Development & Management Plan For:
Quinebaug Solar, LLC
Connecticut Siting Council Petition 1310A

January 19, 2021

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1 INTRODUCTION

On April 23, 2020, the Connecticut Siting Council (Council) issued the Decision and Order approving the Modified Quinebaug Solar, LLC (Quinebaug Solar) Petition (Petition No. 1310A) pursuant to Connecticut General Statues §4-176 and §16-50k, for the proposed construction, maintenance and operation of an approximately 50 megawatt alternating current solar photovoltaic electric generating facility. Quinebaug Solar is located generally north of Wauregan Road in Canterbury, Connecticut, and south of Rukstella Road and Allen Hill Road in Brooklyn, Connecticut (Project or Project Site).

This Development and Management (D&M) Plan is being provided in compliance with §16-50j-60 through §16-50j-62 of the Regulations of Connecticut State Agencies, and serves to meet the requirements of sections 1a through 1l of the Council's Decision and Order as they pertain to construction of the Project. On October 8, 2020, Quinebaug Solar submitted a Partial Development and Management Plan regarding vegetation clearing for the Project Site and construction activities related to the Collector Substation and Canterbury Switching Station. On November 20, 2020, the Council conditionally approved the Partial Development and Management Plan. The remaining D&M requirements outlined in the Decision and Order are provided in this D&M Plan. Figures pertinent to this D&M Plan are provided in Attachment A.

2 SUMMARY OF CHANGES

Quinebaug Solar will adhere to all conditions and commitments included in the Council's Decision and Order. This section describes minor changes to the Project that have occurred since the Petition was approved. These changes include slight modifications to the Project layout and configuration and are entirely within the boundary of the original Study Area for the Project. Based on these changes, stormwater controls have been updated to address changes in grading and overall Site Plan (Attachment B).

Project Footprint

- The total limit of work decreased from approximately 227 acres to approximately 220 acres.
- The smaller areas of the array in the southern central area of the site and the northwest corner of the site were eliminated due to their remoteness and interconnection challenges.

Road Configuration

- Due to layout changes, the road configuration has been modified from the previous submission for electrical efficiency.
- The total length of interior access roads increased from approximately 3.3 miles to approximately 3.4 miles.

Grading

- Grading is adjusted based on an updated internal site road configuration.

Stormwater

- Construction phase and post-construction stormwater management has been updated accordingly based on the updated layout and internal site road configuration, and based on coordination with the Department of Energy and Environmental Protection DEEP. Detailed information on phasing and stormwater controls are provided in Attachment C.
- All roadways, gravel surfaces, equipment pads and solar panels are considered impervious for the purposes of calculating the required Water Quality Volume.
- No solar panels are located within 100 feet of any wetland or waters that, prior to or after construction, is located downgradient of such construction activity.
- No solar panels are located within 50 feet of any property boundary that, prior to or after construction, is located downgradient of such construction activity.
- Within the limit of work, the runoff curve number associated with the Hydrologic Soil Group (HSG) present on-site has been increased by one half the difference between the HSG present on-site and the next higher HSG to account for compaction of soils that results from extensive machinery traffic over the course of the construction of the array. In areas where grading exceeds a 2 foot difference between existing and proposed grades, the runoff curve number has been increased by one full HSG.
    - As a result, several new berms/basins and associated permanent swales have been added and several of the previously designed basins increased in size.
    - The quantity, location, and size of the basins were modified to accommodate the additional runoff caused by the higher curve numbers that were required. Some basins were relocated to accommodate modified access road locations.

Parcel Changes

- Two parcels are no longer part of the Project, as presented in Section 4 below, and identified in Table 3.

Modules and Racking Systems

- Quinebaug Solar plans to use the Longi 445 watt; LR4-72HBD-445M modules in place of the original proposed JinKO Eagle HC 72M G2 390-415 watt modules. The Longi modules are manufactured with similar materials as the JinKO modules, and do not contain materials that are harmful to the environment
- Selection for racking vendors is currently underway. Racking specifications will be provided to the Council upon completion of contract negotiations with vendors.

Herpetofauna Avoidance and Mitigation

- Potential eastern spadefoot toad (*Scaphiopus holbrookii*) breeding pool, Pool C, will be protected from development.
- A portion of the gravel extraction area will be maintained as habitat protection area for the life of the Project.
- Agreements are in place with the landowner to protect certain areas from gravel extraction activities or other disturbance for the life of the Project.

- A 3-year post-construction monitoring plan will be implemented to monitor for the presence of eastern spadefoot toad.

3 DEVELOPMENT AND MANAGEMENT PLAN

a. Site Plans

The final civil drawings for the Project, and the limit of work/tree clearing areas for the entire Project are provided in Attachment B.

b. Final Construction Hours and Schedule

Construction hours will be Monday through Saturday between 7:00 a.m. and 7:00 p.m. Work on Sundays would occur on an as-needed basis, and occur between 8:00 a.m. and 5:00 p.m. Construction is expected to be complete by December 2021, but punch list items and final establishment of vegetation cover may be completed in spring 2022.

c. Construction Traffic Control Plan

During construction, access to the Project Site will utilize the existing access points located along Wauregan Road and Rukstella Road.

To minimize the potential for traffic issues during construction, Project construction contractors are responsible for access and traffic control measures, working with representatives from the towns of Brooklyn and Canterbury, as necessary. Such measures will include procedures for safe ingress and egress of construction equipment and other vehicles, such as implementing traffic control patterns if any vehicle or work area protrudes onto any part of a travel lane or shoulder, or is within the clear zone. Since the Project does not propose any work within a travel lane or shoulder, traffic control patterns are not expected to be necessary.

Signs will be erected to identify active construction zones. Construction signage will be consistent with the federal, state and local standards. Signs shall be placed in a position that allows motorists the opportunity to reduce their speed prior to the work area, and will be installed on the same side of the roadway as the work area.

Major equipment and materials will be delivered directly to the Project Site, and the designated material staging areas (Attachment A, Figure 1).

Contractors for Quinebaug Solar will be responsible for providing notice to the towns of any projected heavy truck traffic days (e.g., material deliveries involving semi-trucks, large concrete pours or hauling out large amounts of spoils).

d. Department of Energy and Environmental Protection (DEEP) General Permit Registration

Quinebaug Solar is currently working with the DEEP on a General Permit registration for the solar facility portion of the Project. The Project's Stormwater Pollution Control Plan (SWPCP) was submitted on December 31, 2020. A copy of the registration will be provided to the Council upon receipt. Quinebaug Solar will be in communication with representatives from DEEP during the review process. Registration is anticipated to be received by the end of January 2021, prior to any construction activities occurring on the site. Quinebaug Solar respectfully requests the Council's approval of this final D&M Plan, contingent on approval of the General Permit Registration from DEEP.

e. Stormwater Pollution Control Plan

A copy of the SWPCP that was submitted to DEEP for registration under the Construction General Permit on December 31, 2020 is provided in Attachment C. This plan is currently under review by DEEP.

f. Site Clearing, Grubbing, Stabilization, and Stormwater Controls Phasing Plan

Site clearing is covered in the Quinebaug Solar Partial D&M plan approved by the Council on November 20, 2020.

Stump removal from cleared areas, or other earth disturbing activities, will only take place once all stormwater permits are received and controls are in place.

The Project is proposed to be constructed in phases to minimize disturbance: four major phases, and 58 sub-phases. Within each major phase, sub-phases will be designed to be less than 10 acres, and each will have a temporary sediment basin or trap as required. The major phases include the following:

- Phase 1: Access Road Construction and Staging
- Phase 2: Stump Removal for Previously Wooded Areas
- Phase 3: Grassed Area Array Construction
- Phase 4: Wooded Area Array Construction

Additional details on construction phasing are provided in the SWPCP in Attachment C.

g. DEEP-approved Stormwater Management Plan

The Project's stormwater management plan is included in the SWPCP and is currently under review by DEEP and is included in Attachment C. The final registration, once received, will be provided to the Council.

h. Compliance with the DEEP Natural Diversity Database Final Determination

Compliance with the March 5, 2020 DEEP NDDB Final Determination includes the following items that were not previously covered in the Partial D&M plan approved by the council on November 20, 2020.

- Redundant stormwater controls in erosion prone areas upslope of watercourses that may contain eastern pearlshell (*Margaritifera margaritifera*) or other sensitive aquatic species.
- Eastern spadefoot toad protection.
    - Potential breeding pool C (Pool C) will be avoided.
    - Habitat around Pool C and a portion of the gravel extraction area will be protected as noted in the herpetofauna avoidance summary provided as Attachment D of the Partial D&M Plan that was previously submitted.
    - Construction-phase environmental monitoring.
    - Post-construction monitoring and maintenance measures (see Attachment D).
- Herpetofauna Protection Area will remain as proposed in the Petition.

- Wetland and watercourse buffers/setbacks will remain as proposed in the Petition, however due to revised stormwater guidelines, these buffers will be increased in some areas. Attachment A contains a map of the proposed buffers and a table outlining details for these buffers.
- Preserved areas will be designated as such for the life of the Project.
- Construction-phase environmental monitoring will take place for American kestrel (*Falco sparverius*).

A revised Avoidance and Mitigation Plan is provided in Attachment D that includes all of these changes. This Plan will inform construction activities and monitoring in relation to protecting sensitive species during Project construction.

Table 1 in Attachment D, provides a summary of all setbacks to natural and cultural resources on the Project Site. The cultural resources are not displayed on any figures to ensure protection of these resource.

i. Compliance with DEEP Stormwater Guidance

A General Permit Registration request was filed with DEEP on December 31, 2020 and is currently under review by the agency. The SWPCP was prepared in compliance with the provisions included in the Construction General Permit. Final Registration will be provided to the Council upon receipt, prior to commencement of clearing and construction of the solar array.

j. Vegetation Management Plan

Visual Screening

The Petitioner will install approximately 5,980 total linear feet of vegetative screening to mitigate potential visual impacts in the following locations: along Wauregan Road (in the vicinity of Liepis Road), along Liepis Road in the southeastern portion of the Project Site (Canterbury, Connecticut), and along portions of Allen Hill Road and Rukstela Road in the northern portion of the Project Site (Brooklyn, Connecticut). Variable planting arrangements will be utilized to replicate natural vegetation spacing patterns and to blend with the natural character of the landscape with preference given to species that benefit pollinator species. Screening will be installed as indicated on the Project Site Plans in Attachment B.

Post-Construction Operational Vegetation Maintenance

Quinebaug Solar and/or its authorized subcontractors will maintain vegetation during the operational phase of the Project. The purpose is to maintain or remove incompatible vegetation to ensure the safe operation of Project components, allow for reliable production and delivery of electrical service, and to protect sensitive natural resources.

Operation and maintenance personnel will inspect the vegetation established on the Project Site following construction. During the first year, operations and maintenance personnel will replace or reseed any dead vegetation or reseed any bare areas that have potential to washout. Inspections will occur at least twice a year and additional inspections would occur as needed to maintain vegetation on site.

Vegetation will be mowed at least twice a year within the array fence line and including infiltration basins. Vegetation located immediately outside of the perimeter fence will be inspected and will be mowed as necessary to prevent shading and maintain the fence properly. Trees and shrubs located outside of the fence line will be trimmed and or removed to prevent shading as necessary.

Mowing and hand clearing and trimming is the preferred and primary method to manage vegetation. Herbicides may be used as a secondary means of control where necessary. All applications would be handled in spot treatment method and target specific discrete locations; broadcast aerial application of herbicides is not anticipated. If necessary, herbicides are only to be used to prevent potential fire hazards and to treat invasive species that cannot be managed with mechanical control. All herbicide use will comply with the regulations and requirements of DEEP's Pesticide Management Program.

k. Invasive Species Management Plan

The Vegetation Management Plan covered in the above section applies to management of invasive species. This will be handled by Quinebaug Solar or an authorized contractor on a case-by-case basis. Preference will be given to mechanical removal of invasives, and herbicides will only be used in spot treatments, as needed in compliance with DEEP's Pesticide Management Program. Invasive species known to be present on site that could potentially become a nuisance on the site include those identified in Table 1.

Nonnative, invasive plant species are ubiquitous throughout the Project Site. As such, the objective of invasive species management will be to limit the introduction of new species to the site and export of species off-site. General construction procedures that will serve to prevent the spread of invasive species onto and off-site include:

- Inspection of contractor equipment and vehicles upon arriving to the Facility Area to ensure the absence of foreign weed parts ("weed clean" inspection);
- Cleaning equipment prior to leaving site;
- Restoration and seeding of workspace areas within prescribed timeframes, to minimize the amount of time disturbed soils remain bare and susceptible to infestation by invasive plants; and
- Mulching with straw, hay, wood fiber hydro-mulch, erosion control fabric, or some functional equivalent to prevent introduction of invasive weeds.

Contractors will be required to ensure that all equipment and vehicles, upon arriving to work at the Facility Area (from other construction projects/geographic regions) are clean and free of plant material. The Facility Environmental Inspector will inspect equipment and vehicles to determine that they are free of soil and debris capable of transporting seeds or other propagules. Equipment that is deemed a risk will be prevented from entering the Facility Area until it has been cleaned thoroughly and passes re-inspection.

Excavated areas will be restored and seeded with a native or naturalized perennial seed mix to encourage establishment of suitable vegetative cover. Final cleanup (including seeding/mulching) will generally be completed within 20 days after restoration in each area, or the area will be temporarily stabilized using temporary seed, mulch, or other acceptable forms of stabilization.

l. Pollinator Species Plans

Plants identified in Table 2, are proposed to be used in the visual screening for the Project in the detail sheets of the Site Plan (Attachment B). The last column in the table identifies which of these species are pollinator friendly. If any of these plants are not available at the time of construction, the Project team will work with internal staff biologists to find alternatives that are equivalent to the species listed below.

Seed mixes applied on site will be selected to include vegetative species that germinate and grow quickly and develop deep root systems, to support the primary goal of site stabilization. As a secondary goal, some vegetative species included within the selected seed mixes may also provide a benefit to pollinator species.

Table 1. Quinebaug Solar Invasive Species[1] List.

Common Name	Scientific Name
Asian bittersweet	*Celastrus orbiculatus*
Border privet	*Ligustrum obtusifolium*
Burning bush	*Euonymus alatus*
Japanese barberry	*Berberis thunbergii*
Japanese honeysuckle	*Lonicera japonica*
Japanese knotweed	*Polygonum cuspidatum*
Mile-a-minute vine	*Polygonum perfoliatum*
Morrow's honeysuckle	*Lonicera morrowii*
Multiflora rose	*Rosa multiflora*
Russian olive	*Elaeagnus angustifolia*
Purple loosestrife	*Lythrum salicaria*

1 – Invasive species - University of Connecticut 2018.

Table 2. Quinebaug Solar Visual Screening Plant Species List.

Common Name	Scientific Name	Pollinator Friendly
Tier 1 – Perennials		
Purple coneflower	*Echinacea purpurea*	Y
Cardinal flower	*Lobelia cardinalis*	Y
Scarlet beebalm	*Monarda didyma*	Y
Largeflower tickseed	*Coreopsis grandiflora*	N
Black-eyed Susan	*Rudbeckia hirta*	Y
Tier 2 – Medium Shrubs		
Prague viburnum	*Clethra alnifolia*	N
Munstead lavender	*Aronia melanocarpa*	N
Winterberry	*Ilex verticillata*	Y
Tier 3 – Evergreen Shrubs		
Eastern red cedar	*Juniperus virginiana*	Y
Common juniper	*Juniperus communis*	N

4 PROJECT PARCELS

The proposed lease and purchase arrangements for all Project parcels has changed slightly from the original Petition. As indicated in the Table 3, two parcels are no longer included in the Project layout:

- 1 – Canterbury Sand and Gravel LLC [CT-022-66-10]
- 2 – Strategic Commercial Realty Inc. [CT-022-21-7-1]

Table 3. Project Site Parcels.

Parcel ID	Current Owner	Project Lease or Purchase
CT-022-67-17J	River Junction Estates	Lease
CT-022-67-17F		Lease
CT-022-67-17B		Lease
CT-022-66-5		Lease
CT-022-67-17		Lease
CT-022-67-17I		Lease
CT-022-67-17G		Lease
CT-022-67-17E		Lease
CT-022-67-17O		Lease
CT-022-67-17K		Lease
CT-022-67-17M		Lease
CT-022-67-17N		Lease
CT-022-67-17H		Lease
CT-022-67-17D		Lease
CT-022- 67-7		Purchase/Lease
CT-022- 66-6		Lease
CT-022-67-17L		Lease
CT-022-67-17A		Lease
CT022-67-17C		Lease
CT-019-30-16		Lease
CT-019-30-17		Lease
CT-019-30-15		Lease
CT-019-30-12A		Lease
CT-019-29-1		Lease
CT-019-21-7		Lease
CT-019-29-2		Lease
CT-019-30-18		Lease
CT-019-30-12	Founders Bee Property and Investments	Lease
Parcels Removed from Project		
CT-022-66-10	Canterbury Sand and Gravel, LLC	Lease
CT-022-21-7-1	Strategic Commercial Realty Inc.	Lease

5 PROJECT EQUIPMENT

Table 4 includes the Project equipment for Quinebaug Solar, including modules, inverters and transformers. Racking vendor selection is currently underway, and racking specifications will be provided to the Council once known. Detailed specifications for modules are provided in Attachment E.

Table 4. Quinebaug Solar Equipment.

Plant Equipment	Description
Photovoltaic Modules	Longi 445 watt; LR4--72HBD-445M
Inverter(s)	TMEIC Solar Ware Ninja
Transformer(s)	ABB Solar-Ready Distribution Transformers
Racking	To be determined

ATTACHMENT A – FIGURES AND RESOURCE TABLE

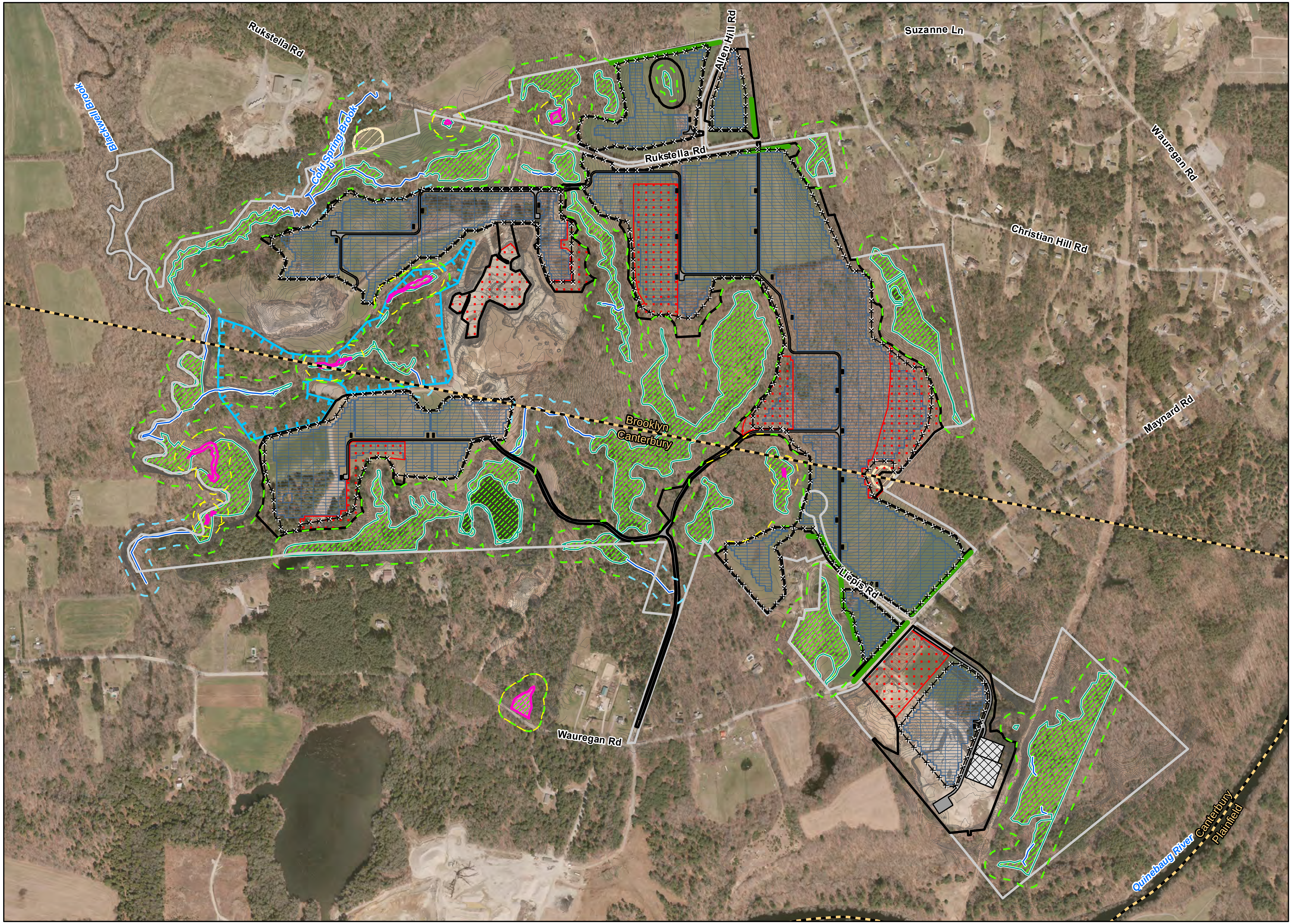
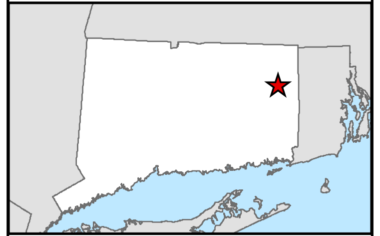


FIGURE 1
PROJECT OVERVIEW

- Limit of Work/Development Area
- Project Site
- Vegetative Screening
- Watercourse Buffer
- Wetland Buffer
- Directional Buffer / 100' Vernal Pool Envelope
- 2-foot Contour
- Watercourse
- Wetland Boundary
- Panels
- Wetland Area
- Herpetofauna Exclusion Area
- Equipment Pad
- Vernal Pool
- Substation
- Road
- Cultural Area
- Laydown Area
- CT Municipal Boundary

LOCUS MAP



N

0 350 700
Feet
1 in = 700 ft

NOTES

1. Based on 2016 Statewide Orthophotography, Courtesy of CTECO.

Quinebaug Solar
Brooklyn & Canterbury,
Connecticut

January 2021

Tighe&Bond
Engineers | Environmental Specialists

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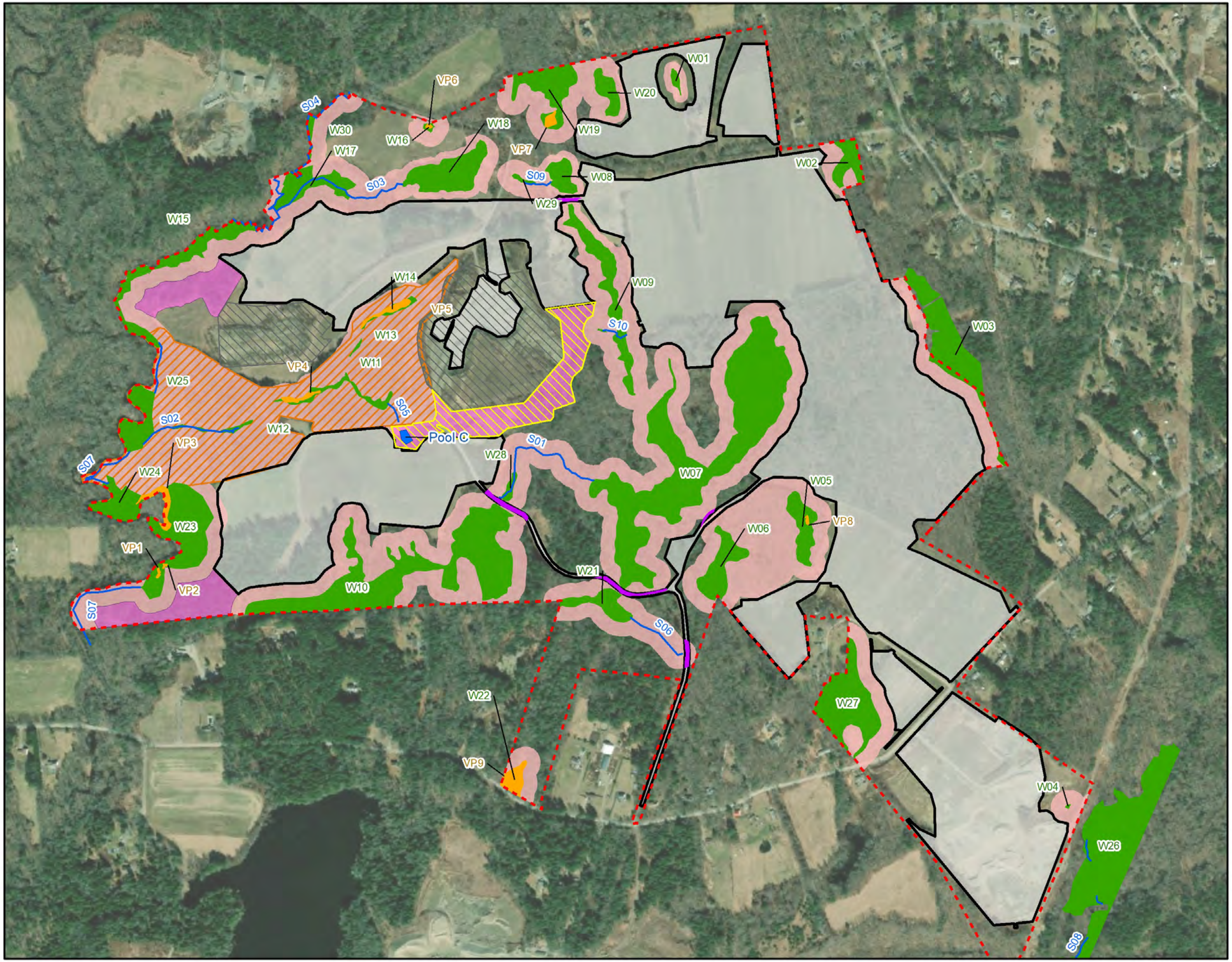
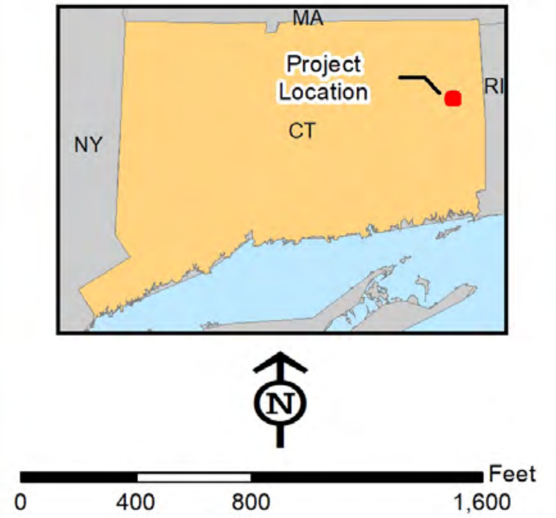
R-0317



Legend

- ⬚ Study Area
- ▭ Development Area (Includes Laydown Areas)
- ▨ Gravel Area and 25ft Buffer
- 🟩 Delineated Wetland
- 🟧 Vernal Pool
- ▨ Herpteofauna Protection Area
- 🟥 Natural Resource Buffer and Protection Area
- 🟪 Additional Protection Area
- ▨ Spadefoot Toad Protection Area
- 🟦 Potential Spadefoot Toad Breeding Pool
- 🟪 Encroachment Area (Along or Adjacent to Existing Roads)
- — Delineated Watercourse



Natural Resources and Buffers
Quinebaug Solar Project
Brooklyn and Canterbury, CT

Prepared For: NEXTera ENERGY RESOURCES

Prepared By: TETRA TECH

Date: 01/2021

Source: NAIP Imagery, 2018; NextEra, 2018; Tetra Tech, 2019

Coordinate System: North American Datum, 1983 Universal Transverse Mercator, Zone 19 North

Not for Construction

Quinebaug Resource Buffers

Resource	Buffer (Feet)	Explanation
Natural resources with reduced buffer to array areas		
Wetland W01	50	Wetland is in active agricultural field
Wetland W02	50-100	50' within field, 100' in forested areas.
Wetland W08	50	Wetland is in active agricultural field, upgrades to existing farm road will occur within 30' of resource.
Wetland W09	50 - 100	50' within field, 100' in forested areas, upgrades to existing farm road will occur within 28' of resource.
Wetland W18	50-100	50' within field, 100' in forested areas.
Wetland W20	50-100	50' within field, 100' in forested areas.
Potential breeding Pool C	50	Directional buffer provies habiat connectivity between spadefoot protection area and herpetofauna protection area
Natural Resources with buffer encroachments due to existing or planned access roads		
Wetland W06	90-100	proposed road will encroach slightly into wetland buffer along existing logging path.
Wetland W07	6-100	Existing gravel road crosses the southern edge of this wetland. proposed road will encroach slightly into wetland buffer along existing logging path.
Wetland W10	10-100	Existing gravel road occurs on the north side of the wetland.
Wetland W21	6-100	Existing gravel road occurs on the north side of the wetland.
Wetland W28	6-100	Existing gravel road occurs on the south side of the wetland.
Watercourse S01	0	Existing gravel road crosses this stream as it flows out of wetland W28.
Watercourse S05	25-100	Eisting gravel road and agricultural field occurs on the south side of this watercourse.
Watercourse S06	30-100	Existing gravel road occurs on southeast side of watercourse.
Cultural Resources (not displayed on figure)		
Mowry Farmstead	Avoid	No work is proposed within this area (a potentially significant historic resource)
Stone Town Boundary Marker with stone wall segment and Locus 12-1	50-100	The Town Boundary marker will be preserved in place. Within the 0' to 50' buffer: vegetation clearing is allowed ; no grubbing or panel installation. Within the 50' to 100' buffer: vegetation clearing, grading and panel installation are allowed. No stone wall breaches are proposed within 100 feet of the marker. Buffered areas for the Town Marker will be clearly marked and protected in the field during construction with fencing.
Bennett/Gallagher/Taylor Cemetery with two stone wall segments	50	Buffer extends from cemetery exterior wall. Buffered areas for the cemetery and stone wall segments will be clearly marked and protected in the field during construction with fencing.
Locus 12-1	100	Locus 12-1 is located within the buffer established for the town boundary marker. Please refer to the buffer/work description provided above. The site/buffer will be depicted on construction maps as sensitive areas to be avoided.
Locus 4-1 (Site 22-36)	50	The site/buffer will be depicted on construction maps as sensitive areas to be avoided. Fencing is not required because the site is located a sufficient distance from project development areas and is naturally protected within forested areas.
Locus 6-1 (Site 19-34)	50	No work is proposed within this buffer. The site/buffer will be depicted on construction maps as sensitive areas to be avoided. Fencing is not required because the site is located a sufficient distance from project development areas and is naturally protected within forested areas.
Locus 25-1 (Site 19-8)	50	No work is proposed within this buffer. Fencing will be installed prior to construction with archaeologist guidance.

Locus 2-1 (Site 22-38) (Western avoidance area and Eastern avoidance area)	25	25' exclusion area around Cluster 1 boundary and 25' buffers around excavation units within Cluster 2. Tree removal restrictions include no grubbing/stump grinding, time of year considerations, use of low ground pressure equipment or ground protection with matting, and marking of exclusion areas to be avoided. Based on confirmation with the project archaeologist and SHPO, in western avoidance area: clearing (no grubbing) can occur as long as conducted when ground is frozen and with an archaeologist on site. After clearing (no grubbing) is completed, the western avoidance area must be fenced off to prevent disturbance during construction. In the eastern avoidance area, clearing (no grubbing) can occur and the eastern avoidance area must be fenced off to prevent ground disturbance during construction. Fencing will be installed in consultation with the project archaeologist.

ATTACHMENT B – QUINEBAUG SOLAR PROJECT SITE PLAN CONSTRUCTION DRAWINGS

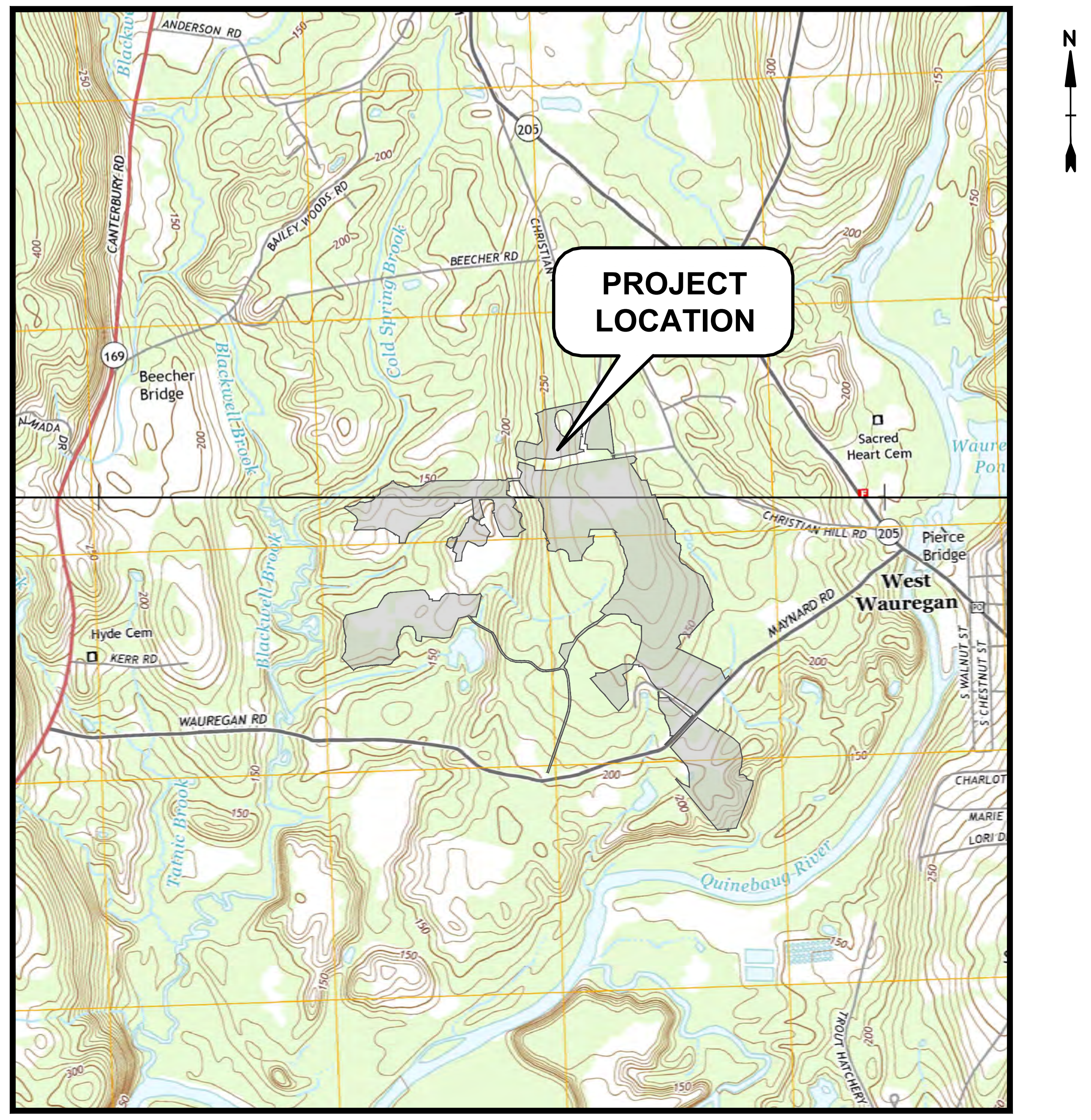
QUINEBAUG SOLAR PROJECT

SITE / CIVIL CONSTRUCTION SET

BROOKLYN AND CANTERBURY, CONNECTICUT

JANUARY 2021

SHEET NO.	SHEET TITLE
	COVER SHEET
G-001	NOTES AND LEGEND
C-001	EXISTING CONDITIONS AND DEMOLITION - OVERALL
C-002 - C-040	EXISTING CONDITIONS AND DEMOLITION
C-041	PROPOSED CONDITIONS - OVERALL
C-042 - C-080	PROPOSED CONDITIONS
C-081 - C-084	DETAILS



SCALE: 1" = 2,000'

PREPARED BY:

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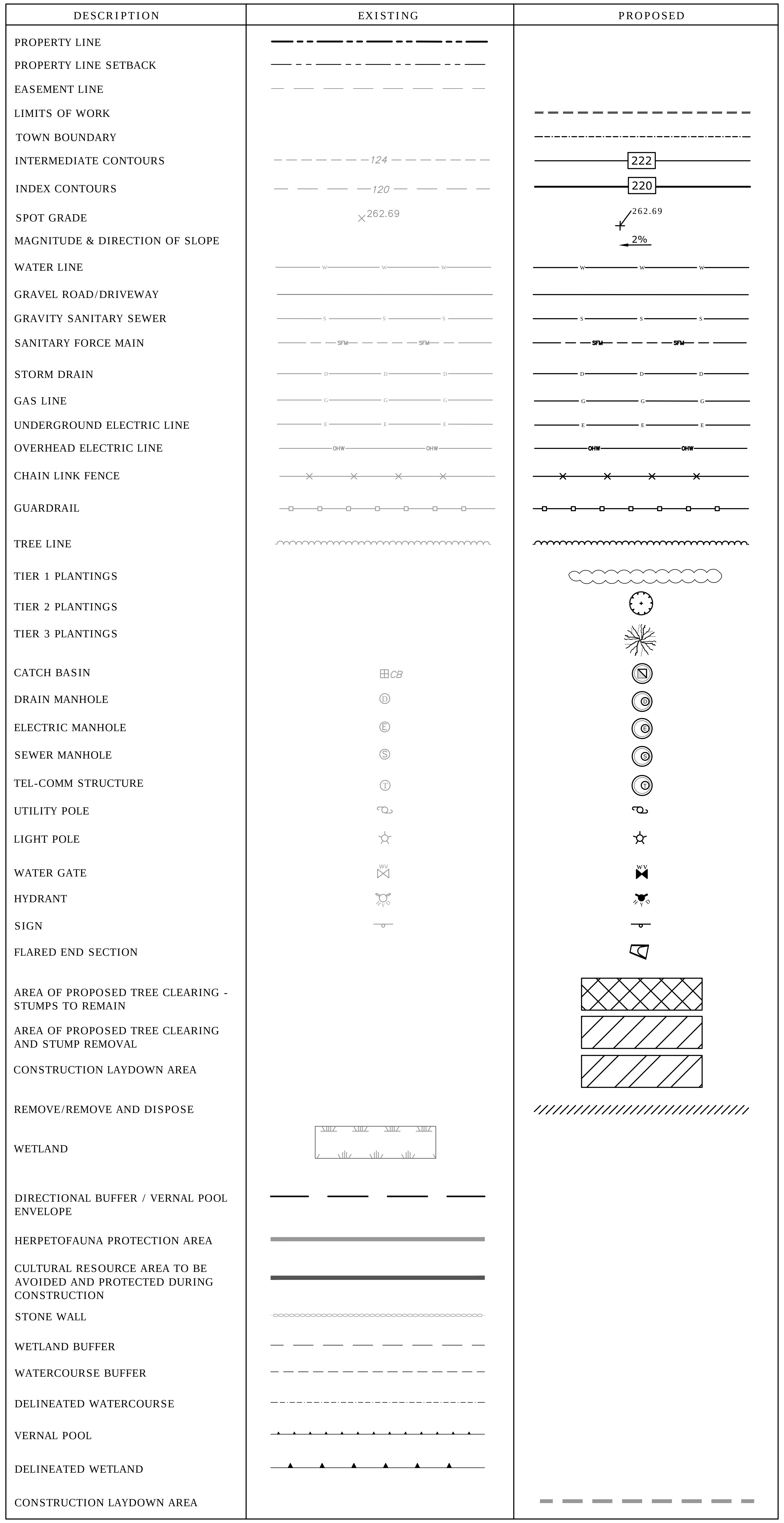
ISSUED FOR CONSTRUCTION

COMPLETE SET 86 SHEETS

Jan 12, 2021-8:43am Plotted By: AGilchrist
Tighe & Bond, Inc. J:\R\R0317 Ranger Solar\R-0317-2_Quinebaug\Drawings_Figures\AutoCAD\Sheet\Construction Drawings\Quinebaug COVER - CD.dwg

LEGEND



DESCRIPTION	EXISTING	PROPOSED
PROPERTY LINE		
PROPERTY LINE SETBACK		
EASEMENT LINE		
LIMITS OF WORK		
TOWN BOUNDARY		
INTERMEDIATE CONTOURS	124	222
INDEX CONTOURS	120	220
SPOT GRADE	262.69	262.69
MAGNITUDE & DIRECTION OF SLOPE		2%
WATER LINE	W W W	W W W
GRAVEL ROAD/DRIVEWAY		
GRAVITY SANITARY SEWER	S S S	S S S
SANITARY FORCE MAIN	SFM SFM	SFM SFM
STORM DRAIN	D D D	D D D
GAS LINE	G G G	G G G
UNDERGROUND ELECTRIC LINE	E E E	E E E
OVERHEAD ELECTRIC LINE	OHW OHW	OHW OHW
CHAIN LINK FENCE		
GUARDRAIL		
TREE LINE		
TIER 1 PLANTINGS		
TIER 2 PLANTINGS		
TIER 3 PLANTINGS		
CATCH BASIN	CB	
DRAIN MANHOLE	D	D
ELECTRIC MANHOLE	E	E
SEWER MANHOLE	S	S
TEL-COMM STRUCTURE	T	T
UTILITY POLE		
LIGHT POLE		
WATER GATE	WV	WV
HYDRANT	HYD	HYD
SIGN		
FLARED END SECTION		
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN		
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL		
CONSTRUCTION LAYDOWN AREA		
REMOVE/REMOVE AND DISPOSE		
WETLAND		
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE		
HERPETOFAUNA PROTECTION AREA		
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		
STONE WALL		
WETLAND BUFFER		
WATERCOURSE BUFFER		
DELINEATED WATERCOURSE		
VERNAL POOL		
DELINEATED WETLAND		
CONSTRUCTION LAYDOWN AREA		

ABBREVIATIONS

ABDN('D)	ABANDON(ED)
AC	ASBESTOS CEMENT PIPE
APPROX.	APPROXIMATE
BC	BITUMINOUS CURB
BFP	BACK FLOW PREVENTOR
BIT	BITUMINOUS
BL	BASELINE
BLDG	BUILDING
BND	BOUND
BOC	BOTTOM OF CURB
BOT	BOTTOM
BS	BOTTOM OF STEP
BW	BOTTOM OF WALL
CATV	CABLE TELEVISION
CB	CATCH BASIN
CEM	CEMENT
CI	CAST IRON PIPE
CL	CENTERLINE
CLF	CHAIN LINK FENCE
CO	CLEAN OUT
CONC	CONCRETE
CPP	CORRUGATED POLYETHYLENE PIPE
CY	CUBIC YARD
DH	DRILL HOLE
DHF	DRILL HOLE IN STONE REMAINS (FOUND)
DI	DUCTILE IRON PIPE
DIA	DIAMETER
DMH	DRAIN MANHOLE
E	EAST
EF	EACH FACE
EG	EXISTING GRADE
EL/ELEV	ELEVATION
ELEC	ELECTRIC
EMH	ELECTRIC MANHOLE
EOP	EDGE OF PAVEMENT
EW	EACH WAY
EXIST	EXISTING
FES	FLARED END SECTION
FF	FINISH FLOOR
FM	FORCE MAIN
G	GAS
GG	GAS GATE
GRAN	GRANITE
HC	HANDICAP
HDPE	HIGH DENSITY POLYETHELENE
HMA	HOT MIX ASPHALT
HYD	HYDRANT
IN	INCHES
INV	INVERT
IPF	IRON PIPE (FOUND)
IRF	IRON PIN (FOUND)
L	LENGTH OF CURB
LF	LINEAR FEET
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MON	MONUMENT
MJ	MECHANICAL JOINT
N	NORTH
NITC	NOT IN THIS CONTRACT
NTS	NOT TO SCALE
N/A	NOT APPLICABLE
N/F	NOW OR FORMERLY
OC	ON CENTER
OCS	OUTLET CONTROL STRUCTURE
OH	OVERHEAD
PB	PLANT BED
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCPP	PERFORATED CORRUGATED POLYETHYLENE PIPE
PERF	PERFORATED
PI	POINT OF INTERSECTION
PRC	POINT OF REVERSE CURVATURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE FOOT
PT	POINT OF TANGENCY
PVC	POLYVINYLCHLORIDE
PVMT	PAVEMENT
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
REV	REVISION
ROW	RIGHT OF WAY
RT	RIGHT
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
S	SOUTH
SAN	SANITARY
SB	TOWN LINE MONUMENT
SCH	SCHEDULE
SF	SQUARE FOOT
SMH	SEWER MANHOLE
SS	STAINLESS STEEL
STA	STATION
STL	STEEL
STRM	STORM
T	TANGENT LENGTH
TC	TOP OF CURB
TEL	TEL-DATA
TP	TEST PIT
TS	TOP OF STEP
TW	TOP OF WALL
TYP	TYPICAL
UP	UTILITY POLE
W	WATER
WG	WATER GATE
WV	WATER VALVE
XFMR	TRANSFORMER

GENERAL NOTES

1. PER CONNECTICUT LAW, CALL 811 (CALL BEFORE YOU DIG), THE MUNICIPALITY AND THE PROPERTY OWNER PRIOR TO ANY UNDERGROUND EXCAVATION ON SITE. SUBMIT THE CALL BEFORE YOU DIG VERIFICATION NUMBER TO THE APPROPRIATE MUNICIPALITY PRIOR TO ANY EXCAVATION, DEMOLITION AND REMOVAL OR CONSTRUCTION WORK.
2. OBTAIN, PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK. ARRANGE AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
3. FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION. IF FIELD CONDITIONS ARE OBSERVED THAT SIGNIFICANTLY VARY FROM THOSE SHOWN ON THESE PLANS, IMMEDIATELY NOTIFY THE ENGINEER FOR RESOLUTION OF THE CONFLICTING INFORMATION.
4. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS. BOLD TEXT AND LINES INDICATE PROPOSED WORK.
5. NOTIFY THE ENGINEER OF ANY EXISTING UTILITY DISCOVERED DURING THE WORK THAT IS NOT SHOWN ON THE DRAWINGS.
6. COMPLY WITH LATEST OSHA STANDARDS FOR EXCAVATION WORK. FOLLOW ALL REQUIREMENTS OF OSHA EXCAVATION STANDARDS INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE AND ANY REQUIRED DOCUMENTATION REQUIRES CERTIFICATION BY A PROFESSIONAL ENGINEER.
7. MAINTAIN ALL UTILITIES FUNCTIONING PROPERLY IN THE AREAS UNDER CONSTRUCTION PRIOR TO THE TIME WHEN FINAL WORK IS PUT INTO USE. LEAVE ALL PIPES AND STRUCTURES WITHIN THE LIMITS OF THIS CONTRACT IN A CLEAN AND OPERABLE CONDITION AT THE COMPLETION OF THE WORK. TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SAND AND SILT FROM DISTURBED AREAS FROM ENTERING EXISTING UTILITY SYSTEMS. CONTRACTOR IS RESPONSIBLE FOR DAMAGE SUSTAINED TO ANY EXISTING UTILITIES AND IS RESPONSIBLE FOR REPAIRS THAT COMPLY WITH THE REQUIREMENTS OF THE MUNICIPALITY OR RESPECTIVE UTILITY COMPANY AT NO ADDITIONAL COST TO THE OWNER.
8. DISPOSE OF ANY AND ALL DEMOLISHED BUILDING MATERIALS, STORAGE TANKS, PAVEMENT, BITUMINOUS CURBING, CONCRETE, VEGETATION, SURPLUS MATERIAL, SITE RUBBLE AND OTHER DEMOLITION DEBRIS OFF-SITE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
9. LOAM AND SEED ALL DISTURBED AREAS UNLESS OTHERWISE SPECIFIED. OVER-EXCAVATE LOAM AND SEED AREAS AS REQUIRED TO PROVIDE REQUIRED LOAM DEPTH AND MEET ADJACENT GRADE.
10. TEST PITS TO LOCATE EXISTING UTILITIES ARE STRONGLY ENCOURAGED AND MAY BE ORDERED BY THE OWNERS PROJECT REPRESENTATIVE.
11. TAKE NECESSARY MEASURES AND PROVIDE CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE AND STRENGTH TO PREVENT ACCESS TO ALL WORK AND STAGING AREAS AT THE COMPLETION OF EACH DAY'S WORK.
12. STORE FUEL, OIL, PAINT OR OTHER HAZARDOUS MATERIALS IN A SECONDARY CONTAINER AND REMOVE FROM THE SITE TO A LOCKED INDOOR AREA WITH AN IMPERVIOUS FLOOR DURING NON-WORK HOURS.
13. PROVIDE A SUPPLY OF ABSORBENT SPILL RESPONSE MATERIALS, SUCH AS BOOMS, BLANKETS AND OIL ABSORBENT MATERIALS AT THE CONSTRUCTION SIT AT ALL TIMES TO CLEAN UP POTENTIAL SPILLS OF HAZARDOUS MATERIALS. IMMEDIATELY REPORT SPILLS OF HAZARDOUS MATERIALS TO THE STATE ENVIRONMENTAL AGENCY AND THE MUNICIPALITY WHERE THE SPILL OCCURRED.
14. REGRADE ALL UNPAVED AREAS DISTURBED BY THE WORK TO ORIGINAL CONTOURS OR PROPOSED CONTOURS AS REQUIRED BY THE DRAWINGS. LOAM AND SEED ALL UNPAVED AREAS DISTURBED BY THE WORK.
15. PROVIDE ACCESS FOR EMERGENCY VEHICLES AT ALL TIMES.
16. ALL PROPOSED WORK MAY BE MODIFIED IN THE FIELD BY THE OWNERS PROJECT REPRESENTATIVE TO MATCH EXISTING CONDITIONS.
17. COORDINATE ALL WORK WITH ALL SUBCONTRACTORS, THE OWNER, AND OTHER CONTRACTORS WORKING WITHIN THE PROJECT LIMITS.
18. AREAS OUTSIDE THE LIMIT OF WORK DISTURBED BY CONSTRUCTION SHALL BE RETURNED TO THEIR ORIGINAL CONDITION OR BETTER AND WILL BE GRADED TO MATCH THE ADJACENT PROPOSED CONSTRUCTION AS DIRECTED BY THE OWNERS PROJECT REPRESENTATIVE. COST FOR THIS WORK WILL BE BORNE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
19. CULVERTS TO BE INSPECTED AT COMPLETION OF PROJECT AND REPLACED IF NEEDED DUE TO DAMAGE DURING CONSTRUCTION.
20. UNDERDRAIN SYSTEMS ARE COMMON IN AGRICULTURAL FIELDS AND ARE NOT DOCUMENTED ON SITE NOR LOCATED BY SURVEY. IF UNDERDRAINS ARE DAMAGED DURING CONSTRUCTION THEY SHALL BE REPAIRED SO EXISTING SUBSURFACE DRAINAGE SYSTEM IS FUNCTIONAL AT THE END OF THE CONSTRUCTION.

PLAN REFERENCES

1. EXISTING CONDITIONS ARE BASED ON INFORMATION PROVIDED BY WSP USA INC. IN "PROPERTY AND TOPOGRAPHIC SURVEY", DATED MARCH 22, 2019 AND "ALTA/NSPS LAND TITLE SURVEY", DATED AUGUST 28, 2019.
2. VERNAL POOL SURVEYS WERE CONDUCTED BY TETRA TECH AND SUBCONTRACTORS IN 2016, 2018 AND 2019.
3. WETLAND AND WATERCOURSE DELINEATIONS WERE COMPLETED BY TETRA TECH IN JULY AND AUGUST 2016, FALL 2018 AND WINTER/SPRING 2019.
4. DESIGN PARAMETERS (E.G., INTERROW SPACING, PANEL TILT, LEADING EDGE HEIGHT, ETC.) PROVIDED BY NEXTERA ENERGY.
5. THE HORIZONTAL DATUM REFERENCED IS NAD83 AND THE VERTICAL DATUM IS NAVD 88.

EROSION CONTROL NOTES

1. INSTALL ALL EROSION CONTROL MEASURES SHOWN, SPECIFIED AND REQUIRED BY THE ENGINEER PRIOR TO ANY CONSTRUCTION OR IMMEDIATELY UPON REQUEST. MAINTAIN ALL SUCH CONTROL MEASURES UNTIL FINAL SURFACE TREATMENTS ARE IN PLACE AND/OR UNTIL PERMANENT VEGETATION IS ESTABLISHED.
2. PRIOR TO STARTING WORK, CLEARLY STAKE WORK LIMIT LINE(S). DO NOT DISTURB VEGETATION AND TOPSOIL BEYOND THE PROPOSED LIMIT LINE. COORDINATE WITH THE OWNERS PROJECT REPRESENTATIVE ON LOCATIONS FOR THE TEMPORARY STOCKPILING OF TOPSOIL DURING CONSTRUCTION.
3. SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS SHALL BE GRADED TO A MAXIMUM GRADE OF 3:1, COMPACTED, STABILIZED, AND LOAMED AND SEEDED AS SHOWN ON PLANS. SLOPES STEEPER THAN 3:1 SHALL BE COVERED WITH EROSION CONTROL BLANKETS TO PREVENT EROSION.
4. REMOVE SILT TRAPPED AT BARRIERS AND DISPOSE OF IT IN UPLAND AREAS OUTSIDE OF BUFFER ZONES. REMOVE MATERIALS DEPOSITED IN ANY TEMPORARY SETTLING BASIN AT THE COMPLETION OF PROJECT. RESTORE ALL AREAS DISTURBED BY SETTLING BASINS TO PRECONSTRUCTION CONDITIONS.
5. SETTLE OR FILTER ALL SILT-LADEN WATER FROM DEWATERING ACTIVITIES IN A SEDIMENTATION OR FILTER BAG TO REMOVE SEDIMENTS PRIOR TO RELEASE TO ANY WATERWAY LOCATED DOWNSTREAM OF THE DEWATERED AREA.
6. SWEEP AND COLLECT ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS AT THE END OF EACH DAY.
7. LOAM AND SEED ALL DISTURBED AREAS TO ESTABLISH VEGETATIVE COVER AND STABILIZATION AS SOON AS POSSIBLE FOLLOWING DISTURBANCE.
8. THIS DRAWING SET COVERS POST-CONSTRUCTION STORMWATER CONTROL MEASURES ONLY. REFER TO THE QUINEBAUG SOLAR PROJECT SOIL EROSION AND SEDIMENT CONTROL PLAN DRAWINGS AND STORMWATER POLLUTION CONTROL PLAN FOR CONSTRUCTION STORMWATER CONTROL MEASURES.

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M Caceci
01/15/21

ISSUED FOR
CONSTRUCTION

Quinebaug
Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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DATE:	01/2021
FILE: Quinebaug Details - CD.dwg	
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NOTES AND LEGEND

SCALE: AS SHOWN

G-001

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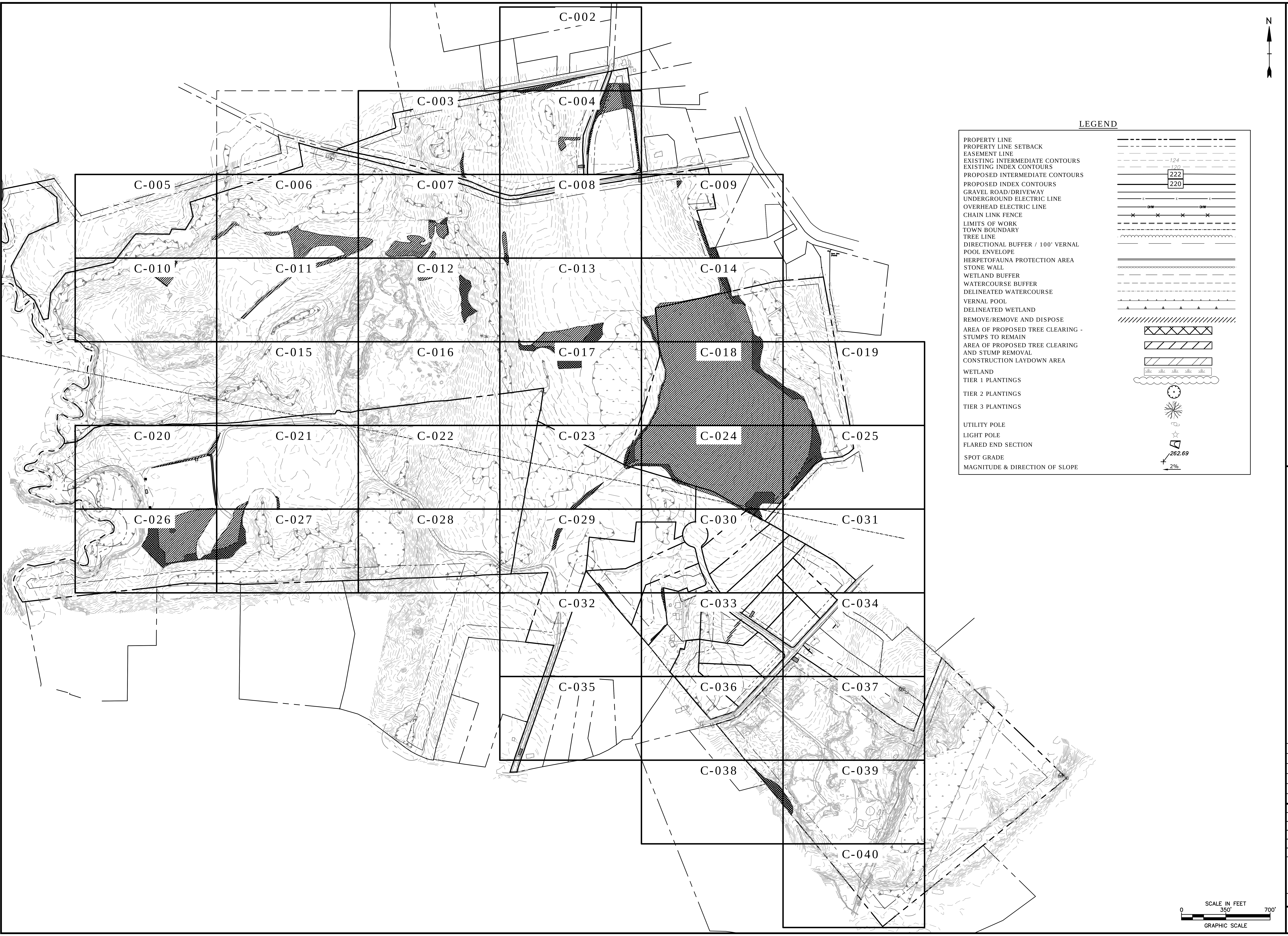

LEGEND

PROPERTY LINE	— - - — - - —
PROPERTY LINE SETBACK	— - - — - - —
EASEMENT LINE	— — — —
EXISTING INTERMEDIATE CONTOURS	– – – 124 – – –
EXISTING INDEX CONTOURS	— — 120 — —
PROPOSED INTERMEDIATE CONTOURS	—— 222 ——
PROPOSED INDEX CONTOURS	—— 220 ——
GRAVEL ROAD/DRIVEWAY	———
UNDERGROUND ELECTRIC LINE	—— E —— E —— E ——
OVERHEAD ELECTRIC LINE	—— OHW —— OHW ——
CHAIN LINK FENCE	—×—×—×—×—
LIMITS OF WORK	▬ ▬ ▬ ▬
TOWN BOUNDARY	—·—·—·—
TREE LINE	⌒⌒⌒⌒⌒
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	—— —— ——
HERPETOFAUNA PROTECTION AREA	▬▬▬
STONE WALL	∞∞∞∞∞
WETLAND BUFFER	— — — —
WATERCOURSE BUFFER	– – – – –
DELINEATED WATERCOURSE	–·–·–·–
VERNAL POOL	‸‸‸‸‸
DELINEATED WETLAND	▲ ▲ ▲
REMOVE/REMOVE AND DISPOSE	//////////
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	ψ ψ ψ ψ ψ
TIER 1 PLANTINGS	⌒⌒⌒
TIER 2 PLANTINGS	⊕
TIER 3 PLANTINGS	✳
UTILITY POLE	○
LIGHT POLE	☆
FLARED END SECTION	◁
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	← 2%

Tighe&Bond

No. 31180

1-15-21

NO. 33828

Jaclyn M. Caceci
01/15/21

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APPROVED: FJH

EXISTING CONDITIONS AND DEMOLOLITION - OVERALL

SCALE: 1" = 350'

C-001

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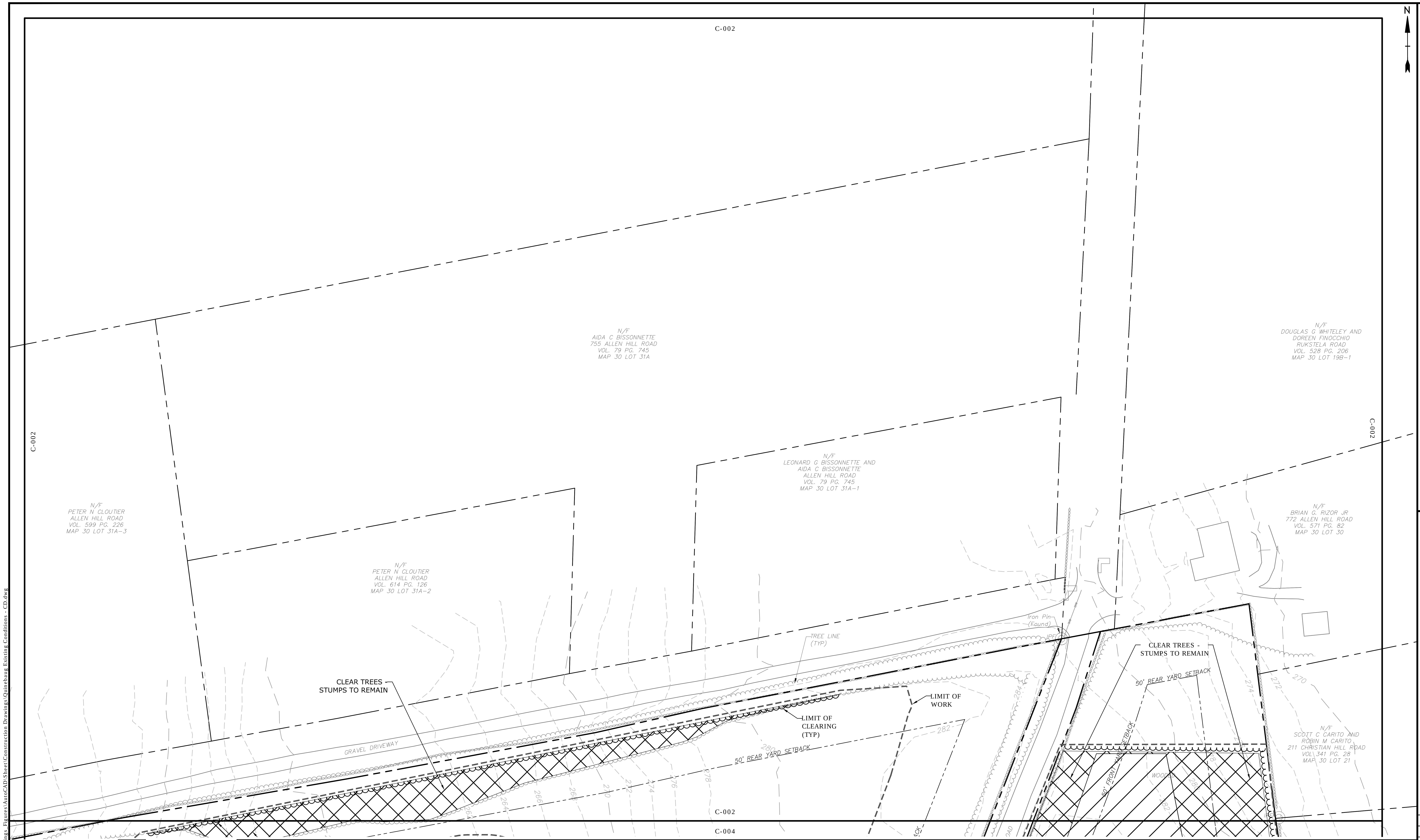

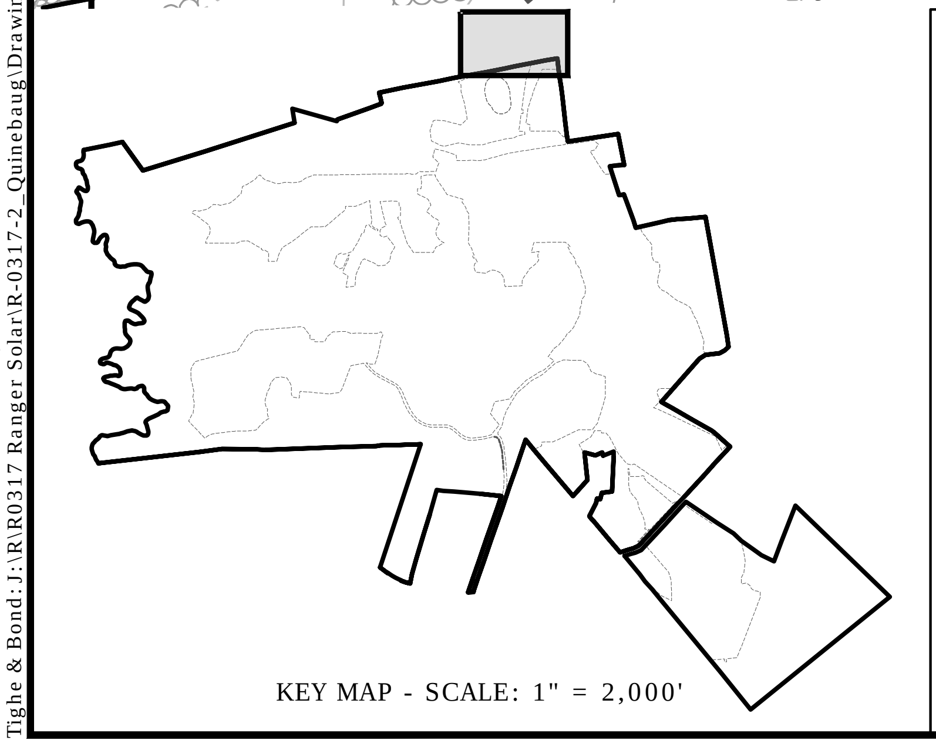

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	— - — - —	HERPETOFAUNA PROTECTION AREA	━━━	WETLAND	‹wetland symbol›
PROPERTY LINE SETBACK	— - - —	CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	━━━	TIER 1 PLANTINGS	◠◠◠
EASEMENT LINE	— — —	STONE WALL	∘∘∘∘	TIER 2 PLANTINGS	⊕
EXISTING INTERMEDIATE CONTOURS	– – 124 – –	WETLAND BUFFER	— — —	TIER 3 PLANTINGS	✳
EXISTING INDEX CONTOURS	— 120 —	WATERCOURSE BUFFER	– – – –	UTILITY POLE	☌
PROPOSED INTERMEDIATE CONTOURS	—222—	DELINEATED WATERCOURSE	–·–·–·–	LIGHT POLE	☼
PROPOSED INDEX CONTOURS	—220—	VERNAL POOL	—▴—▴—	FLARED END SECTION	◁
GRAVEL ROAD/DRIVEWAY	———	DELINEATED WETLAND	—▲—▲—	SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	—E—E—	REMOVE/REMOVE AND DISPOSE	//////	MAGNITUDE & DIRECTION OF SLOPE	2% ←
OVERHEAD ELECTRIC LINE	—OHW—OHW—	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒☒☒		
CHAIN LINK FENCE	—×—×—	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK	━ ━ ━	CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY	–··–··–				
TREE LINE	◠◠◠◠				
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	—— ——				

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
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GRAPHIC SCALE

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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR
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Quinebaug Solar Project

Quinebaug
Solar, LLC

Brooklyn &
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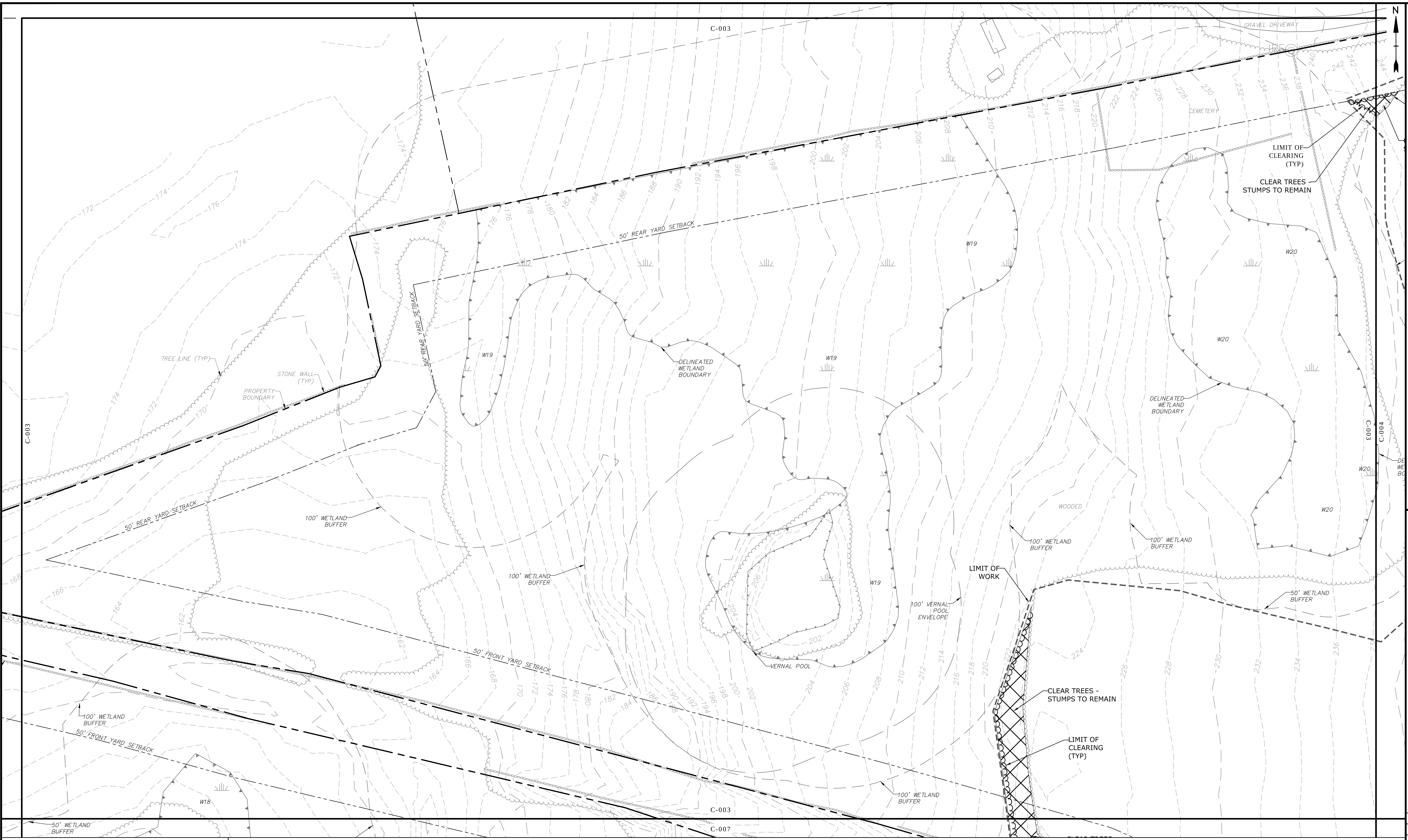
EXISTING CONDITIONS AND DEMOLITION - 1

SCALE: 1" = 40'

C-002



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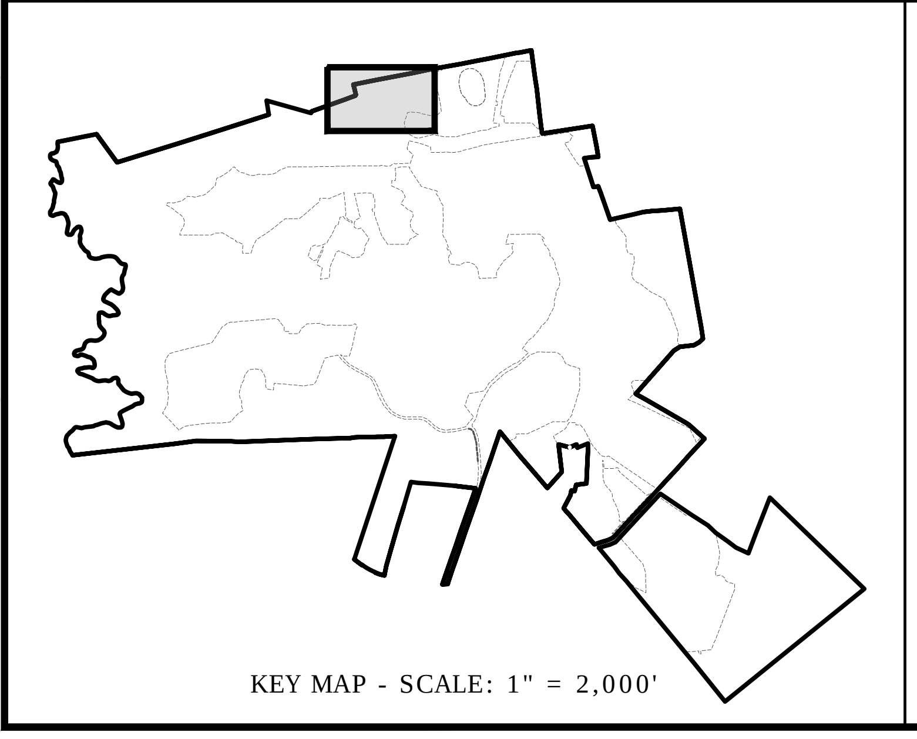
EXISTING CONDITIONS AND DEMOLITION - 2

SCALE: 1" = 40'

C-003


KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE — ×
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE
HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA
WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
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GRAPHIC SCALE

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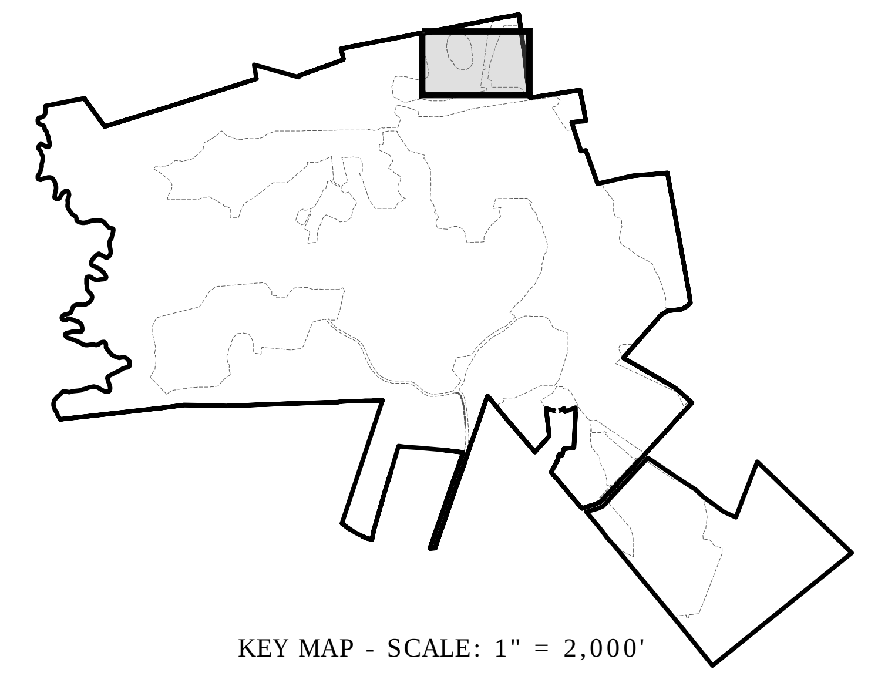

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
EASEMENT LINE		STONE WALL		TIER 2 PLANTINGS	
EXISTING INTERMEDIATE CONTOURS	124	WETLAND BUFFER		TIER 3 PLANTINGS	
EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☆
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	//////	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒		
CHAIN LINK FENCE	×	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE					

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

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Tighe&Bond

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EXISTING CONDITIONS AND DEMOLITION - 3

SCALE: 1" = 40'

C-004

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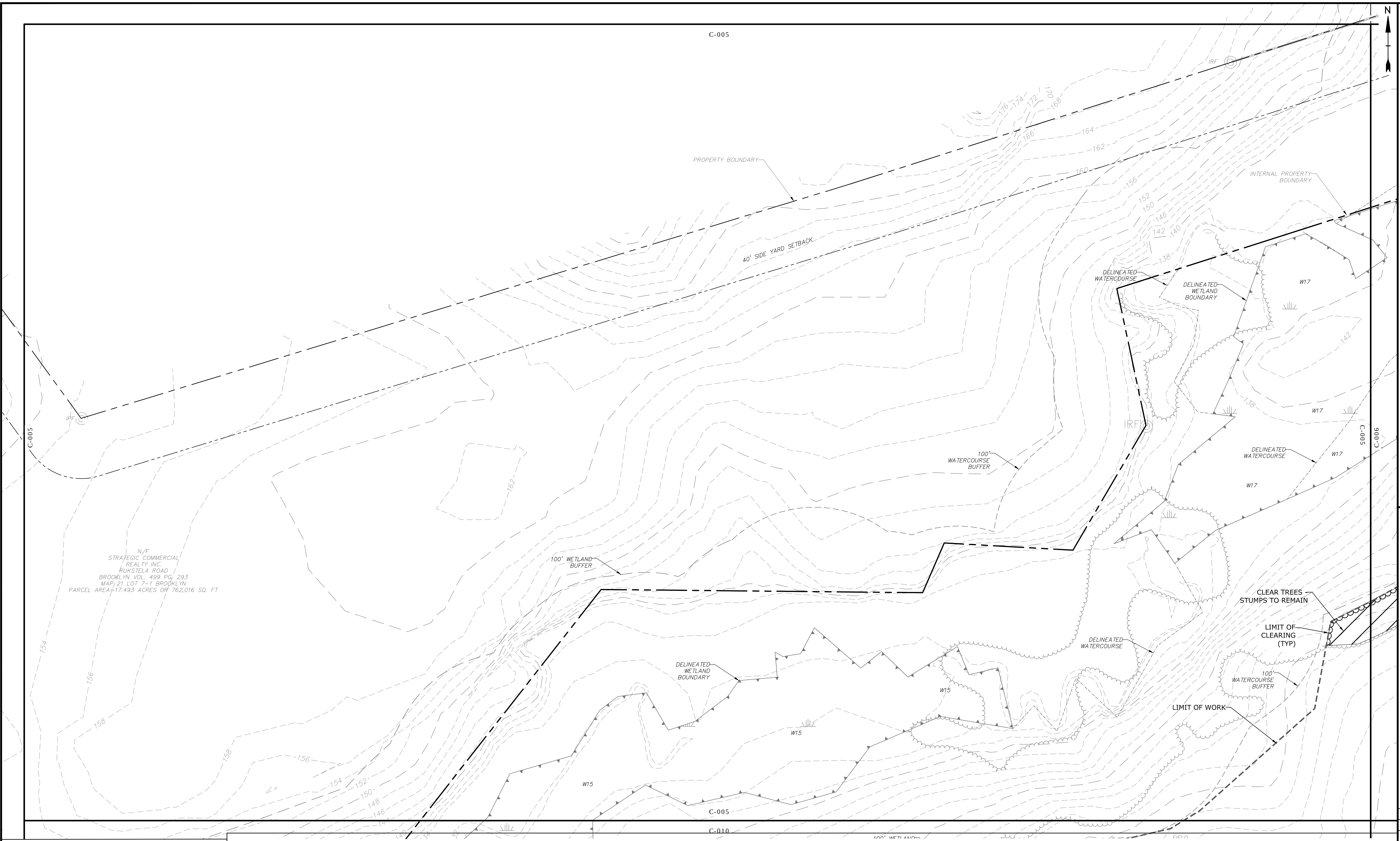

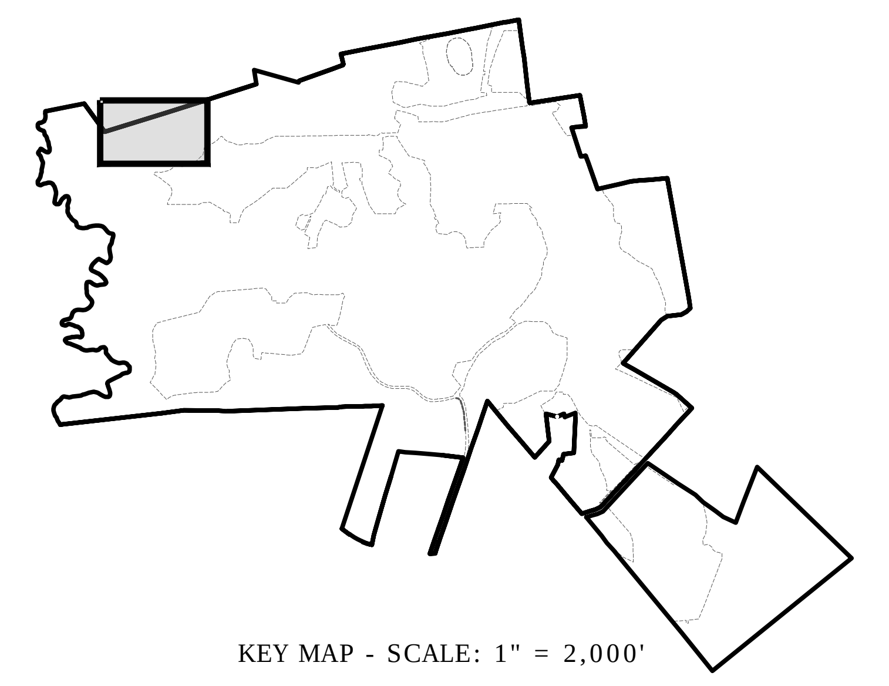
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS
EXISTING INDEX CONTOURS
PROPOSED INTERMEDIATE CONTOURS
PROPOSED INDEX CONTOURS
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE
OVERHEAD ELECTRIC LINE
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE
MAGNITUDE & DIRECTION OF SLOPE

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE
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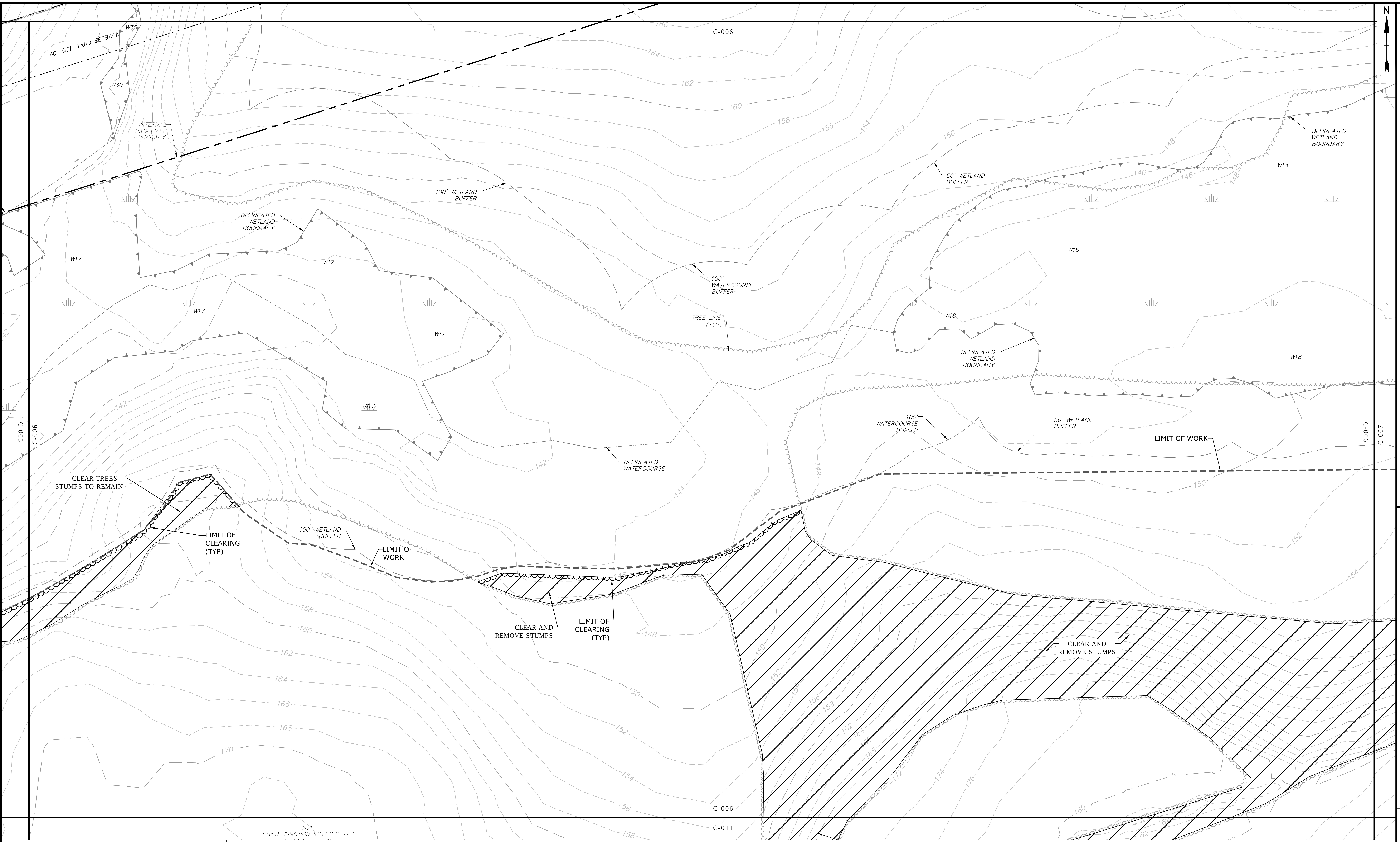
APPROVED: FJH

EXISTING CONDITIONS AND DEMOLITION - 4

SCALE: 1" = 40'

C-005



Tighe&Bond

STATE OF CONNECTICUT BRIAN S. HUNTLEY No. 31180 LICENSED PROFESSIONAL ENGINEER

1-15-21

STATE OF CONNECTICUT JACLYN M. CACECI NO. 33828 LICENSED PROFESSIONAL ENGINEER

Jaclyn M. Caceci
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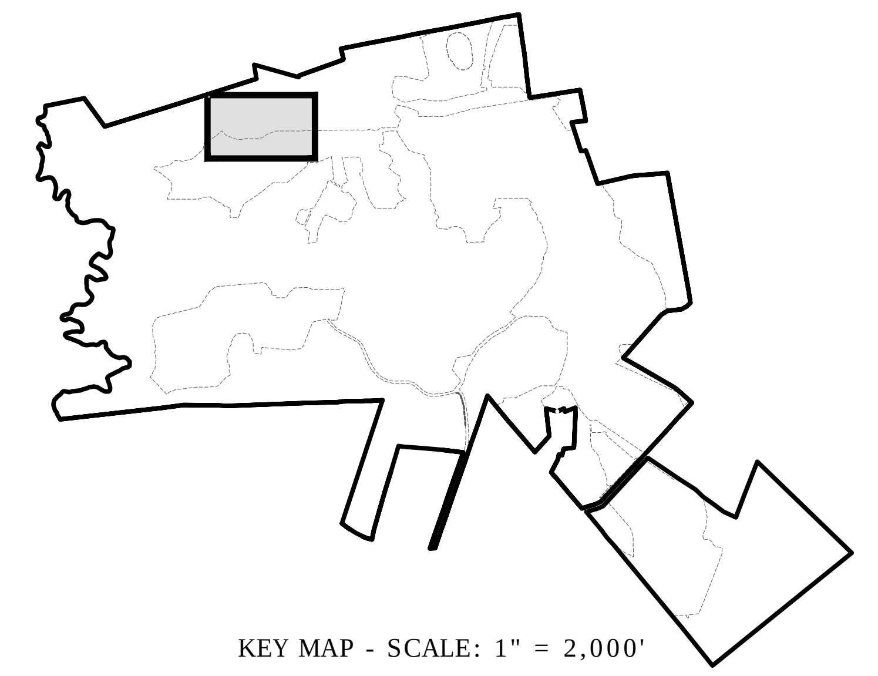

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	×
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☆
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

MARK	DATE	DESCRIPTION

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EXISTING CONDITIONS AND DEMOLITION - 5

SCALE: 1" = 40'

C-006

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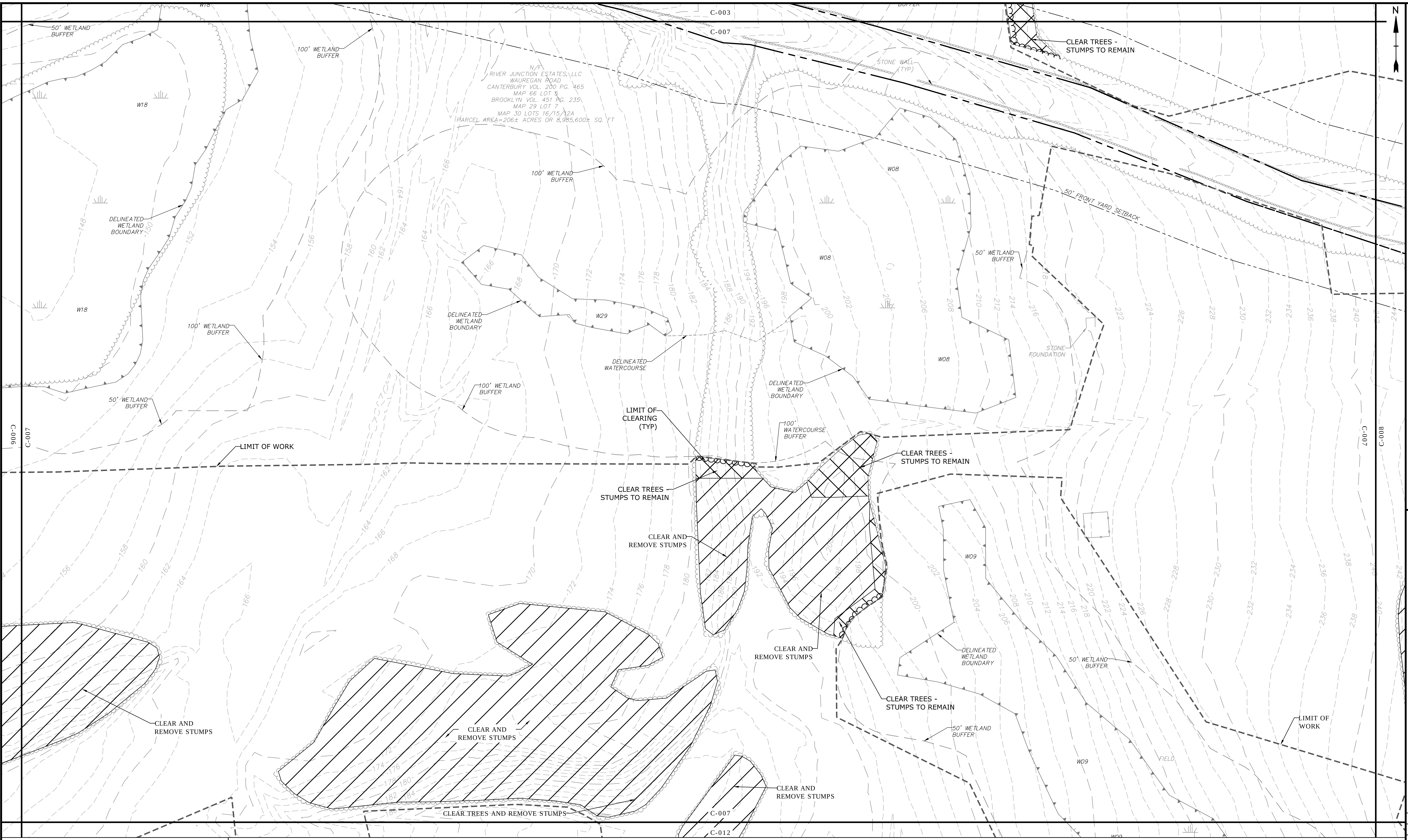

Tighe&Bond

No. 31180
BRIAN S. HUNTLEY
1-15-21

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JACLYN M. CACCI
Jaclyn M Cacci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
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Connecticut

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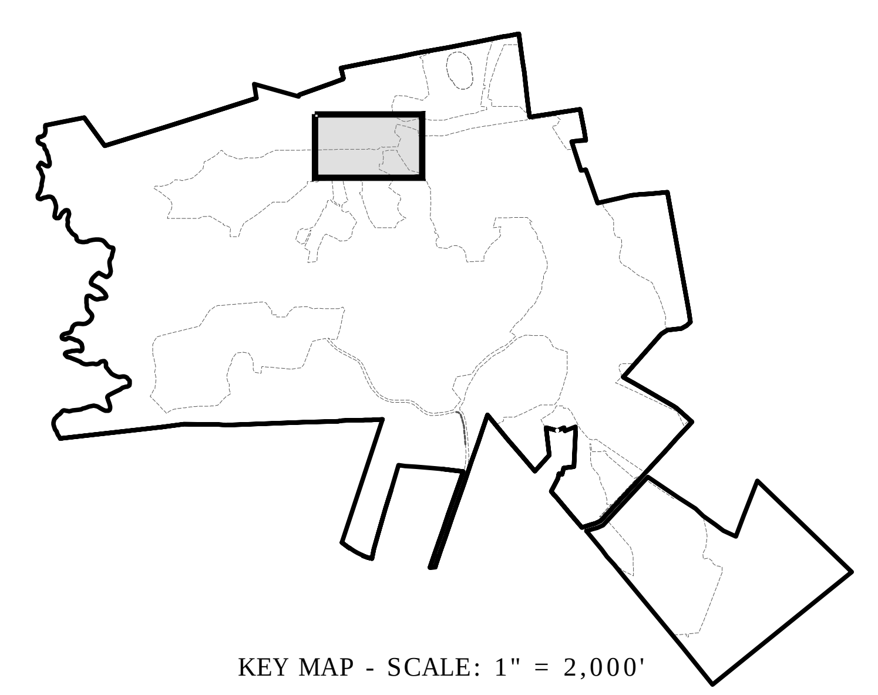
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 6

SCALE: 1" = 40'

C-007



KEY MAP - SCALE: 1" = 2,000'

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS — 124
- EXISTING INDEX CONTOURS — 120
- PROPOSED INTERMEDIATE CONTOURS — 222
- PROPOSED INDEX CONTOURS — 220
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE — E
- OVERHEAD ELECTRIC LINE — OHW
- CHAIN LINK FENCE — ×
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
- STONE WALL
- WETLAND BUFFER
- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE ▨
- AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN ▩
- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL ▨
- CONSTRUCTION LAYDOWN AREA ▨
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE ☆
- FLARED END SECTION
- SPOT GRADE — 262.69
- MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
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GRAPHIC SCALE

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C-004

C-008

N/F
RIVER JUNCTION ESTATES, LLC
WAUREGAN ROAD
CANTERBURY VOL. 200 PG. 465
MAP 66 LOT 5
BROOKLYN VOL. 451 PG. 235
MAP 29 LOT 7
MAP 30 LOTS 16/15/12A
PARCEL AREA=206± ACRES OR 8,985,600± SQ FT

C-008

C-013

Tighe&Bond

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No. 31180
1-15-21

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Jaclyn M. Caceci
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EXISTING CONDITIONS AND DEMOLITION - 7

SCALE: 1" = 40'

C-008

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS 124
- EXISTING INDEX CONTOURS 120
- PROPOSED INTERMEDIATE CONTOURS 222
- PROPOSED INDEX CONTOURS 220
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE E
- OVERHEAD ELECTRIC LINE OHW
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
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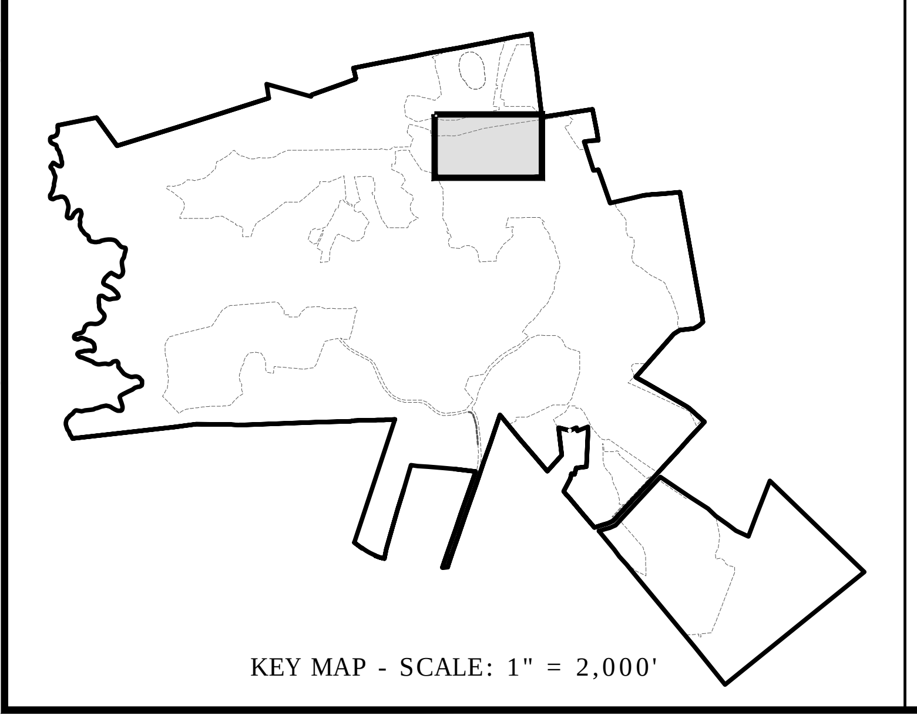
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE
- AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
- CONSTRUCTION LAYDOWN AREA
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE
- FLARED END SECTION
- SPOT GRADE 262.69
- MAGNITUDE & DIRECTION OF SLOPE 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE



KEY MAP - SCALE: 1" = 2,000'

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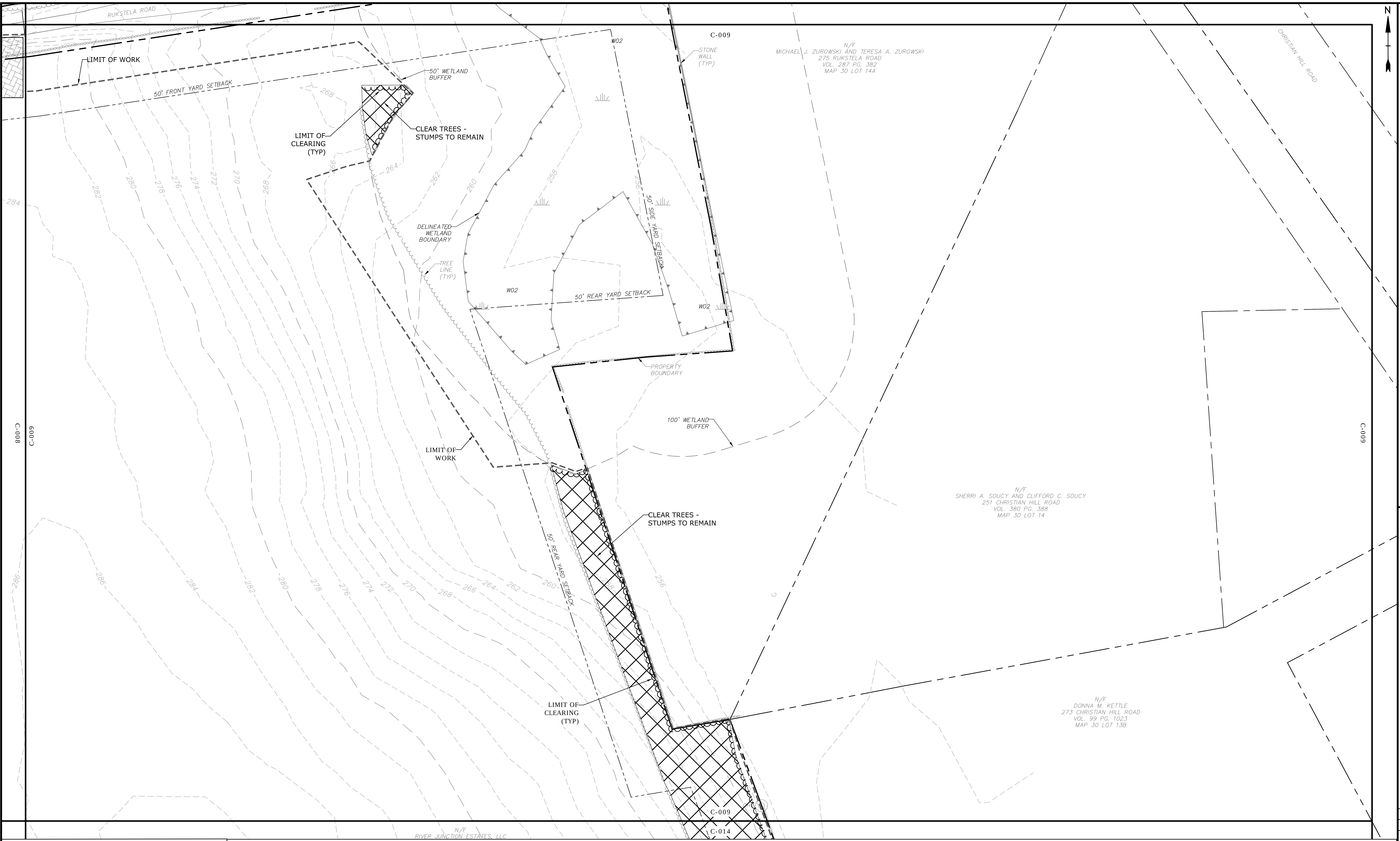

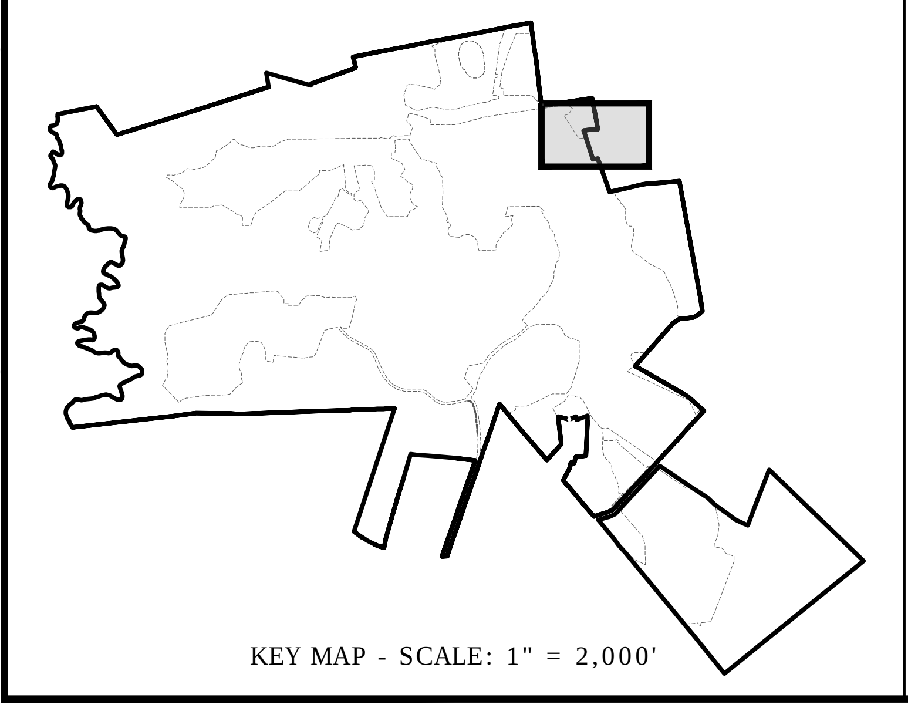
KEY MAP - SCALE: 1" = 2,000'

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS (124)
- EXISTING INDEX CONTOURS (120)
- PROPOSED INTERMEDIATE CONTOURS (222)
- PROPOSED INDEX CONTOURS (220)
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE (E)
- OVERHEAD ELECTRIC LINE (OHW)
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
- STONE WALL
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- DELINEATED WATERCOURSE
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- DELINEATED WETLAND
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- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
- CONSTRUCTION LAYDOWN AREA
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE
- FLARED END SECTION
- SPOT GRADE (262.69)
- MAGNITUDE & DIRECTION OF SLOPE (2%)

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 8

SCALE: 1" = 40'

C-009

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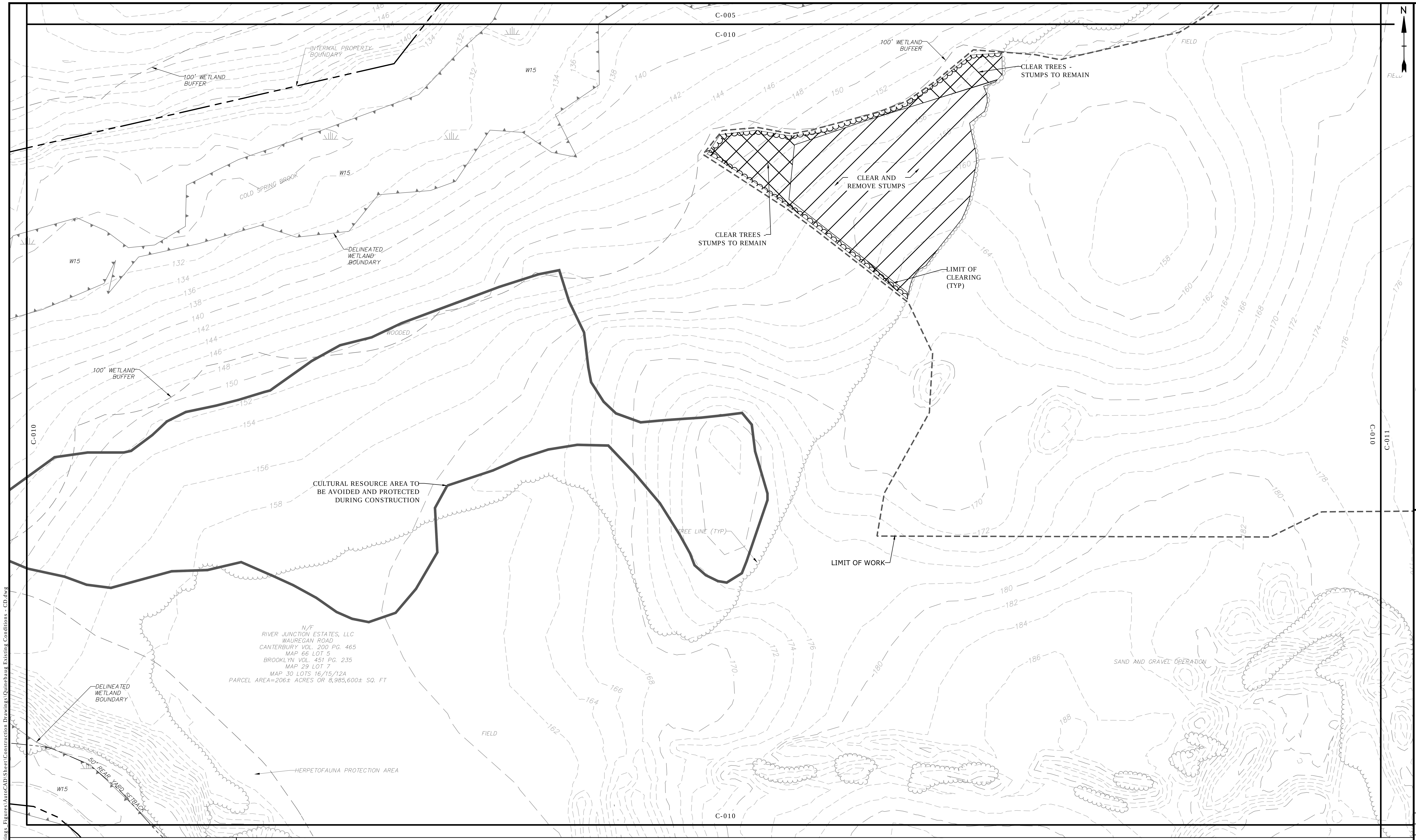

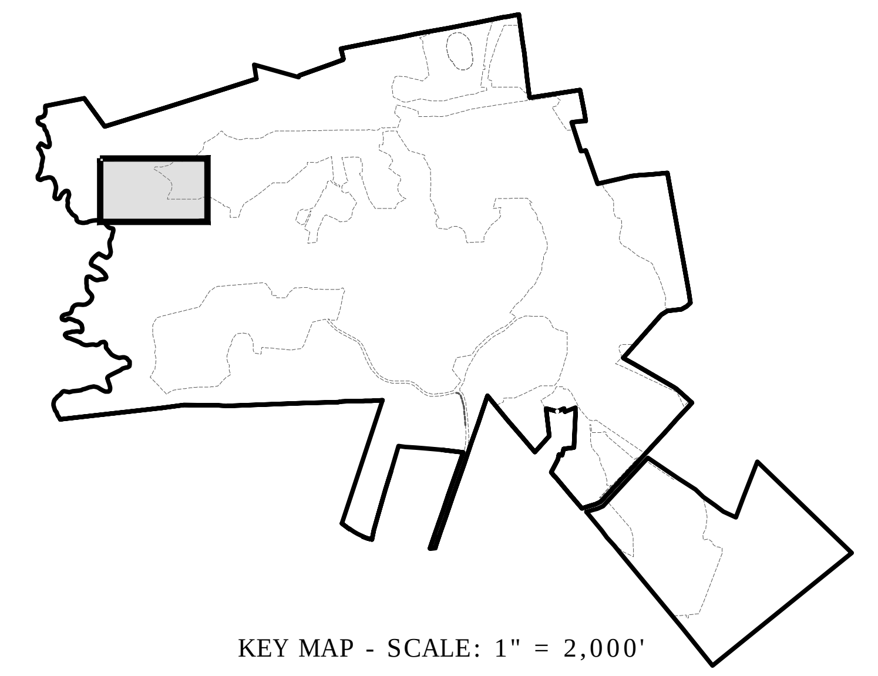

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	— - - — - - —	HERPETOFAUNA PROTECTION AREA	▬	WETLAND	⁂
PROPERTY LINE SETBACK	— - — - —	CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	▬	TIER 1 PLANTINGS	⌒⌒⌒
EASEMENT LINE	— — —	STONE WALL	∘∘∘∘	TIER 2 PLANTINGS	⊙
EXISTING INTERMEDIATE CONTOURS	— — 124 — —	WETLAND BUFFER	— — —	TIER 3 PLANTINGS	✳
EXISTING INDEX CONTOURS	— — 120 — —	WATERCOURSE BUFFER	- - - -	UTILITY POLE	☌
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE	- · - · -	LIGHT POLE	☆
PROPOSED INDEX CONTOURS	220	VERNAL POOL	─▴─▴─	FLARED END SECTION	⏢
GRAVEL ROAD/DRIVEWAY	───	DELINEATED WETLAND	─▲─▲─	SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	── E ── E ──	REMOVE/REMOVE AND DISPOSE	//////	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	── OHW ── OHW ──	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒☒☒		
CHAIN LINK FENCE	─×─×─×─	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK	— — — —	CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY	— · · — · · —				
TREE LINE	⌒⌒⌒⌒				
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	── ── ──				

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

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EXISTING CONDITIONS AND DEMOLITION - 9

SCALE: 1" = 40'

C-010

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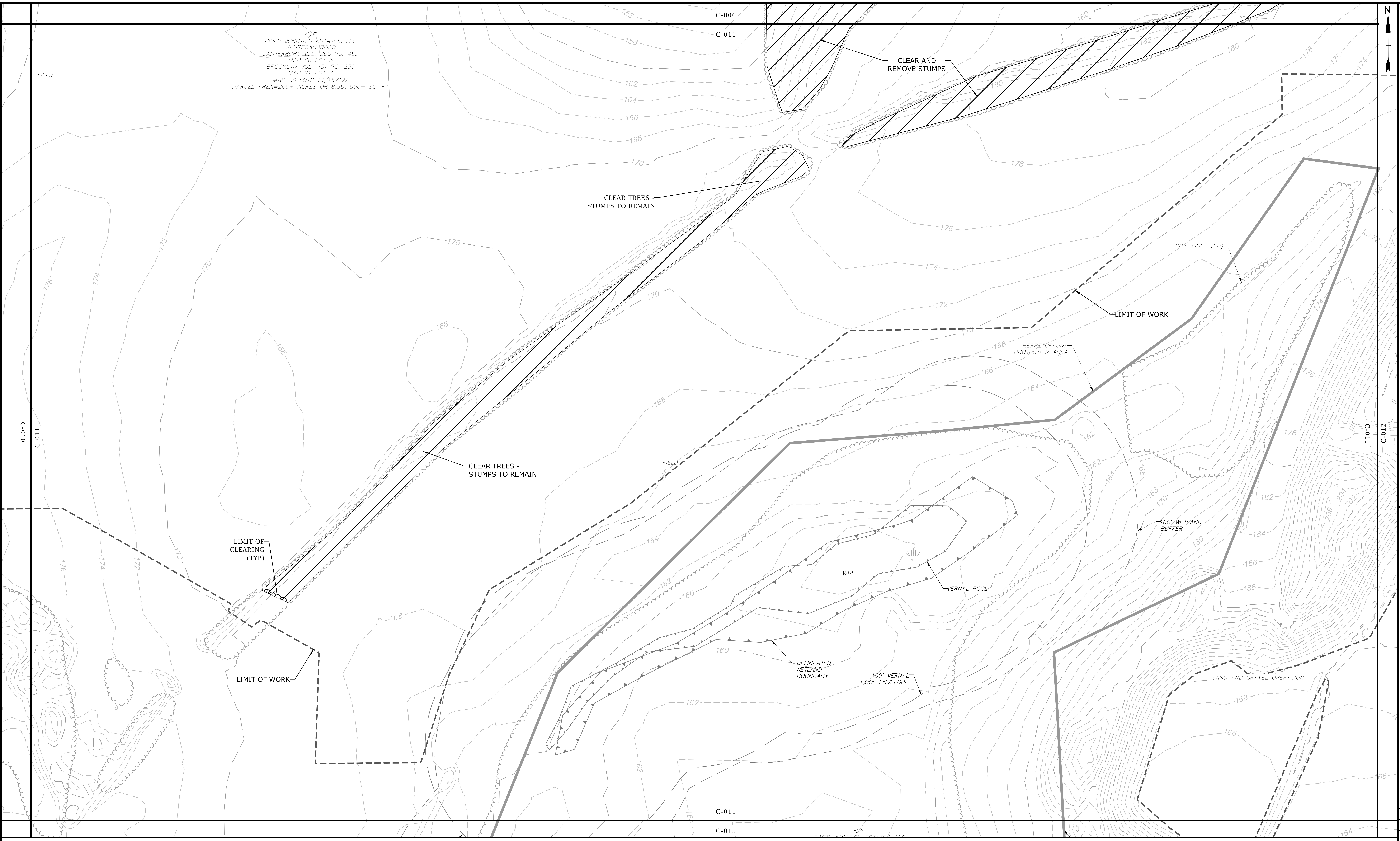

Tighe&Bond

STATE OF CONNECTICUT BRIAN S. HUNTLEY No. 31180 LICENSED PROFESSIONAL ENGINEER

1-15-21

STATE OF CONNECTICUT JACLYN M. CACECI NO. 33828 LICENSED PROFESSIONAL ENGINEER

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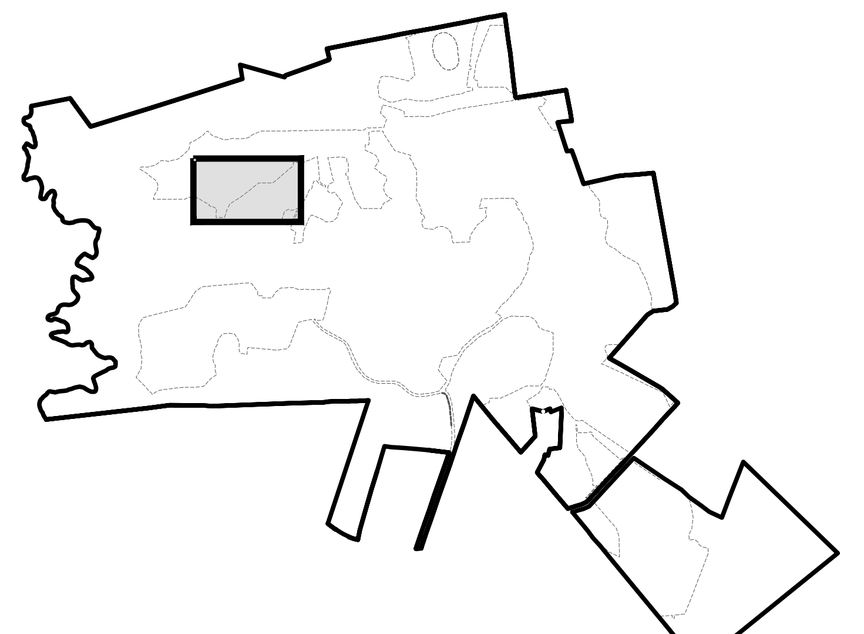
EXISTING CONDITIONS AND DEMOLITION - 10

SCALE: 1" = 40'

C-011



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	×
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	

HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨

WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☼
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

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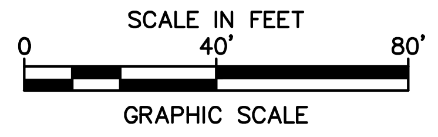

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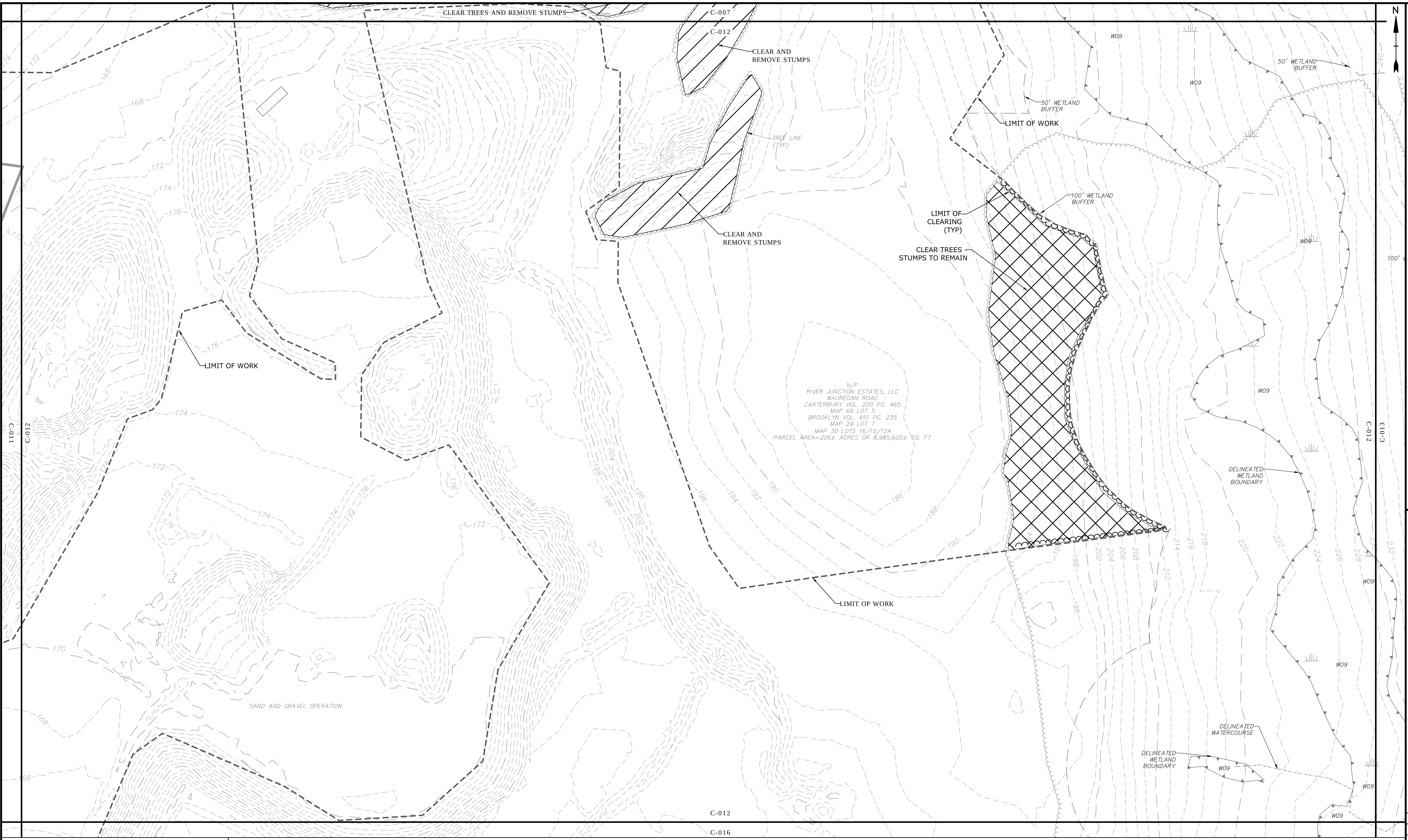

Tighe&Bond

Brian S. Huntley No. 31180 1-15-21

Jaclyn M. Caccia No. 33828 01/15/21

ISSUED FOR CONSTRUCTION

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Quinebaug Solar, LLC

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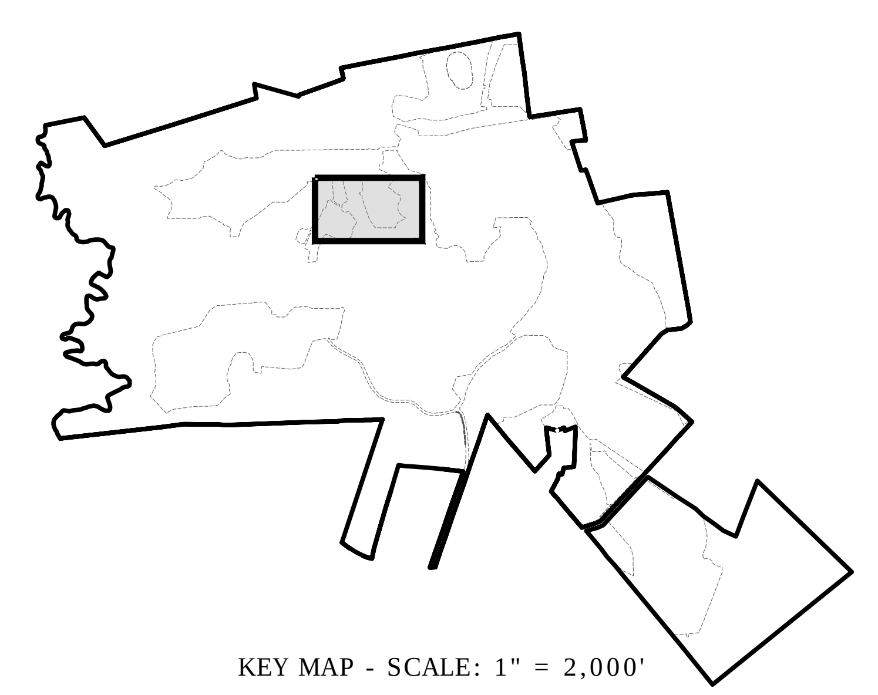

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	HERPETOFAUNA PROTECTION AREA
PROPERTY LINE SETBACK	CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
EASEMENT LINE	STONE WALL
EXISTING INTERMEDIATE CONTOURS (124)	WETLAND BUFFER
EXISTING INDEX CONTOURS (120)	WATERCOURSE BUFFER
PROPOSED INTERMEDIATE CONTOURS (222)	DELINEATED WATERCOURSE
PROPOSED INDEX CONTOURS (220)	VERNAL POOL
GRAVEL ROAD/DRIVEWAY	DELINEATED WETLAND
UNDERGROUND ELECTRIC LINE (E)	REMOVE/REMOVE AND DISPOSE
OVERHEAD ELECTRIC LINE (OHW)	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
CHAIN LINK FENCE	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
LIMITS OF WORK	CONSTRUCTION LAYDOWN AREA
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE (262.69)
MAGNITUDE & DIRECTION OF SLOPE (2%)

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SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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EXISTING CONDITIONS AND DEMOLITION - 11

SCALE: 1" = 40'

C-012

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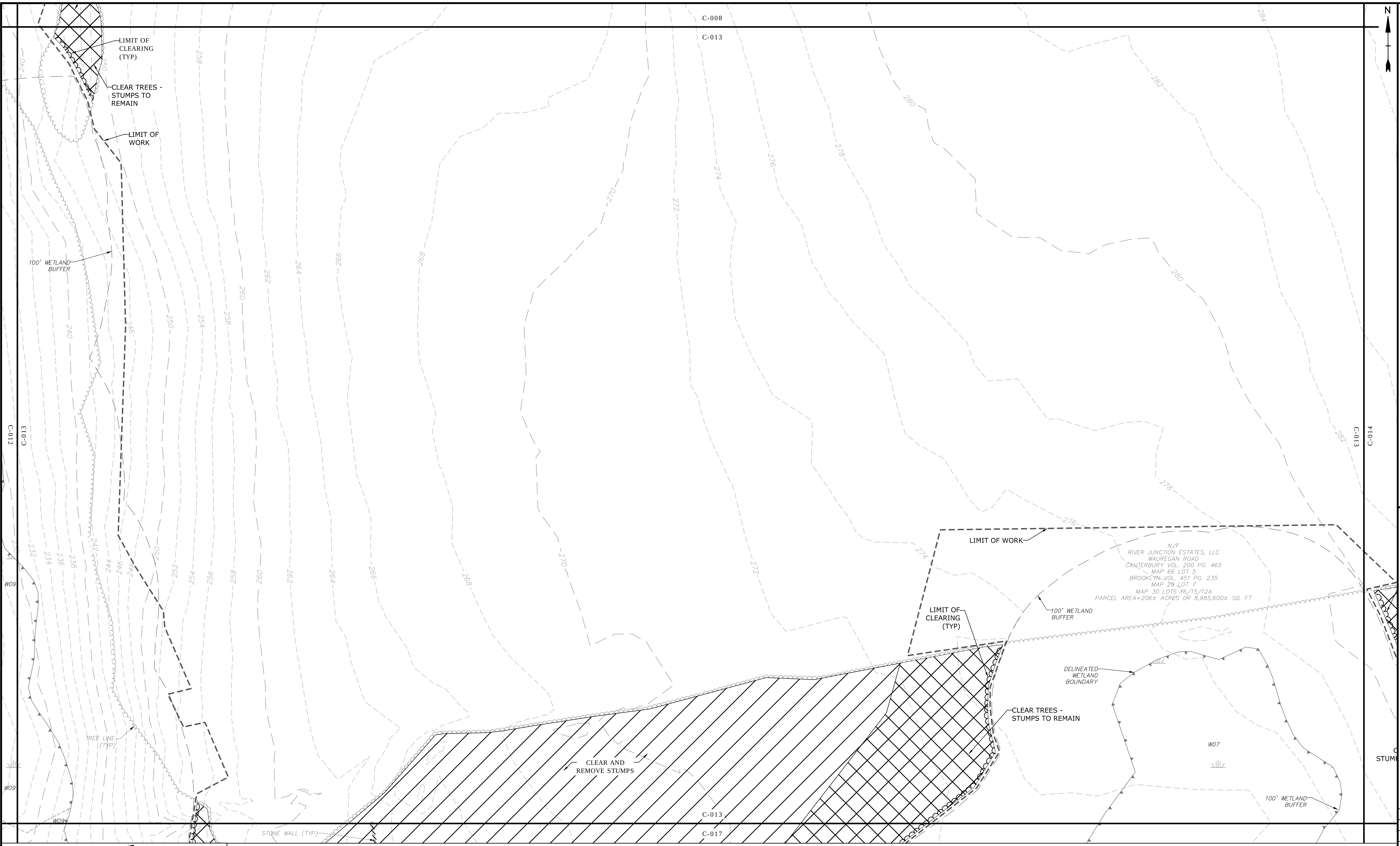

Tighe&Bond

STATE OF CONNECTICUT
BRIAN S. HUNTLEY
No. 31160
LICENSED PROFESSIONAL ENGINEER
1-15-21

STATE OF CONNECTICUT
JACLYN M. CACCIO
NO. 33628
LICENSED PROFESSIONAL ENGINEER
Jaclyn M. Caccio
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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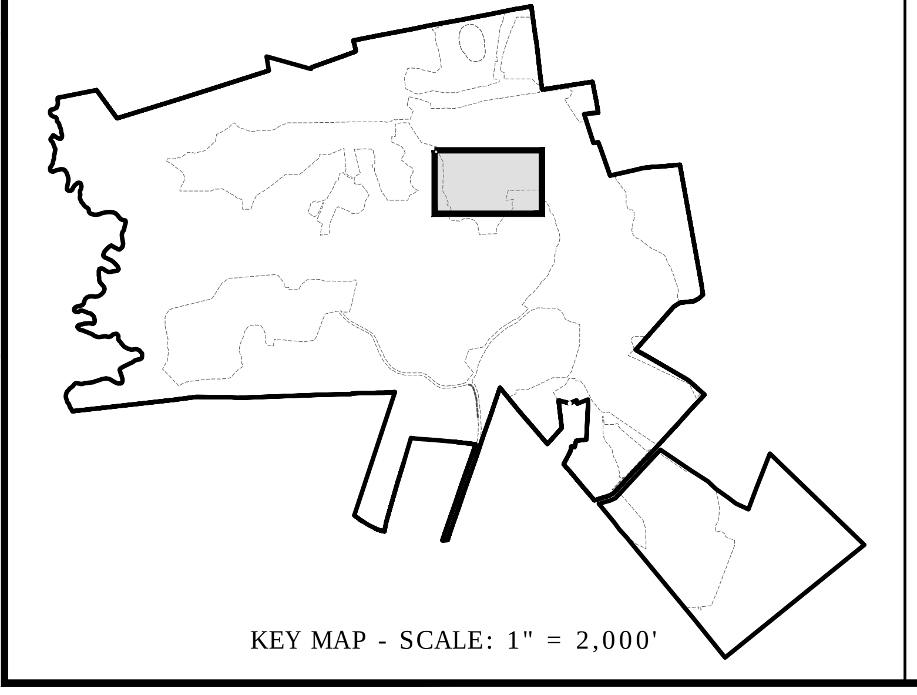
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 12

SCALE: 1" = 40'

C-013



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE — ×
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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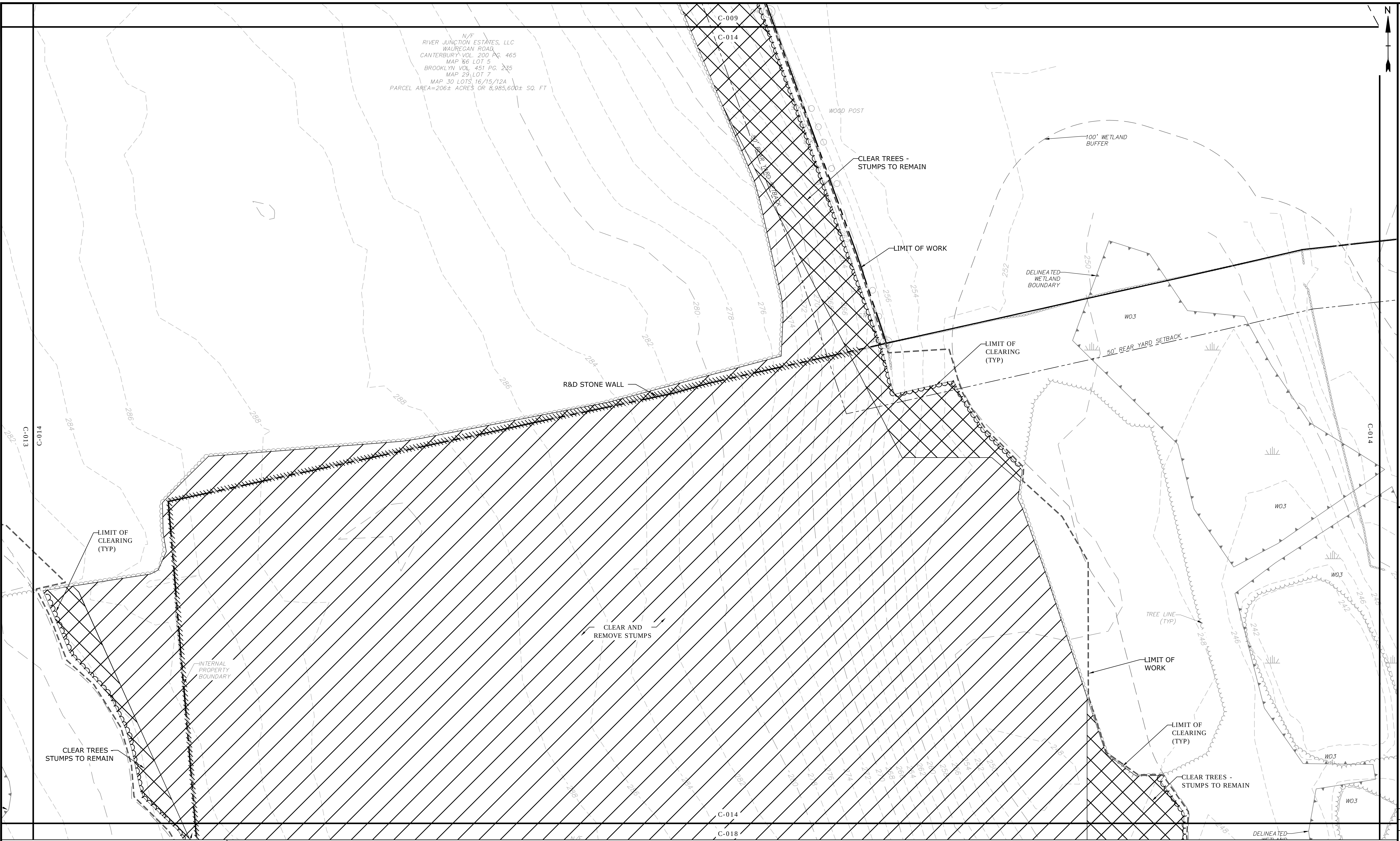

Tighe&Bond

BRIAN S. HUNTLEY No. 31180
1-15-21

JACLYN M. CACACE NO. 33828
Jaclyn M Cacace 01/15/21

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Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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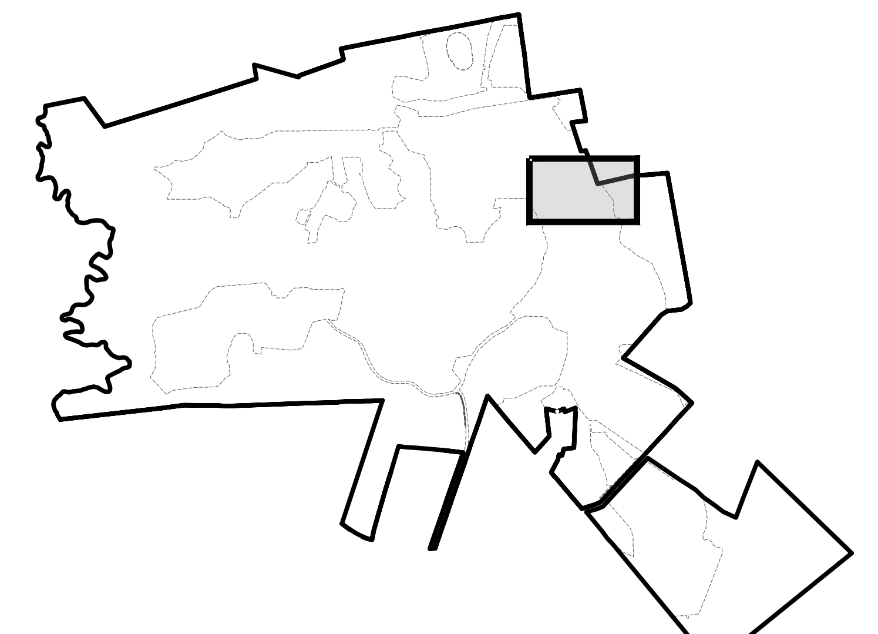
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 13

SCALE: 1" = 40'

C-014



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	×
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	//////
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☆
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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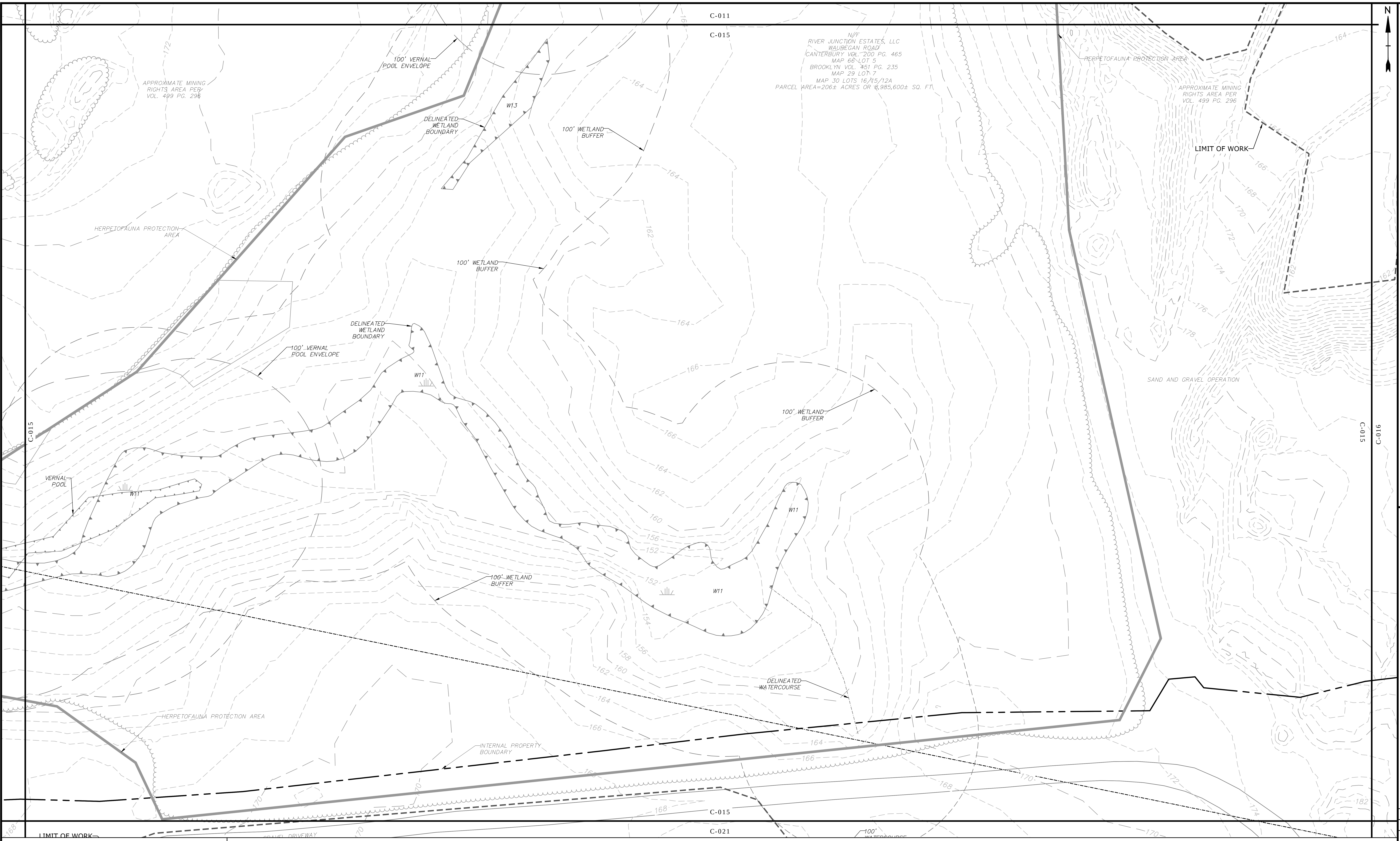

Tighe&Bond

No. 31180
1-15-21

NO. 33828
01/15/21

ISSUED FOR CONSTRUCTION

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Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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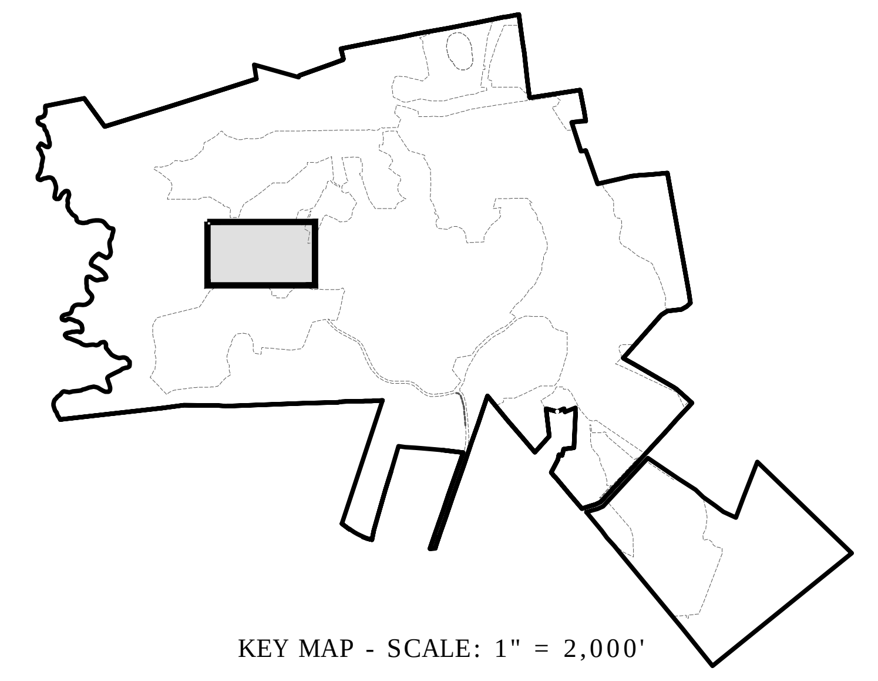
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 14

SCALE: 1" = 40'

C-015



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS 124
EXISTING INDEX CONTOURS 120
PROPOSED INTERMEDIATE CONTOURS 222
PROPOSED INDEX CONTOURS 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE E
OVERHEAD ELECTRIC LINE OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE
HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA
WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE 262.69
MAGNITUDE & DIRECTION OF SLOPE 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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Tighe&Bond

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BRIAN S. HUNTLEY
1-15-21

No. 33828
JACLYN M. CACCIOLA
01/15/21

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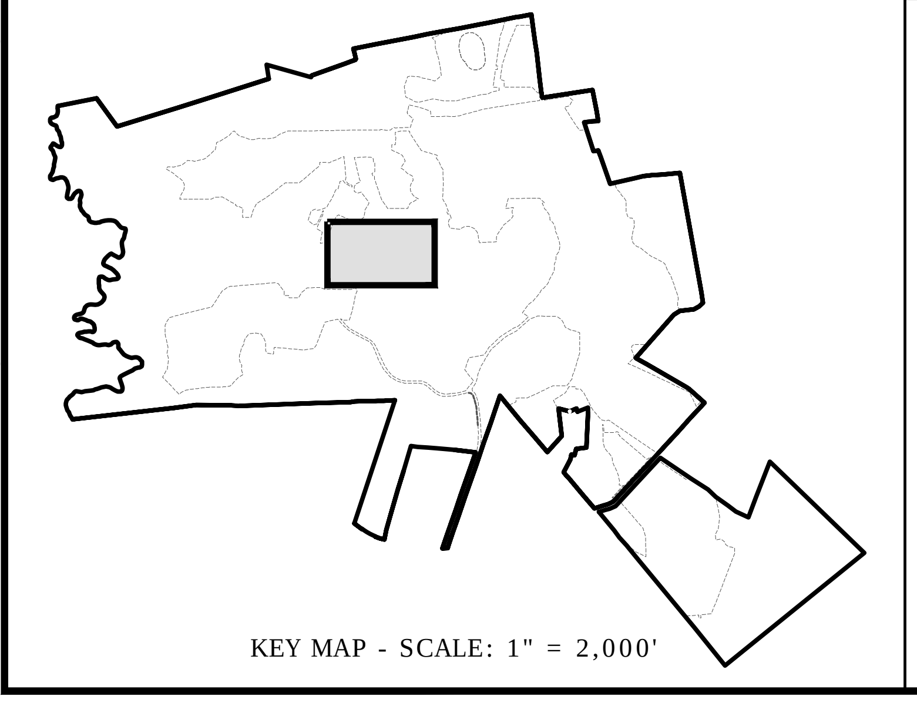
EXISTING CONDITIONS AND DEMOLITION - 15

SCALE: 1" = 40'

C-016



KEY MAP - SCALE: 1" = 2,000'

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS (124)
- EXISTING INDEX CONTOURS (120)
- PROPOSED INTERMEDIATE CONTOURS (222)
- PROPOSED INDEX CONTOURS (220)
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE (E)
- OVERHEAD ELECTRIC LINE (OHW)
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
- STONE WALL
- WETLAND BUFFER
- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE
- AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
- CONSTRUCTION LAYDOWN AREA
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE ☆
- FLARED END SECTION
- SPOT GRADE (262.69)
- MAGNITUDE & DIRECTION OF SLOPE (2%)

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
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GRAPHIC SCALE

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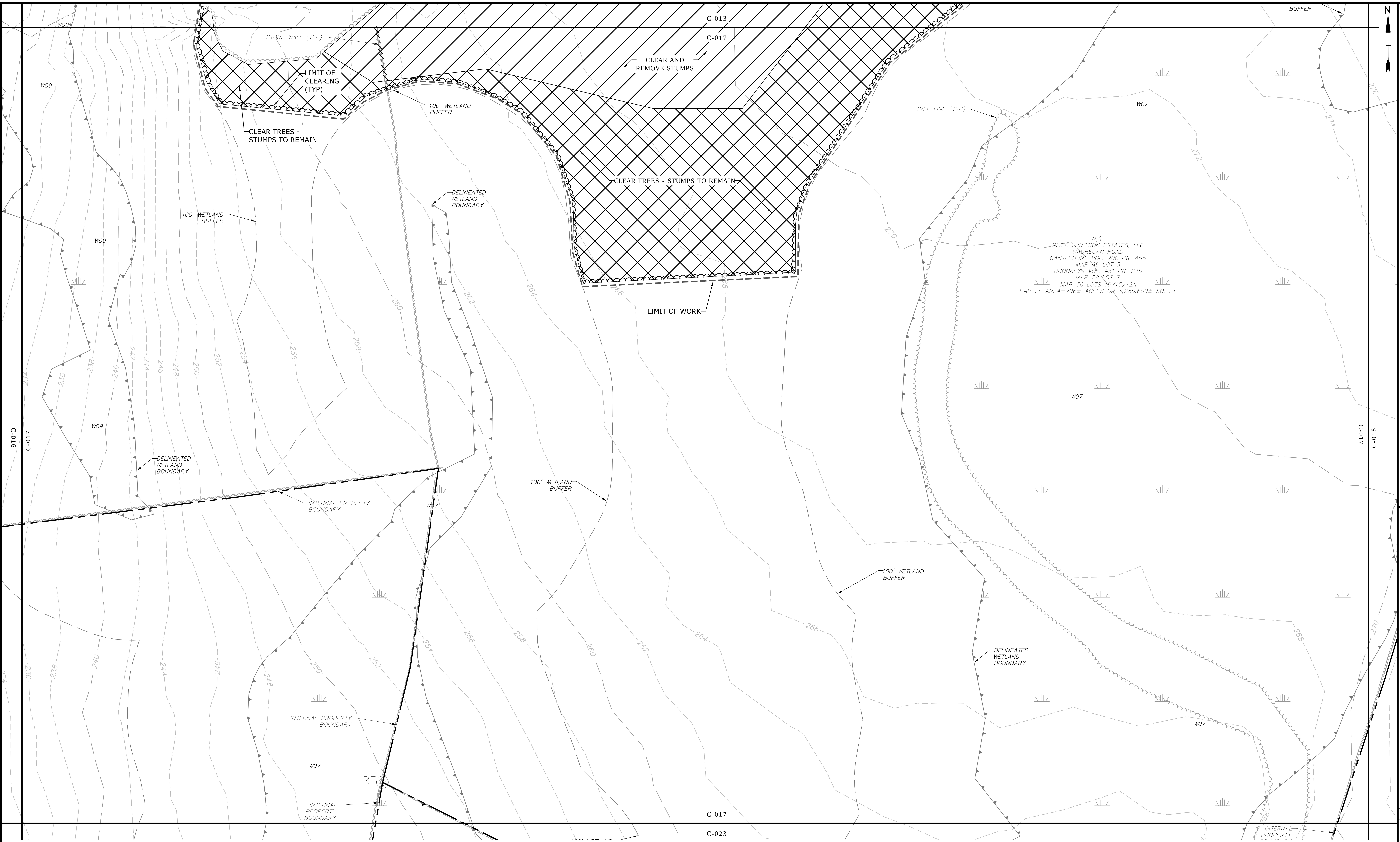

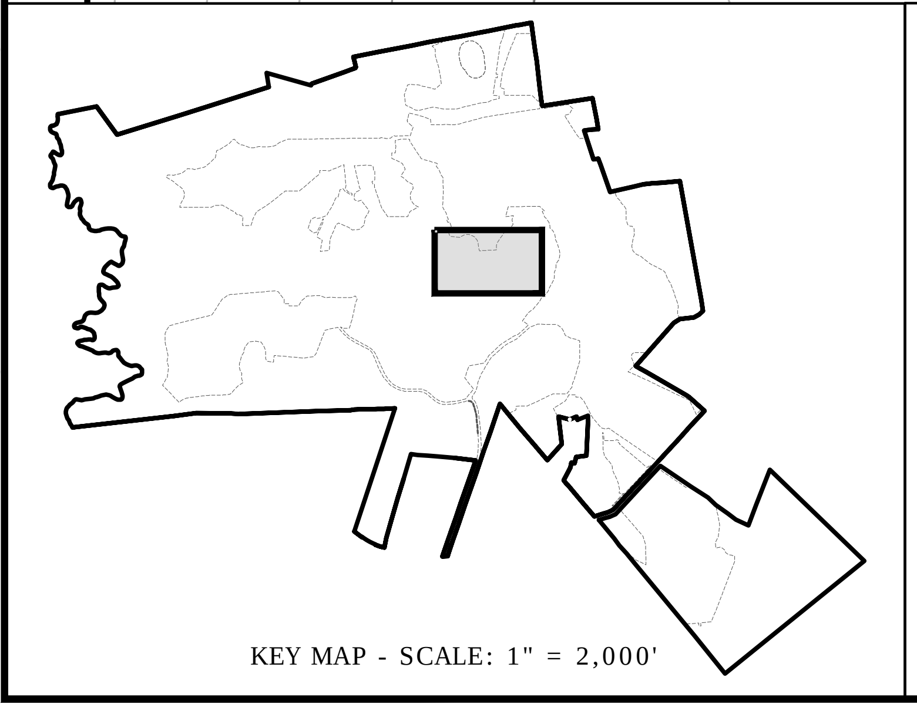
KEY MAP - SCALE: 1" = 2,000'

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS (124)
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- UNDERGROUND ELECTRIC LINE (E)
- OVERHEAD ELECTRIC LINE (OHW)
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
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- FLARED END SECTION
- SPOT GRADE (262.69)
- MAGNITUDE & DIRECTION OF SLOPE (2%)

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SCALE IN FEET
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GRAPHIC SCALE

Tighe&Bond

STATE OF CONNECTICUT
BRIAN S. HUNTLEY
No. 31180
LICENSED PROFESSIONAL ENGINEER
1-15-21

STATE OF CONNECTICUT
JACLYN M. CACECI
NO. 33828
LICENSED PROFESSIONAL ENGINEER
Jaclyn M. Cacci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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EXISTING CONDITIONS AND DEMOLITION - 16

SCALE: 1" = 40'

C-017

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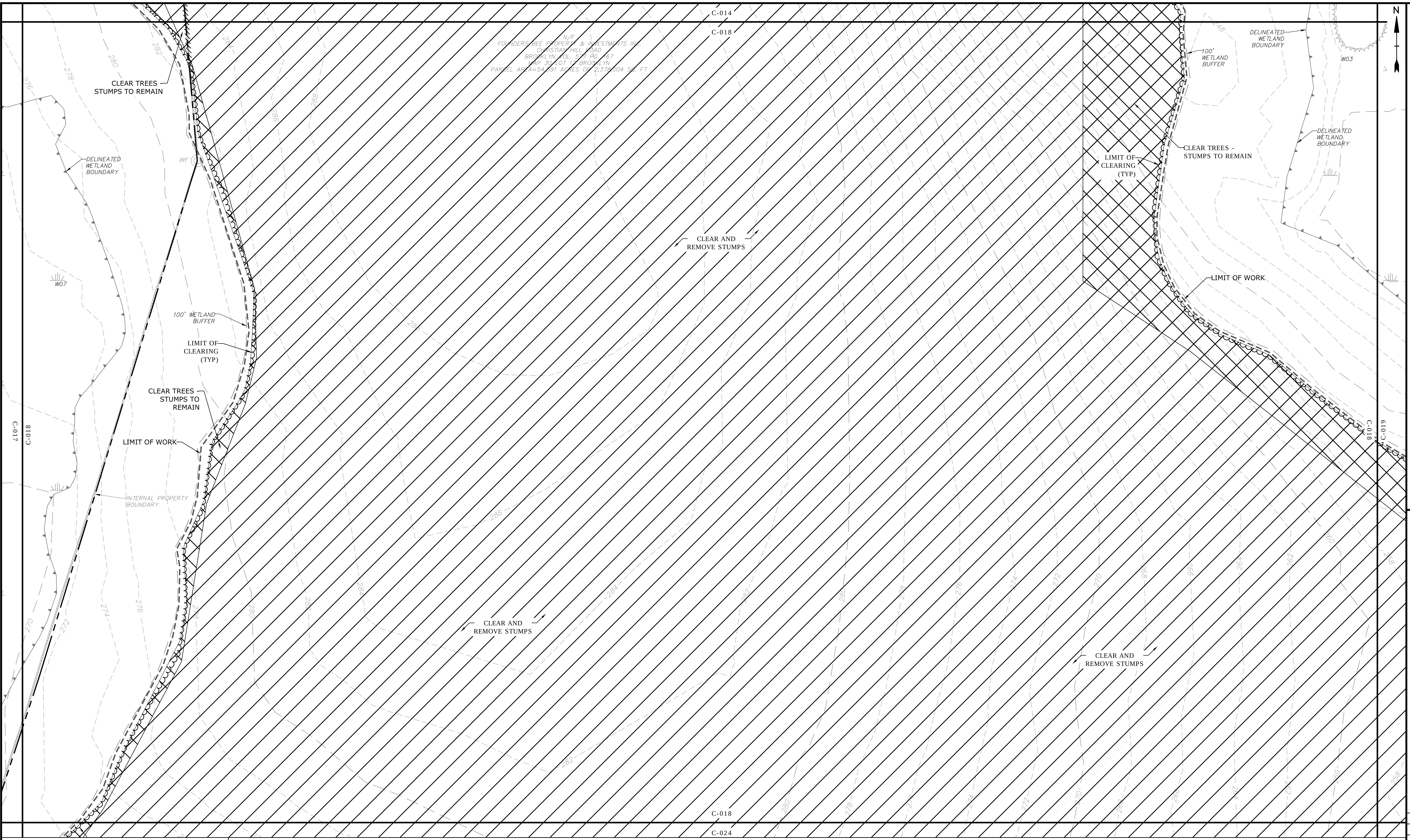

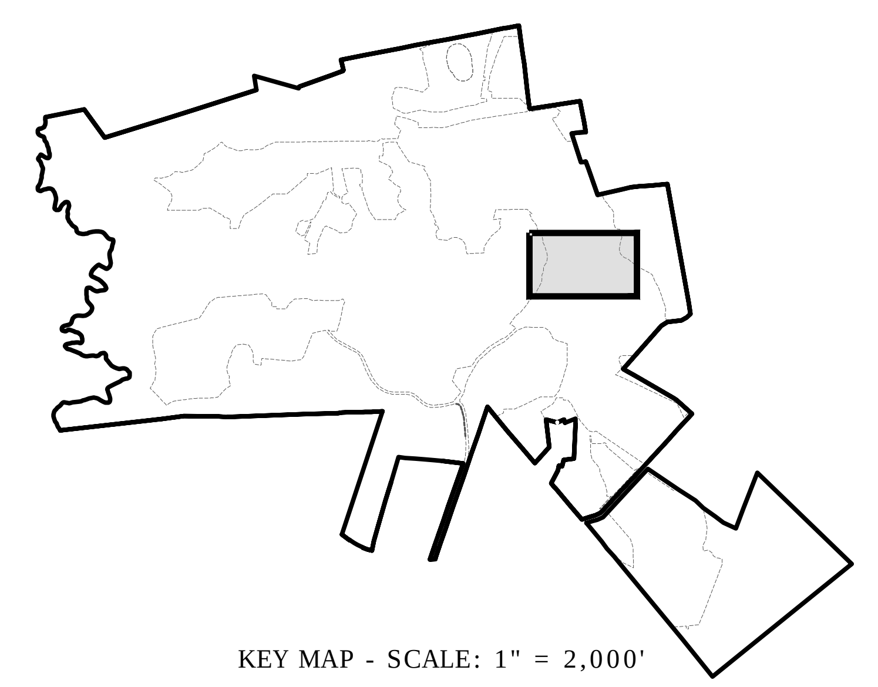
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE — ×
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN — ☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL — ▨
CONSTRUCTION LAYDOWN AREA — ▨

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNSLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR
CONSTRUCTION

Quinebaug
Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 17

SCALE: 1" = 40'

C-018

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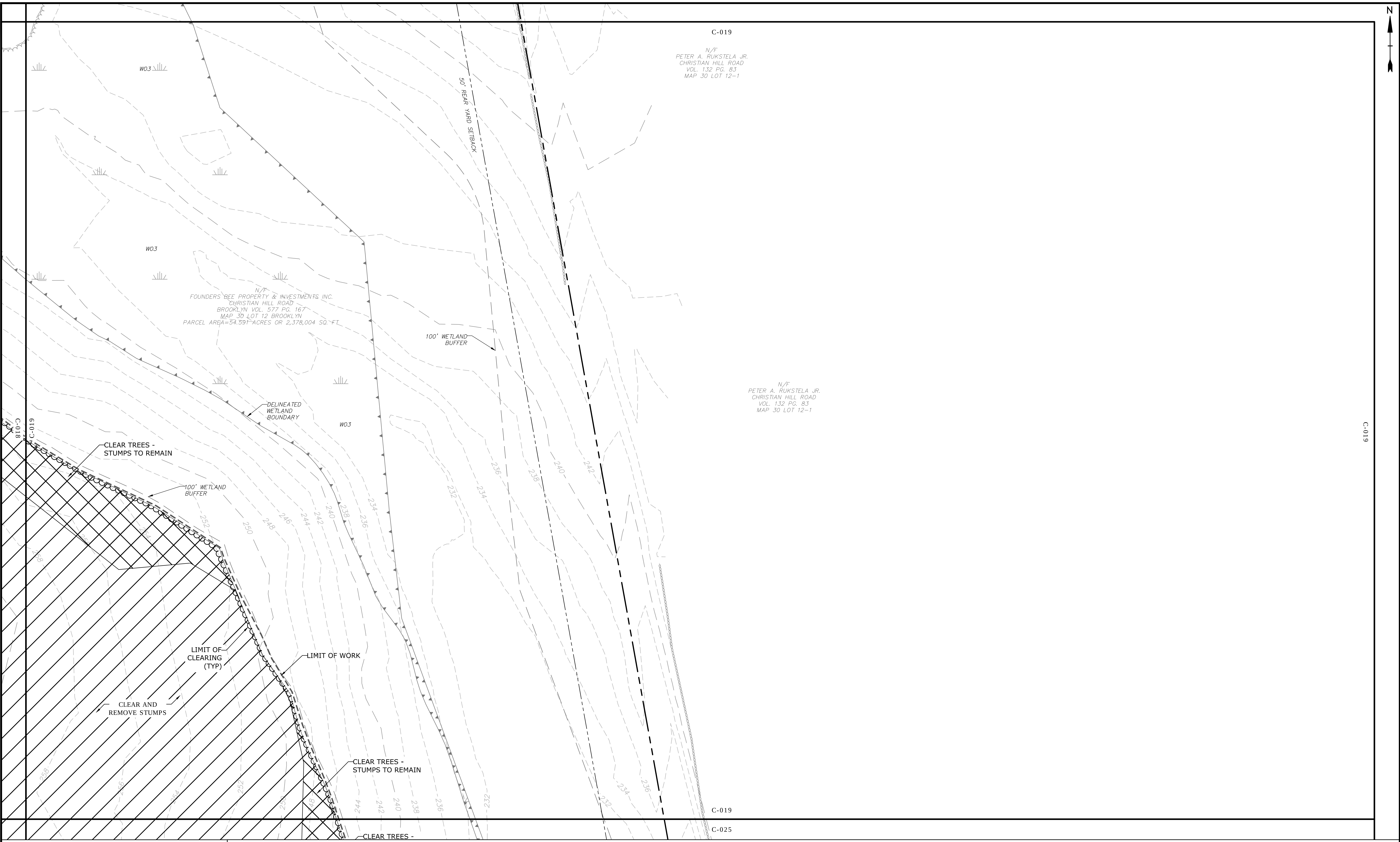

Tighe&Bond

BRIAN S. HUNTLEY No. 31180
1-15-21

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Jaclyn M Caceci 01/15/21

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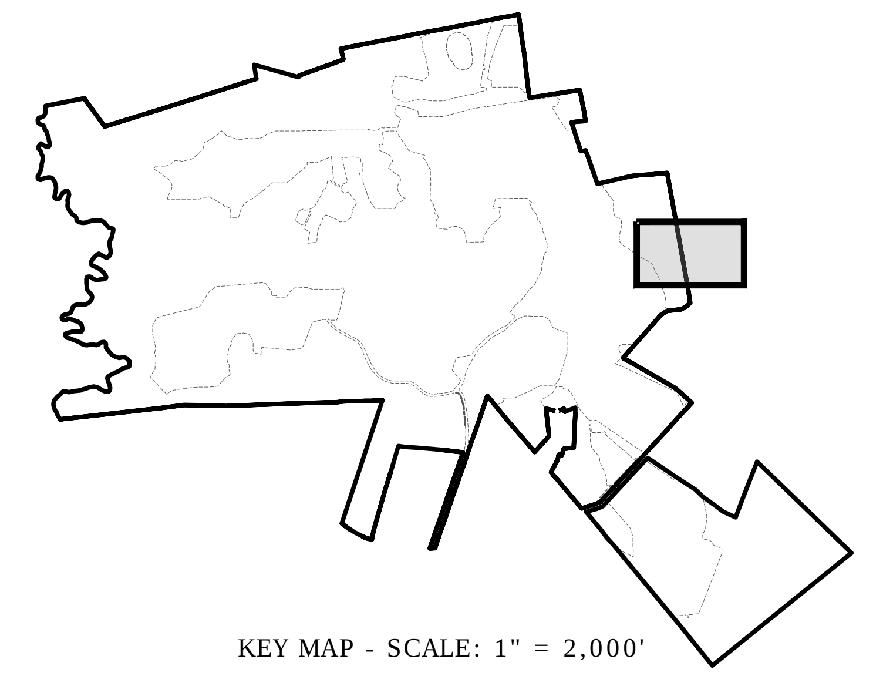
EXISTING CONDITIONS AND DEMOLITION - 18

SCALE: 1" = 40'

C-019


KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	×
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	

HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	▩
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨

WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☆
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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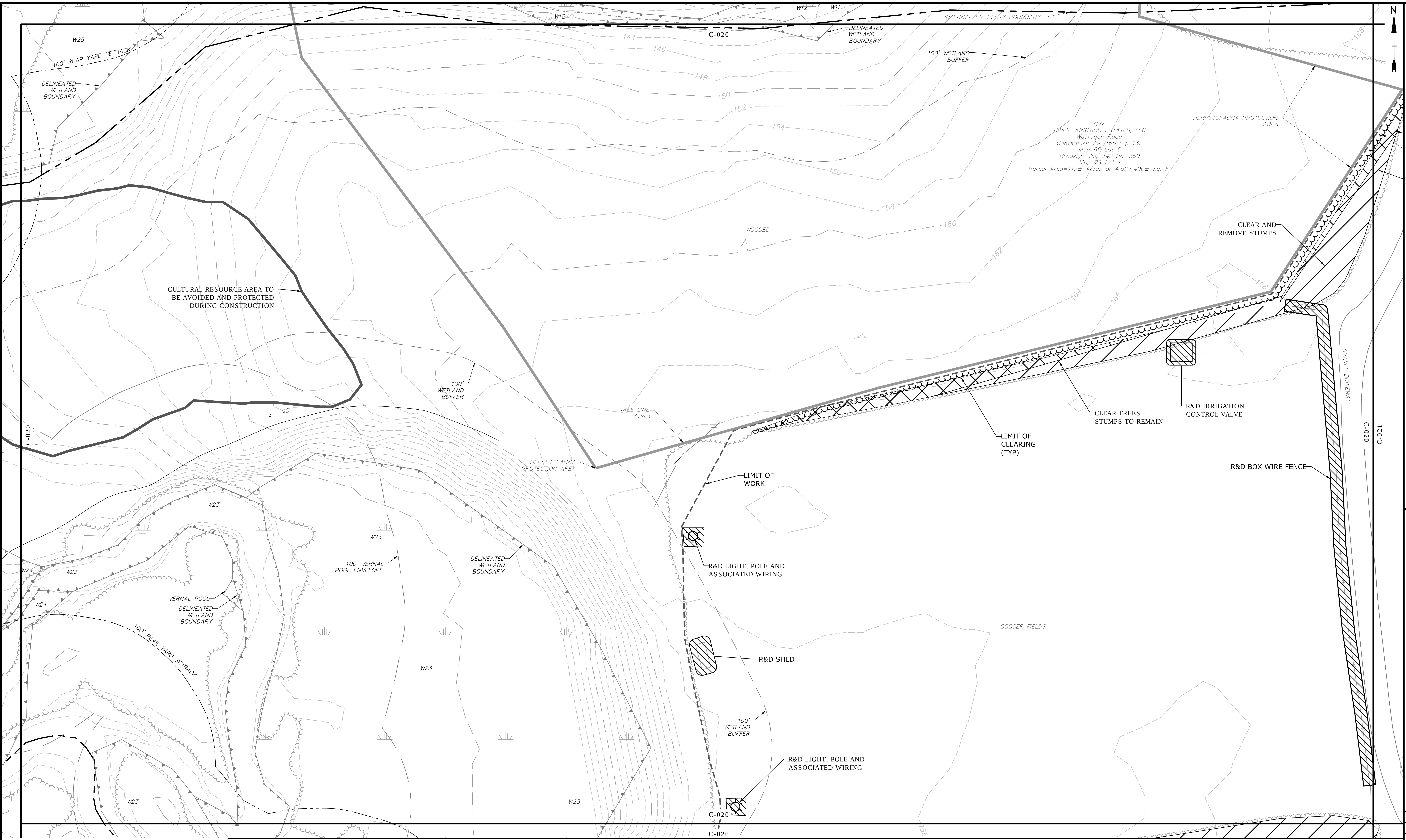

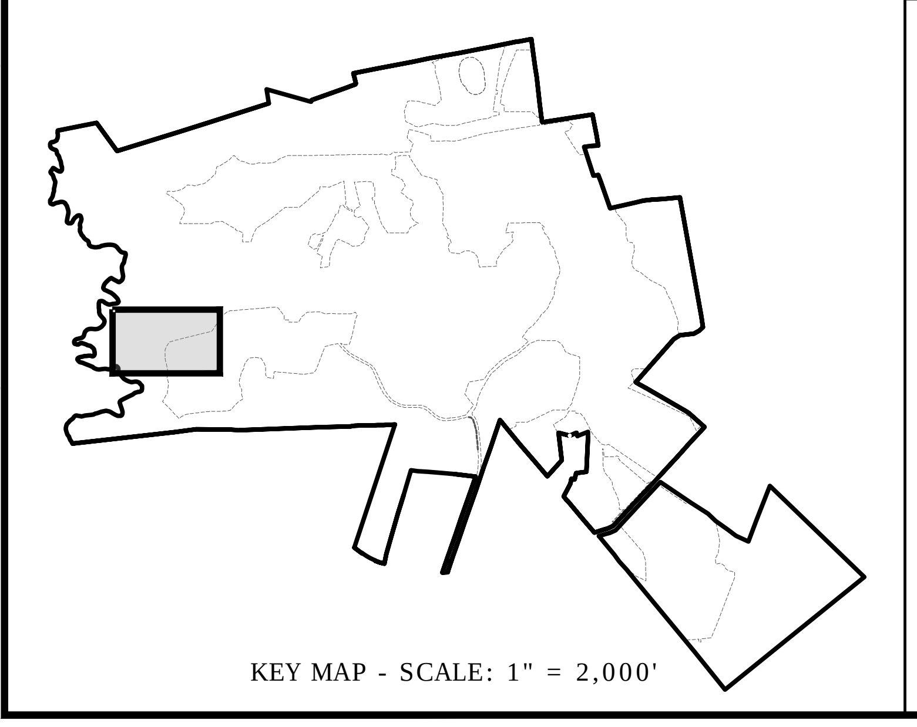

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
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EXISTING INTERMEDIATE CONTOURS — 124
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0 40' 80'
GRAPHIC SCALE

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Jaclyn M. Caceci
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APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 19

SCALE: 1" = 40'

C-020

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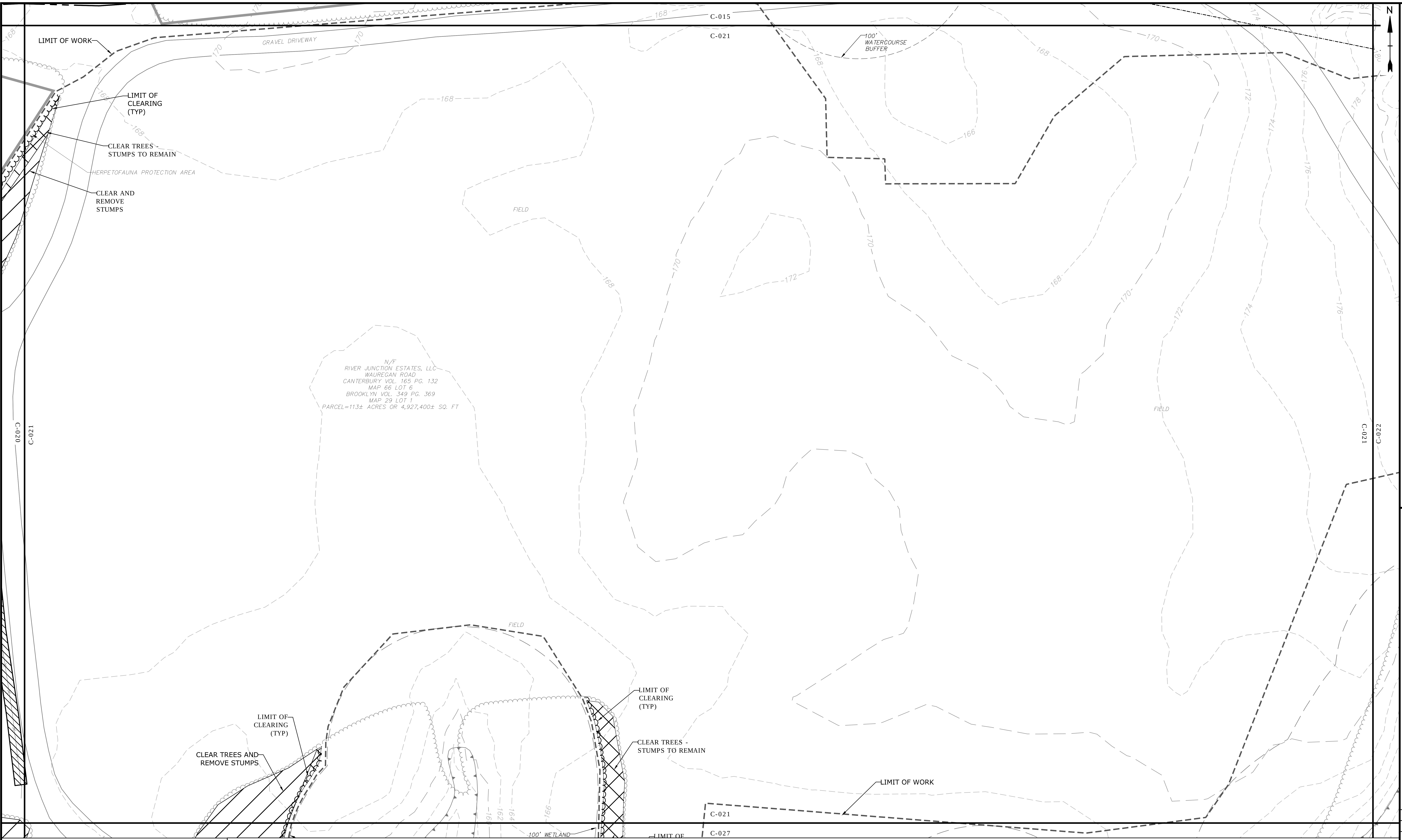

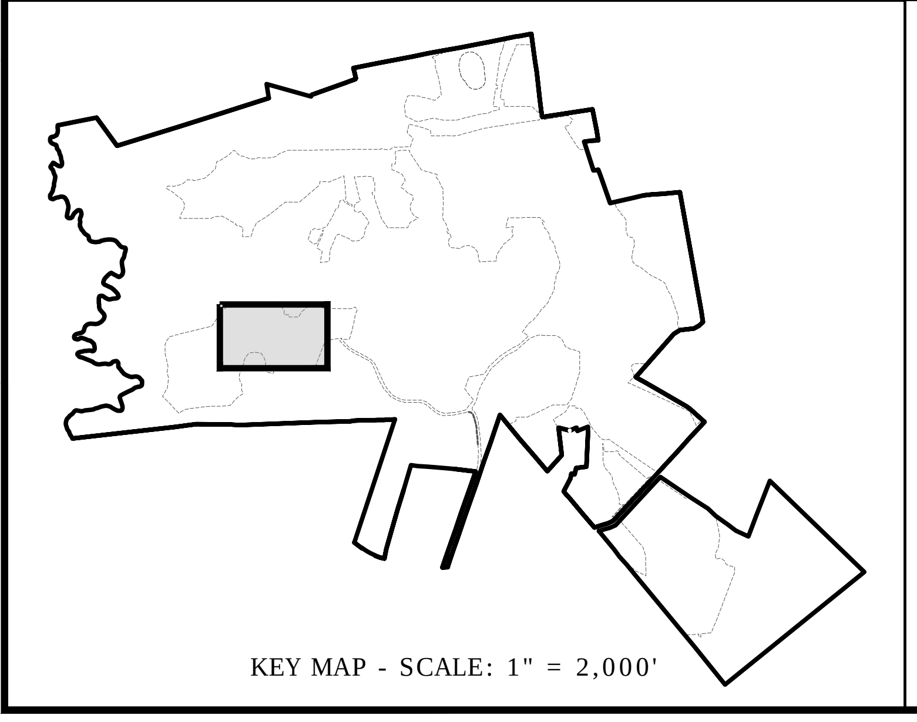

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	×
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	▩
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☆
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn & Canterbury, Connecticut

VERIFY SCALE
BAR IS 1 INCH ON ORIGINAL DRAWING
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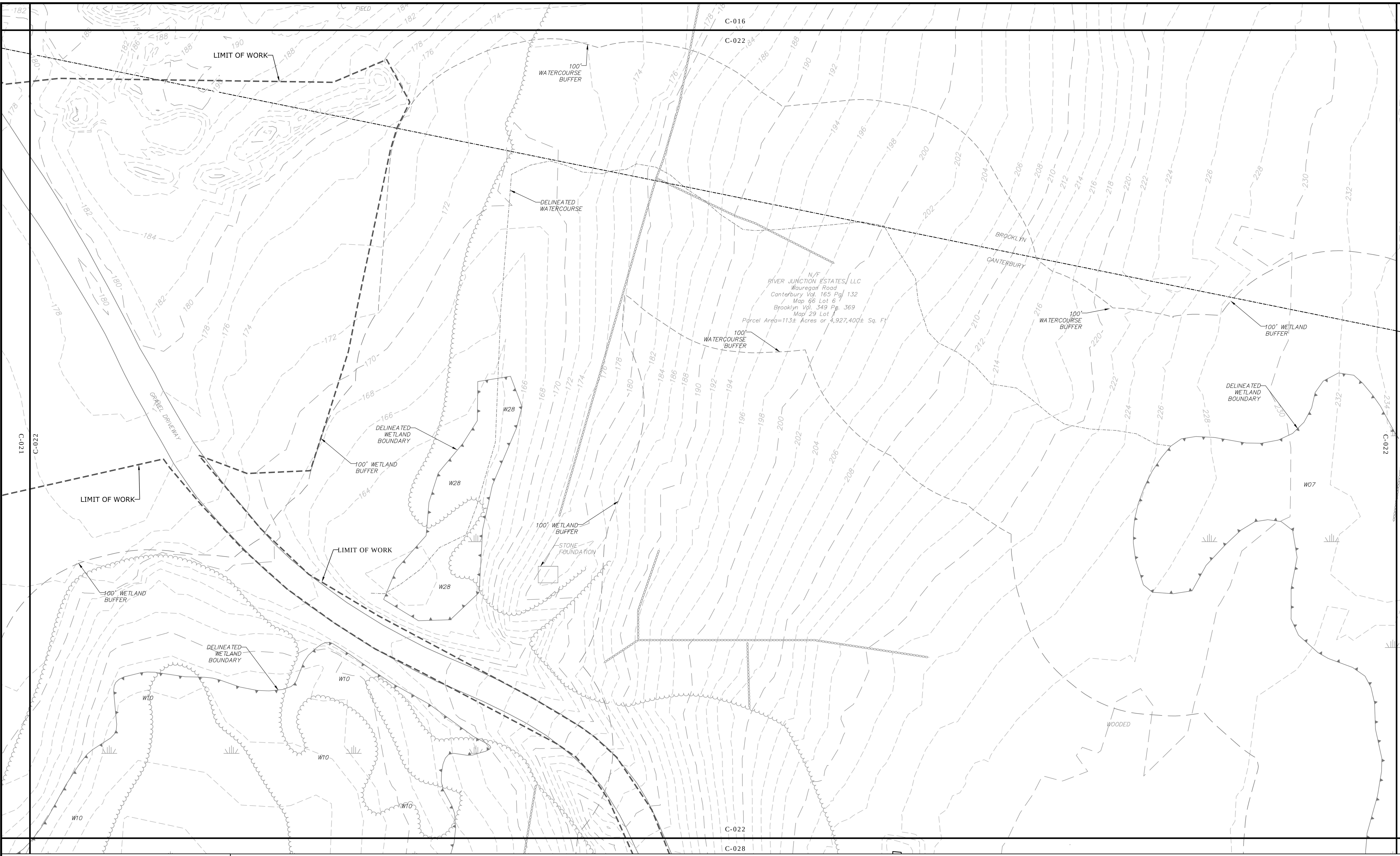
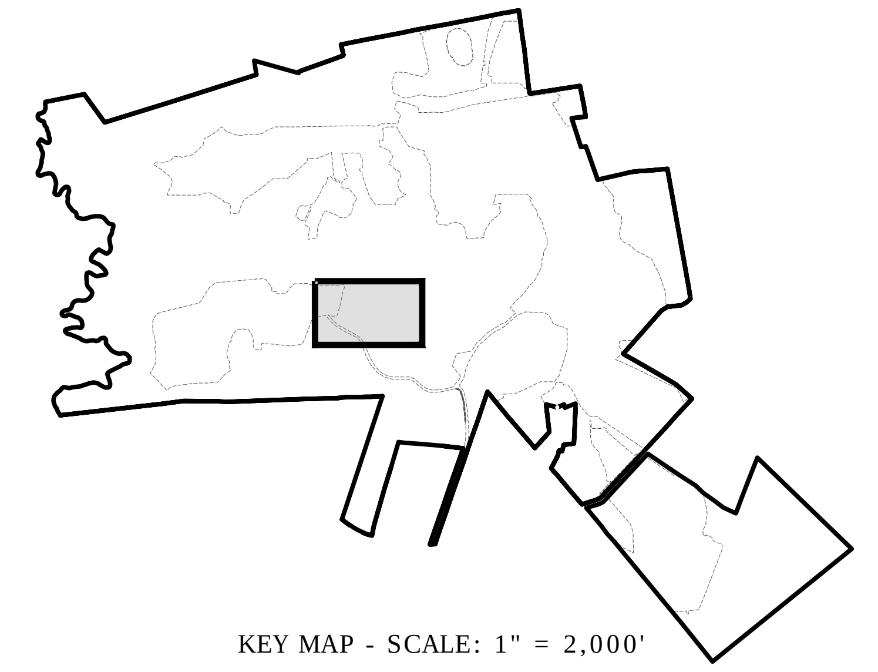
PROJECT NO:	R0317
DATE:	01/2021
FILE:	Quinebaug Existing Conditions - CD.dwg
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 20

SCALE: 1" = 40'

C-021





KEY MAP - SCALE: 1" = 2,000'

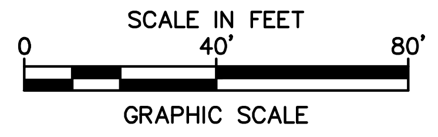
LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE — ×
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.



Tighe&Bond

BRIAN S. HUNSLEY
No. 31180
1-15-21

JACLYN M. CASCIO
NO. 33828
01/15/21

ISSUED FOR
CONSTRUCTION

Quinebaug
Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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PROJECT NO:	R0317
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FILE:	Quinebaug Existing Conditions - CD.dwg
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CHECKED:	BSH/JEC
APPROVED:	FJH

EXISTING CONDITIONS AND
DEMOLITION - 21

SCALE: 1" = 40'

C-022

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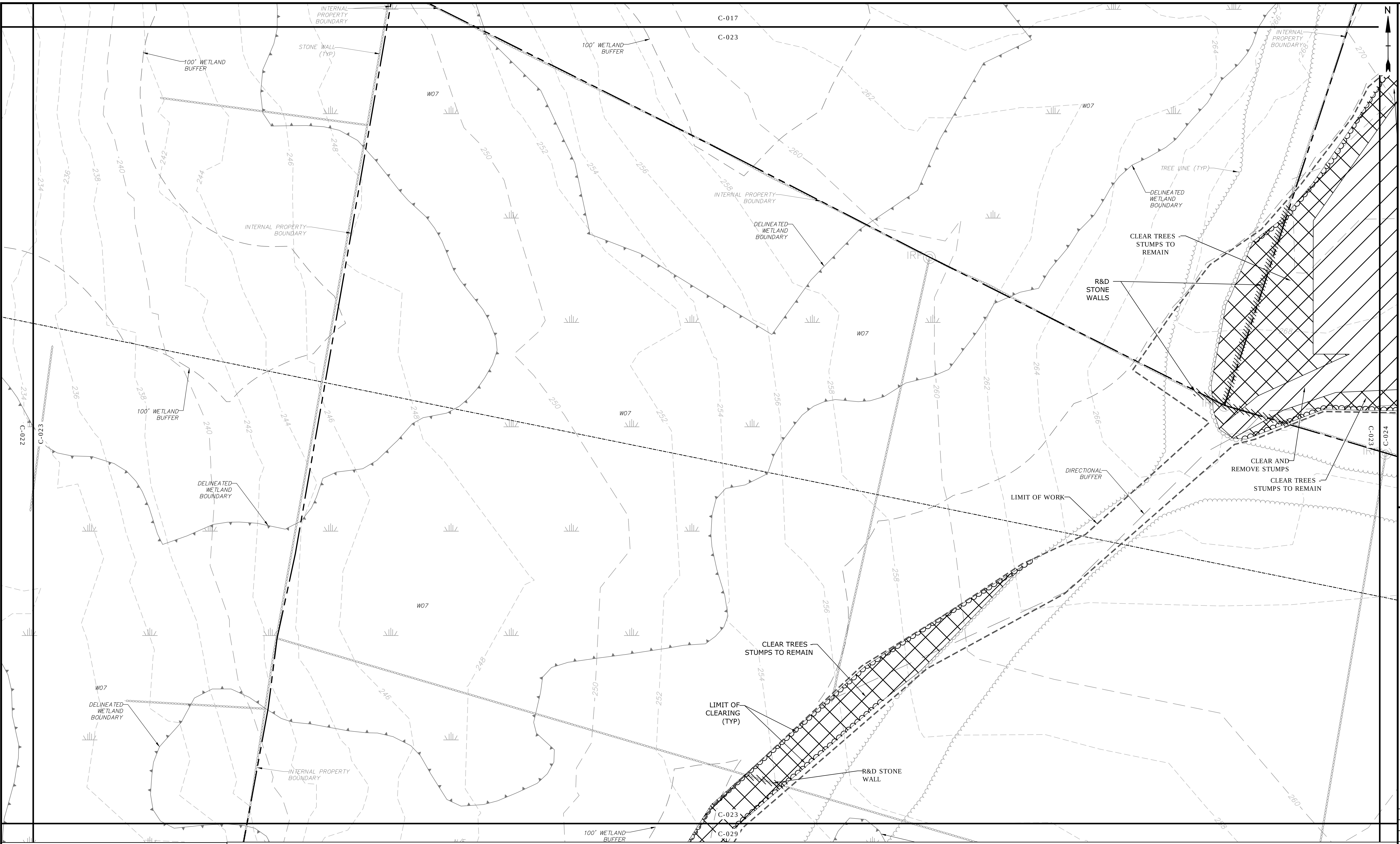

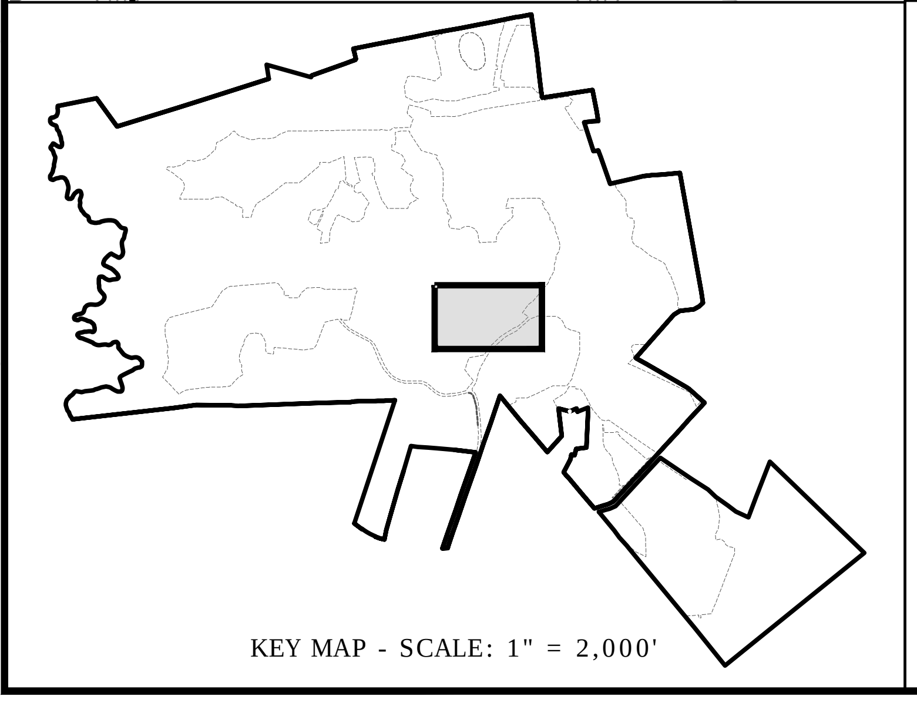

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE — ×
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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MARK	DATE	DESCRIPTION

PROJECT NO:	R0317
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FILE: Quinebaug Existing Conditions - CD.dwg	
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 22

SCALE: 1" = 40'

C-023

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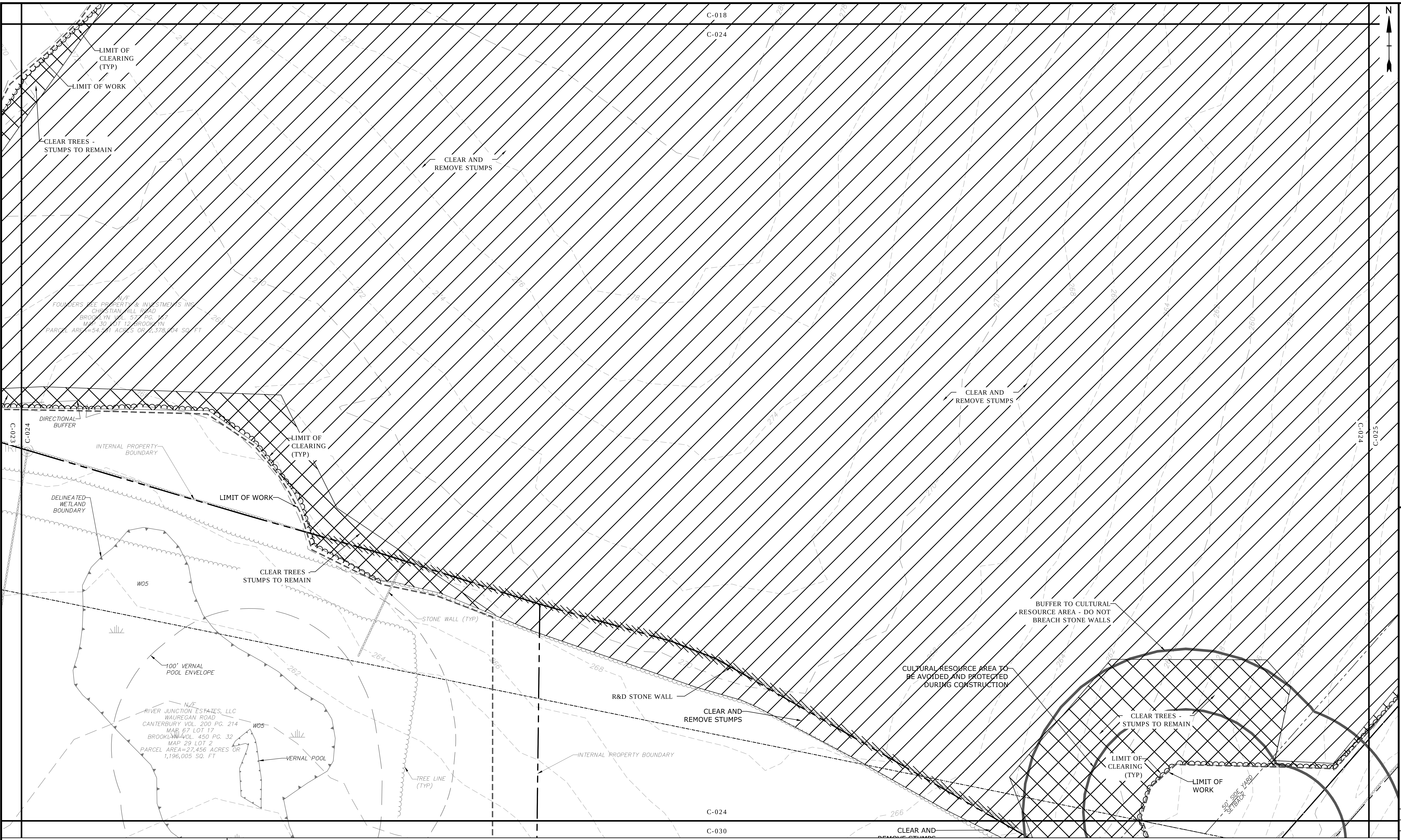

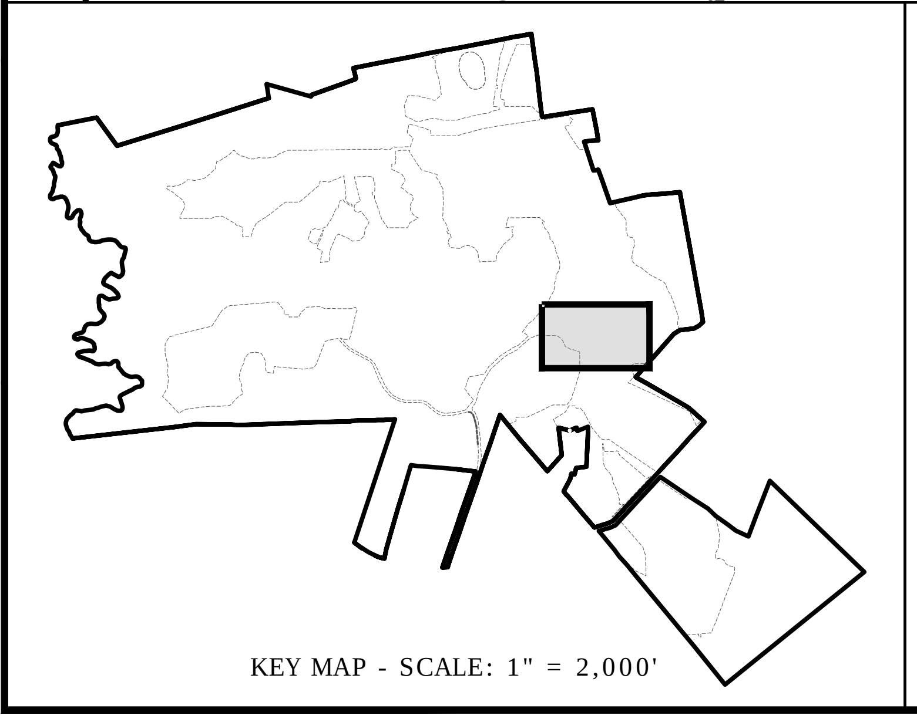

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS 124
EXISTING INDEX CONTOURS 120
PROPOSED INTERMEDIATE CONTOURS 222
PROPOSED INDEX CONTOURS 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE E
OVERHEAD ELECTRIC LINE OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE
HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA
WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE 262.69
MAGNITUDE & DIRECTION OF SLOPE 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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CHECKED: BSH/JEC
APPROVED: FJH

EXISTING CONDITIONS AND DEMOLITION - 23

SCALE: 1" = 40'

C-024

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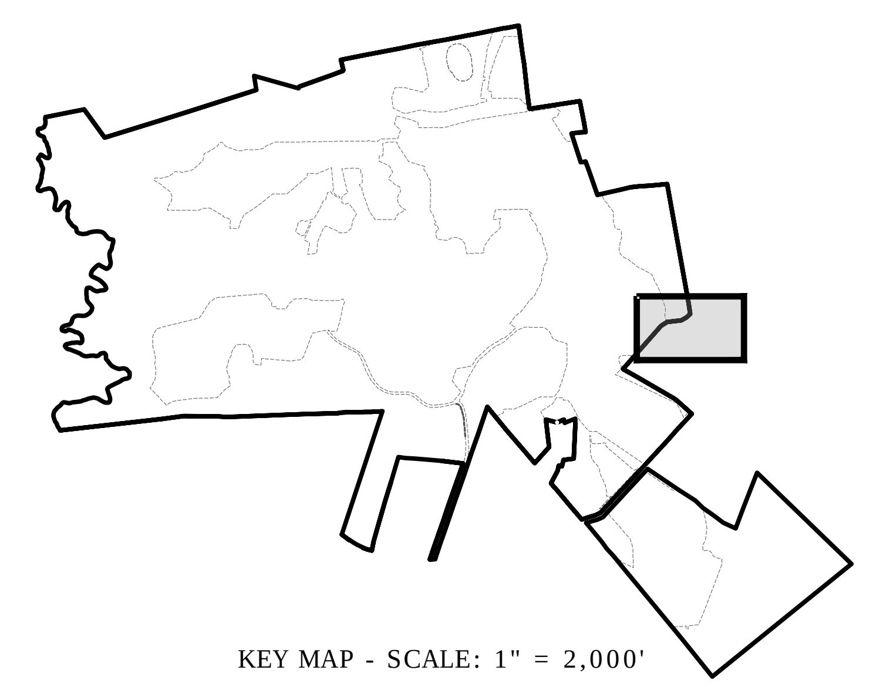

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
EASEMENT LINE		STONE WALL		TIER 2 PLANTINGS	
EXISTING INTERMEDIATE CONTOURS	124	WETLAND BUFFER		TIER 3 PLANTINGS	
EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☆
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	▨	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒		
CHAIN LINK FENCE	×	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE					

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
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1-15-21

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Jaclyn M. Caceci
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Quinebaug Solar, LLC

Brooklyn & Canterbury, Connecticut

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CHECKED:	BSH/JEC
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 24

SCALE: 1" = 40'

C-025

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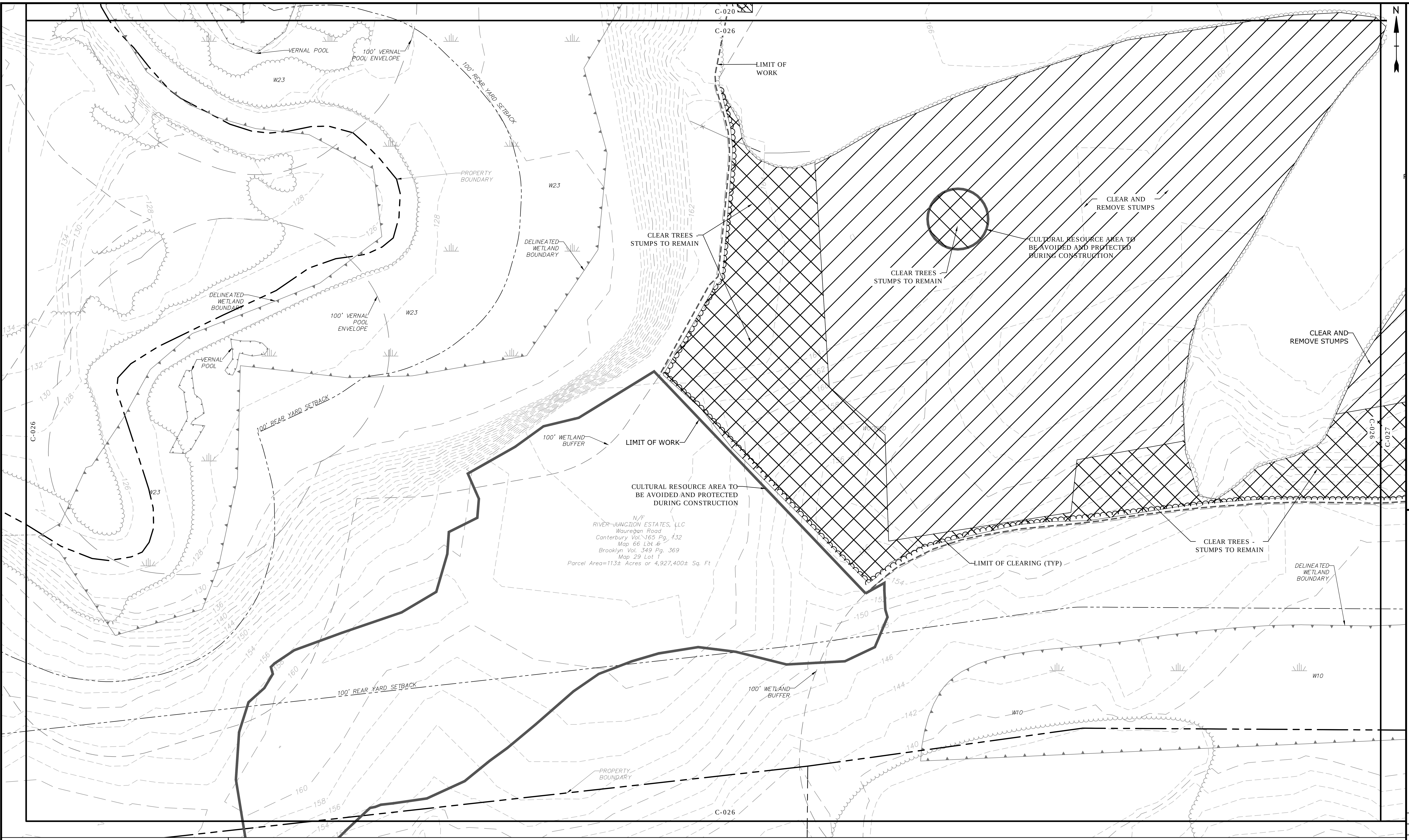

Tighe&Bond

No. 31180
BRIAN S. HUNTLEY
1-15-21

NO. 33828
JACLYN M. CACECI
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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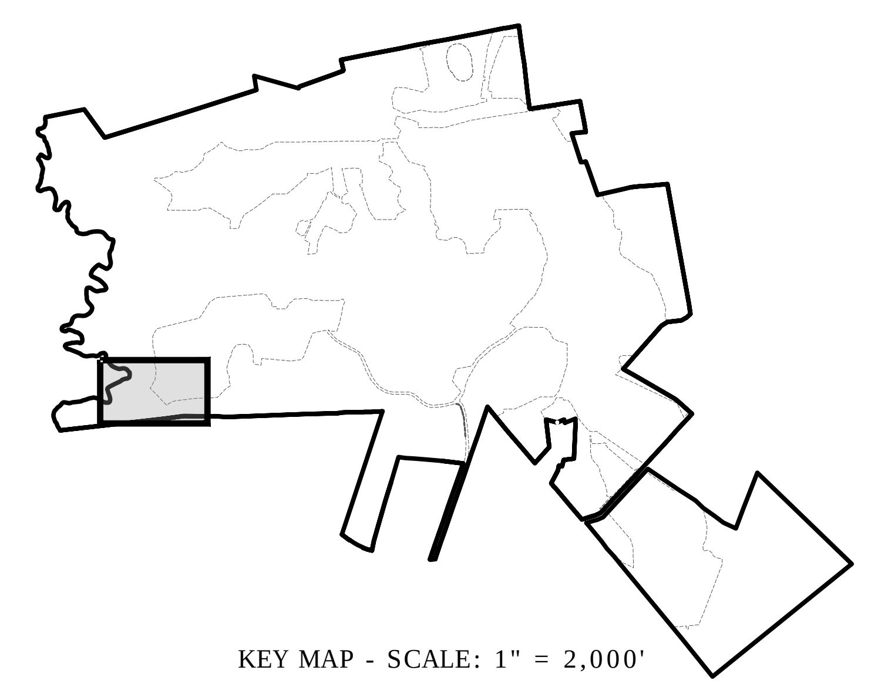
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 25

SCALE: 1" = 40'

C-026



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E E E
OVERHEAD ELECTRIC LINE	OHW OHW
CHAIN LINK FENCE	× × × ×
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	//////////
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☼
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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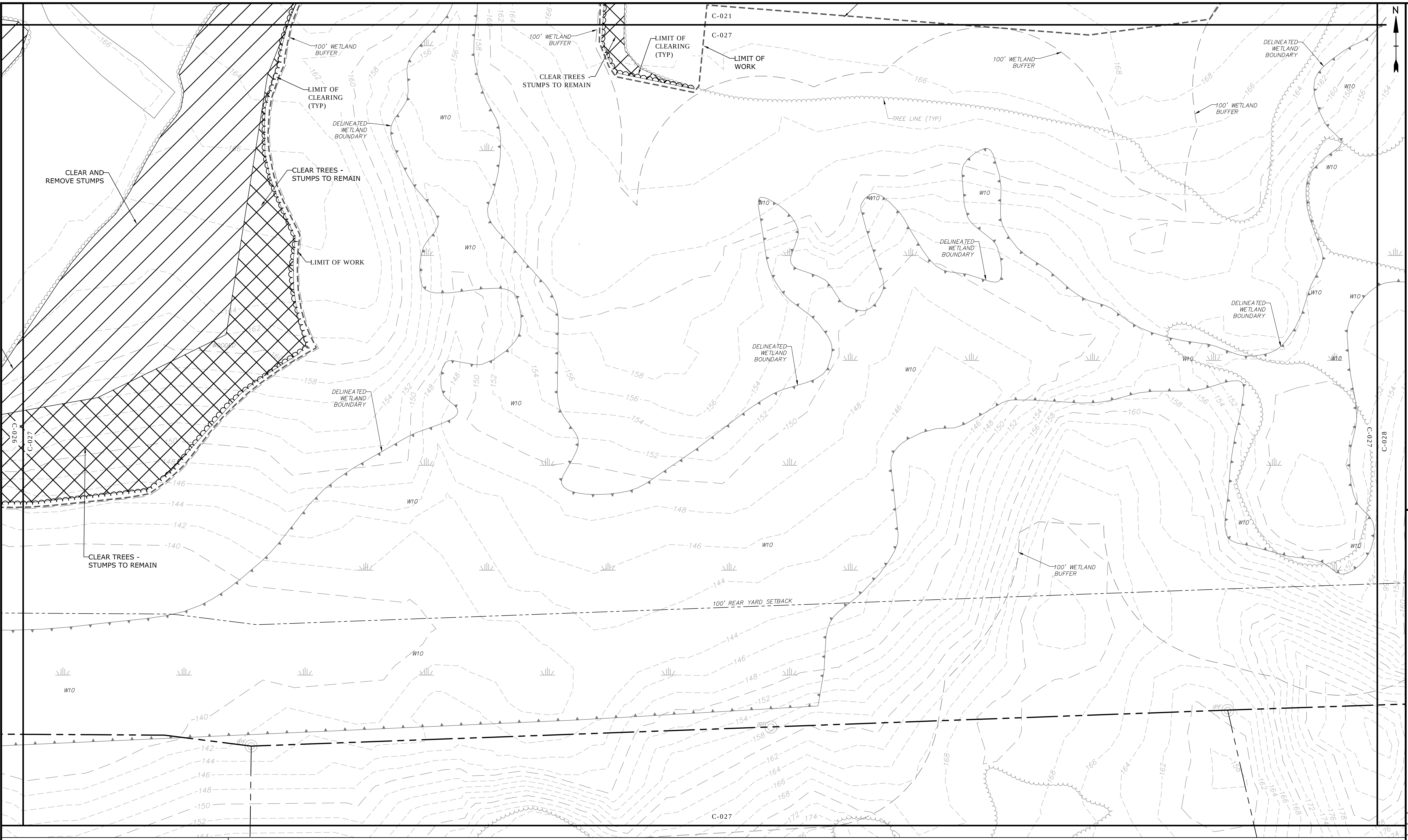

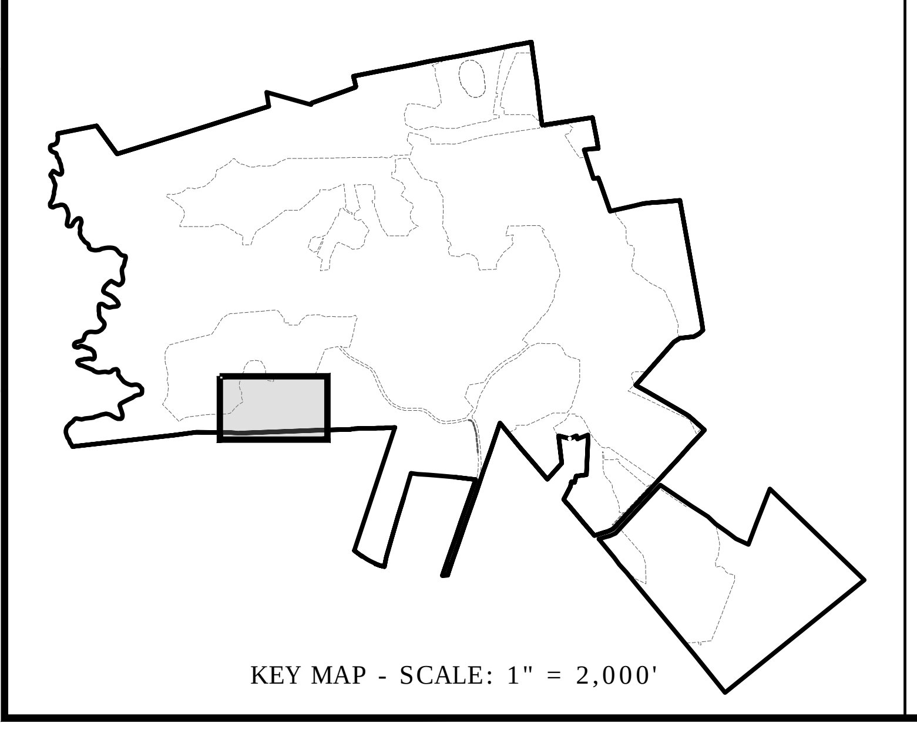

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
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EXISTING INTERMEDIATE CONTOURS — 124
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CHAIN LINK FENCE — ×
LIMITS OF WORK
TOWN BOUNDARY
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DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE
HERPETOFAUNA PROTECTION AREA
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VERNAL POOL
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REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN ☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL ▨
CONSTRUCTION LAYDOWN AREA ▨
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UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

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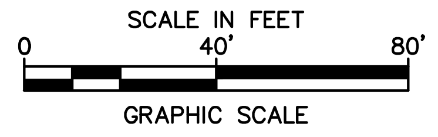

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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE
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PROJECT NO:	R0317
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DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 26

SCALE: 1" = 40'

C-027

Tighe&Bond

STATE OF CONNECTICUT · BRIAN S. HUMPHREY · No. 31180 · LICENSED PROFESSIONAL ENGINEER

1-15-21

STATE OF CONNECTICUT · JACLYN M. CACCIA · NO. 33828 · LICENSED PROFESSIONAL ENGINEER

Jaclyn M Caccia
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
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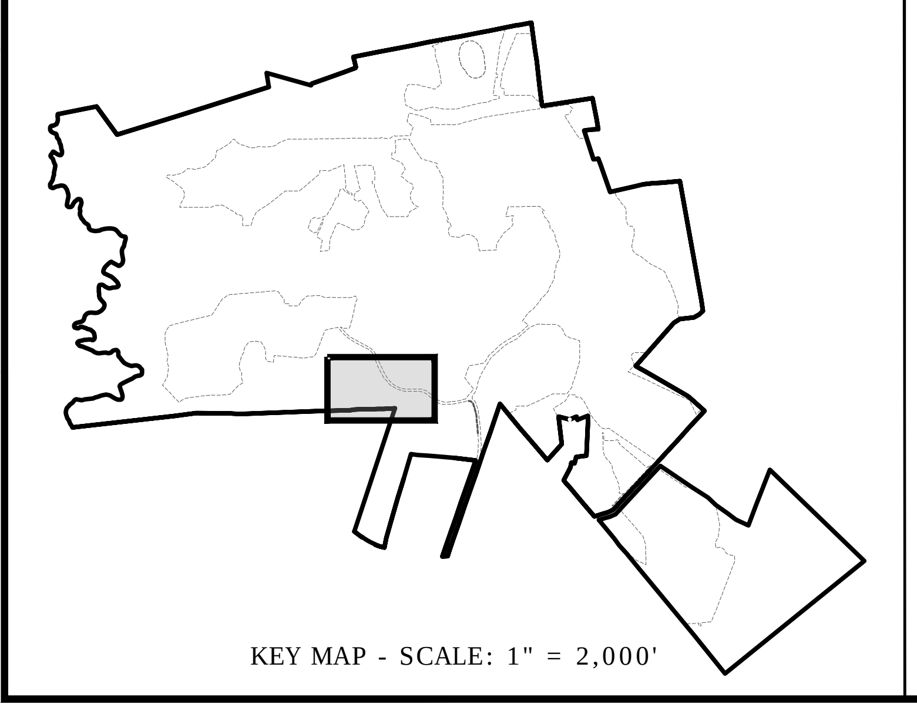

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
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PROPOSED INTERMEDIATE CONTOURS — 222
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GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE — ×
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

MARK	DATE	DESCRIPTION

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DATE:	01/2021
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DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 27

SCALE: 1" = 40'

C-028

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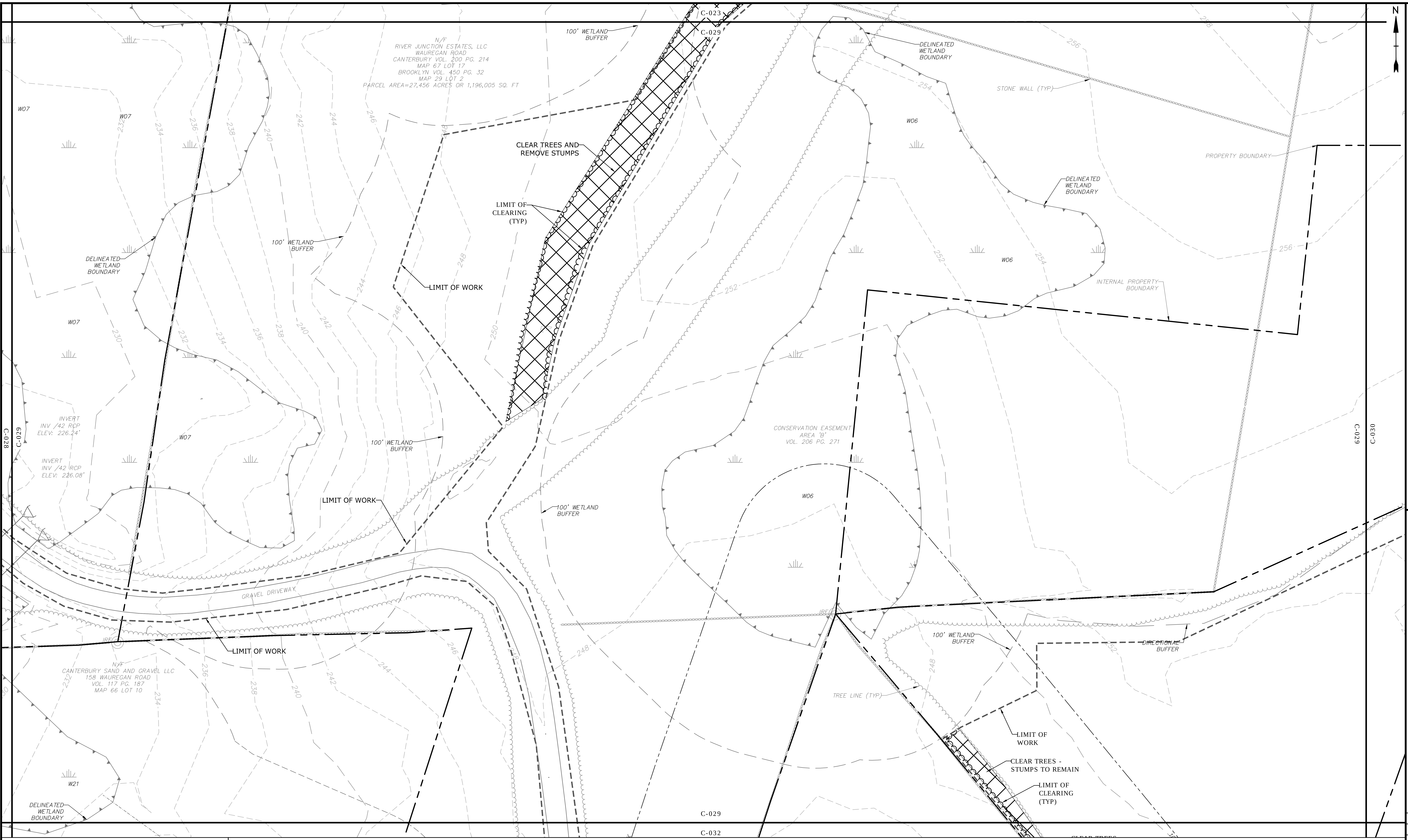

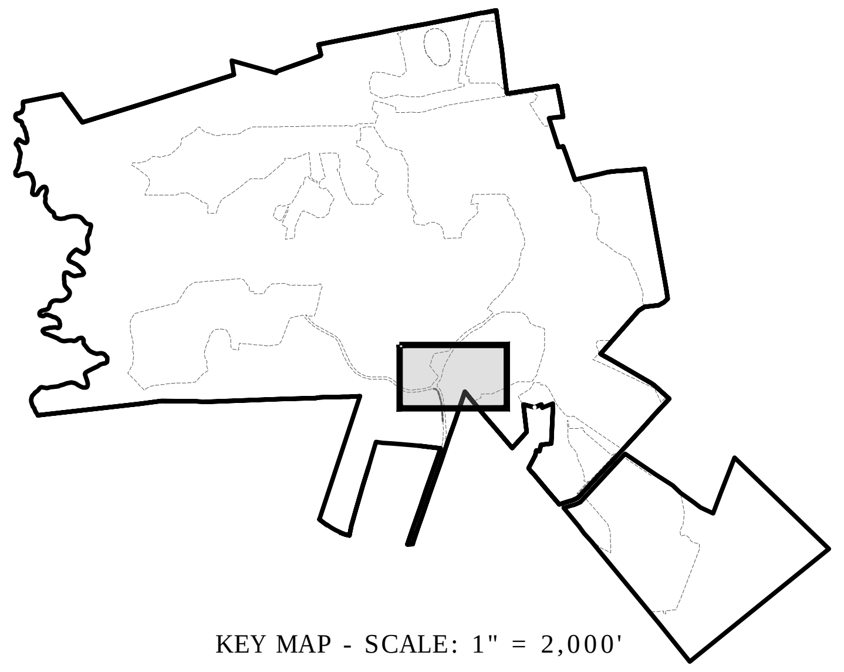

KEY MAP - SCALE: 1" = 2,000'

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS 124
- EXISTING INDEX CONTOURS 120
- PROPOSED INTERMEDIATE CONTOURS 222
- PROPOSED INDEX CONTOURS 220
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE
- OVERHEAD ELECTRIC LINE
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
- STONE WALL
- WETLAND BUFFER
- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE
- AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
- CONSTRUCTION LAYDOWN AREA
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE
- FLARED END SECTION
- SPOT GRADE 262.69
- MAGNITUDE & DIRECTION OF SLOPE 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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APPROVED: FJH

EXISTING CONDITIONS AND DEMOLITION - 28

SCALE: 1" = 40'

C-029

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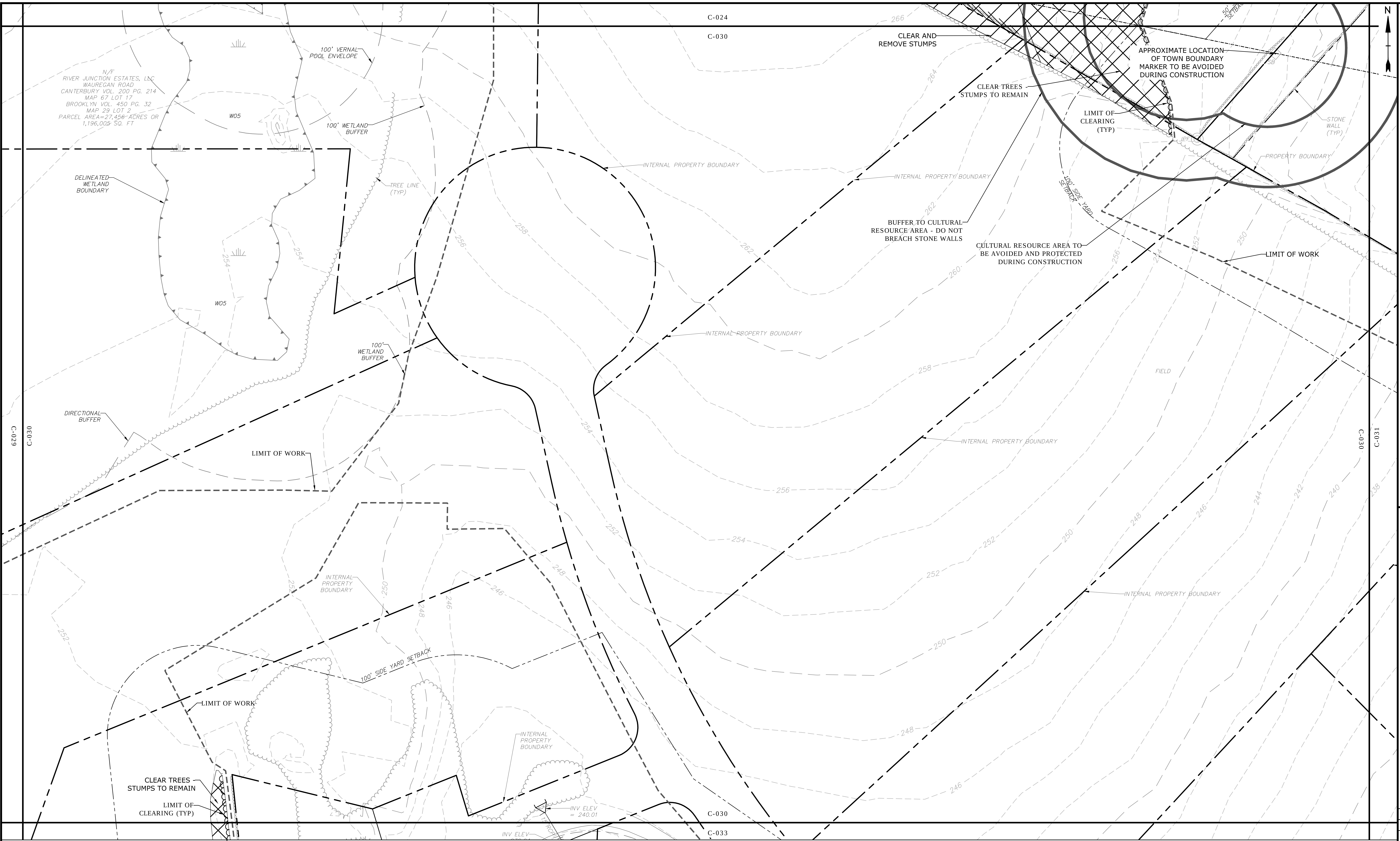

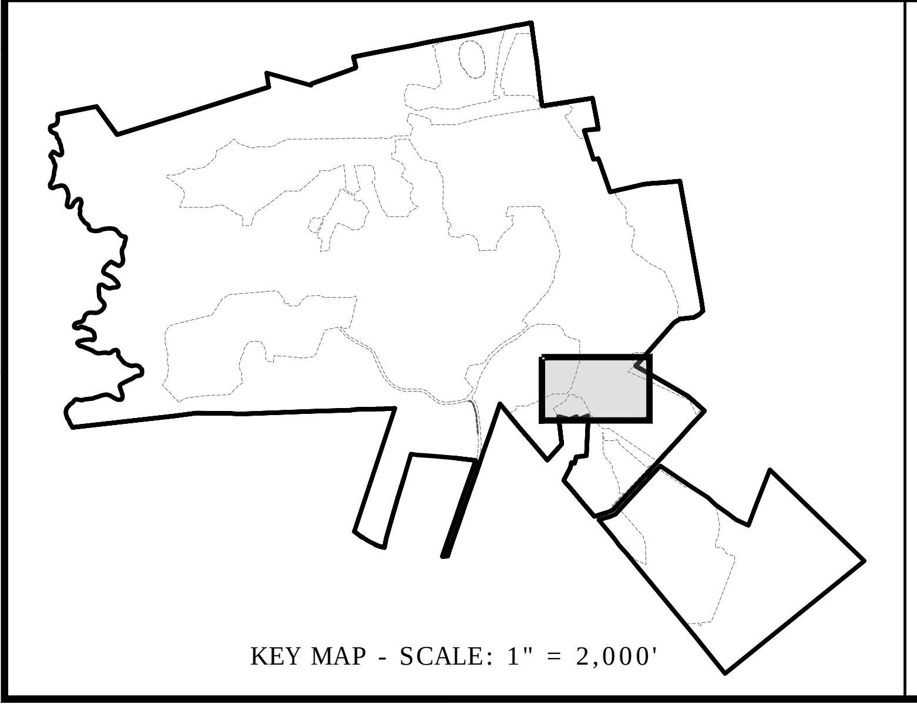
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS
EXISTING INDEX CONTOURS
PROPOSED INTERMEDIATE CONTOURS
PROPOSED INDEX CONTOURS
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE
OVERHEAD ELECTRIC LINE
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE
MAGNITUDE & DIRECTION OF SLOPE

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF CONNECTICUT BRIAN S. HUNTLEY No. 31180 LICENSED PROFESSIONAL ENGINEER
1-15-21

STATE OF CONNECTICUT JACLYN M. CACECI NO. 33828 LICENSED PROFESSIONAL ENGINEER
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn & Canterbury, Connecticut

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APPROVED: FJH

EXISTING CONDITIONS AND DEMOLITION - 29

SCALE: 1" = 40'

C-030

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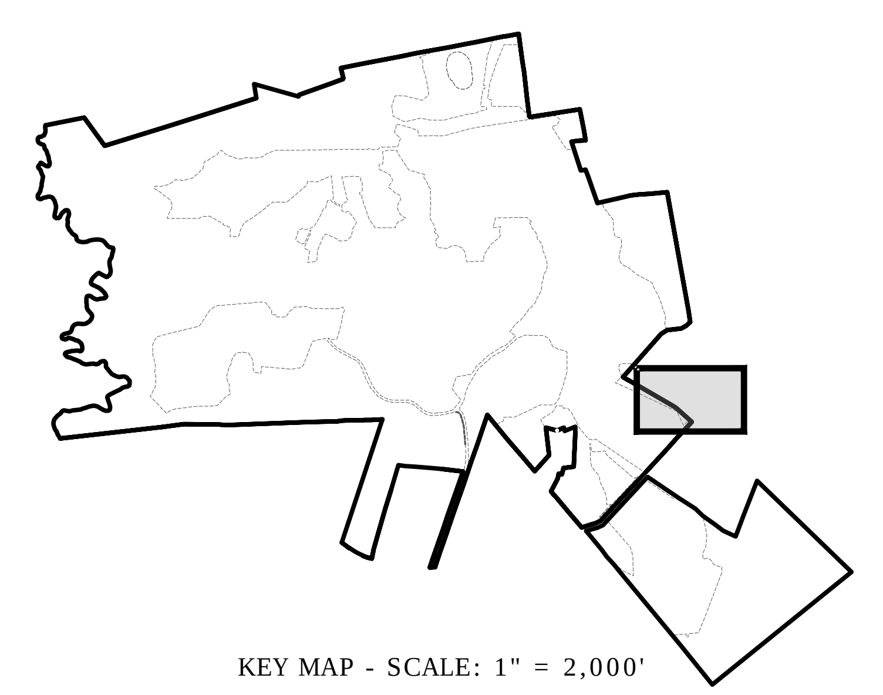
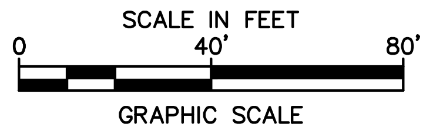


KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
EASEMENT LINE		STONE WALL		TIER 2 PLANTINGS	
EXISTING INTERMEDIATE CONTOURS	124	WETLAND BUFFER		TIER 3 PLANTINGS	
EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☆
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	▨	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒		
CHAIN LINK FENCE	×	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE					

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.



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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
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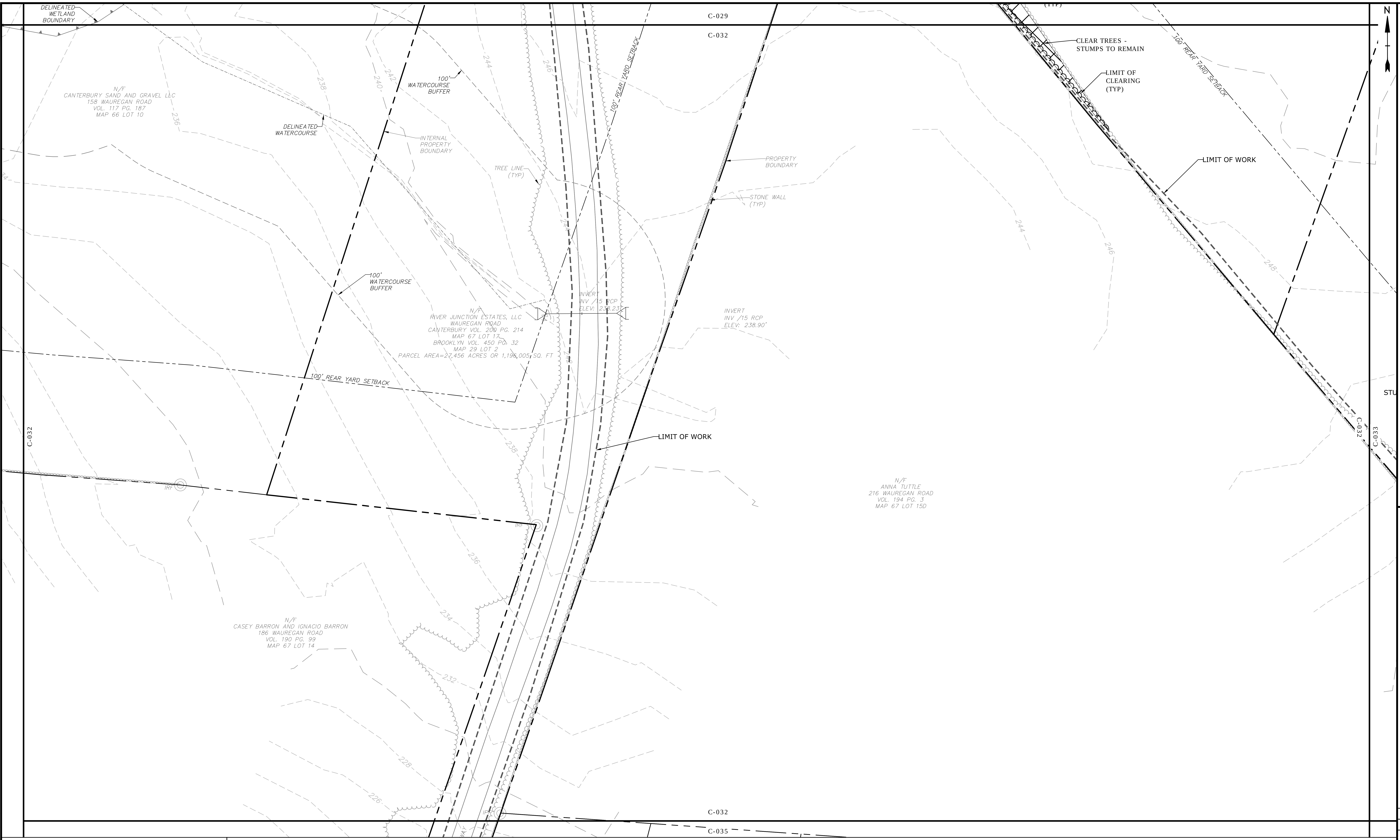
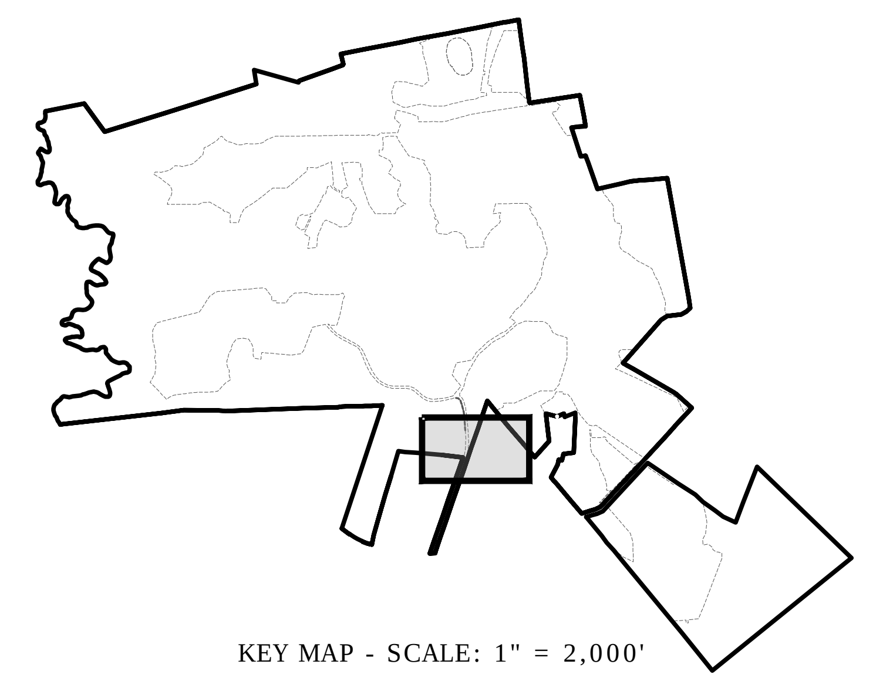
CHECKED:	BSH/JEC
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 30

SCALE: 1" = 40'

C-031





KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE
OVERHEAD ELECTRIC LINE
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACCHI
NO. 33828
Jaclyn M. Cacchi
01/15/21

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Quinebaug Solar, LLC

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EXISTING CONDITIONS AND DEMOLITION - 31

SCALE: 1" = 40'

C-032

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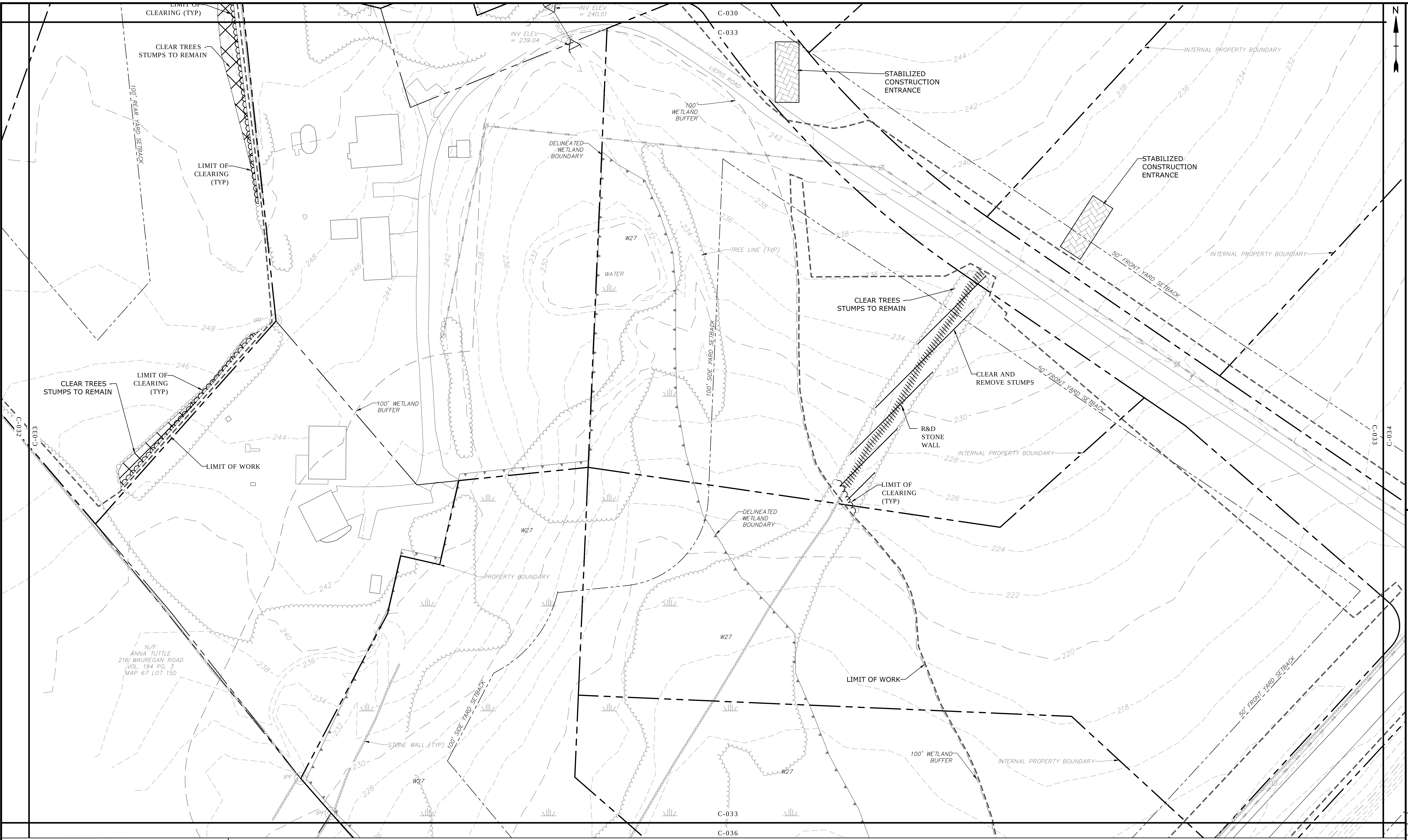
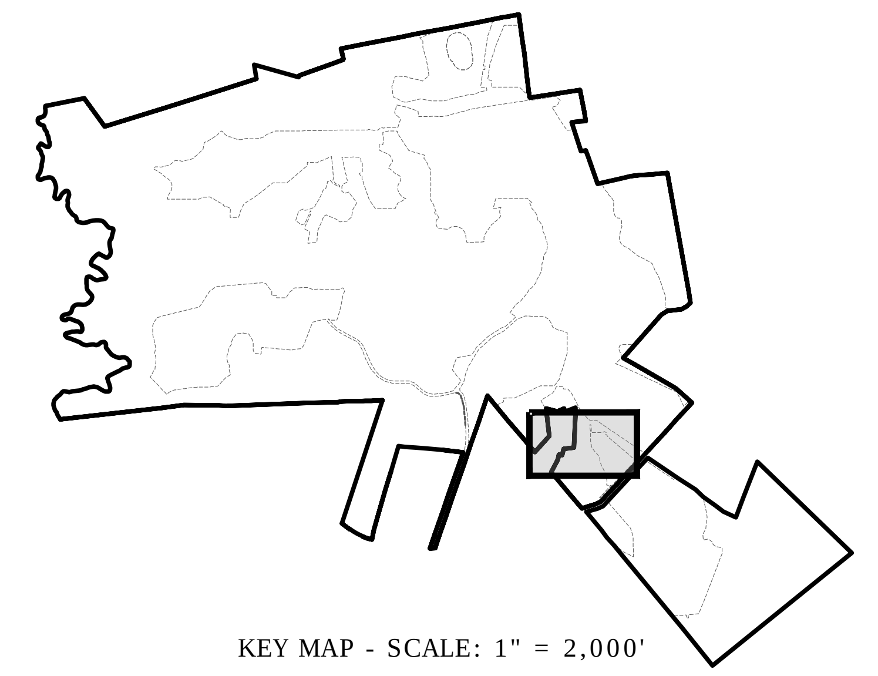


LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS — 124
- EXISTING INDEX CONTOURS — 120
- PROPOSED INTERMEDIATE CONTOURS — 222
- PROPOSED INDEX CONTOURS — 220
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE — E
- OVERHEAD ELECTRIC LINE — OHW
- CHAIN LINK FENCE — ×
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
- STONE WALL
- WETLAND BUFFER
- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE ////
- AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN ☒
- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL ▨
- CONSTRUCTION LAYDOWN AREA ▨

- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE ☆
- FLARED END SECTION
- SPOT GRADE — 262.69
- MAGNITUDE & DIRECTION OF SLOPE — 2%



KEY MAP - SCALE: 1" = 2,000'

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci 01/15/21

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Quinebaug Solar, LLC

Brooklyn &
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APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 32

SCALE: 1" = 40'

C-033

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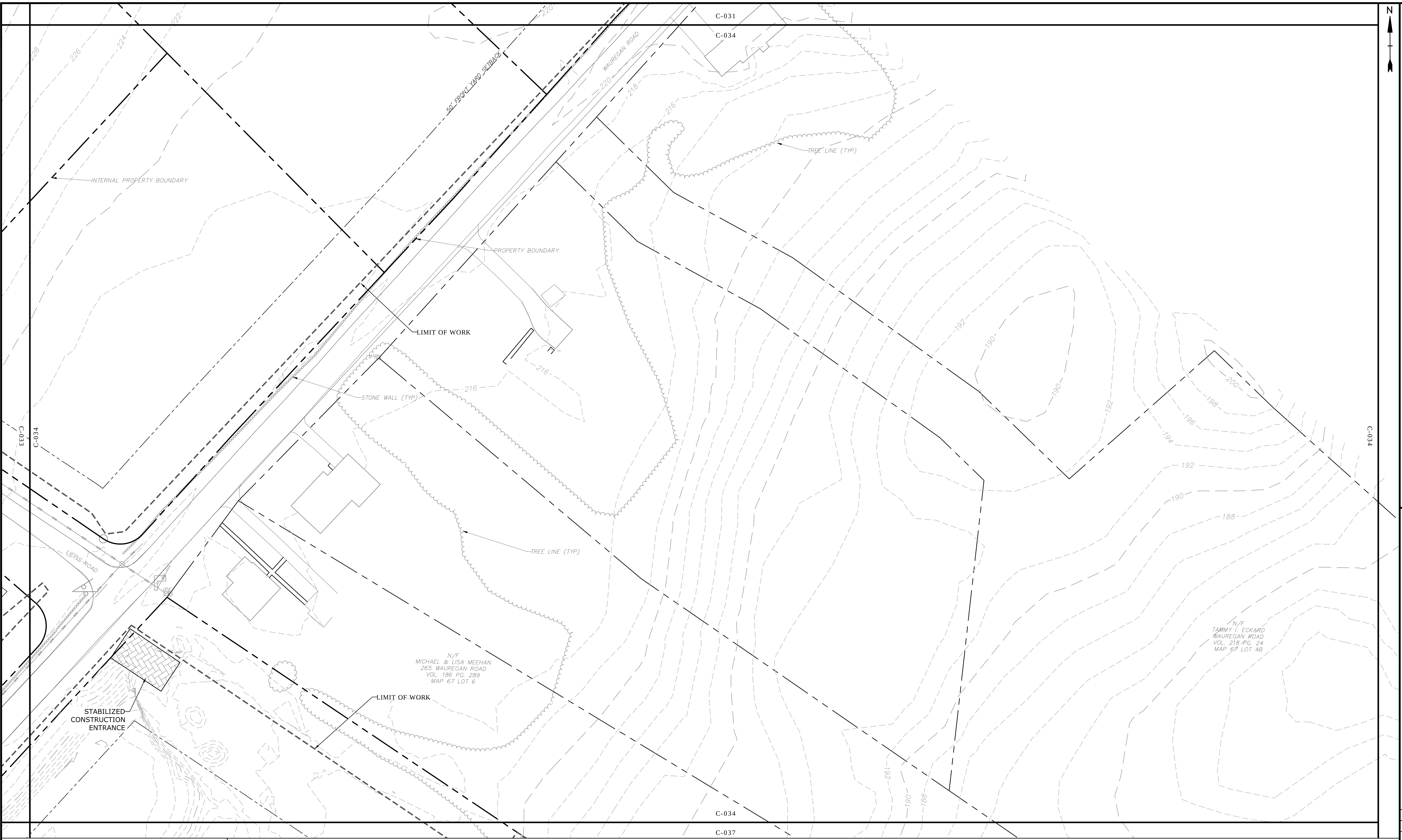

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BRIAN S. HUNTLEY
1-15-21

NO. 33828
JACLYN M. CACECI
Jaclyn M. Ca
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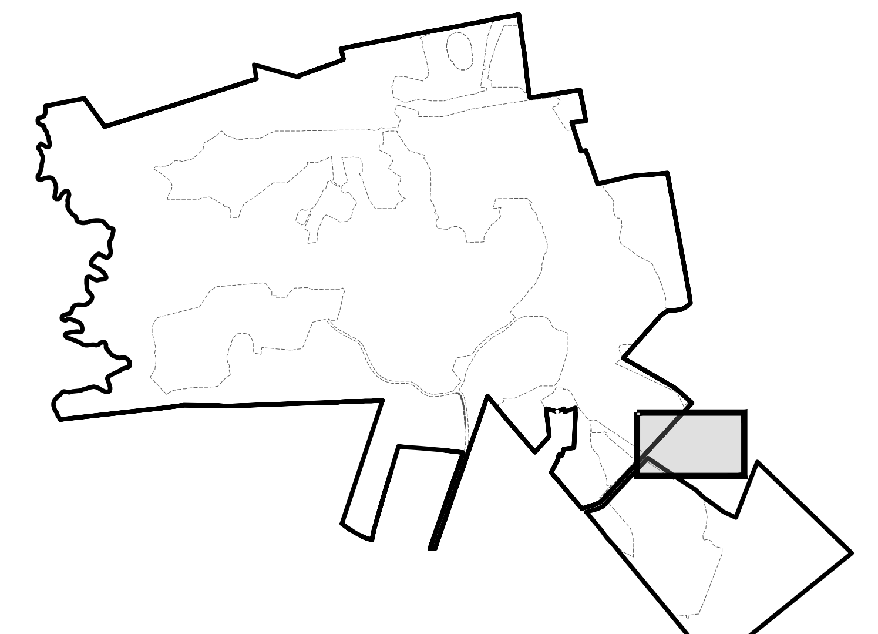

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS 124
EXISTING INDEX CONTOURS 120
PROPOSED INTERMEDIATE CONTOURS 222
PROPOSED INDEX CONTOURS 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE E
OVERHEAD ELECTRIC LINE OHW
CHAIN LINK FENCE ×
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE ////
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE 262.69
MAGNITUDE & DIRECTION OF SLOPE 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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APPROVED: FJH

EXISTING CONDITIONS AND DEMOLITION - 33

SCALE: 1" = 40'

C-034

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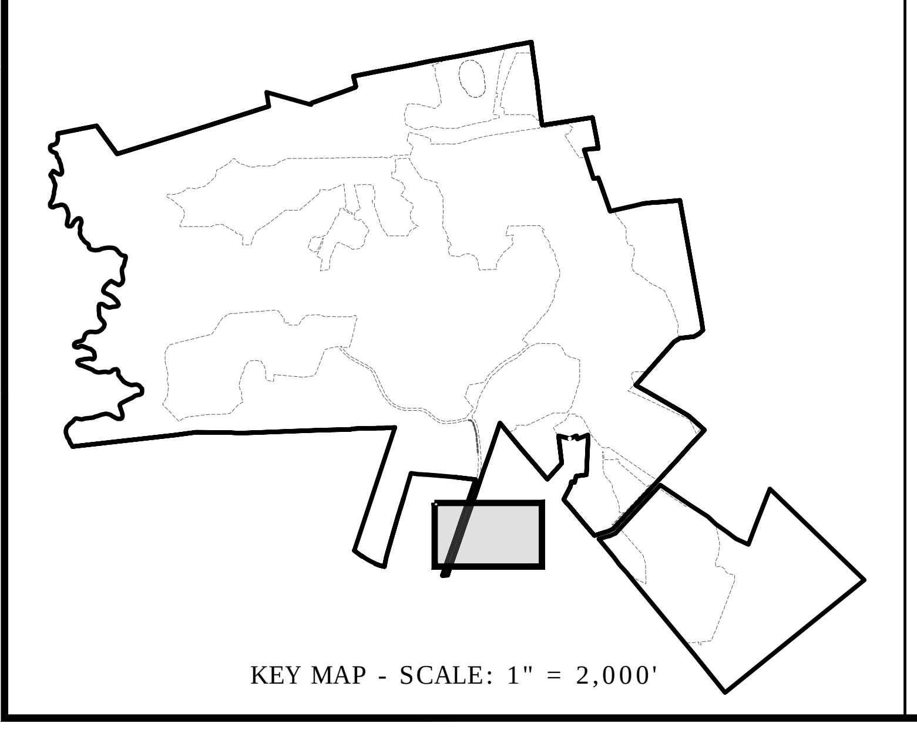
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
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EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☼
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	////////	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒		
CHAIN LINK FENCE	×	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE					

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SCALE IN FEET
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GRAPHIC SCALE

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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33628
Jaclyn M. Caceci
01/15/21

ISSUED FOR
CONSTRUCTION

Quinebaug Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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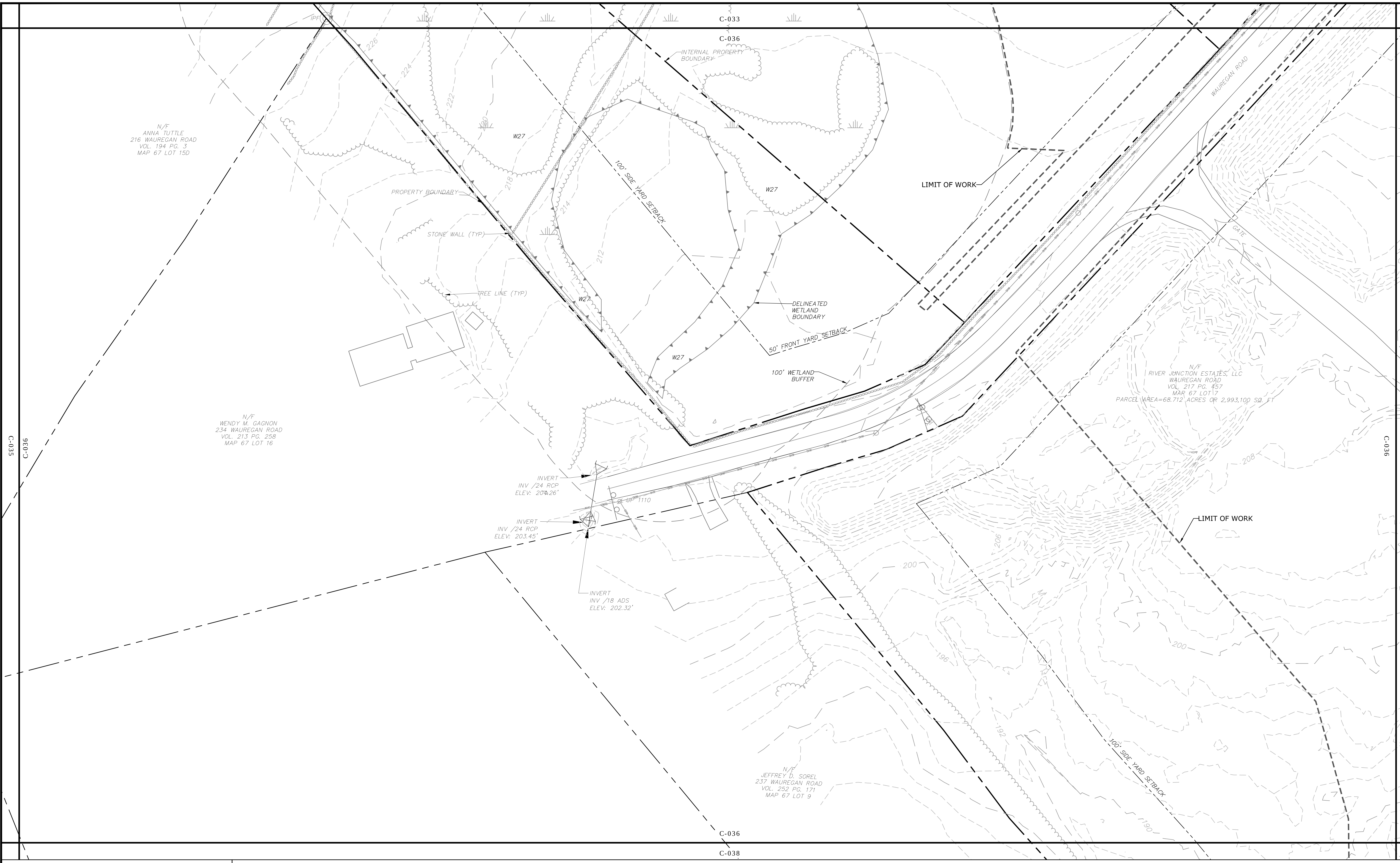
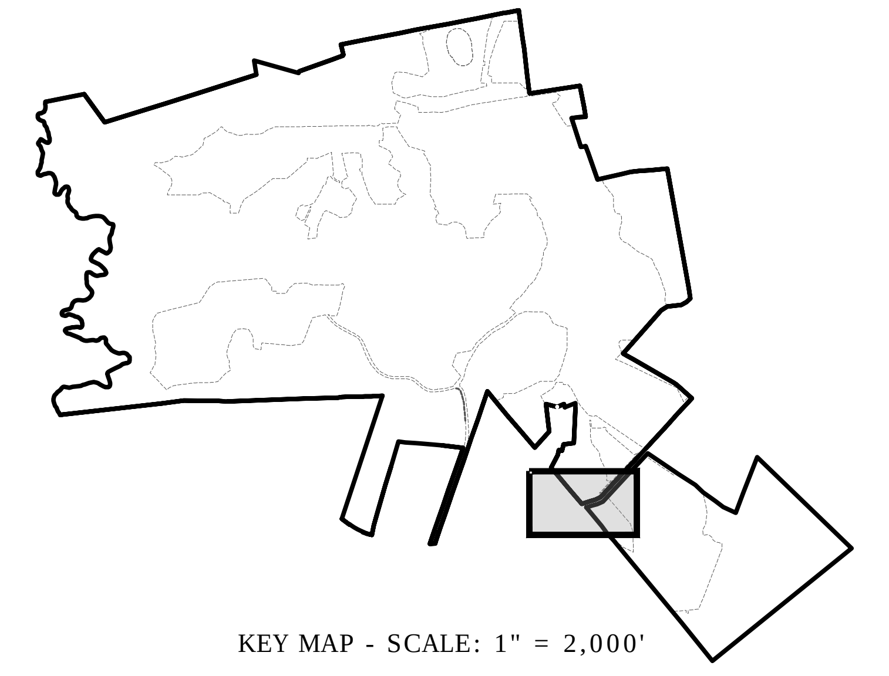
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 34

SCALE: 1" = 40'

C-035





KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
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OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE — ×
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE ▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN ▨
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL ▨
CONSTRUCTION LAYDOWN AREA ▨

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE ☆
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

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No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M Caceci
01/15/21

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Quinebaug Solar, LLC

Brooklyn &
Canterbury,
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CHECKED:	BSH/JEC
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 35

SCALE: 1" = 40'

C-036

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Tighe&Bond

STATE OF CONNECTICUT
BRIAN S. HUNTLEY
No. 31180
LICENSED PROFESSIONAL ENGINEER
1-15-21

STATE OF CONNECTICUT
JACLYN M. CACECI
NO. 33828
LICENSED PROFESSIONAL ENGINEER
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE

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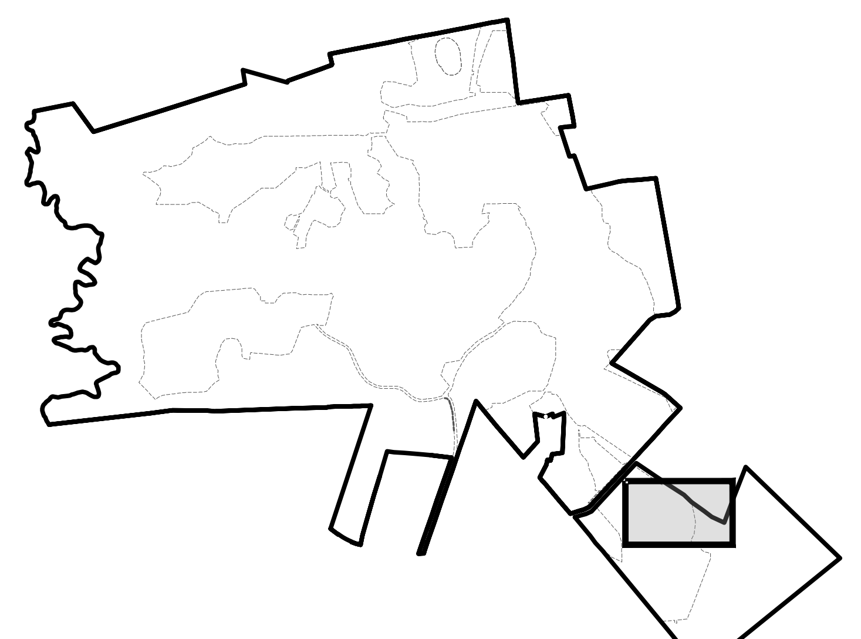
MARK	DATE	DESCRIPTION

PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Existing Conditions - CD.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

EXISTING CONDITIONS AND DEMOLITION - 36

SCALE: 1" = 40'

C-037



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS (124)
EXISTING INDEX CONTOURS (120)
PROPOSED INTERMEDIATE CONTOURS (222)
PROPOSED INDEX CONTOURS (220)
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE (E)
OVERHEAD ELECTRIC LINE (OHW)
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE (262.69)
MAGNITUDE & DIRECTION OF SLOPE (2%)

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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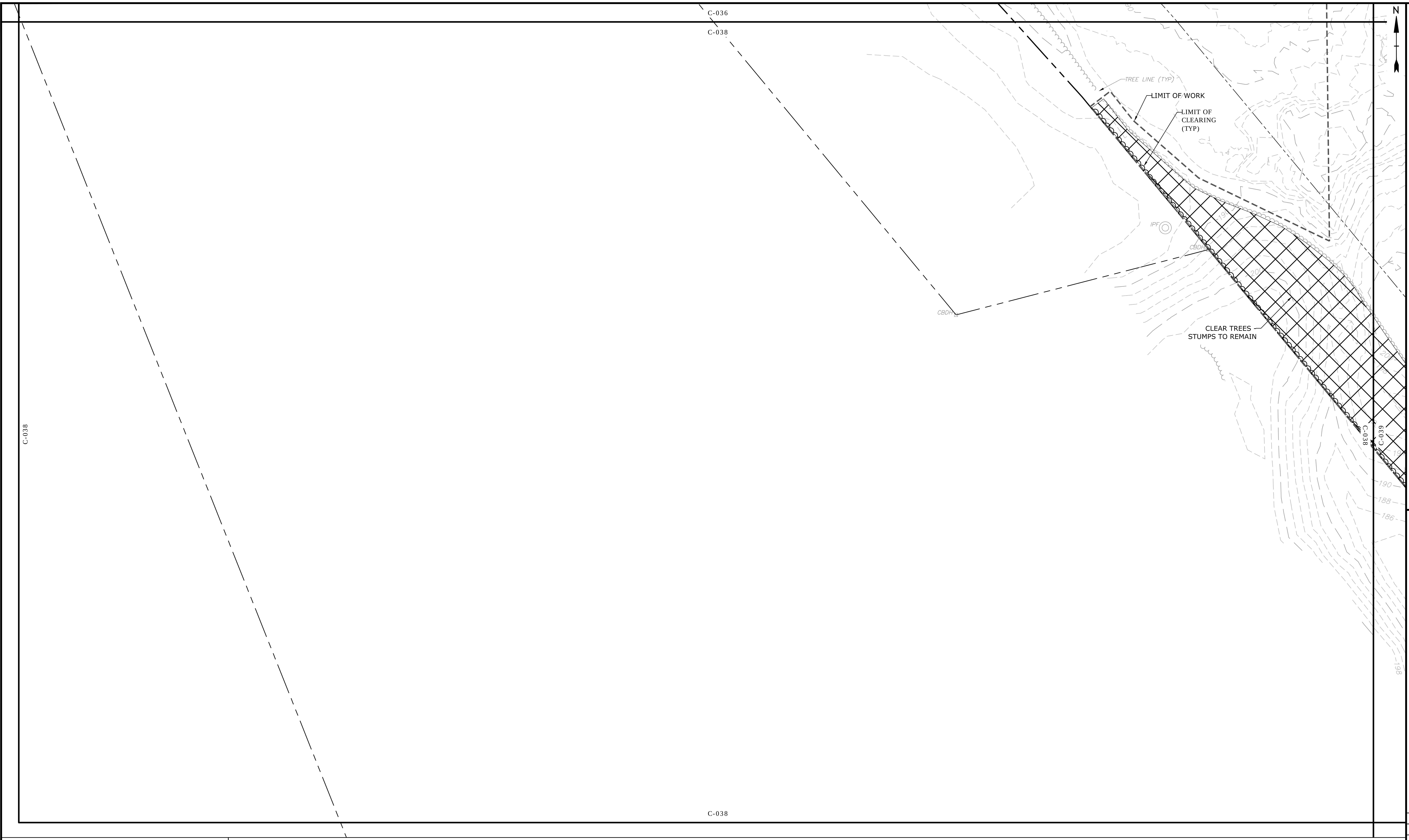

Tighe&Bond

No. 31180
1-15-21

NO. 33828
Jaclyn M Caceci
01/15/21

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Brooklyn &
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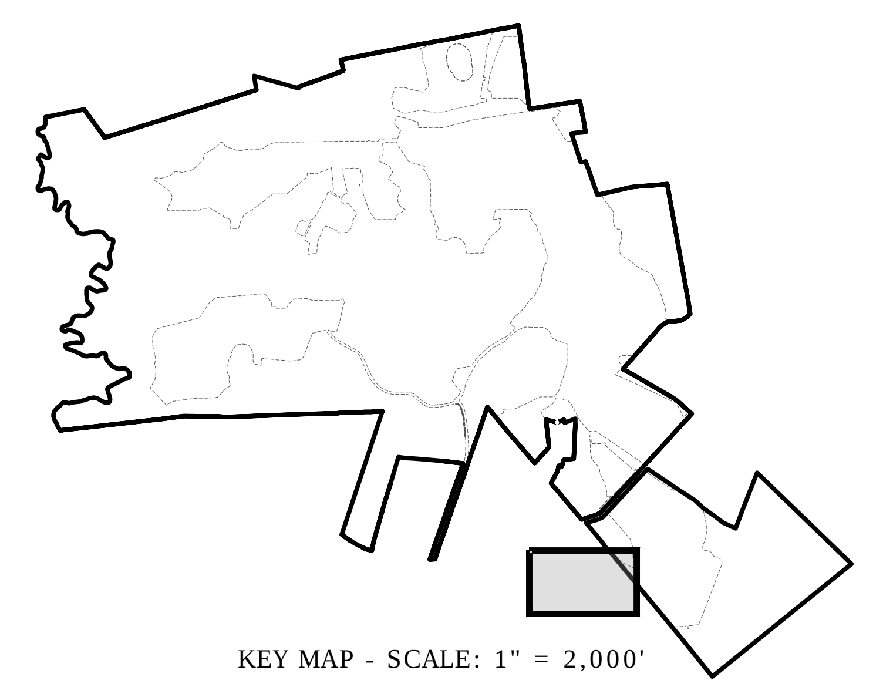
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

EXISTING CONDITIONS AND DEMOLITION - 37

SCALE: 1" = 40'

C-038



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E E E
OVERHEAD ELECTRIC LINE	OHW OHW
CHAIN LINK FENCE	× × × ×
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE	

HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	//////////
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨

WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☆
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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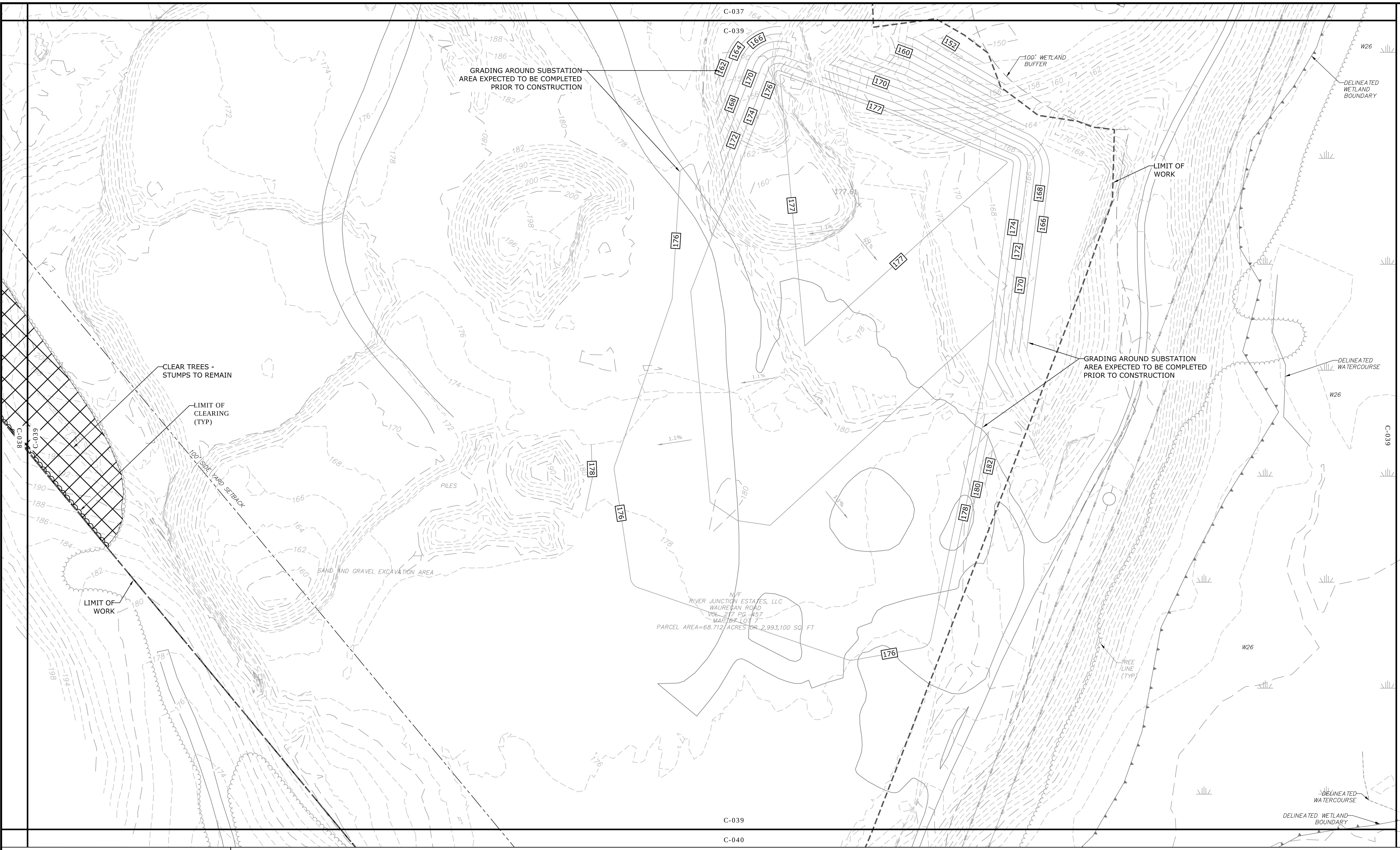

Tighe&Bond

STATE OF CONNECTICUT BRIAN S. HUNTLEY No. 31180 LICENSED PROFESSIONAL ENGINEER
1-15-21

STATE OF CONNECTICUT JACLYN M. CACECI NO. 33828 LICENSED PROFESSIONAL ENGINEER
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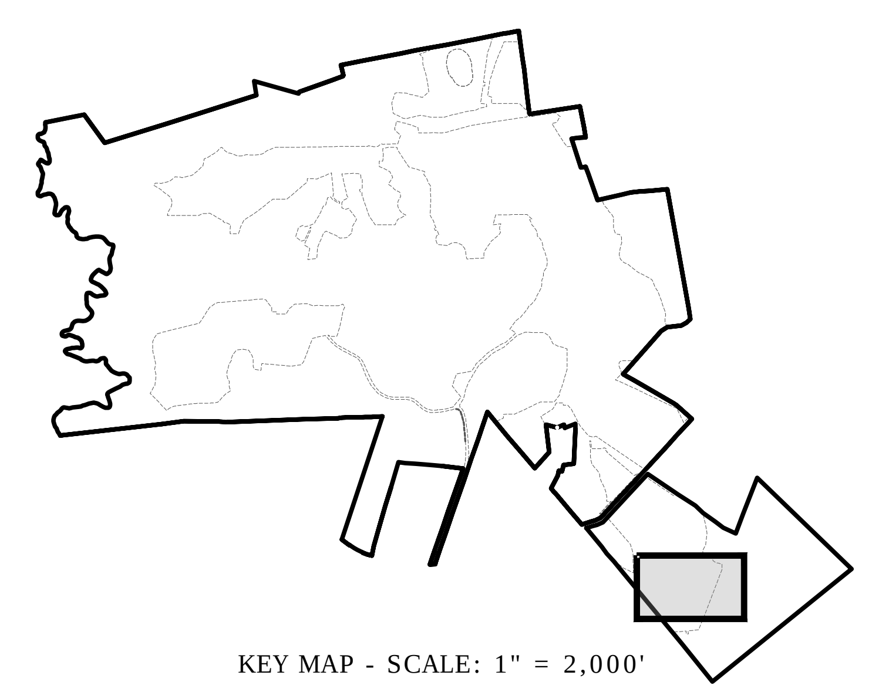
EXISTING CONDITIONS AND DEMOLITION - 38

SCALE: 1" = 40'

C-039



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS 124
EXISTING INDEX CONTOURS 120
PROPOSED INTERMEDIATE CONTOURS 222
PROPOSED INDEX CONTOURS 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE E E E
OVERHEAD ELECTRIC LINE OHW OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE 262.69
MAGNITUDE & DIRECTION OF SLOPE 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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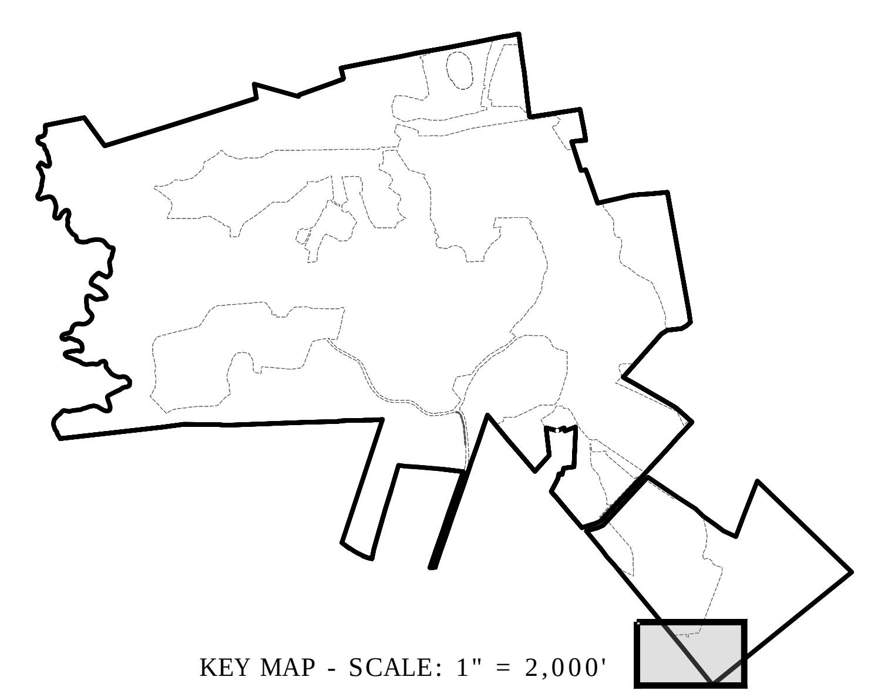
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
EASEMENT LINE		STONE WALL		TIER 2 PLANTINGS	
EXISTING INTERMEDIATE CONTOURS	124	WETLAND BUFFER		TIER 3 PLANTINGS	
EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☆
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	//////	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	▨		
CHAIN LINK FENCE	×	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / 100' VERNAL POOL ENVELOPE					

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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACCIO
NO. 33828
Jaclyn M Caccio
01/15/21

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CONSTRUCTION

Quinebaug
Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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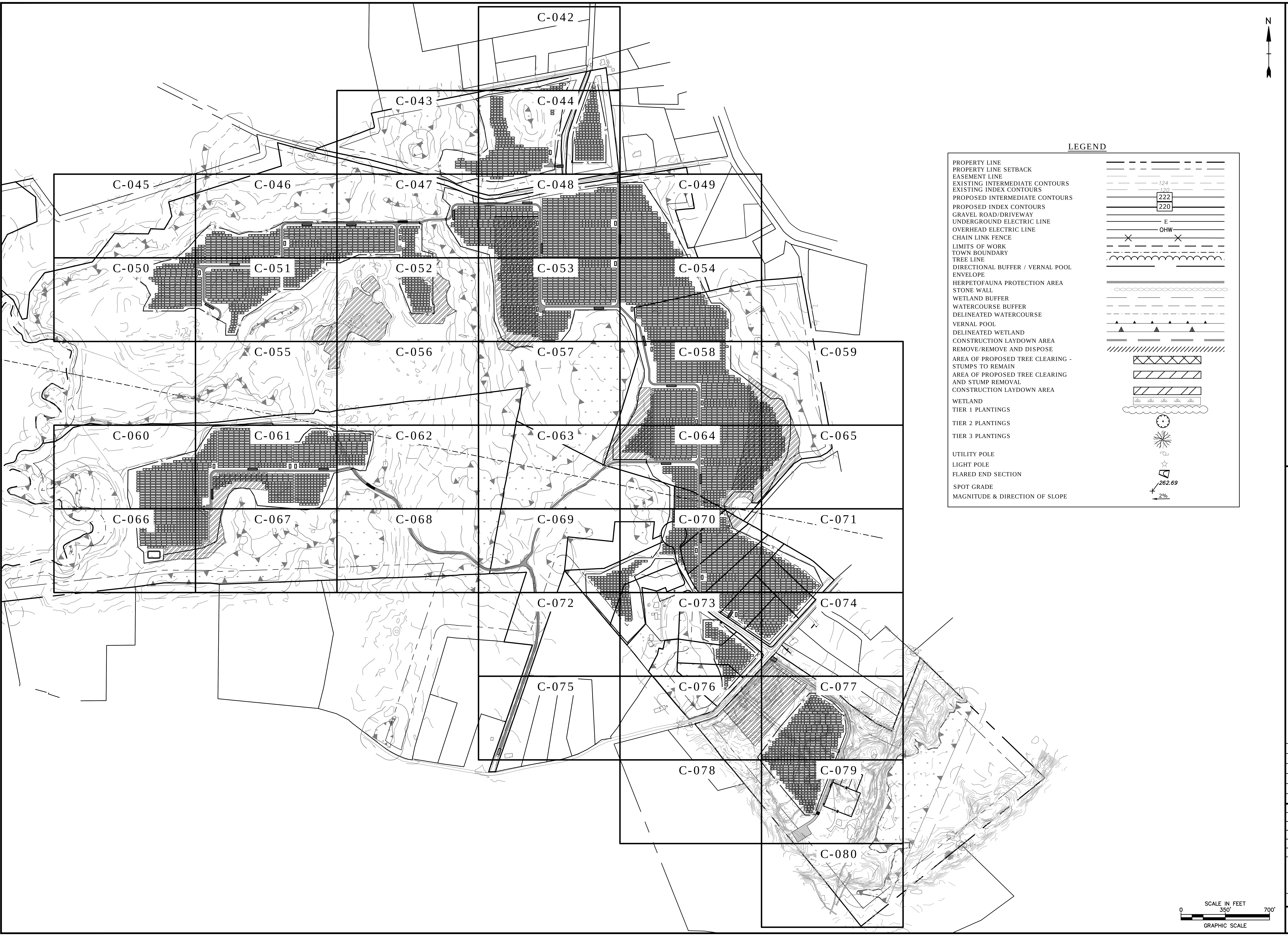
CHECKED: BSH/JEC
APPROVED: FJH

EXISTING CONDITIONS AND
DEMOLITION - 39

SCALE: 1" = 40'

C-040



LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
CONSTRUCTION LAYDOWN AREA	
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

Tighe&Bond

BRIAN S. HUNTLEY
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1-15-21

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DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - OVERALL

SCALE: 1" = 350'

C-041

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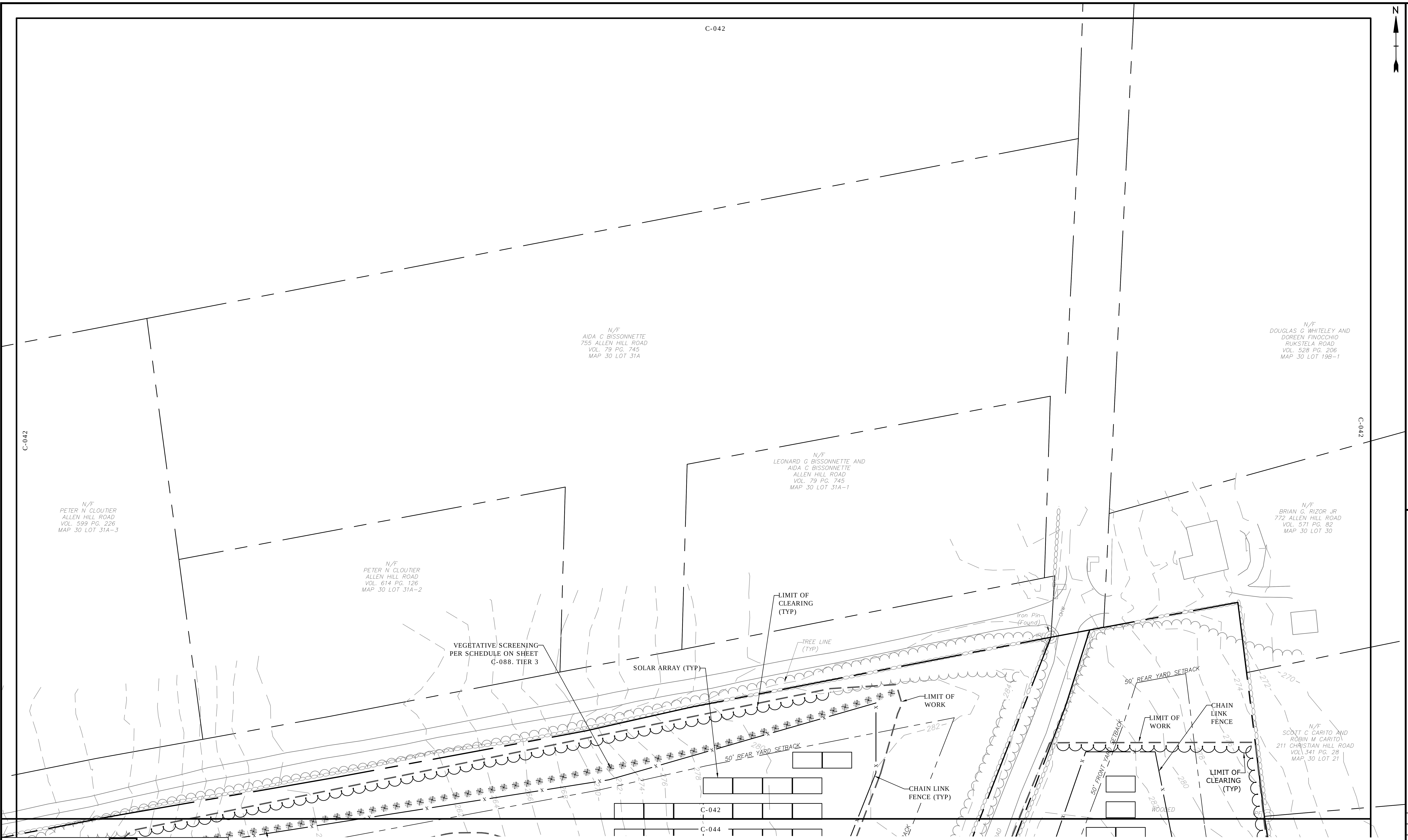

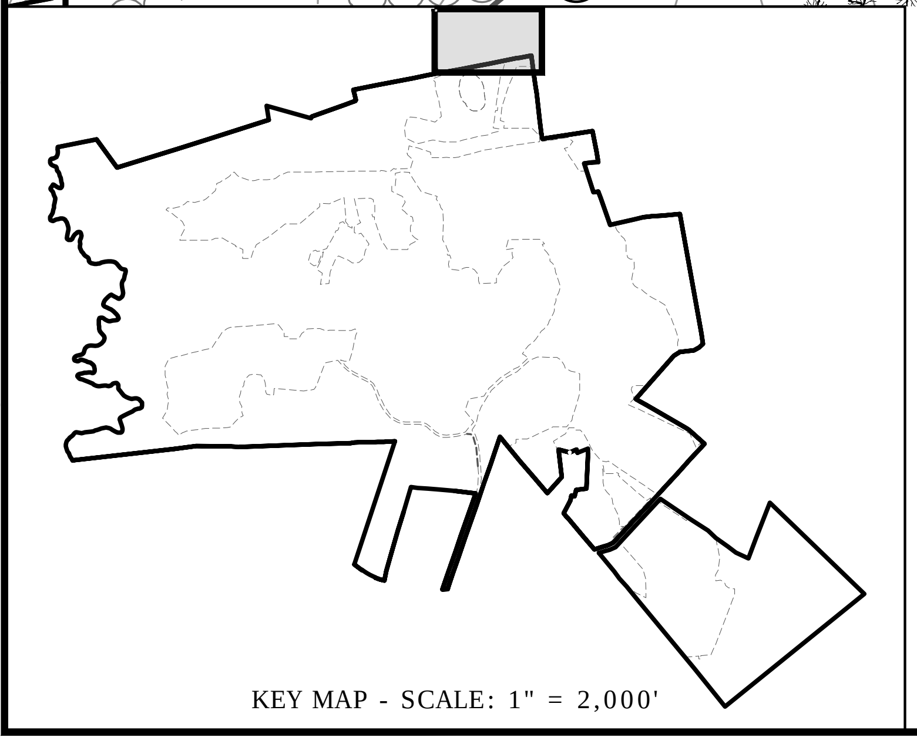
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	— — – – —	HERPETOFAUNA PROTECTION AREA	▬	WETLAND	⫫
PROPERTY LINE SETBACK	— – – —	CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	▬	TIER 1 PLANTINGS	⌒⌒⌒
EASEMENT LINE	— — —	STONE WALL	○○○○	TIER 2 PLANTINGS	⊙
EXISTING INTERMEDIATE CONTOURS	— — 124 — —	WETLAND BUFFER	— — —	TIER 3 PLANTINGS	✳
EXISTING INDEX CONTOURS	— — 120 — —	WATERCOURSE BUFFER	– – – –	UTILITY POLE	☌
PROPOSED INTERMEDIATE CONTOURS	—— 222 ——	DELINEATED WATERCOURSE	— · — · —	LIGHT POLE	☼
PROPOSED INDEX CONTOURS	—— 220 ——	VERNAL POOL	▲ ▲ ▲	FLARED END SECTION	⏢
GRAVEL ROAD/DRIVEWAY	———	DELINEATED WETLAND	▲ ▲ ▲	SPOT GRADE	+ 262.69
UNDERGROUND ELECTRIC LINE	—— E ——	REMOVE/REMOVE AND DISPOSE	//////	MAGNITUDE & DIRECTION OF SLOPE	2% ←
OVERHEAD ELECTRIC LINE	—— OHW ——	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒☒☒		
CHAIN LINK FENCE	—×——×—	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK	— — — —	CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY	— · — · —				
TREE LINE	⌒⌒⌒⌒				
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	——— ———				

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
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GRAPHIC SCALE

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Tighe&Bond

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No. 31180
1-15-21

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Jaclyn M. Caceci
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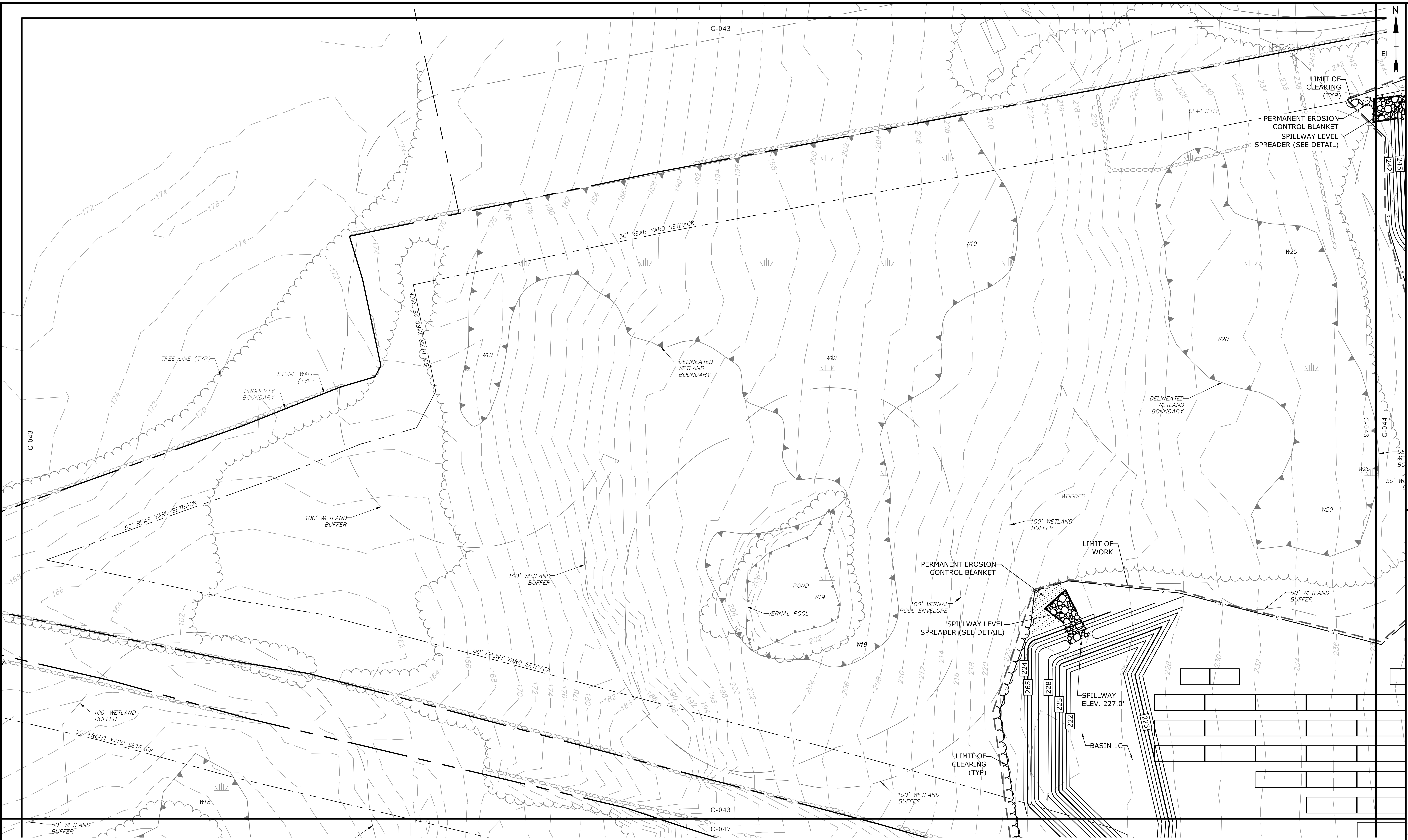
PROPOSED CONDITIONS - 1

SCALE: 1" = 40'

C-042



Tighe&Bond

Brian S. Humphrey No. 31180 1-15-21

Jaclyn M. Caceci No. 33828 01/15/21

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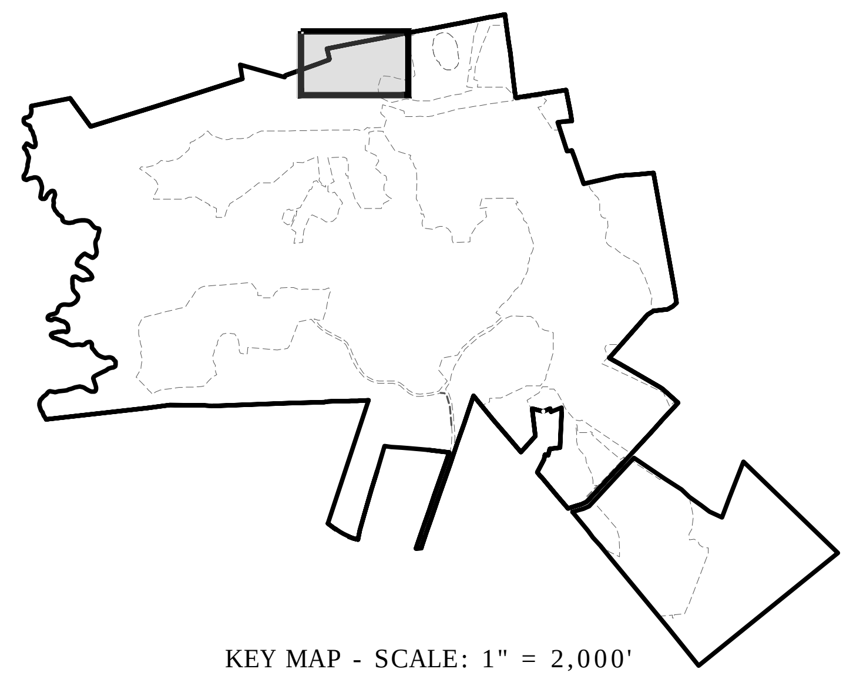
PROPOSED CONDITIONS - 2

SCALE: 1" = 40'

C-043

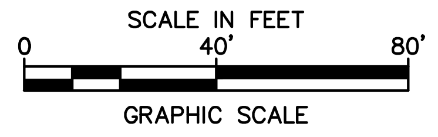


KEY MAP - SCALE: 1" = 2,000'

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS
- EXISTING INDEX CONTOURS — 124
- PROPOSED INTERMEDIATE CONTOURS — 222
- PROPOSED INDEX CONTOURS — 220
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE — E
- OVERHEAD ELECTRIC LINE — OHW
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
- STONE WALL
- WETLAND BUFFER
- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE
- AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
- CONSTRUCTION LAYDOWN AREA
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE
- FLARED END SECTION
- SPOT GRADE — 262.69
- MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.



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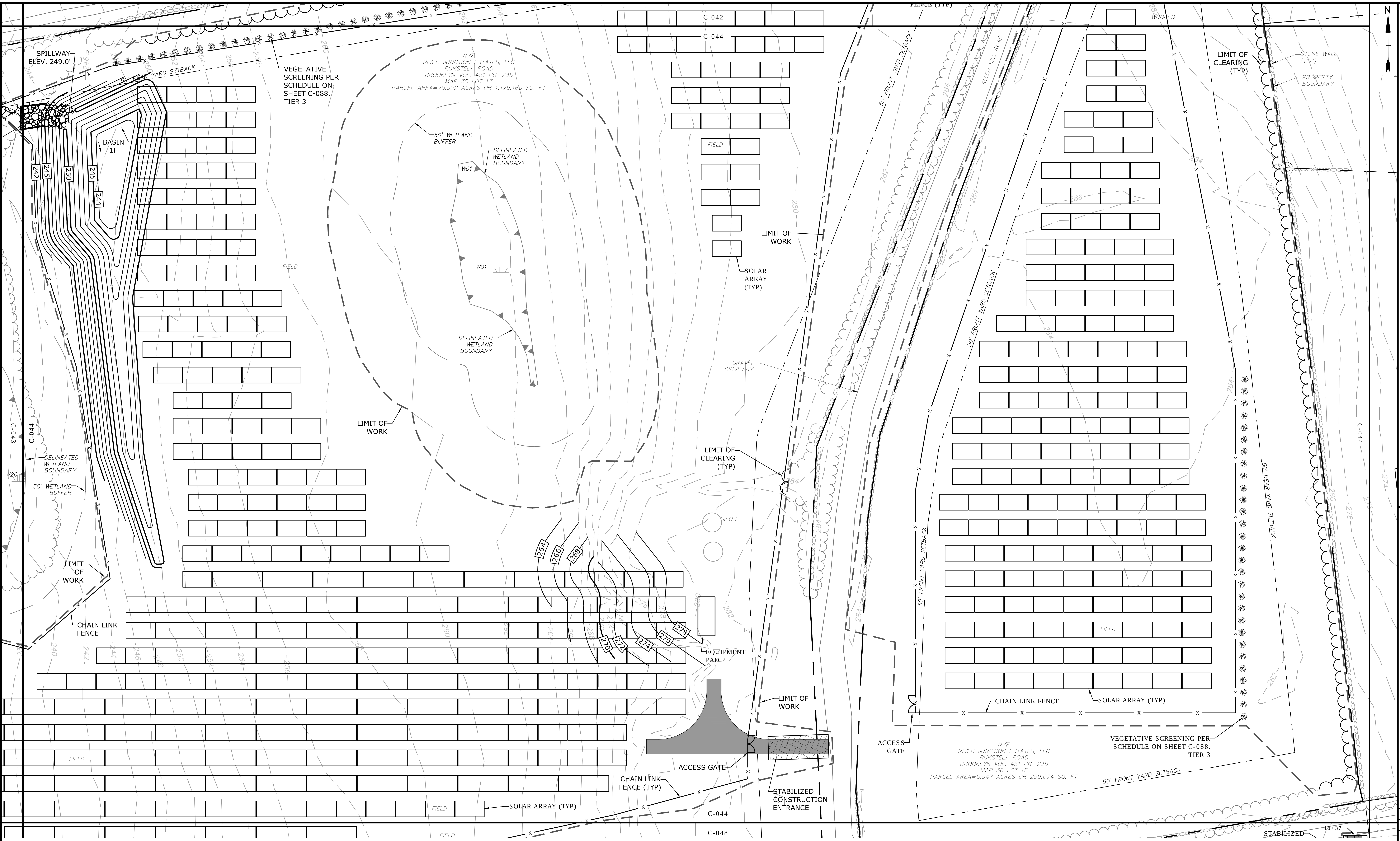

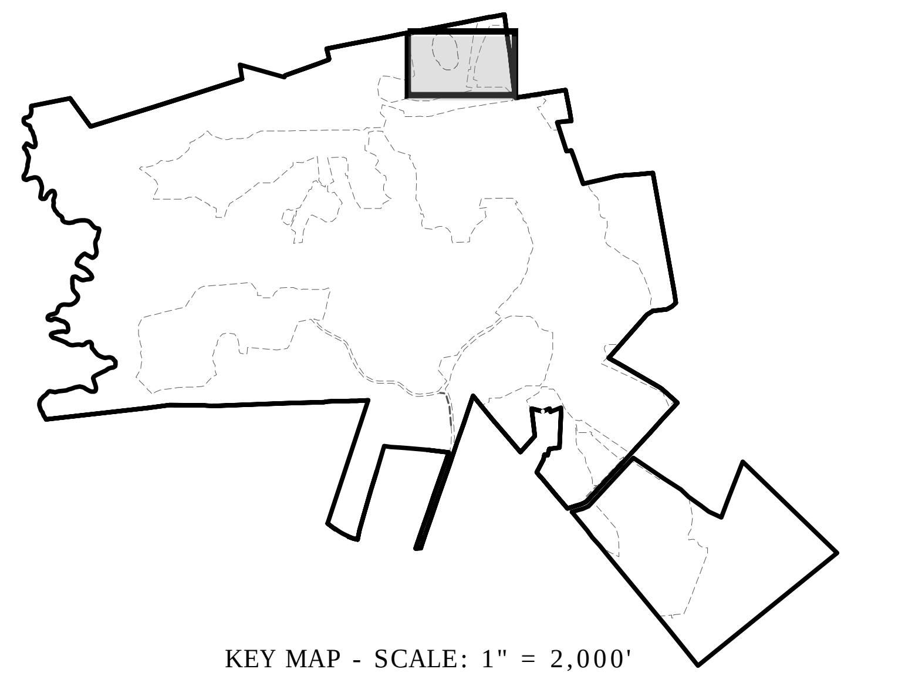
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TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

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0 40' 80'
GRAPHIC SCALE

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Jaclyn M. Caccia 01/15/21

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PROPOSED CONDITIONS - 3

SCALE: 1" = 40'

C-044

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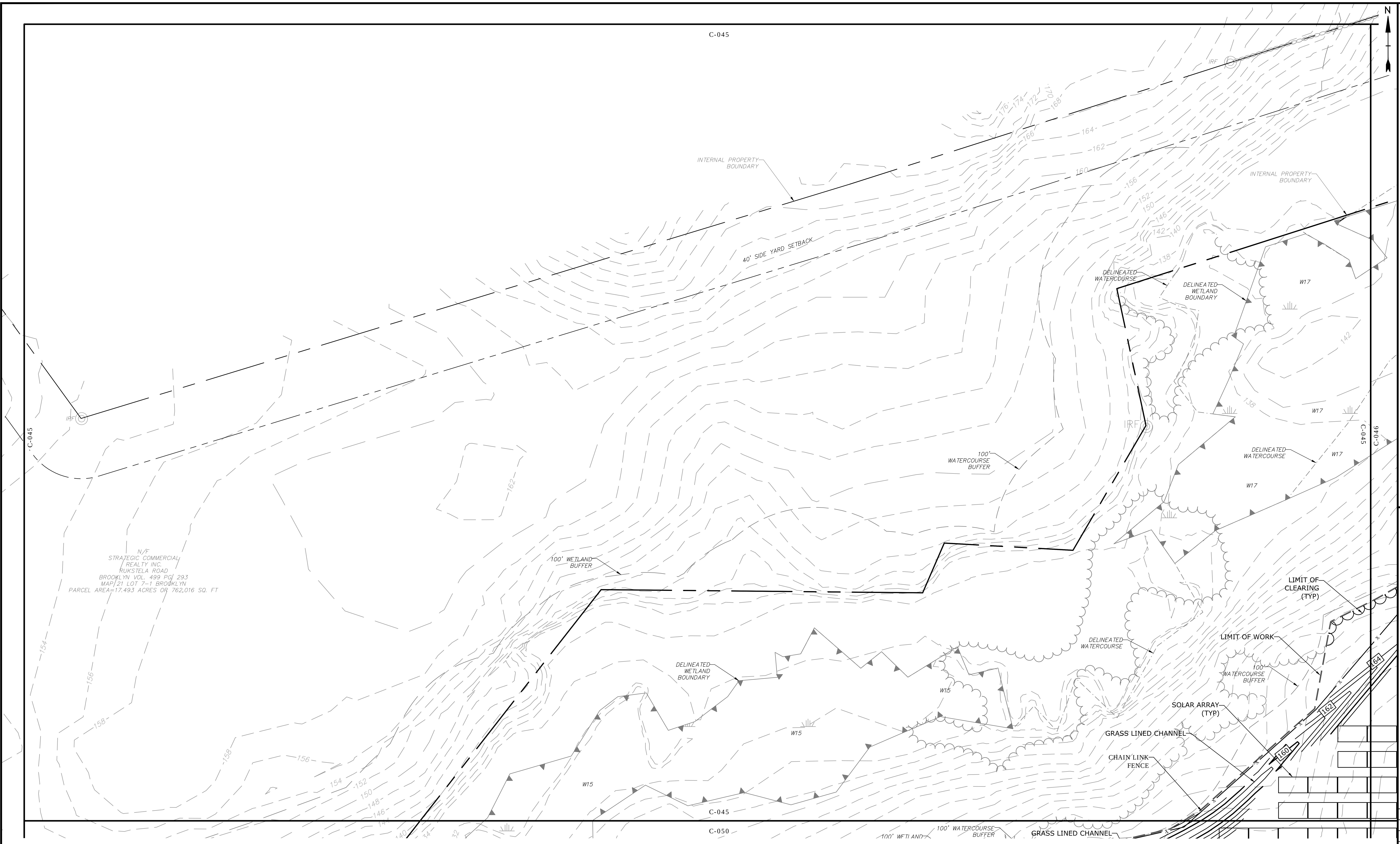

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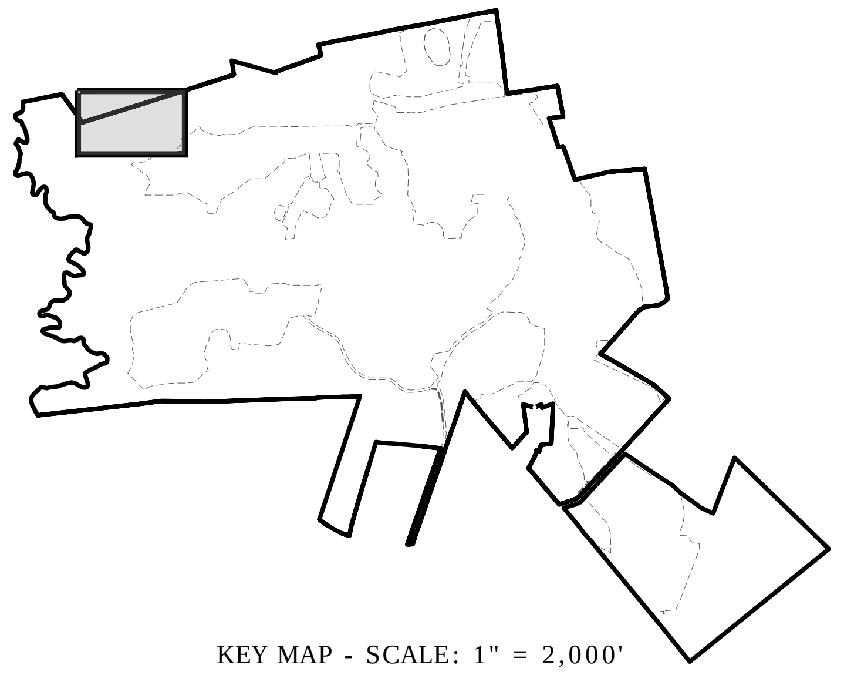
PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124 —
EXISTING INDEX CONTOURS — 120 —
PROPOSED INTERMEDIATE CONTOURS — 222 —
PROPOSED INDEX CONTOURS — 220 —
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E —
OVERHEAD ELECTRIC LINE — OHW —
CHAIN LINK FENCE — × —
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

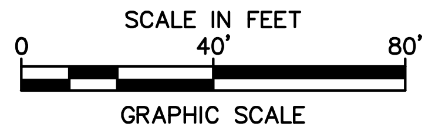
HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN ☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL ▨
CONSTRUCTION LAYDOWN AREA ▨

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE ☆
FLARED END SECTION
SPOT GRADE + 262.69
MAGNITUDE & DIRECTION OF SLOPE ← 2%



KEY MAP - SCALE: 1" = 2,000'

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.



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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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DATE:	01/2021
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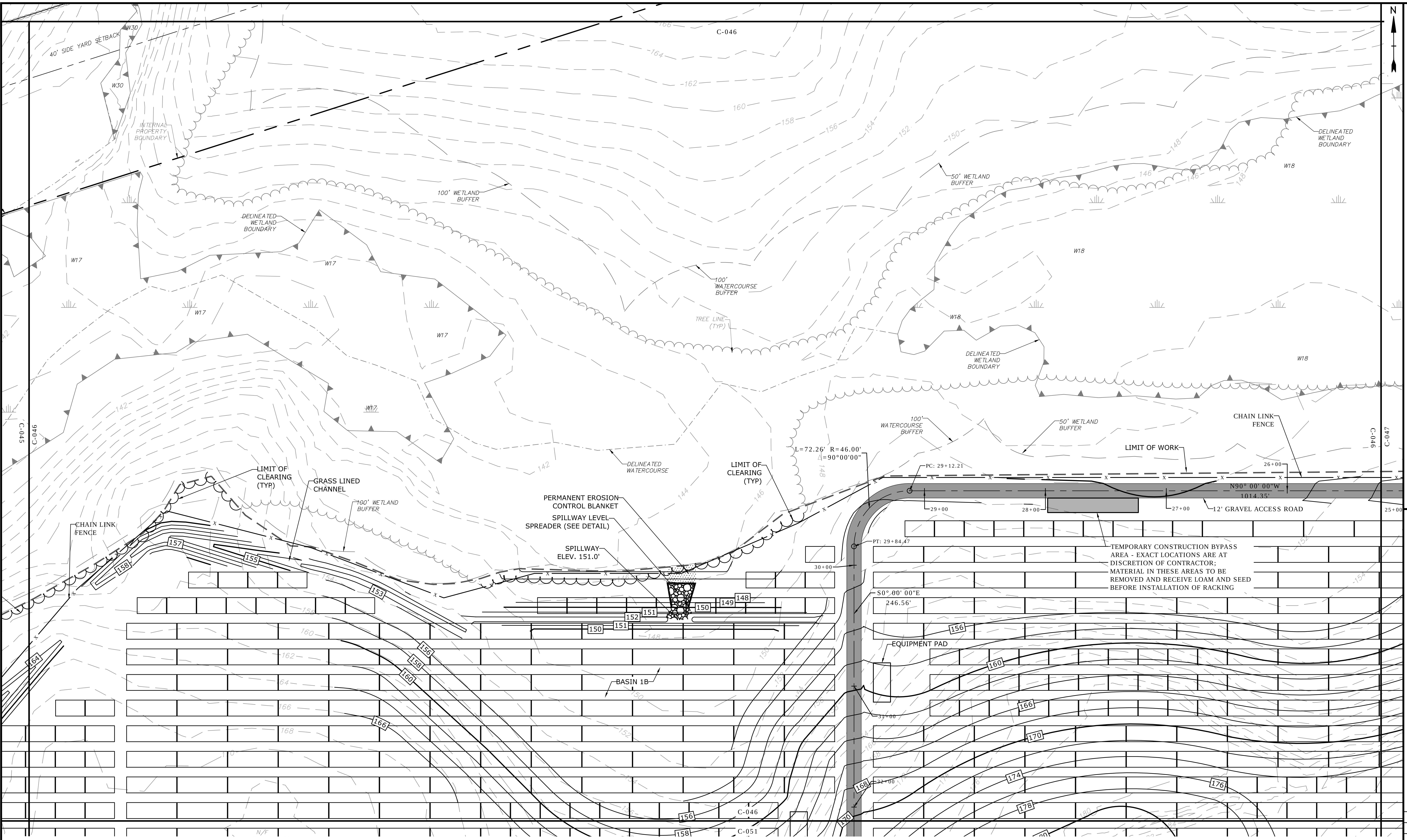
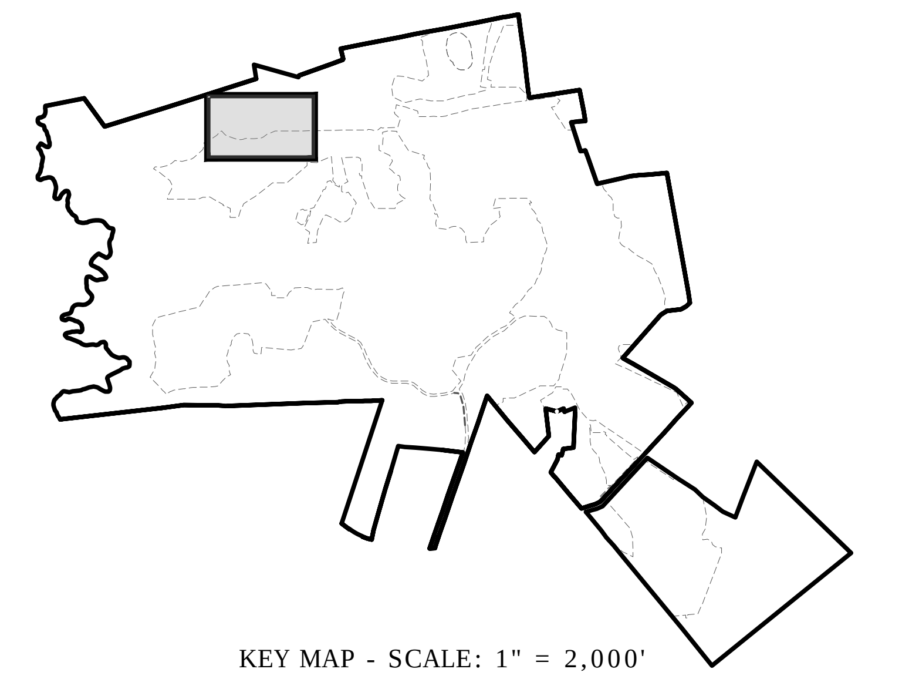
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 4

SCALE: 1" = 40'

C-045




KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
EASEMENT LINE		STONE WALL		TIER 2 PLANTINGS	
EXISTING INTERMEDIATE CONTOURS	124	WETLAND BUFFER		TIER 3 PLANTINGS	
EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☆
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	▨	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒		
CHAIN LINK FENCE	× ×	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE					

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
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Jaclyn M. Caceci
01/15/21

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Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
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Connecticut

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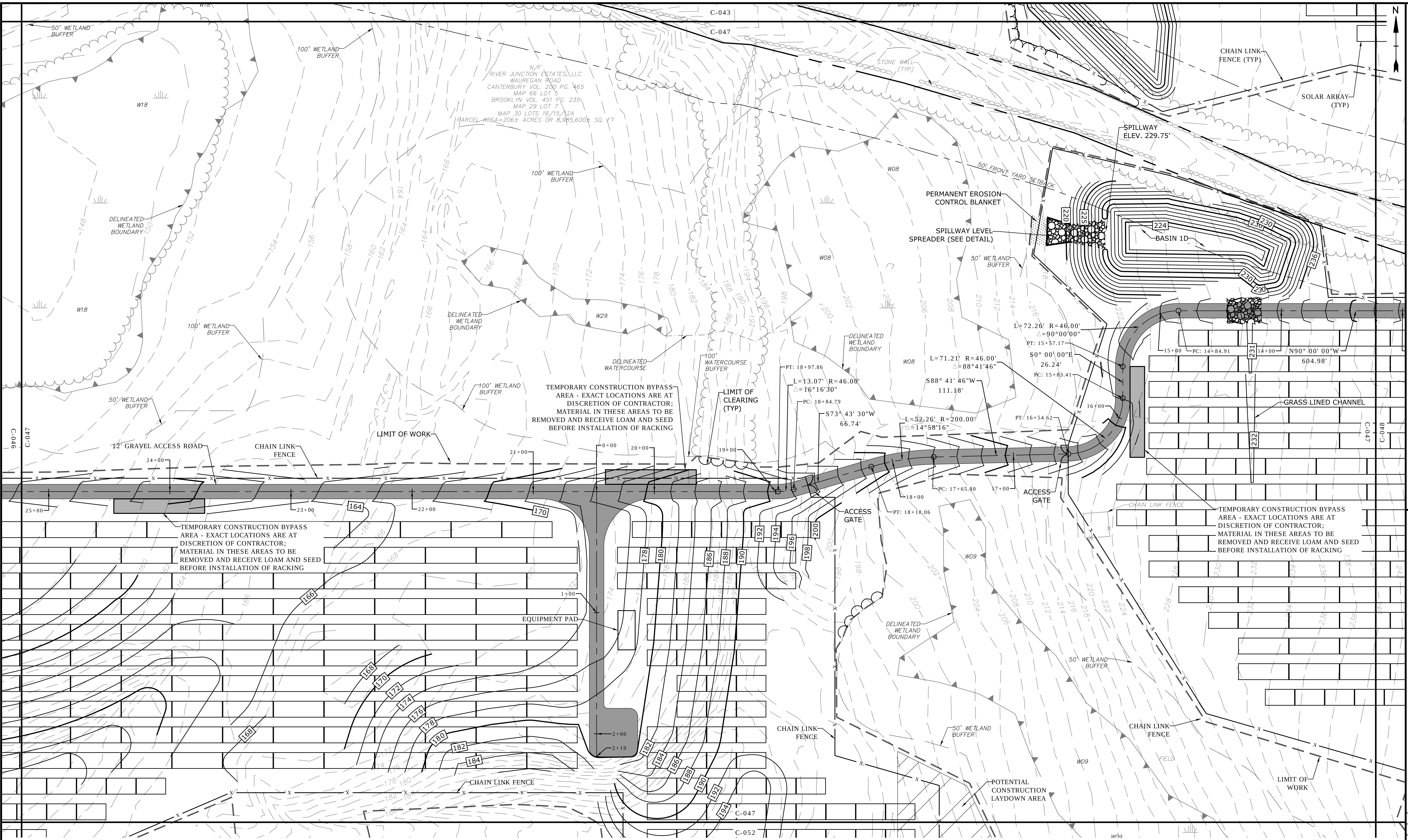
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 5

SCALE: 1" = 40'

C-046



Tighe&Bond

STATE OF CONNECTICUT BRIAN S. HUNTLEY No. 31180 LICENSED PROFESSIONAL ENGINEER

1-15-21

STATE OF CONNECTICUT JACLYN M. CACECI NO. 33828 LICENSED PROFESSIONAL ENGINEER

Jaclyn M. Caceci 01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
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Connecticut

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DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 6

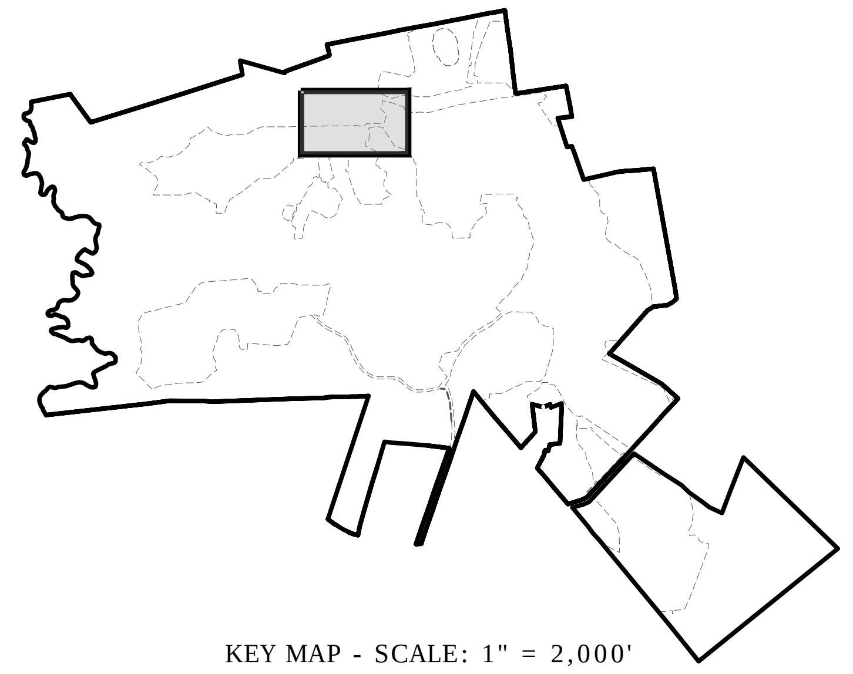
SCALE: 1" = 40'

C-047

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE
HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA
WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.


KEY MAP - SCALE: 1" = 2,000'

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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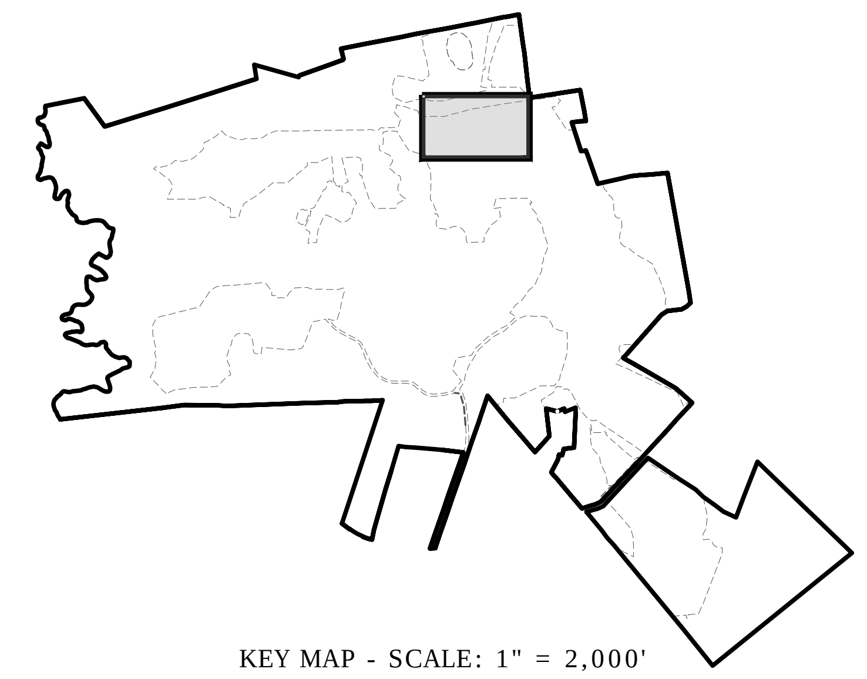

KEY MAP - SCALE: 1" = 2,000'

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS (124)
- EXISTING INDEX CONTOURS (120)
- PROPOSED INTERMEDIATE CONTOURS (222)
- PROPOSED INDEX CONTOURS (220)
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE (E)
- OVERHEAD ELECTRIC LINE (OHW)
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
- STONE WALL
- WETLAND BUFFER
- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE
- AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
- CONSTRUCTION LAYDOWN AREA
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE
- FLARED END SECTION
- SPOT GRADE (262.69)
- MAGNITUDE & DIRECTION OF SLOPE (2%)

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY No. 31180
Bhh 1-15-21

JACLYN M. CACECI NO. 33828
Jaclyn M Caceci 01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg
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APPROVED: FJH

PROPOSED CONDITIONS - 7

SCALE: 1" = 40'

C-048

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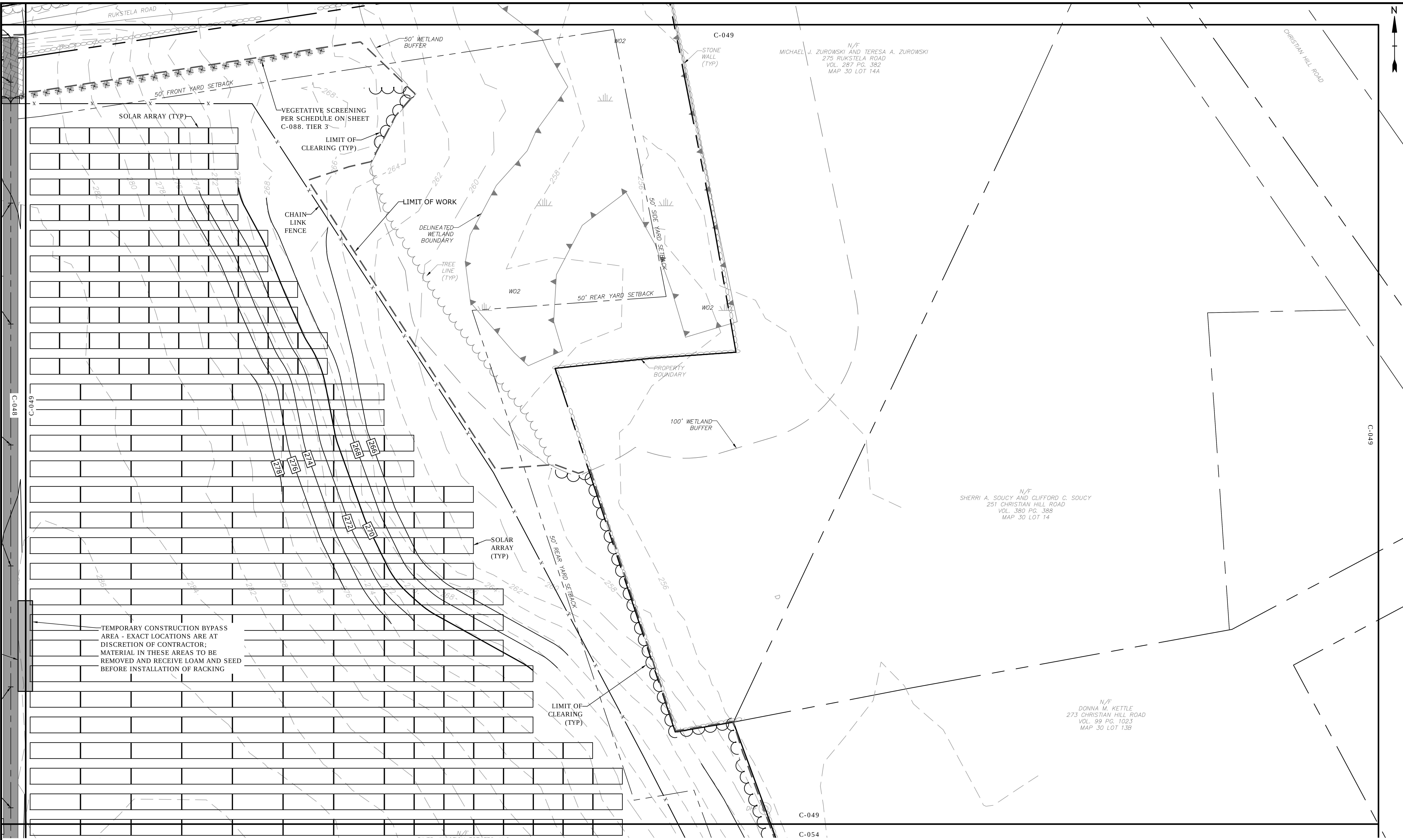

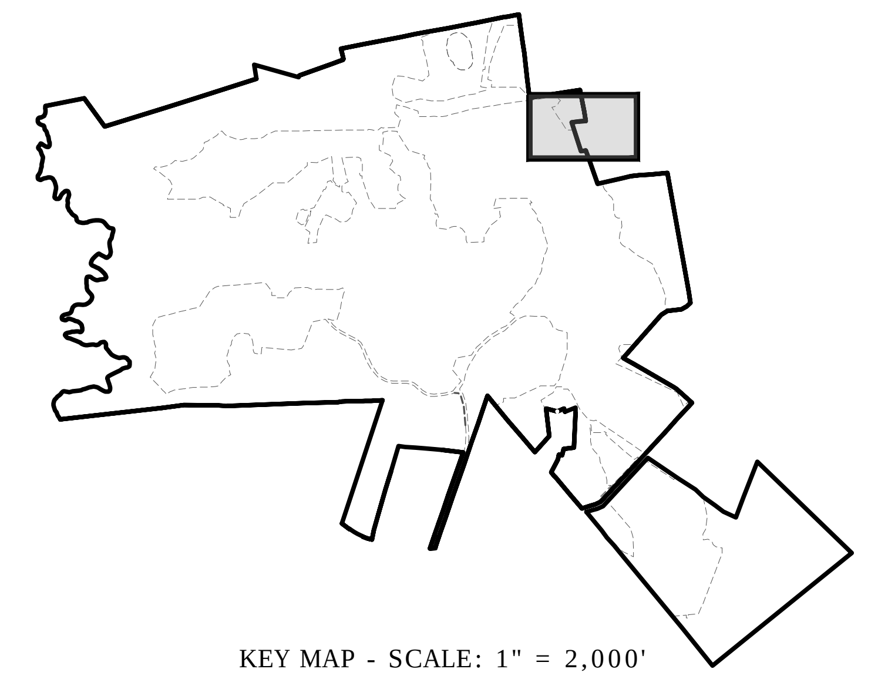
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTER
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
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APPROVED:	FJH

PROPOSED CONDITIONS - 8

SCALE: 1" = 40'

C-049

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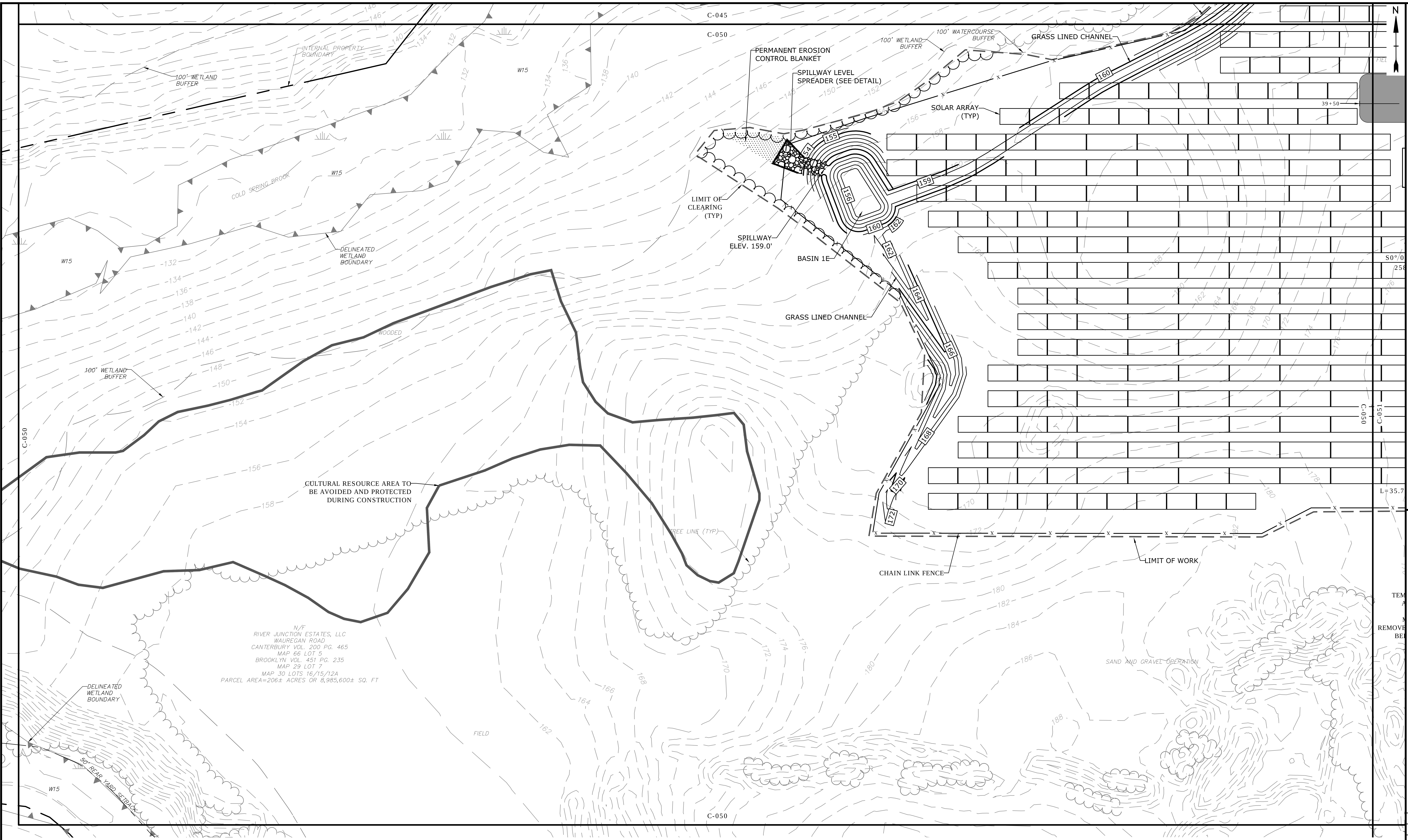

Tighe&Bond

Brian S. Huntley No. 31180
1-15-21

Jaclyn M. Caceci NO. 33828
Jaclyn M. Caceci
01/15/21

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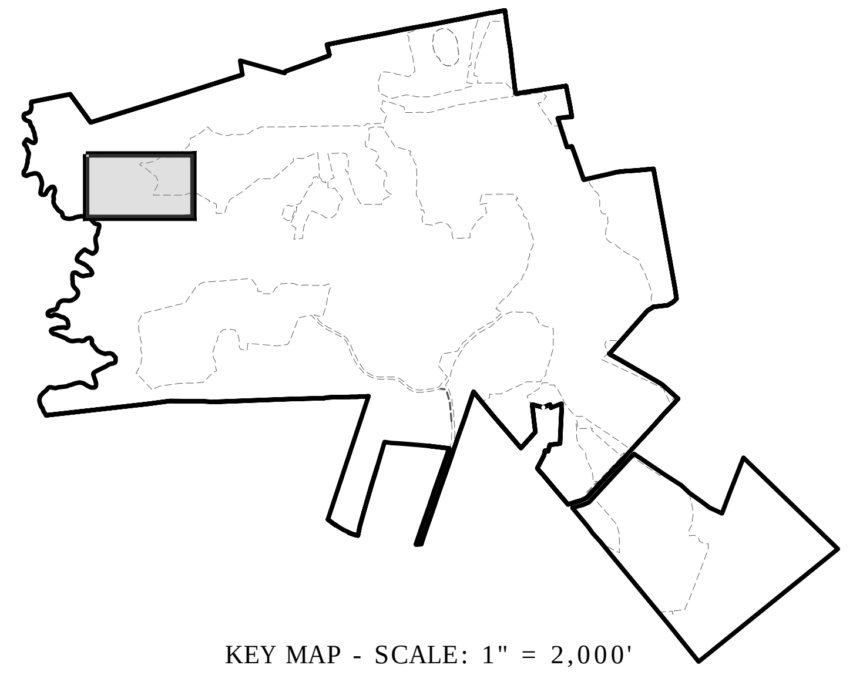
PROPOSED CONDITIONS - 9

SCALE: 1" = 40'

C-050



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	✕
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☆
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
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GRAPHIC SCALE

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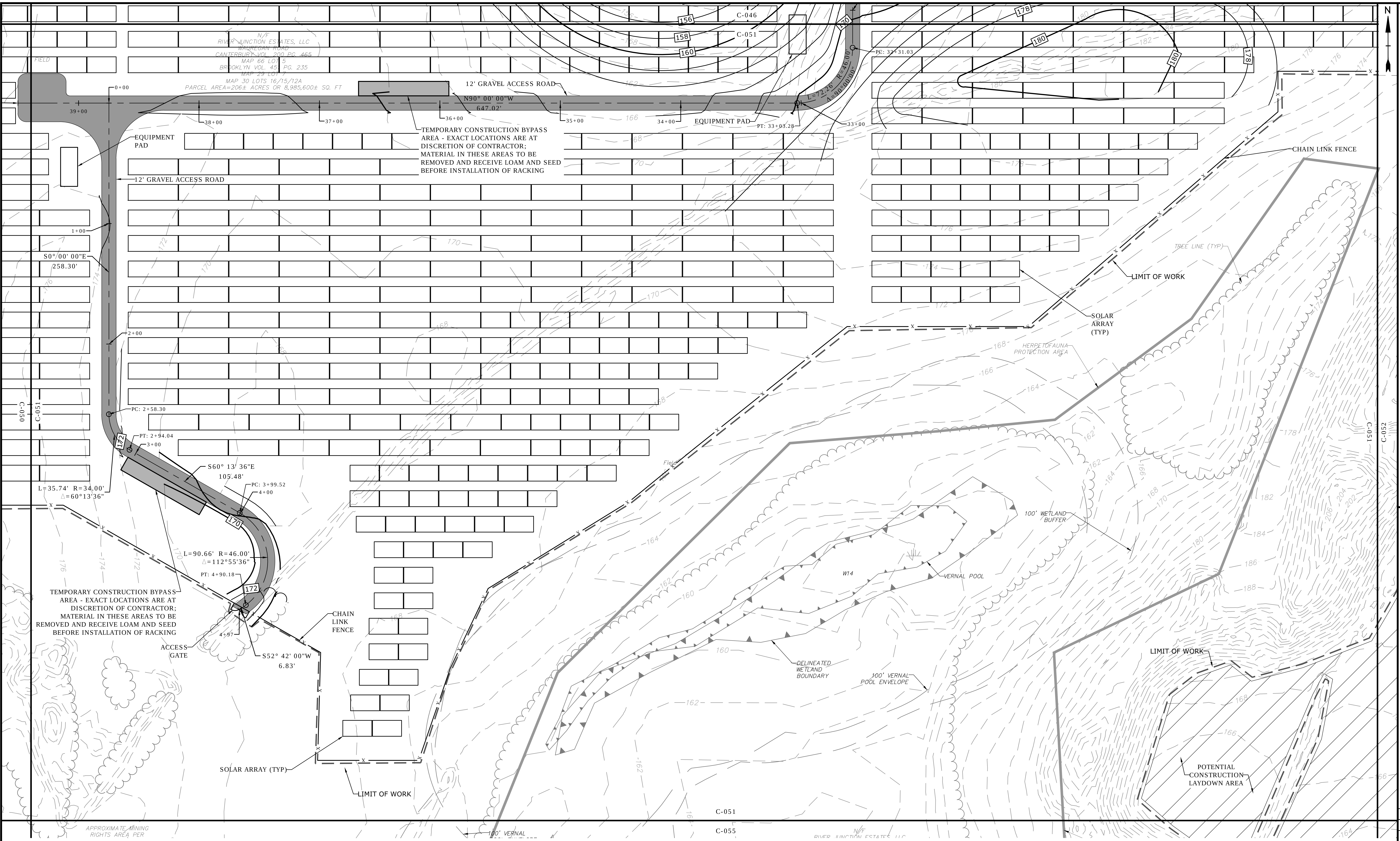

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

1-15-21

JACLYN M. CACECI
NO. 33828

Jaclyn M Caceci
01/15/21

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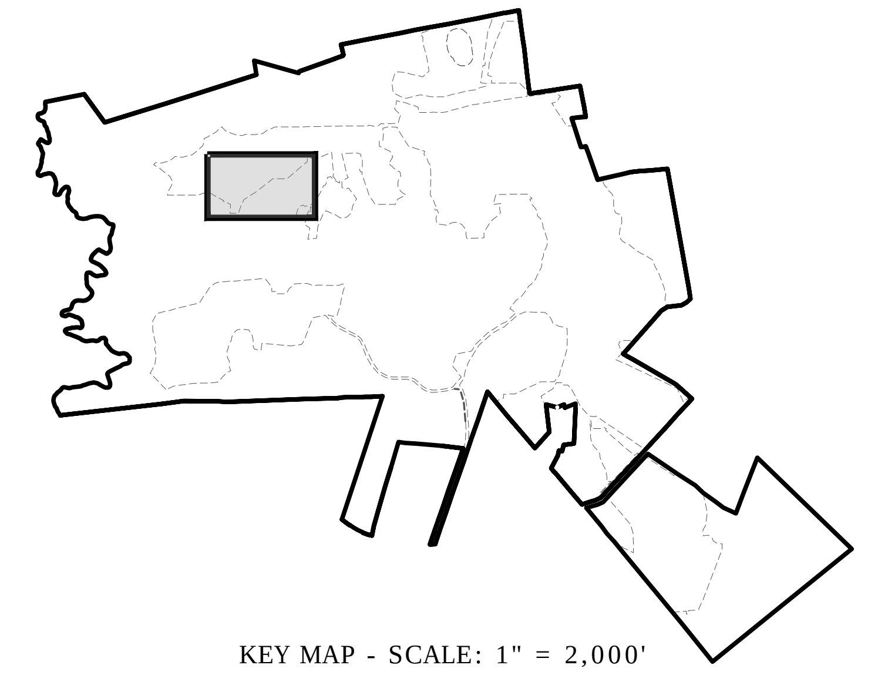
PROPOSED CONDITIONS - 10

SCALE: 1" = 40'

C-051



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	▬ ‒ ‒ ▬
PROPERTY LINE SETBACK	― ‒ ‒ ―
EASEMENT LINE	― ―
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	―
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	× ×
LIMITS OF WORK	‒ ‒ ‒
TOWN BOUNDARY	‒ · ‒ ·
TREE LINE	⌒⌒⌒
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	― ―
HERPETOFAUNA PROTECTION AREA	▬
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	▬
STONE WALL	○○○○
WETLAND BUFFER	― ―
WATERCOURSE BUFFER	‒ ‒ ‒
DELINEATED WATERCOURSE	‒ · ‒ ·
VERNAL POOL	▲ ▲ ▲
DELINEATED WETLAND	▲ ▲
REMOVE/REMOVE AND DISPOSE	//////
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒☒☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	▭
TIER 1 PLANTINGS	⌒⌒⌒
TIER 2 PLANTINGS	⊙
TIER 3 PLANTINGS	✳
UTILITY POLE	○
LIGHT POLE	☆
FLARED END SECTION	▱
SPOT GRADE	+ 262.69
MAGNITUDE & DIRECTION OF SLOPE	← 2%

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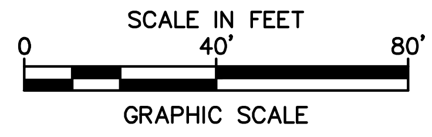

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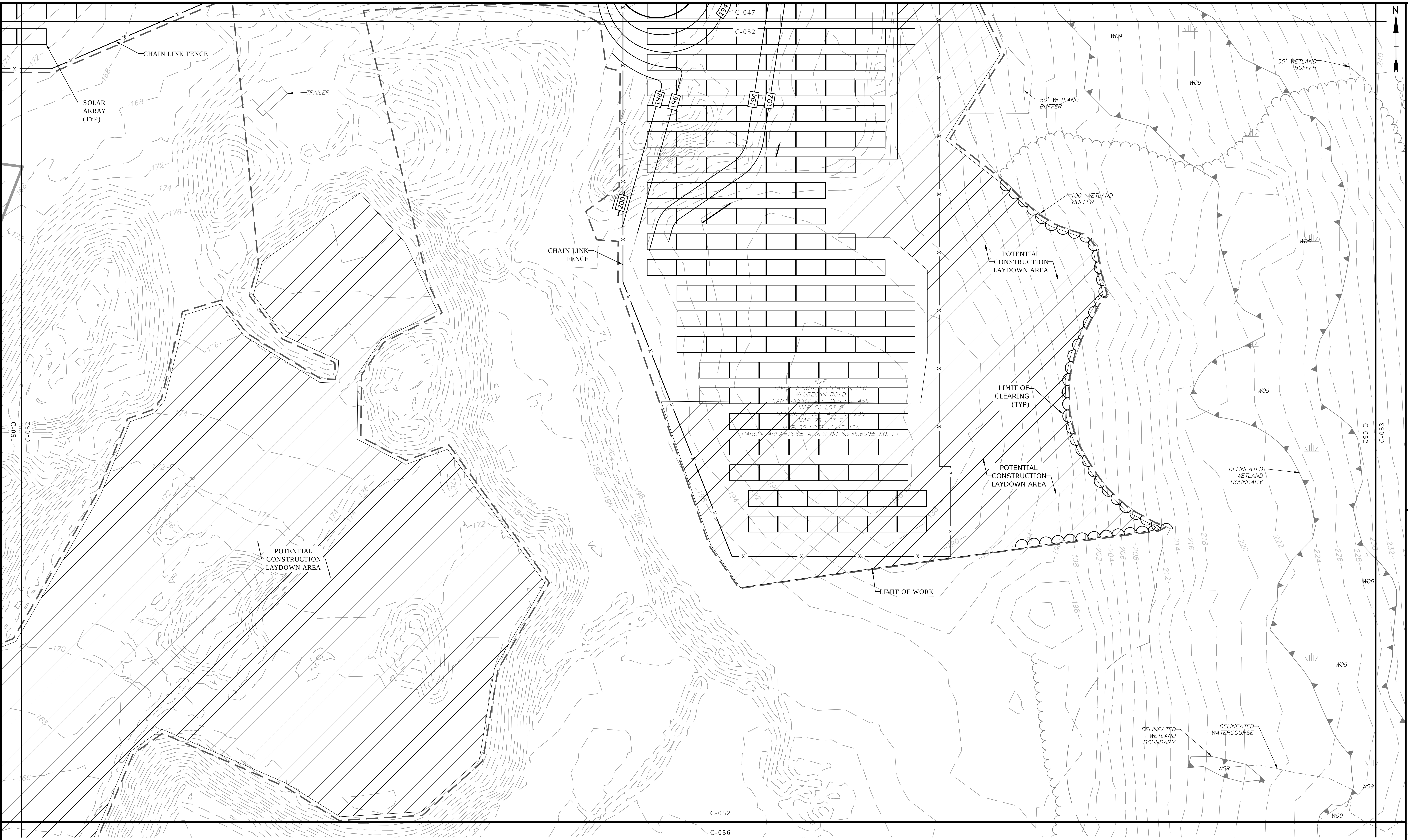

Tighe&Bond

BRIAN S. HUNTLEY No. 31180
1-15-21

JACLYN M. CACCIA No. 33828
Jaclyn M Caccia
01/15/21

ISSUED FOR CONSTRUCTION

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Brooklyn &
Canterbury,
Connecticut

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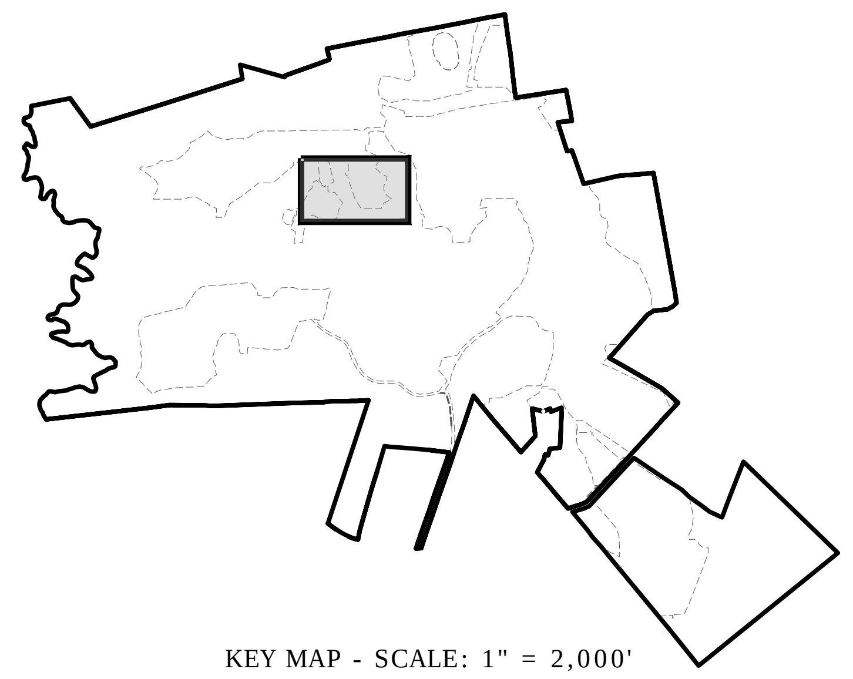
MARK	DATE	DESCRIPTION

PROJECT NO:	R0317
DATE:	01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg	
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 11

SCALE: 1" = 40'

C-052



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS
EXISTING INDEX CONTOURS
PROPOSED INTERMEDIATE CONTOURS
PROPOSED INDEX CONTOURS
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE
OVERHEAD ELECTRIC LINE
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE
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REMOVE/REMOVE AND DISPOSE
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CONSTRUCTION LAYDOWN AREA
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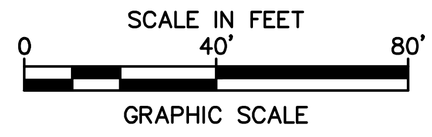
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE
MAGNITUDE & DIRECTION OF SLOPE

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.



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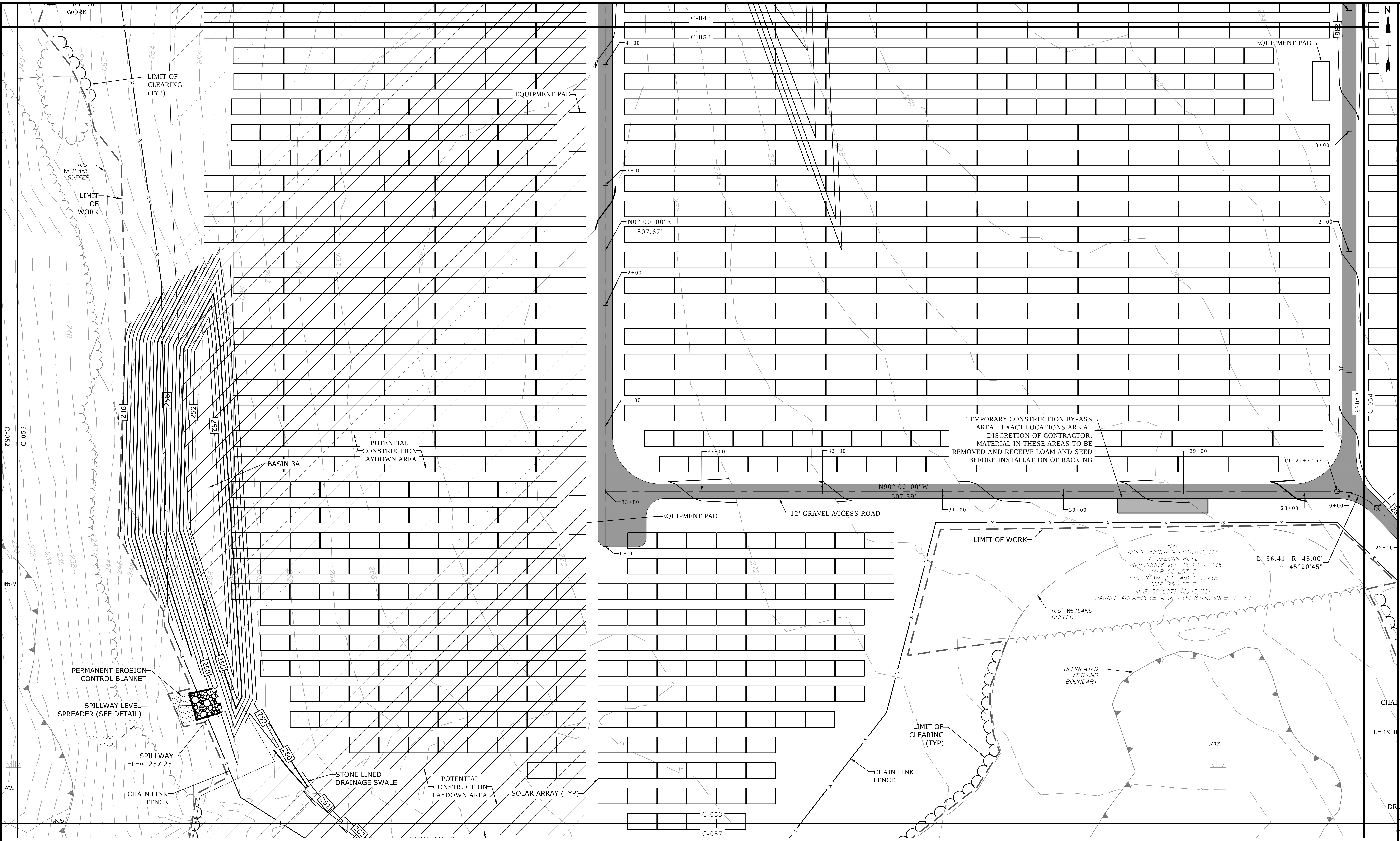

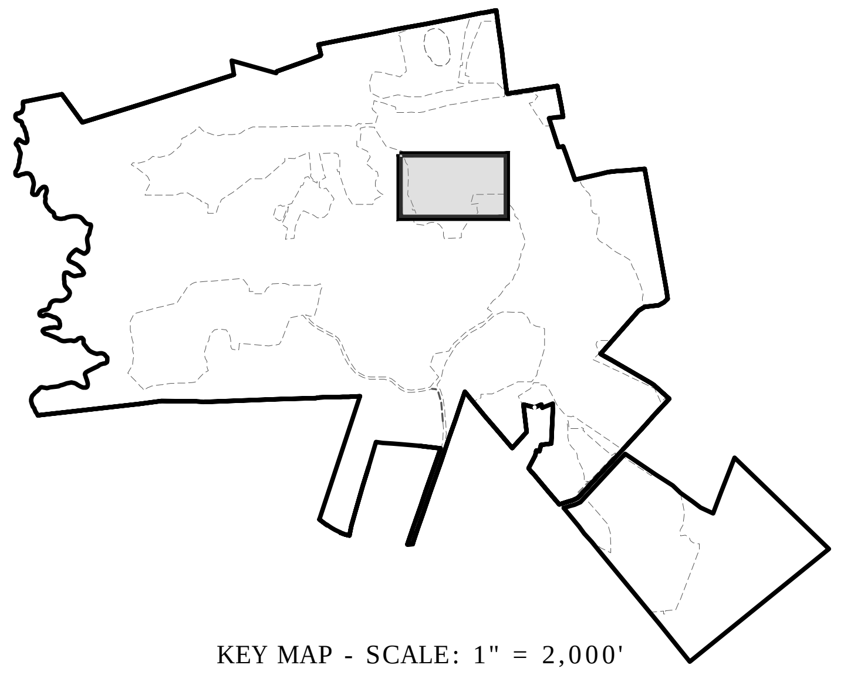
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE
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MARK	DATE	DESCRIPTION

PROJECT NO:	R0317
DATE:	01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg	
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 12

SCALE: 1" = 40'

C-053

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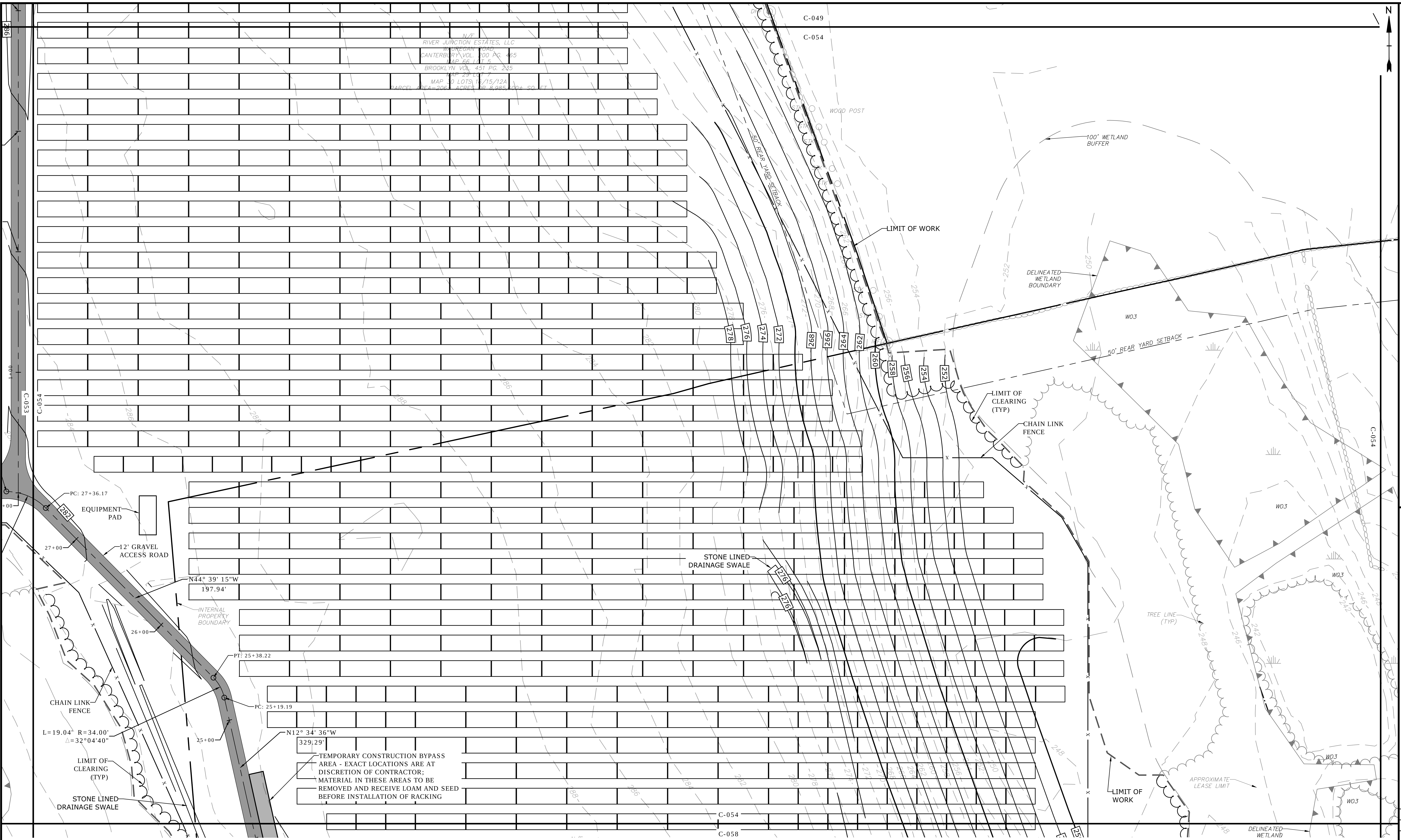

Tighe&Bond

No. 31180
1-15-21

No. 33828
01/15/21

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Brooklyn &
Canterbury,
Connecticut

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0 ▬ 1 INCH

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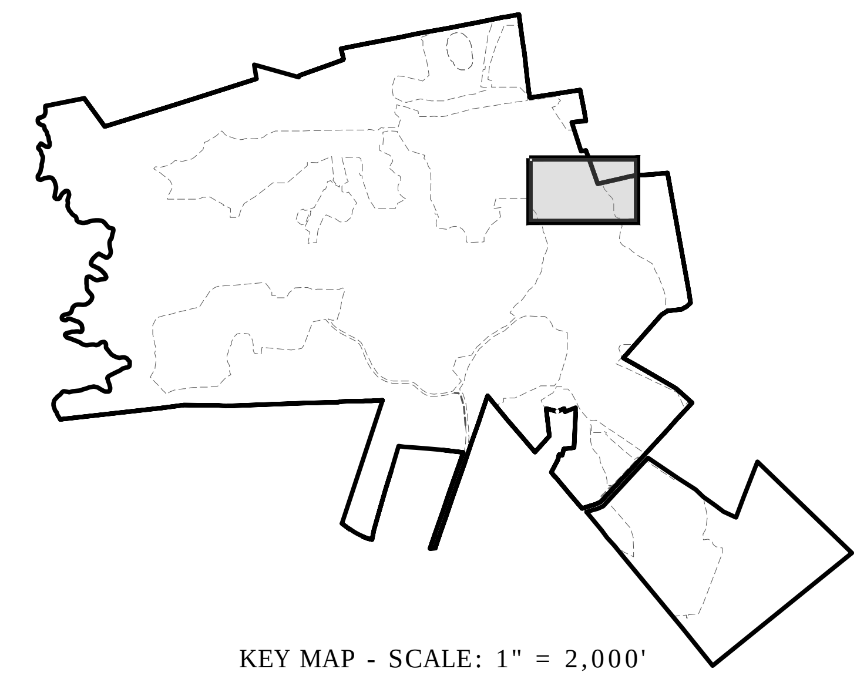
FILE:	Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 13

SCALE: 1" = 40'

C-054



KEY MAP - SCALE: 1" = 2,000'

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS — 124
- EXISTING INDEX CONTOURS — 120
- PROPOSED INTERMEDIATE CONTOURS — 222
- PROPOSED INDEX CONTOURS — 220
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE — E
- OVERHEAD ELECTRIC LINE — OHW
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
- STONE WALL
- WETLAND BUFFER
- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE
- AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
- CONSTRUCTION LAYDOWN AREA
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE
- FLARED END SECTION
- SPOT GRADE — 262.69
- MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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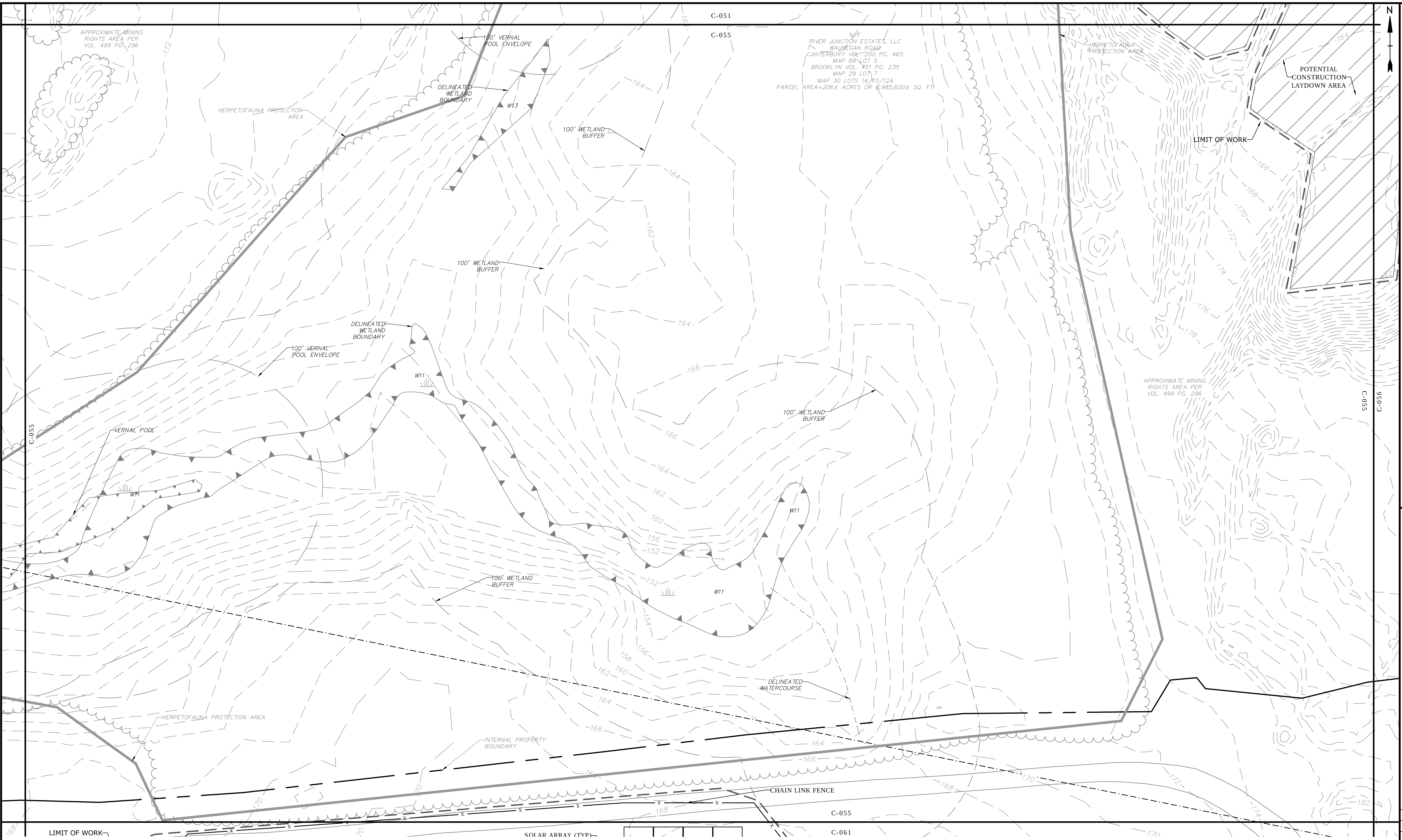

Tighe&Bond

STATE OF CONNECTICUT · BRIAN S. HUNTLEY · No. 31180 · LICENSED PROFESSIONAL ENGINEER

1-15-21

STATE OF CONNECTICUT · JACLYN M. CACECI · NO. 33828 · LICENSED PROFESSIONAL ENGINEER

Jaclyn M Caceci 01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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PROJECT NO:	R0317
DATE:	01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg	
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 14

SCALE: 1" = 40'

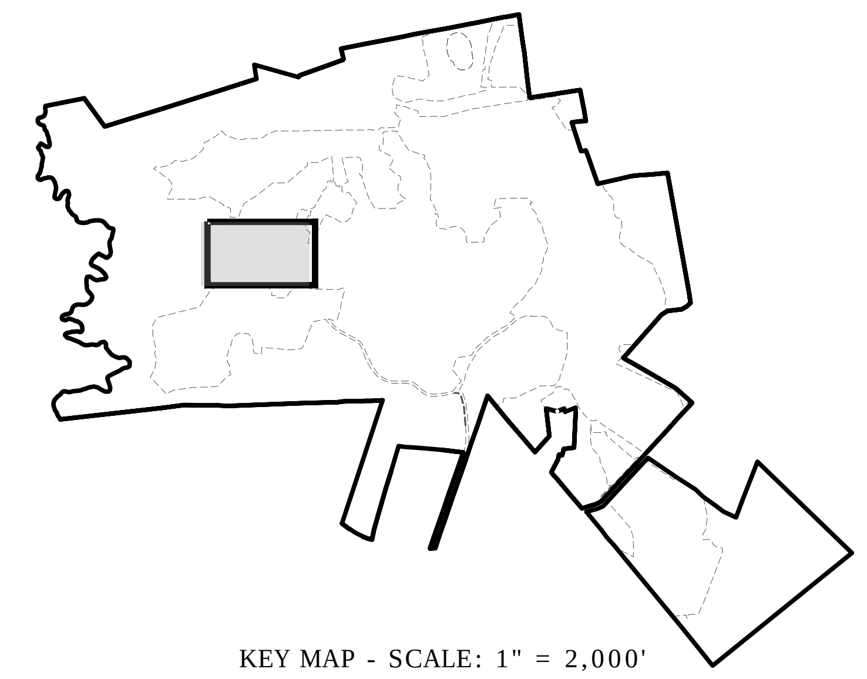
C-055

LEGEND

PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
EASEMENT LINE		STONE WALL		TIER 2 PLANTINGS	
EXISTING INTERMEDIATE CONTOURS	124	WETLAND BUFFER		TIER 3 PLANTINGS	
EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☆
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	▨	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒		
CHAIN LINK FENCE	✕	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE					

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE



KEY MAP - SCALE: 1" = 2,000'

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Plotted On:Jan 13, 2021-11:48pm By: AGilchrist
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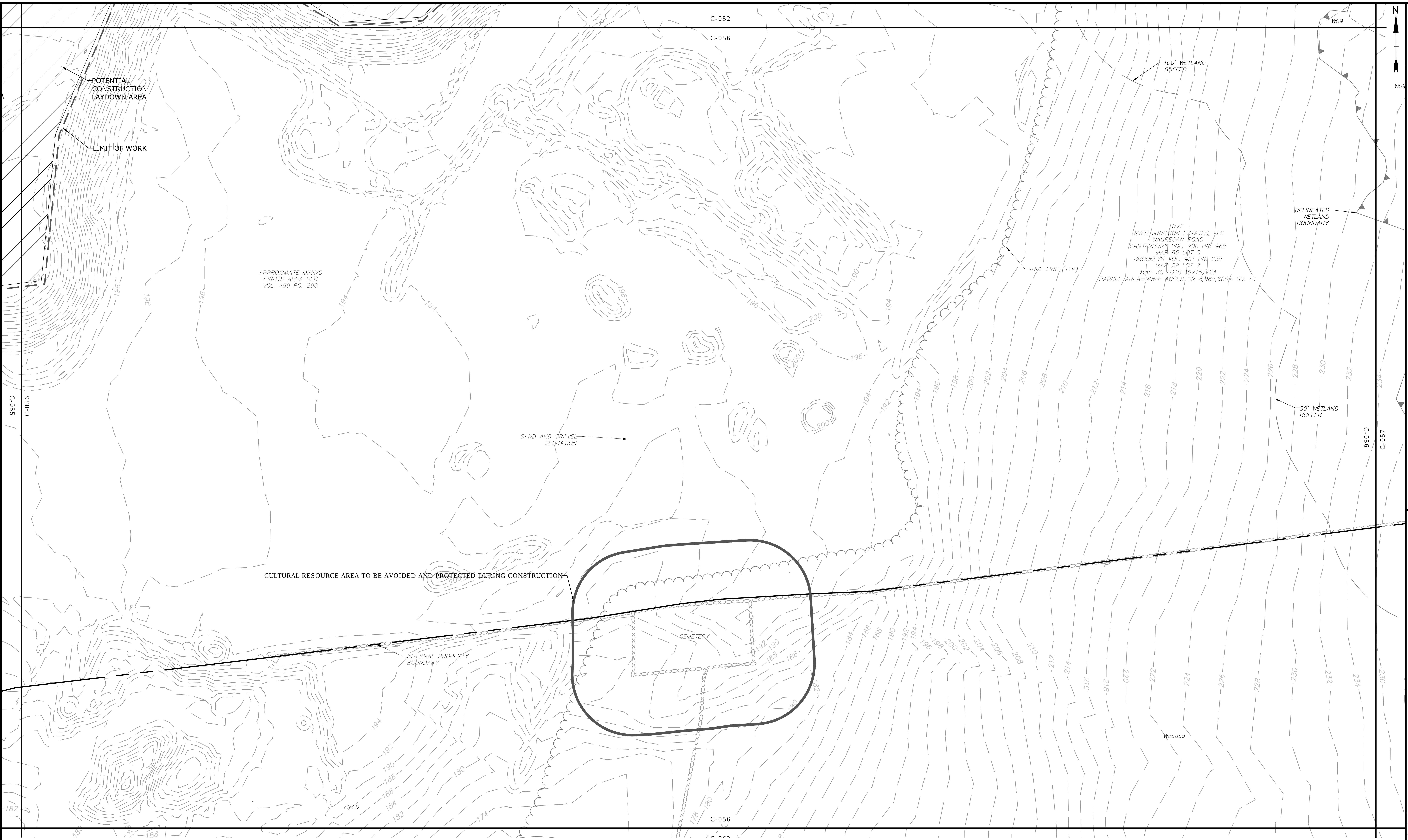

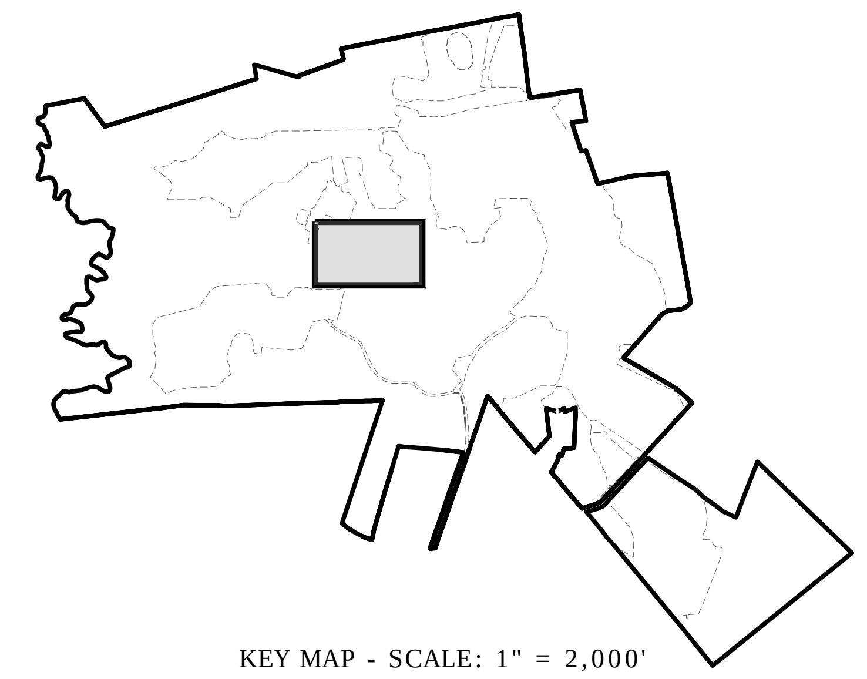

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
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CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
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WETLAND BUFFER
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CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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MARK	DATE	DESCRIPTION

PROJECT NO:	R0317
DATE:	01/2021
FILE:	Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 15

SCALE: 1" = 40'

C-056

Last Saved: 1/13/2021
Plotted On:Jan 13, 2021-11:49pm By: AGilchrist
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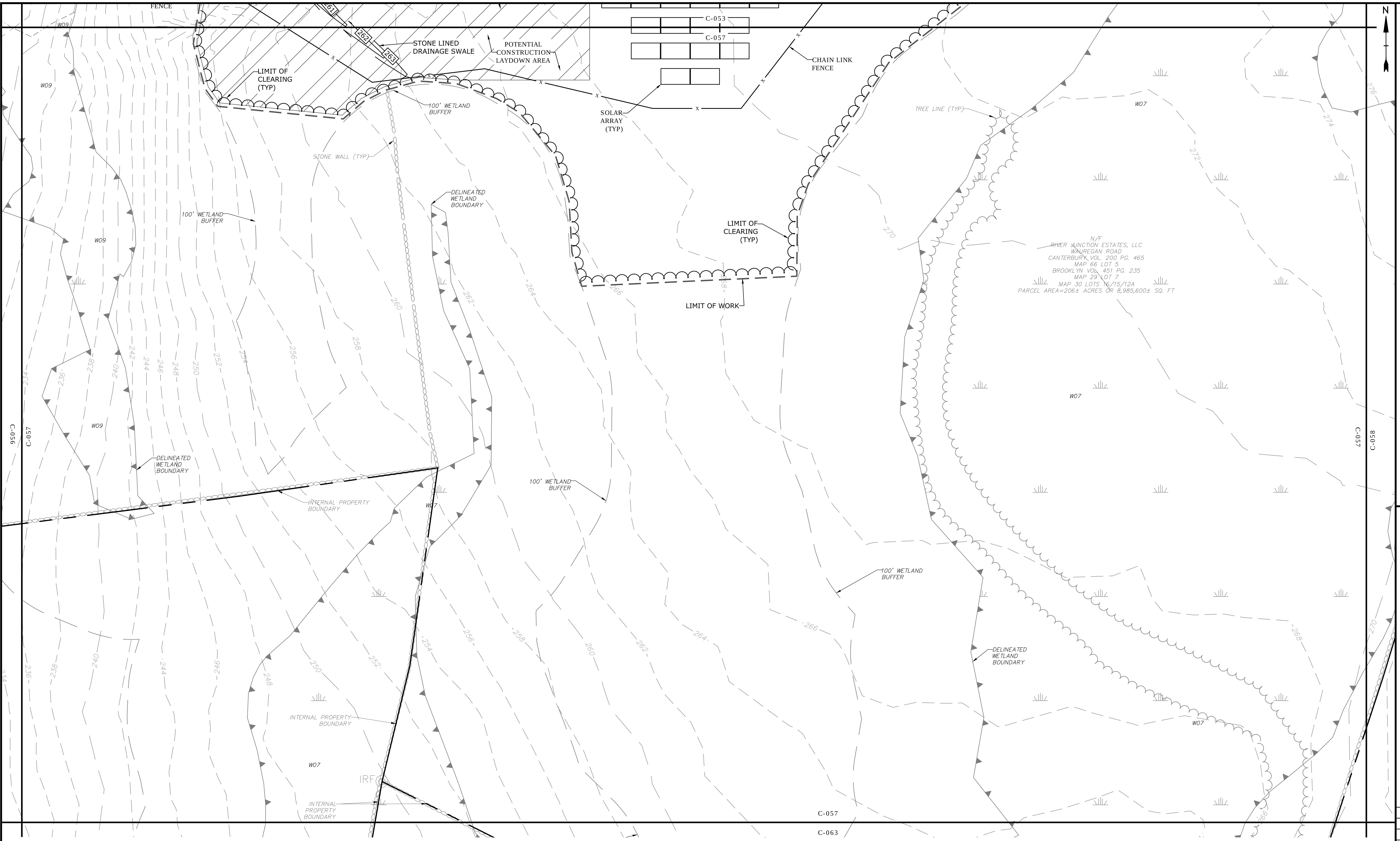

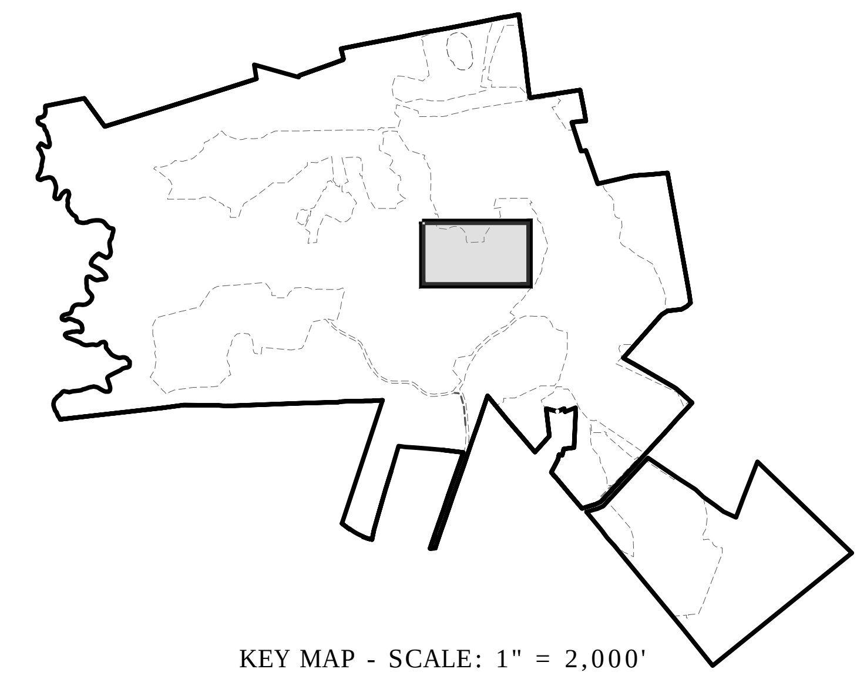

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
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EXISTING INTERMEDIATE CONTOURS — 124
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CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

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Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 16

SCALE: 1" = 40'

C-057

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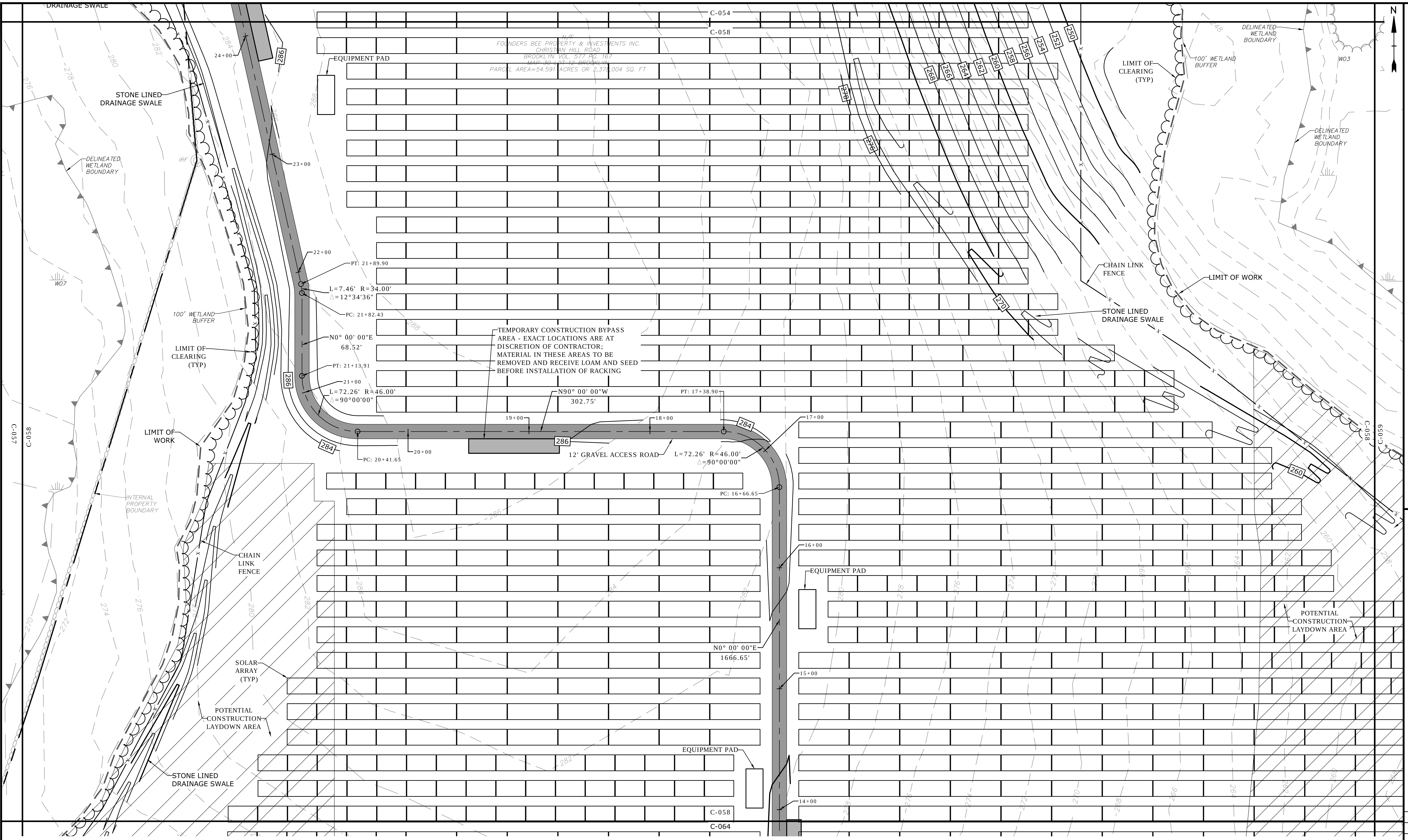

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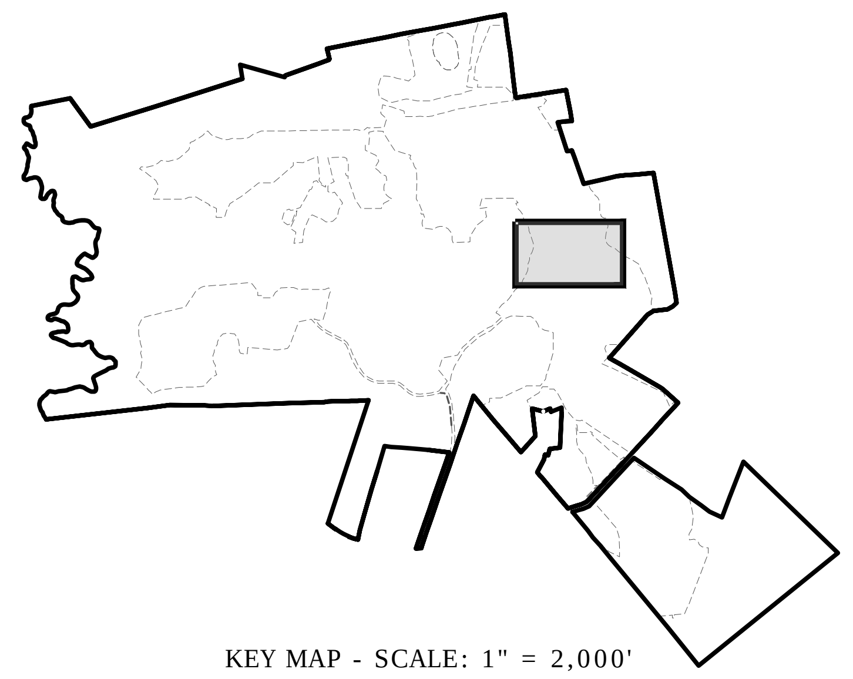

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
EASEMENT LINE		STONE WALL		TIER 2 PLANTINGS	
EXISTING INTERMEDIATE CONTOURS	124	WETLAND BUFFER		TIER 3 PLANTINGS	
EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☆
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	//////	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒		
CHAIN LINK FENCE	✕	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE					

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SCALE IN FEET
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GRAPHIC SCALE

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DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 17

SCALE: 1" = 40'

C-058

Last Saved: 1/13/2021
Plotted On:Jan 13, 2021-11:50pm By: AGilchrist
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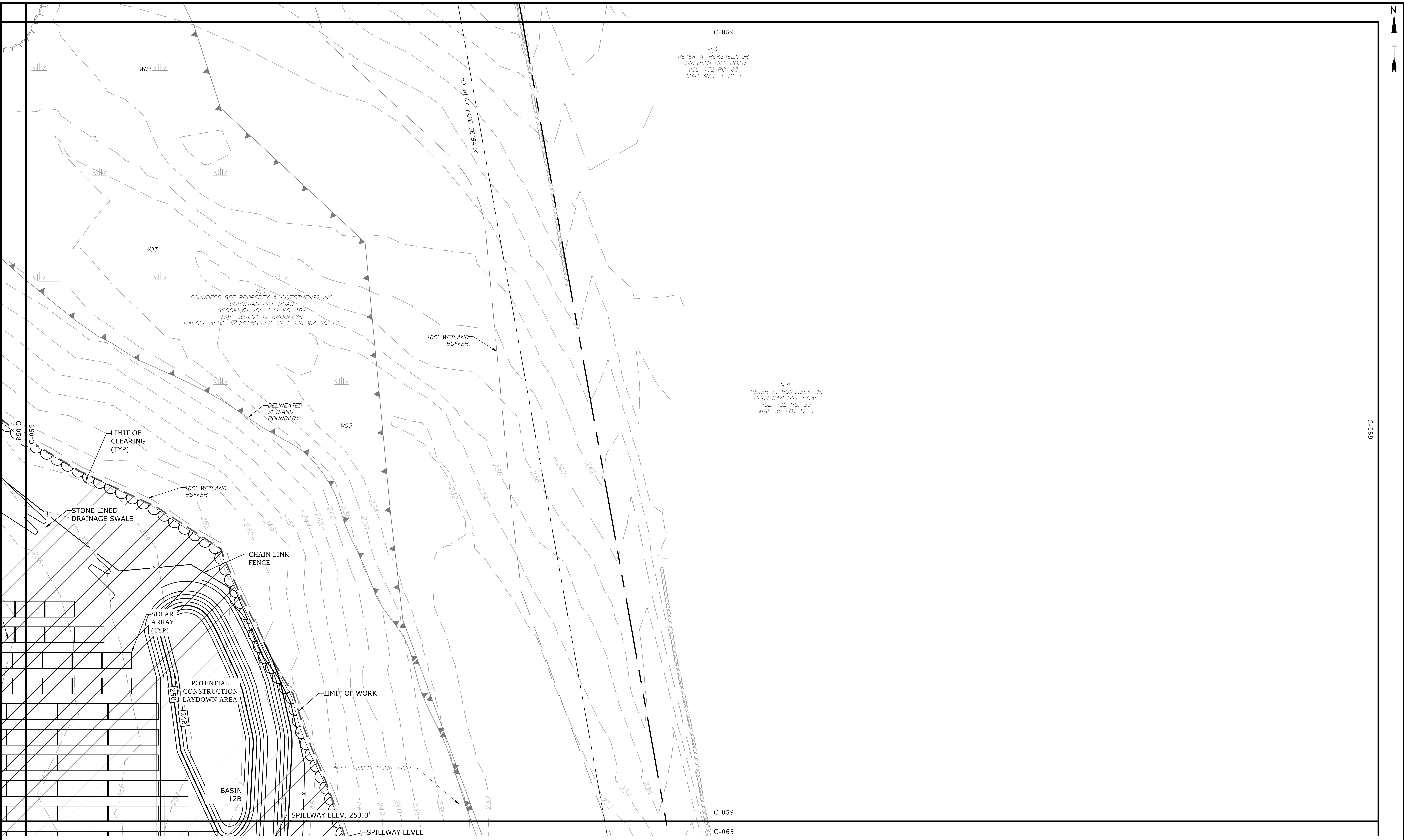

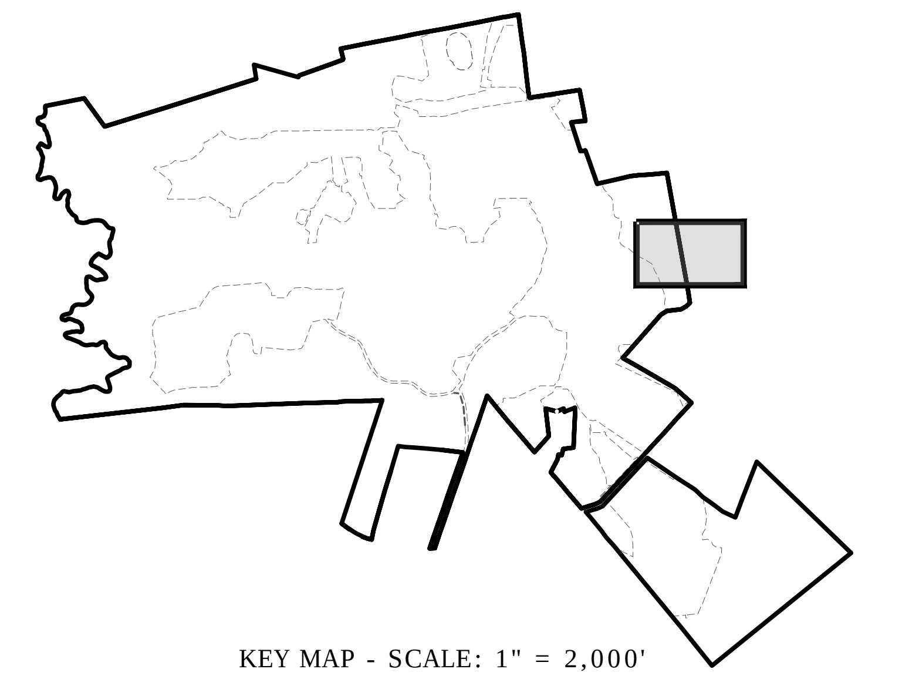

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
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UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	✕
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	▲
DELINEATED WETLAND	▲
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	▨
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☼
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

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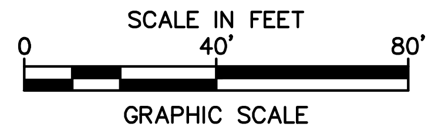

Tighe&Bond

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1-15-21

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Jaclyn Caceci 01/15/21

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Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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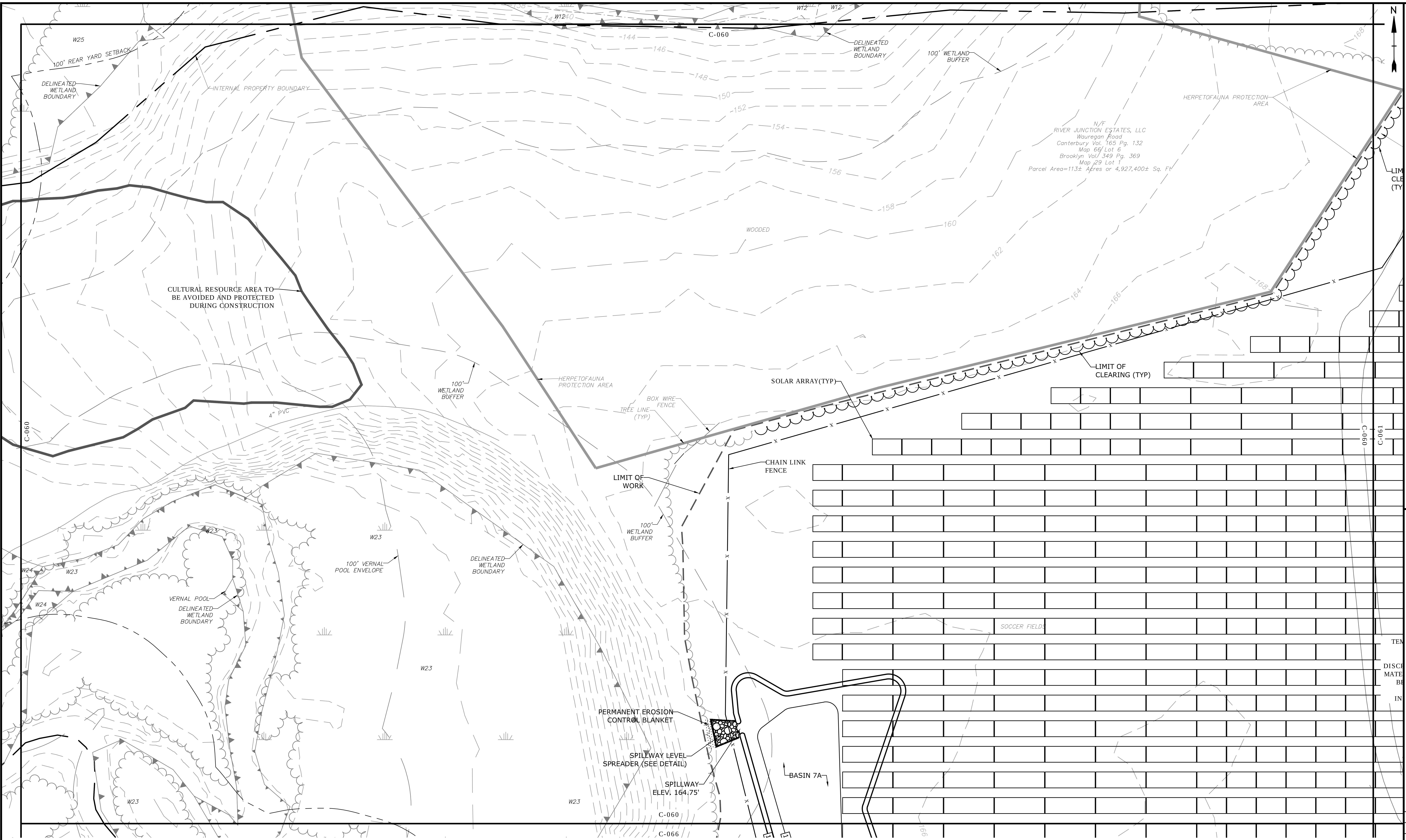
FILE: Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 18

SCALE: 1" = 40'

C-059



LEGEND

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EXISTING INTERMEDIATE CONTOURS	124
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LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	
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VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	//////////
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	▨
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
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UTILITY POLE	
LIGHT POLE	☆
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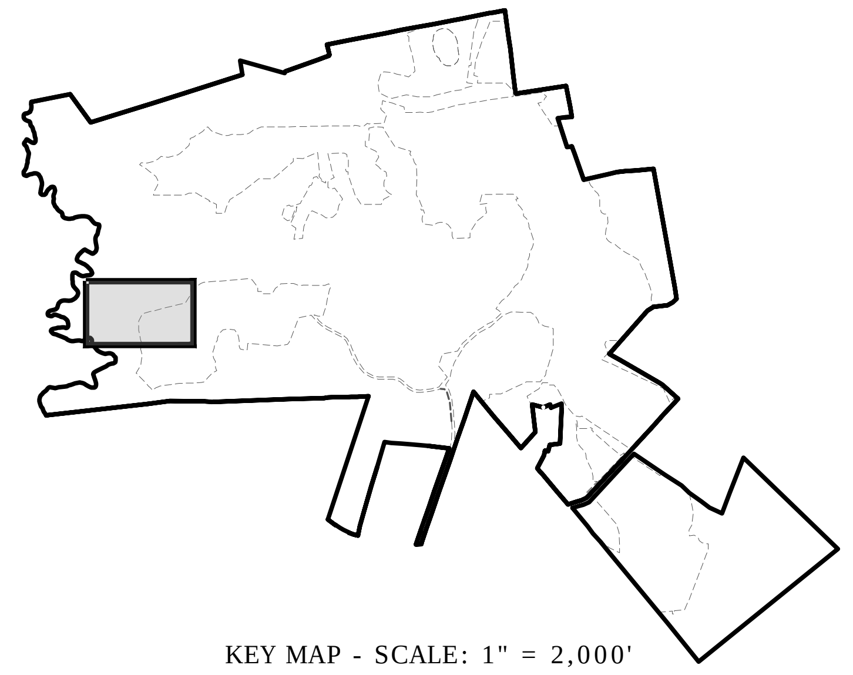
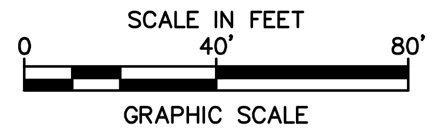
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%



KEY MAP - SCALE: 1" = 2,000'

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.



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Tighe&Bond

BRIAN S. HUNTLEY No. 31180

1-15-21

JACLYN M. CACCI NO. 33828

Jaclyn M. Cacci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE
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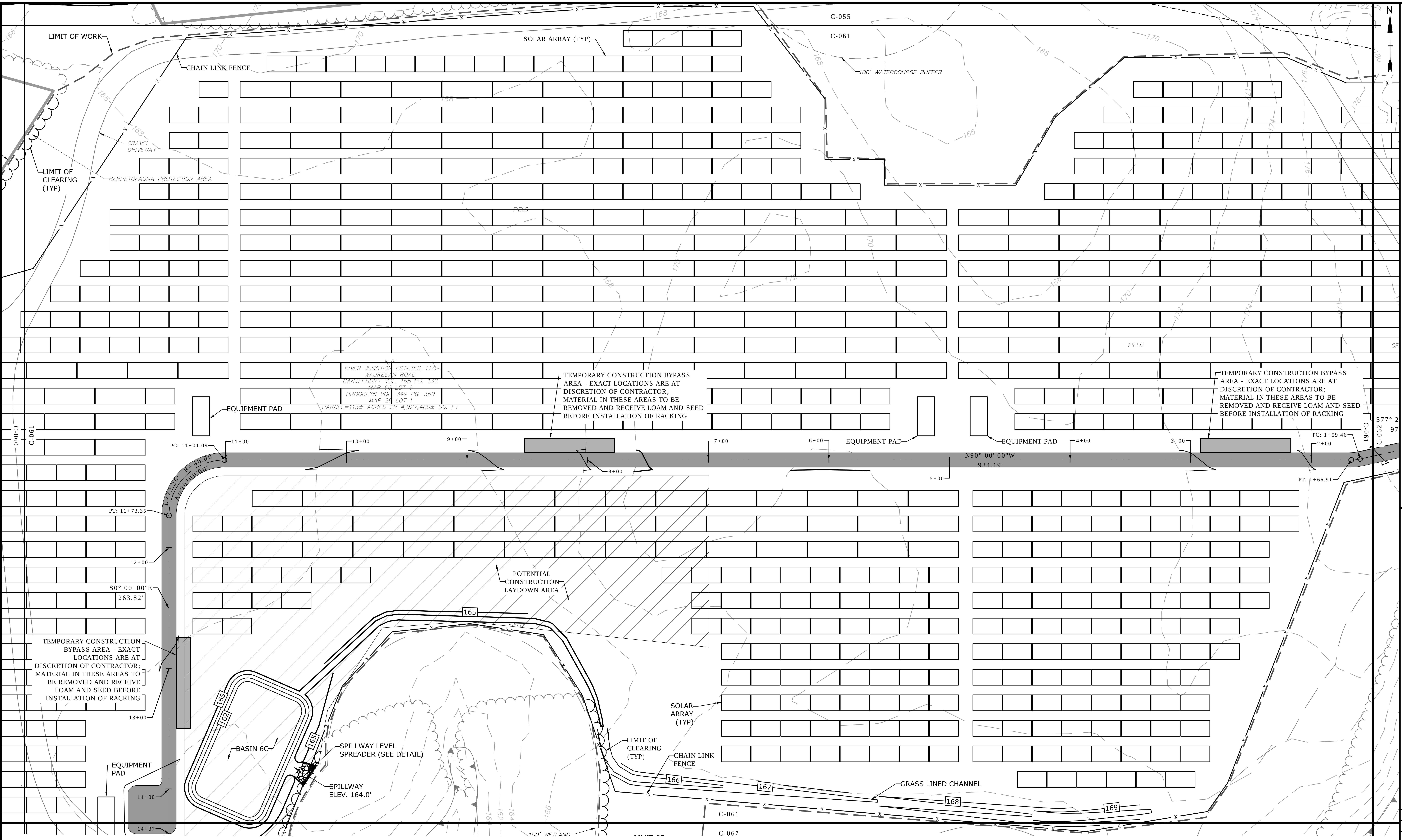
MARK	DATE	DESCRIPTION

PROJECT NO:	R0317
DATE:	01/2021
FILE:	Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 19

SCALE: 1" = 40'

C-060



Tighe&Bond

STATE OF CONNECTICUT
BRIAN S. HUNTLEY
No. 31180
LICENSED
PROFESSIONAL ENGINEER
1-15-21

STATE OF CONNECTICUT
JACLYN M. CACECI
NO. 33828
LICENSED
PROFESSIONAL ENGINEER
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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PROJECT NO:	R0317
DATE:	01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg	
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 20

SCALE: 1" = 40'

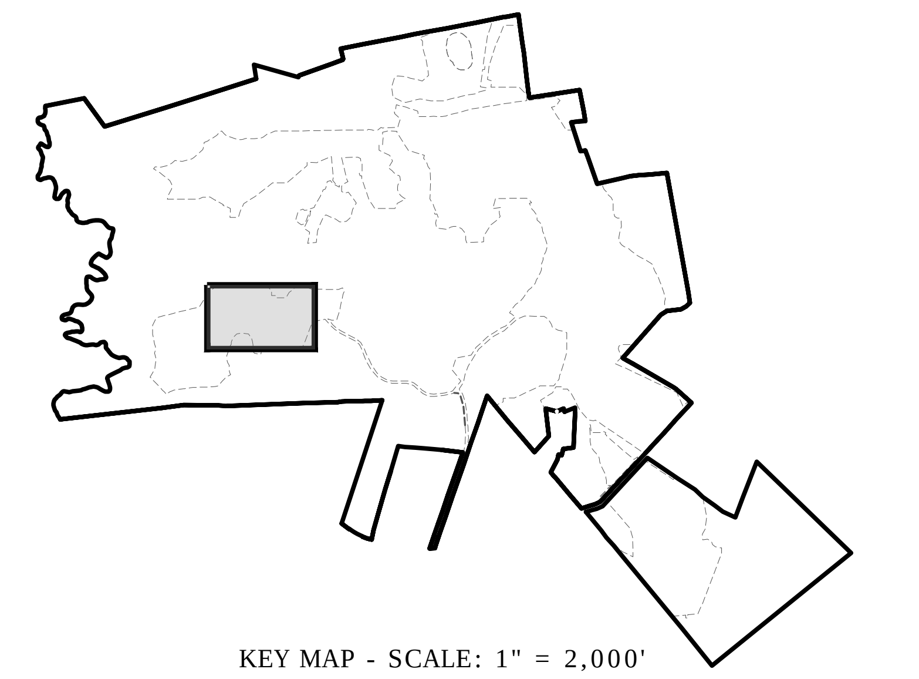
C-061

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS (124)
- EXISTING INDEX CONTOURS (120)
- PROPOSED INTERMEDIATE CONTOURS (222)
- PROPOSED INDEX CONTOURS (220)
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE (E)
- OVERHEAD ELECTRIC LINE (OHW)
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
- CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
- STONE WALL
- WETLAND BUFFER
- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE
- AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
- CONSTRUCTION LAYDOWN AREA
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE
- FLARED END SECTION
- SPOT GRADE (262.69)
- MAGNITUDE & DIRECTION OF SLOPE (2%)

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE



KEY MAP - SCALE: 1" = 2,000'

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Plotted On:Jan 14, 2021-6:21pm By: AGilchrist
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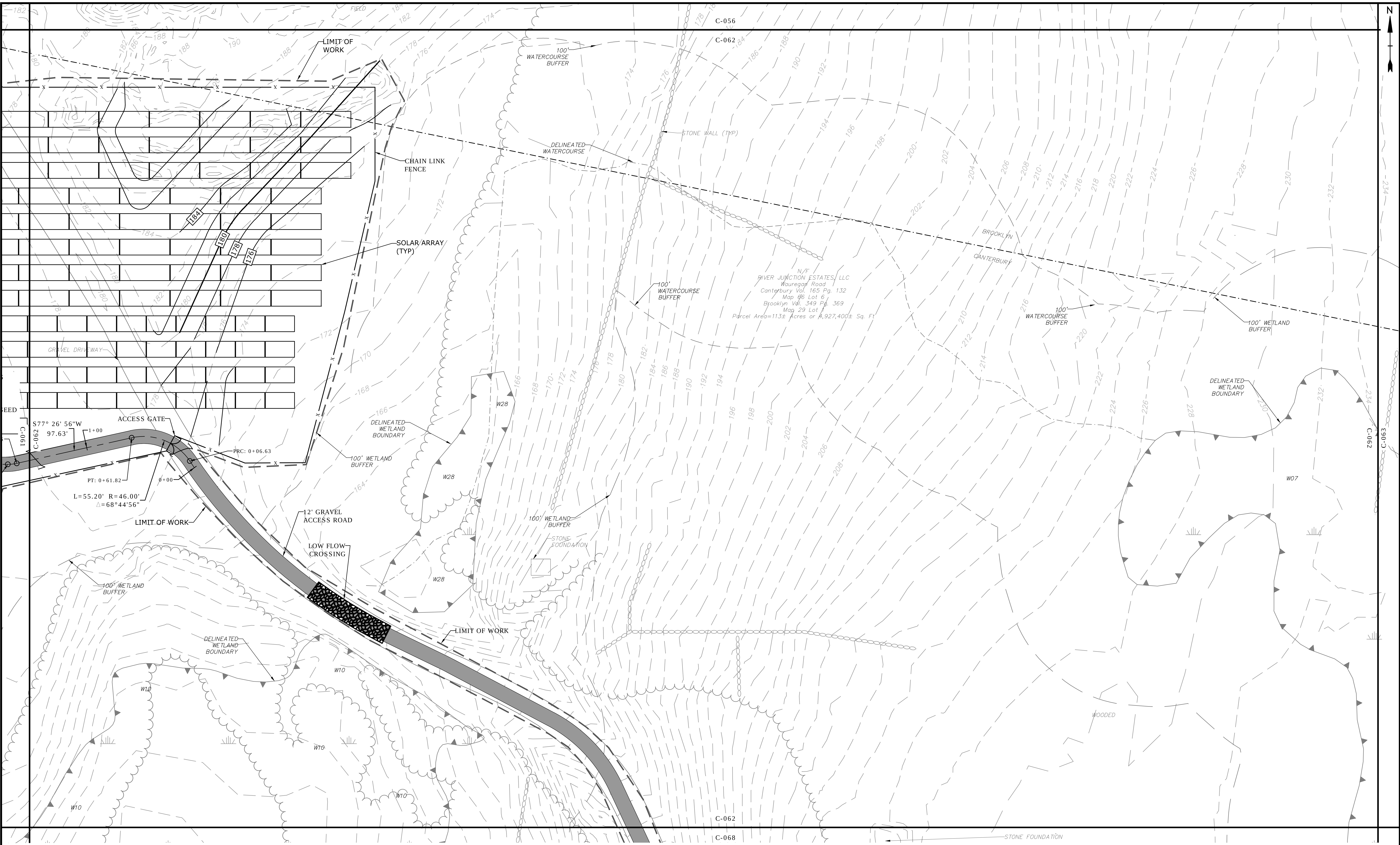


ISSUED FOR CONSTRUCTION

Tighe&Bond

STATE OF CONNECTICUT BRIAN S. HUNTLEY No. 31180 LICENSED PROFESSIONAL ENGINEER

1-15-21

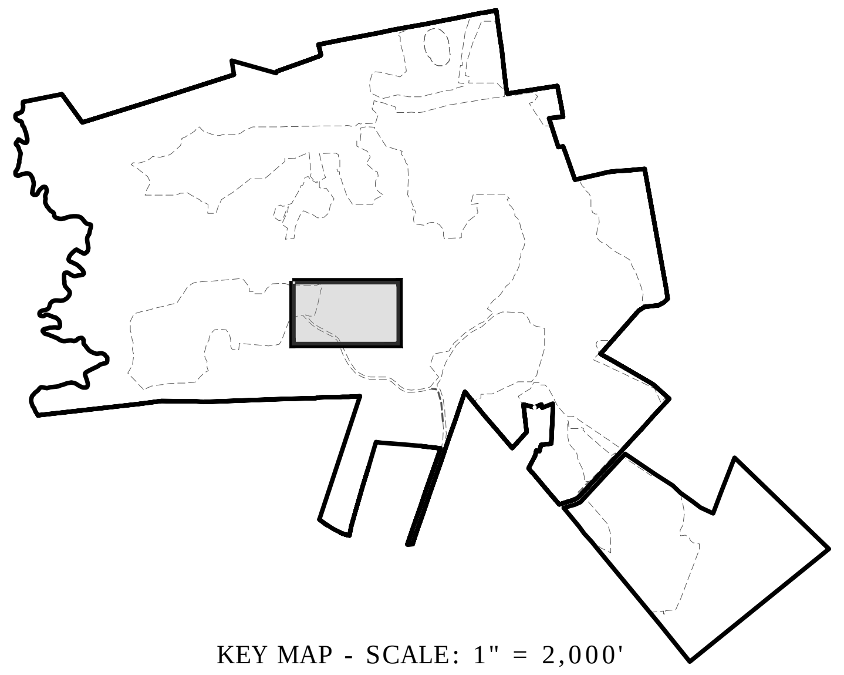
STATE OF CONNECTICUT JACLYN M. CACECI NO. 33828 LICENSED PROFESSIONAL ENGINEER

Jaclyn M. Caceci
01/15/21

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	✕
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	▲
DELINEATED WETLAND	▲
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☼
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

VERIFY SCALE
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MARK	DATE	DESCRIPTION

PROJECT NO:	R0317
DATE:	01/2021
FILE:	Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 21

SCALE: 1" = 40'

C-062

Last Saved: 1/13/2021
Plotted On:Jan 13, 2021-11:52pm By: AGilchrist
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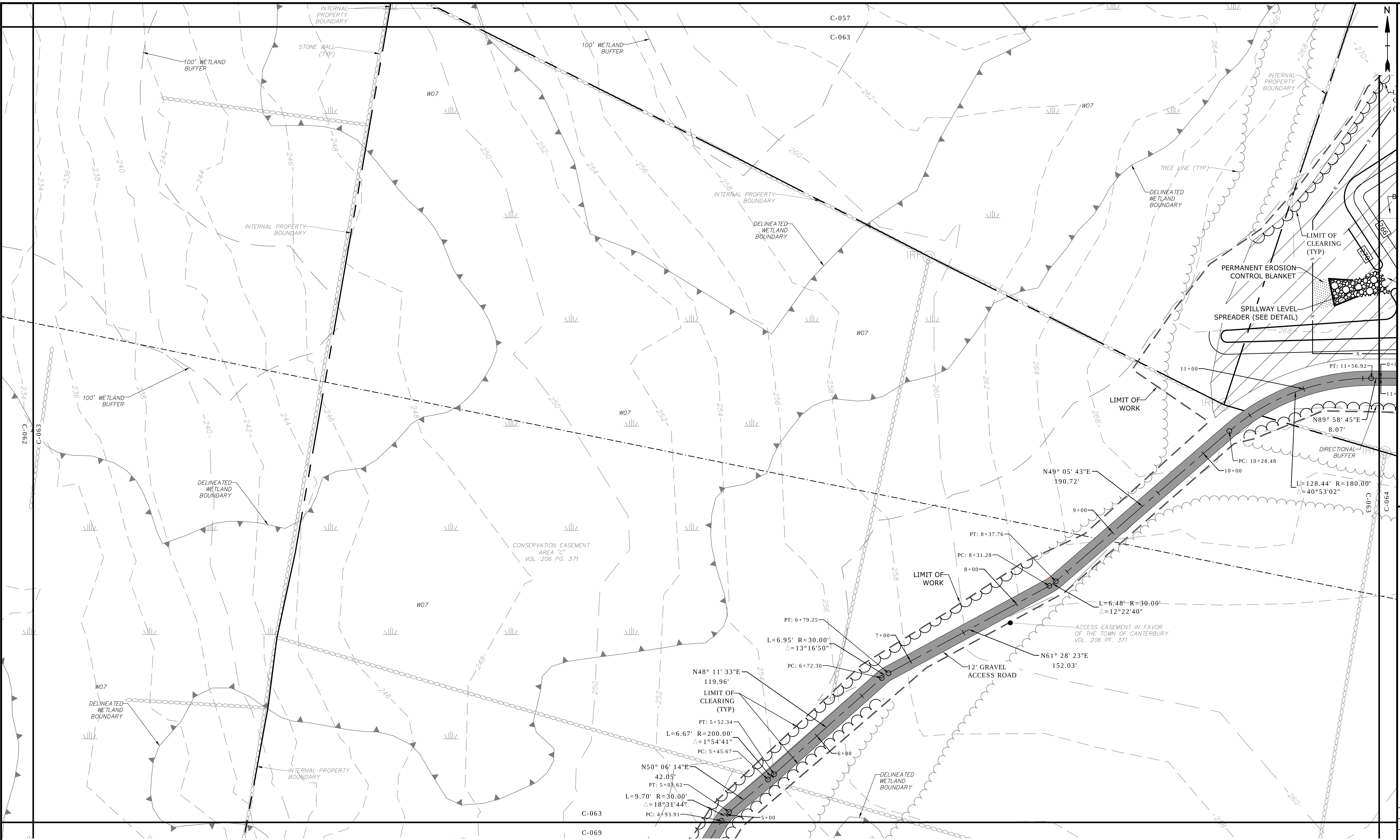

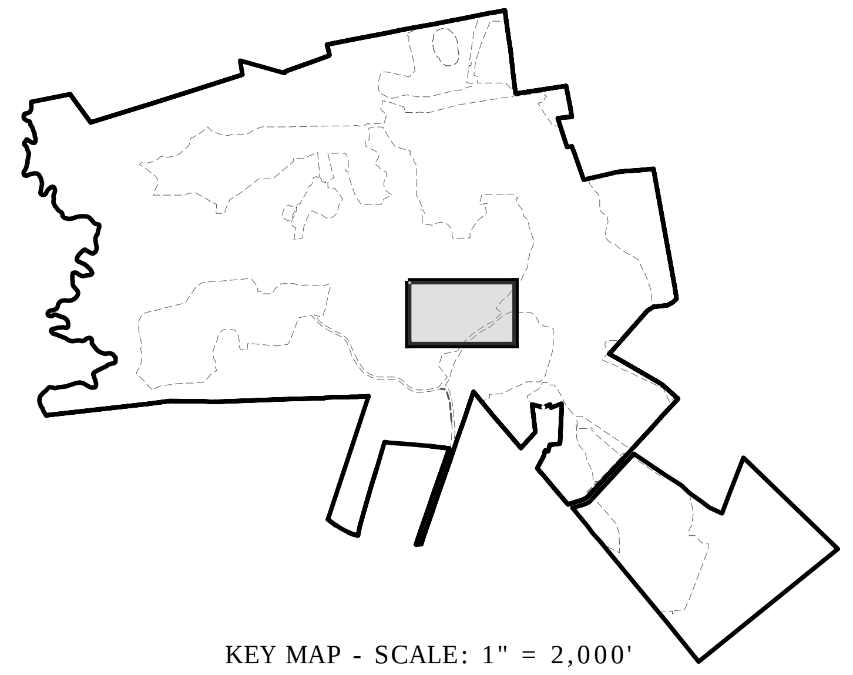
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS
EXISTING INDEX CONTOURS
PROPOSED INTERMEDIATE CONTOURS
PROPOSED INDEX CONTOURS
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE
OVERHEAD ELECTRIC LINE
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE
MAGNITUDE & DIRECTION OF SLOPE

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Last Saved: 1/13/2021
Plotted On:Jan 13, 2021-11:52pm By: AGilchrist
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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug
Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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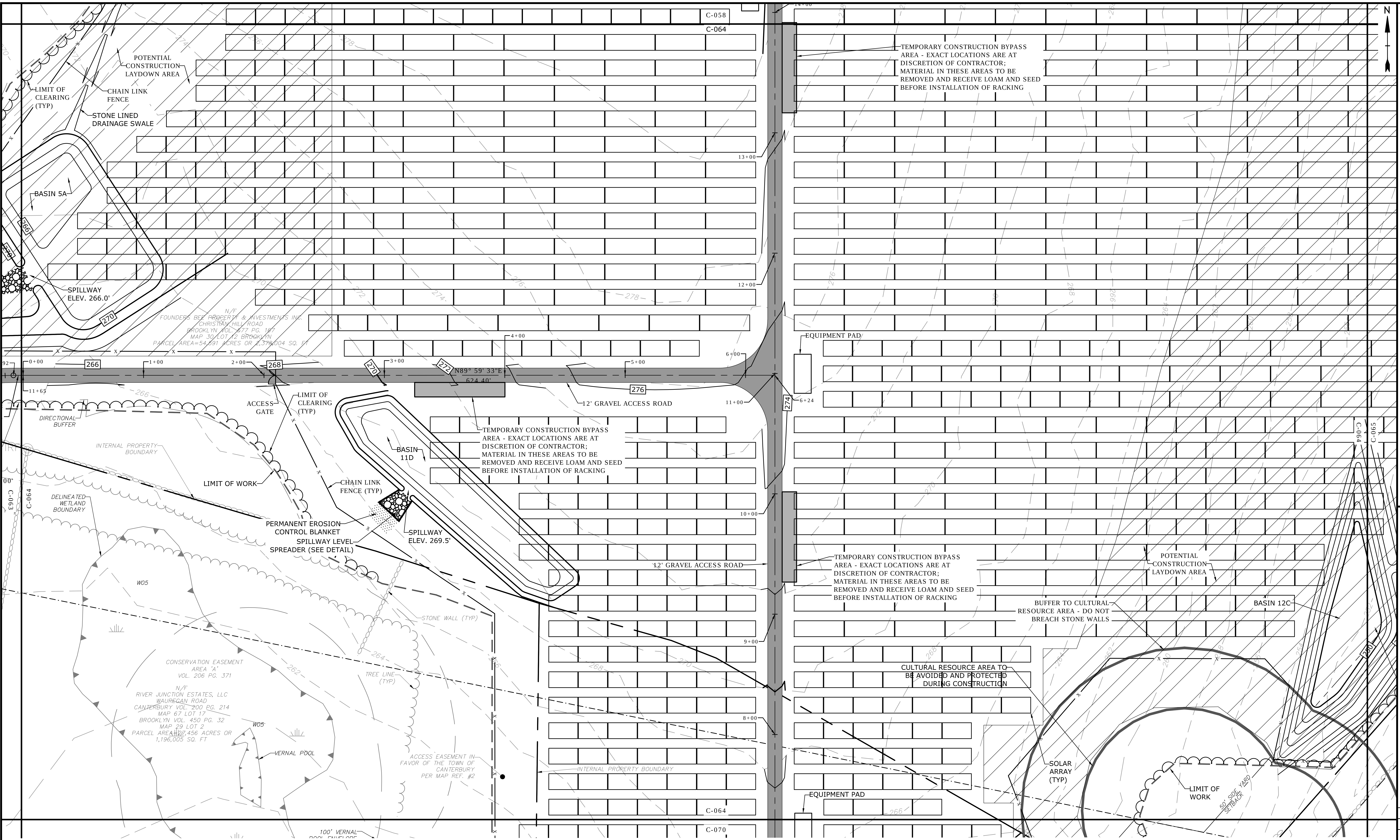
MARK	DATE	DESCRIPTION

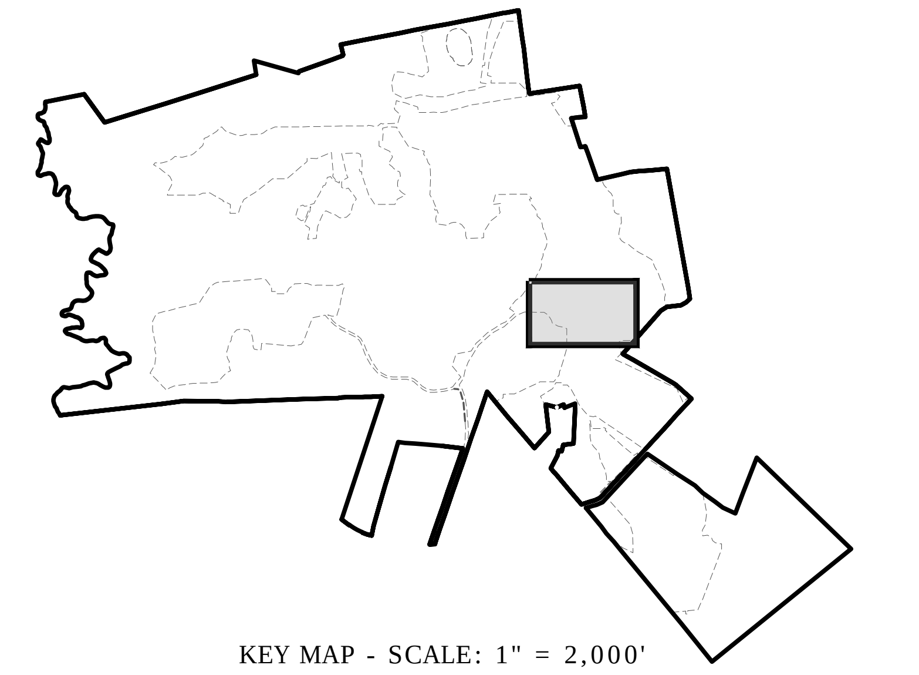
PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 22

SCALE: 1" = 40'

C-063





KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M Caceci
01/15/21

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APPROVED:	FJH

PROPOSED CONDITIONS - 23

SCALE: 1" = 40'

C-064

Last Saved: 1/13/2021
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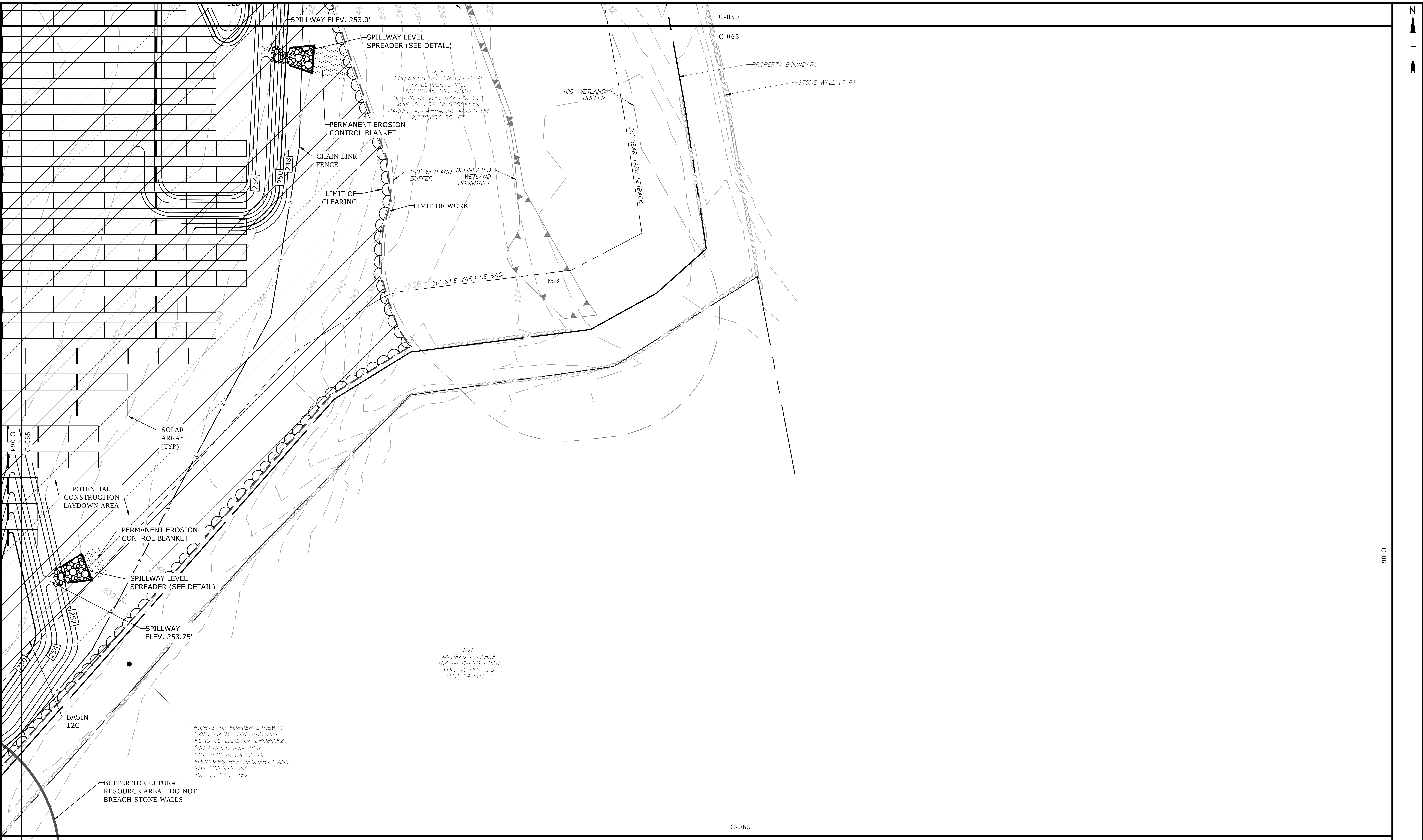
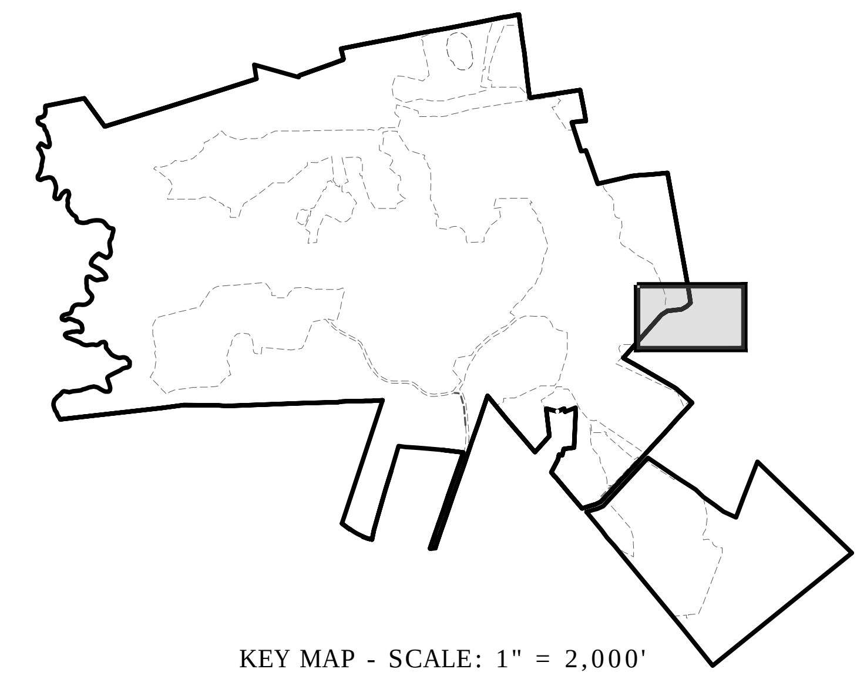


C-071



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 24

SCALE: 1" = 40'

C-065

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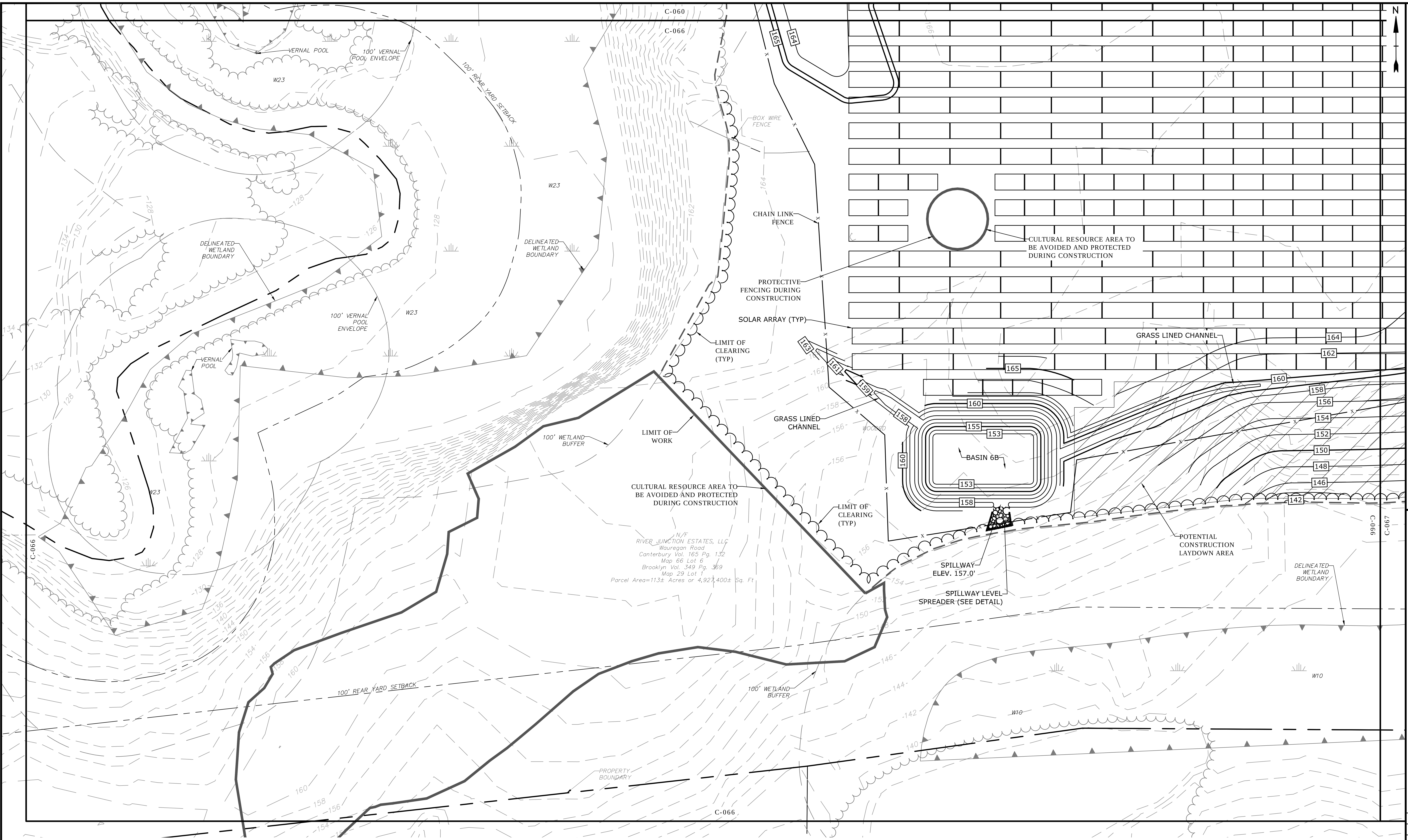

Tighe&Bond

No. 31180

1-15-21

No. 33828

JACLYN M. CACECI

01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE

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FILE:	Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 25

SCALE: 1" = 40'

C-066

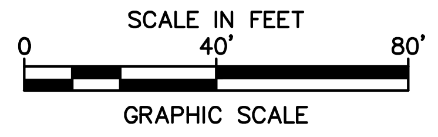
LEGEND

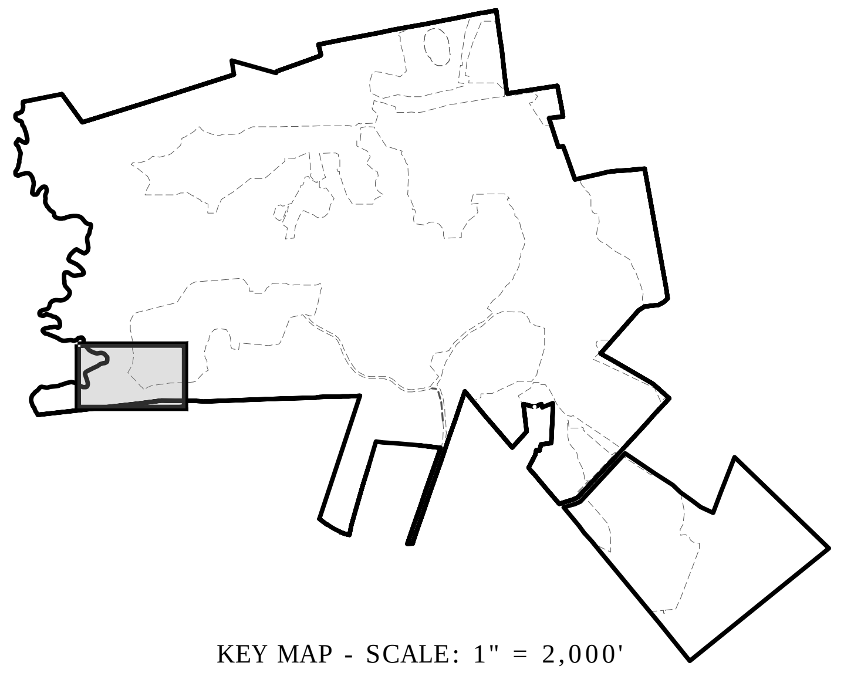
PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.





KEY MAP - SCALE: 1" = 2,000'

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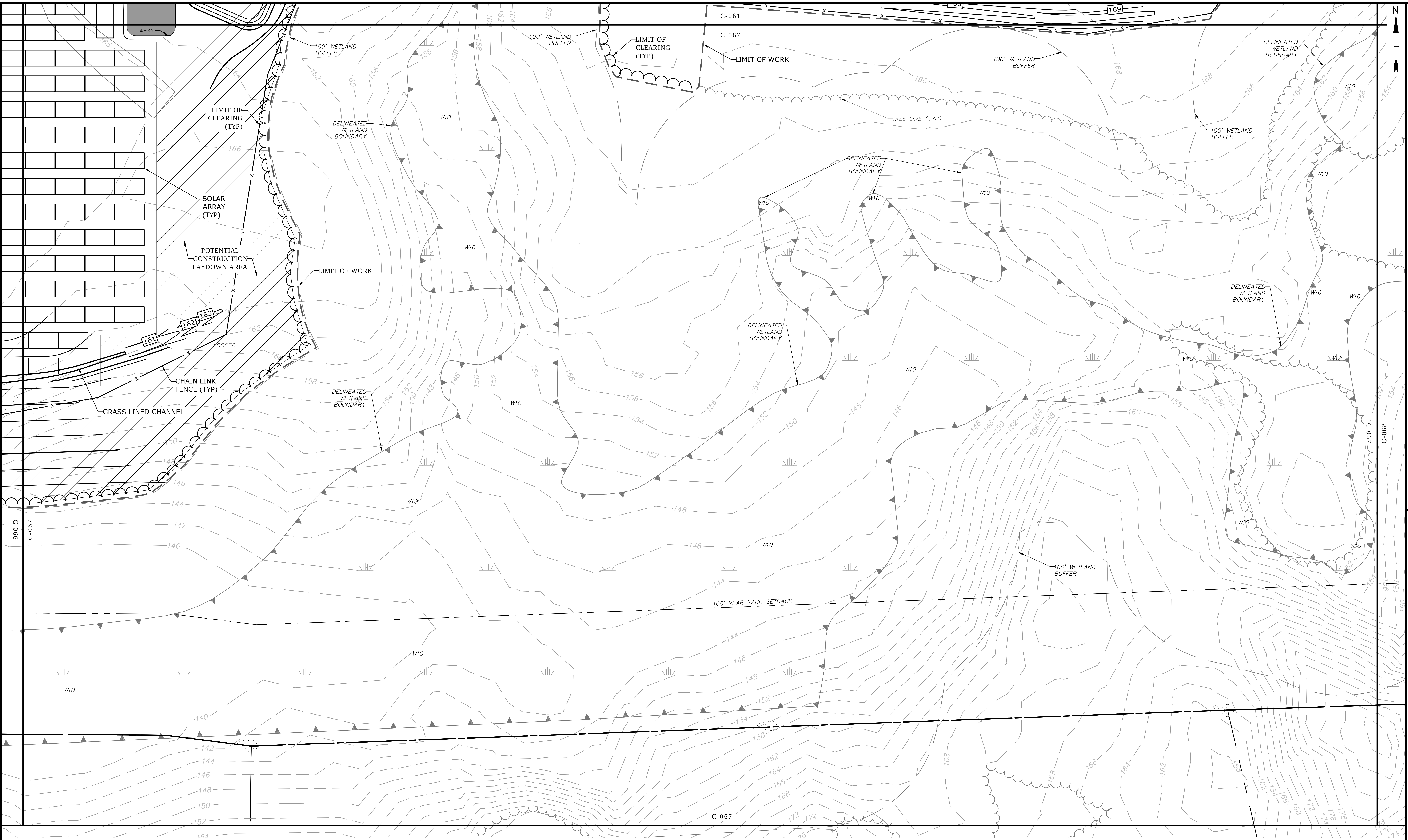

Tighe&Bond

STATE OF CONNECTICUT BRIAN S. HUNTLEY No. 31180 LICENSED PROFESSIONAL ENGINEER

1-15-21

STATE OF CONNECTICUT JACLYN M. CACECI NO. 33828 LICENSED PROFESSIONAL ENGINEER

Jaclyn M. Caceci 01/15/21

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Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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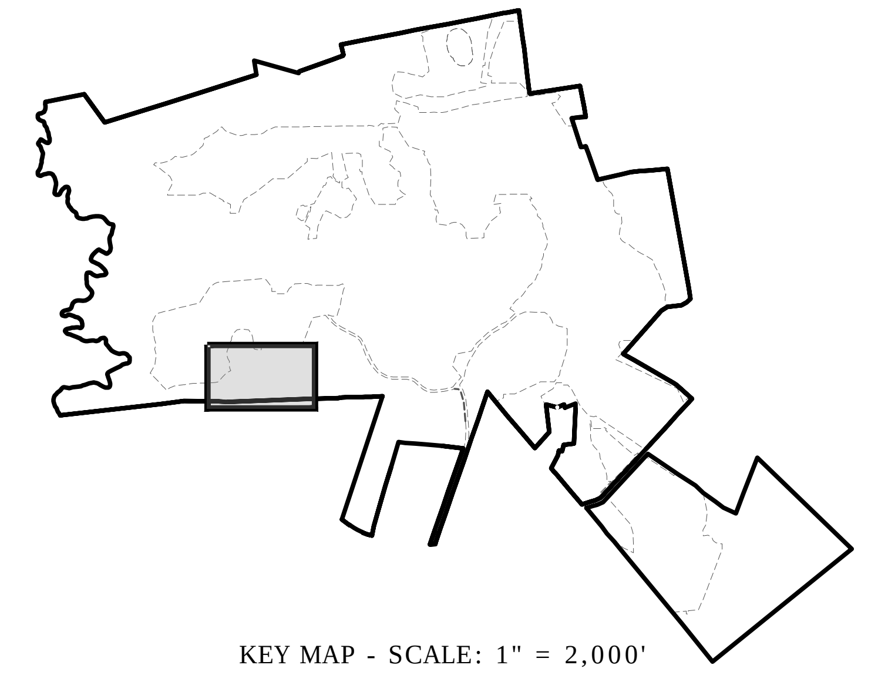
MARK	DATE	DESCRIPTION

PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 26

SCALE: 1" = 40'

C-067



KEY MAP - SCALE: 1" = 2,000'

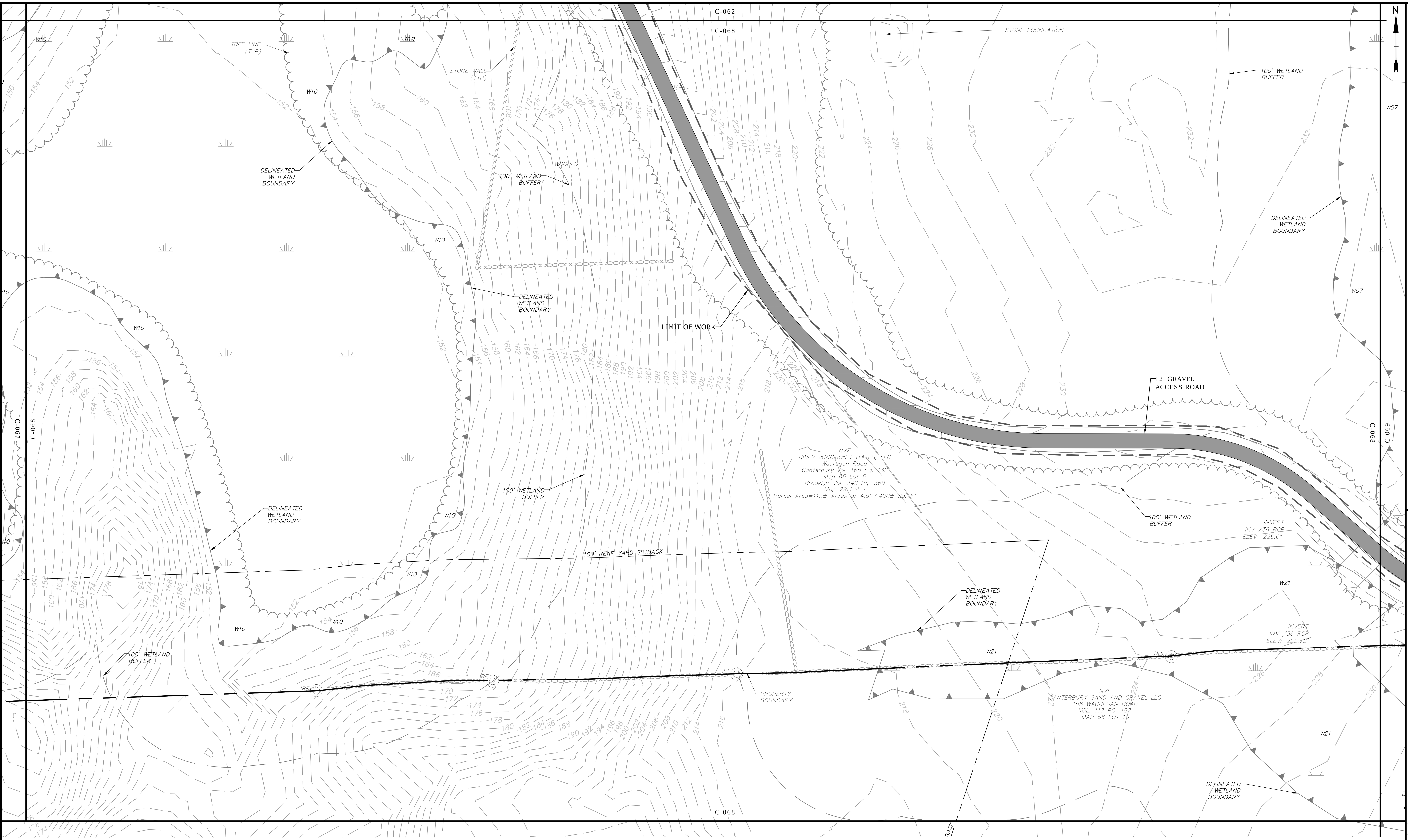
LEGEND

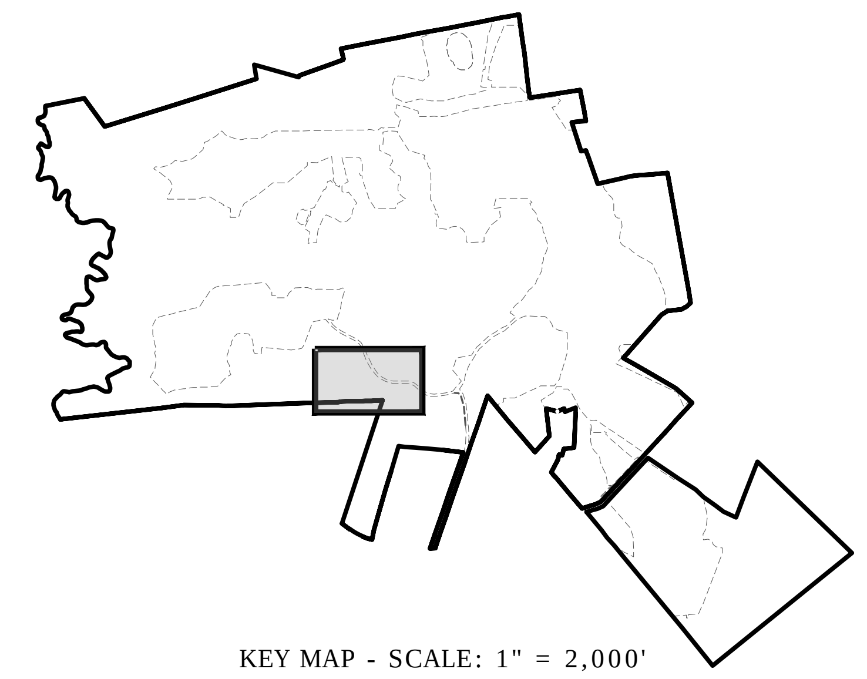
PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
EASEMENT LINE		STONE WALL		TIER 2 PLANTINGS	
EXISTING INTERMEDIATE CONTOURS	124	WETLAND BUFFER		TIER 3 PLANTINGS	
EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☆
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	▨	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒		
CHAIN LINK FENCE	×—×	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE					

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Last Saved: 1/13/2021
Plotted On:Jan 13, 2021-11:54pm By: AGilchrist
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-2_Quinebaug\Drawings_Figures\AutoCAD\Sheet\Construction Drawings\Quinebaug Proposed Conditions - CD2.dwg




KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE
HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA
WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY No. 31180
1-15-21

JACLYN M. CACCIO NO. 33828
Jaclyn M. Caccio
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn & Canterbury, Connecticut

VERIFY SCALE
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

MARK	DATE	DESCRIPTION

PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 27

SCALE: 1" = 40'

C-068

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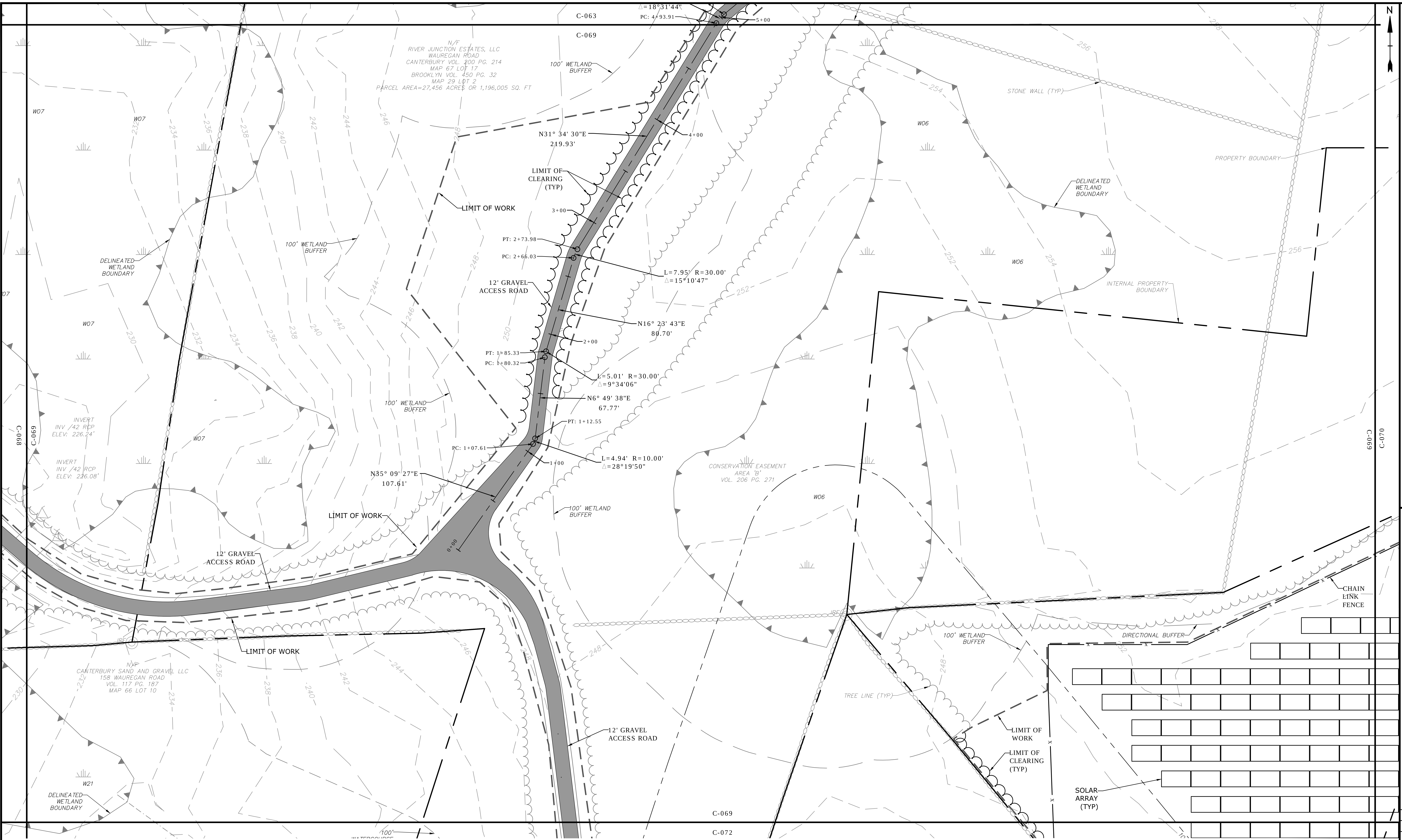

Tighe&Bond

No. 31180
1-15-21

No. 33828
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn & Canterbury, Connecticut

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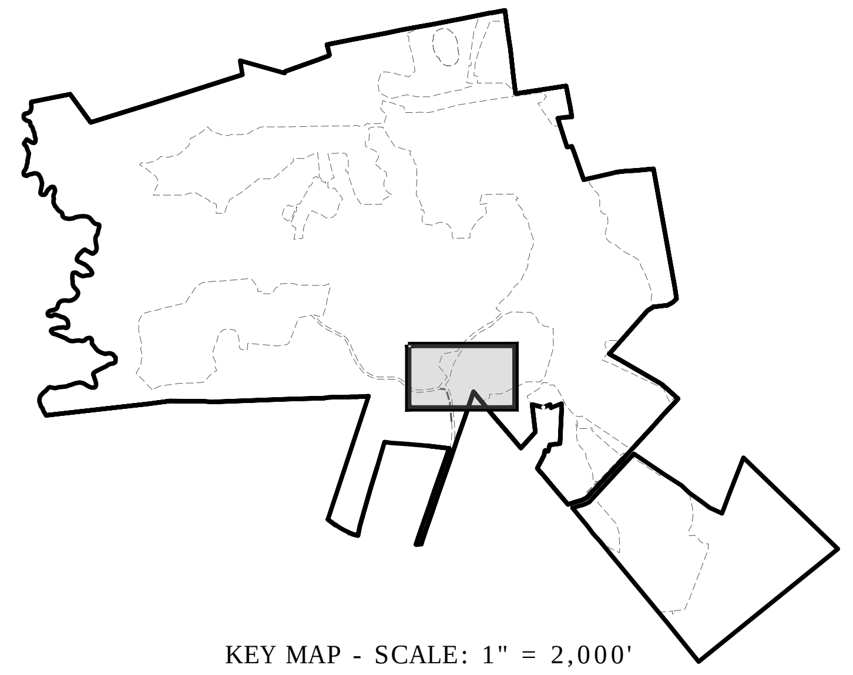
PROJECT NO:	R0317
DATE:	01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg	
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 28

SCALE: 1" = 40'

C-069



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	✕
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☆
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Last Saved: 1/13/2021
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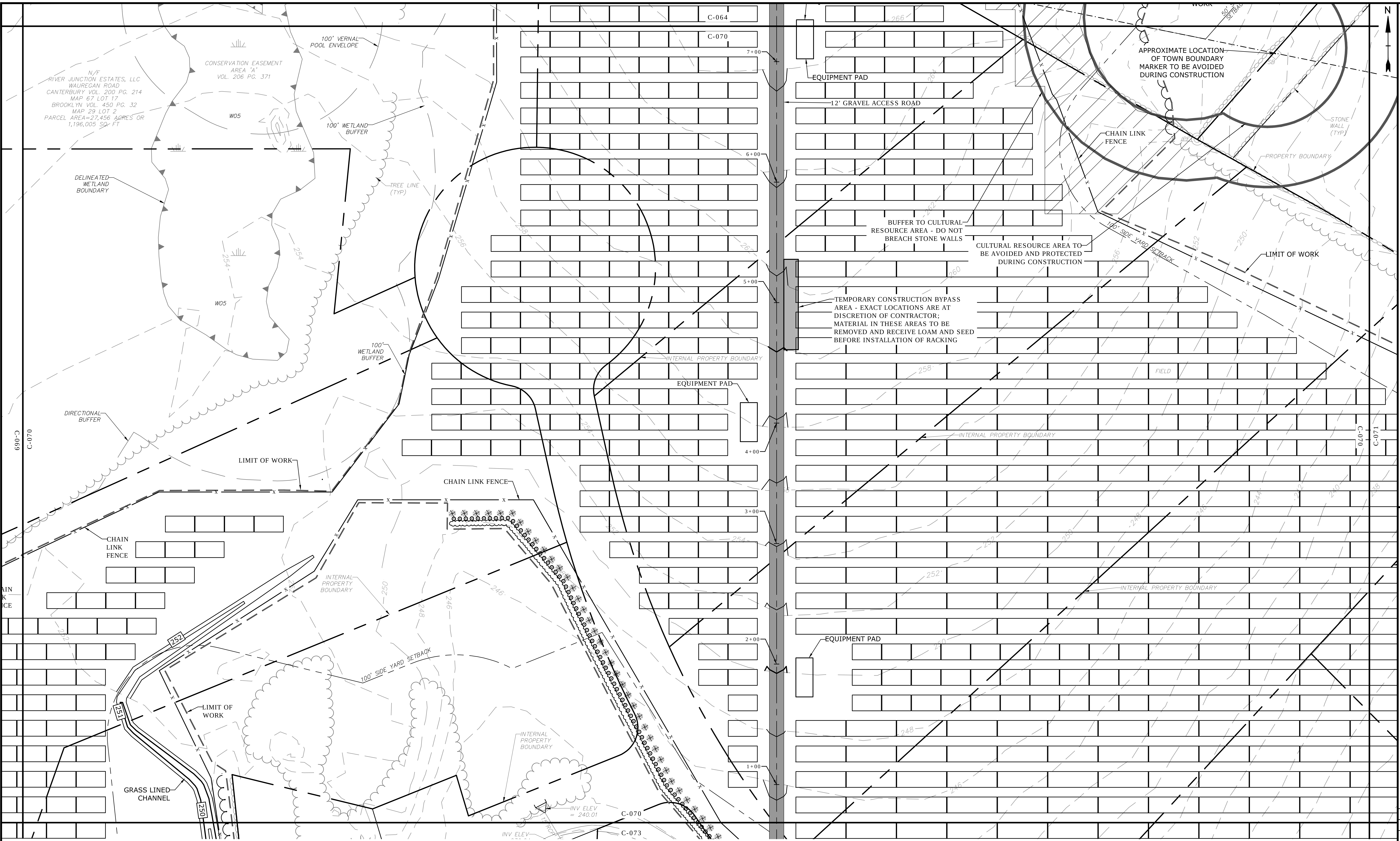
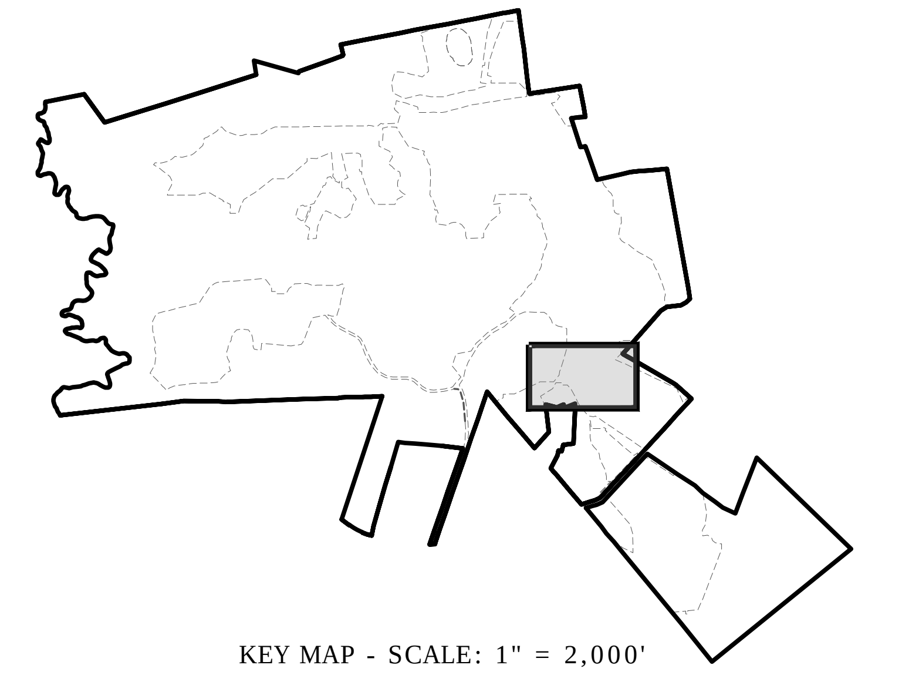
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-2_Quinebaug\Drawings_Figures\AutoCAD\Sheet\Construction Drawings\Quinebaug Proposed Conditions - CD2.dwg




KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE
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CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
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WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
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CONSTRUCTION LAYDOWN AREA
WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

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SCALE IN FEET
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GRAPHIC SCALE

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Tighe&Bond

BRIAN S. HUNTER
No. 31180
1-15-21

JACLYN M. CACCIO
NO. 33828
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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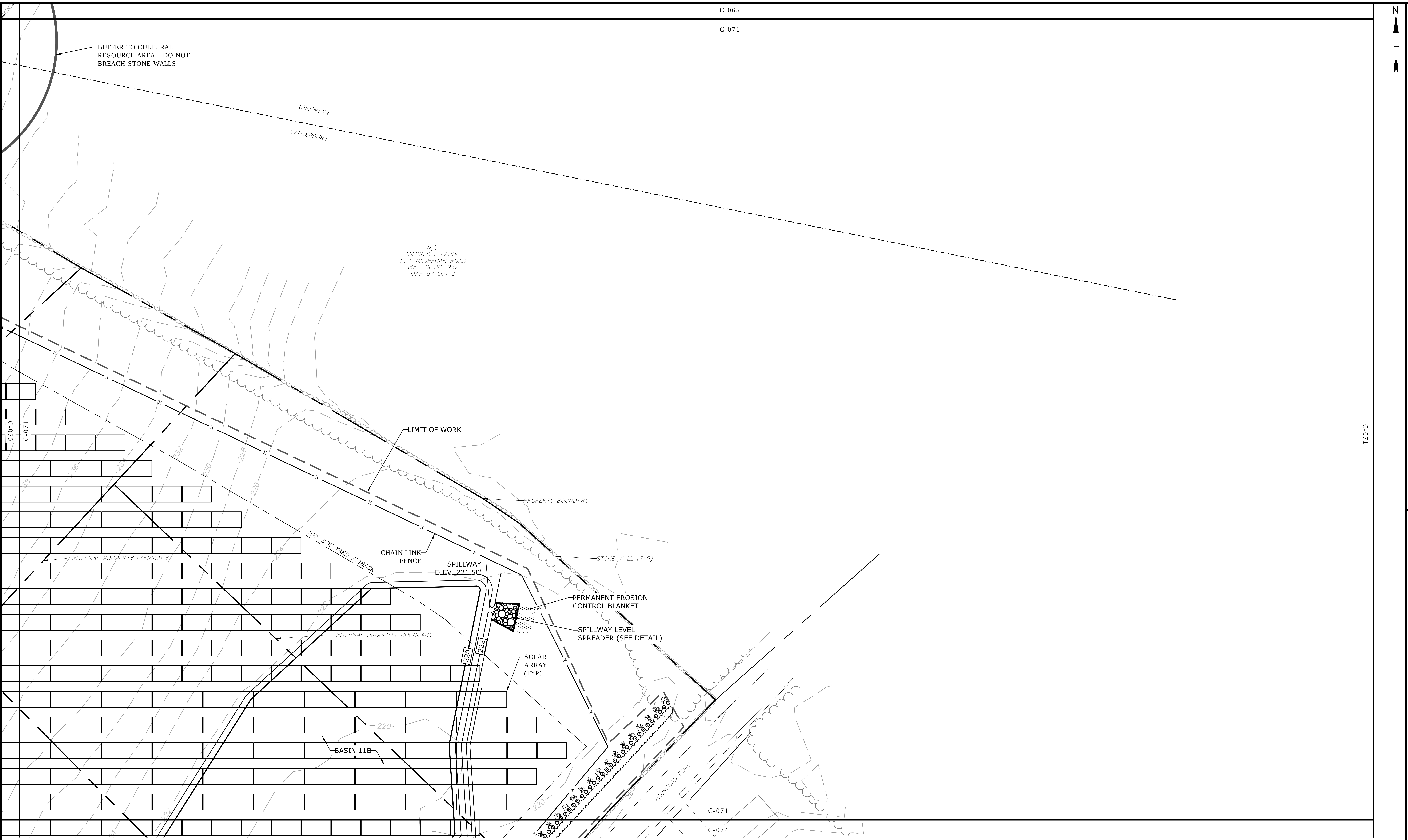
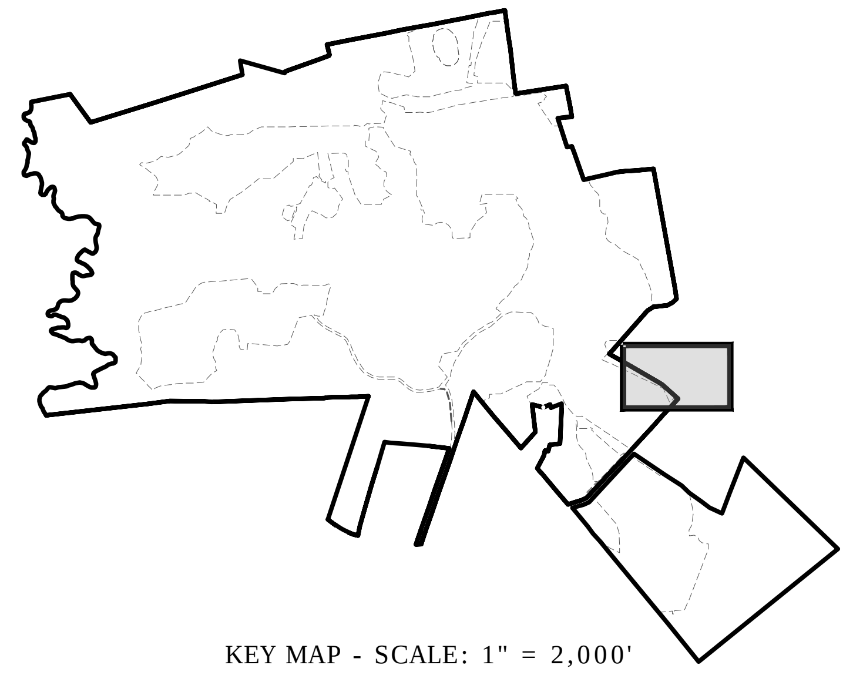
PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 29

SCALE: 1" = 40'

C-070





KEY MAP - SCALE: 1" = 2,000'

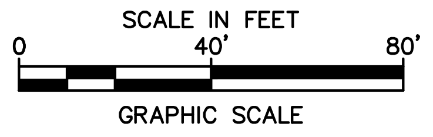
LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS 124
EXISTING INDEX CONTOURS 120
PROPOSED INTERMEDIATE CONTOURS 222
PROPOSED INDEX CONTOURS 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE E
OVERHEAD ELECTRIC LINE OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE 262.69
MAGNITUDE & DIRECTION OF SLOPE 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.



Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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PROJECT NO:	R0317
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FILE:	Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 30

SCALE: 1" = 40'

C-071

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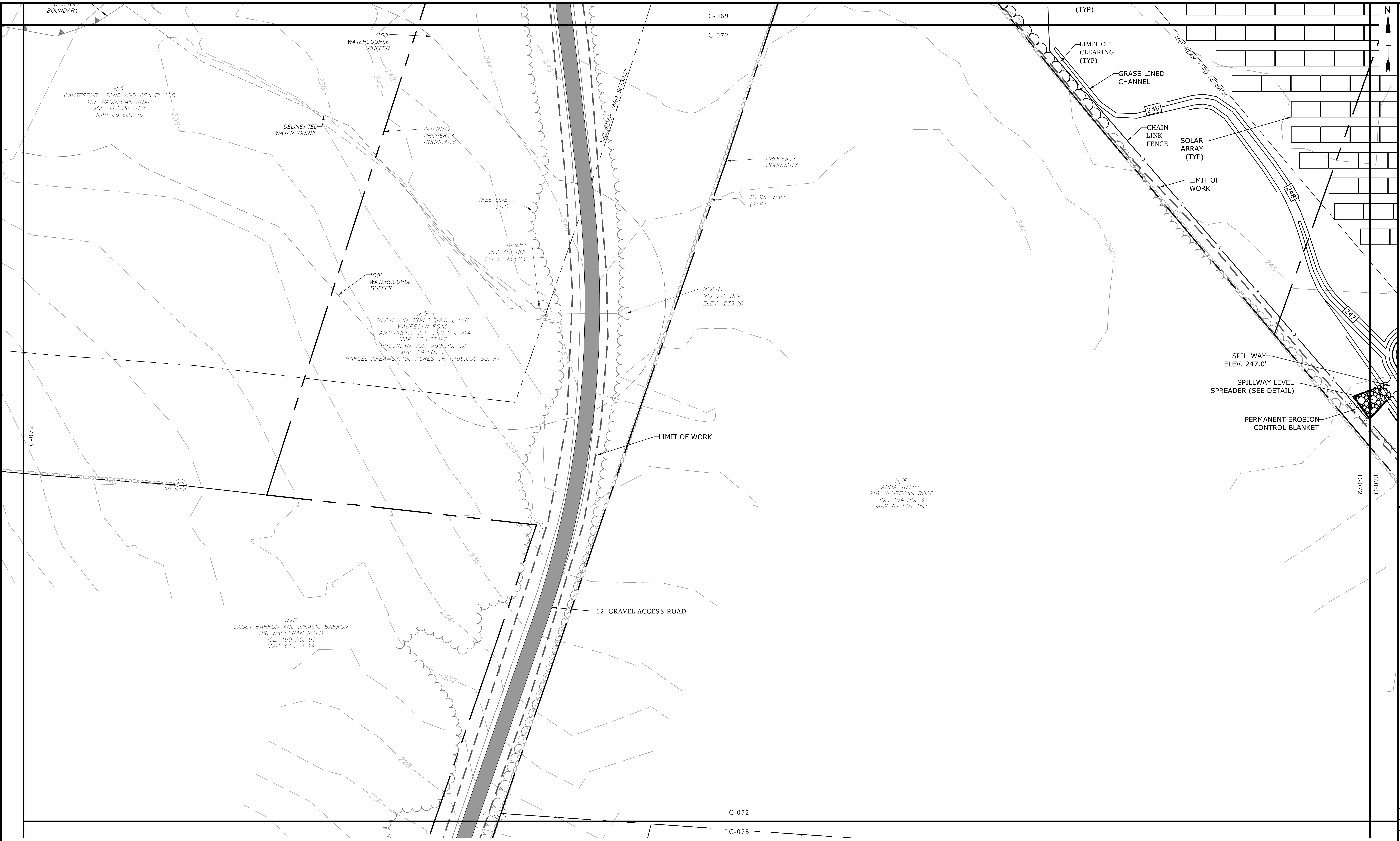

Tighe&Bond

STATE OF CONNECTICUT
BRIAN S. HUNTLEY
No. 31180
LICENSED PROFESSIONAL ENGINEER
1-15-21

STATE OF CONNECTICUT
JACLYN M. CACECI
NO. 33828
LICENSED PROFESSIONAL ENGINEER
Jaclyn M Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
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Connecticut

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DATE:	01/2021
FILE:	Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 31

SCALE: 1" = 40'

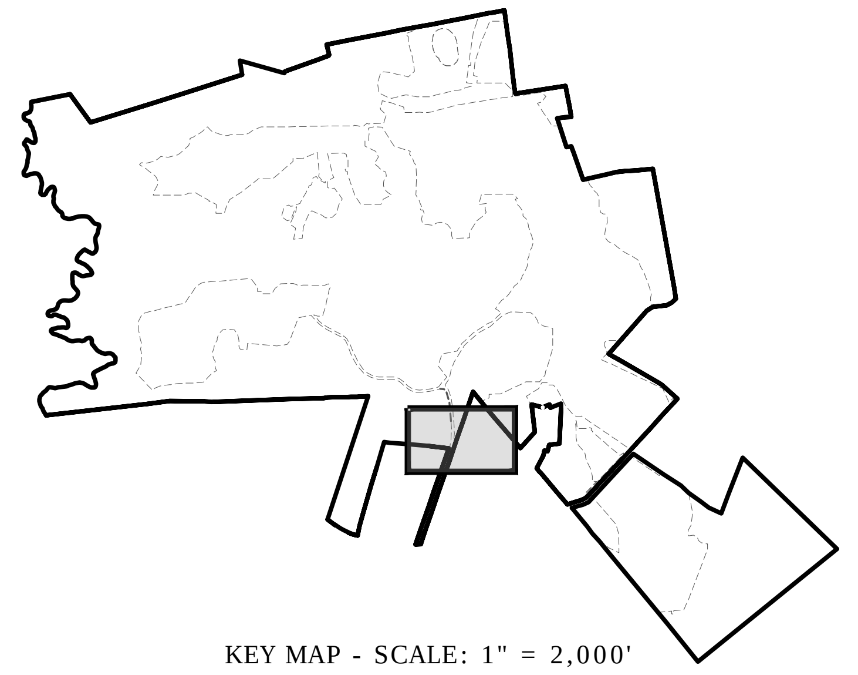
C-072

LEGEND

PROPERTY LINE		HERPETOFAUNA PROTECTION AREA		WETLAND	
PROPERTY LINE SETBACK		CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION		TIER 1 PLANTINGS	
EASEMENT LINE		STONE WALL		TIER 2 PLANTINGS	
EXISTING INTERMEDIATE CONTOURS	124	WETLAND BUFFER		TIER 3 PLANTINGS	
EXISTING INDEX CONTOURS	120	WATERCOURSE BUFFER		UTILITY POLE	
PROPOSED INTERMEDIATE CONTOURS	222	DELINEATED WATERCOURSE		LIGHT POLE	☼
PROPOSED INDEX CONTOURS	220	VERNAL POOL		FLARED END SECTION	
GRAVEL ROAD/DRIVEWAY		DELINEATED WETLAND		SPOT GRADE	262.69
UNDERGROUND ELECTRIC LINE	E	REMOVE/REMOVE AND DISPOSE	▨	MAGNITUDE & DIRECTION OF SLOPE	2%
OVERHEAD ELECTRIC LINE	OHW	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒		
CHAIN LINK FENCE	✕	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨		
LIMITS OF WORK		CONSTRUCTION LAYDOWN AREA	▨		
TOWN BOUNDARY					
TREE LINE					
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE					

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE



KEY MAP - SCALE: 1" = 2,000'

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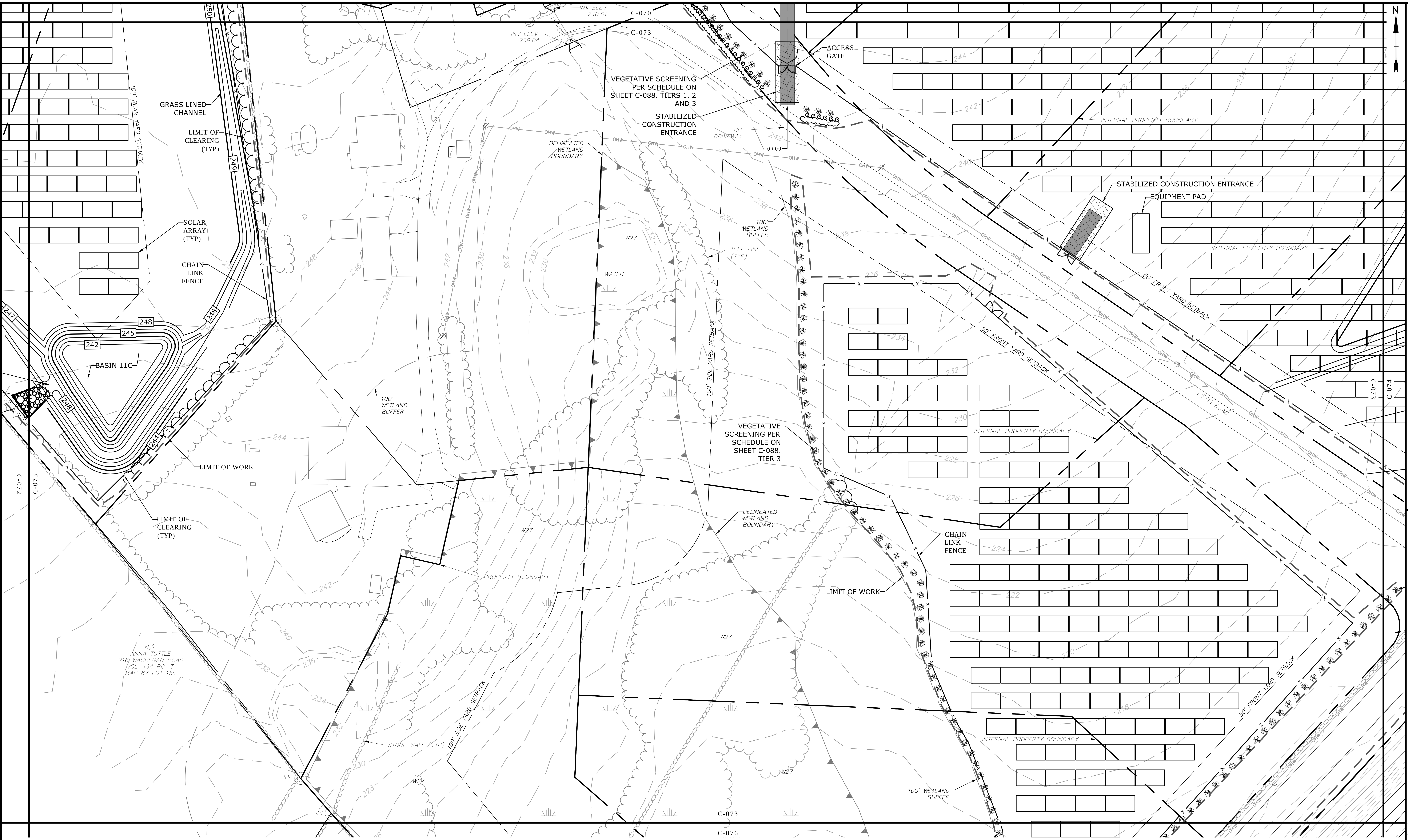

Tighe&Bond

BRIAN S. HUNTLEY No. 31180

1-15-21

JACLYN M. CACECI No. 33828

01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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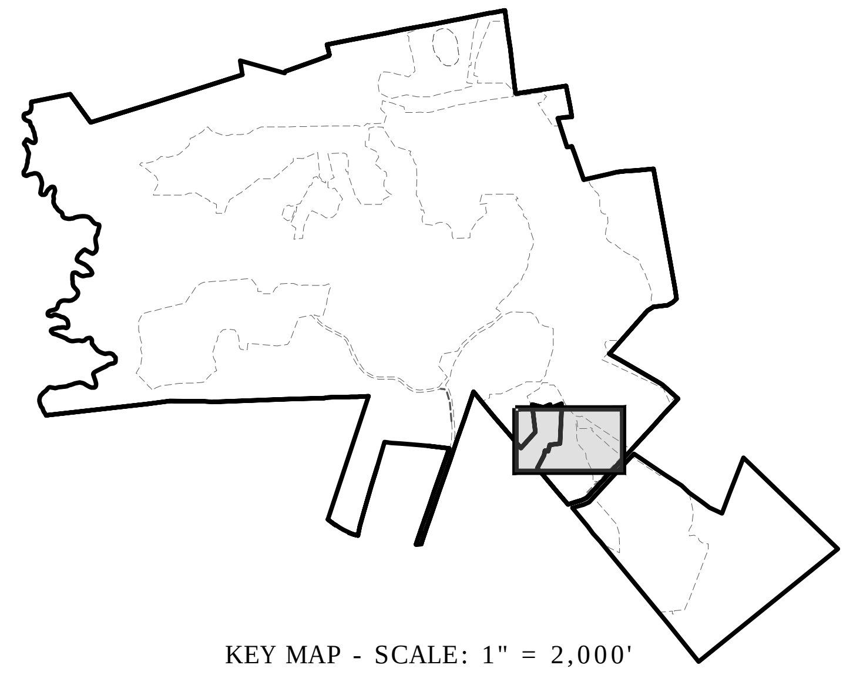
FILE: Quinebaug Proposed Conditions - CD2.dwg	
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 32

SCALE: 1" = 40'

C-073



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	✕ ✕
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	//////
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☼
FLARED END SECTION	
SPOT GRADE	+ 262.69
MAGNITUDE & DIRECTION OF SLOPE	← 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Last Saved: 1/13/2021
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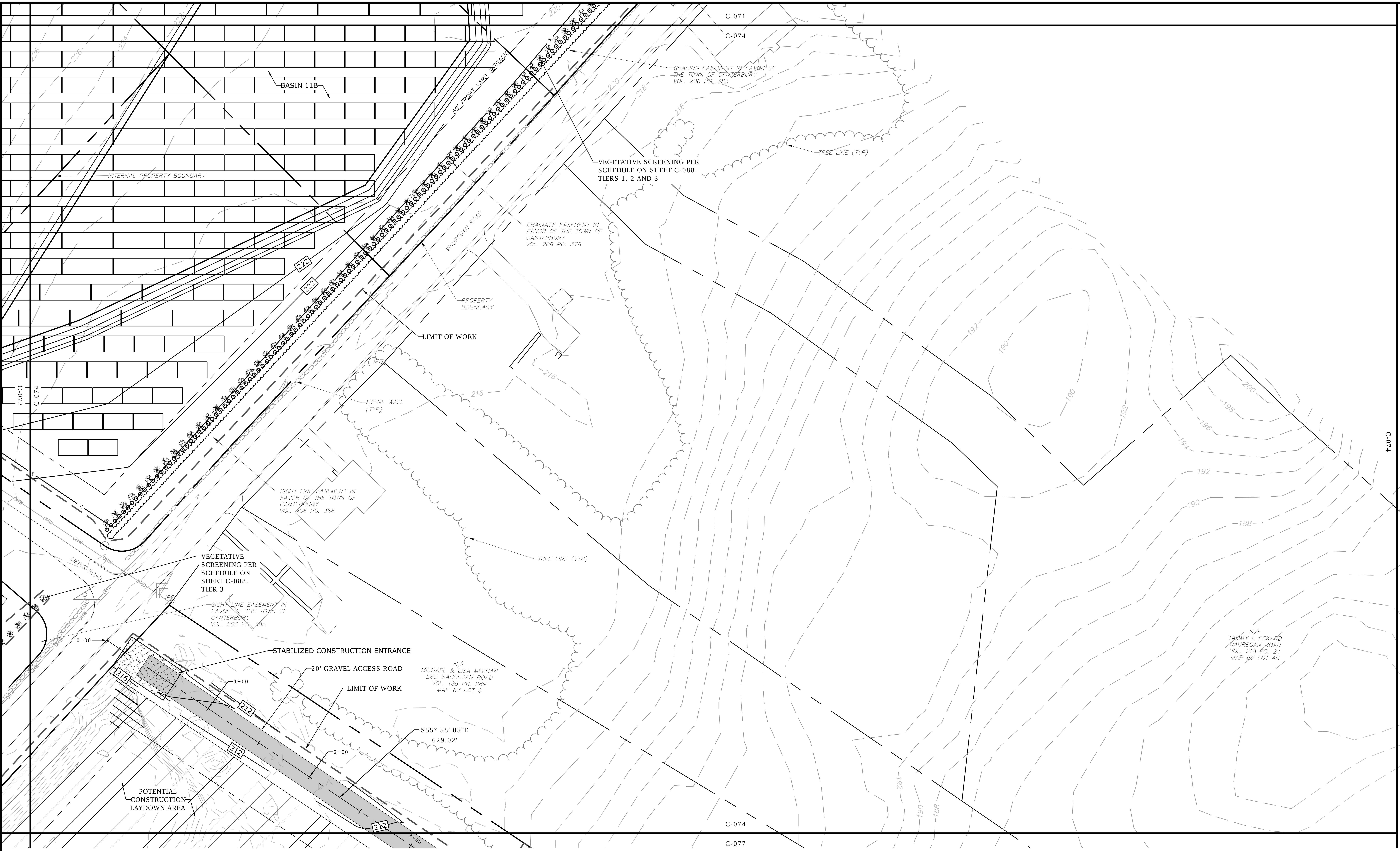

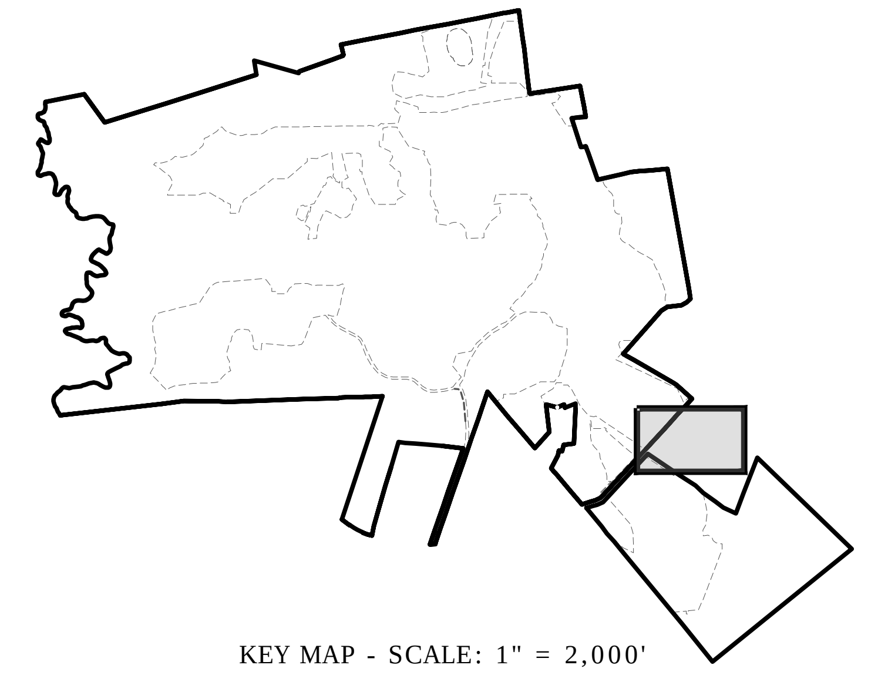

KEY MAP - SCALE: 1" = 2,000'

LEGEND

- PROPERTY LINE
- PROPERTY LINE SETBACK
- EASEMENT LINE
- EXISTING INTERMEDIATE CONTOURS — 124
- EXISTING INDEX CONTOURS — 120
- PROPOSED INTERMEDIATE CONTOURS — 222
- PROPOSED INDEX CONTOURS — 220
- GRAVEL ROAD/DRIVEWAY
- UNDERGROUND ELECTRIC LINE — E
- OVERHEAD ELECTRIC LINE — OHW
- CHAIN LINK FENCE
- LIMITS OF WORK
- TOWN BOUNDARY
- TREE LINE
- DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE
- HERPETOFAUNA PROTECTION AREA
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- STONE WALL
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- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- REMOVE/REMOVE AND DISPOSE
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- AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
- CONSTRUCTION LAYDOWN AREA
- WETLAND
- TIER 1 PLANTINGS
- TIER 2 PLANTINGS
- TIER 3 PLANTINGS
- UTILITY POLE
- LIGHT POLE
- FLARED END SECTION
- SPOT GRADE — 262.69
- MAGNITUDE & DIRECTION OF SLOPE — 2%

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GRAPHIC SCALE

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Tighe&Bond

BRIAN S. HUNTLEY No. 31180
1-15-21

JACLYN M. CACECI NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

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DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 33

SCALE: 1" = 40'

C-074

Tighe&Bond

STATE OF CONNECTICUT
BRIAN S. HUNTLEY
No. 31180
LICENSED
PROFESSIONAL ENGINEER
1-15-21

STATE OF CONNECTICUT
JACLYN M. CACECI
NO. 33828
LICENSED
PROFESSIONAL ENGINEER
Jaclyn M Caceci
01/15/21

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Quinebaug
Solar, LLC

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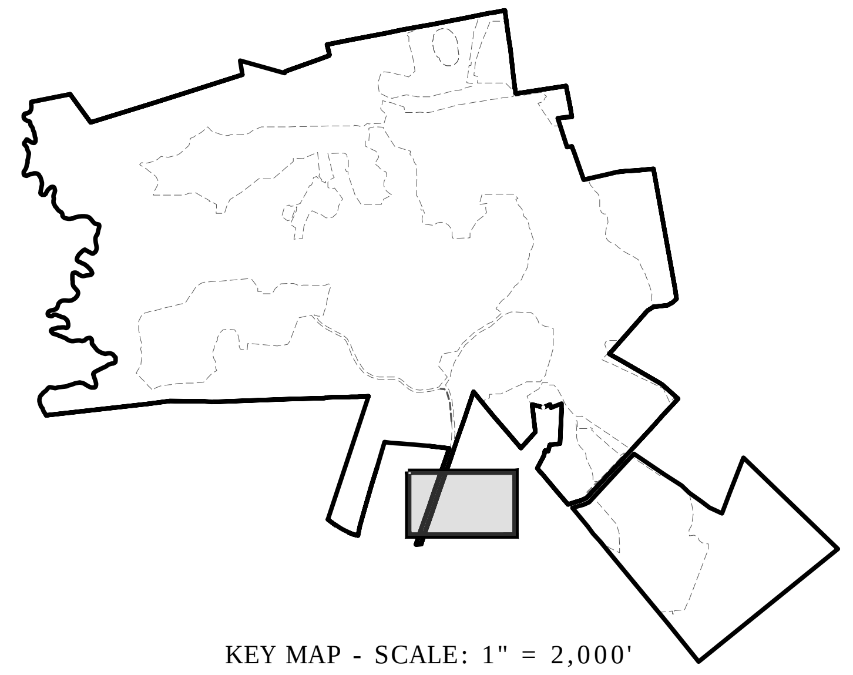
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 34

SCALE: 1" = 40'

C-075



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS (124)
EXISTING INDEX CONTOURS (120)
PROPOSED INTERMEDIATE CONTOURS (222)
PROPOSED INDEX CONTOURS (220)
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE (E)
OVERHEAD ELECTRIC LINE (OHW)
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
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CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE (262.69)
MAGNITUDE & DIRECTION OF SLOPE (2%)

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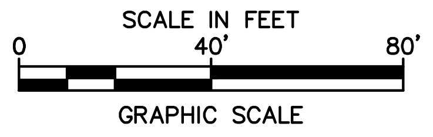

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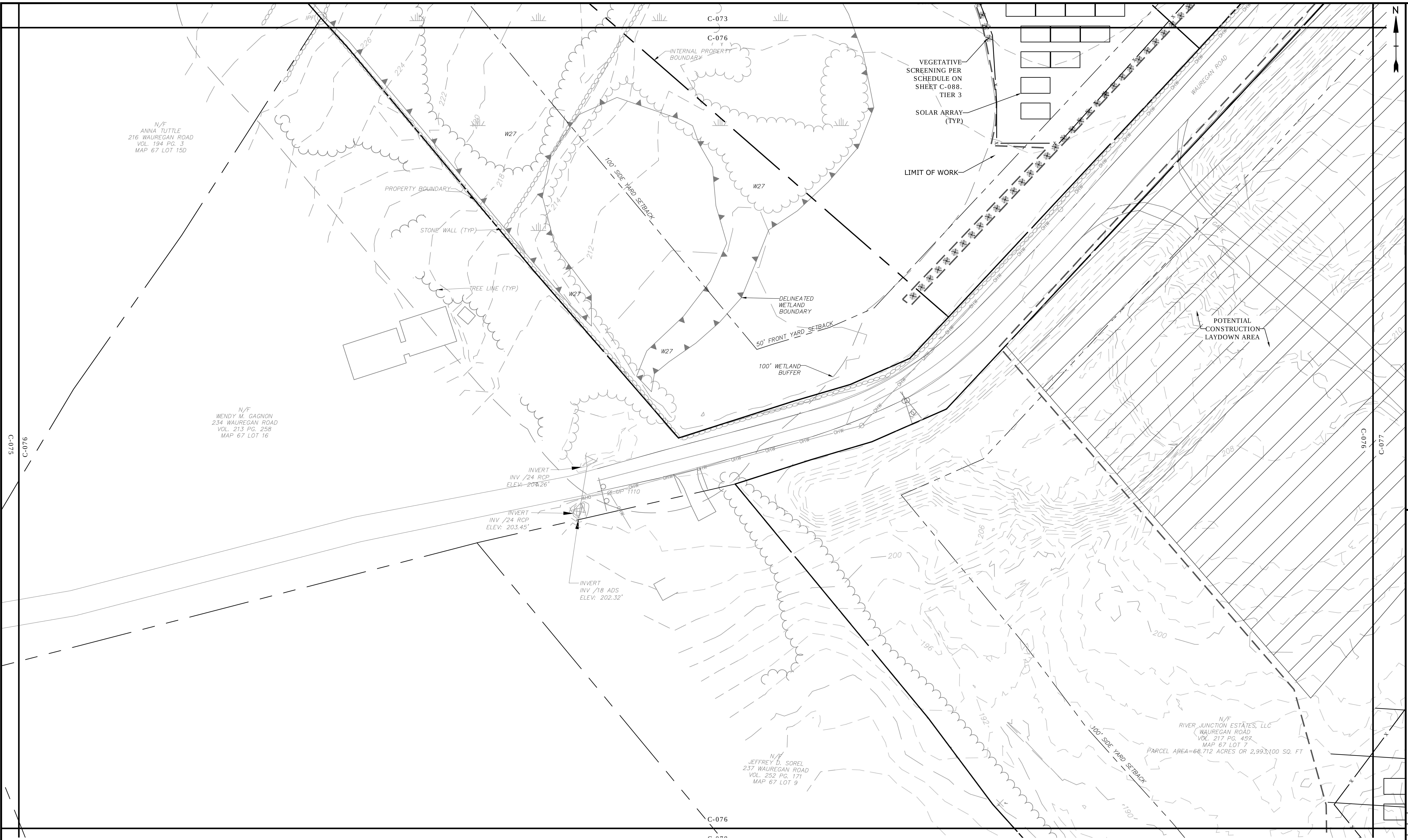

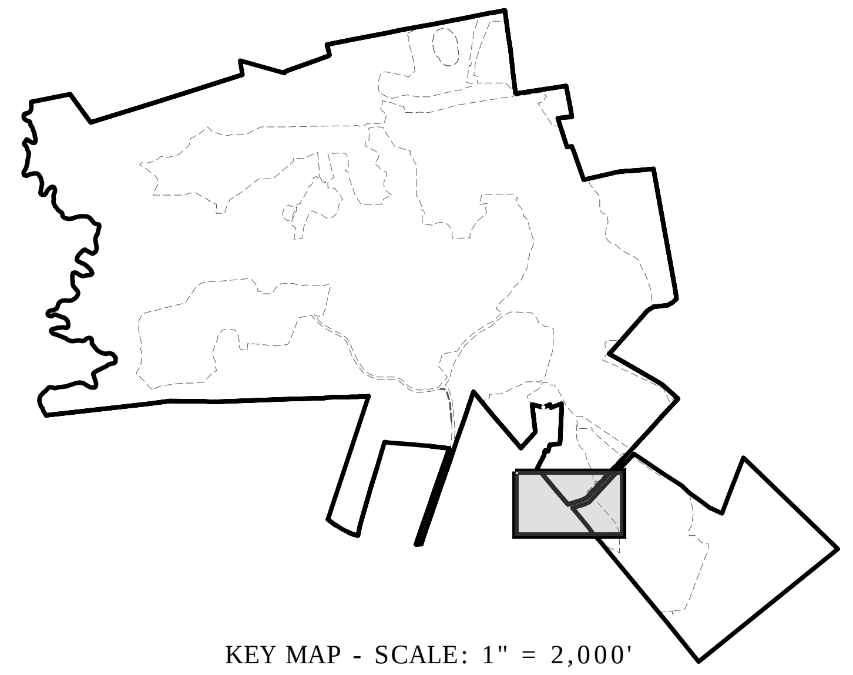
KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
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GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
REMOVE/REMOVE AND DISPOSE
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE
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0 ▬▬▬ 1 INCH
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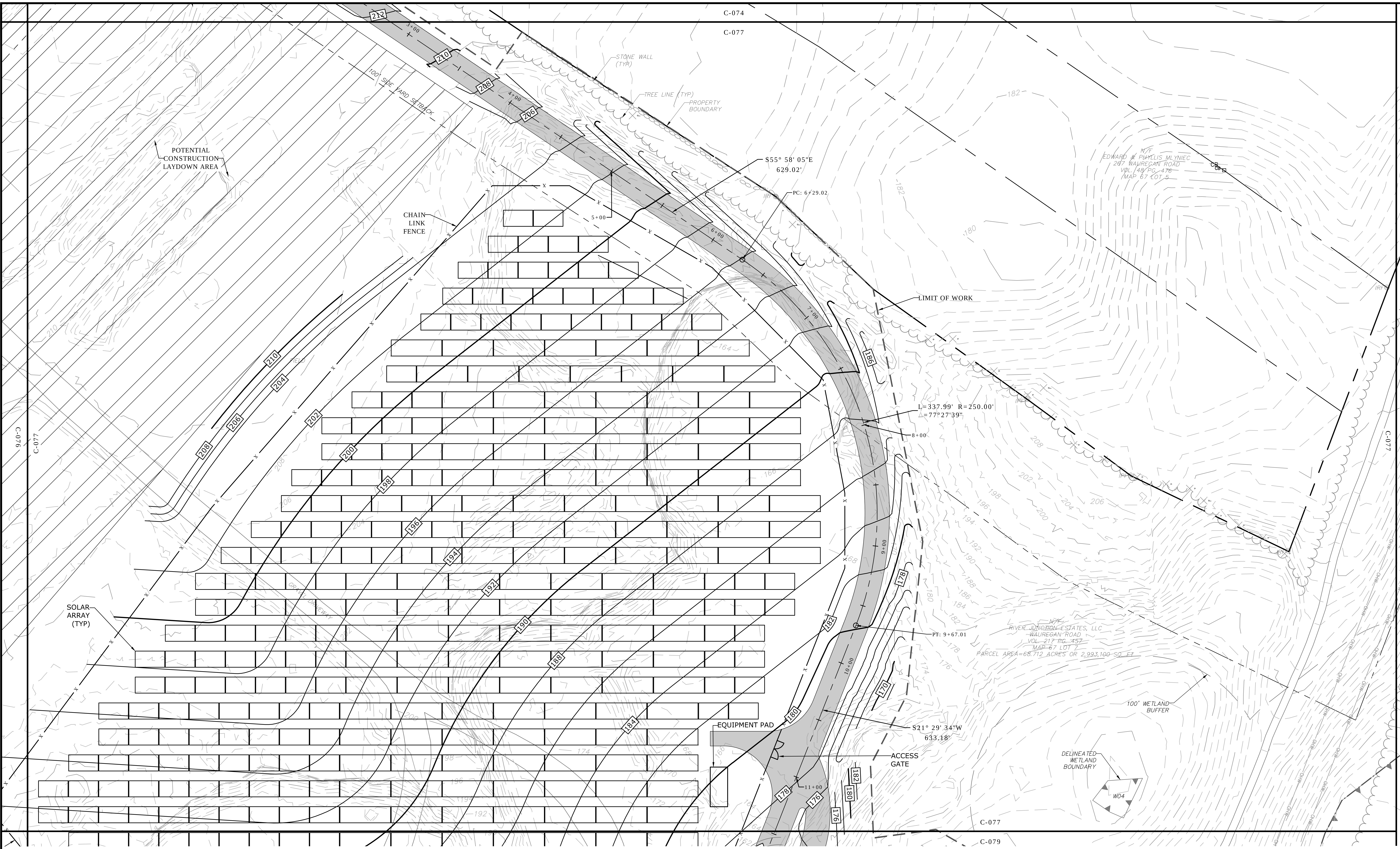
MARK	DATE	DESCRIPTION

PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Proposed Conditions - CD2.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

PROPOSED CONDITIONS - 35

SCALE: 1" = 40'

C-076



Tighe&Bond

STATE OF CONNECTICUT BRIAN S. HUNTLEY No. 31180 LICENSED PROFESSIONAL ENGINEER
1-15-21

STATE OF CONNECTICUT JACLYN M. CACECI NO. 33828 LICENSED PROFESSIONAL ENGINEER
Jaclyn M Caceci 01/15/21

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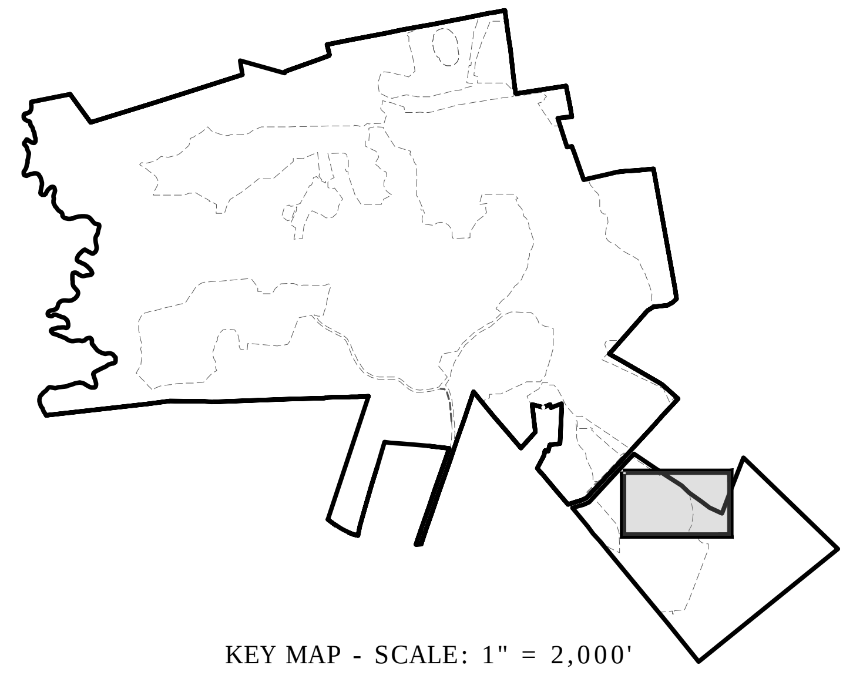
APPROVED:	FJH

PROPOSED CONDITIONS - 36

SCALE: 1" = 40'

C-077



KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE
PROPERTY LINE SETBACK
EASEMENT LINE
EXISTING INTERMEDIATE CONTOURS — 124
EXISTING INDEX CONTOURS — 120
PROPOSED INTERMEDIATE CONTOURS — 222
PROPOSED INDEX CONTOURS — 220
GRAVEL ROAD/DRIVEWAY
UNDERGROUND ELECTRIC LINE — E
OVERHEAD ELECTRIC LINE — OHW
CHAIN LINK FENCE
LIMITS OF WORK
TOWN BOUNDARY
TREE LINE
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE

HERPETOFAUNA PROTECTION AREA
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION
STONE WALL
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AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL
CONSTRUCTION LAYDOWN AREA

WETLAND
TIER 1 PLANTINGS
TIER 2 PLANTINGS
TIER 3 PLANTINGS
UTILITY POLE
LIGHT POLE
FLARED END SECTION
SPOT GRADE — 262.69
MAGNITUDE & DIRECTION OF SLOPE — 2%

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SCALE IN FEET
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GRAPHIC SCALE

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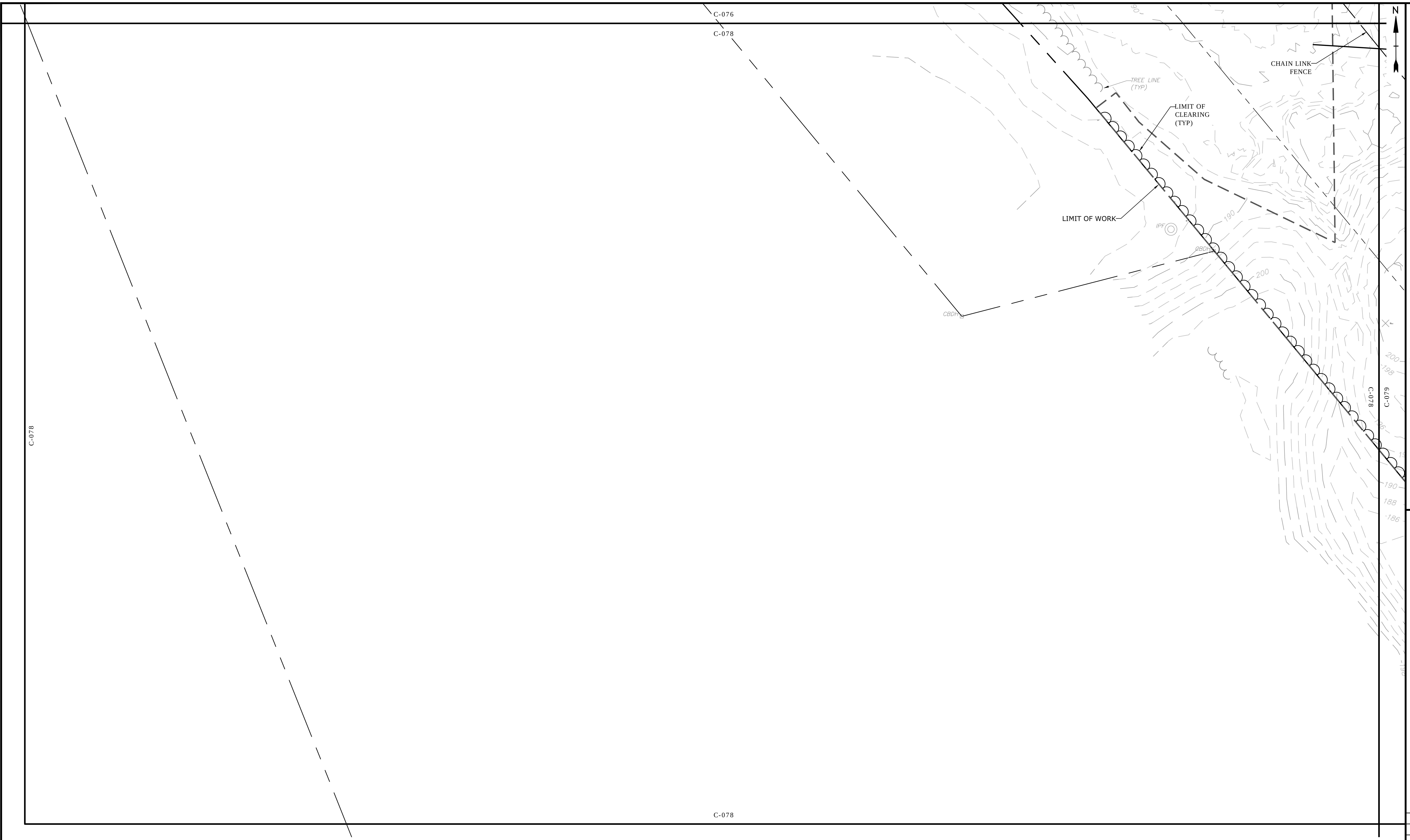

Tighe&Bond

STATE OF CONNECTICUT
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LICENSED PROFESSIONAL ENGINEER
1-15-21

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JACLYN M. CACECI
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Jaclyn M. Caceci
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Brooklyn &
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CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 37

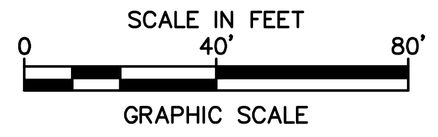
SCALE: 1" = 40'

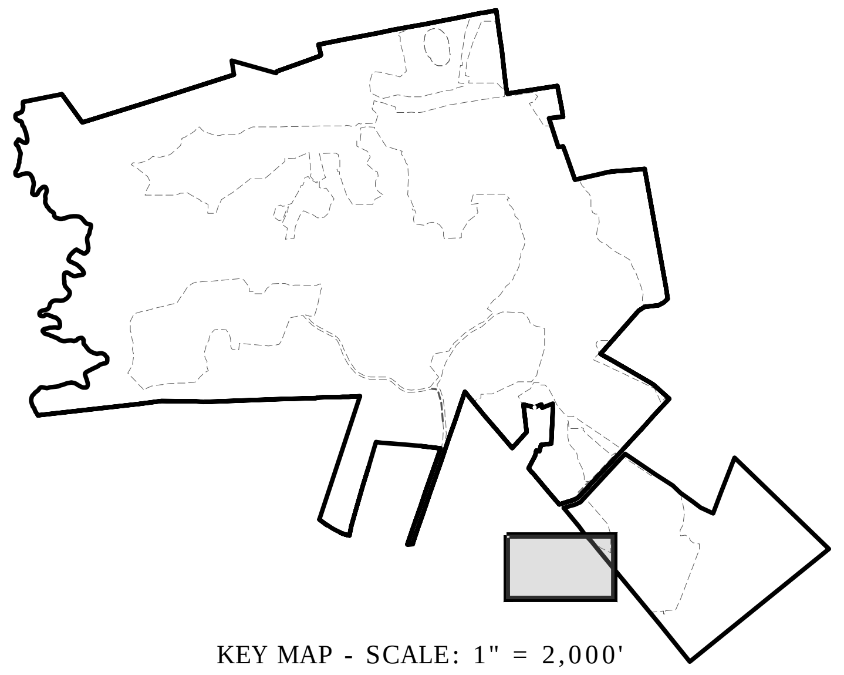
C-078

LEGEND

PROPERTY LINE	—— – – ——	HERPETOFAUNA PROTECTION AREA	▬▬▬	WETLAND	⩛ ⩛ ⩛
PROPERTY LINE SETBACK	—— - - ——	CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	▬▬▬	TIER 1 PLANTINGS	︵︵︵︵
EASEMENT LINE	—— ——	STONE WALL	○○○○○○	TIER 2 PLANTINGS	⊙
EXISTING INTERMEDIATE CONTOURS	— — 124 — —	WETLAND BUFFER	—— ——	TIER 3 PLANTINGS	✳
EXISTING INDEX CONTOURS	—— 120 ——	WATERCOURSE BUFFER	— — — —	UTILITY POLE	⚲
PROPOSED INTERMEDIATE CONTOURS	—— 222 ——	DELINEATED WATERCOURSE	— · — · —	LIGHT POLE	☆
PROPOSED INDEX CONTOURS	—— 220 ——	VERNAL POOL	—▲—▲—▲—	FLARED END SECTION	⏢
GRAVEL ROAD/DRIVEWAY	———	DELINEATED WETLAND	—▲——▲——▲—	SPOT GRADE	+ 262.69
UNDERGROUND ELECTRIC LINE	—— E ——	REMOVE/REMOVE AND DISPOSE	//////////	MAGNITUDE & DIRECTION OF SLOPE	← 2%
OVERHEAD ELECTRIC LINE	—— OHW ——	AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	⊠⊠⊠⊠		
CHAIN LINK FENCE	——×——×——	AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨▨▨▨		
LIMITS OF WORK	— — — —	CONSTRUCTION LAYDOWN AREA	▨ ▨ ▨		
TOWN BOUNDARY	— · — · —				
TREE LINE	︶︶︶︶				
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	——— ———				

NOTE: BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.





KEY MAP - SCALE: 1" = 2,000'

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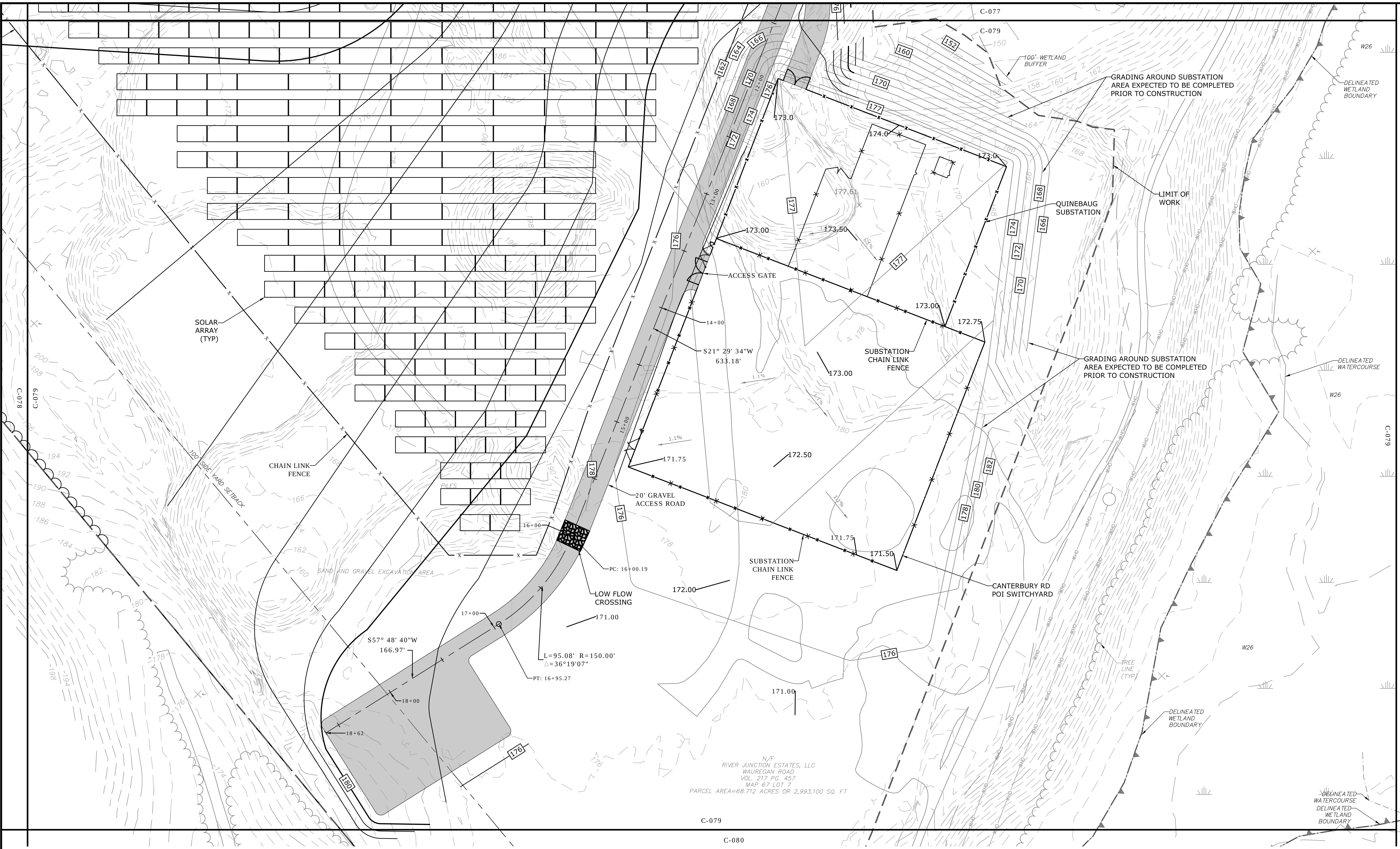

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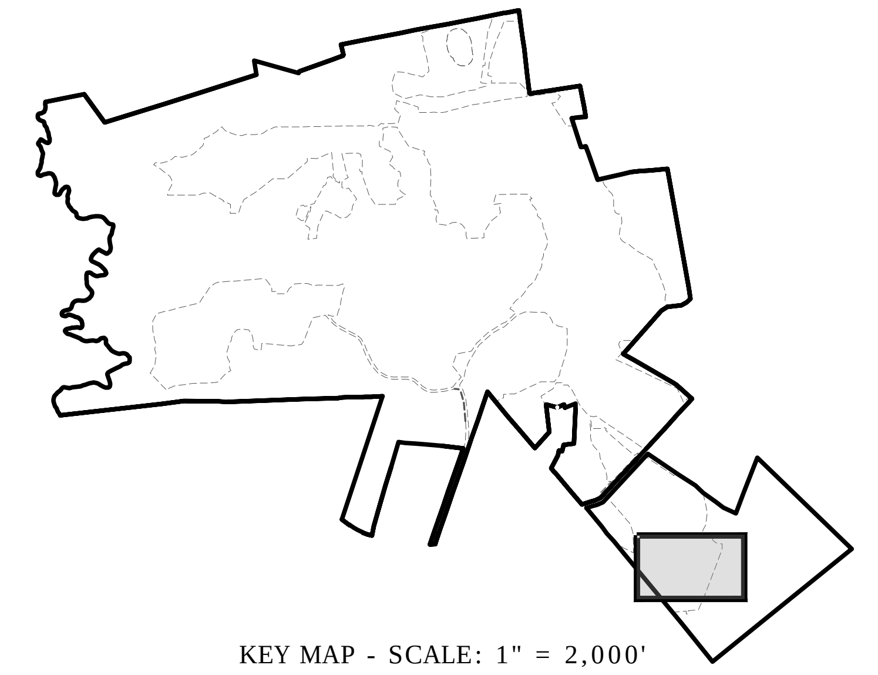

KEY MAP - SCALE: 1" = 2,000'

LEGEND

PROPERTY LINE	
PROPERTY LINE SETBACK	
EASEMENT LINE	
EXISTING INTERMEDIATE CONTOURS	124
EXISTING INDEX CONTOURS	120
PROPOSED INTERMEDIATE CONTOURS	222
PROPOSED INDEX CONTOURS	220
GRAVEL ROAD/DRIVEWAY	
UNDERGROUND ELECTRIC LINE	E
OVERHEAD ELECTRIC LINE	OHW
CHAIN LINK FENCE	× ×
LIMITS OF WORK	
TOWN BOUNDARY	
TREE LINE	
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	
HERPETOFAUNA PROTECTION AREA	
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	
STONE WALL	
WETLAND BUFFER	
WATERCOURSE BUFFER	
DELINEATED WATERCOURSE	
VERNAL POOL	
DELINEATED WETLAND	
REMOVE/REMOVE AND DISPOSE	▨
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	
TIER 1 PLANTINGS	
TIER 2 PLANTINGS	
TIER 3 PLANTINGS	
UTILITY POLE	
LIGHT POLE	☆
FLARED END SECTION	
SPOT GRADE	262.69
MAGNITUDE & DIRECTION OF SLOPE	2%

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SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRIAN S. HUNTLEY No. 31160
1-15-21

JACLYN M. CACECI NO. 33828
Jaclyn M. Caceci 01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug Solar Project

Quinebaug Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE
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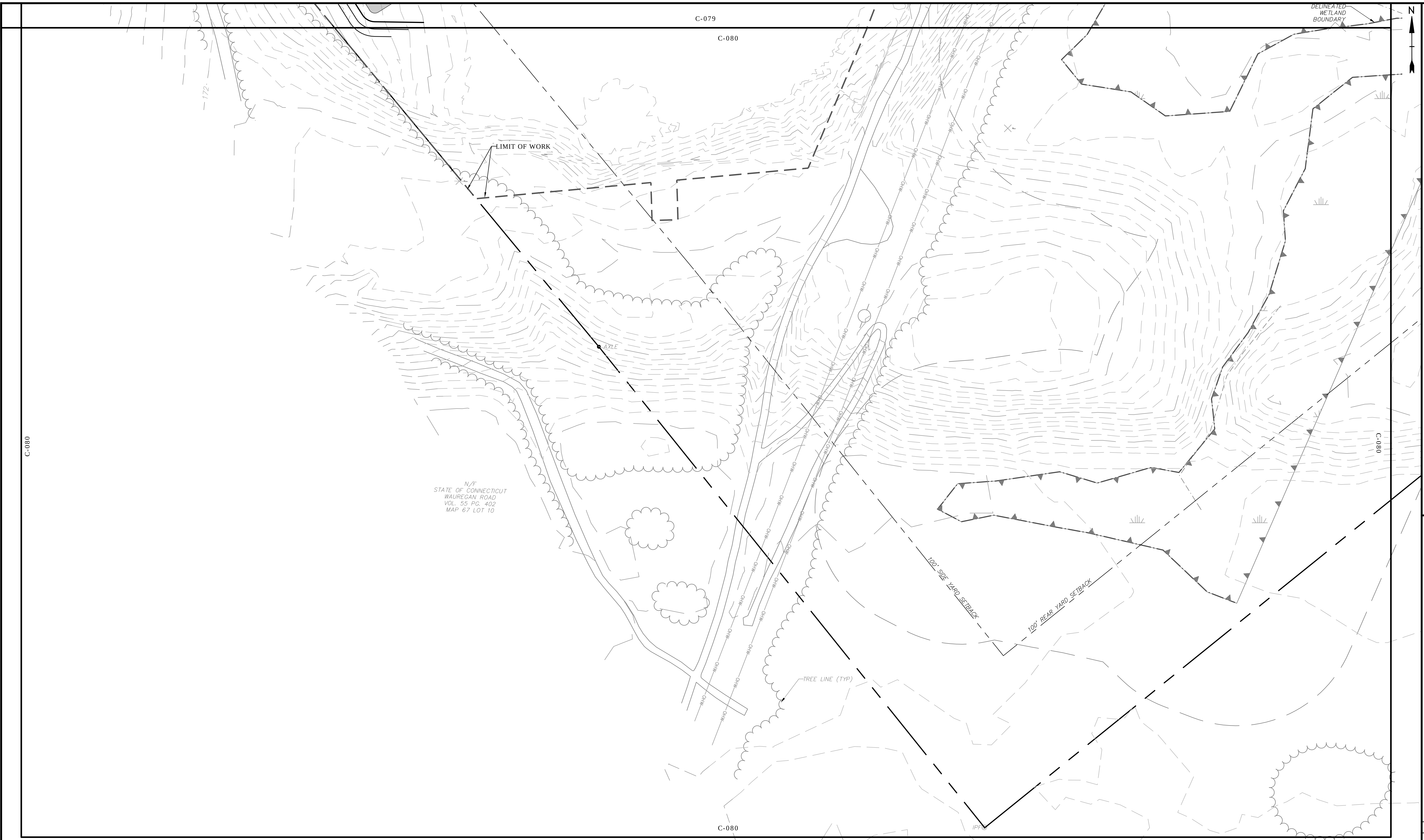
CHECKED:	BSH/JEC
APPROVED:	FJH

PROPOSED CONDITIONS - 38

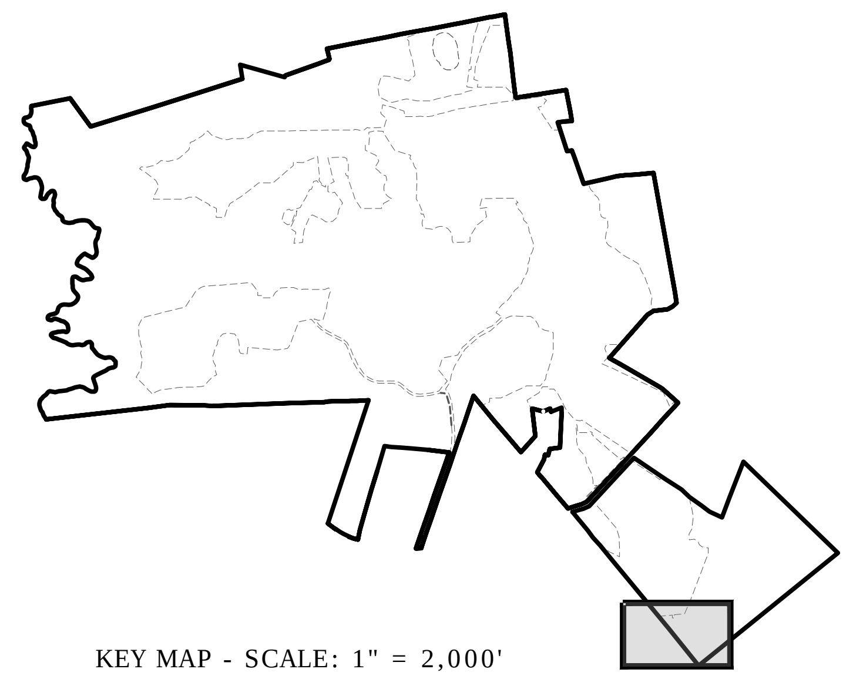
SCALE: 1" = 40'

C-079



LEGEND

PROPERTY LINE	▬ ─ ─ ▬ ─ ─ ▬
PROPERTY LINE SETBACK	── ─ ─ ── ─ ─ ──
EASEMENT LINE	── ── ──
EXISTING INTERMEDIATE CONTOURS	— — 124 — —
EXISTING INDEX CONTOURS	—— 120 ——
PROPOSED INTERMEDIATE CONTOURS	—— 222 ——
PROPOSED INDEX CONTOURS	—— 220 ——
GRAVEL ROAD/DRIVEWAY	────
UNDERGROUND ELECTRIC LINE	—— E ——
OVERHEAD ELECTRIC LINE	—— OHW ——
CHAIN LINK FENCE	──×────×──
LIMITS OF WORK	— — — —
TOWN BOUNDARY	— · — · —
TREE LINE	⌒⌒⌒⌒⌒
DIRECTIONAL BUFFER / VERNAL POOL ENVELOPE	──── ────
HERPETOFAUNA PROTECTION AREA	▬▬▬▬
CULTURAL RESOURCE AREA TO BE AVOIDED AND PROTECTED DURING CONSTRUCTION	▬▬▬▬
STONE WALL	○○○○○○
WETLAND BUFFER	─── ─── ───
WATERCOURSE BUFFER	─ ─ ─ ─ ─
DELINEATED WATERCOURSE	─ · ─ · ─
VERNAL POOL	─▲─▲─▲─
DELINEATED WETLAND	──▲──▲──
REMOVE/REMOVE AND DISPOSE	//////////
AREA OF PROPOSED TREE CLEARING - STUMPS TO REMAIN	☒☒☒☒☒
AREA OF PROPOSED TREE CLEARING AND STUMP REMOVAL	▨
CONSTRUCTION LAYDOWN AREA	▨
WETLAND	ψ ψ ψ ψ ψ
TIER 1 PLANTINGS	⌒⌒⌒⌒⌒
TIER 2 PLANTINGS	⊙
TIER 3 PLANTINGS	✳
UTILITY POLE	☌
LIGHT POLE	☆
FLARED END SECTION	⏢
SPOT GRADE	+ 262.69
MAGNITUDE & DIRECTION OF SLOPE	← 2%



KEY MAP - SCALE: 1" = 2,000'

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SCALE IN FEET
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GRAPHIC SCALE

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Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M Caceci
01/15/21

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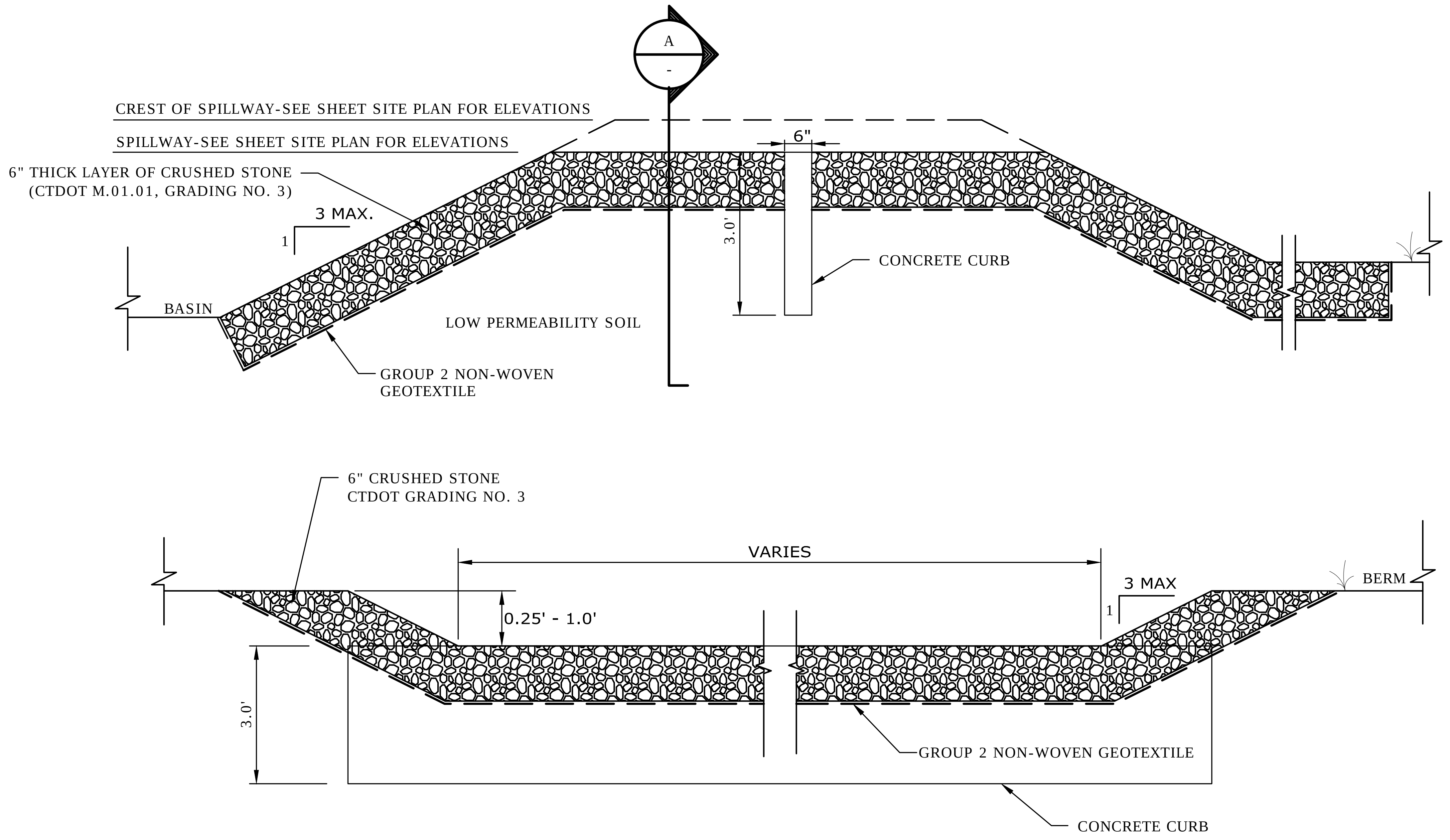
PROPOSED CONDITIONS - 39

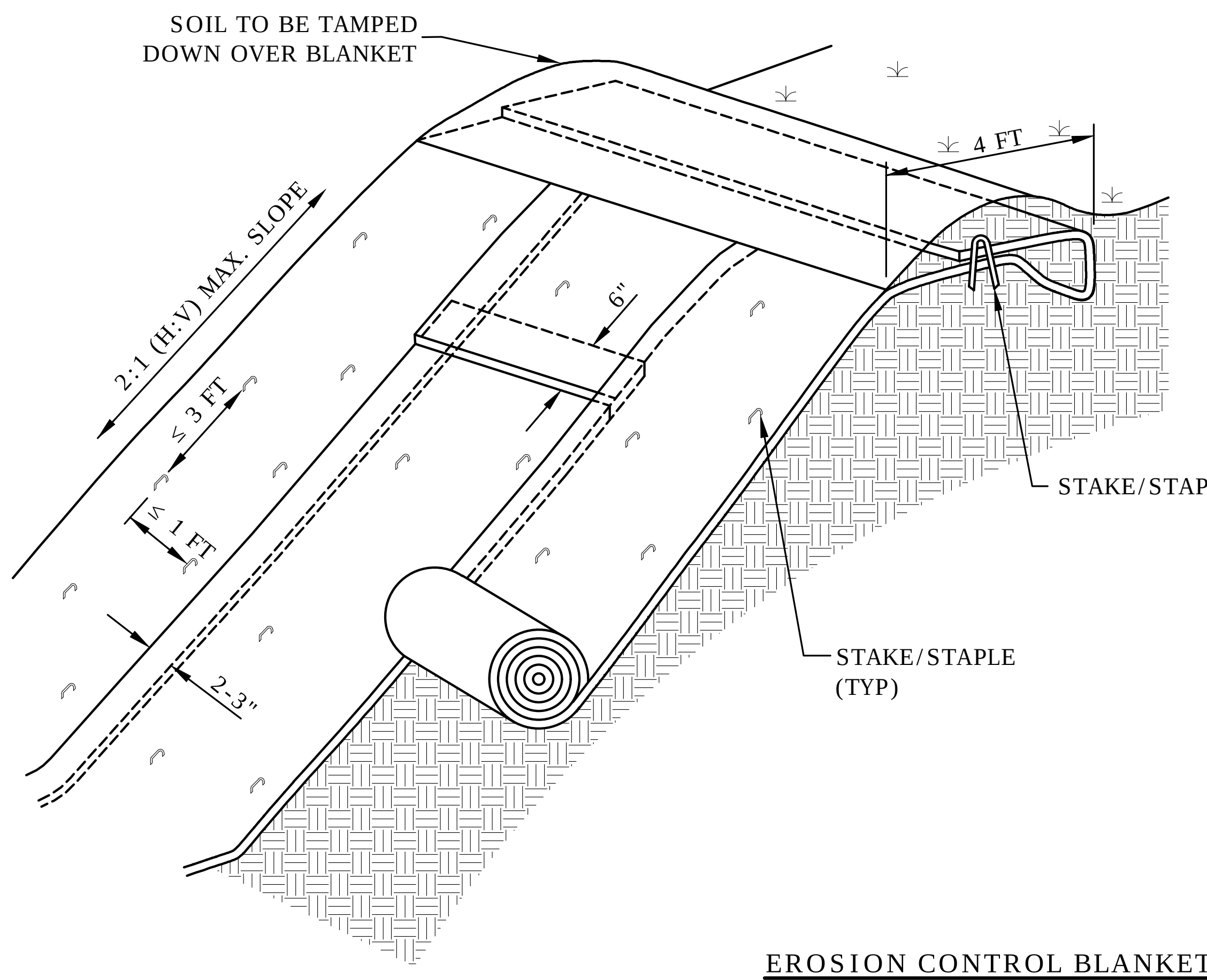
SCALE: 1" = 40'

C-080



SECTION A -
NO SCALE

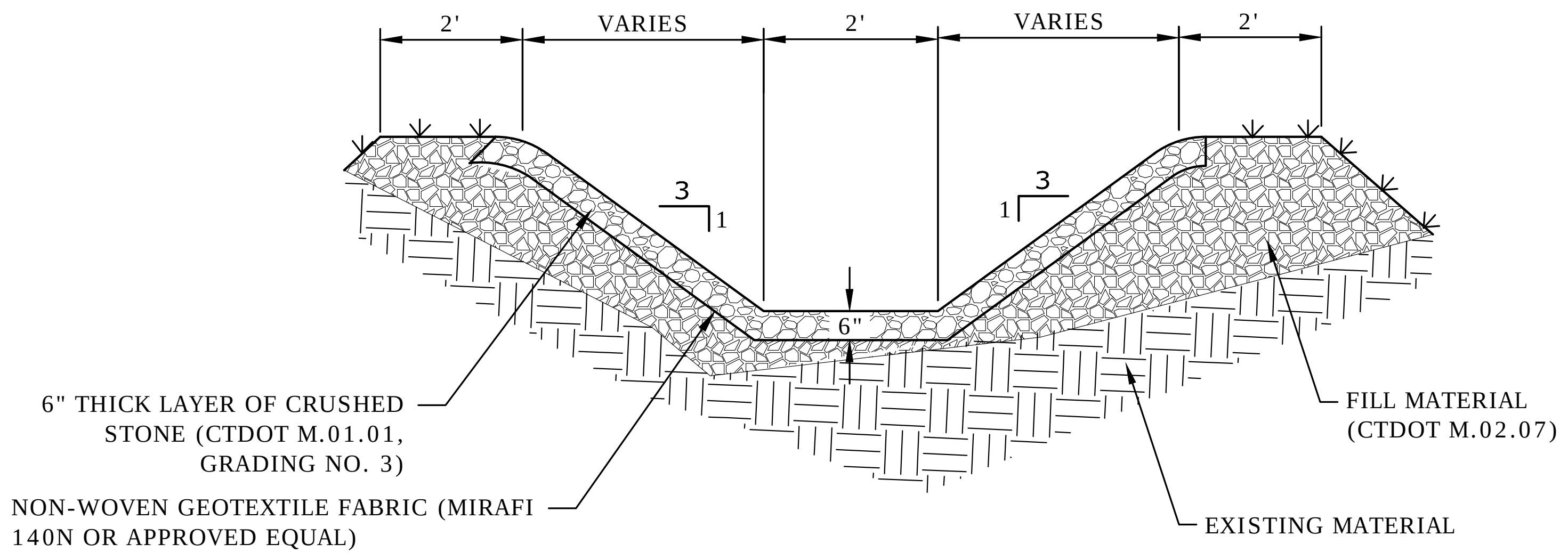
EMERGENCY SPILLWAY/SPILLWAY
NO SCALE



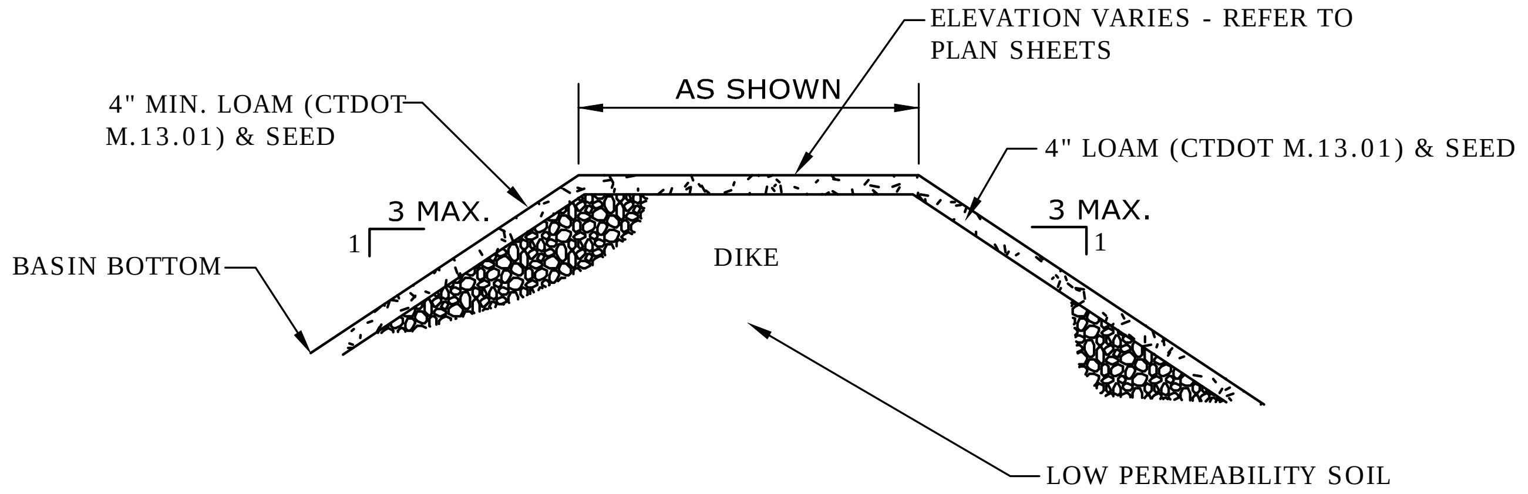
EROSION CONTROL BLANKET
NO SCALE

NOTES:

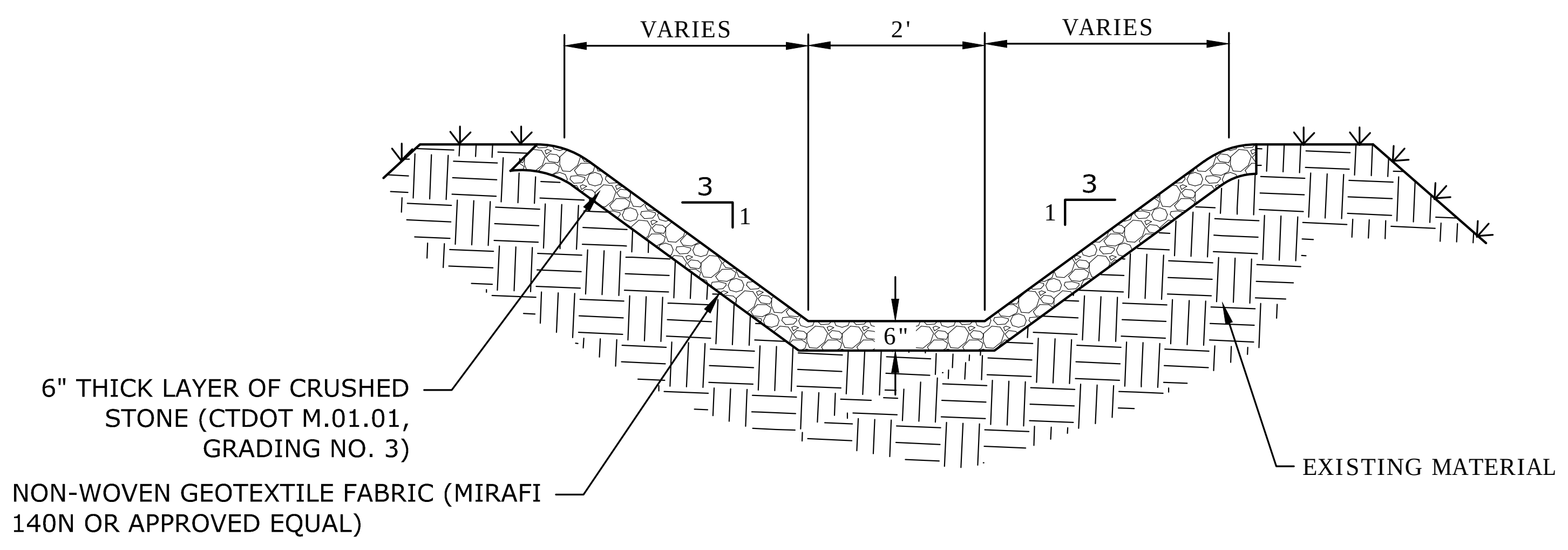
1. EROSION CONTROL BLANKET TO BE INSTALLED VERTICALLY DOWNSLOPE.
2. STAKES/STAPLES TO BE PLACED NO MORE THAN 3 FT APART VERTICALLY, AND 1 FT APART HORIZONTALLY.
3. SLOPE SURFACE TO BE FREE OF STICKS, ROCKS, AND OTHER OBSTRUCTIONS.
4. BLANKETS TO BE ROLLED OUT LOOSELY AND STAKED/STAPLED TO MAINTAIN DIRECT SOIL CONTACT. DO NOT STRETCH THE BLANKETS.



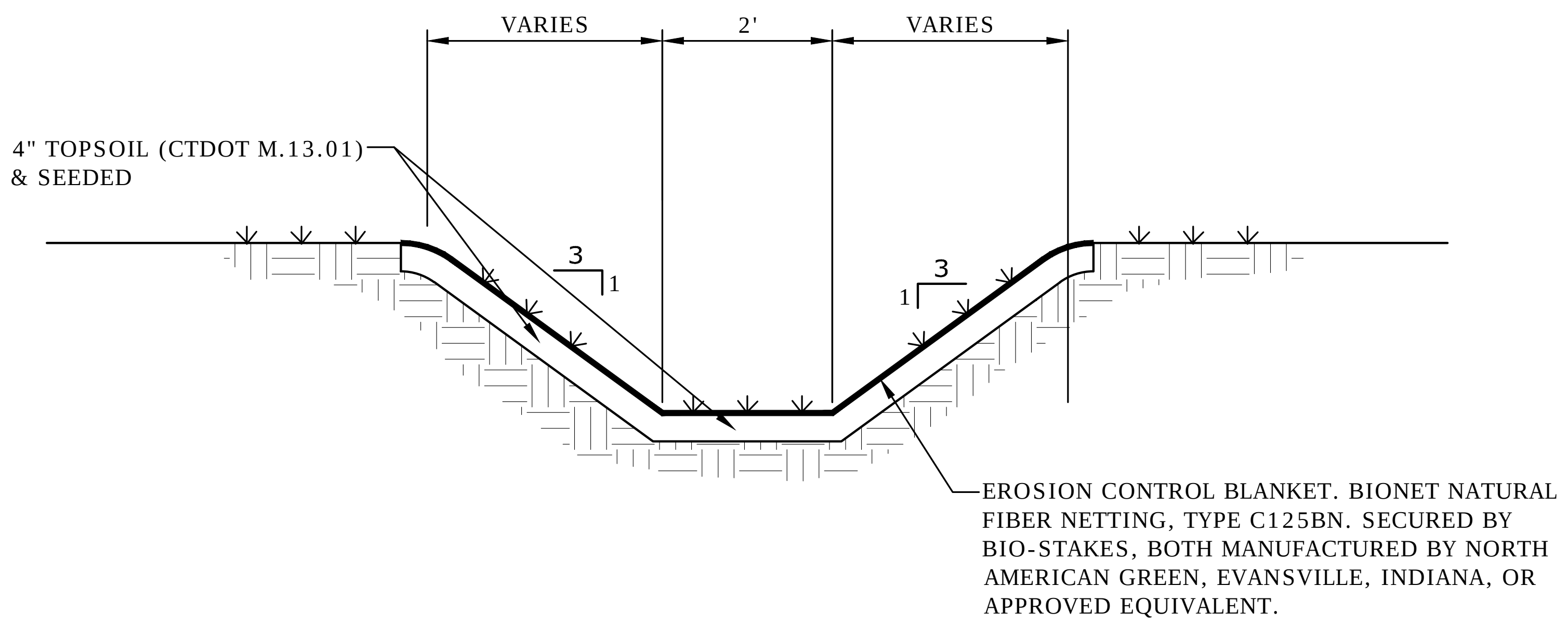
STONE LINED DRAINAGE SWALE: FILL
NO SCALE



STORMWATER BASIN - BERM DETAIL
NO SCALE



STONE LINED DRAINAGE SWALE: CUT
NO SCALE



GRASS LINED CHANNEL
NO SCALE

Tighe&Bond

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1-15-21

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Jaclyn M. Caceci
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DETAILS - 1

SCALE: AS SHOWN

C-081

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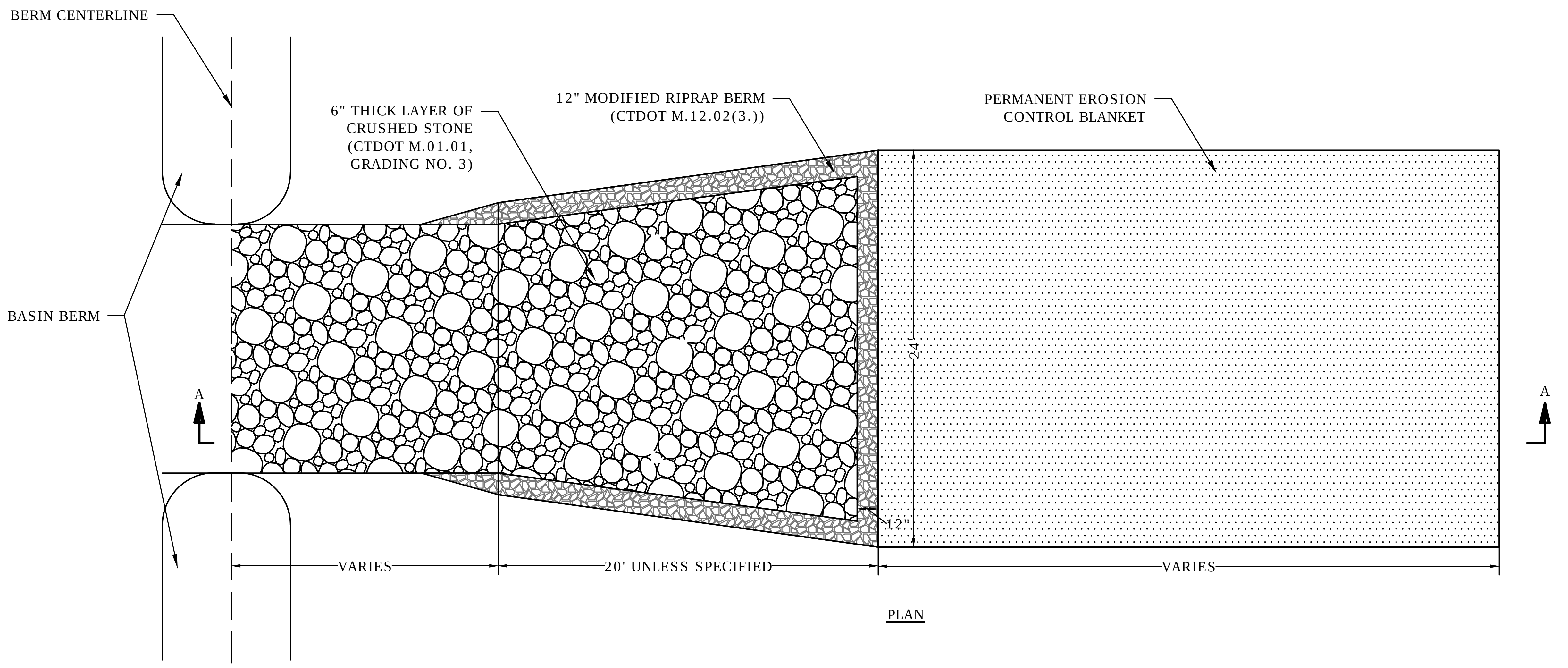
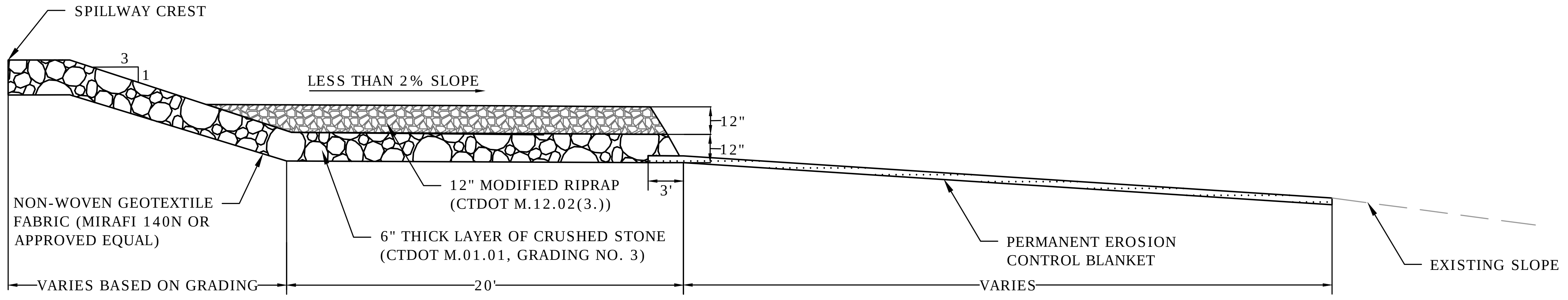
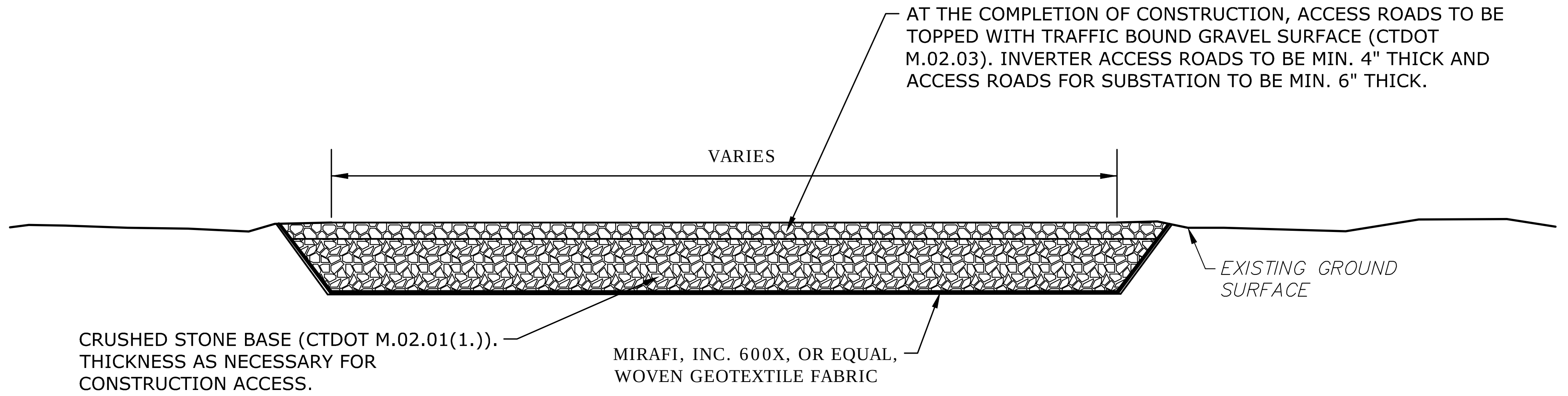


PLAN



SECTION A-A

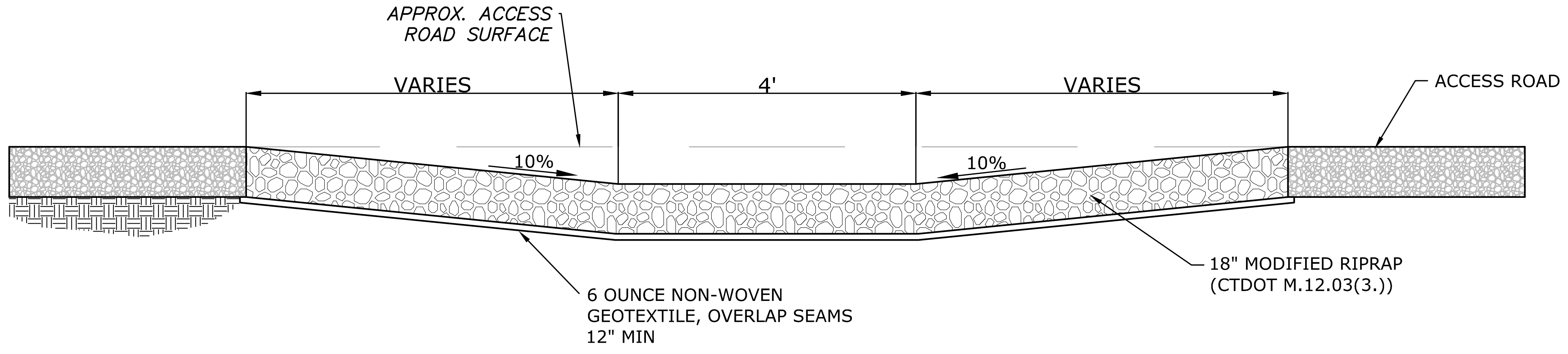
SPILLWAY LEVEL SPREADER
NO SCALE



NOTES:

1. EXCAVATE UNSUITABLE MATERIAL WITHIN ROADWAY SECTION.
2. PROOF ROLL SUBGRADE PRIOR TO PLACEMENT OF GEOTEXTILE FABRIC AND STONE.
3. MAINTAIN ROAD SURFACE THROUGHOUT CONSTRUCTION AND OPERATION AS NECESSARY TO ADDRESS ANY RUTTING.
4. STOCKPILE AGRICULTURAL SOILS IN ACCORDANCE WITH QUINEBAUG SOLAR, LLC SOIL MITIGATION PLAN.

TYPICAL ACCESS ROAD SECTION
NO SCALE



LOW FLOW CROSSING
NO SCALE

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Tighe&Bond

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No. 31180
1-15-21

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NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR
CONSTRUCTION

Quinebaug
Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
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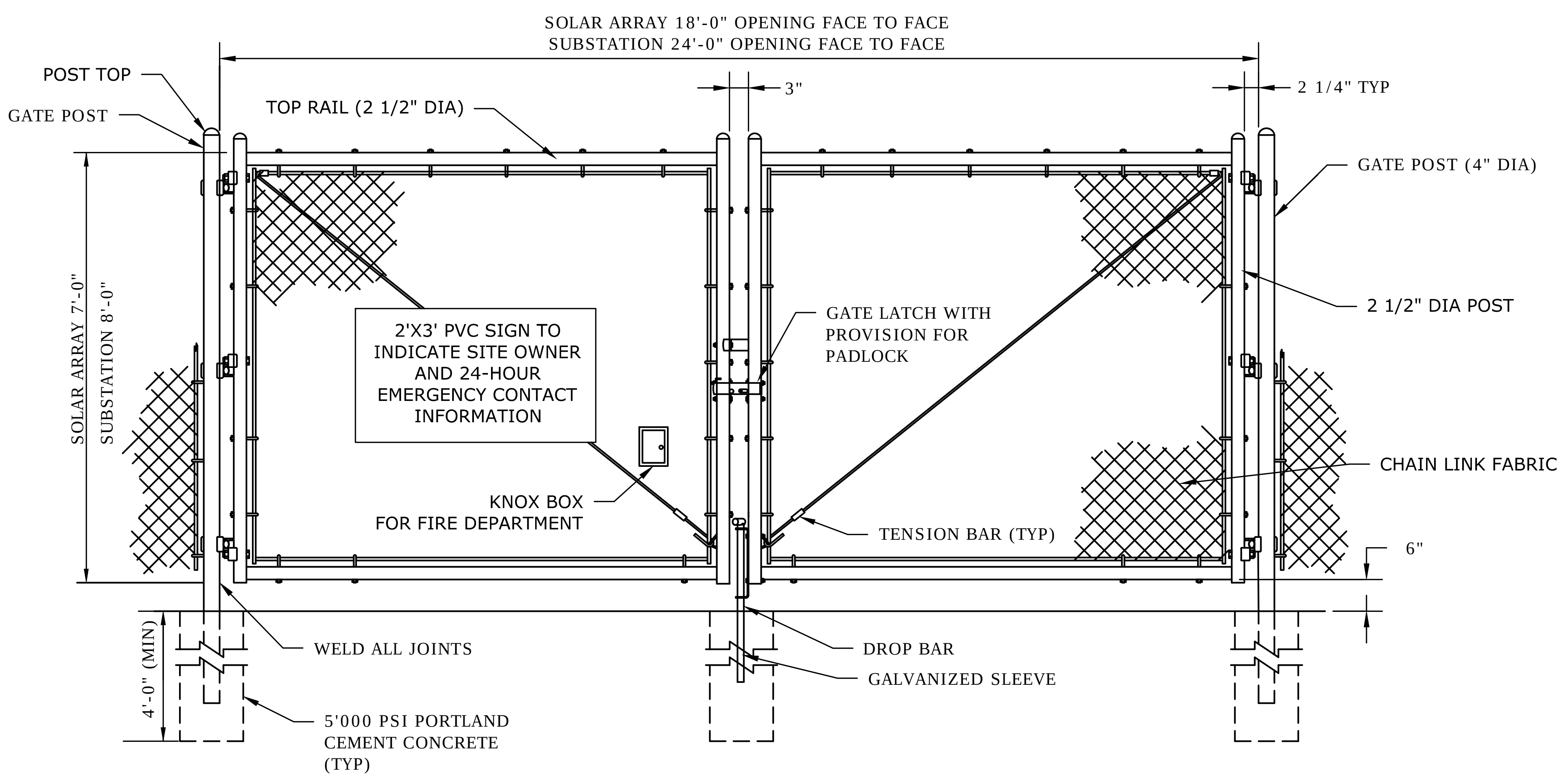
APPROVED:	FJH

DETAILS - 2

SCALE: AS SHOWN

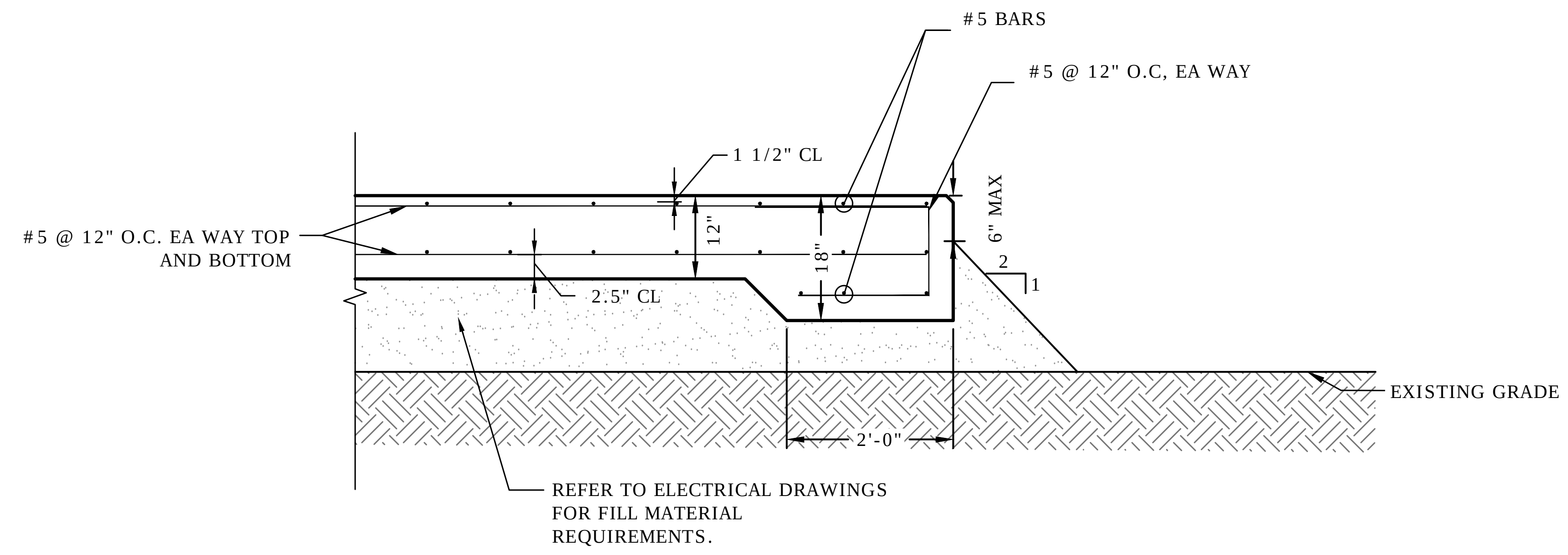
C-082



DOUBLE SWING GATE NOTES:

1. SUBSTATION GATE TO HAVE THREE (3) STRANDS OF BARBED WIRE. EACH CONSISTING OF 2 STRAND LINE WIRE WITH 4 PT BARBS.
2. FOOTING WIDTH TO BE (4)X POST WIDTH.
3. GATES MAY BE MANUALLY OPERATED.

DOUBLE SWING GATE
NO SCALE

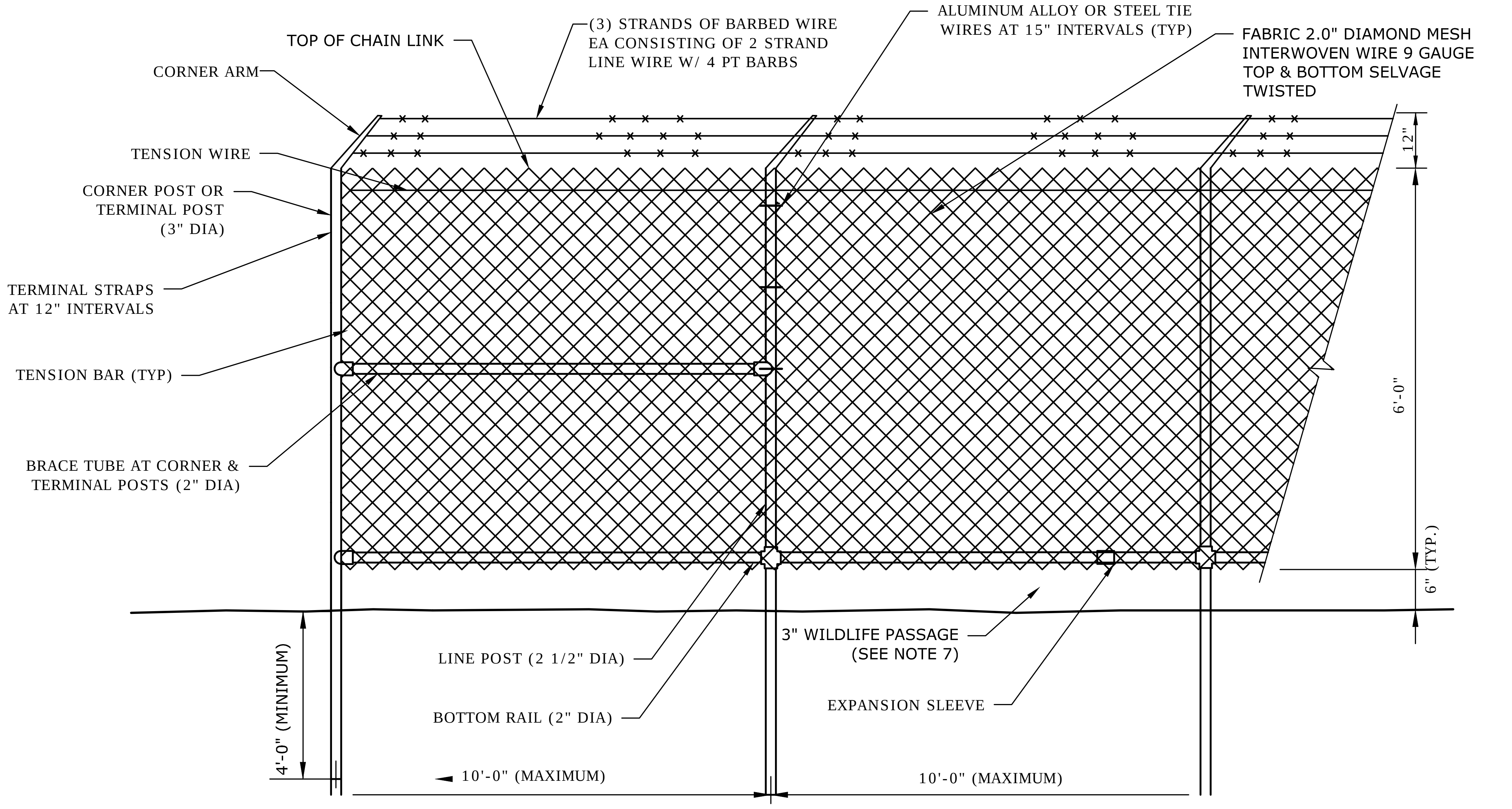


REFER TO ELECTRICAL DRAWINGS FOR FILL MATERIAL REQUIREMENTS.

NOTES:

1. FINISH SURFACE OF PAD TO PROVIDE POSITIVE DRAINAGE AWAY FROM EACH PIECE OF EQUIPMENT.
2. ALL CONCRETE TO BE BROOM FINISHED UNLESS OTHERWISE NOTED.
3. ALL EDGES TO HAVE ¾" CHAMFER UNLESS OTHERWISE NOTED.

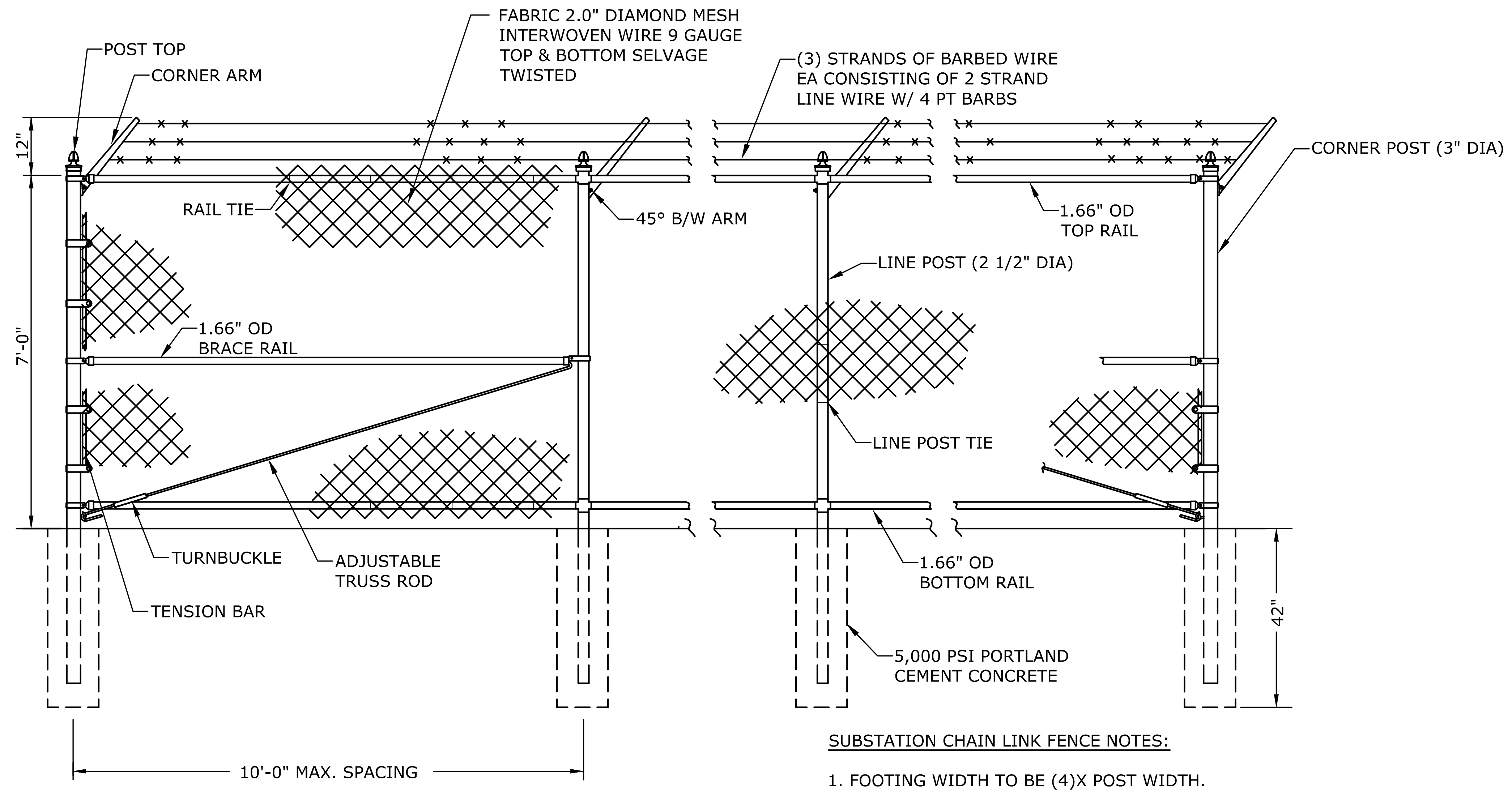
ELECTRICAL EQUIPMENT PAD DETAIL
NO SCALE



SOLAR ARRAY & SUBSTATION CHAIN LINK FENCING NOTES:

1. UNLESS OTHERWISE NOTED ON THE SITE PLANS, ALL CHAINLINK FENCING COMPONENTS SHALL HAVE A HOT DIPPED GALVANIZED FINISH. ANY CHIPS IN THE GALVANIZED FINISH DUE TO SITE INSTALLATION SHOULD BE MINIMIZED AND REPAIRED WITH INDUSTRIAL GRADE GALVANIZED PAINT. ALL CUT ENDS ARE TO BE FINISHED WITH INDUSTRIAL GRADE PAINT ON GALVANIZED FINISH.
2. CHAINLINK FABRIC SHALL BE MADE OF 9 GAUGE STEEL WIRE, 2" MESH SIZE, AND HOT DIPPED GALVANIZED PRIOR TO WEAVING. THE FABRIC SHALL BE FINISHED WITH A SELVAGE TWIST TOP AND BOTTOM.
3. ALL POSTS ARE TO BE PLUMB IN ALL DIRECTIONS.
4. LINE POSTS TO BE HAMMER DRIVEN. POST END MUST BE CUT TO FINAL HEIGHT AFTER DRIVING IS COMPLETE. CUT END IS TO BE CUT SQUARE AND FREE OF BENDS, MUSHROOMING, AND BURRS. CUT END TO BE TREATED AS PER NOTE #1.
5. LINE & TERMINAL POSTS, BRACE TUBES, TOP RAILS, & GATE POSTS SHALL ALL BE SCHEDULE 40 PIPE. REFERENCED DIAMETER IS NOMINAL.
6. ALL FENCE POSTS TO HAVE CAPS.
7. 3" WILDLIFE PASSAGE TO BE PROVIDED ON PERIMETER FENCE IN ALL AREAS THAT DO NOT ABUT PUBLIC ROADS. 6" GAP TO BE PROVIDED IN AREAS OF WILDLIFE TRAVEL.

SOLAR ARRAY CHAIN LINK FENCE
NO SCALE



SUBSTATION CHAIN LINK FENCE NOTES:

1. FOOTING WIDTH TO BE (4)X POST WIDTH.

SUBSTATION CHAIN LINK FENCE
NO SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
Jaclyn M. Caceci
01/15/21

ISSUED FOR CONSTRUCTION

Quinebaug
Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE
BAR IS 1 INCH ON ORIGINAL DRAWING
0 ▬ 1 INCH
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317
DATE:	01/2021
FILE: Quinebaug Details - CD.dwg	
DRAWN BY:	ALG
CHECKED:	BSH/JEC
APPROVED:	FJH

DETAILS - 3

SCALE: AS SHOWN

C-083

Last Saved: 1/13/2021
Plotted On: Jan 13, 2021-1:48pm By: ELD
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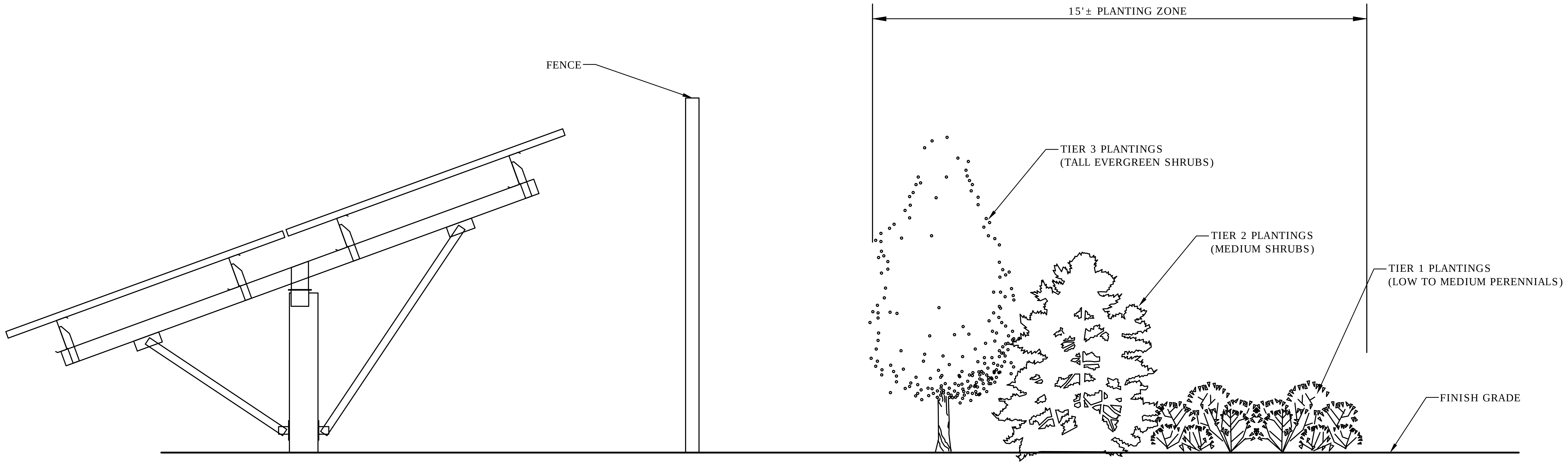


LANDSCAPE BUFFER - 3 TIER SECTION
NO SCALE

PLANT LIST - TIER 1: PERENNIALS

BOTANICAL NAME	COMMON NAME	SIZE	SPACING
ECHINACEA PURPUREA	PURPLE CONEFLOWER	#2 CONT.	18" O.C.
LOBELIA CARDINALIS	CARDINAL FLOWER	#2 CONT.	18" O.C.
MONARDA DIDYMA	SCARLET BEEBALM	#2 CONT.	18" O.C.
COREOPSIS GRANDIFLORA	LARGEFLOWER TICKSEED	#2 CONT.	18" O.C.
RUDBECKIA HIRTA	BLACK-EYED SUSAN	#2 CONT.	18" O.C.

PLANT LIST - TIER 2: MEDIUM SHRUBS

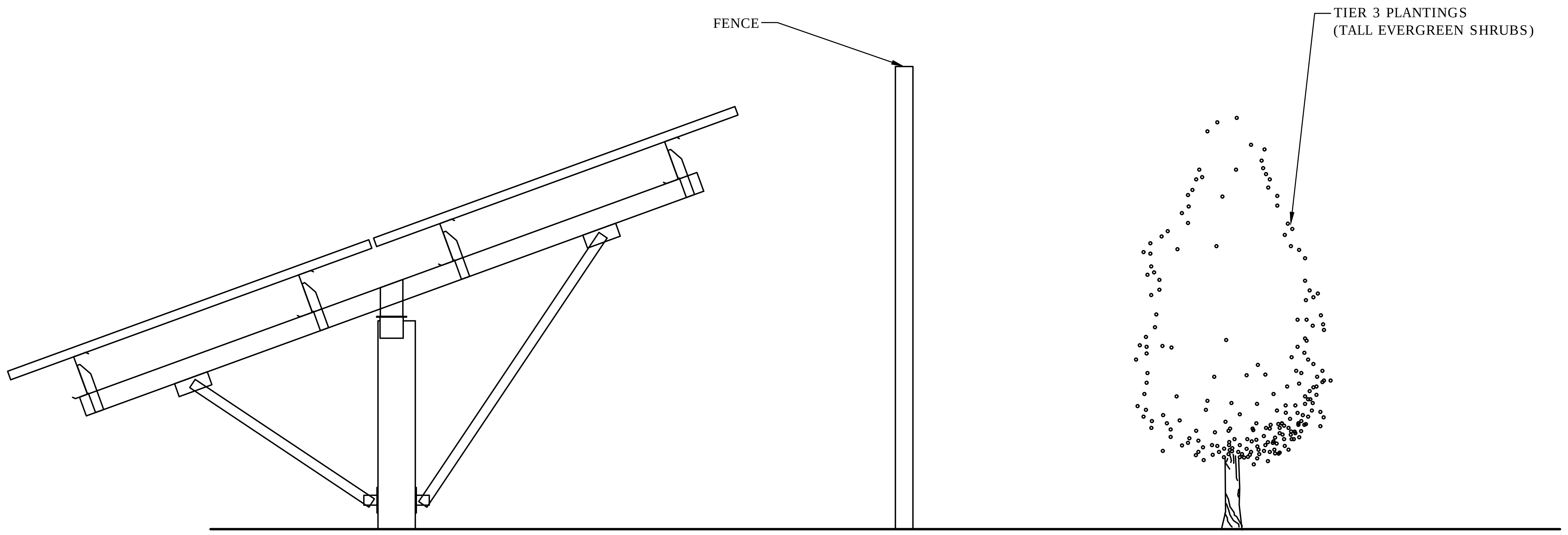
BOTANICAL NAME	COMMON NAME	SIZE	SPACING
CLETHRA ALNIFOLIA	PRAGUE VIBURNUM	2-3' HT.	5' O.C.
ARONIA MELANOCARPA	MUNSTEAD LAVENDER	2-3' HT.	5' O.C.
ILEX VERTICILLATA	WINTERBERRY	2-3' HT.	5' O.C.

PLANT LIST - TIER 3: EVERGREEN SHRUBS

BOTANICAL NAME	COMMON NAME	SIZE	SPACING - 3 TIERS	SPACING - TIER 3 ONLY
JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	6-7' HT.	8' O.C.	10' O.C.
JUNIPERUS COMMUNIS	COMMON JUNIPER	6-7' HT.	8' O.C.	10' O.C.

PLANTING NOTES:

1. ALTERNATE PLANTINGS WITHIN THEIR RESPECTIVE TIERS FOR THE ENTIRE LENGTH OF THE LANDSCAPE BUFFER .



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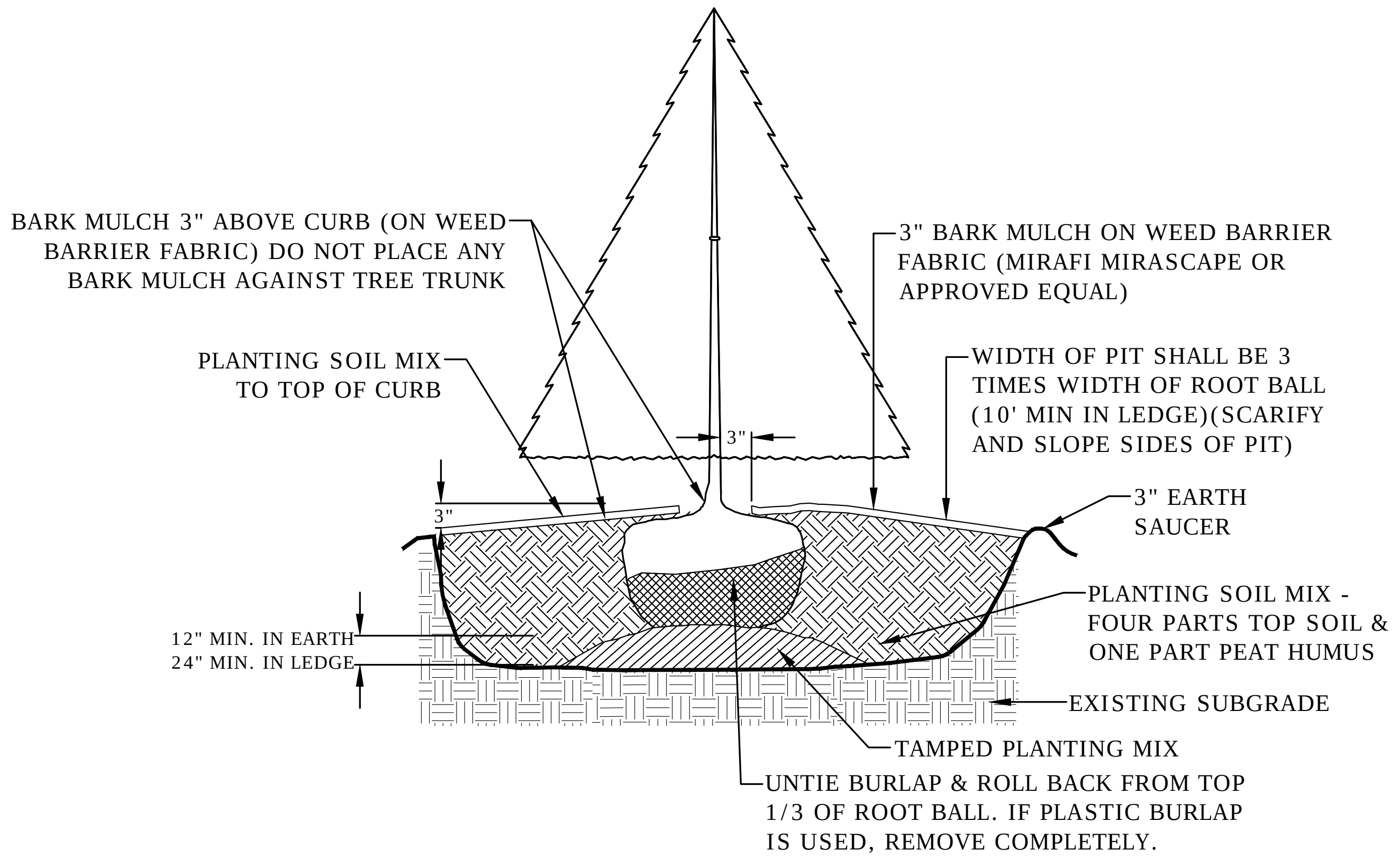
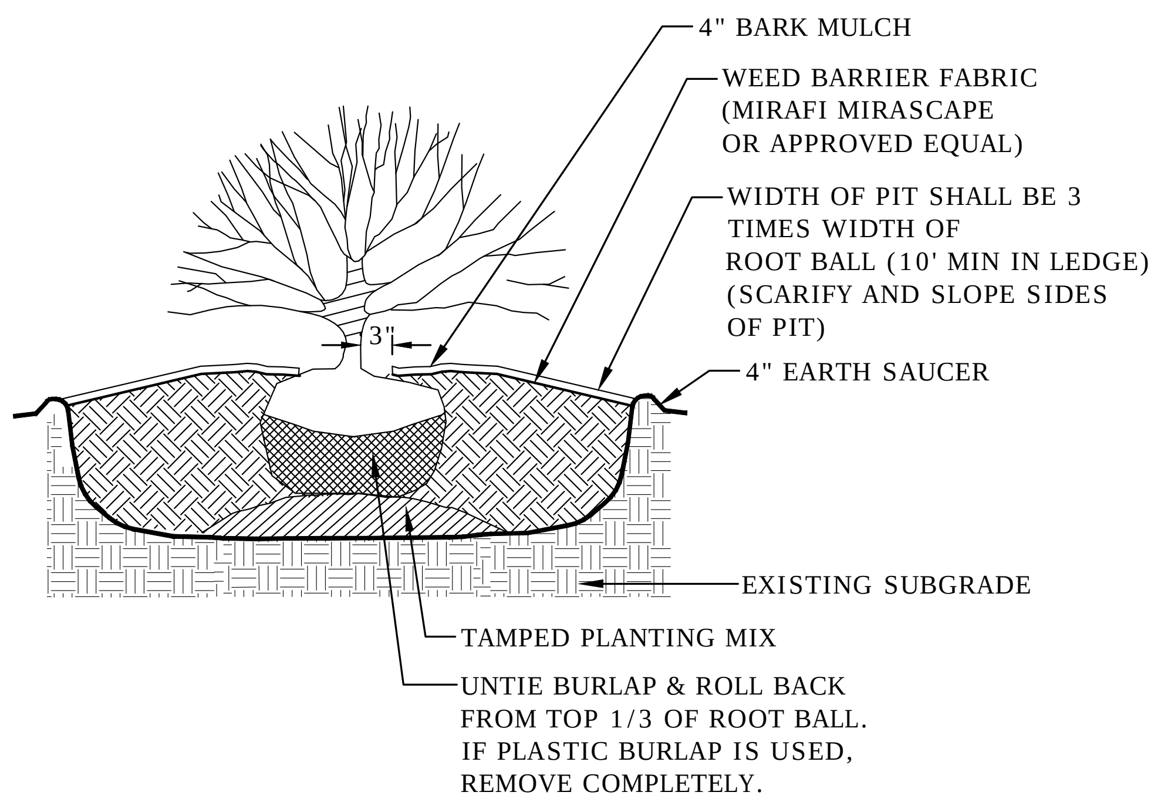


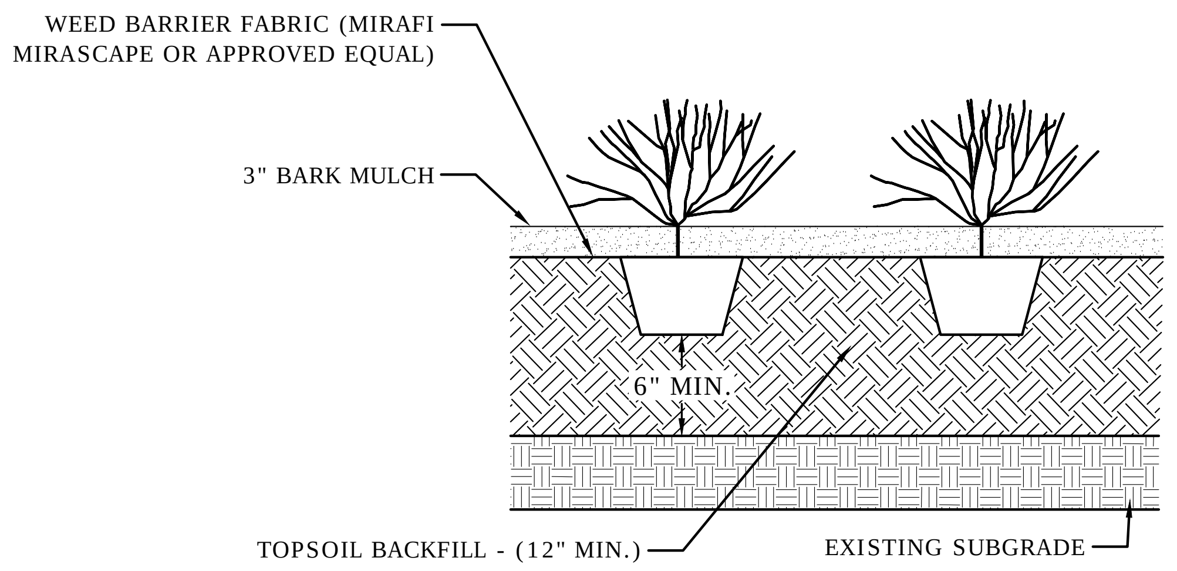
NOTE:

PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED IN NURSERY, OR WITHIN 2" ABOVE.

EVERGREEN TREE PLANTING
NO SCALE



SHRUB PLANTING
NO SCALE



PERENNIAL PLANTING
NO SCALE

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
1-15-21

JACLYN M. CACECI
NO. 33828
01/15/21

ISSUED FOR
CONSTRUCTION

Quinebaug
Solar Project

Quinebaug
Solar, LLC

Brooklyn &
Canterbury,
Connecticut

VERIFY SCALE
BAR IS 1 INCH ON
ORIGINAL DRAWING
0 ▬ 1 INCH
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

MARK	DATE	DESCRIPTION

PROJECT NO: R0317
DATE: 01/2021
FILE: Quinebaug Details - CD.dwg
DRAWN BY: ALG
CHECKED: BSH/JEC
APPROVED: FJH

DETAILS - 4

SCALE: AS SHOWN

C-084

Last Saved: 1/13/2021
Plotted On:Jan 13, 2021-1:49pm By: ELD
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-2_Quinebaug\Drawings_Figures\AutoCAD\Sheet\Construction Drawings\Quinebaug Details - CD.dwg

ATTACHMENT C – STORMWATER POLLUTION CONTROL PLAN

STORMWATER POLLUTION CONTROL PLAN

Constitution Solar Project

PROJECT NAME AND LOCATION:

Name:	Constitution Solar Project Plainfield, Connecticut
Latitude:	41.714593
Longitude:	-71.957524

OPERATOR:

Owner:	Constitution Solar, LLC
General Contractor:	TBD

CONTENTS

Section 1 Certification Statements

Section 2 Stormwater Pollution Control Plan

Appendices

SECTION 1

Section 1
Certification Statements

1.1 Permittee

Certification Statement

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

Signature: ______________________________________ **Date:** ________________

Name: _____________________________________**Title:**______________________

Company name: ____

Address: ____

Telephone:_______________________________ **Fax:** ________________________

Project Site: Constitution Solar Project, Plainfield, CT

1.2 Contractors and Subcontractors

Each Contractor and Subcontractor that will perform actions on the site which may reasonably be expected to cause or have the potential to cause pollution of the waters of the State shall sign the certification statement included in this plan.

Certification Statement

"I certify under penalty of the law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as a contractor or subcontractor at the site, I am authorized by this General Permit, and must comply with the terms and conditions of this General Permit, including but not limited to the requirements of the Stormwater Pollution Control Plan prepared for the site."

CONTRACTOR CERTIFICATION

Signature: ____ **Date:** _________________

Name: _______________________________________**Title:**_______________________

Company name: ____

Address: ____

Telephone:________________________________ **Fax:** _________________________

Project Site: Constitution Solar Project, Plainfield, CT

SUBCONTRACTOR CERTIFICATION

Signature: ____ **Date:** _________________

Name: _______________________________________**Title:**_______________________

Company name: ____

Address: ____

Telephone:________________________________ **Fax:** _________________________

Project Site: Constitution Solar Project, Plainfield, CT

SUBCONTRACTOR CERTIFICATION

Signature: ____ **Date:** _________________

Name: _______________________________________**Title:**________________________

Company name: ____

Address: ____

Telephone:_________________________________ **Fax:** __________________________

Project Site: Constitution Solar Project, Plainfield, CT

SUBCONTRACTOR CERTIFICATION

Signature: ____ **Date:** _________________

Name: _______________________________________**Title:**________________________

Company name: ____

Address: ____

Telephone:_________________________________ **Fax:** __________________________

Project Site: Constitution Solar Project, Plainfield, CT

SUBCONTRACTOR CERTIFICATION

Signature: ____ **Date:** _________________

Name: _______________________________________**Title:**________________________

Company name: ____

Address: ____

Telephone:_________________________________ **Fax:** __________________________

Project Site: Constitution Solar Project, Plainfield, CT

SECTION 2

Section 2
Stormwater Pollution Control Plan

2.1 Responsible Parties

The following Parties are identified in this Plan:

- Permittee: Constitution Solar, LLC. The Permittee is the party that initiates, creates or maintains a discharge in accordance with Section 3 of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (General Permit).
- Owner: Constitution Solar, LLC. Owner of the proposed solar facility and associated stormwater management measures.
- Contractor: Engineering, Procurement, and Construction (EPC) Contractor hired by Constitution Solar, LLC to perform installation of the solar facility and appurtenances.
- Sub-Contractor: Specialty sub-contractor hired by Contractor or Constitution Solar, LLC to perform installation of the solar facility and appurtenances.
- Site Superintendent: Representative of Contractor tasked with overseeing daily operations at the site.
- Qualified Inspector: As defined in the GP, means an individual possessing either (1) a professional license or certification by a professional organization recognized by the commissioner (as defined in section 22a-2(b) of the Connecticut General Statutes) related to agronomy, civil engineering, landscape architecture, soil science, and two years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and commercial construction projects in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, established pursuant to section 22a-328 of the Connecticut General Statutes (Guidelines); or (2) five years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and commercial construction projects in accordance with the Guidelines; or (3) certification by the Connecticut Department of Transportation(DOT).
- Environmental Monitor: Representative of Constitution Solar, LLC on-site full time to provide construction and permit compliance oversight.
- Design Engineer: Professional Engineer licensed in the state of CT who sealed the construction-period stormwater design.

2.2 Project Description

Constitution Solar, LLC (the Permittee or Owner) is proposing to install a 20 megawatt (AC) ground-mounted solar photovoltaic (PV) facility in the Town of Plainfield, Connecticut (Project).

The Project Site consists of 4 privately-owned parcels located in the western portion of the Town of Plainfield, Connecticut. The Project Site is generally bounded by the

Quinebaug River to the north and west, wooded area to the south, and wooded area and Sugarbrook State Park to the east.

The Project Site consists of large, level fields, and a few moderately to steeply sloping areas that currently contain woodlands and agricultural fields. The Permittee intends to utilize existing access roadways within the Project Area wherever possible. Land uses in the vicinity of the Project Area include open space and agriculture.

The topography of the existing conditions site conveys stormwater towards three design points. The first design point is the property adjacent to and west of the southernmost portion of the array, which we presume eventually drains to the Quinebaug River. Design Point 2 is the Quinebaug River, and Design Point 3 is a smaller subwatershed to the northeast. Quinebaug River, located to the west of the project area, is the receiving water for the majority of the project area with a smaller portion of the project draining to the northeast. The Project has been designed to avoid construction within areas of steeper slopes where possible.

The 100-year flood zone overlaps with the subject parcels; however, no floodplain exists within the limits of disturbance. The Site contains inland wetlands and watercourses and the project has been designed to limit impacts to these areas. A description of wetland and watercourse impacts can be found in the Wetland and Watercourse Delineation Report prepared by Tetra Tech Inc. in the Connecticut Siting Council (CSC) Petition (Petition).

In the post-construction or proposed condition, stormwater management will be accomplished through the conversion of agricultural areas to a grassy meadow condition and the construction of wet-bottomed swales, basins and wet ponds. The conversion of agricultural areas to a grassy meadow offsets the impacts of the proposed gravel access roads, concrete equipment pads and solar panels. The construction of wet-bottomed swales, basins and wet ponds adds additional infiltration and storage to attenuate the runoff rate and volume caused by a decrease in the time of concentration with the conversion of woods to meadow while providing water quality improvements to treat the required Water Quality Volume (WQV).

In the proposed condition, within the solar array, stormwater will fall onto the PV modules and will flow off the edge into the grassy ground cover. Stormwater runoff will continue to flow across the ground surface as under existing conditions generally along existing flow paths. To mitigate for the changes in stormwater flow patterns, engineered wet-bottomed swales, basins and wet ponds to mitigate peak discharge rates, to encourage infiltration and to allow for suspended solids to settle were incorporated within the project area.

The Project is proposed to be constructed in phases to minimize disturbance. Within each Phase, sub-phases will be designed to be less than 10 acres and each sub-phase will have a temporary sediment basin or trap as required. A phased Soil Erosion and Sediment Control Plan for construction activities can be found in Appendix C. While a total of approximately 75 acres will be disturbed as part of the proposed project, only 26 +/- acres of that disturbed area will experience any significant grading and/ or clearing activities. Significant grading is not anticipated in most of the proposed array areas. Grading is required in certain areas to flatten steep slopes and to accommodate internal access roads, stormwater features, and the equipment pads.

In the area of the agricultural fields, the site will be planted with a low growing seed mix to stabilize the site. Micro-grading to smooth existing undulations will be performed as necessary.

The proposed scope of work is shown on the drawings in Appendix C.

2.3 Estimated Total Site Area and Total Disturbed Area

Combined, the Project Area/Site parcels encompass approximately 149 acres. As proposed, the Development Area/ limit of work of the proposed project will occupy approximately 75 acres of the 149-acre Project Area/ Site. While a total of approximately 75 acres will be disturbed as part of the proposed project, only 26 +/- acres of that disturbed area will experience any significant grading and clearing activities.

2.4 Soils & Geology

Bedrock geology within the Study Area is primarily granite, schist, and gneiss. Glacial till is the dominant surface material, with some stratified deposits in valleys. Open hills with low elevations form in irregular plains (Griffith et al. 2009). Typical soil orders include coarse-loamy and sandy, mesic Inceptisols and some Entisols. Soils are generally sandy loam, loamy sand, and stony soils. Depth to bedrock is expected to be very deep throughout the Study Area (USDA NRCS 2008). Approximately 40 percent of the Study Area soils have been regularly tilled for agricultural use. A Site Specific Soil Report was developed by Broadwater Environmental, LLC in February 2020 for the Project Site. The soils found on-site included in the table below.

Table 1
Site Specific Soil Summary

Map Unit Designation	Soil Association	Additional Description	Hydrologic Soil Group (HSG)
2 (SWP)	Ridgebury fine sandy loam (SWP), 0-8% slope	Somewhat poorly drained	D
23A	Sudbury sandy loam, 0-8% slope	Moderately well drained	B
23B	Sudbury sandy loam, 8-15% slope	Moderately well drained	B
24A	Deerfield loamy fine sand, 0-8% slope	Moderately well drained	B
24B	Deerfield loamy fine sand, 8-15% slope	Moderately well drained	B
36A	Windsor loamy sand, 0-3% slope	Well drained	A
38C	Hinckley loamy sand, 3-15% slope	Excessively drained	A
38E	Hinckley loamy sand, 15-45% slope	Excessively drained	A
45B	Woodbridge fine sandy loam, 3-8%	Moderately well drained	C
85B	Paxton and Montauk fine sandy loams, 3-8%	Well drained	C
85C	Paxton and Montauk fine sandy loams, 8-15%	Well drained	C

2.4.1 Wetland Soils

General soil observations were made as part of the wetland and watercourse delineation survey effort, and to determine if unique soil conditions occur on site. Soils observed as part of this survey are described in the Wetland and Watercourse Delineation Report provided in the Petition.

2.4.2 Non-Wetland Soils

Areas mapped by the United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS) as Prime Farmland and Soils of Statewide Importance are located within the Project Site. A Farmland Soil Mitigation Plan has been prepared to minimize and mitigate impacts to agricultural soils. As defined by the USDA NRCS, farmland soils are based on soil type and include Prime Farmland, Soils of Statewide Importance, and Locally Important Farmland. USDA NRCS defines Prime Farmland Soils as those having the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops, and that also are available for these uses. The Farmland Soil Mitigation Plan is included in the Petition.

Additionally, in 2019 Tetra Tech performed a site visit, including test pit investigations, to confirm the soils present on site to support stormwater engineering calculations. Test pits were excavated and evaluated and the soil associations determined to be present on site are provided in Table 1 above. The site-specific soil mapping was used in stormwater engineering calculations. Detailed results of this investigation are provided in Appendix D.

2.4.3 Measured Infiltration Rate

An infiltration test was not performed to determine the infiltration capacity of the existing soils. Infiltration rates assumed in stormwater management calculations were determined in accordance with the National Resource Conservation Service (NRCS) Minimum Infiltration Rates of Hydrologic Soil Groups, as provided in the 2004 Connecticut Stormwater Quality Manual.

2.5 Runoff Curve Number

The weighted runoff curve number "CN" for the existing project is 74. The weighted runoff curve number "CN" for the completed project will be 69.

2.6 Site Map

See Figure 1 for site location mapping and see Appendix C for detailed site maps.

2.7 Name of Receiving Water

The Quinebaug River is located to the north and east of the project. Stormwater runoff from the post-construction project will ultimately discharge to the Quinebaug River. According to the Thames River Basin Partnership, the Quinebaug River watershed is approximately 255,070 acres and extends into south central Massachusetts and ends where it discharges to Shetucket River in Norwich, Connecticut. According to the State of Connecticut Department of Energy and Environmental Projection (CTDEEP) 2016 Integrated Water Quality Report, the impairments observed in the Quinebaug River include Escherichia coli with potential sources including stormwater, remediation sites, spills, groundwater impacts, industrial discharges, landfills, municipal discharges, illicit discharges, insufficient on-site treatment/septic systems, agricultural activities, and salt storage facilities. The 2016 Report recommended delisting of the Quinebaug River, noting applicable water quality standards had been attained. The proposed project will not result in an increase in the identified pollutants.

2.8 Sequence of Major Activities

The construction period stormwater design for the Constitution Solar Project has been designed in accordance with the CT General Permit, the Soil Erosion and Sediment Control Manual, and CT DEEP’s September 8, 2017 Guidance Document on “*Stormwater Management for Solar Farm Construction Projects*”. The SESC Manual indicates that construction phases should occur in 5-acre areas, with sediment traps designed to hold a volume of water. Particulates then settle out of suspension, with a secondary volume to retain runoff during larger storm events. The trap includes a spillway through which water is allowed to flow onto stable ground. Runoff from the construction area is diverted through use of swales equipped with check dams to reduce the velocity of stormwater flow. The swales direct stormwater to the sediment trap. Perimeter erosion control barriers will be installed along the downgradient edges of the phase, with other phase demarcation to be determined by the Contractor installed along the limit of work for each phase. Once earth disturbing activities are complete, the ground surface is considered stabilized once it has reached 80% vegetative coverage per the SESC Manual. Temporary stormwater controls may be removed once the contributing area can be considered stable. Larger development areas are allowed up to 10-acres; however, temporary sediment basins will be required.

For the purpose of this Stormwater Pollution Control Plan, the following activities are considered earth disturbing activities: solar infrastructure installation (i.e., driving piles for solar panel racking); tree clearing if ground is not frozen; vegetation removal; grading; roadway installation; concrete equipment pad installation; and subsurface utility infrastructure construction. The Project is proposed to be constructed in phases to minimize disturbance: 4 major phases with 22 sub-phases, as shown in Appendix C. Within each major phase, sub-phases will be designed to be less than 10 acres and each will have a temporary sediment basin or trap as required. The major phases include the following:

- Phase 1: Access Road Construction and Staging
- Phase 2: Stump Removal for Previously Wooded Areas
- Phase 3: Grassed Area Array Construction
- Phase 4: Wooded Area Array Construction

Note that Phase 1 must occur before all other phases. Subsequent subphases can occur simultaneously provided that each active subphase has all temporary measures installed and each trap/basin is discharging to stable ground. Phase 2 and Phase 4 occur in the same location, with differing construction activities. Phase 4 is the installation of solar infrastructure in the area that required stump removal and was temporarily stabilized in Phase 2.

Stabilization and removal of temporary features will be considered individually for each sub-phase. For example, if sub-phase D is determined stable by the Engineer and sub-phase A is not, the temporary features in sub-phase D may be decommissioned prior to achieving stabilization in sub-phase A as long as it will not impact the stability of another sub-phase. Some temporary features may be removed prior to full stabilization of the sub-phase with approval from the Engineer, provided that the engineer determines that temporary measures that remain in place will provide a level of protection against off site impacts due to rain events. Notification will be made to the Department prior to removal of portions of the temporary measures in a sub phase, and the decision by the engineer will be based on the level of vegetative growth contributing to the measures to be removed as well as the anticipated potential for further ground disturbance by the contractors on site, their equipment being used and their track record on the site previously.

Once stabilization is achieved in any sub-phase, some features may be determined to be beneficial to post-construction site conditions and the Engineer will determine which features will remain. CT DEEP will be notified of these changes.

Construction of the Project is expected to begin in the first quarter of 2021 with mobilization of equipment and land clearing efforts. Further site work and land preparation is expected to be complete by the end of the second quarter of 2021. Final site stabilization, testing, and commissioning is expected to be complete in the third quarter of 2021. The following describes the sequence of construction activities:

2.8.1 Pre-Construction

1. Demarcation of clearing limits, selective cutting zones, and buffer areas.
2. Cut trees above ground (retain stumps) in frozen conditions. If reliably frozen conditions do not exist, or if the tree cutting operation results in ground disturbance or rutting, stormwater controls must be installed in accordance with the Soil Erosion and Sediment Control Plans in Appendix C for each area to be cleared prior to the tree clearing.
3. Environmental restriction and safety training for all site personnel.
4. Preconstruction meeting.

2.8.2 Phase 1: Access Road Construction and Staging

1. Flag the limits of construction necessary to facilitate the preconstruction meeting.
2. Conduct environmental restriction and safety training for all site personnel.
3. Hold preconstruction meeting.
4. Install construction entrance.
5. Install perimeter controls to establish phase work area in accordance with site plan and Stormwater Pollution Control Plan (SWPCP).
6. Prior to installing stormwater controls, such as temporary diversions and stone check dams, inspect existing conditions to ensure discharge locations are stable. If not stable, review discharge conditions with the design engineer and implement additional stabilization measures prior to installing surface water controls.
7. Construct temporary sediment traps and/or basins, diversion swales and berms with check dams.
8. Once temporary stormwater controls are established, clear and remove existing stumps.
9. Where applicable, strip, re-distribute, and stabilize all topsoil that is within the footprint of the site roads, site road appurtenances and the collector substation (pursuant to 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, Chapter 4, Part ii and the Farmland Soils Mitigation Plan in Exhibit E of the CSC Petition).
10. Construct site roads and appurtenances. Install conduits for crossings simultaneous to construction of the road.
11. Stabilize site with seed and mulch in all disturbed areas. If a minimum 4” of topsoil is not present, amend with loam borrow for a minimum 4” of vegetative support material to promote grass growth. Stabilize areas with a slope of 7% or steeper with hydroseed with bonded fiber matrix or hydroseed and install erosion control blankets. Monitor disturbed areas weekly or following rain events and amend with additional seeding as needed until stabilization is achieved.
12. Upon stabilization, temporary controls may be removed or relocated as necessary and construction may advance on subsequent sub-phases.

2.8.3 Phase 2: Stump Removal for Previously Wooded Areas

1. Flag the limits of construction.

2. Install perimeter controls to establish phase work area in accordance with site plan and SWPCP plans.
3. Prior to installing surface water controls, such as temporary diversions and stone check dams, inspect existing conditions to ensure discharge locations are stable. If not stable, review discharge conditions with the design engineer and implement additional stabilization measures prior to installing surface water controls.
4. Construct temporary sediment traps and/or basins, diversion swales and berms with check dams.
5. Once temporary stormwater controls are established, remove existing stumps from previously cleared trees.
6. Stabilize site with seed and mulch in all disturbed areas. If a minimum 4” of topsoil is not present, amend with loam borrow for a minimum 4” of vegetative support material to promote grass growth. Stabilize areas with a slope of 7% or steeper with hydroseed with bonded fiber matrix or hydroseed and install erosion control blankets. Monitor disturbed areas weekly or following rain events and amend with additional seeding as needed until stabilization is achieved.
7. Check and repair temporary controls as needed. Temporary controls to remain in place through Phase 4 construction.

2.8.4 Phase 3: Grassed Area Array Construction

1. Flag the limits of construction.
2. Install perimeter controls to establish phase work area in accordance with site plan and SWPCP plans.
3. Prior to installing surface water controls, such as temporary diversions and stone check dams, inspect existing conditions to ensure discharge locations are stable. If not stable, review discharge conditions with the design engineer and implement additional stabilization measures prior to installing surface water controls.
4. Construct temporary sediment traps and/or basins, diversion swales and berms with check dams.
5. Clear and remove existing stumps as needed.
6. Install solar infrastructure, including racking, solar modules, utility connections, and equipment pads. Solar array construction will begin with posts or ground screws being driven into the ground; racking will then be affixed to the posts; and modules will be mounted and installed on the racks.
7. Stabilize site with seed and mulch in all disturbed areas. If a minimum 4” of topsoil is not present, amend with loam borrow for a minimum 4” of vegetative support material to promote grass growth. Stabilize areas with a slope of 7% or steeper with hydroseed with bonded fiber matrix or hydroseed and install erosion control blankets. Monitor disturbed areas weekly or following rain events and amend with additional seeding as needed until stabilization is achieved.
8. After phase is fully stabilized, remove temporary stormwater controls.
9. Once the temporary measures are removed, install the remaining racking and components that are located where the temporary measures were removed.

2.8.5 Phase 4: Wooded Area Array Construction

1. Inspect and install perimeter controls established in Phase 2 to ensure phase work area is in accordance with site plan and SWPCP plans.
2. Inspect and construct temporary sediment traps and/or basins, diversion swales and berms with check dams installed in Phase 2.
3. Install solar infrastructure, including racking, solar modules, utility connections, and equipment pads. Solar array construction will begin with posts or ground screws being driven into the ground; racking will then be affixed to the posts; and modules will be mounted and installed on the racks.
4. Stabilize site with seed and mulch in all disturbed areas. If a minimum 4" of topsoil is not present, amend with loam borrow for a minimum 4" of vegetative support material to promote grass growth. Stabilize areas with a slope of 7% or steeper with hydroseed with bonded fiber matrix or hydroseed and install erosion control blankets. Monitor disturbed areas weekly or following rain events and amend with additional seeding as needed until stabilization is achieved.
5. After phase is fully stabilized, remove temporary stormwater controls.
6. Once the temporary measures are removed, install the remaining racking and components that are located where the temporary measures were removed.

2.9 Post-Construction Stormwater Management

2.9.1 Site Hydrology and Hydraulic Analysis

Under proposed conditions, large portions of the agricultural uses will be converted to solar array where panels will be installed using driven posts; in some areas, screws or piles may be used in lieu of or in addition to the posts. Existing woodland within the limits of the project will be cleared and stumps will be removed, allowing the area to stabilize prior to construction of solar infrastructure.

Following construction, stormwater will fall onto solar panels and will flow off the edge into the vegetated surface and flow along existing flow paths as under existing conditions. Therefore, for purposes of peak rate reduction calculations, the only solar panels that are considered impervious will be the most up-gradient panels in each subcatchment.[1] The remainder of the solar facility within the limit of work will be considered meadow, non-grazed. Concrete equipment pads or skids, existing and proposed gravel access roads, woodland, remaining agricultural fields and basins were also included in the post-development analysis.

The topography of the site will be altered in select areas to accommodate the solar array, stormwater berms and basins, and proposed access roads. The delineation of drainage areas will not substantially change as a result of the proposed development. The Proposed Conditions Drainage Area Map, provided as Figure 4 in Appendix A, indicates that the three existing conditions design points will be maintained under proposed conditions. The

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[1] Cook, L.M. & McCuen, R. H., (2013). Hydrologic Response of Solar Farms. *Journal of Hydrologic Engineering*, 18(5). pp.536-541

contributing drainage areas will convey stormwater runoff generally as under existing conditions.

The proposed Project will not substantially alter stormwater flow paths and will result in decreased peak discharge rates as a result of incorporation of stormwater management features. The existing Site is primarily woodland and agricultural fields with existing gravel roads and inland wetlands and watercourses. The CN value for the existing site is 74 and the proposed CN value is 69 for the entire site. Additionally, infiltration and storage to attenuate runoff rate and volume was achieved through the construction of wet-bottomed swales, basins and wet ponds.

Table 2.5 presents the results of the pre-development stormwater runoff analysis versus the post-development stormwater runoff analysis for each design point.

Table 2.5

Peak Discharge Rate Comparison

		2-year Storm Event (cfs)	**25-year Storm Event (cfs)**	**50-year Storm Event (cfs)**	**100-year Storm Event (cfs)**
Design Point 1 (Southwest)	Existing	44.3	101.8	122.5	138.0
	Proposed	43.1	101.2	122.1	137.9
Design Point 2 (Northwest)	Existing	55.8	137.5	219.8	255.2
	Proposed	12.5	104.3	165.7	209.5
Design Point 3 (Northeast)	Existing	3.7	11.9	15.2	17.7
	Proposed	1.4	7.1	9.9	14.1

Table 2.5 indicates that existing peak discharge rates are reduced for the 2-, 25-, 50- and 100-year storm events.

2.9.2 Best Management Practices and Water Quality

The proposed conditions stormwater management plan for the proposed site has been designed to remove a high percentage of sediments in accordance with the Connecticut Department of Energy and Environmental Protection "Stormwater General Permit Criteria".

The Project has been designed to utilize a "country drainage" scheme which allows stormwater runoff from impervious surfaces to flow into adjacent grassed areas and allowed to recharge to groundwater as under existing conditions. The Project does not include large, uninterrupted spans of impervious ground coverage. Concrete equipment pads are relatively small in comparison to the overall watershed, will not adversely impact groundwater recharge capabilities of the proposed conditions site.

The post-construction stormwater management plan for this site uses "Best Management Practices ("BMPs")" to meet or exceed the Connecticut DEEP's goal of 80% removal of total suspended solids and Water Quality requirements. The BMPs include:

Wet-Bottomed Swales: Wet-Bottomed swales are vegetated open channels which temporarily store and treat runoff by allowing pollutants to settle from suspension prior to discharge, improving water quality. Wet-bottomed swales were designed to run parallel with existing grades to allow for pretreatment of runoff through the grass strip or meadow surface in a manner similar to the existing condition.

Wet Ponds: Wet ponds are wet-bottomed stormwater management features that use a constant pool of water to allow suspended solids to fall from suspension, resulting in clean runoff from the basins following storm events. Pretreatment of runoff is achieved in the sediment forebay of the wet pond, which allows coarse sediment particles to settle out prior to entering the permanent wet pond, enhancing the pond's overall performance while reducing the maintenance required. Pocket ponds are a type of wet pond that serves a smaller drainage area. The wet pond and pocket pond were designed to capture and treat the entire computed WQV from the contributing drainage area.

Infiltration Basins: Infiltration basins, created through vegetated berms, are stormwater features that capture and infiltrate runoff to reduce runoff volume and remove fine sediment, improving water quality. For this site the southern vegetated berm acts as the sediment forebay and provides pretreatment, while the northern vegetated berm is the main infiltration basin.

The required WQV for the proposed conditions is based on the acreage of impervious surfaces including gravel access roads, solar panels and impervious concrete pads.

All other impervious surfaces, specifically gravel roads, will not be curbed in order to promote a “country drainage” scenario. The lack of curb and gutter will allow stormwater runoff from the roadways to flow through the adjacent grasses. This will remove any sediment from the runoff prior to discharge off-site. The Site Plans indicate that impervious surfaces will be located over 50 feet from any receiving water, providing suitable residence time within the grass to remove sediment from runoff.

2.9.3 Post-Construction Storm Water Management Measures

2.9.3.1 General Permit Coverage Termination

Upon the completion of any and all construction activities on site, the Registrant shall submit a Notice of Termination Form, to the CT DEEP to ensure the proper handling of the permit termination. See Appendix M for a blank form.

Upon completion of the construction activities the Owner (or their delegate) shall conduct monthly inspections of the BMPs which include all areas covered by the SWPCP and all stormwater structures and outfalls on the site for surface or floating debris, oil and sediment for the first 90 days. Following the initial 90 day inspection period, stormwater BMPs shall be inspected in accordance with the recommended schedule outlined in 2002 Connecticut Stormwater Quality Manual, or as further detailed in Section 2.8.3.2 below. The site shall be inspected bi-annually for trash accumulation and surface debris. Routine inspection forms can be found in Appendix I.

2.9.3.2 Operations and Maintenance

The Owner (or their delegate) will be responsible for implementing the Operations and Maintenance Plan on the entire property that shall cover the following:

Roadway Surface

Gravel roadway surfaces shall be observed periodically by the Owner to clean trash and other debris, and to identify areas where concentrated runoff may cause erosion of the roadway surface.

Perform a visual inspection of roadway areas four times per year with one inspection after the last snowfall, but no later than April 1. Repair roadway areas as necessary during the remainder of the year.

Landscape

Meadow vegetation surrounding and underneath the solar PV array will be inspected and mowed at least twice per year to allow for healthy meadow cover, while preventing woody vegetation growth. The number of mows will be adjusted based on field conditions and actual vegetation growth.

Existing vegetation around the perimeter of the project site will be maintained in its native condition. No clearing, grading, stockpiling, storage or development will occur in these areas.

Spill Containment

Any oil or gasoline spills should be cleaned from the site immediately, and the stormwater management system components cleaned. The Owner should not wait until the next inspection to clean the components. A record of spills should be kept in a log book, and reported as required to Connecticut DEEP. See Appendices F and G for reporting forms.

2.10 Pollution Controls

2.10.1 Stabilization Practices

Major erosion and sediment controls are shown on the plans in Appendix C. Stabilization practices include:

1. **Vehicle areas:** Stabilization of construction road access, staging, and parking areas using coarse aggregate.

2. **Temporary Stabilization:** Hydroseed with bonded fiber matrix or install erosion control blankets and broadcast seed areas.

3. **Permanent Vegetation:** Sodding and/or seeding of all disturbed areas.

2.10.2 Erosion and Sediment Controls

Construction phase erosion and sediment controls will include structural controls such as conveyance swales, temporary sediment basins and temporary sediment traps in addition to perimeter controls, check dams, and other measures as required during construction to manage stormwater. Structural controls have been designed in accordance with the 2002 Guidelines for Soil Erosion and Sediment Control manual. Additional details regarding temporary basin and trap location and sizing are provided in Appendix D.

2.10.3 Sequence of Major Erosion and Sediment Control Activities

The construction will proceed in sequences as previously described in Section 2.7. The stabilized construction access, staging, and parking areas will be constructed first. The following pollution prevention controls and measures will be implemented throughout the project:

1. Perimeter erosion controls, construction entrances, and silt fence will be constructed in predetermined locations.
2. Prior to installing surface water controls such as temporary diversions and stone check dams, inspect existing conditions to ensure discharge locations are stable. If not stable, review discharge conditions with the design engineer and implement additional stabilization measures prior to installing surface water controls.
3. Construct temporary sediment traps and/ or basins, diversion swales and berms with check dams.
4. Complete work designated to sequence sub-phase.
5. Stabilize site with seed and mulch in all disturbed areas. Stabilize areas with a slope of 7% or steeper with hydroseed with bonded fiber matrix or hydroseed and install erosion control blankets. Monitor disturbed areas weekly or following rain events and amend with additional seeding as needed until stabilization is achieved.
6. Upon stabilization, temporary controls may be removed in order to construct subsequent sub-phases.

2.10.4 Waste Materials

All trash and construction debris from the site will be hauled to an approved landfill or other legal means of disposal. No construction waste material will be buried on the site. Employee waste and other loose materials will be collected so as to prevent the release of floatables during runoff events.

All personnel will receive instructions regarding the correct procedure for waste disposal. Notices describing these practices shall be posted in the construction office. The site superintendent will be responsible for seeing that these procedures are followed.

2.10.5 Hazardous Waste

No hazardous waste is expected to be generated or encountered during this Project. In the event that hazardous waste is encountered, all hazardous waste materials will be disposed of in the manner specified by local, state or federal regulation or by the manufacturer.

The site superintendent will be responsible for seeing that these practices are followed.

2.10.6 Sanitary Waste

Portable sanitary units will be provided for use by all workers throughout the life of the project. All sanitary waste will be regularly collected from the portable units by a licensed sanitary waste management contractor.

2.11 Maintenance

To maintain the erosion and sediment controls, the following procedures will be performed.

1. **Sediment Capture Devices:** Sediment will be removed from the upstream or upslope side of the perimeter erosion controls when the depth of accumulated sediment reaches about one-third the height of the structure. Sediment accumulations in temporary traps and basins shall be removed when sediment depth exceeds one half of the wet storage capacity of the basin or trap, or when the depth of the available pool in the basin is reduced to 18 inches.

2. **Temporary Controls:** All temporary controls will be removed after the disturbed areas have been stabilized.

The contractor shall haul off-site and properly dispose of, or use as backfill, sediment that is removed from structural barriers. Sediment temporarily stockpiled on site will be placed in such areas and in such manner as to minimize wash-off into the local drainage system. Berms, perimeter erosion controls, and polyethylene or polypropylene covers are measures which may be utilized in minimizing washoff.

2.11.1 Inspection Procedures

All construction activities submitting a registration for the General Permit shall be inspected initially for Plan implementation and then weekly for routine inspections. Weekly inspection forms can be found in Appendix J. Inspections will be conducted by a Qualified Inspector (defined below at Section 2.10.1.3). The Permittee will also have a full-time, on-site Environmental Monitor to oversee construction and permit compliance. The Design Engineer will be on-site during the establishment of each major Phase to oversee compliance with the proposed design.

2.11.1.1 Plan Implementation Inspection

Within the first 30 days following commencement of the construction activity on the Site, the Permittee shall contact a qualified soil erosion and sediment control professional or a qualified professional engineer (a Qualified Inspector) to inspect the site. The site shall be inspected at least once and no more than three times during the first 90 days to confirm compliance with the General Permit and proper initial implementation of all controls measures designated in the Plan for the site for the initial phase of construction. The inspection forms can found in Appendix I, J, and K.

2.11.1.2 Routine Inspections

The Permittee shall routinely inspect the site for compliance with the General Permit and the Plan for the site until a Notice of Termination has been submitted. Inspection procedures for these routine inspections shall be addressed and implemented in the following manner:

a. The Permittee shall maintain a rain gauge on-site to document rainfall amounts. At least once a week and within 24 hours of the end of a storm that generates a discharge, a qualified inspector (provided by the Permittee), as defined in the “Definitions” section (Section 2) of the General Permit, shall inspect, at a minimum, the following: disturbed areas of the construction activity that have not been finally stabilized; all erosion and sedimentation control measures; all structural control measures; soil stockpile areas; washout areas and locations where vehicles enter or exit the site. These areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system and impacts to the receiving waters. Locations where vehicles enter or exit the site shall also be inspected for evidence of off-site sediment tracking. For storms that end on a weekend, holiday or other time after which normal working hours will not commence within 24 hours, an inspection is required within 24 hours only for storms that equal or exceed 0.5 inches. For storms of less than 0.5 inches, an inspection shall occur immediately upon the start of the subsequent normal working hours. Where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three months.

b. The Qualified Inspector(s) shall evaluate the effectiveness of erosion and sediment controls, structural controls, stabilization practices, and any other controls implemented to prevent pollution and determine if it is necessary to install, maintain, or repair such controls and/or practices to improve the quality of stormwater discharge(s).

c. A report shall be prepared and retained as part of the Plan. This report shall summarize: the scope of the inspection; name(s) and qualifications of personnel making the inspection; the date(s) of the inspection; weather conditions including precipitation information; major observations relating to erosion and sediment controls and the implementation of the Plan; a description of the stormwater discharge(s) from the site; and any water quality monitoring performed during the inspection. The report shall be signed by the Permittee or his/her authorized representative in accordance with the "Certification of Documents" section (subsection 5(i)) of the General Permit. The report shall include a statement that, in the judgment of the qualified inspector(s) conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the Plan and permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance. Non-engineered corrective actions (as identified in the Guidelines) shall be implemented on site within 24 hours and incorporated into a revised Plan within three (3) calendar days of the date of inspection unless another schedule is specified in the Guidelines. Engineered corrective actions (as identified in the Guidelines) shall be implemented on site within seven (7) days and incorporated into a revised Plan within ten (10) days of the date of inspection, unless another schedule is specified in the Guidelines or is approved by the commissioner. During the period in which any corrective actions are being developed and have not yet been fully implemented, interim measures shall be implemented to minimize the potential for the discharge of pollutants from the site.

d. Inspectors from the CT DEEP may inspect the site for compliance with the General Permit at any time construction activities are ongoing and upon completion of construction activities to verify the final stabilization of the site and/or the installation of post-construction stormwater management measures pursuant to Section 6(a).

e. Additional inspections, reports and documentation may also be required to comply with the "Monitoring Requirements" section (Section 5(c)) of the General Permit.

2.11.1.3 Inspection Personnel Qualifications

The site shall be inspected by a qualified soil erosion and sediment control professional or a qualified professional engineer (Qualified Inspector). The inspector shall be someone who:

a. is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant, and

b. has no ownership interest of any kind in the Project for which the registration is being submitted.

2.12 Monitoring

2.12.1 Turbidity Monitoring Requirements

Sampling shall be conducted in accordance with the requirements of the General Permit at least once every month, when there is a discharge of stormwater from the site while construction activity is ongoing, until final stabilization of the drainage area associated with each outfall is achieved.

The Permittee is only required to take samples during normal working hours as defined in Section 2 of the General Permit. The Site's normal working hours must be identified in the Plan pursuant to Section 5(b)(1)(B)(vii) of the General Permit. If sampling is discontinued due to the end of normal working hours, the Permittee shall resume sampling the following morning or the morning of the next working day following a weekend or holiday, as long as the discharge continues.

Sampling may be temporarily suspended any time conditions exist that may reasonably pose a threat to the safety of the person taking the sample. Such conditions may include high winds, lightning, impinging wave or tidal activity, intense rainfall or other hazardous condition. Once the unsafe condition is no longer present, sampling shall resume.

If there is no stormwater discharge during a month, sampling is not required, and the form must be submitted with a notation explaining that a rainfall event did not occur in coincidence with normal working hours.

2.12.2 Sample Collection

All samples shall be collected from discharges resulting from a storm event that occurs at least 24 hours after any previous storm event generating a stormwater discharge. Any sample containing snow or ice melt must be identified on the Stormwater Monitoring Report form. Sampling of snow or ice melt in the absence of a storm event is not a valid sample.

Samples shall be grab samples taken at least three separate times during a storm event and shall be representative of the flow and characteristics of the discharge(s). Samples may be taken manually or by an in-situ turbidity probe or other automatic sampling device equipped to take individual turbidity readings (i.e. not composite). The first sample shall be taken within the first hour of stormwater discharge from the site. In cases where samples are collected manually and the discharge begins outside of normal working hours, the first sample shall be taken at the start of normal working hours.

2.12.3 Sampling Locations

Sampling is required of all point source discharges of stormwater from disturbed areas except as may be modified for linear projects. Where there are two or more discharge points that discharge substantially identical runoff, based on similarities of the exposed soils, slope, and type of stormwater controls used, a sample may be taken from just one of the discharge points. In such case, the Permittee shall report that the results also apply to the substantially identical discharge point(s). No more than 5 substantially identical outfalls may be identified for one representative discharge. If such project is planned to continue for more than one year, the Permittee shall rotate twice per year the location where samples are taken so that a different discharge point is sampled every six months. The Plan must identify each outfall authorized by the permit and describe the rationale for any substantially identical outfall determinations.

All sampling point(s) shall be identified in the Plan and be clearly marked in the field with a flag, stake, or other visible marker. At a minimum, discharge locations from temporary sediment basins and traps will be identified as sampling points. Additional points will be identified during construction in the event that field conditions vary from the available plan information.

2.12.4 Analysis

Sampling and analysis shall be prescribed by 40 CFR Part 136 in accordance with the requirements of the General Permit.

2.12.5 Turbidity Values

The stormwater discharge turbidity value for each sampling point shall be determined by taking the average of the turbidity values of all samples taken at that sampling point during a given storm.

2.121.6 Monitoring Reports

a) Within thirty (30) days following the end of each month, the Permittee shall enter the stormwater sampling result(s) on the Stormwater Monitoring Report (SMR) form, Appendix K, (available at www.ct.gov/deep/stormwater) and submit it in accordance with the NetDMR provisions in subsection f, below, or, if the Permittee has opted out of NetDMR, to the following address:

Bureau of Materials Management and Compliance Assurance
Water Permitting and Enforcement Division (Attn: DMR Processing)
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

b) If there was no discharge during any given monitoring period, the Permittee shall submit the form as required with the words “no discharge” entered in place of the monitoring results.

c) If the Permittee monitors any discharge more frequently than required by this General Permit, the results of this monitoring shall be included in additional SMRs for the month in which the samples were collected.

d) If sampling protocols are modified due to the limitations of normal working hours or unsafe conditions in accordance with Section 5(c1A ii) or (iii) in the General Permit, a description of and reason for the modifications shall be included with the SMR.

e) If the Permittee samples a discharge that is representative of two or more substantially identical discharge points, the Permittee shall include the names or locations of the other discharge points.

f) NetDMR Reporting Requirements

Prior to one-hundred and eighty (180) days after the issuance of the permit, the Permittee may either submit monitoring data and other reports to the Department in hard copy form or electronically using NetDMR, a web-based tool that allows Permittees to electronically submit stormwater monitoring reports through a secure internet connection. Unless otherwise approved in writing by the commissioner, no later than one-hundred and eighty (180) days after the issuance of the permit the Permittee shall begin reporting electronically using NetDMR. Specific requirements regarding subscription to NetDMR and submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

i. Submittal of NetDMR Subscriber Agreement: On or before fifteen (15) days after the issuance of the permit, the Permittee and/or the person authorized to sign the Permittee's discharge monitoring reports ("Signatory Authority") as described in RCSA Section 22a-430-3(b2) shall contact the Department at deep.netdmr@ct.gov and initiate the NetDMR subscription process for electronic submission of Stormwater Monitoring Report information. Information on NetDMR is available on the Department's website at www.ct.gov/deep/netdmr. On or before ninety (90) days after issuance of this permit the Permittee shall submit a signed and notarized copy of the *Connecticut DEEP NetDMR Subscriber Agreement* to the Department.

ii. Submittal of Reports Using NetDMR: Unless otherwise approved by the commissioner, on or before one-hundred and eighty (180) days after issuance of the permit, the Permittee and/or the Signatory Authority shall electronically submit SMRs required under the permit to the Department using NetDMR in satisfaction of the SMR submission requirements of Sections 5(c2A) of the permit. SMRs shall be submitted electronically to the Department no later than the 30th day of the month following the completed reporting period. Any additional monitoring conducted in accordance with 40 CFR 136 shall be submitted to the Department as an electronic attachment to the SMR in NetDMR. Once a Permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of SMRs to the Department. NetDMR is accessed from: http://www.epa.gov/netdmr.

iii. Submittal of NetDMR Opt-Out Requests If the Permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for electronically submitting SMRs, the commissioner may approve the submission of SMRs in hard copy form ("opt-out request"). Opt-out requests must be submitted in writing to the Department for written approval on or before fifteen (15) days prior to the date a Permittee would be required under the permit to begin filing SMRs using NetDMR. This demonstration shall be valid for twelve (12) months from the date of the Department's approval and shall thereupon expire. At such time, SMRs shall be submitted electronically to the

Department using NetDMR unless the Permittee submits a renewed opt-out request and such request is approved by the Department. All opt-out requests and requests for the NetDMR subscriber form should be sent to the following address or by email at deep.netdmr@ct.gov:

Attn: NetDMR Coordinator
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

2.13 Letter of Credit

The Permittee will establish a Financial Assurance Mechanism (FAM) in the amount of **$1,125,000** with the CT Department of Energy and Environmental Protection (CT DEEP) prior to initiating construction. The value of the Letter of Credit is based on the total disturbance of 75 acres and the $15,000.00 per acre requirement.

2.14 Non-Stormwater Discharges

It is not expected that non-stormwater discharges will occur at the Site during the construction period, however if groundwater is apparent then the following discharge may occur:

1. **Dewatering discharges:** Water pumped from the construction area during dewatering operations.

2.15 Significant-Materials Inventory

Significant materials expected to be found at the construction site include:

- Concrete mix (trucked to the site for proposed site improvements)
- Steel reinforcing bars and related materials
- Photovoltaic panels and related materials
- Diesel fuel and lubricating oils
- Paints
- Fertilizers

This list of significant materials may be reduced or expanded once a contractor has been selected and the materials to be used have been specified. If fewer, or additional, materials are required, the SWPCP will be amended to reflect these changes.

2.26 Spill Prevention and Response Procedures

Spill prevention and response include good housekeeping as well as specific practices for certain products and established procedures for responding to spills.

2.26.1 Good Housekeeping

The following good housekeeping practices will be followed on site during the construction project.

1. **Minimize materials:** An effort will be made to store only enough material required to complete the job.
2. **Storage:** All materials stored on site will be stored in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
3. **Labeling:** Products will be stored in their original containers with the original manufacturer's label affixed to each container.
4. **Mixing:** Substances will not be mixed with one another unless this is recommended by the manufacturer.
5. **Disposal:** Whenever possible, all of a product will be used prior to disposal of the container. Manufacturers' recommendations for proper use and disposal will be followed.
6. **Inspections:** The site superintendent will inspect the site daily to ensure proper use and disposal of materials on site.
7. **Spoil materials:** Any excavated material that will not be used for fill material and all demolished pavement will be hauled off site and will be disposed of properly.

2.16.2 Product-Specific Practices

Petroleum products: All on-site vehicles will be monitored for leaks and will receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used on site will be applied according to the manufacturer's recommendations.

Concrete trucks: Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water at the site.

Paints: All containers will be tightly sealed and stored when not required for use. Excess paint will be properly disposed of according to manufacturers' instructions and state and local regulations.

Fertilizers: Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Fertilizer will be stored in a covered area, and any partially used bags will be transferred to a sealable plastic bin to avoid spills.

2.26.3 Spill Control and Response Practices

A spill prevention and response team will be designated by the Owner or the site superintendent. In addition, the following practices will be followed for spill cleanup:

1. **Information:** Manufacturers' recommended methods for spill cleanup will be clearly posted, and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
2. **Equipment:** Materials and equipment necessary for spill cleanup will be present on the site at all times. Equipment and materials will include but not limited to brooms, shovels, rags, gloves, goggles, absorbent materials (sand, sawdust, etc.), and plastic or metal trash containers specifically designed for this purpose. The materials and equipment necessary for spill cleanup will be dependent upon the nature and quantity of the material stored on site.
3. **Response:** All spills will be cleaned up immediately upon discovery.
4. **Safety**: The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances.
5. **Reporting**: Spills of toxic or hazardous material will be reported to the appropriate state or local government agency, regardless of the spill's size, immediately upon discovery.
6. **Record keeping:** The spill prevention plan will be modified to include measures to prevent a spill from recurring as well as improved methods for cleaning up any future spills. A description of each spill, what caused it, and the cleanup measures used will be kept with the plan.

2.17 Plan Location and Public Access

This SWPCP must be available at the construction site from the date of project initiation to the date of final stabilization. The SWPCP and all reports required by the General Permit for permit must be retained by the Owner for at least three years from the date on which the site is finally stabilized.

2.18 Reporting and Record Keeping

The Permittee is responsible for keeping the Plan in compliance with the General Permit at all times. For a period of at least five years from the date that construction is complete, the Permittee shall retain copies of the Plan and all reports required by this General Permit, and records of all data used to complete the registration for this General Permit, unless the commissioner specifies another time period in writing. Inspection records must be retained as part of the Plan for a period of five (5) years after the date of inspection.

The Permittee shall retain an updated copy of the Plan required by the General Permit at the construction site from the date construction is initiated at the site until the date construction at the site is completed.

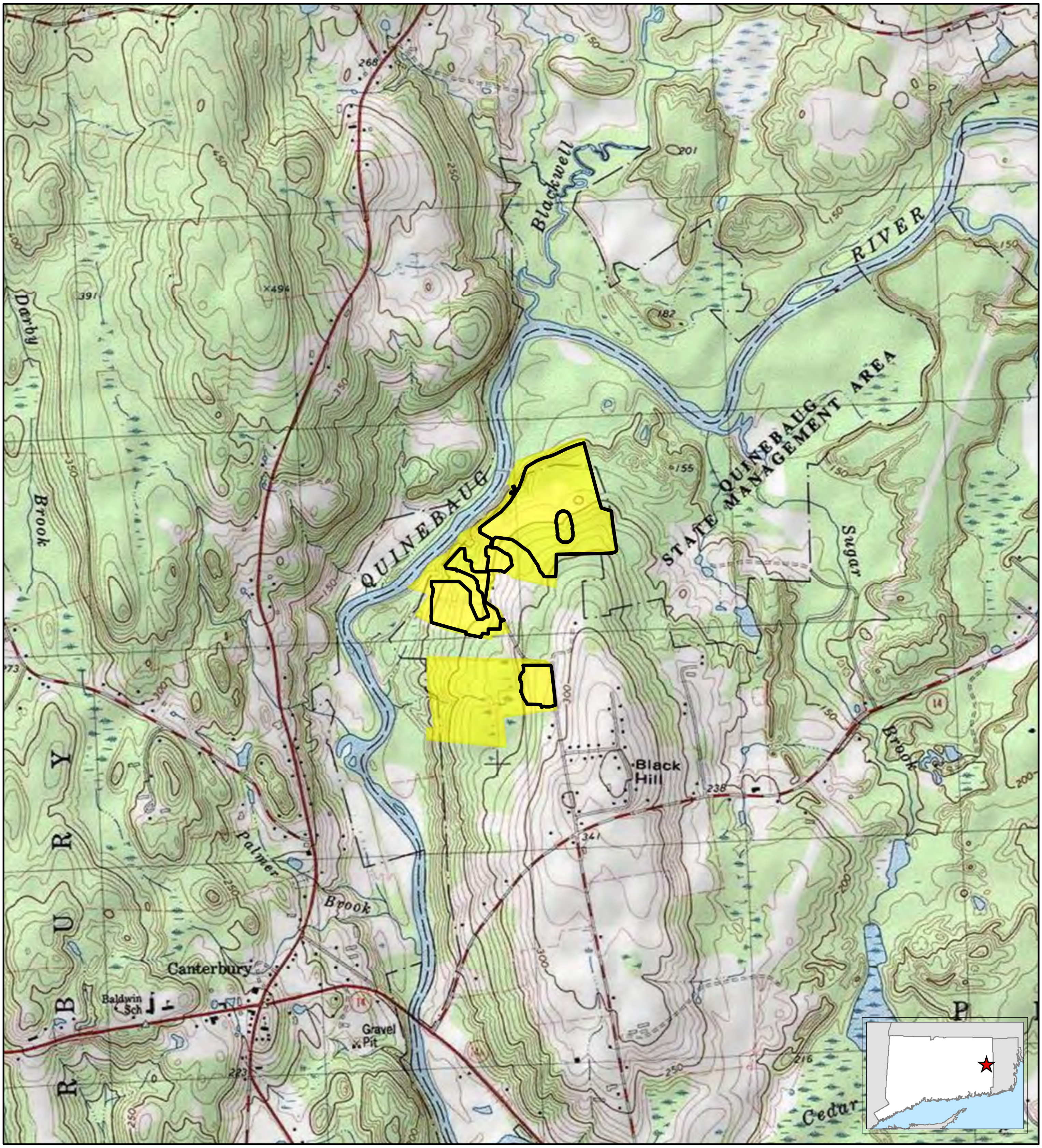
Revisions to the plan may involve the following actions:

- The Permittee shall amend the Plan if the actions required by the Plan fail to prevent pollution or fail to otherwise comply with any other provision of the General Permit. The Plan shall also be amended whenever there is a change in contractors or subcontractors at the site, or a change in design, construction, operation, or maintenance at the site which has the potential for the discharge of pollutants to the waters of the state and which has not otherwise been addressed in the Plan.

- The commissioner may notify the Permittee at any time that the Plan and/or the site do not meet one or more of the minimum requirements of the General Permit. Within 7 days of such notice, or such other time as the commissioner may allow, the Permittee shall make the required changes to the Plan and perform all actions required by such revised Plan. Within 15 days of such notice, or such other time as the commissioner may allow, the Permittee shall submit to the commissioner a written certification that the requested changes have been made and implemented and such other information as the commissioner requires, in accordance with the "Duty to Provide Information" and "Certification of Documents" sections (subsections 5(h) and 5(i)) of the General Permit.

In no event shall failure to complete, maintain or update a Plan, in accordance with the "Development of Contents of the Plan" and "Keeping Plans Current" sections (subsections 5(b)(1) and 5(b)(5)) of the General Permit, relieve a Permittee of responsibility to implement any actions required to protect the waters of the state and to comply with all conditions of the permit.

APPENDIX A



— Limit of Work/Development Area

🟨 Project Site

FIGURE 1

SITE LOCATION

Constitution Solar

Plainfield, Connecticut

1:24,000

0 1,000 2,000

Feet

N

Tighe&Bond

Engineers | Environmental Specialists

Based on USGS Topographic Map for Plainfield, CT

December 2020

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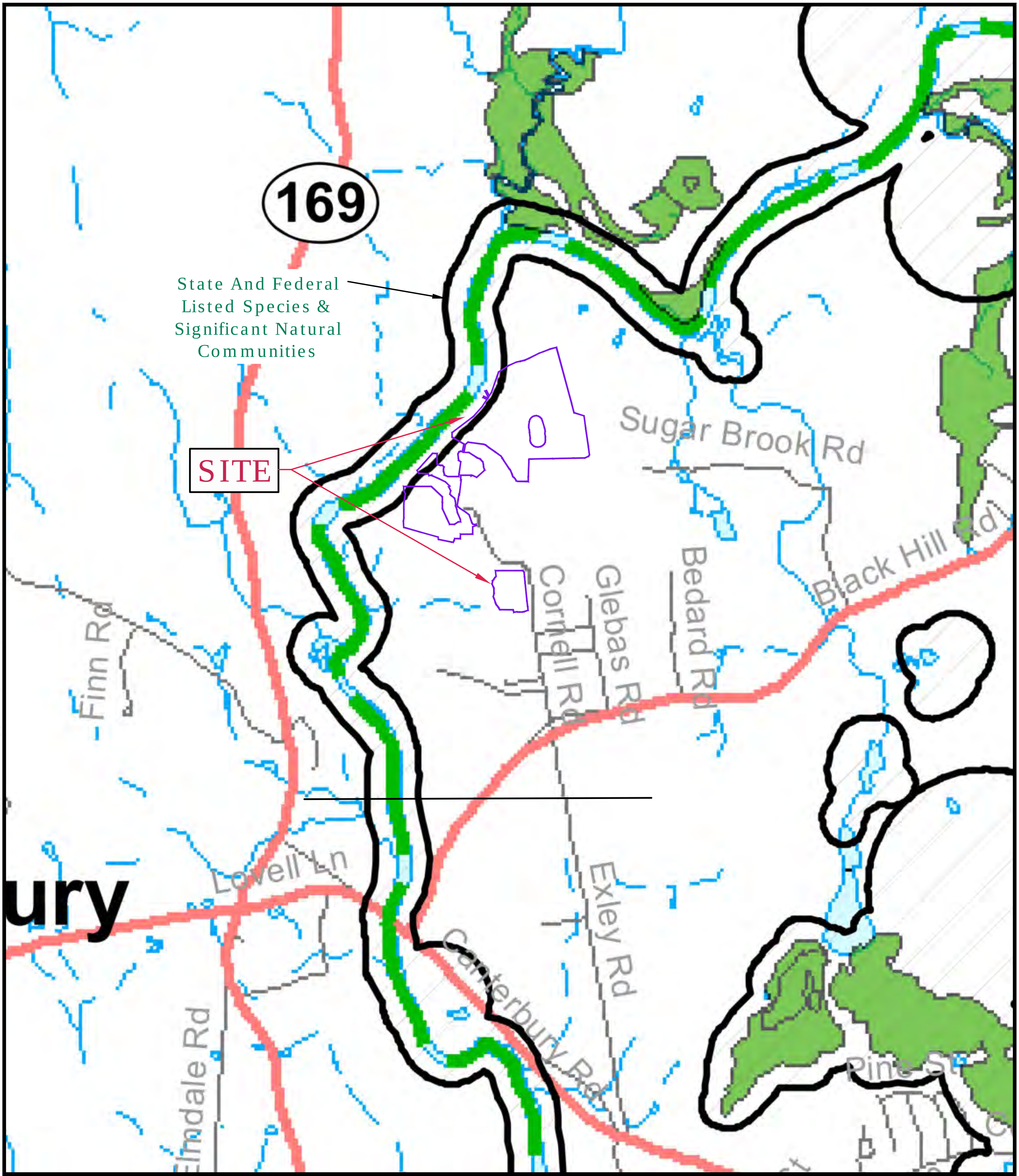
R-0317



Tighe & Bond, Inc. J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Permitting\Petition\SWPCP\Appendices\App_A Figures\Figure 2.dwg

Tighe&Bond
www.tighebond.com

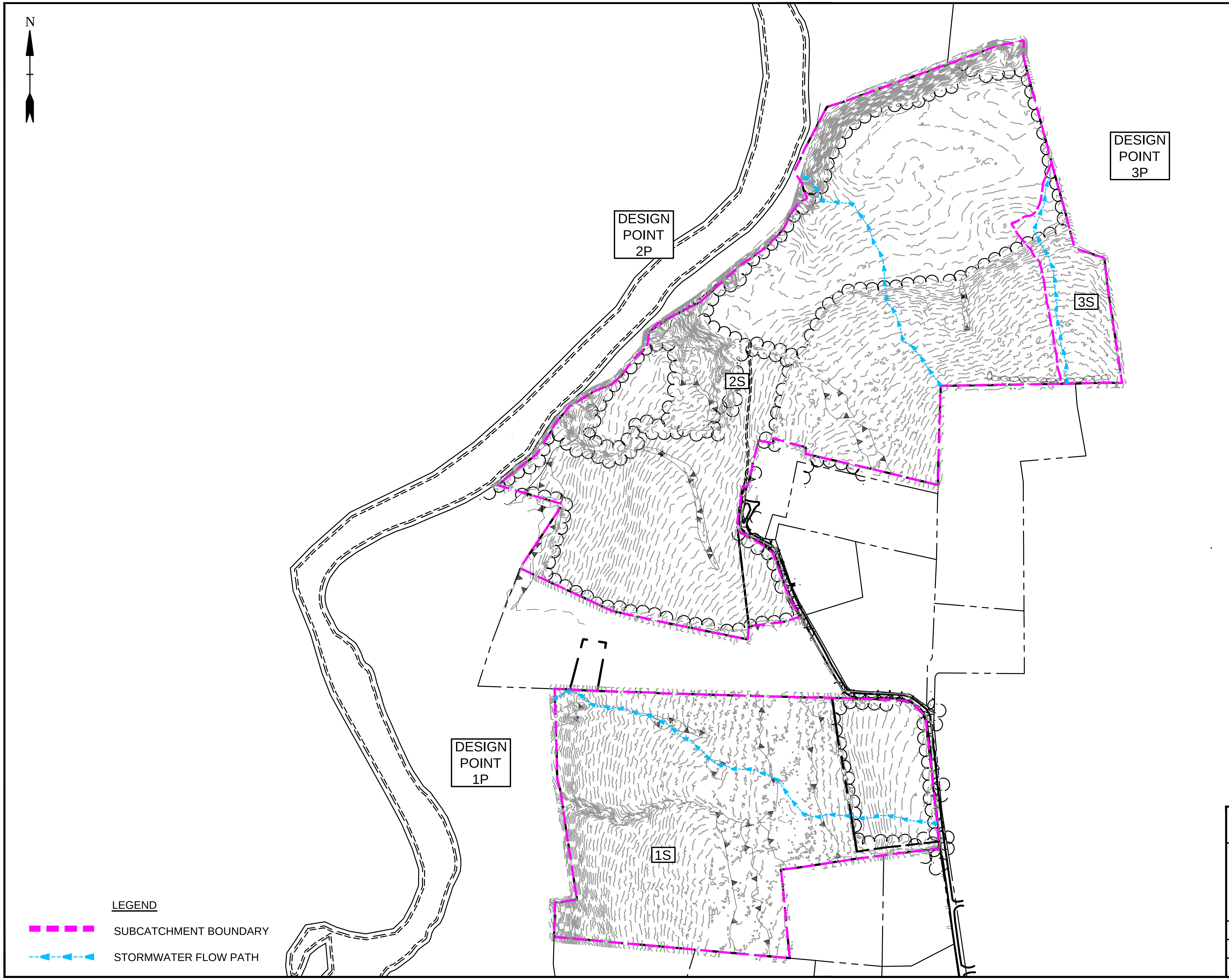
Constitution Solar Project
Plainfield, Connecticut

CT DEEP
Endangered Species Map

NORTH
1" = 2000'

FIGURE 2

12/15/2020

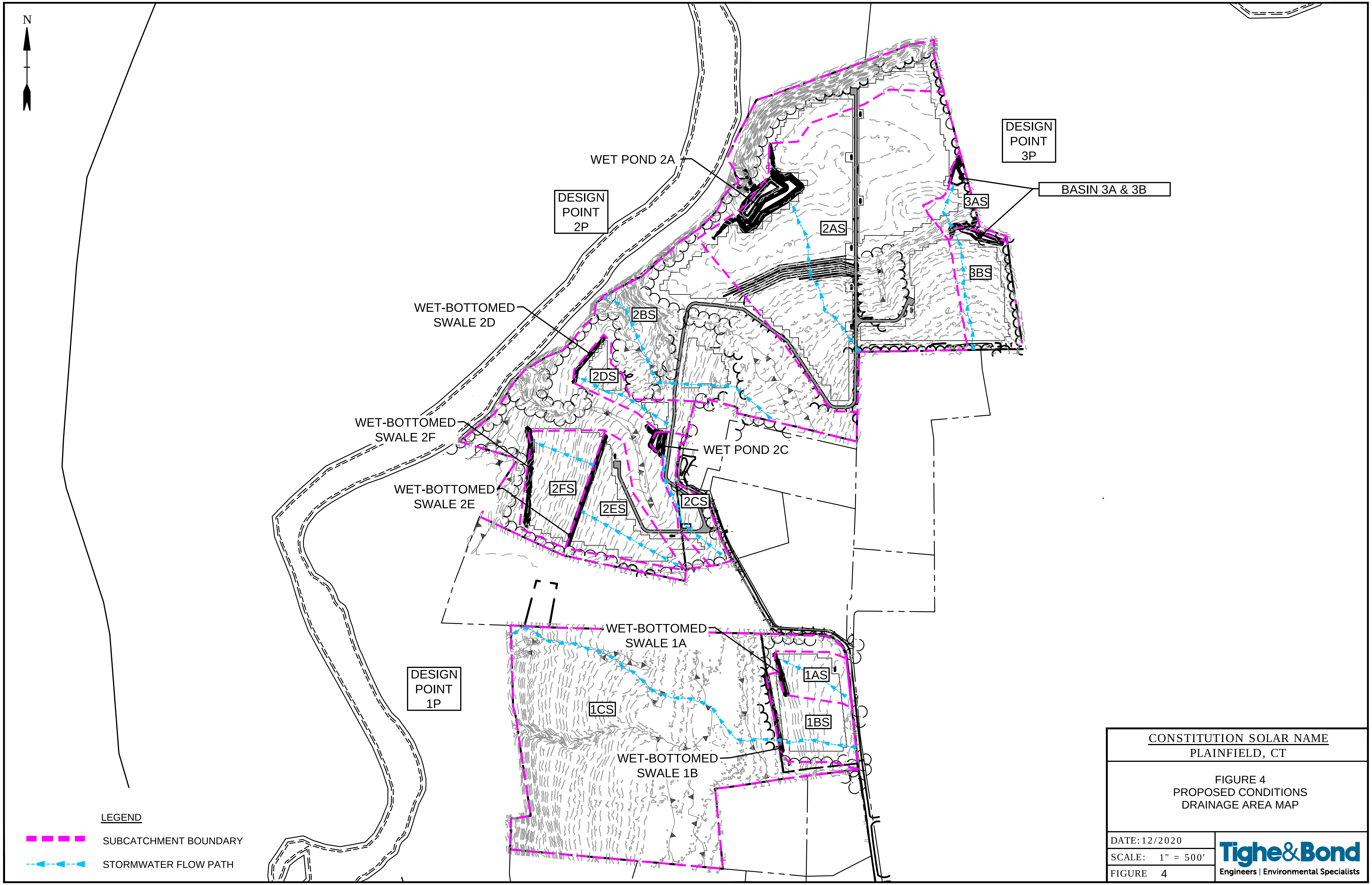


CONSTITUTION SOLAR
PLAINFIELD, CT

FIGURE 3
EXISTING CONDITIONS
DRAINAGE AREA MAP

DATE: 12/2020
SCALE: 1"=500'
FIGURE 3

Tighe&Bond
Engineers | Environmental Specialists

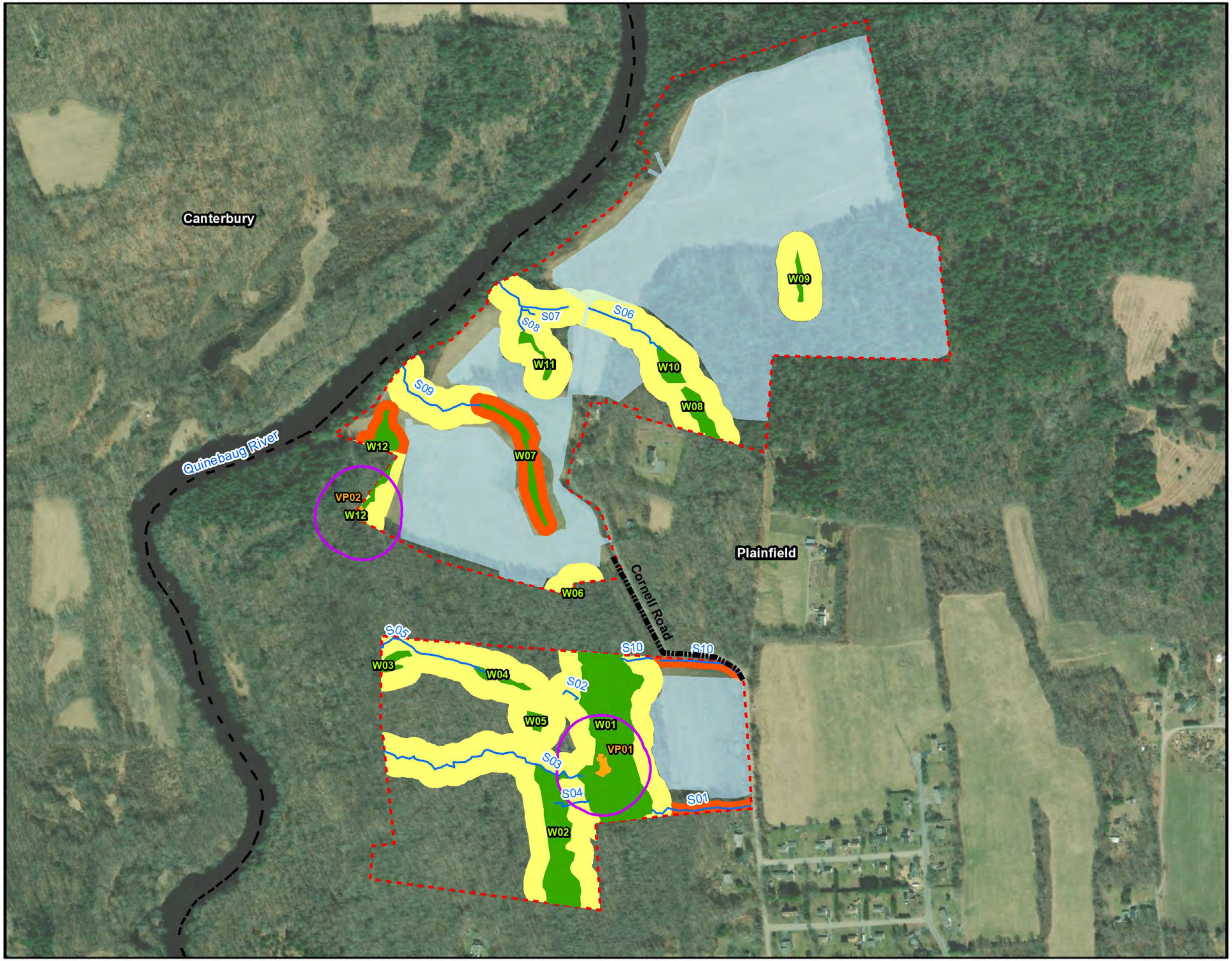


CONSTITUTION SOLAR NAME
PLAINFIELD, CT

FIGURE 4
PROPOSED CONDITIONS
DRAINAGE AREA MAP

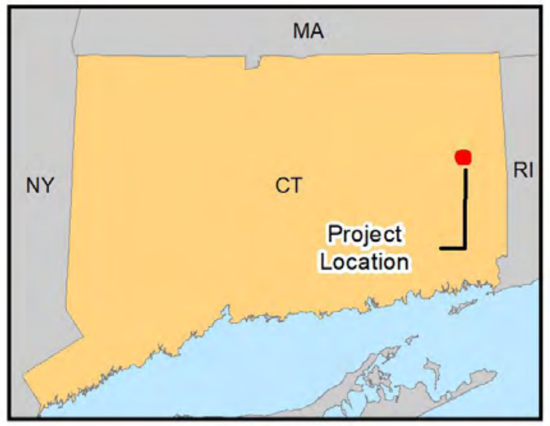
DATE: 12/2020
SCALE: 1" = 500'
FIGURE 4

Tighe&Bond
Engineers | Environmental Specialists



Legend

- ▭ Study Area
- ■ Development Footprint
- ▭ Township Boundary
- 🟩 Delineated Wetland
- 🟧 Vernal Pool
- 🟥 50 ft Buffer
- 🟨 100 ft Buffer
- ▭ Vernal Pool Envelope (200 ft)
- — Watercourse
- — Proposed Collection Route



N

0 250 500 1,000 Feet

Wetlands and Watercourse Buffers
Constitution Solar,
Plainfield, Connecticut

Prepared For: NEXTera ENERGY RESOURCES

Prepared By: TETRA TECH

Date: 12/2020

Source: Esri, et. al., 2018; NextEra, 2019; DEEP, 2017

Coordinate System: North American Datum, 1983 Universal Transverse Mercator, Zone 19 North

Not for Construction

APPENDIX B

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

November 11, 2020

Ms. Katelin Nickerson
Tetra Tech, Inc.
451 Presumpscot Street
Portland, ME 04103
Katelin.nickerson@tetratech.com

Project: Proposed 20 MW Utility-Scale Constitution Solar Project on 147.7 Acres on Cornell Road in Plainfield, Connecticut
NDDB REVISED Final Determination No.: 201905175 (Preliminary Assessment No. 201706152)

Dear Katelin Nickerson,

I have re-reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map provided for a proposed 20 MW Utility-Scale Constitution Solar Project on 147.7 Acres on Cornell Road in Plainfield, Connecticut. As you are aware, according to our records there are extant populations of State Listed Species known to occur within or close to the boundaries of this property. The species include:

Amphibians and Reptiles
Scaphiopus holbrookii (Eastern spadefoot) – State Endangered
Ambystoma laterale (Blue-spotted salamander) - State Endangered
Heterodon platirhinos (Eastern hognose snake) – Special Concern
Thamnophis sauritus (Eastern ribbon snake) – Special Concern

Birds
Falco sparverius (American kestrel) – Special Concern
Toxostoma rufum (Brown thrasher) – Special Concern

Invertebrates
Calopteryx dimidiata (Sparkling Jewelwing) - Threatened
Margaritifera margaritifera (Eastern pearlshell) – Special Concern

Plants
Agalinis acuta (Sandplain agalinis) – Federal & State Endangered
Crocanthemum propinquum (Low frostweed) – Special Concern
Prunus alleghaniensis (Alleghany plum) – Special Concern (historic)

Bats
Perimyotis subflavus (Tricolored bat) –State Endangered
Lasiurus borealis (Red Bat) – State Special Concern
Lasiurus cinereus (Hoary Bat) - State Special Concern
Lasionycteris noctivagans (Silver-haired Bat) – State Special Concern

Protection for All State Listed Species

The following conservation measures are required to protect State Listed Species from project impacts:

1. A minimum 200-foot wide vegetative (no cut) buffer is required between the Project's limits of disturbance and the Quinebaug River. There must be no tree clearing of the existing tree cover in this 200-foot wide buffer area. No solar arrays or project components can be placed within 200 feet of the Quinebaug River and there can be no direct discharges of stormwater to the Quinebaug River.

2. Forty-two contiguous acres of habitat will be preserved in the southwest corner of the project site. This area was originally slated for solar panels but now the entire area will be avoided; this area includes the large forested wetland complex that contains a cryptic vernal pool (VP01) and a cluster of intermittent and ephemeral streams that flow toward the Quinebaug River and the Oxbow that contains vernal pool 2 (VP02). Protecting this forested area will preserve the forested critical terrestrial habitat of VP01 and the critical habitat of VP02. The entire area of critical habitat of Vernal pool 2 (VP02) is required to be conserved. This may be accomplished by implementing a 200-foot buffer around both VP01 and VPO2.

3. Habitat Enhancement will occur in two areas. Restoration Area 1, in the northern most project area is .3 acres and occurs in a field adjacent to stream S06. Native, non-invasive tree species will be planted to enhance and restore this area. Restoration Area 2 is in the southern most area and is 1.5 acres and contains wetland 12 (W12). Restoration Area 2 will be planted with native, non-invasive shrubs and trees to restore W12 to its natural condition and aid the restoration to vernal pool 2 (VP02). Constitution Solar will develop this 2 acre restoration (Area 1 and 2) and provide a plan to the NDDB Program for approval before it is implemented.

4. During construction Constitution Solar must employ qualified biologists to be on site to monitor construction activities and specifically employ a qualified herpetologist to monitor the protection of amphibians and reptiles and an ornithologist to be on site to conduct surveys during the nesting season for American kestrel (March 1st through August 30th). The reports of the avian survey will be provided to the NDDB program within 30 days of completion.

5. Constitution Solar agrees to provide 3 years of post-construction monitoring. A detailed post-construction monitoring plan will be developed and approved by the NDDB before construction begins. Monitoring will be conducted by qualified biologists and interim and annual reports will be expected. All state listed species observed on site will be reported to the NDDB utilizing rare plant and animal forms provided at the NDDB Program site.

Protection for Amphibian and Reptiles:

The state endangered "pure diploid" blue-spotted salamander (*Ambystoma laterale*) is also known from this area of Plainfield. This small to medium mole salamander is generally associated with lowland swamps, marshes, wet meadows and the surrounding uplands (upland forest) with sandy or loamy soils. The adults spend much time underground. These salamanders lay eggs in early spring (March through

April). The larvae metamorphosis in late June through August but sometimes may overwinter as larvae. Adults may migrate up to several hundred meters between their breeding pools and summer foraging area. These salamanders have high site fidelity to their breeding pools. Populations of this salamander are threatened by habitat loss and fragmentation as well as increased urbanization. Conservation strategies and best management practices to protect this salamander includes the protection of lowland forested wetlands and surrounding uplands.

Special Concern *Thamnophis sauritus* (Eastern ribbon snake) **i**nhabits areas with shallow water, grassy or shrubby areas bordering streams and wooded swamps. They also prefer sunny areas with low dense vegetation near shallow water areas. Their diet consists of insects, fish, frogs, salamanders and toads. They are most often encountered in high quality wetlands and riparian areas. They are quite sensitive to habitat degradation.

Eastern hognose snake snakes are a Special Concern species that has been declining due to loss of suitable habitat. They favor sandy areas with well drained gravelly soils. The active period for these snakes is April through November.

Protection and Mitigation for State Listed Amphibians and Reptiles

The following conservation measures are required to protect amphibians and reptiles from project impacts:

- A qualified herpetologist must be hired to be on site during construction activities at this project site. The herpetologist will be responsible for educating workers and doing sweeps before construction equipment is moved each day at the project site and will be able to move and handle any amphibians and reptiles that may be encountered. The herpetologist must maintain a valid CT scientific collector's permit and report all state listed species to the NDDB Program (deep.nddbrequest@ct.gov) within 30 days of the observation of any state listed species found during the project construction.

Recommended Protection Strategies for Amphibians and Reptiles Specifically During Construction:

- A qualified herpetologist (a biologist familiar with amphibians and reptiles) will remain on site to ensure these protection guidelines remain in effect and prevent amphibians and reptiles from being run over when moving heavy equipment.
- Exclusionary practices will be required to prevent any amphibian or reptile access into construction areas. These measures will need to be installed at the limits of disturbance.
- Exclusionary fencing must be at least 20 in tall and must be secured to and remain in contact with the ground and be regularly maintained (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through. Do not use plastic netted silt-fence. Many amphibians and reptiles get tangled in the netting.
- All staging and storage areas, outside of previously paved locations, regardless of the duration of time they will be utilized, must be reviewed to remove individuals and exclude them from re-entry.
- All construction personnel working must be apprised of state listed species description and the possible presence of a listed species, and instructed that the amphibian or reptile found inside work areas or notify the appropriate authorities to relocate individuals.
- Any amphibian or reptile encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and fencing should be inspected to identify and remove access point.

- In areas where silt fence is used for exclusion, it shall be removed as soon as the area is stable to allow for reptile and amphibian passage to resume.
- Special precautions must be taken to avoid degradation of wetland habitats including any wet meadows and seasonal pools.
- The Contractor and consulting biologist must search the work area each morning prior to any work being done.
- Vehicles and heavy machinery should operate at slower speeds to allow animals the time to move out of harm's way on their own.
- Work conducted during early morning, evening hours or shortly after rain events shall occur with special care not to harm basking or foraging individuals.
- Vehicles shall be parked on graveled surfaces only.
- If eastern spadefoot are observed on site, all work will cease until the NDDB Program (deep.nddbrequest@ct.gov) is notified and a conservation plan is developed.

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

Protection for State Listed Bird Species

State Special Concern *Falco sparverius* (American kestrel) and *Toxostoma rufum* (Brown thrasher) are known to occur in this area of Plainfield.

Protection Strategies for American kestrel:

- Avoid doing project work March1st through August 30th. If work must occur during the active breeding time (March 1st - August 30th) then an ornithologist familiar with the habitat requirements of this species conduct surveys (between April and September) to see if they are present. A report summarizing the results of such surveys should include habitat descriptions, avian species list and a statement/resume giving the ornithologist' qualifications. (A DEEP Wildlife Division permit may be required by the ornithologist to conduct survey work, you should ask if your ornithologist has one). The results of this investigation can be forwarded to our NDDB Program at deep.nddbrequest@ct.gov
- If kestrels are nesting in the vicinity of this site then work not be conducted near the nest from March through August. A sufficient buffer should be left from the nest to minimize disturbance. This buffer should be determined after the nest is located. Silvicultural practices that maintain high densities of nesting and roosting cavities in trees with a minimum diameter of 30.5 cm will benefit this species.
- We concur that the installation of exclusion fencing around active work areas during construction and performing sweeps of enclosed areas to remove any wildlife that may become entrapped also should limit the presence of potential prey items that could attract kestrels to the construction areas.

Protection Strategies for Brown thrasher

- Brown thrashers are birds that nest in brushy second-growth tangles, briers and dense thickets. Their breeding season is from April through August. During this time they are most susceptible to disturbances in their feeding and nesting habitat. Minimizing impacts to shrubby habitats during this time period will likewise minimize impacts to this species.

Protection for State Listed Bat Species

Bat surveys were conducted in 2018 at this site. State Endangered tricolor bat, State Special Concern red, hoary and silver-haired bats were all detected during the acoustic surveys.

- **No cutting of trees should take place between May 15th and October 31st to protect these tree roosting bats.**

- Retaining larger diameter trees (12-inch DBH and larger) wherever possible on-site, may additionally minimize the potential for negative impacts to bats.
- Trees with loose, rough bark such as maples, hickories, and oaks are more desirable than other tree species due to the increased cover that the loose bark provides. Large trees with cavities are also utilized by different bat species.

Protection for State Listed Plant Species

There are no further conservation actions required to protect state listed plant species.

This determination is good for two years. Please re-submit a new NDDB Request for Review if the scope of work changes or if work has not begun on this project by November 11, 2022.

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

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 C

SOIL EROSION AND SEDIMENT CONTROL
PLAN UNDER SEPARATE COVER

APPENDIX D

Soils Report

Site Specific Soil Report for Constitution Solar Project, Plainfield, Connecticut

February 2020

Prepared for:

Tetra Tech
451 Presumpscot St.
Portland, Maine
04101

Prepared by:

Broadwater Environmental, LLC
18 Grand Street
South Portland, Maine
04106

Table of Contents

APPENDICES

1.0 Introduction

NextEra Energy, Inc. is proposing construction of a solar farm on an area of land measuring approximately 95 acres in Plainfield, Connecticut. A majority of the land where the development is proposed is currently farmed and is located off of the north end of Cornell Road (see inset on revised soil map in Appendix D, Map D-2). Tetra Tech, Inc. (Tetra Tech) has been retained by NextEra Energy, Inc. to complete engineering and permitting of the proposed facility.

As part of the permitting process, Tetra Tech decided to have a review of the soils on the property conducted to support stormwater engineering calculations. Tetra Tech retained Broadwater Environmental, LLC (BE-LLC) of South Portland, Maine to complete the site-specific evaluation. Ian Broadwater, owner, is a Certified Soil Scientist (SS305) in Maine and meets the criteria the State of Connecticut uses to define a Soil Scientist but there is no certification process in Connecticut.

This site was surveyed for wetlands by Tetra Tech in 2017 and 2018. Information obtained during the wetland survey was used to supplement data collected during the site-specific soil evaluation fieldwork. The soil fieldwork indicates that wetland boundaries were consistent with hydric soil series boundaries as discussed in Section 3.0.

This report consists of this introduction, a discussion of the methodology used to complete the site-specific soil evaluation, and a discussion of the results including a revised soil map based on the observation made at the site. Four appendices are also attached to this document and they include:

- soil map unit descriptions,
- test pit logs,
- official published soil series description by the U.S. Natural Resource Conservation Service (NRCS), and
- a revised soil map.

2.0 Methodology

The evaluation consisted of reviewing the existing NRCS mapping on the NRCS's Web Soil Survey web site and the existing wetland and stream map of the site developed by Tetra Tech.

A field investigation was then planned an executed and included completion of 10 test pits (Appendix D, Map D-2) with an excavator and field reconnaissance of the map unit boundaries. A Global Positioning System (GPS), capable of submeter accuracy, was used to collect data on the location of the test pits and revised soil map unit boundaries, where observed.

Fieldwork was conducted over three days, from December 11th to December 13th, 2019. After a Dig Safe ticket was issued for the site, an excavation company was retained by BE-LLC to complete test pits on the proposed development site. Test pits were logged and then backfilled. An excavator was needed due to the high potential of contacting dense soils with coarse fragments. Before and after the test pits were completed, the soil map units depicted by NRCS were reviewed in the field with a screw auger and/or Dutch auger. The depth of auger borings was limited in some map units due to dense soils with coarse fragments in soil profiles.

Interpreted revised soil unit boundaries were then located using the GPS. GPS data was then provided to Tetra Tech and a draft map was created showing the location of test pits and proposed revised boundaries. BE-LLC reviewed the map and drafted revised soil map that more accurately reflects the current conditions at the site.

The general field procedures used follow those of the National Soil Survey Handbook (NRCS, 2017). The soils mapped are established soil series used in the State of Connecticut by the NRCS as depicted in the state soil catena revised 2014.

After soil series boundaries and characteristics were interpreted, map unit descriptions were created specific to this site and they are provided in Appendix A. Soil test pit logs were completed and are provided in Appendix B. NRCS official soil series descriptions are contained in Appendix C. Appendix D, Map D-1 contains the existing NRCS soil map of the site and Appendix D, Map D-2 contains a revised soil map based on observations made during the field investigation.

2.1 Soil Map Units

The soil series interpretations provided are based on information in the soil series descriptions and technical information provided by the NRCS web soil survey (NRCS, 2020). All limitations and constraints invoked by the NRCS for such interpretations also apply to this soil evaluation and the revised map.

The map units observed are described in Appendix A. These descriptions are within the NRCS range for each official Soil Series Description unless otherwise noted. The taxonomic classification follows Keys to Soil Taxonomy (Soil Survey Staff, 2014). Information on soil morphology and physical characteristics were obtained from the NRCS website.

The soil map units used for this survey are consociations and complexes. Consociations are dominated by a single soil series and similar soils. A complex is two or more soils that are so intermingled that they cannot be mapped individually. One complex, Paxton and Montauk fine sandy loams, was used on the existing NRCS mapping and was retained and used on the revised map as well.

Several soil consociation map units are also used on the existing NRCS soil survey map and revised map, both contained in Appendix D. Consociations used on the NRCS map and the revised map include Woodbridge fine sandy loam, Windsor loamy sand, Hinckley loamy sand, Scarboro muck, and Sudbury sandy loam. The revised map also included consociations Ridgebury fine sandy loam, Leicester fine sandy loam and Deerfield loamy fine sand.

In accordance with the soil mapping standards, the map units will have a minimum of 75% of the named soil or similar soils. The named soil will be the most common of all similar soils. The total number of dissimilar soils in any one mapping unit for consociations should not exceed 25% of the map unit of which no more than 15% is limiting. Similar soils are alike in most properties and share similar limitations such as depth to water table or content of organic matter. Dissimilar soils do not share limits of some important diagnostic properties of the named soil and may have different use or management requirements for a particular land use. It is important to note that some dissimilar soils are more limiting in their use than the named soil. For instance, an inclusion of poorly drained soils can occur within a moderately well-drained soil map unit.

Slope phases, when pertinent, are designated with a letter at the end of the map unit symbol. Designation may be A through E which refers to slope class. The topographic slope class range for each series is shown on the map legend. Several slope ranges were expanded from the State of Connecticut listed series slope class to reflect conditions by the topographic data. The soil series with expanded ranges are noted in the legend on the map (Appendix D, Map D-2).

2.2 Wetland Survey and Hydric Soils

In preparation for this project, a wetland survey was conducted by Tetra Tech in 2017 and 2018. Some flagging was still present during the soil survey fieldwork. Delineated wetlands were, in general, found to coincide with the hydric-nonhydric soil boundaries. Hydric soils refer to those soil series the NRCS considers to be either poorly or very poorly drained. Areas of hydric soils are defined as wetlands in the State of Connecticut.

3.0 Summary of Findings

The following summarizes the results of the soil survey. In general, the site has gentle to moderate slopes and is agricultural field used for growing corn. On the west side of the site is the Quinebaug River. Slopes along the river edge are generally severe measuring over 45% in some locations. There are several areas of hydric soils (i.e., wetlands) that were identified by Tetra Tech and confirmed during this evaluation. Tetra Tech also mapped several stream segments and they are shown on the revised soil map in Appendix D, Map D-2.

There were four areas of the site that notable changes to the existing NRCS mapping were made based on the site-specific evaluation. These are discussed below.

Area 1-This area is in the northeast corner of the project area around TP-1. The NRCS had mapped this area as Hinckley loamy sand and it was found to be Windsor loamy sand. Therefore, the boundary of between the Hinckley and Windsor map units was moved north, closer to the edge of a severe slope that showed characteristics of a Hinckley. Area 1 is shown on the NRCS map contained in Appendix D, Map D-1.

Area 2- The existing NRCS mapping showed a fairly extensive map unit of Scarboro muck on the west side of the site. This area is noted on the existing NRCS mapping in Appendix D, Map D-1. Instead of Scarboro, the soils within a wetland on the east side of the Scarboro map unit resembled Leicester fine sandy loam and not Scarboro muck.

The Windsor loamy sand map unit depicted on the NRCS map, west of the Scarboro muck unit, was found to be slightly more extensive than shown. To the south of the Windsor map unit, an area mapped as Hinckley loamy sand on the NRCS map was found to resemble a Deerfield fine loamy sand as there were no appreciable course fragments in the top 30 inches. Adjacent, a map unit of Sudbury was included on the site-specific soil map. Although the soil was coarser than a typical Sudbury, it was moderately well drained which is the typical condition of Sudbury and not the typical drainage condition of Hinckley (excessively drained).

Area 3-Woodbridge fine sandy loam in the large central field was found to be less extensive than mapped by the NRCS. Instead, Ridgebury fine sandy loam was found to be more prevalent in the central field around what appears to be a man-made drainage. Area 3 is labeled on the NRCS map in Appendix D, Map D-1.

Area 4-In the southern field, Ridgebury fine sandy loam in a somewhat poorly drained condition was found throughout but this area had been mapped as Woodbridge fine sandy loam. The change in soil types on the revised map reflects more accurately the drainage condition observed in the field (somewhat poorly drained versus moderately well drained). Area 4 is the southern field and is highlighted on Appendix D, Map D-1.

In conclusion, the revised soil map contained in Appendix D, Map D-2 should more accurately reflect the soil series present at the site as it was supported with current field data, and interpreted boundaries were located with an accurate GPS.

References

NRCS, 2020. Web Soil Survey at www.websoilsurvey.sc.egov.usda.gov, Natural Resource Conservation Service, 2017.

NRCS, 2017. “National Soil Survey Handbook”, Natural Resource Conservation Service, 2017.

Soil Survey Staff, 2014. “Keys to Soil Taxonomy”, Natural Resource Conservation Service, 2014.

APPENDIX A-MAP UNIT DESCRIPTIONS

Appendix A

Soil Map Unit Descriptions

Ridgebury fine sandy loam (SWP) - This map unit contains Ridgebury fine sandy loam in a somewhat poorly drained condition as the primary series in the unit. Ridgebury fine sandy loam is one of a few series that spans two drainage classes; somewhat poorly drained and poorly drained. Dissimilar soils that may occur in this unit would include Ridge bury fine sandy loam in a poorly drained condition or Whitman loam a very poorly drained soil.

Ridgebury fine sandy loam (PD) - This map unit contains Ridgebury fine sandy loam in a poorly drained condition as the primary series. Areas mapped as Ridgebury (PD) are wetlands as defined by the State of Connecticut. Ridgebury fine sandy loam is one of a few series that spans two drainage classes; somewhat poorly drained and poorly drained. Dissimilar soils that may occur in this unit would include Ridgebury fine sandy loam in a somewhat poorly drained condition. Similar soils that may occur include Whitman loam, a very poorly drained soil.

Leicester fine sandy loam-This map unit is dominated by Leicester fine sandy loam, a poorly drained soil. Dissimilar soils that may occur in this map unit include Sutton or Woodbridge fine sandy loams. It may also continue Ridgebury in a somewhat poorly or poorly drained condition with the later being a similar soil.

Scarborough muck-This map unit contains Scarboro muck in a very poorly drained condition as the primary series. Similar series that may also be present include Walpole sandy loam, a poorly drained soil. Dissimilar soils may in this map unit include Sudbury fine sandy loam or Deerfield loamy fine sand.

Sudbury sandy loam-This soil series, similar to Ridgebury, spans two drainage classes; moderately well drained and somewhat poorly drained. It is estimated that most of the Sudbury soil series observed on this site was in a moderately well drained condition. Similar soils that may occur in the map unit include Sudbury in a somewhat poorly drained condition. and potentially small inclusions of Hinckley loamy sand. Dissimilar soils in this map unit may include the poorly drained Walpole series, very poorly drained Scarboro muck or excessively drained Hinckley loamy sand.

Deerfield loamy fine sand-This map unit is dominated by Deerfield fine loamy sand, a moderately well drained soil. Other dissimilar soils that may occur in this map unit include Windsor loamy sand which is excessively drained and small inclusions of Scarboro muck, a very poorly drained soil.

Windsor loamy sand-This map unit is dominated by Windsor loamy sand and may contain the dissimilar soils Deerfield fine loamy. Similar soils that may be present in small inclusion include Hinckley loamy sand.

Hinckley loamy sand-This map unit occurs along the steep slopes to the Quinebaug River and on the east side of the northern most field. Similar soils that may occur in the unit include Merrimac loamy sand and Windsor loamy sand. Small inclusions of the dissimilar soils, Walpole and Scarborough may also be present.

Woodbridge fine sandy loam- This map unit contains Woodbridge fine sandy loam as the primary series with potential inclusions of the similar soils Ridgebury fine sandy loam in a somewhat poorly drained condition and Paxton sandy loam, a well drained soil.

Paxton and Montauk fine sandy loams- In this complex, Paxton sandy loam and Montauk loam occur in irregular patterns that make then too hard to map individually. Within this map unit, very stony phases of Paxton and Montauk may be encountered. The similar soil series, Woodbridge fine sandy loam. Dissimilar soils in this map unit may include Ridgebury fine sandy loam in a somewhat poorly drained or poorly drained condition, Leicester fine sandy loam or Whitman loam may also be present in small percentages.

APPENDIX B-TEST PIT LOGS

Attachment A

Test Pit Logs

TP-1

0”-10” 10YR 3/2 fine loamy sand, v. friable, 10% fine to medium roots, moist

10”-17” 7.5YR 5/6 fine loamy sand, v. friable, organic matter staining on grains in upper 2” of horizon, moist

17”-29” 7.5YR 6/6 fine loamy sand, friable, moist

29”-48” Salt and pepper colored loamy sand with 15% coarse fragments as fine to coarse gravel and cobbles, iron nodules present at 32” below ground surface (bgs), moist

TP-2

0”-6” 10YR 3/2 fine loamy sand, friable, 15% fine- medium roots, moist

6”-11” 7.5YR 5/8 fine loamy sand, friable, weak granular structure, moist

11”-25” 10YR 5/6 fine loamy sand, friable, moist

25”-43” 10YR 7/2 loamy sand, medium, poorly graded, very friable, weak granular structure, faint bands of iron staining at 27”

43”-50” 7.5YR 5/6 loamy sand with 15% coarse fragments as gravel and cobbles (rounded), moist

TP-3

0”-6” 10YR 3/2 fine loamy sand, friable, 10% fine roots, moist

6”-10” 7.5YR 6/6 fine loamy sand, friable, weak granular structure, moist

10”-16” 7.5YR 6/8 fine loamy sand, friable, weak granular structure, moist

16”-24” 2.5Y 6/4 fine loamy sand with 20% coarse fragments as rounded gravel and cobbles, dense, moist

24”-48” Salt/pepper gravelly sand (rounded gravel), 15% cobbles, dense, redox concentrations of 7.5YR 6/8 common at 44”; moist

TP-3A

0”-5” 10YR 3/2 sandy loam with 15% coarse fragments as f-c gravel, friable, moist

5”-11” 7.5YR 5/6 sandy loam with 15% coarse fragments as f-c gravel, friable, moist

11”-22” 10YR 5/4 loamy sand with 20% coarse fragments as gravel and cobbles, dense, moist

22”-50” Salt and pepper gravelly sand with 10% cobbles; dense, moist, iron staining on rock and sand grains at 35” and lenses of staining below

TP-4

0”-7” 10YR 3/2 fine loamy sand, friable, 10% fine roots, moist

7”-32” 10YR 5/6 fine loamy sand, friable, micro-channels in profile face, weak granular structure, moist, common redox depletions of 10YR 7/2 (large) at 30” bgs

32”-49” 2.5Y 4/3 loamy sand with 10% coarse fragments as rounded f-m gravel, dense, moist-saturated but no free water

TP-5

0”-7” 10YR 3/2 loamy sand, friable, 15% fine roots, moist

6”-16” 10YR 5/4 loamy sand with 5% f-m gravel, friable, micro-channels with organic matter or Mn staining, weak granular structure, moist, common redox depletions of 10YR 7/1 at 11” bgs

16”-28” 10YR 4/3 loamy sand, friable, weak granular structure, moist

28”-45” 10YR 4/4 loamy sand, dense, platey structure, free water seeping out of profile at 28” bgs

45”-50” Salt and pepper gravelly sand with 15% cobbles; dense, moist, no free water

TP-7

0”-9” 10YR 2/2 fine loamy sand, friable, 15% fine roots, moist

9”-23” 10YR 5/8 fine loamy sand, friable, weak granular structure, moist

23”-29” 2.5Y 6/2 fine loamy sand, dense, moist, common redox concentrations of 7.5YR 5/8 at 24” bgs, depletions of 10YR 7/1 also present

16”-24” 2.5Y 6/4 fine loamy sand with 20% coarse fragments as rounded gravel and cobbles, dense, moist

24”-49” 10YR 4/3 loamy sand with 30% coarse fragments as gravel and cobbles, dense, moist, water seep at 32” bgs on pit wall

TP-8

0”-9” 10YR 3/2 fine loamy sand, friable, 10% fine roots, moist

9”-20” 7.5YR 5/6 loamy sand, friable, 10% fine roots, moist

20”-42” 7.5YR 5/8 loamy sand with 10% coarse fragments as rounded f-m gravel, loose and single grained, moist, redox concentrations of 5YR 5/8 at 38” and depletions of 10YR 7/1 common

42”-50” 7.5YR 5/6 coarse loamy sand dense, moist-saturated, water seep at 43” bgs

TP-9

0”-5” 10YR 3/2 fine sandy loam, friable, granular structure, 30% fine roots, moist

5”-9” 10YR 4/6 fine sandy loam with10% coarse fragments as f-c gravel, friable, moist

9”-17” 10YR 5/6 sandy loam with 20% coarse fragments, friable, redox concentrations of 7.5 YR 5/8 and depletions of 10YR 7/1 are common at 11” bgs, moist

17”-31” 10YR 2/1 mucky loam, massive, moist-saturated, 10% fine roots, possible buried horizon

31”-50” 10 YR 5/4 sandy loam with 25% coarse fragments as f-c gravel and cobbles, dense, water seep at 31” bgs

TP-10

0”-7” 10YR 3/2 fine sandy loam, friable, granular structure, 10% fine roots, moist

7”-17” 10YR 4/4 fine sandy loam, friable, worm/root tunnel, trace fine roots, depletions of 10YR 7/1 are common at 15”; moist

17”-29” 10YR 6/4 sandy loam, friable, redox concentrations of 7.5 YR 5/6 are common, moist

29”-50” 10 YR 5/3 sandy loam, 20% coarse fragments as f-c gravel, dense, moist

Water flowing out of the profile at 30” bgs

APPENDIX C-NRCS OFFICAL SERIES DESCRIPTIONS

LOCATION DEERFIELD MA+CT ME NH NY RI VT

Established Series
Rev. CAW-MFF-JTI
05/2018

DEERFIELD SERIES

The Deerfield series consists of very deep, moderately well drained soils formed in glaciofluvial deposits. They are nearly level to strongly sloping soils on terraces, deltas, and outwash plains. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity is high or very high. Mean annual temperature is about 9 degrees C. and mean annual precipitation is about 1194 mm.

TAXONOMIC CLASS: Mixed, mesic Aquic Udipsamments

TYPICAL PEDON: Deerfield loamy fine sand in a hayfield at an elevation of about 19 meters. (Colors are for moist soil.)

Ap --0 to 23 cm; very dark brown (10YR 2/2) loamy fine sand; weak fine and medium granular structure; very friable; common fine roots; moderately acid; abrupt smooth boundary. (15 to 30 cm thick)

Bw1 --23 to 43 cm; strong brown (7.5YR 5/6) loamy fine sand; weak fine and medium granular structure; very friable; common fine roots; moderately acid; clear smooth boundary.

Bw2 --43 to 64 cm; yellowish brown (10YR 5/6) loamy fine sand; weak fine granular structure; very friable; few fine faint brownish yellow (10YR 6/6), moist, masses of oxidized iron accumulation; strongly acid; clear wavy boundary. (Combined thickness of the Bw horizons is 13 to 69 cm.)

BC --64 to 84 cm; yellowish brown (10YR 5/6) fine sand; single grain structure; loose; common fine and medium distinct strong brown (7.5YR 5/8) masses of oxidized iron accumulation and common fine and medium distinct light brownish gray (10YR 6/2) iron depletions; strongly acid; clear broken boundary. (0 to 51 cm thick)

C1 --84 to 102 cm; light brownish gray (10YR 6/2) stratified sand and fine sand; single grain structure; loose; common fine prominent strong brown (7.5YR 5/8) masses of oxidized iron accumulation; strongly acid; clear wavy boundary.

C2 --102 to 152 cm; light brownish gray (10YR 6/2) stratified sand and gravelly sand; single grain structure; loose; common fine and medium prominent strong brown (7.5YR 5/8) masses of oxidized iron accumulation; 10 percent rounded fine granite and quartzite gravel; very strongly acid; individual strata contain up to 20 percent gravel.

TYPE LOCATION: Essex County, Massachusetts; Town of Andover, 2,525 feet north-northwest (345 deg) of the intersection of Laurel Lane and Old River Road, in a hayfield. USGS Lawrence, Massachusetts topographic quadrangle; Lat. 42 degrees 41 minutes 49.57 seconds N. and long. 71 degrees 12 minutes 52.52 seconds W., WGS 84.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 38 to 100 cm. Gravel, generally fine gravel, ranges from 0 to less than 15 percent in the solum and 0 to 20 percent in the substratum. Reaction ranges from extremely acid through slightly acid unless limed. Iron depletions with chroma of two or less are between depths of 38 and 100 cm from the mineral soil surface.

The O horizon, where present, has a hue of 5YR to 10YR, value of 2 to 3, and chroma of 1 to 3. It is slightly to highly decomposed plant material.

The Ap horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 to 3. It is fine sandy loam, sandy loam, loamy fine sand, loamy sand, fine sand, or sand. Undisturbed pedons commonly have an O horizon and a thin sequence of A, E, and Bs, Bhs or Bh horizons. They may also have an AB or AE horizon. The Ap or A horizon has weak or moderate very fine to medium granular structure and is friable or very friable.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. Texture of the upper part of the Bw horizon, within a depth of 25 cm from the soil surface, has the same range as the A horizon. Below 25 cm the texture is loamy fine sand, loamy sand, fine sand, sand or coarse sand. Structure is weak, very fine to medium granular or subangular blocky, or is single grain. Moist consistence is friable, very friable, or loose.

The BC horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 4. Texture range is the same as the lower part of the Bw horizon. Structure is weak, very fine to medium subangular blocky, or is single grain. Moist consistence is friable, very friable, or loose.

The C horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 1 to 4. Texture is loamy fine sand, loamy sand, fine sand, sand or coarse sand. Stratified textures of these textures and gravel, coarse sand, or loamy coarse sand are present in some pedons. It is single grain or massive. Moist consistence is friable, very friable or loose.

COMPETING SERIES: These are the Algansee, Altmar, Birchwood, Brems, Brockatonorton, Elnora, Fortress, Livonia, Meckling, Morocco, Ottokee, Partridge, Succotash, Tedrow, and Zaborowsky series. The Algansee, Brems, Brockatonorton, Meckling, Morocco, Ottokee, Partridge, Tedrow, and Zaborowsky soils are from outside of region R. Algansee soils have an irregular decrease of organic matter with depth. Altmar soils have rock fragments dominated by sandstone. Birchwood soils formed in sandy sediments over glacial till. Brems and Ottokee soils have sola more than 100 cm thick, and Ottokee soils have lamellae. Elnora soils contain more fine sand in the lower part of the series control section. Fortress soils formed in anthropotransported soil material from eolian sand, outwash, ordredging activities. Livonia soils formed in glaciolacustrine parent material with neutral to moderately alkaline reaction and average less than 960 mm of annual precipitation. Meckling soils are calcareous throughout. Morocco soils have redox features within a depth of 38 cm. Partridge soils have bedrock at depths of 50 to 100 cm. Succotash soils formed in sandy eolian and/or marine overwash deposits. Tedrow and Zaborosky soils have carbonates.

GEOGRAPHIC SETTING: Deerfield soils are level to strongly sloping soils on outwash terraces, outwash deltas, and outwash plains. Slope gradients are commonly 0 to 3 percent, but range to 15 percent. The soils formed in thick deposits of sand derived mainly from granite, gneiss and quartzite, but in places containing materials from schist and sandstone. The sand is poorly graded; medium sand is generally dominant and typically contains little or no gravel. The mean annual precipitation typically ranges from 965 to 1397 mm but the range includes as low as 660 mm in some places east of Adirondack Mountains in the Champlain Valley of New York. The mean annual temperature ranges from 7 to 11 degrees C. The frost-free period ranges from 120 to 200 days.

GEOGRAPHICALLY ASSOCIATED SOILS: Deerfield soils are in a drainage sequence that includes the excessively drained Carver and Windsor soils, the somewhat poorly drained Wareham and Pipestone soils, and the very poorly drained Scarboro soils. The well drained Agawam, moderately well drained Ninigret, and poorly drained Walpole soils are terrace associates that are loamy over stratified sand and gravel. The somewhat excessively drained Merrimac and the excessively drained Hinckley and Penwood soils are on nearby glaciofluvial landforms and have sandy and gravelly substrata. The excessively drained Plymouth, somewhat excessively drained Gloucester, well drained Canton, Charlton, Cheshire, Essex and Paxton, and moderately well drained Woodbridge soils are on nearby glacial till uplands.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Moderately well drained. Runoff is negligible to low. Saturated hydraulic conductivity is high or very high.

USE AND VEGETATION: Mainly cleared and used for truck crops, tobacco, potatoes, hay, pasture and silage corn. Forested areas have pitch pine, white pine, gray birch, red maple, oaks, and sugar maple. Many areas are in urban uses.

DISTRIBUTION AND EXTENT: New Hampshire, Vermont, Maine, Massachusetts, Rhode Island, Connecticut, and New York. (MLRAs 101, 142, 144A, 144B, 145, and 149B) The soils of this series are moderately extensive.

SOIL SURVEY REGIONAL OFFICE (SSRO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Franklin County, Massachusetts, 1964.

REMARKS: Diagnostic horizons and features recognized in this pedon include:
Ochric epipedon - the zone from 0 to 23 cm (Ap horizon).
Redox depletions with chroma of 2 or less - the zone from 64 to 152 cm. (BC, Cg1, and Cg2 horizons).

ADDITIONAL DATA: Full characterization data for pedons with User Pedon IDs of S1959MA005001, S1970MA011004, S1991MA023005, S2005CT003003, and S2013NY085002. Pedons analyzed by the KSSL, Lincoln, NE. The laboratory characterization data for these pedons and similar soils is available through the National Cooperative Soil Survey Soil Characterization Database: http://ncsslabdatamart.sc.egov.usda.gov/

National Cooperative Soil Survey
U.S.A.

LOCATION HINCKLEY MA+CT ME NH NJ NY RI VT

Established Series
Rev. CAW-SMF-DCP
08/2017

HINCKLEY SERIES

The Hinckley series consists of very deep, excessively drained soils formed in glaciofluvial materials. They are nearly level through very steep soils on outwash terraces, outwash plains, outwash deltas, kames, kame terraces, and eskers. Saturated hydraulic conductivity is high or very high. Slope ranges from 0 to 60 percent. Mean annual temperature is about 7 degrees C, and mean annual precipitation is about 1143 mm.

TAXONOMIC CLASS: Sandy-skeletal, mixed, mesic Typic Udorthents

TYPICAL PEDON: Hinckley loamy sand in woodland at an elevation of about 240 meters. (All colors are for moist soil.)

Oe -- 0 to 3 cm; moderately decomposed plant material derived from red pine needles and twigs. (0 to 5 cm thick.)

Ap -- 3 to 20 cm; very dark grayish brown (10YR 3/2) loamy sand; weak fine and medium granular structure; very friable; many fine and medium roots; 5 percent fine gravel; very strongly acid; abrupt smooth boundary. (3 to 25 cm thick.)

Bw1 -- 20 to 28 cm; strong brown (7.5YR 5/6) gravelly loamy sand; weak fine and medium granular structure; very friable; common fine and medium roots; 20 percent gravel; very strongly acid; clear smooth boundary.

Bw2 -- 28 to 41 cm; yellowish brown (10YR 5/4) gravelly loamy sand; weak fine and medium granular structure; very friable; common fine and medium roots; 25 percent gravel; very strongly acid; clear irregular boundary. (Combined thickness of the Bw horizon is 8 to 41 cm.)

BC -- 41 to 48 cm; yellowish brown (10YR 5/4) very gravelly sand; single grain; loose; common fine and medium roots; 40 percent gravel; strongly acid; clear smooth boundary. (0 to 13 cm thick)

C -- 48 to 165 cm; light olive brown (2.5Y 5/4) extremely gravelly sand consisting of stratified sand, gravel and cobbles; single grain; loose; common fine and medium roots in the upper 20 cm and very few below; 60 percent gravel and cobbles; moderately acid.

TYPE LOCATION: Worcester County, Massachusetts; Town of Petersham, Harvard Forest, 240 feet north of Tom Swamp Road at a point 1.15 miles east of the intersection of Athol Road and Tom Swamp Road. USGS Athol, MA topographic quadrangle, Latitude 42 degrees, 30 minutes, 41.8 seconds N., and Longitude 72 degrees, 12 minutes, 28.9 seconds W., NAD 1983.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 30 to 87 cm. Rock fragment content of the solum ranges from 5 through 50 percent gravel, 0 through 30 percent cobbles, and 0 through 3 percent stones. Rock fragment content of individual horizons of the substratum ranges from 10 through 55 percent gravel, 5 through 25 percent cobbles, and 0 through 5 percent stones. In some places gravel content throughout the soil ranges up through 75 percent. The soil ranges from extremely acid through moderately acid, except where limed.

The O horizons, where present, consist of slightly, moderately, and/or highly decomposed plant material. They have hue N or 2.5YR through 7.5YR, value of 2 or 3, and chroma of 0 through 3.

The Ap horizon has hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 1 through 4. Texture of the fine-earth fraction is very fine sandy loam, fine sandy loam, sandy loam, coarse sandy loam, loamy fine sand, loamy sand, or loamy coarse sand. Structure is weak or moderate very fine through coarse granular or subangular blocky. Consistence is friable or very friable. Undisturbed areas have an A horizon that has hue of 10YR, value of 2 or 3, and chroma of 1 through 4.

Some pedons have thin E, Bhs, Bh, or Bs horizons below the A horizon.

The upper part of the Bw horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 3 through 8. The lower part has hue of 7.5YR through 2.5Y, value of 3 through 6, and chroma of 3 through 8. Texture, to a depth of 25 cm from the surface, is fine sandy loam, sandy loam, coarse sandy loam, loamy fine sand, loamy sand, or loamy coarse sand in the fine-earth fraction. Below 25 cm it is loamy fine sand, loamy sand, loamy coarse sand, fine sand, sand, or coarse sand in the fine-earth fraction. Structure commonly is weak fine and/or medium granular or the horizon is structureless, but ranges through weak subangular blocky in some places. It is very friable, friable, or loose.

Some pedons have a BC horizon with characteristics similar to both the B and 2C horizons.

The C horizon has hue of 7.5YR through 5Y, value of 3 through 7, and chroma of 2 through 8. Texture is loamy fine sand, loamy sand, loamy coarse sand, fine sand, sand or coarse sand in the fine-earth fraction, and is stratified.

COMPETING SERIES: These are the Bonaparte, Manchester, Mecosta, Multorpor, Otisville, Quonset, and Rikers series. Mecosta and Multorpor soils are from outside Land Resource Region R. Bonaparte soils have carbonates within a depth of 100 cm. Manchester soils have 5YR or redder hue in the Bw and C horizons. Mecosta soils are calcareous and Multorpor soils do not have Bw horizons. Otisville soils have rock fragments dominated by sandstone, shale, and slate. Quonset soils have rock fragments dominated by phyllite, slate, and shale. Rikers soils have carboliths in the soil.

GEOGRAPHIC SETTING: Hinckley soils are nearly level through very steep soils on outwash terraces, outwash plains, outwash deltas, kames, kame terraces, and eskers. Slope is generally 0 through 8 percent on tops of the terraces, outwash plains and deltas. Slope of 8 through 60 percent or more are on the kames, eskers and margins of the outwash plains, deltas, and terraces. The soils formed in glaciofluvial sand and gravel derived principally from granite, gneiss, and schist. Mean annual temperature ranges from 7 to 13 degrees C, and mean annual precipitation ranges from 1016 to 1270 mm. Length of the growing season ranges from 140 through 240 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Agawam, Canton, Charlton, Deerfield, Essex, Gloucester, Horseneck, Mashpee, Massasoit, Merrimac, Paxton, Pompton, Riverhead, Scarboro, Sudbury, Walpole, Wareham, and Windsor soils on nearby landscapes. Horseneck, Pompton, and Riverhead soils are commonly associates in the extreme southern portions of MLRA 144A. Agawam, Merrimac, and Riverhead soils are similar to Hinckley soils, but have cambic horizons. Canton, Charlton, Essex, Gloucester, and Paxton soils formed in till. Deerfield, Horseneck, and Sudbury soils are moderately well drained and Horseneck and Sudbury soils have Cambic horizons. Pompton soils have Cambic horizons and are moderately well and somewhat poorly drained. Scarboro soils are very poorly drained. Windsor soils have less than 15 percent rock fragments. Mashpee and Massasoit soils are poorly drained with spodic horizons. Walpole and Wareham soils are poorly drained.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Excessively drained. Surface runoff is negligible through low. Saturated hydraulic conductivity is high or very high.

USE AND VEGETATION: Cleared areas are used for hay, pasture, and silage corn. In the southern Connecticut River Valley, Hinckley soils are used for growing tobacco and truck crops and in eastern Massachusetts, truck crops. Most areas are forested, brush land or used as urban land. Northern red, black, white, scarlet and scrub oak, eastern white and pitch pine, eastern hemlock, and gray birch are the common trees. Unimproved pasture and idle land support hardhack, little bluestem, bracken fern, sweet fern, and low bush blueberry.

DISTRIBUTION AND EXTENT: Connecticut, southern Maine, Massachusetts, New Hampshire, northern New Jersey, New York, Rhode Island, and Vermont. MLRA's 101, 141, 142, 144A, 145, and 149B. The series is extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Oneida County, New York, 1913.

REMARKS: The use of the Hinckley series in frigid areas of Maine, and in MLRA 143 and 144B, is relict to before temperature classes. These have been removed from the SC file.

Diagnostic horizons and features recognized in this pedon are:
1. Ochric epipedon - the zone from 3 to 20 cm (Ap horizon).
2. Sandy-skeletal feature - the zone from 25 to 100 cm has a weighted average content of rock fragments of 51 percent and a particle size of the fine-earth fraction is sandy (Bw, BC, and C horizons).

ADDITIONAL DATA: Reference samples from pedons S55NH015002, S56MA011002, S56MA011003, S57MA023005, S58NH015002, S73MA009001, S73MA005002, S73MA009004, S73MA005005, S96NH013003 from Massachusetts and New Hampshire, samples by NSSL, Lincoln, NE, various dates.

National Cooperative Soil Survey
U.S.A.

LOCATION LEICESTER CT+MA ME NH NY RI

Established Series
Rev. MFF-SMF-JTI
05/2016

LEICESTER SERIES

The Leicester series consists of very deep, poorly drained soils formed in coarse-loamy till. They are nearly level or gently sloping soils in drainageways and low-lying positions on hills. Slope ranges from 0 to 8 percent. Permeability is moderate or moderately rapid in the surface layer and subsoil and moderate to rapid in the substratum. Mean annual temperature is about 9 degrees C, and mean annual precipitation is about 1205 mm.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, acid, mesic Aeric Endoaquepts

TYPICAL PEDON: Leicester fine sandy loam - forested, extremely stony. (Colors are for moist soil.)

Oe--0 to 3 cm; black (10YR 2/1) moderately decomposed plant material. (0 to 10 cm thick)

A--3 to 18 cm; black (10YR 2/1) fine sandy loam; moderate medium granular structure; friable; common fine and medium roots; 10 percent gravel and cobbles; strongly acid; clear wavy boundary. (10 to 15 cm thick)

Bg1--18 to 25 cm; grayish brown (2.5Y 5/2) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent gravel and cobbles; common medium prominent yellowish red (5YR 5/6) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bg2--25 to 46 cm; light brownish gray (2.5Y 6/2) fine sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 10 percent gravel and cobbles; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid; gradual wavy boundary. (Combined thickness of the Bg horizons is 16 to 68 cm.)

BC--46 to 61 cm; pale brown (10YR 6/3) fine sandy loam; massive; friable; few fine roots; 10 percent gravel and cobbles; many medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 4/6) masses of iron accumulation; strongly acid; clear wavy boundary. (0 to 20 cm thick)

C1--61 to 84 cm; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; massive; friable; 15 percent gravel and cobbles; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation and prominent pinkish gray (7.5YR 6/2) iron depletions; strongly acid; gradual wavy boundary.

C2--84 to 155 cm; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; massive; friable; 15 percent gravel and cobbles; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid.

TYPE LOCATION: New Haven County, Connecticut; town of Prospect, 5,200 feet north of the Prospect-Bethany town line and 130 feet west of Route 69; USGS Mount Carmel topographic quadrangle; latitude 41 degrees 28 minutes 48.88 seconds N. and longitude 72 degrees 58 minutes 14.81 seconds W., WGS 84.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 46 to 100 cm. Depth to bedrock is commonly more than 183 cm. Rock fragments range from 5 to 35 percent by volume to a depth of 100 cm and up to 50 percent below 100 cm. Except where the surface is stony, the fragments are mostly subrounded gravel and typically comprise 60 percent or more of the total rock fragments. Unless limed, reaction is very strongly acid or strongly acid in the upper 100 cm and ranges from very strongly acid to moderately acid below.

The O horizon, where present, consists of slightly, intermediately, and/or highly decomposed organic material.

The A horizon has hue of 10YR, value of 2 or 3 and chroma of 1 or 2. Disturbed pedons have an Ap horizon that includes chroma of 3. The A or Ap horizon is fine sandy loam, very fine sandy loam, or loam in the fine-earth fraction. It has weak or moderate granular structure and is very friable or friable.

Some pedons have a thin Eg horizon below the A horizon. It has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. Texture, structure, and consistence are like the underlying B horizon.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. Chroma of 3 and 4 are limited to subhorizons. Chroma of 1 or 2 is in some subhorizons within a 50 cm depth. The horizon has distinct or prominent redoximorphic features. Texture is fine sandy loam, loam, or sandy loam in the fine-earth fraction. Structure is weak granular or subangular blocky, or the horizon is massive.

The BC horizon, where present, has hue of 10YR to 5Y, value of 4 to 6, and chroma of 3 or 4. The horizon has distinct or prominent redoximorphic features. Texture is fine sandy loam, loam, or sandy loam in the fine earth fraction. Structure is weak subangular blocky or massive.

The C horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It has redoximorphic features that typically decrease in abundance with depth. Texture is fine sandy loam or sandy loam in the fine-earth fraction, but may range to loamy sand at depth. Some pedons have pockets or thin lenses of silt loam, loamy sand, or sand. The horizon is massive or it has weak plates. Consistence commonly is very friable or friable but some pedons have lenses or layers that are firm.

COMPETING SERIES: There are no other series currently in the same family.

The Fredon, Lamson, Lyme, Mansfield, Massena, Menlo, Neversink, Newstead, Raynham, Raypol, Red Hook, Ridgebury, Stissing, Sun, and Whitman series are similar soils in related families. Fredon, Lamson, Red Hook, and Raynham soils formed in water sorted materials and are nonacid. Lyme soils are in a frigid family. Mansfield, Menlo, and Whitman soils have a dense substratum and are very poorly drained. The Massena, Newstead, and Sun soils are nonacid. Raypol soils are coarse-loamy over sandy or sandy-skeletal. Ridgebury and Stissing soils are nonacid and have a dense substratum. Neversink soils have rock fragments dominated by sandstone, siltstone, and shale.

GEOGRAPHIC SETTING: Leicester soils are nearly level to gently sloping and are in low-lying depressional areas and drainageways of glaciated hills. Slope commonly is less than 3 percent but the range includes 0 to 8 percent. The soils formed in acid coarse-loamy till derived from granite, gneiss, and/or schist. Mean annual temperature ranges from 4 to 13 degrees C, and the mean annual precipitation ranges from 910 to 1800 mm. The frost-free period ranges from 140 to 240 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Ridgebury and Whitman soils and the Acton, Broadbrook, Brookfield, Canton, Charlton, Chatfield, Essex, Georgia, Gloucester, Hollis, Montauk, Narragansett, Paxton, Rainbow, Scituate, Stockbridge, Sutton, Wapping, and Woodbridge soils. The well drained Charlton and the moderately well drained Sutton soils are associated in a drainage sequence. Acton soils are sandy and moderately well drained. Broadbrook, Essex, Montauk, and Paxton soils are well drained with a dense substratum. Brookfield, Canton, Narragansett, and Stockbridge soils are well drained. Chatfield and Hollis soils have bedrock at 50 to 100 cm and 25 to 50 cm depths, respectively. Georgia and Wapping soils are moderately well drained. Gloucester soils are sandy and excessively drained. Rainbow, Scituate, and Woodbridge soils are moderately well drained and have a dense substratum.

DRAINAGE AND PERMEABILITY: Poorly drained. Surface runoff is slow. Saturated hydraulic conductivity is moderately high or high. Leicester soils have a water table at or near the surface much of the year.

USE AND VEGETATION: Most areas are wooded. Some areas are in brushy unimproved pasture. Cleared areas are used for hay or pasture. Tree species include alder, gray birch, red maple, eastern hemlock, American elm, and spruce. Shrub species include northern spicebush, winterberry, and silky dogwood. Herb species include skunk cabbage, green false hellebore, sensitive fern, cinnamon fern, jewelweed, and water-tolerant sedges and rushes.

DISTRIBUTION AND EXTENT: Low-lying areas on glaciated uplands in Connecticut, Massachusetts, Maine, New Hampshire, eastern New York, and Rhode Island; MLRAs 144A and 145. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Windham County, Connecticut, 1947.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
1. Ochric epipedon - the zone from 0 to 18 cm (Oe and A horizons)
2. Cambic horizon - the zone from 18 to 46 cm (Bg horizons).
3. Aquic moisture regime as indicated by 2 chroma matrix color with redox concentrations at 18 cm (Bg horizons).
4. Endosaturation - based on saturation to a depth of 200 cm from the mineral soil surface.
5. Aeric great group based on matrix color and chroma of 3 or more in one subhorizon between the Ap and 75 cm. (BC horizon).
6. Particle-size class in control section from 25 to 100 cm - coarse-loamy.
7. Acid reaction class and mesic temperature regime.

National Cooperative Soil Survey
U.S.A.

LOCATION PAXTON CT+MA NH NY RI VT

Established Series
Rev. MFF-SMF-JTI
04/2015

PAXTON SERIES

The Paxton series consists of well drained loamy soils formed in lodgment till. The soils are very deep to bedrock and moderately deep to a densic contact. They are nearly level to steep soils on hills, drumlins, till plains, and ground moraines. Slope ranges from 0 to 45 percent. Saturated hydraulic conductivity is moderately high or high in the surface layer and subsoil and low or moderately low in the substratum. Mean annual temperature is about 10 degrees C., and mean annual precipitation is about 1194 mm.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts

TYPICAL PEDON: Paxton fine sandy loam - in a brushy field at an elevation of about 850 feet. (Colors are for moist soil unless otherwise noted.)

Ap -- 0 to 20 cm; dark brown (10YR 3/3) fine sandy loam, pale brown (10YR 6/3) dry; moderate medium granular structure; friable; many fine roots; 5 percent gravel; strongly acid; abrupt smooth boundary. (13 to 28 cm thick)

Bw1 -- 20 to 38 cm; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 5 percent gravel; few earthworm casts; strongly acid; gradual wavy boundary.

Bw2 -- 38 to 66 cm; olive brown (2.5Y 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent gravel; strongly acid; clear wavy boundary. (Combined thickness of the Bw horizon is 38 to 94 cm thick.)

Cd -- 66 to 165 cm; olive (5Y 5/3) gravelly fine sandy loam; medium plate-like divisions; massive; very firm, brittle; 25 percent gravel; many dark coatings on plates; strongly acid.

TYPE LOCATION: New Haven County, Connecticut; town of Prospect, 0.4 mile east of Straitsville Road and 0.5 mile north of the Bethany - Prospect town line; USGS Mount Carmel, CT topographic quadrangle; Latitude 41 degrees, 28 minutes, 34 33.79 seconds N., Longitude 72 degrees, 59 minutes, 16 119.19 seconds W., WGS 84

RANGE IN CHARACTERISTICS: Thickness of the mineral solum and depth to the densic contact ranges from 50 to 100 cm. Depth to bedrock is commonly more than 1.5 meters. Rock fragments range from 5 through 35 percent by volume in the mineral soil. Except where the surface is stony, the fragments are mostly subrounded gravel and typically make up 60 percent or more of the total rock fragments. Unless limed, reaction ranges from very strongly acid to slightly acid in the mineral soil.

The O horizon, where present, has hue of 5YR to 10YR or it is neutral, value of 2 or 3 and chroma of 0 to 2. It is mainly composed of slightly, moderately, or highly decomposed plant material.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. Dry value is 6 or more. The structure is commonly granular but the range includes subangular blocky in some pedons. Undisturbed pedons have a thin A horizon with value of 2 or 3 and chroma of 1 or 2. The Ap or A horizon is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

Some pedons have a thin E horizon below the A horizon. It has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3.

The upper part of the Bw horizon has hue of 7.5YR or 2.5Y, value of 4 to 6, and chroma of 4 to 8. The lower part of the Bw horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. Some pedons have few faint redoximorphic features just above the Cd horizon. The Bw horizon is loam, fine sandy loam, or sandy loam with less than 65 percent silt plus very fine sand. It has granular or subangular blocky structure Consistence is friable or very friable.

Some pedons have a BC horizon up to 20 cm thick.

Some pedons have an E or E' horizon up to 8 cm thick below the B horizon. It has hue of 10YR to 5Y, value of 5 or 6, and chroma of 2 or 3. Typically, it is coarser textured than the overlying horizon.

The Cd has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. In some pedons there are a few faint or distinct areas of iron depletion or masses of iron accumulation in the upper part. Texture is loam, fine sandy loam, sandy loam, or coarse sandy loam in the fine-earth fraction. A few thin lenses of loamy sand are in some pedons. The structure is geogenetically derived, appearing in the form of medium to very thick plates, or it is massive. Consistence is firm or very firm. Some pedons have a friable C horizon above the Cd horizon.

COMPETING SERIES: These are Amostown, Bernardston, Broadbrook, Horseneck, Nantucket, Scituate, and Wethersfield series. Amostown soils are underlain by stratified very fine sand or silt within a depth of 100 cm. Bernardston and Broadbrook soils have a solum with more than 65 percent silt plus very fine sand. Horseneck soils lack a densic contact. Nantucket soils have a lithologic discontinuity. Scituate soils have sandy substrata. Wethersfield soils have 5YR or redder hue in the B and C horizons.

GEOGRAPHIC SETTING: Paxton soils are nearly level to steep and are on till plains, ground moraines, hills, and drumlins. Slope commonly is 0 to 35 percent, but range from 0 to 45 percent in some pedons. The soils formed in acid lodgment till derived mostly from schist, gneiss, and granite. Mean annual temperature ranges from 7 to 11 degrees C., mean annual precipitation ranges from 940 to 1245 mm, and the growing season ranges from 115 to 180 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Bernardston, Broadbrook, and Scituate soils and the Canton, Charlton, Chatfield, Georgia, Hollis, Leicester, Montauk, Narragansett, Pittstown, Ridgebury, Stockbridge, Sutton, Wapping, Whitman, and Woodbridge soils on nearby landscapes. The moderately well drained Woodbridge, poorly drained Ridgebury, and the very poorly drained Whitman soils are associated in a drainage sequence. Canton soils have a friable loamy sand substratum. Well drained Stockbridge and moderately well drained Georgia soils have higher base status. Hollis soils have bedrock within a depth of 25 to 50 cm. Leicester soils are poorly drained and do not have a dense substratum. Montauk soils have sandy substrata. Narragansett soils have a lithologic discontinuity within a depth of 100 cm and a solum high in silt and very fine sand. Sutton and Wapping soils are moderately well drained and do not have a dense substratum.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained. Water may perch on the densic contact for brief periods in late fall through early spring. Surface runoff is negligible to high. Saturated hydraulic conductivity is moderately high or high in the mineral solum and low or moderately low in the substratum.

USE AND VEGETATION: Many areas are cleared and used for cultivated crops, hay, or pasture. Scattered areas are used for community development. Some areas are wooded. Common trees are red, white, and black oak, hickory, sugar maple, red maple, gray and black birch, eastern white pine, and eastern hemlock.

DISTRIBUTION AND EXTENT: Glaciated uplands in Connecticut, Massachusetts, New Hampshire, eastern

New York, Rhode Island, and Vermont. MLRAs 144A and 145. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Worcester County, Massachusetts, 1922.

REMARKS: Paxton is the state soil of Massachusetts.

Prior revisions included changes to the range in characteristics as well as general updating to metric units. Cation exchange activity class placement was determined from a review of limited lab data and similar or associated soils. Paxton soils were previously classified as Typic Dystrochrepts, and before that as Typic Fragiochrepts.

The Paxton series was previously used in some surveys in Maine. Maine determined from soil temperature studies that the mesic soil temperature regime would no longer be used. Maine is re-evaluating the soil temperature regimes in southern Maine as of the date of this revision.

Diagnostic horizons and features recognized in this pedon include:
1. Ochric epipedon - the zone from 0 to 20 cm (Ap horizon).
2. Cambic horizon - the zone from 20 to 66 cm (Bw horizons).
3. Densic material - the zone from 66 to 165 cm (Cd horizon).
4. Oxyaquic subgroup - based on saturation in one or more layers within 100 cm of the mineral surface, for one month or more per year, in 6 out of 10 years.
5) Particle-size control section - the zone from 20 to 66 cm (Bw horizons).

ADDITIONAL DATA: Full characterization data for pedons with User Pedon IDs of S1955MA027002, S1955NH015001, S1973MA005001, S1973MA005006, S1975CT013001, S1996NH013001, S1999NY061001. Pedons analyzed by the NSSL, Lincoln, NE. Laboratory characterization data for these pedons and similar soils is available through the National Cooperative Soil Survey Soil Characterization Database: http://ncsslabdatamart.sc.egov.usda.gov/

National Cooperative Soil Survey
U.S.A.

LOCATION RIDGEBURY MA+CT NH NJ NY RI

Established Series
Rev. SMF-JTI-DHZ
03/2015

RIDGEBURY SERIES

The Ridgebury series consists of very deep, somewhat poorly and poorly drained soils formed in lodgment till derived mainly from granite, gneiss and/or schist. They are commonly shallow to a densic contact. They are nearly level to gently sloping soils in depressions in uplands. They also occur in drainageways in uplands, in toeslope positions of hills, drumlins, and ground moraines, and in till plains. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity is moderately high or high in the solum and very low to moderately low in the substratum. Mean annual temperature is about 9 degrees C. and the mean annual precipitation is about 1143 mm.

TAXONOMIC CLASS: Loamy, mixed, superactive, acid, mesic, shallow Aeric Endoaquepts

TYPICAL PEDON: Ridgebury sandy loam - on a 3 to 8 percent slope in an extremely stony wooded area at an elevation of about 334 m. (Colors are for moist soil.)

A--0 to 13 cm; black (N 2/0) fine sandy loam; weak medium and coarse granular structure; friable; many very fine, fine and medium tree roots; 5 percent gravel and 5 percent cobbles; very strongly acid; abrupt smooth boundary. (5 to 25 cm thick)

Bw--13 to 23 cm; brown (10YR 4/3) sandy loam; weak medium subangular blocky structure; friable; few fine tree roots; 5 percent gravel and 5 percent cobbles; very strongly acid; abrupt wavy boundary. (8 to 22 cm thick)

Bg--23 to 46 cm; dark gray (10YR 4/1) gravelly sandy loam; massive; friable; 10 percent gravel and 5 percent cobbles; common fine prominent yellowish brown (10YR 5/6) and common medium distinct reddish brown (5YR 4/4) masses of iron accumulation; very strongly acid; gradual wavy boundary. (10 to 43 cm thick)

Cd--46 to 165 cm; gray (5Y 5/1) gravelly sandy loam; massive; firm; 10 percent gravel and 5 percent cobbles; common fine prominent reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid.

TYPE LOCATION: Hampshire County, Massachusetts; Town of Pelham; 1,600 feet east of Route 202 at a point 3,950 feet south of its junction with Amherst Road; USGS Shutesbury quadrangle; latitude 42 degrees 22 minutes 53 seconds N. and longitude 72 degrees 23 minutes 45 second W., NAD 27.

RANGE IN CHARACTERISTICS: Depth to the dense till commonly is 36 to 49 cm. The A horizon has 5 to 25 percent gravel, 0 to 10 percent cobbles, and 0 to 25 percent stones by volume. The B and C horizons have 5 to 25 percent gravel, 0 to 5 percent cobbles and 0 to 5 percent stones. Rock fragments within the soil range from 5 to 35 percent by volume and are subangular fragments. The unlimed soil ranges from very strongly acid to slightly acid.

The O horizon, where present, has hue of 7.5YR to 2.5Y, value of 2, 2.5, or 3 and chroma of 0 to 2.

The A or Ap horizon is neutral or has hue of 10YR to 5Y, value of 2, 2.5, or 3 and chroma of 0 to 2. Texture is sandy loam, fine sandy loam or loam in the fine-earth fraction.

Some pedons have a thin E horizon with hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. Texture is the same as the A horizon.

The B horizon is neutral or has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 0 to 3. The chroma is 4 in some places. Chroma of 3 or 4 is restricted to subhorizons. Redoximorphic features are few to many and are distinct or prominent. Texture is sandy loam, fine sandy loam, very fine sandy or loam in the fine earth fraction with fifteen percent or more fine sand or coarser and clay content less than 18 percent. The B horizon has subangular blocky structure, weak to moderate very thin to medium platy structure or is massive. It is very friable or friable.

The Cd horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4. It commonly has distinct or prominent redoximorphic features which generally become less abundant with depth but the range includes faint. Texture is coarse sandy loam, sandy loam, fine sandy loam, very fine sandy or loam in the fine-earth fraction. Consistence is firm or very firm and brittle. It is massive or has plates. Any physical aggregation is considered to not be pedogenic.

Some pedons have a C horizon below the Cd that is firm but not brittle.

COMPETING SERIES: There are no series currently in the same family.

The Painesville, Punsit, and Sun series are in a closely related family. Painesville soils lack a densic contact. Punsit soils have more than 60 percent silt plus very fine sand in the particle size control section. Sun soils formed in till derived from limestone and sandstone.

GEOGRAPHIC SETTING: The nearly level to gently sloping Ridgebury soils are in depressions and drainageways of till uplands. They also occur in toeslope positions and concave microfeatures of hills, drumlins, and ground moraines, and in till plains. Slope ranges from 0 to 15 percent. The soils formed in loamy lodgment till derived mainly from granite, gneiss and schist. Mean annual air temperature ranges from 7 to 11 degrees C and mean annual precipitation ranges from 1016 to 1270 mm. Mean growing season ranges from 100 to 195 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These include the Charlton, Chatfield, Hollis, Leicester, Paxton and Sutton, Whitman and Woodbridge soils. Ridgebury is a member of a drainage sequence that includes the well drained Paxton, moderately well drained Woodbridge, and very poorly drained Whitman soils. Charlton and Sutton soils are better drained and have friable substrata. Chatfield and Hollis soils have bedrock within depths of 100 and 50 cm respectively. Leicester soils do not have a densic contact.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Commonly poorly drained but the range includes the wetter part of somewhat poorly drained. Runoff is negligible to medium. Saturated hydraulic conductivity is moderately high or high in the solum and very low to moderately low in the substratum. A perched, fluctuating water table above the dense till saturates the solum to or near the surface for 7 to 9 months of the year.

USE AND VEGETATION: Largely forested to gray birch, yellow birch, red maple, hemlock, elm, spruce and balsam fir. Cleared areas are used mainly for hay and pasture.

DISTRIBUTION AND EXTENT: Glaciated landforms in Connecticut, Massachusetts, New Hampshire, New Jersey, New York, and Rhode Island. (MLRAs 142, 144A, 145, and 149B) The series is extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Franklin County, Vermont, 1948.

REMARKS: An analysis of Ridgebury soils in 2002 for 38 surveys showed that this series most commonly has a densic contact at 40 to 60 cm including 8 surveys with the depth to a densic contact at 50 cm. The average depth to a densic contact was 50 cm - the data showed an almost even split between depth class occurrences. A review of characterization data for Ridgebury soils shows a very slight dominance in the acid reaction class. Any physical aggregation in the Cd is considered to not be pedogenic. The type location is currently within the officially designated mesic zone in Massachusetts. Previous revision of this series was 12/2005.

Diagnostic horizons and features in this pedon include:

1. Ochric epipedon - the zone from 0 to 13 cm (A horizon).
2. Aeric feature 100 percent of the zone from 13 to 23 cm has hue of 10YR and both color value moist of 4 and chroma moist of 3 (Bw1 horizon).
3. Cambic horizon - the zone from 13 to 46 cm (Bw and Bg horizons).
3. Densic contact root limiting material begins at 46 cm (Cd horizon).
4. Endosaturation the zone from 23 to 46 cm is saturated above the densic contact (Bw2 horizon). A seasonal high water table is perched above the densic materials.
5. Reaction - the pH in the zone from 25 to 46 cm (control section for reaction) is presumed less than 5.0 in 0.01 M CaCl2 (1:2) (see remarks).
6. Series control section - the zone from 0 to 71 cm.

ADDITIONAL DATA: Reference samples from pedons with User Pedon IDs of S2000CT013002, S1995NH013005, and S1996NH013002
from Connecticut and New Hampshire, samples by NSSL, Lincoln, NE, various years. The laboratory data for these pedons and similar soils is available through the National Cooperative Soil Survey Soil Characterization Database: http://ncsslabdatamart.sc.egov.usda.gov/

National Cooperative Soil Survey
U.S.A.

`LOCATION SCARBORO MA CT NH NY RI VT`

Established Series
Rev. WHT-SMF-MFF
03/2010

SCARBORO SERIES

The Scarboro series consists of very deep, very poorly drained soils in sandy glaciofluvial deposits on outwash plains, deltas, and terraces. They are nearly level soils in depressions. Slope ranges from 0 through 3 percent. Saturated hydraulic conductivity is high or very high. Mean annual temperature is about 49 degrees F. (9 degrees C.) and the mean annual precipitation is about 44 inches (1118 millimeters).

TAXONOMIC CLASS: Sandy, mixed, mesic Histic Humaquepts

TYPICAL PEDON: Scarboro mucky fine sandy loam woodland; in an area of Scarboro mucky fine sandy loam at an elevation of about 212 meters. (Colors are for moist soil.)

Oi-- 0 to 1 inch (0 to 3 centimeters); slightly decomposed maple leaves and other plant material

Oa-- 1 to 8 inches (3 to 20 centimeters); dark brown (10YR3/3) mucky peat; thin platy structure; friable; common fine roots; very strongly acid; abrupt wavy boundary. (Combined thickness of Oi, Oe, and Oa horizons is 8 to 13 inches (20 to 33 centimeters).)

A-- 8 to 14 inches (20 to 36 centimeters); black (N 2/0) mucky fine sandy loam; weak medium granular structure; friable; common fine roots; very strongly acid; abrupt smooth boundary. (0 to 14 inches (0 to 36 centimeters) thick.)

Cg1-- 14 to 19 inches (36 to 48 centimeters); grayish brown (2.5Y 5/2) loamy sand; massive; friable; many fine roots; very strongly acid; abrupt irregular boundary.

Cg2-- 19 to 22 inches (48 to 56 centimeters); grayish brown (2.5Y 5/2) sand; massive; friable; few fine roots; 10 percent rock fragments; common medium prominent dark brown (7.5YR 3/2) areas of iron depletion and common medium prominent yellowish red (5YR 4/6) masses of iron; very strongly acid; clear wavy boundary.

Cg3-- 22 to 65 inches (56 to 165 centimeters); grayish brown (2.5Y 5/2) gravelly sand; single grain; loose; 15 percent rock fragments; strongly acid.

TYPE LOCATION: 60 feet north of Electric Avenue near the south edge of Forest Hill Cemetery in the City of Fitchburg, Massachusetts. USGS Fitchburg, MA topographic quadrangle, Latitude 42 degrees, 34 minutes, 0.3 seconds N., and Longitude 71 degrees, 48 minutes, 33.3 seconds W., NAD 1983.

RANGE IN CHARACTERISTICS: Stones range from 0 through 5 percent by volume in the A horizon and upper part of the C horizon and are absent in the lower part of the C horizon. Cobbles range from 0 through 10 percent in the A horizon, 0 through 5 percent in the upper part of the C horizon, and are absent in the lower part of the C horizon. Gravel ranges from 0 through 10 percent by volume in the A horizon, 0 through 20 percent in the upper part of the C horizon to a depth of 30 inches (76 centimeters), and 0 through 50 percent in the C horizon below a depth of 30 inches (76 centimeters). Reaction ranges from very strongly acid through moderately acid in the A horizon and upper part of the C horizon, and from very strongly acid through neutral in the lower part of the C horizon.

The O horizon is commonly mucky peat or muck, but the range includes thin layers of peat at the surface. The O horizon is neutral or has hue 5YR through 10YR, value of 2 or 3, and chroma of 0 through 3.

The A horizon where present is neutral or has hue of 5YR through 2.5Y, value of 2 through 3, and chroma of 0 through 2. It is fine sandy loam, sandy loam, loamy fine sand, loamy sand, fine sand, sand or their mucky analogues in the fine-earth fraction. This horizon commonly is 5 through 14 inches (13 through 36 centimeters) thick, but in some places may be less than 5 inches (13 centimeters) thick or absent.

The upper part of the Cg horizon is neutral or has hue of 10YR through 5Y, value of 3 through 7, and chroma of 0 through 3. Some pedons have few or common fine through coarse redoximorphic features. Texture is fine sandy loam, sandy loam, loamy fine sand, loamy coarse sand, loamy sand, fine sand, or sand in the fine-earth fraction.

The lower part of the C horizon is neutral or has hue of 10YR through 5Y or 5GY, value of 3 through 6, and chroma of 0 through 4. Redoximorphic features range from none through many and are fine through coarse. Texture is loamy fine sand, loamy sand, fine sand, sand, loamy coarse sand, or coarse sand in the fine-earth fraction. The C horizon is structureless and loose, very friable, or friable. It is often stratified.

COMPETING SERIES: These are the Ackerman and Antung series. These soils are from outside LRR R and S. Ackerman soils are more alkaline in the organic horizons and the upper part of the C horizon. They also contain coprogenous material. Antung soils are more alkaline and effervesce in the C horizon.

GEOGRAPHIC SETTING: Scarboro soils are in level or nearly level depressions on outwash plains, deltas, and terraces. Slope is less than 3 percent. The soils formed in sandy glaciofluvial deposits. Mean annual temperature ranges from 46 through 57 degrees F. (8 through 14 degrees C.) and mean annual precipitation ranges from 38 through 55 inches (965 through 1397 millimeters).

GEOGRAPHICALLY ASSOCIATED SOILS: The excessively drained Hinckley, Windsor and Penwood soils, somewhat excessively drained Merrimac soils, moderately well drained Sudbury and Deerfield soils, poorly drained Mashpee(T) and Massasoit(T) soils, somewhat poorly and poorly drained Walpole and Wareham soils are on higher positions on associated glaciofluvial landforms. The poorly drained Rippowam soils and very poorly drained Saco soils are on nearby flood plains. The very poorly drained Rainberry soils lack a Histic epipedon and have Spodic horizons.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Very poorly drained. Saturated hydraulic conductivity is high or very high. Surface runoff is high or very high. The water table is at or near the surface for 6 to 12 months of the year, and many areas are ponded for short periods.

USE AND VEGETATION: Shrub and brush land or woodland. Common shrubs are speckled alder, smooth alder, rhoda azalea, steeplebush spirea, leatherleaf, labrador-tea, winterberry, highbush blueberry, large cranberry, black huckleberry, poison sumac, and sheep laurel. Common trees are red maple, slippery elm, Atlantic white cedar, tamarack, eastern white pine, willow, and gray birch.

DISTRIBUTION AND EXTENT: Glaciofluvial landforms in Connecticut, Massachusetts, New Hampshire, Rhode Island, eastern New York, and Vermont. MLRAs 142, 144A, 145, and 149B. Scarboro soils are extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Cumberland County, Maine; 1915.

REMARKS: 1. Geographical location (latitude and longitude) determined from the published soil survey.

2. The use of the Scarboro series in Maine, and in MLRA 144B, is relict to before temperature classes. These have been removed from the SC file.

Diagnostic horizons and features recognized in this pedon are:
1. Histic epipedon - the zone from the soil surface to a depth of 8 inches (20 centimeters), (Oi and Oa horizons).
2. Thickness of organic soil materials is 8 inches (20 centimeters).

3. Aquic conditions - Histic epipedon or the zone from 19 to 22 inches (48 to 56 centimeters) has 50 percent or more 2 chroma with redox concentrations (Cg2 horizon).

National Cooperative Soil Survey
U.S.A.

LOCATION SUDBURY MA+CT NH NY RI VT

Established Series
Rev. DGG-MFF-DCP
01/2013

SUDBURY SERIES

The Sudbury series consists of very deep, moderately well and somewhat poorly drained soils on outwash plains. They are nearly level through strongly sloping soils in slight depressions and on terraces and foot slopes in areas of outwash or glaciofluvial deposits. Slope ranges from 0 through 15 percent. Saturated hydraulic conductivity is moderately high or high in the upper solum and high or very high in the lower solum and substratum. Mean annual temperature is about 48 degrees F. (9 degrees C.) and the mean annual precipitation is about 43 inches (1092 millimeters).

TAXONOMIC CLASS: Sandy, mixed, mesic Aquic Dystrudepts

TYPICAL PEDON: Sudbury fine sandy loam in a cultivated field at an elevation of about 92 feet (28 meters). (Colors are for moist soils unless otherwise stated.)

Ap -- 0 to 13 inches (0 to 33 centimeters); very dark grayish brown (10YR 3/2) fine sandy loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; very friable; many fine roots; 5 percent gravel; moderately acid; abrupt smooth boundary. (6 to 14 inches, 15 to 36 centimeters thick.)

Bw -- 13 to 19 inches (33 to 48 centimeters); yellowish brown (10YR 5/6) sandy loam; weak medium granular structure; very friable; common grass roots; 10 percent fine gravel; few fine and medium prominent dark reddish gray (5YR 4/2) areas of iron depletion in the lower 3 inches (8 centimeters); moderately acid; abrupt wavy boundary. (2 to 20 inches, 5 to 51 centimeters thick.)

2CB -- 19 to 26 inches(48 to 66 centimeters) ; yellowish brown (10YR 5/4) gravelly coarse sand; single grain; loose; few fine roots; yellowish red (5YR 4/8) coatings on some sand grains; 20 percent gravel; many fine prominent dark reddish brown (2.5YR 3/4) and common coarse prominent reddish yellow (5YR 6/8) masses of iron accumulations; moderately acid; abrupt wavy boundary. (0 to 10 inches, 0 to 25 centimeters thick.)

2C -- 26 to 65 inches (66 to 165 centimeters); light olive brown (2.5Y 5/4) very gravelly coarse sand; single grain; loose; many sand grains coated with strong brown (7.5YR 5/6) and some sand grains slightly cemented, and many pebbles and cobbles coated with black (5YR 2/1); few fine roots; strata of sand and gravel consisting of about 50 percent gravel and some cobbles; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; moderately acid.

TYPE LOCATION: Essex County, Massachusetts; town of Beverly, 0.2 miles south of the junction of Essex Street and Cole Street and 150 feet south of railroad track. USGS Salem, MA quadrangle; Latitude 42 degrees, 33 minutes, 52 seconds N., Longitude 70 degrees, 51 minutes, 38 seconds W., NAD 1983.

RANGE IN CHARACTERISTICS: Thickness of the solum and depth to stratified sand and gravel range from 18 through 36 inches (46 through 91 centimeters). Depth to redoximorphic features ranges from 12 through 24 inches (30 through 60 centimeters) and must include redoximorphic depletions with chroma of 2 or less. Rock fragment content of individual horizons of the solum ranges from 0 through 30 percent by volume. The fragments are primarily fine gravel but include some medium gravel, coarse gravel and cobbles. Rock fragment content of the C horizon ranges from 0 through 75 percent, and consists of 0 through 65 percent gravel and 0 through 25 percent cobbles and stones. The fragments are mainly granite or gneiss with less than 25 percent dark, fine-grained shale, slate, or phyllite. Reaction ranges from extremely acid through slightly acid in the solum, unless limed, and from very strongly acid through slightly acid in the substratum.

Some pedons have an O horizon.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 0 through 4. It is fine sandy loam, sandy loam, or very fine sandy loam in the fine-earth fraction. Structure is granular or subangular blocky.

Some pedons have an E horizon that has hue of 7.5YR or 10YR, value of 4 through 6, and chroma of 1 or 2. The E horizon has the same texture range as the A horizon. Structure is granular or subangular blocky.

The Bw horizon has hue of 7.5YR through 2.5Y, value of 3 through 5, and chroma of 2 through 8. The upper part of the B horizon is fine sandy loam or sandy loam and the lower part ranges from sandy loam through coarse sand in the fine-earth fraction. Structure is granular or subangular blocky or the horizon is massive. The structure may be single grain in the lower part in some pedons.

The 2CB horizon, where present, has hue of 7.5YR through 2.5Y, value of 3 through 6, and chroma of 2 through 8. Texture ranges from loamy sand through coarse sand in the fine-earth fraction.
The 2C horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 2 through 8. It consists of stratified sand, gravel, and cobbles and ranges from loamy fine sand through coarse sand in the fine-earth fraction.

COMPETING SERIES: There are no other series in the same family.

The Deerfield, Merrimac, Ninigret, Tisbury, and Walpole series are in related families. Deerfield soils have loamy fine sand or coarser textures below a depth of 10 inches (25 centimeters). Merrimac soils are somewhat excessively drained. Ninigret soils are coarse loamy over sandy or sandy-skeletal. Tisbury soils are silt loam or very fine sandy loam in the upper part of the B horizon. Walpole soils are poorly drained.

GEOGRAPHIC SETTING: Sudbury soils are nearly level through strongly sloping soils in slight depressions on outwash plains and on gentle foot slopes. Slope ranges from 0 through 15 percent. The soils formed in water sorted sandy and gravelly glaciofluvial materials derived mainly from granite, gneiss, and schist. Mean annual precipitation ranges from 30 through 55 inches (762 through 1397 millimeters) and mean annual temperature ranges from 45 through 50 degrees F. (7 through 10 degrees C.). Mean growing season ranges from 120 through 240 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Agawam, Deerfield, Hinckley, Merrimac, Walpole and Windsor soils on nearby landscapes. Agawam, Hinckley, Merrimac, and Windsor soils do not have redox depletions within 24 inches (60 centimeters) of the surface. In addition, the Hinckley and Windsor soils have loamy sand or coarser textures in the B horizon. Deerfield soils have loamy fine sand or coarser textures below a depth of 10 inches (25 centimeters). Walpole soils are poorly drained.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Moderately well and somewhat poorly drained. The potential for surface runoff is low to very high. The internal drainage is restricted by a seasonal high water table. Saturated hydraulic conductivity is moderately high or high in the upper solum and high or very high in the lower solum and substratum.

USE AND VEGETATION: Most areas used for growing hay, pasture, field and truck crops. Some are forested areas with mainly red maple, gray birch, eastern hemlock, larch, eastern white pine, and red, black, and scarlet oaks.

DISTRIBUTION AND EXTENT: Massachusetts, Connecticut, Rhode Island, Vermont, New Hampshire and eastern New York. MLRAs 144A, 145, and 149B. The series is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Middlesex County, Massachusetts, 1924.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
1. Ochric epipedon - the zone from the soil surface to a depth of 13 inches (33 centimeters) (Ap horizon).
2. Cambic horizon - the zone from 13 to 19 inches (33 to 48 centimeters) (Bw horizon).
3. Aquic subgroup - redox depletions with a chroma of 2 within 24 inches (60 centimeters) of the soil surface.

National Cooperative Soil Survey
U.S.A.

LOCATION WHITMAN MA+CT NH NJ NY RI

Established Series
Rev. DGG-WHT-SMF
01/2018

WHITMAN SERIES

The Whitman series consists of very deep, very poorly drained soils formed in lodgment till derived mainly from granite, gneiss, and schist. They are shallow to a densic contact. These soils are nearly level or gently sloping soils in depressions and drainageways on uplands. Saturated hydraulic conductivity is moderately high or high in the solum and very low to moderately low in the substratum. Mean annual precipitation is about 1143 mm and mean annual temperature is about 9 degrees C.

TAXONOMIC CLASS: Loamy, mixed, superactive, acid, mesic, shallow Typic Humaquepts

TYPICAL PEDON: Whitman loam - on a 0 percent slope in an idle area at an elevation of about 214 meters. (Colors are for moist soils.)

Ap -- 0 to 25 cm; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak medium granular structure; friable; 10 percent rock fragments; common medium distinct red (2.5YR 4/8) masses of iron accumulation lining pores; moderately acid; abrupt wavy boundary. (5 to 35 cm thick.)

Bg -- 25 to 46 cm; gray (5Y 5/1) fine sandy loam; massive; friable; 10 percent rock fragments, few medium distinct pale olive (5Y 6/4) and light olive brown (2.5Y 5/4) masses of iron accumulation; strongly acid; abrupt wavy boundary. (15 to 44 cm thick.)

Cdg -- 46 to 79 cm; gray (5Y 6/1) fine sandy loam; moderate medium plates; firm; 10 percent rock fragments; many medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation; moderately acid; clear wavy boundary.

Cd1 -- 79 to 122 cm; olive (5Y 4/3) fine sandy loam; massive; firm; 10 percent rock fragments; few medium prominent dark reddish brown (2.5YR 3/4) masses of iron accumulation; moderately acid; gradual wavy boundary.

Cd2 -- 122 to 165 cm; olive (5Y 5/3) fine sandy loam; massive; firm; 10 percent rock fragments; moderately acid.

TYPE LOCATION: Worcester County, Massachusetts; Town of Leominster, 1 mile west intersection of Pleasant and Wachusett Streets, and 500 feet north of Wachusett Street. USGS Sterling, MA topographic quadrangle, Latitude 42 degrees, 30 minutes, 4 seconds N.; Longitude 71 degrees, 47 minutes, 40 seconds W., NAD 1983.

RANGE IN CHARACTERISTICS: Depth to a densic contact commonly is 30 to 58 cm. The A horizon has 5 to 30 percent gravel, 0 to 15 percent cobbles, and 0 to 25 percent stones by volume. The B and C horizons have 5 to 30 percent gravel, 0 to 15 percent cobbles, and 0 to 10 percent stones . The soil reaction, unless limed, ranges from extremely acid to slightly acid in the solum and very strongly acid to slightly acid in the substratum.

The O horizon, where present, ranges in thickness from 2 to 20 centimeters. It has hue 7.5YR or 10YR, value 2 or 3, and chroma 1 or 2. It consists of slightly, intermediately, and/or highly decomposed organic material.

The A horizon is neutral or has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 0 to 2. It sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam or their mucky analogues. Structure is weak granular or subangular blocky, or the horizon is massive. Consistence is very friable or friable.

The Bg horizon is neutral or has hue of 7.5YR to 5Y, value of 4 through 6, and chroma of 0 to 2. Redoximorphic concentrations range from few to many where matrix chroma is 2 and none to many where chroma is 1. Texture is sandy loam, fine sandy loam, very fine sandy loam, or loam in the fine earth fraction. It has fifteen percent or more fine sand or coarser with clay content less than 18 percent. Structure is weak granular or subangular blocky, or the horizon is massive. Consistence is very friable or friable.

The Cdg or Cd layer is neutral or has hue of 10YR to 5Y, value of 4 through 6, and chroma of 0 to 2. The chroma is 3 or 4 in some pedons. Redoximorphic features range from few to many. Texture is loam, very fine sandy loam, fine sandy loam, or sandy loam in the fine earth fraction. Consistence commonly is firm to extremely firm and the layer may be brittle in some part. Geogenic structure is commonly in the form of weak or moderate thin plates in the upper part. Otherwise it is massive throughout.

COMPETING SERIES: There are no series currently in the same family.

GEOGRAPHIC SETTING: Whitman soils are 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. The soils formed in loamy, till derived mainly from granite, gneiss and schist. Mean annual precipitation ranges from 1016 to 1422 mm and mean annual temperature ranges from 7 to 11 degrees C. The frost free period is 100 to 195 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Charlton, Chatfield, Hollis, Leicester, Paxton, Ridgebury, Sutton, and Woodbridge soils. The well drained Paxton, moderately well drained Woodbridge, and somewhat poorly and poorly drained Ridgebury soils are in a drainage sequence with Whitman soils. Charlton, Leicester, and Sutton soils have friable substrata. Chatfield and Hollis soils have bedrock within depths of 100 and 50 cm respectively.

DRAINAGE AND PERMEABILITY: Very poorly drained. Runoff potential is high or very high. Saturated hydraulic conductivity is moderately high or high in the solum and very low to moderately low in the densic material. A perched water table, or excess seepage water, is at or near the surface for about 9 months of the year.

USE AND VEGETATION: Nearly all areas are forested. Only a few areas are cleared and drained and used for pasture. Tree species include alder, gray birch, red maple, eastern hemlock, American elm, and spruce. Shrub species include northern spicebush, winterberry, red maple, and silky dogwood. Herb species include skunk cabbage, green false hellebore, sensitive fern, cinnamon fern, jewelweed, and water-tolerant sedges and rushes.

DISTRIBUTION AND EXTENT: Connecticut, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. MLRAs 142, 144A, 145, 149B. The series is extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Plymouth County, Massachusetts, 1911.

REMARKS: 1. Location previously revised to 500 feet north of Wachusett Street after review of soil map showed no Whitman map unit 50 feet north of road.

2. Before the existence of the Shallow family class, some pedons were correlated as Whitman that are moderately deep to a densic contact.

3. Diagnostic horizons and features in this pedon include:

a. Umbric epipedon - the zone from the soil surface to a depth of 25 cm (Ap horizon).
b. Cambic horizon - the zone from 25 to 46 cm (Bg horizon).
c. Aquic conditions - as evidenced by chroma of 1 in the Bg horizon.
d. Densic contact - root limiting layer begins at 46 cm .
e. Shallow depth class - depth to a densic contact is less than 50 cm (Cdg begins at 46 cm).

ADDITIONAL DATA: Reference samples from pedons S1977MA005002, S1977MA005004, S1977MA005005, S1995NH013005, S2000CT013001. Lab characterization data for these pedons and pedons of similar soils are available through the National Cooperative Soil Survey Soil Characterization Database: http://ncsslabdatamart.sc.egov.usda.gov/

National Cooperative Soil Survey
U.S.A.

LOCATION WINDSOR CT+MA NH NY RI VT

Established Series
Rev. MFF-SMF-DCP
03/2014

WINDSOR SERIES

The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep soils on glaciofluvial landforms. Slope ranges from 0 through 60 percent. Saturated hydraulic conductivity is high or very high. Mean annual temperature is about 10 degrees C and mean annual precipitation is about 1092 mm.

TAXONOMIC CLASS: Mixed, mesic Typic Udipsamments

TYPICAL PEDON: Windsor loamy sand - forested, 3 percent slope, at an elevation of about 24 meters. (Colors are for moist soil.)

Oe--0 to 3 cm; black (10YR 2/1) moderately decomposed forest plant material; many very fine and fine roots; very strongly acid; abrupt smooth boundary. (0 to 8 cm thick.)

A--3 to 8 cm; very dark grayish brown (10YR 3/2) loamy sand; weak medium granular structure; very friable; many very fine and fine roots; strongly acid; abrupt wavy boundary. (3 to 25 cm thick.)

Bw1--8 to 23 cm; strong brown (7.5YR 5/6) loamy sand; very weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary.

Bw2--23 to 53 cm; yellowish brown (10YR 5/6) loamy sand; very weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary.

Bw3--53 to 64 cm; light yellowish brown (10YR 6/4) sand; single grain; loose; few coarse roots; strongly acid; clear wavy boundary. (Combined thickness of the Bw horizons is 23 to 86 cm.)

C--64 to 165 cm; pale brown (10YR 6/3) and light brownish gray (10YR 6/2) sand; single grain; loose; few coarse roots; strongly acid.

TYPE LOCATION: Hartford County, Connecticut; town of South Windsor, 1100 feet northwest along Chapel Road from the intersection of Chapel Road and Ellington Road and 100 feet due south of Chapel Road. USGS Manchester, CT topographic quadrangle, Latitude 41 degrees, 48 minutes, 35 seconds N., Longitude 72 degrees, 36 minutes, 22 seconds W., NAD 1983

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 25 to 92 cm. Rock fragments, dominantly fine gravel, range from 0 through 10 percent by volume in the solum and from 0 to 15 percent in the substratum. Thin strata of gravel or thin subhorizons of coarse sand or loamy coarse sand are present in some pedons. Unless limed, reaction in the solum commonly is extremely acid to moderately acid, but the range includes slightly acid. Unless limed, reaction in the substratum commonly is very strongly acid to slightly acid, but the range includes neutral.

O horizons are present in some pedons.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3. Many pedons have an Ap horizon up to 12 inches thick with value of 3 or 4 and chroma of 2 to 4. The A or Ap horizon is loamy fine sand, loamy sand, fine sand, or sand. It has weak or moderate granular structure and is very friable, friable, or loose.

Some pedons have a thin E horizon with hue 7.5YR or 10YR, value of 4 to 6, and chroma of 1 or 2.

The upper part of the Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. The lower part of Bw horizon has hue of 7.5YR to 5Y, value of 4 to 7, and chroma of 3 to 6. The Bw horizon is loamy sand or loamy fine sand in the upper part and loamy fine sand, loamy sand, fine sand, or sand in the lower part. The Bw horizon has weak granular or weak subangular blocky structure, or it is massive or single grain. Consistence is very friable or loose.

Some pedons have a BC horizon similar to the lower part of the Bw horizon.

The C horizon has hue of 5YR to 5Y, value of 4 to 7, and chroma of 1 to 6. It is fine sand, sand, coarse sand, loamy fine sand, or loamy sand. The horizon is massive or single grain and consistence is very friable or loose.

COMPETING SERIES: These are the Acquango, Aldo, Bigapple, Biltmore, Boplain, Breeze, Caesar, Chute, Dabney, Hodge, Oakville, Osolo, Pahuk, Penwood, Perks, Pinegrove, Plainfield, Poquonock, Ronda, Samoa, Sardak, Sarpy, Scotah, Spessard, Suncook, Tyner, and Wapanucket series. Aquango, Aldo, Biltmore, Boplain, Chute, Dabney, Hodge, Osolo, Pahuk, Perks, Ronda, Samoa, Sardak, Spessard, and Tyner soils are from outside of LRRs L, R, and S. Acquango soils are very slightly to moderately saline within the soil profile. Aldo soils have a water table and saturation within the series control section for as much as one month per year in 6 out of 10 years. Bigapple soils formed in human transported soil material from dredging activities. Biltmore and Spessard soils are well drained. Breeze soils formed in human transported sandy soil materials intermingled with construction debris. Caesar soils contain more coarse sand. Chute, Hodge, and Sarpy soils contain free carbonates and do not have a B horizon. Dabney soils do not have a B horizon and receive more than 152 cm of precipitation annually. Oakville soils typically average 50 percent or more fine sand in the subsoil. Osolo soils have a solum thicker than 1.5 m. Penwood soils have hue of 5YR or redder in the B horizon. Pahuk, Perks, Samoa, and Suncook soils do not have a B horizon. Plainfield soils are less moist in all parts of the control section for the 120 days following the summer solstice. Poquonock soils have a densic contact with in 1 m. Ronda soils formed in alluvium from residuum sources. Sardak soils formed in alluvium and are calcareous. Tyner soils have a thicker solum. Wapanucket soils are underlain by glaciolacustrine deposits with in the series control section.

GEOGRAPHIC SETTING: Windsor soils are nearly level through very steep soils typically on glaciofluvial landforms but include late-Wisconsin-aged dunes. The steeper slopes are typically on terrace escarpments. Slope ranges from 0 to 60 percent. The soils formed in outwash or eolian deposits of poorly graded sands and loamy sands derived mainly from crystalline rocks. Mean annual temperature ranges from 7 to 12 degrees C, and the mean annual precipitation typically ranges from 965 to 1270 mm, but the range includes as low as 660 mm in some places east of Adirondack Mountains in the Champlain Valley of New York. The growing season ranges from 120 to 190 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Deerfield, Hinckley, Merrimac, Quonset, Suncook, Agawam, Hadley, Haven, Occum, Pootatuck, Scarboro, Sudbury, Walpole, Wareham, and Winooski soils on nearby landscapes. The moderately well drained Deerfield and Sudbury, the somewhat poorly drained and poorly drained Walpole and Wareham, and the very poorly drained Scarboro soils are common drainage associates. Agawam and Haven soils are coarse-loamy over sandy or sandy-skeletal or coarse-loamy terrace associates, respectively. Hadley, Occum, Pootatuck, and Winooski soils are on nearby flood plains.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Excessively drained. Surface runoff is negligible to medium. Saturated hydraulic conductivity is high or very high.

USE AND VEGETATION: Most areas are forested or in low growing brushy vegetation. Some areas are used for silage corn, hay, and pasture. Small areas, mostly irrigated, are used for shade tobacco, vegetables and nursery stock. Some areas are in community development. Common trees are white, black, and northern red oak, eastern white pine, pitch pine, gray birch, poplar, red maple, and sugar maple.

DISTRIBUTION AND EXTENT: Late Wisconsin glaciofluvial or eolian landforms in Connecticut, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont; MLRAs 101, 142, 144A, and 145. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Connecticut Valley Area, 1899.

REMARKS: The use of the Windsor series in Maine, and in MLRAs 141, 144B, and 143 is relict to before temperature classes in soil taxoonomy. These have been removed from the SC file.

Diagnostic horizons and features recognized in this pedon include:
1. Ochric epipedon - the zone from 0 to 8 cm (Oe and A horizons).
2. Particle-size class - averages sandy in the control section from 25 to 100 cm.
3. No cambic horizon and development of color - the zone from 8 to 64 cm demonstrates development of color with no illuvial accumulation of material (Bw horizons).

ADDITIONAL DATA: Reference samples from pedons 54MA023005, 63VT011001, 63VT011002, 64NH017003, 64NH017004, 70CT003003, 70MA011003, 70VT017002, 73MA005003, 73MA005004, 91MA023006, 95NH013001, 96NH013004, 98NY045002, 98NY085002, S07VT011004.

National Cooperative Soil Survey
U.S.A.

LOCATION WOODBRIDGE CT+MA NH NY RI

Established Series
Rev. MFF-JTI-DHZ
05/2016

WOODBRIDGE SERIES

The Woodbridge series consists of moderately well drained loamy soils formed in lodgment till. They are very deep to bedrock and moderately deep to a densic contact. They are nearly level to moderately steep soils on hills, drumlins, till plains, and ground moraines. Slope ranges from 0 to 25 percent. Saturated hydraulic conductivity ranges from moderately high to high in the surface layer and subsoil and low or moderately low in the dense substratum. Mean annual temperature is about 9 degrees C., and mean annual precipitation is about 1168 mm.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Aquic Dystrudepts

TYPICAL PEDON: Woodbridge fine sandy loam - grass field, at an elevation of about 177 meters. (Colors are for moist soil unless otherwise noted.)

Ap--0 to 18 cm; very dark grayish brown (10YR 3/2) fine sandy loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; many fine and medium roots; few very dark brown (10YR 2/2) earthworm casts; 5 percent gravel; moderately acid; abrupt wavy boundary. (10 to 30 cm thick.)

Bw1--18 to 46 cm; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; few very dark brown (10YR 2/2) earthworm casts; 10 percent gravel; moderately acid; gradual wavy boundary.

Bw2--46 to 66 cm; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; few very dark brown (10YR 2/2) earthworm casts; 10 percent gravel; few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation and light brownish gray (10YR 6/2) areas of iron depletion; moderately acid; gradual wavy boundary.

Bw3--66 to 76 cm; light olive brown (2.5Y 5/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent gravel; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation and light brownish gray (10YR 6/2) areas of iron depletion; moderately acid; clear wavy boundary. (Combined thickness of the Bw horizons is 31 to 94 cm.)

Cd1--76 to 109 cm; light olive brown (2.5Y 5/4) gravelly fine sandy loam; weak thick plates of geogenic origin; very firm, brittle; 20 percent gravel; many medium prominent strong brown (7.5YR 5/8) masses of iron accumulation and light brownish gray (10YR 6/2) areas of iron depletion; moderately acid; gradual wavy boundary.

Cd2--109 to 165 cm; light olive brown (2.5Y 5/4) gravelly fine sandy loam; weak thick plates of geogenic origin; very firm, brittle; few fine prominent very dark brown (10YR 2/2) coatings on plates; 25 percent gravel; common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation; moderately acid.

TYPE LOCATION: Tolland County, Connecticut; town of Mansfield, 0.75 mile south of the intersection of Connecticut Routes 275 and 195, and 0.25 mile east on the University of Connecticut Agronomy Farm, 800 feet north of the greenhouses near the corner of a brushy field. USGS Spring Hill, CT topographic quadrangle, Latitude 41 degrees, 47 minutes, 53.43 seconds N., Longitude 72 degrees, 13 minutes, 48.69 seconds W., WGS

1984.

RANGE IN CHARACTERISTICS: The thickness of the solum and depth to densic materials is 50 to 100 cm. Depth to bedrock is commonly more than 2 meters. Rock fragments commonly range from 0 to 35 percent. Except where the surface is stony, the fragments are mostly subrounded gravel and typically make up 60 percent or more of the total rock fragments. Unless limed, reaction ranges from very strongly acid to slightly acid.

Some pedons have an O horizon.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. Dry value is 6 or more. Undisturbed pedons have a thin A horizon commonly with hue of 7.5YR or 10YR but the range includes 2.5Y, value of 2 or 3 and chroma of 1 or 2. The Ap or A horizon is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

Some pedons have a thin E horizon below the A horizon. It has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3.

The upper part of the Bw horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 3 to 8. The lower part of the Bw horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. Iron depletions are within 60 cm. The Bw horizon is loam, fine sandy loam, or sandy loam with less than 65 percent silt plus very fine sand.

Some pedons have a thin BC horizon.

Some pedons have an E or E&#39; horizon up to 8 cm thick below the B horizon. It has hue of 10YR to 5Y, value of 5 or 6, chroma of 2 or 3, and has redoximorphic features. Typically, it is coarser-textured than the overlying horizon.

Some pedons have a C horizon above the Cd horizon.

The Cd horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It commonly has redoximorphic features. Texture is loam, fine sandy loam, sandy loam, or coarse sandy loam in the fine-earth fraction. The structure is not pedogenetically derived, and appears in the form of medium to very thick plates, or it is massive. Consistence is firm or very firm.

COMPETING SERIES: These are the Chautauqua, North Meadow, Pittstown, Pompton, Rainbow, Sutton, Wapping, and Wilbraham series. Chautauqua, Pompton, Sutton, and Wapping soils do not have a dense substratum. North Meadow soils have a cap of human transported material 25 to 100 cm thick. Pittstown and Rainbow soils have more than 65 percent silt plus very fine sand in the solum. Wilbraham soils are poorly drained and developed from red parent materials (originating from reddish sandstone, shale, and conglomerate with some basalt).

GEOGRAPHIC SETTING: Woodbridge soils are nearly level to moderately steep and are on hills, drumlins, till plains, and ground moraines. Slope commonly is less than 8 percent, but the range includes 0 to 25 percent. The soils formed in acid till derived mostly from schist, gneiss, and granite. Mean annual temperature ranges from 7 to 13 degrees C and mean annual precipitation ranges from 940 to 1250 mm, and the growing season ranges from 115 to 180 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Rainbow, Sutton, and Wapping soils and the Bernardston, Broadbrook, Canton, Charlton, Chatfield, Georgia, Hollis, Leicester, Montauk, Paxton, Ridgebury, Scituate, and Whitman soils on nearby landscapes. The well drained Paxton, somewhat poorly and poorly drained Ridgebury, and the very poorly drained Whitman soils are associated in a drainage sequence. Bernardston and Broadbrook soils are well drained and are finer textured. Canton and Charlton soils are well drained and do not have a dense substratum. Chatfield and Hollis soils have bedrock within depths of 50 to 100 and 25 to 50 cm, respectively. Georgia soils are calcareous within 200 cm. Leicester soils are poorly drained and do not have a dense substratum. Montauk soils are well drained and are coarser textured. Scituate soils have a loamy sand substratum.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Moderately well drained. The potential for surface runoff is moderate to very high. Saturated hydraulic conductivity is moderately high or high in the solum and low or moderately low in the dense substratum.

USE AND VEGETATION: Many areas are cleared and used for cultivated crops, hay, or pasture. Scattered areas are used for community development. Some areas are wooded. Common trees are red, white, and black oak, hickory, white ash, sugar maple, red maple, eastern hemlock, and eastern white pine.

DISTRIBUTION AND EXTENT: Glaciated uplands of Connecticut, Massachusetts, New Hampshire, eastern New York, and Rhode Island. MLRAs 144A, 145, and 149B. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Essex County, Massachusetts, 1925.

REMARKS: Woodbridge soils were previously used in Maine. Soil temperature studies in Maine have resulted in the use of the frigid soil temperature regime for soils in areas formerly identified as mesic.

Diagnostic horizons and features recognized in this pedon include:
1. Ochric epipedon - the zone from 0 to 18 cm (Ap horizon).
2. Cambic horizon - the zone from 18 to 76 cm (Bw horizons).
3. Aquic feature - low chroma areas of iron depletion within 60 cm (Bw2 horizon).
4. Densic materials - the zone from 76 to 165 cm (Cd1 and Cd2 horizons).
5) Particle-size control section - the zone from 18 to 76 cm (Bw horizons).

ADDITIONAL DATA: Full characterization data for pedons with User Pedon IDs of S2000CT013003, S1956NH017002, S1956NH017003, S1958CT013004, S1958MA015002, S1978NH011002, and S1991MA023007. Pedons analyzed by the NSSL, Lincoln, NE. The laboratory characterization data for these pedons and similar soils is available through the National Cooperative Soil Survey Soil Characterization Database: http://ncsslabdatamart.sc.egov.usda.gov/

National Cooperative Soil Survey
U.S.A.

APPENDIX D-SOIL MAPS

APPENDIX D, Map D-1

NRCS SOIL MAP

Soil Map—State of Connecticut
(Constitution Solar Plainfield, CT)

Map Scale: 1:7,440 if printed on A portrait (8.5" x 11") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N 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
- ʎ 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
- ø 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.

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 19, Sep 13, 2019

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

Date(s) aerial images were photographed: Mar 30, 2011—May 1, 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

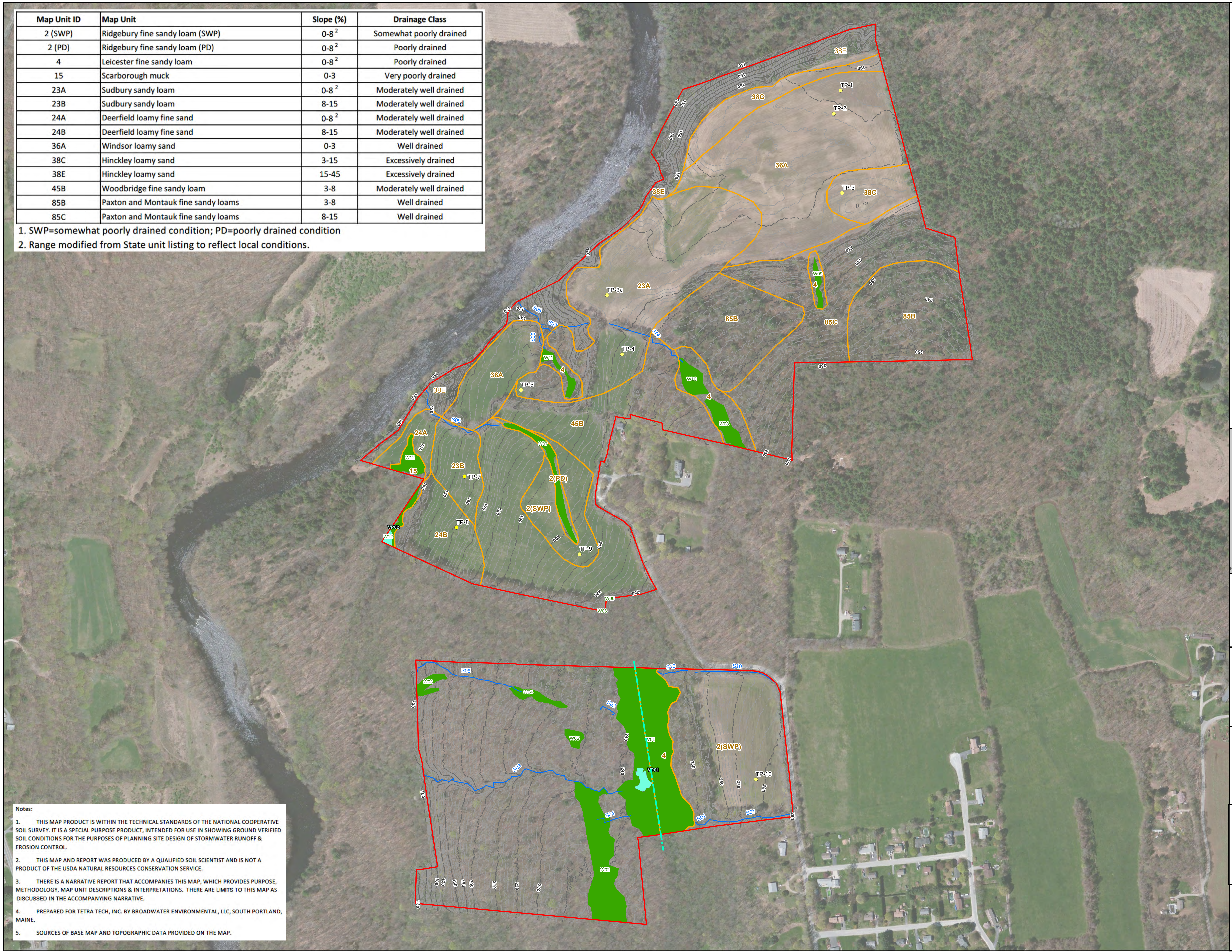
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	9.9	8.5%
15	Scarboro muck, 0 to 3 percent slopes	6.7	5.8%
23A	Sudbury sandy loam, 0 to 5 percent slopes	16.3	14.0%
36A	Windsor loamy sand, 0 to 3 percent slopes	14.9	12.7%
36B	Windsor loamy sand, 3 to 8 percent slopes	3.3	2.8%
38C	Hinckley loamy sand, 3 to 15 percent slopes	8.8	7.5%
38E	Hinckley loamy sand, 15 to 45 percent slopes	5.3	4.6%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	27.6	23.6%
47C	Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony	4.5	3.8%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	9.5	8.1%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	5.7	4.9%
86C	Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony	2.7	2.3%
W	Water	1.6	1.4%
Totals for Area of Interest		**117.0**	**100.0%**

APPENDIX D, MAP D-2

REVISED SITE SPECIFIC SOIL MAP

Map Unit ID	Map Unit	Slope (%)	Drainage Class
2 (SWP)	Ridgebury fine sandy loam (SWP)	0-8^2	Somewhat poorly drained
2 (PD)	Ridgebury fine sandy loam (PD)	0-8^2	Poorly drained
4	Leicester fine sandy loam	0-8^2	Poorly drained
15	Scarborough muck	0-3	Very poorly drained
23A	Sudbury sandy loam	0-8^2	Moderately well drained
23B	Sudbury sandy loam	8-15	Moderately well drained
24A	Deerfield loamy fine sand	0-8^2	Moderately well drained
24B	Deerfield loamy fine sand	8-15	Moderately well drained
36A	Windsor loamy sand	0-3	Well drained
38C	Hinckley loamy sand	3-15	Excessively drained
38E	Hinckley loamy sand	15-45	Excessively drained
45B	Woodbridge fine sandy loam	3-8	Moderately well drained
85B	Paxton and Montauk fine sandy loams	3-8	Well drained
85C	Paxton and Montauk fine sandy loams	8-15	Well drained

1. SWP=somewhat poorly drained condition; PD=poorly drained condition
2. Range modified from State unit listing to reflect local conditions.



Notes:

1. THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR USE IN SHOWING GROUND VERIFIED SOIL CONDITIONS FOR THE PURPOSES OF PLANNING SITE DESIGN OF STORMWATER RUNOFF & EROSION CONTROL.

2. THIS MAP AND REPORT WAS PRODUCED BY A QUALIFIED SOIL SCIENTIST AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE.

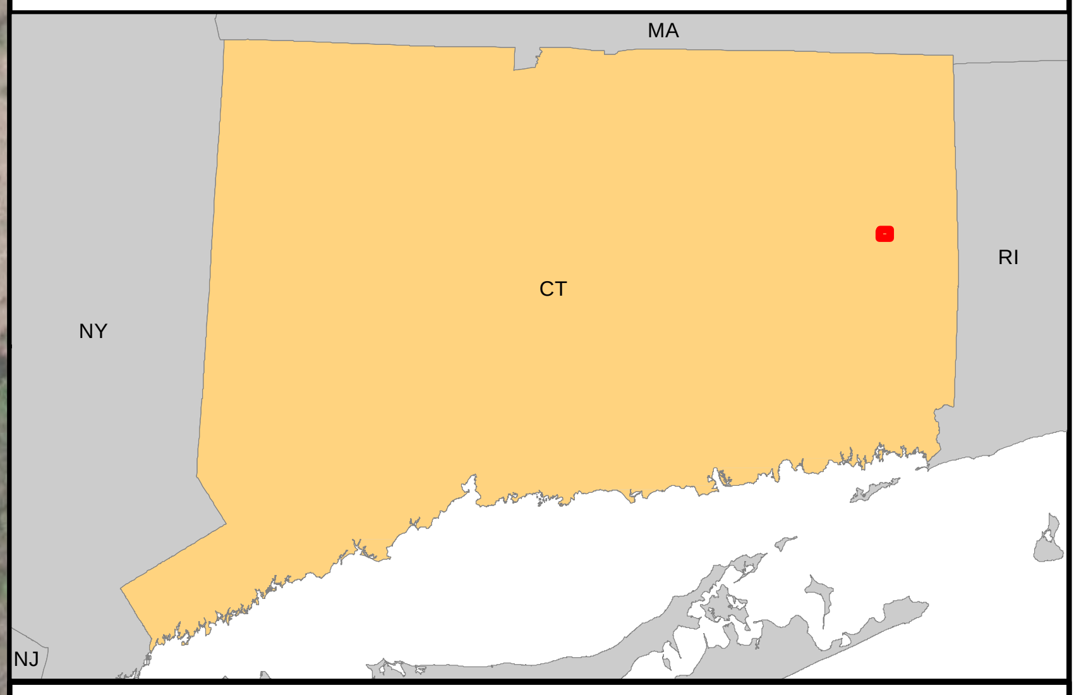
3. THERE IS A NARRATIVE REPORT THAT ACCOMPANIES THIS MAP, WHICH PROVIDES PURPOSE, METHODOLOGY, MAP UNIT DESCRIPTIONS & INTERPRETATIONS. THERE ARE LIMITS TO THIS MAP AS DISCUSSED IN THE ACCOMPANYING NARRATIVE.

4. PREPARED FOR TETRA TECH, INC. BY BROADWATER ENVIRONMENTAL, LLC, SOUTH PORTLAND, MAINE.

5. SOURCES OF BASE MAP AND TOPOGRAPHIC DATA PROVIDED ON THE MAP.

Legend

🟥 Study Area
🟧 Soil Unit
🟩 Delineated Wetland
🟦 Vernal Pool
— Elevation Contour (10 ft)
— Elevation Contour (2 ft)
- - Extent of Soil Survey
— Watercourse
● Test Pit



Not for Construction

N

0 400 800 Feet

Site-Specific Soil Map
Constitution Solar
Plainfield, Connecticut

Prepared For: NEXTera ENERGY RESOURCES

Prepared By: TETRA TECH

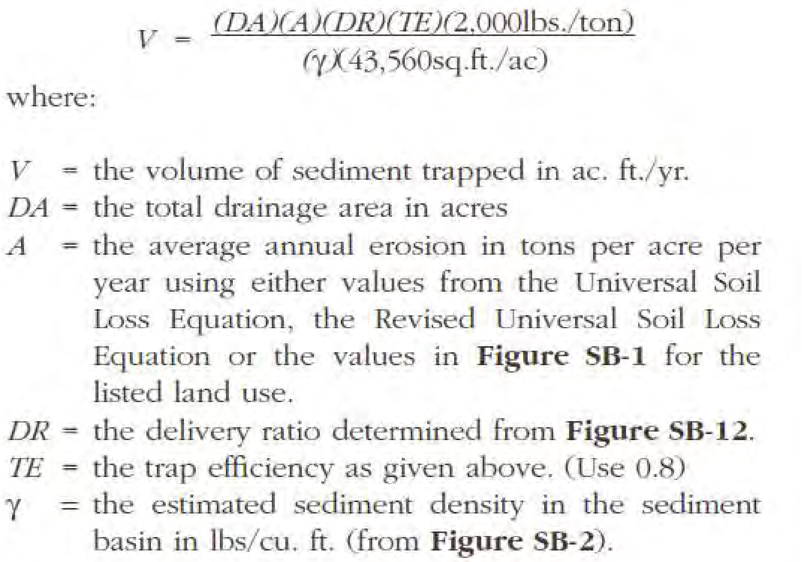
Source: Esri, et. al., 2016; NextEra, 2018; Connecticut DEEP, 2017, Broadwater, 2020

Coordinate System: North American Datum, 1983
Connecticut State Plane, Feet

Temporary Sediment Basin and Sediment Trap Sizing Calculations

Temporary Sediment Basin 2A/4A

Sediment Storage Volume



$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 6.7 Acres

A = Site will be considered a construction area

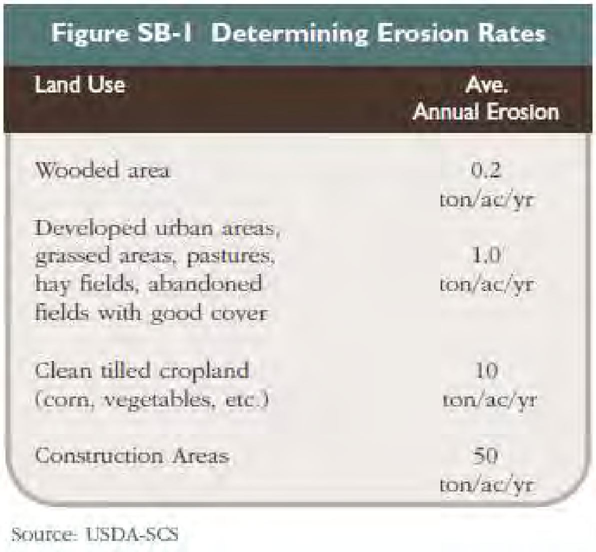


Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

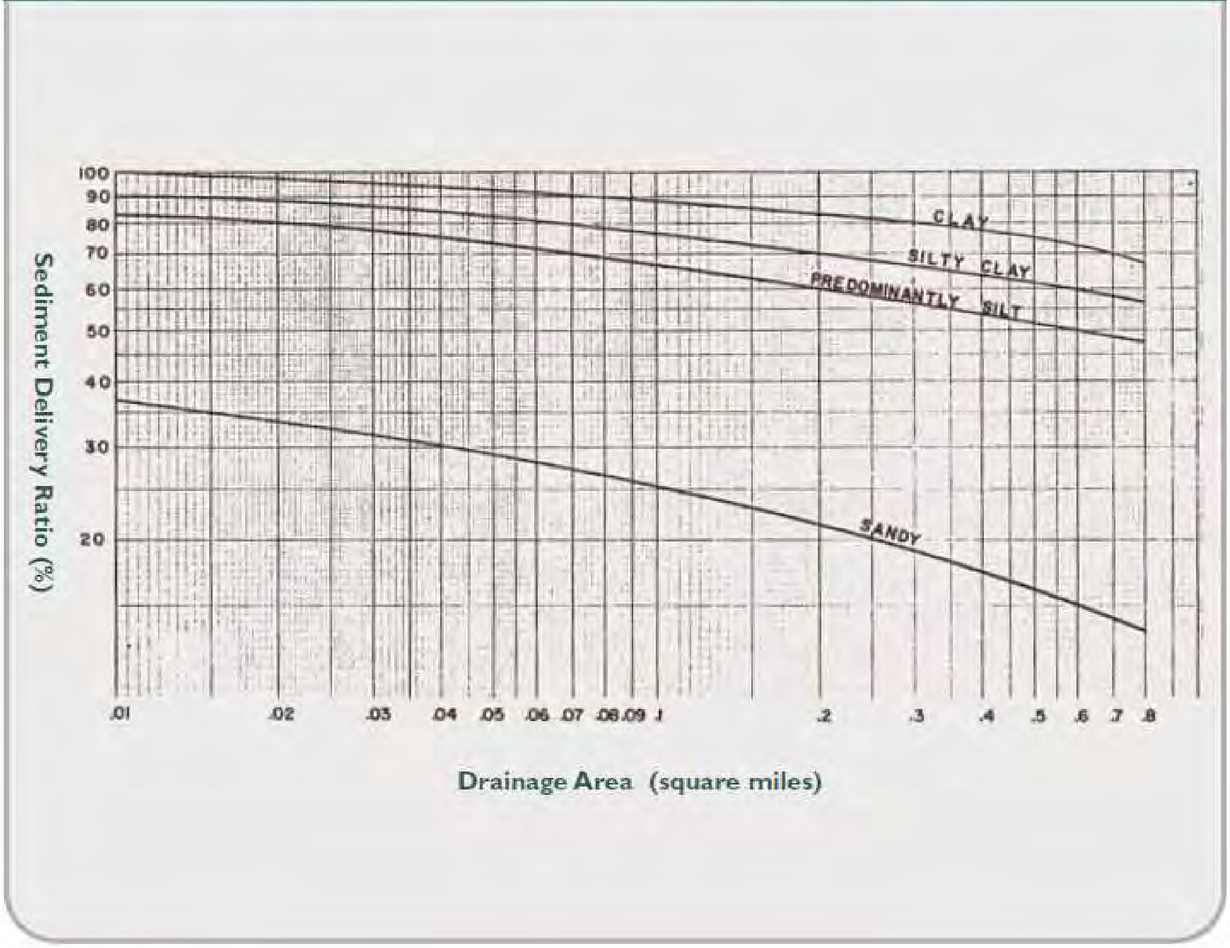
Source: USDA-SCS

A = 50.0 ton/acre/yr

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

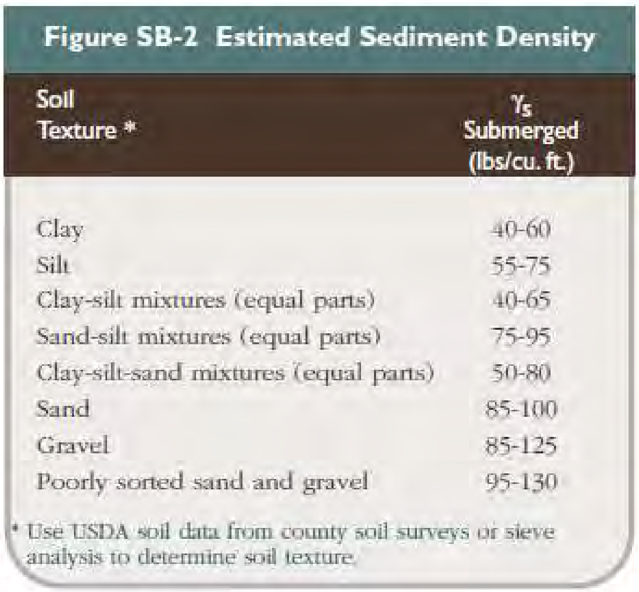


Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.077 Acre Ft
V_S = 3342.12 Cu. Ft
123.78 Cu. Yd.

Wet Storage Volume

V_W = 2 * V
V_W = 6684 Cu. Ft
247.56 Cu Yd

Total Required Basin Capacity

Total Volume = V_S + V_W + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency
24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 12639 Cu. Ft.
468 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

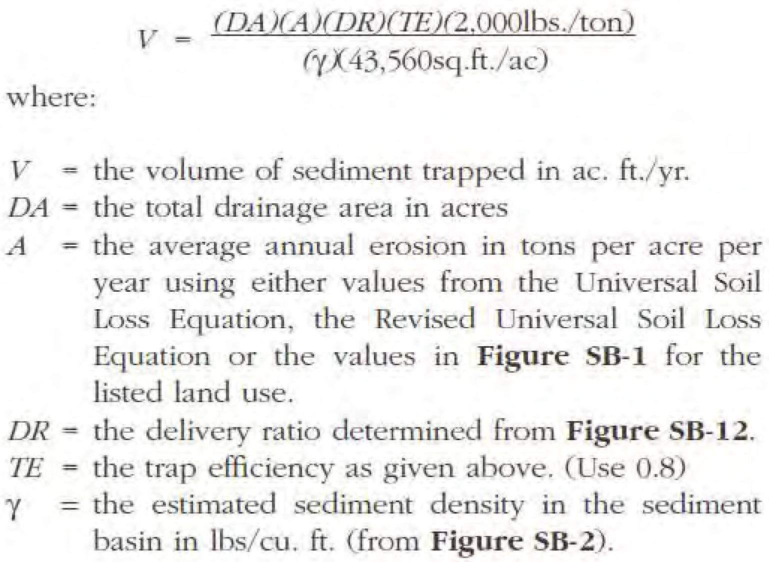
J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Permitting\Petition\SWPCP\Calcs\Constitution Temporary Sediment Basin Sizing.xlsx

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 2C/4C

Sediment Storage Volume



$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 9.8 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

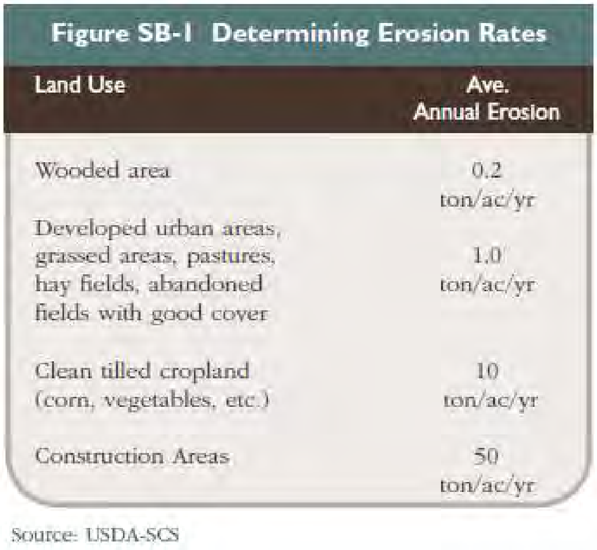


Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

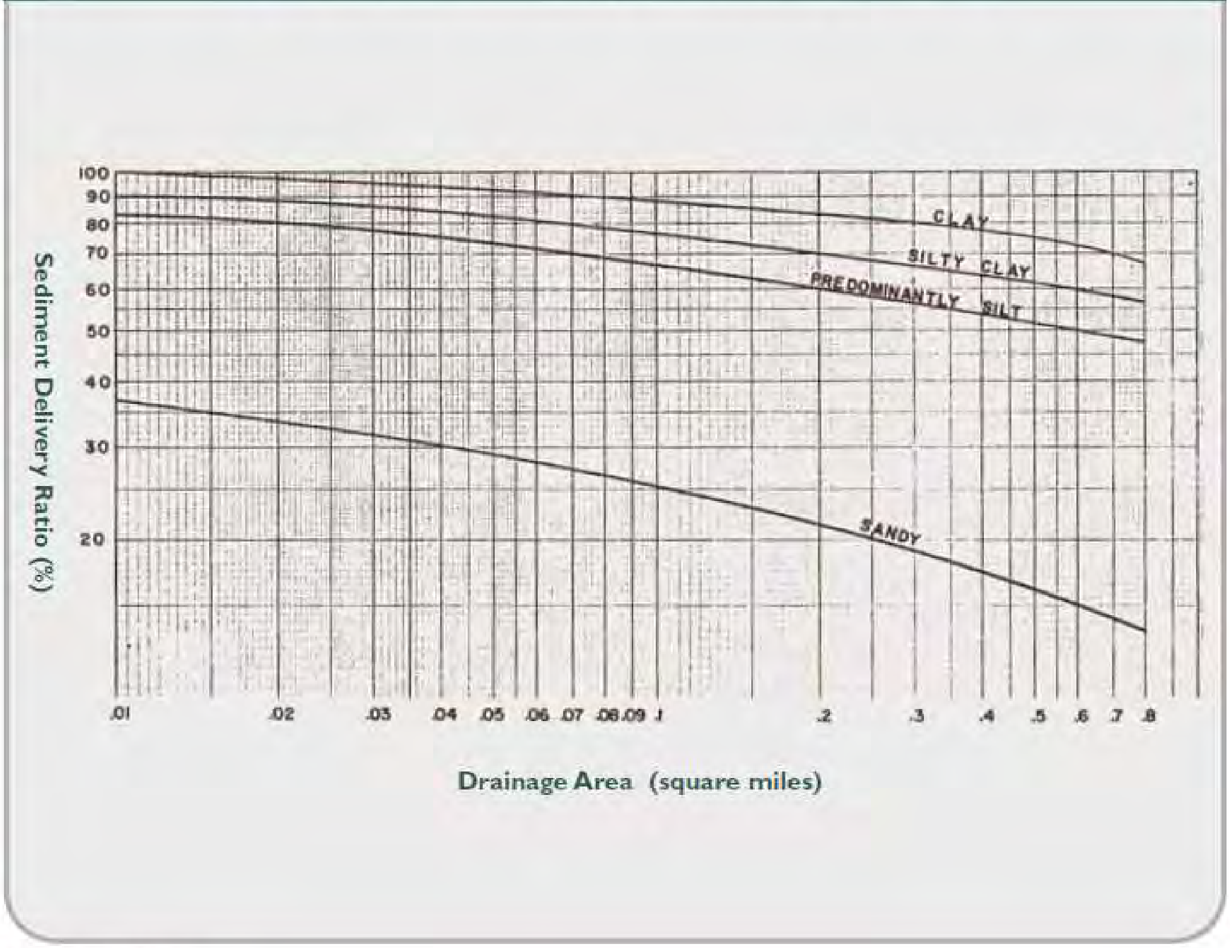
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

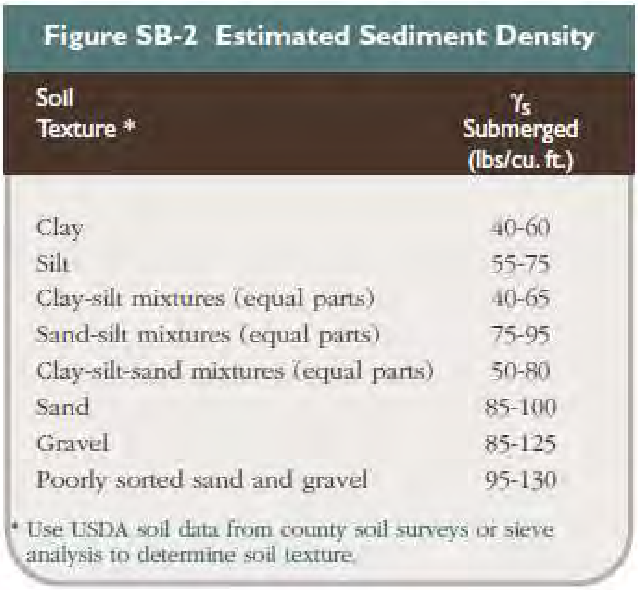


Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.112 Acre Ft
V_S = 4888.47 Cu. Ft
181.05 Cu. Yd.

Wet Storage Volume

V_W = 2 * V
V_W = 9777 Cu. Ft
362.11 Cu Yd

Total Required Basin Capacity

Total Volume = V_S + V_W + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 17278 Cu. Ft.
640 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Permitting\Petition\SWPCP\Calcs\Constitution Temporary Sediment Basin Sizing.xlsx

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 3C

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 6.2 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

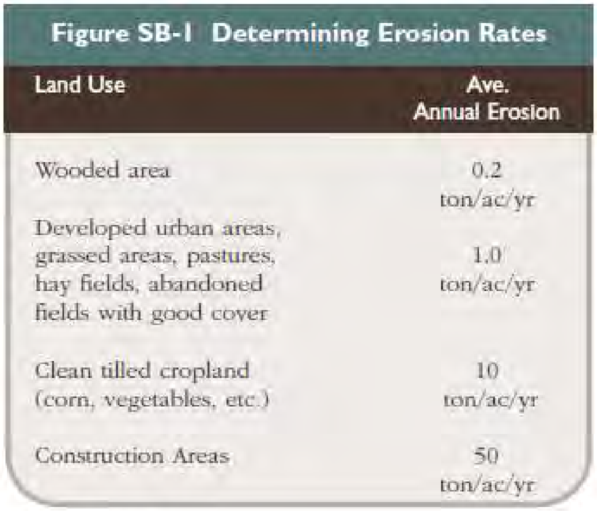


Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

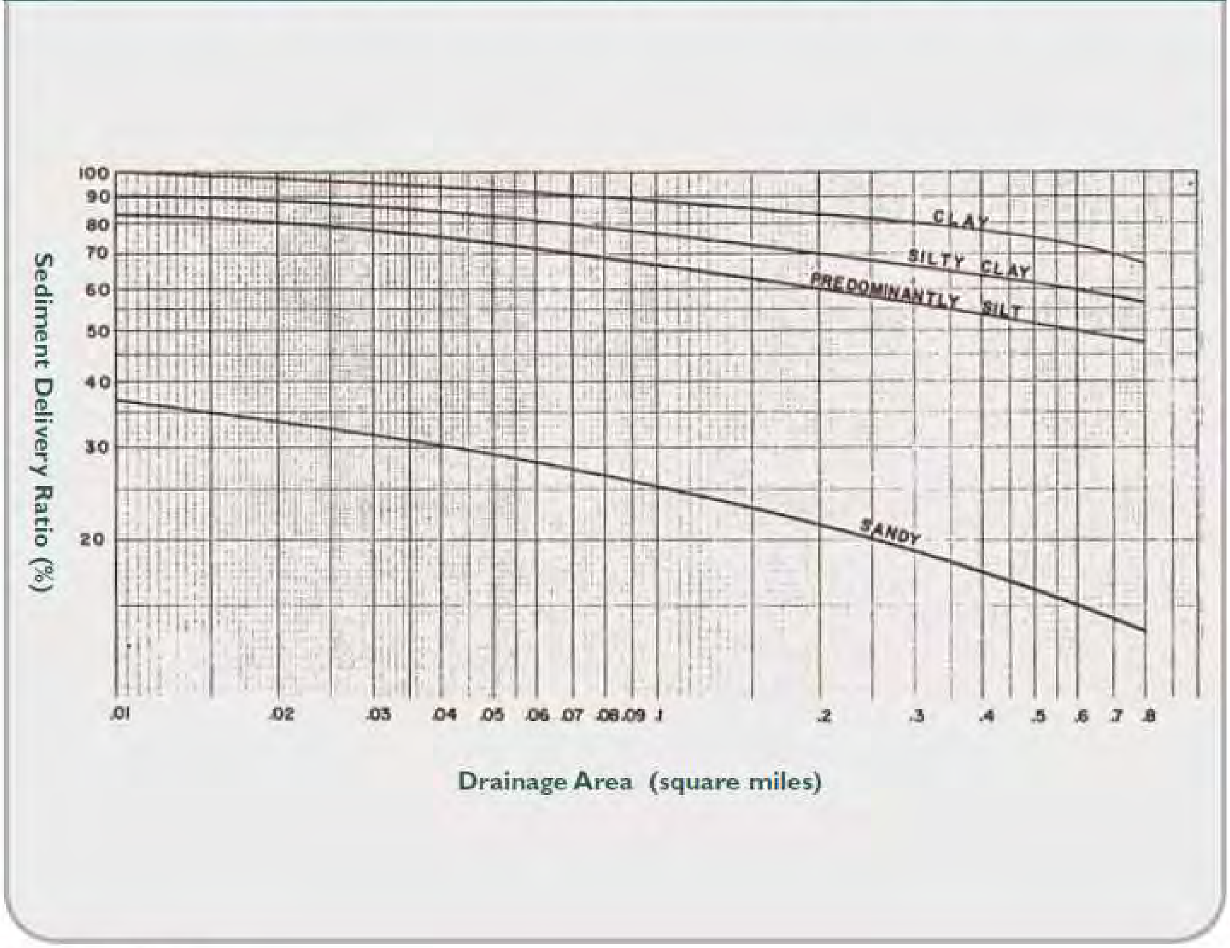
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

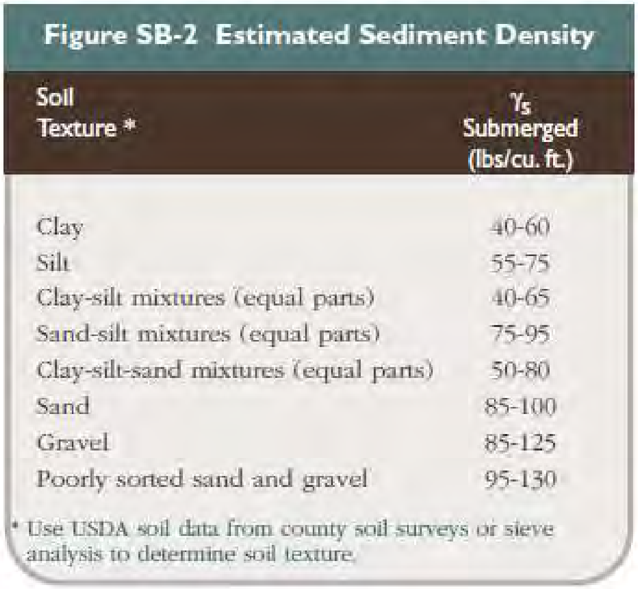


Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.071 Acre Ft
V_S = 3092.71 Cu. Ft
114.54 Cu. Yd.

Wet Storage Volume

V_W = 2 * V
V_W = 6185 Cu. Ft
229.09 Cu Yd

Total Required Basin Capacity

Total Volume = V_S + V_W + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 11891 Cu. Ft.
440 Cu. Yd.

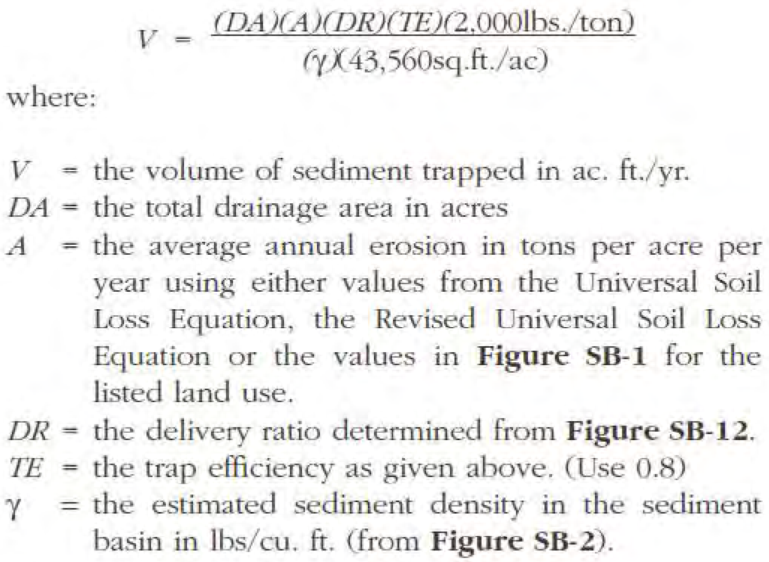
Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 3G

Sediment Storage Volume



$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 9.1 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

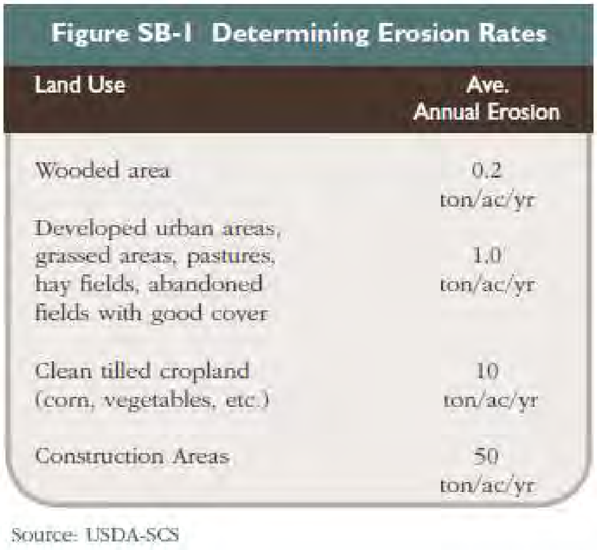


Figure SB-1 Determining Erosion Rates

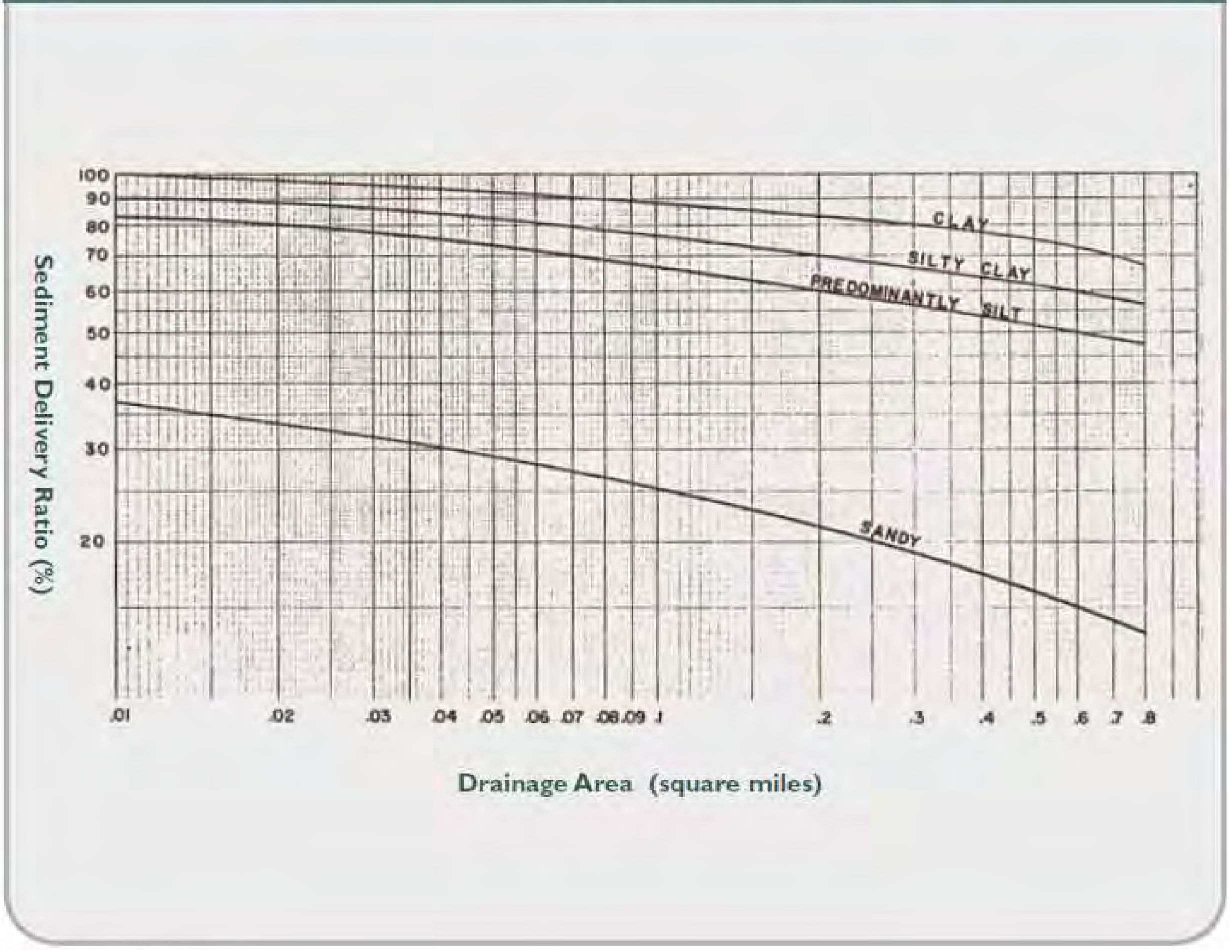
Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

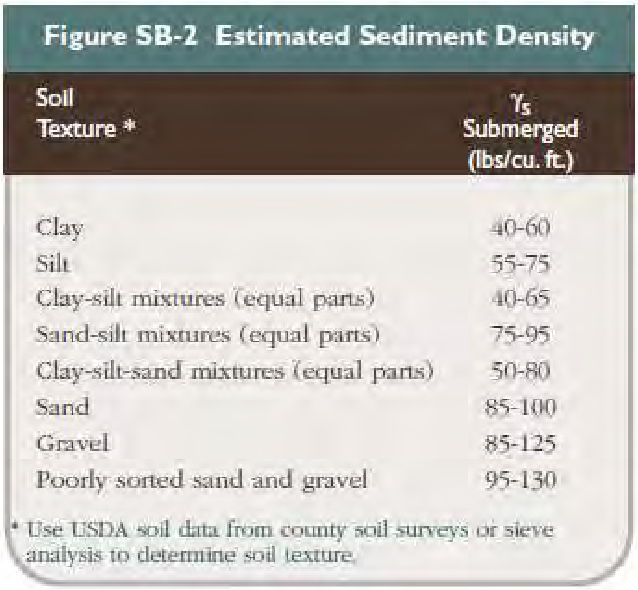


Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.104 Acre Ft
V_S = 4539.29 Cu. Ft
168.12 Cu. Yd.

Wet Storage Volume

V_W = 2 * V
V_W = 9079 Cu. Ft
336.24 Cu Yd

Total Required Basin Capacity

Total Volume = V_S + V_W + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency
24 hour duration, type III distribution storm

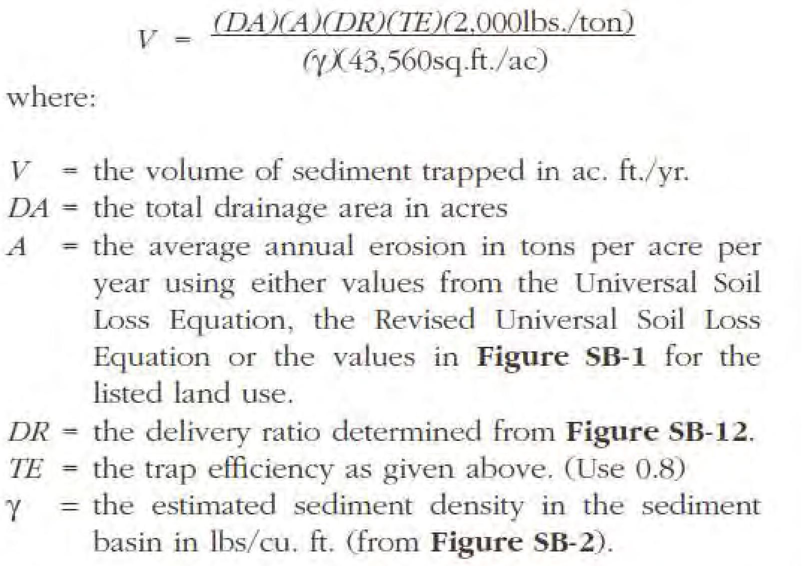
Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 16231 Cu. Ft.
601 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Temporary Sediment Basin 3H

Sediment Storage Volume



$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 7.2 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

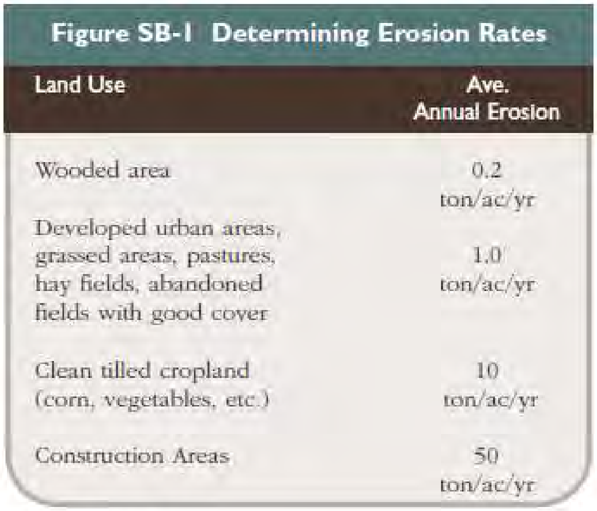


Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

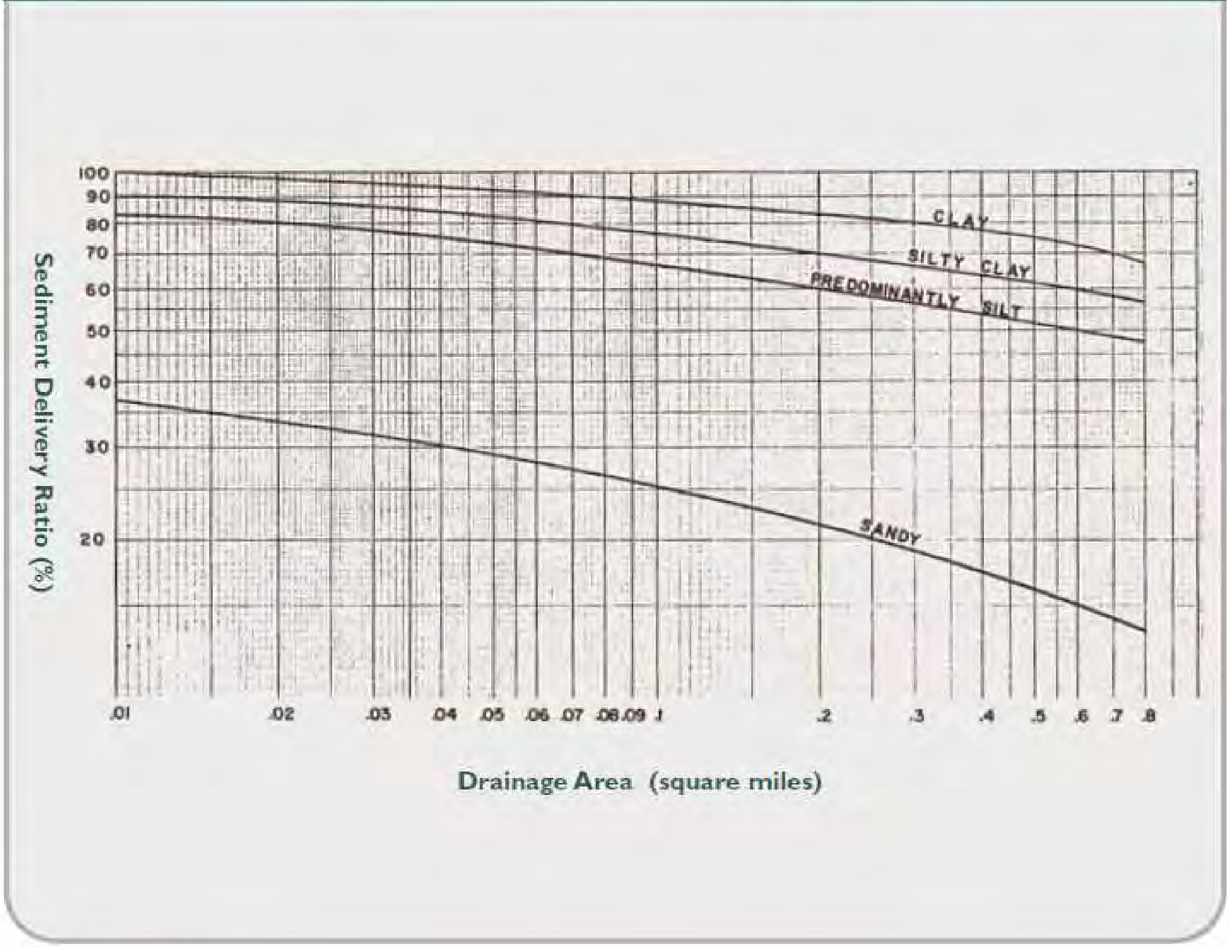
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R-0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

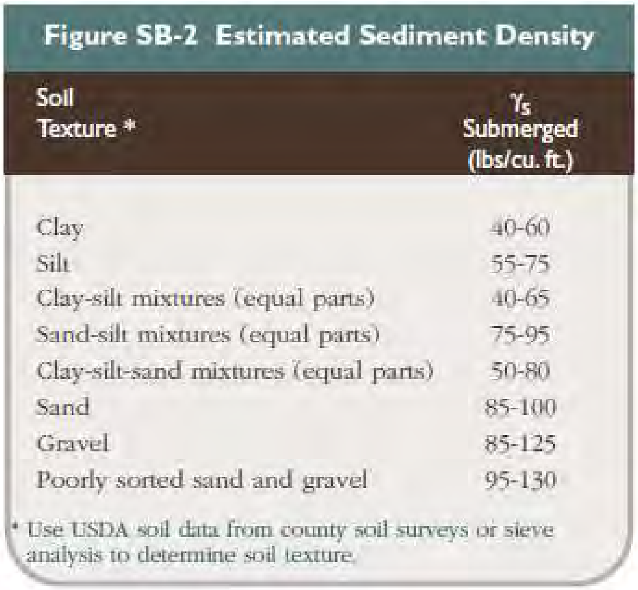


Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.082 Acre Ft
V_S = 3591.53 Cu. Ft
133.02 Cu. Yd.

Wet Storage Volume

V_W = 2 * V
V_W = 7183 Cu. Ft
266.04 Cu Yd

Total Required Basin Capacity

Total Volume = V_S + V_W + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 13388 Cu. Ft.

496 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 1A/3F - Sediment Trap Sizing Calculations

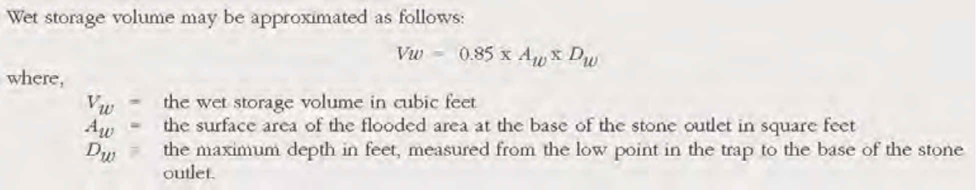
Sediment Storage Volume

Drainage Area = 1.66 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **222** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$Vw = 0.85 \text{ x } A_w \text{ x } D_w$$

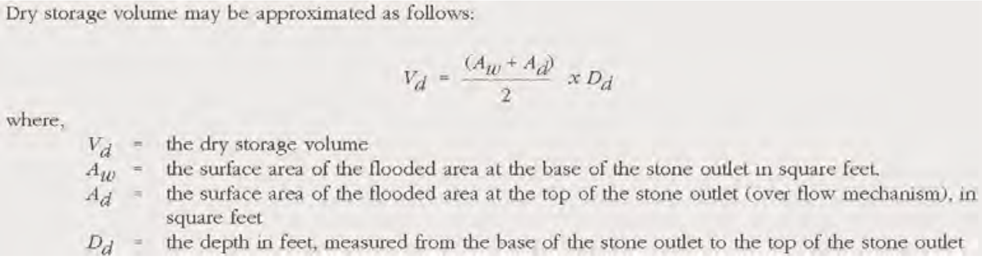
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,147 Sq. Ft.
D_W= 2.5 feet

V_W= 6,687 Cu. Ft.
V_W= 248 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \text{ x } D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,147 Sq. Ft.
A_d= 4,499 Sq. Ft.
D_d= 1.5 feet

V_d= 5,735 Cu. Ft.
V_d= 212 Cu. Yd.

Provided Storage

Wet Storage 6,687 Cu. Ft.
248 Cu. Yd.

Dry Storage 5,735 Cu. Ft.
212 Cu. Yd.

Total Storage 12,422 Cu. Ft.
460 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 1B - Sediment Trap Sizing Calculations

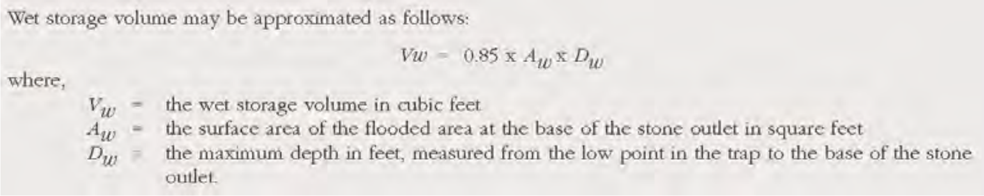
Sediment Storage Volume

Drainage Area = 1.5 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **201** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$V_w = 0.85 \times A_w \times D_w$$

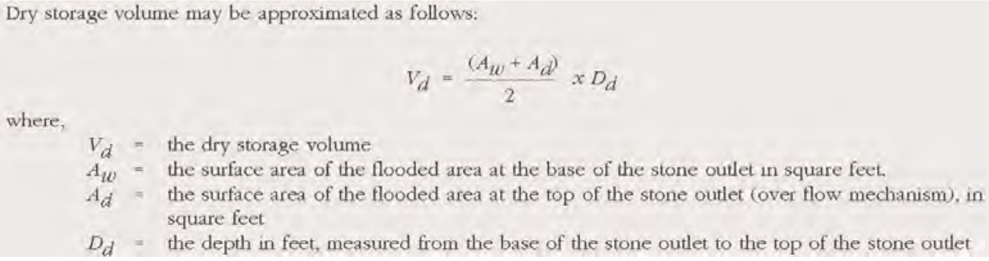
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 1,847 Sq. Ft.
D_W= 2.5 feet

V_W= 3,925 Cu. Ft.
V_W= 145 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 1,847 Sq. Ft.
A_d= 2,782 Sq. Ft.
D_d= 1.5 feet

V_d= 3,472 Cu. Ft.
V_d= 129 Cu. Yd.

Provided Storage

Wet Storage	3,925	Cu. Ft.
	145	Cu. Yd.
Dry Storage	3,472	Cu. Ft.
	129	Cu. Yd.
Total Storage	**7,397**	**Cu. Ft.**
	274	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 1C - Sediment Trap Sizing Calculations

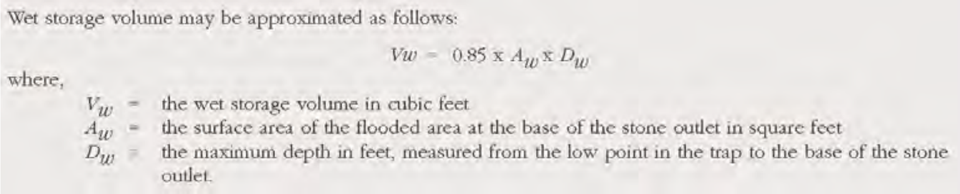
Sediment Storage Volume

Drainage Area = 2.3 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **308** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

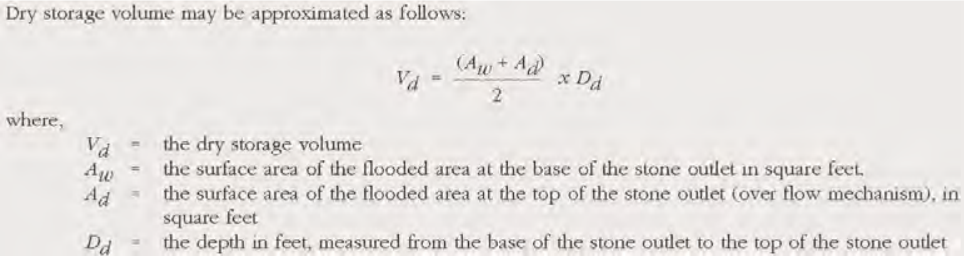
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 2,954 Sq. Ft.
D_W= 2 feet

V_W= 5,022 Cu. Ft.
V_W= 186 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} x\, D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 2,954 Sq. Ft.
A_d= 4,343 Sq. Ft.
D_d= 2 feet

V_d= 7,297 Cu. Ft.
V_d= 270 Cu. Yd.

Provided Storage

Wet Storage	5,022	Cu. Ft.
	186	Cu. Yd.
Dry Storage	7,297	Cu. Ft.
	270	Cu. Yd.
Total Storage	**12,319**	**Cu. Ft.**
	456	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

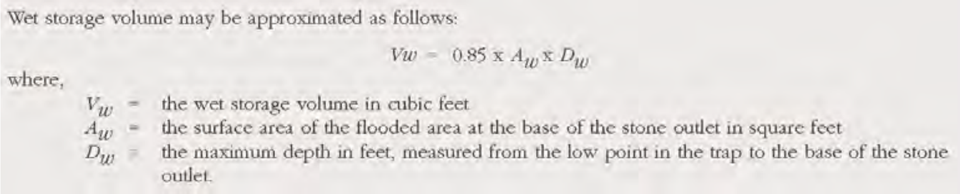
Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 1D - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area =	2	Acres
Required Storage=	134	Cu. Yds / Acre
Total Required Storage=	**268**	Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

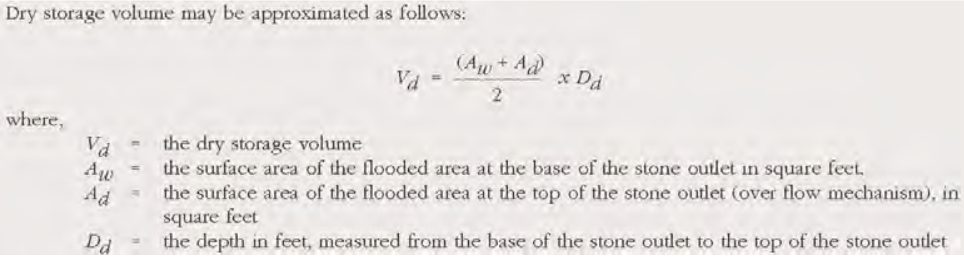
$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W=	2,554	Sq. Ft.
D_W=	2	feet
V_W=	**4,342**	**Cu. Ft.**
V_W=	**161**	**Cu. Yd.**

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \ x\ D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W=	2,554	Sq. Ft.
A_d=	3,943	Sq. Ft.
D_d=	2	feet
V_d=	**6,497**	**Cu. Ft.**
V_d=	**241**	**Cu. Yd.**

Provided Storage

Wet Storage	4,342	Cu. Ft.
	161	Cu. Yd.
Dry Storage	6,497	Cu. Ft.
	241	Cu. Yd.
Total Storage	**10,839**	**Cu. Ft.**
	401	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

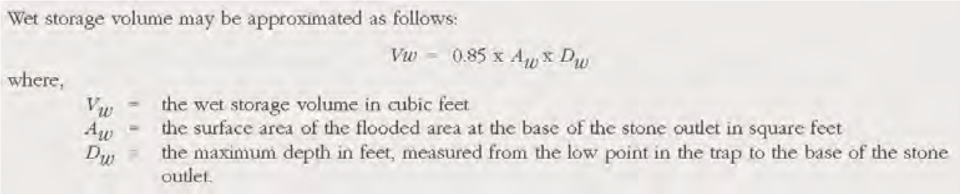
Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 1E - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area =	0.6	Acres
Required Storage=	134	Cu. Yds / Acre
Total Required Storage=	**80**	Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

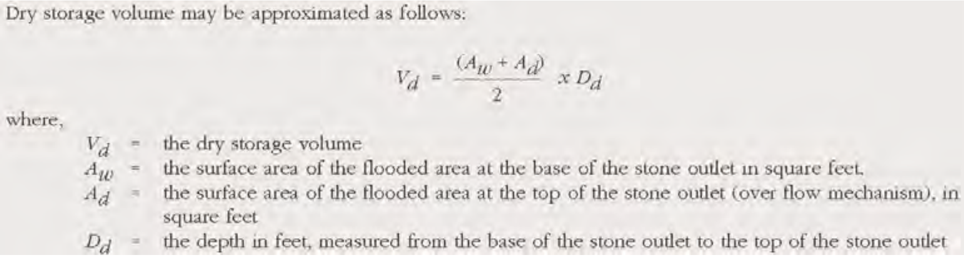
$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W=	1,122	Sq. Ft.
D_W=	2	feet
V_W=	**1,907**	**Cu. Ft.**
V_W=	**71**	**Cu. Yd.**

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \; x \; D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W=	1,122	Sq. Ft.
A_d=	1,973	Sq. Ft.
D_d=	2	feet
V_d=	**3,095**	**Cu. Ft.**
V_d=	**115**	**Cu. Yd.**

Provided Storage

Wet Storage	1,907	Cu. Ft.
	71	Cu. Yd.
Dry Storage	3,095	Cu. Ft.
	115	Cu. Yd.
Total Storage	**5,002**	**Cu. Ft.**
	185	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 2B - Sediment Trap Sizing Calculations

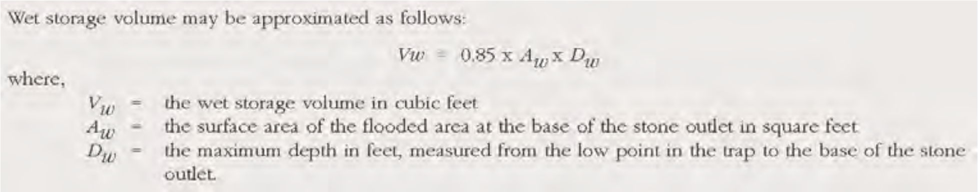
Sediment Storage Volume

Drainage Area = 5.00 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **670** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$V_w = 0.85 \times A_w \times D_w$$

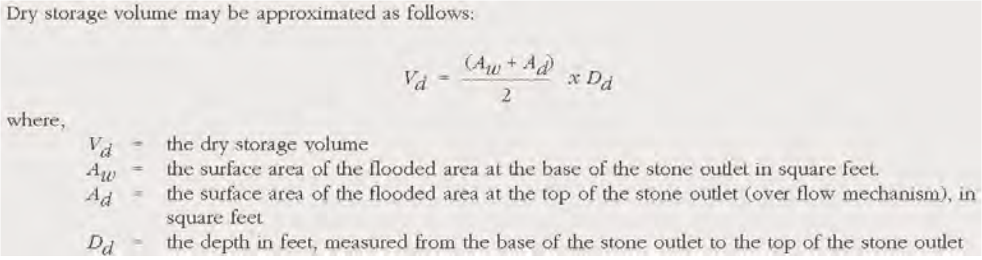
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 5,329 Sq. Ft.
D_W= 2 feet

V_W= 9,059 Cu. Ft.
V_W= 336 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 5,329 Sq. Ft.
A_d= 7,195 Sq. Ft.
D_d= 2 feet

V_d= 12,524 Cu. Ft.
V_d= 464 Cu. Yd.

Provided Storage

Wet Storage 9,059 Cu. Ft.
336 Cu. Yd.

Dry Storage 12,524 Cu. Ft.
464 Cu. Yd.

Total Storage 21,583 Cu. Ft.
799 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

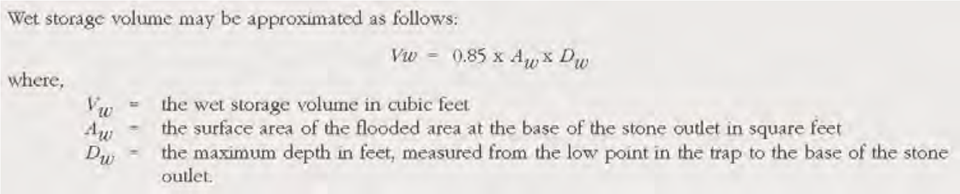
Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 3A - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area =	3.60	Acres
Required Storage=	134	Cu. Yds / Acre
Total Required Storage=	**482**	Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

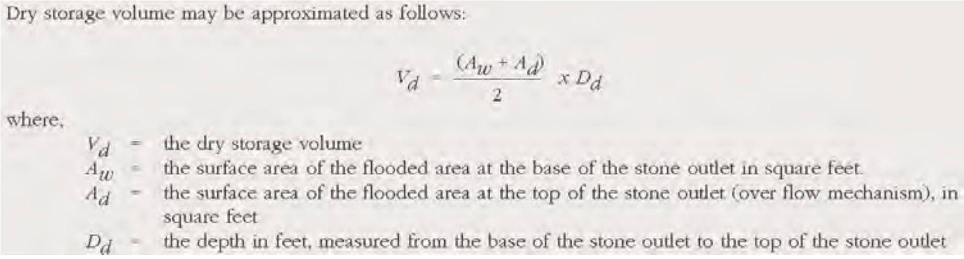
$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W=	4,091	Sq. Ft.
D_W=	2	feet
V_W=	**6,955**	**Cu. Ft.**
V_W=	**258**	**Cu. Yd.**

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W=	4,091	Sq. Ft.
A_d=	6,140	Sq. Ft.
D_d=	2	feet
V_d=	**10,231**	**Cu. Ft.**
V_d=	**379**	**Cu. Yd.**

Provided Storage

Wet Storage	6,955	Cu. Ft.
	258	Cu. Yd.
Dry Storage	10,231	Cu. Ft.
	379	Cu. Yd.
Total Storage	**17,186**	**Cu. Ft.**
	637	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 3B - Sediment Trap Sizing Calculations

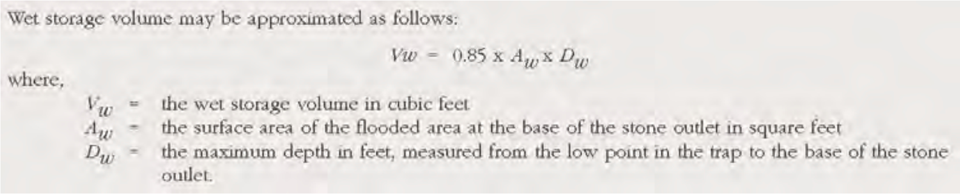
Sediment Storage Volume

Drainage Area = 3.10 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **415** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$V_w = 0.85 \times A_w \times D_w$$

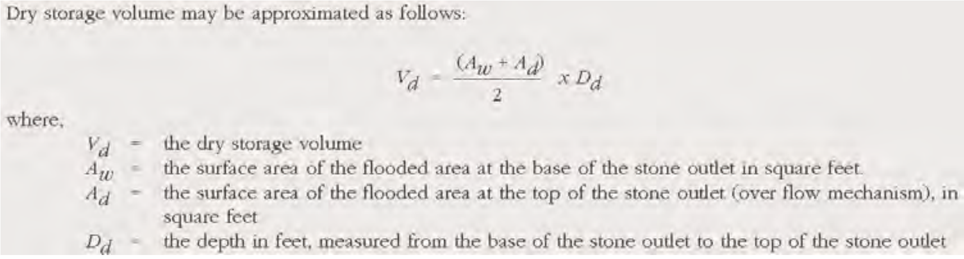
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,599 Sq. Ft.
D_W= 2 feet

V_W= 6,118 Cu. Ft.
V_W= 227 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,599 Sq. Ft.
A_d= 4,893 Sq. Ft.
D_d= 2 feet

V_d= 6,369 Cu. Ft.
V_d= 236 Cu. Yd.

Provided Storage

Wet Storage 6,118 Cu. Ft.
227 Cu. Yd.

Dry Storage 6,369 Cu. Ft.
236 Cu. Yd.

Total Storage 12,487 Cu. Ft.
462 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 3D - Sediment Trap Sizing Calculations

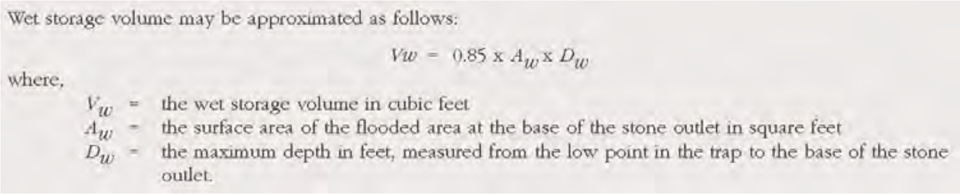
Sediment Storage Volume

Drainage Area = 5.00 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **670** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$V_w = 0.85 \times A_w \times D_w$$

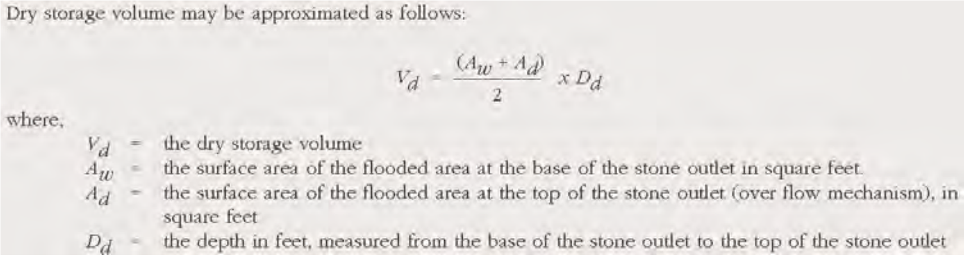
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 5,329 Sq. Ft.
D_W= 2 feet

V_W= 9,059 Cu. Ft.
V_W= 336 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 5,329 Sq. Ft.
A_d= 7,195 Sq. Ft.
D_d= 2 feet

V_d= 12,524 Cu. Ft.
V_d= 464 Cu. Yd.

Provided Storage

Wet Storage 9,059 Cu. Ft.
336 Cu. Yd.

Dry Storage 12,524 Cu. Ft.
464 Cu. Yd.

Total Storage 21,583 Cu. Ft.
799 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 3E - Sediment Trap Sizing Calculations

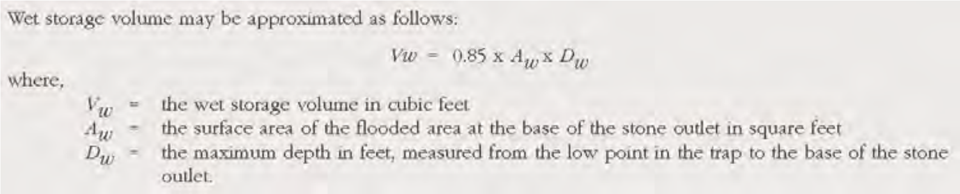
Sediment Storage Volume

Drainage Area = 3.10 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **415** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

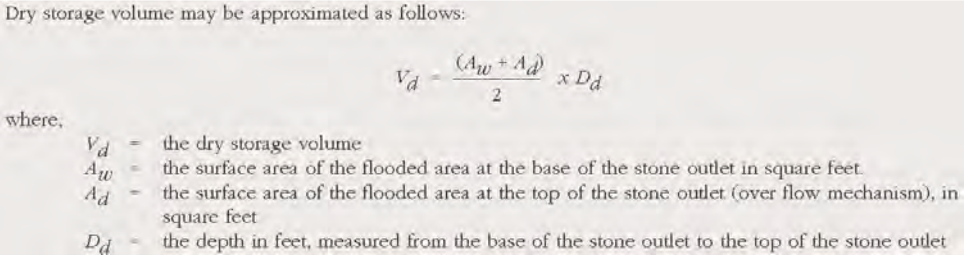
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 4,751 Sq. Ft.
D_W= 2 feet

V_W= 8,077 Cu. Ft.
V_W= 299 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 4,751 Sq. Ft.
A_d= 7,474 Sq. Ft.
D_d= 2 feet

V_d= 12,225 Cu. Ft.
V_d= 453 Cu. Yd.

Provided Storage

Wet Storage	8,077	Cu. Ft.
	299	Cu. Yd.
Dry Storage	12,225	Cu. Ft.
	453	Cu. Yd.
Total Storage	**20,302**	**Cu. Ft.**
	752	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

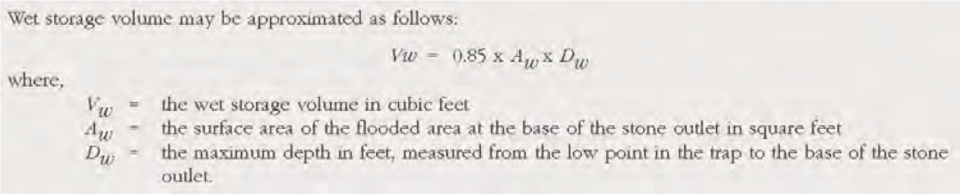
Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 3F - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area =	2.60	Acres
Required Storage=	134	Cu. Yds / Acre
Total Required Storage=	**348**	Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

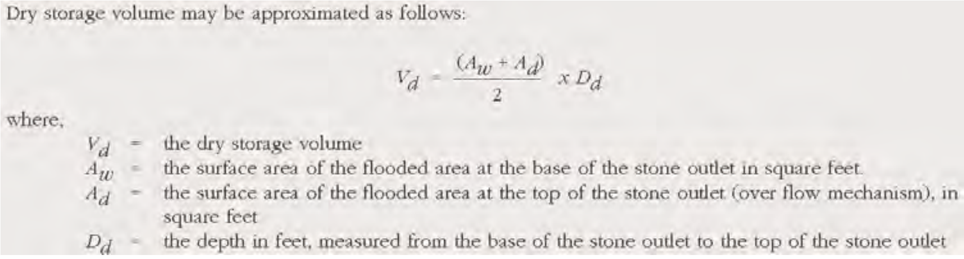
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W=	3,147	Sq. Ft.
D_W=	2.5	feet

V_W=	**6,687**	**Cu. Ft.**
V_W=	**248**	**Cu. Yd.**

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W=	3,147	Sq. Ft.
A_d=	4,499	Sq. Ft.
D_d=	1.5	feet

V_d=	**5,735**	**Cu. Ft.**
V_d=	**212**	**Cu. Yd.**

Provided Storage

Wet Storage	6,687	Cu. Ft.
	248	Cu. Yd.
Dry Storage	5,735	Cu. Ft.
	212	Cu. Yd.

Total Storage	**12,422**	**Cu. Ft.**
	460	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 31 - Sediment Trap Sizing Calculations

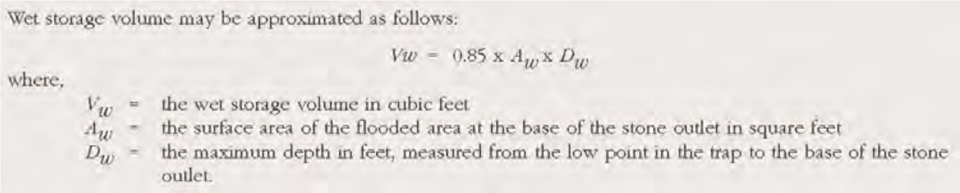
Sediment Storage Volume

Drainage Area = 2.51 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **336** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

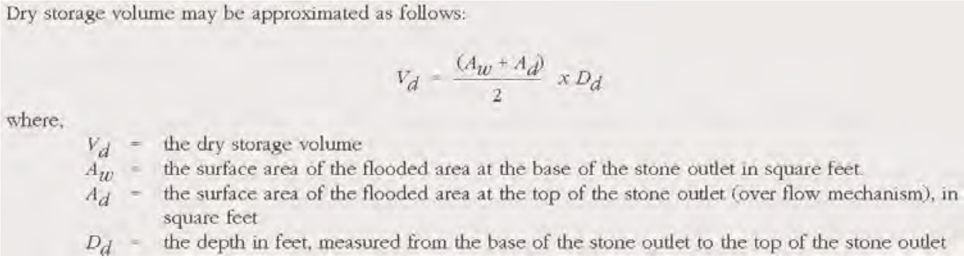
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 2,726 Sq. Ft.
D_W= 2 feet

V_W= 4,634 Cu. Ft.
V_W= 172 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 2,726 Sq. Ft.
A_d= 3,818 Sq. Ft.
D_d= 1.5 feet

V_d= 4,908 Cu. Ft.
V_d= 182 Cu. Yd.

Provided Storage

Wet Storage 4,634 Cu. Ft.
172 Cu. Yd.

Dry Storage 4,908 Cu. Ft.
182 Cu. Yd.

Total Storage 9,542 Cu. Ft.
353 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 3J - Sediment Trap Sizing Calculations

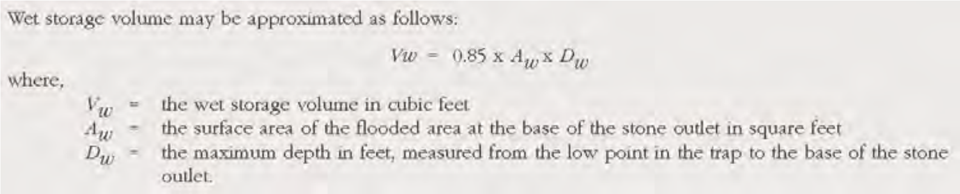
Sediment Storage Volume

Drainage Area = 4.10 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **549** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

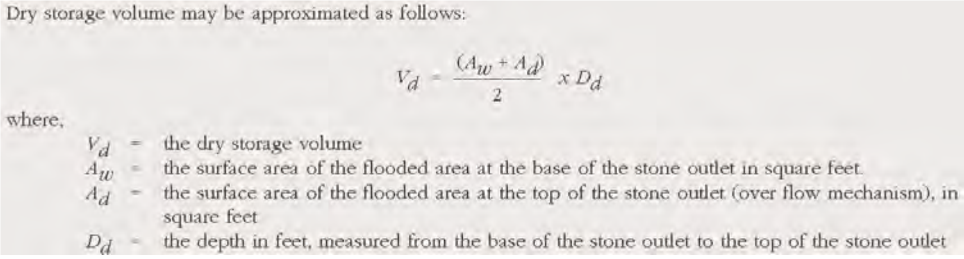
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 5,900 Sq. Ft.
D_W= 2 feet

V_W= 10,030 Cu. Ft.
V_W= 371 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 5,900 Sq. Ft.
A_d= 7,845 Sq. Ft.
D_d= 2 feet

V_d= 13,745 Cu. Ft.
V_d= 509 Cu. Yd.

Provided Storage

Wet Storage 10,030 Cu. Ft.
371 Cu. Yd.

Dry Storage 13,745 Cu. Ft.
509 Cu. Yd.

Total Storage 23,775 Cu. Ft.
881 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Constitution Solar Project**
Project Number: **R0317**
Project Location: **Plainfield, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ELD/ALG** Date: **December 2020**

Phase 3K - Sediment Trap Sizing Calculations

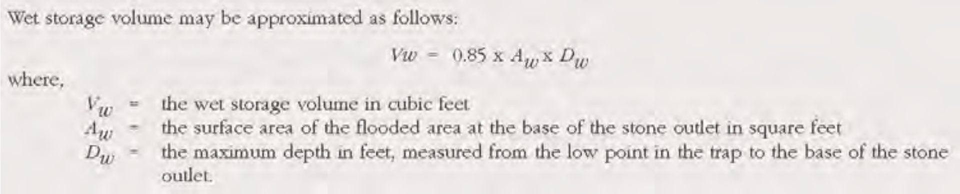
Sediment Storage Volume

Drainage Area = 1.50 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **201** Cu. Yds

Provided Wet Storage



Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

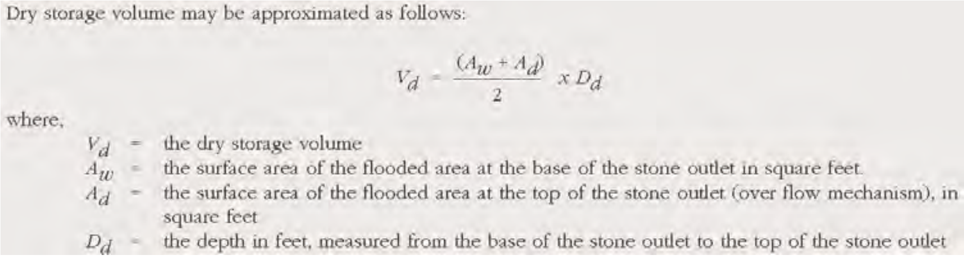
where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,195 Sq. Ft.
D_W= 1 feet

V_W= 2,716 Cu. Ft.
V_W= 101 Cu. Yd.

Provided Dry Storage



Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,195 Sq. Ft.
A_d= 3,906 Sq. Ft.
D_d= 1 feet

V_d= 3,551 Cu. Ft.
V_d= 132 Cu. Yd.

Provided Storage

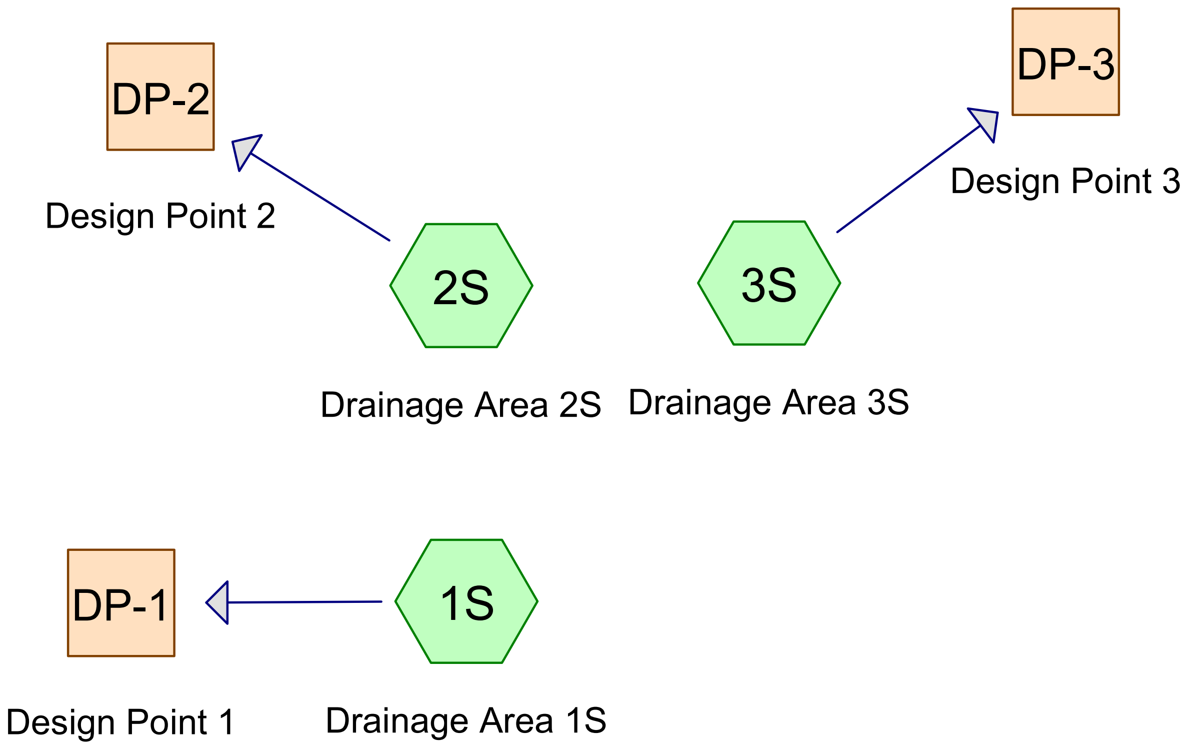
Wet Storage 2,716 Cu. Ft.
101 Cu. Yd.

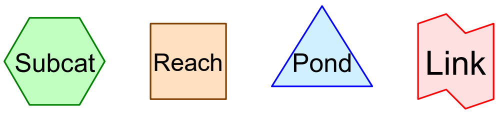
Dry Storage 3,551 Cu. Ft.
132 Cu. Yd.

Total Storage 6,266 Cu. Ft.
232 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Long-Term Existing Conditions Hydrology





Routing Diagram for Constitution Existing Hydrology
Prepared by Tighe & Bond, Printed 12/14/2020
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.137	96	Gravel Road (2S)
23.837	67	Row crops, straight row, Good, HSG A (2S, 3S)
17.716	78	Row crops, straight row, Good, HSG B (2S)
13.184	85	Row crops, straight row, Good, HSG C (2S, 3S)
10.063	89	Row crops, straight row, Good, HSG D (1S, 2S)
10.621	98	Water Body (1S, 2S)
7.810	30	Woods, Good, HSG A (2S, 3S)
3.212	55	Woods, Good, HSG B (2S)
27.533	70	Woods, Good, HSG C (2S, 3S)
35.235	77	Woods, Good, HSG D (1S, 2S)
149.348	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
31.647	HSG A	2S, 3S
20.928	HSG B	2S
40.717	HSG C	2S, 3S
45.297	HSG D	1S, 2S
10.758	Other	1S, 2S
149.348		**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	0.000	0.000	0.137	0.137	Gravel Road	2S
23.837	17.716	13.184	10.063	0.000	64.800	Row crops, straight row, Good	1S, 2S, 3S
0.000	0.000	0.000	0.000	10.621	10.621	Water Body	1S, 2S
7.810	3.212	27.533	35.235	0.000	73.790	Woods, Good	1S, 2S, 3S
31.647	**20.928**	**40.717**	**45.297**	**10.758**	**149.348**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1S Runoff Area=2,116,079 sf 16.92% Impervious Runoff Depth=1.54"
Flow Length=2,225' Tc=37.5 min CN=82 Runoff=44.26 cfs 6.227 af

Subcatchment 2S: Drainage Area 2S Runoff Area=4,102,372 sf 2.55% Impervious Runoff Depth=0.88"
Flow Length=1,417' Tc=22.9 min CN=71 Runoff=55.78 cfs 6.891 af

Subcatchment 3S: Drainage Area 3S Runoff Area=287,135 sf 0.00% Impervious Runoff Depth=0.83"
Flow Length=1,127' Tc=21.8 min CN=70 Runoff=3.69 cfs 0.455 af

Reach DP-1: Design Point 1 Inflow=44.26 cfs 6.227 af
Outflow=44.26 cfs 6.227 af

Reach DP-2: Design Point 2 Inflow=55.78 cfs 6.891 af
Outflow=55.78 cfs 6.891 af

Reach DP-3: Design Point 3 Inflow=3.69 cfs 0.455 af
Outflow=3.69 cfs 0.455 af

Total Runoff Area = 149.348 ac Runoff Volume = 13.573 af Average Runoff Depth = 1.09"
92.89% Pervious = 138.727 ac 7.11% Impervious = 10.621 ac

Summary for Subcatchment 1S: Drainage Area 1S

Runoff = 44.26 cfs @ 12.53 hrs, Volume= 6.227 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	358,010	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	1,457,760	77	Woods, Good, HSG D
	0	67	Row crops, straight row, Good, HSG A
	0	78	Row crops, straight row, Good, HSG B
	0	85	Row crops, straight row, Good, HSG C
	300,309	89	Row crops, straight row, Good, HSG D
*	0	96	Gravel Road
	2,116,079	82	Weighted Average
	1,758,069		83.08% Pervious Area
	358,010		16.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0900	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.20"
1.5	161	0.0404	1.81		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.2	180	0.0106	0.93		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.4	43	0.0349	1.68		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.6	202	0.0668	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	356	0.0140	0.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	861	0.0534	1.16		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	372	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
37.5	2,225	Total			

Summary for Subcatchment 2S: Drainage Area 2S

Runoff = 55.78 cfs @ 12.36 hrs, Volume= 6.891 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	104,634	98	Water Body
	336,687	30	Woods, Good, HSG A
	139,915	55	Woods, Good, HSG B
	961,395	70	Woods, Good, HSG C
	77,058	77	Woods, Good, HSG D
	1,003,314	67	Row crops, straight row, Good, HSG A
	771,725	78	Row crops, straight row, Good, HSG B
	563,662	85	Row crops, straight row, Good, HSG C
	138,015	89	Row crops, straight row, Good, HSG D
*	5,967	96	Gravel Road
	4,102,372	71	Weighted Average
	3,997,738		97.45% Pervious Area
	104,634		2.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.1	93	0.0860	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.4	370	0.0514	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	90	0.1667	2.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.5	240	0.0271	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	386	0.0479	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	51	0.1961	3.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	137	0.2628	3.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.9	1,417	Total			

Summary for Subcatchment 3S: Drainage Area 3S

Runoff = 3.69 cfs @ 12.35 hrs, Volume= 0.455 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	0	98	Water Body
	3,533	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	237,946	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	35,017	67	Row crops, straight row, Good, HSG A
	0	78	Row crops, straight row, Good, HSG B
	10,639	85	Row crops, straight row, Good, HSG C
	0	89	Row crops, straight row, Good, HSG D
*	0	96	Gravel Road
	287,135	70	Weighted Average
	287,135		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
9.0	603	0.0498	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	123	0.1463	1.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	48	0.0938	2.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.0	85	0.0235	1.38		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.5	218	0.0252	1.43		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
21.8	1,127	Total			

Summary for Reach DP-1: Design Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 48.578 ac, 16.92% Impervious, Inflow Depth = 1.54" for 2-yr event
Inflow = 44.26 cfs @ 12.53 hrs, Volume= 6.227 af
Outflow = 44.26 cfs @ 12.53 hrs, Volume= 6.227 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Design Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 94.178 ac, 2.55% Impervious, Inflow Depth = 0.88" for 2-yr event
Inflow = 55.78 cfs @ 12.36 hrs, Volume= 6.891 af
Outflow = 55.78 cfs @ 12.36 hrs, Volume= 6.891 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Design Point 3

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =      6.592 ac,   0.00% Impervious,  Inflow Depth =   0.83"    for  2-yr event
Inflow      =       3.69 cfs @  12.35 hrs,  Volume=          0.455 af
Outflow     =       3.69 cfs @  12.35 hrs,  Volume=          0.455 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

```
                      Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
                        Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
                 Reach routing by Stor-Ind+Trans method  -  Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1S     Runoff Area=2,116,079 sf  16.92% Impervious  Runoff Depth=3.53"
                                    Flow Length=2,225'  Tc=37.5 min  CN=82  Runoff=101.79 cfs  14.290 af

Subcatchment 2S: Drainage Area 2S      Runoff Area=4,102,372 sf  2.55% Impervious  Runoff Depth=2.50"
                                    Flow Length=1,417'  Tc=22.9 min  CN=71  Runoff=173.48 cfs  19.631 af

Subcatchment 3S: Drainage Area 3S        Runoff Area=287,135 sf  0.00% Impervious  Runoff Depth=2.41"
                                      Flow Length=1,127'  Tc=21.8 min  CN=70  Runoff=11.94 cfs  1.326 af

Reach DP-1: Design Point 1                                           Inflow=101.79 cfs  14.290 af
                                                                    Outflow=101.79 cfs  14.290 af

Reach DP-2: Design Point 2                                           Inflow=173.48 cfs  19.631 af
                                                                    Outflow=173.48 cfs  19.631 af

Reach DP-3: Design Point 3                                             Inflow=11.94 cfs  1.326 af
                                                                      Outflow=11.94 cfs  1.326 af

            Total Runoff Area = 149.348 ac   Runoff Volume = 35.247 af   Average Runoff Depth = 2.83"
                                       92.89% Pervious = 138.727 ac    7.11% Impervious = 10.621 ac
```

Summary for Subcatchment 1S: Drainage Area 1S

Runoff = 101.79 cfs @ 12.51 hrs, Volume= 14.290 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	358,010	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	1,457,760	77	Woods, Good, HSG D
	0	67	Row crops, straight row, Good, HSG A
	0	78	Row crops, straight row, Good, HSG B
	0	85	Row crops, straight row, Good, HSG C
	300,309	89	Row crops, straight row, Good, HSG D
*	0	96	Gravel Road
	2,116,079	82	Weighted Average
	1,758,069		83.08% Pervious Area
	358,010		16.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0900	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.20"
1.5	161	0.0404	1.81		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.2	180	0.0106	0.93		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.4	43	0.0349	1.68		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.6	202	0.0668	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	356	0.0140	0.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	861	0.0534	1.16		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	372	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
37.5	2,225	Total			

Summary for Subcatchment 2S: Drainage Area 2S

Runoff = 173.48 cfs @ 12.33 hrs, Volume= 19.631 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	104,634	98	Water Body
	336,687	30	Woods, Good, HSG A
	139,915	55	Woods, Good, HSG B
	961,395	70	Woods, Good, HSG C
	77,058	77	Woods, Good, HSG D
	1,003,314	67	Row crops, straight row, Good, HSG A
	771,725	78	Row crops, straight row, Good, HSG B
	563,662	85	Row crops, straight row, Good, HSG C
	138,015	89	Row crops, straight row, Good, HSG D
*	5,967	96	Gravel Road
	4,102,372	71	Weighted Average
	3,997,738		97.45% Pervious Area
	104,634		2.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.1	93	0.0860	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.4	370	0.0514	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	90	0.1667	2.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.5	240	0.0271	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	386	0.0479	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	51	0.1961	3.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	137	0.2628	3.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.9	1,417	Total			

Summary for Subcatchment 3S: Drainage Area 3S

Runoff = 11.94 cfs @ 12.31 hrs, Volume= 1.326 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	0	98	Water Body
	3,533	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	237,946	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	35,017	67	Row crops, straight row, Good, HSG A
	0	78	Row crops, straight row, Good, HSG B
	10,639	85	Row crops, straight row, Good, HSG C
	0	89	Row crops, straight row, Good, HSG D
*	0	96	Gravel Road
	287,135	70	Weighted Average
	287,135		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
9.0	603	0.0498	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	123	0.1463	1.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	48	0.0938	2.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.0	85	0.0235	1.38		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.5	218	0.0252	1.43		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
21.8	1,127	Total			

Summary for Reach DP-1: Design Point 1

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =      48.578 ac,  16.92% Impervious,  Inflow Depth =   3.53"    for  25-yr event
Inflow      =     101.79 cfs @   12.51 hrs,  Volume=          14.290 af
Outflow     =     101.79 cfs @   12.51 hrs,  Volume=          14.290 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Design Point 2

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =      94.178 ac,   2.55% Impervious,  Inflow Depth =   2.50"    for  25-yr event
Inflow      =     173.48 cfs @   12.33 hrs,  Volume=          19.631 af
Outflow     =     173.48 cfs @   12.33 hrs,  Volume=          19.631 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Design Point 3

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =        6.592 ac,    0.00% Impervious,  Inflow Depth =   2.41"    for  25-yr event
Inflow      =       11.94 cfs @   12.31 hrs,  Volume=            1.326 af
Outflow     =       11.94 cfs @   12.31 hrs,  Volume=            1.326 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

```
                      Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
                     Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
            Reach routing by Stor-Ind+Trans method  -  Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1S      Runoff Area=2,116,079 sf   16.92% Impervious   Runoff Depth=4.26"
                                  Flow Length=2,225'   Tc=37.5 min   CN=82   Runoff=122.46 cfs  17.261 af

Subcatchment 2S: Drainage Area 2S       Runoff Area=4,102,372 sf   2.55% Impervious   Runoff Depth=3.14"
                                  Flow Length=1,417'   Tc=22.9 min   CN=71   Runoff=219.75 cfs  24.661 af

Subcatchment 3S: Drainage Area 3S          Runoff Area=287,135 sf   0.00% Impervious   Runoff Depth=3.05"
                                    Flow Length=1,127'   Tc=21.8 min   CN=70   Runoff=15.18 cfs  1.673 af

Reach DP-1: Design Point 1                                                  Inflow=122.46 cfs  17.261 af
                                                                           Outflow=122.46 cfs  17.261 af

Reach DP-2: Design Point 2                                                  Inflow=219.75 cfs  24.661 af
                                                                           Outflow=219.75 cfs  24.661 af

Reach DP-3: Design Point 3                                                    Inflow=15.18 cfs  1.673 af
                                                                             Outflow=15.18 cfs  1.673 af

          Total Runoff Area = 149.348 ac   Runoff Volume = 43.595 af   Average Runoff Depth = 3.50"
                                     92.89% Pervious = 138.727 ac     7.11% Impervious = 10.621 ac
```

Summary for Subcatchment 1S: Drainage Area 1S

Runoff = 122.46 cfs @ 12.51 hrs, Volume= 17.261 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	358,010	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	1,457,760	77	Woods, Good, HSG D
	0	67	Row crops, straight row, Good, HSG A
	0	78	Row crops, straight row, Good, HSG B
	0	85	Row crops, straight row, Good, HSG C
	300,309	89	Row crops, straight row, Good, HSG D
*	0	96	Gravel Road
	2,116,079	82	Weighted Average
	1,758,069		83.08% Pervious Area
	358,010		16.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0900	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.20"
1.5	161	0.0404	1.81		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.2	180	0.0106	0.93		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.4	43	0.0349	1.68		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.6	202	0.0668	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	356	0.0140	0.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	861	0.0534	1.16		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	372	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
37.5	2,225	Total			

Summary for Subcatchment 2S: Drainage Area 2S

Runoff = 219.75 cfs @ 12.32 hrs, Volume= 24.661 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	104,634	98	Water Body
	336,687	30	Woods, Good, HSG A
	139,915	55	Woods, Good, HSG B
	961,395	70	Woods, Good, HSG C
	77,058	77	Woods, Good, HSG D
	1,003,314	67	Row crops, straight row, Good, HSG A
	771,725	78	Row crops, straight row, Good, HSG B
	563,662	85	Row crops, straight row, Good, HSG C
	138,015	89	Row crops, straight row, Good, HSG D
*	5,967	96	Gravel Road
	4,102,372	71	Weighted Average
	3,997,738		97.45% Pervious Area
	104,634		2.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.1	93	0.0860	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.4	370	0.0514	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	90	0.1667	2.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.5	240	0.0271	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	386	0.0479	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	51	0.1961	3.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	137	0.2628	3.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.9	1,417	Total			

Summary for Subcatchment 3S: Drainage Area 3S

Runoff = 15.18 cfs @ 12.31 hrs, Volume= 1.673 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	0	98	Water Body
	3,533	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	237,946	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	35,017	67	Row crops, straight row, Good, HSG A
	0	78	Row crops, straight row, Good, HSG B
	10,639	85	Row crops, straight row, Good, HSG C
	0	89	Row crops, straight row, Good, HSG D
*	0	96	Gravel Road
	287,135	70	Weighted Average
	287,135		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
9.0	603	0.0498	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	123	0.1463	1.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	48	0.0938	2.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.0	85	0.0235	1.38		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.5	218	0.0252	1.43		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
21.8	1,127	Total			

Summary for Reach DP-1: Design Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 48.578 ac, 16.92% Impervious, Inflow Depth = 4.26" for 50-yr event
Inflow = 122.46 cfs @ 12.51 hrs, Volume= 17.261 af
Outflow = 122.46 cfs @ 12.51 hrs, Volume= 17.261 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Design Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 94.178 ac, 2.55% Impervious, Inflow Depth = 3.14" for 50-yr event
Inflow = 219.75 cfs @ 12.32 hrs, Volume= 24.661 af
Outflow = 219.75 cfs @ 12.32 hrs, Volume= 24.661 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Design Point 3

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =         6.592 ac,    0.00% Impervious,  Inflow Depth =   3.05"    for  50-yr event
Inflow       =        15.18 cfs @   12.31 hrs,  Volume=            1.673 af
Outflow      =        15.18 cfs @   12.31 hrs,  Volume=            1.673 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

```
                    Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
                   Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
           Reach routing by Stor-Ind+Trans method  -  Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1S   Runoff Area=2,116,079 sf  16.92% Impervious  Runoff Depth=4.82"
                          Flow Length=2,225'  Tc=37.5 min  CN=82  Runoff=138.02 cfs  19.523 af

Subcatchment 2S: Drainage Area 2S    Runoff Area=4,102,372 sf  2.55% Impervious  Runoff Depth=3.64"
                          Flow Length=1,417'  Tc=22.9 min  CN=71  Runoff=255.16 cfs  28.563 af

Subcatchment 3S: Drainage Area 3S      Runoff Area=287,135 sf  0.00% Impervious  Runoff Depth=3.54"
                            Flow Length=1,127'  Tc=21.8 min  CN=70  Runoff=17.68 cfs  1.942 af

Reach DP-1: Design Point 1                                       Inflow=138.02 cfs  19.523 af
                                                                Outflow=138.02 cfs  19.523 af

Reach DP-2: Design Point 2                                       Inflow=255.16 cfs  28.563 af
                                                                Outflow=255.16 cfs  28.563 af

Reach DP-3: Design Point 3                                         Inflow=17.68 cfs  1.942 af
                                                                  Outflow=17.68 cfs  1.942 af

      Total Runoff Area = 149.348 ac   Runoff Volume = 50.027 af   Average Runoff Depth = 4.02"
                                    92.89% Pervious = 138.727 ac     7.11% Impervious = 10.621 ac
```

Summary for Subcatchment 1S: Drainage Area 1S

Runoff = 138.02 cfs @ 12.51 hrs, Volume= 19.523 af, Depth= 4.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	358,010	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	1,457,760	77	Woods, Good, HSG D
	0	67	Row crops, straight row, Good, HSG A
	0	78	Row crops, straight row, Good, HSG B
	0	85	Row crops, straight row, Good, HSG C
	300,309	89	Row crops, straight row, Good, HSG D
*	0	96	Gravel Road
	2,116,079	82	Weighted Average
	1,758,069		83.08% Pervious Area
	358,010		16.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0900	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.20"
1.5	161	0.0404	1.81		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.2	180	0.0106	0.93		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.4	43	0.0349	1.68		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.6	202	0.0668	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	356	0.0140	0.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	861	0.0534	1.16		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	372	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
37.5	2,225	Total			

Summary for Subcatchment 2S: Drainage Area 2S

Runoff = 255.16 cfs @ 12.32 hrs, Volume= 28.563 af, Depth= 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	104,634	98	Water Body
	336,687	30	Woods, Good, HSG A
	139,915	55	Woods, Good, HSG B
	961,395	70	Woods, Good, HSG C
	77,058	77	Woods, Good, HSG D
	1,003,314	67	Row crops, straight row, Good, HSG A
	771,725	78	Row crops, straight row, Good, HSG B
	563,662	85	Row crops, straight row, Good, HSG C
	138,015	89	Row crops, straight row, Good, HSG D
*	5,967	96	Gravel Road
	4,102,372	71	Weighted Average
	3,997,738		97.45% Pervious Area
	104,634		2.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.1	93	0.0860	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.4	370	0.0514	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	90	0.1667	2.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.5	240	0.0271	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	386	0.0479	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	51	0.1961	3.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	137	0.2628	3.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.9	1,417	Total			

Summary for Subcatchment 3S: Drainage Area 3S

Runoff = 17.68 cfs @ 12.31 hrs, Volume= 1.942 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	0	98	Water Body
	3,533	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	237,946	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	35,017	67	Row crops, straight row, Good, HSG A
	0	78	Row crops, straight row, Good, HSG B
	10,639	85	Row crops, straight row, Good, HSG C
	0	89	Row crops, straight row, Good, HSG D
*	0	96	Gravel Road
	287,135	70	Weighted Average
	287,135		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
9.0	603	0.0498	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	123	0.1463	1.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	48	0.0938	2.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.0	85	0.0235	1.38		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.5	218	0.0252	1.43		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
21.8	1,127	Total			

Summary for Reach DP-1: Design Point 1

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =      48.578 ac,  16.92% Impervious,  Inflow Depth =   4.82"    for  100-yr event
Inflow      =     138.02 cfs @   12.51 hrs,  Volume=          19.523 af
Outflow     =     138.02 cfs @   12.51 hrs,  Volume=          19.523 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Design Point 2

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =      94.178 ac,   2.55% Impervious,  Inflow Depth =   3.64"    for  100-yr event
Inflow      =     255.16 cfs @   12.32 hrs,  Volume=          28.563 af
Outflow     =     255.16 cfs @   12.32 hrs,  Volume=          28.563 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

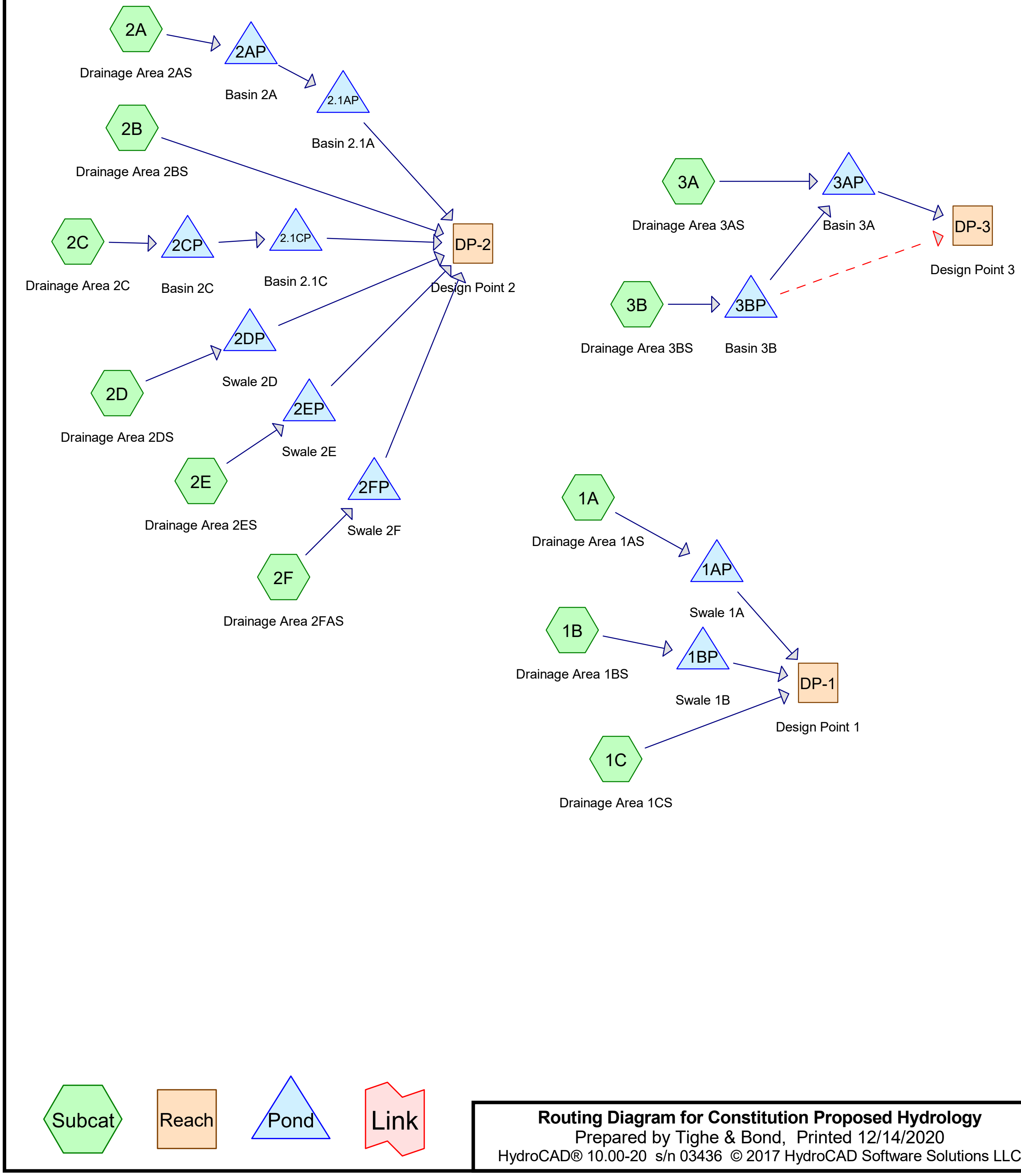
Summary for Reach DP-3: Design Point 3

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =      6.592 ac,   0.00% Impervious,  Inflow Depth =   3.54"    for  100-yr event
Inflow      =     17.68 cfs @  12.31 hrs,  Volume=          1.942 af
Outflow     =     17.68 cfs @  12.31 hrs,  Volume=          1.942 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Long-Term Proposed Conditions Hydrology



Routing Diagram for Constitution Proposed Hydrology
Prepared by Tighe & Bond, Printed 12/14/2020
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
24.435	44	1/2 Meadow, non-grazed, HSG A (2A, 2B, 2D, 3A)
15.588	65	1/2 Meadow, non-grazed, HSG B (2A, 2B, 2D, 2F)
31.544	75	1/2 Meadow, non-grazed, HSG C (2A, 2B, 2C, 2D, 2E, 2F, 3A, 3B)
0.274	74	1/2 Woods, Good, HSG C (2C)
2.167	96	Gravel Road (2A, 2B, 2C, 2D, 2E)
4.165	98	Impervious (1A, 1B, 2A, 2B, 2C, 2D, 2E, 2F, 3A, 3B)
10.098	78	Meadow, non-grazed, HSG D (1A, 1B, 1C, 2B, 2C, 2E)
11.004	98	Water Body (1C, 2A, 2B, 3A, 3B)
7.206	30	Woods, Good, HSG A (2B)
2.536	55	Woods, Good, HSG B (2B)
5.847	70	Woods, Good, HSG C (2A, 2B, 3B)
1.770	77	Woods, Good, HSG D (2A, 2B)
32.714	77	Woods, Good, HSG D (Outside LOW) (1C)
149.348	**69**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
31.641	HSG A	2A, 2B, 2D, 3A
18.124	HSG B	2A, 2B, 2D, 2F
37.665	HSG C	2A, 2B, 2C, 2D, 2E, 2F, 3A, 3B
44.582	HSG D	1A, 1B, 1C, 2A, 2B, 2C, 2E
17.336	Other	1A, 1B, 1C, 2A, 2B, 2C, 2D, 2E, 2F, 3A, 3B
149.348		**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
24.435	15.588	31.544	0.000	0.000	71.567	1/2 Meadow, non-grazed	2A, 2B, 2C, 2D, 2E, 2F, 3A, 3B
0.000	0.000	0.274	0.000	0.000	0.274	1/2 Woods, Good	2C
0.000	0.000	0.000	0.000	2.167	2.167	Gravel Road	2A, 2B, 2C, 2D, 2E
0.000	0.000	0.000	0.000	4.165	4.165	Impervious	1A, 1B, 2A, 2B, 2C, 2D, 2E, 2F, 3A, 3B
0.000	0.000	0.000	10.098	0.000	10.098	Meadow, non-grazed	1A, 1B, 1C, 2B, 2C, 2E
0.000	0.000	0.000	0.000	11.004	11.004	Water Body	1C, 2A, 2B, 3A, 3B
7.206	2.536	5.847	34.483	0.000	50.072	Woods, Good	1C, 2A, 2B, 3B
31.641	**18.124**	**37.665**	**44.582**	**17.336**	**149.348**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3BP	217.00	214.00	37.0	0.0811	0.025	15.0	0.0	0.0

```
                    Time span=0.00-120.00 hrs, dt=0.05 hrs, 2401 points
                     Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
           Reach routing by Stor-Ind+Trans method  -  Pond routing by Stor-Ind method

Subcatchment 1A: Drainage Area 1AS      Runoff Area=105,800 sf   11.05% Impervious   Runoff Depth=1.40"
                                         Flow Length=442'   Tc=11.3 min   CN=80   Runoff=3.28 cfs  0.284 af

Subcatchment 1B: Drainage Area 1BS      Runoff Area=169,850 sf   4.75% Impervious   Runoff Depth=1.34"
                                          Flow Length=406'   Tc=7.9 min   CN=79   Runoff=5.55 cfs  0.434 af

Subcatchment 1C: Drainage Area 1CS    Runoff Area=1,840,429 sf   19.45% Impervious   Runoff Depth=1.47"
                                    Flow Length=1,791'   Tc=33.0 min   CN=81   Runoff=38.97 cfs  5.172 af

Subcatchment 2A: Drainage Area 2AS     Runoff Area=1,676,046 sf   4.04% Impervious   Runoff Depth=0.48"
                                       Flow Length=978'   Tc=10.3 min   CN=62   Runoff=12.29 cfs  1.542 af

Subcatchment 2B: Drainage Area 2BS     Runoff Area=1,737,125 sf   6.49% Impervious   Runoff Depth=0.37"
                                      Flow Length=1,303'   Tc=20.8 min   CN=59   Runoff=6.84 cfs  1.243 af

Subcatchment 2C: Drainage Area 2C        Runoff Area=114,590 sf   3.17% Impervious   Runoff Depth=1.34"
                                          Flow Length=689'   Tc=9.1 min   CN=79   Runoff=3.58 cfs  0.293 af

Subcatchment 2D: Drainage Area 2DS      Runoff Area=122,541 sf   11.19% Impervious   Runoff Depth=0.73"
                                         Flow Length=588'   Tc=10.5 min   CN=68   Runoff=1.75 cfs  0.172 af

Subcatchment 2E: Drainage Area 2ES       Runoff Area=235,462 sf   4.76% Impervious   Runoff Depth=1.21"
                                         Flow Length=630'   Tc=11.6 min   CN=77   Runoff=6.15 cfs  0.546 af

Subcatchment 2F: Drainage Area 2FAS     Runoff Area=216,608 sf   16.14% Impervious   Runoff Depth=1.09"
                                                          Tc=6.0 min   CN=75   Runoff=6.01 cfs  0.453 af

Subcatchment 3A: Drainage Area 3AS       Runoff Area=75,256 sf   13.26% Impervious   Runoff Depth=0.64"
                                          Flow Length=272'   Tc=5.7 min   CN=66   Runoff=1.05 cfs  0.093 af

Subcatchment 3B: Drainage Area 3BS      Runoff Area=211,879 sf   13.71% Impervious   Runoff Depth=1.27"
                                         Flow Length=674'   Tc=11.9 min   CN=78   Runoff=5.80 cfs  0.516 af

Reach DP-1: Design Point 1                                                         Inflow=43.13 cfs  5.782 af
                                                                                  Outflow=43.13 cfs  5.782 af

Reach DP-2: Design Point 2                                                         Inflow=12.52 cfs  2.372 af
                                                                                  Outflow=12.52 cfs  2.372 af

Reach DP-3: Design Point 3                                                          Inflow=1.44 cfs  0.135 af
                                                                                   Outflow=1.44 cfs  0.135 af

Pond 1AP: Swale 1A                         Peak Elev=258.23'  Storage=2,213 cf   Inflow=3.28 cfs  0.284 af
                                                                                   Outflow=3.13 cfs  0.246 af

Pond 1BP: Swale 1B                         Peak Elev=253.28'  Storage=4,446 cf   Inflow=5.55 cfs  0.434 af
                                                                                   Outflow=4.37 cfs  0.363 af
```

Pond 2.1AP: Basin 2.1A Peak Elev=176.53' Storage=19,780 cf Inflow=1.57 cfs 0.657 af
Outflow=0.65 cfs 0.212 af

Pond 2.1CP: Basin 2.1C Peak Elev=193.04' Storage=4,162 cf Inflow=2.76 cfs 0.214 af
Outflow=0.36 cfs 0.121 af

Pond 2AP: Basin 2A Peak Elev=176.82' Storage=40,052 cf Inflow=12.29 cfs 1.542 af
Outflow=1.57 cfs 0.657 af

Pond 2CP: Basin 2C Peak Elev=193.15' Storage=3,820 cf Inflow=3.58 cfs 0.293 af
Outflow=2.76 cfs 0.214 af

Pond 2DP: Swale 2D Peak Elev=155.77' Storage=5,080 cf Inflow=1.75 cfs 0.172 af
Outflow=0.14 cfs 0.057 af

Pond 2EP: Swale 2E Peak Elev=179.45' Storage=7,806 cf Inflow=6.15 cfs 0.546 af
Outflow=3.27 cfs 0.403 af

Pond 2FP: Swale 2F Peak Elev=137.45' Storage=6,424 cf Inflow=6.01 cfs 0.453 af
Outflow=2.53 cfs 0.336 af

Pond 3AP: Basin 3A Peak Elev=191.11' Storage=8,953 cf Inflow=3.58 cfs 0.608 af
Discarded=0.37 cfs 0.473 af Primary=1.44 cfs 0.135 af Outflow=1.81 cfs 0.608 af

Pond 3BP: Basin 3B Peak Elev=218.06' Storage=5,168 cf Inflow=5.80 cfs 0.516 af
Discarded=0.02 cfs 0.001 af Primary=3.08 cfs 0.516 af Secondary=0.00 cfs 0.000 af Outflow=3.11 cfs 0.516 af

Total Runoff Area = 149.348 ac Runoff Volume = 10.748 af Average Runoff Depth = 0.86"
89.84% Pervious = 134.179 ac 10.16% Impervious = 15.168 ac

Summary for Subcatchment 1A: Drainage Area 1AS

Runoff = 3.28 cfs @ 12.16 hrs, Volume= 0.284 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
	94,109	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	11,691	98	Impervious
	105,800	80	Weighted Average
	94,109		88.95% Pervious Area
	11,691		11.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0300	0.12		**Sheet Flow,**
					Grass: Dense n= 0.240 P2= 3.20"
4.3	392	0.0472	1.52		**Shallow Concentrated Flow, SCF1**
					Short Grass Pasture Kv= 7.0 fps
11.3	442	Total			

Summary for Subcatchment 1B: Drainage Area 1BS

Runoff = 5.55 cfs @ 12.12 hrs, Volume= 0.434 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
	161,780	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	8,070	98	Impervious
	169,850	79	Weighted Average
	161,780		95.25% Pervious Area
	8,070		4.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow,**
					Grass: Dense n= 0.240 P2= 3.20"
1.9	161	0.0400	1.40		**Shallow Concentrated Flow, SCF1**
					Short Grass Pasture Kv= 7.0 fps
1.5	195	0.0974	2.18		**Shallow Concentrated Flow, SCF2**
					Short Grass Pasture Kv= 7.0 fps
7.9	406	Total			

Summary for Subcatchment 1C: Drainage Area 1CS

Runoff = 38.97 cfs @ 12.47 hrs, Volume= 5.172 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	358,010	98	Water Body
*	0	70	Woods, Good, HSG C (Outside LOW)
*	1,425,016	77	Woods, Good, HSG D (Outside LOW)
*	0	89	Row crops, straight row, Good, HSG D (Outside LOW)
	57,403	78	Meadow, non-grazed, HSG D
	1,840,429	81	Weighted Average
	1,482,419		80.55% Pervious Area
	358,010		19.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
2.1	152	0.0592	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	356	0.0140	0.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	861	0.0534	1.16		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	372	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.0	1,791	Total			

Summary for Subcatchment 2A: Drainage Area 2AS

Runoff = 12.29 cfs @ 12.20 hrs, Volume= 1.542 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	6,347	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	64,687	70	Woods, Good, HSG C
	12,625	77	Woods, Good, HSG D
*	676,676	44	1/2 Meadow, non-grazed, HSG A
*	233,571	65	1/2 Meadow, non-grazed, HSG B
*	574,913	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	45,876	96	Gravel Road
*	61,351	98	Impervious
	1,676,046	62	Weighted Average
	1,608,348		95.96% Pervious Area
	67,698		4.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	90	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.9	370	0.0514	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	90	0.1667	2.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.5	240	0.0271	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	138	0.0616	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.3	978	Total			

Summary for Subcatchment 2B: Drainage Area 2BS

Runoff = 6.84 cfs @ 12.46 hrs, Volume= 1.243 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	98,260	98	Water Body
	313,898	30	Woods, Good, HSG A
	110,477	55	Woods, Good, HSG B
	188,496	70	Woods, Good, HSG C
	64,455	77	Woods, Good, HSG D
*	321,804	44	1/2 Meadow, non-grazed, HSG A
*	350,378	65	1/2 Meadow, non-grazed, HSG B
*	173,921	75	1/2 Meadow, non-grazed, HSG C
	79,419	78	Meadow, non-grazed, HSG D
*	21,559	96	Gravel Road
*	14,458	98	Impervious
	1,737,125	59	Weighted Average
	1,624,407		93.51% Pervious Area
	112,718		6.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	223	0.0628	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	325	0.0831	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0588	4.92		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	100	0.1500	2.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.4	466	0.0815	1.43		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	122	0.1475	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.8	1,303	Total			

Summary for Subcatchment 2C: Drainage Area 2C

Runoff = 3.58 cfs @ 12.14 hrs, Volume= 0.293 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
*	11,945	74	1/2 Woods, Good, HSG C
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
*	0	65	1/2 Meadow, non-grazed, HSG B
*	73,349	75	1/2 Meadow, non-grazed, HSG C
	10,711	78	Meadow, non-grazed, HSG D
*	14,947	96	Gravel Road
*	3,638	98	Impervious
	114,590	79	Weighted Average
	110,952		96.83% Pervious Area
	3,638		3.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.4	147	0.0612	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	76	0.0789	1.97		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.3	391	0.0358	2.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.1	689	Total			

Summary for Subcatchment 2D: Drainage Area 2DS

Runoff = 1.75 cfs @ 12.17 hrs, Volume= 0.172 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	37,233	44	1/2 Meadow, non-grazed, HSG A
*	11,167	65	1/2 Meadow, non-grazed, HSG B
*	57,454	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	2,977	96	Gravel Road
*	13,710	98	Impervious
	122,541	68	Weighted Average
	108,831		88.81% Pervious Area
	13,710		11.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
2.6	255	0.0549	1.64		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.7	200	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	83	0.0482	1.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.5	588	Total			

Summary for Subcatchment 2E: Drainage Area 2ES

Runoff = 6.15 cfs @ 12.17 hrs, Volume= 0.546 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	178,754	75	1/2 Meadow, non-grazed, HSG C
	36,455	78	Meadow, non-grazed, HSG D
*	9,048	96	Gravel Road
*	11,205	98	Impervious
	235,462	77	Weighted Average
	224,257		95.24% Pervious Area
	11,205		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
5.4	580	0.0655	1.79		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.6	630	Total			

Summary for Subcatchment 2F: Drainage Area 2FAS

Runoff = 6.01 cfs @ 12.10 hrs, Volume= 0.453 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
*	83,902	65	1/2 Meadow, non-grazed, HSG B
*	97,736	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	34,970	98	Impervious
	216,608	75	Weighted Average
	181,638		83.86% Pervious Area
	34,970		16.14% Impervious Area

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

Summary for Subcatchment 3A: Drainage Area 3AS

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.05 cfs @ 12.11 hrs, Volume= 0.093 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	5,010	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	28,672	44	1/2 Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	36,604	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	4,970	98	Impervious
	75,256	66	Weighted Average
	65,276		86.74% Pervious Area
	9,980		13.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.2800	0.29		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
0.4	48	0.0938	2.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	85	0.0235	1.07		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	89	0.0393	1.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	272	Total			

Summary for Subcatchment 3B: Drainage Area 3BS

Runoff = 5.80 cfs @ 12.17 hrs, Volume= 0.516 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (sf)	CN	Description
*	11,700	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	1,498	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	181,335	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	17,346	98	Impervious
	211,879	78	Weighted Average
	182,833		86.29% Pervious Area
	29,046		13.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
6.6	624	0.0513	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	674	Total			

Summary for Reach DP-1: Design Point 1

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =      48.578 ac,  17.85% Impervious,  Inflow Depth =   1.43"    for  2-yr event
Inflow      =      43.13 cfs @   12.45 hrs,  Volume=          5.782 af
Outflow     =      43.13 cfs @   12.45 hrs,  Volume=          5.782 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Design Point 2

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =      94.178 ac,   5.95% Impervious,  Inflow Depth =   0.30"    for  2-yr event
Inflow      =      12.52 cfs @   12.43 hrs,  Volume=          2.372 af
Outflow     =      12.52 cfs @   12.43 hrs,  Volume=          2.372 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Design Point 3

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =       6.592 ac,  13.59% Impervious,  Inflow Depth =   0.25"    for  2-yr event
Inflow      =       1.44 cfs @   13.04 hrs,  Volume=          0.135 af
Outflow     =       1.44 cfs @   13.04 hrs,  Volume=          0.135 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Pond 1AP: Swale 1A

```
Inflow Area =       2.429 ac,  11.05% Impervious,  Inflow Depth =   1.40"    for  2-yr event
Inflow      =       3.28 cfs @   12.16 hrs,  Volume=          0.284 af
Outflow     =       3.13 cfs @   12.21 hrs,  Volume=          0.246 af,  Atten= 5%,  Lag= 2.8 min
Primary     =       3.13 cfs @   12.21 hrs,  Volume=          0.246 af
```

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 258.23' @ 12.21 hrs Surf.Area= 2,695 sf Storage= 2,213 cf

Plug-Flow detention time= 89.4 min calculated for 0.246 af (87% of inflow)
Center-of-Mass det. time= 29.1 min (876.7 - 847.7)

```
Volume       Invert    Avail.Storage   Storage Description
  #1        257.00'         4,741 cf   Custom Stage Data (Prismatic) Listed below (Recalc)

 Elevation         Surf.Area          Inc.Store        Cum.Store
    (feet)            (sq-ft)      (cubic-feet)      (cubic-feet)
    257.00               921                 0                0
    258.00             2,356             1,639            1,639
    259.00             3,848             3,102            4,741

Device   Routing            Invert   Outlet Devices
   #1    Primary           258.00'   12.0' long  x 4.0' 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)  2.38  2.54  2.69  2.68  2.67  2.67  2.65  2.66  2.66
                                     2.68  2.72  2.73  2.76  2.79  2.88  3.07  3.32

Primary OutFlow  Max=3.08 cfs @ 12.21 hrs  HW=258.23'   (Free Discharge)
└─1=Broad-Crested Rectangular Weir  (Weir Controls 3.08 cfs @ 1.14 fps)
```

Summary for Pond 1BP: Swale 1B

```
Inflow Area =         3.899 ac,    4.75% Impervious,  Inflow Depth =   1.34"    for  2-yr event
Inflow      =         5.55 cfs @   12.12 hrs,  Volume=            0.434 af
Outflow     =         4.37 cfs @   12.21 hrs,  Volume=            0.363 af,  Atten= 21%,  Lag= 5.5 min
Primary     =         4.37 cfs @   12.21 hrs,  Volume=            0.363 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 253.28' @ 12.21 hrs   Surf.Area= 5,201 sf   Storage= 4,446 cf

Plug-Flow detention time= 108.4 min calculated for 0.363 af (84% of inflow)
Center-of-Mass det. time= 38.4 min ( 886.2 - 847.7 )

Volume       Invert    Avail.Storage   Storage Description
  #1        252.00'         8,894 cf   Custom Stage Data (Prismatic) Listed below (Recalc)

 Elevation         Surf.Area          Inc.Store        Cum.Store
    (feet)            (sq-ft)      (cubic-feet)      (cubic-feet)
    252.00             1,753                 0                0
    253.00             4,433             3,093            3,093
    254.00             7,168             5,801            8,894

Device   Routing            Invert   Outlet Devices
   #1    Primary           253.00'   12.0' long  x 4.0' 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)  2.38  2.54  2.69  2.68  2.67  2.67  2.65  2.66  2.66
                                     2.68  2.72  2.73  2.76  2.79  2.88  3.07  3.32

Primary OutFlow  Max=4.29 cfs @ 12.21 hrs  HW=253.28'   (Free Discharge)
└─1=Broad-Crested Rectangular Weir  (Weir Controls 4.29 cfs @ 1.29 fps)
```

Summary for Pond 2.1AP: Basin 2.1A

```
Inflow Area =      38.477 ac,   4.04% Impervious,  Inflow Depth =   0.20"    for  2-yr event
Inflow       =      1.57 cfs @  15.36 hrs,  Volume=          0.657 af
Outflow      =      0.65 cfs @  20.61 hrs,  Volume=          0.212 af,  Atten= 59%,  Lag= 315.2 min
Primary      =      0.65 cfs @  20.61 hrs,  Volume=          0.212 af
```

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 176.53' @ 20.61 hrs Surf.Area= 12,548 sf Storage= 19,780 cf

Plug-Flow detention time= 394.9 min calculated for 0.212 af (32% of inflow)
Center-of-Mass det. time= 218.5 min (1,339.0 - 1,120.5)

Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	43,620 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
174.00	4,835	529.0	0	0	4,835
175.00	7,004	555.0	5,886	5,886	7,142
176.00	9,275	580.0	8,113	13,999	9,471
177.00	15,837	681.0	12,411	26,410	19,625
178.00	18,621	706.0	17,210	43,620	22,470

Device	Routing	Invert	Outlet Devices
#1	Primary	176.50'	**40.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=0.58 cfs @ 20.61 hrs HW=176.53' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.58 cfs @ 0.46 fps)

Summary for Pond 2.1CP: Basin 2.1C

[79] Warning: Submerged Pond 2CP Primary device # 1 by 0.04'

```
Inflow Area =       2.631 ac,   3.17% Impervious,  Inflow Depth =   0.98"    for  2-yr event
Inflow       =      2.76 cfs @  12.27 hrs,  Volume=          0.214 af
Outflow      =      0.36 cfs @  13.57 hrs,  Volume=          0.121 af,  Atten= 87%,  Lag= 78.4 min
Primary      =      0.36 cfs @  13.57 hrs,  Volume=          0.121 af
```

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 193.04' @ 13.57 hrs Surf.Area= 2,774 sf Storage= 4,162 cf

Plug-Flow detention time= 255.3 min calculated for 0.121 af (56% of inflow)
Center-of-Mass det. time= 121.9 min (1,025.6 - 903.7)

Volume	Invert	Avail.Storage	Storage Description
#1	191.00'	7,200 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
191.00	1,375	200.0	0	0	1,375
192.00	2,019	228.0	1,687	1,687	2,352
193.00	2,746	256.0	2,373	4,060	3,458
194.00	3,552	279.0	3,140	7,200	4,473

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.35 cfs @ 13.57 hrs HW=193.04' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.35 cfs @ 0.48 fps)

Summary for Pond 2AP: Basin 2A

Inflow Area = 38.477 ac, 4.04% Impervious, Inflow Depth = 0.48" for 2-yr event
Inflow = 12.29 cfs @ 12.20 hrs, Volume= 1.542 af
Outflow = 1.57 cfs @ 15.36 hrs, Volume= 0.657 af, Atten= 87%, Lag= 189.6 min
Primary = 1.57 cfs @ 15.36 hrs, Volume= 0.657 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 176.82' @ 15.36 hrs Surf.Area= 20,609 sf Storage= 40,052 cf

Plug-Flow detention time= 370.4 min calculated for 0.657 af (43% of inflow)
Center-of-Mass det. time= 207.0 min (1,120.5 - 913.5)

Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	67,500 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
174.00	7,566	619.0	0	0	7,566
175.00	12,573	1,025.0	9,964	9,964	60,687
176.00	16,900	1,080.0	14,683	24,647	69,960
177.00	21,456	1,138.0	19,133	43,780	80,258
178.00	26,058	1,163.0	23,720	67,500	84,978

Device	Routing	Invert	Outlet Devices
#1	Primary	176.75'	**30.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=1.53 cfs @ 15.36 hrs HW=176.82' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.53 cfs @ 0.70 fps)

Summary for Pond 2CP: Basin 2C

Inflow Area = 2.631 ac, 3.17% Impervious, Inflow Depth = 1.34" for 2-yr event
Inflow = 3.58 cfs @ 12.14 hrs, Volume= 0.293 af
Outflow = 2.76 cfs @ 12.27 hrs, Volume= 0.214 af, Atten= 23%, Lag= 7.8 min
Primary = 2.76 cfs @ 12.27 hrs, Volume= 0.214 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 193.15' @ 12.27 hrs Surf.Area= 2,691 sf Storage= 3,820 cf

Plug-Flow detention time= 150.0 min calculated for 0.214 af (73% of inflow)
Center-of-Mass det. time= 54.8 min (903.7 - 848.8)

Volume	Invert	Avail.Storage	Storage Description
#1	191.00'	6,442 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
191.00	897	238.0	0	0	897
192.00	1,740	263.0	1,295	1,295	1,925
193.00	2,568	288.0	2,141	3,436	3,055
194.00	3,467	309.0	3,006	6,442	4,096

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.54 cfs @ 12.27 hrs HW=193.14' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 2.54 cfs @ 0.92 fps)

Summary for Pond 2DP: Swale 2D

Inflow Area = 2.813 ac, 11.19% Impervious, Inflow Depth = 0.73" for 2-yr event
Inflow = 1.75 cfs @ 12.17 hrs, Volume= 0.172 af
Outflow = 0.14 cfs @ 15.58 hrs, Volume= 0.057 af, Atten= 92%, Lag= 204.8 min
Primary = 0.14 cfs @ 15.58 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 155.77' @ 15.58 hrs Surf.Area= 4,548 sf Storage= 5,080 cf

Plug-Flow detention time= 398.8 min calculated for 0.057 af (33% of inflow)
Center-of-Mass det. time= 244.7 min (1,132.1 - 887.3)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	6,163 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
154.00	1,208	0	0
155.00	3,067	2,138	2,138
156.00	4,983	4,025	6,163

Device	Routing	Invert	Outlet Devices
#1	Primary	155.75'	**15.0' long x 1.7' 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 Coef. (English) 2.59 2.63 2.63 2.65 2.71 2.80 2.86 3.00 2.99 2.96 3.20 3.27 3.32

Primary OutFlow Max=0.13 cfs @ 15.58 hrs HW=155.77' (Free Discharge)
↳**1=Broad-Crested Rectangular Weir** (Weir Controls 0.13 cfs @ 0.39 fps)

Summary for Pond 2EP: Swale 2E

Inflow Area = 5.405 ac, 4.76% Impervious, Inflow Depth = 1.21" for 2-yr event
Inflow = 6.15 cfs @ 12.17 hrs, Volume= 0.546 af
Outflow = 3.27 cfs @ 12.44 hrs, Volume= 0.403 af, Atten= 47%, Lag= 16.2 min
Primary = 3.27 cfs @ 12.44 hrs, Volume= 0.403 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 179.45' @ 12.44 hrs Surf.Area= 8,258 sf Storage= 7,806 cf

Plug-Flow detention time= 158.8 min calculated for 0.403 af (74% of inflow)
Center-of-Mass det. time= 63.7 min (921.2 - 857.6)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	12,956 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
178.00	2,529	0	0
179.00	6,464	4,497	4,497
180.00	10,454	8,459	12,956

Device	Routing	Invert	Outlet Devices
#1	Primary	179.25'	**15.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.25 cfs @ 12.44 hrs HW=179.45' (Free Discharge)
↳**1=Broad-Crested Rectangular Weir** (Weir Controls 3.25 cfs @ 1.09 fps)

Summary for Pond 2FP: Swale 2F

Inflow Area = 4.973 ac, 16.14% Impervious, Inflow Depth = 1.09" for 2-yr event
Inflow = 6.01 cfs @ 12.10 hrs, Volume= 0.453 af
Outflow = 2.53 cfs @ 12.38 hrs, Volume= 0.336 af, Atten= 58%, Lag= 16.8 min
Primary = 2.53 cfs @ 12.38 hrs, Volume= 0.336 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 137.45' @ 12.38 hrs Surf.Area= 6,787 sf Storage= 6,424 cf

Plug-Flow detention time= 160.3 min calculated for 0.336 af (74% of inflow)
Center-of-Mass det. time= 64.7 min (923.5 - 858.8)

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	10,648 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
136.00	2,094	0	0
137.00	5,303	3,699	3,699
138.00	8,595	6,949	10,648

Device	Routing	Invert	Outlet Devices
#1	Primary	137.25'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.50 cfs @ 12.38 hrs HW=137.45' (Free Discharge)
↰**1=Broad-Crested Rectangular Weir** (Weir Controls 2.50 cfs @ 1.25 fps)

Summary for Pond 3AP: Basin 3A

Inflow Area = 6.592 ac, 13.59% Impervious, Inflow Depth = 1.11" for 2-yr event
Inflow = 3.58 cfs @ 12.38 hrs, Volume= 0.608 af
Outflow = 1.81 cfs @ 13.04 hrs, Volume= 0.608 af, Atten= 49%, Lag= 39.8 min
Discarded = 0.37 cfs @ 13.04 hrs, Volume= 0.473 af
Primary = 1.44 cfs @ 13.04 hrs, Volume= 0.135 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 191.11' @ 13.04 hrs Surf.Area= 5,107 sf Storage= 8,953 cf

Plug-Flow detention time= 246.2 min calculated for 0.608 af (100% of inflow)
Center-of-Mass det. time= 246.2 min (1,150.8 - 904.5)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	13,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
189.00	3,417	241.0	0	0	3,417
190.00	4,189	264.0	3,796	3,796	4,375
191.00	5,010	283.0	4,593	8,390	5,246
192.00	5,917	302.0	5,457	13,847	6,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	189.00'	**1.715 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 187.00'
#2	Primary	191.00'	**15.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Discarded OutFlow Max=0.37 cfs @ 13.04 hrs HW=191.11' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.37 cfs)

Primary OutFlow Max=1.43 cfs @ 13.04 hrs HW=191.11' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.43 cfs @ 0.86 fps)

Summary for Pond 3BP: Basin 3B

Inflow Area = 4.864 ac, 13.71% Impervious, Inflow Depth = 1.27" for 2-yr event
Inflow = 5.80 cfs @ 12.17 hrs, Volume= 0.516 af
Outflow = 3.11 cfs @ 12.44 hrs, Volume= 0.516 af, Atten= 46%, Lag= 15.8 min
Discarded = 0.02 cfs @ 12.44 hrs, Volume= 0.001 af
Primary = 3.08 cfs @ 12.44 hrs, Volume= 0.516 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 218.06' @ 12.44 hrs Surf.Area= 6,200 sf Storage= 5,168 cf

Plug-Flow detention time= 51.3 min calculated for 0.516 af (100% of inflow)
Center-of-Mass det. time= 52.2 min (906.8 - 854.6)

Volume	Invert	Avail.Storage	Storage Description
#1	217.00'	21,536 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
217.00	3,600	466.0	0	0	3,600
218.00	6,070	593.0	4,782	4,782	14,316
219.00	8,292	622.0	7,152	11,934	17,185
220.00	10,975	657.0	9,602	21,536	20,804

Device	Routing	Invert	Outlet Devices
#1	Discarded	217.00'	**0.130 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 214.00'
#2	Secondary	219.50'	**20.0' long x 9.0' 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) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69
#3	Primary	217.00'	**15.0" Round Culvert** L= 37.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 217.00' / 214.00' S= 0.0811 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf
#4	Device 1	218.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.44 hrs HW=218.06' (Free Discharge)
↑└─**1=Exfiltration** (Controls 0.02 cfs)
  ↑└─**4=Orifice/Grate** (Passes 0.02 cfs of 0.20 cfs potential flow)

Primary OutFlow Max=3.08 cfs @ 12.44 hrs HW=218.06' (Free Discharge)
↑└─**3=Culvert** (Inlet Controls 3.08 cfs @ 2.77 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=217.00' (Free Discharge)
↑└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-120.00 hrs, dt=0.05 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Drainage Area 1AS Runoff Area=105,800 sf 11.05% Impervious Runoff Depth=3.33"
Flow Length=442' Tc=11.3 min CN=80 Runoff=7.90 cfs 0.675 af

Subcatchment 1B: Drainage Area 1BS Runoff Area=169,850 sf 4.75% Impervious Runoff Depth=3.24"
Flow Length=406' Tc=7.9 min CN=79 Runoff=13.68 cfs 1.052 af

Subcatchment 1C: Drainage Area 1CS Runoff Area=1,840,429 sf 19.45% Impervious Runoff Depth=3.43"
Flow Length=1,791' Tc=33.0 min CN=81 Runoff=91.68 cfs 12.080 af

Subcatchment 2A: Drainage Area 2AS Runoff Area=1,676,046 sf 4.04% Impervious Runoff Depth=1.76"
Flow Length=978' Tc=10.3 min CN=62 Runoff=63.93 cfs 5.631 af

Subcatchment 2B: Drainage Area 2BS Runoff Area=1,737,125 sf 6.49% Impervious Runoff Depth=1.53"
Flow Length=1,303' Tc=20.8 min CN=59 Runoff=42.88 cfs 5.076 af

Subcatchment 2C: Drainage Area 2C Runoff Area=114,590 sf 3.17% Impervious Runoff Depth=3.24"
Flow Length=689' Tc=9.1 min CN=79 Runoff=8.81 cfs 0.710 af

Subcatchment 2D: Drainage Area 2DS Runoff Area=122,541 sf 11.19% Impervious Runoff Depth=2.24"
Flow Length=588' Tc=10.5 min CN=68 Runoff=6.18 cfs 0.526 af

Subcatchment 2E: Drainage Area 2ES Runoff Area=235,462 sf 4.76% Impervious Runoff Depth=3.05"
Flow Length=630' Tc=11.6 min CN=77 Runoff=15.96 cfs 1.372 af

Subcatchment 2F: Drainage Area 2FAS Runoff Area=216,608 sf 16.14% Impervious Runoff Depth=2.86"
Tc=6.0 min CN=75 Runoff=16.35 cfs 1.185 af

Subcatchment 3A: Drainage Area 3AS Runoff Area=75,256 sf 13.26% Impervious Runoff Depth=2.08"
Flow Length=272' Tc=5.7 min CN=66 Runoff=4.05 cfs 0.299 af

Subcatchment 3B: Drainage Area 3BS Runoff Area=211,879 sf 13.71% Impervious Runoff Depth=3.14"
Flow Length=674' Tc=11.9 min CN=78 Runoff=14.67 cfs 1.273 af

Reach DP-1: Design Point 1 Inflow=101.15 cfs 13.698 af
Outflow=101.15 cfs 13.698 af

Reach DP-2: Design Point 2 Inflow=104.30 cfs 12.623 af
Outflow=104.30 cfs 12.623 af

Reach DP-3: Design Point 3 Inflow=7.14 cfs 0.964 af
Outflow=7.14 cfs 0.964 af

Pond 1AP: Swale 1A Peak Elev=258.40' Storage=2,696 cf Inflow=7.90 cfs 0.675 af
Outflow=7.66 cfs 0.637 af

Pond 1BP: Swale 1B Peak Elev=253.54' Storage=5,882 cf Inflow=13.68 cfs 1.052 af
Outflow=12.57 cfs 0.981 af

Pond 2.1AP: Basin 2.1A Peak Elev=177.01' Storage=26,597 cf Inflow=46.26 cfs 4.745 af
Outflow=39.04 cfs 4.300 af

Pond 2.1CP: Basin 2.1C Peak Elev=193.30' Storage=4,929 cf Inflow=8.73 cfs 0.631 af
Outflow=8.45 cfs 0.537 af

Pond 2AP: Basin 2A Peak Elev=177.44' Storage=53,684 cf Inflow=63.93 cfs 5.631 af
Outflow=46.26 cfs 4.745 af

Pond 2CP: Basin 2C Peak Elev=193.31' Storage=4,273 cf Inflow=8.81 cfs 0.710 af
Outflow=8.73 cfs 0.631 af

Pond 2DP: Swale 2D Peak Elev=156.00' Storage=6,139 cf Inflow=6.18 cfs 0.526 af
Outflow=4.73 cfs 0.412 af

Pond 2EP: Swale 2E Peak Elev=179.76' Storage=10,582 cf Inflow=15.96 cfs 1.372 af
Outflow=14.49 cfs 1.229 af

Pond 2FP: Swale 2F Peak Elev=137.84' Storage=9,339 cf Inflow=16.35 cfs 1.185 af
Outflow=14.04 cfs 1.068 af

Pond 3AP: Basin 3A Peak Elev=191.32' Storage=10,049 cf Inflow=8.06 cfs 1.568 af
Discarded=0.40 cfs 0.604 af Primary=7.14 cfs 0.964 af Outflow=7.54 cfs 1.568 af

Pond 3BP: Basin 3B Peak Elev=219.27' Storage=14,257 cf Inflow=14.67 cfs 1.273 af
Discarded=0.04 cfs 0.004 af Primary=5.98 cfs 1.269 af Secondary=0.00 cfs 0.000 af Outflow=6.02 cfs 1.273 af

Total Runoff Area = 149.348 ac Runoff Volume = 29.879 af Average Runoff Depth = 2.40"
89.84% Pervious = 134.179 ac 10.16% Impervious = 15.168 ac

Summary for Subcatchment 1A: Drainage Area 1AS

Runoff = 7.90 cfs @ 12.16 hrs, Volume= 0.675 af, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
	94,109	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	11,691	98	Impervious
	105,800	80	Weighted Average
	94,109		88.95% Pervious Area
	11,691		11.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0300	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
4.3	392	0.0472	1.52		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
11.3	442	Total			

Summary for Subcatchment 1B: Drainage Area 1BS

Runoff = 13.68 cfs @ 12.11 hrs, Volume= 1.052 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
	161,780	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	8,070	98	Impervious
	169,850	79	Weighted Average
	161,780		95.25% Pervious Area
	8,070		4.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.9	161	0.0400	1.40		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
1.5	195	0.0974	2.18		**Shallow Concentrated Flow, SCF2** Short Grass Pasture Kv= 7.0 fps
7.9	406	Total			

Summary for Subcatchment 1C: Drainage Area 1CS

Runoff = 91.68 cfs @ 12.45 hrs, Volume= 12.080 af, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	358,010	98	Water Body
*	0	70	Woods, Good, HSG C (Outside LOW)
*	1,425,016	77	Woods, Good, HSG D (Outside LOW)
*	0	89	Row crops, straight row, Good, HSG D (Outside LOW)
	57,403	78	Meadow, non-grazed, HSG D
	1,840,429	81	Weighted Average
	1,482,419		80.55% Pervious Area
	358,010		19.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
2.1	152	0.0592	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	356	0.0140	0.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	861	0.0534	1.16		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	372	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.0	1,791	Total			

Summary for Subcatchment 2A: Drainage Area 2AS

Runoff = 63.93 cfs @ 12.16 hrs, Volume= 5.631 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	6,347	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	64,687	70	Woods, Good, HSG C
	12,625	77	Woods, Good, HSG D
*	676,676	44	1/2 Meadow, non-grazed, HSG A
*	233,571	65	1/2 Meadow, non-grazed, HSG B
*	574,913	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	45,876	96	Gravel Road
*	61,351	98	Impervious
	1,676,046	62	Weighted Average
	1,608,348		95.96% Pervious Area
	67,698		4.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	90	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.9	370	0.0514	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	90	0.1667	2.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.5	240	0.0271	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	138	0.0616	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.3	978	Total			

Summary for Subcatchment 2B: Drainage Area 2BS

Runoff = 42.88 cfs @ 12.32 hrs, Volume= 5.076 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	98,260	98	Water Body
	313,898	30	Woods, Good, HSG A
	110,477	55	Woods, Good, HSG B
	188,496	70	Woods, Good, HSG C
	64,455	77	Woods, Good, HSG D
*	321,804	44	1/2 Meadow, non-grazed, HSG A
*	350,378	65	1/2 Meadow, non-grazed, HSG B
*	173,921	75	1/2 Meadow, non-grazed, HSG C
	79,419	78	Meadow, non-grazed, HSG D
*	21,559	96	Gravel Road
*	14,458	98	Impervious
	1,737,125	59	Weighted Average
	1,624,407		93.51% Pervious Area
	112,718		6.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	223	0.0628	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	325	0.0831	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0588	4.92		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	100	0.1500	2.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.4	466	0.0815	1.43		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	122	0.1475	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.8	1,303	Total			

Summary for Subcatchment 2C: Drainage Area 2C

Runoff = 8.81 cfs @ 12.13 hrs, Volume= 0.710 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
*	11,945	74	1/2 Woods, Good, HSG C
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
*	0	65	1/2 Meadow, non-grazed, HSG B
*	73,349	75	1/2 Meadow, non-grazed, HSG C
	10,711	78	Meadow, non-grazed, HSG D
*	14,947	96	Gravel Road
*	3,638	98	Impervious
	114,590	79	Weighted Average
	110,952		96.83% Pervious Area
	3,638		3.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.4	147	0.0612	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	76	0.0789	1.97		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.3	391	0.0358	2.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.1	689	Total			

Summary for Subcatchment 2D: Drainage Area 2DS

Runoff = 6.18 cfs @ 12.16 hrs, Volume= 0.526 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	37,233	44	1/2 Meadow, non-grazed, HSG A
*	11,167	65	1/2 Meadow, non-grazed, HSG B
*	57,454	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	2,977	96	Gravel Road
*	13,710	98	Impervious
	122,541	68	Weighted Average
	108,831		88.81% Pervious Area
	13,710		11.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
2.6	255	0.0549	1.64		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.7	200	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	83	0.0482	1.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.5	588	Total			

Summary for Subcatchment 2E: Drainage Area 2ES

Runoff = 15.96 cfs @ 12.16 hrs, Volume= 1.372 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	178,754	75	1/2 Meadow, non-grazed, HSG C
	36,455	78	Meadow, non-grazed, HSG D
*	9,048	96	Gravel Road
*	11,205	98	Impervious
	235,462	77	Weighted Average
	224,257		95.24% Pervious Area
	11,205		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
5.4	580	0.0655	1.79		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.6	630	Total			

Summary for Subcatchment 2F: Drainage Area 2FAS

Runoff = 16.35 cfs @ 12.09 hrs, Volume= 1.185 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
*	83,902	65	1/2 Meadow, non-grazed, HSG B
*	97,736	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	34,970	98	Impervious
	216,608	75	Weighted Average
	181,638		83.86% Pervious Area
	34,970		16.14% Impervious Area

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

Summary for Subcatchment 3A: Drainage Area 3AS

[49] Hint: Tc<2dt may require smaller dt

Runoff = 4.05 cfs @ 12.09 hrs, Volume= 0.299 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	5,010	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	28,672	44	1/2 Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	36,604	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	4,970	98	Impervious
	75,256	66	Weighted Average
	65,276		86.74% Pervious Area
	9,980		13.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.2800	0.29		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
0.4	48	0.0938	2.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	85	0.0235	1.07		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	89	0.0393	1.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	272	Total			

Summary for Subcatchment 3B: Drainage Area 3BS

Runoff = 14.67 cfs @ 12.17 hrs, Volume= 1.273 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	11,700	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	1,498	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	181,335	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	17,346	98	Impervious
	211,879	78	Weighted Average
	182,833		86.29% Pervious Area
	29,046		13.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
6.6	624	0.0513	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	674	Total			

Summary for Reach DP-1: Design Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 48.578 ac, 17.85% Impervious, Inflow Depth = 3.38" for 25-yr event
Inflow = 101.15 cfs @ 12.43 hrs, Volume= 13.698 af
Outflow = 101.15 cfs @ 12.43 hrs, Volume= 13.698 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Design Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 94.178 ac, 5.95% Impervious, Inflow Depth = 1.61" for 25-yr event
Inflow = 104.30 cfs @ 12.40 hrs, Volume= 12.623 af
Outflow = 104.30 cfs @ 12.40 hrs, Volume= 12.623 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Design Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.592 ac, 13.59% Impervious, Inflow Depth = 1.76" for 25-yr event
Inflow = 7.14 cfs @ 12.37 hrs, Volume= 0.964 af
Outflow = 7.14 cfs @ 12.37 hrs, Volume= 0.964 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Pond 1AP: Swale 1A

Inflow Area = 2.429 ac, 11.05% Impervious, Inflow Depth = 3.33" for 25-yr event
Inflow = 7.90 cfs @ 12.16 hrs, Volume= 0.675 af
Outflow = 7.66 cfs @ 12.19 hrs, Volume= 0.637 af, Atten= 3%, Lag= 1.8 min
Primary = 7.66 cfs @ 12.19 hrs, Volume= 0.637 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 258.40' @ 12.19 hrs Surf.Area= 2,950 sf Storage= 2,696 cf

Plug-Flow detention time= 47.9 min calculated for 0.637 af (94% of inflow)
Center-of-Mass det. time= 17.7 min (840.3 - 822.6)

Volume	Invert	Avail.Storage	Storage Description
#1	257.00'	4,741 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
257.00	921	0	0
258.00	2,356	1,639	1,639
259.00	3,848	3,102	4,741

Device	Routing	Invert	Outlet Devices
#1	Primary	258.00'	**12.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=7.57 cfs @ 12.19 hrs HW=258.40' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 7.57 cfs @ 1.60 fps)

Summary for Pond 1BP: Swale 1B

Inflow Area = 3.899 ac, 4.75% Impervious, Inflow Depth = 3.24" for 25-yr event
Inflow = 13.68 cfs @ 12.11 hrs, Volume= 1.052 af
Outflow = 12.57 cfs @ 12.16 hrs, Volume= 0.981 af, Atten= 8%, Lag= 2.7 min
Primary = 12.57 cfs @ 12.16 hrs, Volume= 0.981 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 253.54' @ 12.16 hrs Surf.Area= 5,908 sf Storage= 5,882 cf

Plug-Flow detention time= 57.8 min calculated for 0.981 af (93% of inflow)
Center-of-Mass det. time= 22.2 min (844.3 - 822.1)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	8,894 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
252.00	1,753	0	0
253.00	4,433	3,093	3,093
254.00	7,168	5,801	8,894

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	**12.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=12.39 cfs @ 12.16 hrs HW=253.53' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 12.39 cfs @ 1.93 fps)

Summary for Pond 2.1AP: Basin 2.1A

[79] Warning: Submerged Pond 2AP Primary device # 1 by 0.26'

```
Inflow Area =       38.477 ac,   4.04% Impervious,  Inflow Depth =   1.48"    for  25-yr event
Inflow      =       46.26 cfs @   12.30 hrs,  Volume=          4.745 af
Outflow     =       39.04 cfs @   12.43 hrs,  Volume=          4.300 af,  Atten= 16%,  Lag= 7.6 min
Primary     =       39.04 cfs @   12.43 hrs,  Volume=          4.300 af
```

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 177.01' @ 12.43 hrs Surf.Area= 15,869 sf Storage= 26,597 cf

Plug-Flow detention time= 70.0 min calculated for 4.300 af (91% of inflow)
Center-of-Mass det. time= 23.1 min (928.3 - 905.2)

Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	43,620 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
174.00	4,835	529.0	0	0	4,835
175.00	7,004	555.0	5,886	5,886	7,142
176.00	9,275	580.0	8,113	13,999	9,471
177.00	15,837	681.0	12,411	26,410	19,625
178.00	18,621	706.0	17,210	43,620	22,470

Device	Routing	Invert	Outlet Devices
#1	Primary	176.50'	**40.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=38.62 cfs @ 12.43 hrs HW=177.01' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 38.62 cfs @ 1.90 fps)

Summary for Pond 2.1CP: Basin 2.1C

[81] Warning: Exceeded Pond 2CP by 0.01' @ 12.25 hrs

```
Inflow Area =        2.631 ac,   3.17% Impervious,  Inflow Depth =   2.88"    for  25-yr event
Inflow      =        8.73 cfs @   12.15 hrs,  Volume=          0.631 af
Outflow     =        8.45 cfs @   12.18 hrs,  Volume=          0.537 af,  Atten= 3%,  Lag= 1.6 min
Primary     =        8.45 cfs @   12.18 hrs,  Volume=          0.537 af
```

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 193.30' @ 12.18 hrs Surf.Area= 2,980 sf Storage= 4,929 cf

Plug-Flow detention time= 90.4 min calculated for 0.537 af (85% of inflow)
Center-of-Mass det. time= 26.1 min (874.8 - 848.6)

Volume	Invert	Avail.Storage	Storage Description
#1	191.00'	7,200 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
191.00	1,375	200.0	0	0	1,375
192.00	2,019	228.0	1,687	1,687	2,352
193.00	2,746	256.0	2,373	4,060	3,458
194.00	3,552	279.0	3,140	7,200	4,473

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=8.28 cfs @ 12.18 hrs HW=193.30' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 8.28 cfs @ 1.38 fps)

Summary for Pond 2AP: Basin 2A

Inflow Area = 38.477 ac, 4.04% Impervious, Inflow Depth = 1.76" for 25-yr event
Inflow = 63.93 cfs @ 12.16 hrs, Volume= 5.631 af
Outflow = 46.26 cfs @ 12.30 hrs, Volume= 4.745 af, Atten= 28%, Lag= 8.4 min
Primary = 46.26 cfs @ 12.30 hrs, Volume= 4.745 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 177.44' @ 12.30 hrs Surf.Area= 23,432 sf Storage= 53,684 cf

Plug-Flow detention time= 107.8 min calculated for 4.745 af (84% of inflow)
Center-of-Mass det. time= 38.2 min (905.2 - 867.0)

Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	67,500 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
174.00	7,566	619.0	0	0	7,566
175.00	12,573	1,025.0	9,964	9,964	60,687
176.00	16,900	1,080.0	14,683	24,647	69,960
177.00	21,456	1,138.0	19,133	43,780	80,258
178.00	26,058	1,163.0	23,720	67,500	84,978

Device	Routing	Invert	Outlet Devices
#1	Primary	176.75'	**30.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=46.22 cfs @ 12.30 hrs HW=177.44' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 46.22 cfs @ 2.23 fps)

Summary for Pond 2CP: Basin 2C

Inflow Area = 2.631 ac, 3.17% Impervious, Inflow Depth = 3.24" for 25-yr event
Inflow = 8.81 cfs @ 12.13 hrs, Volume= 0.710 af
Outflow = 8.73 cfs @ 12.15 hrs, Volume= 0.631 af, Atten= 1%, Lag= 1.3 min
Primary = 8.73 cfs @ 12.15 hrs, Volume= 0.631 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 193.31' @ 12.15 hrs Surf.Area= 2,832 sf Storage= 4,273 cf

Plug-Flow detention time= 77.9 min calculated for 0.630 af (89% of inflow)
Center-of-Mass det. time= 25.4 min (848.6 - 823.2)

Volume	Invert	Avail.Storage	Storage Description
#1	191.00'	6,442 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
191.00	897	238.0	0	0	897
192.00	1,740	263.0	1,295	1,295	1,925
193.00	2,568	288.0	2,141	3,436	3,055
194.00	3,467	309.0	3,006	6,442	4,096

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=8.69 cfs @ 12.15 hrs HW=193.31' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 8.69 cfs @ 1.41 fps)

Summary for Pond 2DP: Swale 2D

Inflow Area = 2.813 ac, 11.19% Impervious, Inflow Depth = 2.24" for 25-yr event
Inflow = 6.18 cfs @ 12.16 hrs, Volume= 0.526 af
Outflow = 4.73 cfs @ 12.27 hrs, Volume= 0.412 af, Atten= 24%, Lag= 7.1 min
Primary = 4.73 cfs @ 12.27 hrs, Volume= 0.412 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 156.00' @ 12.27 hrs Surf.Area= 4,974 sf Storage= 6,139 cf

Plug-Flow detention time= 131.4 min calculated for 0.412 af (78% of inflow)
Center-of-Mass det. time= 47.0 min (898.7 - 851.7)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	6,163 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
154.00	1,208	0	0
155.00	3,067	2,138	2,138
156.00	4,983	4,025	6,163

Device	Routing	Invert	Outlet Devices
#1	Primary	155.75'	**15.0' long x 1.7' 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 Coef. (English) 2.59 2.63 2.63 2.65 2.71 2.80 2.86 3.00 2.99 2.96 3.20 3.27 3.32

Primary OutFlow Max=4.54 cfs @ 12.27 hrs HW=155.99' (Free Discharge)
↰**1=Broad-Crested Rectangular Weir** (Weir Controls 4.54 cfs @ 1.27 fps)

Summary for Pond 2EP: Swale 2E

Inflow Area = 5.405 ac, 4.76% Impervious, Inflow Depth = 3.05" for 25-yr event
Inflow = 15.96 cfs @ 12.16 hrs, Volume= 1.372 af
Outflow = 14.49 cfs @ 12.22 hrs, Volume= 1.229 af, Atten= 9%, Lag= 3.6 min
Primary = 14.49 cfs @ 12.22 hrs, Volume= 1.229 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 179.76' @ 12.22 hrs Surf.Area= 9,505 sf Storage= 10,582 cf

Plug-Flow detention time= 79.8 min calculated for 1.229 af (90% of inflow)
Center-of-Mass det. time= 29.7 min (860.3 - 830.6)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	12,956 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
178.00	2,529	0	0
179.00	6,464	4,497	4,497
180.00	10,454	8,459	12,956

Device	Routing	Invert	Outlet Devices
#1	Primary	179.25'	**15.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=14.26 cfs @ 12.22 hrs HW=179.76' (Free Discharge)
↰**1=Broad-Crested Rectangular Weir** (Weir Controls 14.26 cfs @ 1.87 fps)

Summary for Pond 2FP: Swale 2F

```
Inflow Area =        4.973 ac,  16.14% Impervious,  Inflow Depth =   2.86"    for  25-yr event
Inflow      =       16.35 cfs @  12.09 hrs,  Volume=          1.185 af
Outflow     =       14.04 cfs @  12.15 hrs,  Volume=          1.068 af,  Atten= 14%,  Lag= 3.3 min
Primary     =       14.04 cfs @  12.15 hrs,  Volume=          1.068 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 137.84' @ 12.15 hrs   Surf.Area= 8,078 sf   Storage= 9,339 cf

Plug-Flow detention time= 77.0 min calculated for 1.068 af (90% of inflow)
Center-of-Mass det. time= 28.5 min ( 858.9 - 830.4 )

Volume      Invert    Avail.Storage   Storage Description
   #1       136.00'       10,648 cf   Custom Stage Data (Prismatic) Listed below (Recalc)

 Elevation       Surf.Area        Inc.Store       Cum.Store
    (feet)          (sq-ft)     (cubic-feet)    (cubic-feet)
   136.00            2,094                0               0
   137.00            5,303            3,699           3,699
   138.00            8,595            6,949          10,648

Device  Routing          Invert   Outlet Devices
   #1   Primary          137.25'  10.0' long  x 0.5' breadth Broad-Crested Rectangular Weir
                                  Head (feet)  0.20  0.40  0.60  0.80  1.00
                                  Coef. (English)  2.80  2.92  3.08  3.30  3.32

Primary OutFlow  Max=13.99 cfs @ 12.15 hrs  HW=137.84'   (Free Discharge)
  1=Broad-Crested Rectangular Weir  (Weir Controls 13.99 cfs @ 2.36 fps)
```

Summary for Pond 3AP: Basin 3A

```
Inflow Area =        6.592 ac,  13.59% Impervious,  Inflow Depth =   2.85"    for  25-yr event
Inflow      =        8.06 cfs @  12.12 hrs,  Volume=          1.568 af
Outflow     =        7.54 cfs @  12.37 hrs,  Volume=          1.568 af,  Atten= 6%,  Lag= 14.9 min
Discarded   =        0.40 cfs @  12.37 hrs,  Volume=          0.604 af
Primary     =        7.14 cfs @  12.37 hrs,  Volume=          0.964 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 191.32' @ 12.37 hrs   Surf.Area= 5,294 sf   Storage= 10,049 cf

Plug-Flow detention time= 128.1 min calculated for 1.567 af (100% of inflow)
Center-of-Mass det. time= 128.1 min ( 995.5 - 867.4 )

Volume      Invert    Avail.Storage   Storage Description
   #1       189.00'       13,847 cf   Custom Stage Data (Irregular) Listed below (Recalc)
```

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
189.00	3,417	241.0	0	0	3,417
190.00	4,189	264.0	3,796	3,796	4,375
191.00	5,010	283.0	4,593	8,390	5,246
192.00	5,917	302.0	5,457	13,847	6,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	189.00'	**1.715 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 187.00'
#2	Primary	191.00'	**15.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Discarded OutFlow Max=0.40 cfs @ 12.37 hrs HW=191.32' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.40 cfs)

Primary OutFlow Max=7.12 cfs @ 12.37 hrs HW=191.32' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 7.12 cfs @ 1.47 fps)

Summary for Pond 3BP: Basin 3B

```
Inflow Area =       4.864 ac,  13.71% Impervious,  Inflow Depth =   3.14"    for  25-yr event
Inflow      =      14.67 cfs @  12.17 hrs,  Volume=         1.273 af
Outflow     =       6.02 cfs @  12.50 hrs,  Volume=         1.273 af,  Atten= 59%,  Lag= 19.8 min
Discarded  =        0.04 cfs @  12.50 hrs,  Volume=         0.004 af
Primary     =       5.98 cfs @  12.50 hrs,  Volume=         1.269 af
Secondary =         0.00 cfs @   0.00 hrs,  Volume=         0.000 af
```

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 219.27' @ 12.50 hrs Surf.Area= 8,977 sf Storage= 14,257 cf

Plug-Flow detention time= 41.6 min calculated for 1.273 af (100% of inflow)
Center-of-Mass det. time= 42.3 min (870.6 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1	217.00'	21,536 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
217.00	3,600	466.0	0	0	3,600
218.00	6,070	593.0	4,782	4,782	14,316
219.00	8,292	622.0	7,152	11,934	17,185
220.00	10,975	657.0	9,602	21,536	20,804

Device	Routing	Invert	Outlet Devices
#1	Discarded	217.00'	**0.130 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 214.00'
#2	Secondary	219.50'	**20.0' long x 9.0' 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)  2.46  2.55  2.70  2.69  2.68  2.68  2.67  2.64  2.64
                             2.64  2.65  2.64  2.65  2.65  2.66  2.67  2.69
   #3    Primary    217.00'  15.0"  Round Culvert
                             L= 37.0'   CMP, projecting, no headwall,  Ke= 0.900
                             Inlet / Outlet Invert= 217.00' / 214.00'   S= 0.0811 '/'   Cc= 0.900
                             n= 0.025  Corrugated metal,  Flow Area= 1.23 sf
   #4    Device 1   218.00'  15.0" Horiz. Orifice/Grate    C= 0.600
                             Limited to weir flow at low heads

Discarded OutFlow  Max=0.04 cfs @ 12.50 hrs  HW=219.27'   (Free Discharge)
└─1=Exfiltration  ( Controls 0.04 cfs)
   └─4=Orifice/Grate  (Passes 0.04 cfs of 6.66 cfs potential flow)

Primary OutFlow  Max=5.98 cfs @ 12.50 hrs  HW=219.27'   (Free Discharge)
└─3=Culvert  (Inlet Controls 5.98 cfs @ 4.87 fps)

Secondary OutFlow  Max=0.00 cfs @ 0.00 hrs  HW=217.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir  ( Controls 0.00 cfs)
```

Time span=0.00-120.00 hrs, dt=0.05 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Drainage Area 1AS Runoff Area=105,800 sf 11.05% Impervious Runoff Depth=4.05"
Flow Length=442' Tc=11.3 min CN=80 Runoff=9.58 cfs 0.820 af

Subcatchment 1B: Drainage Area 1BS Runoff Area=169,850 sf 4.75% Impervious Runoff Depth=3.95"
Flow Length=406' Tc=7.9 min CN=79 Runoff=16.64 cfs 1.283 af

Subcatchment 1C: Drainage Area 1CS Runoff Area=1,840,429 sf 19.45% Impervious Runoff Depth=4.16"
Flow Length=1,791' Tc=33.0 min CN=81 Runoff=110.73 cfs 14.640 af

Subcatchment 2A: Drainage Area 2AS Runoff Area=1,676,046 sf 4.04% Impervious Runoff Depth=2.30"
Flow Length=978' Tc=10.3 min CN=62 Runoff=85.78 cfs 7.369 af

Subcatchment 2B: Drainage Area 2BS Runoff Area=1,737,125 sf 6.49% Impervious Runoff Depth=2.03"
Flow Length=1,303' Tc=20.8 min CN=59 Runoff=59.15 cfs 6.756 af

Subcatchment 2C: Drainage Area 2C Runoff Area=114,590 sf 3.17% Impervious Runoff Depth=3.95"
Flow Length=689' Tc=9.1 min CN=79 Runoff=10.71 cfs 0.866 af

Subcatchment 2D: Drainage Area 2DS Runoff Area=122,541 sf 11.19% Impervious Runoff Depth=2.85"
Flow Length=588' Tc=10.5 min CN=68 Runoff=7.95 cfs 0.669 af

Subcatchment 2E: Drainage Area 2ES Runoff Area=235,462 sf 4.76% Impervious Runoff Depth=3.74"
Flow Length=630' Tc=11.6 min CN=77 Runoff=19.59 cfs 1.686 af

Subcatchment 2F: Drainage Area 2FAS Runoff Area=216,608 sf 16.14% Impervious Runoff Depth=3.54"
Tc=6.0 min CN=75 Runoff=20.23 cfs 1.467 af

Subcatchment 3A: Drainage Area 3AS Runoff Area=75,256 sf 13.26% Impervious Runoff Depth=2.66"
Flow Length=272' Tc=5.7 min CN=66 Runoff=5.27 cfs 0.384 af

Subcatchment 3B: Drainage Area 3BS Runoff Area=211,879 sf 13.71% Impervious Runoff Depth=3.85"
Flow Length=674' Tc=11.9 min CN=78 Runoff=17.93 cfs 1.559 af

Reach DP-1: Design Point 1 Inflow=122.10 cfs 16.635 af
Outflow=122.10 cfs 16.635 af

Reach DP-2: Design Point 2 Inflow=165.71 cfs 16.934 af
Outflow=165.71 cfs 16.934 af

Reach DP-3: Design Point 3 Inflow=9.90 cfs 1.310 af
Outflow=9.90 cfs 1.310 af

Pond 1AP: Swale 1A Peak Elev=258.45' Storage=2,847 cf Inflow=9.58 cfs 0.820 af
Outflow=9.30 cfs 0.783 af

Pond 1BP: Swale 1B Peak Elev=253.61' Storage=6,306 cf Inflow=16.64 cfs 1.283 af
Outflow=15.38 cfs 1.212 af

Pond 2.1AP: Basin 2.1A Peak Elev=177.23' Storage=30,203 cf Inflow=72.28 cfs 6.484 af
Outflow=67.47 cfs 6.039 af

Pond 2.1CP: Basin 2.1C Peak Elev=193.35' Storage=5,064 cf Inflow=10.64 cfs 0.787 af
Outflow=10.46 cfs 0.694 af

Pond 2AP: Basin 2A Peak Elev=177.69' Storage=59,597 cf Inflow=85.78 cfs 7.369 af
Outflow=72.28 cfs 6.484 af

Pond 2CP: Basin 2C Peak Elev=193.35' Storage=4,393 cf Inflow=10.71 cfs 0.866 af
Outflow=10.64 cfs 0.787 af

Pond 2DP: Swale 2D Peak Elev=156.11' Storage=6,163 cf Inflow=7.95 cfs 0.669 af
Outflow=8.59 cfs 0.555 af

Pond 2EP: Swale 2E Peak Elev=179.84' Storage=11,289 cf Inflow=19.59 cfs 1.686 af
Outflow=17.95 cfs 1.543 af

Pond 2FP: Swale 2F Peak Elev=137.93' Storage=10,040 cf Inflow=20.23 cfs 1.467 af
Outflow=17.69 cfs 1.349 af

Pond 3AP: Basin 3A Peak Elev=191.37' Storage=10,284 cf Inflow=9.83 cfs 1.907 af
Discarded=0.40 cfs 0.626 af Primary=8.69 cfs 1.281 af Outflow=9.09 cfs 1.907 af

Pond 3BP: Basin 3B Peak Elev=219.61' Storage=17,487 cf Inflow=17.93 cfs 1.559 af
Discarded=0.05 cfs 0.005 af Primary=6.58 cfs 1.523 af Secondary=1.84 cfs 0.030 af Outflow=8.46 cfs 1.559 af

Total Runoff Area = 149.348 ac Runoff Volume = 37.498 af Average Runoff Depth = 3.01"
89.84% Pervious = 134.179 ac 10.16% Impervious = 15.168 ac

Summary for Subcatchment 1A: Drainage Area 1AS

Runoff = 9.58 cfs @ 12.16 hrs, Volume= 0.820 af, Depth= 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
	94,109	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	11,691	98	Impervious
	105,800	80	Weighted Average
	94,109		88.95% Pervious Area
	11,691		11.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0300	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
4.3	392	0.0472	1.52		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
11.3	442	Total			

Summary for Subcatchment 1B: Drainage Area 1BS

Runoff = 16.64 cfs @ 12.11 hrs, Volume= 1.283 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
	161,780	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	8,070	98	Impervious
	169,850	79	Weighted Average
	161,780		95.25% Pervious Area
	8,070		4.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.9	161	0.0400	1.40		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
1.5	195	0.0974	2.18		**Shallow Concentrated Flow, SCF2** Short Grass Pasture Kv= 7.0 fps
7.9	406	Total			

Summary for Subcatchment 1C: Drainage Area 1CS

Runoff = 110.73 cfs @ 12.45 hrs, Volume= 14.640 af, Depth= 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	358,010	98	Water Body
*	0	70	Woods, Good, HSG C (Outside LOW)
*	1,425,016	77	Woods, Good, HSG D (Outside LOW)
*	0	89	Row crops, straight row, Good, HSG D (Outside LOW)
	57,403	78	Meadow, non-grazed, HSG D
	1,840,429	81	Weighted Average
	1,482,419		80.55% Pervious Area
	358,010		19.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
2.1	152	0.0592	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	356	0.0140	0.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	861	0.0534	1.16		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	372	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.0	1,791	Total			

Summary for Subcatchment 2A: Drainage Area 2AS

Runoff = 85.78 cfs @ 12.16 hrs, Volume= 7.369 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	6,347	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	64,687	70	Woods, Good, HSG C
	12,625	77	Woods, Good, HSG D
*	676,676	44	1/2 Meadow, non-grazed, HSG A
*	233,571	65	1/2 Meadow, non-grazed, HSG B
*	574,913	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	45,876	96	Gravel Road
*	61,351	98	Impervious
	1,676,046	62	Weighted Average
	1,608,348		95.96% Pervious Area
	67,698		4.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	90	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.9	370	0.0514	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	90	0.1667	2.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.5	240	0.0271	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	138	0.0616	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.3	978	Total			

Summary for Subcatchment 2B: Drainage Area 2BS

Runoff = 59.15 cfs @ 12.31 hrs, Volume= 6.756 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	98,260	98	Water Body
	313,898	30	Woods, Good, HSG A
	110,477	55	Woods, Good, HSG B
	188,496	70	Woods, Good, HSG C
	64,455	77	Woods, Good, HSG D
*	321,804	44	1/2 Meadow, non-grazed, HSG A
*	350,378	65	1/2 Meadow, non-grazed, HSG B
*	173,921	75	1/2 Meadow, non-grazed, HSG C
	79,419	78	Meadow, non-grazed, HSG D
*	21,559	96	Gravel Road
*	14,458	98	Impervious
	1,737,125	59	Weighted Average
	1,624,407		93.51% Pervious Area
	112,718		6.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	223	0.0628	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	325	0.0831	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0588	4.92		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	100	0.1500	2.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.4	466	0.0815	1.43		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	122	0.1475	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.8	1,303	Total			

Summary for Subcatchment 2C: Drainage Area 2C

Runoff = 10.71 cfs @ 12.13 hrs, Volume= 0.866 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
*	11,945	74	1/2 Woods, Good, HSG C
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
*	0	65	1/2 Meadow, non-grazed, HSG B
*	73,349	75	1/2 Meadow, non-grazed, HSG C
	10,711	78	Meadow, non-grazed, HSG D
*	14,947	96	Gravel Road
*	3,638	98	Impervious
	114,590	79	Weighted Average
	110,952		96.83% Pervious Area
	3,638		3.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.4	147	0.0612	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	76	0.0789	1.97		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.3	391	0.0358	2.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.1	689	Total			

Summary for Subcatchment 2D: Drainage Area 2DS

Runoff = 7.95 cfs @ 12.15 hrs, Volume= 0.669 af, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	37,233	44	1/2 Meadow, non-grazed, HSG A
*	11,167	65	1/2 Meadow, non-grazed, HSG B
*	57,454	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	2,977	96	Gravel Road
*	13,710	98	Impervious
	122,541	68	Weighted Average
	108,831		88.81% Pervious Area
	13,710		11.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
2.6	255	0.0549	1.64		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.7	200	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	83	0.0482	1.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.5	588	Total			

Summary for Subcatchment 2E: Drainage Area 2ES

Runoff = 19.59 cfs @ 12.16 hrs, Volume= 1.686 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	178,754	75	1/2 Meadow, non-grazed, HSG C
	36,455	78	Meadow, non-grazed, HSG D
*	9,048	96	Gravel Road
*	11,205	98	Impervious
	235,462	77	Weighted Average
	224,257		95.24% Pervious Area
	11,205		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
5.4	580	0.0655	1.79		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.6	630	Total			

Summary for Subcatchment 2F: Drainage Area 2FAS

Runoff = 20.23 cfs @ 12.09 hrs, Volume= 1.467 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
*	83,902	65	1/2 Meadow, non-grazed, HSG B
*	97,736	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	34,970	98	Impervious
	216,608	75	Weighted Average
	181,638		83.86% Pervious Area
	34,970		16.14% Impervious Area

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

Summary for Subcatchment 3A: Drainage Area 3AS

[49] Hint: Tc<2dt may require smaller dt

Runoff = 5.27 cfs @ 12.09 hrs, Volume= 0.384 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	5,010	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	28,672	44	1/2 Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	36,604	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	4,970	98	Impervious
	75,256	66	Weighted Average
	65,276		86.74% Pervious Area
	9,980		13.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.2800	0.29		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
0.4	48	0.0938	2.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	85	0.0235	1.07		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	89	0.0393	1.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	272	Total			

Summary for Subcatchment 3B: Drainage Area 3BS

Runoff = 17.93 cfs @ 12.17 hrs, Volume= 1.559 af, Depth= 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.30"

	Area (sf)	CN	Description
*	11,700	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	1,498	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	181,335	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	17,346	98	Impervious
	211,879	78	Weighted Average
	182,833		86.29% Pervious Area
	29,046		13.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
6.6	624	0.0513	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	674	Total			

Summary for Reach DP-1: Design Point 1

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =       48.578 ac,  17.85% Impervious,  Inflow Depth =   4.11"    for  50-yr event
Inflow      =      122.10 cfs @   12.43 hrs,  Volume=          16.635 af
Outflow     =      122.10 cfs @   12.43 hrs,  Volume=          16.635 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Design Point 2

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =       94.178 ac,   5.95% Impervious,  Inflow Depth =   2.16"    for  50-yr event
Inflow      =      165.71 cfs @   12.31 hrs,  Volume=          16.934 af
Outflow     =      165.71 cfs @   12.31 hrs,  Volume=          16.934 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Design Point 3

[40] Hint: Not Described (Outflow=Inflow)

```
Inflow Area =        6.592 ac,  13.59% Impervious,  Inflow Depth =   2.39"    for  50-yr event
Inflow      =        9.90 cfs @   12.43 hrs,  Volume=           1.310 af
Outflow     =        9.90 cfs @   12.43 hrs,  Volume=           1.310 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Pond 1AP: Swale 1A

```
Inflow Area =        2.429 ac,  11.05% Impervious,  Inflow Depth =   4.05"    for  50-yr event
Inflow      =        9.58 cfs @   12.16 hrs,  Volume=           0.820 af
Outflow     =        9.30 cfs @   12.19 hrs,  Volume=           0.783 af,  Atten= 3%,  Lag= 1.7 min
Primary     =        9.30 cfs @   12.19 hrs,  Volume=           0.783 af
```

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 258.45' @ 12.19 hrs Surf.Area= 3,026 sf Storage= 2,847 cf

Plug-Flow detention time= 41.8 min calculated for 0.783 af (95% of inflow)
Center-of-Mass det. time= 16.2 min (833.3 - 817.1)

Volume	Invert	Avail.Storage	Storage Description
#1	257.00'	4,741 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
257.00	921	0	0
258.00	2,356	1,639	1,639
259.00	3,848	3,102	4,741

Device	Routing	Invert	Outlet Devices
#1	Primary	258.00'	**12.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=9.18 cfs @ 12.19 hrs HW=258.45' (Free Discharge)
↰**1=Broad-Crested Rectangular Weir** (Weir Controls 9.18 cfs @ 1.72 fps)

Summary for Pond 1BP: Swale 1B

Inflow Area = 3.899 ac, 4.75% Impervious, Inflow Depth = 3.95" for 50-yr event
Inflow = 16.64 cfs @ 12.11 hrs, Volume= 1.283 af
Outflow = 15.38 cfs @ 12.16 hrs, Volume= 1.212 af, Atten= 8%, Lag= 2.6 min
Primary = 15.38 cfs @ 12.16 hrs, Volume= 1.212 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 253.61' @ 12.16 hrs Surf.Area= 6,101 sf Storage= 6,306 cf

Plug-Flow detention time= 50.4 min calculated for 1.212 af (94% of inflow)
Center-of-Mass det. time= 20.4 min (836.8 - 816.4)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	8,894 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
252.00	1,753	0	0
253.00	4,433	3,093	3,093
254.00	7,168	5,801	8,894

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	**12.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=15.22 cfs @ 12.16 hrs HW=253.61' (Free Discharge)
↰**1=Broad-Crested Rectangular Weir** (Weir Controls 15.22 cfs @ 2.09 fps)

Summary for Pond 2.1AP: Basin 2.1A

[79] Warning: Submerged Pond 2AP Primary device # 1 by 0.48'

Inflow Area = 38.477 ac, 4.04% Impervious, Inflow Depth = 2.02" for 50-yr event
Inflow = 72.28 cfs @ 12.24 hrs, Volume= 6.484 af
Outflow = 67.47 cfs @ 12.32 hrs, Volume= 6.039 af, Atten= 7%, Lag= 4.8 min
Primary = 67.47 cfs @ 12.32 hrs, Volume= 6.039 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 177.23' @ 12.32 hrs Surf.Area= 16,471 sf Storage= 30,203 cf

Plug-Flow detention time= 52.1 min calculated for 6.039 af (93% of inflow)
Center-of-Mass det. time= 16.6 min (905.1 - 888.5)

Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	43,620 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
174.00	4,835	529.0	0	0	4,835
175.00	7,004	555.0	5,886	5,886	7,142
176.00	9,275	580.0	8,113	13,999	9,471
177.00	15,837	681.0	12,411	26,410	19,625
178.00	18,621	706.0	17,210	43,620	22,470

Device	Routing	Invert	Outlet Devices
#1	Primary	176.50'	**40.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=65.39 cfs @ 12.32 hrs HW=177.22' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 65.39 cfs @ 2.27 fps)

Summary for Pond 2.1CP: Basin 2.1C

[81] Warning: Exceeded Pond 2CP by 0.02' @ 12.25 hrs

Inflow Area = 2.631 ac, 3.17% Impervious, Inflow Depth = 3.59" for 50-yr event
Inflow = 10.64 cfs @ 12.15 hrs, Volume= 0.787 af
Outflow = 10.46 cfs @ 12.17 hrs, Volume= 0.694 af, Atten= 2%, Lag= 1.1 min
Primary = 10.46 cfs @ 12.17 hrs, Volume= 0.694 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 193.35' @ 12.17 hrs Surf.Area= 3,015 sf Storage= 5,064 cf

Plug-Flow detention time= 75.7 min calculated for 0.694 af (88% of inflow)
Center-of-Mass det. time= 21.0 min (861.5 - 840.6)

Volume	Invert	Avail.Storage	Storage Description
#1	191.00'	7,200 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
191.00	1,375	200.0	0	0	1,375
192.00	2,019	228.0	1,687	1,687	2,352
193.00	2,746	256.0	2,373	4,060	3,458
194.00	3,552	279.0	3,140	7,200	4,473

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=10.21 cfs @ 12.17 hrs HW=193.34' (Free Discharge)
↰**1=Broad-Crested Rectangular Weir** (Weir Controls 10.21 cfs @ 1.49 fps)

Summary for Pond 2AP: Basin 2A

Inflow Area = 38.477 ac, 4.04% Impervious, Inflow Depth = 2.30" for 50-yr event
Inflow = 85.78 cfs @ 12.16 hrs, Volume= 7.369 af
Outflow = 72.28 cfs @ 12.24 hrs, Volume= 6.484 af, Atten= 16%, Lag= 4.9 min
Primary = 72.28 cfs @ 12.24 hrs, Volume= 6.484 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 177.69' @ 12.24 hrs Surf.Area= 24,573 sf Storage= 59,597 cf

Plug-Flow detention time= 86.0 min calculated for 6.481 af (88% of inflow)
Center-of-Mass det. time= 29.8 min (888.5 - 858.7)

Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	67,500 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
174.00	7,566	619.0	0	0	7,566
175.00	12,573	1,025.0	9,964	9,964	60,687
176.00	16,900	1,080.0	14,683	24,647	69,960
177.00	21,456	1,138.0	19,133	43,780	80,258
178.00	26,058	1,163.0	23,720	67,500	84,978

Device	Routing	Invert	Outlet Devices
#1	Primary	176.75'	**30.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=71.62 cfs @ 12.24 hrs HW=177.68' (Free Discharge)
↰**1=Broad-Crested Rectangular Weir** (Weir Controls 71.62 cfs @ 2.56 fps)

Summary for Pond 2CP: Basin 2C

Inflow Area = 2.631 ac, 3.17% Impervious, Inflow Depth = 3.95" for 50-yr event
Inflow = 10.71 cfs @ 12.13 hrs, Volume= 0.866 af
Outflow = 10.64 cfs @ 12.15 hrs, Volume= 0.787 af, Atten= 1%, Lag= 1.2 min
Primary = 10.64 cfs @ 12.15 hrs, Volume= 0.787 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 193.35' @ 12.15 hrs Surf.Area= 2,869 sf Storage= 4,393 cf

Plug-Flow detention time= 68.2 min calculated for 0.786 af (91% of inflow)
Center-of-Mass det. time= 23.1 min (840.6 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1	191.00'	6,442 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
191.00	897	238.0	0	0	897
192.00	1,740	263.0	1,295	1,295	1,925
193.00	2,568	288.0	2,141	3,436	3,055
194.00	3,467	309.0	3,006	6,442	4,096

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=10.63 cfs @ 12.15 hrs HW=193.35' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 10.63 cfs @ 1.51 fps)

Summary for Pond 2DP: Swale 2D

[93] Warning: Storage range exceeded by 0.11'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 2.813 ac, 11.19% Impervious, Inflow Depth = 2.85" for 50-yr event
Inflow = 7.95 cfs @ 12.15 hrs, Volume= 0.669 af
Outflow = 8.59 cfs @ 12.19 hrs, Volume= 0.555 af, Atten= 0%, Lag= 2.3 min
Primary = 8.59 cfs @ 12.19 hrs, Volume= 0.555 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 156.11' @ 12.19 hrs Surf.Area= 4,983 sf Storage= 6,163 cf

Plug-Flow detention time= 108.8 min calculated for 0.555 af (83% of inflow)
Center-of-Mass det. time= 36.9 min (881.6 - 844.6)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	6,163 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
154.00	1,208	0	0
155.00	3,067	2,138	2,138
156.00	4,983	4,025	6,163

Device	Routing	Invert	Outlet Devices
#1	Primary	155.75'	**15.0' long x 1.7' 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 Coef. (English) 2.59 2.63 2.63 2.65 2.71 2.80 2.86 3.00 2.99 2.96 3.20 3.27 3.32

Primary OutFlow Max=8.21 cfs @ 12.19 hrs HW=156.10' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 8.21 cfs @ 1.55 fps)

Summary for Pond 2EP: Swale 2E

Inflow Area = 5.405 ac, 4.76% Impervious, Inflow Depth = 3.74" for 50-yr event
Inflow = 19.59 cfs @ 12.16 hrs, Volume= 1.686 af
Outflow = 17.95 cfs @ 12.22 hrs, Volume= 1.543 af, Atten= 8%, Lag= 3.4 min
Primary = 17.95 cfs @ 12.22 hrs, Volume= 1.543 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 179.84' @ 12.22 hrs Surf.Area= 9,797 sf Storage= 11,289 cf

Plug-Flow detention time= 69.6 min calculated for 1.542 af (91% of inflow)
Center-of-Mass det. time= 27.0 min (851.7 - 824.7)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	12,956 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
178.00	2,529	0	0
179.00	6,464	4,497	4,497
180.00	10,454	8,459	12,956

Device	Routing	Invert	Outlet Devices
#1	Primary	179.25'	**15.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=17.68 cfs @ 12.22 hrs HW=179.83' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 17.68 cfs @ 2.03 fps)

Summary for Pond 2FP: Swale 2F

Inflow Area = 4.973 ac, 16.14% Impervious, Inflow Depth = 3.54" for 50-yr event
Inflow = 20.23 cfs @ 12.09 hrs, Volume= 1.467 af
Outflow = 17.69 cfs @ 12.14 hrs, Volume= 1.349 af, Atten= 13%, Lag= 3.0 min
Primary = 17.69 cfs @ 12.14 hrs, Volume= 1.349 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 137.93' @ 12.14 hrs Surf.Area= 8,359 sf Storage= 10,040 cf

Plug-Flow detention time= 66.7 min calculated for 1.349 af (92% of inflow)
Center-of-Mass det. time= 25.6 min (849.9 - 824.3)

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	10,648 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
136.00	2,094	0	0
137.00	5,303	3,699	3,699
138.00	8,595	6,949	10,648

Device	Routing	Invert	Outlet Devices
#1	Primary	137.25'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=17.48 cfs @ 12.14 hrs HW=137.92' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 17.48 cfs @ 2.59 fps)

Summary for Pond 3AP: Basin 3A

Inflow Area = 6.592 ac, 13.59% Impervious, Inflow Depth = 3.47" for 50-yr event
Inflow = 9.83 cfs @ 12.11 hrs, Volume= 1.907 af
Outflow = 9.09 cfs @ 12.21 hrs, Volume= 1.907 af, Atten= 8%, Lag= 5.6 min
Discarded = 0.40 cfs @ 12.21 hrs, Volume= 0.626 af
Primary = 8.69 cfs @ 12.21 hrs, Volume= 1.281 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 191.37' @ 12.21 hrs Surf.Area= 5,333 sf Storage= 10,284 cf

Plug-Flow detention time= 109.8 min calculated for 1.907 af (100% of inflow)
Center-of-Mass det. time= 109.8 min (971.9 - 862.1)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	13,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
189.00	3,417	241.0	0	0	3,417
190.00	4,189	264.0	3,796	3,796	4,375
191.00	5,010	283.0	4,593	8,390	5,246
192.00	5,917	302.0	5,457	13,847	6,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	189.00'	**1.715 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 187.00'
#2	Primary	191.00'	**15.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Discarded OutFlow Max=0.40 cfs @ 12.21 hrs HW=191.37' (Free Discharge)
└─**1=Exfiltration** (Controls 0.40 cfs)

Primary OutFlow Max=8.66 cfs @ 12.21 hrs HW=191.37' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 8.66 cfs @ 1.58 fps)

Summary for Pond 3BP: Basin 3B

Inflow Area = 4.864 ac, 13.71% Impervious, Inflow Depth = 3.85" for 50-yr event
Inflow = 17.93 cfs @ 12.17 hrs, Volume= 1.559 af
Outflow = 8.46 cfs @ 12.45 hrs, Volume= 1.559 af, Atten= 53%, Lag= 17.0 min
Discarded = 0.05 cfs @ 12.45 hrs, Volume= 0.005 af
Primary = 6.58 cfs @ 12.45 hrs, Volume= 1.523 af
Secondary = 1.84 cfs @ 12.45 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 219.61' @ 12.45 hrs Surf.Area= 9,889 sf Storage= 17,487 cf

Plug-Flow detention time= 42.0 min calculated for 1.559 af (100% of inflow)
Center-of-Mass det. time= 41.3 min (863.8 - 822.6)

Volume	Invert	Avail.Storage	Storage Description
#1	217.00'	21,536 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
217.00	3,600	466.0	0	0	3,600
218.00	6,070	593.0	4,782	4,782	14,316
219.00	8,292	622.0	7,152	11,934	17,185
220.00	10,975	657.0	9,602	21,536	20,804

Device	Routing	Invert	Outlet Devices
#1	Discarded	217.00'	**0.130 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 214.00'
#2	Secondary	219.50'	**20.0' long x 9.0' 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) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69
#3	Primary	217.00'	**15.0" Round Culvert** L= 37.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 217.00' / 214.00' S= 0.0811 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf
#4	Device 1	218.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 12.45 hrs HW=219.61' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.05 cfs)
  ↑—**4=Orifice/Grate** (Passes 0.05 cfs of 7.50 cfs potential flow)

Primary OutFlow Max=6.57 cfs @ 12.45 hrs HW=219.61' (Free Discharge)
↑—**3=Culvert** (Inlet Controls 6.57 cfs @ 5.36 fps)

Secondary OutFlow Max=1.83 cfs @ 12.45 hrs HW=219.61' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.83 cfs @ 0.82 fps)

Time span=0.00-120.00 hrs, dt=0.05 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Drainage Area 1AS Runoff Area=105,800 sf 11.05% Impervious Runoff Depth=4.60"
Flow Length=442' Tc=11.3 min CN=80 Runoff=10.84 cfs 0.932 af

Subcatchment 1B: Drainage Area 1BS Runoff Area=169,850 sf 4.75% Impervious Runoff Depth=4.49"
Flow Length=406' Tc=7.9 min CN=79 Runoff=18.88 cfs 1.460 af

Subcatchment 1C: Drainage Area 1CS Runoff Area=1,840,429 sf 19.45% Impervious Runoff Depth=4.71"
Flow Length=1,791' Tc=33.0 min CN=81 Runoff=125.10 cfs 16.591 af

Subcatchment 2A: Drainage Area 2AS Runoff Area=1,676,046 sf 4.04% Impervious Runoff Depth=2.73"
Flow Length=978' Tc=10.3 min CN=62 Runoff=103.01 cfs 8.746 af

Subcatchment 2B: Drainage Area 2BS Runoff Area=1,737,125 sf 6.49% Impervious Runoff Depth=2.44"
Flow Length=1,303' Tc=20.8 min CN=59 Runoff=72.13 cfs 8.098 af

Subcatchment 2C: Drainage Area 2C Runoff Area=114,590 sf 3.17% Impervious Runoff Depth=4.49"
Flow Length=689' Tc=9.1 min CN=79 Runoff=12.15 cfs 0.985 af

Subcatchment 2D: Drainage Area 2DS Runoff Area=122,541 sf 11.19% Impervious Runoff Depth=3.33"
Flow Length=588' Tc=10.5 min CN=68 Runoff=9.32 cfs 0.781 af

Subcatchment 2E: Drainage Area 2ES Runoff Area=235,462 sf 4.76% Impervious Runoff Depth=4.28"
Flow Length=630' Tc=11.6 min CN=77 Runoff=22.35 cfs 1.926 af

Subcatchment 2F: Drainage Area 2FAS Runoff Area=216,608 sf 16.14% Impervious Runoff Depth=4.06"
Tc=6.0 min CN=75 Runoff=23.18 cfs 1.683 af

Subcatchment 3A: Drainage Area 3AS Runoff Area=75,256 sf 13.26% Impervious Runoff Depth=3.13"
Flow Length=272' Tc=5.7 min CN=66 Runoff=6.21 cfs 0.450 af

Subcatchment 3B: Drainage Area 3BS Runoff Area=211,879 sf 13.71% Impervious Runoff Depth=4.38"
Flow Length=674' Tc=11.9 min CN=78 Runoff=20.41 cfs 1.777 af

Reach DP-1: Design Point 1 Inflow=137.90 cfs 18.874 af
Outflow=137.90 cfs 18.874 af

Reach DP-2: Design Point 2 Inflow=209.51 cfs 20.342 af
Outflow=209.51 cfs 20.342 af

Reach DP-3: Design Point 3 Inflow=14.12 cfs 1.582 af
Outflow=14.12 cfs 1.582 af

Pond 1AP: Swale 1A Peak Elev=258.48' Storage=2,956 cf Inflow=10.84 cfs 0.932 af
Outflow=10.54 cfs 0.894 af

Pond 1BP: Swale 1B Peak Elev=253.66' Storage=6,630 cf Inflow=18.88 cfs 1.460 af
Outflow=17.39 cfs 1.389 af

```
Pond 2.1AP: Basin 2.1A                         Peak Elev=177.38'  Storage=32,703 cf   Inflow=91.93 cfs  7.861 af
                                                                                     Outflow=88.62 cfs  7.416 af

Pond 2.1CP: Basin 2.1C                          Peak Elev=193.38'  Storage=5,156 cf   Inflow=12.09 cfs  0.906 af
                                                                                     Outflow=11.91 cfs  0.813 af

Pond 2AP: Basin 2A                            Peak Elev=177.85'  Storage=63,659 cf   Inflow=103.01 cfs  8.746 af
                                                                                     Outflow=91.93 cfs  7.861 af

Pond 2CP: Basin 2C                              Peak Elev=193.38'  Storage=4,480 cf   Inflow=12.15 cfs  0.985 af
                                                                                     Outflow=12.09 cfs  0.906 af

Pond 2DP: Swale 2D                               Peak Elev=156.17'  Storage=6,163 cf   Inflow=9.32 cfs  0.781 af
                                                                                     Outflow=10.87 cfs  0.666 af

Pond 2EP: Swale 2E                             Peak Elev=179.89'  Storage=11,813 cf   Inflow=22.35 cfs  1.926 af
                                                                                     Outflow=20.49 cfs  1.783 af

Pond 2FP: Swale 2F                             Peak Elev=137.99'  Storage=10,538 cf   Inflow=23.18 cfs  1.683 af
                                                                                     Outflow=20.45 cfs  1.565 af

Pond 3AP: Basin 3A                             Peak Elev=191.41'  Storage=10,503 cf   Inflow=11.15 cfs  2.116 af
                         Discarded=0.41 cfs  0.639 af   Primary=10.22 cfs  1.477 af   Outflow=10.63 cfs  2.116 af

Pond 3BP: Basin 3B                             Peak Elev=219.72'  Storage=18,584 cf   Inflow=20.41 cfs  1.777 af
Discarded=0.05 cfs  0.006 af   Primary=6.75 cfs  1.666 af   Secondary=5.13 cfs  0.106 af   Outflow=11.93 cfs  1.777 af
```

Total Runoff Area = 149.348 ac Runoff Volume = 43.429 af Average Runoff Depth = 3.49"
89.84% Pervious = 134.179 ac 10.16% Impervious = 15.168 ac

Summary for Subcatchment 1A: Drainage Area 1AS

Runoff = 10.84 cfs @ 12.16 hrs, Volume= 0.932 af, Depth= 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
	94,109	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	11,691	98	Impervious
	105,800	80	Weighted Average
	94,109		88.95% Pervious Area
	11,691		11.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0300	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
4.3	392	0.0472	1.52		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
11.3	442	Total			

Summary for Subcatchment 1B: Drainage Area 1BS

Runoff = 18.88 cfs @ 12.11 hrs, Volume= 1.460 af, Depth= 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
	161,780	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	8,070	98	Impervious
	169,850	79	Weighted Average
	161,780		95.25% Pervious Area
	8,070		4.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.9	161	0.0400	1.40		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
1.5	195	0.0974	2.18		**Shallow Concentrated Flow, SCF2** Short Grass Pasture Kv= 7.0 fps
7.9	406	Total			

Summary for Subcatchment 1C: Drainage Area 1CS

Runoff = 125.10 cfs @ 12.45 hrs, Volume= 16.591 af, Depth= 4.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	358,010	98	Water Body
*	0	70	Woods, Good, HSG C (Outside LOW)
*	1,425,016	77	Woods, Good, HSG D (Outside LOW)
*	0	89	Row crops, straight row, Good, HSG D (Outside LOW)
	57,403	78	Meadow, non-grazed, HSG D
	1,840,429	81	Weighted Average
	1,482,419		80.55% Pervious Area
	358,010		19.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
2.1	152	0.0592	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	356	0.0140	0.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	861	0.0534	1.16		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	372	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.0	1,791	Total			

Summary for Subcatchment 2A: Drainage Area 2AS

Runoff = 103.01 cfs @ 12.15 hrs, Volume= 8.746 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	6,347	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	64,687	70	Woods, Good, HSG C
	12,625	77	Woods, Good, HSG D
*	676,676	44	1/2 Meadow, non-grazed, HSG A
*	233,571	65	1/2 Meadow, non-grazed, HSG B
*	574,913	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	45,876	96	Gravel Road
*	61,351	98	Impervious
	1,676,046	62	Weighted Average
	1,608,348		95.96% Pervious Area
	67,698		4.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	90	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.9	370	0.0514	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	90	0.1667	2.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.5	240	0.0271	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	138	0.0616	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.3	978	Total			

Summary for Subcatchment 2B: Drainage Area 2BS

Runoff = 72.13 cfs @ 12.31 hrs, Volume= 8.098 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	98,260	98	Water Body
	313,898	30	Woods, Good, HSG A
	110,477	55	Woods, Good, HSG B
	188,496	70	Woods, Good, HSG C
	64,455	77	Woods, Good, HSG D
*	321,804	44	1/2 Meadow, non-grazed, HSG A
*	350,378	65	1/2 Meadow, non-grazed, HSG B
*	173,921	75	1/2 Meadow, non-grazed, HSG C
	79,419	78	Meadow, non-grazed, HSG D
*	21,559	96	Gravel Road
*	14,458	98	Impervious
	1,737,125	59	Weighted Average
	1,624,407		93.51% Pervious Area
	112,718		6.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	223	0.0628	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	325	0.0831	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0588	4.92		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	100	0.1500	2.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.4	466	0.0815	1.43		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	122	0.1475	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.8	1,303	Total			

Summary for Subcatchment 2C: Drainage Area 2C

Runoff = 12.15 cfs @ 12.13 hrs, Volume= 0.985 af, Depth= 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
*	11,945	74	1/2 Woods, Good, HSG C
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
*	0	65	1/2 Meadow, non-grazed, HSG B
*	73,349	75	1/2 Meadow, non-grazed, HSG C
	10,711	78	Meadow, non-grazed, HSG D
*	14,947	96	Gravel Road
*	3,638	98	Impervious
	114,590	79	Weighted Average
	110,952		96.83% Pervious Area
	3,638		3.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.4	147	0.0612	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	76	0.0789	1.97		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.3	391	0.0358	2.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.1	689	Total			

Summary for Subcatchment 2D: Drainage Area 2DS

Runoff = 9.32 cfs @ 12.15 hrs, Volume= 0.781 af, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	37,233	44	1/2 Meadow, non-grazed, HSG A
*	11,167	65	1/2 Meadow, non-grazed, HSG B
*	57,454	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	2,977	96	Gravel Road
*	13,710	98	Impervious
	122,541	68	Weighted Average
	108,831		88.81% Pervious Area
	13,710		11.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
2.6	255	0.0549	1.64		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.7	200	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	83	0.0482	1.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.5	588	Total			

Summary for Subcatchment 2E: Drainage Area 2ES

Runoff = 22.35 cfs @ 12.16 hrs, Volume= 1.926 af, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	178,754	75	1/2 Meadow, non-grazed, HSG C
	36,455	78	Meadow, non-grazed, HSG D
*	9,048	96	Gravel Road
*	11,205	98	Impervious
	235,462	77	Weighted Average
	224,257		95.24% Pervious Area
	11,205		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
5.4	580	0.0655	1.79		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.6	630	Total			

Summary for Subcatchment 2F: Drainage Area 2FAS

Runoff = 23.18 cfs @ 12.09 hrs, Volume= 1.683 af, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	0	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
*	83,902	65	1/2 Meadow, non-grazed, HSG B
*	97,736	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	34,970	98	Impervious
	216,608	75	Weighted Average
	181,638		83.86% Pervious Area
	34,970		16.14% Impervious Area

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

Summary for Subcatchment 3A: Drainage Area 3AS

[49] Hint: Tc<2dt may require smaller dt

Runoff = 6.21 cfs @ 12.09 hrs, Volume= 0.450 af, Depth= 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	5,010	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	28,672	44	1/2 Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	36,604	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	4,970	98	Impervious
	75,256	66	Weighted Average
	65,276		86.74% Pervious Area
	9,980		13.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.2800	0.29		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
0.4	48	0.0938	2.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	85	0.0235	1.07		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	89	0.0393	1.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	272	Total			

Summary for Subcatchment 3B: Drainage Area 3BS

Runoff = 20.41 cfs @ 12.16 hrs, Volume= 1.777 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.90"

	Area (sf)	CN	Description
*	11,700	98	Water Body
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	1,498	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
	0	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
*	181,335	75	1/2 Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	0	96	Gravel Road
*	17,346	98	Impervious
	211,879	78	Weighted Average
	182,833		86.29% Pervious Area
	29,046		13.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
6.6	624	0.0513	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	674	Total			

Summary for Reach DP-1: Design Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 48.578 ac, 17.85% Impervious, Inflow Depth = 4.66" for 100-yr event
Inflow = 137.90 cfs @ 12.42 hrs, Volume= 18.874 af
Outflow = 137.90 cfs @ 12.42 hrs, Volume= 18.874 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Design Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 94.178 ac, 5.95% Impervious, Inflow Depth = 2.59" for 100-yr event
Inflow = 209.51 cfs @ 12.26 hrs, Volume= 20.342 af
Outflow = 209.51 cfs @ 12.26 hrs, Volume= 20.342 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Design Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.592 ac, 13.59% Impervious, Inflow Depth = 2.88" for 100-yr event
Inflow = 14.12 cfs @ 12.36 hrs, Volume= 1.582 af
Outflow = 14.12 cfs @ 12.36 hrs, Volume= 1.582 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Pond 1AP: Swale 1A

Inflow Area = 2.429 ac, 11.05% Impervious, Inflow Depth = 4.60" for 100-yr event
Inflow = 10.84 cfs @ 12.16 hrs, Volume= 0.932 af
Outflow = 10.54 cfs @ 12.18 hrs, Volume= 0.894 af, Atten= 3%, Lag= 1.7 min
Primary = 10.54 cfs @ 12.18 hrs, Volume= 0.894 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 258.48' @ 12.18 hrs Surf.Area= 3,079 sf Storage= 2,956 cf

Plug-Flow detention time= 38.3 min calculated for 0.894 af (96% of inflow)
Center-of-Mass det. time= 15.3 min (828.8 - 813.5)

Volume	Invert	Avail.Storage	Storage Description
#1	257.00'	4,741 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
257.00	921	0	0
258.00	2,356	1,639	1,639
259.00	3,848	3,102	4,741

Device	Routing	Invert	Outlet Devices
#1	Primary	258.00'	**12.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=10.39 cfs @ 12.18 hrs HW=258.48' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 10.39 cfs @ 1.80 fps)

Summary for Pond 1BP: Swale 1B

Inflow Area = 3.899 ac, 4.75% Impervious, Inflow Depth = 4.49" for 100-yr event
Inflow = 18.88 cfs @ 12.11 hrs, Volume= 1.460 af
Outflow = 17.39 cfs @ 12.16 hrs, Volume= 1.389 af, Atten= 8%, Lag= 2.6 min
Primary = 17.39 cfs @ 12.16 hrs, Volume= 1.389 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 253.66' @ 12.16 hrs Surf.Area= 6,245 sf Storage= 6,630 cf

Plug-Flow detention time= 46.2 min calculated for 1.388 af (95% of inflow)
Center-of-Mass det. time= 19.3 min (832.1 - 812.7)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	8,894 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
252.00	1,753	0	0
253.00	4,433	3,093	3,093
254.00	7,168	5,801	8,894

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	**12.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=17.23 cfs @ 12.16 hrs HW=253.66' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 17.23 cfs @ 2.18 fps)

Summary for Pond 2.1AP: Basin 2.1A

[79] Warning: Submerged Pond 2AP Primary device # 1 by 0.62'

Inflow Area = 38.477 ac, 4.04% Impervious, Inflow Depth = 2.45" for 100-yr event
Inflow = 91.93 cfs @ 12.22 hrs, Volume= 7.861 af
Outflow = 88.62 cfs @ 12.27 hrs, Volume= 7.416 af, Atten= 4%, Lag= 3.2 min
Primary = 88.62 cfs @ 12.27 hrs, Volume= 7.416 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 177.38' @ 12.27 hrs Surf.Area= 16,882 sf Storage= 32,703 cf

Plug-Flow detention time= 43.6 min calculated for 7.413 af (94% of inflow)
Center-of-Mass det. time= 13.7 min (893.3 - 879.6)

Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	43,620 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
174.00	4,835	529.0	0	0	4,835
175.00	7,004	555.0	5,886	5,886	7,142
176.00	9,275	580.0	8,113	13,999	9,471
177.00	15,837	681.0	12,411	26,410	19,625
178.00	18,621	706.0	17,210	43,620	22,470

Device	Routing	Invert	Outlet Devices
#1	Primary	176.50'	**40.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=85.90 cfs @ 12.27 hrs HW=177.37' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 85.90 cfs @ 2.48 fps)

Summary for Pond 2.1CP: Basin 2.1C

[81] Warning: Exceeded Pond 2CP by 0.02' @ 12.25 hrs

Inflow Area = 2.631 ac, 3.17% Impervious, Inflow Depth = 4.13" for 100-yr event
Inflow = 12.09 cfs @ 12.15 hrs, Volume= 0.906 af
Outflow = 11.91 cfs @ 12.17 hrs, Volume= 0.813 af, Atten= 1%, Lag= 1.1 min
Primary = 11.91 cfs @ 12.17 hrs, Volume= 0.813 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 193.38' @ 12.17 hrs Surf.Area= 3,039 sf Storage= 5,156 cf

Plug-Flow detention time= 68.0 min calculated for 0.813 af (90% of inflow)
Center-of-Mass det. time= 18.7 min (854.3 - 835.6)

Volume	Invert	Avail.Storage	Storage Description
#1	191.00'	7,200 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
191.00	1,375	200.0	0	0	1,375
192.00	2,019	228.0	1,687	1,687	2,352
193.00	2,746	256.0	2,373	4,060	3,458
194.00	3,552	279.0	3,140	7,200	4,473

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=11.63 cfs @ 12.17 hrs HW=193.37' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 11.63 cfs @ 1.56 fps)

Summary for Pond 2AP: Basin 2A

Inflow Area = 38.477 ac, 4.04% Impervious, Inflow Depth = 2.73" for 100-yr event
Inflow = 103.01 cfs @ 12.15 hrs, Volume= 8.746 af
Outflow = 91.93 cfs @ 12.22 hrs, Volume= 7.861 af, Atten= 11%, Lag= 3.8 min
Primary = 91.93 cfs @ 12.22 hrs, Volume= 7.861 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 177.85' @ 12.22 hrs Surf.Area= 25,342 sf Storage= 63,659 cf

Plug-Flow detention time= 75.4 min calculated for 7.861 af (90% of inflow)
Center-of-Mass det. time= 26.0 min (879.6 - 853.6)

Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	67,500 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
174.00	7,566	619.0	0	0	7,566
175.00	12,573	1,025.0	9,964	9,964	60,687
176.00	16,900	1,080.0	14,683	24,647	69,960
177.00	21,456	1,138.0	19,133	43,780	80,258
178.00	26,058	1,163.0	23,720	67,500	84,978

Device	Routing	Invert	Outlet Devices
#1	Primary	176.75'	**30.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=90.28 cfs @ 12.22 hrs HW=177.84' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 90.28 cfs @ 2.77 fps)

Summary for Pond 2CP: Basin 2C

Inflow Area = 2.631 ac, 3.17% Impervious, Inflow Depth = 4.49" for 100-yr event
Inflow = 12.15 cfs @ 12.13 hrs, Volume= 0.985 af
Outflow = 12.09 cfs @ 12.15 hrs, Volume= 0.906 af, Atten= 1%, Lag= 1.2 min
Primary = 12.09 cfs @ 12.15 hrs, Volume= 0.906 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 193.38' @ 12.15 hrs Surf.Area= 2,896 sf Storage= 4,480 cf

Plug-Flow detention time= 62.5 min calculated for 0.906 af (92% of inflow)
Center-of-Mass det. time= 21.7 min (835.6 - 813.9)

Volume	Invert	Avail.Storage	Storage Description
#1	191.00'	6,442 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
191.00	897	238.0	0	0	897
192.00	1,740	263.0	1,295	1,295	1,925
193.00	2,568	288.0	2,141	3,436	3,055
194.00	3,467	309.0	3,006	6,442	4,096

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=12.06 cfs @ 12.15 hrs HW=193.38' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 12.06 cfs @ 1.58 fps)

Summary for Pond 2DP: Swale 2D

[93] Warning: Storage range exceeded by 0.17'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 2.813 ac, 11.19% Impervious, Inflow Depth = 3.33" for 100-yr event
Inflow = 9.32 cfs @ 12.15 hrs, Volume= 0.781 af
Outflow = 10.87 cfs @ 12.15 hrs, Volume= 0.666 af, Atten= 0%, Lag= 0.0 min
Primary = 10.87 cfs @ 12.15 hrs, Volume= 0.666 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 156.17' @ 12.15 hrs Surf.Area= 4,983 sf Storage= 6,163 cf

Plug-Flow detention time= 96.6 min calculated for 0.666 af (85% of inflow)
Center-of-Mass det. time= 32.3 min (872.5 - 840.1)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	6,163 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
154.00	1,208	0	0
155.00	3,067	2,138	2,138
156.00	4,983	4,025	6,163

Device	Routing	Invert	Outlet Devices
#1	Primary	155.75'	**15.0' long x 1.7' 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 Coef. (English) 2.59 2.63 2.63 2.65 2.71 2.80 2.86 3.00 2.99 2.96 3.20 3.27 3.32

Primary OutFlow Max=10.82 cfs @ 12.15 hrs HW=156.17' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 10.82 cfs @ 1.71 fps)

Summary for Pond 2EP: Swale 2E

Inflow Area = 5.405 ac, 4.76% Impervious, Inflow Depth = 4.28" for 100-yr event
Inflow = 22.35 cfs @ 12.16 hrs, Volume= 1.926 af
Outflow = 20.49 cfs @ 12.22 hrs, Volume= 1.783 af, Atten= 8%, Lag= 3.3 min
Primary = 20.49 cfs @ 12.22 hrs, Volume= 1.783 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 179.89' @ 12.22 hrs Surf.Area= 10,008 sf Storage= 11,813 cf

Plug-Flow detention time= 64.1 min calculated for 1.783 af (93% of inflow)
Center-of-Mass det. time= 25.4 min (846.3 - 820.9)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	12,956 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
178.00	2,529	0	0
179.00	6,464	4,497	4,497
180.00	10,454	8,459	12,956

Device	Routing	Invert	Outlet Devices
#1	Primary	179.25'	**15.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=20.21 cfs @ 12.22 hrs HW=179.88' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 20.21 cfs @ 2.13 fps)

Summary for Pond 2FP: Swale 2F

Inflow Area = 4.973 ac, 16.14% Impervious, Inflow Depth = 4.06" for 100-yr event
Inflow = 23.18 cfs @ 12.09 hrs, Volume= 1.683 af
Outflow = 20.45 cfs @ 12.14 hrs, Volume= 1.565 af, Atten= 12%, Lag= 2.9 min
Primary = 20.45 cfs @ 12.14 hrs, Volume= 1.565 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 137.99' @ 12.14 hrs Surf.Area= 8,553 sf Storage= 10,538 cf

Plug-Flow detention time= 60.8 min calculated for 1.565 af (93% of inflow)
Center-of-Mass det. time= 24.1 min (844.4 - 820.3)

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	10,648 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
136.00	2,094	0	0
137.00	5,303	3,699	3,699
138.00	8,595	6,949	10,648

Device	Routing	Invert	Outlet Devices
#1	Primary	137.25'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=20.14 cfs @ 12.14 hrs HW=137.98' (Free Discharge)
↑└─**1=Broad-Crested Rectangular Weir** (Weir Controls 20.14 cfs @ 2.76 fps)

Summary for Pond 3AP: Basin 3A

Inflow Area = 6.592 ac, 13.59% Impervious, Inflow Depth = 3.85" for 100-yr event
Inflow = 11.15 cfs @ 12.11 hrs, Volume= 2.116 af
Outflow = 10.63 cfs @ 12.16 hrs, Volume= 2.116 af, Atten= 5%, Lag= 3.2 min
Discarded = 0.41 cfs @ 12.16 hrs, Volume= 0.639 af
Primary = 10.22 cfs @ 12.16 hrs, Volume= 1.477 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 191.41' @ 12.16 hrs Surf.Area= 5,370 sf Storage= 10,503 cf

Plug-Flow detention time= 101.2 min calculated for 2.115 af (100% of inflow)
Center-of-Mass det. time= 101.2 min (961.3 - 860.1)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	13,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
189.00	3,417	241.0	0	0	3,417
190.00	4,189	264.0	3,796	3,796	4,375
191.00	5,010	283.0	4,593	8,390	5,246
192.00	5,917	302.0	5,457	13,847	6,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	189.00'	**1.715 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 187.00'
#2	Primary	191.00'	**15.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Discarded OutFlow Max=0.41 cfs @ 12.16 hrs HW=191.40' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.41 cfs)

Primary OutFlow Max=10.12 cfs @ 12.16 hrs HW=191.40' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 10.12 cfs @ 1.67 fps)

Summary for Pond 3BP: Basin 3B

Inflow Area = 4.864 ac, 13.71% Impervious, Inflow Depth = 4.38" for 100-yr event
Inflow = 20.41 cfs @ 12.16 hrs, Volume= 1.777 af
Outflow = 11.93 cfs @ 12.37 hrs, Volume= 1.777 af, Atten= 42%, Lag= 12.3 min
Discarded = 0.05 cfs @ 12.37 hrs, Volume= 0.006 af
Primary = 6.75 cfs @ 12.37 hrs, Volume= 1.666 af
Secondary = 5.13 cfs @ 12.37 hrs, Volume= 0.106 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 219.72' @ 12.37 hrs Surf.Area= 10,189 sf Storage= 18,584 cf

Plug-Flow detention time= 38.6 min calculated for 1.776 af (100% of inflow)
Center-of-Mass det. time= 39.2 min (858.0 - 818.8)

Volume	Invert	Avail.Storage	Storage Description
#1	217.00'	21,536 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
217.00	3,600	466.0	0	0	3,600
218.00	6,070	593.0	4,782	4,782	14,316
219.00	8,292	622.0	7,152	11,934	17,185
220.00	10,975	657.0	9,602	21,536	20,804

Device	Routing	Invert	Outlet Devices
#1	Discarded	217.00'	**0.130 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 214.00'
#2	Secondary	219.50'	**20.0' long x 9.0' 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

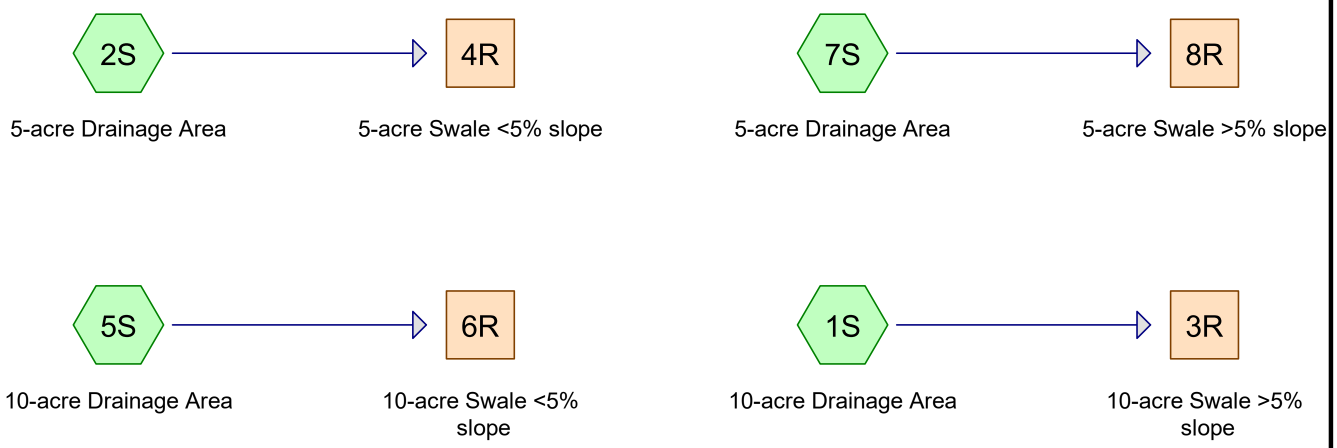
			Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69
#3	Primary	217.00'	**15.0" Round Culvert** L= 37.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 217.00' / 214.00' S= 0.0811 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf
#4	Device 1	218.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

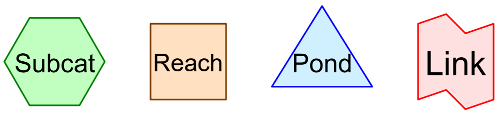
Discarded OutFlow Max=0.05 cfs @ 12.37 hrs HW=219.72' (Free Discharge)
└─**1=Exfiltration** (Controls 0.05 cfs)
  └─**4=Orifice/Grate** (Passes 0.05 cfs of 7.74 cfs potential flow)

Primary OutFlow Max=6.75 cfs @ 12.37 hrs HW=219.72' (Free Discharge)
└─**3=Culvert** (Inlet Controls 6.75 cfs @ 5.50 fps)

Secondary OutFlow Max=4.95 cfs @ 12.37 hrs HW=219.72' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 4.95 cfs @ 1.15 fps)

Temporary Swale Design Hydrology





Routing Diagram for Temp Swale Design Calcs

Prepared by Tighe & Bond, Printed 3/19/2020

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
30.000	82	Dirt roads, HSG B (1S, 2S, 5S, 7S)
30.000	**82**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
30.000	HSG B	1S, 2S, 5S, 7S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
30.000		**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	30.000	0.000	0.000	0.000	30.000	Dirt roads	1S, 2S, 5S, 7S
0.000	**30.000**	**0.000**	**0.000**	**0.000**	**30.000**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 10-acre Drainage Area Runoff Area=10.000 ac 0.00% Impervious Runoff Depth>2.63"
Tc=6.0 min CN=82 Runoff=32.26 cfs 2.192 af

Subcatchment 2S: 5-acre Drainage Area Runoff Area=5.000 ac 0.00% Impervious Runoff Depth>2.63"
Tc=6.0 min CN=82 Runoff=16.13 cfs 1.096 af

Subcatchment 5S: 10-acre Drainage Area Runoff Area=10.000 ac 0.00% Impervious Runoff Depth>2.63"
Tc=6.0 min CN=82 Runoff=32.26 cfs 2.192 af

Subcatchment 7S: 5-acre Drainage Area Runoff Area=5.000 ac 0.00% Impervious Runoff Depth>2.63"
Tc=6.0 min CN=82 Runoff=16.13 cfs 1.096 af

Reach 3R: 10-acre Swale >5% slope Avg. Flow Depth=0.81' Max Vel=7.35 fps Inflow=32.26 cfs 2.192 af
n=0.030 L=100.0' S=0.0500 '/' Capacity=49.53 cfs Outflow=32.00 cfs 2.191 af

Reach 4R: 5-acre Swale <5% slope Avg. Flow Depth=0.92' Max Vel=2.59 fps Inflow=16.13 cfs 1.096 af
n=0.030 L=100.0' S=0.0050 '/' Capacity=18.92 cfs Outflow=15.68 cfs 1.095 af

Reach 6R: 10-acre Swale <5% slope Avg. Flow Depth=1.41' Max Vel=3.16 fps Inflow=32.26 cfs 2.192 af
n=0.030 L=100.0' S=0.0050 '/' Capacity=36.76 cfs Outflow=31.55 cfs 2.190 af

Reach 8R: 5-acre Swale >5% slope Avg. Flow Depth=0.77' Max Vel=6.35 fps Inflow=16.13 cfs 1.096 af
n=0.030 L=100.0' S=0.0500 '/' Capacity=29.60 cfs Outflow=15.98 cfs 1.096 af

Total Runoff Area = 30.000 ac Runoff Volume = 6.576 af Average Runoff Depth = 2.63"
100.00% Pervious = 30.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: 10-acre Drainage Area

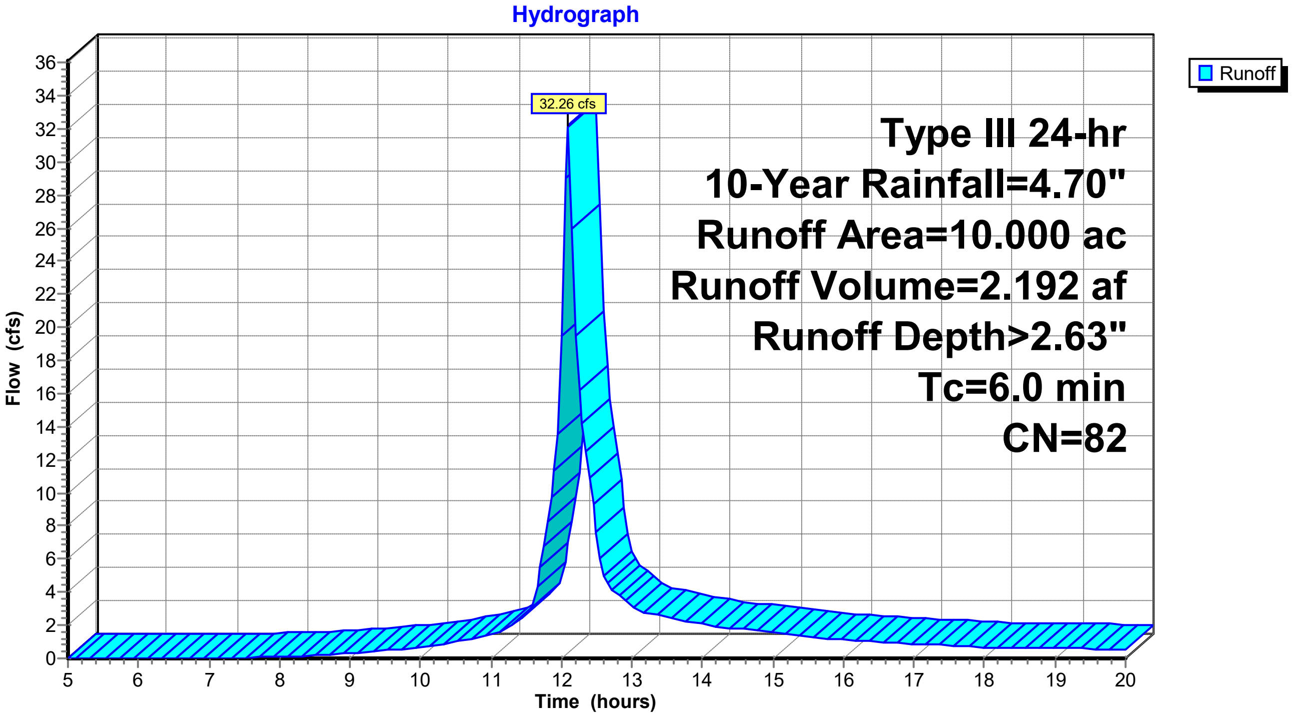
Runoff = 32.26 cfs @ 12.09 hrs, Volume= 2.192 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
10.000	82	Dirt roads, HSG B
10.000		100.00% Pervious Area

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

Subcatchment 1S: 10-acre Drainage Area



Summary for Subcatchment 2S: 5-acre Drainage Area

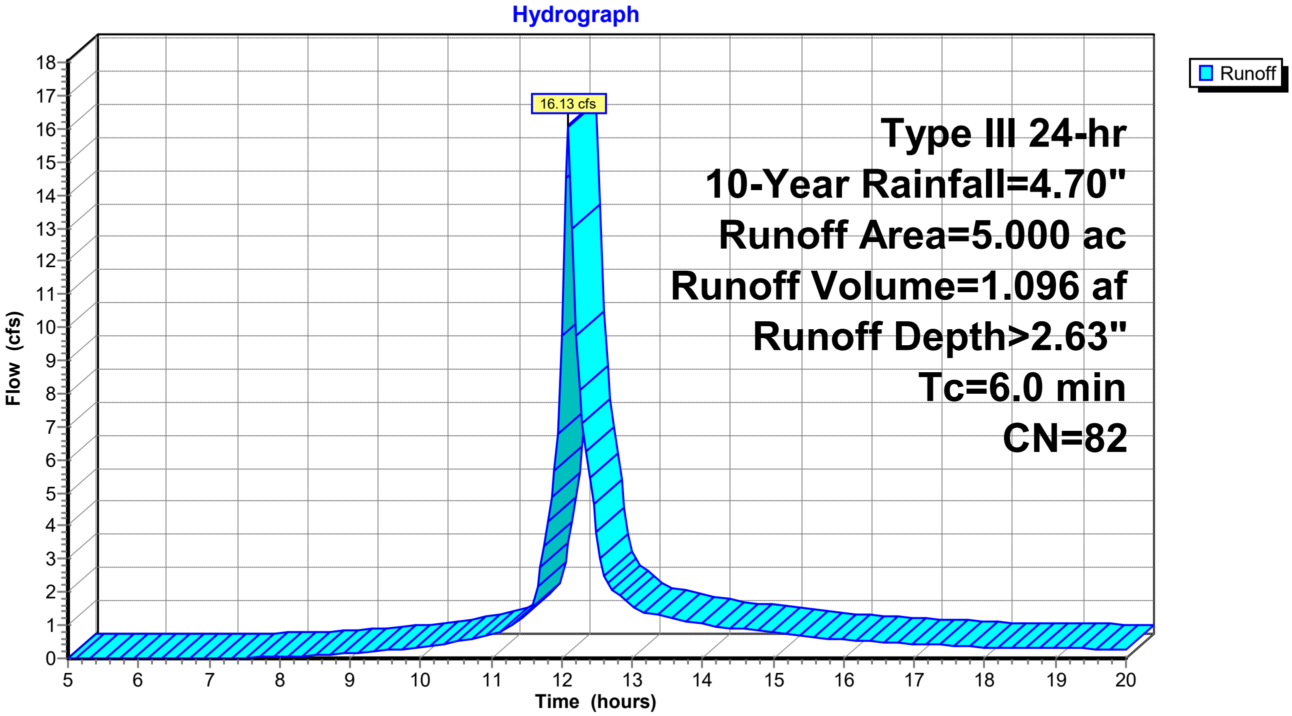
Runoff = 16.13 cfs @ 12.09 hrs, Volume= 1.096 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
5.000	82	Dirt roads, HSG B
5.000		100.00% Pervious Area

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

Subcatchment 2S: 5-acre Drainage Area



Summary for Subcatchment 5S: 10-acre Drainage Area

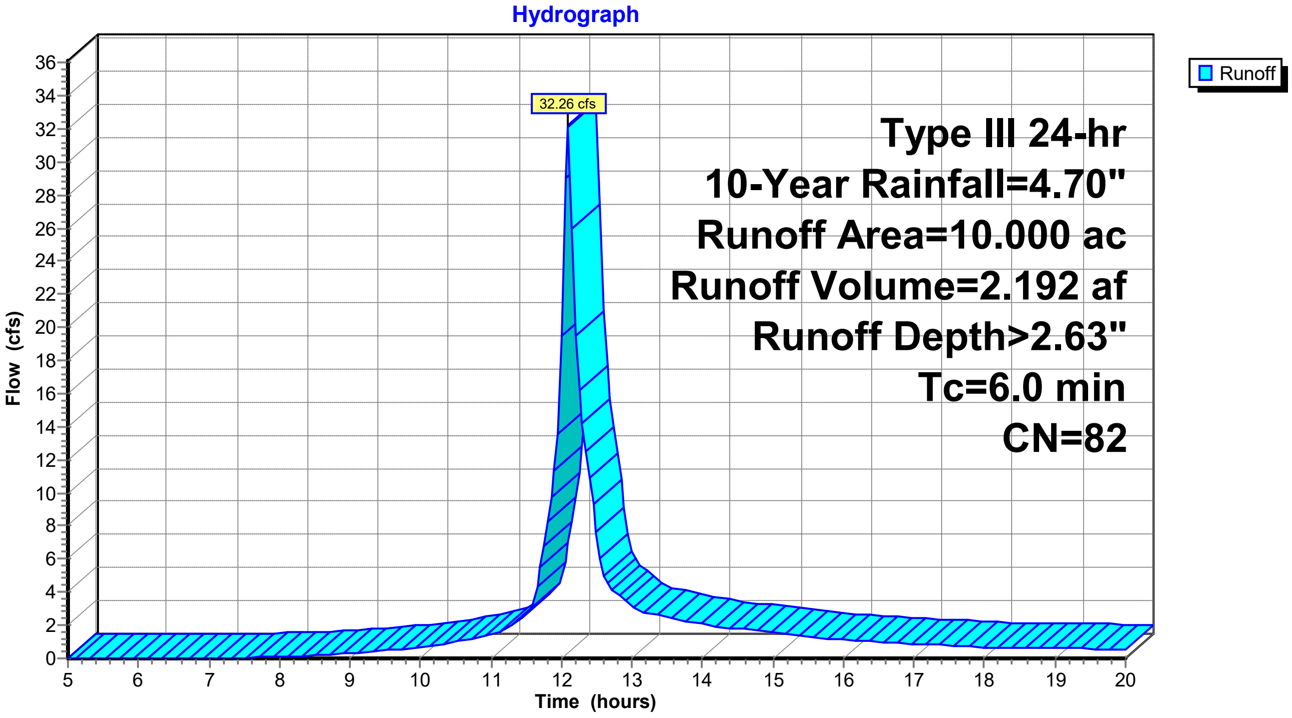
Runoff = 32.26 cfs @ 12.09 hrs, Volume= 2.192 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
10.000	82	Dirt roads, HSG B
10.000		100.00% Pervious Area

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

Subcatchment 5S: 10-acre Drainage Area



Summary for Subcatchment 7S: 5-acre Drainage Area

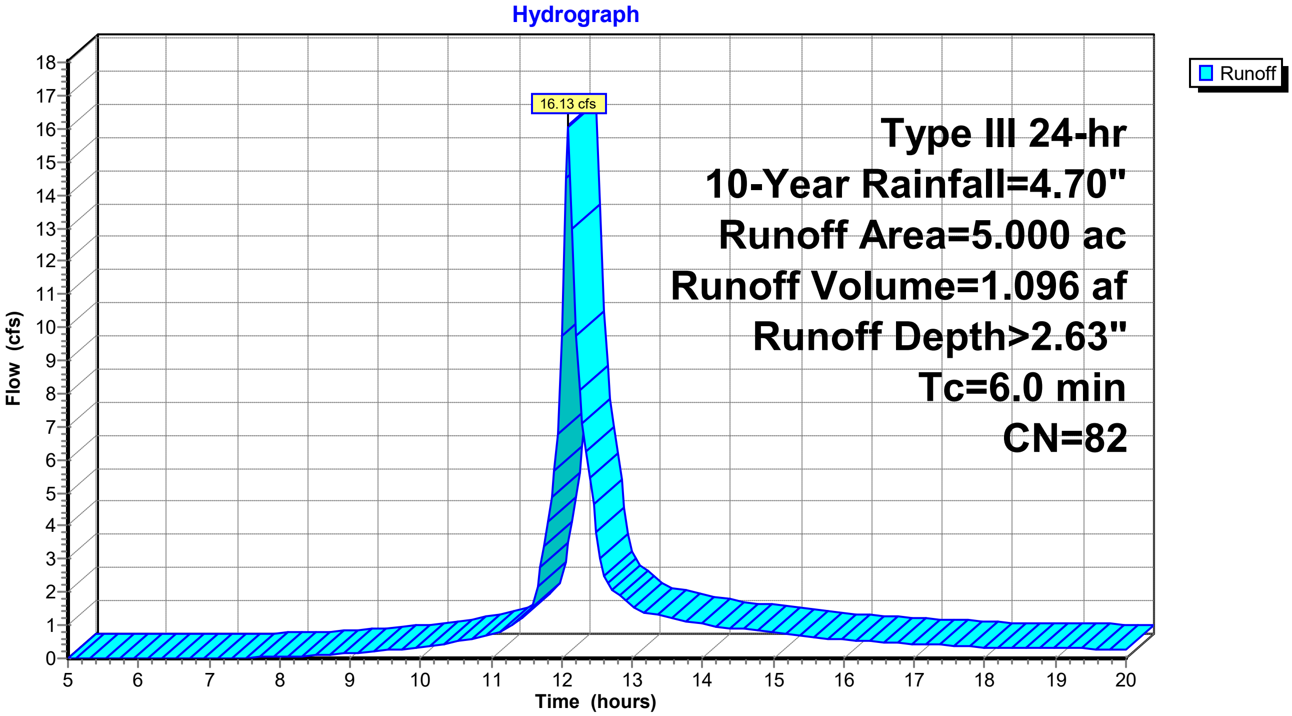
Runoff = 16.13 cfs @ 12.09 hrs, Volume= 1.096 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
5.000	82	Dirt roads, HSG B
5.000		100.00% Pervious Area

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

Subcatchment 7S: 5-acre Drainage Area



Summary for Reach 3R: 10-acre Swale >5% slope

Inflow Area = 10.000 ac, 0.00% Impervious, Inflow Depth > 2.63" for 10-Year event
Inflow = 32.26 cfs @ 12.09 hrs, Volume= 2.192 af
Outflow = 32.00 cfs @ 12.10 hrs, Volume= 2.191 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.35 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 0.6 min

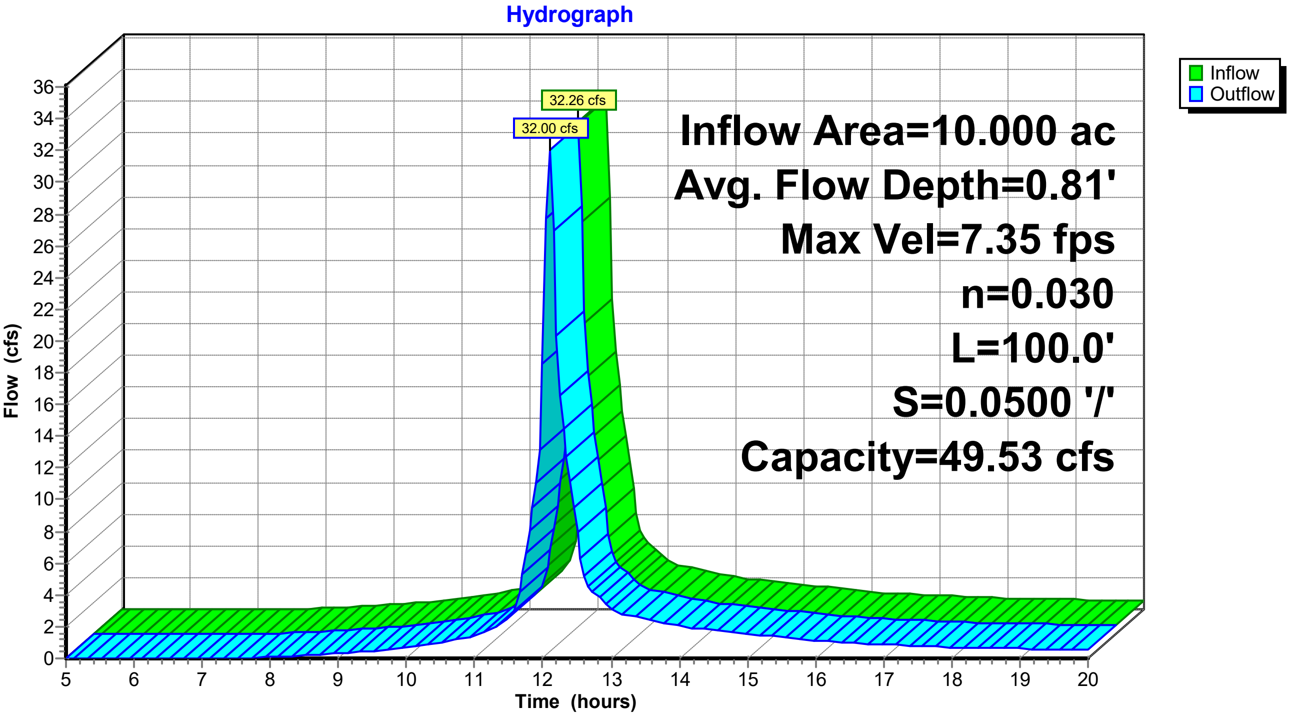
Peak Storage= 440 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 49.53 cfs

Custom cross-section, Length= 100.0' Slope= 0.0500 '/'
Constant n= 0.030 Short grass
Inlet Invert= 5.00', Outlet Invert= 0.00'

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
3.00	-1.00	1.00
6.00	-1.00	1.00
9.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	3.0	0	0.00
1.00	6.0	9.3	600	49.53

Reach 3R: 10-acre Swale >5% slope



Summary for Reach 4R: 5-acre Swale <5% slope

```
Inflow Area =        5.000 ac,   0.00% Impervious,  Inflow Depth >   2.63"    for  10-Year event
Inflow      =       16.13 cfs @  12.09 hrs,  Volume=            1.096 af
Outflow     =       15.68 cfs @  12.11 hrs,  Volume=            1.095 af,  Atten= 3%,  Lag= 1.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.59 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 1.9 min

Peak Storage= 624 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.92'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 18.92 cfs

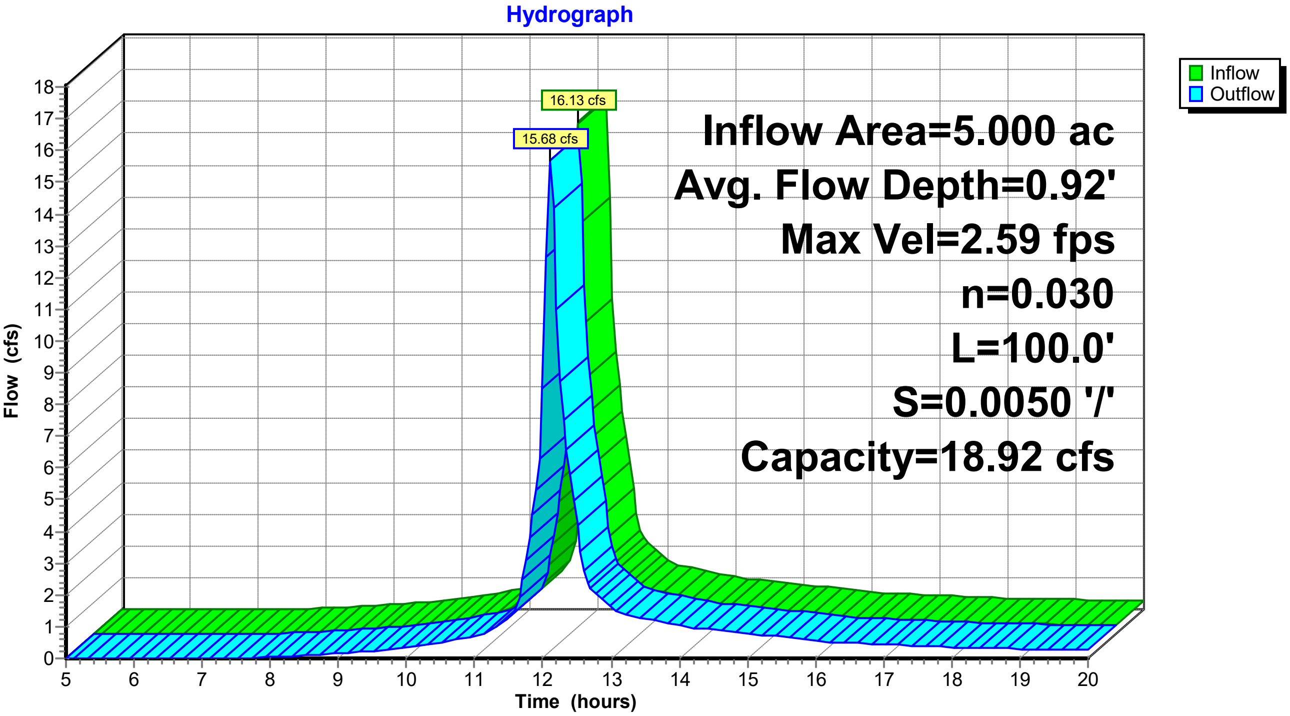
Custom cross-section, Length= 100.0' Slope= 0.0050 '/'
Constant n= 0.030 Short grass
Inlet Invert= 0.50', Outlet Invert= 0.00'


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
3.00	-1.00	1.00
7.00	-1.00	1.00
10.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	4.0	0	0.00
1.00	7.0	10.3	700	18.92

Reach 4R: 5-acre Swale <5% slope



Summary for Reach 6R: 10-acre Swale <5% slope

```
Inflow Area =        10.000 ac,    0.00% Impervious,  Inflow Depth >   2.63"    for  10-Year event
Inflow       =       32.26 cfs @   12.09 hrs,  Volume=            2.192 af
Outflow      =       31.55 cfs @   12.11 hrs,  Volume=            2.190 af,  Atten= 2%,  Lag= 0.8 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.16 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 1.4 min

Peak Storage= 1,023 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 36.76 cfs

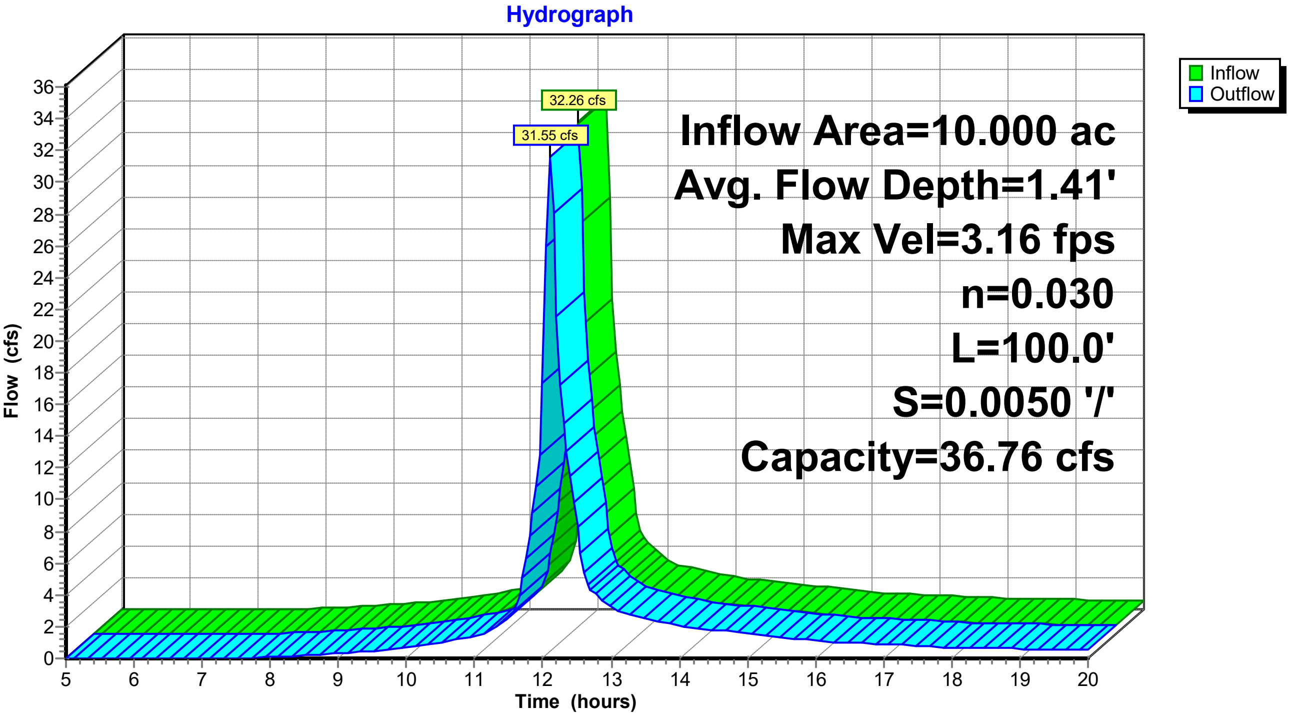
Custom cross-section, Length= 100.0' Slope= 0.0050 '/'
Constant n= 0.030 Short grass
Inlet Invert= 0.50', Outlet Invert= 0.00'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
4.50	-1.50	1.50
7.50	-1.50	1.50
12.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	3.0	0	0.00
1.50	11.3	12.5	1,125	36.76

Reach 6R: 10-acre Swale <5% slope



Summary for Reach 8R: 5-acre Swale >5% slope

```
Inflow Area =        5.000 ac,   0.00% Impervious,  Inflow Depth >   2.63"    for  10-Year event
Inflow       =      16.13 cfs @   12.09 hrs,  Volume=            1.096 af
Outflow      =      15.98 cfs @   12.10 hrs,  Volume=            1.096 af,  Atten= 1%,  Lag= 0.4 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.35 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.55 fps, Avg. Travel Time= 0.7 min

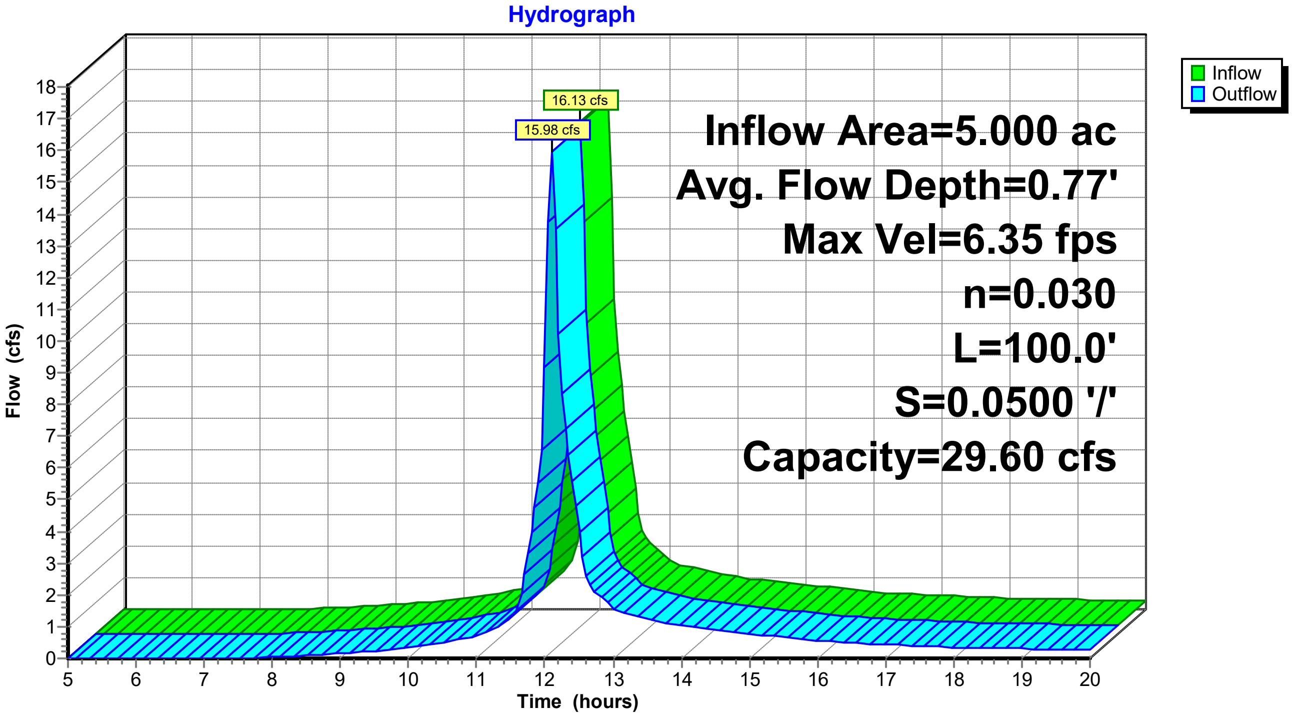
Peak Storage= 255 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 29.60 cfs

Custom cross-section, Length= 100.0' Slope= 0.0500 '/'
Constant n= 0.030 Short grass
Inlet Invert= 5.00', Outlet Invert= 0.00'

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
3.00	-1.00	1.00
4.00	-1.00	1.00
7.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	1.0	0	0.00
1.00	4.0	7.3	400	29.60

Reach 8R: 5-acre Swale >5% slope



APPENDIX E

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Sweeping Schedule and Receipts

All parking areas, sidewalks, driveways and other impervious surfaces (except roofs) shall be swept clean of sand, litter and any other pollutants at least twice a year, once between November 14 and December 15 (after leaf fall) and once during the month of April (after snow melt) and at other times as may be necessary. The following table shall be completed by a member of the Pollution Prevention Team (PPT) after each sweeping. Receipts shall be kept in a pocket accompanying the schedule sheets in this attachment

Date (MM/DD/YY)	Company/Person Sweeping	Supervising Team Member	Comments

APPENDIX F

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Potential Spill Location Information

Spill cleanup equipment is kept

(where)

And includes-

(what; speedi-dri, brooms, etc.)

And all personal are instructed in its location and use.

Types of materials present on-site which could potentially spill and discharge to stormwater include:
1.
2.
3.
4.
5.
6.

Areas where spills may potentially occur and discharge to stormwater include:
1.
2.
3.
4.
5.
6.

Measures used to minimize the possibility of spills include:
1.
2.
3.
4.
5.
6.

APPENDIX G

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Spill Incident Recording Form

A history of spills and/or leaks is shown below. (*Make additional copies of table if needed).*

Date (MM/DD/YY)	(check one)		Location (as indicated	Description				Response Procedures	Measures to prevent reoccurance
	Spill	Leak		Type of Material	Quantity	Source if Known	Reason		

APPENDIX H

Connecticut Department of Environmental Protection
Oil and Chemical Spill Response Division
Report of Petroleum or Chemical Product Discharge, Spillage or Release

1. When did the incident occur? Date___/___/___ Time
month/day/year

2. Where did the incident occur?

____

3. How did the incident occur? (describe the cause)

____

4. Under whose control was the hazardous material at the time of the incident?
Name: ____

Mailing & Street Address: ________________________________

Town:____________________ State: _____ Zip:________ Phone:__________

5. Who is the owner of the property onto which the spill occurred?

____

If this is a corporate property or jointly owned property, who represents the owner?

Corporate Property ☐ Jointly-owned property ☐

Name: ____

Mailing & Street address________________________________

Town:____________________ State:____ Zip:________ Phone:__________

6. When was the incident verbally reported to the Department of Environmental Protection?
Date___/___/___ Time ___:___
Month/day/year

7. Who reported the incident and whom were they representing?
Name:____

Mailing & Street Address:________________________________

Town:____________________ State: ____ Zip:________ Phone:__________

8. What were the chemicals or petroleum products, etc. released, spilled or discharged? Give an exact description of each of the materials involved in the incident, including chemical names, percent concentrations, trade names, etc.

   If the chemicals are Extremely Hazardous substances or CERCLA hazardous substances they must be identified as such and include the reportable quantity (RQ). Please attach a Material Safety Data Sheet (MSDS) for each chemical involved.

   What were the quantities of hazardous materials that were released, spilled or discharged to each environmental medium (air, surface water, soil, and/or ground water)? [NOTE: Connecticut General Statutes requires the reporting of any amount of any substance or material released to the environment].

9. Did any of these hazardous materials travel beyond the property line? [NOTE: Materials that enter the ground water are considered to have gone beyond the property line.]

10. What actions were taken to respond to and contain the release, spill or discharge?

11. What actions are being taken to prevent reoccurrence of an incident of this type? (Attach additional sheets if necessary.)

12. Were there any injuries as a result of the incident? If so, list the names of injured individuals, their addresses, phone numbers and describe their injuries. (Attach additional sheets if necessary)

Name:

Mailing & Street Address:

Town: State: Zip: Telephone:

13. What is the appropriate advice regarding medical attention necessary for exposed individuals?

14. Are there any known or anticipated health risks, acute or chronic, associated with the release of these hazardous materials or medical advice that should be communicated?

15. Was the incident completely cleaned up by the time this report was submitted? If not, what are the anticipated remedial actions and their duration?

16. CERTIFICATION: I hereby affirm that the foregoing statement is true to the best of my knowledge.

Signature Title Date

Print Name Telephone

Street Address/P.O. Box City/Town State & Zip

This form may be reproduced as long as it contains all of the information requested and is on an 81/2 X 11 sheet of white paper, black type format. For serious incidents the questions may be answered in narrative format which must include the preparer's affidavit.

Mail to:

State of Connecticut
Department of Environmental Protection
Bureau of Waste Management
Oil and Chemical Response Division
79 Elm Street
Hartford, CT 06106-5127
www.dep.state.ct.us

Phone:	**Routine calls**	**(860) 424-3024**
	Emergency 24 hrs	**(860) 424-3338**

APPENDIX I

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Monthly Inspection Checklist for Year 20___

The site is inspected weekly for trash and debris. The table on this page is initialed each month by a member of the PPT. If any problems are observed, write "No" in the "OK?" column and note the problem and measures taken in the space in the following table. Make a new copy of this table for each new year.

Date (List Day	Initials	OK?	Problems Noted and Measures Taken
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Drainage Structures and outfalls were cleaned on ___________ ___, ________ (Month, day, year)			

By

____

(Company)

APPENDIX J

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Weekly Inspection Checklist for Year 20___

Report Number:	Page:

The site is inspected weekly for trash and debris. The table on this page is initialed each week by a member of the PPT. If any problems are observed, write "No" in the "OK?" column and note the problem and measures taken in the space following the table. Make a new copy of this table for each new year

Date (MM/DD/YY)	Initials	OK?	Date (MM/DD/YY)	Initials	OK?	Date (MM/DD/YY)	Initials	OK?

Comments or problems and measures taken:

Project Name: Constitution Solar Project

Report Number:	Page:

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Project Phase:

☐ Initial ☐ Intermediate ☐ Final

Inspector: ______________________ Date: __________

No. of Days Since Last Rainfall: __________ Inches: __________

Area	Date Last Disturbed	Date of Next Disturbance	Stabilized?	Stabilized With	Condition

Stabilization Notes:

Stabilization Key

CE = Construction Entrance

TV = Temporary Vegetation

PV = Permanent Vegetation

To be performed by: ______________________ On or before: __________

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Report Number:	Page:

Project Phase:

☐ Initial ☐ Intermediate ☐ Final

Inspector: ____________________ Date: __________

No. of Days Since Last Rainfall: __________ Inches: __________

Control Location	In Place?	Condition	Sediment Depth	Washed Out / Overtopped?

Structural Notes:

To be performed by: ____________________ On or before: __________

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Report Number:	Page:

Project Phase:

☐ Initial ☐ Intermediate ☐ Final

Inspector: ______________________________ Date: ____________

No. of Days Since Last Rainfall: ____________ Inches: ____________

Summary of Required Changes

Reasons for Change

To be performed by: ____________________ On or before: ____________

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Report Number:	Page:

Project Phase:

☐ Initial ☐ Intermediate ☐ Final

Inspector: ______________________________ Date: __________

No. of Days Since Last Rainfall: __________ Inches: __________

Comments

Maintenance and Other Actions Required (Not Noted Elsewhere):

To be performed by: ____________________ On or before: __________

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Report Number:	Page:

This certification must be completed after each inspection to signify that the inspection has been properly completed and the site has been found to be in compliance with the Stormwater Pollution Control Plan.

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals resposnible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

Signed: ______________________________

Name: ______________________________

Title: ______________________________

Company: ______________________________

Address: ______________________________

Telephone: ______________________________

Date: ______________________________

APPENDIX K

Project Name: Constitution Solar Project

Stormwater Pollution Control Plan

Comprehensive Annual Stormwater Evaluation and Inspection Report

Once a year, a member of the PPT shall conduct a Comprehensive Annual Stormwater Evaluation and Inspection of all aspects and provisions of the SWPCP. The following report is prepared and a copy maintained on site in the files of the facility. The Comprehensive Annual Stormwater Evaluation and Inspection Report is reviewed and signed by the same party who signed the registration or by their replacement of equivalent position.

Inspection:

Date of Inspection:

Reviewed By:

Update the PPT if necessary. PPT updated? [ ] Yes [ ] No

Review the SMP. Areas of SMP need to be updated? [ ] Yes [ ] No

Review the checklists within the Attachments K & L of the SWPCP. Update the checklists, spill plan and maintenance practices as necessary. Changes to the checklists, spill plan or maintenance practices are noted here and in the appropriate section of the Plan. (Copy this sheet as necessary).

Additional Comments:

APPENDIX L

Connecticut Department of
Energy & Environmental Protection
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, issued 8/21/13, effective 10/1/13
Stormwater Monitoring Report

SITE INFORMATION

Permittee: ______________________________
Mailing Address: ______________________________
Business Phone: ____________________ ext.: __________ Fax: __________
Contact Person: ____________________ Title: ____________________
Site Name: ______________________________
Site Address: ______________________________
Receiving Water (name, basin): ______________________________
Stormwater Permit No. GSN____________________

SAMPLING INFORMATION (Submit a separate form for each outfall)

Outfall Designation: ____________________ Date/Time Collected: ____________________
Outfall Location(s) (lat/lon or map link): ______________________________
Person Collecting Sample: ______________________________
Storm Magnitude (inches): ______________ Storm Duration (hours): ______________
Size of Disturbed Area at any time: ______________

MONITORING RESULTS

Sample #	Parameter	Method	Results (units)	Laboratory (if applicable)
1	Turbidity			
2	Turbidity			
3	Turbidity			
4	Turbidity			

(provide an attachment if more than 4 samples were taken for this outfall)

Avg =

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: ______________________________

Signature: ____________________ Date: ____________________

Please send completed form to:

DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE
79 ELM STREET
HARTFORD, CT 06106-5127
ATTN: NEAL WILLIAMS

APPENDIX M

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Notice of Termination Form

Please complete and submit this form in accordance with the general permit (DEP-PED-GP-015) in order to ensure the proper handling of your termination. Print or type unless otherwise noted.

Note: Ensure that for commercial and industrial facilities, registrations under the *General Permit for the Discharge of Stormwater Associated with Industrial Activity* (DEP-PED-GP-014) or the *General Permit for the Discharge of Stormwater from Commercial Activities* (DEP-PED-GP-004) have been filed where applicable. For questions about the applicability of these general permits, please call the Department at 860-424-3018.

Part I: Registrant Information

1. Permit number: ***GSN***
2. Fill in the name of the registrant(s) as indicated on the registration certificate:

   Registrant:
3. Site Address:

   City/Town: State: Zip Code:
4. Date all storm drainage structures were cleaned of construction sediment:

   Date of Completion of Construction:

   Date of Last Inspection (must be at least three months after final stabilization pursuant to Section 6(b)(6)(D) of the general permit):
5. Check the post-construction activities at the site (check all that apply):

   ☐ Industrial ☐ Residential ☐ Commercial ☐ Capped Landfill

   ☐ Other (describe):

Part II: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Signature of Permittee

Date

Name of Permittee (print or type)

Title (if applicable)

Note: Please submit this Notice of Termination Form to:

STORMWATER PERMIT COORDINATOR
BUREAU OF WATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

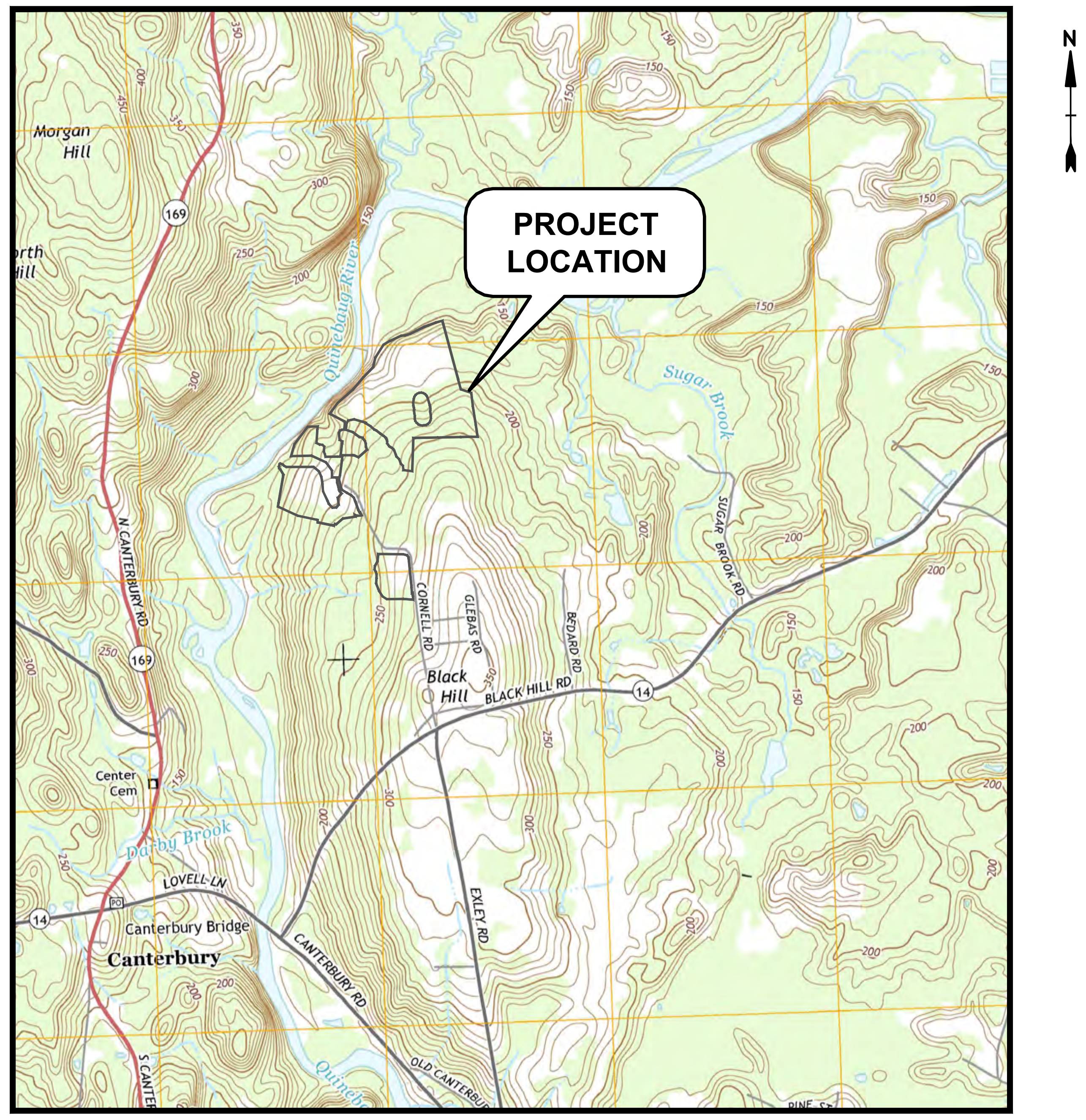
CONSTITUTION SOLAR PROJECT

SOIL EROSION AND SEDIMENT CONTROL PLAN

PLAINFIELD, CONNECTICUT

DECEMBER 2020

SHEET NO.	SHEET TITLE
	COVER SHEET
SESC-1	SOIL EROSION AND SEDIMENT CONTROL PLAN - OVERALL
SESC-2	SOIL EROSION AND SEDIMENT CONTROL PLAN PHASE 1 - OVERALL
SESC-3 - SESC-7	SOIL EROSION AND SEDIMENT CONTROL PLAN PHASE 1A - PHASE 1E
SESC-8	SOIL EROSION AND SEDIMENT CONTROL PLAN PHASE 2 - OVERALL
SESC-9 - SESC-11	SOIL EROSION AND SEDIMENT CONTROL PLAN PHASE 2A - PHASE 2C
SESC-12	SOIL EROSION AND SEDIMENT CONTROL PLAN PHASE 3 - OVERALL
SESC-13 - SESC-24	SOIL EROSION AND SEDIMENT CONTROL PLAN PHASE 3A - PHASE 3K
SESC- 25	SOIL EROSION AND SEDIMENT CONTROL PLAN PHASE 4 - OVERALL
SESC-26 - SESC-28	SOIL EROSION AND SEDIMENT CONTROL PLAN PHASE 4A - PHASE 4C
SESC-29 - SESC-30	DETAILS



SCALE: 1" = 2,000'

PREPARED BY:

Tighe&Bond

No. 31180
BRIAN S. HUNTLEY
12-30-20

BRIAN S. HUNTLEY, PE

DEVELOPER
CONSTITUTION SOLAR, LLC
C/O NEXTERA ENERGY RESOURCES, LLC
700 UNIVERSE BOULEVARD
JUNO BEACH, FL 33408

ENGINEER
TIGHE & BOND, INC.
213 COURT STREET, #1100
MIDDLETOWN, CONNECTICUT 06457

ISSUED FOR CONSTRUCTION

COMPLETE SET 31 SHEETS

Dec 31, 2020-12:02pm Plotted By: AGilchrist
Tighe & Bond, Inc. J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\Cover_SESC.dwg

NOTE: THIS DRAWING SET IS FOR CONSTRUCTION-PERIOD SOIL EROSION AND SEDIMENT CONTROLS ONLY. REFER TO CONSTRUCTION DRAWINGS FOR PLAN REFERENCES, DESIGN INFORMATION AND ADDITIONAL NOTES.

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:39pm By: JGenga
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR
CONSTRUCTION

Constitution Solar

Constitution
Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - OVERALL

SCALE: 1"=250'

SESC - 1

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - PHASE 1 OVERALL

SCALE: 1"=250'

SESC - 2

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:39pm By: JGenga
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

1. EFFECTIVELY STABILIZE SOILS ON PHASE 1 BEFORE COMMENCING GRADING AND CONSTRUCTION ON ANOTHER PHASE. ANY MODIFICATIONS TO THE PROPOSED PHASING PLANS MUST BE SUBMITTED TO CT DEEP FOR REVIEW AND APPROVAL PRIOR TO INITIATING A CONSTRUCTION MODIFICATION.
2. CONFORM TO THE CURRENT CT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR ANY SOIL DISTURBANCE TO THE EXISTING AGRICULTURAL FIELDS.
3. REFER TO STORMWATER POLLUTION CONTROL PLAN FOR SEDIMENT TRAP/BASIN SIZING CALCULATIONS.
4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 1

1. FLAG THE LIMITS OF CONSTRUCTION NECESSARY TO FACILITATE THE PRECONSTRUCTION MEETING.
2. CONDUCT ENVIRONMENTAL RESTRICTION AND SAFETY TRAINING FOR ALL SITE PERSONNEL.
3. HOLD PRECONSTRUCTION MEETING.
4. INSTALL CONSTRUCTION ENTRANCE.
5. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
6. PRIOR TO INSTALLING STORMWATER CONTROLS, SUCH AS TEMPORARY DIVERSIONS AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
7. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
8. ONCE TEMPORARY STORMWATER CONTROLS ARE ESTABLISHED, CLEAR AND REMOVE EXISTING STUMPS.
9. WHERE APPLICABLE, STRIP, RE-DISTRIBUTE, AND STABILIZE ALL TOPSOIL THAT IS WITHIN THE FOOTPRINT OF THE SITE ROADS, SITE ROAD APPURTENANCES AND THE COLLECTOR SUBSTATION (PURSUANT TO 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CHAPTER 4, PART II AND THE FARMLAND SOILS MITIGATION PLAN WHICH IS EXHIBIT E IN THE CSC PETITION).
10. CONSTRUCT SITE ROADS AND APPURTENANCES. INSTALL CONDUITS FOR CROSSINGS SIMULTANEOUS TO CONSTRUCTION OF THE ROAD.
11. CONSTRUCT SWITCHYARD.
12. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOT DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
13. UPON STABILIZATION, TEMPORARY CONTROLS MAY BE REMOVED OR RELOCATED AS NECESSARY TO CONSTRUCT SUBSEQUENT SUB-PHASES.

LEGEND

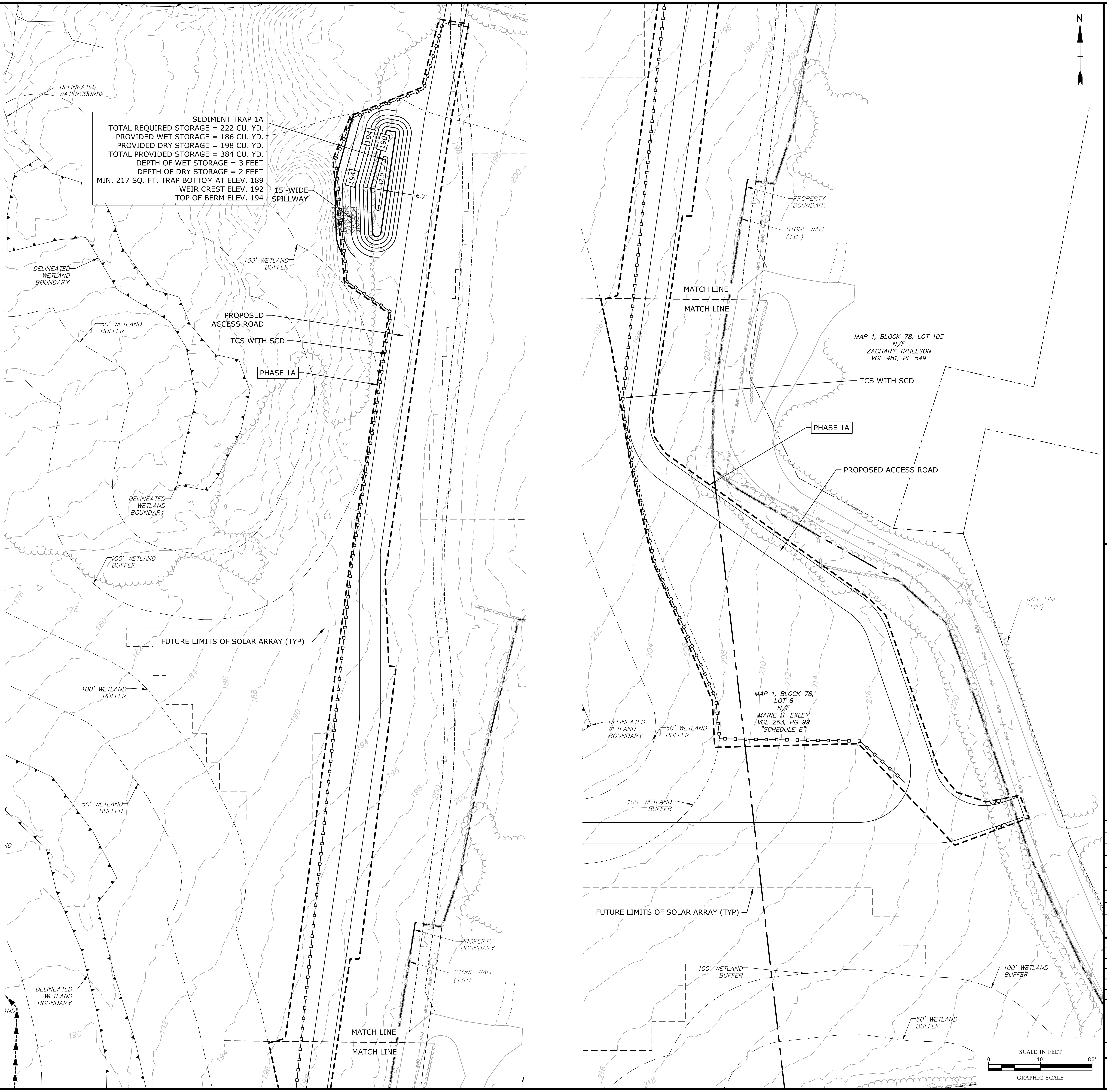
PROPERTY LINE
INTERMEDIATE CONTOURS
INDEX CONTOURS
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE

NOTE: SEDIMENT TRAP 1A SHALL REMAIN IN PLACE FOR PHASE 3F.

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:39pm By: JGenga
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg



Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO: R0317-003
DATE: 12/01/2020
FILE: SESC Plans.dwg
DRAWN BY: ALG/ELD
CHECKED BY: BSH/JEC
APPROVED BY: FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 1A

SCALE: 1"=40'

SESC - 3

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

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SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

1. EFFECTIVELY STABILIZE SOILS ON PHASE 1 BEFORE COMMENCING GRADING AND CONSTRUCTION ON ANOTHER PHASE. ANY MODIFICATIONS TO THE PROPOSED PHASING PLANS MUST BE SUBMITTED TO CT DEEP FOR REVIEW AND APPROVAL PRIOR TO INITIATING A CONSTRUCTION MODIFICATION.
2. CONFORM TO THE CURRENT CT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR ANY SOIL DISTURBANCE TO THE EXISTING AGRICULTURAL FIELDS.
3. REFER TO STORMWATER POLLUTION CONTROL PLAN FOR SEDIMENT TRAP/BASIN SIZING CALCULATIONS.
4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 1

1. FLAG THE LIMITS OF CONSTRUCTION NECESSARY TO FACILITATE THE PRECONSTRUCTION MEETING.
2. CONDUCT ENVIRONMENTAL RESTRICTION AND SAFETY TRAINING FOR ALL SITE PERSONNEL.
3. HOLD PRECONSTRUCTION MEETING.
4. INSTALL CONSTRUCTION ENTRANCE.
5. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
6. PRIOR TO INSTALLING STORMWATER CONTROLS, SUCH AS TEMPORARY DIVERSIONS AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
7. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
8. ONCE TEMPORARY STORMWATER CONTROLS ARE ESTABLISHED, CLEAR AND REMOVE EXISTING STUMPS.
9. WHERE APPLICABLE, STRIP, RE-DISTRIBUTE, AND STABILIZE ALL TOPSOIL THAT IS WITHIN THE FOOTPRINT OF THE SITE ROADS, SITE ROAD APPURTENANCES AND THE COLLECTOR SUBSTATION (PURSUANT TO 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CHAPTER 4, PART II AND THE FARMLAND SOILS MITIGATION PLAN WHICH IS EXHIBIT E IN THE CSC PETITION).
10. CONSTRUCT SITE ROADS AND APPURTENANCES. INSTALL CONDUITS FOR CROSSINGS SIMULTANEOUS TO CONSTRUCTION OF THE ROAD.
11. CONSTRUCT SWITCHYARD.
12. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOT DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
13. UPON STABILIZATION, TEMPORARY CONTROLS MAY BE REMOVED OR RELOCATED AS NECESSARY TO CONSTRUCT SUBSEQUENT SUB-PHASES.

LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124 —
INDEX CONTOURS — 120 —
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE

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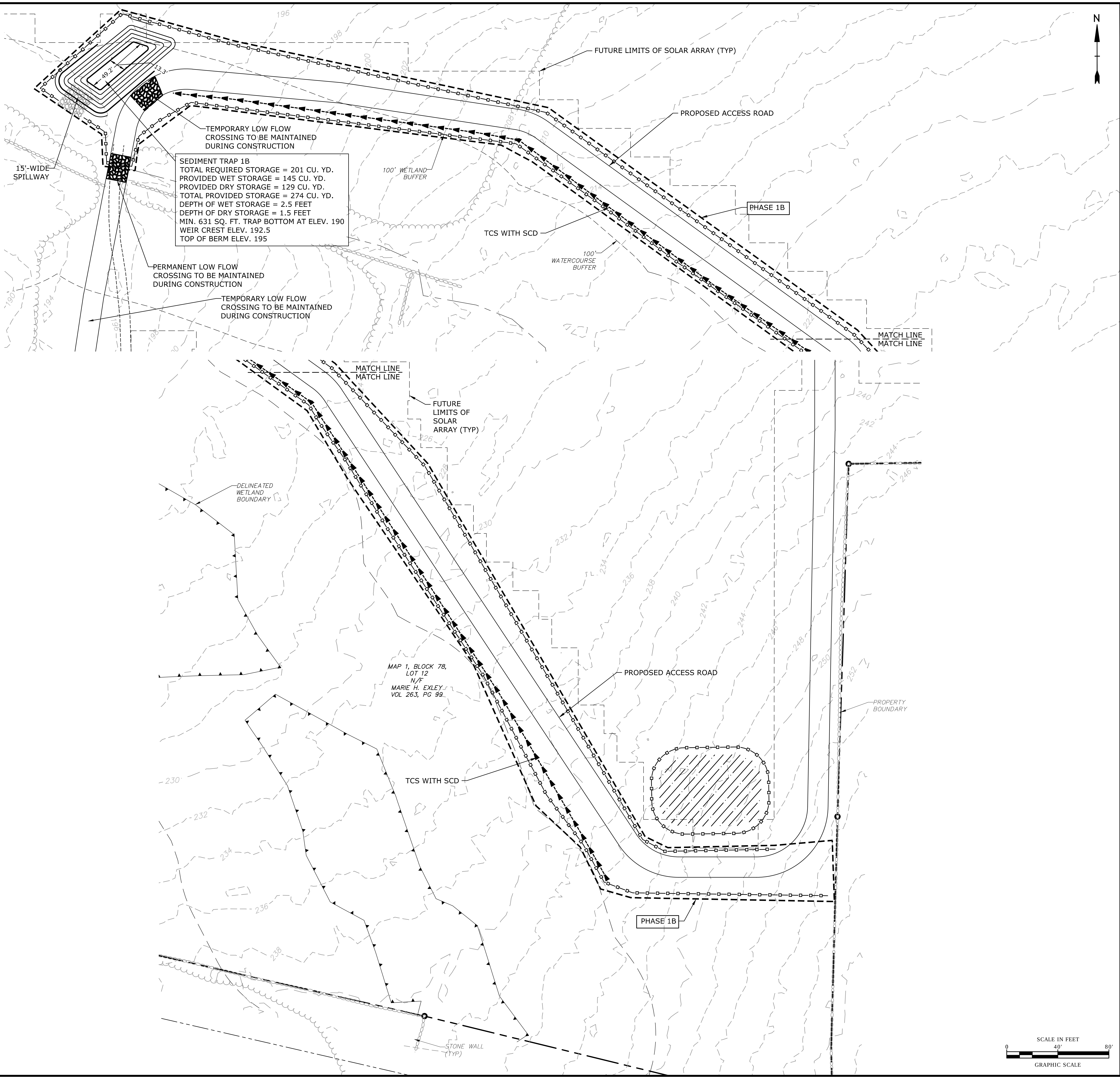

TEMPORARY LOW FLOW CROSSING TO BE MAINTAINED DURING CONSTRUCTION

SEDIMENT TRAP 1B
TOTAL REQUIRED STORAGE = 201 CU. YD.
PROVIDED WET STORAGE = 145 CU. YD.
PROVIDED DRY STORAGE = 129 CU. YD.
TOTAL PROVIDED STORAGE = 274 CU. YD.
DEPTH OF WET STORAGE = 2.5 FEET
DEPTH OF DRY STORAGE = 1.5 FEET
MIN. 631 SQ. FT. TRAP BOTTOM AT ELEV. 190
WEIR CREST ELEV. 192.5
TOP OF BERM ELEV. 195

PERMANENT LOW FLOW CROSSING TO BE MAINTAINED DURING CONSTRUCTION

TEMPORARY LOW FLOW CROSSING TO BE MAINTAINED DURING CONSTRUCTION

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR
CONSTRUCTION

Constitution
Solar

Constitution
Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT
CONTROL PLAN - 1B

SCALE: 1"=40'

SESC - 4

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

1. EFFECTIVELY STABILIZE SOILS ON PHASE 1 BEFORE COMMENCING GRADING AND CONSTRUCTION ON ANOTHER PHASE. ANY MODIFICATIONS TO THE PROPOSED PHASING PLANS MUST BE SUBMITTED TO CT DEEP FOR REVIEW AND APPROVAL PRIOR TO INITIATING A CONSTRUCTION MODIFICATION.
2. CONFORM TO THE CURRENT CT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR ANY SOIL DISTURBANCE TO THE EXISTING AGRICULTURAL FIELDS.
3. REFER TO STORMWATER POLLUTION CONTROL PLAN FOR SEDIMENT TRAP/BASIN SIZING CALCULATIONS.
4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 1

1. FLAG THE LIMITS OF CONSTRUCTION NECESSARY TO FACILITATE THE PRECONSTRUCTION MEETING.
2. CONDUCT ENVIRONMENTAL RESTRICTION AND SAFETY TRAINING FOR ALL SITE PERSONNEL.
3. HOLD PRECONSTRUCTION MEETING.
4. INSTALL CONSTRUCTION ENTRANCE.
5. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
6. PRIOR TO INSTALLING STORMWATER CONTROLS, SUCH AS TEMPORARY DIVERSIONS AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
7. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
8. ONCE TEMPORARY STORMWATER CONTROLS ARE ESTABLISHED, CLEAR AND REMOVE EXISTING STUMPS.
9. WHERE APPLICABLE, STRIP, RE-DISTRIBUTE, AND STABILIZE ALL TOPSOIL THAT IS WITHIN THE FOOTPRINT OF THE SITE ROADS, SITE ROAD APPURTENANCES AND THE COLLECTOR SUBSTATION (PURSUANT TO 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CHAPTER 4, PART II AND THE FARMLAND SOILS MITIGATION PLAN WHICH IS EXHIBIT E IN THE CSC PETITION).
10. CONSTRUCT SITE ROADS AND APPURTENANCES. INSTALL CONDUITS FOR CROSSINGS SIMULTANEOUSLY TO CONSTRUCTION OF THE ROAD.
11. CONSTRUCT SWITCHYARD.
12. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOT DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
13. UPON STABILIZATION, TEMPORARY CONTROLS MAY BE REMOVED OR RELOCATED AS NECESSARY TO CONSTRUCT SUBSEQUENT SUB-PHASES.

LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124
INDEX CONTOURS — 120
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE

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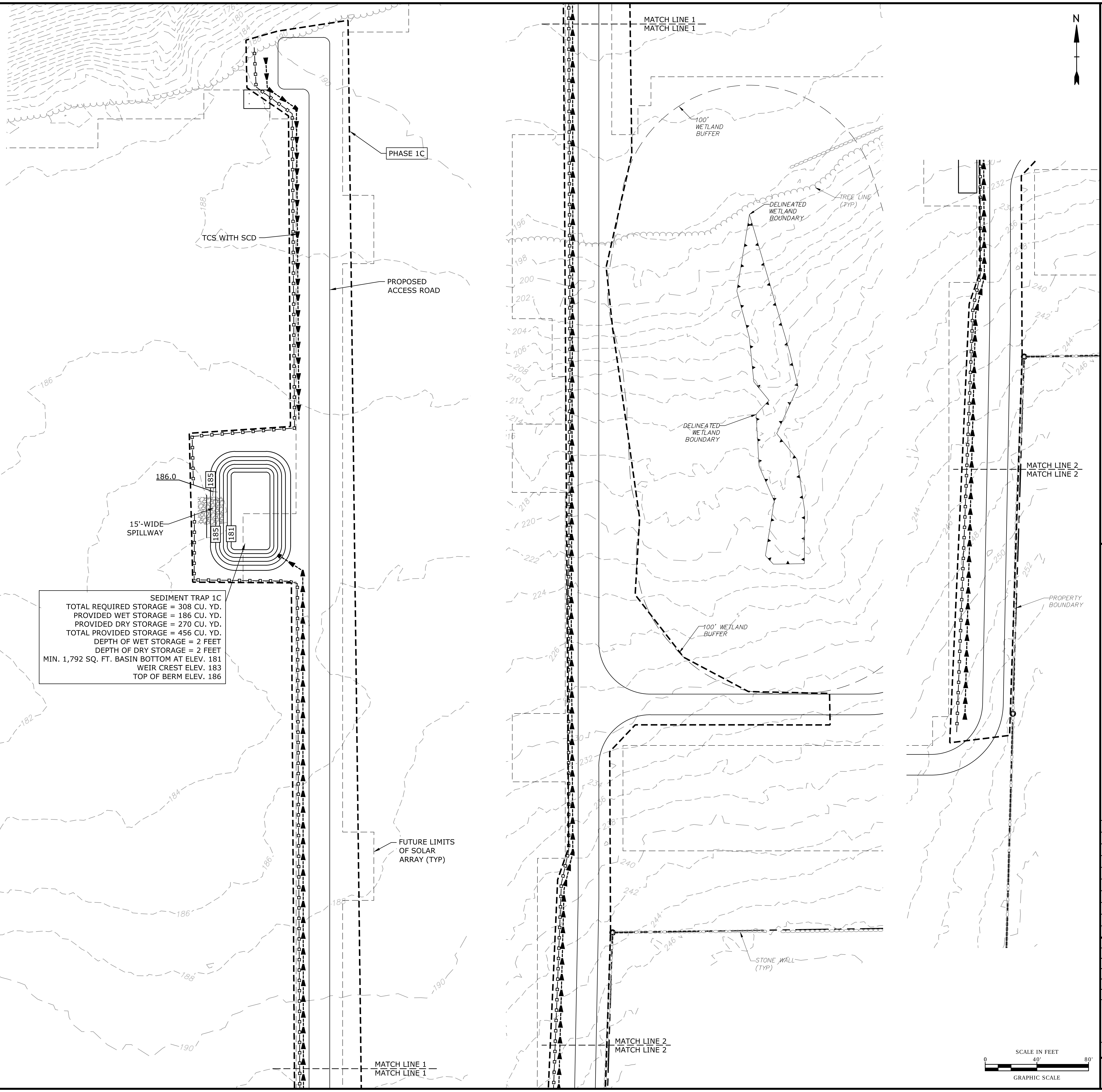

SEDIMENT TRAP 1C
TOTAL REQUIRED STORAGE = 308 CU. YD.
PROVIDED WET STORAGE = 186 CU. YD.
PROVIDED DRY STORAGE = 270 CU. YD.
TOTAL PROVIDED STORAGE = 456 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 1,792 SQ. FT. BASIN BOTTOM AT ELEV. 181
WEIR CREST ELEV. 183
TOP OF BERM ELEV. 186

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 1C

SCALE: 1"=40'

SESC - 5

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

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2. CONFORM TO THE CURRENT CT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR ANY SOIL DISTURBANCE TO THE EXISTING AGRICULTURAL FIELDS.
3. REFER TO STORMWATER POLLUTION CONTROL PLAN FOR SEDIMENT TRAP/BASIN SIZING CALCULATIONS.
4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 1

1. FLAG THE LIMITS OF CONSTRUCTION NECESSARY TO FACILITATE THE PRECONSTRUCTION MEETING.
2. CONDUCT ENVIRONMENTAL RESTRICTION AND SAFETY TRAINING FOR ALL SITE PERSONNEL.
3. HOLD PRECONSTRUCTION MEETING.
4. INSTALL CONSTRUCTION ENTRANCE.
5. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
6. PRIOR TO INSTALLING STORMWATER CONTROLS, SUCH AS TEMPORARY DIVERSIONS AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
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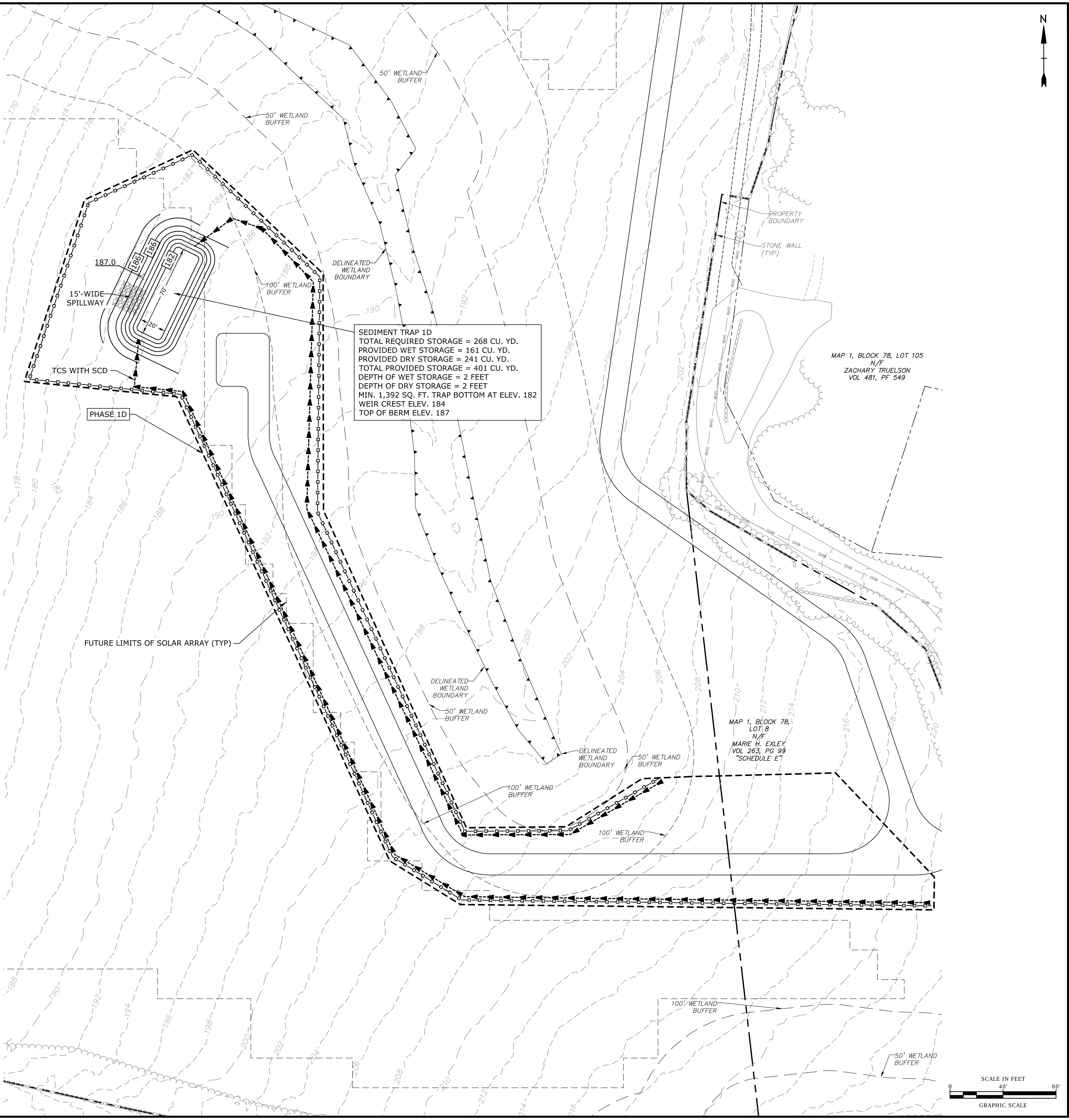
8. ONCE TEMPORARY STORMWATER CONTROLS ARE ESTABLISHED, CLEAR AND REMOVE EXISTING STUMPS.
9. WHERE APPLICABLE, STRIP, RE-DISTRIBUTE, AND STABILIZE ALL TOPSOIL THAT IS WITHIN THE FOOTPRINT OF THE SITE ROADS, SITE ROAD APPURTENANCES AND THE COLLECTOR SUBSTATION (PURSUANT TO 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CHAPTER 4, PART II AND THE FARMLAND SOILS MITIGATION PLAN WHICH IS EXHIBIT E IN THE CSC PETITION).
10. CONSTRUCT SITE ROADS AND APPURTENANCES. INSTALL CONDUITS FOR CROSSINGS SIMULTANEOUS TO CONSTRUCTION OF THE ROAD.
11. CONSTRUCT SWITCHYARD.
12. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOT DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
13. UPON STABILIZATION, TEMPORARY CONTROLS MAY BE REMOVED OR RELOCATED AS NECESSARY TO CONSTRUCT SUBSEQUENT SUB-PHASES.

LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124
INDEX CONTOURS — 120
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE



SEDIMENT TRAP 1D
TOTAL REQUIRED STORAGE = 268 CU. YD.
PROVIDED WET STORAGE = 161 CU. YD.
PROVIDED DRY STORAGE = 241 CU. YD.
TOTAL PROVIDED STORAGE = 401 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 1,392 SQ. FT. TRAP BOTTOM AT ELEV. 182
WEIR CREST ELEV. 184
TOP OF BERM ELEV. 187

Tighe&Bond

STATE OF CONNECTICUT
BRIAN S. HUNTLEY
No. 31180
LICENSED PROFESSIONAL ENGINEER
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 1D

SCALE: 1"=40'

SESC - 6

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:41pm By: JGenga
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SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

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CONSTRUCTION PHASE 1

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2. CONDUCT ENVIRONMENTAL RESTRICTION AND SAFETY TRAINING FOR ALL SITE PERSONNEL.
3. HOLD PRECONSTRUCTION MEETING.
4. INSTALL CONSTRUCTION ENTRANCE.
5. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
6. PRIOR TO INSTALLING STORMWATER CONTROLS, SUCH AS TEMPORARY DIVERSIONS AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
7. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
8. ONCE TEMPORARY STORMWATER CONTROLS ARE ESTABLISHED, CLEAR AND REMOVE EXISTING STUMPS.
9. WHERE APPLICABLE, STRIP, RE-DISTRIBUTE, AND STABILIZE ALL TOPSOIL THAT IS WITHIN THE FOOTPRINT OF THE SITE ROADS, SITE ROAD APPURTENANCES AND THE COLLECTOR SUBSTATION (PURSUANT TO 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CHAPTER 4, PART II AND THE FARMLAND SOILS MITIGATION PLAN WHICH IS EXHIBIT E IN THE CSC PETITION).
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11. CONSTRUCT SWITCHYARD.
12. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOT DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
13. UPON STABILIZATION, TEMPORARY CONTROLS MAY BE REMOVED OR RELOCATED AS NECESSARY TO CONSTRUCT SUBSEQUENT SUB-PHASES.

LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124
INDEX CONTOURS — 120
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE

Last Saved: 12/31/2020
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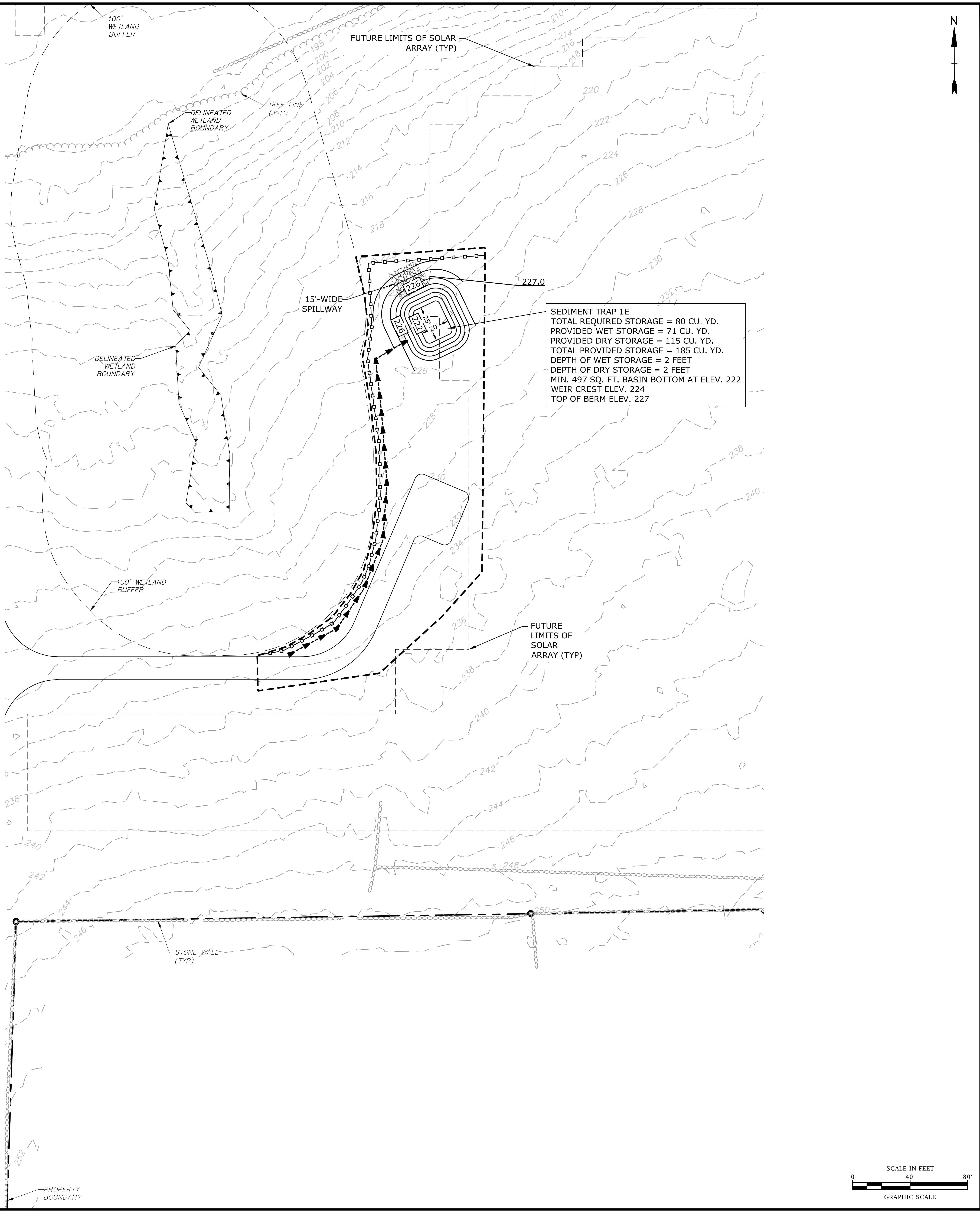
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg



SEDIMENT TRAP 1E
TOTAL REQUIRED STORAGE = 80 CU. YD.
PROVIDED WET STORAGE = 71 CU. YD.
PROVIDED DRY STORAGE = 115 CU. YD.
TOTAL PROVIDED STORAGE = 185 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 497 SQ. FT. BASIN BOTTOM AT ELEV. 222
WEIR CREST ELEV. 224
TOP OF BERM ELEV. 227

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR
CONSTRUCTION

Constitution
Solar

Constitution
Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO: R0317-003
DATE: 12/01/2020
FILE: SESC Plans.dwg
DRAWN BY: ALG/ELD
CHECKED BY: BSH/JEC
APPROVED BY: FJH

SOIL EROSION AND SEDIMENT
CONTROL PLAN - 1E

SCALE: 1"=40'

SESC - 7

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:41pm By: JGenga
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

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DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT
CONTROL PLAN - PHASE 2
OVERALL

SCALE: 1"=250'

SESC - 8

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

1. EFFECTIVELY STABILIZE SOILS ON ONE PHASE 2 BEFORE COMMENCING GRADING AND CONSTRUCTION ON ANOTHER PHASE. ANY MODIFICATIONS TO THE PROPOSED PHASING PLANS MUST BE SUBMITTED TO CT DEEP FOR REVIEW AND APPROVAL PRIOR TO INITIATING A CONSTRUCTION MODIFICATION.
2. CONFORM TO THE CURRENT CT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR ANY SOIL DISTURBANCE TO THE EXISTING AGRICULTURAL FIELDS.
3. REFER TO STORMWATER POLLUTION CONTROL PLAN FOR SEDIMENT TRAP/BASIN SIZING CALCULATIONS.
4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 2

1. FLAG THE LIMITS OF CONSTRUCTION.
2. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
3. PRIOR TO INSTALLING SURFACE WATER CONTROLS, SUCH AS TEMPORARY DIVERSION AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
4. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
5. ONCE TEMPORARY STORMWATER CONTROLS ARE ESTABLISHED, REMOVE EXISTING STUMPS FROM PREVIOUSLY CLEARED TREES.
6. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
7. CHECK AND REPAIR TEMPORARY CONTROLS AS NEEDED. TEMPORARY CONTROLS TO REMAIN IN PLACE THROUGH PHASE 4 CONSTRUCTION.

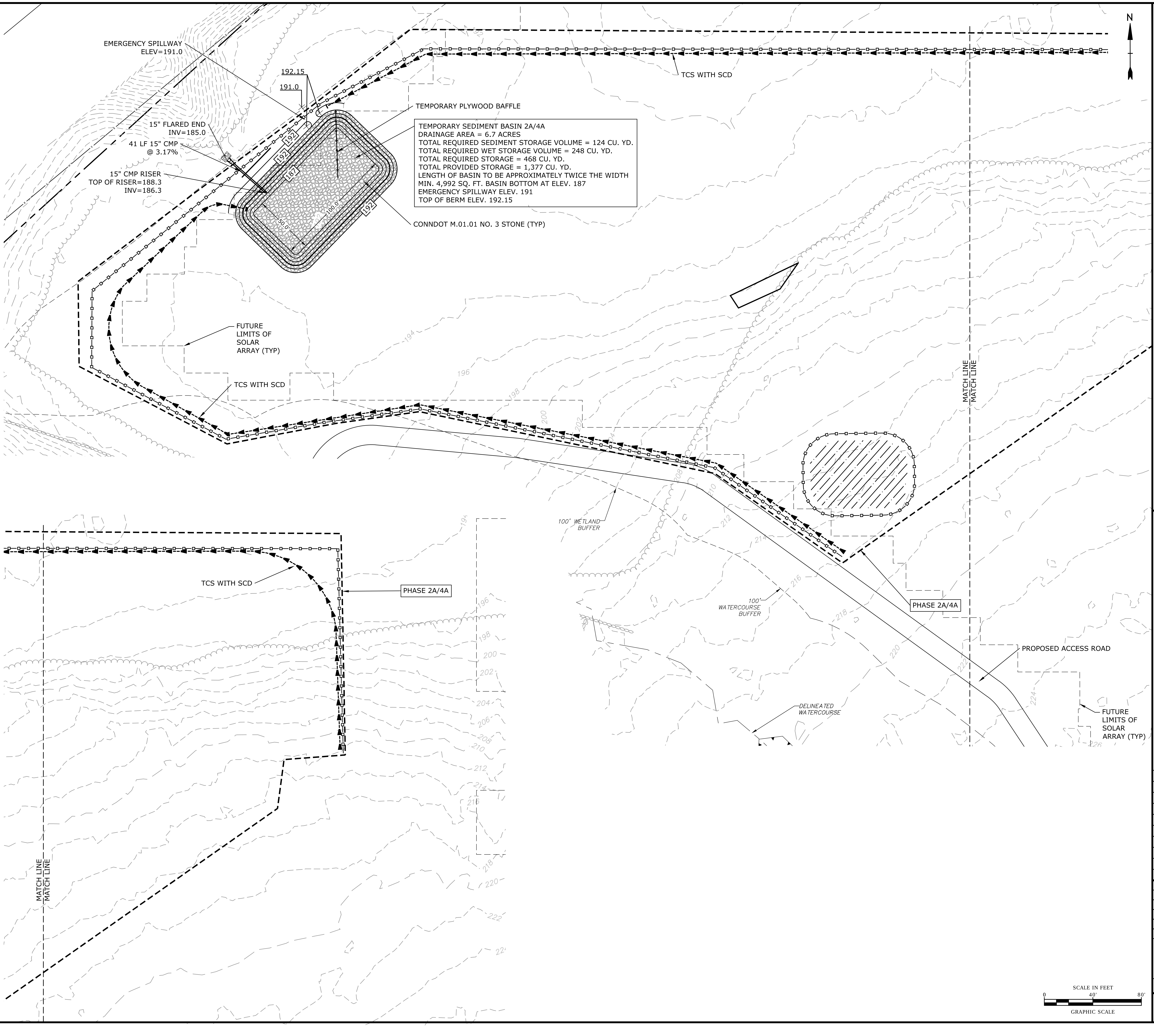
LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124
INDEX CONTOURS — 120
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:42pm By: JGenga
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg



TEMPORARY SEDIMENT BASIN 2A/4A
DRAINAGE AREA = 6.7 ACRES
TOTAL REQUIRED SEDIMENT STORAGE VOLUME = 124 CU. YD.
TOTAL REQUIRED WET STORAGE VOLUME = 248 CU. YD.
TOTAL REQUIRED STORAGE = 468 CU. YD.
TOTAL PROVIDED STORAGE = 1,377 CU. YD.
LENGTH OF BASIN TO BE APPROXIMATELY TWICE THE WIDTH
MIN. 4,992 SQ. FT. BASIN BOTTOM AT ELEV. 187
EMERGENCY SPILLWAY ELEV. 191
TOP OF BERM ELEV. 192.15

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 2A

SCALE: 1"=40'

SESC - 9

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

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GENERAL NOTES

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4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 2

1. FLAG THE LIMITS OF CONSTRUCTION.
2. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
3. PRIOR TO INSTALLING SURFACE WATER CONTROLS, SUCH AS TEMPORARY DIVERSION AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
4. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
5. ONCE TEMPORARY STORMWATER CONTROLS ARE ESTABLISHED, REMOVE EXISTING STUMPS FROM PREVIOUSLY CLEARED TREES.
6. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
7. CHECK AND REPAIR TEMPORARY CONTROLS AS NEEDED. TEMPORARY CONTROLS TO REMAIN IN PLACE THROUGH PHASE 4 CONSTRUCTION.

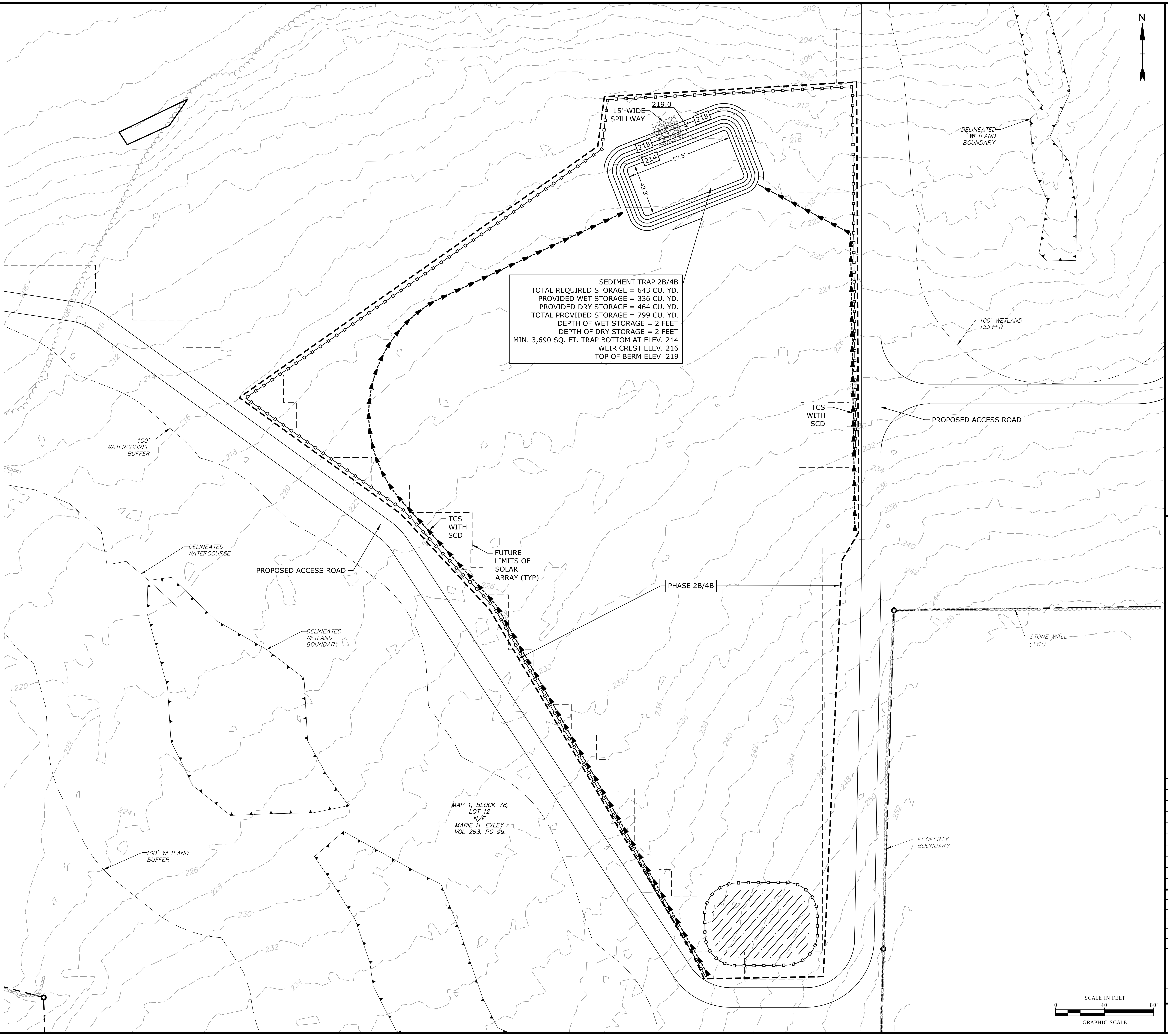
LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124 —
INDEX CONTOURS — 120 —
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:42pm By: JGenga
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg



SEDIMENT TRAP 2B/4B
TOTAL REQUIRED STORAGE = 643 CU. YD.
PROVIDED WET STORAGE = 336 CU. YD.
PROVIDED DRY STORAGE = 464 CU. YD.
TOTAL PROVIDED STORAGE = 799 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 3,690 SQ. FT. TRAP BOTTOM AT ELEV. 214
WEIR CREST ELEV. 216
TOP OF BERM ELEV. 219

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO: R0317-003
DATE: 12/01/2020
FILE: SESC Plans.dwg
DRAWN BY: ALG/ELD
CHECKED BY: BSH/JEC
APPROVED BY: FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 2B

SCALE: 1"=40'

SESC - 10

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

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GENERAL NOTES

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CONSTRUCTION PHASE 2

1. FLAG THE LIMITS OF CONSTRUCTION.
2. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
3. PRIOR TO INSTALLING SURFACE WATER CONTROLS, SUCH AS TEMPORARY DIVERSION AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
4. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
5. ONCE TEMPORARY STORMWATER CONTROLS ARE ESTABLISHED, REMOVE EXISTING STUMPS FROM PREVIOUSLY CLEARED TREES.
6. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
7. CHECK AND REPAIR TEMPORARY CONTROLS AS NEEDED. TEMPORARY CONTROLS TO REMAIN IN PLACE THROUGH PHASE 4 CONSTRUCTION.

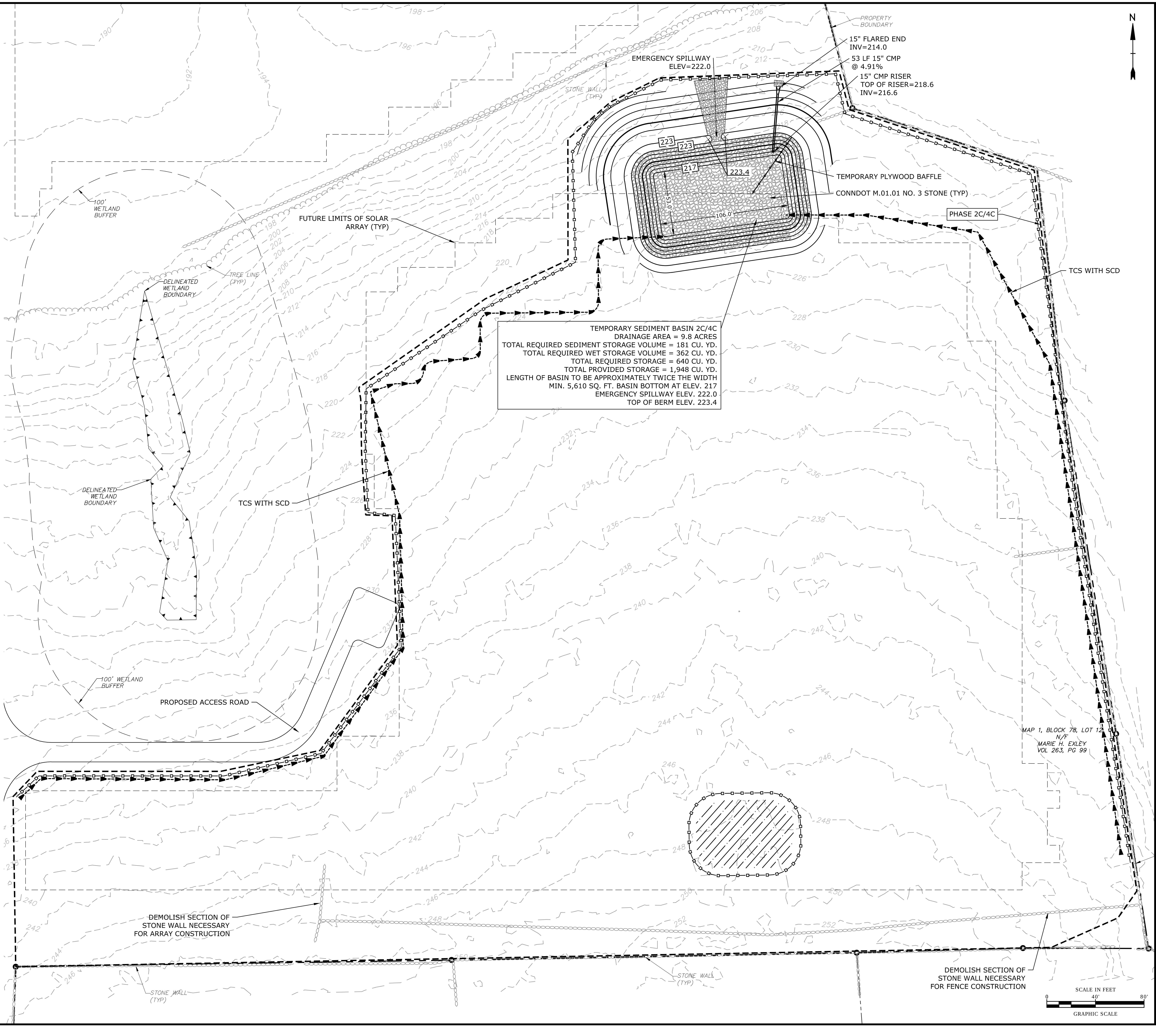
LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS 124
INDEX CONTOURS 120
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD

TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE



TEMPORARY SEDIMENT BASIN 2C/4C
DRAINAGE AREA = 9.8 ACRES
TOTAL REQUIRED SEDIMENT STORAGE VOLUME = 181 CU. YD.
TOTAL REQUIRED WET STORAGE VOLUME = 362 CU. YD.
TOTAL REQUIRED STORAGE = 640 CU. YD.
TOTAL PROVIDED STORAGE = 1,948 CU. YD.
LENGTH OF BASIN TO BE APPROXIMATELY TWICE THE WIDTH
MIN. 5,610 SQ. FT. BASIN BOTTOM AT ELEV. 217
EMERGENCY SPILLWAY ELEV. 222.0
TOP OF BERM ELEV. 223.4

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 2C

SCALE: 1"=40'

SESC - 11

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:43pm By: JGenga
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Tighe&Bond

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SOIL EROSION AND SEDIMENT
CONTROL PLAN - PHASE 3
OVERALL

SCALE: 1"=250'

SESC - 12

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:43pm By: JGenga
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

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SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

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3. REFER TO STORMWATER POLLUTION CONTROL PLAN FOR SEDIMENT TRAP/BASIN SIZING CALCULATIONS.
4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 3

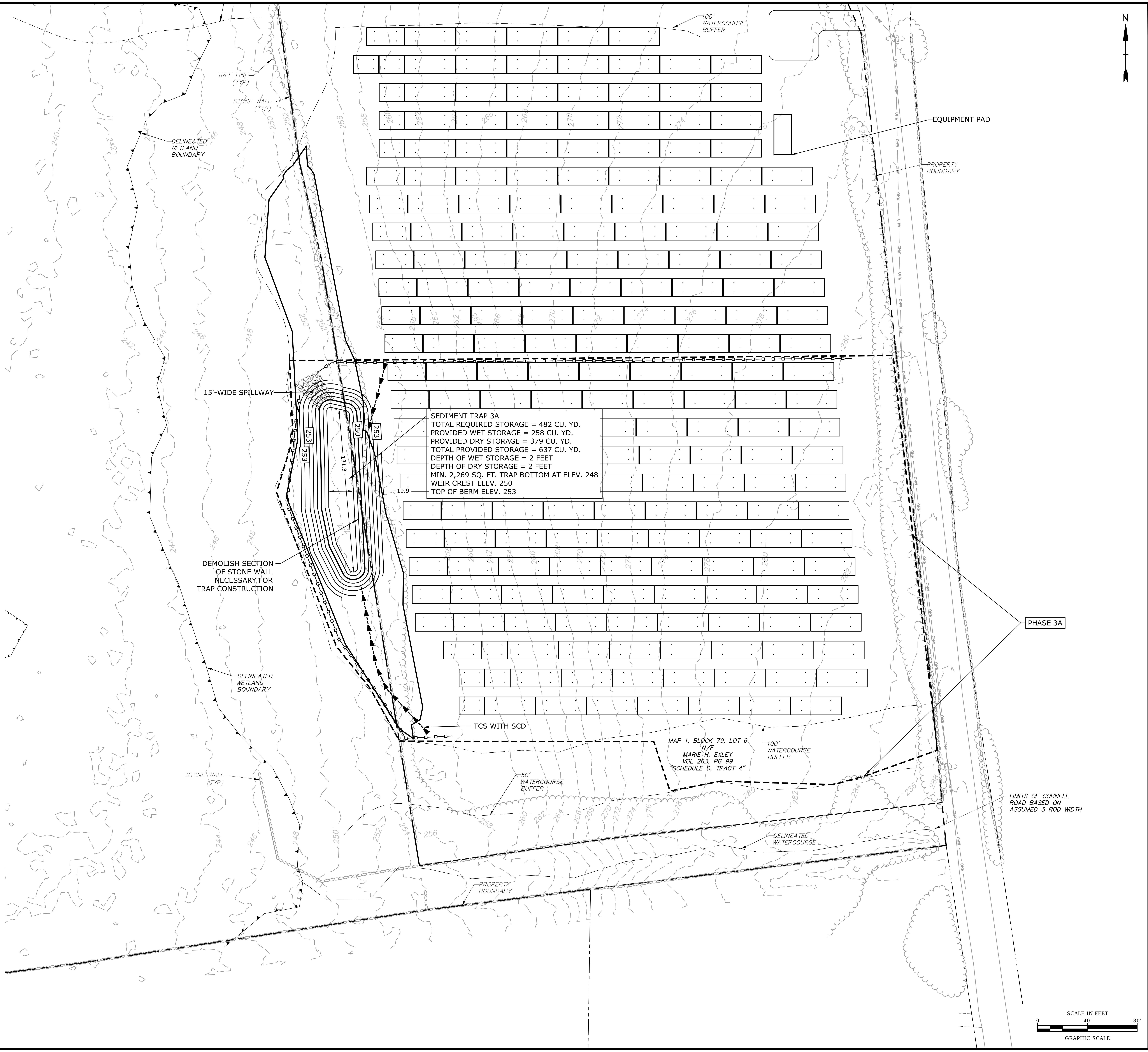
1. FLAG THE LIMITS OF CONSTRUCTION.
2. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
3. PRIOR TO INSTALLING SURFACE WATER CONTROLS, SUCH AS TEMPORARY DIVERSION AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
4. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
5. CLEAR AND REMOVE EXISTING STUMPS AS NEEDED.
6. INSTALL SOLAR INFRASTRUCTURE, INCLUDING RACKING, SOLAR MODULES, UTILITY CONNECTIONS, AND EQUIPMENT PADS. SOLAR ARRAY CONSTRUCTION WILL BEGIN WITH POSTS OR GROUND SCREWS BEING DRIVEN INTO THE GROUND; RACKING WILL THEN BE AFFIXED TO THE POSTS; AND MODULES WILL BE MOUNTED AND INSTALLED ON THE RACKS.
7. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
8. AFTER PHASE IS FULLY STABILIZED, REMOVE TEMPORARY STORMWATER CONTROLS.
9. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124 —
INDEX CONTOURS — 120 —
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE



SEDIMENT TRAP 3A
TOTAL REQUIRED STORAGE = 482 CU. YD.
PROVIDED WET STORAGE = 258 CU. YD.
PROVIDED DRY STORAGE = 379 CU. YD.
TOTAL PROVIDED STORAGE = 637 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 2,269 SQ. FT. TRAP BOTTOM AT ELEV. 248
WEIR CREST ELEV. 250
TOP OF BERM ELEV. 253

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR
CONSTRUCTION

Constitution
Solar

Constitution
Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT
CONTROL PLAN - 3A

SCALE: 1"=40'

SESC - 13

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:43pm By: JGenga
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg

SESC NARRATIVE

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5. CLEAR AND REMOVE EXISTING STUMPS AS NEEDED.
6. INSTALL SOLAR INFRASTRUCTURE, INCLUDING RACKING, SOLAR MODULES, UTILITY CONNECTIONS, AND EQUIPMENT PADS. SOLAR ARRAY CONSTRUCTION WILL BEGIN WITH POSTS OR GROUND SCREWS BEING DRIVEN INTO THE GROUND; RACKING WILL THEN BE AFFIXED TO THE POSTS; AND MODULES WILL BE MOUNTED AND INSTALLED ON THE RACKS.
7. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
8. AFTER PHASE IS FULLY STABILIZED, REMOVE TEMPORARY STORMWATER CONTROLS.
9. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

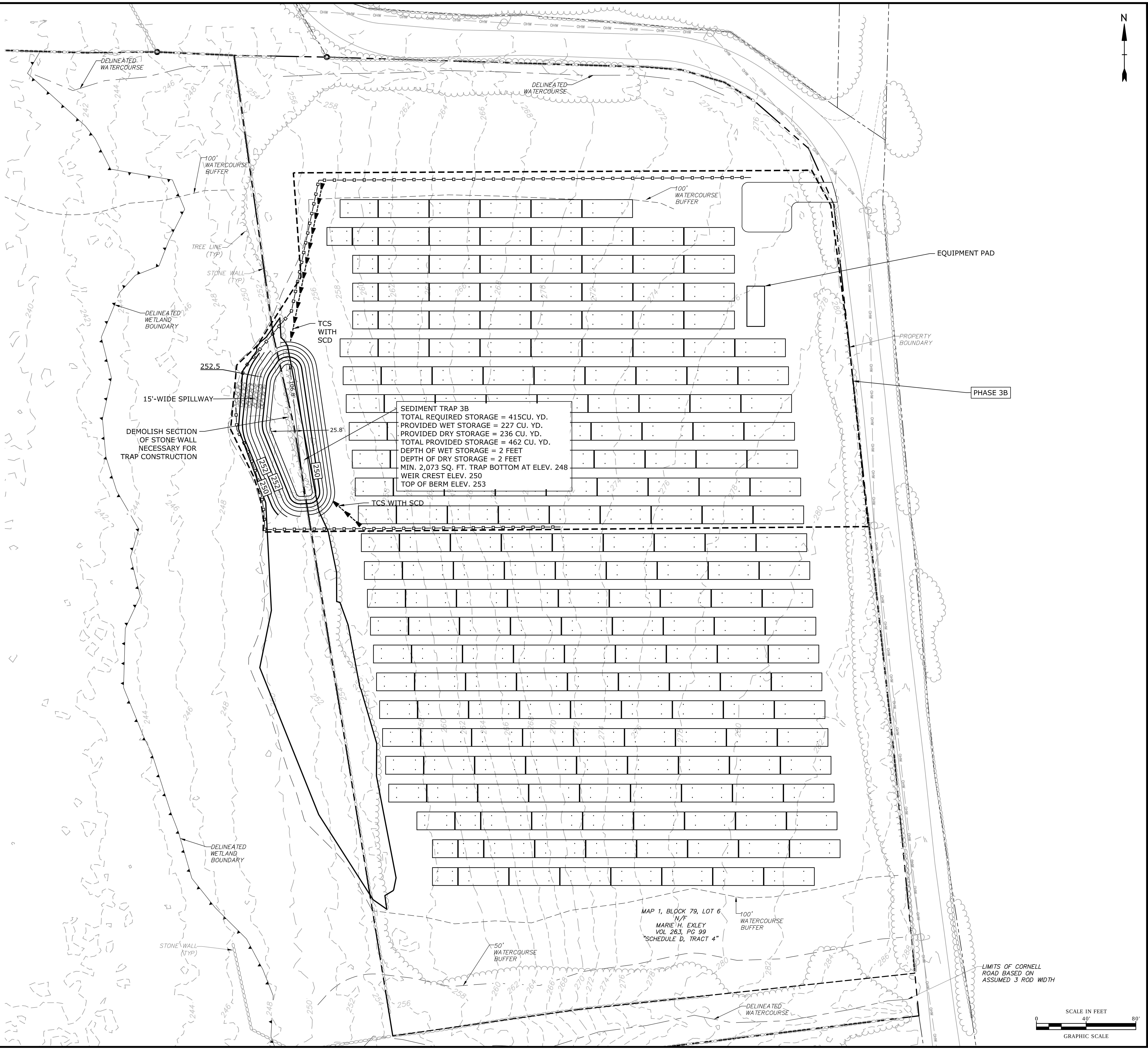
LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS
INDEX CONTOURS
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD

TEMPORARY SOIL STOCKPILE

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE



SEDIMENT TRAP 3B
TOTAL REQUIRED STORAGE = 415CU. YD.
PROVIDED WET STORAGE = 227 CU. YD.
PROVIDED DRY STORAGE = 236 CU. YD.
TOTAL PROVIDED STORAGE = 462 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 2,073 SQ. FT. TRAP BOTTOM AT ELEV. 248
WEIR CREST ELEV. 250
TOP OF BERM ELEV. 253

Tighe&Bond

BRIAN S. HUNDLEY No. 31180

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 3B

SCALE: 1"=40'

SESC - 14

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:43pm By: JGenga
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

1. EFFECTIVELY STABILIZE SOILS ON ONE PHASE 3 BEFORE COMMENCING GRADING AND CONSTRUCTION ON ANOTHER PHASE. ANY MODIFICATIONS TO THE PROPOSED PHASING PLANS MUST BE SUBMITTED TO CT DEEP FOR REVIEW AND APPROVAL PRIOR TO INITIATING A CONSTRUCTION MODIFICATION.
2. CONFORM TO THE CURRENT CT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR ANY SOIL DISTURBANCE TO THE EXISTING AGRICULTURAL FIELDS.
3. REFER TO STORMWATER POLLUTION CONTROL PLAN FOR SEDIMENT TRAP/BASIN SIZING CALCULATIONS.
4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 3

1. FLAG THE LIMITS OF CONSTRUCTION.
2. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
3. PRIOR TO INSTALLING SURFACE WATER CONTROLS, SUCH AS TEMPORARY DIVERSION AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
4. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
5. CLEAR AND REMOVE EXISTING STUMPS AS NEEDED.
6. INSTALL SOLAR INFRASTRUCTURE, INCLUDING RACKING, SOLAR MODULES, UTILITY CONNECTIONS, AND EQUIPMENT PADS. SOLAR ARRAY CONSTRUCTION WILL BEGIN WITH POSTS OR GROUND SCREWS BEING DRIVEN INTO THE GROUND; RACKING WILL THEN BE AFFIXED TO THE POSTS; AND MODULES WILL BE MOUNTED AND INSTALLED ON THE RACKS.
7. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
8. AFTER PHASE IS FULLY STABILIZED, REMOVE TEMPORARY STORMWATER CONTROLS.
9. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

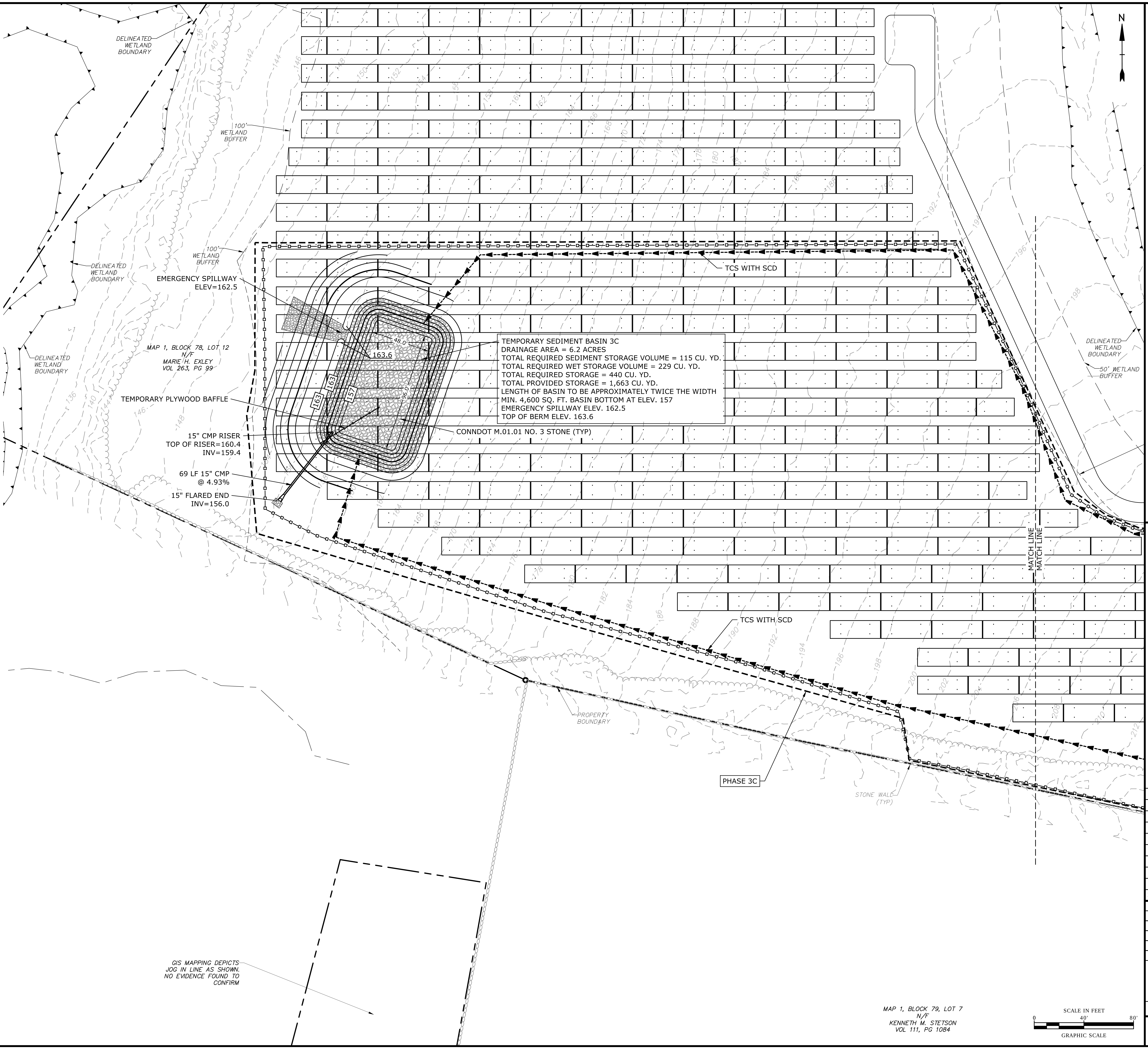
LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS 124
INDEX CONTOURS 120
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD

TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE



TEMPORARY SEDIMENT BASIN 3C
DRAINAGE AREA = 6.2 ACRES
TOTAL REQUIRED SEDIMENT STORAGE VOLUME = 115 CU. YD.
TOTAL REQUIRED WET STORAGE VOLUME = 229 CU. YD.
TOTAL REQUIRED STORAGE = 440 CU. YD.
TOTAL PROVIDED STORAGE = 1,663 CU. YD.
LENGTH OF BASIN TO BE APPROXIMATELY TWICE THE WIDTH
MIN. 4,600 SQ. FT. BASIN BOTTOM AT ELEV. 157
EMERGENCY SPILLWAY ELEV. 162.5
TOP OF BERM ELEV. 163.6

Last Saved: 12/31/2020
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Tighe&Bond

No. 31180
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 3CA

SCALE: 1"=40'

SESC - 15

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

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CONSTRUCTION PHASE 3

1. FLAG THE LIMITS OF CONSTRUCTION.
2. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
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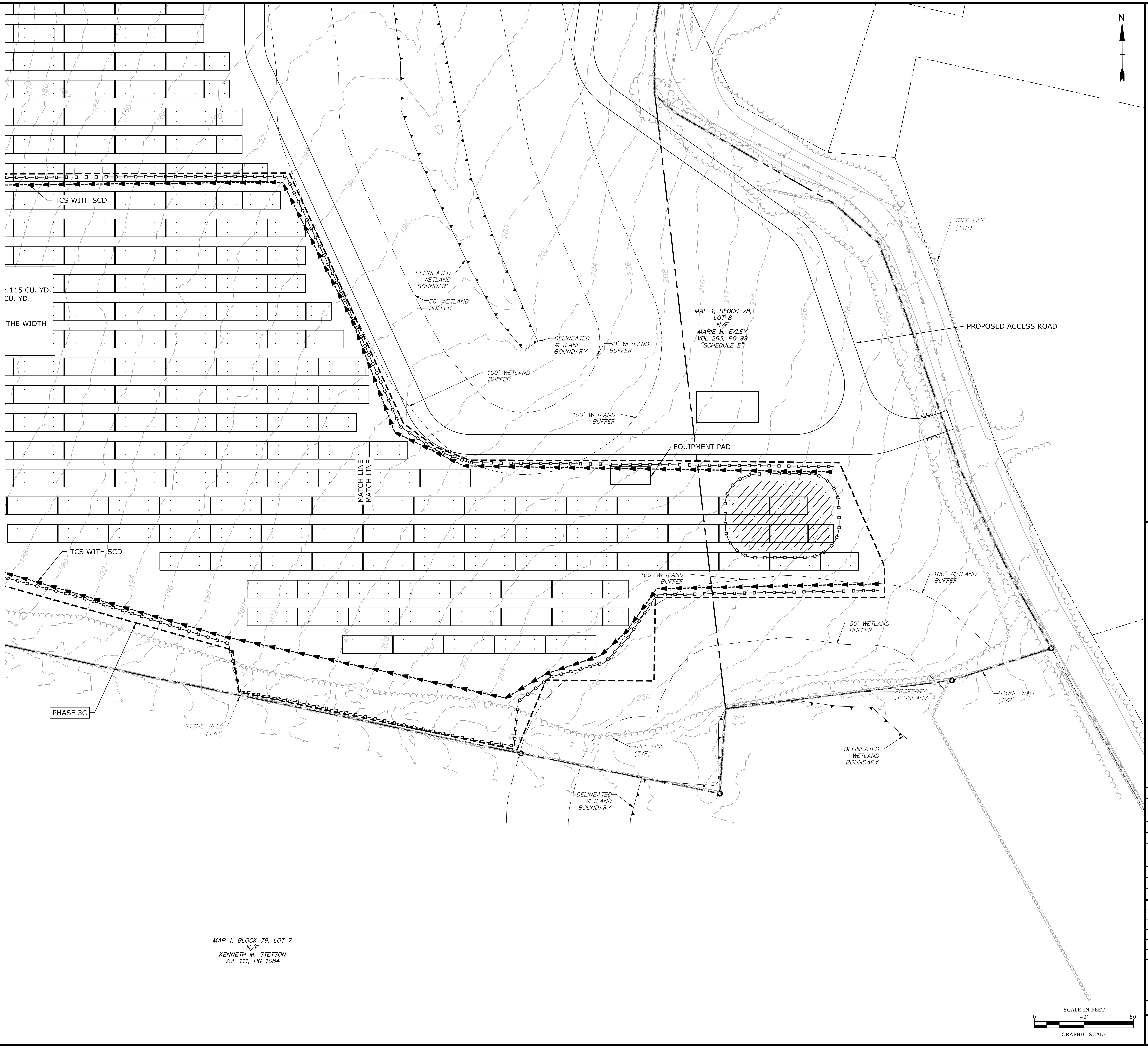
LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124
INDEX CONTOURS — 120
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE



Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 3CB

SCALE: 1"=40'

SESC - 16

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:44pm By: JGenga
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SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

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CONSTRUCTION PHASE 3

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9. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124 —
INDEX CONTOURS — 120 —
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE

Last Saved: 12/31/2020
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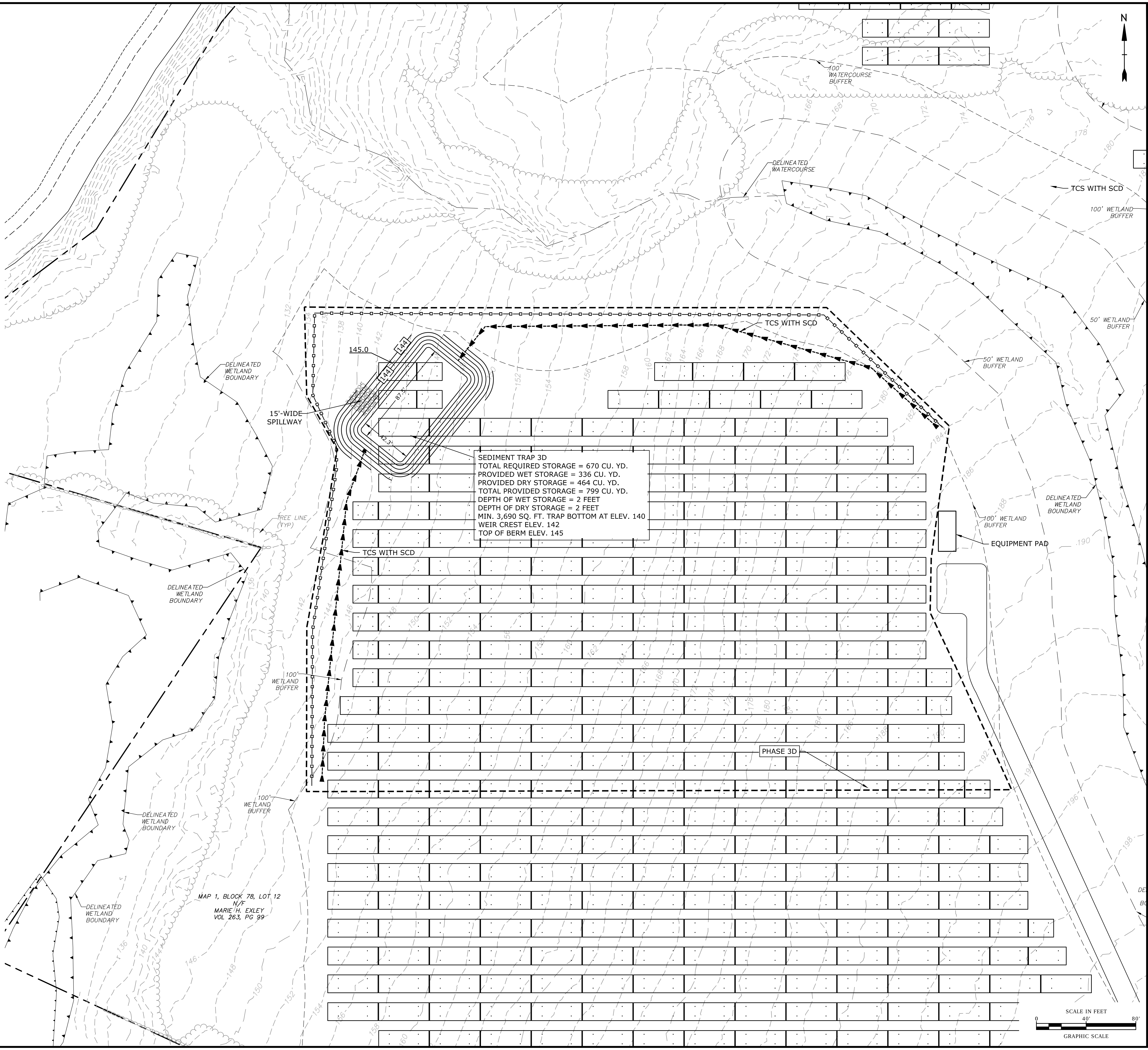
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg



SEDIMENT TRAP 3D
TOTAL REQUIRED STORAGE = 670 CU. YD.
PROVIDED WET STORAGE = 336 CU. YD.
PROVIDED DRY STORAGE = 464 CU. YD.
TOTAL PROVIDED STORAGE = 799 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 3,690 SQ. FT. TRAP BOTTOM AT ELEV. 140
WEIR CREST ELEV. 142
TOP OF BERM ELEV. 145

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
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DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 3D

SCALE: 1"=40'

SESC - 17

SESC NARRATIVE

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CONSTRUCTION PHASE 3

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LEGEND

PROPERTY LINE
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INDEX CONTOURS
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PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD

TEMPORARY SOIL STOCKPILE

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE

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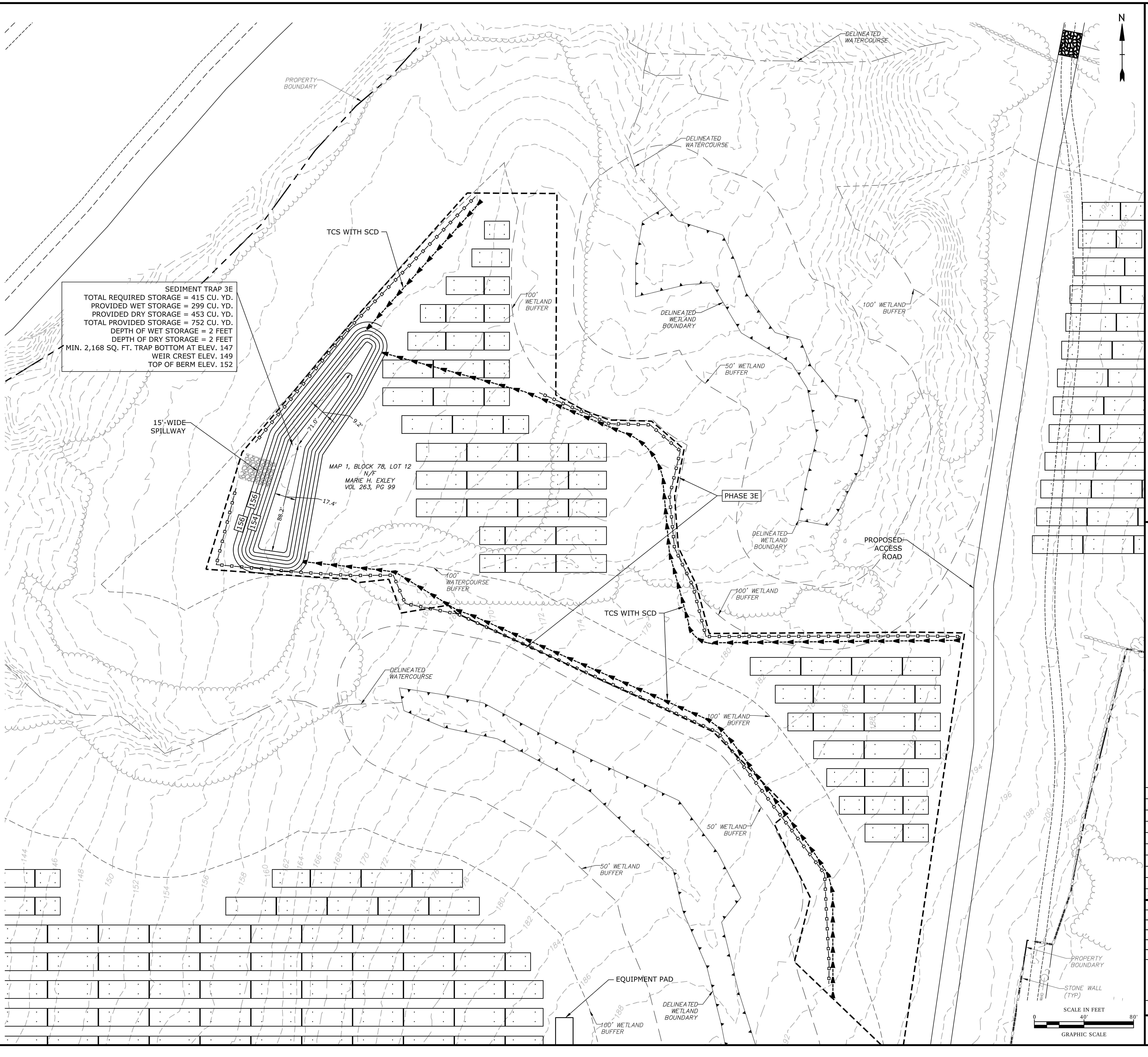
SEDIMENT TRAP 3E
TOTAL REQUIRED STORAGE = 415 CU. YD.
PROVIDED WET STORAGE = 299 CU. YD.
PROVIDED DRY STORAGE = 453 CU. YD.
TOTAL PROVIDED STORAGE = 752 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 2,168 SQ. FT. TRAP BOTTOM AT ELEV. 147
WEIR CREST ELEV. 149
TOP OF BERM ELEV. 152



Tighe&Bond

BRIAN S. HUNTER
No. 31180
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

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Plainfield, Connecticut

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PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 3E

SCALE: 1"=40'

SESC - 18

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

1. EFFECTIVELY STABILIZE SOILS ON ONE PHASE 3 BEFORE COMMENCING GRADING AND CONSTRUCTION ON ANOTHER PHASE. ANY MODIFICATIONS TO THE PROPOSED PHASING PLANS MUST BE SUBMITTED TO CT DEEP FOR REVIEW AND APPROVAL PRIOR TO INITIATING A CONSTRUCTION MODIFICATION.
2. CONFORM TO THE CURRENT CT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR ANY SOIL DISTURBANCE TO THE EXISTING AGRICULTURAL FIELDS.
3. REFER TO STORMWATER POLLUTION CONTROL PLAN FOR SEDIMENT TRAP/BASIN SIZING CALCULATIONS.
4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 3

1. FLAG THE LIMITS OF CONSTRUCTION.
2. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
3. PRIOR TO INSTALLING SURFACE WATER CONTROLS, SUCH AS TEMPORARY DIVERSION AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
4. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
5. CLEAR AND REMOVE EXISTING STUMPS AS NEEDED.
6. INSTALL SOLAR INFRASTRUCTURE, INCLUDING RACKING, SOLAR MODULES, UTILITY CONNECTIONS, AND EQUIPMENT PADS. SOLAR ARRAY CONSTRUCTION WILL BEGIN WITH POSTS OR GROUND SCREWS BEING DRIVEN INTO THE GROUND; RACKING WILL THEN BE AFFIXED TO THE POSTS; AND MODULES WILL BE MOUNTED AND INSTALLED ON THE RACKS.
7. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
8. AFTER PHASE IS FULLY STABILIZED, REMOVE TEMPORARY STORMWATER CONTROLS.
9. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

LEGEND

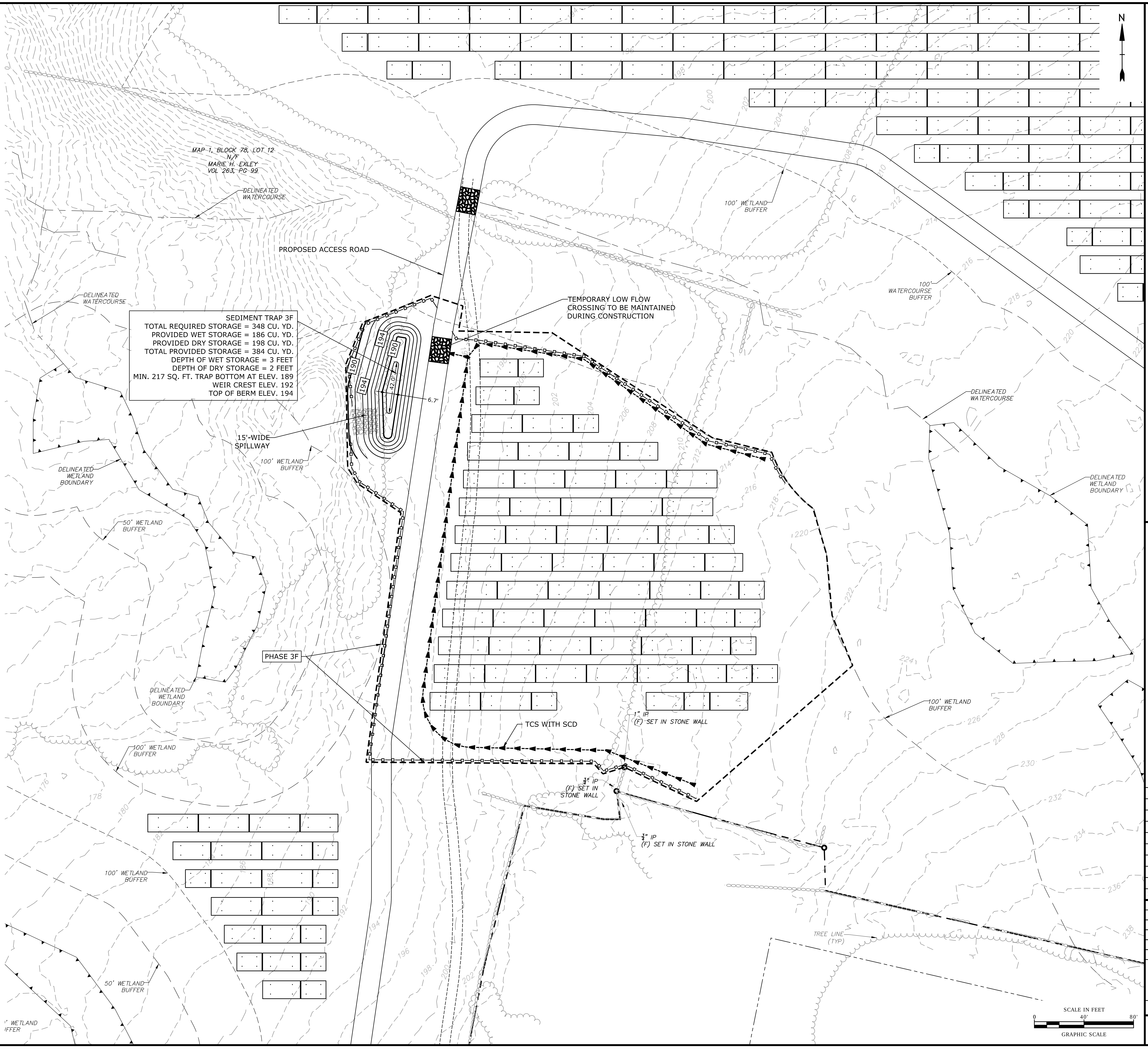
PROPERTY LINE
INTERMEDIATE CONTOURS — 124 —
INDEX CONTOURS — 120 —
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE

NOTE: SEDIMENT TRAP 1A SHALL REMAIN IN PLACE FOR PHASE 3F.

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:45pm By: JGenga
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg



Tighe&Bond

STATE OF CONNECTICUT
BRIAN S. HUNTLEY
No. 31180
LICENSED PROFESSIONAL ENGINEER

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
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SOIL EROSION AND SEDIMENT CONTROL PLAN - 3F

SCALE: 1"=40'

SESC - 19

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

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CONSTRUCTION PHASE 3

1. FLAG THE LIMITS OF CONSTRUCTION.
2. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
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9. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

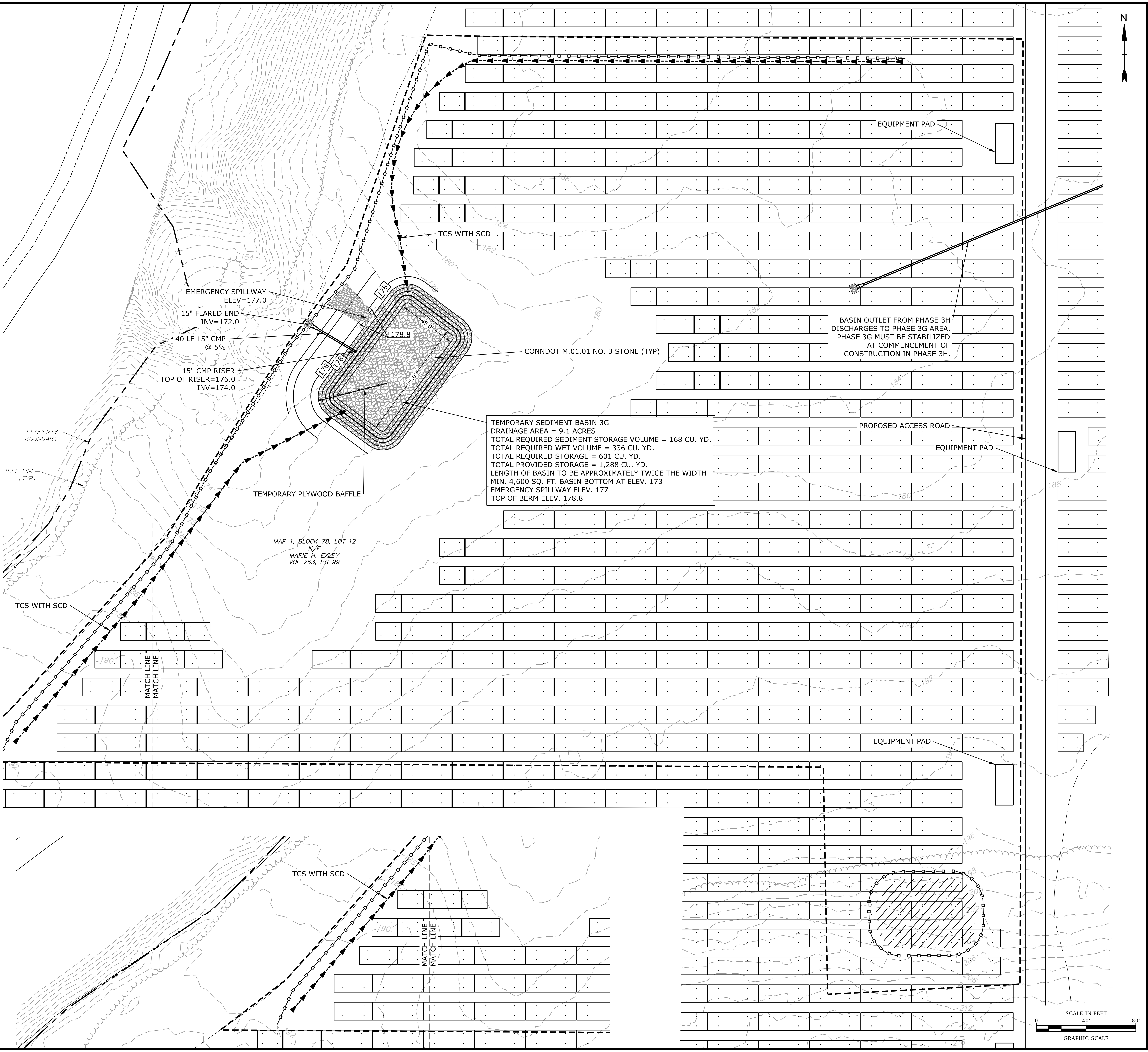
LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124 —
INDEX CONTOURS — 120 —
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE

NOTE: PHASE 3G MUST BE STABILIZED AT COMMENCEMENT OF CONSTRUCTION IN PHASE 3H.



TEMPORARY SEDIMENT BASIN 3G
DRAINAGE AREA = 9.1 ACRES
TOTAL REQUIRED SEDIMENT STORAGE VOLUME = 168 CU. YD.
TOTAL REQUIRED WET VOLUME = 336 CU. YD.
TOTAL REQUIRED STORAGE = 601 CU. YD.
TOTAL PROVIDED STORAGE = 1,288 CU. YD.
LENGTH OF BASIN TO BE APPROXIMATELY TWICE THE WIDTH
MIN. 4,600 SQ. FT. BASIN BOTTOM AT ELEV. 173
EMERGENCY SPILLWAY ELEV. 177
TOP OF BERM ELEV. 178.8

BASIN OUTLET FROM PHASE 3H DISCHARGES TO PHASE 3G AREA. PHASE 3G MUST BE STABILIZED AT COMMENCEMENT OF CONSTRUCTION IN PHASE 3H.

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR
CONSTRUCTION

Constitution
Solar

Constitution
Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

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SOIL EROSION AND SEDIMENT
CONTROL PLAN - 3G

SCALE: 1"=40'

SESC - 20

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:46pm By: JGenga
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg

SESC NARRATIVE

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LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124 —
INDEX CONTOURS — 120 —
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD	STONE CHECK DAM
TCS	TEMP. CONVEYANCE SWALE

NOTE: PHASE 3G MUST BE STABILIZED AT COMMENCEMENT OF CONSTRUCTION IN PHASE 3H. PHASE 3H MUST BE STABILIZED AT COMMENCEMENT OF CONSTRUCTION IN PHASE 3J.

Last Saved: 12/31/2020
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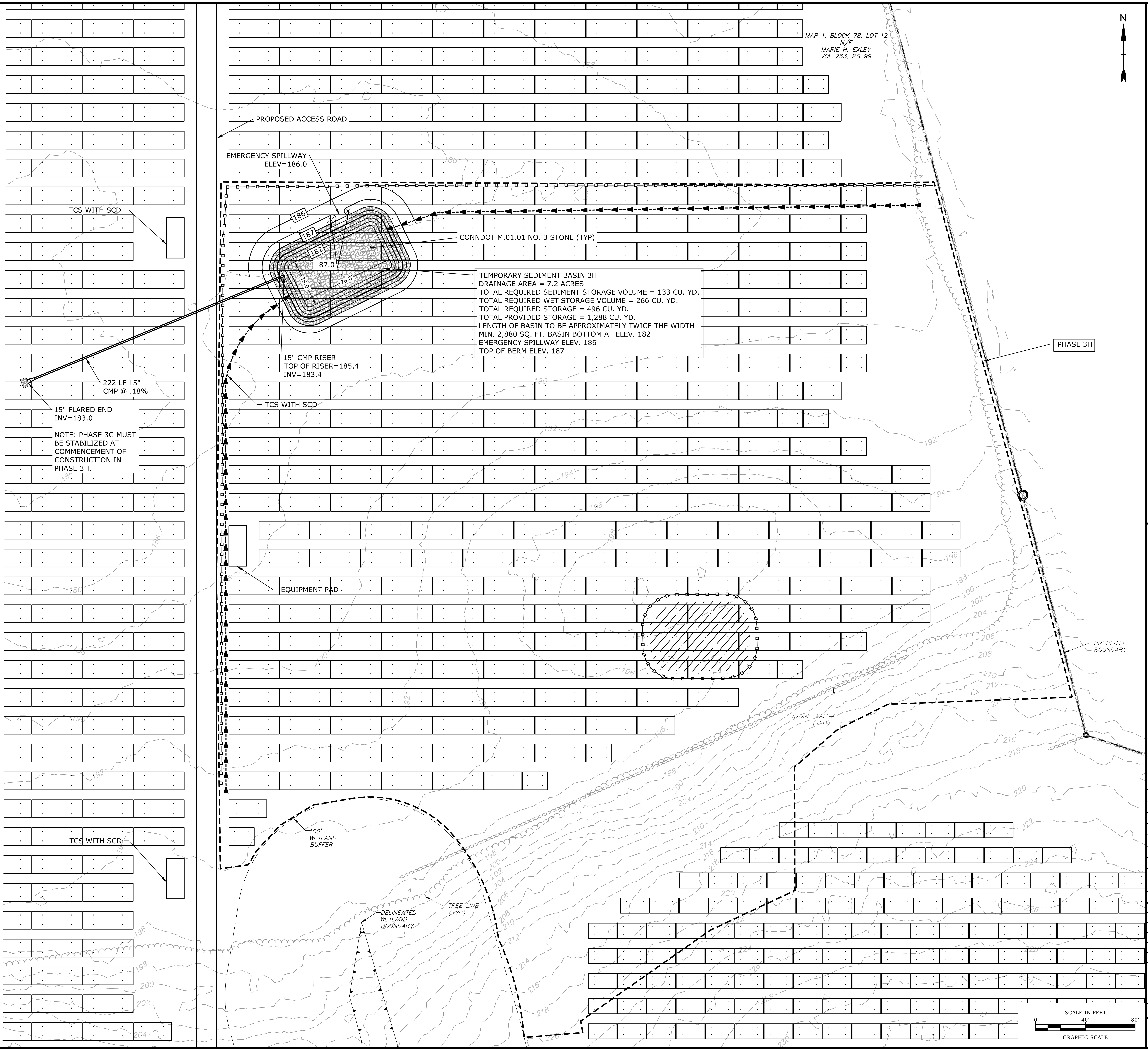
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg



NOTE: PHASE 3G MUST BE STABILIZED AT COMMENCEMENT OF CONSTRUCTION IN PHASE 3H.

TEMPORARY SEDIMENT BASIN 3H
DRAINAGE AREA = 7.2 ACRES
TOTAL REQUIRED SEDIMENT STORAGE VOLUME = 133 CU. YD.
TOTAL REQUIRED WET STORAGE VOLUME = 266 CU. YD.
TOTAL REQUIRED STORAGE = 496 CU. YD.
TOTAL PROVIDED STORAGE = 1,288 CU. YD.
LENGTH OF BASIN TO BE APPROXIMATELY TWICE THE WIDTH
MIN. 2,880 SQ. FT. BASIN BOTTOM AT ELEV. 182
EMERGENCY SPILLWAY ELEV. 186
TOP OF BERM ELEV. 187

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
LICENSED PROFESSIONAL ENGINEER

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
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DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 3H

SCALE: 1"=40'

SESC - 21

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

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LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS
INDEX CONTOURS
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WETLAND BUFFER
WATERCOURSE BUFFER
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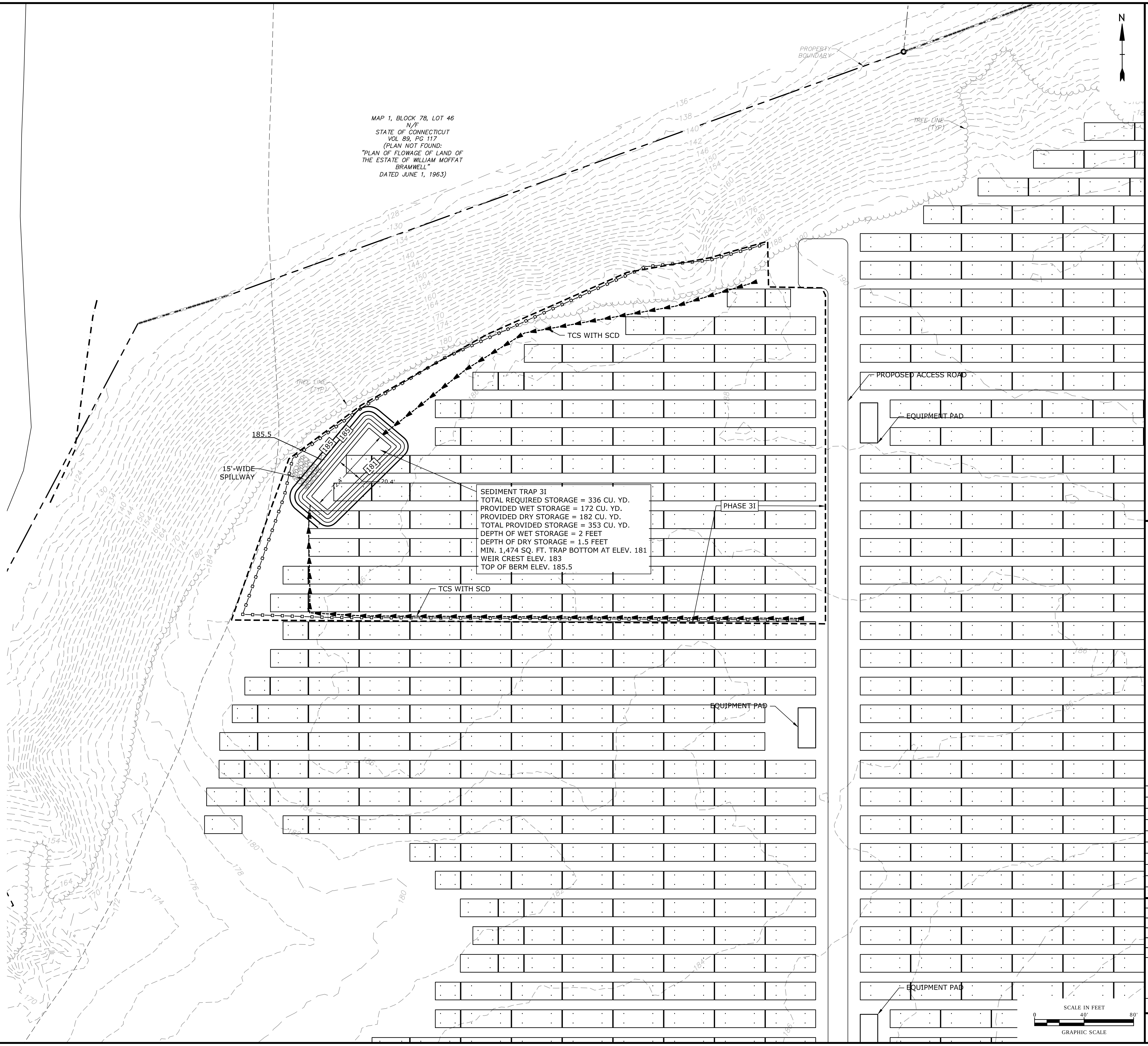
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE



MAP 1, BLOCK 78, LOT 46
N/F
STATE OF CONNECTICUT
VOL 89, PG 117
(PLAN NOT FOUND:
"PLAN OF FLOWAGE OF LAND OF
THE ESTATE OF WILLIAM MOFFAT
BRAMWELL"
DATED JUNE 1, 1963)

SEDIMENT TRAP 3I
TOTAL REQUIRED STORAGE = 336 CU. YD.
PROVIDED WET STORAGE = 172 CU. YD.
PROVIDED DRY STORAGE = 182 CU. YD.
TOTAL PROVIDED STORAGE = 353 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 1.5 FEET
MIN. 1,474 SQ. FT. TRAP BOTTOM AT ELEV. 181
WEIR CREST ELEV. 183
TOP OF BERM ELEV. 185.5

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

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SOIL EROSION AND SEDIMENT CONTROL PLAN - 3I

SCALE: 1"=40'

SESC - 22

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SESC NARRATIVE

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CONSTRUCTION PHASE 3

1. FLAG THE LIMITS OF CONSTRUCTION.
2. INSTALL PERIMETER CONTROLS TO ESTABLISH PHASE WORK AREA IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
3. PRIOR TO INSTALLING SURFACE WATER CONTROLS, SUCH AS TEMPORARY DIVERSION AND STONE CHECK DAMS, INSPECT EXISTING CONDITIONS TO ENSURE DISCHARGE LOCATIONS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING SURFACE WATER CONTROLS.
4. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS.
5. CLEAR AND REMOVE EXISTING STUMPS AS NEEDED.
6. INSTALL SOLAR INFRASTRUCTURE, INCLUDING RACKING, SOLAR MODULES, UTILITY CONNECTIONS, AND EQUIPMENT PADS. SOLAR ARRAY CONSTRUCTION WILL BEGIN WITH POSTS OR GROUND SCREWS BEING DRIVEN INTO THE GROUND; RACKING WILL THEN BE AFFIXED TO THE POSTS; AND MODULES WILL BE MOUNTED AND INSTALLED ON THE RACKS.
7. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
8. AFTER PHASE IS FULLY STABILIZED, REMOVE TEMPORARY STORMWATER CONTROLS.
9. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

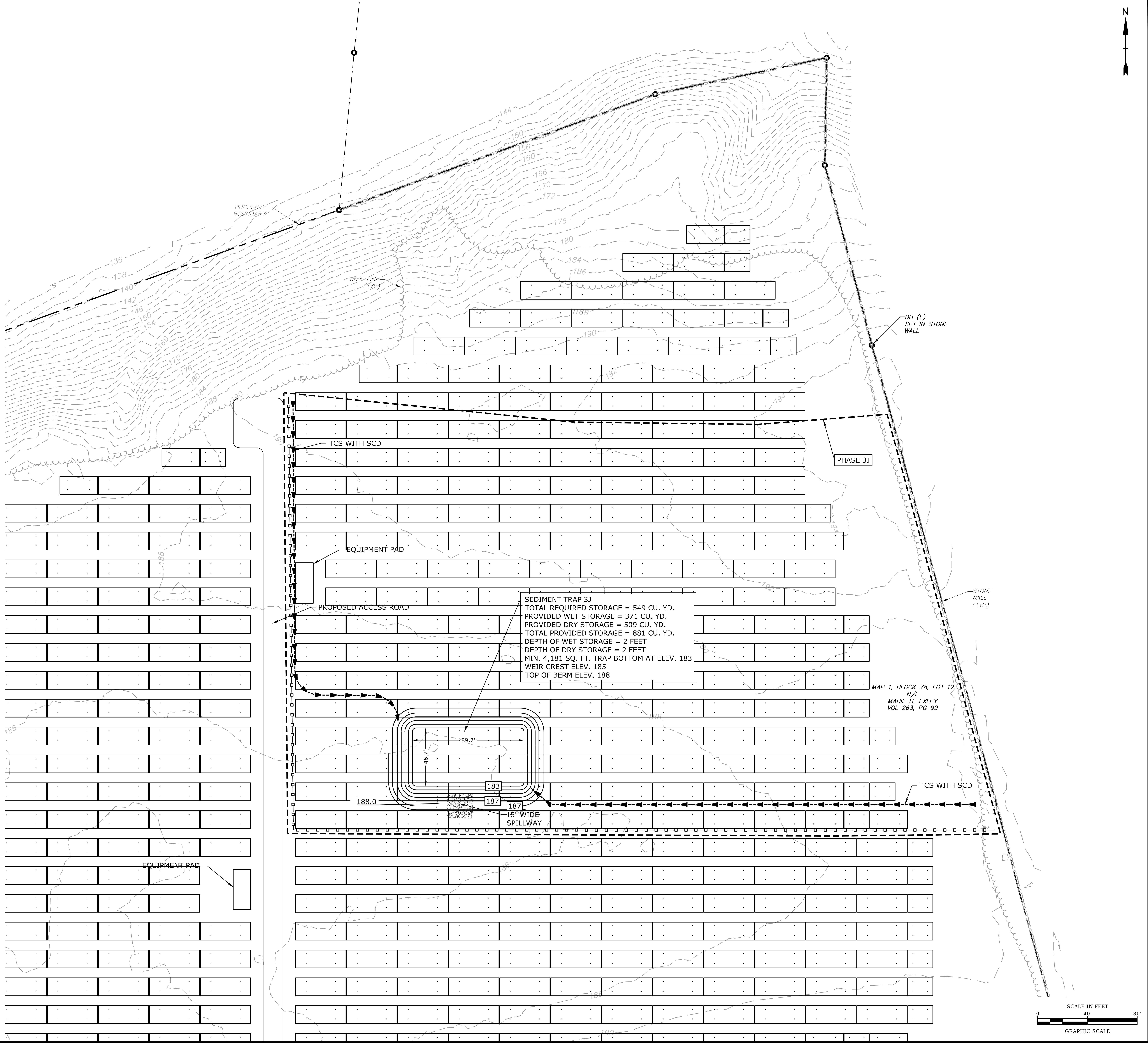
LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS 124
INDEX CONTOURS 120
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE

NOTE: PHASE 3H MUST BE STABILIZED AT COMMENCEMENT OF CONSTRUCTION IN PHASE 3J.



SEDIMENT TRAP 3J
TOTAL REQUIRED STORAGE = 549 CU. YD.
PROVIDED WET STORAGE = 371 CU. YD.
PROVIDED DRY STORAGE = 509 CU. YD.
TOTAL PROVIDED STORAGE = 881 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 4,181 SQ. FT. TRAP BOTTOM AT ELEV. 183
WEIR CREST ELEV. 185
TOP OF BERM ELEV. 188

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT CONTROL PLAN - 3J

SCALE: 1"=40'

SESC - 23

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:47pm By: JGenga
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

1. EFFECTIVELY STABILIZE SOILS ON ONE PHASE 3 BEFORE COMMENCING GRADING AND CONSTRUCTION ON ANOTHER PHASE. ANY MODIFICATIONS TO THE PROPOSED PHASING PLANS MUST BE SUBMITTED TO CT DEEP FOR REVIEW AND APPROVAL PRIOR TO INITIATING A CONSTRUCTION MODIFICATION.
2. CONFORM TO THE CURRENT CT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR ANY SOIL DISTURBANCE TO THE EXISTING AGRICULTURAL FIELDS.
3. REFER TO STORMWATER POLLUTION CONTROL PLAN FOR SEDIMENT TRAP/BASIN SIZING CALCULATIONS.
4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 3

1. FLAG THE LIMITS OF CONSTRUCTION.
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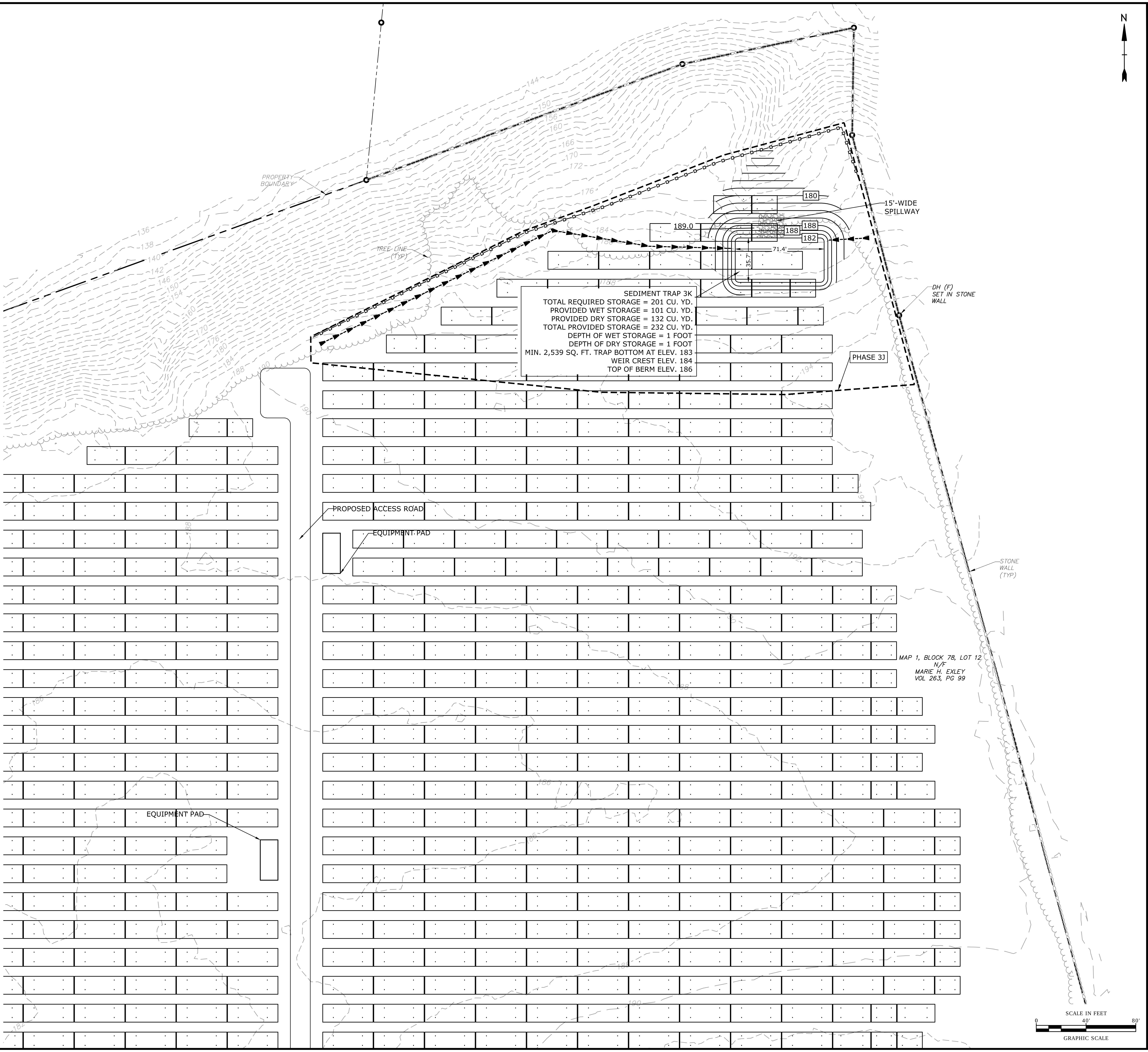
9. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124
INDEX CONTOURS — 120
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE



SEDIMENT TRAP 3K
TOTAL REQUIRED STORAGE = 201 CU. YD.
PROVIDED WET STORAGE = 101 CU. YD.
PROVIDED DRY STORAGE = 132 CU. YD.
TOTAL PROVIDED STORAGE = 232 CU. YD.
DEPTH OF WET STORAGE = 1 FOOT
DEPTH OF DRY STORAGE = 1 FOOT
MIN. 2,539 SQ. FT. TRAP BOTTOM AT ELEV. 183
WEIR CREST ELEV. 184
TOP OF BERM ELEV. 186

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR
CONSTRUCTION

Constitution
Solar

Constitution
Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT
CONTROL PLAN - 3K

SCALE: 1"=40'

SESC - 24

Last Saved: 12/31/2020
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APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT
CONTROL PLAN - PHASE 4
OVERALL

SCALE: 1"=250'

SESC - 25

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

SEDIMENT TRAP AND BASIN SIZING CALCULATIONS ARE PROVIDED IN APPENDIX D OF THE STORMWATER POLLUTION CONTROL PLAN.

GENERAL NOTES

1. EFFECTIVELY STABILIZE SOILS ON ONE PHASE 4 BEFORE COMMENCING GRADING AND CONSTRUCTION ON ANOTHER PHASE. ANY MODIFICATIONS TO THE PROPOSED PHASING PLANS MUST BE SUBMITTED TO CT DEEP FOR REVIEW AND APPROVAL PRIOR TO INITIATING A CONSTRUCTION MODIFICATION.
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4. REFER TO CONSTRUCTION DRAWINGS FOR ALL DESIGN INFORMATION.
5. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MODIFICATION BY THE STORMWATER PROFESSIONAL DEPENDING ON ACTUAL FIELD CONDITIONS THROUGHOUT CONSTRUCTION DURATION.

CONSTRUCTION PHASE 4

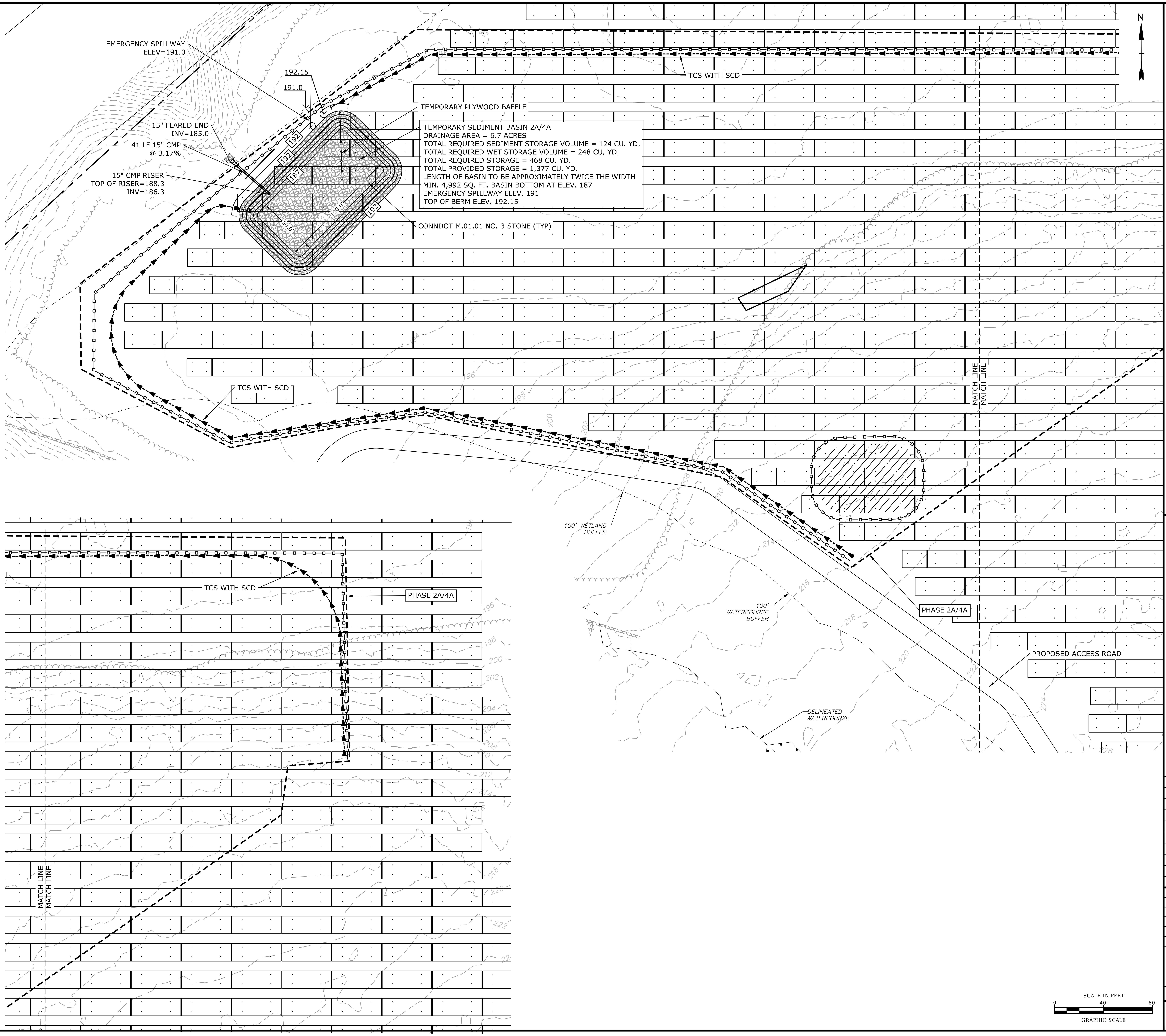
1. INSPECT AND INSTALL PERIMETER CONTROLS ESTABLISHED IN PHASE 2 TO ENSURE PHASE WORK AREA IS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
2. INSPECT AND CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS INSTALLED IN PHASE 2.
3. INSTALL SOLAR INFRASTRUCTURE, INCLUDING RACKING, SOLAR MODULES, UTILITY CONNECTIONS, AND EQUIPMENT PADS. SOLAR ARRAY CONSTRUCTION WILL BEGIN WITH POSTS OR GROUND SCREWS BEING DRIVEN INTO THE GROUND; RACKING WILL THEN BE AFFIXED TO THE POSTS; AND MODULES WILL BE MOUNTED AND INSTALLED ON THE RACKS.
4. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
5. AFTER PHASE IS FULLY STABILIZED, REMOVE TEMPORARY STORMWATER CONTROLS.
6. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124 —
INDEX CONTOURS — 120 —
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE



TEMPORARY SEDIMENT BASIN 2A/4A
DRAINAGE AREA = 6.7 ACRES
TOTAL REQUIRED SEDIMENT STORAGE VOLUME = 124 CU. YD.
TOTAL REQUIRED WET STORAGE VOLUME = 248 CU. YD.
TOTAL REQUIRED STORAGE = 468 CU. YD.
TOTAL PROVIDED STORAGE = 1,377 CU. YD.
LENGTH OF BASIN TO BE APPROXIMATELY TWICE THE WIDTH
MIN. 4,992 SQ. FT. BASIN BOTTOM AT ELEV. 187
EMERGENCY SPILLWAY ELEV. 191
TOP OF BERM ELEV. 192.15

Last Saved: 12/31/2020
Plotted On:Dec 31, 2020-1:48pm By: JGenga
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR
CONSTRUCTION

Constitution
Solar

Constitution
Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT
CONTROL PLAN - 4A

SCALE: 1"=40'

SESC - 26

SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

THE PROJECT SOIL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN MULTIPLE PHASES TOTALING APPROXIMATELY 75 ACRES OF DISTURBANCE.

TREE CLEARING IS ANTICIPATED TO OCCUR PRIOR TO SITE CONSTRUCTION, DURING WINTER 2020/2021, PER NDDB RECOMMENDATIONS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES CONFORM TO THE STANDARDS OUTLINED IN THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CTDEEP), "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST REVISION.

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GENERAL NOTES

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CONSTRUCTION PHASE 4

1. INSPECT AND INSTALL PERIMETER CONTROLS ESTABLISHED IN PHASE 2 TO ENSURE PHASE WORK AREA IS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND SOIL EROSION AND SEDIMENT CONTROL PLAN.
2. INSPECT AND CONSTRUCT TEMPORARY SEDIMENT TRAPS AND/OR BASINS, DIVERSION SWALES AND BERMS WITH CHECK DAMS INSTALLED IN PHASE 2.
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4. STABILIZE SITE WITH SEED AND MULCH IN ALL DISTURBED AREAS. IF A MINIMUM 4" OF TOPSOIL IS NOT PRESENT, AMEND WITH LOAM BORROW FOR A MINIMUM 4" OF VEGETATIVE SUPPORT MATERIAL TO PROMOTE GRASS GROWTH. STABILIZE AREAS WITH A SLOPE OF 7% OR STEEPER WITH HYDROSEED WITH BONDED FIBER MATRIX OR HYDROSEED AND INSTALL EROSION CONTROL BLANKETS. MONITOR DISTURBED AREAS WEEKLY OR FOLLOWING RAIN EVENTS AND AMEND WITH ADDITIONAL SEEDING AS NEEDED UNTIL STABILIZATION IS ACHIEVED.
5. AFTER PHASE IS FULLY STABILIZED, REMOVE TEMPORARY STORMWATER CONTROLS.
6. ONCE THE TEMPORARY MEASURES ARE REMOVED, INSTALL THE REMAINING RACKING AND COMPONENTS THAT ARE LOCATED WHERE THE TEMPORARY MEASURES WERE REMOVED.

LEGEND

PROPERTY LINE
INTERMEDIATE CONTOURS — 124 —
INDEX CONTOURS — 120 —
GRAVEL ROAD/DRIVEWAY
VERNAL POOL BUFFER
STONE WALL
WETLAND BUFFER
WATERCOURSE BUFFER
DELINEATED WATERCOURSE
VERNAL POOL
DELINEATED WETLAND
EXISTING LIMIT OF VEGETATION
PROPOSED LIMIT OF VEGETATION
PHASE LIMIT LINE
FUTURE LIMIT OF SOLAR ARRAY
PERIMETER EROSION CONTROL
TEMP. CONVEYANCE SWALE WITH SCD
TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE

SEDIMENT TRAP 2B/4B
TOTAL REQUIRED STORAGE = 643 CU. YD.
PROVIDED WET STORAGE = 336 CU. YD.
PROVIDED DRY STORAGE = 464 CU. YD.
TOTAL PROVIDED STORAGE = 799 CU. YD.
DEPTH OF WET STORAGE = 2 FEET
DEPTH OF DRY STORAGE = 2 FEET
MIN. 3,690 SQ. FT. TRAP BOTTOM AT ELEV. 214
WEIR CREST ELEV. 216
TOP OF BERM ELEV. 219

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180

12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar

Constitution Solar, LLC

Plainfield,
Connecticut

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DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT
CONTROL PLAN - 4B

SCALE: 1"=40'

SESC - 27

Last Saved: 12/31/2020
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SESC NARRATIVE

THE PROPOSED PROJECT INCLUDES CLEARING AND GRUBBING, THE CONSTRUCTION OF A SOLAR ARRAY, FENCES, ACCESS ROADS, AND SITE LANDSCAPING.

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LEGEND

- PROPERTY LINE
- INTERMEDIATE CONTOURS (124)
- INDEX CONTOURS (120)
- GRAVEL ROAD/DRIVEWAY
- VERNAL POOL BUFFER
- STONE WALL
- WETLAND BUFFER
- WATERCOURSE BUFFER
- DELINEATED WATERCOURSE
- VERNAL POOL
- DELINEATED WETLAND
- EXISTING LIMIT OF VEGETATION
- PROPOSED LIMIT OF VEGETATION
- PHASE LIMIT LINE
- FUTURE LIMIT OF SOLAR ARRAY
- PERIMETER EROSION CONTROL
- TEMP. CONVEYANCE SWALE WITH SCD
- TEMPORARY SOIL STOCKPILE ▨

S&E CODES

SCD STONE CHECK DAM
TCS TEMP. CONVEYANCE SWALE

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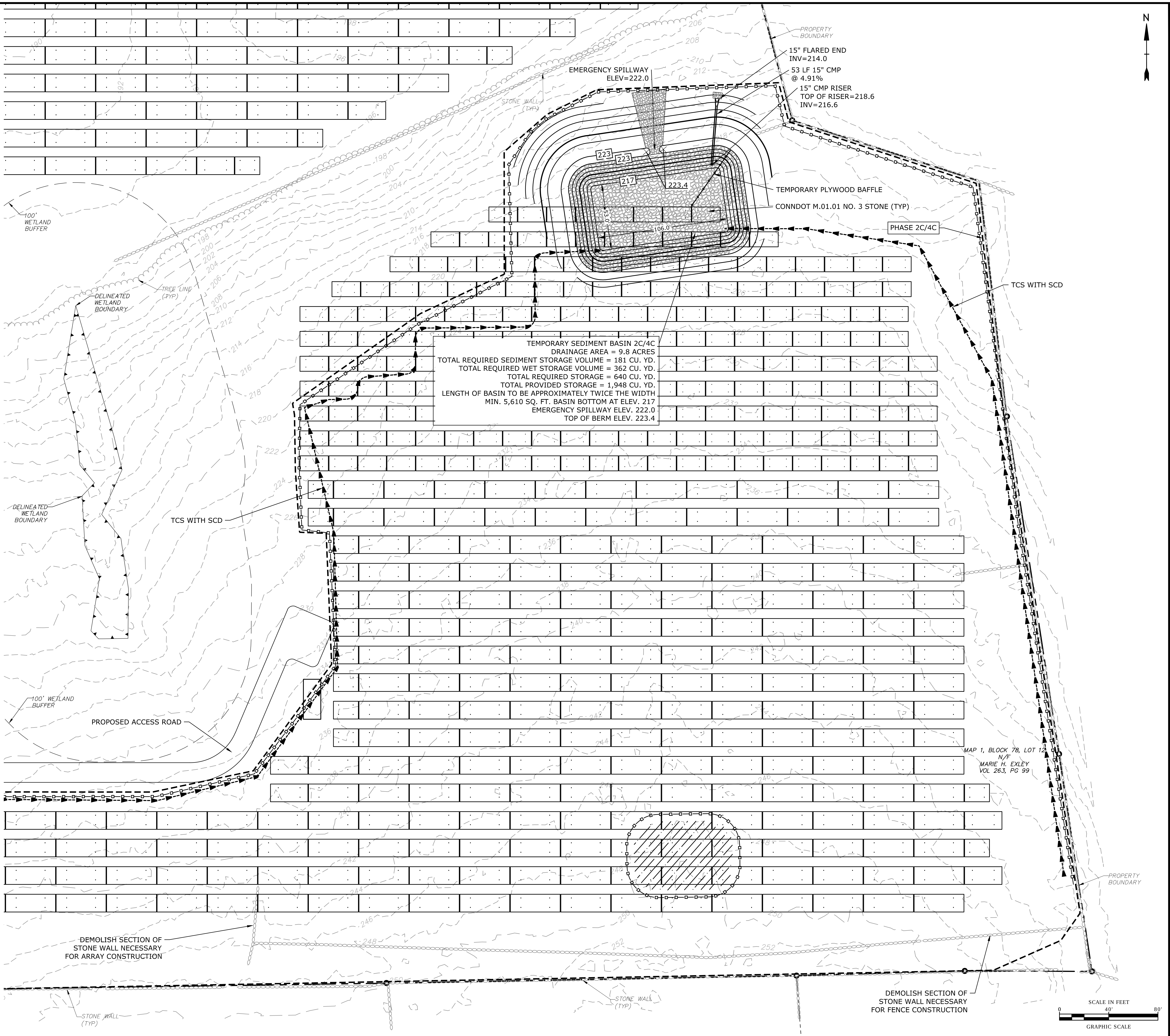
Plotted On:Dec 31, 2020-1:49pm By: JGenga
Tighe & Bond:J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Plans.dwg



TEMPORARY SEDIMENT BASIN 2C/4C
DRAINAGE AREA = 9.8 ACRES
TOTAL REQUIRED SEDIMENT STORAGE VOLUME = 181 CU. YD.
TOTAL REQUIRED WET STORAGE VOLUME = 362 CU. YD.
TOTAL REQUIRED STORAGE = 640 CU. YD.
TOTAL PROVIDED STORAGE = 1,948 CU. YD.
LENGTH OF BASIN TO BE APPROXIMATELY TWICE THE WIDTH
MIN. 5,610 SQ. FT. BASIN BOTTOM AT ELEV. 217
EMERGENCY SPILLWAY ELEV. 222.0
TOP OF BERM ELEV. 223.4

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR
CONSTRUCTION

Constitution
Solar

Constitution
Solar, LLC

Plainfield,
Connecticut

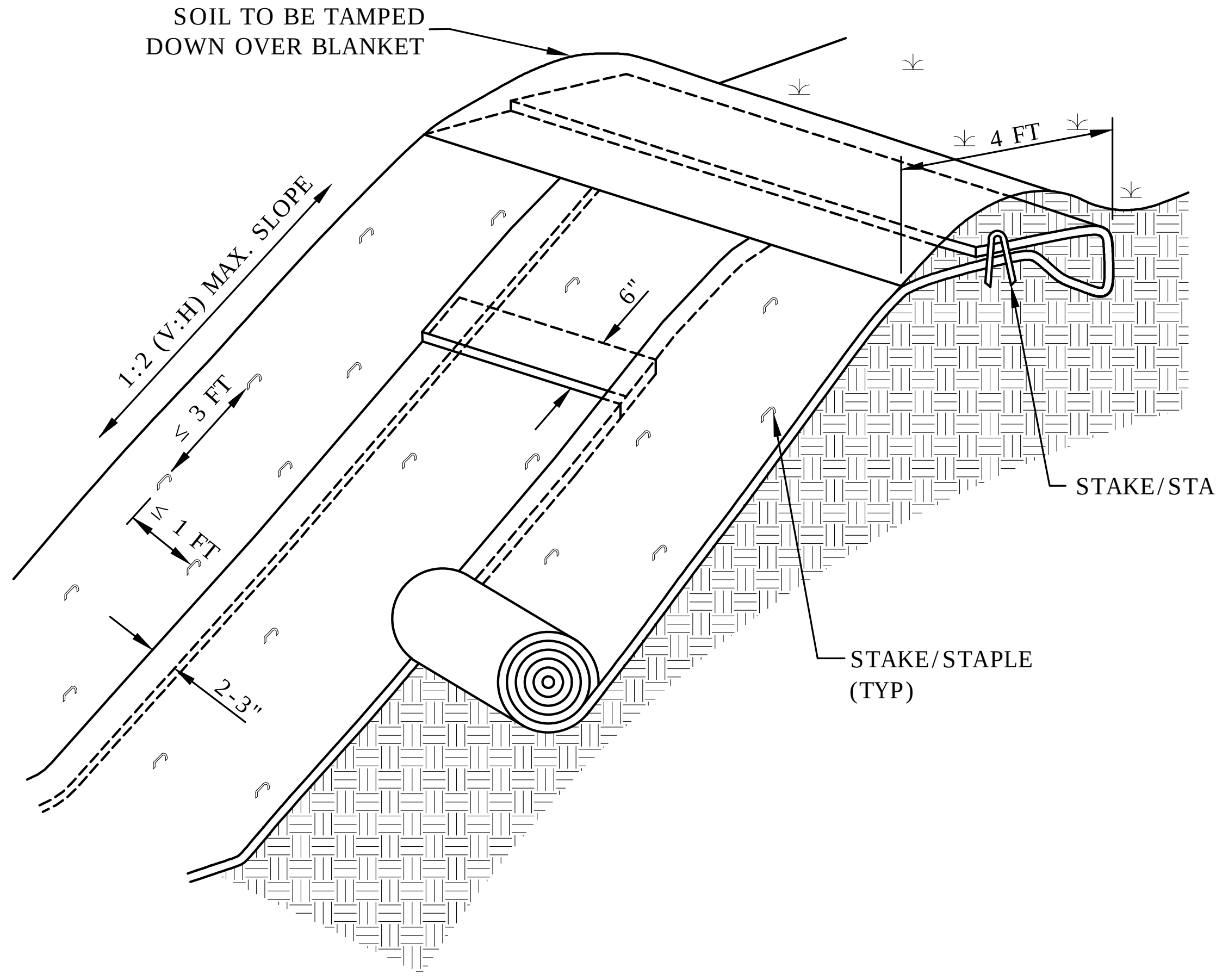
MARK	DATE	DESCRIPTION

PROJECT NO:	R0317-003
DATE:	12/01/2020
FILE:	SESC Plans.dwg
DRAWN BY:	ALG/ELD
CHECKED BY:	BSH/JEC
APPROVED BY:	FJH

SOIL EROSION AND SEDIMENT
CONTROL PLAN - 4C

SCALE: 1"=40'

SESC - 28

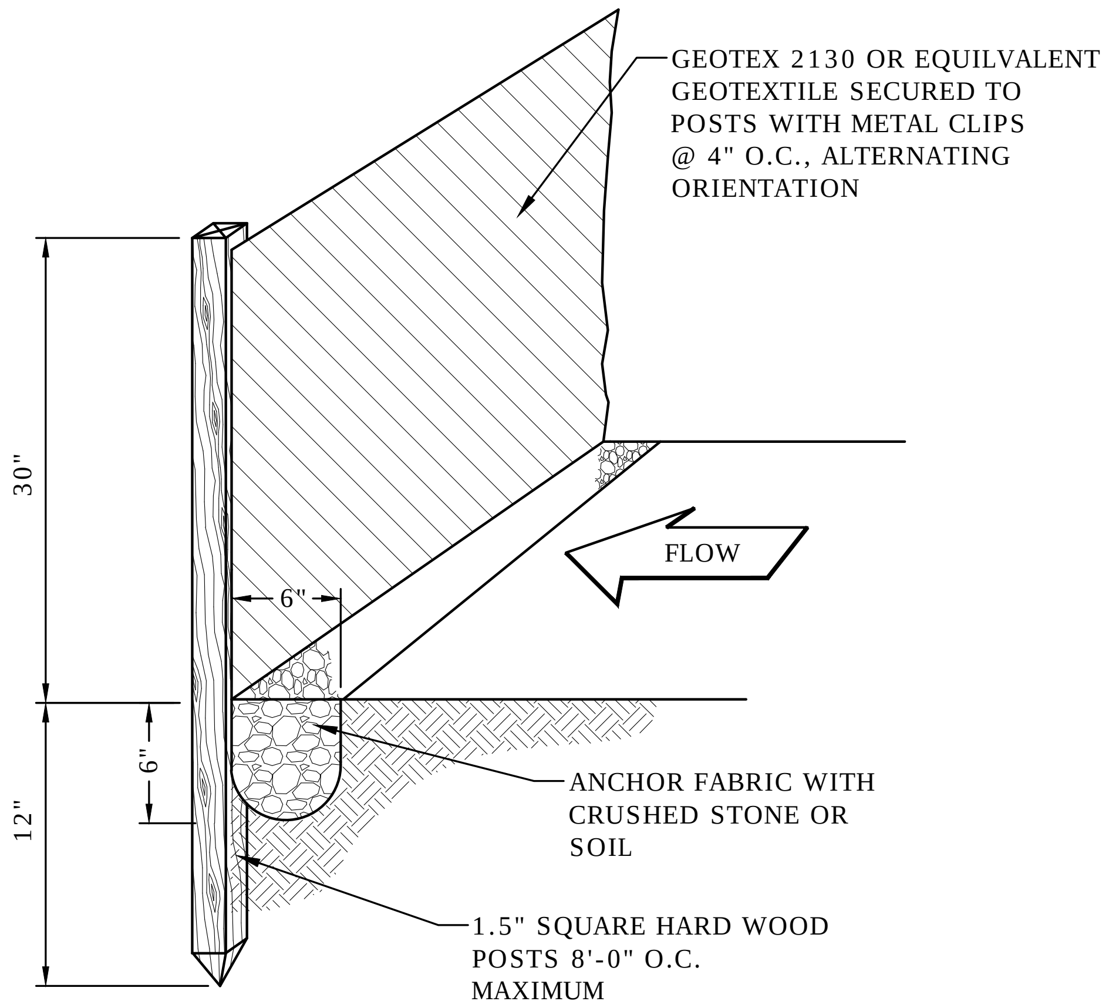


NOTES:

1. EROSION CONTROL BLANKET TO BE INSTALLED VERTICALLY DOWNSLOPE.
2. STAKES/STAPLES TO BE PLACED NO MORE THAN 3 FT APART VERTICALLY, AND 1 FT APART HORIZONTALLY.
3. SLOPE SURFACE TO BE FREE OF STICKS, ROCKS, AND OTHER OBSTRUCTIONS.
4. BLANKETS TO BE ROLLED OUT LOOSELY AND STAKED/STAPLED TO MAINTAIN DIRECT SOIL CONTACT. DO NOT STRETCH THE BLANKETS.

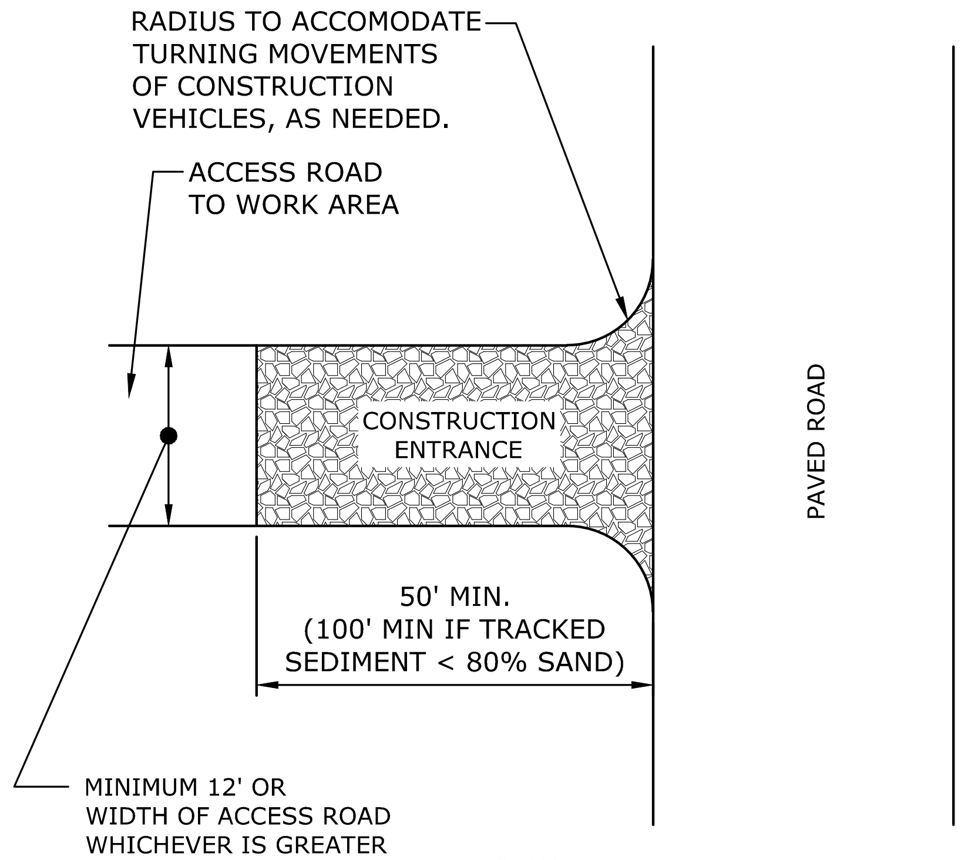
EROSION CONTROL BLANKET

NO SCALE

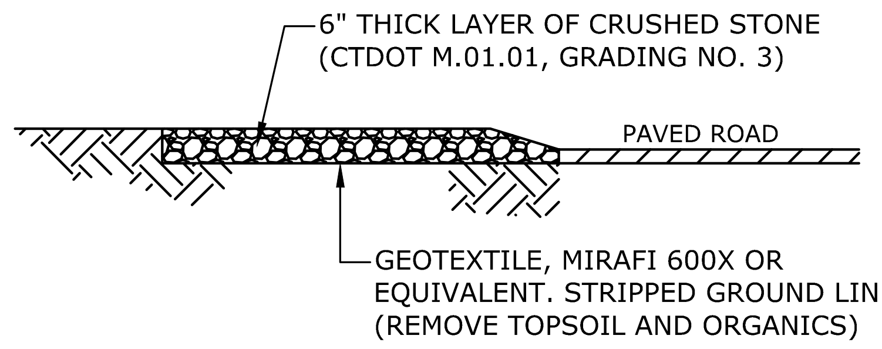


SILT FENCE

NO SCALE



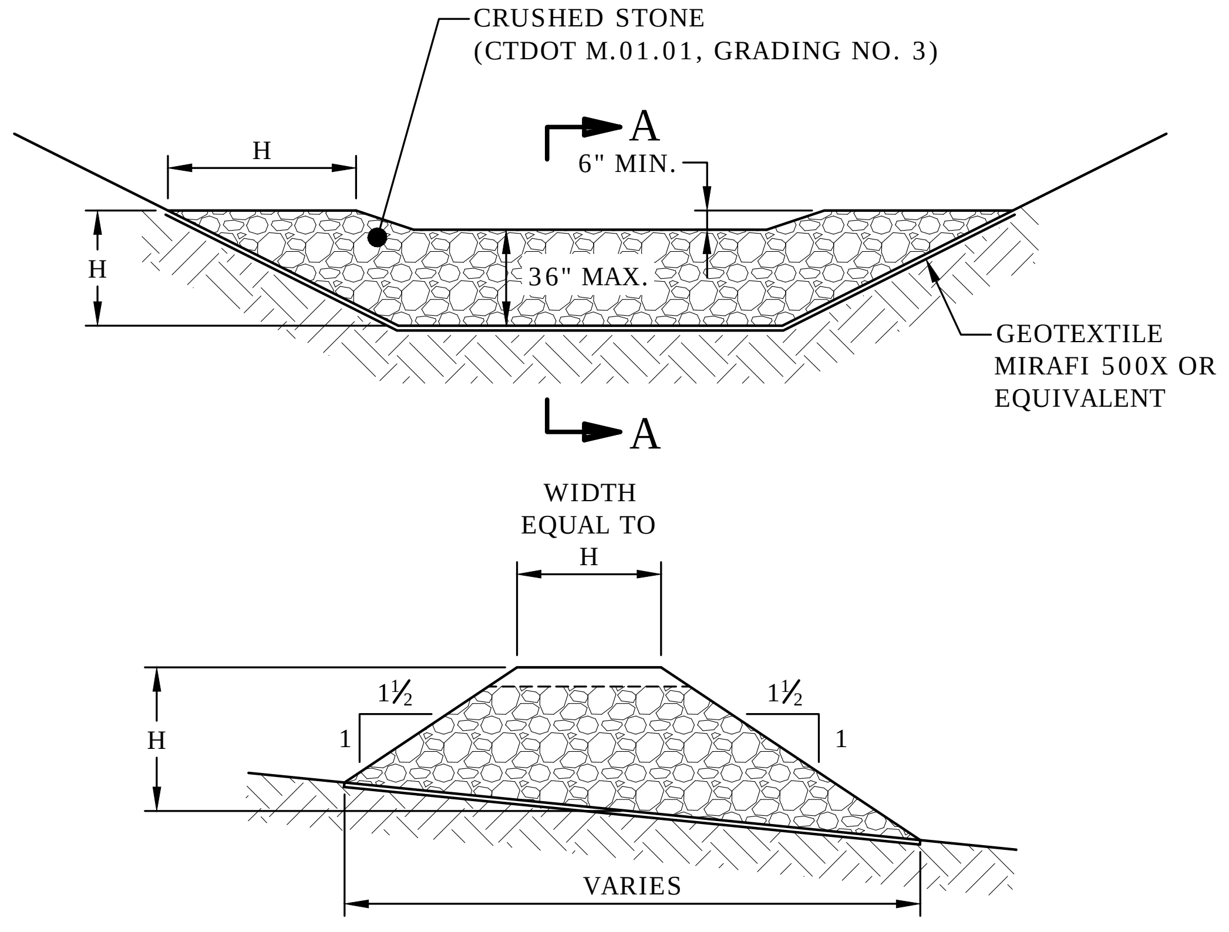
PLAN



ELEVATION

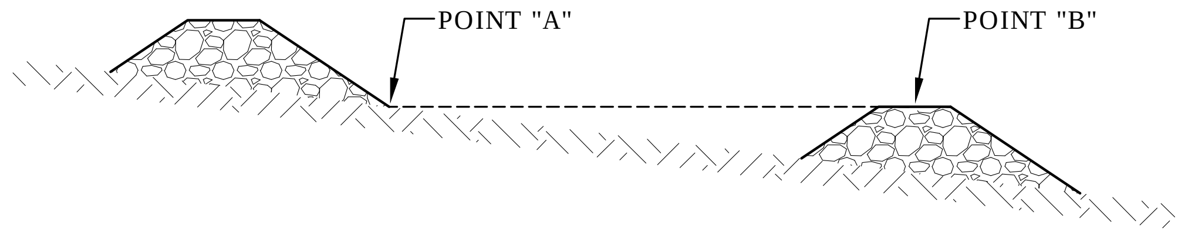
CONSTRUCTION ENTRANCE

NO SCALE



SECTION A-A

TEMP. CONVEYANCE SWALE DEPTH	12"	18"	24"
CHECK DAM "H"	8"	14"	20"

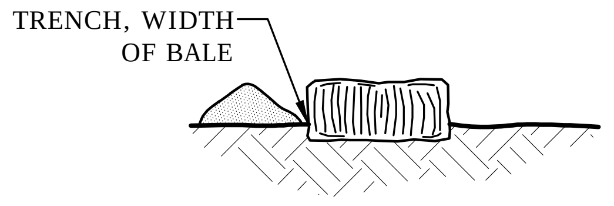


STONE CHECK DAMS TO BE SPACED SUCH THAT POINTS A AND B ARE AT THE SAME ELEVATION

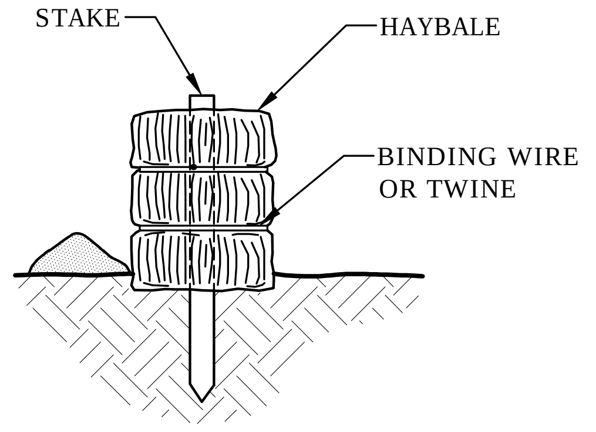
STONE CHECK DAM SPACING

STONE CHECK DAM

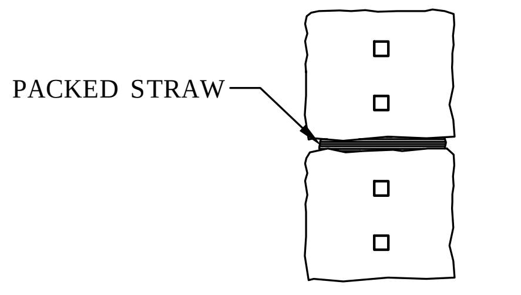
NO SCALE



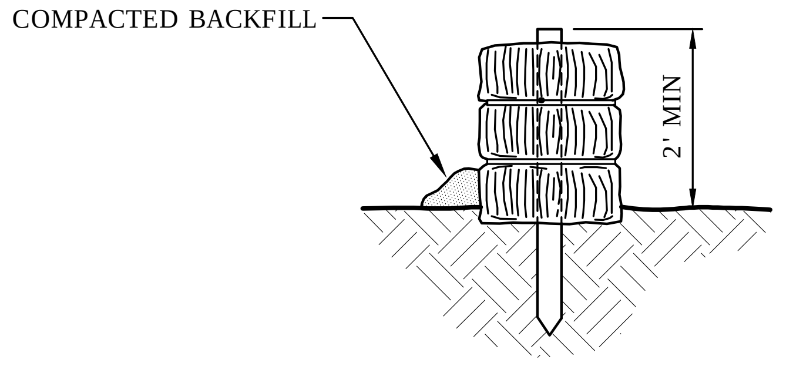
1. EXCAVATE A TRENCH 4" DEEP AND THE WIDTH OF THE HAYBALE



2. PLACE AND STAKE HAYBALES TWO STAKES PER BALE



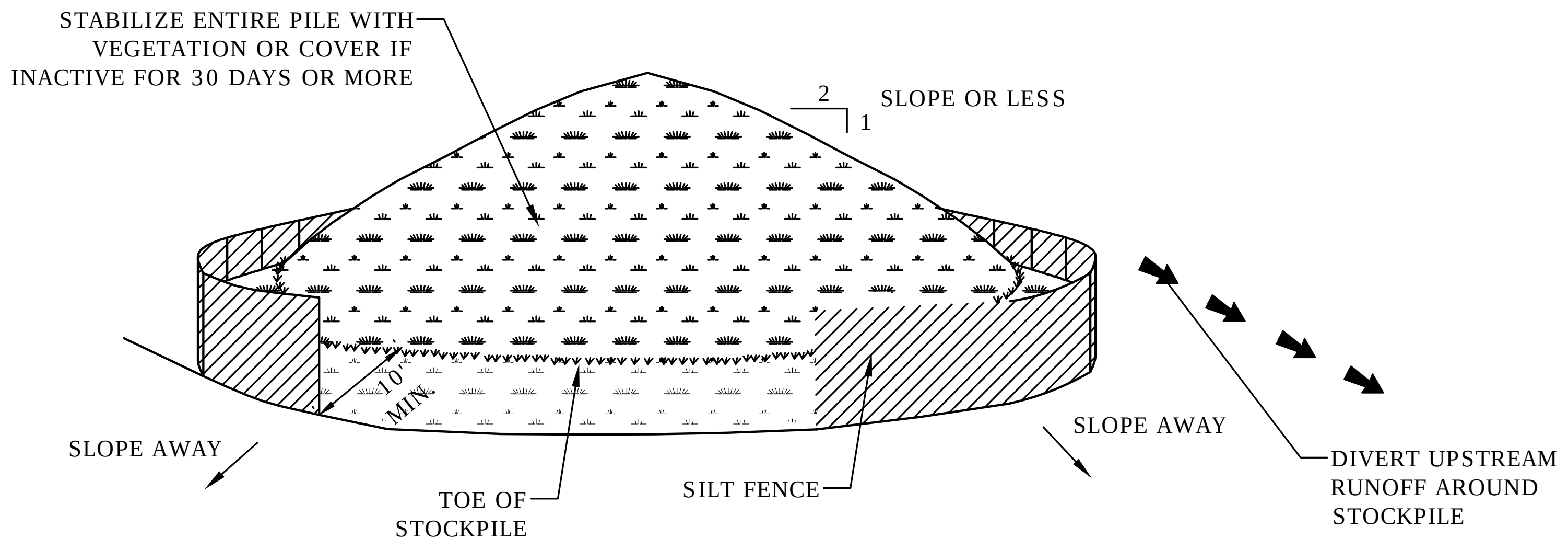
3. WEDGE LOOSE STRAW BETWEEN BALES TO CREATE A CONTINUOUS BARRIER



4. BACKFILL AND COMPACT EXCAVATED SOIL ON THE UPHILL SIDE OF THE BARRIER TO PREVENT PIPING

PLACEMENT AND CONSTRUCTION OF HAYBALE BARRIER

NO SCALE



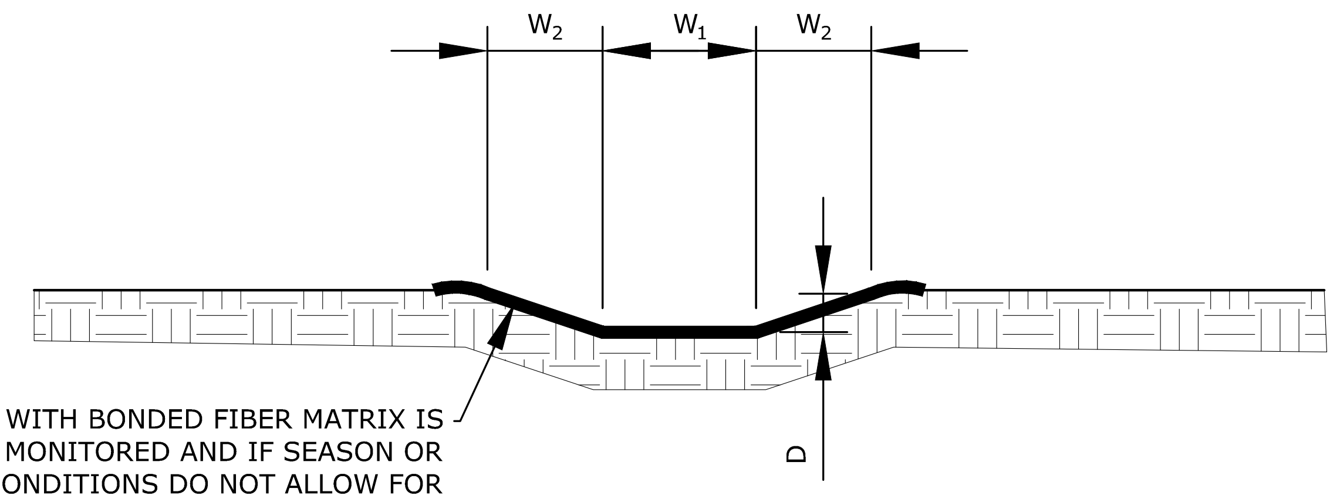
INSTALLATION NOTES:

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2H:1V.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR HAYBALES, THEN STABILIZED WITH VEGETATION OR COVERED.
4. LOCATE STOCKPILES IN UPGRADIENT AREAS OF SUBPHASES SO STORMWATER FLOWS AWAY AND/OR AROUND STOCKPILE TO THE MAXIMUM EXTENT POSSIBLE.

TEMPORARY SOIL STOCKPILING

NO SCALE

	0.5 - 5%			5% +		
	D	W_1	W_2	D	W_1	W_2
5 ACRE MAX	12"	4'	3'	12"	1'	3'
10 ACRE MAX	18"	3'	4.5'	12"	3'	3'



HYDROSEED WITH BONDED FIBER MATRIX IS PREFERRED. MUST BE MONITORED AND IF SEASON OR WEATHER CONDITIONS DO NOT ALLOW FOR GERMINATION AN EROSION CONTROL BLANKET TO BE BIONET NATRUAL FIBER NETTING, TYPE C125BN. SECURED BY BIO-STAKES, BOTH MANUFACTURED BY NORTH AMERICAN GREEN, EVANSVILLE, INDIANA, OR APPROVED EQUAL.

NOTES:

1.MINIMUM RUNNING SLOPE OF 0.5%
2. EXCAVATE SOILS FROM SWALES AND LOCATE ADJACENT TO SWALES WITHOUT IMPEDING STORMWATER FLOWS. LOCATIONS OF SOILS ARE SUBJECT TO APPROVAL BY THE ENGINEER.

TEMPORARY CONVEYANCE SWALE

NO SCALE

Last Saved: 12/14/2020
Plotted On:Dec 15, 2020-11:00pm By: AGilchrist
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Details.dwg

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar Project

Constitution Solar, LLC

Plainfield, Connecticut

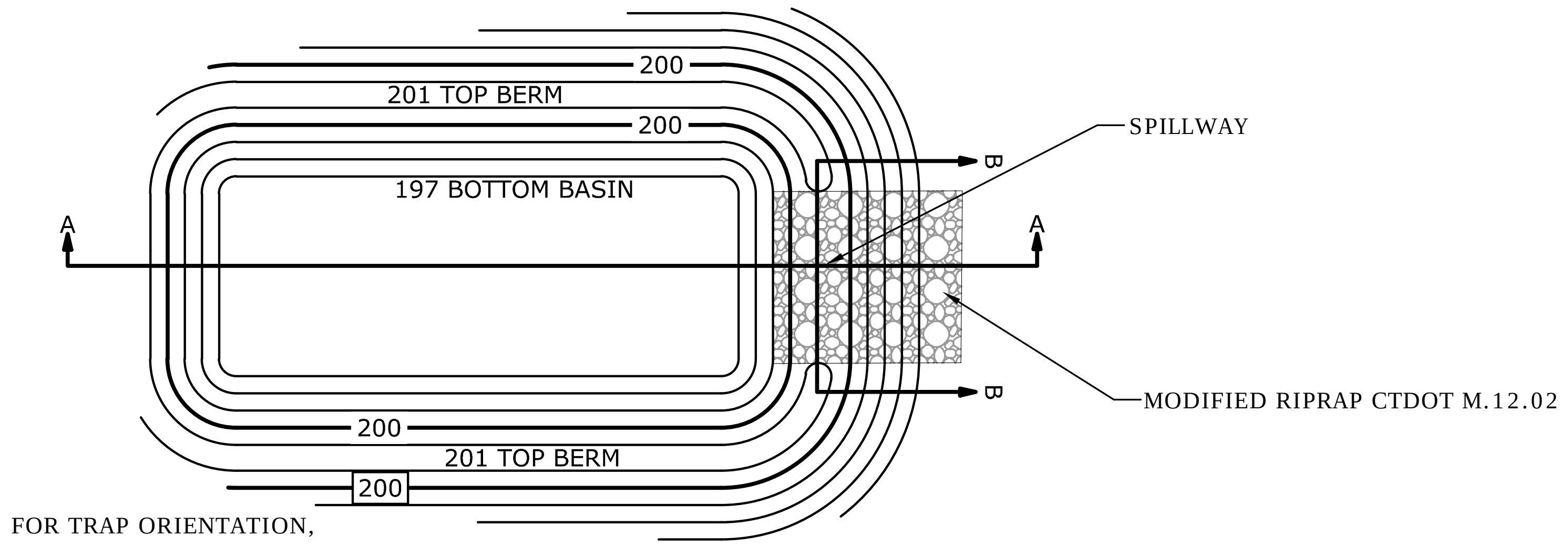
MARK	DATE	DESCRIPTION

PROJECT NO: R-0317
DATE: 12/2020
FILE: SESC Details.dwg
DRAWN BY: ELD/ALG
CHECKED: BSH/JEC
APPROVED: FJH

DETAILS - 1

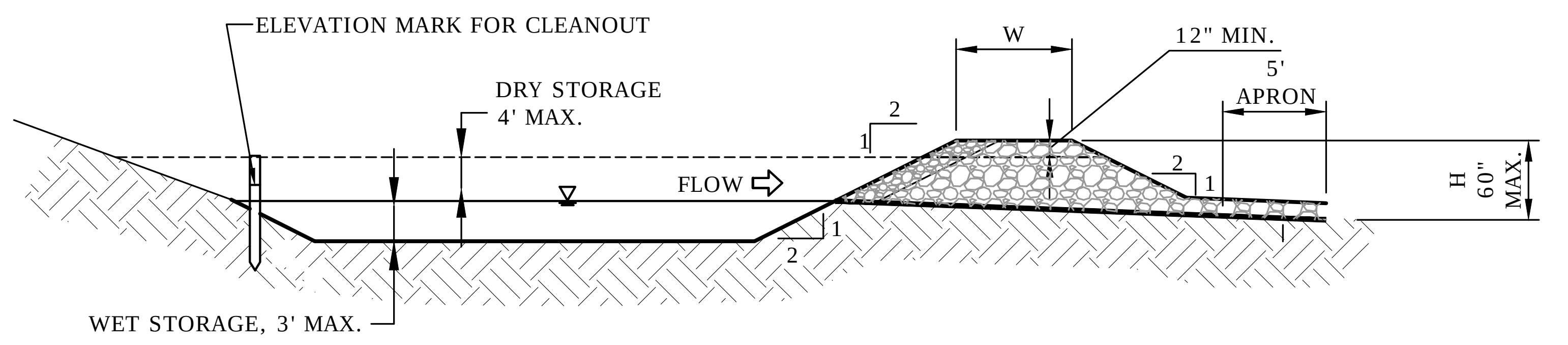
SCALE: NO SCALE

SESC-29



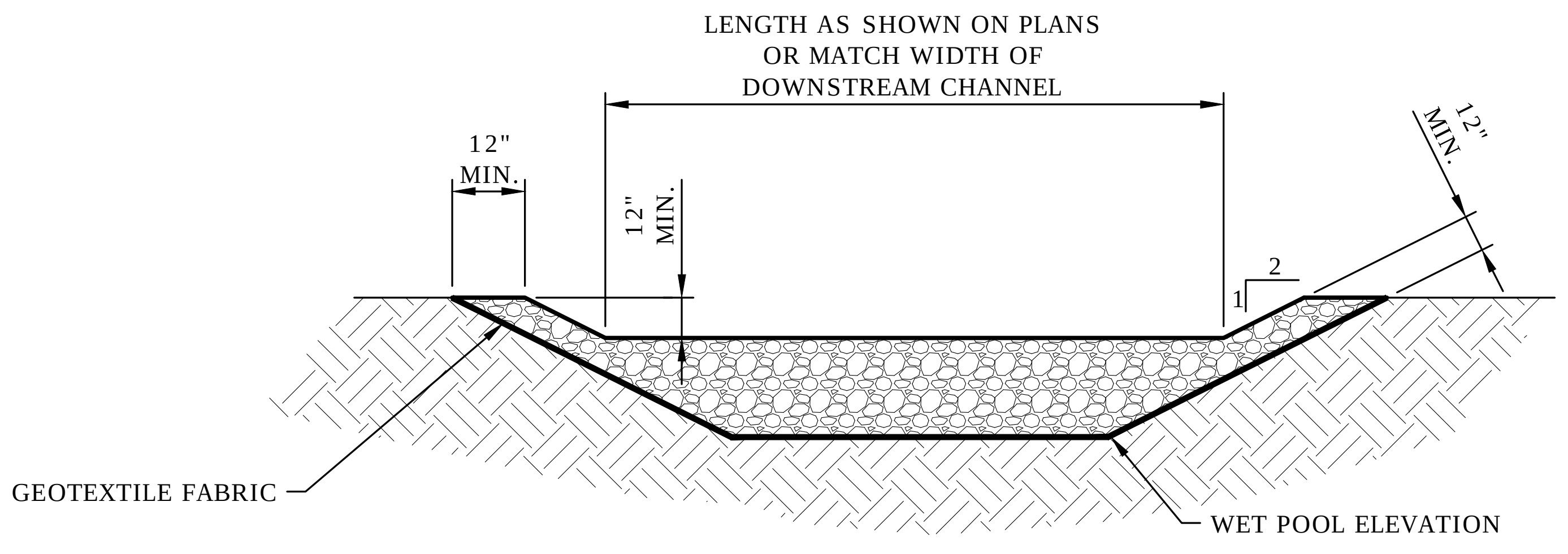
NOTE:
REFER TO PLAN SHEETS FOR TRAP ORIENTATION, SHAPE AND ELEVATION REQUIREMENTS

PLAN



SECTION B-B

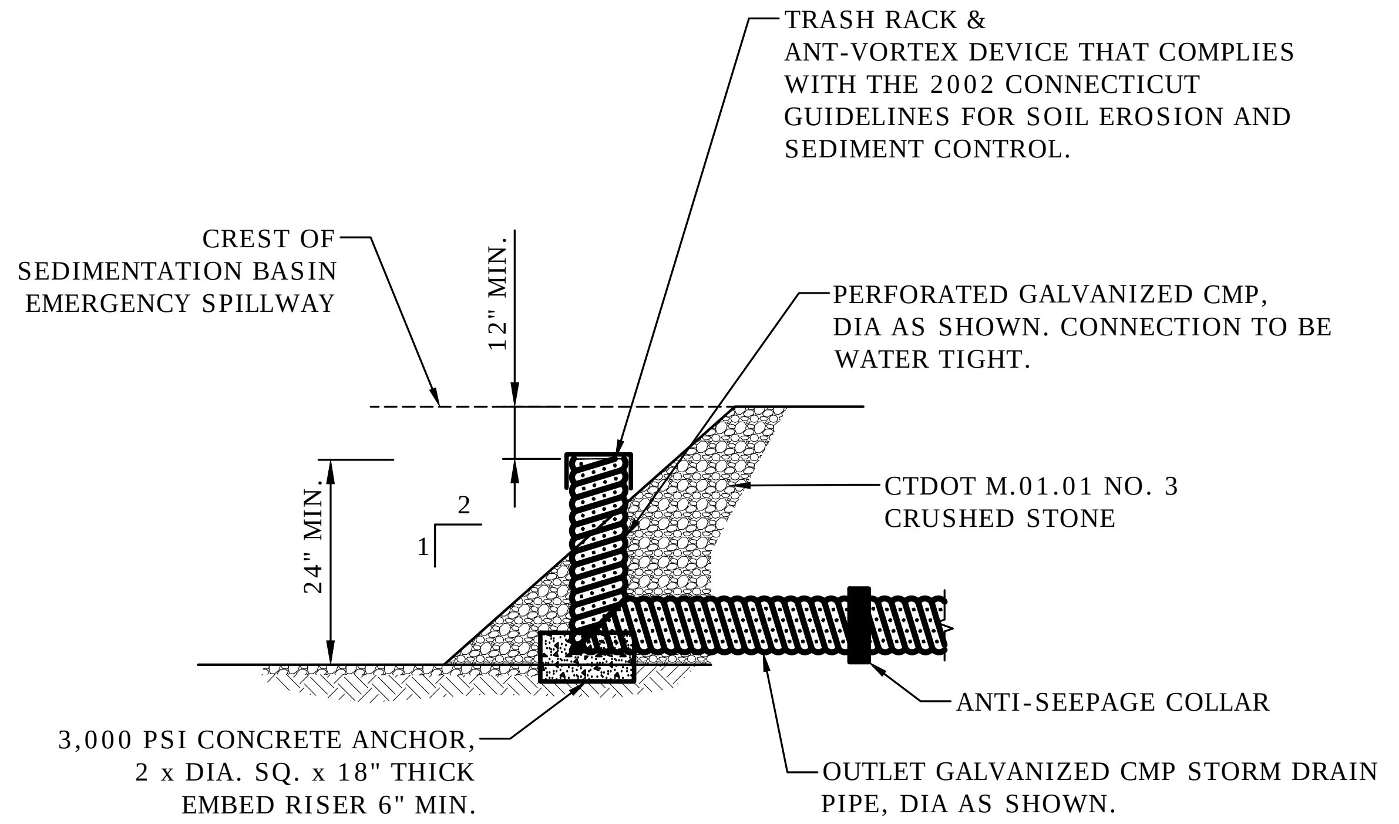
TOP WIDTH VS. HEIGHT	
H(ft)	W(ft)
1.5	2.0
2.0	2.0
2.5	2.5
3.0	2.5
3.5	3.0
4.0	3.0
4.5	4.0
5.0	4.5



SECTION A-A

NOTE:
NON-OVERFLOW PORTIONS AND ABUTMENTS MAY BE CONSTRUCTED OF COMPACTED EARTH FILL.

TYPICAL TEMPORARY SEDIMENT TRAP SECTION
NO SCALE



CORRUGATED METAL PIPE REQUIREMENTS FOR RISERS:

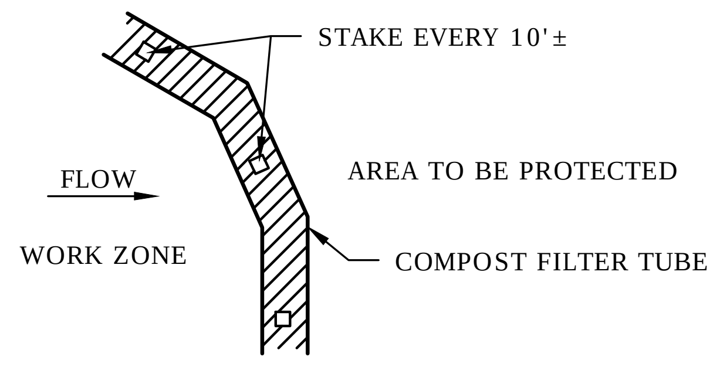
CORRUGATED STEEL PIPE

PIPE DIA. INCHES	8-21	24	30	36	48	54	60	66
MIN. GAUGE	16	16	14	14	12	10	10	10

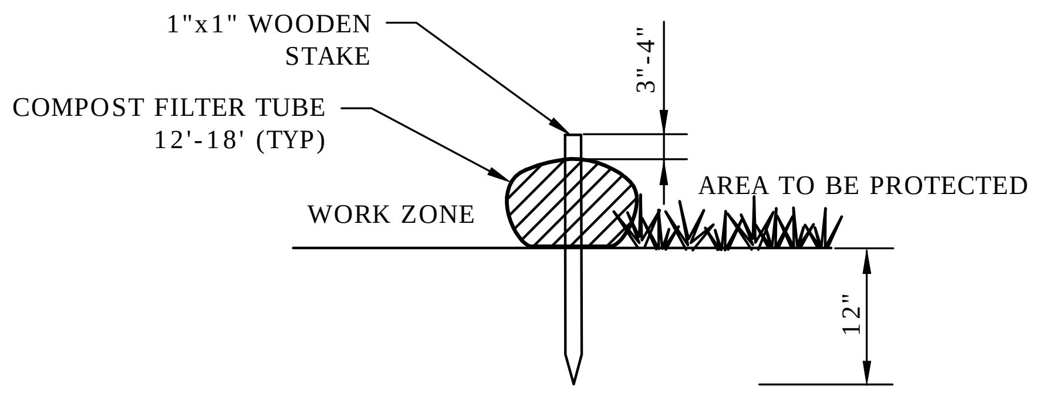
CORRUGATED ALUMINUM PIPE

PIPE DIA. INCHES	8-21	24	30	36	48	54
MIN. GAUGE	16	14	14	14	10	10

TEMPORARY SEDIMENTATION BASIN INLET STANDPIPE
NO SCALE



PLAN

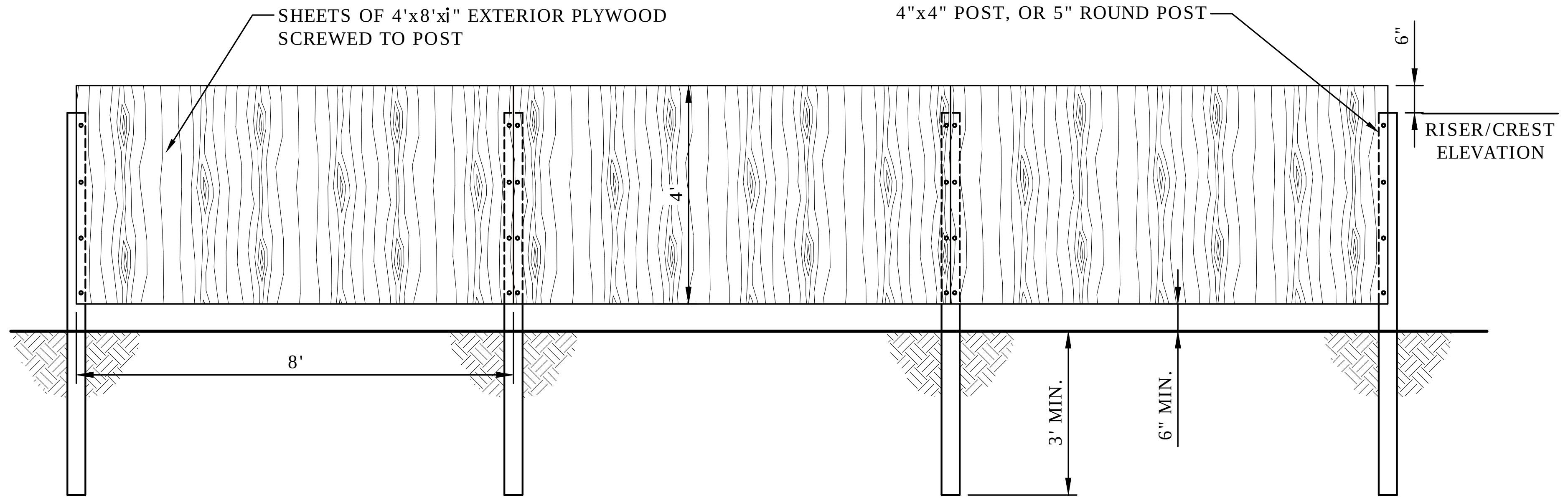


SECTION

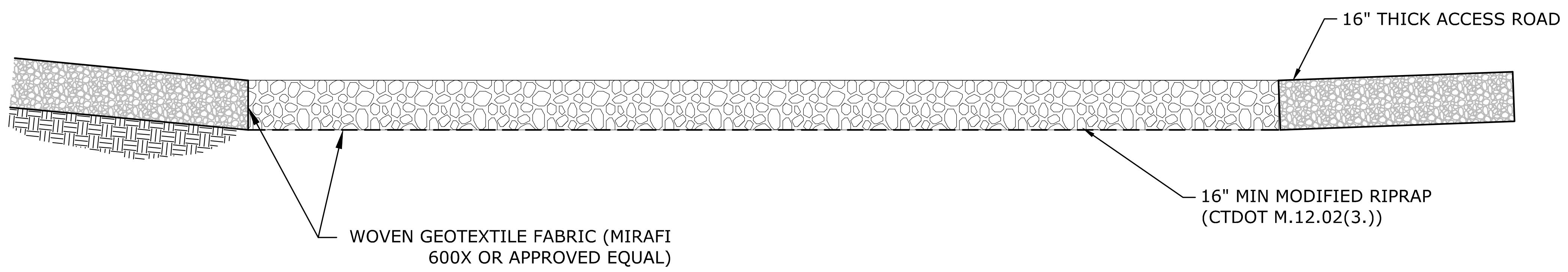
NOTES:

1. TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL.
2. TAMP TUBES IN PLACE TO ENSURE GOOD CONTACT WITH SOIL SURFACE.
3. PROVIDE 3' MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW.
4. COMPOST MATERIAL TO BE DISPERSED ON SITE WITHIN LIMITS OF WORK FOLLOWING SITE STABILIZATION, AS DIRECTED.
5. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
6. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
7. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.

EROSION CONTROL BARRIER
NO SCALE



TEMPORARY PLYWOOD BAFFLE
NO SCALE



NOTES:

1. AT THE COMPLETION OF CONSTRUCTION AND FOLLOWING SITE STABILIZATION REMOVE ALL LOW-FLOW CROSSINGS AND ANY SOILS ON TOP OF FABRIC AND REPLACE WITH CLEAN MODIFIED RIPRAP.
2. INSPECT INSTALLED FABRIC FOR ANY RIPS OR TEARS AND REPLACE AS NECESSARY PRIOR TO INSTALLING CLEAN MODIFIED RIPRAP

MODIFIED RIP RAP LOW FLOW CROSSING
NO SCALE

Last Saved: 12/15/2020
Plotted On:Dec 31, 2020-12:38pm By: JGenga
Tighe & Bond: J:\R\R0317 Ranger Solar\R-0317-3_Constitution\Drawings\Sheets\SESC Plans\SESC Details.dwg

Tighe&Bond

BRIAN S. HUNTLEY
No. 31180
12-30-20

ISSUED FOR CONSTRUCTION

Constitution Solar Project

Constitution Solar, LLC

Plainfield,
Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO: R-0317
DATE: 12/2020
FILE: SESC Details.dwg
DRAWN BY: ELD/ALG
CHECKED: BSH/JEC
APPROVED: FJH

DETAILS - 2

SCALE: NO SCALE

SESC-30

ATTACHMENT D – HERPETOFAUNA AVOIDANCE AND MITIGATION PLAN (REVISED)

Herpetofauna Avoidance and Mitigation Plan

Quinebaug Solar Project

Brooklyn and Canterbury, Connecticut

Prepared for:
Quinebaug Solar, LLC
700 Universe Boulevard
Juno Beach, FL 33408

Prepared by:
FB Environmental Associates
97A Exchange Street
Portland, ME 04101

Construction Revision, December 2020

Executive Summary

This Revised Avoidance and Mitigation Plan was developed to incorporate changes made over the course of the Connecticut Department of Energy and Environmental Protection Natural Diversity Data Base (NDDB) review and approval process. These changes include increased protection areas, slight changes to the mitigation actions, post-construction monitoring, and updated maps to reflect the revised limit of work. The summary table below highlights the specifics of these changes.

Table ES-1. Overview of modifications to Quinebaug Solar based on NDDB review and feedback.

Original Submittal	Modification	Reference
A 40-acre Herpetofauna Protection area has been excluded from the Development Area	Additional 8-acre Spadefoot Toad Protection Area for total of 48 acres that have been excluded from the Development Area	Final determination, March 5, 2020
No requirement	Environmental monitor will be a qualified biologist that holds a valid scientific collection permit issued by the State of Connecticut, that authorizes handling of this listed species.	Spadefoot toad protection summary, emailed to NDDB on January 17, 2020
No requirement	Potential breeding pool C and directional buffer area will be avoided except for vegetation maintenance, which will occur outside of the actual pool depression. Permanent signage will be installed around the pool to prevent mechanized vegetation maintenance equipment from entering the depression.	Final determination, March 5, 2020
Table A1. Construction Measures • Exclusion fencing (March–October)	Table A1. Construction Measures • Exclusion fencing and flagging of eastern spadefoot toad protection areas (March–October)	Final determination, March 5, 2020
Table A1. Construction Measures • Regular monitoring with increased frequency during the amphibian breeding season	Table A1. Construction Measures • Regular monitoring (including pool C), with increased frequency during the amphibian breeding season	Final determination, March 5, 2020
Table A1. Post-construction Measures • No requirement	Table A1. Post-construction Measures • Permanent signage around potential breeding pool C	Final determination, March 5, 2020
Table A3. Eastern Spadefoot Toad	Table A3. Eastern Spadefoot Toad	Final determination, March 5, 2020

Original Submittal	Modification	Reference
• Monitor potential breeding pools	• Monitor potential pool C	
Table A3. Eastern Spadefoot Toad • Protect eastern spadefoot habitat	Table A3. Eastern Spadefoot Toad • Protect and demarcate eastern spadefoot protection area	Final determination, March 5, 2020
Table A3. Eastern Spadefoot Toad • Post-construction population monitoring (if necessary)	Table A3. Eastern Spadefoot Toad • Post-construction population monitoring	Final determination, March 5, 2020
No requirement	*New* Appendix D. 2019 Eastern Spadefoot Survey Summary	
No requirement	*New* Appendix E. 2019 Eastern Spadefoot Toad Three-Year post construction Monitoring Plan	Final determination, March 5, 2020

Table of Contents

Figures

Tables

A black racer (*Coluber c. constrictor*) observed at the Quinebaug Solar site.

1. Introduction

FB Environmental Associates (FBE) with the support of Tetra Tech, Inc. (Tetra Tech) and in consultation with the Connecticut Natural Diversity Data Base (NDDB) has developed the following Avoidance and Mitigation Plan (Plan) for reptiles and amphibians, collectively referred to as herpetofauna, present at the site of the Quinebaug Solar Project in Brooklyn and Canterbury, Connecticut (Project). This revised plan reflects the updated protections and modifications made during the Project's consultation with NDDB prior to receiving a Final Determination for the Project. To proactively avoid and prevent impacts to both resident and transient wildlife that could be present on site, including species listed as endangered, threatened, or special concern by the State of Connecticut, this Plan will be implemented throughout the Project's construction and post-construction periods. This Plan includes NDDB-approved setbacks and clearing restrictions regarding natural resources that will protect herpetofauna and other wildlife species inhabiting the site. These measures also will serve to maintain the physical characteristics, including water quality, of wetlands and watercourses occurring at the site.

The use of construction Best Management Practices (BMPs) is the key to effective implementation of this Plan. Training of construction personnel and general oversight by a qualified biologist (hereafter environmental monitor) will ensure the success of this Plan. The environmental monitor will be employed to work alongside construction personnel during construction to ensure effective implementation of the Plan, as well as make real-time changes and adjustments (i.e., adaptive management[1]) to accommodate changing site conditions and observations made in the field. Table A1 (Appendix A) summarizes the general approach to avoiding and minimizing impacts to herpetofauna during Project construction.

2. Herpetological Surveys

Natural resource surveys were conducted within an area (Study Area) which contains the proposed Project's footprint/limit of work (Development Area) (Figure 1). Tetra Tech conducted wetland and watercourse delineations during the 2016 and 2018 growing seasons. Spring vernal pool breeding amphibian surveys were conducted in 2016 by Verdanterra, LLC and in 2018 by FBE. In 2018, FBE conducted a general herpetological inventory with emphasis on detection of the pure-diploid blue-spotted salamander (*Ambystoma laterale*). Additionally, FBE lead nocturnal surveys to determine if the eastern spadefoot toad (*Scaphiopus holbrookii*) is present within the Study Area. The detailed results of these surveys are described in their respective technical reports provided under separate covers.

The general herpetological inventory resulted in the detection of 14 amphibian and 5 reptile species at the site. Table 1 provides a list of species observed in the Study Area and their status according

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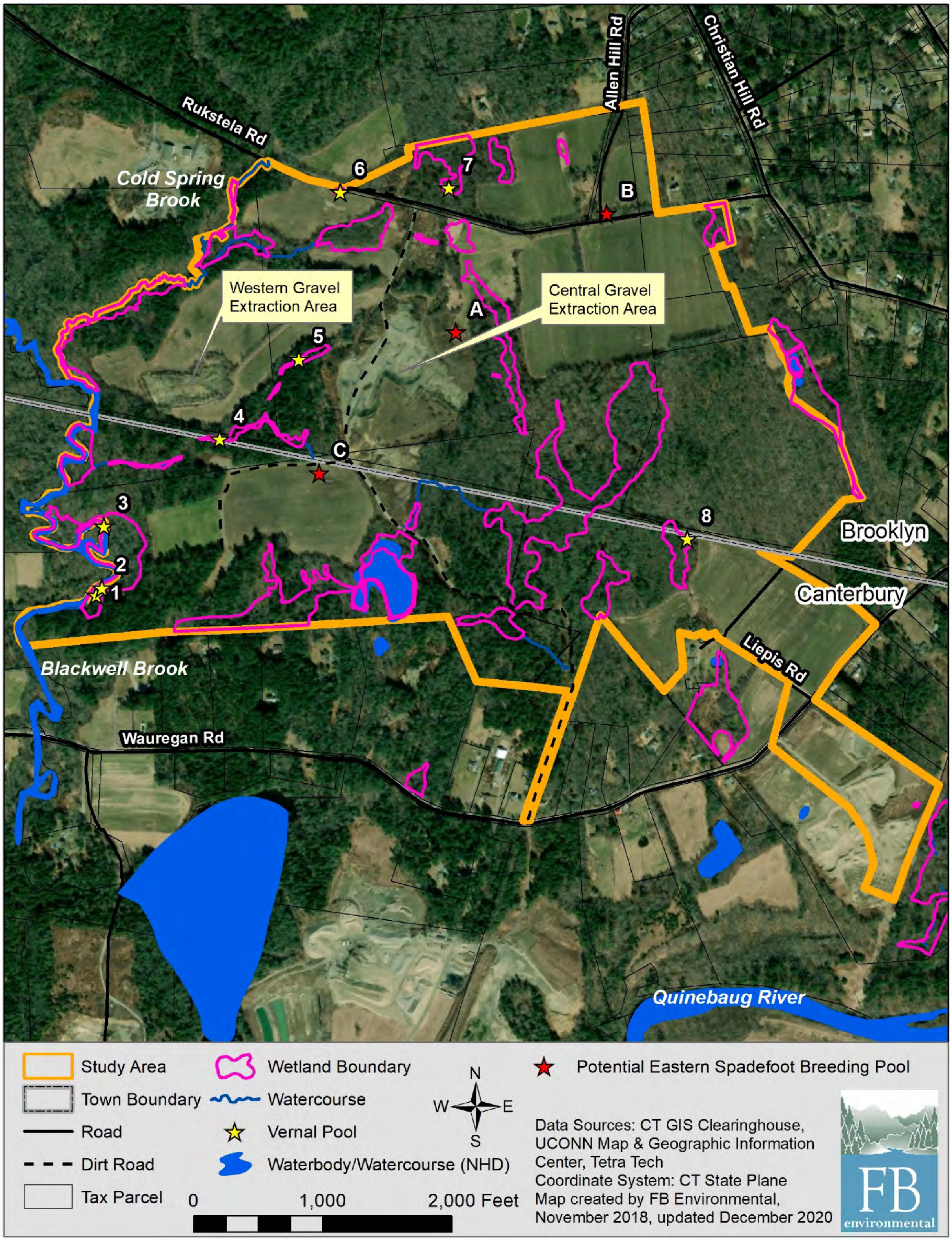
[1] Adaptive management is a structured, iterative process of robust decision making in the face of uncertainty, with an aim to reducing uncertainty over time via system monitoring.



Data Sources: CT GIS Clearinghouse, UCONN Map & Geographic Information Center, Tetra Tech
Coordinate System: CT State Plane
Map created by FB Environmental, November 2018, updated December 2020

Figure 1. Wetlands, watercourses, vernal pools, and potential eastern spadefoot toad breeding pools at the Quinebaug Solar Site, Brooklyn and Canterbury, Connecticut.

Table 1. Amphibian and reptile species observed at the Quinebaug Solar site, Brooklyn and Canterbury, Connecticut and listing under the Connecticut Wildlife Action Plan (WAP).

Scientific Name	Common Name	State Listing	WAP Listing	Age class
		Salamanders		
Ambystoma maculatum	Spotted salamander	-	Important	Egg, juvenile, adult
Desmognathus fuscus	Northern dusky salamander	-	-	Larva, adult
Eurycea bislineata	Northern two-lined salamander	-	-	Adult
Hemidactylium scutatum	Four-toed salamander	-	-	Juvenile, adult
Plethodon cinereus	Redback salamander	-	-	Adult
Notophthalmus v. viridescens	Eastern newt	-	-	Juvenile
		Frogs and Toads		
Anaxyrus americanus	American toad	-	-	Juvenile, adult
Anaxyrus fowleri	Fowler's toad	-	Important	Adult
Hyla versicolor	Gray treefrog	-	-	Adult
Lithobates clamitans melanota	Green frog	-	-	Juvenile, adult
Lithobates palustris	Pickerel frog	-	-	Juvenile, adult
Lithobates sylvaticus	Wood frog	-	Important	Larva, adult
Pseudacris crucifer	Spring peeper	-	-	Adult
Scaphiopus holbrookii	Eastern spadefoot	Endangered	Most Important	Adult
		Turtles		
Chelydra serpentina	Snapping turtle	-	-	Eggs
Chrysemys p. picta	Eastern painted turtle	-	-	Hatchling, adult
Clemmys guttata	Spotted turtle	Special Concern	Very important	Adult
		Snakes		
Coluber c. constrictor	Northern black racer	-	Important	Adult
Thamnophis sirtalis	Common garter snake	-	-	Adult

to the Connecticut Wildlife Action Plan. Eastern spadefoot toad presence was confirmed within the Study Area, with the capture of three individuals at the site. The pure-diploid blue spotted salamander was not detected within the Study Area.

2.1 Species' Legal Status and Wildlife Action Plan Listing

The eastern spadefoot toad is a Connecticut endangered species and categorized as Most Important[2] according to the state's Wildlife Action Plan (Connecticut Department of Energy and Environmental Protection [DEEP] 2015). The spotted turtle (*Clemmys guttata*) is a Connecticut species of special concern and Very Important according to the Wildlife Action Plan. The spotted salamander (*Ambystoma maculatum*), Fowler's toad (*Anaxyrus fowleri*), wood frog (*Lithobates sylvaticus*), and northern black racer (*Coluber c. constrictor*) are all listed as Important in the Connecticut Wildlife Action Plan.

3. General Avoidance and Mitigation Measures

The measures described below taken during Project construction and post-construction will help avoid take of individual amphibians and reptiles that may be present on site, regardless of the conservation concern of an individual species. The following measures are recommended for the Project, and would be applied to all disturbance areas, including the area proposed for temporary laydown:

- Limit of work restrictions;
- Construction timing;
- Construction and operations personnel training;
- Exclusion fencing;
- Regular inspections and monitoring;
- Documentation and reporting of observations; and
- Operational avoidance practices.

These measures are described in detail below and summarized in Table A1 (Appendix A).

3.1 Limit of Work Restrictions

The proposed Project will have no direct impacts on wetlands or watercourses within the Study Area and setbacks have been applied to all said resources. No impacts will occur within the 100-foot envelopes surrounding the eight vernal pools within the Study Area. A 100-foot setback has been applied to all mapped natural resources, with a few exceptions where warranted. In areas where wetlands and watercourses occur in a forested setting, a 100-foot buffer has been applied. In limited areas where development is planned within areas that are already cleared (e.g.,

---

[2] GCN Most Important, Very Important, Important = Greatest Conservation Need species in Connecticut classified by the urgency of needed conservation actions.

agricultural fields), smaller buffers have been applied. Table A2 (Appendix A) summarizes these exceptions to the standard 100-foot buffer. Figure B1 (Appendix B) shows the proposed Development Area, resource setbacks, and exclusion areas. Figures C1–C8 (Appendix C) contain post-construction analyses of the critical terrestrial habitats surrounding the eight vernal pools that occur within the Study Area.

Limit of work restrictions (i.e., no disturbance areas) planned for the Project also include approximately 48-acres that have been excluded from the Development Area, identified as the Herpetofauna Protection Area and Spadefoot Toad Protection Area on Figure B1. The Herpetofauna Protection Area encompasses 40 acres and contains two Tier 1 vernal pools (pools 4 and 5) as well as a series of wetlands and intermittent stream channels. Furthermore, this area is connected to the Blackwell Brook and Cold Spring Brook floodplains located along the western boundary of the site. Thus, when completed, the Project will not interrupt the existing connection between these productive vernal pools and the larger landscape.

In addition to the Herpetofauna Protection Area, additional protection zones around potential breeding pool C (approximately 1 acre) and the edge of the gravel extraction area (approximately 7 acres), will conserve a forested-open canopy complex to serve as the core conservation asset for eastern spadefoot toad. Of specific benefit to eastern spadefoot toads, this combined area is largely underlain by Hinckley soils, has open canopy areas that provide the eastern spadefoot toad’s preferred groundcover types, and was the site of one of the three eastern spadefoot toad detections in the Study Area.

3.2 Construction Timing

Avoiding seasonally sensitive time periods by timing construction to coincide with low herpetological activity (e.g., tree clearing in winter) will help avoid or minimize direct impacts to reptile and amphibian species that occupy the site. Due to the observed presence of vernal pool breeding amphibians, it is recommended to avoid clearing, grading, and heavy earthwork within vernal pool critical terrestrial habitats (CTHs) during the spring amphibian breeding season (March–June). Tree clearing will be restricted to winter (November–March), which will serve to minimize adverse impacts to reptile and amphibian species and reduce ground disturbance by working under frozen/winter conditions. If earthwork activities within CTHs must take place during the spring amphibian breeding season, an increased level of monitoring will be implemented to ensure exclusion fencing is intact and to conduct frequent sweeps of the work areas with particular attention to areas adjacent to vernal pools.

3.3 Construction Personnel Training

The environmental monitor designated by Quinebaug Solar will be responsible for creating a training curriculum prior to the commencement of construction activities. During the initial site safety orientation and contractor on-boarding, new personnel will undergo training on the identification and habits of reptile and amphibians known to occur within the Study Area (e.g., eastern spadefoot toad, northern black racer, spotted turtle). The training will inform construction personnel that avoiding impacts to amphibians and reptiles is of utmost importance to the Project. Flyers will be posted in the general areas (e.g., construction trailers) to aid staff in reptile and amphibian species identification, describe their known habitats and refugia, and identify the necessary procedures to follow if one is observed. The environmental monitor will be the point of contact for personnel to report sightings and determine what action(s) should be taken. Additional training sessions will be provided if personnel change, or changes in site conditions warrant the need.

Construction personnel responsible for site clearing will be required to follow the Project's stormwater pollution control plan that incorporates all applicable rules and regulations for stormwater control at construction sites and stormwater controls for solar development.

3.4 Exclusion Fencing

Exclusionary practices are commonly accepted measures that are used widely for construction Projects in various regions across the U.S., including the Northeast. Exclusion fencing practices are recommended by the United States Fish and Wildlife Service for protecting the desert tortoise (*Gopherus agassizii*) in the Southwestern U.S. (USFWS 2005) and have been used for box turtles in New York and bog turtle (*Glyptemys muhlenbergii*) in Pennsylvania (Anon. 2016). In addition to being used as a reptile and amphibian exclusion BMP, exclusion fencing (i.e., silt fence) also is recommended by the Connecticut Department of Transportation as a BMP for stormwater pollution control (Section 1.10, Article 1.10.03).

Exclusion fencing for the Project will be coordinated with the prescribed stormwater phasing and installed to enclose the work areas at the limit of work, preventing reptiles and amphibians from entering active construction zones. Fencing will consist of Department of Transportation-grade silt fence, typically a minimum of two feet above grade with greater than four inches buried into the soil. Silt fencing will be installed prior to any ground-disturbing activities (e.g., stump removal or grading). In addition, eastern spadefoot toad protection areas will be specifically flagged to prevent construction activities from inadvertently occurring within.

Following initial installation of silt fencing, searches (via cover object searches and visual encounter surveys) will be completed within the enclosed areas to detect and remove any enclosed reptiles and amphibians. Searches will be conducted on at least three separate occasions by the qualified environmental monitor (see discussion of qualified monitor below in Section 3.5). Once Project construction is underway, the environmental monitor, or his/her qualified designee, will conduct daily sweeps of the exclusion fencing to ensure it is functioning properly, make repairs if necessary, and identify any reptiles and amphibians that are near the fencing (it is common to find reptiles and amphibians along the fence who are likely trying to move past it). Any reptiles or amphibians that are found within the work area will be carefully collected and relocated to appropriate habitat nearby and safely outside the active construction site.

Exclusion fencing will be maintained while construction is underway during the active season for amphibians and reptiles (generally March through November).

3.5 Inspections and Monitoring

As mentioned above, the designated on-site environmental monitor will be employed throughout the Project construction period. In addition to stormwater management inspectors who are responsible for maintaining the erosion and sedimentation controls (e.g. detention basins and traps), the environmental monitor, or his/her qualified designee, will be responsible for conducting inspections of the exclusion fencing and other avoidance and mitigation tactics that may be employed during the construction process. This monitor will be a qualified biologist that holds a valid scientific collection permit issued by the State of Connecticut, that authorizes handling of this listed species. Regular communication with the construction personnel on site will be essential to a successful avoidance and mitigation outcome. The environmental monitor will be the point of contact between construction personnel and other Project inspectors, as well as state agencies. The monitor will be responsible for regular reporting of site conditions and contacting the appropriate state agencies if state endangered, threatened, or special concern species are observed within the work areas.

3.6 Documentation and Reporting

If endangered, threatened, or special concern species are found within the fenced construction area, they will be translocated out of the work area to appropriate habitat and the event will be reported to the appropriate person(s) at DEEP. Regular reports from the environmental monitor will be used to evaluate the effectiveness of the Plan and determine whether adjustments need to be made during the construction process to protect certain species. Monitoring reports will be submitted by the environmental monitor to the Project team and will be available to DEEP upon request. Changes to avoidance and mitigation and stormwater plans will be made in consultation with DEEP and third-party inspectors. Formal communication (i.e., reports and memorandums) will be used to help inform the Project team to ensure that the necessary changes are made to the Plan. To this end, a regular schedule for reporting and monitoring efforts will be established prior to the commencement of construction at pre-construction meeting(s).

3.7 Operational Avoidance Practices

Operations personnel will be trained in the identification of development-sensitive species that may be encountered during Project operations. An operations plan will be in place facilitating the appropriate response if particular species are encountered and need to be relocated for their safety or for operational safety purposes. A six-inch wildlife gap along the base of the Project perimeter fence will be included[3], allowing passage of smaller mammals and herpetofauna through and around the site. Furthermore, potential breeding pool C and directional buffer area will be avoided except for vegetation maintenance, which will occur outside of the actual pool depression. Permanent signage will be installed around the pool to prevent mechanized vegetation maintenance equipment from entering the depression.

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[3] A six-inch gap will be maintained around the perimeter of most of the Project, except in select areas where enhanced security measures are required (for example around access points).

4. Species-Specific Avoidance Measures

In addition to the general practices described in Section 3 of this Plan, recommended species-specific measures are detailed below for the following species:

- Eastern spadefoot toad;
- Spotted turtle;
- Northern black racer;
- Fowler's toad;
- Spotted salamander; and
- Wood frog.

These measures are described in detail below and summarized in Table A3 (Appendix A).

4.1 Eastern Spadefoot Toad

Background:

Protecting the eastern spadefoot toad is complicated due to its poorly understood life history and the difficulties inherent in studying a burrow-dwelling, irregularly breeding species. The species burrows in areas of sandy, bare soil, but also requires dense vegetation to hide in during its sporadic nighttime non-breeding (feeding) emergences.

The eastern spadefoot toad can forgo breeding for numerous, consecutive years (Ball, 1936; Klemens, 1993). The known breeding sites in eastern Connecticut are temporary pools with an open canopy that are created by heavy rainfall; some likely do not meet the regulatory definition to be considered wetlands (personal observations; D. Quinn pers. comm.). In years when breeding does occur, the activity is explosive, typically lasting only one or two nights, and can occur anytime from late March through October in southern New England (Klemens, 1993).

During the 2018 field season the survey team captured three individuals on site, only one of which was found in what is considered "classic" (i.e., patches of dense vegetation in bare soil) eastern spadefoot habitat near the edge of the former gravel pit in the center of the Study Area. The other two individuals were captured along the gravel road near the Wauregan Road entrance in an area of mixed forest and residential development. While it is possible that these two spadefoots were utilizing suboptimal "edge" habitat located within the road corridor, the observation that both individuals left the area after a relatively short period of time may suggest that they were captured while making long-distance movements in search of more suitable habitat.

Additional field investigations to determine if eastern spadefoot toad breeds at the site were completed in the spring, summer, and fall of 2019. No evidence of breeding by eastern spadefoot toads was detected in 2019.

In 2018, FBE identified two potential breeding pools (pools A and B) in addition to the wetlands and vernal pools identified and/or delineated by Verdanterra and Tetra Tech; a third, pool C, was first observed in June 2019 (Figure 1). Descriptions of each pool and observations from 2 years of surveys are provided in the following paragraphs.

Potential Breeding Pool A

Potential breeding pool A lies northeast of the gravel extraction area at the center of the site. An access road to an adjacent hayfield traverses the pool. On April 19, 2018 the pool was observed to be approximately 50 to 75 feet in diameter with 2+ feet of standing water at its deepest point. Later, during a field investigation on May 7, 2018 the pool was observed to be completely dry. Tire ruts in the pool contained only several inches of water on September 19, 2018 after precipitation events resulted in a total of 2+ inches of rain in the preceding week.

During 2019 field surveys potential breeding pool A was observed to be inundated on April 17. No amphibian egg masses were observed in the pool. The pool was found to be dry on all subsequent visits with the exception of a visit on August 7, 2019, where the interior of the pool had 1 inch of water due to a heavy rainfall event that occurred preceding the survey. No amphibian egg masses or larvae were observed in the pool during any of the 2018 or 2019 site visits.

Potential Breeding Pool B

Potential breeding pool B is located in an active corn field near the intersection of Rukstela Road and Allen Hill Road. On April 19, 2018 the pool was observed to be approximately 50 feet in diameter with up to 1 foot of standing water. During this time American toad (*Anaxyrus americanus*) tadpoles were observed in this pool, but the pool dried up prior to their metamorphosis.

In 2019 potential breeding pool B was observed to contain three American toad egg masses on April 17. The pool contained no water during subsequent site visits. Planted corn was growing from the pool area during July and August 2019 site visits. Corn was harvested before or during early September, at which time the pool contained no water.

Potential Breeding Pool C

Potential breeding pool C was first observed on June 20, 2019[4], at which time its basin contained no standing water; however the pool was observed to contain a visibly damp substrate. This pool is located within an active agricultural field and is approximately 60 feet in diameter following larger rain events. Visual encounter searches in and around the pool depression during the 2019 season yielded the detection of American toad metamorphs, which likely originated from the pool.

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[4] Potential breeding pool C was not initially observed during the 2018 surveys due to the pool being obscured by vegetation (corn).

On July 26, 2019 the pool contained no standing water, but soil within its basin was damp, indicating recent inundation. Furthermore, no corn was observed in the basin undoubtedly due to the previous presence of enough standing water to inhibit vegetation growth in this area.

Potential breeding pool C contained no water at the start of a nocturnal survey event on August 7, 2019. During heavy rainfall that occurred that night, the pool filled to a depth of 1 foot in approximately 30 minutes, mainly from run-off from the access road to the athletic field. No eastern spadefoot toad breeding activity was detected, nor were any individuals detected in the vicinity of the pool or elsewhere on site during the survey.

On August 29, 2019, the pool contained 12–18 inches of water following a heavy rainfall event that occurred the previous evening. No amphibian egg masses were observed in the pool. The pool was dry on September 7 and September 26, 2019.

The inactive gravel extraction areas within the Study Area appear to provide the most suitable habitat for eastern spadefoot toads, presumably due to the lack of a forest canopy and the presence of bare soil and clumps of dense vegetation. Despite its location within an area mapped as predicted habitat by DEEP (Moran and Button, 2011), no eastern spadefoot toads were observed in the western gravel extraction area. The gravel extraction area on the south side of Wauregan Road (in the general area north and west of wetland W04) is mapped as suitable habitat but is currently an active mine. Further details on the background, survey methods and results, and site photographs of the vernal pool, herpetofauna, and 2018 eastern spadefoot toad surveys are outlined in the technical reports developed by FBE for the Project (see Appendix C of Environmental Site Conditions Report) and 2019 Eastern Spadefoot Toad Survey Summary Report (Appendix D).

Mitigation Action 1: Avoidance of eastern spadefoot toad habitat

Despite considerable survey efforts completed in 2018 and 2019, there was no confirmation that eastern spadefoot toad breeds anywhere within the Study Area. However, as an additional precautionary measure, an area surrounding potential breeding pool C (approximately 1 acre) and the area of suitable eastern spadefoot toad habitat that is present along the edge of the gravel extraction area (approximately 7 acres), will be included within the overall conservation area. The additional 8 acres of protection area forms a forested-open canopy complex that will be connected to the core conservation area via the directional buffer and serves as the core conservation asset for eastern spadefoot toad for the life of the Project.

Mitigation Action 2: Construction monitoring

Potential breeding pool C and adjacent areas will be monitored during Project construction. If individual eastern spadefoot toads are observed within the construction area, they will be relocated to areas outside of the exclusion fence. The protection area will be specifically flagged prior to initiating construction to prevent construction activities from occurring within. Monitoring during construction will be done by a qualified biologist that holds a valid a scientific collection permit issued by the State of Connecticut, that authorizes handling of this listed species.

Mitigation Action 3: Post-construction monitoring

During the operational phase of the Project, potential breeding pool C and directional buffer area will be avoided except for vegetation maintenance, which would occur outside of the actual depression. Permanent signage will be installed to prevent mechanized vegetation maintenance equipment from inadvertently entering the depression.

A post-construction monitoring program for eastern spadefoot toad will be implemented for three consecutive years following completion of Project construction. The purpose of post-construction monitoring is to continue efforts to ascertain whether eastern spadefoot toad breeds at the site. Although no breeding activity was observed in 2018 or 2019, potential breeding pool C will be monitored for three breeding seasons following completion of construction of the Project in 2021. This monitoring period is expected to begin during the summer of 2022 and extend through the summer of 2024. Details of post-construction monitoring activities can be found in the Eastern Spadefoot Toad (*Scaphiopus holbrookii*) Three-Year Monitoring Plan (Appendix E).

4.2 Spotted Turtle

Background:

Spotted turtles may be locally common in some areas of New England and appear to be so in eastern Connecticut, though they have become rare in urbanized areas. Over-collection of these turtles for pets poses a threat to populations in close proximity to humans. As with other species of turtles that make extensive overland movements, habitat loss and fragmentation are the primary conservation problem negatively affecting this species' survival (Klemens, 1993).

A single spotted turtle was observed during the 2018 field investigations, in pool 6 (Figure 1). Due to the spotted turtle's pattern of extensive overland travel, the largest threat to this species within the Study Area is direct mortality during construction and maintenance activities.

Mitigation Actions:

- All personnel working on site, including maintenance personnel that will conduct long-term maintenance of the solar panels and/or the vegetation underneath the panels, will be trained in the identification and habits of spotted turtles to avoid take of individuals;
- If a turtle is encountered and has the potential to be in danger, individuals will be transported to the nearest suitable habitat on the site. Such areas will be identified beforehand and shown on maps to be distributed during training, so that construction and maintenance staff know where nearest areas of suitable habitat are located;
- Particular attention will be focused on turtle nesting during the month of June. Any observed spotted turtle nests will be subsequently marked and avoided; and
- No Project construction will occur within 100 feet of pool 6, or any other vernal pool identified.

4.3 Northern Black Racer

Background:

Racers are often killed by vehicles or during mowing operations. Similar to the spotted turtle, the largest threat to this species in the Study Area is direct mortality from construction and maintenance activities.

Mitigation Actions:

- Individuals performing maintenance on installed solar panels and/or the vegetation underneath will be trained in the identification and habits of black racers to avoid take of individuals during maintenance operations;
- As some individual racers may have an aggressive disposition (particularly when cornered), capture of individuals is not recommended. Rather, individual snakes will be carefully shooed away if encountered during construction or maintenance activities. However, if a racer is discovered inside a construction enclosure, it will be captured and placed outside of the enclosure; and
- Racers bear no resemblance with venomous snakes in the region and are thus less frequently killed than blotched or banded snakes, which bear a cursory resemblance to venomous species. Nonetheless, staff training will make it clear that killing or otherwise harming a black racer (or any other snakes) during site construction or maintenance activities is unacceptable.

4.4 Fowler’s Toad

Background

Fowler’s toads were observed throughout the Study Area, including the gravel extraction areas, and it is likely that the toad breeds in wetlands or other pools on the site (although no breeding activity was observed during surveys). Fowler’s toads typically emerge from hibernation later in the season and breed in shallow pools including marshes, borrow pits and ditches with semi-permanent water (Gibbs et. al. 2007).

Mitigation Actions

No potential breeding pools are being filled in or otherwise altered and existing wetlands will be protected during construction. No additional mitigation measures are recommended for this species.

4.5 Spotted Salamander and Wood Frog

Background:

Pool-breeding amphibians were documented breeding in all vernal pools in the Study Area, except pool 7, which is a permanently inundated old farm pond. The most productive and herpetologically diverse portion of the Study Area was observed to be the block of forest that contains pools 1 through 5. This area consists of the Blackwell Brook floodplain and associated pools, and the wetlands associated with the relict channel and surrounding terrestrial habitat. This entire block will remain unaltered as part of the proposed Herpetofauna Protection Area.

Mitigation Actions:

- To avoid deleterious effects to the population(s) of pool-breeding amphibians present within the Study Area, the site development will be based on the standards set forth in Calhoun and Klemens (2002) *Best Development Practices Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States*;
- Silt fence will be installed surrounding the area to prevent fine materials from being deposited into wetlands. The majority of amphibians using the pools in this block likely reside in the forested terrestrial areas adjacent to the breeding wetlands. Some may traverse the agricultural fields to the north and south of this area as part of their breeding migration. Silt fence installed around this forested block will allow for the passage of animals by using wood chips or erosion control mix to construct exit ramps at appropriate locations; and
- An increased level of monitoring will be conducted during the amphibian breeding season.

5. Conclusion

These avoidance and mitigation measures are based on three years of accumulated natural resource and wildlife surveys. The results of these surveys and the actions described in this document have been used to inform a minimally impactful Project design with the goal of protecting sensitive species throughout the construction and operation of the Project. Updates to previous versions of the Project design include increased wetland buffers and the creation of the approximately 40-acre Herpetofauna Protection Area providing habitat connectivity to Blackwell Brook and Cold Spring Brook (see Appendix B). These measures represent the careful consideration that has gone into this Plan. Quinebaug Solar will continue to work with DEEP and other agencies to be transparent on issues concerning protected species throughout all phases of Project development.

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Appendix A. Avoidance and Mitigation Summary Tables

Table A2. Summary of general avoidance and mitigation measures.

Pre-Construction	Site Prep (Tree Clearing & Earthwork)	Construction	Post Construction
• Field Surveys (Completed) o Vernal pool surveys (2016 and 2018) o Blue-spotted salamander surveys (2018) o Eastern spadefoot toad surveys (2018) o General herpetological inventory (2018) o Continued eastern spadefoot surveys (2019) • Contractor Training: Herpetofauna field identification/reporting	• No direct impacts to wetlands, watercourses, or 100-foot vernal pool envelopes • Setbacks maintained to all wetlands and watercourses • Tree clearing restricted to winter (November–March) • Minimize earthwork within vernal pool critical terrestrial habitats during spring season (March–June)	• Construction team awareness and impact minimization training • Exclusion fencing and flagging of eastern spadefoot toad protection areas (March–October) • Regular monitoring (including pool C), with increased frequency during the amphibian breeding season • Real-time adjustments during construction • Documentation/reporting	• Operations team awareness and impact minimization training • Vegetation/meadow habitat maintenance • Perimeter fence[5] with wildlife 6-inch access gap at bottom • Permanent signage around potential breeding pool C • Post-construction wildlife monitoring (if appropriate)

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[5] A six-inch gap will be maintained around the perimeter of most of the Project, except in select areas where enhanced security measures are required (for example around access points).

Table A3. Summary of wetland and watercourse setbacks approved by Natural Diversity Data Base Program, for wetlands or portions of wetlands having less than the Project-standard 100-foot buffer. Setback measurements are approximate.

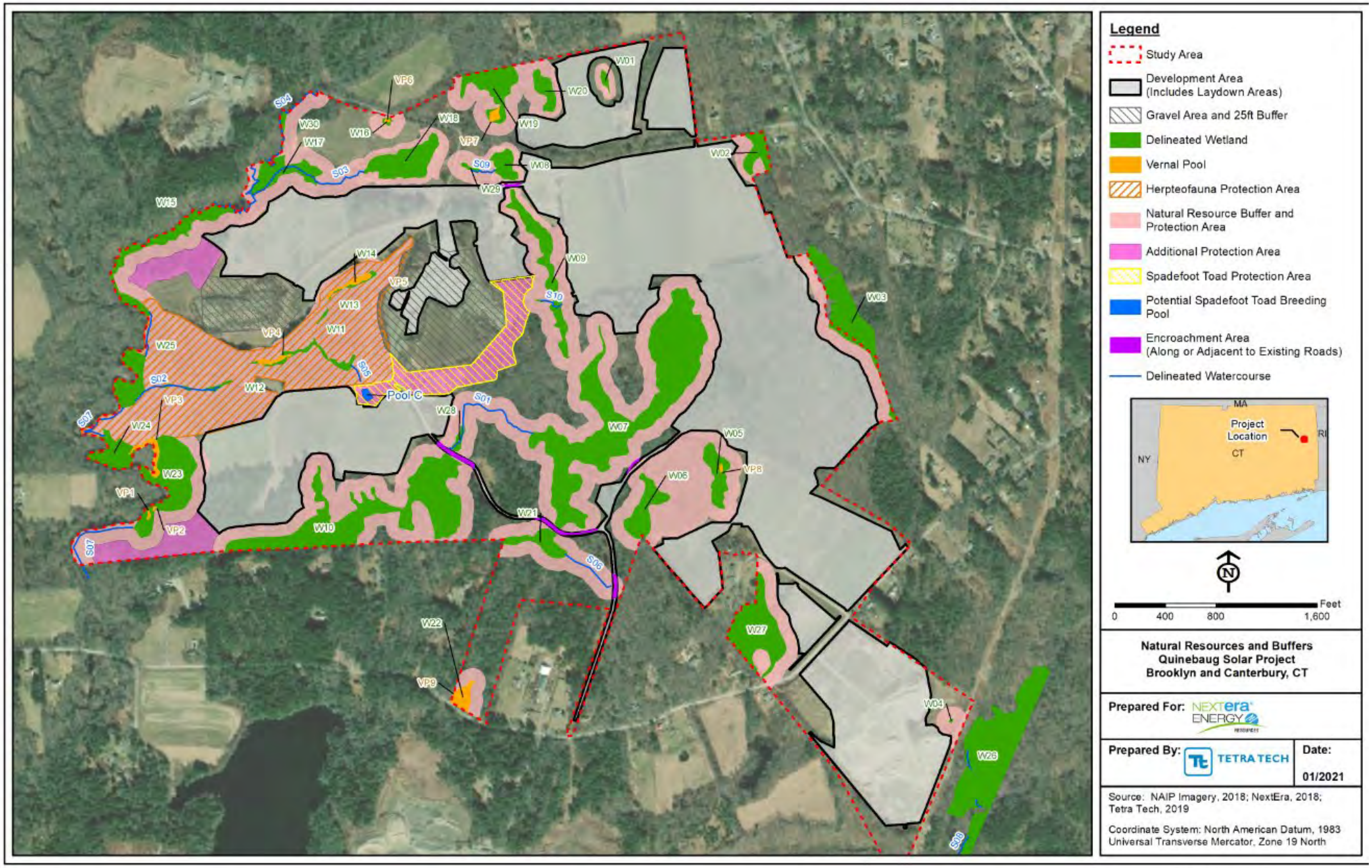
Resource ID	Setback	Explanation
W01	50 feet	• This wetland occurs entirely within an active agricultural field; it is not a vernal pool. The Project will result in cessation of disturbing agricultural activities in and around this wetland (e.g., plowing), therefore, facilitating growth of natural wetland plant species.
W02	100 feet in forested area and 50 feet in cleared area in agricultural field	• The area to the west of this wetland is in active agricultural use. No tree clearing will occur within 100 feet of this wetland.
W06	90 feet	• Existing skidder trail (i.e., used for timber harvest) will be used for Project access road.
W07	100 feet along existing woods road and 6 feet to existing roadway	• Existing woods road (i.e. used for timber harvest) on the east side of the wetland will be used as a Project site road; the existing roadway to the south of the wetland also will be used as a Project site road.
W08	50	• Wetland occurs within an active agricultural field, upgrades to existing farm road will occur within 30 feet of resource.
W09	100 feet in forested area and 50 feet in cleared area in agricultural field	• Upgrades to existing farm road will occur within 28' of resource.
W10	10 feet to existing roadway	• Existing road will be used as a Project site road.

Resource ID	Setback	Explanation
W18	100 feet in forested area and 50 feet in cleared area in agricultural field	• The areas north and south of this wetland are in active agricultural use. No tree clearing will occur within 100 feet of this wetland.
W20	100 feet in forested area and 50 feet in cleared area in agricultural field	• The area to the southeast of this wetland is in active agricultural use. No tree clearing will occur within 100 feet of this wetland.
W21	6 feet to existing roadway	• Existing road on north side of wetland will be used as a Project site road.
W28	6 feet to existing roadway	• Existing gravel road occurs on the south side of the wetland.
S01	0 feet to existing roadway	• The existing road crosses this watercourse and will be used as a Project site road. No tree clearing will occur within 100 feet of this wetland.
S05	25 feet to existing roadway	• The existing road to the south of this watercourse will be used as a Project site road. No tree clearing will occur within 100 feet of this wetland.
S06	30 feet to existing roadway	• Existing road will be used as a Project site road.

Table A4. Summary of species-specific avoidance and mitigation measures.

Species	Avoidance & Mitigation Measures
Eastern spadefoot toad	• Protect and demarcate eastern spadefoot habitat • Construction phasing to avoid take • Silt fence/exclusion fencing • Construction monitoring • Post-construction population monitoring
Spotted turtle	• Contractor training • Silt fence/exclusion fencing • Construction monitoring • Short-distance relocation
Northern black racer	• Contractor training • Silt fence/exclusion fencing • Construction monitoring • Short-distance relocation
Fowler's toad	• Avoid alteration of terrestrial and aquatic habitat • Silt fence/exclusion fencing • Construction monitoring
Spotted salamander and wood frog	• Base development on Calhoun and Klemens (2002) best development practices • Construction timing • Silt fence/exclusion fencing • Construction monitoring

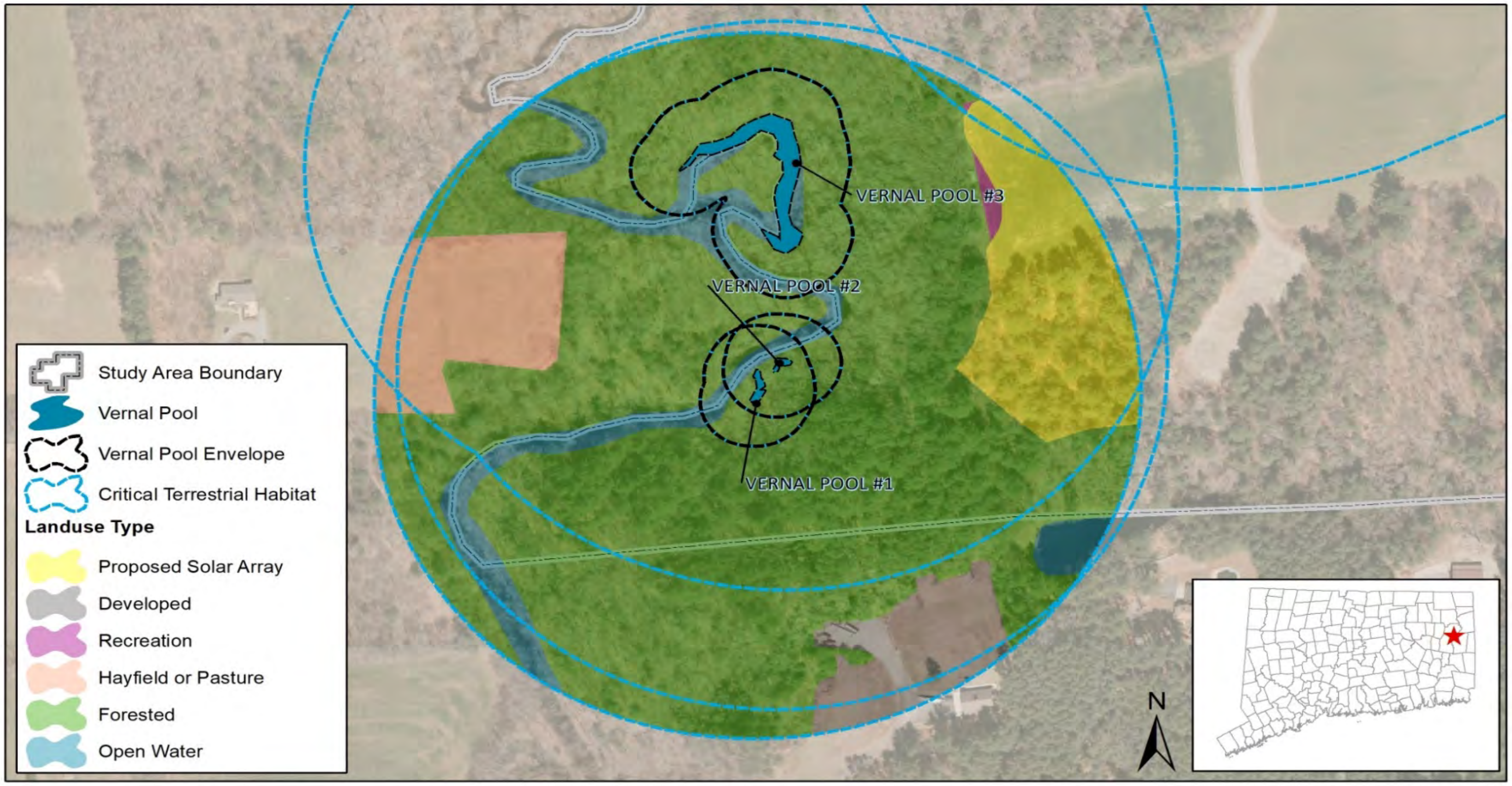
Appendix B. Development Footprint and Wetland Buffers



Not for Construction

Figure B1. Resource buffers and limit of work for the Quinebaug Solar Project, Brooklyn and Canterbury, Connecticut.

Appendix C. Post-construction Vernal Pool Analysis Maps



Cover Type	Development Status	0'-100' Vernal Pool Envelope (acres)	0'-100' Vernal Pool Envelope (percent)	100'-750' Critical Terrestrial Habitat (acres)	100'-750' Critical Terrestrial Habitat (percent)
Developed	Developed	-	-	1.96	4.64
Forested	Undeveloped	0.90	81.49	30.25	71.57
Agricultural Field	Undeveloped	-	-	2.65	6.26
Open Water	Undeveloped	0.20	18.51	3.42	8.08
Recreational Field	Developed	-	-	0.11	0.26
Gravel Pit	Undeveloped	-	-	-	-
Proposed Solar Array	Developed	-	-	3.89	9.20
	Total	1.10	100.00	42.27	100.00

VERNAL POOL #1

Quinebaug Solar, Brooklyn & Canterbury, CT

Data obtained from ESRI DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, TetraTech, and the State of Connecticut
Projection: NAD 1983 State Plane Connecticut FIPS0600 Feet
Created By: FB Environmental, April 2019

0 255 510 Feet

Figure C1. Post-construction vernal pool analysis map for pool 1 at the Quinebaug Solar Site, Brooklyn and Canterbury, Connecticut.

Cover Type	Development Status	0'-100' Vernal Pool Envelope (acres)	0'-100' Vernal Pool Envelope (percent)	100'-750' Critical Terrestrial Habitat (acres)	100'-750' Critical Terrestrial Habitat (percent)
Developed	Developed	-	-	1.54	3.71
Forested	Undeveloped	0.78	80.82	29.17	70.48
Agricultural Field	Undeveloped	-	-	2.31	5.58
Open Water	Undeveloped	0.19	19.18	3.25	7.84
Recreational Field	Developed	-	-	0.11	0.27
Gravel Pit	Undeveloped	-	-	-	-
Proposed Solar Array	Developed	-	-	5.02	12.12
	Total	**0.96**	**100.00**	**41.39**	**100.00**

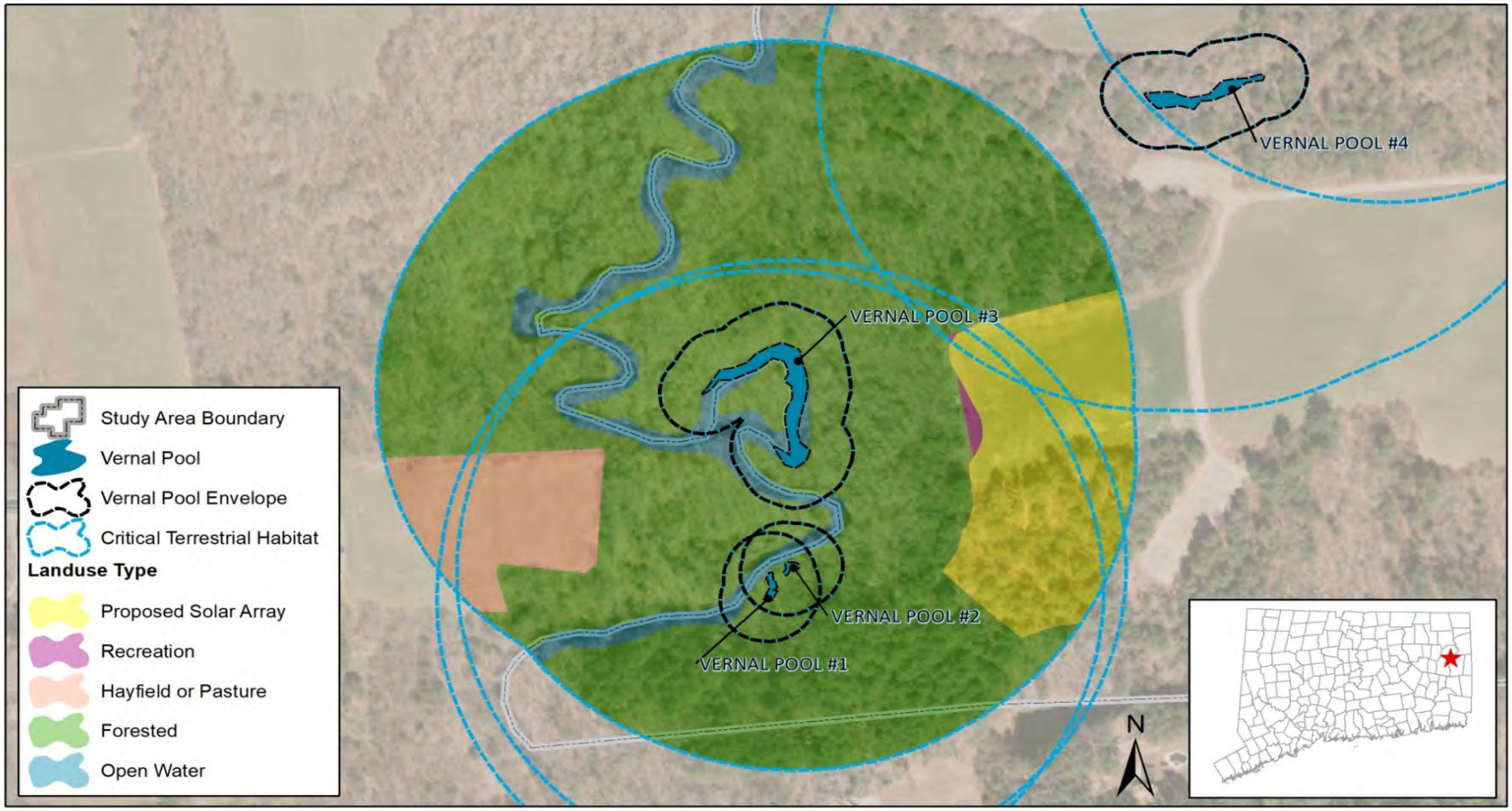
VERNAL POOL #2

Quinebaug Solar, Brooklyn & Canterbury, CT

Data obtained from ESRI DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, TetraTech, and the State of Connecticut
Projection: NAD 1983 State Plane Connecticut FIPS0600 Feet
Created By: FB Environmental, April 2019

0 250 500
Feet

Figure C2. Post-construction vernal pool analysis map for pool 2 at the Quinebaug Solar Site, Brooklyn and Canterbury, Connecticut.



Cover Type	Development Status	0'-100' Vernal Pool Envelope (acres)	0'-100' Vernal Pool Envelope (percent)	100'-750' Critical Terrestrial Habitat (acres)	100'-750' Critical Terrestrial Habitat (percent)
Developed	Developed	-	-	-	-
Forested	Undeveloped	15.94	62.50	39.67	75.18
Agricultural Field	Undeveloped	-	-	3.20	6.06
Open Water	Undeveloped	9.56	37.50	3.24	6.14
Recreational Field	Developed	-	-	0.11	0.21
Gravel Pit	Undeveloped	-	-	-	-
Proposed Solar Array	Developed	-	-	6.55	12.42
	Total	**25.50**	**100.00**	**52.77**	**100.00**

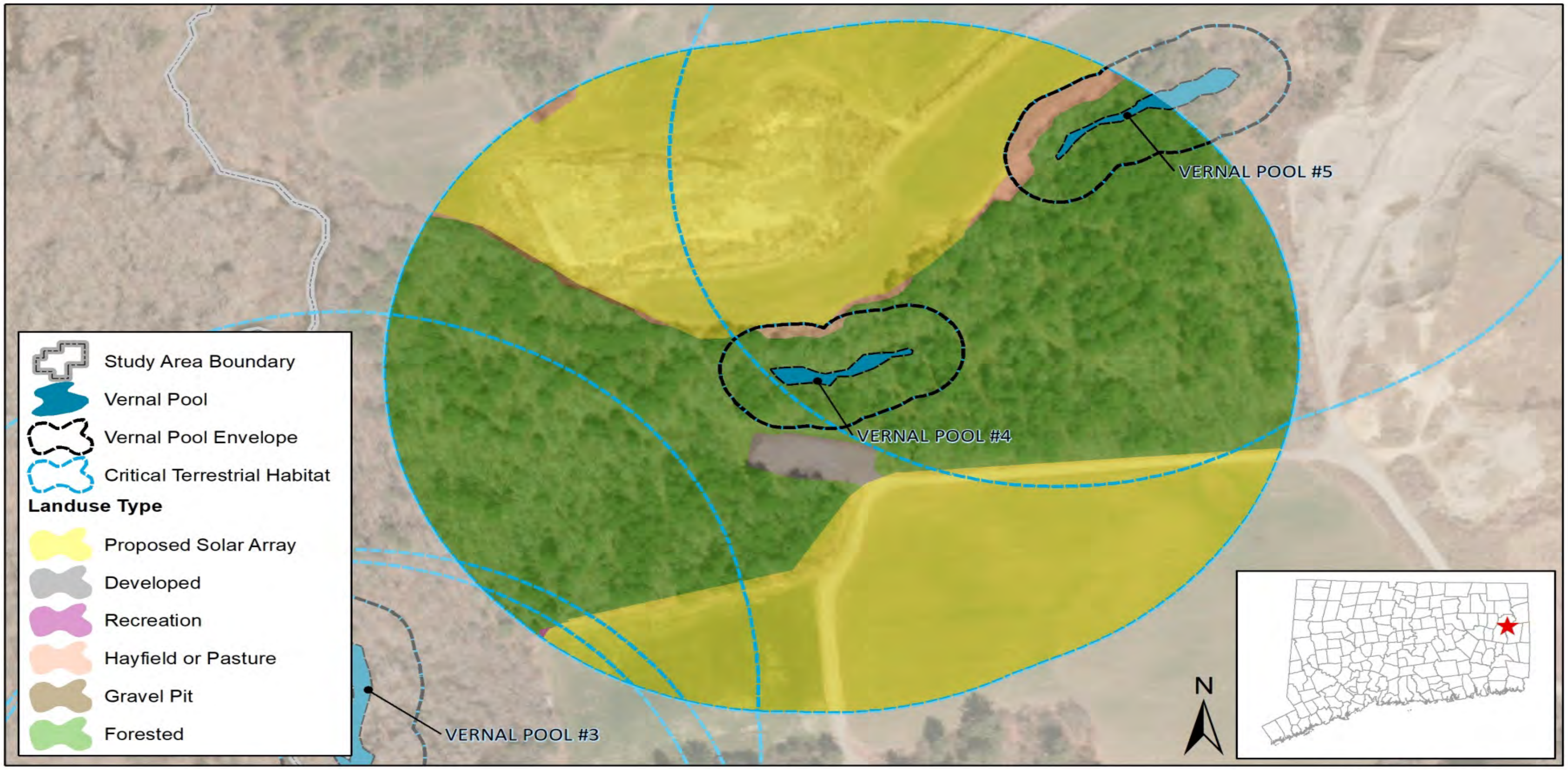
VERNAL POOL #3

Quinebaug Solar, Brooklyn & Canterbury, CT

Data obtained from ESRI DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, TetraTech, and the State of Connecticut
Projection: NAD 1983 State Plane Connecticut FIPS0600 Feet
Created By: FB Environmental, April 2019
0 250 500 Feet

FB environmental

Figure C3. Post-construction vernal pool analysis map for pool 3 at the Quinebaug Solar Site, Brooklyn and Canterbury, Connecticut.



Cover Type	Development Status	0'-100' Vernal Pool Envelope (acres)	0'-100' Vernal Pool Envelope (percent)	100'-750' Critical Terrestrial Habitat (acres)	100'-750' Critical Terrestrial Habitat (percent)
Developed	Developed	-	-	0.52	1.08
Forested	Undeveloped	2.00	95.05	23.19	47.75
Agricultural Field	Undeveloped	0.10	4.95	0.60	1.23
Open Water	Undeveloped	-	-	-	-
Recreational Field	Developed	-	-	0.01	0.01
Gravel Pit	Undeveloped	-	-	0.08	0.16
Proposed Solar Array	Developed	-	-	24.18	49.78
	Total	**2.10**	**100.00**	**48.57**	**100.00**

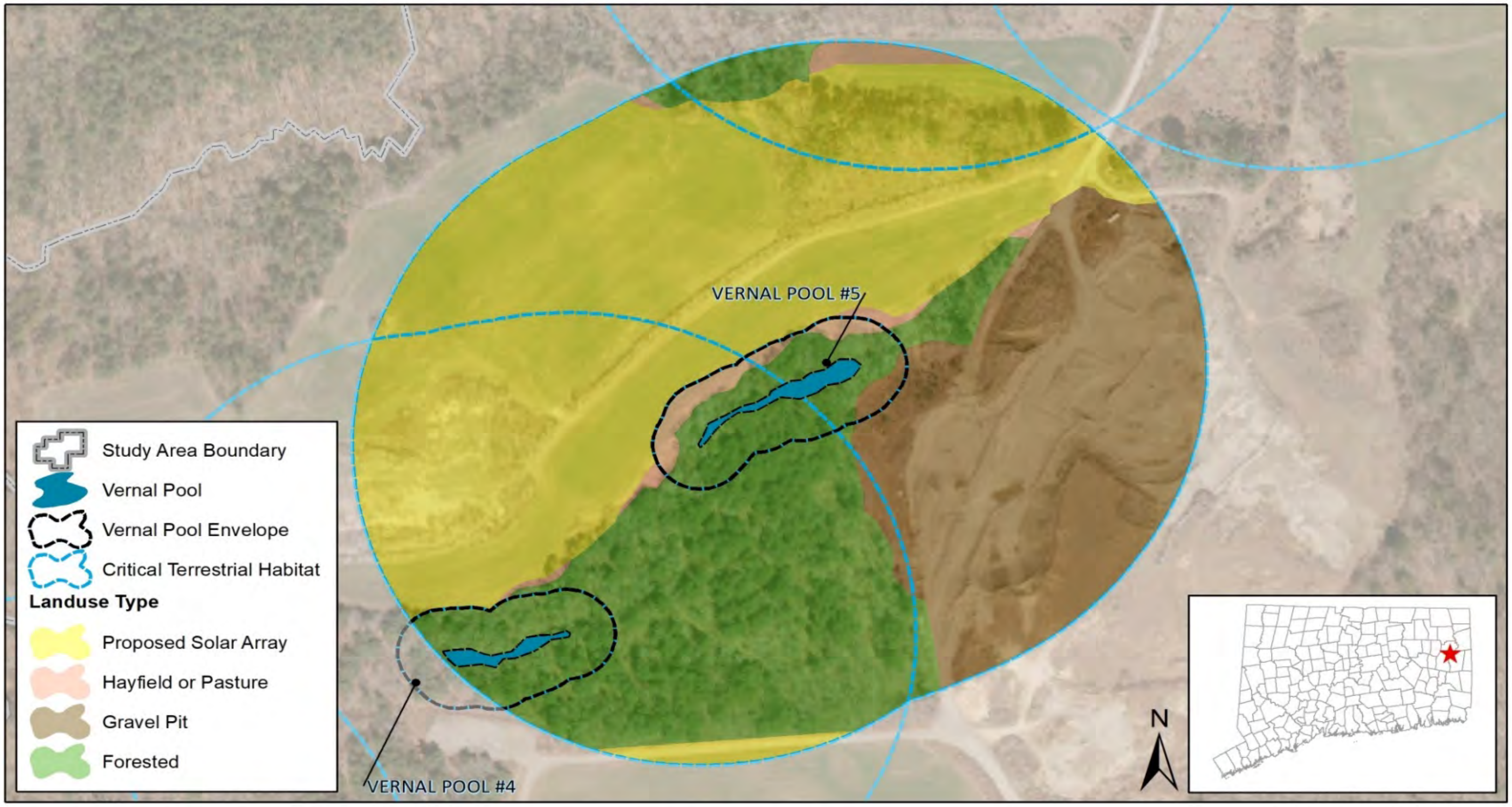
VERNAL POOL #4

Quinebaug Solar, Brooklyn & Canterbury, CT

Data obtained from ESRI DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, TetraTech, and the State of Connecticut
Projection: NAD 1983 State Plane Connecticut FIPS0600 Feet
Created By: FB Environmental, April 2019

0 250 500 Feet

Figure C4. Post-construction vernal pool analysis map for pool 4 at the Quinebaug Solar Site, Brooklyn and Canterbury, Connecticut.



Cover Type	Development Status	0'-100' Vernal Pool Envelope (acres)	0'-100' Vernal Pool Envelope (percent)	100'-750' Critical Terrestrial Habitat (acres)	100'-750' Critical Terrestrial Habitat (percent)
Developed	Developed	-	-	-	-
Forested	Undeveloped	1.92	71.86	13.27	25.38
Agricultural Field	Undeveloped	0.57	21.31	0.65	1.24
Open Water	Undeveloped	-	-	-	-
Recreational Field	Developed	-	-	-	-
Gravel Pit	Uneveloped	0.18	6.83	12.93	24.73
Proposed Solar Array	Developed	-	-	25.42	48.64
	Total	**2.67**	**100.00**	**52.27**	**100.00**

VERNAL POOL #5

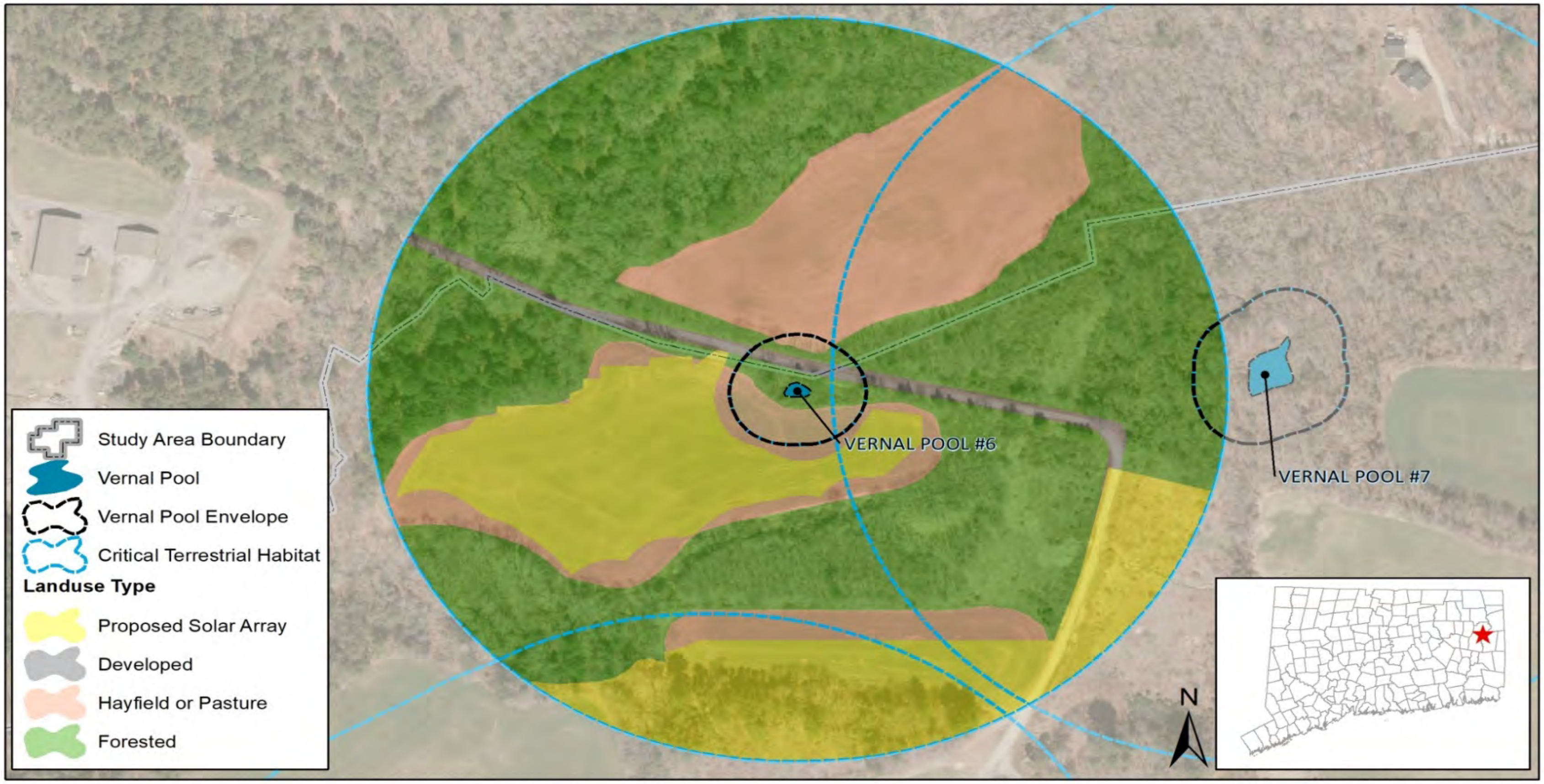
Quinebaug Solar, Brooklyn & Canterbury, CT

Data obtained from ESRI DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, TetraTech, and the State of Connecticut
Projection: NAD 1983 State Plane Connecticut FIPS0600 Feet
Created By: FB Environmental, April 2019

0 250 500 Feet

FB environmental

Figure C5. Post-construction vernal pool analysis map for pool 5 at the Quinebaug Solar Site, Brooklyn and Canterbury, Connecticut.



Cover Type	Development Status	0'-100' Vernal Pool Envelope (acres)	0'-100' Vernal Pool Envelope (percent)	100'-750' Critical Terrestrial Habitat (acres)	100'-750' Critical Terrestrial Habitat (percent)
Developed	Developed	0.13	13.13	0.72	1.73
Forested	Undeveloped	0.39	39.67	22.90	55.09
Agricultural Field	Undeveloped	0.46	47.20	8.11	19.51
Open Water	Undeveloped	-	-	-	-
Recreational Field	Developed	-	-	-	-
Gravel Pit	Undeveloped	-	-	-	-
Proposed Solar Array	Developed	-	-	9.84	23.67
	Total	**0.98**	**100.00**	**41.56**	**100.00**

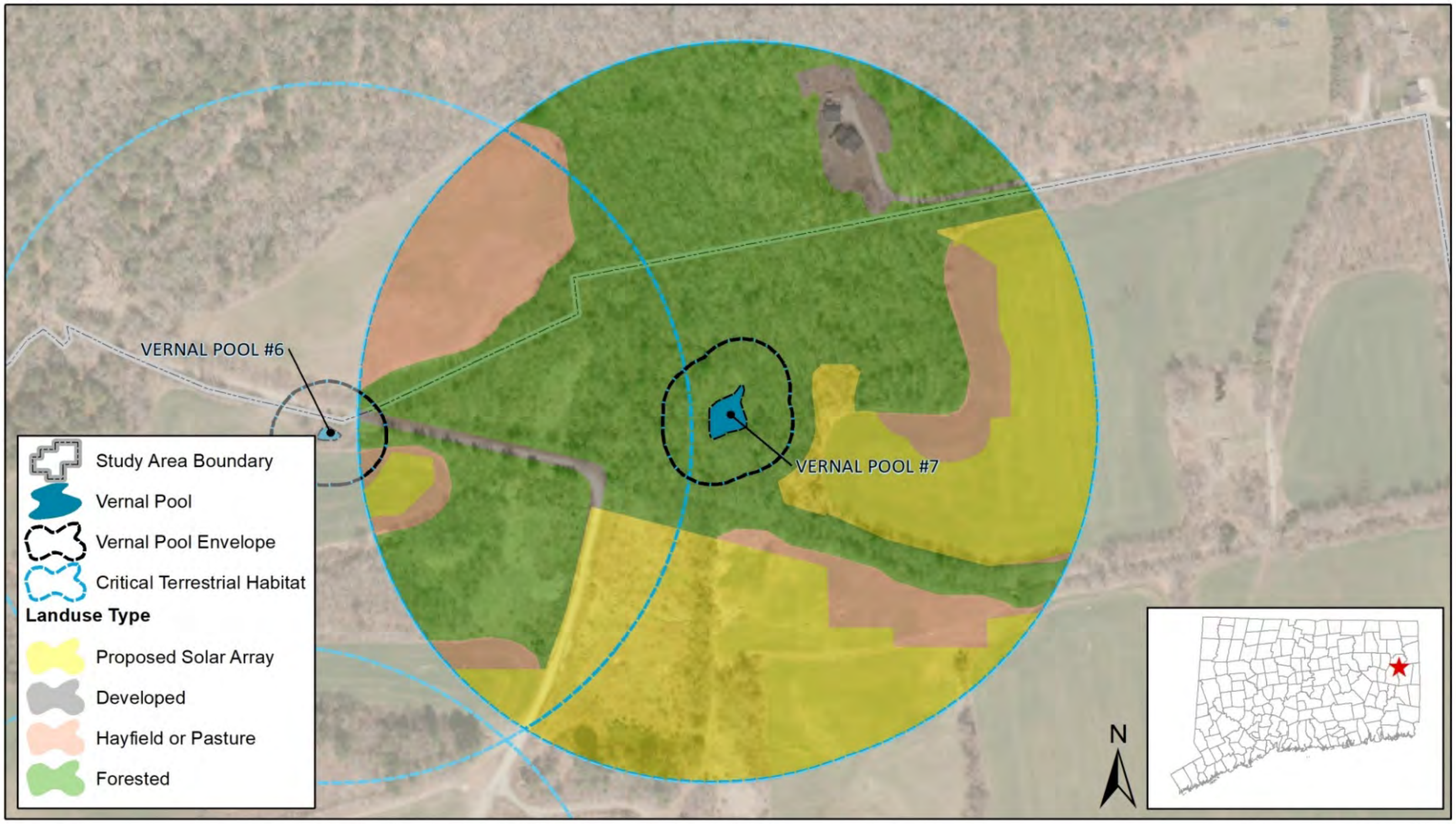
VERNAL POOL #6

Quinebaug Solar, Brooklyn & Canterbury, CT

Data obtained from ESRI DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, TetraTech, and the State of Connecticut
Projection: NAD 1983 State Plane Connecticut FIPS0600 Feet
Created By: FB Environmental, April 2019

0 250 500 Feet

Figure C6. Post-construction vernal pool analysis map for pool 6 at the Quinebaug Solar Site, Brooklyn and Canterbury, Connecticut.



Cover Type	Development Status	0'-100' Vernal Pool Envelope (acres)	0'-100' Vernal Pool Envelope (percent)	100'-750' Critical Terrestrial Habitat (acres)	100'-750' Critical Terrestrial Habitat (percent)
Developed	Developed	-	-	1.36	3.06
Forested	Undeveloped	1.46	100.00	21.76	48.78
Agricultural Field	Undeveloped	-	-	6.51	14.60
Open Water	Undeveloped	-	-	-	-
Recreational Field	Developed	-	-	-	-
Gravel Pit	Undeveloped	-	-	-	-
Proposed Solar Array	Developed	-	-	14.98	33.57
	Total	**1.46**	**100.00**	**44.62**	**100.00**

VERNAL POOL #7

Quinebaug Solar, Brooklyn & Canterbury, CT

Data obtained from ESRI DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, TetraTech, and the State of Connecticut
Projection: NAD 1983 State Plane Connecticut FIPS0600 Feet
Created By: FB Environmental, April 2019
0 250 500 Feet

FB environmental

Figure C7. Post-construction vernal pool analysis map for pool 7 at the Quinebaug Solar Site, Brooklyn and Canterbury, Connecticut.

Cover Type	Development Status	0'-100' Vernal Pool Envelope (acres)	0'-100' Vernal Pool Envelope (percent)	100'-750' Critical Terrestrial Habitat (acres)	100'-750' Critical Terrestrial Habitat (percent)
Developed	Developed	-	-	0.27	0.66
Forested	Undeveloped	0.80	96.91	14.79	36.47
Agricultural Field	Undeveloped	0.03	3.09	0.89	2.21
Open Water	Undeveloped	-	-	-	-
Recreational Field	Developed	-	-	-	-
Gravel Pit	Undeveloped	-	-	-	-
Proposed Solar Array	Developed	-	-	24.59	60.66
	Total	**0.83**	**100.00**	**40.54**	**100.00**

VERNAL POOL #8

Quinebaug Solar, Brooklyn & Canterbury, CT

Data obtained from ESRI DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, TetraTech, and the State of Connecticut

Projection: NAD 1983 State Plane Connecticut FIPS0600 Feet

Created By: FB Environmental, April 2019

0 250 500 Feet

Figure C8. Post-construction vernal pool analysis map for pool 8 at the Quinebaug Solar Site, Brooklyn and Canterbury, Connecticut.

Appendix D. Quinebaug 2019 Spadefoot Toad Monitoring Report

MEMORANDUM

TO: Katelin Nickerson, Tetra Tech

FROM: Kevin Ryan, FB Environmental

SUBJECT: **Quinebaug Solar 2019 Spadefoot Surveys**

DATE: October 7, 2019

CC: Linda Rivard, Tetra Tech; Forrest Bell, FB Environmental

Attachments: 1) Site map; 2) Site photographs.

This memo summarizes the field investigations to determine if the eastern spadefoot toad (*Scaphiopus holbrookii*) breeds at the site of the proposed Quinebaug Solar Project (hereafter Study Area or Site). The surveys described herein were carried out by FB Environmental (FBE) in the spring, summer, and fall of 2019. No evidence of breeding by eastern spadefoots was detected in 2019. Further details are provided in the brief introduction, methods, and results sections below. Maps and site photographs are included as attachments.

Introduction & Methods

At the request of Tetra Tech and to fulfill the requirements of the Avoidance and Mitigation Plan for the Quinebaug Solar Project. FBE conducted surveys to assess eastern spadefoot toad breeding activity at the Site located in Brooklyn and Canterbury, Connecticut. While presence of this species was confirmed in 2018, it was not ascertained whether or not the species breeds within the Study Area. The purpose of the 2019 surveys was to assess whether an eastern spadefoot breeding pool is present at the Site.

During the 2018 vernal pool survey and general herpetological inventory, FBE identified two potential eastern spadefoot breeding pools[1]. The first pool (Pool A) lies northeast of the gravel extraction area at the center of the Site. An access road to an adjacent hayfield traverses the pool. The second pool (Pool B) is in an active agricultural field near the intersection of Rukstella Road and Allen Hill Road. Both pools evidently have very short hydroperiods as they dried rapidly during 2018.

The results of the 2018 spadefoot surveys suggest that eastern spadefoot toads did not utilize either of the above potential breeding pools for breeding that year. With only a single year of data, however, it could not be ruled out that the pools may contain breeding congresses in some years. (No eastern spadefoot breeding events were observed/reported in Connecticut in 2018.) Therefore, additional monitoring was necessary.

Optimal conditions for spadefoot breeding are heavy rain events from roughly April through mid-September when the average air temperature is above 50° Fahrenheit. Surveys conducted in 2019 consisted of checking potential breeding pools for eggs or tadpoles from one to several days following a heavy rain event. Surveys were conducted by either Kevin Ryan (FBE) or Dennis Quinn (CTHerpConsultant), both individuals with experience detecting eastern spadefoot toads. As in 2018, a known spadefoot breeding pool nearby in the town of Plainfield was opportunistically monitored in 2019 as a check on suitability of conditions for spadefoot emergence and breeding. The 2019 survey strategy differed from that of 2018 in that the focus was solely to determine whether eastern spadefoots breed at the site, and not to capture individuals during non-breeding nighttime emergences. (Some of the 2018 surveys occurred during conditions suitable for eastern spadefoot emergence for feeding, but not necessarily breeding [i.e., precipitation events were not substantial enough to initiate breeding]).

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[1] FBE (FB Environmental Associates). 2019. Herpetofauna Avoidance and Mitigation Plan, Quinebaug Solar Project. Prepared for Quinebaug Solar, LLC. 27 pp.

Results

All potential breeding pools at the Study Area were assessed for evidence of breeding by eastern spadefoots on eight separate occasions during 2019: April 17, June 7 and 20, July 26, August 7 and 29, and September 7 and 26. Survey efforts included a third potential breeding pool (Pool C) that was discovered in 2019. Pools C is a small, short-hydroperiod pool in the agricultural field between the gravel extraction area at the center of the site and the athletic field. All surveys took place during the day with the exception of 7 August, which occurred at night during a heavy precipitation event. The majority of these assessments occurred after heavy rainfall events within the previous 24 hours. Results for each pool are presented below.

Pool A

On 17 April pool A was observed to be inundated. No amphibian egg masses were observed in the pool. The pool was found to be dry on all subsequent visits with the exception of during the August 7 visit, where the interior of the pool had one inch of water due to preceding heavy rainfall. No amphibian egg masses or larvae were observed in the pool during any of the site visits.

Pool B

Pool B was observed to contain three American toad (*Anaxyrus americanus*) egg masses on April 17. The pool contained no water during subsequent site visits. Planted corn was growing from the pool area during July and August. Corn was harvested before or during early September, at which time the pool contained no water.

Pool C

Pool C was discovered on June 20 when its basin contained no standing water but the substrate was visibly damp. Visual encounter searches in and around the pool depression yielded the detection of American toad metamorphs which likely originated from the pool. It was therefore reasonable to assume that if American toads can breed in the pool then the eastern spadefoot could as well.

On July 26 the pool contained no standing water but soil within its basin was damp, indicating recent inundation. Furthermore, no corn was observed in the basin due undoubtedly to the previous presence of a sufficient amount of standing water to exclude it.

The pool contained no water at the start of the nocturnal survey event on August 7. During heavy rainfall that night, the pool filled to a depth of one foot in approximately 30 minutes, mainly from run-off from the access road to the athletic field. No breeding activity was detected, nor were any individual eastern spadefoots detected in the vicinity of the pool or elsewhere on site during the survey.

On August 29 the pool contained 12-18 inches of water following heavy rainfall the previous evening. No amphibian egg masses were observed in the pool. The pool was dry on September 7 and September 26.

Spadefoot Activity at Other Sites

Eastern spadefoot toads were observed active near a known breeding pool in the town of Plainfield on the evenings of August 7 and August 28. The individual observed on August 28 was a very small juvenile toad which might have metamorphosed earlier in the year, thus indicating a breeding event may have taken place earlier in the year, possibly May (see below). The presence of an individual that metamorphosed in 2019 would confirm that suitable breeding conditions had taken place in Plainfield during that year.

Eastern spadefoot breeding events were confirmed to occur at two Connecticut sites in 2019. In May, numerous metamorph eastern spadefoots were observed both at a known pool in North Stonington and at a newly-discovered pool in New Milford[2].

Conclusion

The results of the 2019 eastern spadefoot surveys suggest the species did not utilize any of the potential breeding pools within the Survey Area for a second consecutive year. No breeding congresses were observed nor were any egg masses observed in the pools. Furthermore, no eastern spadefoot toads of any age class were observed in the vicinity of potential breeding pools. This is despite the confirmed occurrence of breeding events at known sites in North Stonington and New Milford (Dennis Quinn, personal communication) and a possible breeding event at the nearby known breeding pool in Plainfield.

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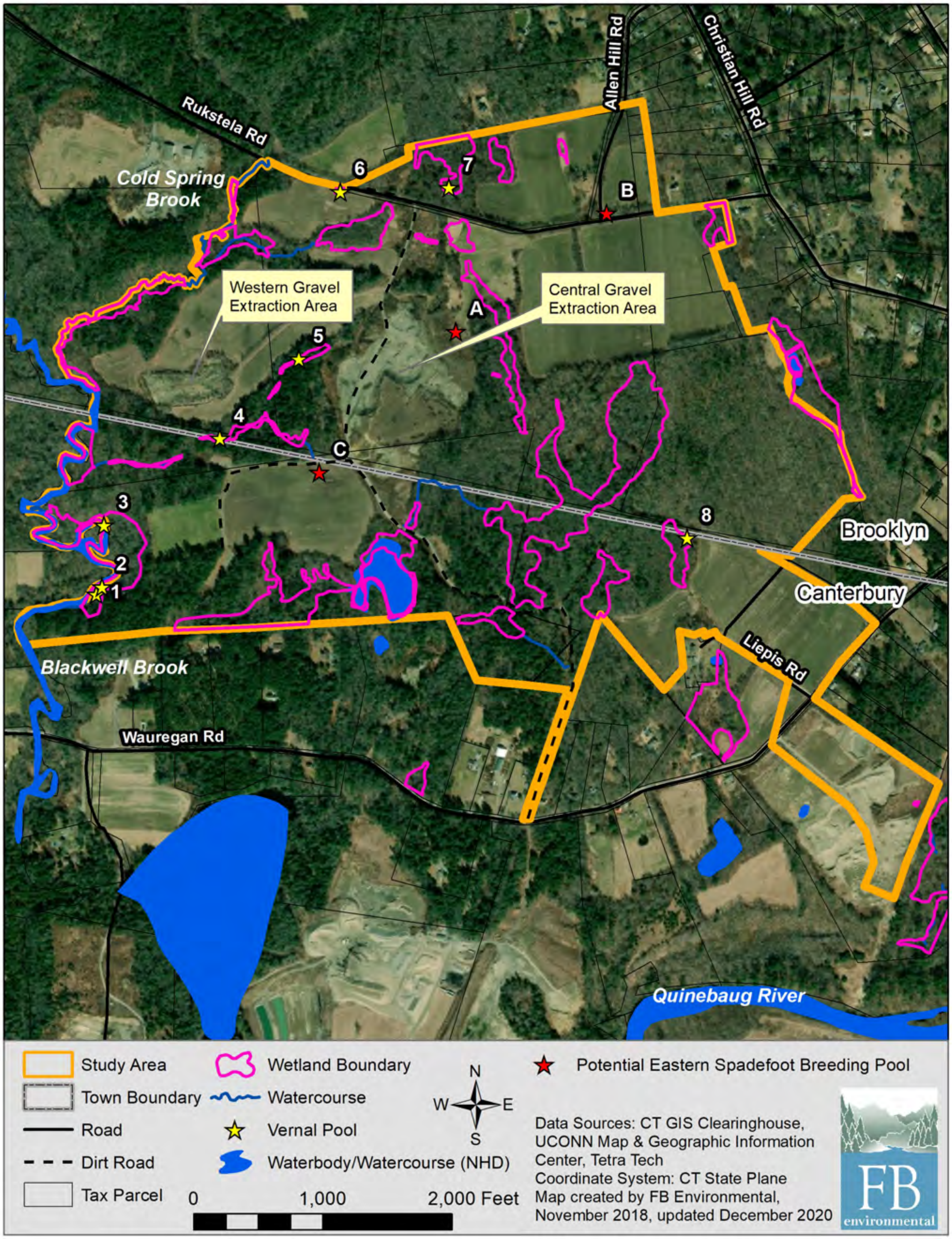
[2] The eastern spadefoot toad breeding pool in North Stonington is situated in an active agricultural field. The newly-discovered pool in New Milford is a detention basin in an industrial park.

ATTACHMENT 1. SITE MAP



ATTACHMENT 2. SITE PHOTOGRAPHS

Photo 1. Pool A was inundated on April 17 but contained no amphibian egg masses.

Photo 2. Pool A contained no standing water on June 7.

Photopoint 3. Pool A was densely vegetated on August 29.

Photo 4. Pool B was inundated on April 17.

Photo 5. An American toad (*Anaxyrus americanus*) egg mass in Pool B on April 17.

Photo 6. Pool B contained no standing water on June 7.

Photo 7. Pool B is covered with mature corn on August 29.

Photo 8. Pool B on September 26 following corn harvest.

Photo 9. Pool C was inundated on August 29.

Photopoint 10. Pool C contained no water on September 7.

Photopoint 11. Pool C on September 26 following corn harvest. No standing water is present in the pool but the basin is clearly visible.

Appendix E. Quinebaug Eastern Spadefoot Toad Monitoring Plan

Eastern Spadefoot Toad
(*Scaphiopus holbrookii*)
Three-Year Monitoring Plan

Quinebaug Solar Project
Brooklyn and Canterbury, Connecticut

Prepared for:

Quinebaug Solar, LLC 700
Universe Boulevard Juno
Beach, FL 33408

Prepared by:

Tetra Tech
451 Presumpscot Street
Portland, ME 04103

AND

FB Environmental
97A Exchange Street, Suite 305
Portland, ME 04101

Introduction

Quinebaug Solar, LLC (Quinebaug Solar), an affiliate of NextEra Energy Resources, is proposing the development of the approximately 50-megawatt Quinebaug Solar Project (Project) in the Towns of Brooklyn and Canterbury, Windham County, Connecticut. As part of conditions of issuance of a Final Determination from the Connecticut Department of Energy and Environmental Protection (DEEP), Natural Diversity Database Program (NDDB), a post-construction monitoring program for eastern spadefoot toad (*Scaphiopus holbrookii*) will be implemented for three consecutive years following completion of Project construction. The purpose of post-construction monitoring is to continue efforts to ascertain whether eastern spadefoot toads breed at the site. To date, no breeding activity has been observed.

Eastern Spadefoot Toad

Eastern spadefoot toad is a Connecticut endangered species. Their fossorial habits and sporadic breeding behavior make them challenging to study and understand. They are nocturnal and usually remain in subterranean burrows, lying dormant for weeks during dry periods. They emerge after heavy rain and breed in fishless, shallow, waterbodies. Eastern spadefoot toad prefers dry habitats with sandy soil; Klemens (1993) has found occurrences correlate strongly with Hinckley soils. Building on Klemens' observations, Moran and Button (2011) used soils and digital elevation model data from known eastern spadefoot toad sites in Connecticut, Massachusetts, and Rhode Island to create a geographic information system model that identifies and predicts potential eastern spadefoot toad habitat in the region.

The eastern spadefoot toad can forgo breeding for numerous, consecutive years (Ball 1936, Klemens 1993). The known breeding sites in eastern Connecticut are temporary pools with an open canopy that are created by heavy rainfall. In years when breeding does occur, the activity is explosive, typically lasting only one or two nights, and can occur anytime from late March through October in southern New England (Klemens 1993). For at least several days following a breeding event, it is possible to determine if a breeding event occurred in a given pool as eggs and/or tadpoles will be present.

Previous Project Surveys

Over the summer of 2018, nocturnal field surveys were completed by FB Environmental (FBE) to determine presence of the eastern spadefoot toad within the Project's Study Area. During this survey period, three individual eastern spadefoot toads were observed. Additionally, potential breeding pools identified within the Study Area were checked during appropriate conditions (i.e., following heavy rain events) to determine if breeding activity had occurred. No breeding was observed during the 2018 surveys.

A second year of eastern spadefoot toad surveys was conducted over the spring and summer of 2019 to determine the possible presence of eastern spadefoot toad breeding pools within the Project Study Area. Pools were examined for eggs and/or tadpoles during the day following rain events. No evidence of eastern spadefoot toad breeding activity was observed during the 2019 surveys.

Potential Breeding Pools

Three potential breeding pools were documented within the Project Study Area during the 2018 and 2019 surveys, potential breeding pools A, B, and C. Potential breeding pools A and B were determined to lack the criteria to be protected as suitable habitat for eastern spadefoot toad for reasons described in the January 17, 2020 supplemental filing to NDDB (Nickerson and Ryan 2020). Potential breeding pool C remains visible throughout the year, holds enough water to inhibit the growth of corn, and appears to have supported successful reproduction by American toads (*Anaxyrus americanus*). Therefore, potential breeding pool C is deemed the most suitable for eastern spadefoot breeding and will be protected for the duration of the Project. Furthermore, potential breeding pool C is located adjacent to the herpetofauna protection area and another area designated for eastern spadefoot toad protection that contains suitable upland habitat for the species. Figures 1 and 2 show these designated protection areas as well as the maximum extent of the proposed project area or development footprint.

Construction Period Monitoring

Protective measures for eastern spadefoot toad will be implemented during construction of the Project. The following sections provide a brief description of each of these measures; a thorough treatment of protection measures is provided in the Herpetofauna Avoidance and Mitigation Plan (FB Environmental 2019).

Herpetofauna Protection Area

The herpetofauna protection area will be established on the Project site as shown in Figures 1 and 2. This area contains a cluster of wetlands and vernal pools in a relic stream channel and will serve as a refuge for herpetofauna known to occur in the Project area. The herpetofauna protection area also includes a directional buffer that connects potential breeding pool C to the core conservation area and an area of suitable eastern spadefoot toad habitat that is present along the edge of the gravel extraction area. Avoiding clearing and development in this habitat corridor will protect breeding eastern spadefoot toads that could potentially be at the site as well as other herpetofauna known to occur.

Construction Phase Protection Measures

Construction period protection measures for eastern spadefoot toad include construction phasing, environmental monitoring, and contractor training. Silt fence will be used as exclusion fencing to keep sensitive species out of the active construction zone. During the construction period, an environmental monitor will be employed to conduct routine sweeps of enclosed/fenced areas to identify the presence of wildlife, including herpetofauna. The Herpetofauna Avoidance and Mitigation Plan describes the actions that would be implemented if an eastern spadefoot toad breeding event occurs during Project construction.

Operational Avoidance Practices

As described in the Herpetofauna Avoidance and Mitigation Plan (FB Environmental 2019), operations personnel will be trained in the identification of development-sensitive species that may be encountered during Project operations, including eastern spadefoot toad. An operations plan will be in place facilitating the appropriate response if particular species are encountered and need to be relocated for their safety or for operational safety purposes. A six-inch wildlife gap along the base of the Project permanent perimeter fence will allow passage of herpetofauna through and around the site.

Post-Construction Monitoring

Following the necessary Project approvals by DEEP and the Connecticut Siting Council, site clearing and construction is planned to begin in late 2020. Although no breeding activity was observed in 2018 or 2019, potential breeding Pool C will be monitored for three breeding seasons following completion of construction of the Project in 2021. This monitoring period is expected to begin during the summer of 2022 and extend through the summer of 2024.

Survey Methods

The proposed monitoring effort will follow the methods deployed during the summer 2019 field surveys, see Ryan 2019. The focus of the proposed monitoring will solely be to determine whether eastern spadefoots breed at the site, and not to capture individuals during non-breeding nighttime emergences. Despite monitoring efforts to date, an eastern spadefoot breeding congress has yet to be documented at the Project site. Therefore, if breeding of eastern spadefoot toad is not observed during the proposed three-year monitoring effort, it will not be indicative of negative impact or disturbance to the species resulting from Project development. Rather, it will be a continuation of what has been previously observed. If breeding is observed to occur, this will add to the dataset of known breeding populations of eastern spadefoot toad in eastern Connecticut and the information will be invaluable to further the conservation of the species.

Quinebaug Solar will be responsible for acquiring the services of a qualified biologist to conduct the monitoring effort. The monitor will be knowledgeable in the identification and detection of the eastern spadefoot toad at all life stages (i.e., eggs, larvae, juveniles, and adults). Prior to initiation of fieldwork, the biologist will acquire a scientific collection permit issued by the state to handle eastern spadefoot toads, if necessary.

Surveys throughout the breeding season from 2022 to 2024 will occur following rain events having the potential to incite breeding of eastern spadefoots. Optimal conditions for spadefoot breeding are heavy rain events from roughly April through mid-September when the average air temperature is greater than 50 degrees Fahrenheit. Surveys will consist of checking potential breeding pool C for eggs and/or tadpoles from one to three days following a qualifying rain event. Qualifying precipitation events are defined as having greater than or equal to one inch of rain. This threshold amount can result from a single event, or several consecutive events (i.e., three days of rain totaling one inch or greater).

If a breeding event is documented, NDDB will be notified within 24 hours. Subsequent hydrological monitoring of the breeding pool, concurrent with larval development, will be conducted to determine if the breeding event was successful (i.e., produced metamorph eastern spadefoots). If breeding is observed within the Project site, no further mitigation actions will be required.

Survey Results and Reporting

Monitoring reports will be submitted to NDDB on an annual basis. These reports will outline the monitoring efforts completed over the previous breeding season including number of qualifying rain events and the observations made during that period.

REFERENCES

Ball, S. C. 1936. The distribution and behavior of the Spadefoot Toad in Connecticut. Transactions of the Connecticut Academy of Arts and Sciences 32:351–379.

FB Environmental 2019. Herpetofauna Avoidance and Mitigation Plan Quinebaug Solar Project. Prepared for Quinebaug Solar, LLC.

Klemens, M. W. 1993. Amphibians and reptiles of Connecticut and adjacent regions. State Geological and Natural History Survey of Connecticut, Bulletin No. 112. Connecticut Department of Environmental Protection, Hartford.

Moran, K. and C. E. Button. 2011. A GIS model for identifying eastern spadefoot toad (*Scaphiopus holbrookii*) habitat in eastern Connecticut. Applied Geography 31:980–989.

Nickerson, K., Ryan, K. 2020. Quinebaug Solar Project, Eastern Spadefoot Toad Protection [Letter to CT DEEP NDDB.]. Submitted 17 January 2020.

Ryan, K. 2019. Quinebaug Solar 2019 Spadefoot Surveys. [Memorandum to Katelin Nickerson of Tetra Tech.] Submitted 7 October 2019.

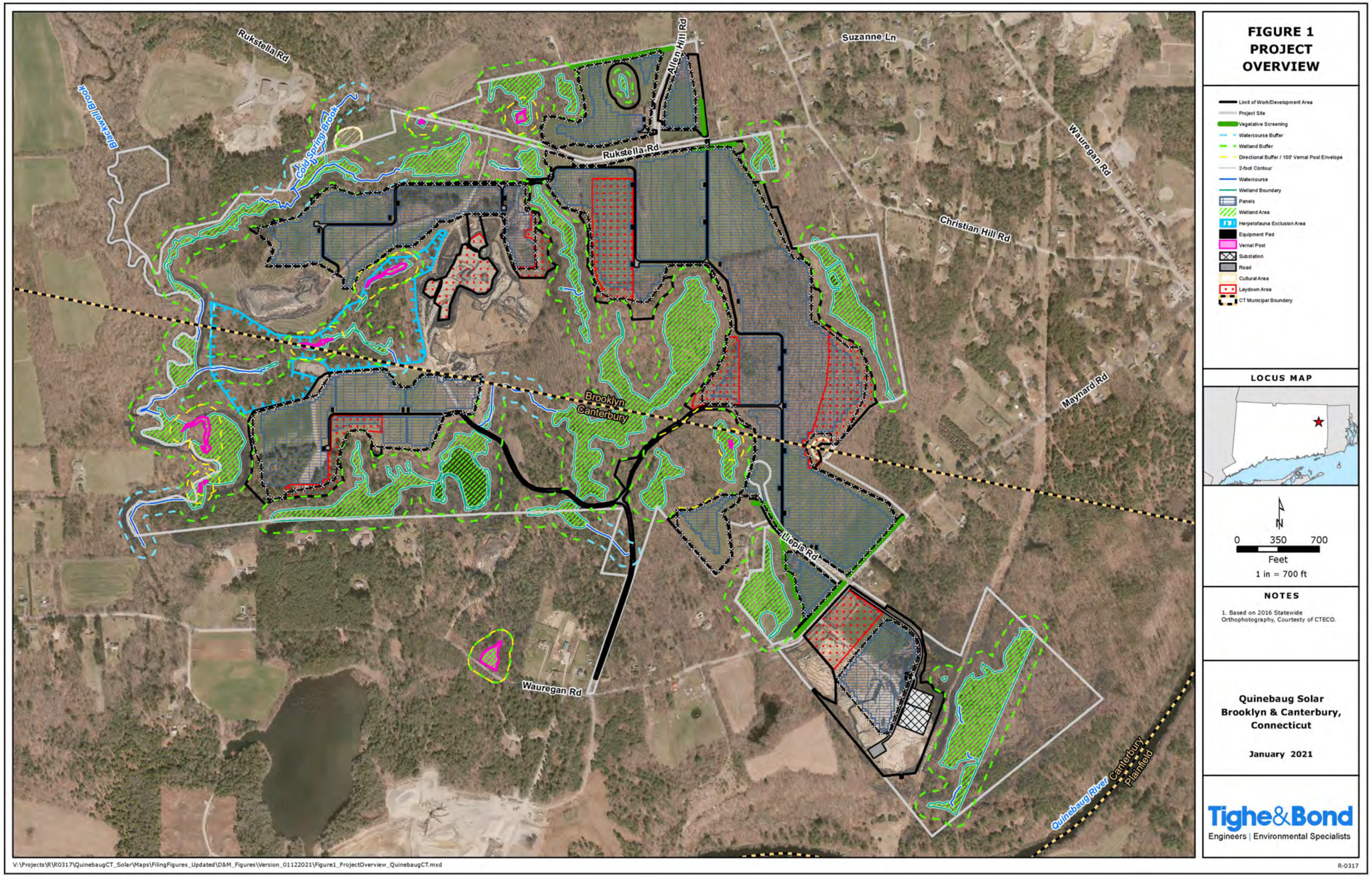


Figure 1: Conceptual layout and maximum Project extent, Quinebaug Solar Project Brooklyn and Canterbury, Connecticut

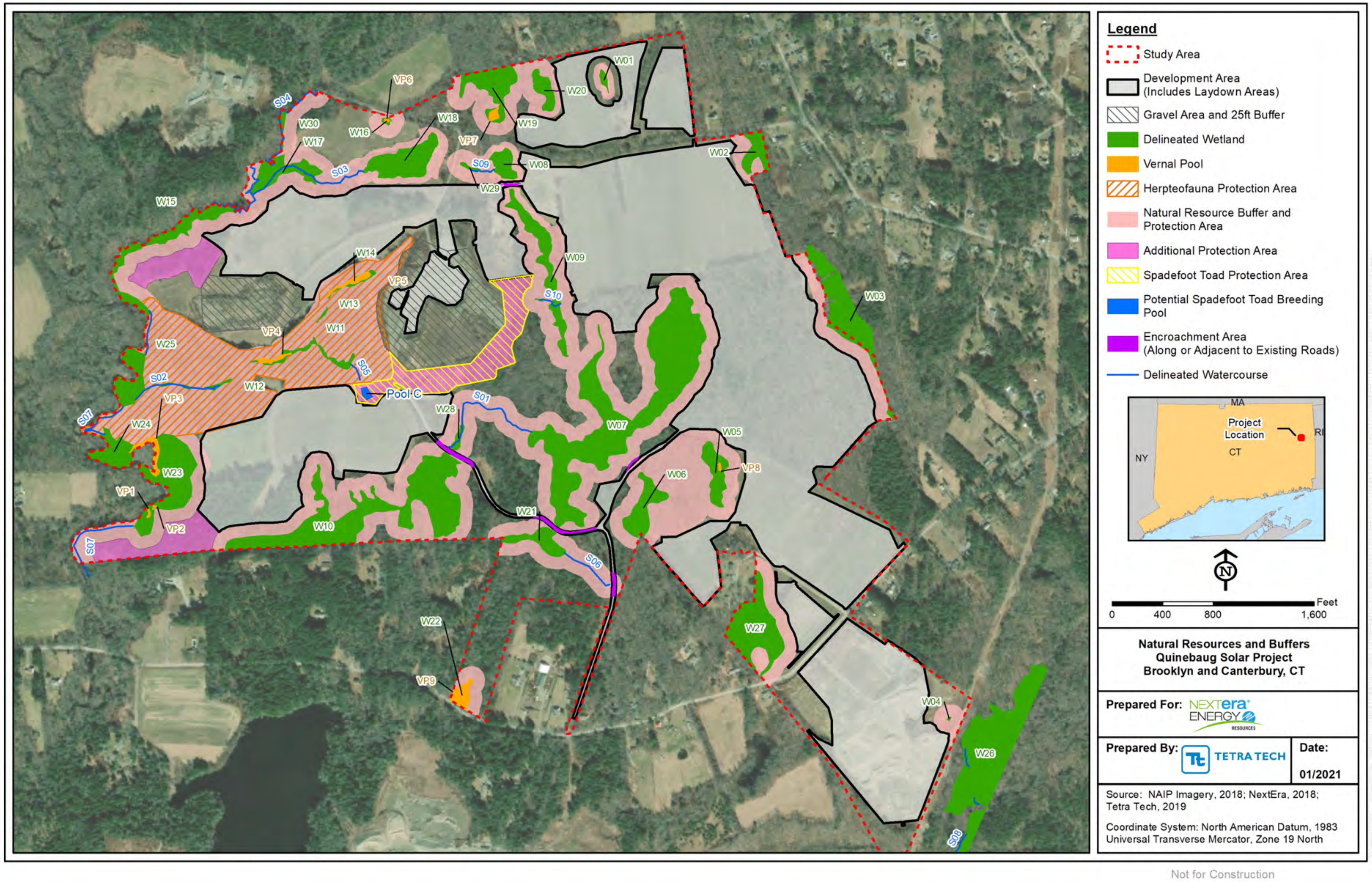


Figure 2: Spadefoot toad protection areas, Quinebaug Solar Project Brooklyn and Canterbury, Connecticut

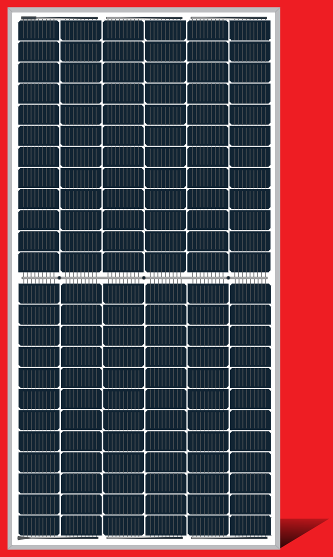
ATTACHMENT E –MODULE SPECIFICATIONS

LR4-72HBD-2
425~455M

Hi-MO 4

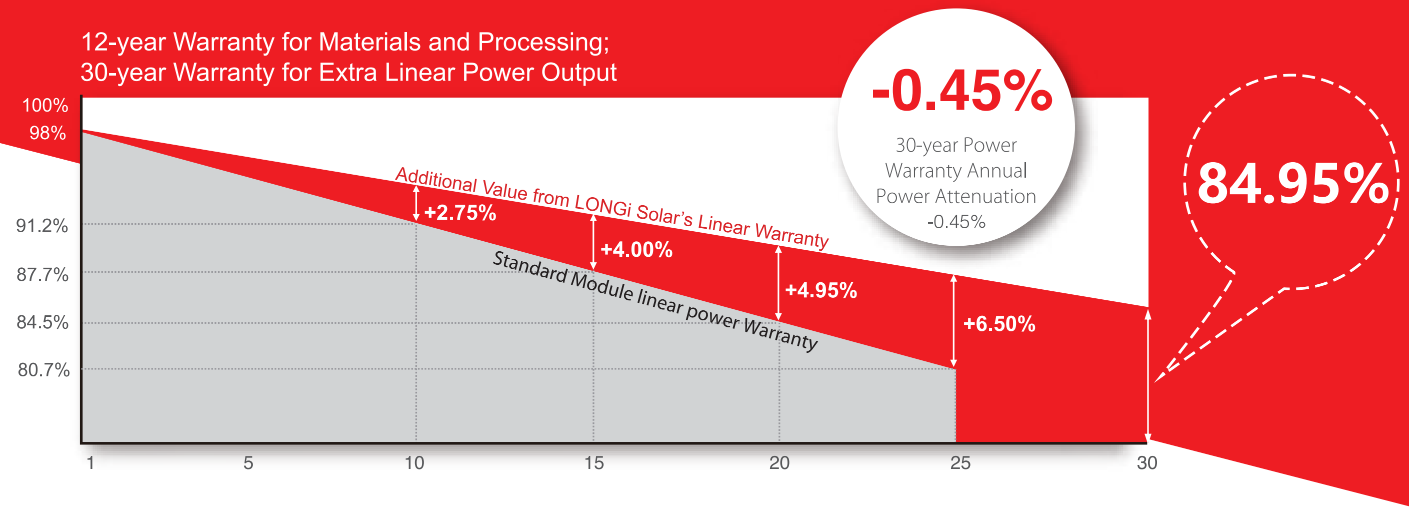
NEW

High Efficiency
Low LID Bifacial PERC with Half-cut Technology



*Both 6BB & 9BB are available

12-year Warranty for Materials and Processing;
30-year Warranty for Extra Linear Power Output



Complete System and Product Certifications

IEC 61215, IEC 61730, UL 61730

ISO 9001:2008: ISO Quality Management System

ISO 14001: 2004: ISO Environment Management System

TS62941: Guideline for module design qualification and type approval

OHSAS 18001: 2007 Occupational Health and Safety

* Specifications subject to technical changes and tests. LONGi Solar reserves the right of interpretation.

Front side performance equivalent to conventional low LID mono PERC:
- High module conversion efficiency (up to 20.9%)
- Better energy yield with excellent low irradiance performance and temperature coefficient
- First year power degradation <2%

Bifacial technology enables additional energy harvesting from rear side (up to 25%)

Glass/glass lamination ensures 30 year product lifetime, with annual power degradation < 0.45%, 1500V compatible to reduce BOS cost

Solid PID resistance ensured by solar cell process optimization and careful module BOM selection

Reduced resistive loss with lower operating current

Higher energy yield with lower operating temperature

Reduced hot spot risk with optimized electrical design and lower operating current

LONGi

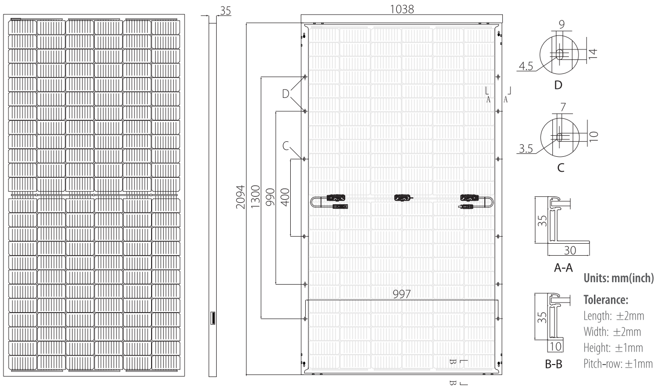
Room 801, Tower 3, Lujiazui Financial Plaza, No.826 Century Avenue, Pudong Shanghai, 200120, China
Tel: +86-21-80162606 E-mail: module@longi-silicon.com Facebook: www.facebook.com/LONGi Solar

Note: Due to continuous technical innovation, R&D and improvement, technical data above mentioned may be of modification accordingly. LONGi have the sole right to make such modification at anytime without further notice; Demanding party shall request for the latest datasheet for such as contract need, and make it a consisting and binding part of lawful documentation duly signed by both parties.

V11-For Nextera Only

LR4-72HBD-2 **425~455M**

Design (mm)



Mechanical Parameters

Cell Orientation: 144 （6×24）

Junction Box: IP68, three diodes

Output Cable: 4mm^2, 300mm in length,
length can be customized

Glass: Dual glass
2.0mm coated tempered glass

Frame: Anodized aluminum alloy frame

Weight: 27.5kg

Dimension: 2094×1038×35mm

Packaging: 30pcs per pallet
150pcs per 20'GP
660pcs per 40'HC

Operating Parameters

Operational Temperature: -40℃ ~ +85℃

Power Output Tolerance: 0 ~ +5 W

Voc and Isc Tolerance: ±3%

Maximum System Voltage: DC1500V (IEC/UL)

Maximum Series Fuse Rating: 25A

Nominal Operating Cell Temperature: 45±2℃

Safety Class: Class II

Fire Rating: UL type 3

Bifaciality: Glazing 70±5%

Electrical Characteristics

Test uncertainty for Pmax: ±3%

Model Number	LR4-72HBD-425M		LR4-72HBD-430M		LR4-72HBD-435M		LR4-72HBD-440M		LR4-72HBD-445M		LR4-72HBD-450M		LR4-72HBD-455M	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	425	317.4	430	321.1	435	324.9	440	328.6	445	332.3	450	336.1	455	339.8
Open Circuit Voltage (Voc/V)	48.7	45.6	48.9	45.8	49.1	45.9	49.2	46.0	49.4	46.2	49.6	46.4	49.8	46.6
Short Circuit Current (Isc/A)	11.22	9.06	11.30	9.13	11.36	9.18	11.45	9.25	11.52	9.30	11.58	9.36	11.65	9.41
Voltage at Maximum Power (Vmp/V)	40.4	37.7	40.6	37.9	40.8	38.0	41.0	38.2	41.2	38.4	41.4	38.6	41.6	38.8
Current at Maximum Power (Imp/A)	10.52	8.42	10.60	8.49	10.66	8.54	10.73	8.60	10.80	8.65	10.87	8.70	10.93	8.76
Module Efficiency(%)	19.6		19.8		20.0		20.2		20.5		20.7		20.9	

STC (Standard Testing Conditions): Irradiance 1000W/m^2, Cell Temperature 25℃, Spectra at AM1.5

NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m^2, Ambient Temperature 20℃, Spectra at AM1.5, Wind at 1m/S

Electrical characteristics with different rear side power gain (reference to 445W front)

Pmax /W	Voc/V	Isc /A	Vmp/V	Imp /A	Pmax gain
467	49.4	12.09	41.2	11.34	5%
490	49.4	12.67	41.2	11.88	10%
512	49.5	13.24	41.3	12.42	15%
534	49.5	13.82	41.3	12.96	20%
556	49.5	14.40	41.3	13.50	25%

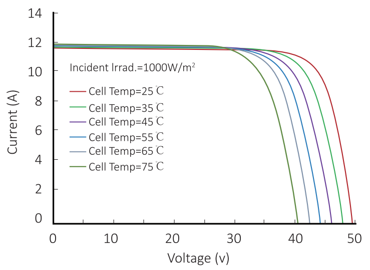
Temperature Ratings (STC)

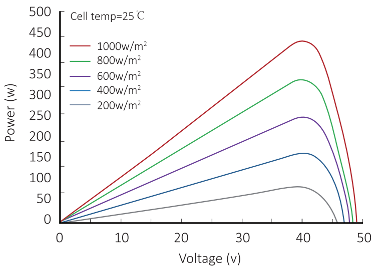
Temperature Coefficient of Isc	+0.050%/℃
Temperature Coefficient of Voc	-0.284%/℃
Temperature Coefficient of Pmax	-0.350%/℃

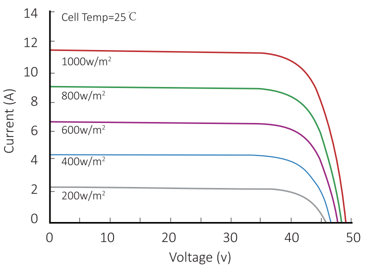
Mechanical Loading

Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

I-V Curve


Current-Voltage Curve (LR4-72HBD-440M)


Power-Voltage Curve (LR4-72HBD-440M)


Current-Voltage Curve (LR4-72HBD-440M)

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