min calculated for 0.886 af (92% of inflow)
Center-of-Mass det. time= 14.4 min (873.5 - 859.1)

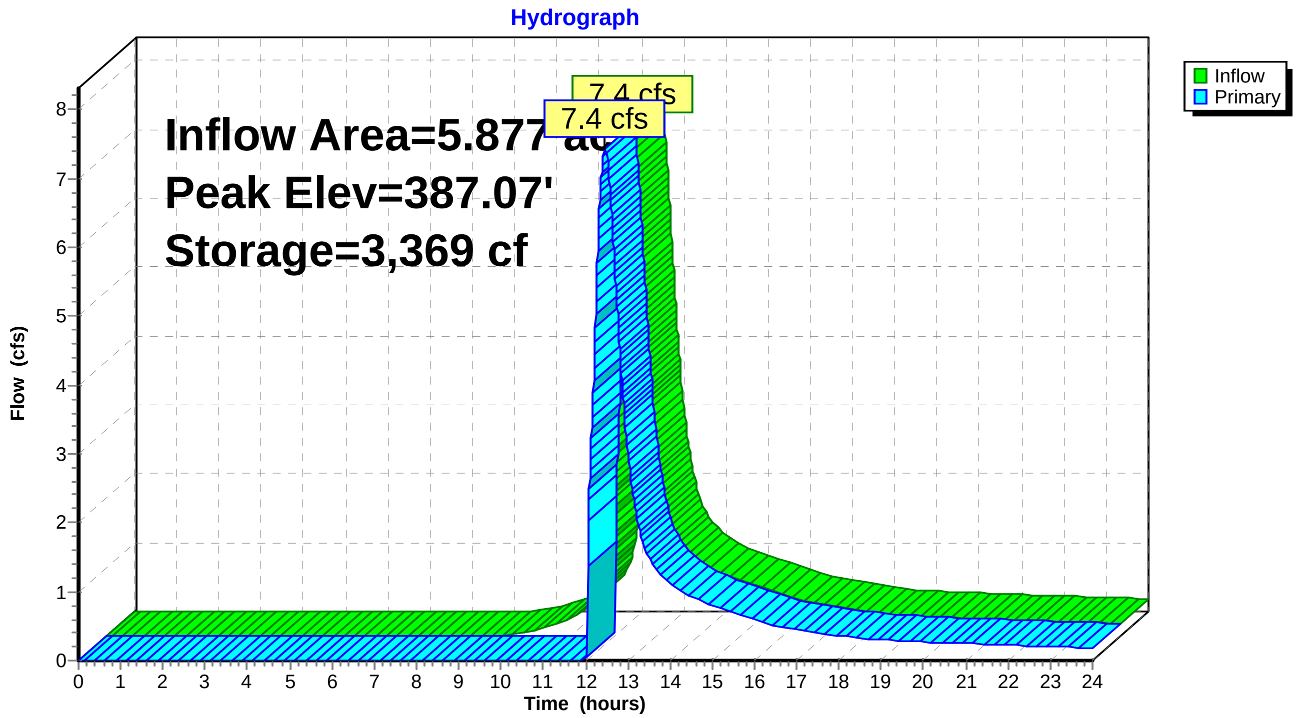
Volume	Invert	Avail.Storage	Storage Description
#1	386.00'	4,979 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
386.00	2,742	0	0
387.50	3,896	4,979	4,979

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	**175.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=7.4 cfs @ 12.45 hrs HW=387.07' TW=0.00' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 7.4 cfs @ 0.62 fps)

Pond 9P: Water Quality Basin #2



Stage-Area-Storage for Pond 9P: Water Quality Basin #2

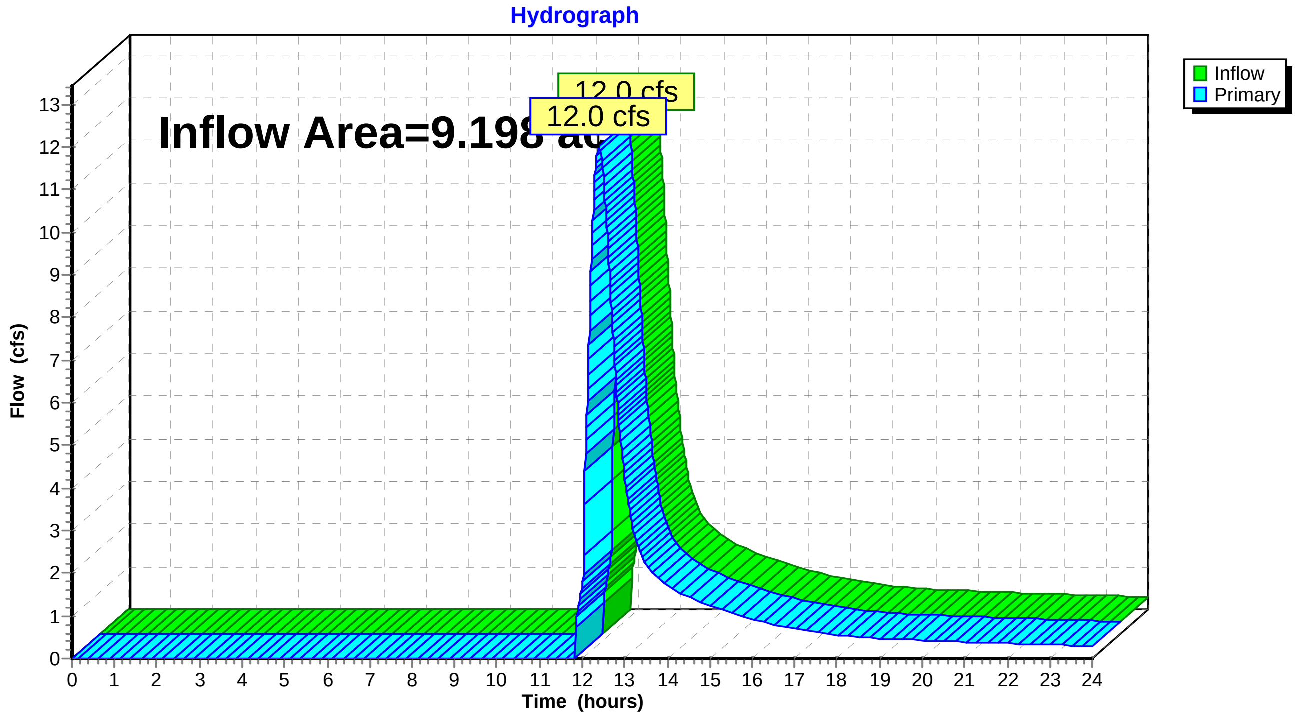
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
386.00	2,742	0	387.06	3,557	3,339
386.02	2,757	55	387.08	3,573	3,410
386.04	2,773	110	387.10	3,588	3,482
386.06	2,788	166	387.12	3,604	3,554
386.08	2,804	222	387.14	3,619	3,626
386.10	2,819	278	387.16	3,634	3,698
386.12	2,834	335	387.18	3,650	3,771
386.14	2,850	391	387.20	3,665	3,844
386.16	2,865	449	387.22	3,681	3,918
386.18	2,880	506	387.24	3,696	3,992
386.20	2,896	564	387.26	3,711	4,066
386.22	2,911	622	387.28	3,727	4,140
386.24	2,927	680	387.30	3,742	4,215
386.26	2,942	739	387.32	3,758	4,290
386.28	2,957	798	387.34	3,773	4,365
386.30	2,973	857	387.36	3,788	4,441
386.32	2,988	917	387.38	3,804	4,517
386.34	3,004	977	387.40	3,819	4,593
386.36	3,019	1,037	387.42	3,834	4,669
386.38	3,034	1,098	387.44	3,850	4,746
386.40	3,050	1,158	387.46	3,865	4,823
386.42	3,065	1,219	387.48	3,881	4,901
386.44	3,081	1,281	387.50	**3,896**	**4,979**
386.46	3,096	1,343			
386.48	3,111	1,405			
386.50	3,127	1,467			
386.52	3,142	1,530			
386.54	3,157	1,593			
386.56	3,173	1,656			
386.58	3,188	1,720			
386.60	3,204	1,784			
386.62	3,219	1,848			
386.64	3,234	1,912			
386.66	3,250	1,977			
386.68	3,265	2,042			
386.70	3,281	2,108			
386.72	3,296	2,174			
386.74	3,311	2,240			
386.76	3,327	2,306			
386.78	3,342	2,373			
386.80	3,357	2,440			
386.82	3,373	2,507			
386.84	3,388	2,575			
386.86	3,404	2,643			
386.88	3,419	2,711			
386.90	3,434	2,779			
386.92	3,450	2,848			
386.94	3,465	2,917			
386.96	3,481	2,987			
386.98	3,496	3,057			
387.00	3,511	3,127			
387.02	3,527	3,197			
387.04	3,542	3,268			

Summary for Link 2L: Sheet flow to West Wetlands

Inflow Area =	9.198 ac,	1.75% Impervious, Inflow Depth > 1.84"		for 5-Year event
Inflow =	12.0 cfs @	12.38 hrs, Volume=	1.411 af	
Primary =	12.0 cfs @	12.38 hrs, Volume=	1.411 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 2L: Sheet flow to West Wetlands

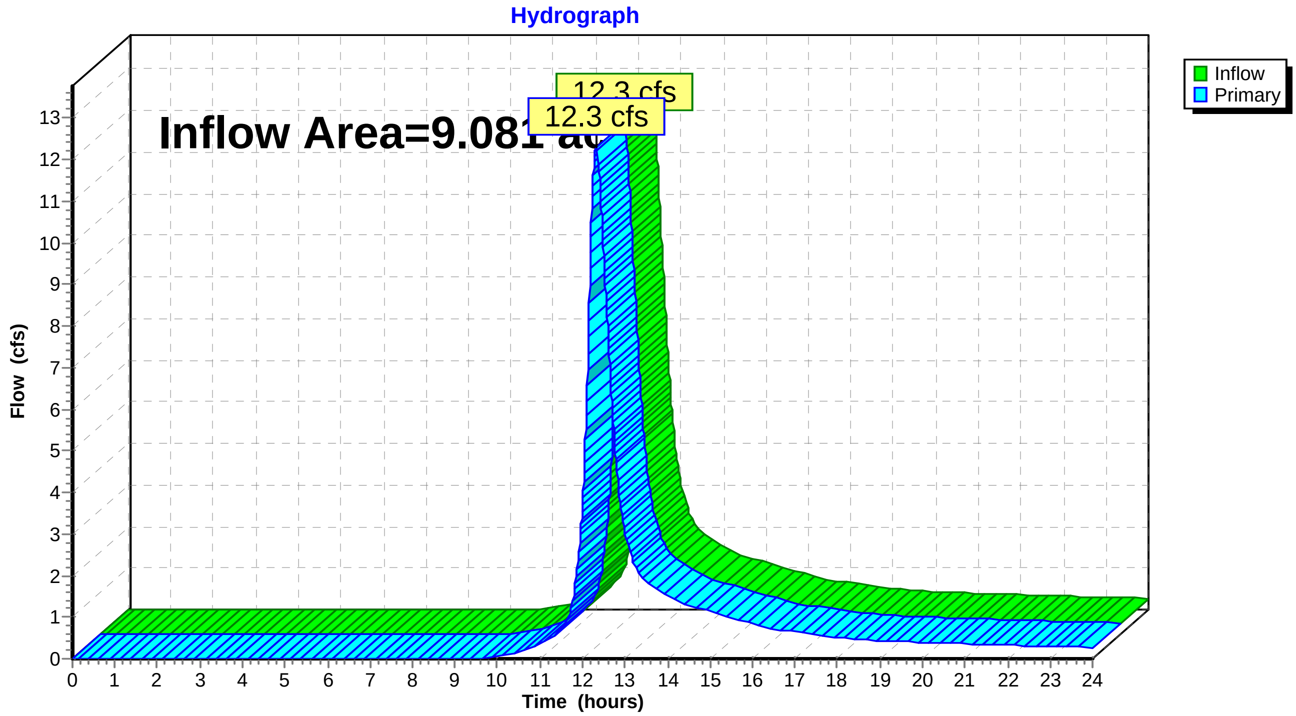


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	1.16% Impervious, Inflow Depth > 1.81"	for 5-Year event	
Inflow =	12.3 cfs @	12.31 hrs, Volume=	1.370 af	
Primary =	12.3 cfs @	12.31 hrs, Volume=	1.370 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 5L: Sheet Flow to Stott Avenue

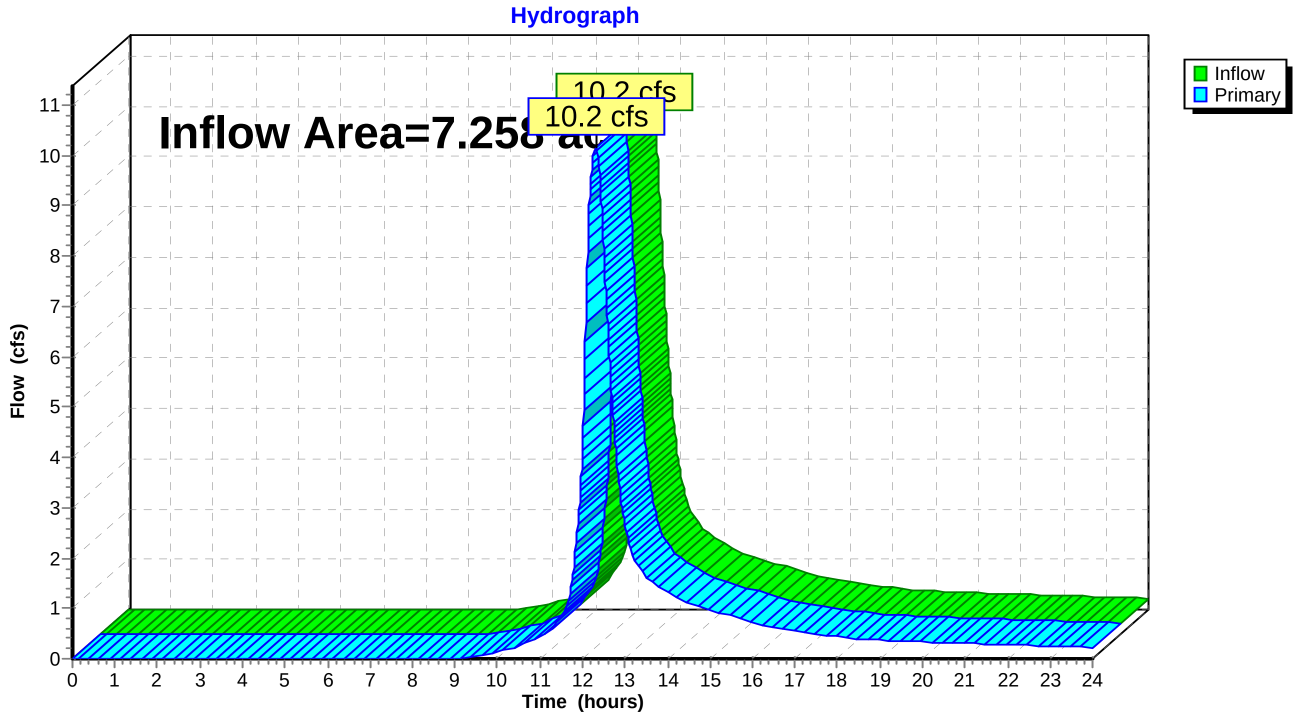


Summary for Link 6L: Sheet flow to North West

Inflow Area =	7.258 ac,	7.14% Impervious, Inflow Depth > 2.04"	for 5-Year event
Inflow =	10.2 cfs @	12.32 hrs, Volume=	1.234 af
Primary =	10.2 cfs @	12.32 hrs, Volume=	1.234 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.010 hrs, 2401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA-1A Runoff Area=5.321 ac 9.74% Impervious Runoff Depth>2.61"
Flow Length=943' Tc=24.8 min UI Adjusted CN=77 Runoff=10.0 cfs 1.157 af

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>2.62"
Flow Length=712' Tc=10.0 min CN=77 Runoff=5.2 cfs 0.423 af

Subcatchment 3S: DA-2A Runoff Area=3.321 ac 4.03% Impervious Runoff Depth>2.61"
Flow Length=993' Tc=21.0 min UI Adjusted CN=77 Runoff=6.7 cfs 0.723 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 1.16% Impervious Runoff Depth>2.35"
Flow Length=900' Tc=22.1 min CN=74 Runoff=16.2 cfs 1.780 af

Subcatchment 12S: DA-2B Runoff Area=5.877 ac 0.46% Impervious Runoff Depth>2.52"
Flow Length=1,409' Tc=31.7 min CN=76 Runoff=9.6 cfs 1.233 af

Pond 7P: Water Quality Basin #1 Peak Elev=393.07' Storage=1,878 cf Inflow=6.7 cfs 0.723 af
Outflow=6.7 cfs 0.683 af

Pond 9P: Water Quality Basin #2 Peak Elev=387.08' Storage=3,415 cf Inflow=9.6 cfs 1.233 af
Outflow=9.6 cfs 1.161 af

Link 2L: Sheet flow to West Wetlands Inflow=15.5 cfs 1.844 af
Primary=15.5 cfs 1.844 af

Link 5L: Sheet Flow to Stott Avenue Inflow=16.2 cfs 1.780 af
Primary=16.2 cfs 1.780 af

Link 6L: Sheet flow to North West Inflow=13.0 cfs 1.579 af
Primary=13.0 cfs 1.579 af

Total Runoff Area = 25.537 ac Runoff Volume = 5.316 af Average Runoff Depth = 2.50"
96.93% Pervious = 24.753 ac 3.07% Impervious = 0.784 ac

Summary for Subcatchment 1S: DA-1A

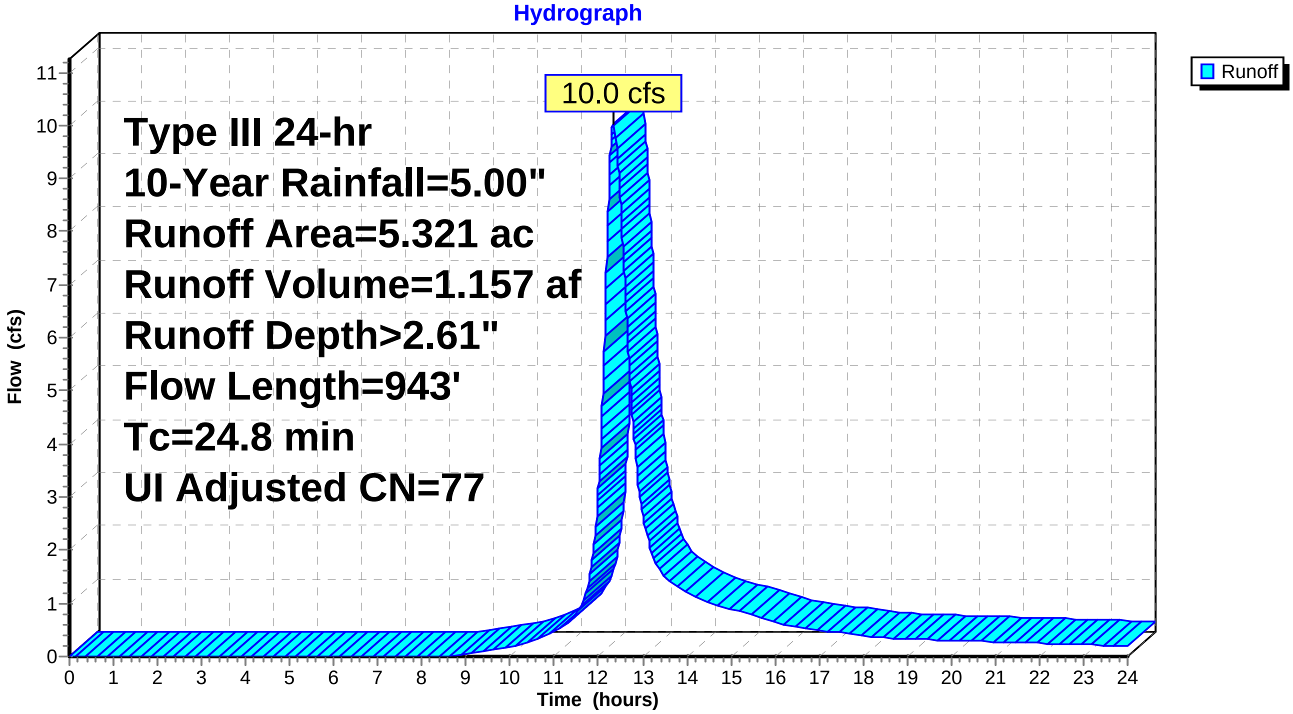
Runoff = 10.0 cfs @ 12.35 hrs, Volume= 1.157 af, Depth> 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=5.00"

	Area (ac)	CN	Adj	Description
	0.518	98		Unconnected roofs, HSG C
	1.337	74		>75% Grass cover, Good, HSG C
*	2.240	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.331	74		Pasture/grassland/range, Good, HSG C
	0.895	87		Dirt roads, HSG C
	5.321	79	77	Weighted Average, UI Adjusted
	4.803			90.26% Pervious Area
	0.518			9.74% Impervious Area
	0.518			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
4.0	281	0.0285	1.18		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
0.9	110	0.0909	2.11		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
24.8	943	Total			

Subcatchment 1S: DA-1A



Summary for Subcatchment 2S: DA-1B

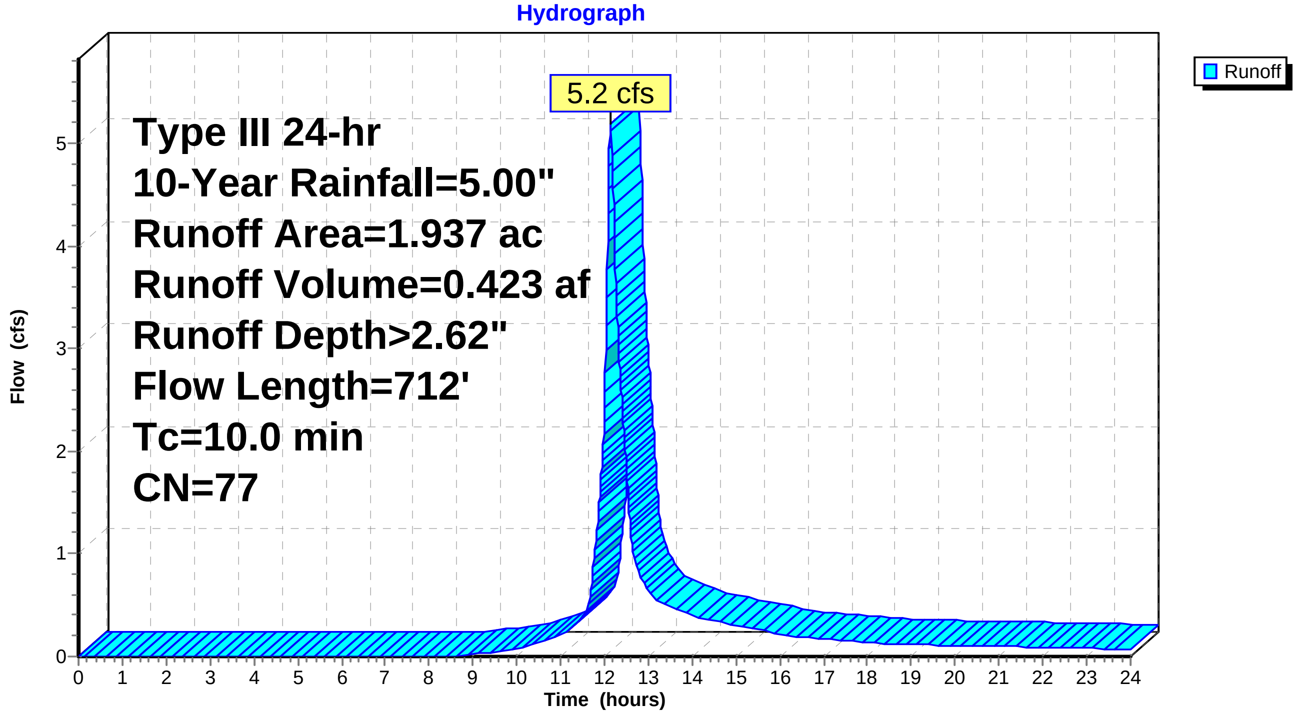
Runoff = 5.2 cfs @ 12.14 hrs, Volume= 0.423 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (ac)	CN	Description
1.231	74	>75% Grass cover, Good, HSG C
0.531	82	Farmsteads, HSG C
0.175	87	Dirt roads, HSG C
1.937	77	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2A

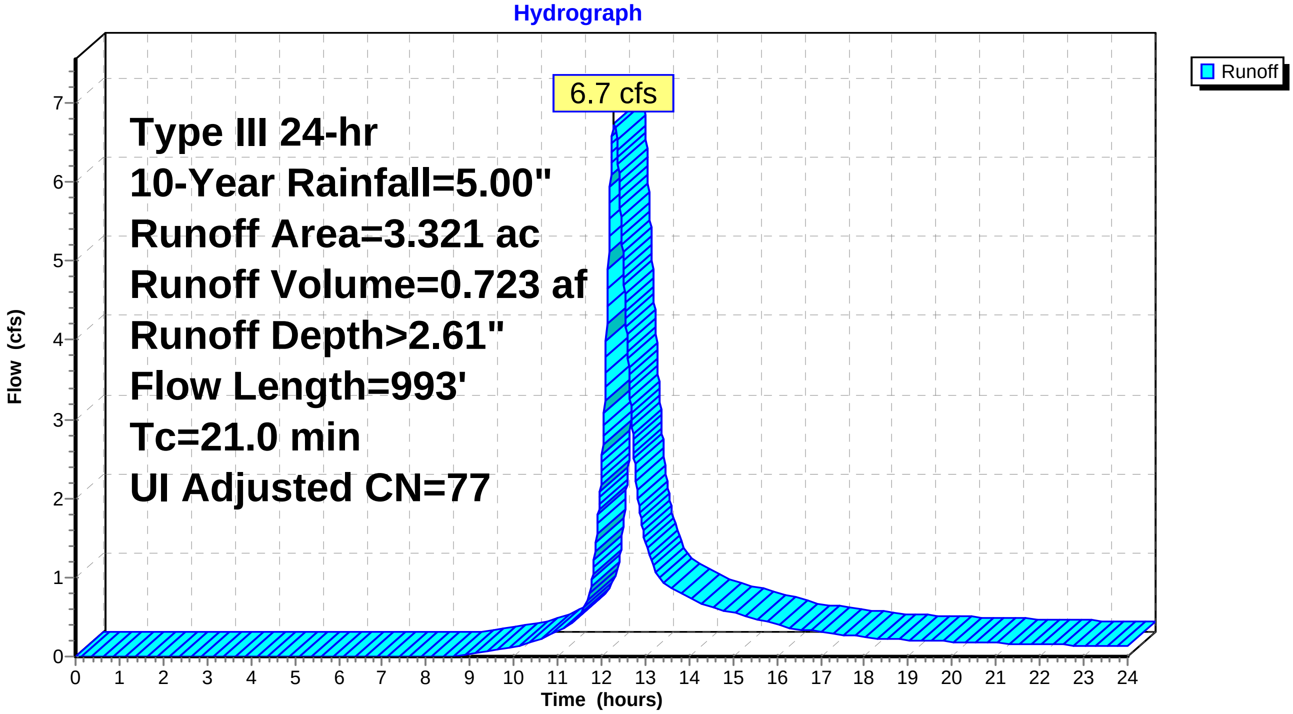
Runoff = 6.7 cfs @ 12.30 hrs, Volume= 0.723 af, Depth> 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=5.00"

	Area (ac)	CN	Adj	Description
	0.229	70		Woods, Good, HSG C
	0.134	98		Unconnected roofs, HSG C
	0.720	82		Farmsteads, HSG C
*	1.865	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.373	87		Dirt roads, HSG C
	3.321	78	77	Weighted Average, UI Adjusted
	3.187			95.97% Pervious Area
	0.134			4.03% Impervious Area
	0.134			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	66	0.0189	0.11		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
0.4	34	0.0267	1.28		**Sheet Flow, Dirt** Smooth surfaces n= 0.011 P2= 3.40"
0.5	109	0.0619	4.01		**Shallow Concentrated Flow, Dirt** Unpaved Kv= 16.1 fps
3.9	252	0.0238	1.08		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.0	114	0.0351	0.94		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.2	296	0.0473	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.8	122	0.1475	2.69		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
21.0	993	Total			

Subcatchment 3S: DA-2A



Summary for Subcatchment 6S: DA-3

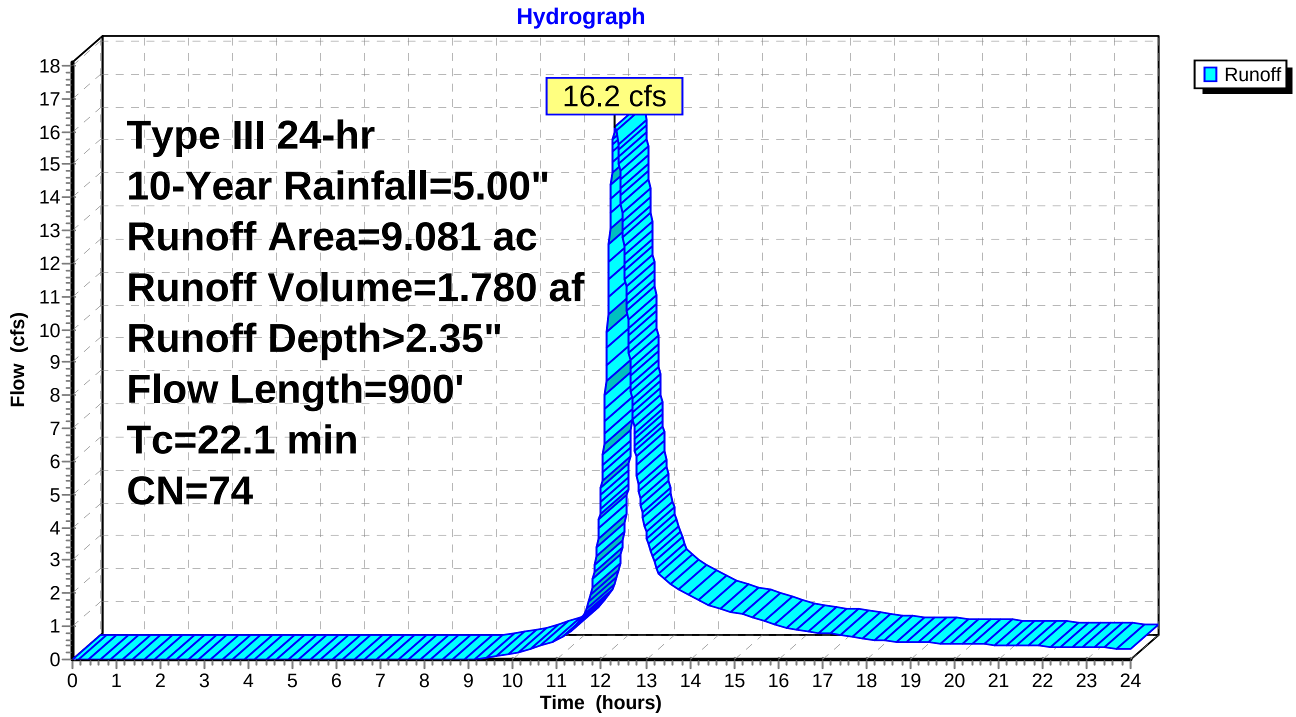
Runoff = 16.2 cfs @ 12.31 hrs, Volume= 1.780 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=5.00"

	Area (ac)	CN	Description
	0.105	98	Unconnected roofs, HSG C
	0.523	70	Woods, Good, HSG C
	0.958	74	>75% Grass cover, Good, HSG C
	0.240	87	Dirt roads, HSG C
*	7.255	74	Solar Arrays, >75% Grass cover, Good, HSG C
	9.081	74	Weighted Average
	8.976		98.84% Pervious Area
	0.105		1.16% Impervious Area
	0.105		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
10.8	800	0.0312	1.24		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
22.1	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 12S: DA-2B

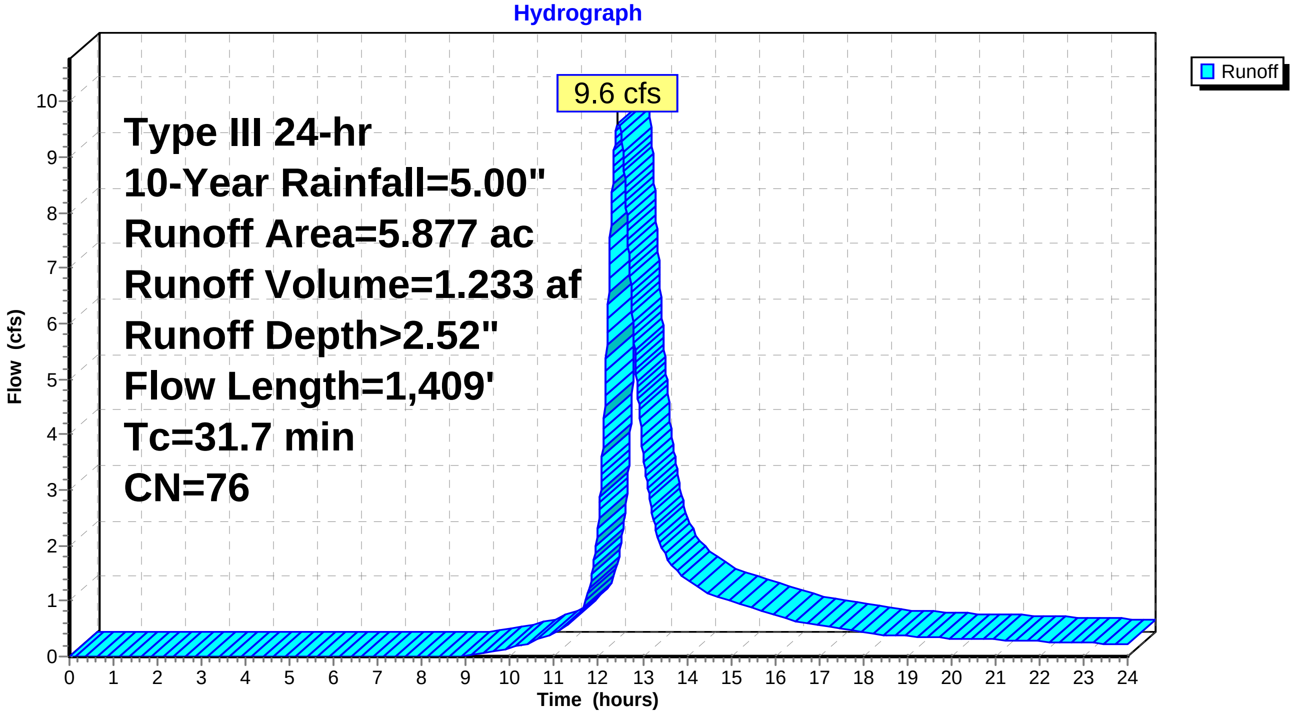
Runoff = 9.6 cfs @ 12.44 hrs, Volume= 1.233 af, Depth> 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=5.00"

	Area (ac)	CN	Description
	0.984	70	Woods, Good, HSG C
	0.027	98	Unconnected roofs, HSG C
	0.269	82	Farmsteads, HSG C
	1.131	81	Row crops, C + CR, Good, HSG C
	0.174	74	>75% Grass cover, Good, HSG C
*	3.006	74	Solar Arrays, >75% Grass cover, Good, HSG C
	0.286	87	Dirt roads, HSG C
	5.877	76	Weighted Average
	5.850		99.54% Pervious Area
	0.027		0.46% Impervious Area
	0.027		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.4	233	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
2.1	151	0.0281	1.17		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
1.2	106	0.0472	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.3	47	0.1277	2.50		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
2.2	118	0.0169	0.91		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
31.7	1,409	Total			

Subcatchment 12S: DA-2B



Summary for Pond 7P: Water Quality Basin #1

Inflow Area = 3.321 ac, 4.03% Impervious, Inflow Depth > 2.61" for 10-Year event
Inflow = 6.7 cfs @ 12.30 hrs, Volume= 0.723 af
Outflow = 6.7 cfs @ 12.30 hrs, Volume= 0.683 af, Atten= 0%, Lag= 0.2 min
Primary = 6.7 cfs @ 12.30 hrs, Volume= 0.683 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 393.07' @ 12.30 hrs Surf.Area= 2,115 sf Storage= 1,878 cf

Plug-Flow detention time= 41.0 min calculated for 0.683 af (94% of inflow)
Center-of-Mass det. time= 12.0 min (852.9 - 840.9)

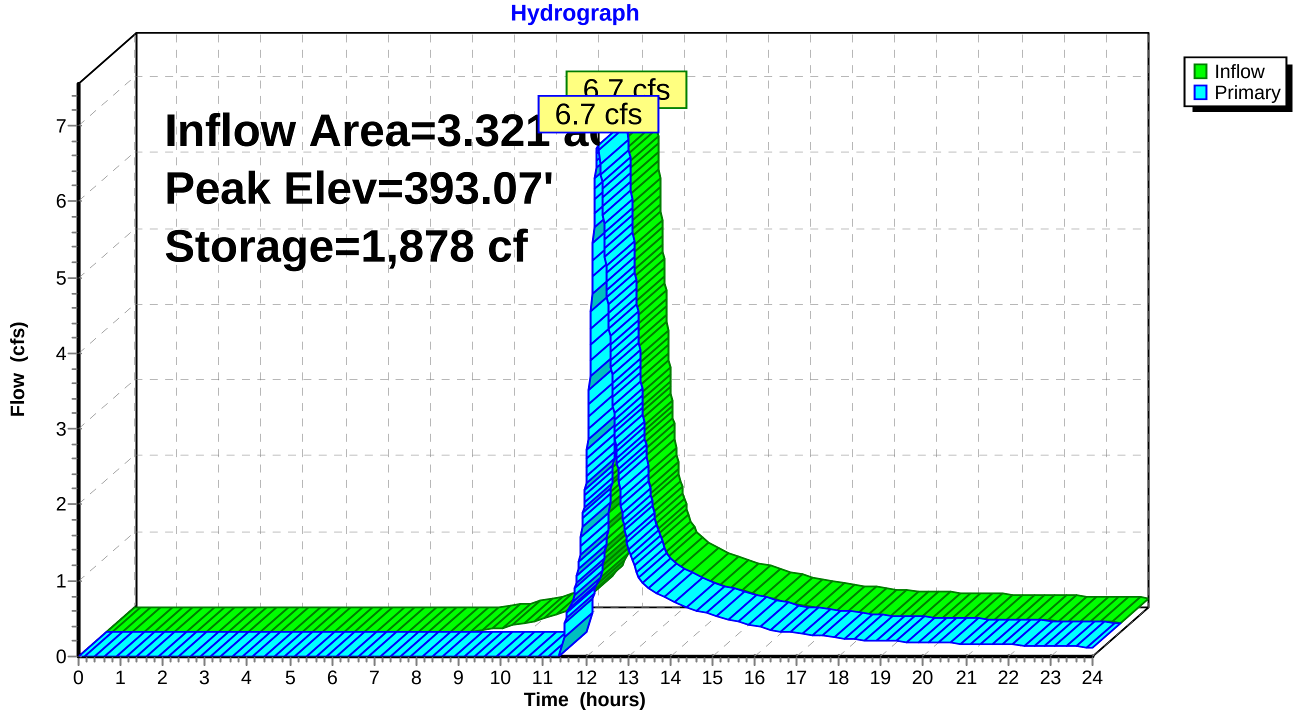
Volume	Invert	Avail.Storage	Storage Description
#1	392.00'	2,848 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
392.00	1,392	0	0
393.50	2,405	2,848	2,848

Device	Routing	Invert	Outlet Devices
#1	Primary	393.00'	**150.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=6.7 cfs @ 12.30 hrs HW=393.07' TW=0.00' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 6.7 cfs @ 0.63 fps)

Pond 7P: Water Quality Basin #1



Stage-Area-Storage for Pond 7P: Water Quality Basin #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
392.00	1,392	0	393.06	2,108	1,855
392.02	1,406	28	393.08	2,121	1,897
392.04	1,419	56	393.10	2,135	1,940
392.06	1,433	85	393.12	2,148	1,983
392.08	1,446	114	393.14	2,162	2,026
392.10	1,460	143	393.16	2,175	2,069
392.12	1,473	172	393.18	2,189	2,113
392.14	1,487	201	393.20	2,202	2,157
392.16	1,500	231	393.22	2,216	2,201
392.18	1,514	262	393.24	2,229	2,245
392.20	1,527	292	393.26	2,243	2,290
392.22	1,541	323	393.28	2,256	2,335
392.24	1,554	354	393.30	2,270	2,380
392.26	1,568	385	393.32	2,283	2,426
392.28	1,581	416	393.34	2,297	2,472
392.30	1,595	448	393.36	2,310	2,518
392.32	1,608	480	393.38	2,324	2,564
392.34	1,622	512	393.40	2,337	2,611
392.36	1,635	545	393.42	2,351	2,658
392.38	1,649	578	393.44	2,364	2,705
392.40	1,662	611	393.46	2,378	2,752
392.42	1,676	644	393.48	2,391	2,800
392.44	1,689	678	393.50	**2,405**	**2,848**
392.46	1,703	712			
392.48	1,716	746			
392.50	1,730	780			
392.52	1,743	815			
392.54	1,757	850			
392.56	1,770	885			
392.58	1,784	921			
392.60	1,797	957			
392.62	1,811	993			
392.64	1,824	1,029			
392.66	1,838	1,066			
392.68	1,851	1,103			
392.70	1,865	1,140			
392.72	1,878	1,177			
392.74	1,892	1,215			
392.76	1,905	1,253			
392.78	1,919	1,291			
392.80	1,932	1,330			
392.82	1,946	1,368			
392.84	1,959	1,408			
392.86	1,973	1,447			
392.88	1,986	1,486			
392.90	2,000	1,526			
392.92	2,013	1,566			
392.94	2,027	1,607			
392.96	2,040	1,648			
392.98	2,054	1,688			
393.00	2,067	1,730			
393.02	2,081	1,771			
393.04	2,094	1,813			

Summary for Pond 9P: Water Quality Basin #2

Inflow Area = 5.877 ac, 0.46% Impervious, Inflow Depth > 2.52" for 10-Year event
Inflow = 9.6 cfs @ 12.44 hrs, Volume= 1.233 af
Outflow = 9.6 cfs @ 12.45 hrs, Volume= 1.161 af, Atten= 0%, Lag= 0.4 min
Primary = 9.6 cfs @ 12.45 hrs, Volume= 1.161 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 387.08' @ 12.45 hrs Surf.Area= 3,574 sf Storage= 3,415 cf

Plug-Flow detention time= 42.4 min calculated for 1.160 af (94% of inflow)
Center-of-Mass det. time= 12.4 min (864.3 - 851.9)

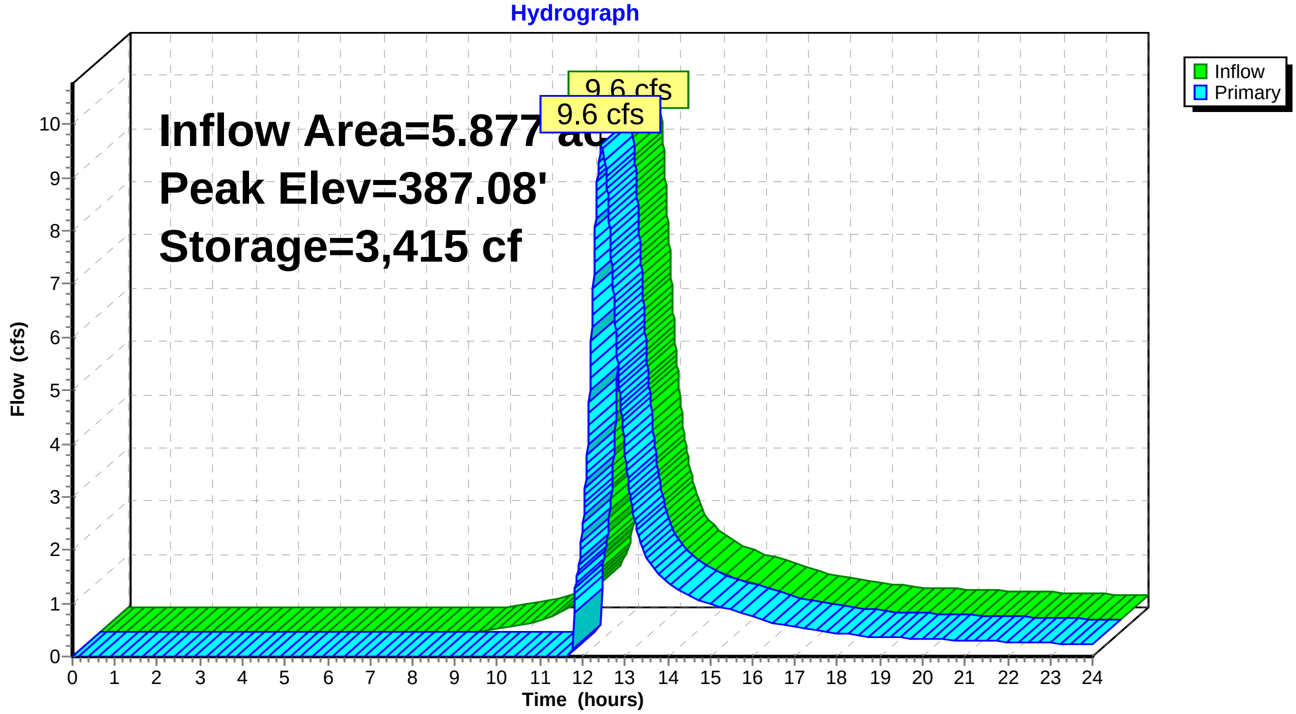
Volume	Invert	Avail.Storage	Storage Description
#1	386.00'	4,979 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
386.00	2,742	0	0
387.50	3,896	4,979	4,979

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	**175.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=9.6 cfs @ 12.45 hrs HW=387.08' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 9.6 cfs @ 0.68 fps)

Pond 9P: Water Quality Basin #2



Stage-Area-Storage for Pond 9P: Water Quality Basin #2

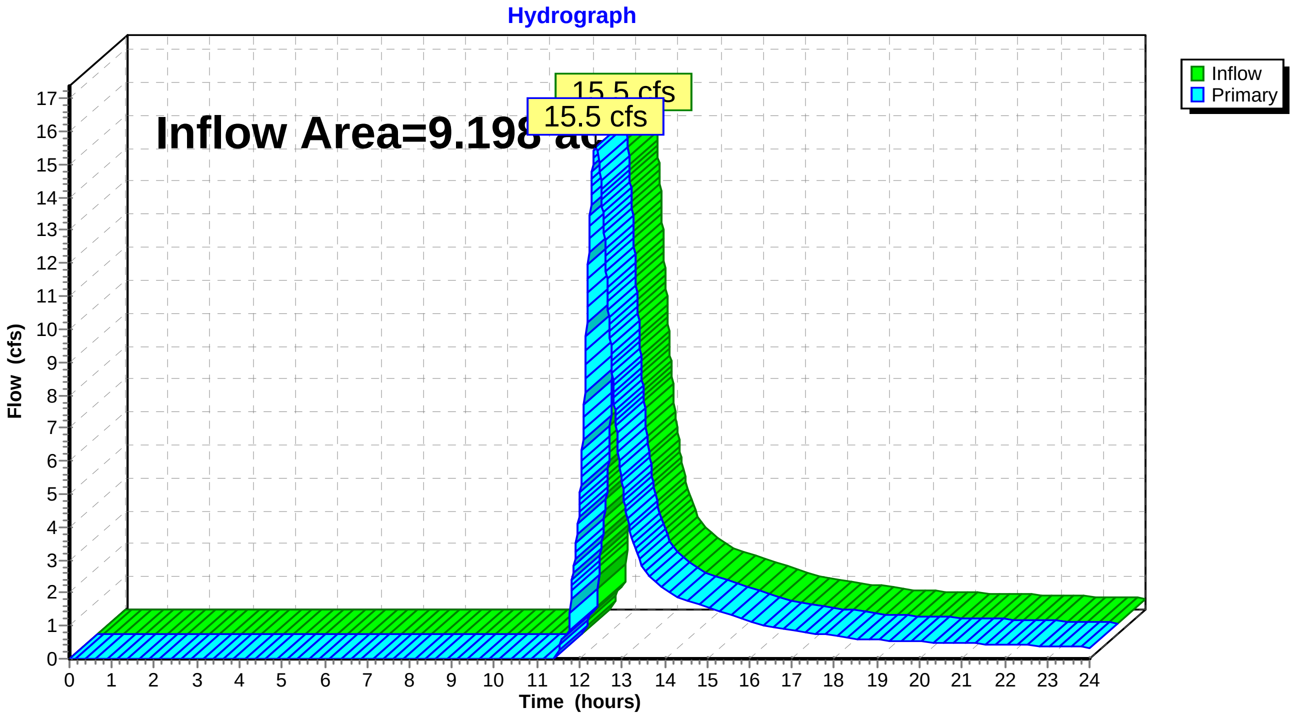
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
386.00	2,742	0
386.02	2,757	55
386.04	2,773	110
386.06	2,788	166
386.08	2,804	222
386.10	2,819	278
386.12	2,834	335
386.14	2,850	391
386.16	2,865	449
386.18	2,880	506
386.20	2,896	564
386.22	2,911	622
386.24	2,927	680
386.26	2,942	739
386.28	2,957	798
386.30	2,973	857
386.32	2,988	917
386.34	3,004	977
386.36	3,019	1,037
386.38	3,034	1,098
386.40	3,050	1,158
386.42	3,065	1,219
386.44	3,081	1,281
386.46	3,096	1,343
386.48	3,111	1,405
386.50	3,127	1,467
386.52	3,142	1,530
386.54	3,157	1,593
386.56	3,173	1,656
386.58	3,188	1,720
386.60	3,204	1,784
386.62	3,219	1,848
386.64	3,234	1,912
386.66	3,250	1,977
386.68	3,265	2,042
386.70	3,281	2,108
386.72	3,296	2,174
386.74	3,311	2,240
386.76	3,327	2,306
386.78	3,342	2,373
386.80	3,357	2,440
386.82	3,373	2,507
386.84	3,388	2,575
386.86	3,404	2,643
386.88	3,419	2,711
386.90	3,434	2,779
386.92	3,450	2,848
386.94	3,465	2,917
386.96	3,481	2,987
386.98	3,496	3,057
387.00	3,511	3,127
387.02	3,527	3,197
387.04	3,542	3,268
387.06	3,557	3,339
387.08	3,573	3,410
387.10	3,588	3,482
387.12	3,604	3,554
387.14	3,619	3,626
387.16	3,634	3,698
387.18	3,650	3,771
387.20	3,665	3,844
387.22	3,681	3,918
387.24	3,696	3,992
387.26	3,711	4,066
387.28	3,727	4,140
387.30	3,742	4,215
387.32	3,758	4,290
387.34	3,773	4,365
387.36	3,788	4,441
387.38	3,804	4,517
387.40	3,819	4,593
387.42	3,834	4,669
387.44	3,850	4,746
387.46	3,865	4,823
387.48	3,881	4,901
387.50	**3,896**	**4,979**

Summary for Link 2L: Sheet flow to West Wetlands

Inflow Area =	9.198 ac,	1.75% Impervious, Inflow Depth > 2.41"	for 10-Year event	
Inflow =	15.5 cfs @	12.37 hrs, Volume=	1.844 af	
Primary =	15.5 cfs @	12.37 hrs, Volume=	1.844 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 2L: Sheet flow to West Wetlands

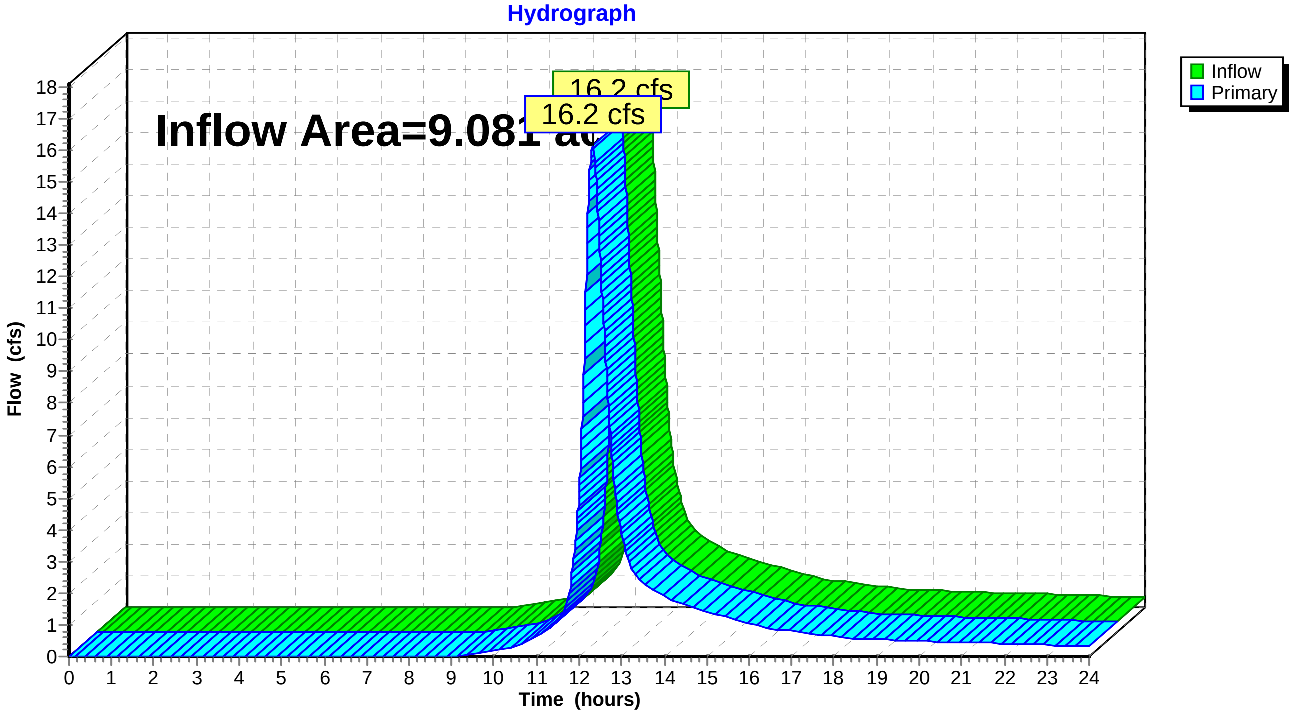


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	1.16% Impervious, Inflow Depth > 2.35"	for 10-Year event	
Inflow =	16.2 cfs @	12.31 hrs, Volume=	1.780 af	
Primary =	16.2 cfs @	12.31 hrs, Volume=	1.780 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 5L: Sheet Flow to Stott Avenue

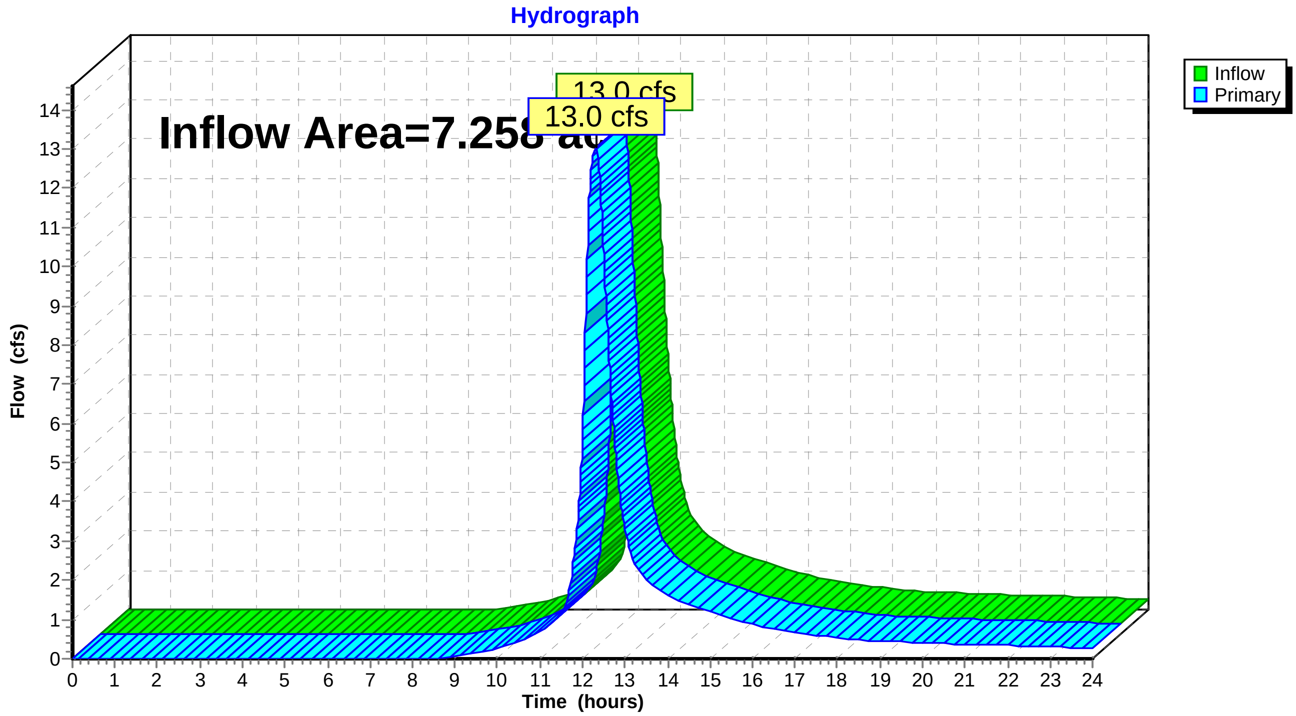


Summary for Link 6L: Sheet flow to North West

Inflow Area =	7.258 ac,	7.14% Impervious, Inflow Depth > 2.61"	for 10-Year event
Inflow =	13.0 cfs @	12.31 hrs, Volume=	1.579 af
Primary =	13.0 cfs @	12.31 hrs, Volume=	1.579 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.010 hrs, 2401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA-1A Runoff Area=5.321 ac 9.74% Impervious Runoff Depth>3.20"
Flow Length=943' Tc=24.8 min UI Adjusted CN=77 Runoff=12.3 cfs 1.420 af

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>3.21"
Flow Length=712' Tc=10.0 min CN=77 Runoff=6.4 cfs 0.518 af

Subcatchment 3S: DA-2A Runoff Area=3.321 ac 4.03% Impervious Runoff Depth>3.20"
Flow Length=993' Tc=21.0 min UI Adjusted CN=77 Runoff=8.3 cfs 0.887 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 1.16% Impervious Runoff Depth>2.92"
Flow Length=900' Tc=22.1 min CN=74 Runoff=20.2 cfs 2.210 af

Subcatchment 12S: DA-2B Runoff Area=5.877 ac 0.46% Impervious Runoff Depth>3.10"
Flow Length=1,409' Tc=31.7 min CN=76 Runoff=11.9 cfs 1.519 af

Pond 7P: Water Quality Basin #1 Peak Elev=393.08' Storage=1,901 cf Inflow=8.3 cfs 0.887 af
Outflow=8.3 cfs 0.847 af

Pond 9P: Water Quality Basin #2 Peak Elev=387.09' Storage=3,459 cf Inflow=11.9 cfs 1.519 af
Outflow=11.9 cfs 1.447 af

Link 2L: Sheet flow to West Wetlands Inflow=19.2 cfs 2.294 af
Primary=19.2 cfs 2.294 af

Link 5L: Sheet Flow to Stott Avenue Inflow=20.2 cfs 2.210 af
Primary=20.2 cfs 2.210 af

Link 6L: Sheet flow to North West Inflow=16.0 cfs 1.938 af
Primary=16.0 cfs 1.938 af

Total Runoff Area = 25.537 ac Runoff Volume = 6.555 af Average Runoff Depth = 3.08"
96.93% Pervious = 24.753 ac 3.07% Impervious = 0.784 ac

Summary for Subcatchment 1S: DA-1A

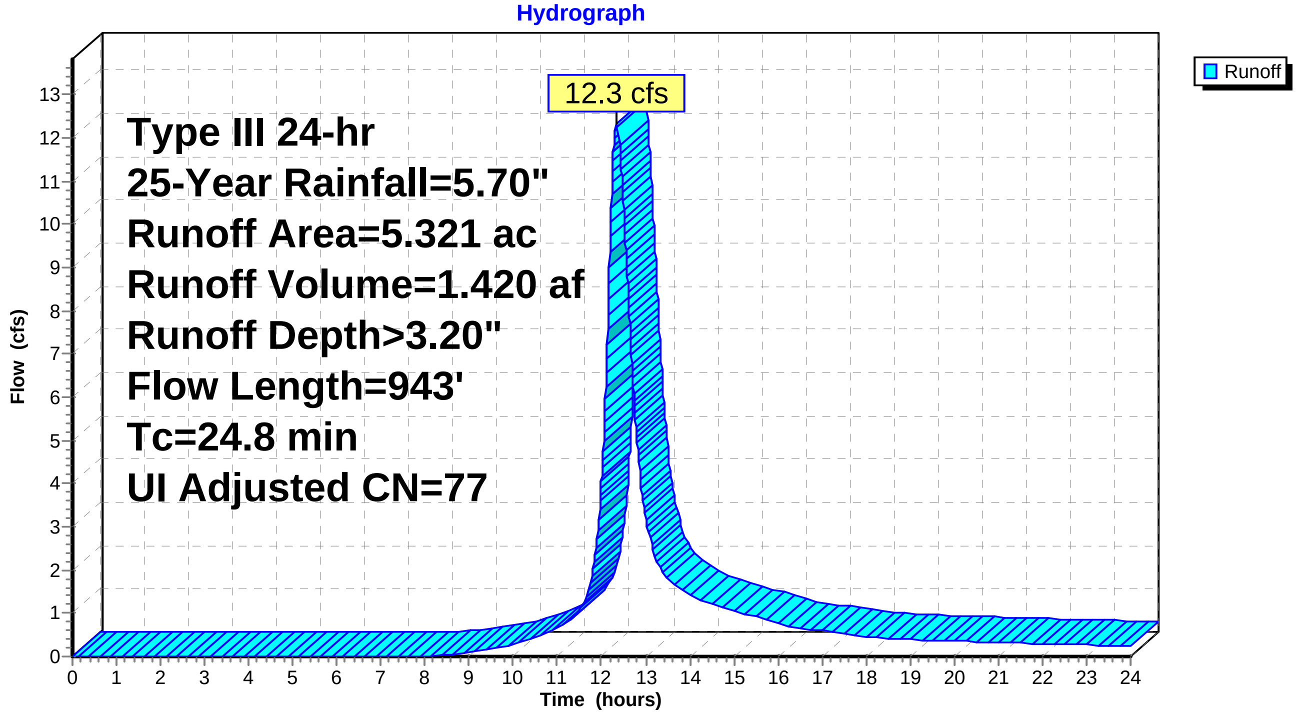
Runoff = 12.3 cfs @ 12.34 hrs, Volume= 1.420 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 25-Year Rainfall=5.70"

	Area (ac)	CN	Adj	Description
	0.518	98		Unconnected roofs, HSG C
	1.337	74		>75% Grass cover, Good, HSG C
*	2.240	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.331	74		Pasture/grassland/range, Good, HSG C
	0.895	87		Dirt roads, HSG C
	5.321	79	77	Weighted Average, UI Adjusted
	4.803			90.26% Pervious Area
	0.518			9.74% Impervious Area
	0.518			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
4.0	281	0.0285	1.18		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
0.9	110	0.0909	2.11		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
24.8	943	Total			

Subcatchment 1S: DA-1A



Summary for Subcatchment 2S: DA-1B

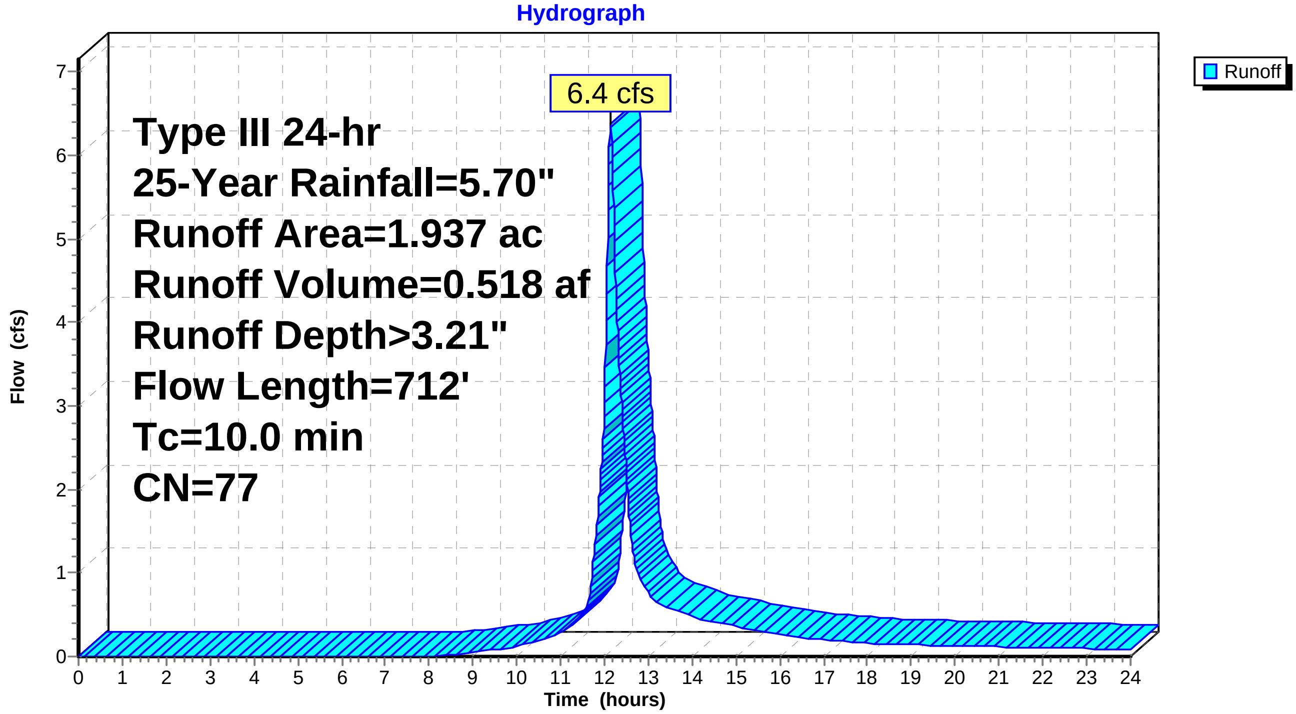
Runoff = 6.4 cfs @ 12.14 hrs, Volume= 0.518 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (ac)	CN	Description
1.231	74	>75% Grass cover, Good, HSG C
0.531	82	Farmsteads, HSG C
0.175	87	Dirt roads, HSG C
1.937	77	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2A

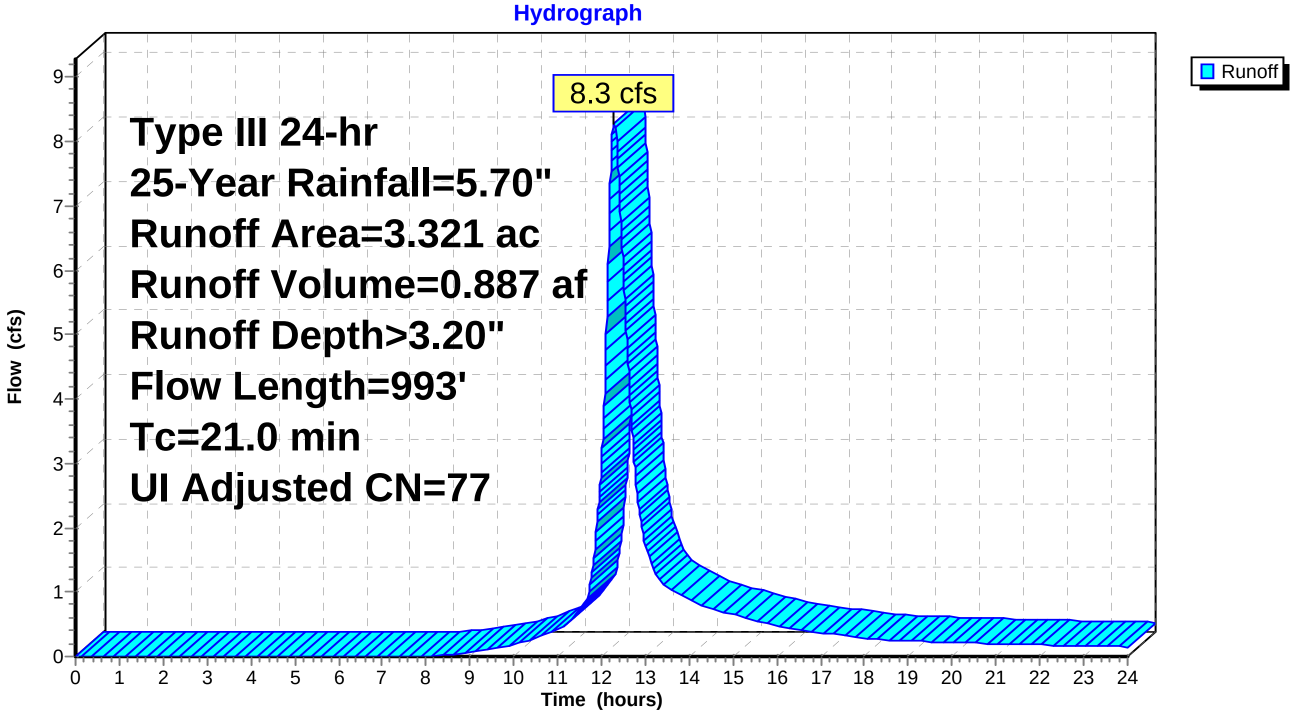
Runoff = 8.3 cfs @ 12.29 hrs, Volume= 0.887 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 25-Year Rainfall=5.70"

	Area (ac)	CN	Adj	Description
	0.229	70		Woods, Good, HSG C
	0.134	98		Unconnected roofs, HSG C
	0.720	82		Farmsteads, HSG C
*	1.865	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.373	87		Dirt roads, HSG C
	3.321	78	77	Weighted Average, UI Adjusted
	3.187			95.97% Pervious Area
	0.134			4.03% Impervious Area
	0.134			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	66	0.0189	0.11		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
0.4	34	0.0267	1.28		**Sheet Flow, Dirt** Smooth surfaces n= 0.011 P2= 3.40"
0.5	109	0.0619	4.01		**Shallow Concentrated Flow, Dirt** Unpaved Kv= 16.1 fps
3.9	252	0.0238	1.08		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.0	114	0.0351	0.94		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.2	296	0.0473	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.8	122	0.1475	2.69		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
21.0	993	Total			

Subcatchment 3S: DA-2A



Summary for Subcatchment 6S: DA-3

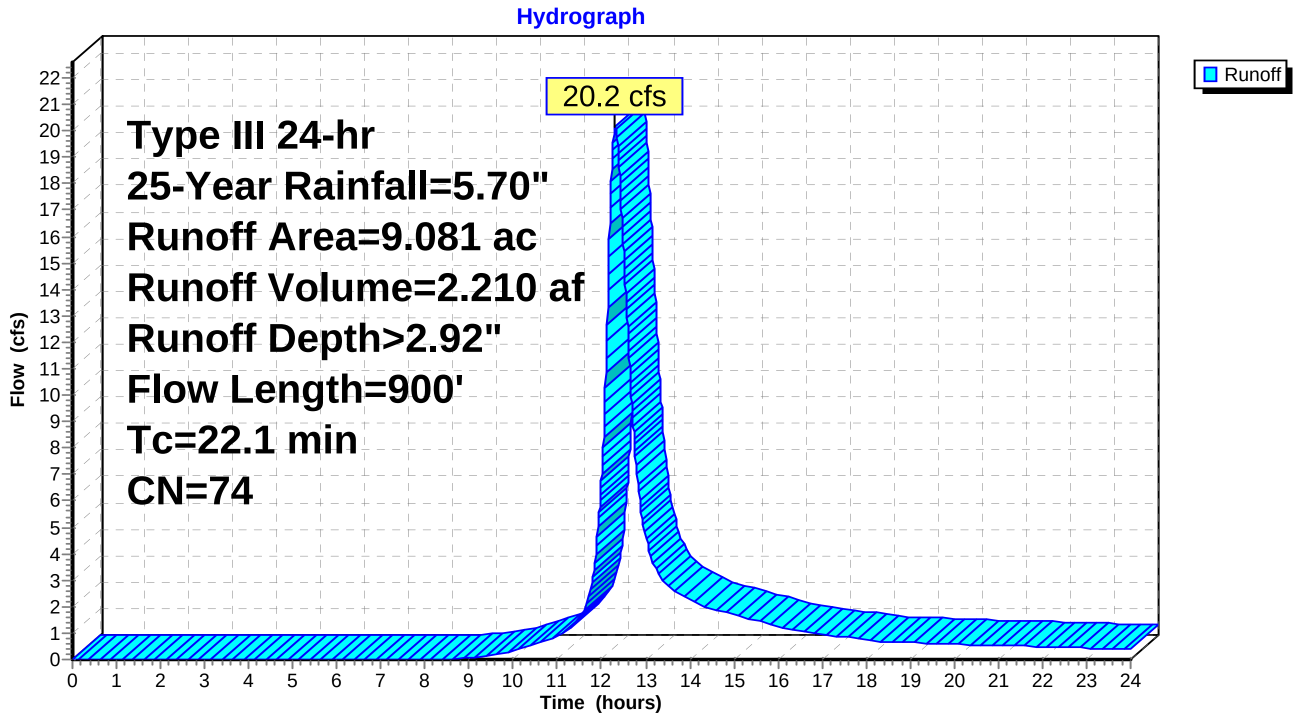
Runoff = 20.2 cfs @ 12.30 hrs, Volume= 2.210 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 25-Year Rainfall=5.70"

	Area (ac)	CN	Description
	0.105	98	Unconnected roofs, HSG C
	0.523	70	Woods, Good, HSG C
	0.958	74	>75% Grass cover, Good, HSG C
	0.240	87	Dirt roads, HSG C
*	7.255	74	Solar Arrays, >75% Grass cover, Good, HSG C
	9.081	74	Weighted Average
	8.976		98.84% Pervious Area
	0.105		1.16% Impervious Area
	0.105		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
10.8	800	0.0312	1.24		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
22.1	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 12S: DA-2B

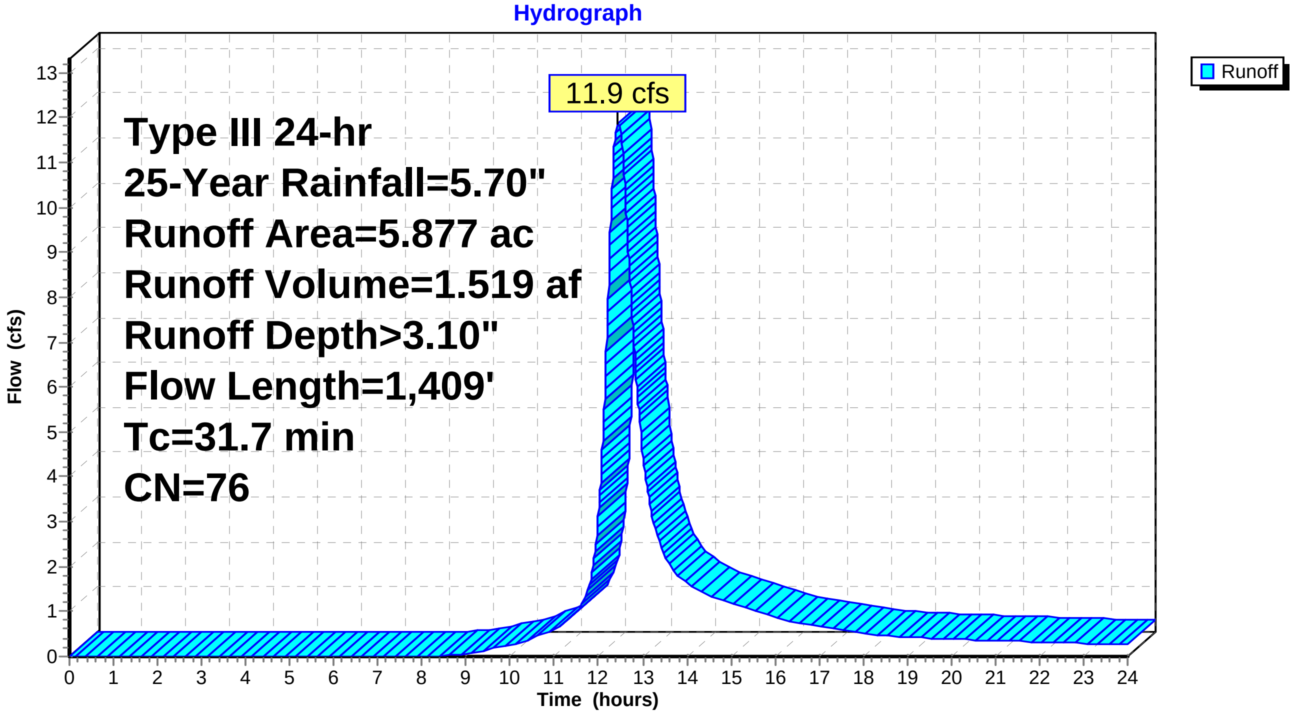
Runoff = 11.9 cfs @ 12.44 hrs, Volume= 1.519 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 25-Year Rainfall=5.70"

	Area (ac)	CN	Description
	0.984	70	Woods, Good, HSG C
	0.027	98	Unconnected roofs, HSG C
	0.269	82	Farmsteads, HSG C
	1.131	81	Row crops, C + CR, Good, HSG C
	0.174	74	>75% Grass cover, Good, HSG C
*	3.006	74	Solar Arrays, >75% Grass cover, Good, HSG C
	0.286	87	Dirt roads, HSG C
	5.877	76	Weighted Average
	5.850		99.54% Pervious Area
	0.027		0.46% Impervious Area
	0.027		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.4	233	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
2.1	151	0.0281	1.17		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
1.2	106	0.0472	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.3	47	0.1277	2.50		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
2.2	118	0.0169	0.91		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
31.7	1,409	Total			

Subcatchment 12S: DA-2B



Summary for Pond 7P: Water Quality Basin #1

Inflow Area = 3.321 ac, 4.03% Impervious, Inflow Depth > 3.20" for 25-Year event
Inflow = 8.3 cfs @ 12.29 hrs, Volume= 0.887 af
Outflow = 8.3 cfs @ 12.30 hrs, Volume= 0.847 af, Atten= 0%, Lag= 0.2 min
Primary = 8.3 cfs @ 12.30 hrs, Volume= 0.847 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 393.08' @ 12.30 hrs Surf.Area= 2,122 sf Storage= 1,901 cf

Plug-Flow detention time= 35.1 min calculated for 0.847 af (95% of inflow)
Center-of-Mass det. time= 10.8 min (846.0 - 835.1)

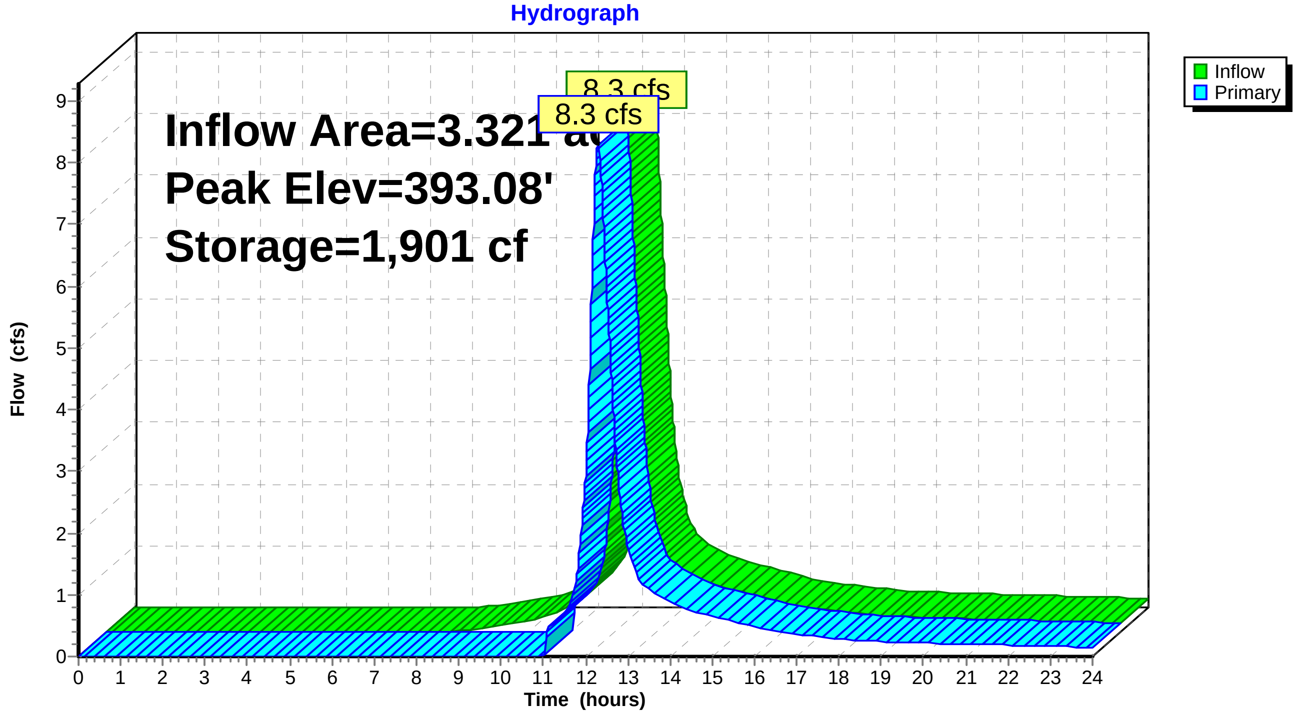
Volume	Invert	Avail.Storage	Storage Description
#1	392.00'	2,848 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
392.00	1,392	0	0
393.50	2,405	2,848	2,848

Device	Routing	Invert	Outlet Devices
#1	Primary	393.00'	**150.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=8.3 cfs @ 12.30 hrs HW=393.08' TW=0.00' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 8.3 cfs @ 0.68 fps)

Pond 7P: Water Quality Basin #1



Stage-Area-Storage for Pond 7P: Water Quality Basin #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
392.00	1,392	0	393.06	2,108	1,855
392.02	1,406	28	393.08	2,121	1,897
392.04	1,419	56	393.10	2,135	1,940
392.06	1,433	85	393.12	2,148	1,983
392.08	1,446	114	393.14	2,162	2,026
392.10	1,460	143	393.16	2,175	2,069
392.12	1,473	172	393.18	2,189	2,113
392.14	1,487	201	393.20	2,202	2,157
392.16	1,500	231	393.22	2,216	2,201
392.18	1,514	262	393.24	2,229	2,245
392.20	1,527	292	393.26	2,243	2,290
392.22	1,541	323	393.28	2,256	2,335
392.24	1,554	354	393.30	2,270	2,380
392.26	1,568	385	393.32	2,283	2,426
392.28	1,581	416	393.34	2,297	2,472
392.30	1,595	448	393.36	2,310	2,518
392.32	1,608	480	393.38	2,324	2,564
392.34	1,622	512	393.40	2,337	2,611
392.36	1,635	545	393.42	2,351	2,658
392.38	1,649	578	393.44	2,364	2,705
392.40	1,662	611	393.46	2,378	2,752
392.42	1,676	644	393.48	2,391	2,800
392.44	1,689	678	393.50	**2,405**	**2,848**
392.46	1,703	712			
392.48	1,716	746			
392.50	1,730	780			
392.52	1,743	815			
392.54	1,757	850			
392.56	1,770	885			
392.58	1,784	921			
392.60	1,797	957			
392.62	1,811	993			
392.64	1,824	1,029			
392.66	1,838	1,066			
392.68	1,851	1,103			
392.70	1,865	1,140			
392.72	1,878	1,177			
392.74	1,892	1,215			
392.76	1,905	1,253			
392.78	1,919	1,291			
392.80	1,932	1,330			
392.82	1,946	1,368			
392.84	1,959	1,408			
392.86	1,973	1,447			
392.88	1,986	1,486			
392.90	2,000	1,526			
392.92	2,013	1,566			
392.94	2,027	1,607			
392.96	2,040	1,648			
392.98	2,054	1,688			
393.00	2,067	1,730			
393.02	2,081	1,771			
393.04	2,094	1,813			

Summary for Pond 9P: Water Quality Basin #2

Inflow Area = 5.877 ac, 0.46% Impervious, Inflow Depth > 3.10" for 25-Year event
Inflow = 11.9 cfs @ 12.44 hrs, Volume= 1.519 af
Outflow = 11.9 cfs @ 12.44 hrs, Volume= 1.447 af, Atten= 0%, Lag= 0.4 min
Primary = 11.9 cfs @ 12.44 hrs, Volume= 1.447 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 387.09' @ 12.44 hrs Surf.Area= 3,583 sf Storage= 3,459 cf

Plug-Flow detention time= 36.2 min calculated for 1.446 af (95% of inflow)
Center-of-Mass det. time= 11.1 min (857.2 - 846.1)

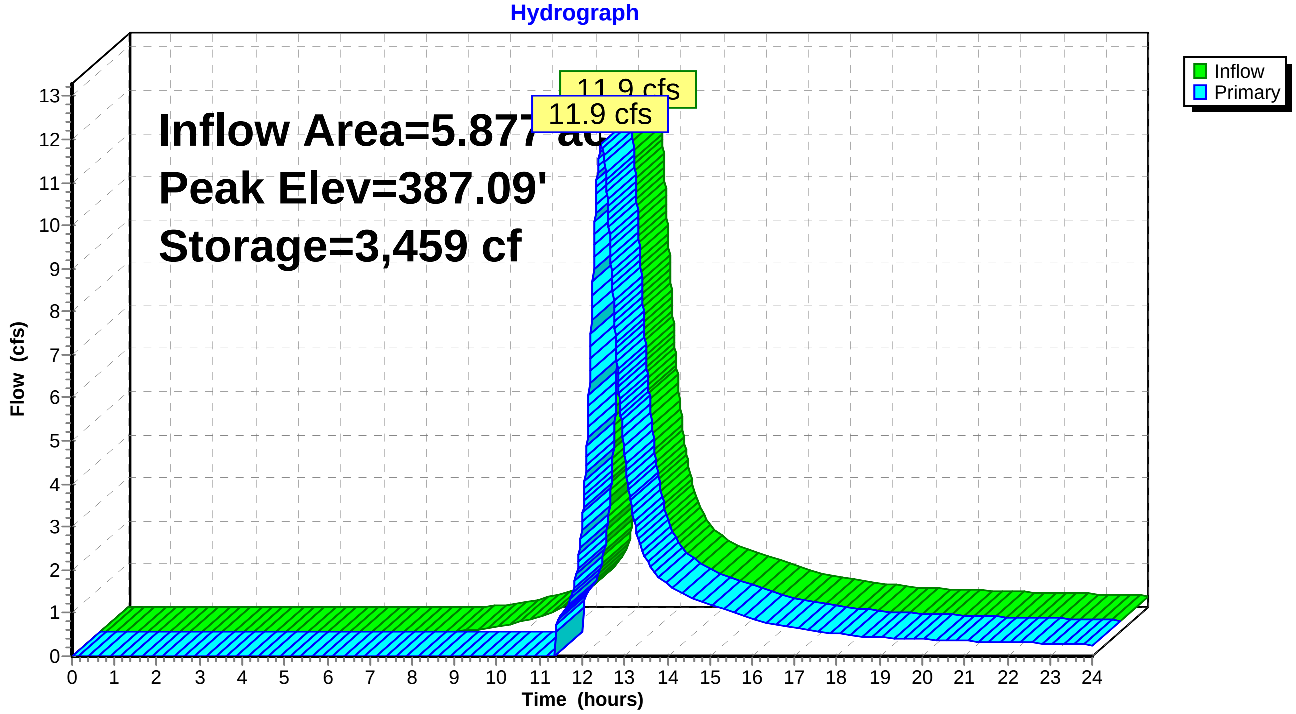
Volume	Invert	Avail.Storage	Storage Description
#1	386.00'	4,979 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
386.00	2,742	0	0
387.50	3,896	4,979	4,979

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	**175.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=11.9 cfs @ 12.44 hrs HW=387.09' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 11.9 cfs @ 0.72 fps)

Pond 9P: Water Quality Basin #2



Stage-Area-Storage for Pond 9P: Water Quality Basin #2

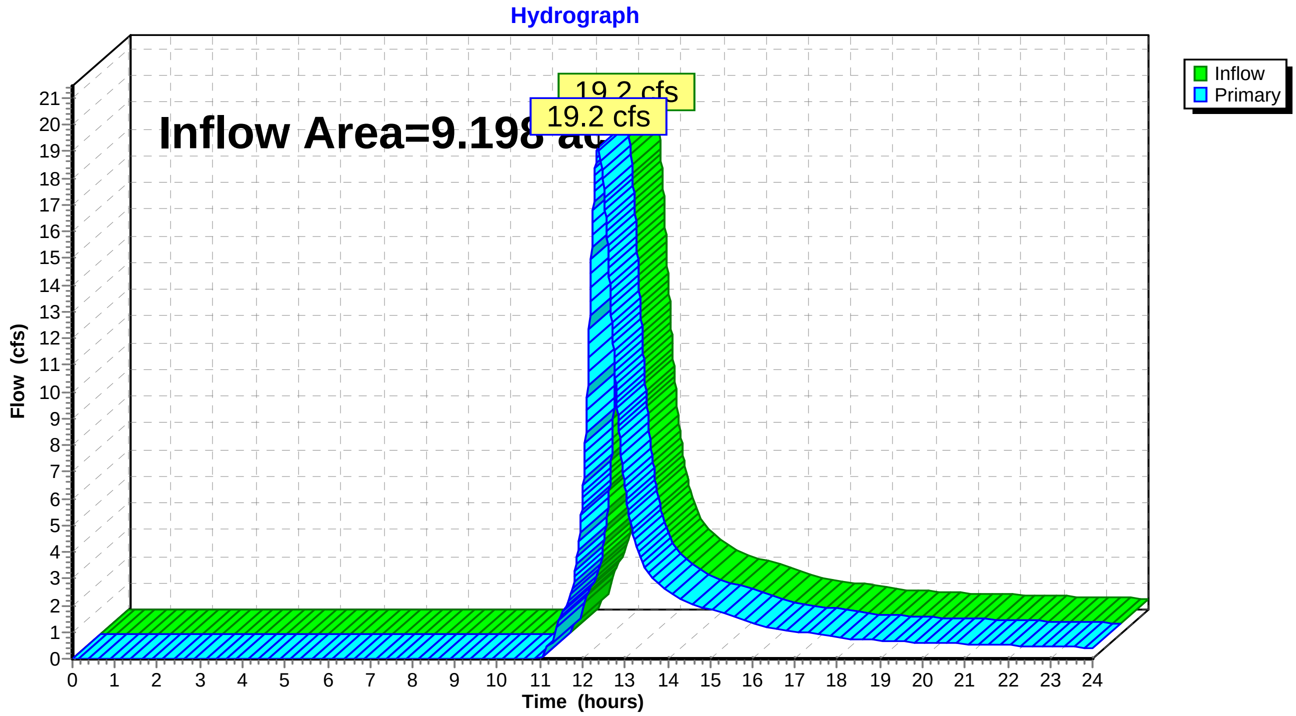
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
386.00	2,742	0
386.02	2,757	55
386.04	2,773	110
386.06	2,788	166
386.08	2,804	222
386.10	2,819	278
386.12	2,834	335
386.14	2,850	391
386.16	2,865	449
386.18	2,880	506
386.20	2,896	564
386.22	2,911	622
386.24	2,927	680
386.26	2,942	739
386.28	2,957	798
386.30	2,973	857
386.32	2,988	917
386.34	3,004	977
386.36	3,019	1,037
386.38	3,034	1,098
386.40	3,050	1,158
386.42	3,065	1,219
386.44	3,081	1,281
386.46	3,096	1,343
386.48	3,111	1,405
386.50	3,127	1,467
386.52	3,142	1,530
386.54	3,157	1,593
386.56	3,173	1,656
386.58	3,188	1,720
386.60	3,204	1,784
386.62	3,219	1,848
386.64	3,234	1,912
386.66	3,250	1,977
386.68	3,265	2,042
386.70	3,281	2,108
386.72	3,296	2,174
386.74	3,311	2,240
386.76	3,327	2,306
386.78	3,342	2,373
386.80	3,357	2,440
386.82	3,373	2,507
386.84	3,388	2,575
386.86	3,404	2,643
386.88	3,419	2,711
386.90	3,434	2,779
386.92	3,450	2,848
386.94	3,465	2,917
386.96	3,481	2,987
386.98	3,496	3,057
387.00	3,511	3,127
387.02	3,527	3,197
387.04	3,542	3,268
387.06	3,557	3,339
387.08	3,573	3,410
387.10	3,588	3,482
387.12	3,604	3,554
387.14	3,619	3,626
387.16	3,634	3,698
387.18	3,650	3,771
387.20	3,665	3,844
387.22	3,681	3,918
387.24	3,696	3,992
387.26	3,711	4,066
387.28	3,727	4,140
387.30	3,742	4,215
387.32	3,758	4,290
387.34	3,773	4,365
387.36	3,788	4,441
387.38	3,804	4,517
387.40	3,819	4,593
387.42	3,834	4,669
387.44	3,850	4,746
387.46	3,865	4,823
387.48	3,881	4,901
387.50	**3,896**	**4,979**

Summary for Link 2L: Sheet flow to West Wetlands

Inflow Area =	9.198 ac,	1.75% Impervious, Inflow Depth > 2.99"	for 25-Year event	
Inflow =	19.2 cfs @	12.37 hrs, Volume=	2.294 af	
Primary =	19.2 cfs @	12.37 hrs, Volume=	2.294 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 2L: Sheet flow to West Wetlands

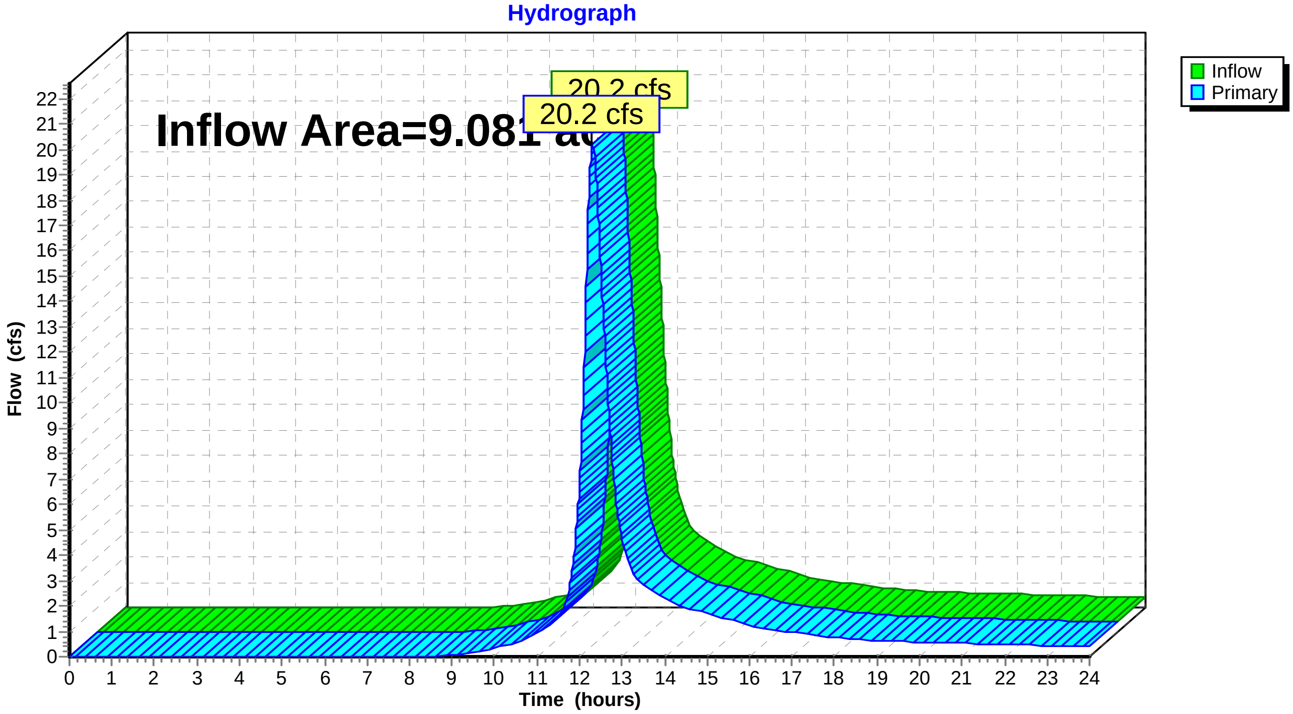


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	1.16% Impervious,	Inflow Depth > 2.92"	for 25-Year event	
Inflow =	20.2 cfs @	12.30 hrs,	Volume=	2.210 af	
Primary =	20.2 cfs @	12.30 hrs,	Volume=	2.210 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 5L: Sheet Flow to Stott Avenue

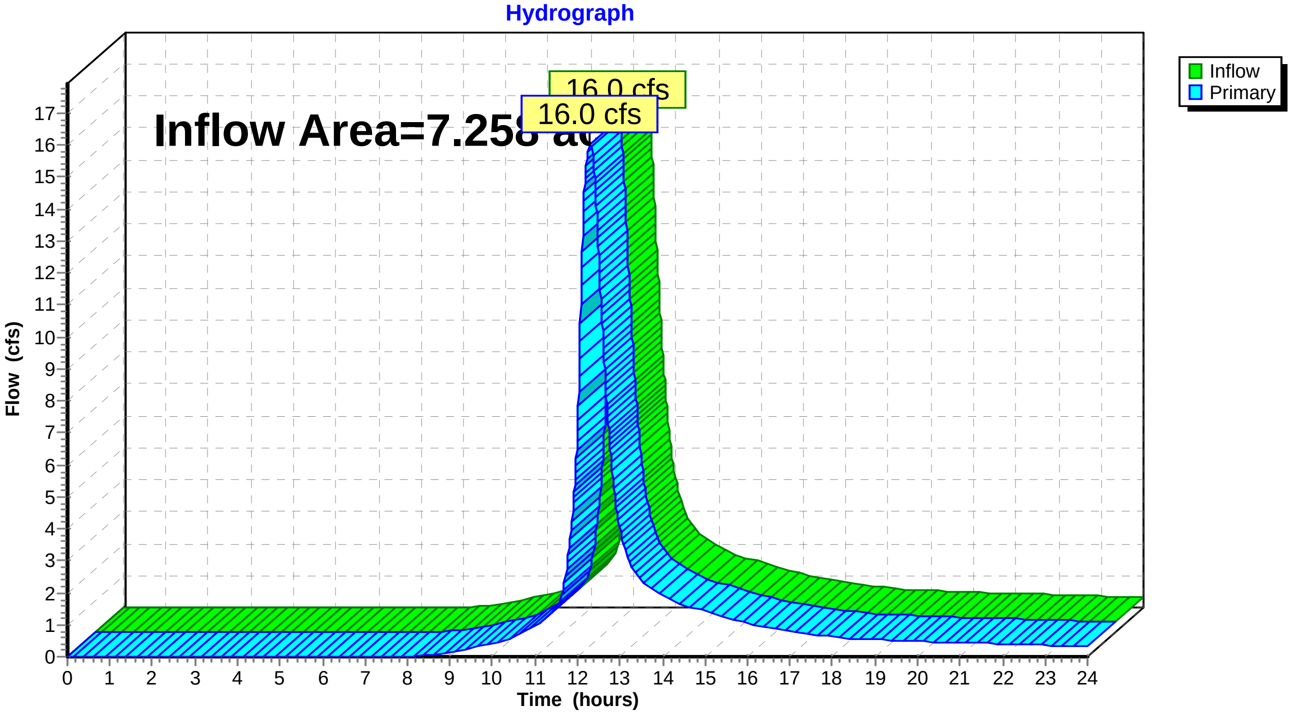


Summary for Link 6L: Sheet flow to North West

Inflow Area =	7.258 ac,	7.14% Impervious, Inflow Depth > 3.20"	for 25-Year event	
Inflow =	16.0 cfs @	12.30 hrs, Volume=	1.938 af	
Primary =	16.0 cfs @	12.30 hrs, Volume=	1.938 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.010 hrs, 2401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA-1A Runoff Area=5.321 ac 9.74% Impervious Runoff Depth>3.72"
Flow Length=943' Tc=24.8 min UI Adjusted CN=77 Runoff=14.4 cfs 1.651 af

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>3.74"
Flow Length=712' Tc=10.0 min CN=77 Runoff=7.4 cfs 0.603 af

Subcatchment 3S: DA-2A Runoff Area=3.321 ac 4.03% Impervious Runoff Depth>3.73"
Flow Length=993' Tc=21.0 min UI Adjusted CN=77 Runoff=9.6 cfs 1.031 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 1.16% Impervious Runoff Depth>3.42"
Flow Length=900' Tc=22.1 min CN=74 Runoff=23.7 cfs 2.590 af

Subcatchment 12S: DA-2B Runoff Area=5.877 ac 0.46% Impervious Runoff Depth>3.62"
Flow Length=1,409' Tc=31.7 min CN=76 Runoff=13.9 cfs 1.771 af

Pond 7P: Water Quality Basin #1 Peak Elev=393.09' Storage=1,919 cf Inflow=9.6 cfs 1.031 af
Outflow=9.6 cfs 0.991 af

Pond 9P: Water Quality Basin #2 Peak Elev=387.10' Storage=3,495 cf Inflow=13.9 cfs 1.771 af
Outflow=13.8 cfs 1.699 af

Link 2L: Sheet flow to West Wetlands Inflow=22.3 cfs 2.690 af
Primary=22.3 cfs 2.690 af

Link 5L: Sheet Flow to Stott Avenue Inflow=23.7 cfs 2.590 af
Primary=23.7 cfs 2.590 af

Link 6L: Sheet flow to North West Inflow=18.6 cfs 2.254 af
Primary=18.6 cfs 2.254 af

Total Runoff Area = 25.537 ac Runoff Volume = 7.647 af Average Runoff Depth = 3.59"
96.93% Pervious = 24.753 ac 3.07% Impervious = 0.784 ac

Summary for Subcatchment 1S: DA-1A

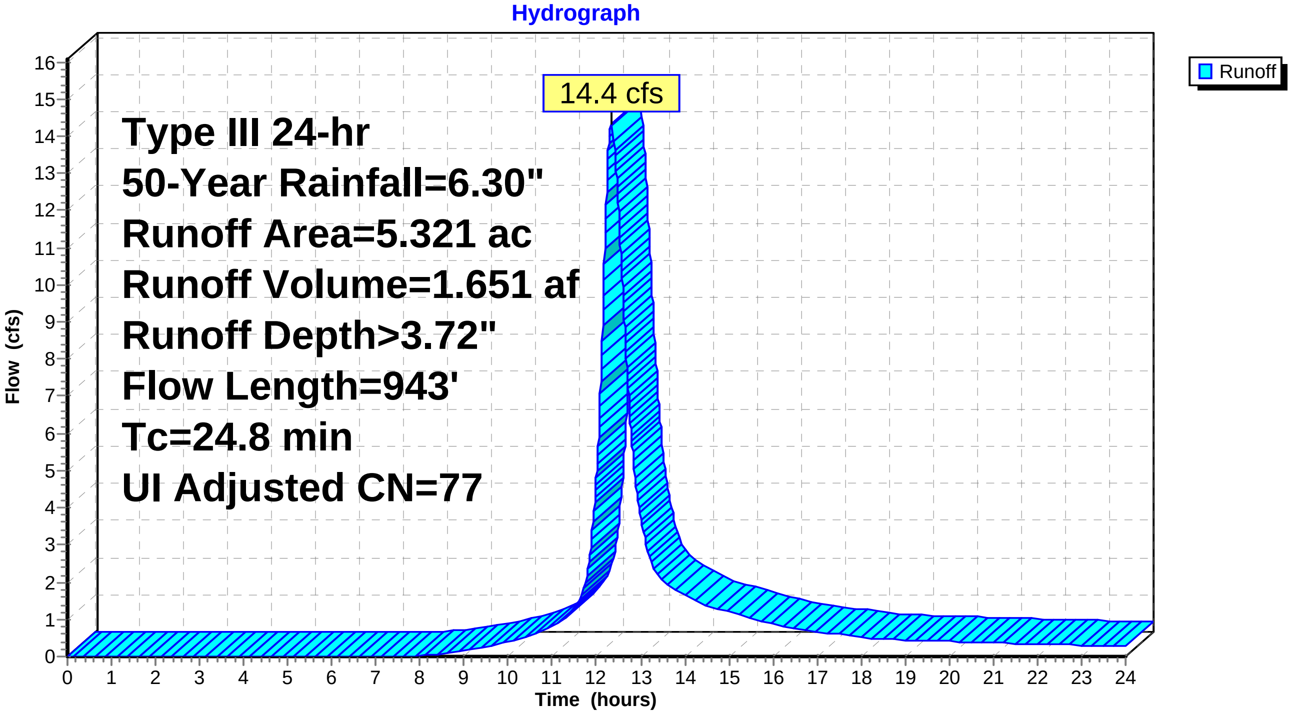
Runoff = 14.4 cfs @ 12.34 hrs, Volume= 1.651 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 50-Year Rainfall=6.30"

	Area (ac)	CN	Adj	Description
	0.518	98		Unconnected roofs, HSG C
	1.337	74		>75% Grass cover, Good, HSG C
*	2.240	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.331	74		Pasture/grassland/range, Good, HSG C
	0.895	87		Dirt roads, HSG C
	5.321	79	77	Weighted Average, UI Adjusted
	4.803			90.26% Pervious Area
	0.518			9.74% Impervious Area
	0.518			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
4.0	281	0.0285	1.18		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
0.9	110	0.0909	2.11		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
24.8	943	Total			

Subcatchment 1S: DA-1A



Summary for Subcatchment 2S: DA-1B

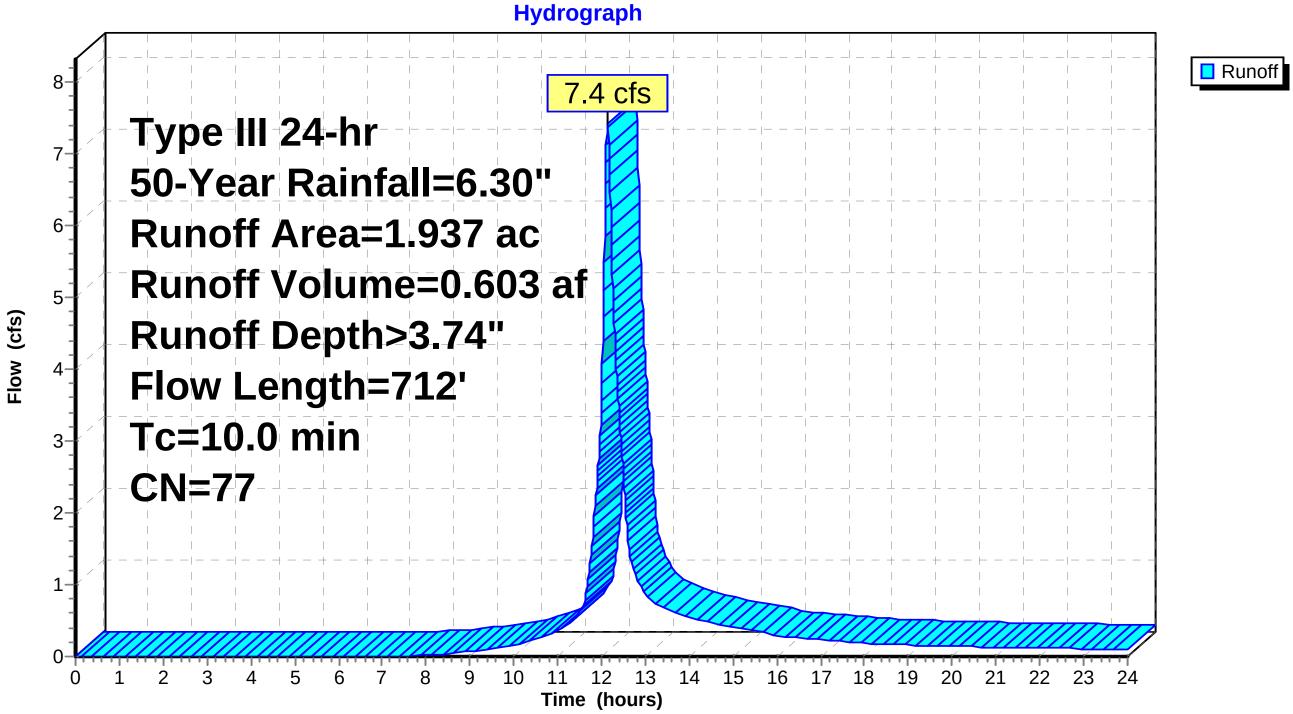
Runoff = 7.4 cfs @ 12.14 hrs, Volume= 0.603 af, Depth> 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (ac)	CN	Description
1.231	74	>75% Grass cover, Good, HSG C
0.531	82	Farmsteads, HSG C
0.175	87	Dirt roads, HSG C
1.937	77	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2A

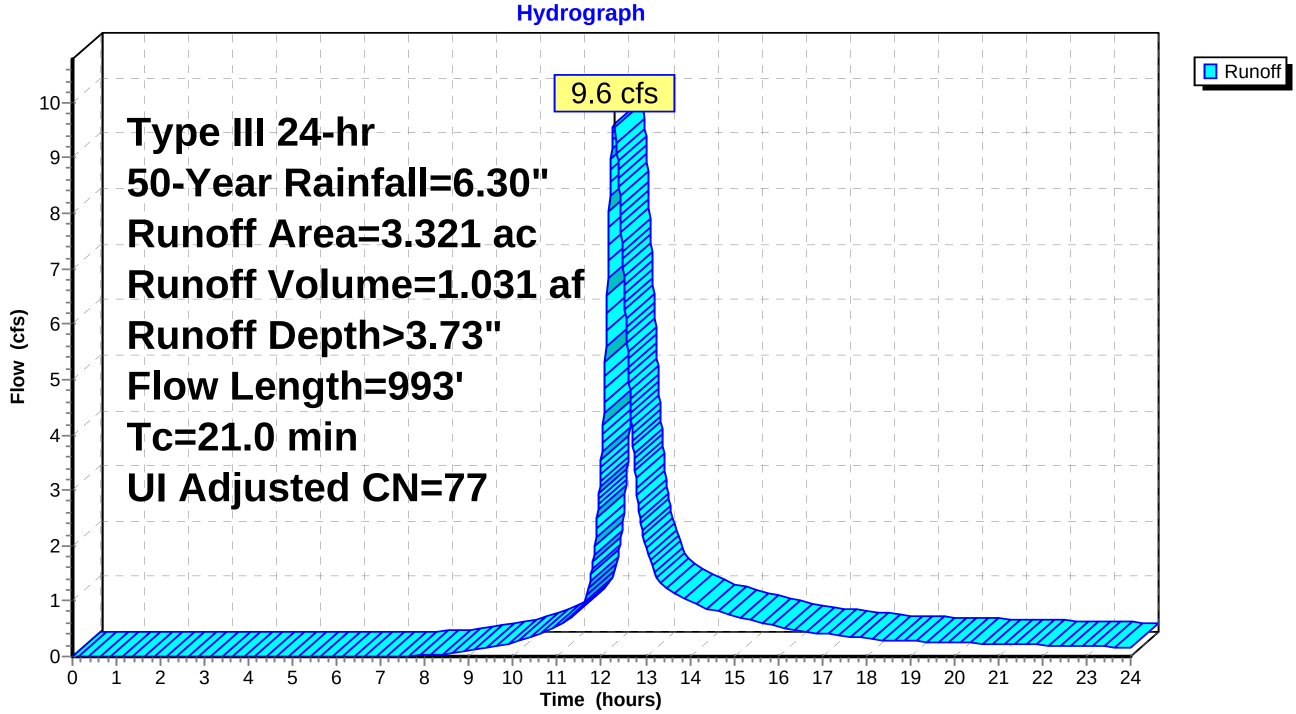
Runoff = 9.6 cfs @ 12.29 hrs, Volume= 1.031 af, Depth> 3.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 50-Year Rainfall=6.30"

	Area (ac)	CN	Adj	Description
	0.229	70		Woods, Good, HSG C
	0.134	98		Unconnected roofs, HSG C
	0.720	82		Farmsteads, HSG C
*	1.865	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.373	87		Dirt roads, HSG C
	3.321	78	77	Weighted Average, UI Adjusted
	3.187			95.97% Pervious Area
	0.134			4.03% Impervious Area
	0.134			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	66	0.0189	0.11		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
0.4	34	0.0267	1.28		**Sheet Flow, Dirt** Smooth surfaces n= 0.011 P2= 3.40"
0.5	109	0.0619	4.01		**Shallow Concentrated Flow, Dirt** Unpaved Kv= 16.1 fps
3.9	252	0.0238	1.08		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.0	114	0.0351	0.94		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.2	296	0.0473	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.8	122	0.1475	2.69		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
21.0	993	Total			

Subcatchment 3S: DA-2A



Summary for Subcatchment 6S: DA-3

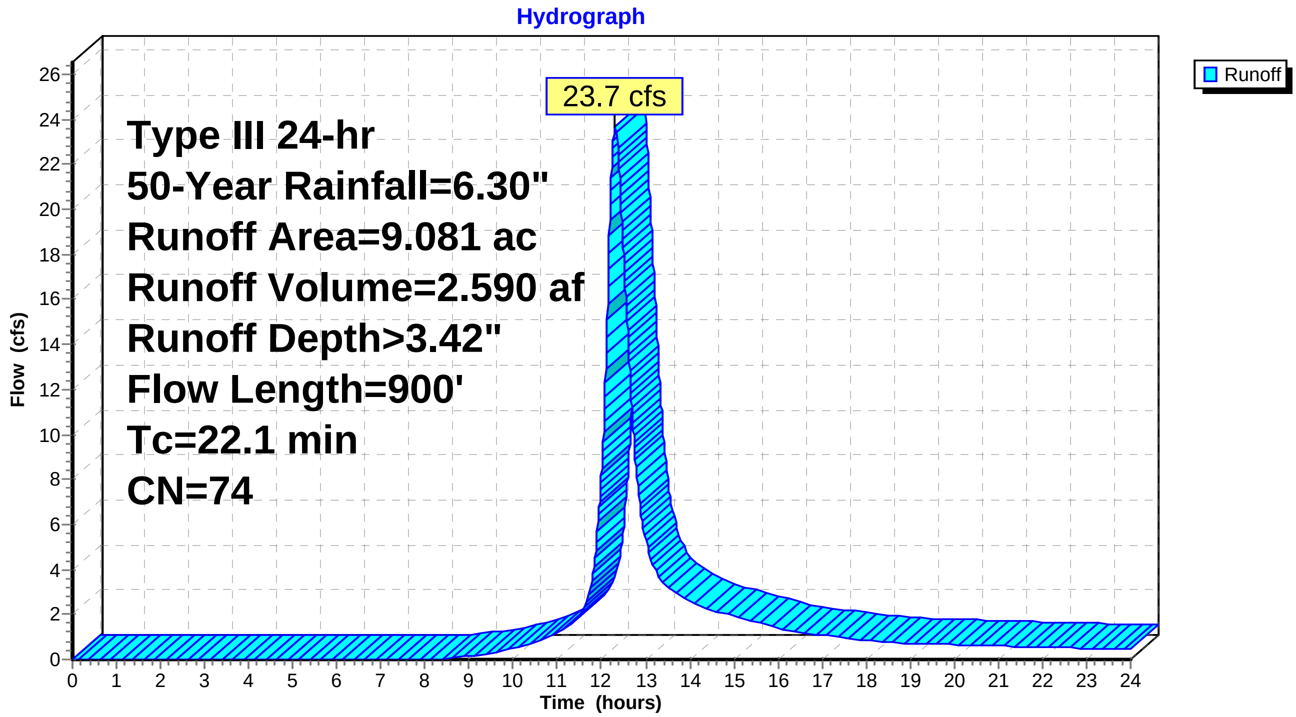
Runoff = 23.7 cfs @ 12.30 hrs, Volume= 2.590 af, Depth> 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 50-Year Rainfall=6.30"

	Area (ac)	CN	Description
	0.105	98	Unconnected roofs, HSG C
	0.523	70	Woods, Good, HSG C
	0.958	74	>75% Grass cover, Good, HSG C
	0.240	87	Dirt roads, HSG C
*	7.255	74	Solar Arrays, >75% Grass cover, Good, HSG C
	9.081	74	Weighted Average
	8.976		98.84% Pervious Area
	0.105		1.16% Impervious Area
	0.105		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
10.8	800	0.0312	1.24		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
22.1	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 12S: DA-2B

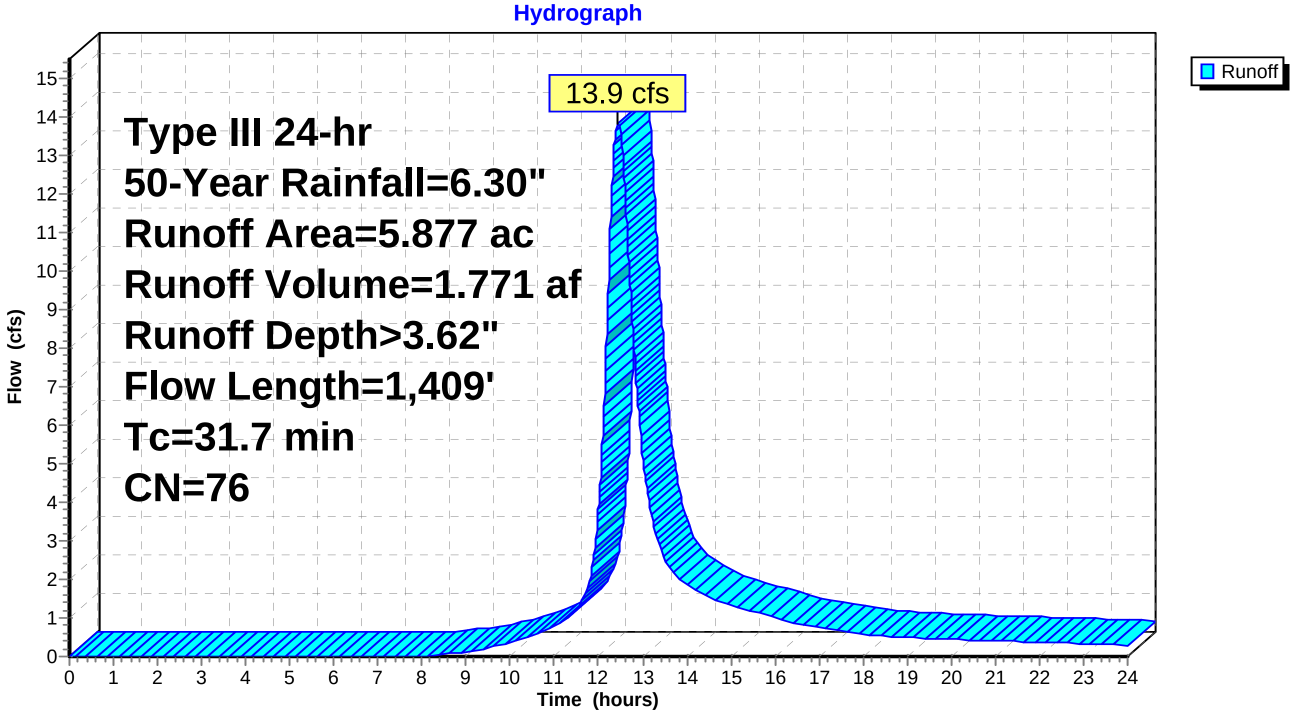
Runoff = 13.9 cfs @ 12.44 hrs, Volume= 1.771 af, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 50-Year Rainfall=6.30"

	Area (ac)	CN	Description
	0.984	70	Woods, Good, HSG C
	0.027	98	Unconnected roofs, HSG C
	0.269	82	Farmsteads, HSG C
	1.131	81	Row crops, C + CR, Good, HSG C
	0.174	74	>75% Grass cover, Good, HSG C
*	3.006	74	Solar Arrays, >75% Grass cover, Good, HSG C
	0.286	87	Dirt roads, HSG C
	5.877	76	Weighted Average
	5.850		99.54% Pervious Area
	0.027		0.46% Impervious Area
	0.027		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.4	233	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
2.1	151	0.0281	1.17		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
1.2	106	0.0472	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.3	47	0.1277	2.50		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
2.2	118	0.0169	0.91		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
31.7	1,409	Total			

Subcatchment 12S: DA-2B



Summary for Pond 7P: Water Quality Basin #1

Inflow Area = 3.321 ac, 4.03% Impervious, Inflow Depth > 3.73" for 50-Year event
Inflow = 9.6 cfs @ 12.29 hrs, Volume= 1.031 af
Outflow = 9.6 cfs @ 12.30 hrs, Volume= 0.991 af, Atten= 0%, Lag= 0.2 min
Primary = 9.6 cfs @ 12.30 hrs, Volume= 0.991 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 393.09' @ 12.30 hrs Surf.Area= 2,128 sf Storage= 1,919 cf

Plug-Flow detention time= 31.4 min calculated for 0.991 af (96% of inflow)
Center-of-Mass det. time= 10.1 min (840.9 - 830.9)

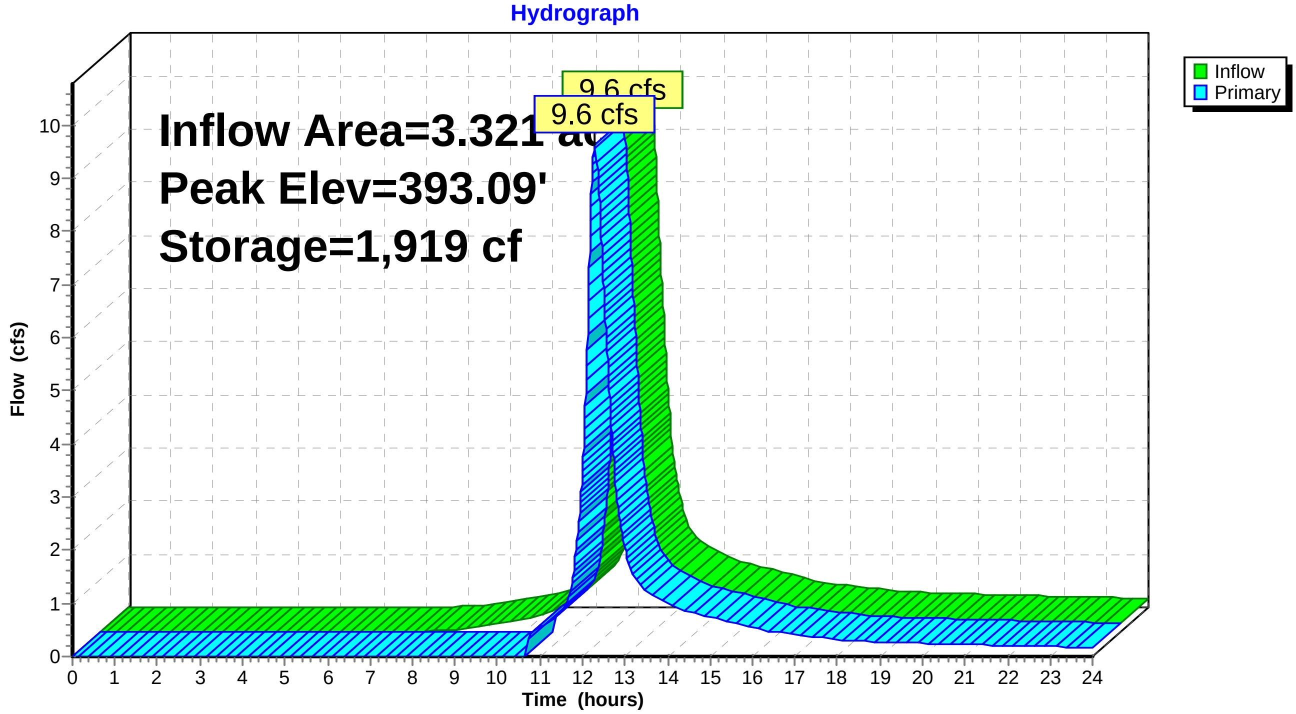
Volume	Invert	Avail.Storage	Storage Description
#1	392.00'	2,848 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
392.00	1,392	0	0
393.50	2,405	2,848	2,848

Device	Routing	Invert	Outlet Devices
#1	Primary	393.00'	**150.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=9.6 cfs @ 12.30 hrs HW=393.09' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 9.6 cfs @ 0.71 fps)

Pond 7P: Water Quality Basin #1



Stage-Area-Storage for Pond 7P: Water Quality Basin #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
392.00	1,392	0
392.02	1,406	28
392.04	1,419	56
392.06	1,433	85
392.08	1,446	114
392.10	1,460	143
392.12	1,473	172
392.14	1,487	201
392.16	1,500	231
392.18	1,514	262
392.20	1,527	292
392.22	1,541	323
392.24	1,554	354
392.26	1,568	385
392.28	1,581	416
392.30	1,595	448
392.32	1,608	480
392.34	1,622	512
392.36	1,635	545
392.38	1,649	578
392.40	1,662	611
392.42	1,676	644
392.44	1,689	678
392.46	1,703	712
392.48	1,716	746
392.50	1,730	780
392.52	1,743	815
392.54	1,757	850
392.56	1,770	885
392.58	1,784	921
392.60	1,797	957
392.62	1,811	993
392.64	1,824	1,029
392.66	1,838	1,066
392.68	1,851	1,103
392.70	1,865	1,140
392.72	1,878	1,177
392.74	1,892	1,215
392.76	1,905	1,253
392.78	1,919	1,291
392.80	1,932	1,330
392.82	1,946	1,368
392.84	1,959	1,408
392.86	1,973	1,447
392.88	1,986	1,486
392.90	2,000	1,526
392.92	2,013	1,566
392.94	2,027	1,607
392.96	2,040	1,648
392.98	2,054	1,688
393.00	2,067	1,730
393.02	2,081	1,771
393.04	2,094	1,813
393.06	2,108	1,855
393.08	2,121	1,897
393.10	2,135	1,940
393.12	2,148	1,983
393.14	2,162	2,026
393.16	2,175	2,069
393.18	2,189	2,113
393.20	2,202	2,157
393.22	2,216	2,201
393.24	2,229	2,245
393.26	2,243	2,290
393.28	2,256	2,335
393.30	2,270	2,380
393.32	2,283	2,426
393.34	2,297	2,472
393.36	2,310	2,518
393.38	2,324	2,564
393.40	2,337	2,611
393.42	2,351	2,658
393.44	2,364	2,705
393.46	2,378	2,752
393.48	2,391	2,800
393.50	**2,405**	**2,848**

Summary for Pond 9P: Water Quality Basin #2

Inflow Area = 5.877 ac, 0.46% Impervious, Inflow Depth > 3.62" for 50-Year event
Inflow = 13.9 cfs @ 12.44 hrs, Volume= 1.771 af
Outflow = 13.8 cfs @ 12.44 hrs, Volume= 1.699 af, Atten= 0%, Lag= 0.4 min
Primary = 13.8 cfs @ 12.44 hrs, Volume= 1.699 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 387.10' @ 12.44 hrs Surf.Area= 3,591 sf Storage= 3,495 cf

Plug-Flow detention time= 32.3 min calculated for 1.698 af (96% of inflow)
Center-of-Mass det. time= 10.3 min (852.1 - 841.7)

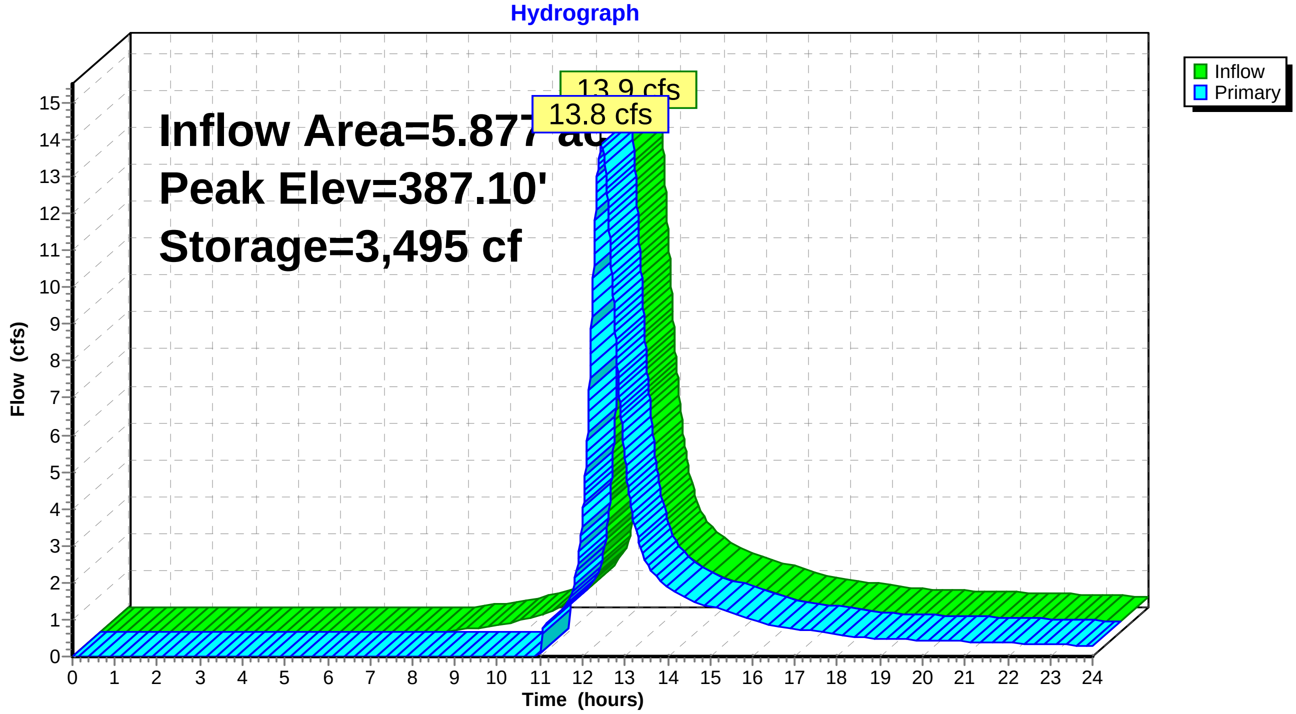
Volume	Invert	Avail.Storage	Storage Description
#1	386.00'	4,979 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
386.00	2,742	0	0
387.50	3,896	4,979	4,979

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	**175.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=13.8 cfs @ 12.44 hrs HW=387.10' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 13.8 cfs @ 0.76 fps)

Pond 9P: Water Quality Basin #2



Stage-Area-Storage for Pond 9P: Water Quality Basin #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
386.00	2,742	0
386.02	2,757	55
386.04	2,773	110
386.06	2,788	166
386.08	2,804	222
386.10	2,819	278
386.12	2,834	335
386.14	2,850	391
386.16	2,865	449
386.18	2,880	506
386.20	2,896	564
386.22	2,911	622
386.24	2,927	680
386.26	2,942	739
386.28	2,957	798
386.30	2,973	857
386.32	2,988	917
386.34	3,004	977
386.36	3,019	1,037
386.38	3,034	1,098
386.40	3,050	1,158
386.42	3,065	1,219
386.44	3,081	1,281
386.46	3,096	1,343
386.48	3,111	1,405
386.50	3,127	1,467
386.52	3,142	1,530
386.54	3,157	1,593
386.56	3,173	1,656
386.58	3,188	1,720
386.60	3,204	1,784
386.62	3,219	1,848
386.64	3,234	1,912
386.66	3,250	1,977
386.68	3,265	2,042
386.70	3,281	2,108
386.72	3,296	2,174
386.74	3,311	2,240
386.76	3,327	2,306
386.78	3,342	2,373
386.80	3,357	2,440
386.82	3,373	2,507
386.84	3,388	2,575
386.86	3,404	2,643
386.88	3,419	2,711
386.90	3,434	2,779
386.92	3,450	2,848
386.94	3,465	2,917
386.96	3,481	2,987
386.98	3,496	3,057
387.00	3,511	3,127
387.02	3,527	3,197
387.04	3,542	3,268

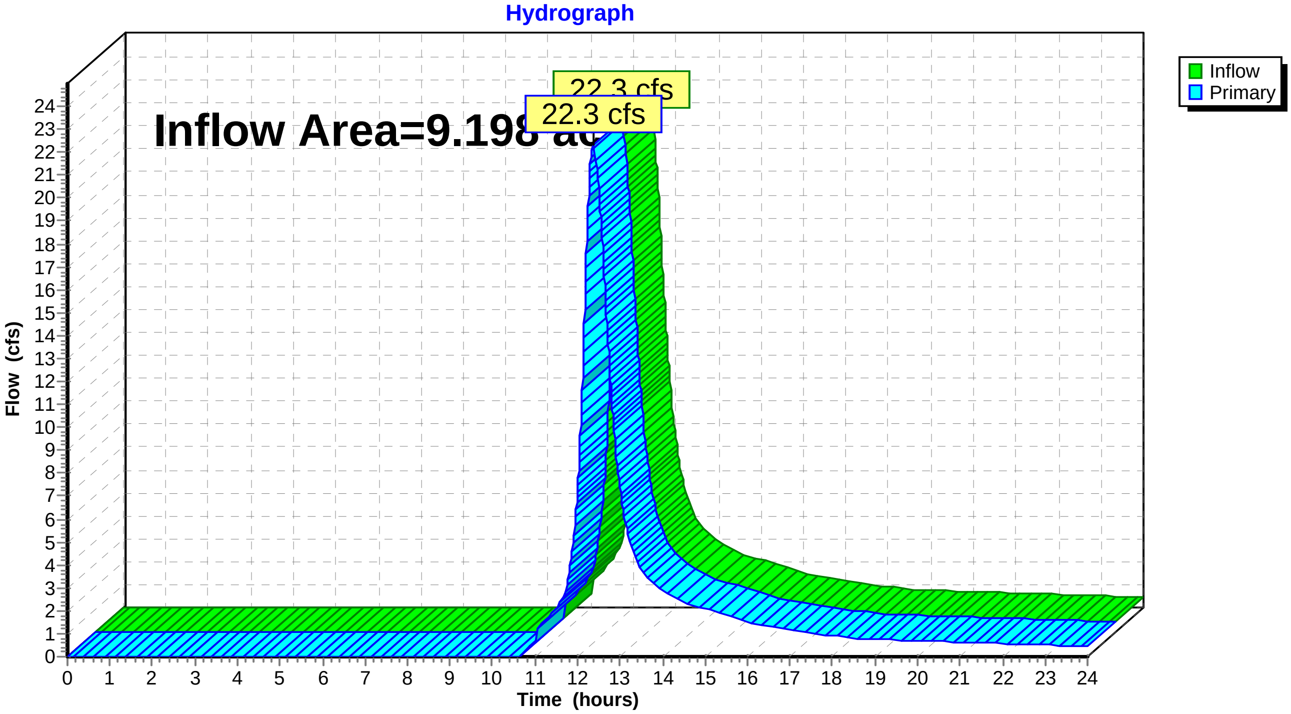
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
387.06	3,557	3,339
387.08	3,573	3,410
387.10	3,588	3,482
387.12	3,604	3,554
387.14	3,619	3,626
387.16	3,634	3,698
387.18	3,650	3,771
387.20	3,665	3,844
387.22	3,681	3,918
387.24	3,696	3,992
387.26	3,711	4,066
387.28	3,727	4,140
387.30	3,742	4,215
387.32	3,758	4,290
387.34	3,773	4,365
387.36	3,788	4,441
387.38	3,804	4,517
387.40	3,819	4,593
387.42	3,834	4,669
387.44	3,850	4,746
387.46	3,865	4,823
387.48	3,881	4,901
387.50	**3,896**	**4,979**

Summary for Link 2L: Sheet flow to West Wetlands

Inflow Area =	9.198 ac,	1.75% Impervious, Inflow Depth > 3.51"	for 50-Year event
Inflow =	22.3 cfs @	12.37 hrs, Volume=	2.690 af
Primary =	22.3 cfs @	12.37 hrs, Volume=	2.690 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 2L: Sheet flow to West Wetlands

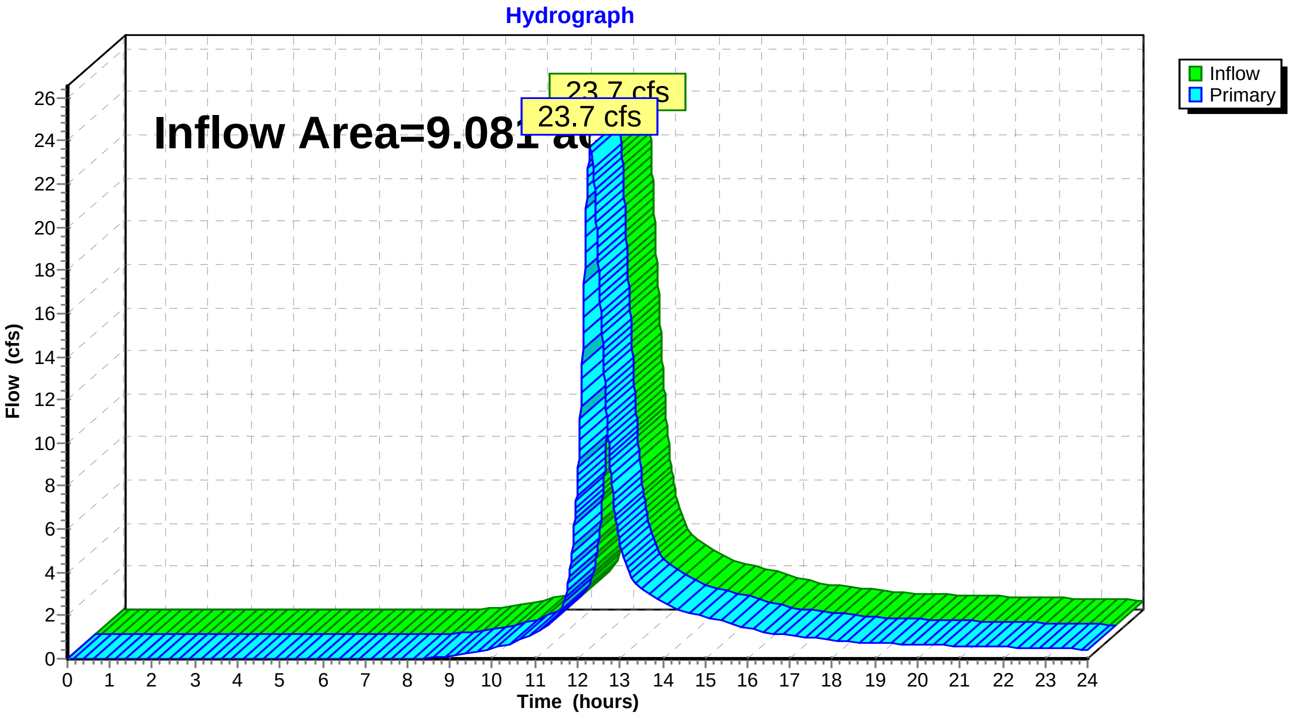


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area =	9.081 ac,	1.16% Impervious, Inflow Depth >	3.42"	for 50-Year event
Inflow =	23.7 cfs @	12.30 hrs, Volume=	2.590 af	
Primary =	23.7 cfs @	12.30 hrs, Volume=	2.590 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 5L: Sheet Flow to Stott Avenue

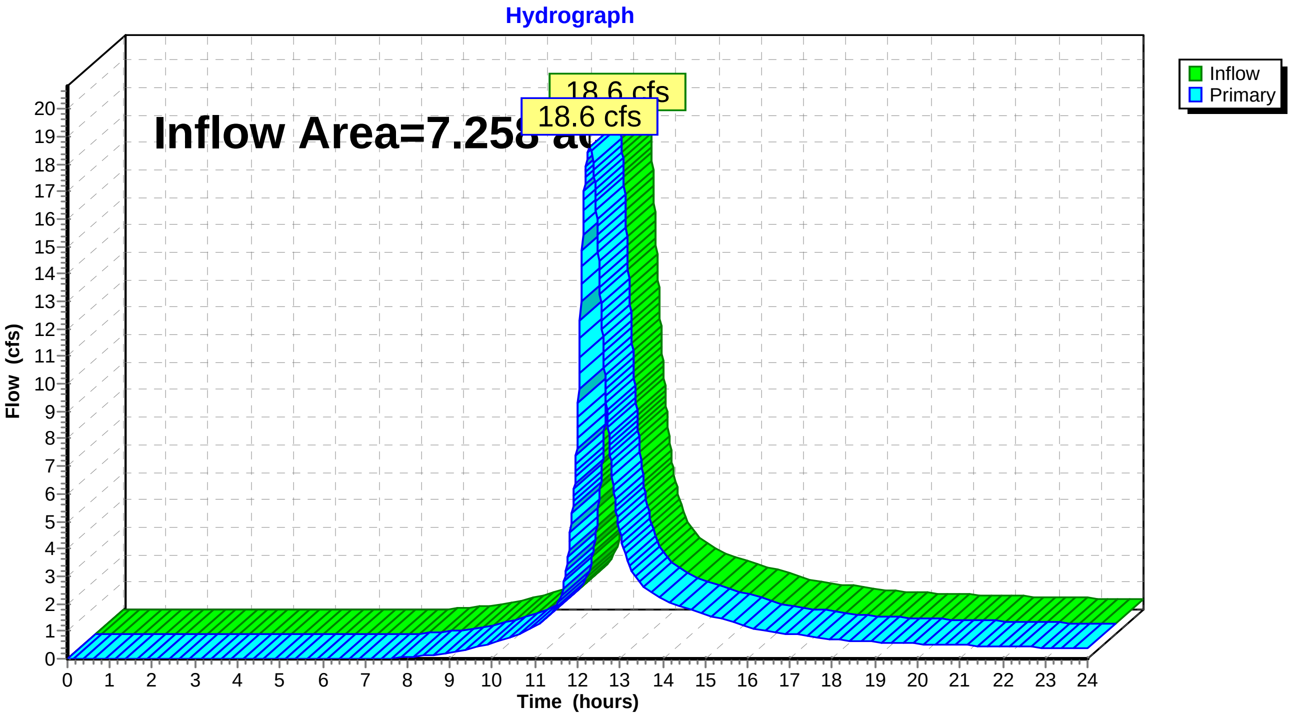


Summary for Link 6L: Sheet flow to North West

Inflow Area =	7.258 ac,	7.14% Impervious, Inflow Depth > 3.73"	for 50-Year event	
Inflow =	18.6 cfs @	12.29 hrs, Volume=	2.254 af	
Primary =	18.6 cfs @	12.29 hrs, Volume=	2.254 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 6L: Sheet flow to North West



Time span=0.00-24.00 hrs, dt=0.010 hrs, 2401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA-1A Runoff Area=5.321 ac 9.74% Impervious Runoff Depth>4.43"
Flow Length=943' Tc=24.8 min UI Adjusted CN=77 Runoff=17.1 cfs 1.966 af

Subcatchment 2S: DA-1B Runoff Area=1.937 ac 0.00% Impervious Runoff Depth>4.45"
Flow Length=712' Tc=10.0 min CN=77 Runoff=8.8 cfs 0.718 af

Subcatchment 3S: DA-2A Runoff Area=3.321 ac 4.03% Impervious Runoff Depth>4.44"
Flow Length=993' Tc=21.0 min UI Adjusted CN=77 Runoff=11.4 cfs 1.228 af

Subcatchment 6S: DA-3 Runoff Area=9.081 ac 1.16% Impervious Runoff Depth>4.11"
Flow Length=900' Tc=22.1 min CN=74 Runoff=28.5 cfs 3.111 af

Subcatchment 12S: DA-2B Runoff Area=5.877 ac 0.46% Impervious Runoff Depth>4.32"
Flow Length=1,409' Tc=31.7 min CN=76 Runoff=16.5 cfs 2.115 af

Pond 7P: Water Quality Basin #1 Peak Elev=393.10' Storage=1,942 cf Inflow=11.4 cfs 1.228 af
Outflow=11.4 cfs 1.188 af

Pond 9P: Water Quality Basin #2 Peak Elev=387.12' Storage=3,541 cf Inflow=16.5 cfs 2.115 af
Outflow=16.5 cfs 2.043 af

Link 2L: Sheet flow to West Wetlands Inflow=26.6 cfs 3.231 af
Primary=26.6 cfs 3.231 af

Link 5L: Sheet Flow to Stott Avenue Inflow=28.5 cfs 3.111 af
Primary=28.5 cfs 3.111 af

Link 6L: Sheet flow to North West Inflow=22.1 cfs 2.684 af
Primary=22.1 cfs 2.684 af

Total Runoff Area = 25.537 ac Runoff Volume = 9.139 af Average Runoff Depth = 4.29"
96.93% Pervious = 24.753 ac 3.07% Impervious = 0.784 ac

Summary for Subcatchment 1S: DA-1A

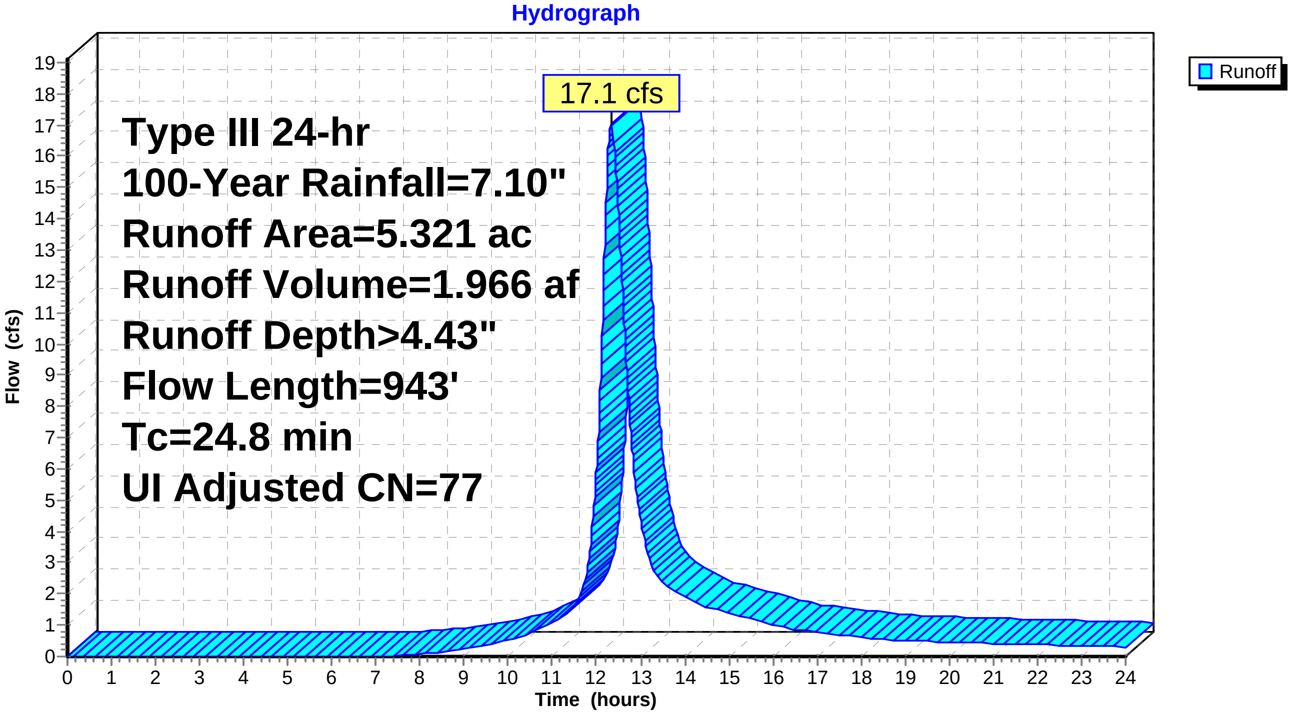
Runoff = 17.1 cfs @ 12.34 hrs, Volume= 1.966 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (ac)	CN	Adj	Description
	0.518	98		Unconnected roofs, HSG C
	1.337	74		>75% Grass cover, Good, HSG C
*	2.240	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.331	74		Pasture/grassland/range, Good, HSG C
	0.895	87		Dirt roads, HSG C
	5.321	79	77	Weighted Average, UI Adjusted
	4.803			90.26% Pervious Area
	0.518			9.74% Impervious Area
	0.518			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0233	0.13		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
2.5	138	0.0179	0.94		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
1.1	96	0.0417	1.43		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
3.3	218	0.0252	1.11		**Shallow Concentrated Flow, Pasture** Short Grass Pasture Kv= 7.0 fps
4.0	281	0.0285	1.18		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
0.9	110	0.0909	2.11		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
24.8	943	Total			

Subcatchment 1S: DA-1A



Summary for Subcatchment 2S: DA-1B

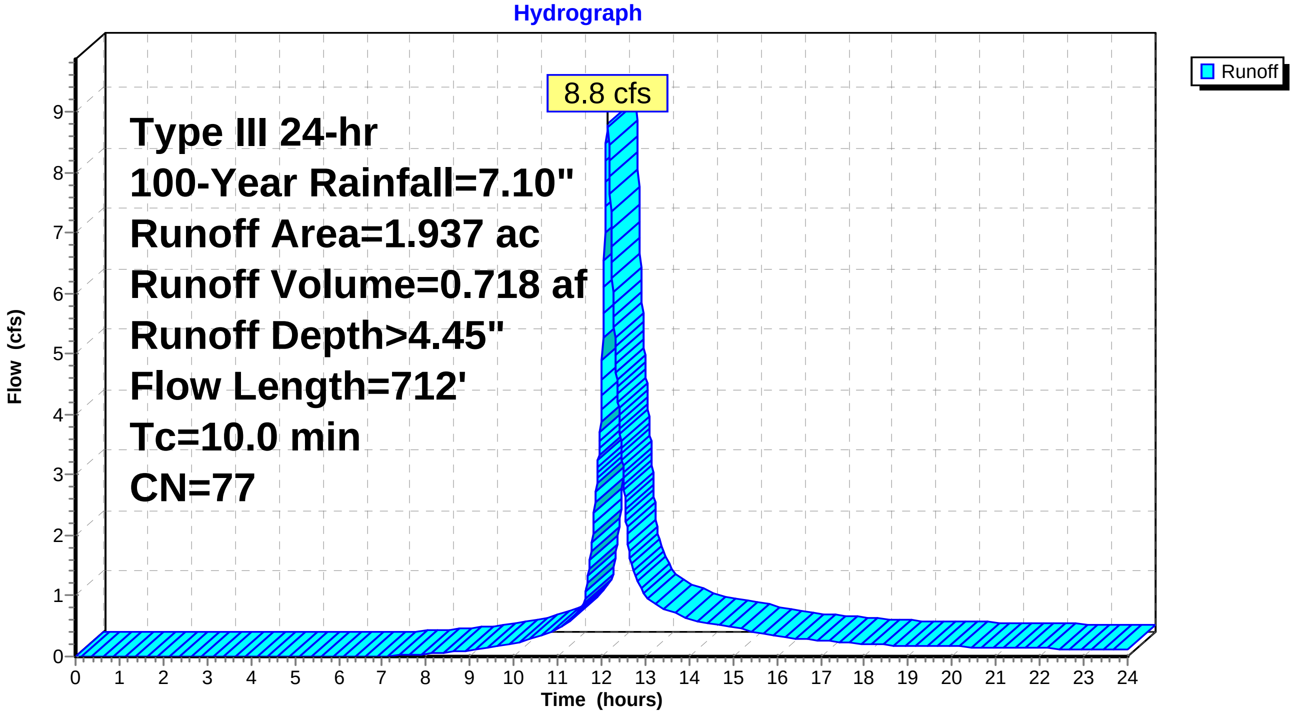
Runoff = 8.8 cfs @ 12.14 hrs, Volume= 0.718 af, Depth> 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (ac)	CN	Description
1.231	74	>75% Grass cover, Good, HSG C
0.531	82	Farmsteads, HSG C
0.175	87	Dirt roads, HSG C
1.937	77	Weighted Average
1.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, Dirt Drive** Smooth surfaces n= 0.011 P2= 3.40"
0.8	124	0.0242	2.50		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
0.2	60	0.1000	5.09		**Shallow Concentrated Flow, Dirt Drive** Unpaved Kv= 16.1 fps
3.7	307	0.0391	1.38		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.7	121	0.1488	2.70		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
7.0	712	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-2A

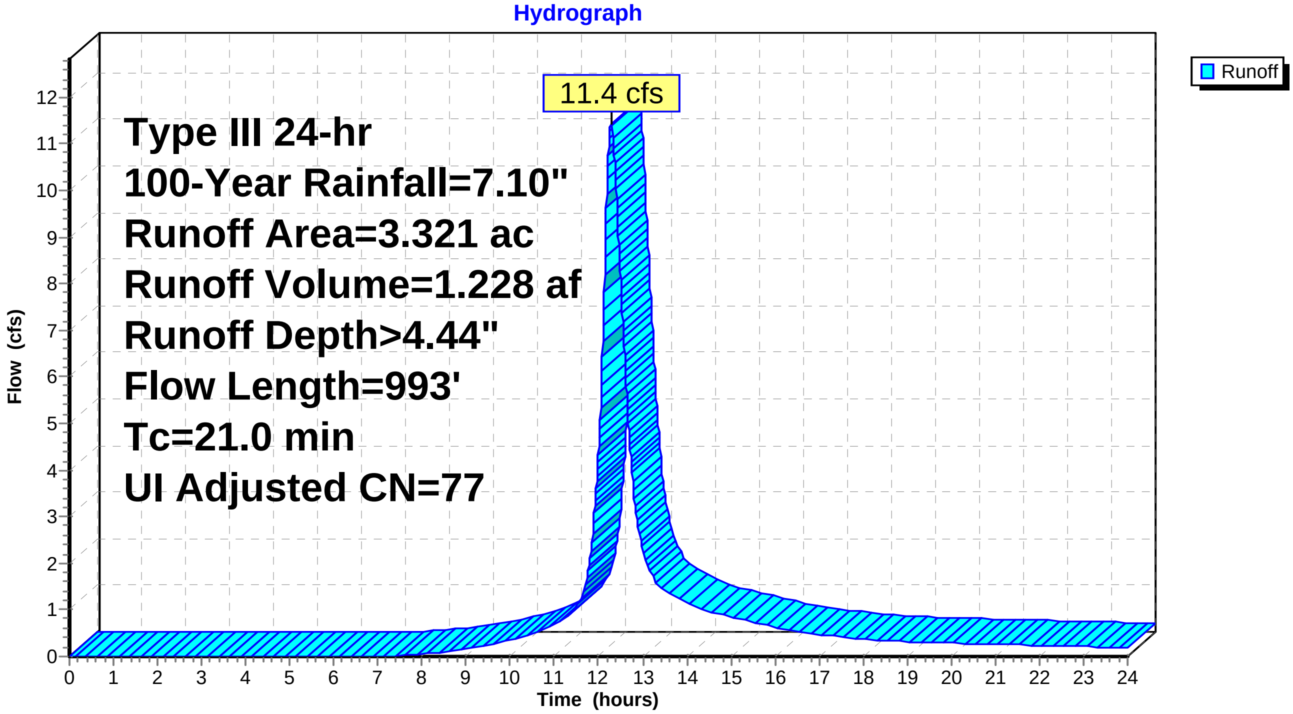
Runoff = 11.4 cfs @ 12.29 hrs, Volume= 1.228 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (ac)	CN	Adj	Description
	0.229	70		Woods, Good, HSG C
	0.134	98		Unconnected roofs, HSG C
	0.720	82		Farmsteads, HSG C
*	1.865	74		Solar Arrays, >75% Grass cover, Good, HSG C
	0.373	87		Dirt roads, HSG C
	3.321	78	77	Weighted Average, UI Adjusted
	3.187			95.97% Pervious Area
	0.134			4.03% Impervious Area
	0.134			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	66	0.0189	0.11		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
0.4	34	0.0267	1.28		**Sheet Flow, Dirt** Smooth surfaces n= 0.011 P2= 3.40"
0.5	109	0.0619	4.01		**Shallow Concentrated Flow, Dirt** Unpaved Kv= 16.1 fps
3.9	252	0.0238	1.08		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.0	114	0.0351	0.94		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.2	296	0.0473	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.8	122	0.1475	2.69		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
21.0	993	Total			

Subcatchment 3S: DA-2A



Summary for Subcatchment 6S: DA-3

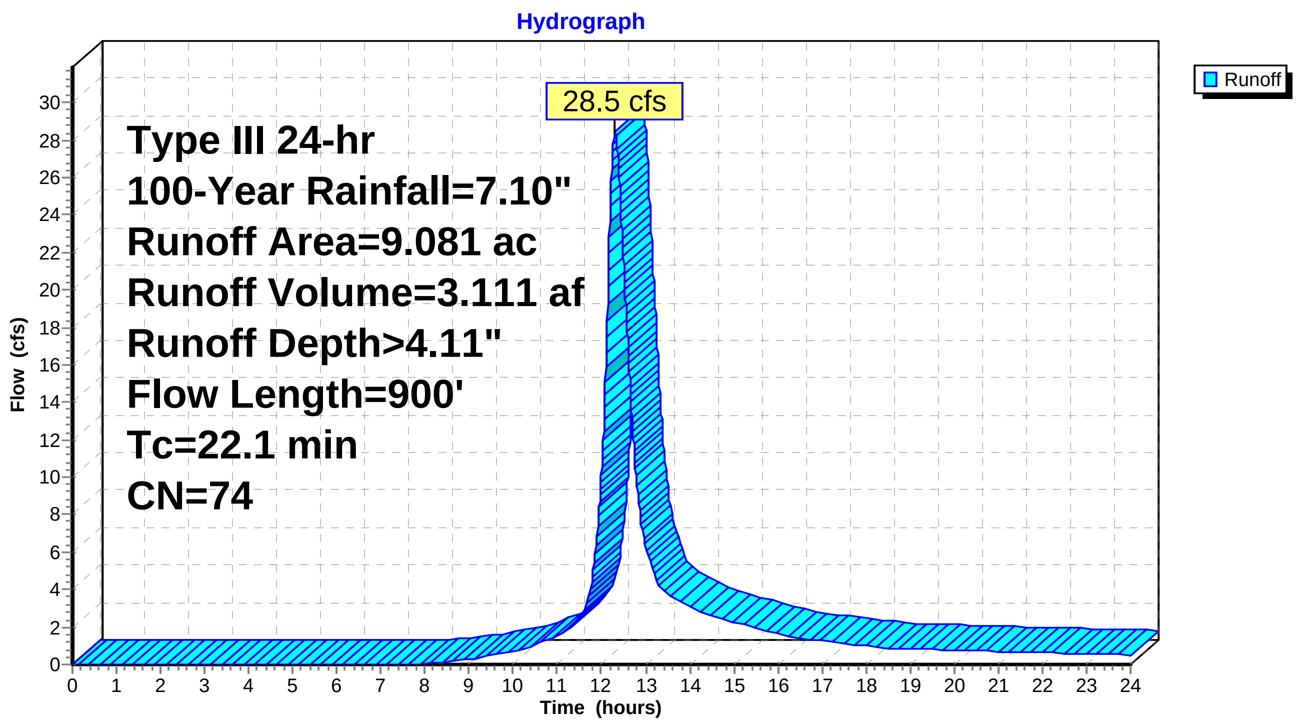
Runoff = 28.5 cfs @ 12.30 hrs, Volume= 3.111 af, Depth> 4.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (ac)	CN	Description
	0.105	98	Unconnected roofs, HSG C
	0.523	70	Woods, Good, HSG C
	0.958	74	>75% Grass cover, Good, HSG C
	0.240	87	Dirt roads, HSG C
*	7.255	74	Solar Arrays, >75% Grass cover, Good, HSG C
	9.081	74	Weighted Average
	8.976		98.84% Pervious Area
	0.105		1.16% Impervious Area
	0.105		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0333	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.40"
10.8	800	0.0312	1.24		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
22.1	900	Total			

Subcatchment 6S: DA-3



Summary for Subcatchment 12S: DA-2B

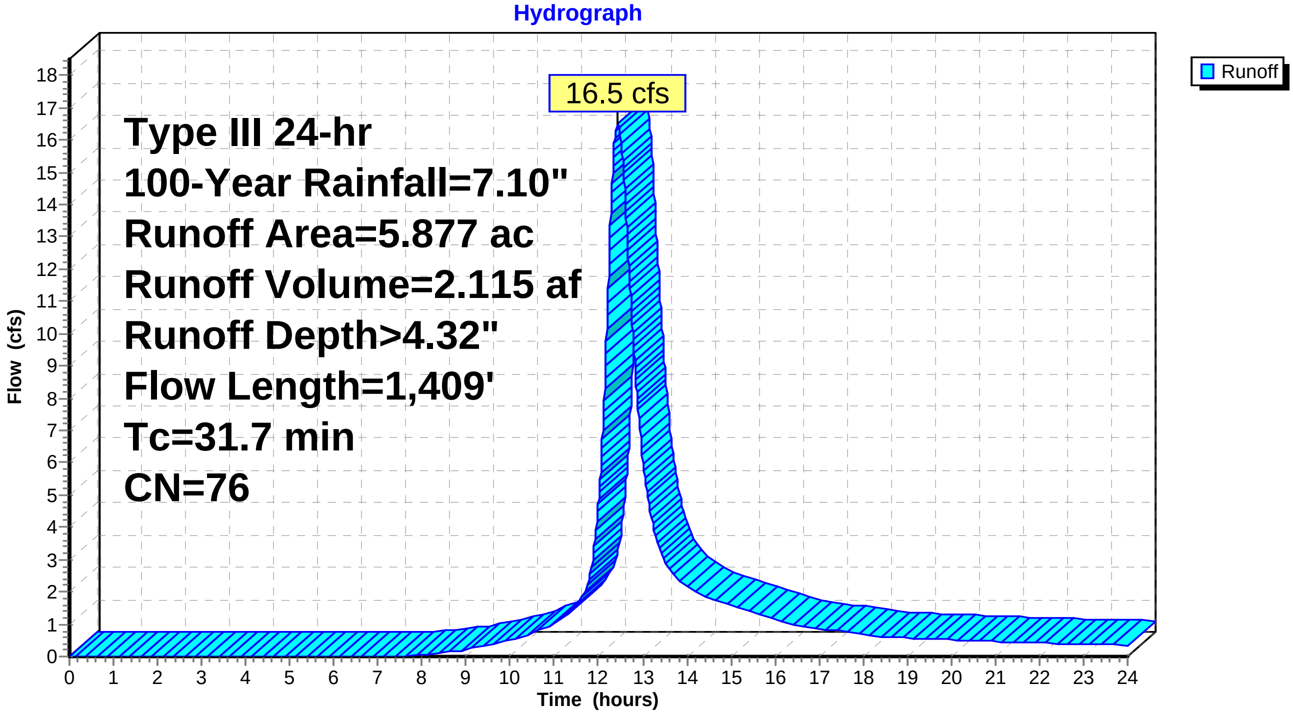
Runoff = 16.5 cfs @ 12.43 hrs, Volume= 2.115 af, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (ac)	CN	Description
	0.984	70	Woods, Good, HSG C
	0.027	98	Unconnected roofs, HSG C
	0.269	82	Farmsteads, HSG C
	1.131	81	Row crops, C + CR, Good, HSG C
	0.174	74	>75% Grass cover, Good, HSG C
*	3.006	74	Solar Arrays, >75% Grass cover, Good, HSG C
	0.286	87	Dirt roads, HSG C
	5.877	76	Weighted Average
	5.850		99.54% Pervious Area
	0.027		0.46% Impervious Area
	0.027		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 3.40"
3.9	230	0.0196	0.98		**Shallow Concentrated Flow, Grassed** Short Grass Pasture Kv= 7.0 fps
2.4	233	0.0327	1.63		**Shallow Concentrated Flow, Field** Cultivated Straight Rows Kv= 9.0 fps
2.1	151	0.0281	1.17		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
4.1	230	0.0348	0.93		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
1.2	106	0.0472	1.52		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
1.7	194	0.0773	1.95		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
0.3	47	0.1277	2.50		**Shallow Concentrated Flow, Solar Arrays** Short Grass Pasture Kv= 7.0 fps
2.2	118	0.0169	0.91		**Shallow Concentrated Flow, Check Dam** Short Grass Pasture Kv= 7.0 fps
31.7	1,409	Total			

Subcatchment 12S: DA-2B



Summary for Pond 7P: Water Quality Basin #1

Inflow Area = 3.321 ac, 4.03% Impervious, Inflow Depth > 4.44" for 100-Year event
Inflow = 11.4 cfs @ 12.29 hrs, Volume= 1.228 af
Outflow = 11.4 cfs @ 12.29 hrs, Volume= 1.188 af, Atten= 0%, Lag= 0.2 min
Primary = 11.4 cfs @ 12.29 hrs, Volume= 1.188 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 393.10' @ 12.29 hrs Surf.Area= 2,136 sf Storage= 1,942 cf

Plug-Flow detention time= 27.5 min calculated for 1.188 af (97% of inflow)
Center-of-Mass det. time= 9.2 min (835.1 - 825.9)

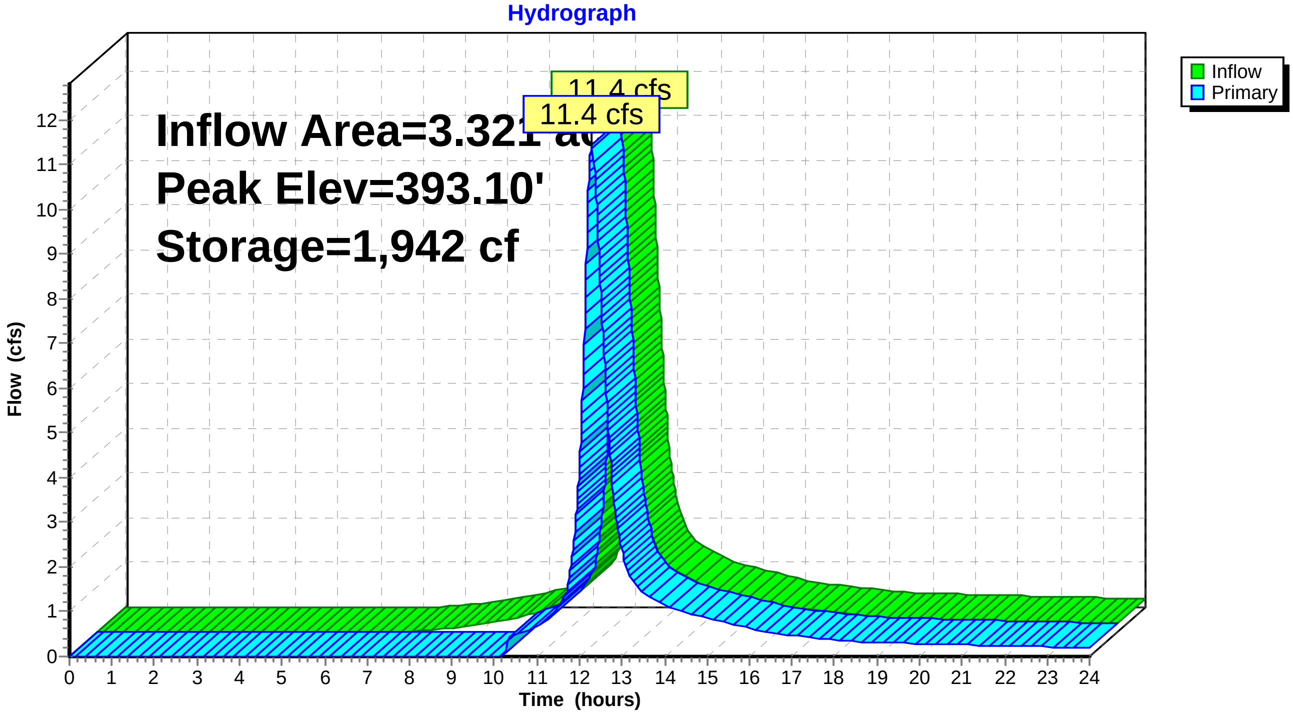
Volume	Invert	Avail.Storage	Storage Description
#1	392.00'	2,848 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
392.00	1,392	0	0
393.50	2,405	2,848	2,848

Device	Routing	Invert	Outlet Devices
#1	Primary	393.00'	**150.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=11.4 cfs @ 12.29 hrs HW=393.10' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 11.4 cfs @ 0.75 fps)

Pond 7P: Water Quality Basin #1



Stage-Area-Storage for Pond 7P: Water Quality Basin #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
392.00	1,392	0
392.02	1,406	28
392.04	1,419	56
392.06	1,433	85
392.08	1,446	114
392.10	1,460	143
392.12	1,473	172
392.14	1,487	201
392.16	1,500	231
392.18	1,514	262
392.20	1,527	292
392.22	1,541	323
392.24	1,554	354
392.26	1,568	385
392.28	1,581	416
392.30	1,595	448
392.32	1,608	480
392.34	1,622	512
392.36	1,635	545
392.38	1,649	578
392.40	1,662	611
392.42	1,676	644
392.44	1,689	678
392.46	1,703	712
392.48	1,716	746
392.50	1,730	780
392.52	1,743	815
392.54	1,757	850
392.56	1,770	885
392.58	1,784	921
392.60	1,797	957
392.62	1,811	993
392.64	1,824	1,029
392.66	1,838	1,066
392.68	1,851	1,103
392.70	1,865	1,140
392.72	1,878	1,177
392.74	1,892	1,215
392.76	1,905	1,253
392.78	1,919	1,291
392.80	1,932	1,330
392.82	1,946	1,368
392.84	1,959	1,408
392.86	1,973	1,447
392.88	1,986	1,486
392.90	2,000	1,526
392.92	2,013	1,566
392.94	2,027	1,607
392.96	2,040	1,648
392.98	2,054	1,688
393.00	2,067	1,730
393.02	2,081	1,771
393.04	2,094	1,813
393.06	2,108	1,855
393.08	2,121	1,897
393.10	2,135	1,940
393.12	2,148	1,983
393.14	2,162	2,026
393.16	2,175	2,069
393.18	2,189	2,113
393.20	2,202	2,157
393.22	2,216	2,201
393.24	2,229	2,245
393.26	2,243	2,290
393.28	2,256	2,335
393.30	2,270	2,380
393.32	2,283	2,426
393.34	2,297	2,472
393.36	2,310	2,518
393.38	2,324	2,564
393.40	2,337	2,611
393.42	2,351	2,658
393.44	2,364	2,705
393.46	2,378	2,752
393.48	2,391	2,800
393.50	**2,405**	**2,848**

Summary for Pond 9P: Water Quality Basin #2

Inflow Area =	5.877 ac,	0.46% Impervious, Inflow Depth > 4.32"	for 100-Year event	
Inflow =	16.5 cfs @	12.43 hrs, Volume=	2.115 af	
Outflow =	16.5 cfs @	12.44 hrs, Volume=	2.043 af,	Atten= 0%, Lag= 0.4 min
Primary =	16.5 cfs @	12.44 hrs, Volume=	2.043 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs / 2
Peak Elev= 387.12' @ 12.44 hrs Surf.Area= 3,601 sf Storage= 3,541 cf

Plug-Flow detention time= 28.3 min calculated for 2.042 af (97% of inflow)
Center-of-Mass det. time= 9.4 min (846.2 - 836.8)

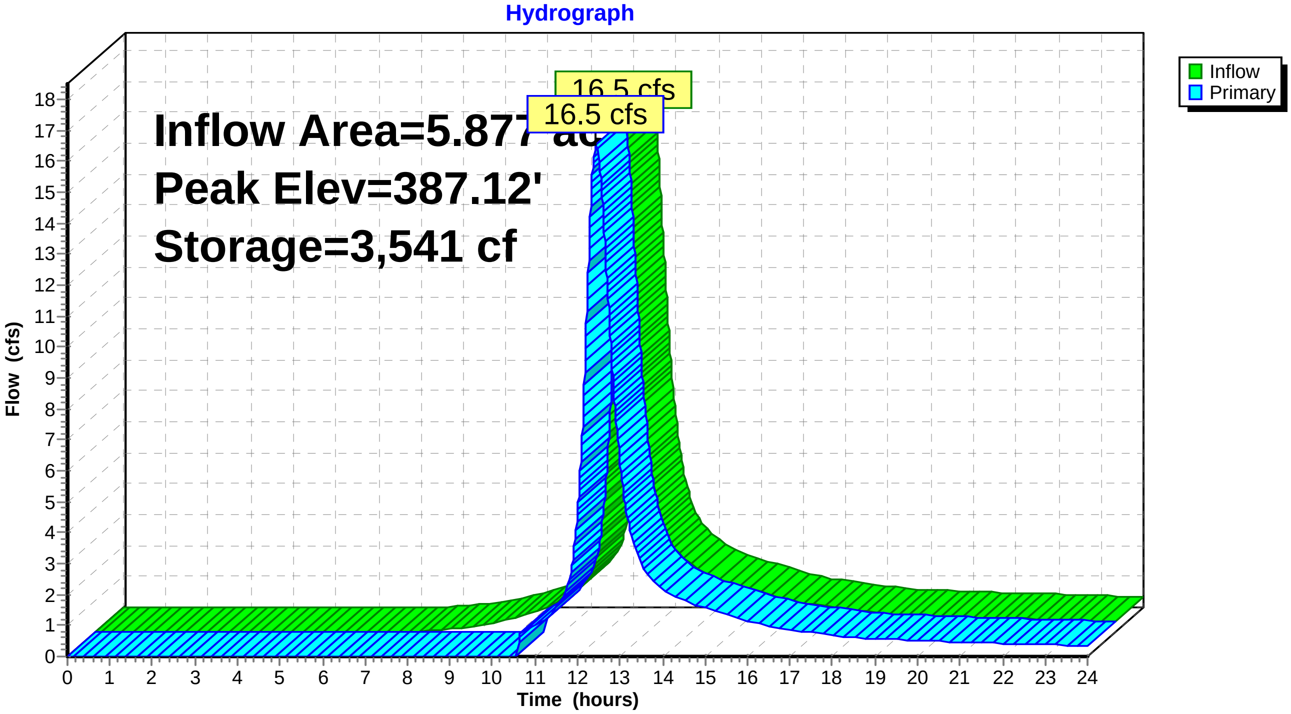
Volume	Invert	Avail.Storage	Storage Description
#1	386.00'	4,979 cf	**Basin (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
386.00	2,742	0	0
387.50	3,896	4,979	4,979

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	**175.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=16.5 cfs @ 12.44 hrs HW=387.12' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 16.5 cfs @ 0.81 fps)

Pond 9P: Water Quality Basin #2



Stage-Area-Storage for Pond 9P: Water Quality Basin #2

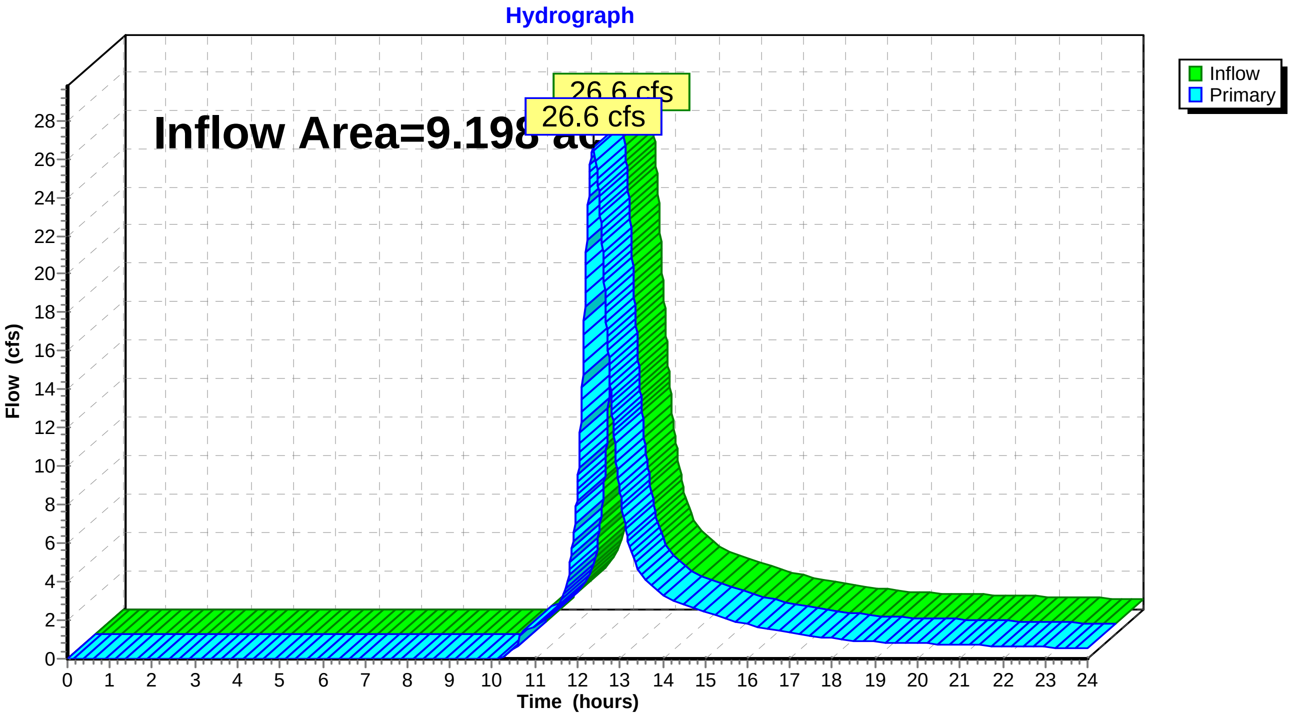
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
386.00	2,742	0	387.06	3,557	3,339
386.02	2,757	55	387.08	3,573	3,410
386.04	2,773	110	387.10	3,588	3,482
386.06	2,788	166	387.12	3,604	3,554
386.08	2,804	222	387.14	3,619	3,626
386.10	2,819	278	387.16	3,634	3,698
386.12	2,834	335	387.18	3,650	3,771
386.14	2,850	391	387.20	3,665	3,844
386.16	2,865	449	387.22	3,681	3,918
386.18	2,880	506	387.24	3,696	3,992
386.20	2,896	564	387.26	3,711	4,066
386.22	2,911	622	387.28	3,727	4,140
386.24	2,927	680	387.30	3,742	4,215
386.26	2,942	739	387.32	3,758	4,290
386.28	2,957	798	387.34	3,773	4,365
386.30	2,973	857	387.36	3,788	4,441
386.32	2,988	917	387.38	3,804	4,517
386.34	3,004	977	387.40	3,819	4,593
386.36	3,019	1,037	387.42	3,834	4,669
386.38	3,034	1,098	387.44	3,850	4,746
386.40	3,050	1,158	387.46	3,865	4,823
386.42	3,065	1,219	387.48	3,881	4,901
386.44	3,081	1,281	387.50	**3,896**	**4,979**
386.46	3,096	1,343			
386.48	3,111	1,405			
386.50	3,127	1,467			
386.52	3,142	1,530			
386.54	3,157	1,593			
386.56	3,173	1,656			
386.58	3,188	1,720			
386.60	3,204	1,784			
386.62	3,219	1,848			
386.64	3,234	1,912			
386.66	3,250	1,977			
386.68	3,265	2,042			
386.70	3,281	2,108			
386.72	3,296	2,174			
386.74	3,311	2,240			
386.76	3,327	2,306			
386.78	3,342	2,373			
386.80	3,357	2,440			
386.82	3,373	2,507			
386.84	3,388	2,575			
386.86	3,404	2,643			
386.88	3,419	2,711			
386.90	3,434	2,779			
386.92	3,450	2,848			
386.94	3,465	2,917			
386.96	3,481	2,987			
386.98	3,496	3,057			
387.00	3,511	3,127			
387.02	3,527	3,197			
387.04	3,542	3,268			

Summary for Link 2L: Sheet flow to West Wetlands

Inflow Area =	9.198 ac,	1.75% Impervious, Inflow Depth > 4.22"	for 100-Year event	
Inflow =	26.6 cfs @	12.37 hrs, Volume=	3.231 af	
Primary =	26.6 cfs @	12.37 hrs, Volume=	3.231 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 2L: Sheet flow to West Wetlands

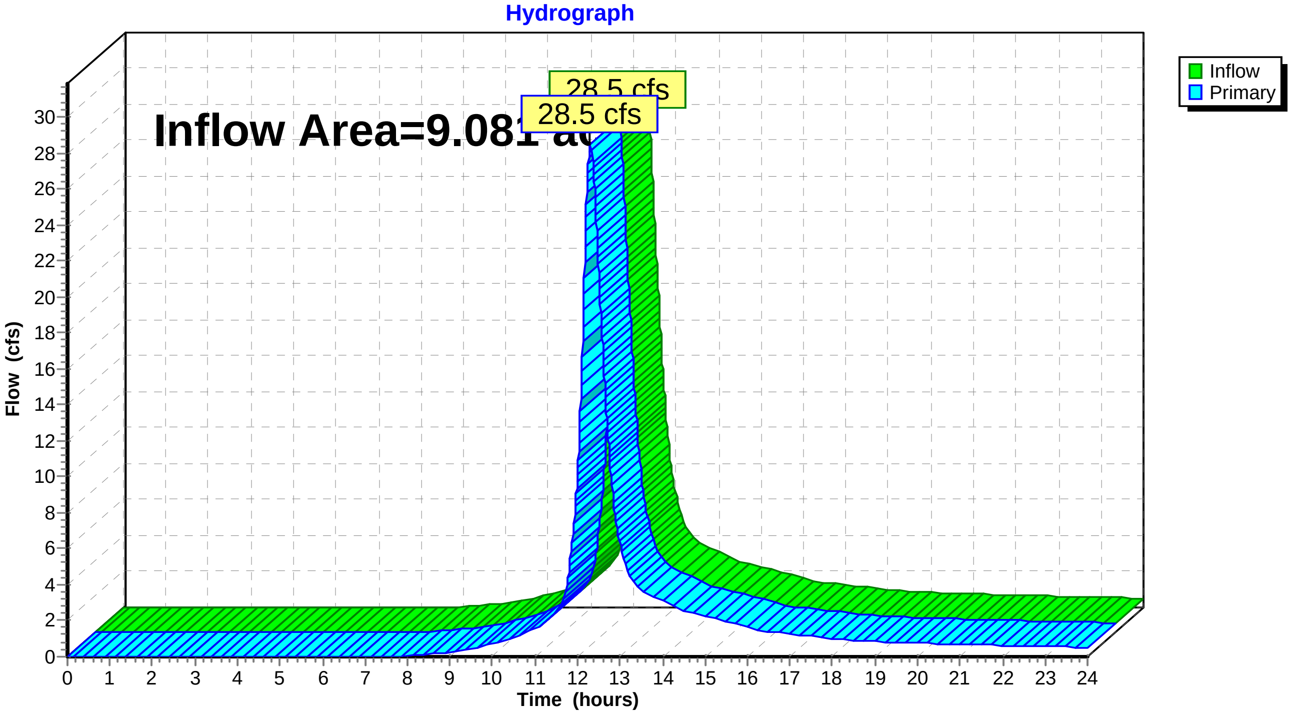


Summary for Link 5L: Sheet Flow to Stott Avenue

Inflow Area = 9.081 ac, 1.16% Impervious, Inflow Depth > 4.11" for 100-Year event
Inflow = 28.5 cfs @ 12.30 hrs, Volume= 3.111 af
Primary = 28.5 cfs @ 12.30 hrs, Volume= 3.111 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 5L: Sheet Flow to Stott Avenue

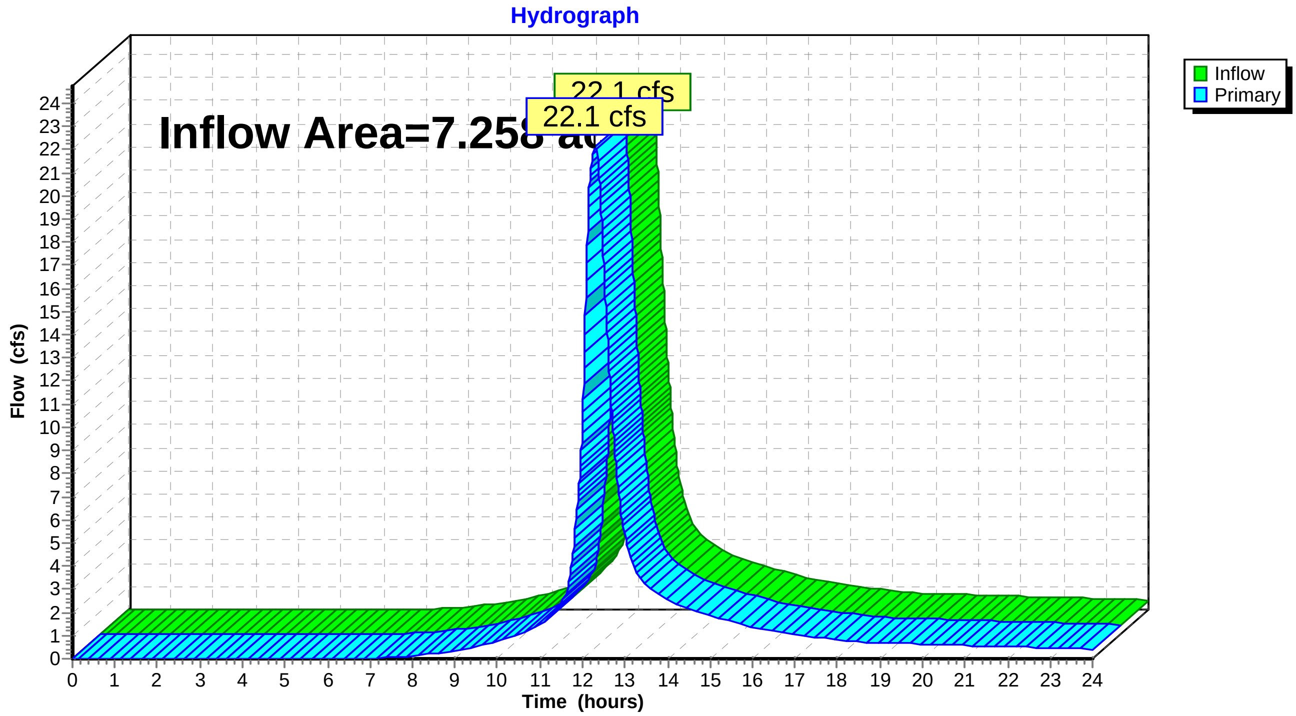


Summary for Link 6L: Sheet flow to North West

Inflow Area =	7.258 ac,	7.14% Impervious, Inflow Depth > 4.44"	for 100-Year event	
Inflow =	22.1 cfs @	12.29 hrs, Volume=	2.684 af	
Primary =	22.1 cfs @	12.29 hrs, Volume=	2.684 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.010 hrs

Link 6L: Sheet flow to North West



Appendix C
Stormwater Quality Calculations

Appendix C
Stormwater Quality Calculations

Groundwater Recharge Volume (GRV)

GRV = (D)(A)(I)/12

GRV = Groundwater Recharge Volume (acre-feet)

D = Depth of Runoff to be Recharged (inches)

A = Site Area (acres)

I = Post-Development Imperviousness (decimal)

D=	0.10	inches	(from Table 7-4, Chapter 7, Stormwater Quality Manual)
A =	14.80	acres	
I =	0.03		(See Table 2, Stormwater Mangement Report for new impervious)
GRV =	0.003	acre-feet	
=	**139.48**	**cubic feet**	

Water Quality Volume (WQV)

WQV = (1")(R)(A)/12

WQV = Water Quality Volume (acre-feet)

R = Runoff Co-Efficient = 0.005 + 0.009(I)

I = Impervious Area (%)

A = Site Area (acres)

IA=	0.38	
I =	2.60	%
R =	0.03	
A =	14.80	
WQV =	0.03	acre-feet
=	**1,523.97**	**cubic feet**

Required Treatment Volume

Water Quality Basins (WQB) are sized to treat both the GRV and the WQV.

WQV requirements are reduced by the amount of GRV provided.

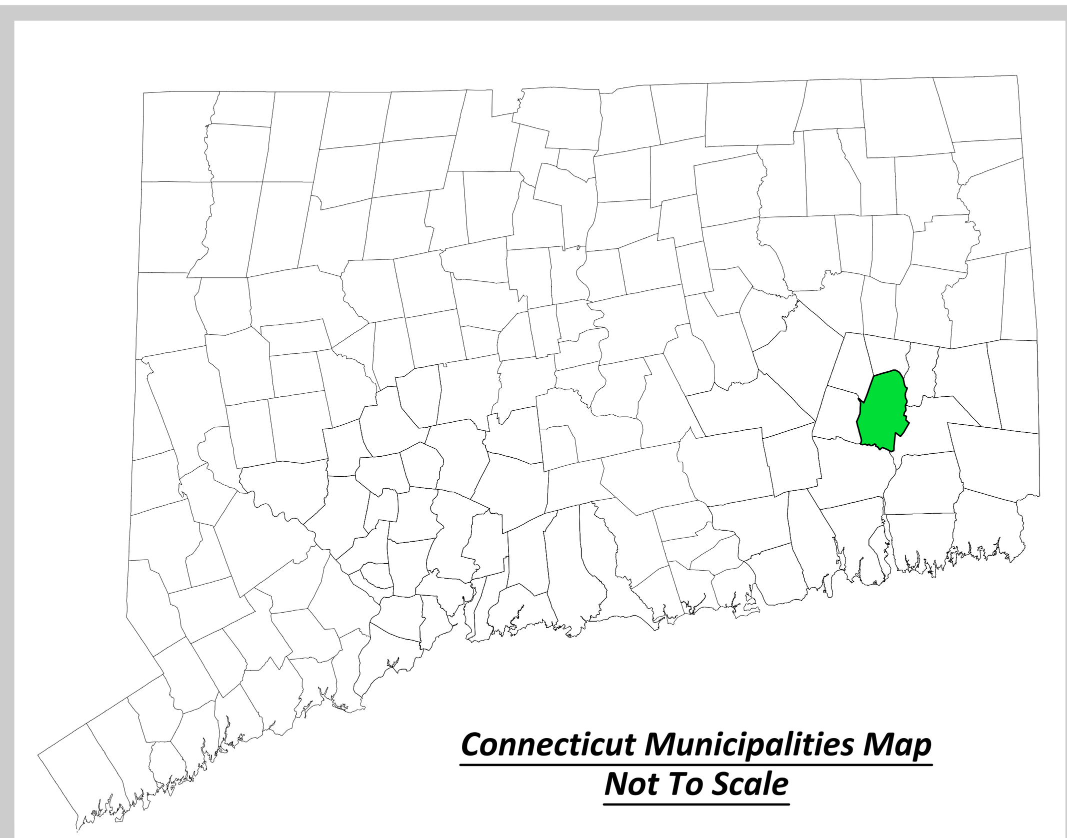
Treatment volume provided taken from HydroCAD stage-storage results.

Required treatement volume = (WQV - GRV) + GRV

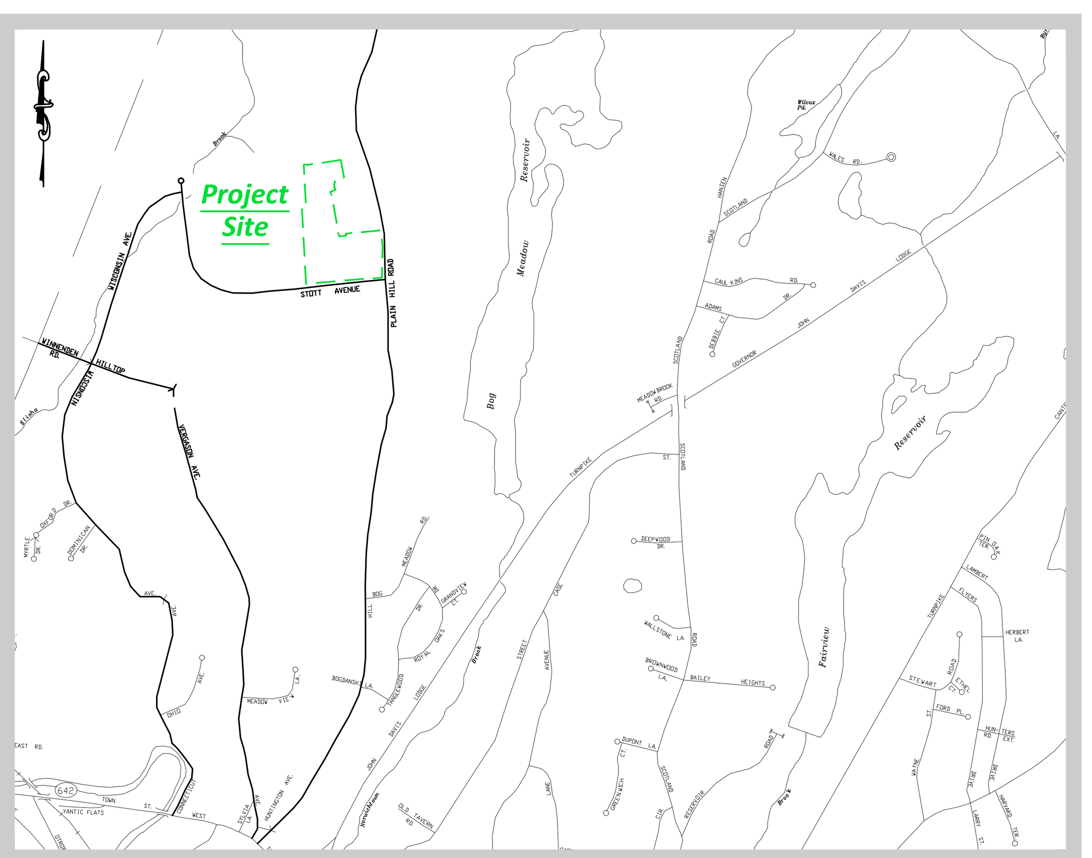
Volume Required	**1,523.97**	**cubic feet**	
WQB #1 Volume Provided	**1,730**	**cubic feet**	(Up to elevation 393.0)
WQB #2 Volume Provided	**3,127**	**cubic feet**	(Up to elevation 387.0)
Total Volume Provided	**4,857**	**cubic feet**	(Exceeds required volume)

Appendix D
Site Development Plans

STOTT AVENUE SOLAR PROJECT
SOLAR PHOTOVOLTAIC (PV) SYSTEM
SolarCity Corporation
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
August 2015



Connecticut Municipalities Map
Not To Scale



Site Location Map
Scale: 1"=2000'

Site Location Aerial View
Not To Scale

Project Information

Developed By:

Brightfields Development, LLC
41 Walnut Street, Suite 301
Wellesley, MA 02481

SolarCity Corporation
714 Brook Street
Rocky Hill, CT 06067

Civil Engineer:

Boundaries LLC
179 Pachaug River Drive
Griswold, CT 06351

Electrical Engineer:

SolarCity Corporation
714 Brook Street
Rocky Hill, CT 06067

Host:

Kelvin H. Stott & Frances S. Stott
9 Stott Avenue
292 Plain Hill Road
Norwich, CT 06360

Utility:

Connecticut Municipal Electric
Energy Cooperative
30 Stott Avenue
Norwich, CT 06360

Index To Drawings

Sheet	Sheet Title
1	Cover Sheet
2-3	Topographic Survey-Existing Conditions
4	Lease Plan
5-6	Site Preparation and Demolition Plan
7-8	Site Development Plan Solar Modules and Infrastructure
9	Erosion & Sediment Control Narrative and Details
10	Site Details

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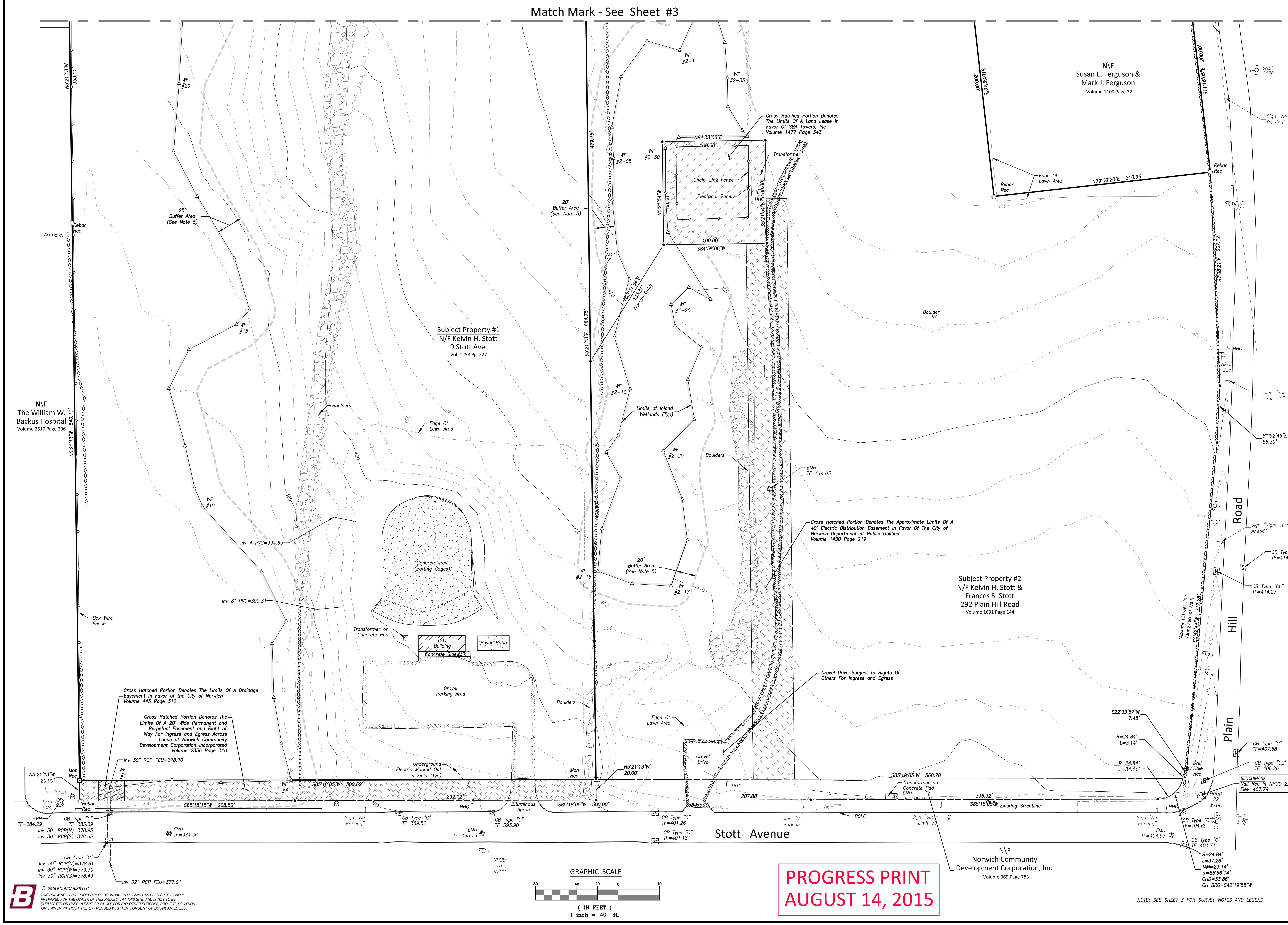

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Rocky Hill, CT 06067
www.solarcity.com

SolarCity Corporation
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Topographic Survey-Existing Conditions

SCALE: 1"=40'
DATE: August 2015
JOB I.D. NO. 15-2327
Revisions

SHEET NO.
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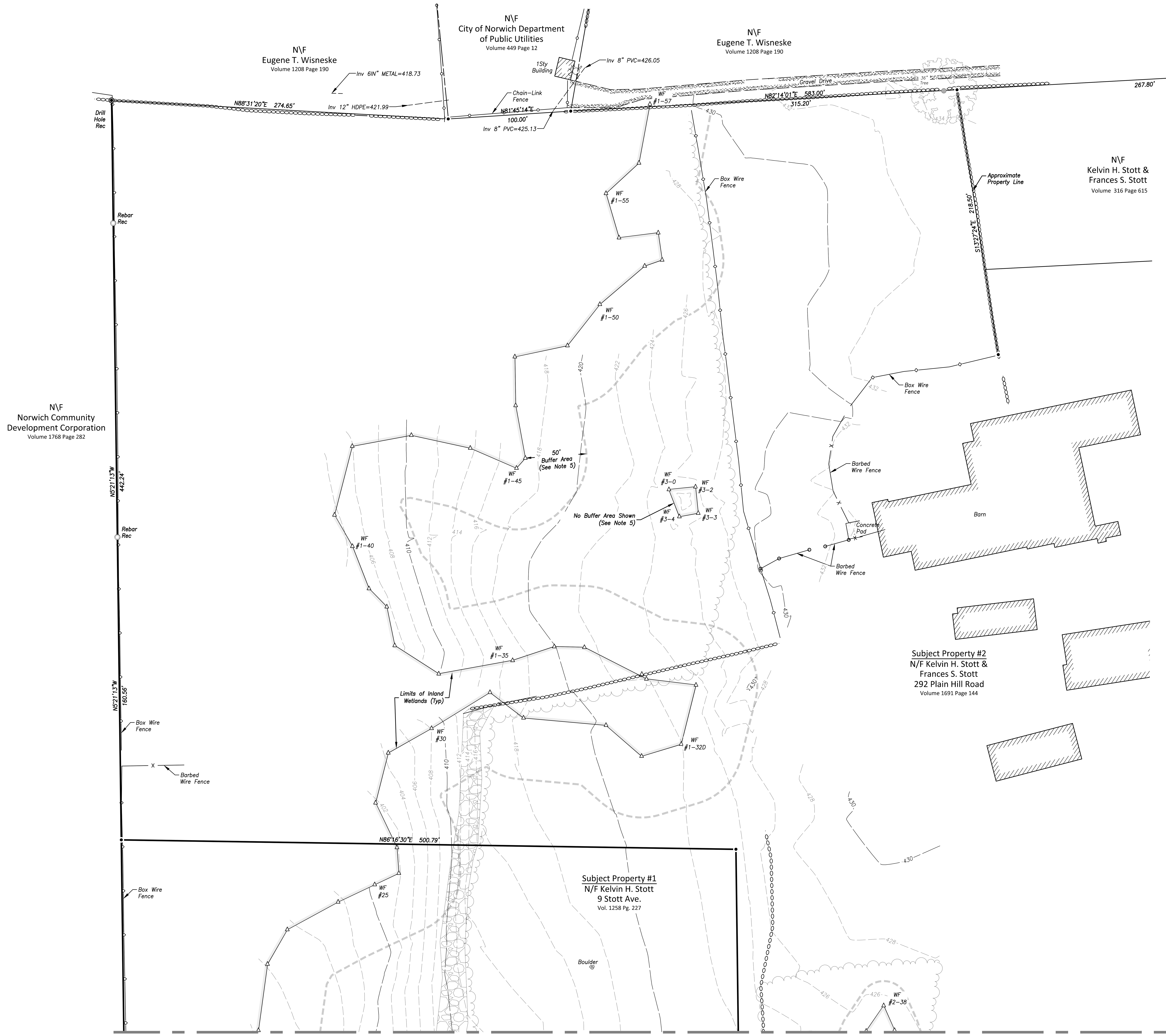

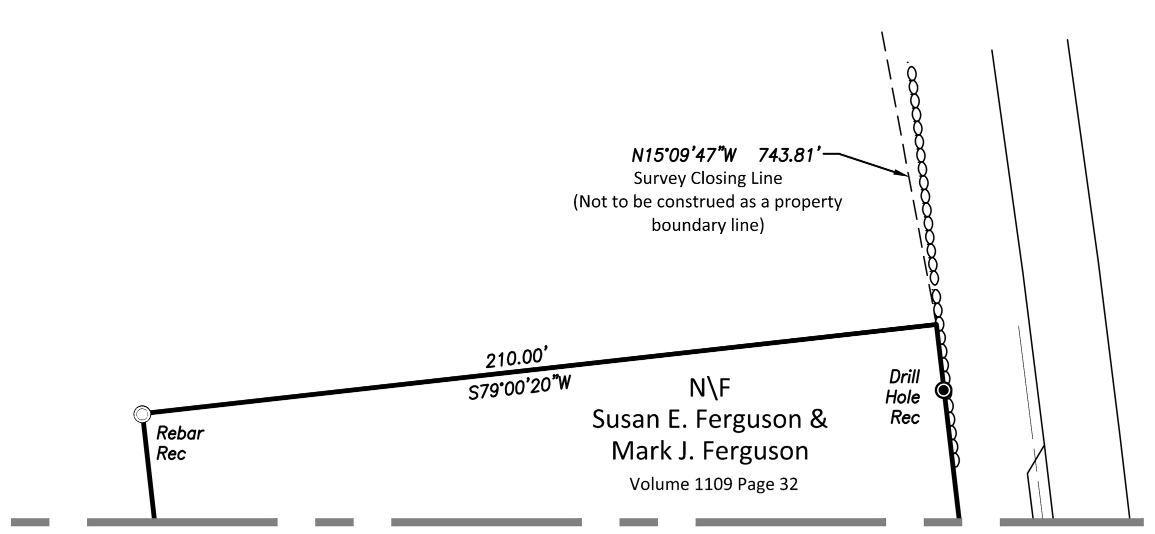

LEGEND & ABBREVIATIONS

±	MORE OR LESS		TREELINE
TYP	TYPICAL		STONEWALL
PVC	POLYVINYL CHLORIDE		STONEWALL REMAINS
RCP	REINFORCED CONCRETE PIPE		ANGLE POINT
HDPE	HIGH DENSITY POLYETHYLENE PIPE		IRON PIN
S.F.	SQUARE FEET		DRILL HOLE
SMH	SANITARY MANHOLE		MONUMENT
CB	CATCH BASIN		FENCE POST
TF	TOP OF FRAME		UTILITY POLE
INV	INVERT		UTILITY POLE WITH LIGHT
WV	WATER VALVE		GUY WIRE
HH	HANDHOLE		CATCH BASIN
WF #1	WETLAND FLAG		SANITARY MANHOLE
MON	MONUMENT		ELECTRIC MANHOLE
REC	RECOVERED		WATER VALVE
NPUD	NORWICH PUBLIC UTILITIES		SIGN
N/F	NOW OR FORMERLY		WETLAND FLAG
320	EXISTING CONTOUR		

REFERENCE MAPS

A. RESUBDIVISION SURVEY PROPERTY OF KELVIN H. STOTT, PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED FEBRUARY 1996, SCALE: 1"= 100', PREPARED BY CLA ENGINEERS, INC.

B. LOT LINE RECONFIGURATION PROPERTY OF HILLTOP INVESTMENTS, LLC, #11 STOTT AVENUE NORWICH, CONNECTICUT, DATED 1/15/03, SCALE: 1"= 50', PREPARED BY CLA ENGINEERS, INC.

C. LOT LINE REVISION OF 292 PLAIN HILL ROAD, NORWICH, CONNECTICUT, PREPARED FOR KELVIN H. STOTT DECEMBER 16, 1998, SCALE: 1"= 100', PREPARED BY GESICK & ASSOCIATES P.C.

D. BOUNDARY SURVEY PROPERTY TO BE CONVEYED TO THE WM. W. BACKUS HOSPITAL, #11 STOTT AVENUE, NORWICH, CONNECTICUT, DATED APRIL 2010, SCALE 1"= 40' PREPARED BY CLA ENGINEERS, INC.

E. EXISTING CONDITIONS OF PROPOSED LEASE PARCEL, 292 PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED DECEMBER 17, 1998, SCALE: 1"= 50', SBA, INC., PREPARED BY GESICK & ASSOCIATES P.C.

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G. KELVIN STOTT BASEBALL BATTING RANGE SITE PLAN, 292 PLAIN HILL ROAD NORWICH, CONNECTICUT, DATED JANUARY 1996, REVISED 2/13/96, SCALE: 1"= 20', PREPARED BY CLA ENGINEERS, INC.

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SURVEY NOTES

1. THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THROUGH 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES AND "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED FOR USE BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996. IT IS A PROPERTY AND TOPOGRAPHIC SURVEY BASED ON RESURVEY AND CONFORMS TO HORIZONTAL CLASS A-2 AND TOPOGRAPHIC CLASS T-2 ACCURACY STANDARDS. IT IS INTENDED TO DEPICT EXISTING SITE CONDITIONS FOR THE BASIS OF FUTURE DEVELOPMENT.

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4. THE SUBJECT PROPERTIES ARE IDENTIFIED AS 9 STOTT AVENUE AND 292 PLAIN HILL ROAD, NORWICH, CONNECTICUT. FURTHER REFERENCE MAY BE MADE TO ASSESSORS MAP 28, BLOCK 1, LOTS 10 AND 13.

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Match Mark - See Sheet #2

GRAPHIC SCALE

80 40 20 0 40

(IN FEET)
1 inch = 40 ft.

PROGRESS PRINT
AUGUST 14, 2015

"TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

70016

JOHN U. FAULISE JR. L.S. LICENSE NO. DATE

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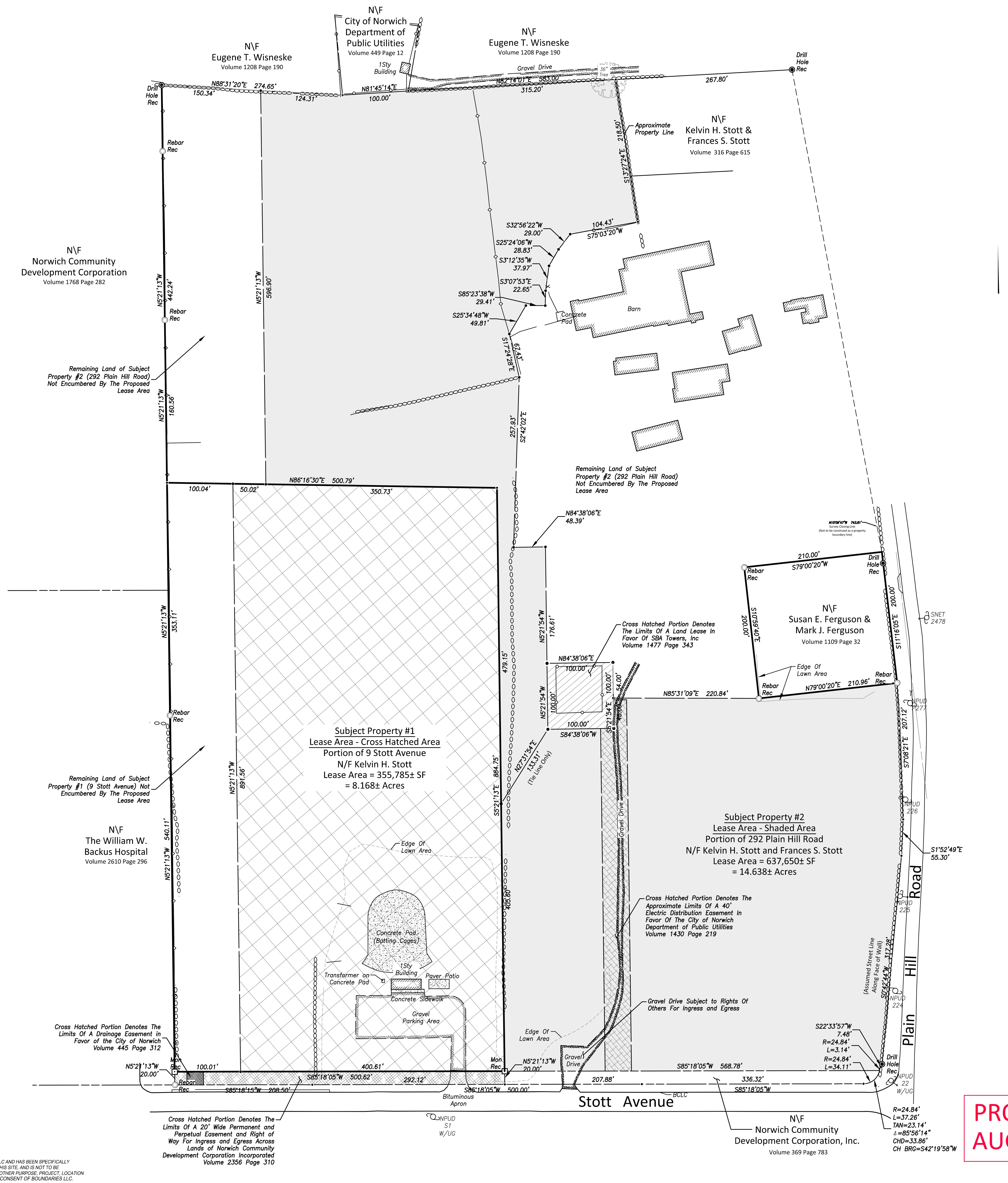

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LEGEND & ABBREVIATIONS

±	MORE OR LESS
TYP	TYPICAL
S.F.	SQUARE FEET
MON	MONUMENT
REC	RECOVERED
NPUD	NORWICH PUBLIC UTILITIES
N/F	NOW OR FORMERLY
	STONEWALL
	STONEWALL REMAINS
	ANGLE POINT
	IRON PIN
	DRILL HOLE
	MONUMENT
	FENCE POST
	UTILITY POLE
	UTILITY POLE WITH LIGHT
	GUY WIRE

GRAPHIC SCALE

160 80 40 0 80

(IN FEET)
1 inch = 80 ft.

"TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

JOHN U. FAULISE JR. L.S. | LICENSE NO. 70016 | DATE

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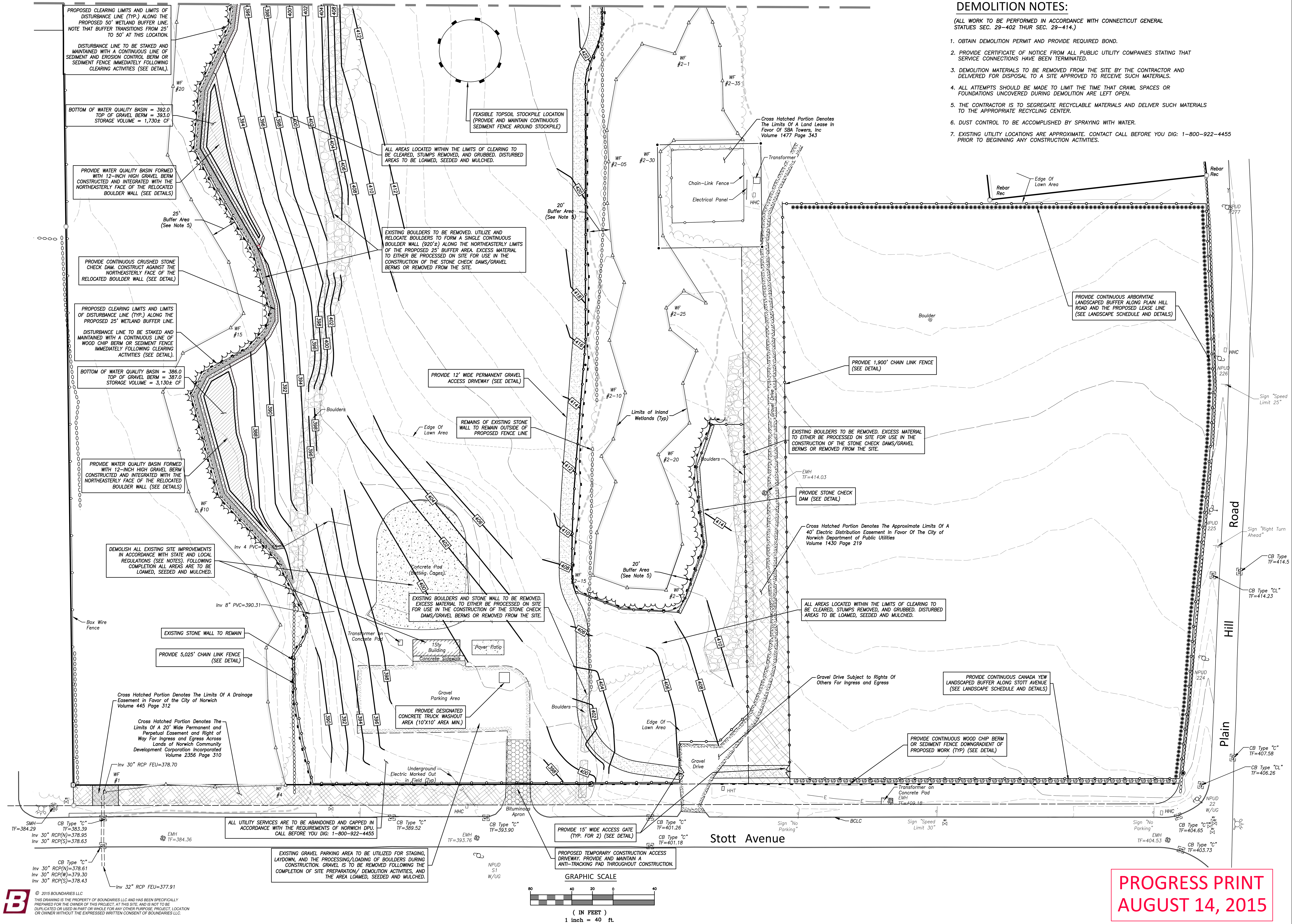
Match Mark - See Sheet #6



DEMOLITION NOTES:

(ALL WORK TO BE PERFORMED IN ACCORDANCE WITH CONNECTICUT GENERAL STATUES SEC. 29-402 THUR SEC. 29-414.)

1. OBTAIN DEMOLITION PERMIT AND PROVIDE REQUIRED BOND.
2. PROVIDE CERTIFICATE OF NOTICE FROM ALL PUBLIC UTILITY COMPANIES STATING THAT SERVICE CONNECTIONS HAVE BEEN TERMINATED.
3. DEMOLITION MATERIALS TO BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DELIVERED FOR DISPOSAL TO A SITE APPROVED TO RECEIVE SUCH MATERIALS.
4. ALL ATTEMPTS SHOULD BE MADE TO LIMIT THE TIME THAT CRAWL SPACES OR FOUNDATIONS UNCOVERED DURING DEMOLITION ARE LEFT OPEN.
5. THE CONTRACTOR IS TO SEGREGATE RECYCLABLE MATERIALS AND DELIVER SUCH MATERIALS TO THE APPROPRIATE RECYCLING CENTER.
6. DUST CONTROL TO BE ACCOMPLISHED BY SPRAYING WITH WATER.
7. EXISTING UTILITY LOCATIONS ARE APPROXIMATE. CONTACT CALL BEFORE YOU DIG: 1-800-922-4455 PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES.

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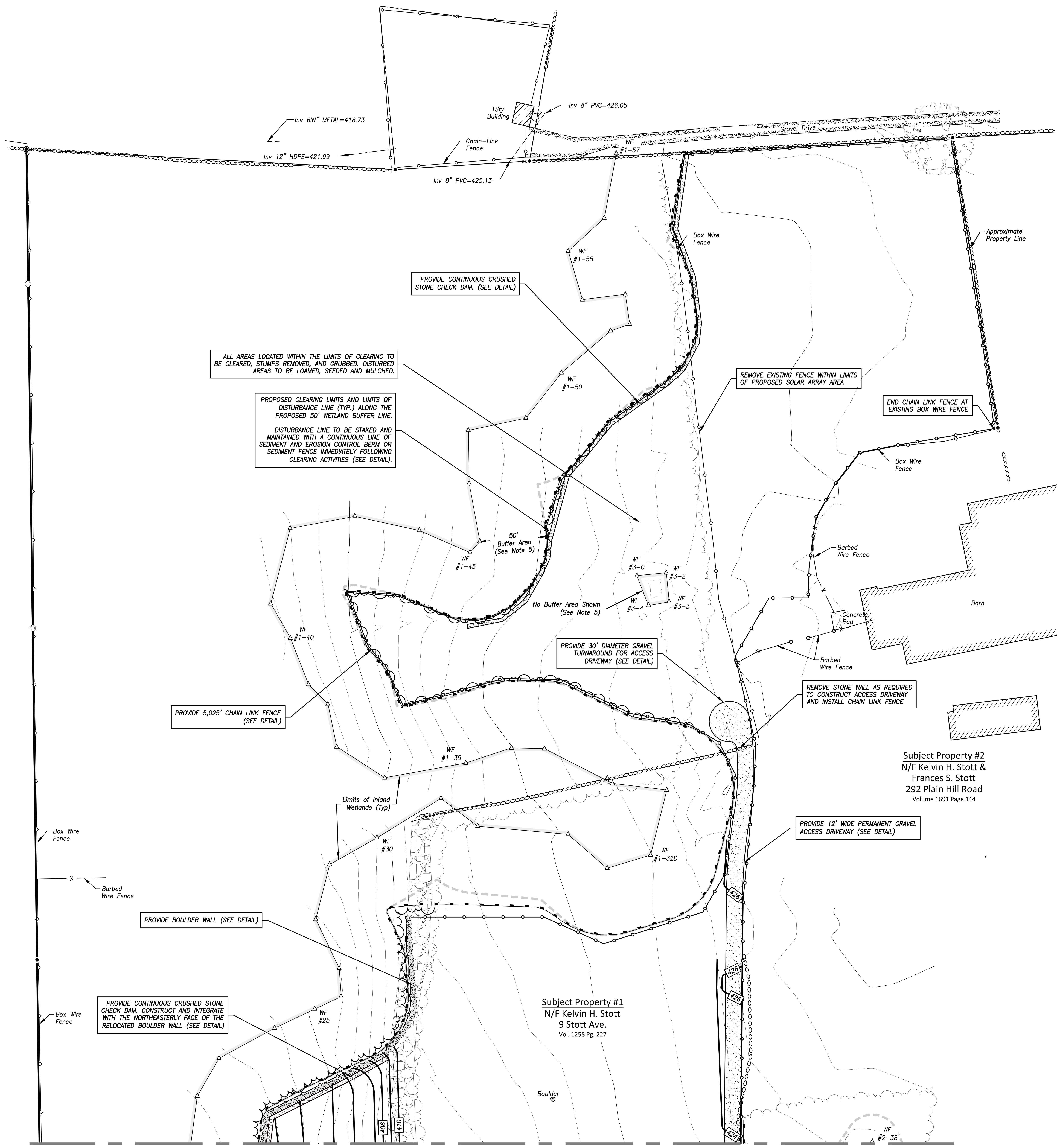
SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Site Preparation and Demolition Plan

SCALE:	1"=40'
DATE:	August 2015
JOB I.D. NO.	15-2327
Revisions	

SHEET NO.
5
10



Match Mark - See Sheet #5

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Norwich, Connecticut
Site Preparation and Demolition Plan

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Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Site Development Plan Solar Modules and Infrastructure

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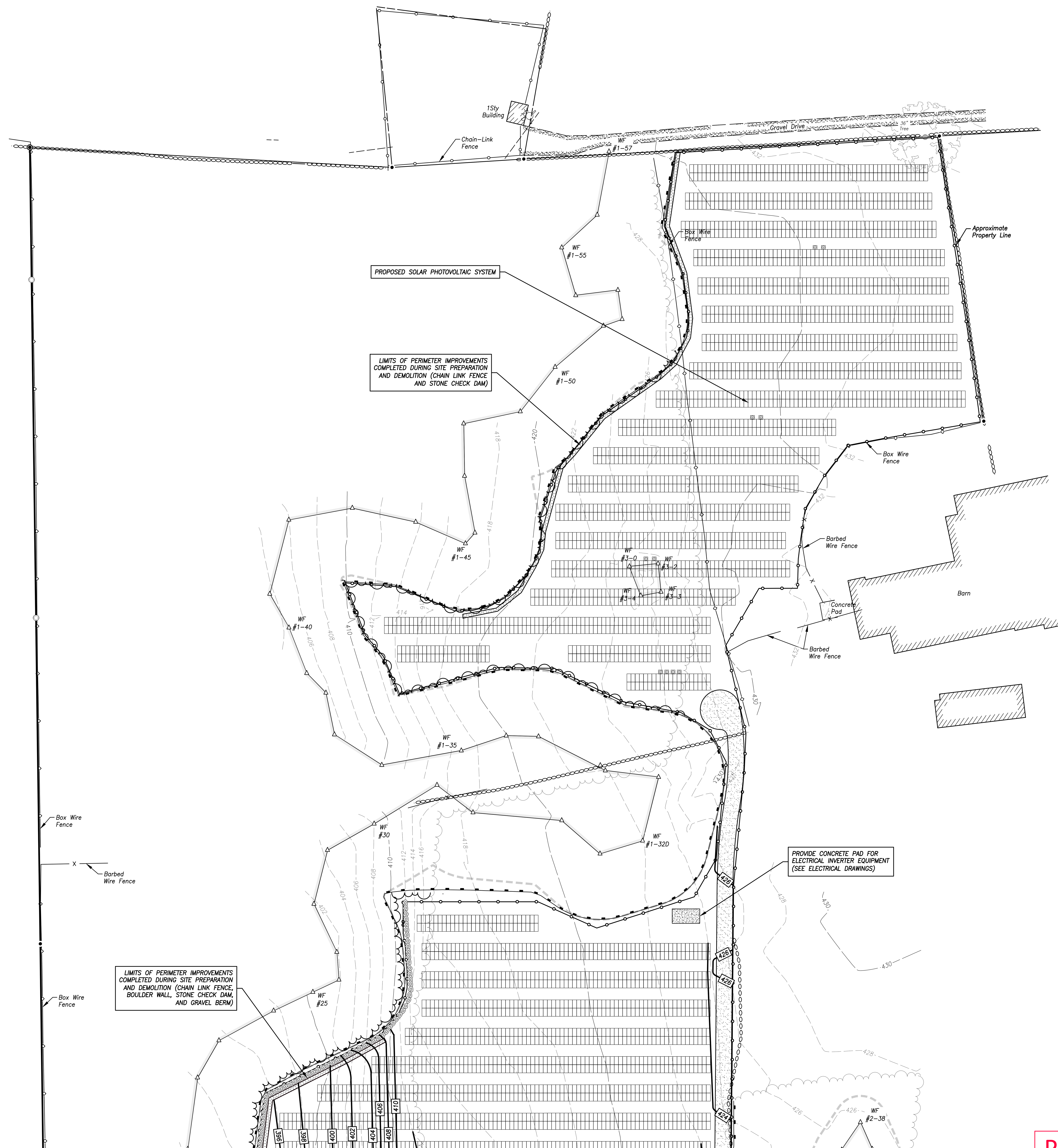

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Revisions	
SHEET NO.	8 / 10

Reference Is Made To:
1. Connecticut Guidelines For Soil Erosion and Sediment Control, MAY 2002.
2. Soil Survey Of New London County Connecticut, U.S.D.A. Soil Conservation Service.

Development Schedule:

Prior to the start of construction, the contractor is to schedule a mandatory preconstruction meeting on site to discuss issues as they relate to the proposed project. These issues will include but not be limited to:
1. Resource Protection.
2. Construction Vehicle Access and Parking.
3. Construction Methods and Scheduling.
4. Existing site utilities and mark–out coordination.
5. Material delivery and stockpiling.
6. Site Inspection procedures and As–Built drawings.

General Sequence of Construction:
1. Secure all necessary local, state, and federal permits. Register for all applicable state and federal permits as required.
2. Install anti–tracking pad at construction entrance and sediment fence in vicinity of proposed access drive.
3. Rough grade (cut and fill as required) access drive. Place and compact driveway base and install traffic bound gravel surface for access drive. Stabilize all side slopes as soon as completed by loaming all disturbed areas (4" minimum), seed with grass/hydroseed and mulch.
4. Clear and remove all trees within the proposed clearing limits. Chip trees for use as sediment and erosion control berms.
5. Install sediment and erosion control berms or sediment fence as shown down gradient of proposed development area prior to grubbing operations.
6. Install chain link security fence along entire perimeter of development area and access road.
7. Grub stumps and strip topsoil in cleared areas and proposed grading areas stockpile all topsoil at the locations indicated or other approved location. Seed these stockpiles with ryegrass and surround with sediment fence or sediment and erosion control berm. All stumps are to be ground or disposed of off–site.
8. Install boulder barriers, stormwater basins/temporary sediment traps, and crushed stone check dams, and grade as shown within the cleared areas (13% maximum within the solar array area and 3H:1V maximum in other areas), place 4" of topsoil (minimum), seed and mulch disturbed areas.
9. Demolish existing structures in accordance with local, state, and federal requirements.
10. Grade remainder of site to the grades shown (13% maximum within the solar array area and 3H:1V maximum in other areas), place 4" of topsoil (minimum), seed and mulch disturbed areas.
11. Install final landscaping improvements and proposed solar array system. Install conduit, concrete utility pads and electrical equipment as required for harvesting power.
12. After all areas have been permanently stabilized, remove erosion control measures. Sediment and erosion control berms may be left in place at the option of the Owner.

Soil Disturbance Phasing:

The project results in an estimated total soil disturbance of 5.3 acres as a result of the following activities:
1. Access drive construction and grading – 0.8 acres
2. Clearing, grubbing, and grading of cleared areas – 3.2 acres
3. Existing structure demolition and grading – 1.2 acres
4. Miscellaneous site improvements (landscaping, utilities, etc.) – 0.1 acres

Each of the soil disturbing activities referenced above will be completed and disturbed areas stabilized prior to beginning the next activity to insure that the total disturbed area on site does not exceed 5.0 acres at any given time.

Construction Notes:

1. The Contractor shall Call Before You Dig at 811 or 1–800–922–4455 at least 72 hours, Saturdays, Sundays, and holidays excluded, prior to excavation at any location. A copy of the Call Before You Dig project reference number(s) shall be given to the Owner prior to excavation.
2. Locations of existing pipes, conduits, utilities, foundations and other underground objects are not warranted to be correct and the Contractor shall have no claim on that account should they be other than that shown.
3. Stone walls, fences, curbs, etc. shall be removed and replaced as necessary to perform the work. Unless otherwise indicated, all such work shall be incidental to construction of the project.
4. All other areas disturbed by the Contractor beyond payment limits shall be restored at no additional cost to the Owner.
5. The wetland buffer line shall be staked out in the field prior to any clearing operations.
6. All work shall be done in accordance with OSHA requirements and the contractor is responsible for compliance with these requirements. In addition, it shall be the responsibility of the Contractor to provide any excavation safeguards, necessary barricades, flagmen, etc. for traffic control and site safety.
7. All erosion & sedimentation control measures shall be installed prior to the start of construction.
8. All fuel, oil, paint or other hazardous materials used during construction should be stored in a secondary container and removed to a locked indoor area with an impervious floor during non–work hours.
9. No waste materials (such as stumps) are allowed to be buried on site. All waste materials shall be disposed of off–site at an appropriate location in accordance with all local, state, and federal regulations.

Erosion Control Operation & Maintenance:

The applicant shall be responsible for the installation and maintenance of erosion and sediment control measures throughout the project. No construction shall proceed until proper sedimentation and erosion control methods have been installed as the sequence of construction necessitates.

Every precaution shall be used during construction to prevent and minimize the degradation of the existing water quality from stormwater runoff during construction. All activities shall be in conformance to and consistent with all applicable water quality standards and management practices as set forth by local, state and federal agencies.

The applicant shall appoint an onsite agent who shall be personally responsible for implementing this erosion and sediment control plan and enforcing the prescribed safeguards during the excavation and operation period.

This responsibility includes the installation and maintenance of control measures throughout the project, informing all parties engaged on site of the requirements and objectives of the plan, notifying the proper agency and officials of any transfer of this responsibility.

All erosion and sediment control measures shall be repaired, cleaned and/or replaced as necessary throughout the project in order to maintain complete and integral erosion and sediment control protection. Once in place, all erosion and sediment control measures are to remain in place in proper condition and be continuously maintained until site restoration has been completed. Following such permanent stabilization, the erosion and sediment control measures shall be dismantled, removed, and disposed of in an approved manner. Additional erosion and sediment control measures beyond those shown on the plans or prescribed herein shall be put in place, whenever necessary, to address field conditions and/or as ordered by the engineer.

Qualified personnel provided by the applicant shall inspect disturbed areas and the locations where vehicles enter and leave the site. These areas shall be inspected at least once every seven calendar days and within twenty–four hours at the end of a storm that is 0.5 inches or greater. Additional measures beyond those indicated and/or shown on this plan set or prescribed herein shall be put in place, whenever necessary, to address field conditions and/or as ordered by the engineer, where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three consecutive months.

No soil, fill or other materials shall be deposited in surrounding inland wetlands.

All temporary storage and/or stockpile areas shall be properly stabilized to prevent erosion and suitably contained to prevent turbid runoff.

Dumping of oil or other deleterious materials on the ground is forbidden. The applicant shall provide a means of catching, retaining and properly disposing of drained oil, removed oil filters, or other deleterious material from equipment used on site. Vehicle maintenance shall be completed off site. All oil spills shall be immediately reported to the department of energy and environmental protection/hazardous materials office. Failure to do so may result in the imposition of fines under the applicable Connecticut General Statutes.

During construction, the applicant shall be responsible for site inspection and maintenance to assure proper performance of erosion control measures. Inspection and maintenance shall include, at a minimum, the following:

- Inspect all sediment fence, sediment and erosion control berms and other erosion control measures. Repair or replace any damaged portion of erosion control measures surrounding these areas in order to prevent sedimentation downgradient.
- Inspect all stockpiles. Repair or replace any damaged portion of erosion control measures surrounding these areas in order to prevent sedimentation downgradient.
- Inspect grass restored areas. Revegetate any eroded or disturbed areas to provide permanent stabilization. Reseed and/or revegetate any areas that do not have a suitable stand of grass or any scoured areas to provide permanent stabilization.
- Inspect anti–tracking pad. Remove and dispose of pad and replace if pad is no longer functioning efficiently or accumulated sediment is to a depth of 2" below the stone surface.
- Inspect all stone check dams. Remove accumulated sediment if required (blocking more than 3" depth of flow).
- Inspect all temporary and permanent stormwater basins. Remove accumulated sediment if required (greater than 6" depth), revegetate if necessary to provide stabilization.
- Inspect downgradient areas of all outlets and solar arrays. Stabilize any eroded areas if found.

Erosion and Sediment Control Best Management Practices (BMP'S)

Minimize Disturbed Area and Protect Natural Features and Soil:

Topsoil:

Topsoil will be removed and stockpiled on site and utilized for final grading. Additional topsoil, if required will be supplied from an off–site source. Excess materials resulting from "cut slopes" in the areas of the proposed construction that are not intended for reuse will be immediately removed from the site. When soil is stockpiled, the slope of the stockpile will not exceed 2 horizontal to 1 vertical.
Installation Schedule: As noted, excavated topsoil will be stockpiled on site. Sediment fence will be placed around any stockpiles that are not immediately removed from the site to protect the existing drainage ditches and off site areas.
Maintenance and Inspection: The cut and fill areas will be inspected weekly for erosion. These areas will be stabilized immediately with erosion controls or graded to avoid possible disturbance to the existing drainage ditches or off site areas. See also maintenance and inspection procedures for silt fence.

Control Stormwater Flowing Onto and Through the Project:

Area for Silt to accumulate:

BMP/Installation Schedule: Before any grading operations begin, a sediment and erosion control berm or sediment fence will be installed adjacent to the areas under construction just outside the limits of disturbance.
Other adjacent off site areas will always be protected by a sediment fence or another BMP until final stabilization is achieved.
Maintenance and Inspection: The graded areas and sediment fence will be inspected weekly to ensure that there are no structural failures and immediately after rain events.

Construction Specifications

Sediment and Erosion Control Berm
1. The material for sediment and erosion control berms will be acquired in conjunction with the removal and chipping of trees located within the project area.

Installation

Erect sediment and erosion control berm in a continuous fashion at the specified height and width.

Maintenance:
1. Sediment should be removed once it has accumulated to a depth of 4".
2. Berm should be repaired if it has been breached.
3. Berm can be left in place permanently and left to deteriorate.
4. All sediment accumulated at the berm should be removed and properly disposed of if the berm is to be removed.

Sediment Fence
1. The material for sediment fences should be a pervious sheet of synthetic fabric such as polypropylene, nylon, polyester, or polyethylene yarn.
2. The stakes used to anchor the filter fabric should be wood or metal. Wooden stakes should be at least 3 feet long and have a minimum diameter of 2 inches if a hardwood like oak is used. Stakes from soft woods like pine should be at least 4 inches in diameter.
3. Erect sediment fence in a continuous fashion from a single roll of fabric to eliminate gaps in the fence. If a continuous roll of fabric is not available, overlap the fabric from both directions only at stakes or posts. Overlap at least 6 inches. Excavate a trench to bury the bottom of the fabric fence at least 6 inches below the ground surface. This helps to prevent gaps from forming near the ground surface. Gaps would make the fencing useless as a sediment barrier.
4. The height of the fence posts should be 16 to 34 inches above the original ground surface. Space the posts no more than 10 feet apart.
5. The fence should be designed to withstand the runoff from a 10–year peak storm event. Once installed, it should remain in place until all areas upslope have been permanently stabilized by vegetation or other means.

Installation:
1. Dig a 6" deep trench on the uphill side of the proposed barrier location.
2. Position the posts on the downhill side of the fabric barrier and drive the post 1.5 feet into the ground.
3. Lay the bottom 6" of the fabric barrier in the trench to prevent undermining and backfill.

Maintenance:
1. Sediment should be removed once it has accumulated to 4" depth.
2. Filter fabric should be replaced whenever it has deteriorated to such an extent that the effectiveness of the fabric is reduced (approximately six months).
3. Sediment fence should remain in place until disturbed areas have been permanently stabilized.
4. All sediment accumulated at the fence should be removed and properly disposed of before the fence is removed.

Inspection:
1. Inspect sediment fence before anticipated storm events (or series of storm events such as intermittent showers over one or more days) and within 24 hours after the end of a storm event of 0.5 inches or greater, and at least once every seven calendar days, at least 72 hours apart.
2. Where sites have been finally or temporarily stabilized, such inspections may be conducted once per month.

Straw Bale Barrier

Installation
1. Excavate trench 4" and place material upslope of trench.
2. Place bales in a single row in the trench, lengthwise, with ends of adjacent bales tightly abutting one another and the bindings oriented around the sides rather than along the tops and bottoms of the bales (to avoid premature rotting of the bindings).
3. Anchor each bale with at least 2 stakes, driving the first stake in each bale toward the previously laid bale to force the bales together. Stakes must be driven a minimum of 18 inches into the ground. Fill any gaps between the bales with straw to prevent water from escaping between the bales.
4. Backfill the bales with the excavated trench material to a minimum depth of 4 inches on the uphill side of the bales. Tamp by hand or machine and compact the soil. Loose straw scattered over the disturbed area immediately uphill from the hay bale barrier tends to increase barrier efficiency.

Maintenance
1. Inspect the straw bale barrier 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 to determine maintenance needs. For dewatering operations, inspect frequently before, during, and after pumping operations. Remove the sediment deposits when sediment deposits reach approximately one half the height of the barrier.
2. Replace or repair the barrier within 24 hours of observed failure. Failure of the barrier has occurred when sediment fails to be retained by the barrier because:
   (a) the barrier has been overtopped, undercut or bypassed by runoff water,
   (b) the barrier has been moved out of position, or
   (c) the straw bales have deteriorated or been damaged.
3. When repetitive failures occur at the same location, review conditions and limitations for use and determine if additional controls are needed to reduce failure rate or replace straw bale barrier.
4. Maintain the straw bale barrier until the contributing area is stabilized. After the upslope areas have been permanently stabilized, pull the stakes out of the hay bales. Remove sediment.

Dust Control:

Dust from the site will be controlled by using a mobile pressure–type distributor truck that will apply potable water at rate of 300 gallons per acre and minimized as needed to avoid ponding.
Installation Schedule: Dust control will be implemented as needed once site grading has been initiated, and during windy conditions exceeding 20mph, while site grading is occurring. Spraying of potable water will be performed once per day during the months of March through May and no more than three times per day from June to September or whenever dryness of soil warrants it.
Maintenance Schedule: At least one mobile unit will be available at all times during construction to apply potable water. Each mobile unit shall be equipped with a positive shutoff valve to prevent over watering of disturbed areas.

Soil Stabilization:

Temporary Stabilization:

BMP Description: Hydromulching will be used on slopes where construction will cease for more than 14 days and over the winter months to stabilize erodible materials. Straw mulch and wood fiber will be mixed with a tackifier and applied uniformly by machine with an application rate of 2 tons (100–200 bales) per acre. The contractor will use crimping equipment to bind the mulch to the soil if the tackifier is not effective. Netting will be used on small areas with steep slopes. In areas where hydromulching is inaccessible, straw mulch will be applied by hand at the same application rate.
Temporary Seeding will be used on any area where construction activity is suspended for more than twenty–one days to stabilize erodible materials. Refer to the Erosion Control Plan for guidance on seeding mixtures, rates, and acceptable planting dates for temporary seeding.

Installation Schedule: Portions of the site where construction activities will temporarily cease for more than 14 days will be stabilized with mulch. Where construction activities will temporarily cease for more than 21 days it will be temporarily seeded. Winter stabilization will be provided between December 25 and March 30.
Maintenance and Inspection: Mulched areas will be inspected weekly to ensure that adequate coverage is provided. Repairs will be conducted as needed.

Seed Mixture For Temporary Seeding

	LBS./ACRE	LBS./1000 S.F.
Annual Ryegrass	40	1.0

See Figure TS–2 in the 2002 Guidelines for additional temporary seed mixes.

Final Stabilization:

Permanent seeding should be applied immediately after the final design grades are achieved at the site but no later than 14 days after construction activities have permanently ceased. After the entire site is stabilized, any sediment that has accumulated will be removed and hauled off site to a licensed landfill facility. Construction debris, trash, and temporary BMP's will also be removed and any areas disturbed during removal will be seeded immediately.

Seedbed Preparation:
1. Topsoil will be spread over final graded areas at a minimum depth of four inches. Topsoil shall inclusively mean a soil meeting one of the following soil textural classes established by the United States Department of Agriculture classification system based upon the proportion of sand, silt, and clay size particles after passing a 2 millimeter (mm) sieve and subjected to a particle size analysis:
   1.1. Loamy sand, including coarse, loamy fine, and loamy very fine sand, sandy loam, including coarse, fine and very fine sandy loam, loam, or silt loam with not more than 60% silt;
   1.2. Containing not less than 6% and not more than 20% organic matter as determined by loss–on–ignition of oven dried samples dried at 105 degrees centigrade;
   1.3. Possessing a ph range of 6.0–7.5, except if the vegetative practice being used specifically requires a lower ph, then ph may be adjusted accordingly;
   1.4. Having soluble salts not exceeding 500 ppm;
   1.5. And that is loose and friable and free from refuse, stumps, roots, brush, weeds, frozen particles, rocks, and stones over 1.25 inches in diameter, and any material that will prevent the formation of a suitable seedbed or prevent seed germination and plant growth.
2. Fertilizer will be applied to the seedbed as needed. Fertilizers will be commercial type of uniform composition, free–flowing and conforming to the applicable State and Federal laws. Choose native species that are adapted to local weather and soil conditions wherever possible to reduce water and fertilizer inputs and lower maintenance overall.
3. Topsoil will be loosened by raking, tilling or other suitable methods.

Final stabilization should be installed on portions of the site where construction activities have permanently ceased but no later than 14 days after construction ceases.
All seeded areas will be inspected weekly during construction activities for failure until a dense cover of vegetation has been established. If failure is noticed on the seeded area, the area will be reseeded, fertilized and mulched immediately. After construction is complete at the site permanent stabilization measures will be monitored until final stabilization is reached.

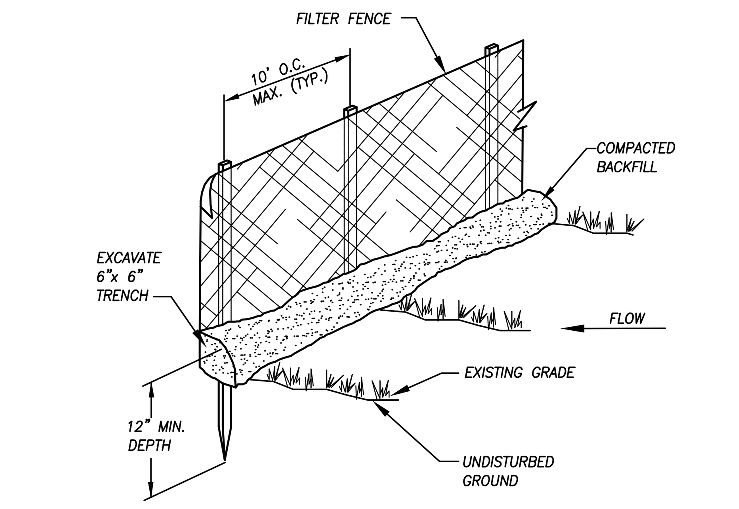
Seed Mixture For Upland Areas

	LBS./ACRE	LBS./1000 S.F.
Kentucky Bluegrass	20	0.45
Creeping Red Fescue	20	0.45
Perennial Ryegrass	5	0.10
	45	1.00

The recommended seeding dates are: April 1–June 15 and August 1–September 15

Planting Specifications:

1. All materials and construction methods shall conform to the requirements of the Connecticut Association of Landscape Contractors Specification. All plants shall be nursery grown and conform to the latest edition of ANSI 260.1, AMERICAN STANDARD FOR NURSERY STOCK and also the minimum guidelines established for nursery stock published by the American Association of Nurserymen, Inc.
2. No substitution of plant materials will be allowed without the prior written consent of the Project Owner. Where a plant size range is provided at least 50% of the plants shall be of the larger size.
3. All lawn and planting area soil preparation shall be fertilized and amended according to recommendations of a soil analysis provided by an approved soil testing laboratory.
4. All exterior ground areas disturbed by construction and not covered by buildings, structures, paving, continuous planting beds or other site improvements shall be graded, topsoiled to a minimum depth of 4" and grass seeded. Provide lawn development in all areas of selective clearing as directed.
5. All plant pits must be free draining. Break up the bottom of the hole by fork if necessary to ensure plant has proper drainage.
6. Set all plants in center of plant pits, plumb and straight and as detailed on the drawing. All plant material shall bear the same relationship to finished grade as to original planting grade prior to digging. Trees shall be planted with the junction of roots and stem level with finished grade.
7. Handle balled and burlapped plants from the ball only. Once positioned in the hole, remove the top 1/3 of the burlap from the root ball without disturbing the roots.
8. Face each plant to give the best appearance. Final location of plant material should be approved by the Project Owner in the field.
9. Fill plant pits 2/3 their depth with prepared planting mixture, water thoroughly and allow to settle. Complete back–filling, water thoroughly to eliminate any voids and air pockets. Provide additional back–fill as necessary to conform to required elevation and as detailed.
10. Form saucer and install mulch over entire plant pit and saucer area as detailed.
11. All tree staking or guying shall be completed immediately after planting, but in no instance more than 24 hours after planting. See staking/guying detail. At the completion of the maintenance period remove all stakes, flags, guys, tree wrap, and anchors.
12. Mulch all new shrub beds and plant pits to achieve a 3" depth after settlement. Mulch all ground cover beds to achieve a 2" depth after settlement. Mulch for saucers and planting areas to be a double shredded bark mulch.
13. All plants shall be guaranteed for a period of one full year after inspection and acceptance by the Owner's representative, and shall have at least 80% healthy growth at the end of the guarantee period.
14. Landscape planting materials as proposed by this plan are Connecticut native and/or non–invasive species. This landscape plan has been designed to incorporate species which are prolific in USDA plant hardiness zone 6b and which require minimal energy input for upkeep and maintenance. References utilized for Connecticut native and non–invasive species selection include the Connecticut Botanical Society, the Connecticut agricultural experiment station, the U.S. Department of Transportation Federal Highway Administration, 2004 Connecticut Stormwater Quality Manual, New England Wetland Plants, Inc., and other sources.



SEDIMENT FENCE DETAIL

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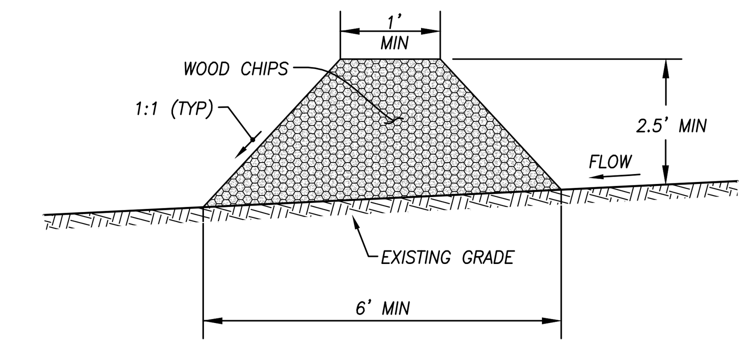

SEDIMENT AND EROSION CONTROL BERM

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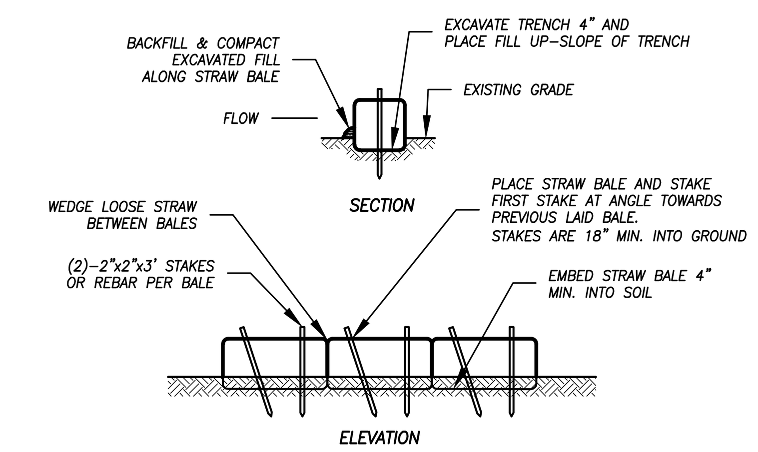

STRAW BALE BARRIER DETAIL

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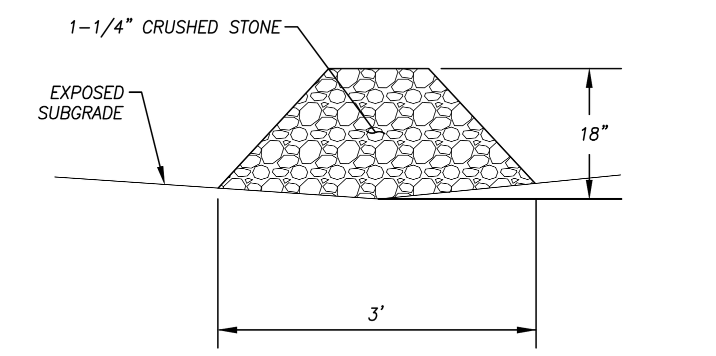

STONE CHECK DAM SECTION

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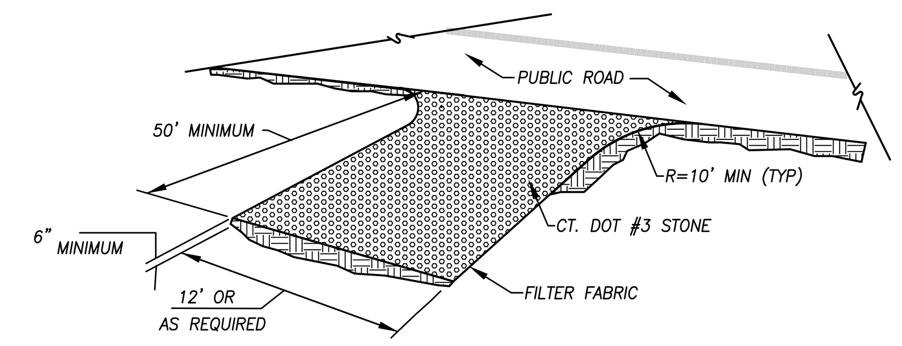

ANTI-TRACKING PAD

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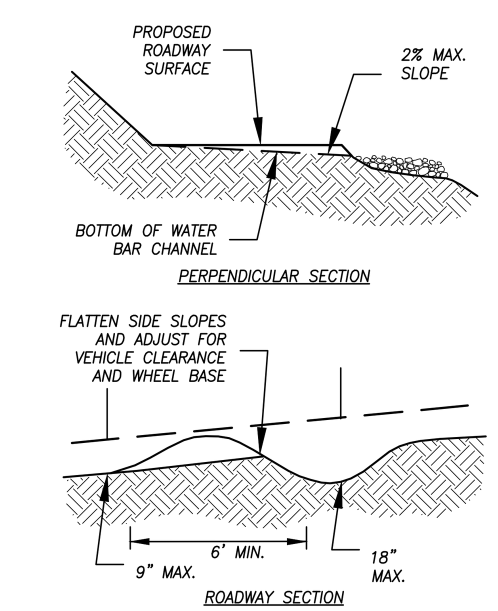

WATER BAR DETAIL

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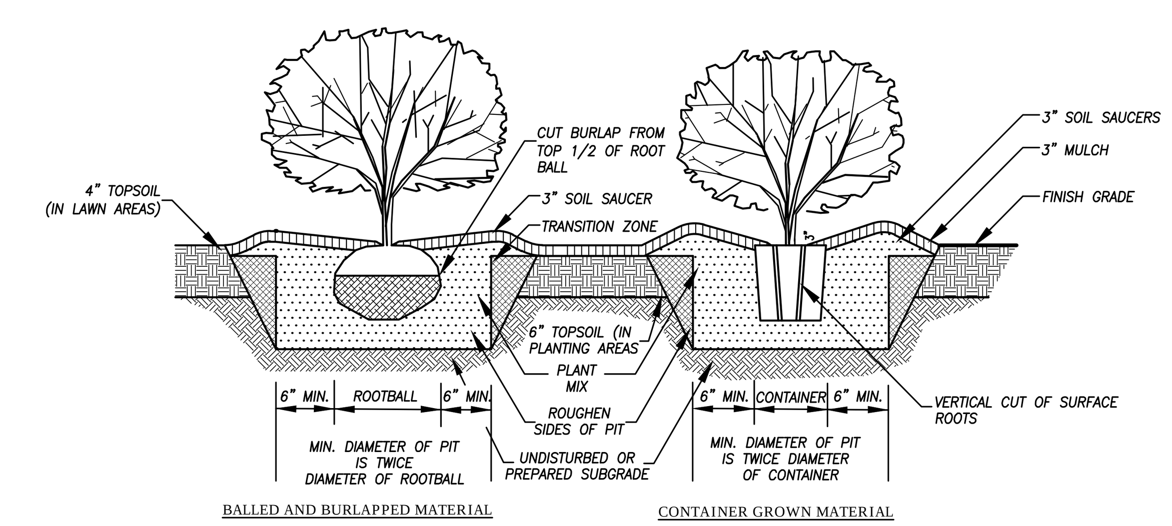

NOTES:
1. SET CROWN OF ROOTBALL 2" ABOVE FINISH GRADE.
2. FOR CONTAINER GROWN STOCK USE FINGERS OR A SHARP KNIFE TO LOOSEN ROOTS OUT OF THE OUTER LAYER OF POTTING SOIL. THEN CUT OR PULL APART ANY ROOTS CIRCLING THE PERIMETER OF THE CONTAINER.
3. AT PLANTING THOROUGHLY SOAK THE ROOT MASS AND ADJACENT SOIL. REPEAT SEVERAL TIMES DURING THE FIRST MONTH AND THROUGHOUT THE FOLLOWING TWO SUMMERS.

SHRUB PLANTING DETAIL

NOT TO SCALE

LANDSCAPE SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY	COMMENT
TREES AND SHRUBS					
THOC2	Thuja Occidentalis	"Emerald Green" Arborvitae	5' Height	238	C.G.
TACA7	Taxus Canadensis	Canada Yew	2–3' Height	62	C.G.

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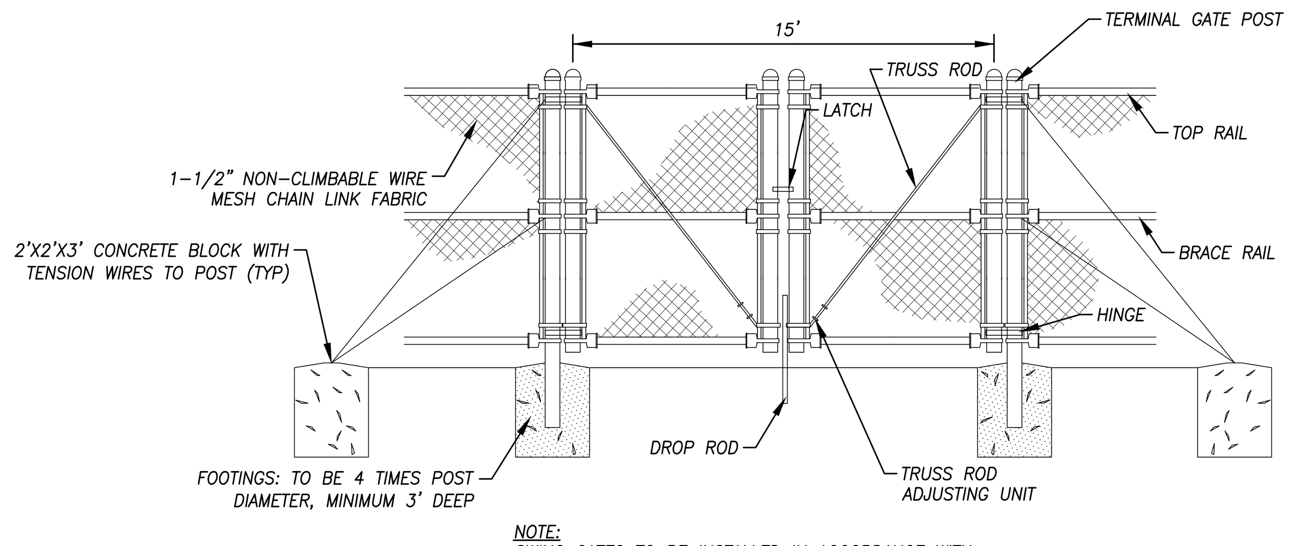
SolarCity Corporation
Proposed Solar Photovoltaic System
9 Stott Avenue & 292 Plain Hill Road
Norwich, Connecticut
Erosion and Sediment Control Narrative & Details

SCALE:	As Noted
DATE:	August 2015
JOB I.D. NO.	15-2327
Revisions	

SHEET NO.

9

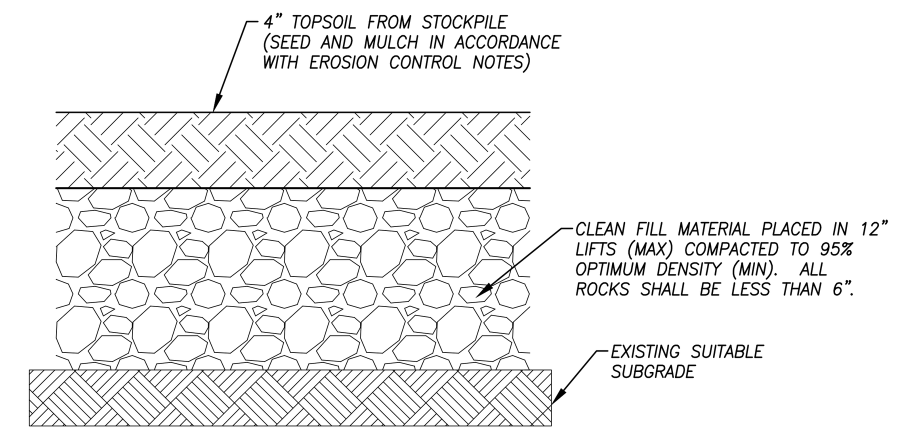
10



NOTE:
SWING GATES TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

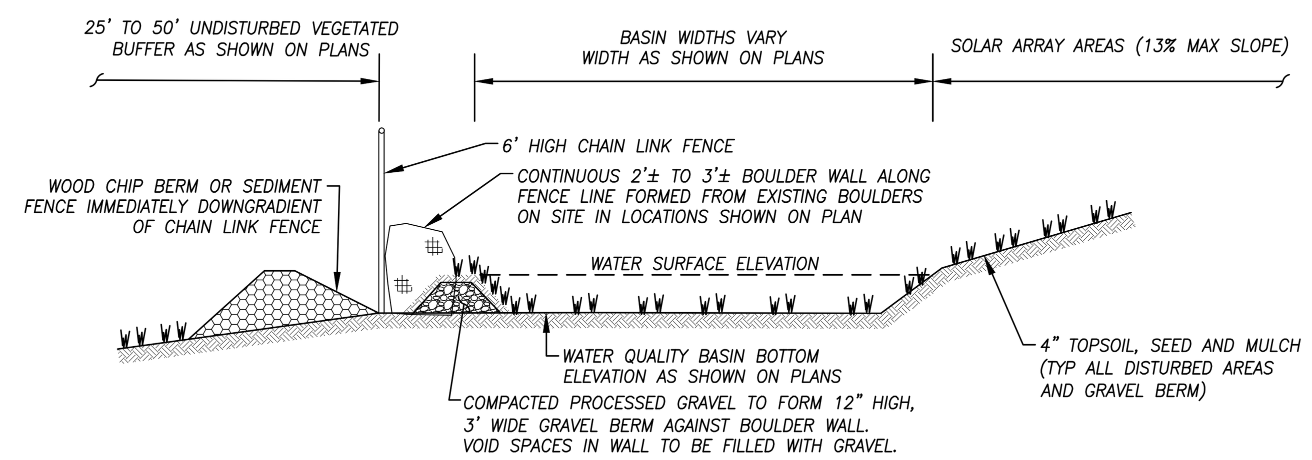
6' HIGH GALVANIZED SWING GATE DETAIL

NOT TO SCALE



FILL PLACEMENT DETAIL

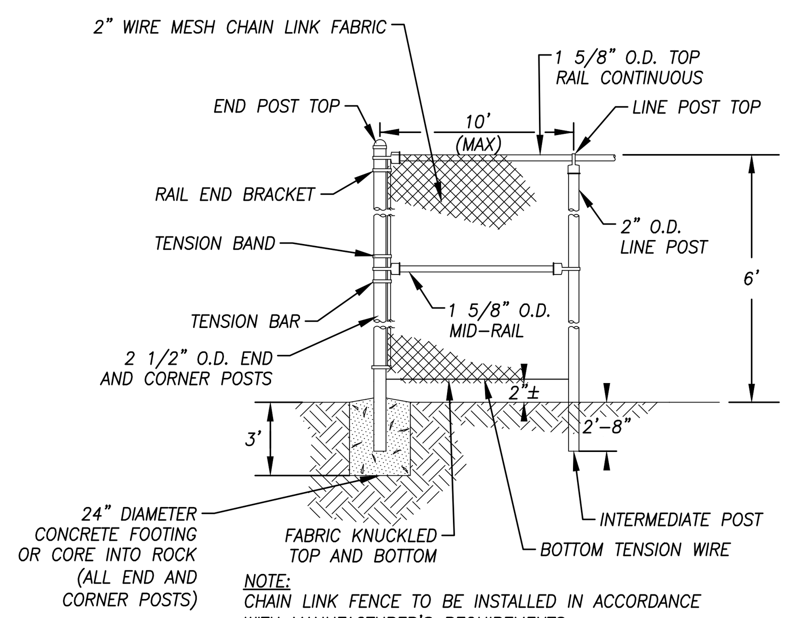
NOT TO SCALE



NOTES:
ALL GRAVEL FILL FOR WATER QUALITY BASIN BERM TO MEET THE REQUIREMENTS OF CT DOT FORM 816 M.02.06 GRADATION A.

WATER QUALITY BASIN DETAIL

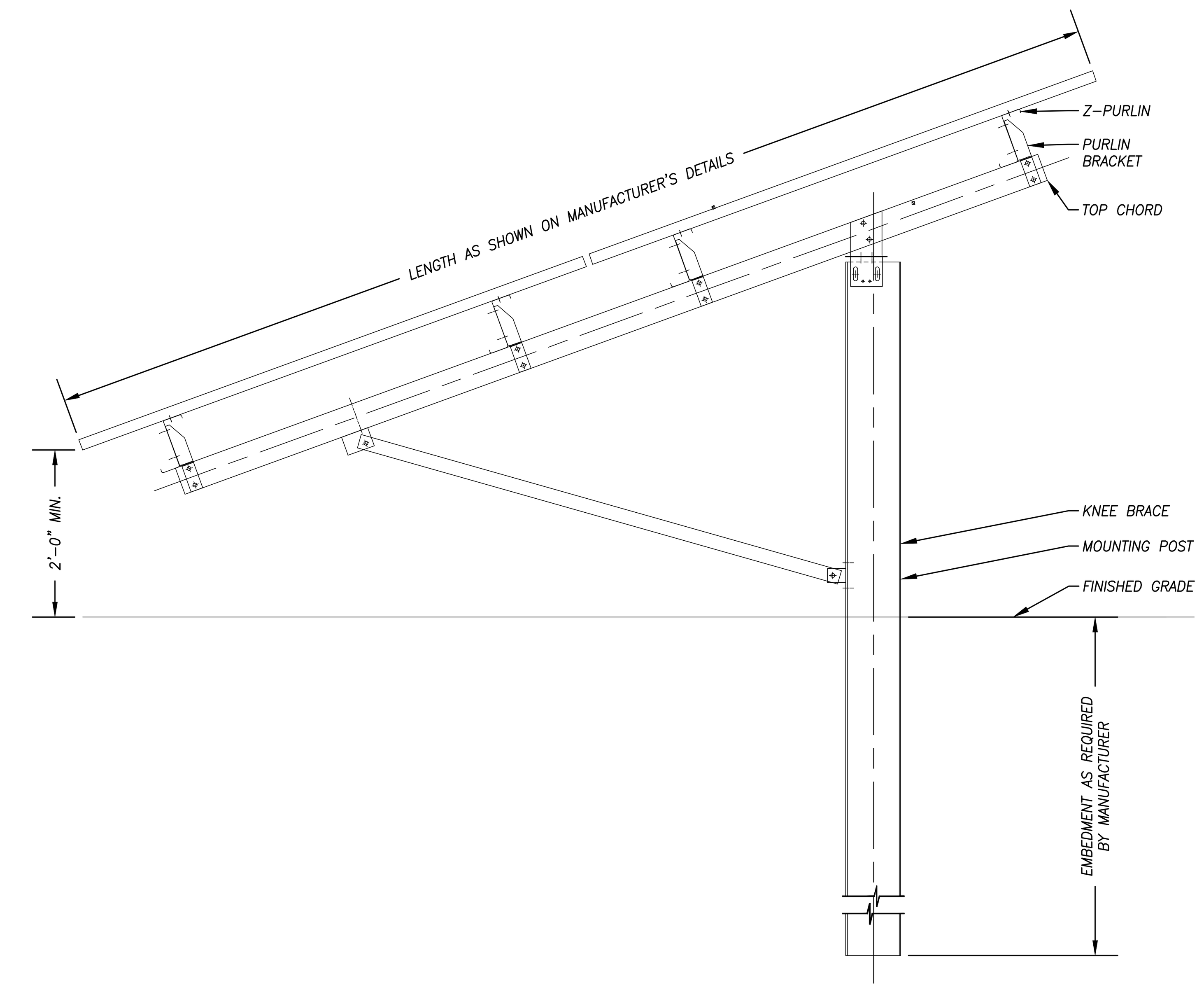
NOT TO SCALE



NOTE:
CHAIN LINK FENCE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

GALVANIZED CHAIN LINK FENCE DETAIL

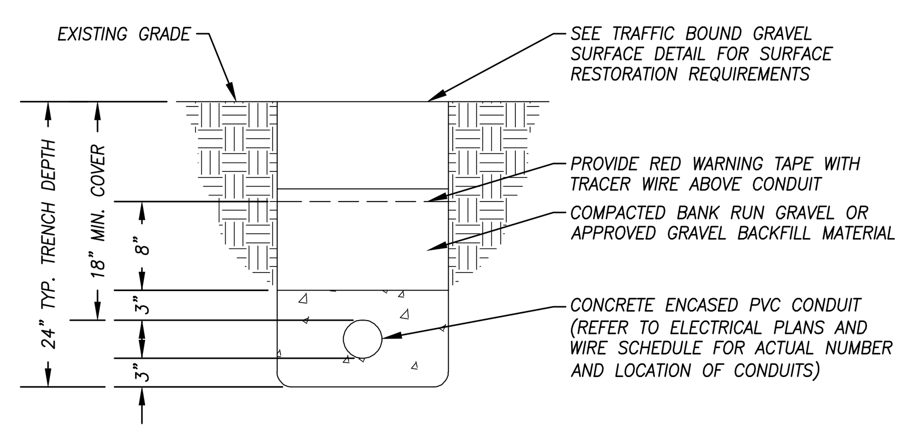
NOT TO SCALE



NOTES:
SEE MANUFACTURER'S DETAIL SHEETS FOR ADDITIONAL INFORMATION REGARDING RACKING SYSTEM REQUIREMENTS AND INSTALLATION PROCEDURES. RACKING SYSTEM TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

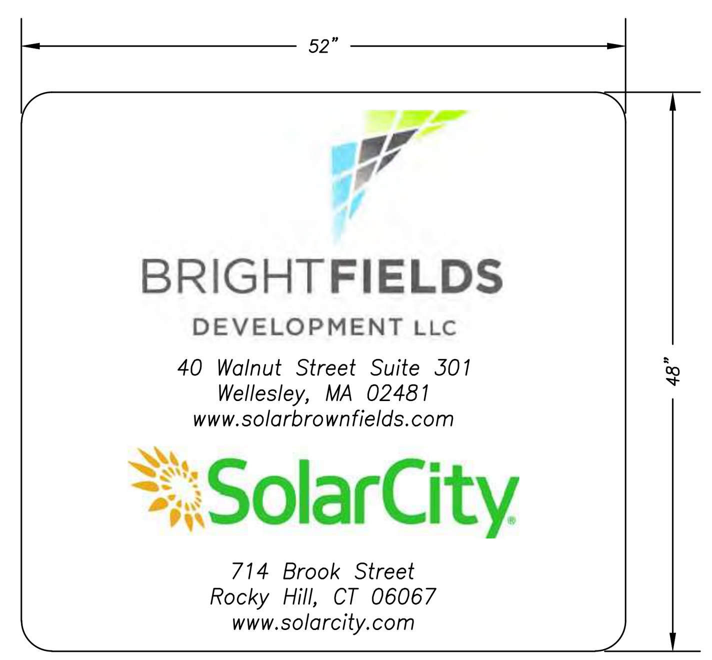
TYPICAL POST MOUNTED RACKING SYSTEM DETAIL

NOT TO SCALE



CONDUIT TRENCH THROUGH GRAVEL DRIVE DETAIL

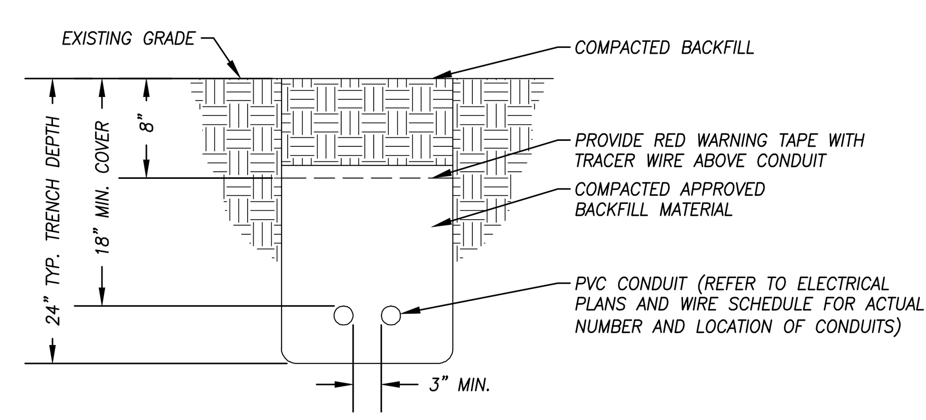
NOT TO SCALE



NOTE:
1. SIGNS MOUNTED ON GATES AT ALL ENTRANCES.
2. SIGNS TO BE RATED FOR OUTDOOR ENVIRONMENTS.

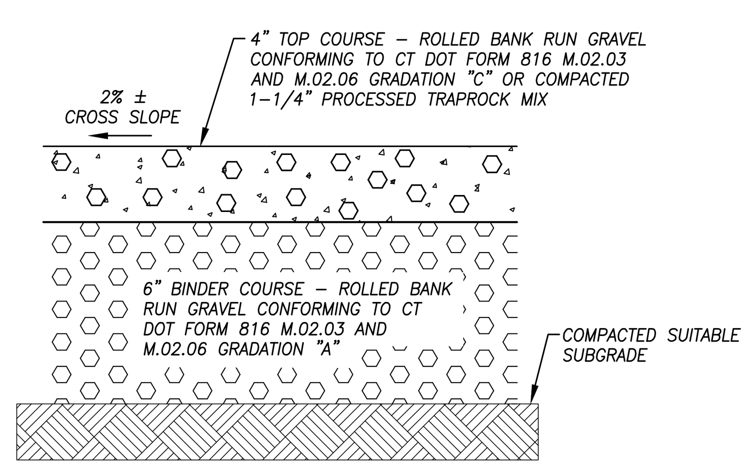
IDENTIFICATION SIGNAGE

NOT TO SCALE



NON-TRAFFIC CONDUIT TRENCH DETAIL

NOT TO SCALE



TRAFFIC BOUND GRAVEL SURFACE

NOT TO SCALE

PROGRESS PRINT
AUGUST 14, 2015

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EXHIBIT 7

Decommissioning Plan

9 Stott Ave and 292 Plain Hill Road Solar Project
Norwich, CT

This Decommissioning Plan establishes the approach to conduct decommissioning activities for the permanent closure of the solar panels and appurtenant equipment (Project or Facility) at the end of the Facility's useful life or the permanent cessation of the Facility's' operation, whichever comes first. This Plan also describes the approach for removal and/or abandonment of facilities and equipment associated with the Facility's and describes anticipated land-restoration activities.

As background, the Site License Agreement (SLA) for the Facility site requires that no later than 90 days after its expiration all tangible personal property comprising the Facility must be removed from the site. The SLA also requires that the site be returned to its original condition, excepting ordinary wear and tear, including the removal of mounting pads or other support structures for the solar modules.

DECOMMISSIONING ACTIVITIES

In accordance with the SLA, decommissioning will involve removal and disposal or recycling of all Project components. All recyclable materials will be transported to the appropriate nearby recycling facilities. Any non-recyclable materials will be properly disposed of at a nearby landfill. 95% or greater of the Facility's components will be recyclable.

Decommissioning Preparation

The first step in the decommissioning process will be to prepare the site for decommissioning. Site decommissioning and equipment removal can take up to eight months to complete for a project of this size. Therefore, access roads, fencing, and electrical power will temporarily remain in place for use by the decommissioning and site restoration workers until no longer needed. Demolition debris will be placed in temporary on-site storage areas pending final transportation and disposal/recycling according to the procedures listed below.

PV Equipment Removal and Recycling

During decommissioning, all Facility components that will not be used by the site owner will be removed from the site. Equipment removal will include all pad-mounted cabinets, wiring, solar modules, solar module racking, inverters, batteries, and panel boards. Steel posts that supported the module racking will be removed and any resulting holes will be backfilled with locally imported soil to match existing site soil conditions. The concrete transformer and interconnection equipment pads will be broken up and removed.

The demolition debris and removed equipment may be cut or dismantled into pieces that can be safely lifted or carried with the on-site equipment being used. The majority of glass, steel and aluminum will be processed for transportation and delivery to a licensed off-site recycling center. The solar modules will be transported to and recycled at the nearest facility that will accept them. Minimal non-recyclable materials are anticipated; these will be properly disposed of at the nearest qualified disposal facility.

Internal Power Collection System

The DC and AC power collection system will be dismantled and removed. All conduit and cabling that is removed will be recycled.

Access Roads

The onsite access driveway will remain in place to accomplish decommissioning at the end of the Facility's life. At the time of decommissioning, if the landowner determines that this road will be beneficial for the future use of the site, the access road may remain after decommissioning. The future use of the site is undetermined at this time. Roads that will not be used will be restored to pre-construction conditions by removal of the aggregate base material, fill of the compacted base section with locally imported soil to match existing onsite soils, and hydroseeding with a seed mix to match existing onsite groundcover.

Security Fence

The 6-foot high chain link perimeter security fence will remain in place during decommissioning activities for site safety and security purposes. At the time of decommissioning, if the landowner determines that this fence will be beneficial for the future use of the site, the fence may remain after decommissioning. The future use of the site is undetermined at this time. If the fence will not be used, it will be removed and transported to the nearest recycling facility. Holes left behind by the fence support posts will be backfilled with locally imported soil to match existing onsite soils, and hydroseeded with a seed mix to match existing onsite groundcover.

Landscaping

The double row of screening vegetation along certain areas of the perimeter of the Site will remain in place during decommissioning activities for site safety and security purposes. At the time of decommissioning, if the landowner determines that this landscaping will be beneficial for the future use of the site, the landscaping may remain. The future use of the site is undetermined at this time. If the landscaping will not be used by the landowner, it will be removed and transported to the nearest plant material disposal facility for composting or mulching. Shrubs, bushes, and trees would be stump cut to ground level.

Interconnection Line

The overhead interconnection cabling that connects the Project to the Norwich Public Utilities distribution network will remain in place during decommissioning activities to provide electric service onsite during decommissioning. At the time of decommissioning, if the landowner determines that this electric service line will be beneficial for the future use of the site, the line may remain after decommissioning. If the line is not used, it will be removed per Norwich Public Utilities guidelines and transported offsite to the nearest recycling facility.

SITE RECLAMATION

After the Project is completely decommissioned, and all Project equipment has been removed from the Site, additional activities will be performed to return the property back to its pre-construction conditions, excepting ordinary wear and tear,

Restoration Process

The decommissioning process will remove Project-related structures and infrastructure as described in the previous sections. Following decommissioning, site reclamation activities will occur. Reclamation will restore landform features, vegetative cover, and hydrologic function after the closure of the facility. The process will involve (where needed) the replacement of topsoil and vegetation, as well as modification of site topography where necessary to bring the Site back to substantially pre-construction conditions compatible with the adjacent surroundings.

Any excavated areas remain after removal of equipment pads or access road base material, will be backfilled and compacted with locally imported soil to match existing onsite soils, and hydroseeded with a seed mix to match existing onsite groundcover. Any other areas of lower than average ground surface level will receive similar treatment.

If any soils are compacted at levels that would affect successful re-vegetation, they will be de-compacted. The method of de-compaction will depend on how compacted the soil has become over the life of the Project. Following de-compaction, re-contouring of the site will be conducted, if necessary, to return the Site to approximately match the pre-construction surface conditions and the surrounding area conditions. Original site drainage characteristics will be restored if they have not been maintained. It is unlikely that a significant amount of earthwork will be required, because the Project construction plan calls for minimal disturbance of the Site during Project construction. Grading activities will be limited to areas as shown on the design plans that require re-contouring. Efforts will be made to disturb as little of the natural drainages and existing natural vegetation that remain post-decommissioning as possible.

Any remaining bare earth areas will be hydroseeded with a seed mix to match existing onsite groundcover. Site restoration activities are anticipated to be limited, because the pre-construction conditions of the site are not planned to be significantly altered during Project construction. Also, any other activities that become necessary, will be performed to return the Site to a pre-construction condition.

Monitoring Activities

The Site will be monitored by SolarCity after site restoration activities are complete to confirm that any earthwork and re-vegetation were performed correctly. The Site will be periodically inspected (at least quarterly) to check for any eroded earthwork or failed vegetation. Any deficiencies will be promptly corrected. This monitoring will continue for a period of one year, or until the Site is re-developed for another future purpose, whichever comes first.