



Solar Procurement Services

Town of Plymouth, Massachusetts
September 13th 2024



Onsite Generation Consulting

STEP 1



Utility Bill Review

Discovering project feasibility requires a thorough review of utility data to guide all future action

STEP 2



Building Audit

Each facility is unique, so we take the time to uncover every important detail before a proposal is created for the client

STEP 3



Proposal Delivery

Whether it's one proposal or many, we walk our clients through the options that best suit their energy management needs

STEP 4



Project Implementation

The road from proposal to finished product can have many twists and turns; we'll be your guide along the way

STEP 5



Measurement & Verification

Peace of mind comes from knowing your project is performing as intended, once commissioned we provide reports on production and savings

Process Overview

- TitanGen and the Town of Plymouth issued a solar-focused RFP on June 15th 2024 through the Town procurement office.
- Titan and Town Officials conducted a series of mandatory site visits on July 9th 2024 at the Cedarville Landfill, Library, Department of Public Works, South Middle School, South High School and North High School. Six companies were present.
- Proposals were received on August 23rd 2024.
- The projects are split into two categories – a land lease (landfill) and behind-the-meter power purchase agreements (PPA). The projects are further divided into Town and School projects. Each will be discussed in the following slides.
- Titan has conducted a thorough review of the proposals and feels confident recommending the proposal from Greenskies Clean Energy.
- Incentive funding timelines should be strongly considered when deciding to act on the proposal, as SMART 3.0 begins accepting applications on January 15th 2025 and applicants are addressed on a first-come, first-serve basis.

Plymouth Town Bid Results

Library						
Bidder	System Size (DC)	Annual kWh Production	Eversource \$/kWh	Solar \$/kWh	Annual Savings	Lifetime Savings
Greenskies	229	276,500	\$.1512	\$.0208	\$36,055.60	\$810,151.56
Kearsarge	240	288,000	\$.1512	\$.1326	\$5,348.16	\$229,404.02

DPW						
Bidder	System Size (DC)	Annual kWh Production	Eversource \$/kWh	Solar \$/kWh	Annual Savings	Lifetime Savings
Greenskies	107	130,519	\$.2252	\$.1147	\$14,422.35	\$361,123.35

Mary B Way						
Bidder	System Size (DC)	Annual kWh Production	Eversource \$/kWh	Solar \$/kWh	Annual Savings	Lifetime Savings
Greenskies	94	118,026	\$.2252	\$.0397	\$21,893.82	\$495,434.05
Kearsarge	260	312,000	\$.2252	\$.1326	\$28,891.20	\$756,703.41
Summit	211	253,000	\$.2252	\$.1600	\$16,495.60	\$481,357.01

- The library and department of public works are designed as solar-mounted parking canopies with 14' minimum height clearance.
- The new facility on Mary B. Way will have a rooftop mounted system.
- Summit and Kearsarge treated MBW and DPW as one system, which was contrary to the bid instruction.

Plymouth Public School Bid Results

PSHS						
Bidder	System Size (DC)	Annual kWh Production	Eversource \$/kWh	Solar \$/kWh	Annual Savings	Lifetime Savings
Greenskies	611	662,381	\$.1512	\$.0489	\$67,761.58	\$1,585,696.82
RWE	510	633,418	\$.1512	\$.2670	NA	NA
Kearsarge	750	900,000	\$.1512	\$.1361	\$13,635.00	\$658,165.78

PSMS						
Bidder	System Size (DC)	Annual kWh Production	Eversource \$/kWh	Solar \$/kWh	Annual Savings	Lifetime Savings
Greenskies	522	667,338	\$.1512	\$.0286	\$81,815.64	\$1,856,011.18
RWE	510	633,418	\$.1512	\$.2670	NA	NA
Kearsarge	750	900,000	\$.1512	\$.1354	\$14,238.00	\$669,669.76

PNHS						
Bidder	System Size (DC)	Annual kWh Production	Eversource \$/kWh	Solar \$/kWh	Annual Savings	Lifetime Savings
Greenskies	325	390,391	\$.1512	\$.0012	\$58,558.65	\$1,289,832.60
Kearsarge	339	406,800	\$.1512	\$.1361	\$7,554.28	\$324,033.18

- All projects are designed as solar-mounted parking canopies with 14' minimum height clearance.
- Incorporating all three projects may require rearranging of existing Net Metering Credit allocations. Titan can assist with this task.

Cedarville Landfill

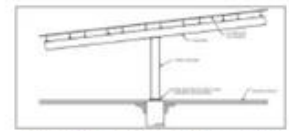
Landfill						
Bidder	System Size (DC)	Annual kWh Production	Lease Rate/kW	Lease Escalation	Annual Lease Payment	Lifetime Lease Payment
Greenskies (1)	1,839	2,501,040	\$79.93	0.00%	\$147,000.00	\$2,940,000.00
Greenskies (2)	2,527	3,436,720	\$102.10	0.00%	\$258,000.00	\$5,160,000.00
RWE	3,369	4,583,604	\$58.18	2.00%	\$196,000.00	\$4,762,284.48
Kearsarge	2,717	3,396,250	\$50.00	1.50%	\$135,850.00	\$3,141,350.18

- The project is designed to send electricity directly back to the grid. Eversource is the ultimate recipient of the power and the array itself will be placed in service as a “community solar” asset.
- Instead of receiving energy from the system, the Town of Plymouth will receive an annual lease payment from the chosen vendor.
- Greenskies is offering the highest lease rate per installed kilowatt (kW), which is ultimately the most important factor to consider. Every company will attempt to build the biggest system the site will allow. Greenskies has proposed a system based on no additional site leveling, and a version with site leveling.
- **RWE grossly overdesigned their system with no regard to site conditions and should be excluded from consideration.**
- There is zero price risk or production risk for Plymouth, as the lease terms will remain fixed over a 20-year period regardless of system production or energy price fluctuation.
- The system will not penetrate or disturb the ground on top of or beneath the cap.



SYSTEM INFORMATION	
SYSTEM SIZE (DC)	229.14 kW
SYSTEM SIZE (AC)	185 kW
PANEL SIZE	HANWHA Q CELLS 670W*
PANEL QUANTITY	342
PANEL TILT	7°
PANEL AZIMUTH	40°
ROW SPACING	0.5°
Min. CLEARANCE HEIGHT	13.5'
INVERTER SIZE	(1) SOLECTRIA 60K* (2) SOLECTRIA 50K* (1) SOLECTRIA 25K*
ESTIMATED ANNUAL PRODUCTION	276.5 MWh

*Preliminary equipment selection, equivalent alternative may be used in actual installation



RACKING CROSS-SECTION (NOT TO SCALE)

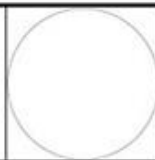


PROGRESS SET NOT FOR CONSTRUCTION

Greenskies
 127 Washington Avenue
 North Haven, CT 06473
 PH - 860.398.5408
 FAX - 860.398.5423

REVISIONS:		
NO.	DATE	DESCRIPTION

PROPOSED SITE PLAN
 PLYMOUTH LIBRARY
 PV SOLAR ARRAY
 132 SOUTH ST
 PLYMOUTH, MA 02360



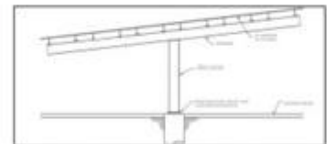
BATCH NO.:	PROPOSAL
DRAWN BY:	AH
SCALE:	AS NOTED
DATE:	11 JUL 2024

PV.01



SYSTEM INFORMATION	
SYSTEM SIZE (DC)	107.2 kW
SYSTEM SIZE (AC)	96 kW
PANEL SIZE	HANWHA Q CELLS 670W*
PANEL QUANTITY	160
PANEL TILT	7°
PANEL AZIMUTH	60°
ROW SPACING	0.5°
Min. CLEARANCE HEIGHT	14'
INVERTER SIZE	(1) SOLECTRIA SOLAR 60K* (1) SOLECTRIA SOLAR 36K*
ESTIMATED ANNUAL PRODUCTION	130.5 MWh

*Preliminary equipment selection, equivalent alternative may be used in actual installation



RACKING CROSS-SECTION (NOT TO SCALE)

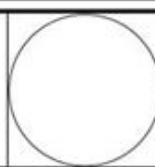


PROGRESS SET
NOT FOR CONSTRUCTION

Greenskies
 127 Washington Avenue
 North Haven, CT 06473
 PH - 860.398.5408
 FAX - 860.398.5423

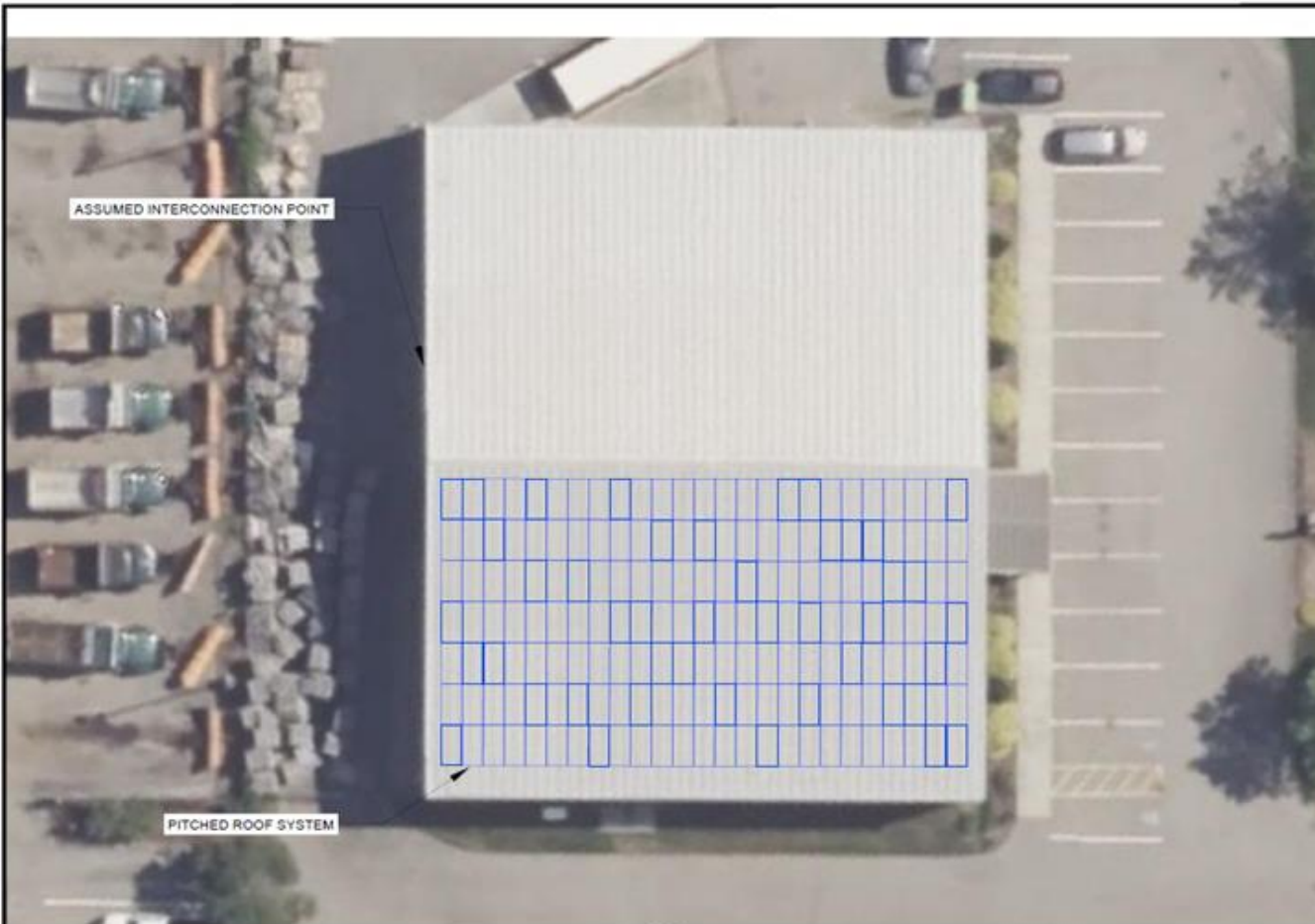
REVISIONS:		
NO.	DATE	DESCRIPTION

PROPOSED SITE PLAN
PV SOLAR ARRAY
 159 CAMELOT DRIVE
 PLYMOUTH, MA 02360



BATCH NO.:	PROPOSAL
DRAWN BY:	UA
SCALE:	AS NOTED
DATE:	10 JULY 2024

PV.01



SYSTEM INFORMATION	
SYSTEM SIZE (DC)	94.50 kW
SYSTEM SIZE (AC)	76 kW
PANEL SIZE	HELIONE 144HC M10 540W*
PANEL QUANTITY	175
PANEL TILT	9°
PANEL AZIMUTH	31°
ROW SPACING	0.5°
INVERTER SIZE	(1) GINLONG SOLIS 40K* (1) GINLONG SOLIS 36K*
ESTIMATED ANNUAL PRODUCTION	118.0 MWh

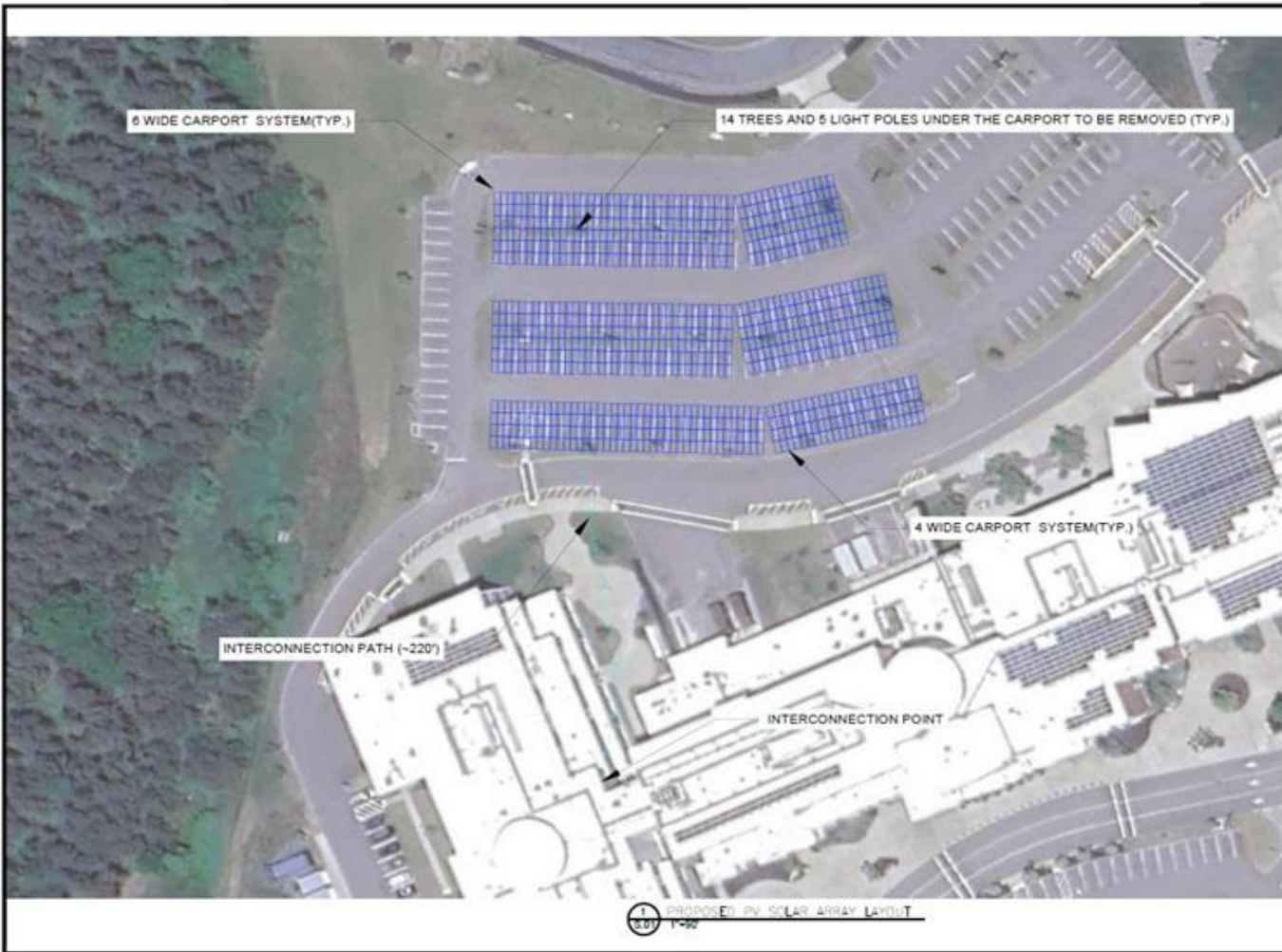
*Preliminary equipment selection, equivalent alternative may be used in actual installation



PROPOSED PV SOLAR ARRAY LAYOUT
REV 1-20

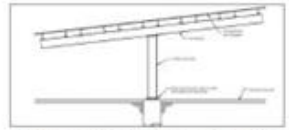
PROGRESS SET
NOT FOR CONSTRUCTION

Greenskies 127 Washington Avenue North Haven, CT 06473 PH - 860.398.5408 FAX - 860.398.5423	REVISIONS:		PROPOSED SITE PLAN PV SOLAR ARRAY 22 MARY B LANE PLYMOUTH, MA 02360		BATCH NO.:	PROPOSAL	PV.01	
	NO.	DATE			DESCRIPTION	DRAWN BY:		AH
	SCALE:	AS NOTED						
	DATE:	11 JUL 2024						



SYSTEM INFORMATION	
SYSTEM SIZE (DC)	611.04 kW
SYSTEM SIZE (AC)	500 kW
PANEL SIZE	HANWHA Q CELL 670W*
PANEL QUANTITY	912
PANEL TILT	7°
PANEL AZIMUTH	20°/ 35°
ROW SPACING	0.5°
Min. CLEARANCE HEIGHT	13.5'
INVERTER SIZE	(5) SOLECTRIA 60K* (3) SOLECTRIA 50K* (2) SOLECTRIA 25K*
ESTIMATED ANNUAL PRODUCTION	784.5 MWh

*Preliminary equipment selection, equivalent alternative may be used in actual installation



RACKING CROSS-SECTION (NOT TO SCALE)



PROGRESS SET
NOT FOR CONSTRUCTION

1 PROPOSED PV SOLAR ARRAY LAYOUT
1-20

Greenskies
 127 Washington Avenue
 North Haven, CT 06473
 PH - 860.398.5408
 FAX - 860.398.5423

REVISIONS:		
NO.	DATE	DESCRIPTION

PROPOSED SITE PLAN

PV SOLAR ARRAY
 490 LONG POND ROAD
 PLYMOUTH, MA 02360

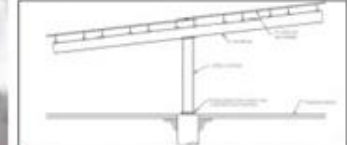
BATCH NO.:	PROPOSAL
DRAWN BY:	AH
SCALE:	AS NOTED
DATE:	23 JUL 2024

PV.01



SYSTEM INFORMATION	
SYSTEM SIZE (DC)	522.6 kW
SYSTEM SIZE (AC)	425 kW
PANEL SIZE	HANWHA Q CELLS 670W*
PANEL QUANTITY	780
PANEL TILT	7°
PANEL AZIMUTH	28°/30°/41°
ROW SPACING	0.5'
Min. CLEARANCE HEIGHT	13.5'
INVERTER SIZE	(5) SOLECTRIA SOLAR 60K* (5) SOLECTRIA SOLAR 25K*
ESTIMATED ANNUAL PRODUCTION	667.3 MWh

*Preliminary equipment selection, equivalent alternative may be used in actual installation



RACKING CROSS-SECTION (NOT TO SCALE)



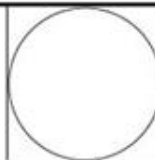
PROGRESS SET
NOT FOR CONSTRUCTION

PROPOSED PV SOLAR ARRAY LAYOUT
1-50'

Greenskies
127 Washington Avenue
North Haven, CT 06473
PH - 860.398.5408
FAX - 860.398.5423

REVISIONS:		
NO.	DATE	DESCRIPTION

PROPOSED SITE PLAN
PV SOLAR ARRAY
488 LONG POND ROAD
PLYMOUTH, MA 02360



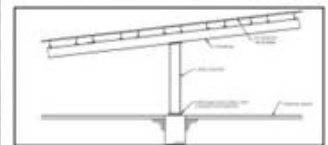
BATCH NO.:	PROPOSAL
DRAWN BY:	NB
SCALE:	AS NOTED
DATE:	11 JUN 2024

PV.01



SYSTEM INFORMATION	
SYSTEM SIZE (DC)	325.82 kW
SYSTEM SIZE (AC)	245 kW
PANEL SIZE	HANWHA Q CELLS 670W*
PANEL QUANTITY	486
PANEL TILT	5°
PANEL AZIMUTH	73°
ROW SPACING	0.5°
Min. CLEARANCE HEIGHT	13.5'
INVERTER SIZE	(2) SOLECTRIA SOLAR 80k* (2) SOLECTRIA SOLAR 50k* (1) SOLECTRIA SOLAR 25k*
ESTIMATED ANNUAL PRODUCTION	390.4 MWh

*Preliminary equipment selection, equivalent alternative may be used in actual installation



RACKING CROSS-SECTION (NOT TO SCALE)

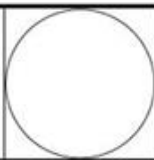


PROGRESS SET
NOT FOR CONSTRUCTION

Greenskies
127 Washington Avenue
North Haven, CT 06473
PH - 860.398.5408
FAX - 860.398.5423

REVISIONS:		
NO.	DATE	DESCRIPTION

PROPOSED SITE PLAN
PV SOLAR ARRAY
41 OBERY STREET
PLYMOUTH, MA 02360



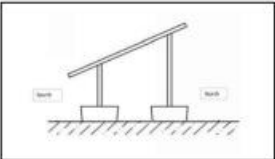
BATCH NO.:	PROPOSAL
DRAWN BY:	NB
SCALE:	AS NOTED
DATE:	11 JUL 2024

PV.01



SYSTEM INFORMATION	
SYSTEM SIZE (DC)	1839.24 kW
SYSTEM SIZE (AC)	1500 kW
PANEL SIZE	HELIENE 144HC M10 540W*
PANEL QUANTITY	3,406
PANEL TILT	20°
PANEL AZIMUTH	0°
ROW SPACING	14'
INVERTER SIZE	(12) SOLECTRIA XGI 125W*
ESTIMATED ANNUAL PRODUCTION	2549 MWh

*Preliminary equipment selection, equivalent alternative may be used in actual installation



RACKING CROSS-SECTION (NOT TO SCALE)



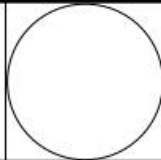
PROGRESS SET
NOT FOR CONSTRUCTION

1 PROPOSED PV SOLAR ARRAY LAYOUT
3.01 1"=150'

Greenskies
127 Washington Avenue
North Haven, CT 06457
PH - 860.398.5408
FAX - 860.398.5423

REVISIONS:		
NO.	DATE	DESCRIPTION

PROPOSED SITE PLAN
PV SOLAR ARRAY
53 HEDGES POND ROAD
PLYMOUTH, MA 02360



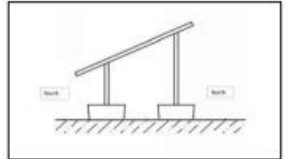
BATCH NO.:	PROPOSAL
DRAWN BY:	AH
SCALE:	AS NOTED
DATE:	04 SEP 2024

PV.01



SYSTEM INFORMATION	
SYSTEM SIZE (DC)	2527.2 kW
SYSTEM SIZE (AC)	2125 kW
PANEL SIZE	HELIENE 144HC M10 540W*
PANEL QUANTITY	4,680
PANEL TILT	20°
PANEL AZIMUTH	0°
ROW SPACING	14'
INVERTER SIZE	(17) SOLECTRIA XGI 125W*
ESTIMATED ANNUAL PRODUCTION	3524 MWh

*Preliminary equipment selection, equivalent alternative may be used in actual installation



RACKING CROSS-SECTION (NOT TO SCALE)



PROGRESS SET
NOT FOR CONSTRUCTION

PROPOSED PV SOLAR ARRAY LAYOUT
1" = 150'

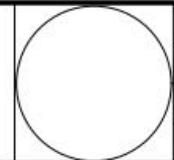
Greenskies

127 Washington Avenue
North Haven, CT 06457
PH - 860.398.5408
FAX - 860.398.5423

REVISIONS:		
NO.	DATE	DESCRIPTION

PROPOSED SITE PLAN

PV SOLAR ARRAY
53 HEDGES POND ROAD
PLYMOUTH, MA 02360



BATCH NO.:	PROPOSAL
DRAWN BY:	AH
SCALE:	AS NOTED
DATE:	09 SEP 2024

PV.01

Key Conclusions

- There is still quite a bit of engineering work to be done until the landfill system size and lease rate can be finalized. That said, we feel the results presented in this analysis represent a reliable depiction of the potential future for this site, as Titan has controlled for every knowable variable at this time.
- Two major factors will dictate the outcome of the landfill project: environmental engineering to prepare the site for solar and the cost to connect the system to the local grid.
- Interconnection costs will be known when the chosen vendor completes the interconnection application process with Eversource, at which time Eversource will provide the exact cost of connection to the local grid system. For bid leveling purposes, vendors are holding approximately \$500,000 for this line item.
- The extent of the environmental engineering work required for the landfill will be dependent upon the extent of which the Town will work with the vendor to provide additional fill to better utilize the acreage of the site. The system can become larger and more lucrative for the Town if the site is leveled.
- Concerning the incentive funding, the SMART application window is set to open on January 15th 2025. All projects submitted in the first ten days will be ordered by the Interconnection Agreement execution date until the annual capacity is reached. Projects are then awarded on a first-come, first-serve basis. If/when the program capacity is exhausted, uncommitted projects will be waitlisted and given priority in the next year's allocation.
- Securing an interconnection agreement with Eversource can take up to 235 business days. Thankfully, SMART capacity in the eastern part of Eversource hasn't traditionally been filled immediately, so there is a reasonable chance the projects can be eligible for 2025 funding. It is also possible that the canopy projects could go through an expedited process which would be require approximately 65 business days.
- The rooftop and parking canopy projects do not require the same degree of extensive environmental work or interconnection cost review.

Short-Term Timeline

1

- Titan to review results with town stakeholders
- No later than 10-1-24

2

- Town to execute contract documents with vendor
- No later than 1-1-25

3

- Vendor to submit for Eversource interconnection
- No later than 1-15-25

4

- Prepare applications SMART
- Q1 2025

5

- Submit applications into SMART
- End of Q3 2025