Town of Secaucus

Energy Savings Plan

October 18, 2021

Schneider Electric

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1.0 Executive Summary

Overview of the Energy Savings Improvement Program

The Energy Savings Improvement Program, or ESIP, was created in 2009 by the NJ legislature to reduce energy & operational costs, reinvest in infrastructure, and support the individual goals of public entities across the state. The ESIP program is a design-build financing mechanism that is regulated by the NJ Board of Public Utilities (BPU). The Town of Secaucus will implement a comprehensive ESIP that addresses infrastructure needs at 14 facilities throughout the Town.

Project Goals

The Town's energy conservation measures (ECMs) were developed with significant input from administration, finance, facilities, and environmental departments, along with Council members. The Secaucus core team and Schneider Electric collaborated to meet the following project goals:

1. Reduce energy & operational expenses
2. Expand Secaucus's position as a sustainability leader
3. Fund outdated infrastructure such as heating, ventilation, and air conditioning (HVAC) systems
4. Improve indoor air quality and comfort
5. Create local green jobs

Commitment to Sustainability

Town of Secaucus has long been a state-wide environmental leader. This program will allow the Town of Secaucus to reduce energy usage significantly while increase the use of on-site renewable energy.

The ECMs in the Energy Savings Plan range from core savings opportunities like LED lighting and envelope improvements to solar PV at the Recreation Center and the Ice Rink.

1. Reduce energy & operational costs	2. Minimize comfort & maintenance issues	3. Reduce the Town's carbon footprint	4. Fund high priority capital projects
$3.7 M in cost savings over 20 years	Replace outdated HVAC systems Reduced maintenance from new LED lighting	Reduce the Town's carbon footprint by 31% through energy efficiency and on-site renewable energy	Fund $3.4 million in infrastructure upgrades

Overall, this project will address outdated HVAC systems, improve sustainability and create $1.1 M in positive cash flow over 20 years.

This chart provides an overview of the ECMs included in the Energy Savings Plan, shown in green. Section 3.2 of this Report also discusses Optional ECMs that were considered but not currently included in the Plan.

		Solar PV	LED Lighting	HVAC Unit Replacement	Boiler Replacement	Fuel Use Economizer	Water Conservation	Pipe Insulation	Building Envelope & Air Sealing	Pool Improvements
1	Town Hall									
2	Rec Center									
3	Ice Rink & Tennis Courts									
4	Town Pool									
5	Old Rec Center									
6	DPW									
7	Teen Tot Center									
8	EPOS Museum									
9	Firehouse, Paterson Plank									
10	Firehouse, County Ave									
11	Firehouse, 7th St									
12	Town Hall Annex									
13	Golden Ave Pump Station									
14	Animal Shelter									

2.0 Financial Analysis

2.1 Scope Summary

The intent of this project is to maximize savings, improve comfort, and increase sustainability of the Town's operations. We believe that the following energy conservation measures are the best solution to maximizing savings and meeting the Town needs.

	Proposed Preliminary Energy Savings Plan	Estimated Installed Hard Costs ($)	Estimated Annual Savings ($)	Estimated Simple Payback (years)
Energy Conservation Measures				
1	Direct Install: LED Lighting, HVAC, and Water Conservation	$ 417,113	$ 60,607	7
2	Building Envelope, Insulation, and Air Sealing	$ 58,761	$ 4,614	13
3	Natatorium Improvements (Rec Center)	$ 10,062	$ 1,605	6
4	Solar PV Installation (Rec Center & Ice Rink)	$ 2,135,972	$ 67,353	32
5	Solar PPA Buyout (Town Hall)	$ 160,000	$ 18,261	9
	Project Summary:	**$ 2,781,908**	**$ 152,439**	**18**
	Turn-key Through ESCO	$ 2,204,795		
	PPA Buyout (Town Hall)	$ 160,000		
	Direct Install (total cost)	$ 635,608		
	Direct Install (cost to town)	$ 417,113		

2.2 Financial Summary

The table below represents the turn-key cost of the ESIP based on the scope of work listed on the prior page and Form V from SE's RFP Response. This ESP program is a firm fixed-price contract. Schneider Electric will serve as the primary contractor, responsible for the execution of all scopes of work under the ESP program except for the Direct Install scope of work for which the Town will contract directly, and the solar PPA buyout, which is primarily a financial transaction.

Fee Category	Fees (1) Dollar ($) Value	Percentage of Hard Costs
Estimated Value of Hard Costs (2):	$ 2,204,795	
Project Service Fees		
Investment Grade Energy Audit	$ 55,120	2.50%
Design Engineering Fees	$ 103,625	4.70%
Construction Management & Project Administration	$ 123,469	5.60%
System Commissioning	$ 33,072	1.50%
Equipment Initial Training Fees	$ 55,120	2.50%
ESCO Overhead	$ 99,216	4.50%
ESCO Profit	$ 121,264	5.50%
Project Service Fees Sub Total	$ 370,406	16.80%
TOTAL FINANCED PROJECT COSTS:	$ 2,795,680	26.80%

NOTES:
(1) Fees should include all mark-ups, overhead, and profit. Figures stated as a range will NOT be accepted.
(2) The total value of Hard Costs is defined in accordance with standard AIA definitions that include:
Labor Costs, Subcontractor Costs, Cost of Materials and Equipment, Temporary Facilities and Related Items, and Miscellaneous Costs such as Permits, Bonds Taxes, Insurance, Mark-ups, Overhead and Profit, etc.

2.3 Cash Flow Analysis

ESCO Name: Schneider Electric

Note: Respondents must use the following assumptions in all financial calculations:
(a) The cost of all types of energy should be assumed to inflate at 2.4% natural gas, 2.2% electric per year; and

1. Term of Agreement: 20 years
2. Construction Period (2) (months):
3. Cash Flow Analysis Format:

ESIP Financing	
ESCO Cost (Form V):	$ 2,795,680
Financing Costs:	$ 50,000
Direct Install (Customer Share):	$ 417,113
PPA Buyout (Town Hall):	$ 160,000
Total Cost:	**$ 3,422,793**
Funded by CARES (HVAC):	$ 236,482
ESIP Financing:	$ 1,786,311
Funded by Town - GO Bonds:	$ 1,400,000

Interest Rate: **2.00%**

Year	Annual Electric Savings	Annual Natural Gas Savings	ESIP Solar Savings	Energy Rebates / Incentives	Total Annual Savings	Annual ESIP Costs	Annual Service Costs (3)	Solar O&M Costs	Town Costs	Net Cash-Flow to Client	Cumulative Cash Flow
Install	$ 38,070	$ 12,049		$ -	$ 50,119						
1	$ 50,761	$ 16,065	$ 67,353	$ 2,043	$ 142,036	$ (152,987)	$ (25,000)	$ (12,168)	$ (190,155)	$ 2,000	$ 2,000
2	$ 51,877	$ 16,450	$ 68,491	$ 1,802	$ 144,435	$ (105,267)	$ (25,000)	$ (12,168)	$ (142,435)	$ 2,000	$ 4,000
3	$ 53,019	$ 16,845	$ 69,647	$ 1,502	$ 146,828	$ (132,660)		$ (12,168)	$ (144,828)	$ 2,000	$ 6,000
4	$ 54,185	$ 17,249	$ 70,824	$ 1,201	$ 149,274	$ (135,106)		$ (12,168)	$ (147,274)	$ 2,000	$ 8,000
5	$ 55,377	$ 17,663	$ 72,020		$ 150,875	$ (136,707)		$ (12,168)	$ (148,875)	$ 2,000	$ 10,000
6	$ 56,595	$ 18,087	$ 73,236		$ 147,919	$ (133,751)		$ (12,168)	$ (145,919)	$ 2,000	$ 12,000
7	$ 57,841	$ 18,521	$ 74,473		$ 150,835	$ (136,667)		$ (12,168)	$ (148,835)	$ 2,000	$ 14,000
8	$ 59,113	$ 18,966	$ 75,731		$ 153,810	$ (139,642)		$ (12,168)	$ (151,810)	$ 2,000	$ 16,000
9	$ 60,414	$ 19,421	$ 77,010		$ 156,845	$ (142,676)		$ (12,168)	$ (154,845)	$ 2,000	$ 18,000
10	$ 61,743	$ 19,887	$ 78,311		$ 159,941	$ (145,772)		$ (12,168)	$ (157,941)	$ 2,000	$ 20,000
11	$ 63,101	$ 20,364	$ 79,634		$ 163,099	$ (148,931)		$ (12,168)	$ (161,099)	$ 2,000	$ 22,000
12	$ 64,489	$ 20,853	$ 80,979		$ 166,321	$ (152,153)		$ (12,168)	$ (164,321)	$ 2,000	$ 24,000
13	$ 65,908	$ 21,354	$ 82,346		$ 169,608	$ (155,440)		$ (12,168)	$ (167,608)	$ 2,000	$ 26,000
14	$ 67,358	$ 21,866	$ 83,737		$ 172,961	$ (158,793)		$ (12,168)	$ (170,961)	$ 2,000	$ 28,000
15	$ 68,840	$ 22,391	$ 85,152		$ 176,382	$ (114,868)		$ (12,168)	$ (127,036)	$ 49,346	$ 77,346
Totals	**$ 928,691**	**$ 298,032**	**$ 1,138,944**	**$ 6,548**	**$ 2,401,290**	**$ (2,091,417)**	**$ (50,000)**	**$ (182,527)**	**$ (2,323,944)**	**$ 77,346**	

NOTES:
(1) Includes: Hard costs and project service fees defined in ESCO's PROPOSED "FORM V"
(2) No payments are made by the Town of Secaucus during the construction period.
(3) This figure should equal the value indicated on the ESCO's PROPOSED "FORM V". DO NOT include in the Financed Project Cost

2.4 Annual Service Costs

Implementing some of the ECMs will have additional service cost that is currently not incurred by the Town. These costs are reflective in the 2.3 Cash Flow Analysis.

Year	Solar Maintenance	PASS[1]	Total
1	$12,168	$25,000	$37,168

[1]Schneider Electric's Performance Assurance Support Services (PASS) are optional and are budgeted for the first 2 years of the project cash flow. More information can be found in Section 5 of this Report. Solar maintenance costs are also at the town's discretion, and are budgeted for the full ESIP term within the cash flow.

2.5 Incentives, Rebates, and Curtailment Services

A variety of incentive and rebate programs were evaluated during the development of the Project. Based upon the scope of this project, the following rebates are currently included:

	Direct Install[1]	PJM Energy Efficiency Credit	Total
Installation	$ 218,495		$ -
Year 1	$ -	$ 2,043	$ 2,043
Year 2	$ -	$ 1,802	$ 1,802
Year 3	$ -	$ 1,502	$ 1,502
Year 4	$ -	$ 1,201	$ 1,201
Total	$ 218,495	$ 6,548	$ 6,548

[1]Direct Install incentives are paid directly to the Direct Install contractor.

All rebates and incentives are subject to program terms, conditions, approvals, and availability of funds.

NJ Clean Energy Program – Direct Install

The Direct Install program is applicable to small to mid-sized commercial and industrial facilities with an average peak electric demand that does not exceed an average of 200 kW in the preceding 12 months. The Direct Install program is funded up to 80% by the NJ Clean Energy program, and can address lighting, HVAC, refrigeration, motors, variable frequency drives, and more. For more information, please visit:

https://www.njcleanenergy.com/commercial-industrial/programs/direct-install

Scope of work documents have been completed by the Direct Install contractor and can be found in the Appendix.

NJ Clean Energy Program – Smart Start

The Smart Start Program provides prescriptive rebates for specific equipment changes, such as lighting upgrades or installation of variable frequency drives (VFDs). To learn more about the Smart Start Program, please visit:

http://www.njcleanenergy.com/ssb

The New Jersey Clean Energy Program requires that customer choose either the P4P or the Smart Start program. Based upon our analysis, all buildings that do not qualify for P4P will utilize the Smart Start program.

NJ Clean Energy Program – Combined Heat and Power

One of the goals of the State of New Jersey is to enhance energy efficiency through on-site power generation with recovery and productive use of waste heat, and to reduce existing and new demands to the electric power grid. The Board of Public Utilities seeks to accomplish this goal by providing generous financial incentives for Combined Heat & Power (CHP) installations. For more information, please visit:

https://www.njcleanenergy.com/commercial-industrial/programs/combined-heat-power/combined-heat-power

PJM Energy Efficiency Program (PJM EE)

The Energy Efficiency program is designed to provide financial benefit to the consumer for permanent reductions in electrical load. Examples of energy efficiency projects include upgrading to more efficient lighting, or replacing HVAC systems with more efficient ones, or other ECMs that reduce electrical load.

The Town of Secaucus will see permanent reductions in peak kW, primarily from lighting upgrades. After the installation of this Project, Schneider Electric will work to ensure that these incentives are secured on behalf of the Town.

PJM Capacity Market Program (Demand Response)

The capacity market program stems from the need for utilities to balance electric supply with electric demand on the grid. Because there is a finite amount of generating capacity, demand response was created to allow consumers to shed demand when needed by PJM. Consumers must work with Curtailment Service Providers (CSPs) to shed electrical load when needed by PJM, in order to generate revenue. The load-shaving can be done through a variety of measures including energy efficiency, on-site generation, or manual shutdown.

Based upon the current conditions of the Town's building automation systems, it has been deemed that demand response may not be an immediate opportunity. However, following the ESIP project and the installation of more sophisticated building automation systems, Schneider Electric will evaluate demand response revenue opportunities under future programs.

3.0 Energy Conservation Measures

3.1 ECM Descriptions

Please see the following descriptions of ECMs currently included in the project.

1. Direct Install: LED Lighting, HVAC, and Water Conservation

Overview

Most of the buildings included in the ESP qualified for New Jersey Direct Install. Schneider Electric reviewed the proposals for each of the qualified buildings. As part of the ESIP, Schneider Electric re-calculated the electric rate impact as the New Jersey Direct Install program does not use actual utility rates.

Scope

Each of the buildings included in the scope is receiving LED lighting. The below is summary of the mechanical scope included in the project. Please refer to the PSEG Energy Savers and NJ Direct Install scope in the Appendix for more information.

- Old Rec Center – replace (2) HVAC units, low flow aerators on lavatory faucets, and install LED lamps
- 7th Street Firehouse – replace (1) gas fired boiler and install low flow aerators on lavatory faucets
- DPW Buildings – replace (1) gas fired boiler, install LED lights, and install lavatory low flow aerators
- Secaucus Firehouse, (1567 Paterson Plank Road) – replace (1) HVAC unit, replace (1) gas fired boiler, install LED lights, and low flow aerators.
- Secaucus Firehouse (227 County Ave) – install LED lights and pipe insulation
- Secaucus Ice Rink – install LED lights and low flow aerators
- Secaucus Town Museum – replace (1) gas fired boiler and install LED lights
- Secaucus Pumping Station – replace (1) HVAC unit, install LED lights
- Secaucus Teen and Tot Center – replace (1) boiler, replace (1) HVAC unit, install LED lights, and low flow aerators
- Secaucus Town Hall Annex (20 Centre Ave) – replace (2) gas fired boilers, (1) HVAC unit, low flow aerators and install LED lights
- Secaucus Town Hall (1203 Paterson Road) – install low flow aerators and LED lights
- Secaucus Town Pool – Install low flow aerators and LED lights.
- Secaucus Golden Ave Pump Station – Replace (1) split system HVAC unit and install LED lights.

2. Solar Photovoltaic (PV) System Installation

Overview

This measure will involve the procurement and installation of solar PV panels at the Recreational Center, and the Ice Rink and the buyout of the PPA at the Town Hall. The PV system will allow the Town to produce renewable energy on-site. The solar power generated onsite will be net-metered and will offset a significant amount of energy that would otherwise be purchased from the utility. These savings are realized for as long as the PV systems are producing power, which can often last 25 years or longer.

In addition to these financial benefits, there are many positive societal and environmental impacts as well. Not only will the Town's carbon footprint be drastically reduced so that each building that receives solar and the impact on the environment is smaller, but the Town will be a model, showcasing to other communities and the private sector how sustainability and energy efficiency objectives can be achieved in a fiscally responsible way.

Scope

Interconnection applications have already been submitted to PSE&G for these facilities. This is an important step in the process and helps ensure that the utility provider accepts and approves of the plan to put PV systems at each location, and that existing electrical and utility-grid infrastructure are both able to handle the onsite power generation, without the need for expensive upgrades.

The following table summarizes the solar systems, which may be a combination of roof-mounted, ballasted rooftop, and carport structures. The system sizes (kW) were designed using Helioscope, and the PV production values (kWh) were calculated using NREL's PVWatts tool.

Building	PV System Size (kW)	Post ESIP Baseline (kWh)	Expected PV Production (kWh)	PV% of Post ESIP Baseline	1st Year PV Savings
Rec Center - Roof & Carport	513	775,969	612,943	79%	$51,176
Ice Rink - Roof	145.8	669,732	181,885	27%	$16,177
Total	**658.8**	**1,445,701**	**794,828**	**55%**	**$67,353**

For solar panel layouts, please see the Appendix.

3. Building Envelope, Insulation, and Air Sealing Improvements

Overview

This ECM addresses the shell of the building and how well it is keeping conditioned air in and ambient air out. Our onsite testing and analysis of energy consumption indicate there is an opportunity to improve the indoor air quality, occupant comfort, and energy use by upgrading the existing air barrier systems. A tighter Building Envelope will provide the following advantages:

- Drafts will be reduced providing greater comfort for the building occupants. A tighter building envelope will lower the possibility of “hot” or “cold” spots brought on by unconditioned air infiltrating into conditioned spaces.
- Decreased Energy Consumption - Less conditioned air will be lost through the building envelope and the Heating and Cooling equipment will operate less to maintain the set point of the conditioned space. This will decrease the energy consumed and save on energy costs.
- Improved Air Quality – Decreasing infiltration of contaminated air promotes less humidity and greater air quality. This allows for the existing systems to run at peak performance and maintain the highest level of air quality for the occupants.
- Reduced Maintenance Costs – Reducing the “runtime” will increase the operating life of the heating and cooling equipment and increase the performance of new equipment.

Scope

The following is a breakout of the Building Envelope scope by facility:

Task	Animal Shelter	Rec Center	Old Rec Center	Teen Tot Center	Town Hall	Total Quantity
Door - Install Jamb Spacer (Units)					1	1
Door Weather Striping - Doubles (Units)	1	11	2	2	2	18
Door Weather Stripping - Singles (Units)	3	4	1	3	2	13
Overhang Air Sealing (LF)					60	60
Overhang Air Sealing (SF)					1,374	1,374
Overhead Door Weather Stripping (Units)			1			1
Penetration Air Sealing (Units)		1	6			7
Retrofit Attic Hatch (Units)	1					1
Rooftop Exhaust Fan Sealing (Units)				8		8
Wall Air Sealing (LF)		20				20
Wall Air Sealing (SF)		40				40

4. Natatorium Improvements

Overview

Install a pump to reclaim heat from the Seresco pool HVAC system

Scope

The current HVAC system for the Natatorium has the ability to reject condenser heat to the swimming pool versus the roof mounted condenser. In this installation, there is no pump from the swimming pool water loop to the HVAC unit on the roof, but there is piping. This scope installs a circulating pump in the existing piping and necessary power supply and controls to allow operation with the HVAC unit.

3.2 Optional ECMs

The following opportunities have been identified during the Investment Grade Audit but are not currently included in the Energy Savings Plan.

1. **Town Hall HVAC system replacement** – The current HVAC system in Town hall is aged and in need of replacement. This system would also address airflow and comfort issues throughout the building. This comprehensive system would include the air handling unit serving the majority of the building, new chiller and upgrades to the hot water distribution system. A new system could involve electrification & decarbonization.
2. **EPOS, Museum, Firehouse HVAC System Replacement** – The current system is a mix of hot water boiler, mini-split ac units, and air to air heat exchangers. This system would provide a cohesive system throughout the building providing heating, cooling and ventilation air to each space.
3. **Building Automation System** – This would be part of the HVAC system upgrades and provide facilities management staff with control and insight to the systems in the Town Hall, Recreational Center, Old Recreational center, and the EPOS, Museum, and Firehouse buildings.
4. **Town Hall Comprehensive Building Envelope Improvements** – This would replace the roof with up to date insulation levels and the windows. Both improvements would reduce the carbon emissions of the building and the window replacement would dramatically improve the occupant comfort levels.
5. **Remote Net Metering solar** – After solar is installed as part of the ESIP, additional solar could possibly be added to many of the sites under the municipal remote net metering program.
6. **Battery Storage / Microgrid** – The New Jersey Board of Public Utilities has not yet released a battery storage incentive. Each of the sites could be a good candidate based on price of electricity and the funding level of any future incentives.
7. **Generator Installation** – Several of the facilities included Town Hall could benefit from backup power supply. The existing generator at Town Hall is beyond its estimated useful life, but is not being replaced currently.
8. **Combined Heat & Power (CHP) –** The Rec Center and possibly Town Hall are candidates for a CHP system, which may be installed in the future as part of a more comprehensive project.
9. **Plug Load Control** – Plug load control devices could be added through Town facilities in the future.
10. **High Efficiency Transformer Replacements –** Several facilities including the Town Hall, Rec Center, and Golden Ave Pump Station have electrical transformers which could be replaced in the future with more efficient units.
11. **Water Fixture Upgrades –** Due to the Town not paying for water consumption, water conservation improvements were not included in this project.
12. **Vestibule Installation –** Several sites including the Town Hall may benefit from installation of a security vestibule which also functions as an air barrier to keep conditioned air within the building during hot and cold months.
13. **Sports Field Lighting –** Several sites including Kane Stadium, Shetik Field, the Little League Field, and the Tennis Courts could benefit from new LED sports field lighting. Due to longer paybacks, these projects are not currently included.

4.0 Energy Savings

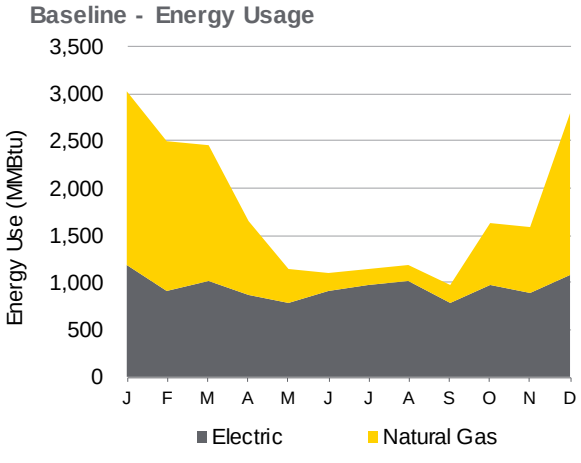
4.1 Baseline Energy Use

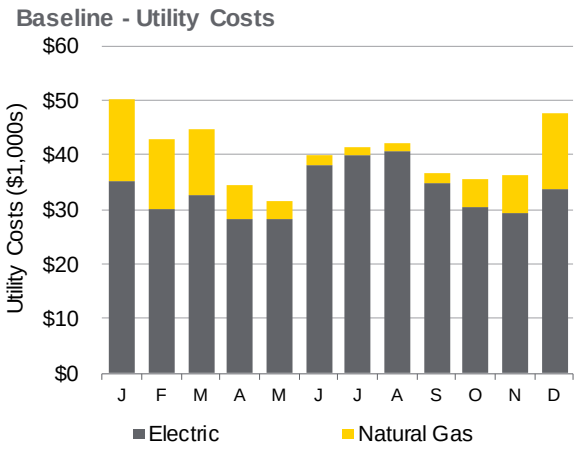
This baseline includes all facilities and was created by taking several years of utility data and utilizing the following:

- Prorating the usage into clean monthly bins
- Weather normalizing the baseline to represent a typical meteorological year

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Jan	346,224	824	$35,125	18,534	$15,093	3,035	$50,218
Feb	266,994	769	$29,915	15,818	$13,002	2,493	$42,918
Mar	300,522	817	$32,675	14,305	$11,897	2,456	$44,572
Apr	253,132	741	$28,175	7,898	$6,185	1,654	$34,360
May	227,016	622	$28,325	3,705	$3,138	1,145	$31,463
Jun	266,408	673	$38,106	1,969	$1,824	1,106	$39,929
Jul	288,337	756	$40,046	1,540	$1,531	1,138	$41,577
Aug	300,723	714	$40,750	1,549	$1,565	1,181	$42,315
Sept	228,609	725	$34,848	1,898	$1,832	970	$36,680
Oct	288,078	824	$30,451	6,509	$5,069	1,634	$35,520
Nov	259,105	755	$29,231	6,954	$6,916	1,580	$36,147
Dec	318,070	824	$33,644	16,991	$13,958	2,785	$47,602
Year	**3,343,219**	**9,044**	**$401,291**	**97,671**	**$82,010**	**21,177**	**$483,301**

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	42.0	3.0	$1.48	36.0	$0.30	78.0	$1.78





Site ID	Town Hall
Total sq ft	40,350

Town of Secaucus NJ - Town Hall - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	817,876	1,751	$102,371	22,028	$18,823	4,994	$121,194

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	69.2	4.1	$2.54	54.6	$0.47	123.8	$3.00

Site ID	Rec Center
Total sq ft	25,883

Town of Secaucus NJ - Rec Center - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	859,108	1,948	$93,459	16,110	$12,884	4,543	$106,343

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	113.3	7.2	$3.61	62.2	$0.50	175.5	$4.11

Site ID	Ice Rink and Courts
Total sq ft	25,200

Town of Secaucus NJ - Ice Rink and Courts - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	669,732	2,052	$48,595	5,274	$4,615	2,813	$53,210

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	90.7	10.3	$1.93	20.9	$0.18	111.6	$2.11

Site ID	Town Pool
Total sq ft	113,000

Town of Secaucus NJ - Town Pool - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	157,759	398	$30,440	0	$0	538	$30,440

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	4.8	0.6	$0.27	0.0	$0.00	4.8	$0.27

Site ID	Old Rec Center
Total sq ft	8,330

Town of Secaucus NJ - Old Rec Center - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	92,629	219	$13,590	5,274	$4,420	844	$18,010

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	38.0	3.1	$1.63	63.3	$0.53	101.3	$2.16

Site ID	DPW Facility
Total sq ft	16,307

Town of Secaucus NJ - DPW Facility - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	51,365	276	$6,318	15,501	$12,617	1,725	$18,935

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	10.8	1.9	$0.39	95.1	$0.77	105.8	$1.16

Site ID	Pump Station
Total sq ft	1,000

Town of Secaucus NJ - Pump Station - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	175,553	482	$23,480	0	$0	599	$23,480

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	599.2	119.5	$23.48	0.0	$0.00	599.2	$23.48

Site ID	Teen Tot Center
Total sq ft	9,940

Town of Secaucus NJ - Teen Tot Center - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	57,187	227	$14,737	7,324	$6,064	928	$20,801

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	19.6	3.3	$1.48	73.7	$0.61	93.3	$2.09

Site ID	EPOS Museum
Total sq ft	8,378

Town of Secaucus NJ - EPOS Museum - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	59,505	223	$11,306	7,145	$5,920	918	$17,226

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	24.2	2.9	$1.35	85.3	$0.71	109.5	$2.06

Site ID	Animal Shelter
Total sq ft	7,100

Town of Secaucus NJ - Animal Shelter - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	116,600	413	$11,835	0	$0	398	$11,835

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	56.1	7.6	$1.67	0.0	$0.00	56.1	$1.67

Site ID	County Ave Firestation
Total sq ft	4,138

Town of Secaucus NJ - County Ave Firestation - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	127,191	341	$14,460	3,684	$3,146	802	$17,606

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	104.9	8.9	$3.49	89.0	$0.76	193.9	$4.25

Site ID	7th Street Firestation
Total sq ft	3,102

Town of Secaucus NJ - 7th Street Firestation - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	11,801	59	$2,916	3,039	$2,629	344	$5,545

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	13.0	2.8	$0.94	98.0	$0.85	110.9	$1.79

Site ID	Paterson Firestation
Total sq ft	5,580

Town of Secaucus NJ - Paterson Firestation - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	30,925	118	$5,335	5,987	$4,992	704	$10,327

	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	18.9	4.0	$0.96	107.3	$0.89	126.2	$1.85

Site ID	Town Hall Annex
Total sq ft	3,280

Town of Secaucus NJ - Town Hall Annex - Baseline

	Electricity			Natural Gas		Total	
Month	Energy Use	Energy Demand	Cost	Energy Use	Cost	Energy Use	Cost
mmm	*kWh*	*kW*	*$*	*Therm*	*$*	*MMBtu*	*$*
Year	56,191	237	$8,821	1,815	$1,648	373	$10,470

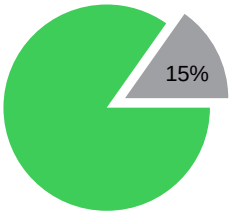
	Electricity			Natural Gas		Total	
Indices	kBtu/sf	W/sf	$/sf	kBtu/sf	$/sf	kBtu/sf	$/sf
	58.5	6.9	$2.69	55.3	$0.50	113.8	$3.19

4.2 Energy Savings

The following table highlights projected energy savings as a result of implementing the recommended ECMs.

Town of Secaucus NJ - Project Summary

Energy Cost Savings



Energy Indicies	Energy	Cost
	kBtu/sf	*$/sf*
Baseline	78.0	$1.78
Post Project	64.5	$1.51
% Savings	17.3%	15.2%

Project Summary			
Project Phase	Electricity Costs $	Fossil Fuels Costs $	Total Costs $
Baseline	$401,291	$82,010	$483,301
Post Project	$333,048	$76,681	$409,729
Savings, Units	$68,242	$5,329	$73,571
Percent Savings	17.0%	6.5%	15.2%

Notes:

1. Not all buildings are billed on demand. Demand is represented as a yearly total of months.

ECM Savings Summary by Site

ECM Detail		Total Energy Savings			Total Cost Savings			Detail Unit Savings			Detailed Cost Savings	
Site Name	ECM Name	Energy Savings MMBtu	EUI Savings kBtu/sf	Site % Savings %	Cost Savings $	ECI Savings $/sf	Site % Savings %	Electric kWh	Electric kW	Natural Gas Therm	Electric $	Natural Gas $
Town Hall	Building Weatherization	346	8.6	6.9%	$2,241	$0.06	1.8%	1,507	0	3,410	$99	$2,142
Rec Center	Building Weatherization	141	5.5	3.1%	$808	$0.03	0.8%	1,516	0	1,359	$79	$729
Rec Center	Natatorium Improvements	325	12.5	7.1%	$1,605	$0.06	1.5%	0	0	3,246	$0	$1,605
Rec Center	Solar Array - Carport	1,186	45.8	26.1%	$28,482	$1.10	26.8%	347,627	471	0	$28,482	$0
Rec Center	Solar Array - Rooftop	906	35.0	19.9%	$22,694	$0.88	21.3%	265,316	369	0	$22,694	$0
Ice Rink and Courts	Solar Array	621	24.6	22.1%	$16,177	$0.64	30.4%	181,885	248	0	$16,177	$0
Old Rec Center	Building Weatherization	54	6.5	6.4%	$455	$0.05	2.5%	449	0	523	$35	$419
Teen Tot Center	Building Weatherization	56	5.7	6.1%	$484	$0.05	2.3%	638	0	542	$50	$434
Animal Shelter	Building Weatherization	27	3.8	6.8%	$626	$0.09	5.3%	7,983	0		$626	
Total Project Savings		3,662	13.5	17.3%	$73,571	$0.27	15.2%	806,920	171	9081	$68,242	$5,329
Total % Project Savings		*17.3%*	-	-	*15.2%*	-	-	*24.1%*	*1.2%*	*9.3%*	*17.0%*	*6.5%*
Total Baseline		21,177	78.0		$483,301	$1.78		3,343,219	14,025	97,671	$401,291	$82,010
Post Project		17,515	64.5		$409,729	$1.51		2,536,299	13,854	88,590	$333,048	$76,681

4.3 Environmental Impact

The following graphic shows the environmental impact of the project.

Project Emissions Impact

Emissions summary

Town of Secaucus NJ - Emissions Summary

Environmental Benefits			
	Scope 1	Scope 2	Total
Baseline Energy (MMBtu/yr)	9,767	11,410	21,177
Baseline Emissions (Tons CO2e/yr)	577	2,243	2,821
Savings (Tons CO2e/yr)	**53**	**540**	**593**
% Savings	**9.2%**	**24.1%**	**21.0%**

21.0%	593	127	77	23,718
% eTon Savings	eTons GHG	Cars Removed	Equivalent Houses	Equivalent Trees

**Emissions factors are derived from EPA eGrids database and represent the National average.*

> Scope 1 Emissions include ***direct*** emissions from on-site fossil fuel combustion.

> Scope 2 Emissions result from ***indirect*** emissions from purchased generation of electric, chw or steam.

The following table identifies the values used to determine environmental benefits:

AVOIDED EMISSIONS (1)	(lbs) Saved per MWh	(lbs) Saved per Therm	Pounds Saved Total (Lbs)
NOX	1.10	0.0091	1005
SO2	0.97		736
CO2	1,373	11.6	1,2575,082

5.0 Performance Assurance Support Services (PASS)

The purpose of Performance Assurance Support Services (PASS) is to measure, verify, and provide the necessary support services to sustain savings over time. Per NJ ESIP law, the PASS Agreement must be a separate contract from the ESIP Construction Contract. This section includes a description of the proposed measurement & verification plan.

5.1 Description of Services

The following is a description of services and terms that are used within this section.

Remote System Monitoring and Reporting

Activities include monitoring live conditions, reviewing and analyzing trends, recording deficiencies, as well as tuning, adjusting, and optimizing parameters. This also includes reporting operational performance of specific systems and equipment necessary to sustain energy savings, comfort, and safety. This helps manage and ensure key variables for energy measures are maintained to allow for sustained savings, performance, and comfort.

Remote Energy Management, Training & Technical Support

This involves live remote telephone and internet support used to provide instruction, assisted troubleshooting, and system training. This on-call service provides technical support for all installed systems and measures and helps reduce system downtime.

On-site Visits

On-site visits include a review and reporting of changes to operations (past present and future), usage, status, and conditions of building systems and equipment relative to their impact on energy performance. ECM and systems training can be provided upon request. Benefits include:

- Expert advice to aid in energy planning based on operational and future commitments
- Identifying excess energy targets and recommendations for improvement
- An increase in overall energy awareness

Resource Advisor

Resource Advisor is Schneider Electric's enterprise-level application providing secure access to data reports and summaries to drive the Town's energy and sustainability programs. Resource Advisor combines quality assurance and data capture capabilities of utility information into one energy management solution.

Commission and Verify (C&V)

This process is used to qualify and validate the installation, function, operation and performance of ECMs. The protocol consists of a planned process with a deliberate combination of steps which systematically identify, test and challenge various key aspects used to verify the performance objectives of an installed ECM against an established design criterion. Benefits include an improved controls interface, reduced energy demand and consumption, and improve occupancy comfort.

"Option B" Measurement and Verification

The International Performance Measurement & Verification Protocol (IPMVP) was created to determine standards and best practices in the measurement & verification of energy efficiency investments. The IPMVP Option B, retrofit isolation involves localized measurements to isolate the impact of specific energy conservation measures. Specifically, for the Town of Secaucus's ESP, this will ensure performance of the solar system is proven without having to be concerned about any other energy consuming interaction behind the utility meter.

5.2 Measurement & Verification (M&V) Plan

The purpose of the Performance Assurance Support Services (PASS) program is to assist the Town in sustaining savings over the long term. Based upon the scope of this project, we recommend a measurement & verification / guarantee program based upon Option B methodology (as defined by IPMVP) for the solar PV production at the Recreation Center and the Ice Rink. Each year after the initial term, the services can be eliminated or negotiated between SE & the Town of Secaucus, to ensure the proper level of support and savings verification.

Services Included:	Year 1	Year 2	Year 3 +
• Commissioning & Verify ECMs • Measurement & Verification of Savings • Financial guarantee • Savings Reports • On-site Energy Auditing & Consulting • Resource Advisor • Remote Energy Management & Technical Support	$25,000	$25,000	TBD

5.3 Ongoing Maintenance

Under the New Jersey ESIP legislation, all maintenance contracts are required to be procured separately from the ESIP. Schneider Electric will properly commission all equipment, provide training, review manufacturer maintenance requirements, and provide an owner's manual to ensure proper maintenance of the equipment.

ECM Category	O&M Impact
Lighting	Reduced O&M as lamps last much longer and ballasts are removed.
Envelope	Routine, no different than current maintenance of building.
HVAC	No additional maintenance would be required outside of routine maintenance that is being done on existing equipment.
Solar	Maintenance costs are estimated at $15/kW of solar, which is a conservative & healthy budget to maintain these systems. Solar O&M provider will be competitively procured by the Town, with assistance from SE.

Additional information regarding service costs can be found in Section 2.4.

6.0 Implementation

6.1 Design & Compliance Issues

This project was developed using the proper Building Codes, Energy Codes, and Electrical Codes. Safety is of the utmost important to Schneider Electric, not only for our customers, but also for our employees and subcontractors. SE will comply with all the required safety codes and protocols to ensure a successful implementation.

6.2 Assessment of Risks

This assessment of risks is meant to provide the Town with an idea of the potential risks that lie within the ESIP project. By no means is this an effort to eliminate responsibility of the ESCO to provide an Energy Savings Plan that meets industry standards of engineering, energy analysis, and expertise. This is included to allow the Town to understand where potential failure points could be that would result in savings not being achieved or operational issues.

- If actual operation of the buildings deviates significantly from the parameters outlined in the Energy Savings Plan with respect to temperature set points and occupied times, energy savings associated with lighting and HVAC upgrades could be affected.
- Lighting systems will require maintenance as they age. Replacement parts need to be of similar energy efficiency to maintain savings.
- The new solar PV systems will require ongoing maintenance and monitoring to ensure expected savings and incentives are achieved and realized. As part of the Performance Assurance Support Services, Schneider Electric will be performing and aiding in these activities. An Operation and Maintenance contract with a qualified, reliable, and responsive 3rd party for all installed PV systems is very highly recommended. The cost for this solar O&M services has been included in the project cash flow, but it is ultimately the responsibility of the Town of Secaucus to authorize and pay for these services. Schneider Electric will assist the Town in competitively procuring a reputable and high-quality solar O&M service provider.
    - It is critical to maintain the solar system in a high-performing condition. Doing so will increase the solar production from the PV systems, and maximize its lifespan as well. The better the PV system performs, the more savings the Town will see. A well-maintained PV system can last 25-30 years or longer.
    - The cost of a quality solar O&M service contract is small when compared to the long-term benefits that will be realized by having an optimized and high-performing PV system.

7.0 Appendices

7.1 Savings Calculations & Documentation

Below is a high-level summary of how savings were calculated for each measure included in this report.

Energy Analysis Methodology

Many tools and approaches exist for effectively analyzing energy conservation measures. Some ECMs are best analyzed in an individual spreadsheet calculation while other more comprehensive ECMs require higher levels of computer modeling to capture the entirety of their impact on energy consumption and demand. In general, the complexity of analysis tools escalates from spreadsheet calculations to, to more sophisticated computer software-based building simulation tools such as eQuest. Aspects such as total savings potential, influence on other ECMs, influence from weather, and overall complexity are all considered when selecting the analysis approach or tool for an ECM.

Below is a table displaying the ECMs and the analysis tool used for calculating the savings. Following the table are descriptions for each of the analysis tools and approaches used for calculating savings.

ECM Name	Analysis Tool
Building Weatherization	Spreadsheet Calculations
Solar Array	Spreadsheet Calculations/Helioscope
Natatorium Improvements	Spreadsheet Calculations

Savings Methods – Spreadsheet Calculations Non-Solar ECMs

Schneider Electric utilizes a mixture of spreadsheet calculations and basic formula calculation tools. eCalc is a proprietary Microsoft Excel based spreadsheet calculation tool used for calculating energy consumption and savings for an ECM, rather than a comprehensive building analysis approach. Often an approach using eCalcs or other spreadsheet calculations is the most accurate and reasonable way of approaching ECMs in which their operation, situation, or contribution to the baseline is limited.

What separates eCalcs from other spreadsheet-based tools is its integration of bin weather data into many of its standard calculations. Equipment or infiltration often has fluctuating savings opportunity as outside air reaches new high and low average temperatures through different seasons. By capturing the quantity of hours inside specific temperature ranges, these ECMs can better replicate the demand on the system, run hours, and heating and cooling loads. Below is an example of an eCalc spreadsheet for calculating envelope improvement savings.

eCalcs: Energy Calculation Suite

Life Is On Schneider Electric

Secaucus - Rec Center

Infiltration

Building Data

Building Name	Rec Center
Weather City	NJ, Teterboro
Building Height, ft	15
Building Orientation, deg	0
Building L/W Ratio	3.0
Internal Draft Coefficient	0.7

Building Operating Conditions

Occupied Set Point Temp, oF	72.0
Cooling Setup Temp, oF	78.0
Percent of Building Cooled, %	100%
Cooling Seasonal Efficiency, %	290%
Heating Setback Temp, oF	62.0
Percent of Building Heated, %	100%
Heating Seasonal Efficiency, %	80%

Shelter Characteristics

Direction	Shelter Class	Terrain Category
See Reference Tables for Descriptions		
North	3	3
East	3	3
South	3	3
West	3	3

Building Crack Definitions

Penetration Name	Type Select	H ft	Qty #	Length ft	Gap inches	%Open %	Total Area sqft	Wall Only sqft
Crack 1	Door	-4.5	1	443	1/8	100%	4.6	4.6
Crack 2	Roof-Wall	7.5	1	2	1/8	100%	0.0	0.0
Crack 3	Wall	0.0	1	26	1/2	100%	1.1	1.1
Crack 4	Wall	0.0	1	20	1/12	100%	0.1	0.1
Crack 5	Wall	0.0				100%	0.0	0.0
Crack 6	Wall	0.0				100%	0.0	0.0
Crack 7	Wall	0.0				100%	0.0	0.0
Crack 8	Wall	0.0				100%	0.0	0.0
Crack 9	Wall	0.0				100%	0.0	0.0
Crack 10	Wall	0.0				100%	0.0	0.0
Crack 11	Wall	0.0				100%	0.0	0.0
Crack 12	Wall	0.0				100%	0.0	0.0
Crack 13	Wall	0.0				100%	0.0	0.0
	Effective H (Wall Only)	-3.5					5.9	5.9

Notes: H is the height difference between the crack and the neutral pressure level of the building.

Effective Building Coefficients

Shelter Coefficient	0.7
Wind Shear Exponent	0.14
Boundary Layer Thickness, ft	900
Wall Pressure Coefficient	0.10
Roof Pressure Coefficient	-0.30

Site Parameters

Average Wind Speed, mph	8.2
Site Corrected Wind Speed, mph	7.3
Model Wind Coefficient	0.17
Draft Factor	0.13
Volume Factor, ft/min (in-wg)^0.5	2,603

Energy Engineering Calculations

Temperature Bin Hours						Calculated Infiltration Rates				Energy Transfer		Energy Savings	
Mid Pt Temp	MCWB	Density	Enthalpy	4472 Occupied	Unocc	Occupied Rates Wall	Roof	Unoccupied Rates Wall	Roof	Occupied Load	Unocc Load	Cooling Savings	Heating Savings
oF	*oF*	*lb/ft3*	*Btu/lb*	*hrs/yr*	*hrs/yr*	*cfm*	*cfm*	*cfm*	*cfm*	*kBtu/yr*	*kBtu/yr*	*kBtu/yr*	*kBtu/yr*
5	1.9	0.085	1.5	3	4	972	0	870	0	-372	-353	0	907
9	5.9	0.085	2.6	12	17	932	0	825	0	-1,349	-1,328	0	3,346
12	9.4	0.084	3.7	28	28	892	0	779	0	-2,855	-1,932	0	5,984
16	13.9	0.083	5.1	46	52	848	0	729	0	-4,149	-3,062	0	9,013
20	17.2	0.083	6.2	39	51	804	0	678	0	-3,140	-2,583	0	7,154
24	21.2	0.082	7.6	55	72	757	0	620	0	-3,851	-3,010	0	8,576
27	24.1	0.081	8.6	101	159	710	0	562	0	-6,196	-5,494	0	14,612
31	27.0	0.081	9.8	105	160	659	0	497	0	-5,555	-4,411	0	12,457
35	30.6	0.080	11.1	228	264	604	0	420	0	-10,076	-5,398	0	19,342
39	33.9	0.079	12.5	319	322	543	0	327	0	-11,435	-4,386	0	19,777
42	36.8	0.079	13.8	238	222	477	0	198	0	-6,754	-1,558	0	10,390
46	40.3	0.078	15.3	340	310	397	0	175	0	-6,982	-1,505	0	10,609
50	44.0	0.077	17.1	266	298	294	0	319	0	-3,374	-1,846	0	6,525
54	48.2	0.077	19.3	305	394	107	0	420	0	-1,067	-1,538	0	3,256
57	51.4	0.076	21.0	379	376	240	0	495	0	-2,233	-237	0	3,087
61	55.3	0.075	23.4	353	357	364	0	566	0	-1,763	1,893	45	0
65	58.5	0.075	25.4	354	333	449	0	551	0	-732	0	0	915
69	61.5	0.074	27.4	343	308	521	0	549	0	802	0	276	0
72	63.5	0.073	28.8	345	233	576	0	547	0	2,104	0	726	0
76	64.9	0.073	29.9	226	82	623	0	545	0	2,132	0	735	0
80	66.2	0.072	30.8	268	62	665	0	572	0	3,424	139	1,229	0
84	68.5	0.072	32.7	163	22	711	0	625	0	3,122	162	1,132	0
87	70.2	0.071	34.1	73	6	750	0	669	0	1,789	71	641	0
91	71.2	0.071	34.9	37	0	783	0	706	0	1,039	0	358	0
95	75.6	0.070	38.9	2	0	834	0	762	0	87	0	30	0
				4,628	4,132							5,173	135,950

Savings Summary

Type	*Savings*	*Units*	*Utility Type*
Cooling	1,516	kWh	Electricity
Heating	1,359	Therm	Natural Gas - Therm

Savings Methodology by ECM

Below are the Energy Conservation Measures that are being implemented at the Town of Secaucus as part of this project.

1. Building Envelope & Insulation

Schneider Electric uses typical meteorological year (TMY) weather data, draft pressure, internal space temperatures (both occupied and unoccupied), and crack size to conduct savings calculations. Schneider Electric follows ASTM E1186-03 Standard Practices for air leakage in building envelope. ASHRAE Fundamentals 16.23-48 was used to calculate the flow rate and crack method for all envelope calculations.

2. Solar PV System

Solar savings are based off PVWatts and helioscope estimates. PVWatts/Helioscope are both industry standards for estimating production from solar arrays. The energy rates were then applied to the expected production to simulate financial impact.

3. Direct Install ECMs

All direct install ECMs savings was calculated based off the Direct Install savings reports provided by the Direct Install contractor. These savings were then reviewed and run through tariff simulations to ensure accurate $ value savings representation of said ECMs. The Direct Install scope includes both lighting and HVAC measures depending on the site. HVAC measures may include direct HVAC system replacement, thermostat install, insulation upgrade etc.

Site	Measure Type	DI Projected kWh Savings	DI Projected Therms Savings	Baseline Blended $/kwh	Baseline Blended $/Therm	DI kWh Energy Savings ($)	DI Natural Gas Savings ($)	Notes
Town Hall	Lighting	5,896	-	$0.125	$0.850	$737	$0	
	HVAC	-	-	$0.125	$0.850	$0	$0	No HVAC scope
Rec Center	Lighting	75,993	-	$0.121	$0.800	$9,195	$0	
	HVAC	5,631	1,506	$0.121	$0.800	$681	$1,205	Includes RTU, AFUE,programmable thermostats
Teen Tot	Lighting	3,109	-	$0.258	$0.830	$802	$0	
	HVAC	3,097	2,985	$0.258	$0.830	$799	$2,478	Includes 5 Ton RTU, 20 Ton RTU, gas fired boiler replacement, AFUE, and programmable thermostats
FH Patterson	Lighting	8,465	-	$0.173	$0.830	$1,464	$0	
	HVAC	752	2,145	$0.173	$0.830	$130	$1,780	Includes RTU 5 Tons, gas fired boilers, AFUE,programmable thermostats, and pipe wrap insulation
Ice Rink	Lighting	90,878	-	$0.073	$0.870	$6,634	$0	
	HVAC	-	(82)	$0.073	$0.870	$0	($71)	
Town Pool	Lighting	78,612	-	$0.193	$0.000	$15,172	$0	
	HVAC	2,054	-	$0.193	$0.000	$396	$0	Includes pipe wrap insulation
Old Rec Center	Lighting	2,861	-	$0.147	$0.840	$421	$0	
	HVAC	1,596	949	$0.147	$0.840	$235	$797	Includes 2x 7.5 Ton split systems, programmable thermostats and pipe wrap insulation
DPW Facility	Lighting	15,563	-	$0.123	$0.810	$1,914	$0	
	HVAC	1,345	2,100	$0.123	$0.810	$165	$1,701	Includes gas fired boiler replacement, programmable thermostats and pipe wrap insulation
Pump Station	Lighting	7,366	-	$0.134	$0.000	$987	$0	
	HVAC	519	-	$0.134	$0.000	$70	$0	Includes 3 Ton split HVAC and programmable thermostats
EPOS (Museum)	Lighting	34,798	-	$0.190	$0.830	$6,612	$0	
	HVAC	-	2,012	$0.190	$0.830	$0	$1,670	Includes gas fired boiler replacement and programmable thermostats
FH County	Lighting	14,797	-	$0.114	$0.850	$1,687	$0	
	HVAC	-	(32)	$0.114	$0.850	$0	($27)	
FH 7th St	Lighting	-	-	$0.247	$0.870	$0	$0	
	HVAC	-	495	$0.247	$0.870	$0	$431	Includes gas fired boiler replacement, programmable thermostats
Town Hall Annex	Lighting	10,483	-	$0.157	$0.910	$1,646	$0	
	HVAC	787	849	$0.157	$0.910	$124	$773	Includes RTU 3 Tons, gas fired boilers, AFUE,programmable thermostats, and pipe wrap insulation
Totals		364,602	12,927	$0.158	$0.715	$49,871	$10,736	

eCalcs: Energy Calculation Suite

projectName - Name

Swimming Pool Loads

Indoor Pool Parameters

Building Name: Name

Swimming Pool Inputs

Definition	Description	Parameter, Units	Value	Default Reference
Property Type	School, Hotel or Other	-	Other	-
Pool Area	Area of pool, length x width	Ap, ft2	6,931	-
Wind Speed	Sill air assumed for indoor	V, mph	0	0
Pool Water Temp	ASHRAE 2007 depends on type	Tw, oF	78	80
Pool Air DB Temp	ASHRAE 2007 recommends 75-85	Ta, oF	80	75
Pool Air RH	ASHRAE 2007 recommends 50-60	RH, %	50%	50%
Hours Pool is Open	Assumed open all year round	to, hrs/yr	5,008	8,760
Heater Efficiency	Pool heater fuel efficiency	Eff, %	82%	75%
Convection Coefficient	Based on room air speed	hc, Btu/h ft2 oF	0.7	0.7
Head loss	Straight friction loss and bends	Hloss, ft-lbf/lbm	36.0	36
Pump Efficiency	Mechanical & motor efficiency	Eff, %	79.7	70%
Pool Water Density	Density of water	r, lbm/ft3	64.0	64.02
Average Pool Depth	Estimate based on experience	LD, ft	6.0	6.0
Time Pool Purge	To size pump	t, hrs/day	8.0	8.0
Pump Run Time	Assumed 6 hrs/day	tP, hrs/yr	2,190	2,190
Activity Factor	Corrects evaporation loss	AF	0.800	1.036

Energy Engineering Calculations

Calculated Pool Loads

	Boiler Output Loads		Boiler Input Loads	
Energy Use	MBH	kBtu/yr	MBH	Therm/yr
Evaporation	170.7	855,014	208.2	10,427
Convection	-9.7	-48,595	-11.8	-593
Radiation	0	0	0.0	0
Total	161.0	806,419	196	9,834

Energy Usage Summary

Ref	Usage	Units	Utility Type
Pool Heater	9,834	Therm	Natural Gas - Therm
Pool Pumping	124	kWh	Electricity

Version 1.02		Chilled Water	Diesel	Electricity	Fuel Oil	Gasoline	tural Gas - TheNatural Gas - CCatural Gas - MC		Propane	Solid Fuel	Steam	WW	Water	Wood
ECM	Reference	Ton-hrs	gal	kWh	gal	gal	Therm	CCF	MCF	gal	kBtu	klb	kgal	kgal	kBtu
-	-	12.0	130.0	3.413	139.6	114.0	100.0	102.0	1,020.0	91.5	1.0	1,040	1.0	1.0	1.0

Swimming Pool Energy References

Indoor Pool Energy Consumption

Property Type	Recreational yds) Ap = 2,700 ft2	Short Course (25 yds x 20 yds) Ap = 4,500 ft2	Olympic (50 m x 25 m) ft2
Type	kBtu/yr	kBtu/yr	kBtu/yr
School	1,160,067	1,933,445	5,781,430
Hotel	925,222	1,542,037	4,611,033
Other	775,956	1,293,260	3,867,136

Check

Calculated
kBtu/yr
983,861
Calculated value for comparison to <<< EnergySTAR reference types

Outdoor Pool Energy Consumption

Property Type	Recreational (20 yds x 15 Ap = 2,700 ft2	Short Course (25 yds x 20 yds) Ap = 4,500 ft2	Olympic (50 m x 25 m) Ap = 13,456
Type	Source kBtu/yr	Source kBtu/yr	Source kBtu/yr
All	118,536	197,560	590,763

Typical Indoor Pool Design Conditions

Property Type	Air Temperature	Water Temperature	Relative Humidity
Type	oF	oF	%
Recreational	75 to 85	75 to 85	50 to 60
Therapeutic	80 to 85	85 to 95	50 to 60
Competition	78 to 85	76 to 82	50 to 60
Diving	80 to 85	80 to 90	50 to 60
Elderly Swimmers	84 to 90	85 to 90	50 to 60
Hotel	82 to 85	82 to 86	50 to 60
Whirlpool/Spa	80 to 85	97 to 104	50 to 60

Source: ASHRAE 2007 HVAC Applications

Activity Factors (AF)

Property Type	Activity Factor
Type	Factor
Unoccupied	0.500
Residential	0.500
Condominium	0.650
Therapy	0.650
Hotel	0.800
School	1.036
Whirlpools	1.000
Wavepool	1.500

Source: ASHRAE 2007 HVAC Applications

All calculations are based on EnergySTAR "Swimming Pools and the ENERGY STAR Score in the United States and Canada"
https://www.energystar.gov/sites/default/files/tools/Swimming_Pool_August_2018_508.pdf

Calculation Details

$$q^{\cdot}_{evap} = (68.3 + 32V)(P_{pw} - P_{dp}) \times AF$$

24.6	qevap = heat loss by evaporation, Btu/ft2-h
0.96731	Ppw = saturation pressure at pool water temp, in Hg
0.51649	Pdp = saturation pressure at air dew point temp, in Hg
0.0	V = room air speed, mph

Source: ASHRAE 2007 HVAC Applications. Page 4.6.

Existing Boiler Energy Use

eCalcs: Energy Calculation Suite

projectName - Name

Swimming Pool Loads

Indoor Pool Parameters

Building Name: Name

Swimming Pool Inputs

Definition	Description	Parameter, Units	Value	Default Reference
Property Type	School, Hotel or Other	-	Other	-
Pool Area	Area of pool, length x width	Ap, ft2	6,931	-
Wind Speed	Sill air assumed for indoor	V, mph	0	0
Pool Water Temp	ASHRAE 2007 depends on type	Tw, oF	78	80
Pool Air DB Temp	ASHRAE 2007 recommends 75-85	Ta, oF	80	75
Pool Air RH	ASHRAE 2007 recommends 50-60	RH, %	50%	50%
Hours Pool is Open	Assumed open all year round	to, hrs/yr	5,008	8,760
Heater Efficiency	Pool heater fuel efficiency	Eff, %	93%	75%
Convection Coefficient	Based on room air speed	hc, Btu/h ft2 oF	0.7	0.7
Head loss	Straight friction loss and bends	Hloss, ft-lbf/lbm	36.0	36
Pump Efficiency	Mechanical & motor efficiency	Eff, %	79.7	70%
Pool Water Density	Density of water	r, lbm/ft3	64.0	64.02
Average Pool Depth	Estimate based on experience	LD, ft	6.0	6.0
Time Pool Purge	To size pump	t, hrs/day	8.0	8.0
Pump Run Time	Assumed 6 hrs/day	tP, hrs/yr	2,190	2,190
Activity Factor	Corrects evaporation loss	AF	0.800	1.036

Energy Engineering Calculations

Calculated Pool Loads

	Boiler Output Loads		Boiler Input Loads	
Energy Use	MBH	kBtu/yr	MBH	Therm/yr
Evaporation	170.7	855,014	183.6	9,194
Convection	-9.7	-48,595	-10.4	-523
Radiation	0	0	0.0	0
Total	161.0	806,419	173	8,671

Energy Usage Summary

Ref	Usage	Units	Utility Type	
Pool Heater	8,671	Therm	Natural Gas - Therm	1,163 therms saved
Pool Pumping	124	kWh	Electricity	(Existing - New Boiler)

Version 1.02		Chilled Water	Diesel	Electricity	Fuel Oil	Gasoline	tural Gas - TheNatural Gas - CCatural Gas - MC		Propane	Solid Fuel	Steam	WW	Water	Wood
ECM	Reference	Ton-hrs	gal	kWh	gal	gal	Therm	CCF	MCF	gal	kBtu	klb	kgal	kgal	kBtu
-	-	12.0	130.0	3.413	139.6	114.0	100.0	102.0	1,020.0	91.5	1.0	1,040	1.0	1.0	1.0

Swimming Pool Energy References

Indoor Pool Energy Consumption

Property Type	Recreational yds) Ap = 2,700 ft2	Short Course (25 yds x 20 yds) Ap = 4,500 ft2	Olympic (50 m x 25 m) ft2
Type	kBtu/yr	kBtu/yr	kBtu/yr
School	1,160,067	1,933,445	5,781,430
Hotel	925,222	1,542,037	4,611,033
Other	775,956	1,293,260	3,867,136

Check

Calculated
kBtu/yr
867,541
Calculated value for comparison to <<< EnergySTAR reference types

Outdoor Pool Energy Consumption

Property Type	Recreational (20 yds x 15 Ap = 2,700 ft2	Short Course (25 yds x 20 yds) Ap = 4,500 ft2	Olympic (50 m x 25 m) Ap = 13,456
Type	Source kBtu/yr	Source kBtu/yr	Source kBtu/yr
All	118,536	197,560	590,763

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Whirlpool/Spa	80 to 85	97 to 104	50 to 60

Source: ASHRAE 2007 HVAC Applications

Activity Factors (AF)

Property Type	Activity Factor
Type	Factor
Unoccupied	0.500
Residential	0.500
Condominium	0.650
Therapy	0.650
Hotel	0.800
School	1.036
Whirlpools	1.000
Wavepool	1.500

Source: ASHRAE 2007 HVAC Applications

All calculations are based on EnergySTAR "Swimming Pools and the ENERGY STAR Score in the United States and Canada"
https://www.energystar.gov/sites/default/files/tools/Swimming_Pool_August_2018_508.pdf

Calculation Details

$$q^{\circ}_{evap} = (68.3 + 32V)(P_{pw} - P_{dp}) \times AF$$

24.6	qevap = heat loss by evaporation, Btu/ft2-h
0.96731	Ppw = saturation pressure at pool water temp, in Hg
0.51649	Pdp = saturation pressure at air dew point temp, in Hg
0.0	V = room air speed, mph

Source: ASHRAE 2007 HVAC Applications. Page 4.6.

Replacement Boiler Energy Use and Expected Savings

C:\Users\SESA497600\Desktop\Schools\Secaucus\Rec Center - eQuest\Midterm\Rec Center Jason Edit - 1											
Simulated: 2020-Aug-11 17:45:19						2,083	Efficiency Adjusted Heat Saved				
CSV Written: 2020-Aug-11 17:45:53						80%	Boiler Efficiency				
eQUEST 3.65.7175						1,666	Total Therms saved before efficiency				
						166,643,518	Total BTU Saved				
						40%	Assumed HX Efficiency				
						1,041,521,990	Total Possible BTU Savings				
			Var 6	Var 25							
Month	Day	Hour	Total cent	Cool on/o	Therms Sa	Net Therms Saved					
1	1	1	0	1	0	0					
1	1	2	0	1	0	0					
1	1	3	0	1	0	0					
1	1	4	0	1	0	0					
1	1	5	0	1	0	0					
1	1	6	0	1	0	0					
1	1	7	49755.8	1	0.079609	0.0995116					
1	1	8	49997.4	1	0.079996	0.0999948					
1	1	9	44939.3	1	0.071903	0.0898786					
1	1	10	47193.3	1	0.075509	0.0943866					
1	1	11	49012.5	1	0.07842	0.098025					
1	1	12	35191.3	1	0.056306	0.0703826					
1	1	13	10640.3	1	0.017024	0.0212806					
1	1	14	7351.59	1	0.011763	0.01470318					
1	1	15	0	1	0	0					
1	1	16	0	1	0	0					
1	1	17	9749.75	1	0.0156	0.0194995					
1	1	18	34846.5	1	0.055754	0.069693					
1	1	19	39450.4	1	0.063121	0.0789008					
1	1	20	39144.7	1	0.062632	0.0782894					
1	1	21	0	1	0	0					
1	1	22	0	1	0	0					
1	1	23	38086.8	1	0.060939	0.0761736					
1	1	24	46019.2	1	0.073631	0.0920384					
1	2	1	37250.4	1	0.059601	0.0745008					
1	2	2	37214.3	1	0.059543	0.0744286					
1	2	3	40017	1	0.064027	0.080034					
1	2	4	40021.3	1	0.064034	0.0800426					
1	2	5	41528.6	1	0.066446	0.0830572					
1	2	6	39374.6	1	0.062999	0.0787492					
1	2	7	40609.1	1	0.064975	0.0812182					
1	2	8	42556.7	1	0.068091	0.0851134					
1	2	9	38570.9	1	0.061713	0.0771418					
1	2	10	33300.6	1	0.053281	0.0666012					
1	2	11	26199.8	1	0.04192	0.0523996					
1	2	12	0	1	0	0					
1	2	13	102938	1	0.164701	0.205876					

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12	30	22	29108.6	1	0.046574	0.0582172				
12	30	23	28890.5	1	0.046225	0.057781				
12	30	24	44100.5	1	0.070561	0.088201				
12	31	1	44725.1	1	0.07156	0.0894502				
12	31	2	27310.2	1	0.043696	0.0546204				
12	31	3	28808.2	1	0.046093	0.0576164				
12	31	4	28693	1	0.045909	0.057386				
12	31	5	36528.4	1	0.058445	0.0730568				
12	31	6	38901.6	1	0.062243	0.0778032				
12	31	7	44954.4	1	0.071927	0.0899088				
12	31	8	48059.7	1	0.076896	0.0961194				
12	31	9	45522.6	1	0.072836	0.0910452				
12	31	10	44806.1	1	0.07169	0.0896122				
12	31	11	44406.1	1	0.07105	0.0888122				
12	31	12	39110	1	0.062576	0.07822				
12	31	13	39800.9	1	0.063681	0.0796018				
12	31	14	42160.4	1	0.067457	0.0843208				
12	31	15	35193.4	1	0.056309	0.0703868				
12	31	16	31359.5	1	0.050175	0.062719				
12	31	17	38647.7	1	0.061836	0.0772954				
12	31	18	48313.4	1	0.077301	0.0966268				
12	31	19	54928	1	0.087885	0.109856				
12	31	20	72570.8	1	0.116113	0.1451416				
12	31	21	63820.1	1	0.102112	0.1276402				
12	31	22	59330.5	1	0.094929	0.118661				
12	31	23	53758.5	1	0.086014	0.107517				
12	31	24	51582.3	1	0.082532	0.1031646				

Hourly pool heating energy use Analysis

Row Labels	Sum of Total central cool coil output (Btu/hr)	Sum of Therms Saved	Sum of Net Therms Saved
1	10,350,475	17	21
2	6,284,976	10	13
3	14,988,724	24	30
4	33,494,794	54	67
5	136,439,278	218	273
6	170,752,967	273	342
7	198,299,376	317	397
8	190,939,325	306	382
9	144,275,426	231	289
10	84,902,802	136	170
11	38,996,360	62	78
12	11,902,829	19	24
Grand Total	**1,041,627,331**	**1,667**	**2,083**

Consolidated natural gas use savings from pool heater efficiency improvement

Total Combined Savings													
	J	F	M	A	M	J	J	A	S	O	N	D	
Savings from Pool Calc	21	13	30	67	273	342	397	382	289	170	78	24	
Total Savings (From Pool Calc + Boiler Upgrade)	118	110	127	164	370	438	494	479	385	267	175	121	3,246
	Pool Boiler Savings		1,163	Therms									

Total Savings from natatorium improvements

		Month	January	February	March	April	May	June	July	August	September	October	November	December	Total	DC kW	Size (kW)
		kWh	9122	10840	15007	17467	19887	19857	20578	18000	15407	12338	9064	7554	**175121**	139	139
	(Month's kWh/Max Monthly kWh)	**Production Ratio**	0.44	0.53	0.73	0.85	0.97	0.96	1.00	0.87	0.75	0.60	0.44	0.37			
Ice Rink		**Baseline kW**	168	215	252	223	60	69	141	95	149	260	188	183	**2003.662**		
	Assume Max 20% Savings	**kW Savings Ratio**	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2			
	Ratio x Baseline kW	**kW Savings**	12.3	14.6	20.3	23.6	26.9	26.8	27.8	24.3	20.8	16.7	12.2	10.2	**236.6**		
															12%		

		Month	January	February	March	April	May	June	July	August	September	October	November	December	**TOTAL**	Size (kW)
		kWh	10819	13412	19379	23114	27021	27175	27931	24204	20243	15426	10860	8814	**228398**	189.4
	(Month's kWh/Max Monthly kWh)	**Production Ratio**	0.39	0.48	0.69	0.83	0.97	0.97	1.00	0.87	0.72	0.55	0.39	0.32		
Rec Center Rooftop		**Baseline kW**	162	146	154	126	156	166	172	167	161	158	168	168	**1902.682**	
	Assume Max 20% Savings	**kW Savings Ratio**	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
	Ratio x Baseline kW	**kW Savings**	14.7	18.2	26.3	31.3	36.6	36.9	37.9	32.8	27.5	20.9	14.7	12.0	**309.8**	
															16%	

		Month	January	February	March	April	May	June	July	August	September	October	November	December	**TOTAL**	Size (kW)
		kWh	19634	24222	34589	40935	47831	48018	49305	42962	36194	27738	19722	16056	**407206**	332.9
	(Month's kWh/Max Monthly kWh)	**Production Ratio**	0.40	0.49	0.70	0.83	0.97	0.97	1.00	0.87	0.73	0.56	0.40	0.33		
Rec Center Carport		**Baseline kW**	162	146	154	126	156	166	172	167	161	158	168	168	**1902.682**	
	Assume Max 20% Savings	**kW Savings Ratio**	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
	Ratio x Baseline kW	**kW Savings**	26.5	32.7	46.7	55.3	64.6	64.8	66.6	58.0	48.9	37.5	26.6	21.7	**549.9**	
															29%	

Note:

Assume 20% of the demand savings can be achieved based on historical project performance data

eCalcs: Energy Calculation Suite

Life Is On Schneider Electric

Secaucus - Animal Shelter

Infiltration

Building Data

Building Name	Animal Shelter
Weather City	NJ, Teterboro
Building Height, ft	15
Building Orientation, deg	0
Building L/W Ratio	3.0
Internal Draft Coefficient	0.7

Building Operating Conditions

Occupied Set Point Temp, oF	72.0
Cooling Setup Temp, oF	72.0
Percent of Building Cooled, %	100%
Cooling Seasonal Efficiency, %	290%
Heating Setback Temp, oF	70.0
Percent of Building Heated, %	100%
Heating Seasonal Efficiency, %	80%

Shelter Characteristics

Direction	Shelter Class	Terrain Category
	See Reference Tables for Descriptions	
North	3	3
East	3	3
South	3	3
West	3	3

Building Crack Definitions

	Penetration Name	Type Select	H ft	Qty #	Length ft	Gap inches	% Open %	Total Area sqft	Wall Only sqft
	Crack 1	Roof	7.5	1	10	1/8	100%	0.1	0.0
	Crack 2	Door	-4.5	1	56	1/8	100%	0.6	0.6
	Crack 3	Wall	0.0				100%	0.0	0.0
	Crack 4	Wall	0.0				100%	0.0	0.0
	Crack 5	Wall	0.0				100%	0.0	0.0
	Crack 6	Wall	0.0				100%	0.0	0.0
	Crack 7	Wall	0.0				100%	0.0	0.0
	Crack 8	Wall	0.0				100%	0.0	0.0
	Crack 9	Wall	0.0				100%	0.0	0.0
	Crack 10	Wall	0.0				100%	0.0	0.0
	Crack 11	Wall	0.0				100%	0.0	0.0
	Crack 12	Wall	0.0				100%	0.0	0.0
	Crack 13	Wall	0.0				100%	0.0	0.0
	Effective H (Wall Only)		-4.5					0.7	0.6

Notes: H is the height difference between the crack and the neutral pressure level of the building.

Effective Building Coefficients

Shelter Coefficient	0.7
Wind Shear Exponent	0.14
Boundary Layer Thickness, ft	900
Wall Pressure Coefficient	0.10
Roof Pressure Coefficient	-0.30

Site Parameters

Average Wind Speed, mph	8.2
Site Corrected Wind Speed, mph	7.3
Model Wind Coefficient	0.17
Draft Factor	0.13
Volume Factor, ft/min (in-wg)^0.5	2,603

Energy Engineering Calculations

Ref	Mid Pt Temp oF	MCWB oF	Density lb/ft3	Enthalpy Btu/lb	Temperature Bin Hours 4472 Occupied hrs/yr	Temperature Bin Hours Unocc hrs/yr	Calculated Infiltration Rates Occupied Rates Wall cfm	Occupied Rates Roof cfm	Unoccupied Rates Wall cfm	Unoccupied Rates Roof cfm	Energy Transfer Occupied Load kBtu/yr	Energy Transfer Unocc Load kBtu/yr	Energy Savings Cooling Savings kBtu/yr	Energy Savings Heating Savings kBtu/yr
1	5	1.9	0.085	1.5	3	4	114	24	112	23	-53	-66	0	148
2	9	5.9	0.085	2.6	12	17	109	22	107	22	-191	-252	0	554
3	12	9.4	0.084	3.7	28	28	105	21	103	21	-404	-376	0	976
4	16	13.9	0.083	5.1	46	52	100	20	98	19	-589	-615	0	1,505
5	20	17.2	0.083	6.2	39	51	96	19	93	18	-447	-537	0	1,230
6	24	21.2	0.082	7.6	55	72	90	17	88	17	-549	-656	0	1,506
7	27	24.1	0.081	8.6	101	159	85	16	83	15	-887	-1,263	0	2,687
8	31	27.0	0.081	9.8	105	160	80	15	77	14	-798	-1,089	0	2,359
9	35	30.6	0.080	11.1	228	264	74	13	71	12	-1,456	-1,487	0	3,679
10	39	33.9	0.079	12.5	319	322	68	11	64	10	-1,665	-1,453	0	3,897
11	42	36.8	0.079	13.8	238	222	61	9	57	7	-993	-778	0	2,213
12	46	40.3	0.078	15.3	340	310	54	5	49	2	-1,039	-735	0	2,217
13	50	44.0	0.077	17.1	266	298	44	4	39	7	-558	-513	0	1,338
14	54	48.2	0.077	19.3	305	394	32	8	23	10	-400	-357	0	947
15	57	51.4	0.076	21.0	379	376	11	11	19	12	-205	-225	0	537
16	61	55.3	0.075	23.4	353	357	29	13	36	14	-202	-157	0	448
17	65	58.5	0.075	25.4	354	333	41	14	47	15	-91	6	0	106
18	69	61.5	0.074	27.4	343	308	51	16	56	17	103	208	107	0
19	72	63.5	0.073	28.8	345	233	58	17	58	17	275	186	159	0
20	76	64.9	0.073	29.9	226	82	64	18	64	18	282	102	132	0
21	80	66.2	0.072	30.8	268	62	69	19	69	19	455	105	193	0
22	84	68.5	0.072	32.7	163	22	75	20	75	20	418	56	164	0
23	87	70.2	0.071	34.1	73	6	80	21	80	21	240	20	90	0
24	91	71.2	0.071	34.9	37	0	83	22	83	22	140	0	48	0
25	95	75.6	0.070	38.9	2	0	90	23	90	23	12	0	4	0
					4,628	4,132							898	26,348

Version 1.01	Chilled Water	Diesel	Electricity	Fuel Oil	Gasoline	tural Gas - The	Natural Gas - CCF	ral Gas -	Propane	Solid Fuel	Steam	WW	Water	Wood
ECM	Reference	Ton-hrs	gal	kWh	gal	gal	Therm	CCF	MCF	gal	klb	kgal	kgal	kBtu
-	-	12.0	130.0	3.413	139.6	114.0	100.0	102.0	1,020.0	91.5	1.0	1,040	1.0	1.0	1.0

Shelter Class Designation (ASHRAE 2013 Fundamentals Ch16 Table 5)

Class	Description
1	*No obstructions or local shielding*
2	*Typical shelter for an isolated rural house*
3	*Typical shelter caused by other buildings across the street from the building under study*
4	*Typical shelter for urban buildings on large lots where sheltering obstacles are more than one building height away*
5	*Typical shelter produced by buildings or other structures that are immediately adjacent (closer than one house height)*

Terrain Category (ASHRAE 2013 Fundamentals Ch 24,Table 1)

Category	Description
1	*Large City Centers, in which at least 50% of buildings are higher than 70 ft, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
2	*Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of a single-family dwelling or larger, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
3	*Open terrain with scattered obstructions having heights generally less than 30 ft, including flat open country typical of meteorological station surroundings*
4	*Flat, unobstructed areas exposed to wind flowing over water for at least 1 mile, over a distance of 1,500 ft or 10 times the height of the structure inland, whichever is greater*

Air Property Lookup

	Temp oF	Density lb/ft3	Enthalpy Btu/lb
Set Point	72	0.0736	26.4
Htg Setback	70	0.0739	25.3
Clg Setup	72	0.0736	26.4

2013 Fund, Ch16 Table 9

Shelter Class	Factor s
1	1.0
2	0.9
3	0.7
4	0.5
5	0.3

2013 Fund, Ch 24, Table 1

Terrain Category	Wind Shear Exponent -	Bound Layer Thickness ft
1	0.33	1,500
2	0.22	1,200
3	0.14	900
4	0.10	700

Height Difference, H

Type	Height
Select	ft
Roof	7.50
Roof-Wall	7.50
Wall	0.00
Door	-4.50
Slab	-7.50

Effective Building Coefficients

Direction	Building Side Ratio	Building Side Area	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness
N	3.0	38%	0.7	0.14	900
E	1.0	13%	0.7	0.14	900
S	3.0	38%	0.7	0.14	900
W	1.0	13%	0.7	0.14	900
	8.0	100%	0.70	0.14	900

Pressure Coefficient, Cp

Wind Direction Degrees	Typical Cp* -	Effective Cp -	Notes -
0	0.6	0.16	Cp(1) = when wind is at 0 deg
90	-0.65	0.17	Cp(3) = when wind is at 90 deg
180	-0.3	0.05	Cp(2) = when wind is at 180 deg
270	-0.65	0.01	Cp(4) = when wind is at 270 deg
		0.103	

**Typical values for pressure coefficients, ASHRAE 2016 Fundamentals, Chapter 16, Eq 29*

Wind Direction, Frequency, and Effective Pressure Coefficient Calculation Table

Degrees from North, Rounds to the nearest 10 degrees for lookup table

Wind Direction Degrees	Wind Direction Radians	Freq % Yr	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness	Ref Wall Cp	North Wall Degrees	North Wall Cp	East Wall Degrees	East Wall Cp	South Wall Degrees	South Wall Cp	West Wall Degrees	West Wall Cp
0	0.000	3%	0.700	0.14	900	0.600	0	0.60	90	0.00	180	-0.30	270	0.00
10	0.175	2%	0.700	0.14	900	0.594	10	0.59	100	-0.06	190	-0.30	280	0.18
20	0.349	3%	0.700	0.14	900	0.575	20	0.57	110	-0.11	200	-0.28	290	0.29
30	0.524	2%	0.700	0.14	900	0.544	30	0.54	120	-0.16	210	-0.26	300	0.37
40	0.698	2%	0.700	0.14	900	0.500	40	0.50	130	-0.20	220	-0.24	310	0.44
50	0.873	2%	0.700	0.14	900	0.443	50	0.44	140	-0.24	230	-0.20	320	0.50
60	1.047	2%	0.700	0.14	900	0.374	60	0.37	150	-0.26	240	-0.16	330	0.54
70	1.222	2%	0.700	0.14	900	0.299	70	0.29	160	-0.28	250	-0.11	340	0.57
80	1.396	2%	0.700	0.14	900	0.184	80	0.18	170	-0.30	260	-0.06	350	0.59
90	1.571	1%	0.700	0.14	900	0.000	90	0.00	180	-0.30	270	0.00	0	0.60
100	1.745	1%	0.700	0.14	900	-0.059	100	-0.06	190	-0.30	280	0.18	10	0.59
110	1.920	1%	0.700	0.14	900	-0.114	110	-0.11	200	-0.28	290	0.29	20	0.57
120	2.094	1%	0.700	0.14	900	-0.162	120	-0.16	210	-0.26	300	0.37	30	0.54
130	2.269	1%	0.700	0.14	900	-0.203	130	-0.20	220	-0.24	310	0.44	40	0.50
140	2.443	1%	0.700	0.14	900	-0.237	140	-0.24	230	-0.20	320	0.50	50	0.44
150	2.618	1%	0.700	0.14	900	-0.264	150	-0.26	240	-0.16	330	0.54	60	0.37
160	2.793	1%	0.700	0.14	900	-0.284	160	-0.28	250	-0.11	340	0.57	70	0.29
170	2.967	2%	0.700	0.14	900	-0.296	170	-0.30	260	-0.06	350	0.59	80	0.18
180	3.142	3%	0.700	0.14	900	-0.300	180	-0.30	270	0.00	0	0.60	90	0.00
190	3.316	3%	0.700	0.14	900	-0.296	190	-0.30	280	0.18	10	0.59	100	-0.06
200	3.491	3%	0.700	0.14	900	-0.284	200	-0.28	290	0.29	20	0.57	110	-0.11
210	3.665	3%	0.700	0.14	900	-0.264	210	-0.26	300	0.37	30	0.54	120	-0.16
220	3.840	3%	0.700	0.14	900	-0.237	220	-0.24	310	0.44	40	0.50	130	-0.20
230	4.014	3%	0.700	0.14	900	-0.203	230	-0.20	320	0.50	50	0.44	140	-0.24
240	4.189	3%	0.700	0.14	900	-0.162	240	-0.16	330	0.54	60	0.37	150	-0.26
250	4.363	2%	0.700	0.14	900	-0.114	250	-0.11	340	0.57	70	0.29	160	-0.28
260	4.538	2%	0.700	0.14	900	-0.059	260	-0.06	350	0.59	80	0.18	170	-0.30
270	4.712	2%	0.700	0.14	900	0.000	270	0.00	0	0.60	90	0.00	180	-0.30
280	4.887	2%	0.700	0.14	900	0.184	280	0.18	10	0.59	100	-0.06	190	-0.30
290	5.061	2%	0.700	0.14	900	0.299	290	0.29	20	0.57	110	-0.11	200	-0.28
300	5.236	3%	0.700	0.14	900	0.374	300	0.37	30	0.54	120	-0.16	210	-0.26
310	5.411	3%	0.700	0.14	900	0.443	310	0.44	40	0.50	130	-0.20	220	-0.24
320	5.585	5%	0.700	0.14	900	0.500	320	0.50	50	0.44	140	-0.24	230	-0.20
330	5.760	6%	0.700	0.14	900	0.544	330	0.54	60	0.37	150	-0.26	240	-0.16
340	5.934	5%	0.700	0.14	900	0.575	340	0.57	70	0.29	160	-0.28	250	-0.11
350	6.109	4%	0.700	0.14	900	0.594	350	0.59	80	0.18	170	-0.30	260	-0.06
		88%												

**Cp equations assume low-rise building (3 stories or less), rectangular form, longest wall less than three times the length of shortest wall.*

eCalcs: Energy Calculation Suite

Life Is On Schneider Electric

Secaucus - Old Rec Center

Infiltration

Building Data

Building Name	Old Rec Center
Weather City	NJ, Teterboro
Building Height, ft	15
Building Orientation, deg	0
Building L/W Ratio	3.0
Internal Draft Coefficient	0.7

Building Operating Conditions

Occupied Set Point Temp, oF	72.0
Cooling Setup Temp, oF	78.0
Percent of Building Cooled, %	100%
Cooling Seasonal Efficiency, %	290%
Heating Setback Temp, oF	62.0
Percent of Building Heated, %	100%
Heating Seasonal Efficiency, %	80%

Shelter Characteristics

Direction	Shelter Class	Terrain Category
	See Reference Tables for Descriptions	
North	3	3
East	3	3
South	3	3
West	3	3

Building Crack Definitions

Penetration	Type	H	Qty	Length	Gap	% Open	Total Area	Wall Only
Name	Select	ft	#	ft	inches	%	sqft	sqft
Crack 1	Door	-4.5	1	86	1/8	100%	0.9	0.9
Crack 2	Door	-4.5	1	38	1/18	100%	0.2	0.2
Crack 3	Slab	-7.5	1	4	1/2	100%	0.2	0.2
Crack 4	Slab	-7.5	1	28	1/8	100%	0.3	0.3
Crack 5	Wall	0.0				100%	0.0	0.0
Crack 6	Wall	0.0				100%	0.0	0.0
Crack 7	Wall	0.0				100%	0.0	0.0
Crack 8	Wall	0.0				100%	0.0	0.0
Crack 9	Wall	0.0				100%	0.0	0.0
Crack 10	Wall	0.0				100%	0.0	0.0
Crack 11	Wall	0.0				100%	0.0	0.0
Crack 12	Wall	0.0				100%	0.0	0.0
Crack 13	Wall	0.0				100%	0.0	0.0
Effective H (Wall Only)		-5.4					1.5	1.5

Notes: H is the height difference between the crack and the neutral pressure level of the building.

Effective Building Coefficients

Shelter Coefficient	0.7
Wind Shear Exponent	0.14
Boundary Layer Thickness, ft	900
Wall Pressure Coefficient	0.10
Roof Pressure Coefficient	-0.30

Site Parameters

Average Wind Speed, mph	8.2
Site Corrected Wind Speed, mph	7.3
Model Wind Coefficient	0.17
Draft Factor	0.13
Volume Factor, ft/min (in-wg)^0.5	2,603

Energy Engineering Calculations

Ref	Mid Pt Temp oF	MCWB oF	Density lb/ft3	Enthalpy Btu/lb	Temperature Bin Hours 4472 Occupied hrs/yr	Temperature Bin Hours Unocc hrs/yr	Calculated Infiltration Rates Occupied Rates Wall cfm	Occupied Rates Roof cfm	Unoccupied Rates Wall cfm	Unoccupied Rates Roof cfm	Energy Transfer Occupied Load kBtu/yr	Energy Transfer Unocc Load kBtu/yr	Energy Savings Cooling Savings kBtu/yr	Energy Savings Heating Savings kBtu/yr
1	5	1.9	0.085	1.5	3	4	334	0	303	0	-128	-123	0	314
2	9	5.9	0.085	2.6	12	17	322	0	290	0	-466	-466	0	1,165
3	12	9.4	0.084	3.7	28	28	309	0	276	0	-990	-684	0	2,093
4	16	13.9	0.083	5.1	46	52	296	0	261	0	-1,449	-1,095	0	3,180
5	20	17.2	0.083	6.2	39	51	283	0	246	0	-1,104	-936	0	2,551
6	24	21.2	0.082	7.6	55	72	269	0	229	0	-1,367	-1,111	0	3,097
7	27	24.1	0.081	8.6	101	159	255	0	212	0	-2,222	-2,077	0	5,374
8	31	27.0	0.081	9.8	105	160	240	0	194	0	-2,020	-1,726	0	4,683
9	35	30.6	0.080	11.1	228	264	224	0	174	0	-3,733	-2,238	0	7,464
10	39	33.9	0.079	12.5	319	322	206	0	151	0	-4,349	-2,034	0	7,979
11	42	36.8	0.079	13.8	238	222	188	0	126	0	-2,668	-987	0	4,569
12	46	40.3	0.078	15.3	340	310	168	0	92	0	-2,948	-790	0	4,671
13	50	44.0	0.077	17.1	266	298	143	0	29	0	-1,645	-168	0	2,266
14	54	48.2	0.077	19.3	305	394	112	0	84	0	-1,121	-309	0	1,788
15	57	51.4	0.076	21.0	379	376	73	0	120	0	-676	-57	0	917
16	61	55.3	0.075	23.4	353	357	52	0	150	0	-251	500	86	0
17	65	58.5	0.075	25.4	354	333	100	0	144	0	-164	0	0	204
18	69	61.5	0.074	27.4	343	308	132	0	143	0	203	0	70	0
19	72	63.5	0.073	28.8	345	233	154	0	143	0	564	0	195	0
20	76	64.9	0.073	29.9	226	82	173	0	142	0	591	0	204	0
21	80	66.2	0.072	30.8	268	62	188	0	153	0	971	37	348	0
22	84	68.5	0.072	32.7	163	22	205	0	174	0	903	45	327	0
23	87	70.2	0.071	34.1	73	6	220	0	191	0	524	20	188	0
24	91	71.2	0.071	34.9	37	0	232	0	204	0	307	0	106	0
25	95	75.6	0.070	38.9	2	0	250	0	225	0	26	0	9	0
					4,628	4,132							1,532	52,315

Savings Summary

	Type	Savings	Units	Utility Type
	Cooling	449	kWh	Electricity
	Heating	523	Therm	Natural Gas - Therm

Version 1.01	Chilled Water	Diesel	Electricity	Fuel Oil	Gasoline	tural Gas - The	Natural Gas - CCF	ral Gas -	Propane	Solid Fuel	Steam	WW	Water	Wood
ECM	Reference	Ton-hrs	gal	kWh	gal	gal	Therm	CCF	MCF	gal	kBtu	klb	kgal	kgal	kBtu
-	-	12.0	130.0	3,413	139.6	114.0	100.0	102.0	1,020.0	91.5	1.0	1,040	1.0	1.0	1.0

Shelter Class Designation (ASHRAE 2013 Fundamentals Ch16 Table 5)

Class	Description
1	*No obstructions or local shielding*
2	*Typical shelter for an isolated rural house*
3	*Typical shelter caused by other buildings across the street from the building under study*
4	*Typical shelter for urban buildings on large lots where sheltering obstacles are more than one building height away*
5	*Typical shelter produced by buildings or other structures that are immediately adjacent (closer than one house height)*

Terrain Category (ASHRAE 2013 Fundamentals Ch 24,Table 1)

Category	Description
1	*Large City Centers, in which at least 50% of buildings are higher than 70 ft, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
2	*Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of a single-family dwelling or larger, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
3	*Open terrain with scattered obstructions having heights generally less than 30 ft, including flat open country typical of meteorological station surroundings*
4	*Flat, unobstructed areas exposed to wind flowing over water for at least 1 mile, over a distance of 1,500 ft or 10 times the height of the structure inland, whichever is greater*

Air Property Lookup

	Temp oF	Density lb/ft3	Enthalpy Btu/lb
Set Point	72	0.0736	26.4
Htg Setback	62	0.0753	21.3
Clg Setup	78	0.0726	29.9

2013 Fund, Ch16 Table 9

Shelter Class	Factor s
1	1.0
2	0.9
3	0.7
4	0.5
5	0.3

2013 Fund, Ch 24, Table 1

Terrain Category	Wind Shear Exponent -	Bound Layer Thickness ft
1	0.33	1,500
2	0.22	1,200
3	0.14	900
4	0.10	700

Height Difference, H

Type	Height
Select	ft
Roof	7.50
Roof-Wall	7.50
Wall	0.00
Door	-4.50
Slab	-7.50

Effective Building Coefficients

Direction	Building Side Ratio	Building Side Area	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness
N	3.0	38%	0.7	0.14	900
E	1.0	13%	0.7	0.14	900
S	3.0	38%	0.7	0.14	900
W	1.0	13%	0.7	0.14	900
	8.0	100%	0.70	0.14	900

Pressure Coefficient, Cp

Wind Direction	Typical Cp'	Effective Cp	Notes
Degrees	-	-	-
0	0.6	0.16	Cp(1) = when wind is at 0 deg
90	-0.65	0.17	Cp(3) = when wind is at 90 deg
180	-0.3	0.05	Cp(2) = when wind is at 180 deg
270	-0.65	0.01	Cp(4) = when wind is at 270 deg
		0.103	

'Typical values for pressure coefficients, ASHRAE 2016 Fundamentals, Chapter 16, Eq 29

Wind Direction, Frequency, and Effective Pressure Coefficient Calculation Table

Degrees from North, Rounds to the nearest 10 degrees for lookup table

Wind Direction		Freq	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness	Ref Wall	North Wall		East Wall		South Wall		West Wall	
Degrees	Radians	% Yr				Cp	Degrees	Cp	Degrees	Cp	Degrees	Cp	Degrees	Cp
0	0.000	3%	0.700	0.14	900	0.600	0	0.60	90	0.00	180	-0.30	270	0.00
10	0.175	2%	0.700	0.14	900	0.594	10	0.59	100	-0.06	190	-0.30	280	0.18
20	0.349	3%	0.700	0.14	900	0.575	20	0.57	110	-0.11	200	-0.28	290	0.29
30	0.524	2%	0.700	0.14	900	0.544	30	0.54	120	-0.16	210	-0.26	300	0.37
40	0.698	2%	0.700	0.14	900	0.500	40	0.50	130	-0.20	220	-0.24	310	0.44
50	0.873	2%	0.700	0.14	900	0.443	50	0.44	140	-0.24	230	-0.20	320	0.50
60	1.047	2%	0.700	0.14	900	0.374	60	0.37	150	-0.26	240	-0.16	330	0.54
70	1.222	2%	0.700	0.14	900	0.299	70	0.29	160	-0.28	250	-0.11	340	0.57
80	1.396	2%	0.700	0.14	900	0.184	80	0.18	170	-0.30	260	-0.06	350	0.59
90	1.571	1%	0.700	0.14	900	0.000	90	0.00	180	-0.30	270	0.00	0	0.60
100	1.745	1%	0.700	0.14	900	-0.059	100	-0.06	190	-0.30	280	0.18	10	0.59
110	1.920	1%	0.700	0.14	900	-0.114	110	-0.11	200	-0.28	290	0.29	20	0.57
120	2.094	1%	0.700	0.14	900	-0.162	120	-0.16	210	-0.26	300	0.37	30	0.54
130	2.269	1%	0.700	0.14	900	-0.203	130	-0.20	220	-0.24	310	0.44	40	0.50
140	2.443	1%	0.700	0.14	900	-0.237	140	-0.24	230	-0.20	320	0.50	50	0.44
150	2.618	1%	0.700	0.14	900	-0.264	150	-0.26	240	-0.16	330	0.54	60	0.37
160	2.793	1%	0.700	0.14	900	-0.284	160	-0.28	250	-0.11	340	0.57	70	0.29
170	2.967	2%	0.700	0.14	900	-0.296	170	-0.30	260	-0.06	350	0.59	80	0.18
180	3.142	3%	0.700	0.14	900	-0.300	180	-0.30	270	0.00	0	0.60	90	0.00
190	3.316	3%	0.700	0.14	900	-0.296	190	-0.30	280	0.18	10	0.59	100	-0.06
200	3.491	3%	0.700	0.14	900	-0.284	200	-0.28	290	0.29	20	0.57	110	-0.11
210	3.665	3%	0.700	0.14	900	-0.264	210	-0.26	300	0.37	30	0.54	120	-0.16
220	3.840	3%	0.700	0.14	900	-0.237	220	-0.24	310	0.44	40	0.50	130	-0.20
230	4.014	3%	0.700	0.14	900	-0.203	230	-0.20	320	0.50	50	0.44	140	-0.24
240	4.189	3%	0.700	0.14	900	-0.162	240	-0.16	330	0.54	60	0.37	150	-0.26
250	4.363	2%	0.700	0.14	900	-0.114	250	-0.11	340	0.57	70	0.29	160	-0.28
260	4.538	2%	0.700	0.14	900	-0.059	260	-0.06	350	0.59	80	0.18	170	-0.30
270	4.712	2%	0.700	0.14	900	0.000	270	0.00	0	0.60	90	0.00	180	-0.30
280	4.887	2%	0.700	0.14	900	0.184	280	0.18	10	0.59	100	-0.06	190	-0.30
290	5.061	2%	0.700	0.14	900	0.299	290	0.29	20	0.57	110	-0.11	200	-0.28
300	5.236	3%	0.700	0.14	900	0.374	300	0.37	30	0.54	120	-0.16	210	-0.26
310	5.411	3%	0.700	0.14	900	0.443	310	0.44	40	0.50	130	-0.20	220	-0.24
320	5.585	5%	0.700	0.14	900	0.500	320	0.50	50	0.44	140	-0.24	230	-0.20
330	5.760	6%	0.700	0.14	900	0.544	330	0.54	60	0.37	150	-0.26	240	-0.16
340	5.934	5%	0.700	0.14	900	0.575	340	0.57	70	0.29	160	-0.28	250	-0.11
350	6.109	4%	0.700	0.14	900	0.594	350	0.59	80	0.18	170	-0.30	260	-0.06
		88%												

Cp equations assume low-rise building (3 stories or less), rectangular form, longest wall less than three times the length of shortest wall.

eCalcs: Energy Calculation Suite

Life Is On Schneider Electric

Secaucus - Rec Center

Infiltration

Building Data

Building Name	Rec Center
Weather City	NJ, Teterboro
Building Height, ft	15
Building Orientation, deg	0
Building L/W Ratio	3.0
Internal Draft Coefficient	0.7

Building Operating Conditions

Occupied Set Point Temp, oF	72.0
Cooling Setup Temp, oF	78.0
Percent of Building Cooled, %	100%
Cooling Seasonal Efficiency, %	290%
Heating Setback Temp, oF	62.0
Percent of Building Heated, %	100%
Heating Seasonal Efficiency, %	80%

Shelter Characteristics

Direction	Shelter Class	Terrain Category
	See Reference Tables for Descriptions	
North	3	3
East	3	3
South	3	3
West	3	3

Building Crack Definitions

Penetration	Type	H	Qty	Length	Gap	% Open	Total Area	Wall Only
Name	Select	ft	#	ft	inches	%	sqft	sqft
Crack 1	Door	-4.5	1	443	1/8	100%	4.6	4.6
Crack 2	Roof-Wall	7.5	1	2	1/8	100%	0.0	0.0
Crack 3	Wall	0.0	1	26	1/2	100%	1.1	1.1
Crack 4	Wall	0.0	1	20	1/12	100%	0.1	0.1
Crack 5	Wall	0.0				100%	0.0	0.0
Crack 6	Wall	0.0				100%	0.0	0.0
Crack 7	Wall	0.0				100%	0.0	0.0
Crack 8	Wall	0.0				100%	0.0	0.0
Crack 9	Wall	0.0				100%	0.0	0.0
Crack 10	Wall	0.0				100%	0.0	0.0
Crack 11	Wall	0.0				100%	0.0	0.0
Crack 12	Wall	0.0				100%	0.0	0.0
Crack 13	Wall	0.0				100%	0.0	0.0
	Effective H (Wall Only)	-3.5					5.9	5.9

Notes: H is the height difference between the crack and the neutral pressure level of the building.

Effective Building Coefficients

Shelter Coefficient	0.7
Wind Shear Exponent	0.14
Boundary Layer Thickness, ft	900
Wall Pressure Coefficient	0.10
Roof Pressure Coefficient	-0.30

Site Parameters

Average Wind Speed, mph	8.2
Site Corrected Wind Speed, mph	7.3
Model Wind Coefficient	0.17
Draft Factor	0.13
Volume Factor, ft/min (in-wg)^0.5	2,603

Energy Engineering Calculations

Ref	Mid Pt Temp oF	MCWB oF	Density lb/ft3	Enthalpy Btu/lb	Temperature Bin Hours: 4472 Occupied hrs/yr	Temperature Bin Hours: Unocc hrs/yr	Calculated Infiltration Rates: Occupied Rates Wall cfm	Occupied Rates Roof cfm	Unoccupied Rates Wall cfm	Unoccupied Rates Roof cfm	Energy Transfer: Occupied Load kBtu/yr	Energy Transfer: Unocc Load kBtu/yr	Energy Savings: Cooling Savings kBtu/yr	Energy Savings: Heating Savings kBtu/yr
1	5	1.9	0.085	1.5	3	4	972	0	870	0	-372	-353	0	907
2	9	5.9	0.085	2.6	12	17	932	0	825	0	-1,349	-1,328	0	3,346
3	12	9.4	0.084	3.7	28	28	892	0	779	0	-2,855	-1,932	0	5,984
4	16	13.9	0.083	5.1	46	52	848	0	729	0	-4,149	-3,062	0	9,013
5	20	17.2	0.083	6.2	39	51	804	0	678	0	-3,140	-2,583	0	7,154
6	24	21.2	0.082	7.6	55	72	757	0	620	0	-3,851	-3,010	0	8,576
7	27	24.1	0.081	8.6	101	159	710	0	562	0	-6,196	-5,494	0	14,612
8	31	27.0	0.081	9.8	105	160	659	0	497	0	-5,555	-4,411	0	12,457
9	35	30.6	0.080	11.1	228	264	604	0	420	0	-10,076	-5,398	0	19,342
10	39	33.9	0.079	12.5	319	322	543	0	327	0	-11,435	-4,386	0	19,777
11	42	36.8	0.079	13.8	238	222	477	0	198	0	-6,754	-1,558	0	10,390
12	46	40.3	0.078	15.3	340	310	397	0	175	0	-6,982	-1,505	0	10,609
13	50	44.0	0.077	17.1	266	298	294	0	319	0	-3,374	-1,846	0	6,525
14	54	48.2	0.077	19.3	305	394	107	0	420	0	-1,067	-1,538	0	3,256
15	57	51.4	0.076	21.0	379	376	240	0	495	0	-2,233	-237	0	3,087
16	61	55.3	0.075	23.4	353	357	364	0	566	0	-1,763	1,893	45	0
17	65	58.5	0.075	25.4	354	333	449	0	551	0	-732	0	0	915
18	69	61.5	0.074	27.4	343	308	521	0	549	0	802	0	276	0
19	72	63.5	0.073	28.8	345	233	576	0	547	0	2,104	0	726	0
20	76	64.9	0.073	29.9	226	82	623	0	545	0	2,132	0	735	0
21	80	66.2	0.072	30.8	268	62	665	0	572	0	3,424	139	1,229	0
22	84	68.5	0.072	32.7	163	22	711	0	625	0	3,122	162	1,132	0
23	87	70.2	0.071	34.1	73	6	750	0	669	0	1,789	71	641	0
24	91	71.2	0.071	34.9	37	0	783	0	706	0	1,039	0	358	0
25	95	75.6	0.070	38.9	2	0	834	0	762	0	87	0	30	0
					4,628	4,132							5,173	135,950

Savings Summary

Type	Savings	Units	Utility Type
Cooling	1,516	kWh	Electricity
Heating	1,359	Therm	Natural Gas - Therm

Version 1.01	Chilled Water	Diesel	Electricity	Fuel Oil	Gasoline	tural Gas - The	Natural Gas - CCF	ural Gas -	Propane	Solid Fuel	Steam	WW	Water	Wood
ECM	Reference	Ton-hrs	gal	kWh	gal	gal	Therm	CCF	MCF	gal	kBtu	klb	kgal	kgal	kBtu
-	-	12.0	130.0	3,413	139.6	114.0	100.0	102.0	1,020.0	91.5	1.0	1,040	1.0	1.0	1.0

Shelter Class Designation (ASHRAE 2013 Fundamentals Ch16 Table 5)

Class	Description
1	*No obstructions or local shielding*
2	*Typical shelter for an isolated rural house*
3	*Typical shelter caused by other buildings across the street from the building under study*
4	*Typical shelter for urban buildings on large lots where sheltering obstacles are more than one building height away*
5	*Typical shelter produced by buildings or other structures that are immediately adjacent (closer than one house height)*

Terrain Category (ASHRAE 2013 Fundamentals Ch 24,Table 1)

Category	Description
1	*Large City Centers, in which at least 50% of buildings are higher than 70 ft, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
2	*Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of a single-family dwelling or larger, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
3	*Open terrain with scattered obstructions having heights generally less than 30 ft, including flat open country typical of meteorological station surroundings*
4	*Flat, unobstructed areas exposed to wind flowing over water for at least 1 mile, over a distance of 1,500 ft or 10 times the height of the structure inland, whichever is greater*

Air Property Lookup

	Temp oF	Density lb/ft3	Enthalpy Btu/lb
Set Point	72	0.0736	26.4
Htg Setback	62	0.0753	21.3
Clg Setup	78	0.0726	29.9

2013 Fund, Ch16 Table 9

Shelter Class	Factor s
1	1.0
2	0.9
3	0.7
4	0.5
5	0.3

2013 Fund, Ch 24, Table 1

Terrain Category	Wind Shear Exponent -	Bound Layer Thickness ft
1	0.33	1,500
2	0.22	1,200
3	0.14	900
4	0.10	700

Height Difference, H

Type	Height
Select	ft
Roof	7.50
Roof-Wall	7.50
Wall	0.00
Door	-4.50
Slab	-7.50

Effective Building Coefficients

Direction	Building Side Ratio	Building Side Area	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness
N	3.0	38%	0.7	0.14	900
E	1.0	13%	0.7	0.14	900
S	3.0	38%	0.7	0.14	900
W	1.0	13%	0.7	0.14	900
	8.0	100%	0.70	0.14	900

Pressure Coefficient, Cp

Wind Direction Degrees	Typical Cp' -	Effective Cp -	Notes -
0	0.6	0.16	Cp(1) = when wind is at 0 deg
90	-0.65	0.17	Cp(3) = when wind is at 90 deg
180	-0.3	0.05	Cp(2) = when wind is at 180 deg
270	-0.65	0.01	Cp(4) = when wind is at 270 deg
		0.103	

'Typical values for pressure coefficients, ASHRAE 2016 Fundamentals, Chapter 16, Eq 29

Wind Direction, Frequency, and Effective Pressure Coefficient Calculation Table

Degrees from North, Rounds to the nearest 10 degrees for lookup table

Wind Direction Degrees	Wind Direction Radians	Freq % Yr	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness	Ref Wall Cp	North Wall Degrees	North Wall Cp	East Wall Degrees	East Wall Cp	South Wall Degrees	South Wall Cp	West Wall Degrees	West Wall Cp
0	0.000	3%	0.700	0.14	900	0.600	0	0.60	90	0.00	180	-0.30	270	0.00
10	0.175	2%	0.700	0.14	900	0.594	10	0.59	100	-0.06	190	-0.30	280	0.18
20	0.349	3%	0.700	0.14	900	0.575	20	0.57	110	-0.11	200	-0.28	290	0.29
30	0.524	2%	0.700	0.14	900	0.544	30	0.54	120	-0.16	210	-0.26	300	0.37
40	0.698	2%	0.700	0.14	900	0.500	40	0.50	130	-0.20	220	-0.24	310	0.44
50	0.873	2%	0.700	0.14	900	0.443	50	0.44	140	-0.24	230	-0.20	320	0.50
60	1.047	2%	0.700	0.14	900	0.374	60	0.37	150	-0.26	240	-0.16	330	0.54
70	1.222	2%	0.700	0.14	900	0.299	70	0.29	160	-0.28	250	-0.11	340	0.57
80	1.396	2%	0.700	0.14	900	0.184	80	0.18	170	-0.30	260	-0.06	350	0.59
90	1.571	1%	0.700	0.14	900	0.000	90	0.00	180	-0.30	270	0.00	0	0.60
100	1.745	1%	0.700	0.14	900	-0.059	100	-0.06	190	-0.30	280	0.18	10	0.59
110	1.920	1%	0.700	0.14	900	-0.114	110	-0.11	200	-0.28	290	0.29	20	0.57
120	2.094	1%	0.700	0.14	900	-0.162	120	-0.16	210	-0.26	300	0.37	30	0.54
130	2.269	1%	0.700	0.14	900	-0.203	130	-0.20	220	-0.24	310	0.44	40	0.50
140	2.443	1%	0.700	0.14	900	-0.237	140	-0.24	230	-0.20	320	0.50	50	0.44
150	2.618	1%	0.700	0.14	900	-0.264	150	-0.26	240	-0.16	330	0.54	60	0.37
160	2.793	1%	0.700	0.14	900	-0.284	160	-0.28	250	-0.11	340	0.57	70	0.29
170	2.967	2%	0.700	0.14	900	-0.296	170	-0.30	260	-0.06	350	0.59	80	0.18
180	3.142	3%	0.700	0.14	900	-0.300	180	-0.30	270	0.00	0	0.60	90	0.00
190	3.316	3%	0.700	0.14	900	-0.296	190	-0.30	280	0.18	10	0.59	100	-0.06
200	3.491	3%	0.700	0.14	900	-0.284	200	-0.28	290	0.29	20	0.57	110	-0.11
210	3.665	3%	0.700	0.14	900	-0.264	210	-0.26	300	0.37	30	0.54	120	-0.16
220	3.840	3%	0.700	0.14	900	-0.237	220	-0.24	310	0.44	40	0.50	130	-0.20
230	4.014	3%	0.700	0.14	900	-0.203	230	-0.20	320	0.50	50	0.44	140	-0.24
240	4.189	3%	0.700	0.14	900	-0.162	240	-0.16	330	0.54	60	0.37	150	-0.26
250	4.363	2%	0.700	0.14	900	-0.114	250	-0.11	340	0.57	70	0.29	160	-0.28
260	4.538	2%	0.700	0.14	900	-0.059	260	-0.06	350	0.59	80	0.18	170	-0.30
270	4.712	2%	0.700	0.14	900	0.000	270	0.00	0	0.60	90	0.00	180	-0.30
280	4.887	2%	0.700	0.14	900	0.184	280	0.18	10	0.59	100	-0.06	190	-0.30
290	5.061	2%	0.700	0.14	900	0.299	290	0.29	20	0.57	110	-0.11	200	-0.28
300	5.236	3%	0.700	0.14	900	0.374	300	0.37	30	0.54	120	-0.16	210	-0.26
310	5.411	3%	0.700	0.14	900	0.443	310	0.44	40	0.50	130	-0.20	220	-0.24
320	5.585	5%	0.700	0.14	900	0.500	320	0.50	50	0.44	140	-0.24	230	-0.20
330	5.760	6%	0.700	0.14	900	0.544	330	0.54	60	0.37	150	-0.26	240	-0.16
340	5.934	5%	0.700	0.14	900	0.575	340	0.57	70	0.29	160	-0.28	250	-0.11
350	6.109	4%	0.700	0.14	900	0.594	350	0.59	80	0.18	170	-0.30	260	-0.06
		88%												

Cp equations assume low-rise building (3 stories or less), rectangular form, longest wall less than three times the length of shortest wall.

eCalcs: Energy Calculation Suite

Life Is On Schneider Electric

Secaucus - Teen Tot

Infiltration

Building Data

Building Name	Teen Tot
Weather City	NJ, Teterboro
Building Height, ft	15
Building Orientation, deg	0
Building L/W Ratio	3.0
Internal Draft Coefficient	0.7

Building Operating Conditions

Occupied Set Point Temp, oF	72.0
Cooling Setup Temp, oF	78.0
Percent of Building Cooled, %	100%
Cooling Seasonal Efficiency, %	290%
Heating Setback Temp, oF	62.0
Percent of Building Heated, %	100%
Heating Seasonal Efficiency, %	85%

Shelter Characteristics

Direction	Shelter Class	Terrain Category
	See Reference Tables for Descriptions	
North	3	3
East	3	3
South	3	3
West	3	3

Building Crack Definitions

Penetration	Type	H	Qty	Length	Gap	% Open	Total Area	Wall Only
Name	Select	ft	#	ft	inches	%	sqft	sqft
Crack 1	Door	-4.5	1	126	1/8	100%	1.3	1.3
Crack 2	Roof	7.5	1	16	1/2	100%	0.7	0.0
Crack 3	Wall	0.0				100%	0.0	0.0
Crack 4	Wall	0.0				100%	0.0	0.0
Crack 5	Wall	0.0				100%	0.0	0.0
Crack 6	Wall	0.0				100%	0.0	0.0
Crack 7	Wall	0.0				100%	0.0	0.0
Crack 8	Wall	0.0				100%	0.0	0.0
Crack 9	Wall	0.0				100%	0.0	0.0
Crack 10	Wall	0.0				100%	0.0	0.0
Crack 11	Wall	0.0				100%	0.0	0.0
Crack 12	Wall	0.0				100%	0.0	0.0
Crack 13	Wall	0.0				100%	0.0	0.0
Effective H (Wall Only)		-4.5					2.0	1.3

Notes: H is the height difference between the crack and the neutral pressure level of the building.

Effective Building Coefficients

Shelter Coefficient	0.7
Wind Shear Exponent	0.14
Boundary Layer Thickness, ft	900
Wall Pressure Coefficient	0.10
Roof Pressure Coefficient	-0.30

Site Parameters

Average Wind Speed, mph	8.2
Site Corrected Wind Speed, mph	7.3
Model Wind Coefficient	0.17
Draft Factor	0.13
Volume Factor, ft/min (in-wg)^0.5	2,603

Energy Engineering Calculations

Ref	Mid Pt Temp oF	MCWB oF	Density lb/ft3	Enthalpy Btu/lb	4472 Occupied hrs/yr	4472 Unocc hrs/yr	Occupied Rates Wall cfm	Occupied Rates Roof cfm	Unoccupied Rates Wall cfm	Unoccupied Rates Roof cfm	Energy Transfer Occupied Load kBtu/yr	Energy Transfer Unocc Load kBtu/yr	Energy Savings Cooling Savings kBtu/yr	Energy Savings Heating Savings kBtu/yr
1	5	1.9	0.085	1.5	3	4	256	150	231	132	-156	-147	0	357
2	9	5.9	0.085	2.6	12	17	246	143	220	124	-564	-554	0	1,315
3	12	9.4	0.084	3.7	28	28	236	136	209	116	-1,193	-805	0	2,351
4	16	13.9	0.083	5.1	46	52	226	128	197	106	-1,732	-1,275	0	3,538
5	20	17.2	0.083	6.2	39	51	215	121	185	97	-1,310	-1,073	0	2,804
6	24	21.2	0.082	7.6	55	72	204	112	171	86	-1,605	-1,246	0	3,355
7	27	24.1	0.081	8.6	101	159	192	103	158	74	-2,578	-2,264	0	5,697
8	31	27.0	0.081	9.8	105	160	180	93	143	60	-2,307	-1,799	0	4,830
9	35	30.6	0.080	11.1	228	264	167	83	126	40	-4,170	-2,140	0	7,424
10	39	33.9	0.079	12.5	319	322	153	70	107	16	-4,704	-1,649	0	7,475
11	42	36.8	0.079	13.8	238	222	138	56	84	46	-2,745	-1,017	0	4,426
12	46	40.3	0.078	15.3	340	310	121	35	50	63	-2,731	-975	0	4,360
13	50	44.0	0.077	17.1	266	298	100	27	46	77	-1,458	-712	0	2,554
14	54	48.2	0.077	19.3	305	394	71	53	83	89	-1,242	-632	0	2,206
15	57	51.4	0.076	21.0	379	376	25	68	107	99	-873	-99	0	1,143
16	61	55.3	0.075	23.4	353	357	65	82	128	109	-711	791	28	0
17	65	58.5	0.075	25.4	354	333	93	93	123	107	-303	0	0	357
18	69	61.5	0.074	27.4	343	308	115	102	123	106	334	0	115	0
19	72	63.5	0.073	28.8	345	233	131	110	122	106	880	0	304	0
20	76	64.9	0.073	29.9	226	82	144	117	122	106	893	0	308	0
21	80	66.2	0.072	30.8	268	62	156	123	130	109	1,436	58	515	0
22	84	68.5	0.072	32.7	163	22	168	130	145	117	1,310	68	475	0
23	87	70.2	0.071	34.1	73	6	179	136	157	123	751	30	269	0
24	91	71.2	0.071	34.9	37	0	188	141	167	129	436	0	150	0
25	95	75.6	0.070	38.9	2	0	202	148	183	137	37	0	13	0
					4,628	4,132							2,177	54,190

Savings Summary

	Type	Savings	Units	Utility Type
	Cooling	638	kWh	Electricity
	Heating	542	Therm	Natural Gas - Therm

Version 1.01	Chilled Water	Diesel	Electricity	Fuel Oil	Gasoline	tural Gas - The	Natural Gas - CCF	ral Gas -	Propane	Solid Fuel	Steam	WW	Water	Wood
ECM	Reference	Ton-hrs	gal	kWh	gal	gal	Therm	CCF	MCF	gal	kBtu	kb	kgal	kgal	kBtu
-	-	12.0	130.0	3.413	139.6	114.0	100.0	102.0	1,020.0	91.5	1.0	1.040	1.0	1.0	1.0

Shelter Class Designation (ASHRAE 2013 Fundamentals Ch16 Table 5)

Class	Description
1	*No obstructions or local shielding*
2	*Typical shelter for an isolated rural house*
3	*Typical shelter caused by other buildings across the street from the building under study*
4	*Typical shelter for urban buildings on large lots where sheltering obstacles are more than one building height away*
5	*Typical shelter produced by buildings or other structures that are immediately adjacent (closer than one house height)*

Terrain Category (ASHRAE 2013 Fundamentals Ch 24,Table 1)

Category	Description
1	*Large City Centers, in which at least 50% of buildings are higher than 70 ft, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
2	*Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of a single-family dwelling or larger, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
3	*Open terrain with scattered obstructions having heights generally less than 30 ft, including flat open country typical of meteorological station surroundings*
4	*Flat, unobstructed areas exposed to wind flowing over water for at least 1 mile, over a distance of 1,500 ft or 10 times the height of the structure inland, whichever is greater*

Air Property Lookup

	Temp oF	Density lb/ft3	Enthalpy Btu/lb
Set Point	72	0.0736	26.4
Htg Setback	62	0.0753	21.3
Clg Setup	78	0.0726	29.9

2013 Fund, Ch16 Table 9

Shelter Class	Factor s
1	1.0
2	0.9
3	0.7
4	0.5
5	0.3

2013 Fund, Ch 24, Table 1

Terrain Category	Wind Shear Exponent -	Bound Layer Thickness ft
1	0.33	1,500
2	0.22	1,200
3	0.14	900
4	0.10	700

Height Difference, H

Type	Height
Select	ft
Roof	7.50
Roof-Wall	7.50
Wall	0.00
Door	-4.50
Slab	-7.50

Effective Building Coefficients

Direction	Building Side Ratio	Building Side Area	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness
N	3.0	38%	0.7	0.14	900
E	1.0	13%	0.7	0.14	900
S	3.0	38%	0.7	0.14	900
W	1.0	13%	0.7	0.14	900
	8.0	100%	0.70	0.14	900

Pressure Coefficient, Cp

Wind Direction Degrees	Typical Cp* -	Effective Cp -	Notes -
0	0.6	0.16	Cp(1) = when wind is at 0 deg
90	-0.65	0.17	Cp(3) = when wind is at 90 deg
180	-0.3	0.05	Cp(2) = when wind is at 180 deg
270	-0.65	0.01	Cp(4) = when wind is at 270 deg
		0.103	

*Typical values for pressure coefficients, ASHRAE 2016 Fundamentals, Chapter 16, Eq 29

Wind Direction, Frequency, and Effective Pressure Coefficient Calculation Table

Degrees from North, Rounds to the nearest 10 degrees for lookup table

Wind Direction Degrees	Wind Direction Radians	Freq % Yr	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness	Ref Wall Cp	North Wall Degrees	North Wall Cp	East Wall Degrees	East Wall Cp	South Wall Degrees	South Wall Cp	West Wall Degrees	West Wall Cp
0	0.000	3%	0.700	0.14	900	0.600	0	0.60	90	0.00	180	-0.30	270	0.00
10	0.175	2%	0.700	0.14	900	0.594	10	0.59	100	-0.06	190	-0.30	280	0.18
20	0.349	3%	0.700	0.14	900	0.575	20	0.57	110	-0.11	200	-0.28	290	0.29
30	0.524	2%	0.700	0.14	900	0.544	30	0.54	120	-0.16	210	-0.26	300	0.37
40	0.698	2%	0.700	0.14	900	0.500	40	0.50	130	-0.20	220	-0.24	310	0.44
50	0.873	2%	0.700	0.14	900	0.443	50	0.44	140	-0.24	230	-0.20	320	0.50
60	1.047	2%	0.700	0.14	900	0.374	60	0.37	150	-0.26	240	-0.16	330	0.54
70	1.222	2%	0.700	0.14	900	0.299	70	0.29	160	-0.28	250	-0.11	340	0.57
80	1.396	2%	0.700	0.14	900	0.184	80	0.18	170	-0.30	260	-0.06	350	0.59
90	1.571	1%	0.700	0.14	900	0.000	90	0.00	180	-0.30	270	0.00	0	0.60
100	1.745	1%	0.700	0.14	900	-0.059	100	-0.06	190	-0.30	280	0.18	10	0.59
110	1.920	1%	0.700	0.14	900	-0.114	110	-0.11	200	-0.28	290	0.29	20	0.57
120	2.094	1%	0.700	0.14	900	-0.162	120	-0.16	210	-0.26	300	0.37	30	0.54
130	2.269	1%	0.700	0.14	900	-0.203	130	-0.20	220	-0.24	310	0.44	40	0.50
140	2.443	1%	0.700	0.14	900	-0.237	140	-0.24	230	-0.20	320	0.50	50	0.44
150	2.618	1%	0.700	0.14	900	-0.264	150	-0.26	240	-0.16	330	0.54	60	0.37
160	2.793	1%	0.700	0.14	900	-0.284	160	-0.28	250	-0.11	340	0.57	70	0.29
170	2.967	2%	0.700	0.14	900	-0.296	170	-0.30	260	-0.06	350	0.59	80	0.18
180	3.142	3%	0.700	0.14	900	-0.300	180	-0.30	270	0.00	0	0.60	90	0.00
190	3.316	3%	0.700	0.14	900	-0.296	190	-0.30	280	0.18	10	0.59	100	-0.06
200	3.491	3%	0.700	0.14	900	-0.284	200	-0.28	290	0.29	20	0.57	110	-0.11
210	3.665	3%	0.700	0.14	900	-0.264	210	-0.26	300	0.37	30	0.54	120	-0.16
220	3.840	3%	0.700	0.14	900	-0.237	220	-0.24	310	0.44	40	0.50	130	-0.20
230	4.014	3%	0.700	0.14	900	-0.203	230	-0.20	320	0.50	50	0.44	140	-0.24
240	4.189	3%	0.700	0.14	900	-0.162	240	-0.16	330	0.54	60	0.37	150	-0.26
250	4.363	2%	0.700	0.14	900	-0.114	250	-0.11	340	0.57	70	0.29	160	-0.28
260	4.538	2%	0.700	0.14	900	-0.059	260	-0.06	350	0.59	80	0.18	170	-0.30
270	4.712	2%	0.700	0.14	900	0.000	270	0.00	0	0.60	90	0.00	180	-0.30
280	4.887	2%	0.700	0.14	900	0.184	280	0.18	10	0.59	100	-0.06	190	-0.30
290	5.061	2%	0.700	0.14	900	0.299	290	0.29	20	0.57	110	-0.11	200	-0.28
300	5.236	3%	0.700	0.14	900	0.374	300	0.37	30	0.54	120	-0.16	210	-0.26
310	5.411	3%	0.700	0.14	900	0.443	310	0.44	40	0.50	130	-0.20	220	-0.24
320	5.585	5%	0.700	0.14	900	0.500	320	0.50	50	0.44	140	-0.24	230	-0.20
330	5.760	6%	0.700	0.14	900	0.544	330	0.54	60	0.37	150	-0.26	240	-0.16
340	5.934	5%	0.700	0.14	900	0.575	340	0.57	70	0.29	160	-0.28	250	-0.11
350	6.109	4%	0.700	0.14	900	0.594	350	0.59	80	0.18	170	-0.30	260	-0.06
		88%												

*Cp equations assume low-rise building (3 stories or less), rectangular form, longest wall less than three times the length of shortest wall.

eCalcs: Energy Calculation Suite

Life Is On Schneider Electric

Secaucus - Town Hall

Infiltration

Building Data

Building Name	Town Hall
Weather City	NJ, Teterboro
Building Height, ft	60
Building Orientation, deg	0
Building L/W Ratio	2.0
Internal Draft Coefficient	0.7

Building Operating Conditions

Occupied Set Point Temp, oF	70.0
Cooling Setup Temp, oF	80.0
Percent of Building Cooled, %	100%
Cooling Seasonal Efficiency, %	290%
Heating Setback Temp, oF	55.0
Percent of Building Heated, %	100%
Heating Seasonal Efficiency, %	80%

Shelter Characteristics

Direction	Shelter Class	Terrain Category
See Reference Tables for Descriptions		
North	3	3
East	3	3
South	3	3
West	3	3

Building Crack Definitions

Penetration	Type	H	Qty	Length	Gap	% Open	Total Area	Wall Only
Name	*Select*	*ft*	*#*	*ft*	*inches*	*%*	*sqft*	*sqft*
Crack 1	Door	-27.0	1	66	1/8	50%	0.3	0.3
Crack 2	Door	-27.0	1	40	1/8	50%	0.2	0.2
Crack 3	Roof-Wall	30.0	1	45	1/8	50%	0.2	0.2
Crack 4	Roof-Wall	30.0	1	423	1/2	25%	4.4	4.4
Crack 5	Roof-Wall	30.0	1	15	1/8	50%	0.1	0.1
Crack 6	Wall	0.0				100%	0.0	0.0
Crack 7	Wall	0.0				100%	0.0	0.0
Crack 8	Wall	0.0				100%	0.0	0.0
Crack 9	Wall	0.0				100%	0.0	0.0
Crack 10	Wall	0.0				100%	0.0	0.0
Crack 11	Wall	0.0				100%	0.0	0.0
Crack 12	Wall	0.0				100%	0.0	0.0
Crack 13	Wall	0.0				100%	0.0	0.0
Effective H (Wall Only)		24.0					5.3	5.3

Notes: H is the height difference between the crack and the neutral pressure level of the building.

Effective Building Coefficients

Shelter Coefficient	0.7
Wind Shear Exponent	0.14
Boundary Layer Thickness, ft	900
Wall Pressure Coefficient	0.10
Roof Pressure Coefficient	-0.30

Site Parameters

Average Wind Speed, mph	8.2
Site Corrected Wind Speed, mph	8.9
Model Wind Coefficient	0.25
Draft Factor	0.13
Volume Factor, ft/min (in-wg)^0.5	2.603

Energy Engineering Calculations

Ref	Mid Pt Temp oF	MCWB oF	Density lb/ft3	Enthalpy Btu/lb	Temperature Bin Hours Schedule2 Occupied hrs/yr	Temperature Bin Hours Unocc hrs/yr	Calculated Infiltration Rates Occupied Rates Wall cfm	Occupied Rates Roof cfm	Unoccupied Rates Wall cfm	Unoccupied Rates Roof cfm	Energy Transfer Occupied Load kBtu/yr	Energy Transfer Unocc Load kBtu/yr	Energy Savings Cooling Savings kBtu/yr	Energy Savings Heating Savings kBtu/yr
1	5	1.9	0.085	1.5	3	4	2,712	0	2,408	0	-993	-823	0	2,270
2	9	5.9	0.085	2.6	12	17	2,629	0	2,315	0	-3,630	-3,099	0	8,411
3	12	9.4	0.084	3.7	22	34	2,547	0	2,221	0	-6,096	-5,496	0	14,490
4	16	13.9	0.083	5.1	37	61	2,458	0	2,119	0	-9,178	-8,427	0	22,007
5	20	17.2	0.083	6.2	29	61	2,372	0	2,018	0	-6,513	-7,296	0	17,261
6	24	21.2	0.082	7.6	31	96	2,280	0	1,909	0	-6,158	-9,533	0	19,614
7	27	24.1	0.081	8.6	58	202	2,190	0	1,801	0	-10,303	-16,833	0	33,921
8	31	27.0	0.081	9.8	68	197	2,097	0	1,687	0	-10,688	-13,420	0	30,135
9	35	30.6	0.080	11.1	141	351	1,998	0	1,561	0	-19,143	-18,460	0	47,004
10	39	33.9	0.079	12.5	206	435	1,894	0	1,426	0	-23,735	-16,651	0	50,482
11	42	36.8	0.079	13.8	161	299	1,788	0	1,282	0	-15,649	-7,912	0	29,452
12	46	40.3	0.078	15.3	243	407	1,671	0	1,114	0	-18,936	-5,976	0	31,140
13	50	44.0	0.077	17.1	191	373	1,543	0	910	0	-11,227	-1,675	0	16,127
14	54	48.2	0.077	19.3	219	480	1,395	0	628	0	-8,489	1,531	0	8,697
15	57	51.4	0.076	21.0	244	511	1,245	0	605	0	-5,954	0	0	7,442
16	61	55.3	0.075	23.4	216	494	1,056	0	602	0	-2,007	0	0	2,508
17	65	58.5	0.075	25.4	249	438	844	0	599	0	61	0	21	0
18	69	61.5	0.074	27.4	234	417	559	0	596	0	1,223	0	422	0
19	72	63.5	0.073	28.8	189	389	195	0	594	0	568	0	196	0
20	76	64.9	0.073	29.9	126	182	602	0	592	0	1,512	0	521	0
21	80	66.2	0.072	30.8	162	168	822	0	590	0	3,192	0	1,101	0
22	84	68.5	0.072	32.7	114	71	1,020	0	121	0	3,682	54	1,288	0
23	87	70.2	0.071	34.1	57	22	1,171	0	563	0	2,495	152	913	0
24	91	71.2	0.071	34.9	34	3	1,289	0	779	0	1,776	36	625	0
25	95	75.6	0.070	38.9	2	0	1,465	0	1,044	0	167	0	57	0
					3,048	5,712							5,144	340,961

Savings Summary

Type	Savings	Units	Utility Type
Cooling	1,507	kWh	Electricity
Heating	3,410	Therm	Natural Gas - Therm

Version 1.01	Chilled Water	Diesel	Electricity	Fuel Oil	Gasoline	tural Gas - The	Natural Gas - CCF	ral Gas -	Propane	Solid Fuel	Steam	WW	Water	Wood
ECM	*Reference*	*Ton-hrs*	*gal*	*kWh*	*gal*	*gal*	*Therm*	*CCF*	*MCF*	*gal*	*kBtu*	*klb*	*kgal*	*kgal*	*kBtu*
-	-	12.0	130.0	3.413	139.6	114.0	100.0	102.0	1,020.0	91.5	1.0	1,040	1.0	1.0	1.0

Shelter Class Designation (ASHRAE 2013 Fundamentals Ch16 Table 5)

Class	Description
1	*No obstructions or local shielding*
2	*Typical shelter for an isolated rural house*
3	*Typical shelter caused by other buildings across the street from the building under study*
4	*Typical shelter for urban buildings on large lots where sheltering obstacles are more than one building height away*
5	*Typical shelter produced by buildings or other structures that are immediately adjacent (closer than one house height)*

Terrain Category (ASHRAE 2013 Fundamentals Ch 24,Table 1)

Category	Description
1	*Large City Centers, in which at least 50% of buildings are higher than 70 ft, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
2	*Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of a single-family dwelling or larger, over a distance of at least 0.5 miles or 10 times the height of the structure upwind, whichever is greater*
3	*Open terrain with scattered obstructions having heights generally less than 30 ft, including flat open country typical of meteorological station surroundings*
4	*Flat, unobstructed areas exposed to wind flowing over water for at least 1 mile, over a distance of 1,500 ft or 10 times the height of the structure inland, whichever is greater*

Air Property Lookup

	Temp oF	Density lb/ft3	Enthalpy Btu/lb
Set Point	70	0.0739	25.3
Htg Setback	55	0.0765	18.2
Clg Setup	80	0.0722	31.2

2013 Fund, Ch16 Table 9

Shelter Class	Factor s
1	1.0
2	0.9
3	0.7
4	0.5
5	0.3

2013 Fund, Ch 24, Table 1

Terrain Category	Wind Shear Exponent -	Bound Layer Thickness ft
1	0.33	1,500
2	0.22	1,200
3	0.14	900
4	0.10	700

Height Difference, H

Type	Height
Select	*ft*
Roof	30.00
Roof-Wall	30.00
Wall	0.00
Door	-27.00
Slab	-30.00

Effective Building Coefficients

Direction	Building Side Ratio	Building Side Area	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness
N	2.0	33%	0.7	0.14	900
E	1.0	17%	0.7	0.14	900
S	2.0	33%	0.7	0.14	900
W	1.0	17%	0.7	0.14	900
	6.0	100%	0.70	0.14	900

Pressure Coefficient, Cp

Wind Direction Degrees	Typical Cp' -	Effective Cp -	Notes -
0	0.6	0.16	Cp(1) = when wind is at 0 deg
90	-0.65	0.17	Cp(3) = when wind is at 90 deg
180	-0.3	0.05	Cp(2) = when wind is at 180 deg
270	-0.65	0.01	Cp(4) = when wind is at 270 deg
		0.102	

'Typical values for pressure coefficients, ASHRAE 2016 Fundamentals, Chapter 16, Eq 29

Wind Direction, Frequency, and Effective Pressure Coefficient Calculation Table

Degrees from North, Rounds to the nearest 10 degrees for lookup table

Wind Direction Degrees	Wind Direction Radians	Freq % Yr	Shelter Class	Wind Shear Exponent	Boundary Layer Thickness	Ref Wall Cp	North Wall Degrees	North Wall Cp	East Wall Degrees	East Wall Cp	South Wall Degrees	South Wall Cp	West Wall Degrees	West Wall Cp
0	0.000	3%	0.700	0.14	900	0.600	0	0.60	90	0.00	180	-0.30	270	0.00
10	0.175	2%	0.700	0.14	900	0.594	10	0.59	100	-0.06	190	-0.30	280	0.18
20	0.349	3%	0.700	0.14	900	0.575	20	0.57	110	-0.11	200	-0.28	290	0.29
30	0.524	2%	0.700	0.14	900	0.544	30	0.54	120	-0.16	210	-0.26	300	0.37
40	0.698	2%	0.700	0.14	900	0.500	40	0.50	130	-0.20	220	-0.24	310	0.44
50	0.873	2%	0.700	0.14	900	0.443	50	0.44	140	-0.24	230	-0.20	320	0.50
60	1.047	2%	0.700	0.14	900	0.374	60	0.37	150	-0.26	240	-0.16	330	0.54
70	1.222	2%	0.700	0.14	900	0.289	70	0.29	160	-0.28	250	-0.11	340	0.57
80	1.396	2%	0.700	0.14	900	0.184	80	0.18	170	-0.30	260	-0.06	350	0.59
90	1.571	1%	0.700	0.14	900	0.000	90	0.00	180	-0.30	270	0.00	0	0.60
100	1.745	1%	0.700	0.14	900	-0.059	100	-0.06	190	-0.30	280	0.18	10	0.59
110	1.920	1%	0.700	0.14	900	-0.114	110	-0.11	200	-0.28	290	0.29	20	0.57
120	2.094	1%	0.700	0.14	900	-0.162	120	-0.16	210	-0.26	300	0.37	30	0.54
130	2.269	1%	0.700	0.14	900	-0.203	130	-0.20	220	-0.24	310	0.44	40	0.50
140	2.443	1%	0.700	0.14	900	-0.237	140	-0.24	230	-0.20	320	0.50	50	0.44
150	2.618	1%	0.700	0.14	900	-0.264	150	-0.26	240	-0.16	330	0.54	60	0.37
160	2.793	1%	0.700	0.14	900	-0.284	160	-0.28	250	-0.11	340	0.57	70	0.29
170	2.967	2%	0.700	0.14	900	-0.296	170	-0.30	260	-0.06	350	0.59	80	0.18
180	3.142	3%	0.700	0.14	900	-0.300	180	-0.30	270	0.00	0	0.60	90	0.00
190	3.316	3%	0.700	0.14	900	-0.296	190	-0.30	280	0.18	10	0.59	100	-0.06
200	3.491	3%	0.700	0.14	900	-0.284	200	-0.28	290	0.29	20	0.57	110	-0.11
210	3.665	3%	0.700	0.14	900	-0.264	210	-0.26	300	0.37	30	0.54	120	-0.16
220	3.840	3%	0.700	0.14	900	-0.237	220	-0.24	310	0.44	40	0.50	130	-0.20
230	4.014	3%	0.700	0.14	900	-0.203	230	-0.20	320	0.50	50	0.44	140	-0.24
240	4.189	3%	0.700	0.14	900	-0.162	240	-0.16	330	0.54	60	0.37	150	-0.26
250	4.363	2%	0.700	0.14	900	-0.114	250	-0.11	340	0.57	70	0.29	160	-0.28
260	4.538	2%	0.700	0.14	900	-0.059	260	-0.06	350	0.59	80	0.18	170	-0.30
270	4.712	2%	0.700	0.14	900	0.000	270	0.00	0	0.60	90	0.00	180	-0.30
280	4.887	2%	0.700	0.14	900	0.184	280	0.18	10	0.59	100	-0.06	190	-0.30
290	5.061	2%	0.700	0.14	900	0.289	290	0.29	20	0.57	110	-0.11	200	-0.28
300	5.236	3%	0.700	0.14	900	0.374	300	0.37	30	0.54	120	-0.16	210	-0.26
310	5.411	3%	0.700	0.14	900	0.443	310	0.44	40	0.50	130	-0.20	220	-0.24
320	5.585	5%	0.700	0.14	900	0.500	320	0.50	50	0.44	140	-0.24	230	-0.20
330	5.760	6%	0.700	0.14	900	0.544	330	0.54	60	0.37	150	-0.26	240	-0.16
340	5.934	5%	0.700	0.14	900	0.575	340	0.57	70	0.29	160	-0.28	250	-0.11
350	6.109	4%	0.700	0.14	900	0.594	350	0.59	80	0.18	170	-0.30	260	-0.06
		88%												

Cp equations assume low-rise building (3 stories or less), rectangular form, longest wall less than three times the length of shortest wall.

LED Lighting - O&M Savings Calculations (Material Only)

	Annual Replacement Cost
Recereational Center	$ 1,972
DPW	$ 118
Old Recreational Center	$ 6
Town Hall	$ 199
Pumping Station	$ 214
Teen & Tot Center	$ 30
Museum	$ 820
Firehouse County	$ 509
Fire House Peterson	$ 139
Town Pool	$ 816
7th Street Fire House	$ -
Ice Rink	$ 577
Town Clerk	$ 415
Total=	**$ 5,815**

Notes:
Note the lamp replacement cost is $6 for the interior and $50 for exterior pole lights
Also, Interior ballast is $30 whereas the exterior ballast is $175.
The exterior light and ballast are manually entered.
Ballasts are replaced every 8 years.
Lamps are replaced every 6 years

7.2 New Jersey Direct Install Reports

Please see the following pages.

PROJECT AGREEMENT

THIS CONTRACT made this 8th of June, 2021 by and between
Donnelly Energy, hereinafter called the Program Manager and
Secaucus Town, hereinafter called the Customer.
Street address: 1203 Paterson Plank Road
City/State/Zip: Secaucus, NJ 07094

Witnesseth, that the Program Manager and the Customer for the consideration names as follows:

Article 1. Scope of the Work

The Customer understands that Donnelly Energy, under the NJ Clean Energy Direct Install Program (Program), shall supply and install the Energy Efficiency Measures at the address as specified in the Scope of Work Attachment (SOWA) to the Direct Install Program Participation Agreement to be executed by Donnelly Energy and the Customer. Please refer to the attached SOWA for the list of proposed measures.

Article 2. Changes to Scope of the Work

The Customer understands that conditions discovered during installation may prevent some measures identified in the energy assessment from being installed or some areas may require additional measures/quantities to be installed. Any alteration or deviation from the SOWA, including, but not limited to, any such alteration or deviation involving additional material and/or labor costs, will only be commenced upon written or verbal order for the changes. If there is any charge for such alteration or deviation, the additional charge or credit will be added to or subtracted from the SOWA. The CUSTOMER PORTION will be adjusted accordingly.

Article 3. Extra Work Outside the Program

The Customer understands that conditions may be discovered during installation, including apparent or hidden safety issues or code violations, which will result in additional work and costs, which do not qualify for any incentive monies under the Program. The extra work includes but is not limited to the following: township requirements, upgrades to code violations, guard rails, privacy screens, remote test stations, smoke detector tie-ins, outlet lights, asbestos removal, unforeseen circumstances, overtime labor (including night and weekend work), engineering fees, and the Customer's request for additional work. Donnelly Energy agrees to provide the Customer with notice of the extra work required and additional charges in connection therewith. If the Customer finds the additional charges unacceptable, the Customer shall have the right to cancel the Project Agreement within ten (10) days after receipt of such notice. The Customer expressly acknowledges and understands that these costs fall outside the parameters of the Program, and such work does not qualify for any Program incentive monies. Thus, the Customer is 100% responsible for and shall pay Donnelly Energy and/or its sub-contractors 100% of these costs. Donnelly Energy reserves the right to cancel the Project should the Customer withhold payment for any and all extra work arising under this Article.

Article 4. The Contract Price

The Customer agrees to pay the Donnelly Energy the sum of Two Hundred Fifty Three Thousand Seven Hundred Fifty Two Dollars and Fifty Nine Cents ($253,752.59) representing the CUSTOMER PORTION as shown on the SOWA, subject to the provisions regarding Extra Work as set forth in Article 3.

Article 5. Payment

The Customer agrees to pay 50% of the CUSTOMER PORTION before the commencement of work. The remaining balance of the CUSTOMER PORTION and payment for all approved extra work is due within 10 days from the date of the final invoice. The INCENTIVE PORTION from NJ Clean Energy shall be paid directly to Donnelly Energy upon Project close-out.

If the Customer is approved for the New Jersey Natural Gas financing option to pay the CUSTOMER PORTION, the Customer agrees to immediately sign and return the final promissory note to New Jersey Natural Gas upon receipt after Project completion. The Customer also agrees and does hereby assign all proceeds received from New Jersey Natural Gas to Donnelly Energy, and agrees to pay 100% of the CUSTOMER PORTION immediately upon receipt of said funds from New Jersey Natural Gas.

If the Customer is approved for any other financing option to pay the CUSTOMER PORTION, the CUSTOMER PORTION shall be paid directly to Donnelly Energy by the financing company.

Article 6. Customer Responsibilities

The Customer shall

- Make the installation area accessible and clear of all debris.
- Provide a safe, accessible work space.
- Provide access to the site for all phases of (pre)construction.
- Notify Donnelly Energy of any known asbestos and/or environmental issues.
- Provide sufficient area for crane, dumpster, and other related construction equipment / materials (if required).

Article 7. General Provisions

1) If payment is not made when due, Donnelly Energy may suspend the work on the Project until all payments due have been made. A failure to make payments when due shall be deemed a material breach of this Project Agreement. If the Customer has multiple projects contracted with Donnelly Energy through the Program, Donnelly Energy reserves the right to suspend installation on all projects until payment is made.

2) All work shall be completed in a workman-like manner and in compliance with all building codes and other applicable laws.

3) To the extent required by law, all work shall be performed by individuals duly licensed and authorized by law to perform said work.

4) Donnelly Energy may at its discretion engage sub-contractors to perform the work hereunder, provided Donnelly Energy shall pay said sub-contractor and in all instances remain responsible for the proper completion of the work under this Project Agreement.

5) Donnelly Energy and/or its sub-contractors shall obtain all permits necessary for the work to be performed. The Customer is not responsible for the permit costs associated with the installation of the measures listed in the SOWA. However, the Customer is responsible for all permit costs associated with the extra work that is not part of the SOWA.

6) In the event the Customer fails to fulfill any Customer Responsibilities as stated in Article 6, Donnelly Energy may cease the work without breach pending resolution of any dispute.

7) Donnelly Energy shall not be liable for any delay due to circumstances beyond its control including strikes, casualty, weather conditions or general unavailability of materials.

8) Once all the measures listed under the Direct Install SOWA are installed, Donnelly Energy will issue a Measure Acceptance Form (MAF) as part of the project close-out process. The MAF shall be delivered either by email, fax, or in person. The Program requires the Customer's signed Measure of Acceptance Form (MAF) in order to release payment for the INCENTIVE PORTION which must be signed by the customer within 7 days.

9) Donnelly Energy warrants all labor and material for a period of one (1) year following the installation of each Energy Efficiency Measure. The warranty on the applicable measures starts from the day the MAF is delivered to the Customer. Donnelly Energy's warranty excludes remedy for damage or defect caused by abuse, alterations to the work not executed by Donnelly Energy, improper or insufficient maintenance, or improper operation. All manufacturer warranties apply and are subject to the proper maintenance by the end user per manufacturer's guidelines. In order to keep the warranty valid on all measures installed under the Direct Install SOWA, all concerns must be directed to Donnelly Energy only. Donnelly Energy will co-ordinate the service concerns during the warranty period. If the installed measure is serviced by any contractor that is not delegated by Donnelly Energy, then the Customer is responsible for all costs and the warranty will be voided. In the event that the Customer is unable to reach Donnelly Energy or in the case of an emergency, the customer must contact the contractor who had performed the installation of the concerned measure.

10) Donnelly Energy has full discretion to supply and install any equipment that meets the Program requirements.

11) TAX EXEMPT ORGANIZATIONS: the Project price does not include sales tax on labor & material. However, the Customer must provide a copy of "Exempt Organization Certificate – ST.5" before the execution of this Project Agreement.

12) NON-TAX EXEMPT ORGANIZATIONS: the price reflects sales tax on material only. The labor is not taxable since the work qualifies as a tax exempt capital improvement. However, the Customer must provide a fully completed and signed "Certificate of Exempt Capital Improvement – ST.8" before the execution of this Project Agreement. Failure to provide the ST.8 will result in the Customer being liable to pay sales tax on the labor.

13) PUBLIC ENTITIES: The Customer acknowledges that pursuant to 26 U.S.C. §179D(d)(4), Donnelly Energy is considered the designer of the Project for the purpose of taking the §179D deduction. Therefore, the Customer cannot allocate the §179D deduction to a third-party. Allocation of the §179D deduction to Donnelly Energy is part of this Project Agreement and must be signed by the Customer.

14) The Customer agrees to transfer the capacity rights, generated by installation of the Direct Install measures listed in the SOWA, to Donnelly Energy. Donnelly Energy intends to auction these rights at the PJM Capacity Market. The Customer individually would not qualify to participate in this auction due to PJM's requirement of having a minimum of 100 kW capacity reduction rights.

15) If the Customer is declined for financing for any reason by any agency, the payment terms as described in Article 5 do not apply and payment of 100% of the CUSTOMER PORTION is required before the commencement of work.

16) In the event the Customer fails to pay any amount owed to Donnelly Energy, the Customer agrees that if Donnelly Energy proceeds with collection of any outstanding amount due under this Project Agreement, including but not limited to, communications with Customer, filing of mechanics lien or the filing of a suit against the Customer for any amount owed to Donnelly Energy, Donnelly Energy will be entitled to collect from the Customer and the Customer agrees to be responsible for and to pay all reasonable attorney's fees, interest and cost. Any unpaid amount due shall bear interest at an annual rate of 12% from the date it was originally owed.

17) The Customer shall not make any alterations to the building and the installed Energy Efficiency Measures prior to the Direct Install post inspection and authorization for incentive payment by the Program and/or TRC.

18) The pricing and the Program parameters have been established by the Program and are subject to change. This Project Agreement shall be considered void upon any Program changes. In such cases, an updated Direct Install Program Participation Agreement, SOWA, and new Project Agreement will be issued.

19) The Customer shall have the right to terminate this Project Agreement for any reason upon fifteen (15) days of notice to Donnelly Energy. In the event the Customer terminates the Project Agreement, the Project no longer qualifies for any incentives under the Program. Therefore, upon termination, the Customer agrees to pay Donnelly Energy all costs incurred including the full cost of any work performed, re-stocking fees, permit fees, and any other costs incurred by Donnelly Energy under this Project Agreement prior to the date of termination.

20) The Customer permits Donnelly Energy to obtain utility bills, usage summary reports, and statements from their Gas and Electric Utility companies.

21) Customer agrees to allow use of project specific information and photographs by Donnelly Energy for marketing purposes including but not limited to featured case studies and social media.

Date Signed: 6/22/2021

By: DocuSigned by: Gary Jeffas C86D7C651BAC4F4...
Signature

Gary Jeffas
Name of Customer (Print)

Town Administrator
Title/Position

By: DocuSigned by: Justin Avallone B89BC7178092401...
Signature

Justin Avallone
Program Manager
Donnelly Energy

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21168

"Parties":

Participating Customer*:	**Town Of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Old Rec Center**			
Facility Address:	**123 Center Ave**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

The Participating Customer (or "Customer") agrees to have Contractor perform retrofit work in connection with the Measures listed on page 2 of this form (attached). In consideration of the Contractor's performance of such work, Customer agrees to pay Contractor based on the measure costs listed below under Customer Unit Cost for the number of completed units for each Measure upon receipt of invoice; provided the Contractor may collect a deposit from Customer prior to performing such work, in which case the final invoice shall be net of such deposit. Customer and Contractor understand that conditions discovered during installation may require that some measures identified in the energy assessment cannot be installed, or some areas may require additional measures/quantities to be installed. Should conditions in the field dictate that the Estimated Program Total Cost shown on page 2 increase by more than 10%, Contractor must obtain both Program Administrator and Customer written approval in the form of an amended Scope of Work Attachment before proceeding with such additional work.

By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by: Gary Jeffas C86D7C651BAC4F4... 6/22/2021

Participating Customer Date

DocuSigned by: Justin Avallone D89DC7178092484... 6/15/2021

Participating Contractor Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp/Reballast: Plug & Play LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Hall	1	$ 73.16	$ 37.74	$ 35.42
Fixture Replacement: LED Exit Sign: 2.3 W / exit signs	4	$ 291.60	$ 150.42	$ 141.18
Electric Split System A/C: 7.5-Tons / System 01	1	$ 14,732.09	$ 7,599.48	$ 7,132.61
Electric Split System A/C: 7.5-Tons / System 02	1	$ 14,732.09	$ 7,599.48	$ 7,132.61
Programmable Thermostats / Wall	2	$ 442.00	$ 228.00	$ 214.00
Low-Flow Aerators (Lavatory) / Restroom	6	$ 71.40	$ 36.83	$ 34.57
Pipe Wrap Insulation / HW	1	$ 483.00	$ 249.15	$ 233.85
Pipe Wrap Insulation / HW	1	$ 417.00	$ 215.11	$ 201.89
TOTALS**		$ 31,242.34	$ 16,116.22	$ 15,126.12

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21173

"Parties":				
Participating Customer*:	**Town of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**7th St Firehouse**			
Facility Address:	**764 7th Street**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

The Participating Customer (or "Customer") agrees to have Contractor perform retrofit work in connection with the Measures listed on page 2 of this form (attached). In consideration of the Contractor's performance of such work, Customer agrees to pay Contractor based on the measure costs listed below under Customer Unit Cost for the number of completed units for each Measure upon receipt of invoice; provided the Contractor may collect a deposit from Customer prior to performing such work, in which case the final invoice shall be net of such deposit. Customer and Contractor understand that conditions discovered during installation may require that some measures identified in the energy assessment cannot be installed, or some areas may require additional measures/quantities to be installed. Should conditions in the field dictate that the Estimated Program Total Cost shown on page 2 increase by more than 10%, Contractor must obtain both Program Administrator and Customer written approval in the form of an amended Scope of Work Attachment before proceeding with such additional work.

By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by: Gary Jeffas C88D7C8051BAC4F4... — 6/22/2021

Participating Customer — Date

DocuSigned by: Justin Avallone B09BC7170092401... — 6/15/2021

Participating Contractor — Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Gas-Fired Boiler / boiler room	1	$ 19,137.00	$ 17,377.57	$ 1,759.43
Programmable Thermostats / Wall	1	$ 221.00	$ 200.68	$ 20.32
Low-Flow Aerators (Lavatory) / Restroom	2	$ 23.80	$ 21.61	$ 2.19
TOTALS**		$ 19,381.80	$ 17,599.86	$ 1,781.94

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21167

"Parties":				
Participating Customer*:	**Town Of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus DPW**			
Facility Address:	**370 Secaucus Rd**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

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By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by: Gary Jeffas C86D7C651BAC4E4... 6/22/2021

Participating Customer Date

DocuSigned by: Justin Avallone B89BC7178092401... 6/15/2021

Participating Contractor Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Fixture Replacement: LED High/Low Bay (90 - 480W): 213 W / 1-garage	12	$ 4,665.96	$ 1,273.48	$ 3,392.48
Fixture Replacement: Linear Ambient Luminaire - 2' (15 - 40W): 20 W / 1-garage	1	$ 236.69	$ 64.60	$ 172.09
Fixture Replacement: LED High/Low Bay (90 - 480W): 213 W / 1-garage	3	$ 1,004.49	$ 274.15	$ 730.34
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Stand. - 12.5W) / 1-garage	2	$ 123.56	$ 33.72	$ 89.84
Relamp: Direct Line LED - 8' Conversion Kit - (4) 4-Foot T8 Lamps (Stand. - 12.5W) / 1-garage	1	$ 108.15	$ 29.52	$ 78.63
Fixture Replacement: LED Outdoor Wall Mount (14 - 60W): 43 W / E-façade	5	$ 1,234.25	$ 336.86	$ 897.39
Gas-Fired Boiler / System 05	1	$ 14,770.00	$ 4,031.16	$ 10,738.84
Programmable Thermostats / wall	1	$ 221.00	$ 60.32	$ 160.68
Low-Flow Aerators (Lavatory) / restroom	6	$ 71.40	$ 19.49	$ 51.91
Low-Flow Aerators (Kitchen) / break room	2	$ 24.80	$ 6.77	$ 18.03
Low-Flow Showerheads / locker room	4	$ 119.00	$ 32.48	$ 86.52
Pipe Wrap Insulation / Boiler room	1	$ 2,160.00	$ 589.53	$ 1,570.47
TOTALS**		$ 24,739.30	$ 6,752.07	$ 17,987.23

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21174

"Parties":				
Participating Customer*:	**Town of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus Fire House - Paterson**			
Facility Address:	**1567 Paterson Plank Road**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

The Participating Customer (or "Customer") agrees to have Contractor perform retrofit work in connection with the Measures listed on page 2 of this form (attached). In consideration of the Contractor's performance of such work, Customer agrees to pay Contractor based on the measure costs listed below under Customer Unit Cost for the number of completed units for each Measure upon receipt of invoice; provided the Contractor may collect a deposit from Customer prior to performing such work, in which case the final invoice shall be net of such deposit. Customer and Contractor understand that conditions discovered during installation may require that some measures identified in the energy assessment cannot be installed, or some areas may require additional measures/quantities to be installed. Should conditions in the field dictate that the Estimated Program Total Cost shown on page 2 increase by more than 10%, Contractor must obtain both Program Administrator and Customer written approval in the form of an amended Scope of Work Attachment before proceeding with such additional work.

By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by:
Gary Jeffas
C86D7C651BAC4E4...

6/22/2021

Participating Customer — Date

DocuSigned by:
Justin Avallone
B09BC7170092401...

6/15/2021

Participating Contractor — Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp: LED - A-Lamp (3 - 25W): 9 W / F3 - Radio / Storage - 3	1	$ 20.76	$ 14.76	$ 6.00
Fixture Replacement: Linear Ambient Luminaire - 8' (60 - 100W): 75 W / F1 - Kitchen - 6	2	$ 628.44	$ 446.70	$ 181.74
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / BF - Boiler Room - 7	1	$ 71.49	$ 50.82	$ 20.67
Relamp: LED - A-Lamp (3 - 25W): 9 W / BF - Boiler Room - 7	1	$ 20.76	$ 14.76	$ 6.00
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / F2 - Room 1 - 9	6	$ 550.32	$ 391.17	$ 159.15
Relamp: LED - A-Lamp (3 - 25W): 9 W / F2 - Room 1 - 9	1	$ 20.76	$ 14.76	$ 6.00
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / F2 - Restroom - 10	1	$ 71.49	$ 50.82	$ 20.67
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / F2 - Gym - 11	5	$ 458.60	$ 325.98	$ 132.62
Fixture Replacement: LED Outdoor Wall Mount (14 - 60W): 40 W / Exterior "A"	2	$ 500.12	$ 355.49	$ 144.63
Fixture Replacement: LED Outdoor Wall Mount (14 - 60W): 22 W / Exterior "B"	2	$ 383.96	$ 272.92	$ 111.04
Fixture Replacement: LED Outdoor Wall Mount (14 - 60W): 43 W / Exterior "C"	1	$ 268.35	$ 190.75	$ 77.60
Packaged RTU (Single-Phase, Gas Heating): 5-Tons / Roof	1	$ 12,200.00	$ 8,671.87	$ 3,528.13
Gas-Fired Boiler / Boiler Room	1	$ 38,059.36	$ 27,052.95	$ 11,006.41
Electronic Fuel-Use Economizers (for Forced Air Heat) / Roof	1	$ 541.00	$ 384.55	$ 156.45
Programmable Thermostats / Wall	2	$ 442.00	$ 314.18	$ 127.82
Low-Flow Aerators (Lavatory) / RR	4	$ 47.60	$ 33.83	$ 13.77
Pipe Wrap Insulation / Boiler Room	1	$ 202.50	$ 143.94	$ 58.56
Pipe Wrap Insulation / Boiler Room	1	$ 660.00	$ 469.13	$ 190.87
TOTALS**		$ 55,147.51	$ 39,199.37	$ 15,948.14

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21172

"Parties":				
Participating Customer*:	**Town of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus Firehouse County**			
Facility Address:	**227 County Ave**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

The Participating Customer (or "Customer") agrees to have Contractor perform retrofit work in connection with the Measures listed on page 2 of this form (attached). In consideration of the Contractor's performance of such work, Customer agrees to pay Contractor based on the measure costs listed below under Customer Unit Cost for the number of completed units for each Measure upon receipt of invoice; provided the Contractor may collect a deposit from Customer prior to performing such work, in which case the final invoice shall be net of such deposit. Customer and Contractor understand that conditions discovered during installation may require that some measures identified in the energy assessment cannot be installed, or some areas may require additional measures/quantities to be installed. Should conditions in the field dictate that the Estimated Program Total Cost shown on page 2 increase by more than 10%, Contractor must obtain both Program Administrator and Customer written approval in the form of an amended Scope of Work Attachment before proceeding with such additional work.

By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by: Gary Jeffas C86D7C651BAC4F4...	6/22/2021	DocuSigned by: Justin Avallone D89DC7178092484...	6/15/2021
Participating Customer	Date	Participating Contractor	Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 3-kitchen electrical panel	1	$ 71.49	$ 14.30	$ 57.19
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 3-kitchen	4	$ 285.96	$ 57.19	$ 228.77
Relamp: LED - A-Lamp (3 - 25W): 10 W / 3-kitchen	3	$ 61.80	$ 12.36	$ 49.44
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 3-classroom 1-3	24	$ 1,715.76	$ 343.15	$ 1,372.61
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 3-store room	1	$ 71.49	$ 14.30	$ 57.19
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 3-hall	5	$ 357.45	$ 71.49	$ 285.96
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 2.5-mens room	5	$ 357.45	$ 71.49	$ 285.96
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 2.5-womens room	4	$ 285.96	$ 57.19	$ 228.77
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 2.5-lounge	6	$ 428.94	$ 85.79	$ 343.15
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 2.5-hall	2	$ 142.98	$ 28.60	$ 114.38
Relamp: Direct Line LED - 2-Lamp - 2-Foot T8 / small stair(3-2.5)	1	$ 65.07	$ 13.01	$ 52.06
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-lounge	5	$ 357.45	$ 71.49	$ 285.96
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-garage bay 2	12	$ 1,025.04	$ 205.01	$ 820.03
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-garage bay 2	6	$ 512.52	$ 102.50	$ 410.02
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-garage bay 1	1	$ 71.49	$ 14.30	$ 57.19
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-garage tool room	2	$ 142.98	$ 28.60	$ 114.38
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-garage tool room storage	1	$ 71.49	$ 14.30	$ 57.19
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-garage laundry	1	$ 71.49	$ 14.30	$ 57.19
Relamp: Direct Line LED - 2-Lamp - 2-Foot T8 / stair A	4	$ 260.28	$ 52.06	$ 208.22
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / B-mech room garage	2	$ 142.98	$ 28.60	$ 114.38
Pipe Wrap Insulation / mech rm garage	1	$ 165.00	$ 33.00	$ 132.00
TOTALS**		$ 6,665.07	$ 1,333.01	$ 5,332.06

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21175

"Parties":				
Participating Customer*:	**Town of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus Ice Rink**			
Facility Address:	**150 Plaza Center**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

The Participating Customer (or "Customer") agrees to have Contractor perform retrofit work in connection with the Measures listed on page 2 of this form (attached). In consideration of the Contractor's performance of such work, Customer agrees to pay Contractor based on the measure costs listed below under Customer Unit Cost for the number of completed units for each Measure upon receipt of invoice; provided the Contractor may collect a deposit from Customer prior to performing such work, in which case the final invoice shall be net of such deposit. Customer and Contractor understand that conditions discovered during installation may require that some measures identified in the energy assessment cannot be installed, or some areas may require additional measures/quantities to be installed. Should conditions in the field dictate that the Estimated Program Total Cost shown on page 2 increase by more than 10%, Contractor must obtain both Program Administrator and Customer written approval in the form of an amended Scope of Work Attachment before proceeding with such additional work.

By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by: Gary Jeffas C86D7C651BAC4F4...	6/22/2021	DocuSigned by: Justin Avallone B09BC7178092401...	6/15/2021
Participating Customer	Date	Participating Contractor	Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / building A-skate sharpening rm	2	$ 183.44	$ 36.69	$ 146.75
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / building A-zamboni garage	6	$ 550.32	$ 110.06	$ 440.26
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / building A-electrical rm	5	$ 458.60	$ 91.72	$ 366.88
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / building A-hockey office	2	$ 142.98	$ 28.60	$ 114.38
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / building A-skate rm	6	$ 511.08	$ 102.22	$ 408.86
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / building A-waiting rm	27	$ 2,299.86	$ 459.97	$ 1,839.89
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / building A-mens rm	4	$ 340.72	$ 68.14	$ 272.58
Relamp: LED - A-Lamp (3 - 25W): 10 W / building A-utility rm	1	$ 20.60	$ 4.12	$ 16.48
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / building A-womens rm	4	$ 340.72	$ 68.14	$ 272.58
Fixture Replacement: LED Architectural Flood/Spot (25 - 150W): 31 W / building A-exterior	1	$ 218.81	$ 43.76	$ 175.05
Fixture Replacement: LED Outdoor Wall Mount (14 - 60W): 28 W / building B-exterior	10	$ 1,763.90	$ 352.78	$ 1,411.12
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / building B-mens locker A	8	$ 733.76	$ 146.75	$ 587.01
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / building B-mens locker B	6	$ 550.32	$ 110.06	$ 440.26
Fixture Replacement: LED High/Low Bay (90 - 480W): 270 W / ice rink	28	$ 19,788.72	$ 3,957.74	$ 15,830.98
Low-Flow Aerators (Kitchen) / restroom building b	2	$ 24.80	$ 4.96	$ 19.84
TOTALS**		$ 27,928.63	$ 5,585.73	$ 22,342.90

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21169

"Parties":				
Participating Customer*:	**Town of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus Town Museum**			
Facility Address:	**150 Plaza Ctr**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

The Participating Customer (or "Customer") agrees to have Contractor perform retrofit work in connection with the Measures listed on page 2 of this form (attached). In consideration of the Contractor's performance of such work, Customer agrees to pay Contractor based on the measure costs listed below under Customer Unit Cost for the number of completed units for each Measure upon receipt of invoice; provided the Contractor may collect a deposit from Customer prior to performing such work, in which case the final invoice shall be net of such deposit. Customer and Contractor understand that conditions discovered during installation may require that some measures identified in the energy assessment cannot be installed, or some areas may require additional measures/quantities to be installed. Should conditions in the field dictate that the Estimated Program Total Cost shown on page 2 increase by more than 10%, Contractor must obtain both Program Administrator and Customer written approval in the form of an amended Scope of Work Attachment before proceeding with such additional work.

By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by: Gary Jeffas C06D7C651DAC4F4...	6/22/2021	DocuSigned by: Justin Avallone B89BC717809240I...	6/15/2021
Participating Customer	Date	Participating Contractor	Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Museum Open Space	12	$ 857.88	$ 688.98	$ 168.90
Fixture Replacement: LED Exit Sign: 2.3 W / Museum Open Space	1	$ 72.90	$ 58.55	$ 14.35
Fixture Replacement: LED Exit Sign: 2.3 W / Fire Dept coat Room	6	$ 437.40	$ 351.29	$ 86.11
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Restroom	1	$ 71.49	$ 57.42	$ 14.07
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Kitchen	2	$ 142.98	$ 114.83	$ 28.15
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / Womens	1	$ 91.72	$ 73.66	$ 18.06
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Restroom	1	$ 71.49	$ 57.42	$ 14.07
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / Vestibule	2	$ 207.42	$ 166.58	$ 40.84
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / Vestibule	3	$ 255.54	$ 205.23	$ 50.31
Fixture Replacement: LED Exit Sign: 2.3 W / Vestibule	2	$ 145.80	$ 117.10	$ 28.70
Fixture Replacement: LED Exit Sign: 2.3 W / Vestibule	1	$ 72.90	$ 58.55	$ 14.35
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / Hallway	11	$ 936.98	$ 752.51	$ 184.47
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / Room #1	14	$ 1,451.94	$ 1,166.09	$ 285.85
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / Room #2	14	$ 1,451.94	$ 1,166.09	$ 285.85
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / Room #3	12	$ 1,244.52	$ 999.50	$ 245.02
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / Office	5	$ 518.55	$ 416.46	$ 102.09
Relamp: LED - A-Lamp (3 - 25W): 10 W / Restroom	2	$ 41.20	$ 33.09	$ 8.11
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / Basement	30	$ 2,555.40	$ 2,052.30	$ 503.10
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Closet	1	$ 71.49	$ 57.42	$ 14.07
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Restrooms	2	$ 142.98	$ 114.83	$ 28.15
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Stairs	1	$ 71.49	$ 57.42	$ 14.07
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Basement Kitchen	3	$ 214.47	$ 172.25	$ 42.22
Fixture Replacement: LED Outdoor Wall Mount (14 - 60W): 40 W / Exterior	10	$ 2,500.60	$ 2,008.29	$ 492.31
Gas-Fired Boiler / basement/kitchen	1	$ 71,732.00	$ 57,609.62	$ 14,122.38
Programmable Thermostats / Basement	1	$ 221.00	$ 177.49	$ 43.51
TOTALS**		$ 85,582.08	$ 68,732.94	$ 16,849.14

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21171

"Parties":				
Participating Customer*:	**Town of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus Pumping Station**			
Facility Address:	**Golden Ave FT**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

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By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by: Gary Jeffas C06B7C0651BAC4F4...	6/22/2021	DocuSigned by: Justin Avallone B89BC7170092401...	6/15/2021
Participating Customer	Date	Participating Contractor	Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / Pump Station	4	$ 414.84	$ 250.27	$ 164.57
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / Pump Station	8	$ 829.68	$ 500.54	$ 329.14
Fixture Replacement: LED Architectural Flood/Spot (25 - 150W): 20 W / Exterior	4	$ 787.40	$ 475.03	$ 312.37
Electric Split System A/C (Three-Phase): 3-Tons / ground	1	$ 7,287.00	$ 4,396.16	$ 2,890.84
Programmable Thermostats / Wall	1	$ 221.00	$ 133.33	$ 87.67
TOTALS**		$ 9,539.92	$ 5,755.31	$ 3,784.61

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21170

"Parties":				
Participating Customer*:	**Town of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus Teen and Tot Center**			
Facility Address:	**145 Front St.**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

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DocuSigned by:
Gary Jeffas
C06D7C651DAC4F4...
Participating Customer

6/22/2021
Date

DocuSigned by:
Justin Avallone
B09BC7170092401...
Participating Contractor

6/15/2021
Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Boiler Room	2	$ 142.98	$ 90.55	$ 52.43
Fixture Replacement: LED Exit Sign: 2.3 W / Boiler Room	1	$ 72.90	$ 46.17	$ 26.73
Fixture Replacement: LED Exit Sign: 2.3 W / Kitchen	1	$ 72.90	$ 46.17	$ 26.73
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Closet	1	$ 71.49	$ 45.28	$ 26.21
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Elevator	2	$ 142.98	$ 90.55	$ 52.43
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Restroom	2	$ 142.98	$ 90.55	$ 52.43
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Janitor Room	1	$ 71.49	$ 45.28	$ 26.21
Fixture Replacement: LED Exit Sign: 2.3 W / Kids Tots	2	$ 145.80	$ 92.34	$ 53.46
Packaged RTU (Three-Phase, Gas Heating): 5-Tons / roof	1	$ 11,206.00	$ 7,097.16	$ 4,108.84
Packaged RTU (Gas Heating): 20-Tons / roof	1	$ 28,641.50	$ 18,139.68	$ 10,501.82
Gas-Fired Boiler / boiler room	1	$ 34,869.36	$ 22,084.01	$ 12,785.35
Electronic Fuel-Use Economizers (for Forced Air Heat) / roof	1	$ 541.00	$ 342.63	$ 198.37
Electronic Fuel-Use Economizers (for Forced Air Heat) / roof	1	$ 541.00	$ 342.63	$ 198.37
Programmable Thermostats / Wall	3	$ 663.00	$ 419.90	$ 243.10
Low-Flow Aerators (Lavatory) / Restroom	4	$ 47.60	$ 30.15	$ 17.45
Low-Flow Aerators (Kitchen) / Kitchen	2	$ 24.80	$ 15.71	$ 9.09
Pipe Wrap Insulation / Air Handler Room	1	$ 347.50	$ 220.08	$ 127.42
Pipe Wrap Insulation / boiler room	1	$ 483.00	$ 305.90	$ 177.10
Pipe Wrap Insulation / boiler room	1	$ 405.00	$ 256.50	$ 148.50
TOTALS**		$ 78,633.28	$ 49,801.25	$ 28,832.03

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DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21177

"Parties":

Participating Customer*:	**Town of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus Town Clerk**			
Facility Address:	**20 Center Ave**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

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By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by: Gary Jeffas C86D7C651BAC4F4... 6/22/2021

Participating Customer Date

DocuSigned by: Justin Avallone B89BC7178092401... 6/15/2021

Participating Contractor Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 3-front room	2	$ 142.98	$ 117.21	$ 25.77
Relamp: LED - A-Lamp (3 - 25W): 10 W / 3-storage B closet	1	$ 20.60	$ 16.89	$ 3.71
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / 3-storage A	2	$ 183.44	$ 150.38	$ 33.06
Relamp: LED - A-Lamp (3 - 25W): 10 W / 3-storage B	1	$ 20.60	$ 16.89	$ 3.71
Relamp: LED - A-Lamp (3 - 25W): 10 W / 3-restroom	1	$ 20.60	$ 16.89	$ 3.71
Relamp: LED - PAR30 (10 - 20W): 12 W / 3-unfinished	1	$ 25.43	$ 20.85	$ 4.58
Relamp: Direct Line LED - 3-Lamp - 4-Foot T8 (Prem. - 10.5W) / 3-open space	2	$ 183.44	$ 150.38	$ 33.06
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 3-hall	1	$ 71.49	$ 58.61	$ 12.88
Relamp: LED - A-Lamp (3 - 25W): 10 W / 3-closet	1	$ 20.60	$ 16.89	$ 3.71
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / 2-middle office	2	$ 207.42	$ 170.04	$ 37.38
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / 2-conference A	6	$ 511.08	$ 418.97	$ 92.11
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 2-kitchen	3	$ 214.47	$ 175.82	$ 38.65
Relamp: LED - A-Lamp (3 - 25W): 10 W / 2-restroom B	1	$ 20.60	$ 16.89	$ 3.71
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / 2-grants	2	$ 207.42	$ 170.04	$ 37.38
Relamp: LED - A-Lamp (3 - 25W): 10 W / 2-closet	1	$ 20.60	$ 16.89	$ 3.71
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 2-prevention coaltion	6	$ 428.94	$ 351.63	$ 77.31
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 2-prevention coaltion restroom	1	$ 71.49	$ 58.61	$ 12.88
Fixture Replacement: Linear Ambient Luminaire - 8' (60 - 100W): 75 W / 1-garage	1	$ 271.76	$ 222.78	$ 48.98
Relamp/Reballast: Plug & Play LED - 8' Conversion Kit - (4) 4-Foot T8 Lamps (Prem. - 10.5W) / 1-garage	1	$ 121.67	$ 99.74	$ 21.93
Relamp: LED - A-Lamp (3 - 25W): 10 W / 1-restroom A	2	$ 41.20	$ 33.77	$ 7.43
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-mech room A	1	$ 71.49	$ 58.61	$ 12.88
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / 1-rec dept office A	3	$ 255.54	$ 209.49	$ 46.05
Relamp: Direct Line LED - 4-Lamp - 2-Foot T8 / 1-rec dept office A	1	$ 90.87	$ 74.49	$ 16.38
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-rec dept office A restroom	1	$ 71.49	$ 58.61	$ 12.88
Relamp: LED - A-Lamp (3 - 25W): 10 W / 1-rec dept closet	1	$ 20.60	$ 16.89	$ 3.71
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-rec dept	3	$ 311.13	$ 255.06	$ 56.07
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / 1-rec dept supervisor	3	$ 255.54	$ 209.49	$ 46.05
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-health dept	2	$ 207.42	$ 170.04	$ 37.38
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-IT room	2	$ 142.98	$ 117.21	$ 25.77
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-meeting room	2	$ 207.42	$ 170.04	$ 37.38
Relamp/Reballast: Plug & Play LED - 2-Lamp - U-Bend (U6): 12W / 1-project mgmt restroom	1	$ 85.18	$ 69.83	$ 15.35
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-project mgmt office	2	$ 207.42	$ 170.04	$ 37.38
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-project mgmt closet	1	$ 71.49	$ 58.61	$ 12.88
Relamp: Direct Line LED - 4-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-hall	2	$ 207.42	$ 170.04	$ 37.38
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / 1-hall	2	$ 142.98	$ 117.21	$ 25.77
Relamp: LED - A-Lamp (3 - 25W): 10 W / exterior	1	$ 20.60	$ 16.89	$ 3.71
Fixture Replacement: LED Outdoor Wall Mount (14 - 60W): 28 W / exterior	2	$ 352.78	$ 289.20	$ 63.58
Fixture Replacement: LED Parking Garage Fixture (35 - 150W): 43 W / exterior	1	$ 263.85	$ 216.30	$ 47.55
Electric Split System A/C (Three-Phase): 3-Tons / System 04	1	$ 7,287.00	$ 5,973.70	$ 1,313.30
Gas-Fired Boiler / System 01	1	$ 15,540.00	$ 12,739.30	$ 2,800.70
Gas-Fired Boiler / System 02	1	$ 15,540.00	$ 12,739.30	$ 2,800.70
Programmable Thermostats / Wall	3	$ 663.00	$ 543.51	$ 119.49
Low-Flow Aerators (Lavatory) / restrooms	7	$ 83.30	$ 68.29	$ 15.01
Pipe Wrap Insulation / garage	1	$ 405.00	$ 332.01	$ 72.99

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

TOTALS**	$ 45,310.33	$ 37,144.25	$ 8,166.08

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM
PARTICIPATION AGREEMENT
SCOPE OF WORK ATTACHMENT

DN21166

"Parties":				
Participating Customer*:	**Town Of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus Town Hall**			
Facility Address:	**1203 Paterson**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

The Participating Customer (or "Customer") agrees to have Contractor perform retrofit work in connection with the Measures listed on page 2 of this form (attached). In consideration of the Contractor's performance of such work, Customer agrees to pay Contractor based on the measure costs listed below under Customer Unit Cost for the number of completed units for each Measure upon receipt of invoice; provided the Contractor may collect a deposit from Customer prior to performing such work, in which case the final invoice shall be net of such deposit. Customer and Contractor understand that conditions discovered during installation may require that some measures identified in the energy assessment cannot be installed, or some areas may require additional measures/quantities to be installed. Should conditions in the field dictate that the Estimated Program Total Cost shown on page 2 increase by more than 10%, Contractor must obtain both Program Administrator and Customer written approval in the form of an amended Scope of Work Attachment before proceeding with such additional work.

By signing below, the Parties agree the above listed Measures shall be installed by the Contractor. The Customer shall pay the Contractor as described herein following Completion and Acceptance of Measures. Customer certifies that he/she has the authority to contract for retrofit work in the Facility in connection with the Measures listed and, if the Customer does not own the Facility, the Owner has granted permission to Customer for performance of such work.

DocuSigned by:
Gary Jeffas
C06B7C651BAC4F4...
Participating Customer — 6/22/2021 Date

DocuSigned by:
Justin Avallone
B89BC7178092401...
Participating Contractor — 6/15/2021 Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Basement Boiler Room	7	$ 500.43	$ 100.09	$ 400.34
Fixture Replacement: LED Exit Sign: 2.3 W / Basement Boiler Room	1	$ 72.90	$ 14.58	$ 58.32
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Telephone Room	1	$ 71.49	$ 14.30	$ 57.19
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / File Room	2	$ 142.98	$ 28.60	$ 114.38
Relamp/Reballast: Plug & Play LED - 2-Lamp - 4-Foot T5HO / Police Department 2	3	$ 282.36	$ 56.47	$ 225.89
Relamp/Reballast: Plug & Play LED - 2-Lamp - 4-Foot T5HO / Garage	7	$ 658.84	$ 131.77	$ 527.07
Fixture Replacement: LED Exit Sign: 2.3 W / Offices	2	$ 145.80	$ 29.16	$ 116.64
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Stairs A	7	$ 500.43	$ 100.09	$ 400.34
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / Stairs B	7	$ 500.43	$ 100.09	$ 400.34
Low-Flow Aerators (Lavatory) / Police Department Restroom	1	$ 11.90	$ 2.38	$ 9.52
TOTALS**		$ 2,887.56	$ 577.51	$ 2,310.05

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

DIRECT INSTALL PROGRAM

PARTICIPATION AGREEMENT

SCOPE OF WORK ATTACHMENT

DN21176

"Parties":

Participating Customer*:	**Town of Secaucus**			
Participating Contractor*:	**Donnelly**			
Facility Name*:	**Secaucus Town Pool**			
Facility Address:	**2000 Koelle Blvd.**	**Secaucus,**	**NJ**	**07094**
	Street	City		Zip

*as listed on Application

When fully signed, this Scope of Work Attachment ("Attachment") shall become part of the Direct Install Program Participation Agreement ("Participation Agreement") previously executed by the Parties in connection with the installation of energy efficiency retrofit Measures to be performed by the Participating Contractor (or "Contractor") at the above listed Facility. This Attachment, together with the Participation Agreement shall constitute the full Agreement between the Parties. Terms capitalized herein are defined in the Participation Agreement.

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DocuSigned by: Gary Jeffas C86D7C631BAC4F4... — 6/22/2021

Participating Customer — Date

DocuSigned by: Justin Avallone B89BC7178092401... — 6/15/2021

Participating Contractor — Date

Savings values are estimates. Actual savings will vary.
Incentives and participation subject to program rules and Participation Agreement.

Page 2

Scope of Work

The work to be performed by the Participating Contractor in connection with the Project shall be comprised of the below listed Measures in the estimated quantities listed:

Measure Description / Location	Quantity To Be Installed	Total Measure Cost	Estimated Customer Total Cost	Estimated Incentive Amount
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / F1 - Women's Locker Room - 1	1	$ 71.49	$ 14.30	$ 57.19
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / F1 - Main Office - 2	2	$ 142.98	$ 28.60	$ 114.38
Relamp: LED - Replacement for Outdoor Pole/Arm-Mounted Luminaire: 80W / Ext - Lower Pole - Exterior "A"	3	$ 732.09	$ 146.42	$ 585.67
Fixture Replacement: LED Pole Mount (1000W Replacement): 368 W / Ext - Higher Pole No. 8 - HP8	3	$ 3,038.01	$ 607.60	$ 2,430.41
Fixture Replacement: LED Pole Mount (1000W Replacement): 368 W / Ext - Higher Pole No. 7 - HP7	2	$ 2,025.34	$ 405.07	$ 1,620.27
Fixture Replacement: LED Pole Mount (1000W Replacement): 368 W / Ext - Higher Pole No. 9 - HP9	3	$ 3,038.01	$ 607.60	$ 2,430.41
Fixture Replacement: LED Outdoor Wall Mount (14 - 60W): 40 W / Ext - Exterior "B"	1	$ 228.56	$ 45.71	$ 182.85
Fixture Replacement: LED Pole Mount (1000W Replacement): 368 W / Ext - Higher Pole No. 6 - HP6	2	$ 2,025.34	$ 405.07	$ 1,620.27
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / F1 - Kitchen - 7	6	$ 428.94	$ 85.79	$ 343.15
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / F1 - Small Pump Room - 8	3	$ 214.47	$ 42.89	$ 171.58
Relamp: Direct Line LED - 2-Lamp - 4-Foot T8 (Prem. - 10.5W) / F1 - Big Pump Room - 9	5	$ 357.45	$ 71.49	$ 285.96
Fixture Replacement: LED Outdoor Wall Mount (14 - 60W): 40 W / Ext - Exterior "C"	1	$ 228.56	$ 45.71	$ 182.85
Fixture Replacement: LED Pole Mount (1000W Replacement): 368 W / Ext - Higher Pole No. 4 - HP4	2	$ 2,025.34	$ 405.07	$ 1,620.27
Fixture Replacement: LED Pole Mount (1000W Replacement): 368 W / Ext - Higher Pole No. 3 - HP3	3	$ 3,038.01	$ 607.60	$ 2,430.41
Fixture Replacement: LED Pole Mount (1000W Replacement): 368 W / Ext - Higher Pole No. 2 - HP2	3	$ 3,038.01	$ 607.60	$ 2,430.41
Fixture Replacement: LED Pole Mount (1000W Replacement): 368 W / Ext - Higher Pole No. 1 - HP1	2	$ 2,025.34	$ 405.07	$ 1,620.27
Fixture Replacement: LED Pole Mount (1000W Replacement): 368 W / Ext - Higher Pole No. 5 - HP5	3	$ 3,038.01	$ 607.60	$ 2,430.41
Low-Flow Aerators (Lavatory) / Family Restrrom	1	$ 11.90	$ 2.38	$ 9.52
Pipe Wrap Insulation / HWH	1	$ 67.50	$ 13.50	$ 54.00
TOTALS**		$ 25,775.35	$ 5,155.07	$ 20,620.28

**Maximum incentive amount per project is $125,000. Measures that would qualify the project for funding through the State Energy Program (SEP) are identified above with an 'S'. If any "SEP measures" are included then the total incentive amount for all measures will be paid with SEP funds, otherwise the total incentive amount will come from NJ Clean Energy funds.

Donnelly Energy

Sold To:	**Secaucus Town**
Address	**1203 Paterson Plank Road**
	Secaucus, NJ 07094

Ship To:	**Secaucus Town**
Address	**1203 Paterson Plank Road**
	Secaucus, NJ 07094

INVOICE No.	**DN21166 - 1**
DATE:	6/8/2021
ACCOUNT NO.:	
Job #:	
YOUR P.O. NO.:	
TERMS:	Due Upon Receipt
ACCOUNT MANAGER:	Diana Meneses

A service charge of 1.5% per month will be applied on all unpaid balances after Net Due Upon Receipt days

Description				Total Measure Cost	Incentive Portion	Customer's Portion
S.No.	**Building**	**Address**	**TRC's Approval #**			
1	Secaucus Town Hall	1203 Paterson Plank Road	DN21166	$ 2,887.56	$ 2,310.05	$ 577.51
2	Secaucus DPW	370 Secaucus Rd	DN21167	$ 24,739.30	$ 17,987.23	$ 6,752.07
3	Old Rec Center	123 Center Ave	DN21168	$ 31,242.34	$ 15,126.12	$ 16,116.22
4	Secaucus Town Museum	150 Plaza Ctr	DN21169	$ 85,582.08	$ 16,849.14	$ 68,732.94
5	Secaucus Teen and Tot Center	145 Front St.	DN21170	$ 78,633.28	$ 28,832.03	$ 49,801.25
6	Secaucus Pumping Station	Golden Ave FT	DN21171	$ 9,539.92	$ 3,784.61	$ 5,755.31
7	Secaucus Firehouse County	227 County Ave	DN21172	$ 6,665.07	$ 5,332.06	$ 1,333.01
8	7th St Firehouse	764 7th Street	DN21173	$ 19,381.80	$ 1,781.94	$ 17,599.86
9	Secaucus Fire House - Paterson	1567 Paterson Plank Road	DN21174	$ 55,147.51	$ 15,948.14	$ 39,199.37
10	Secaucus Ice Rink	150 Plaza Center	DN21175	$ 27,928.63	$ 22,342.90	$ 5,585.73
11	Secaucus Town Pool	2000 Koelle Blvd.	DN21176	$ 25,775.35	$ 20,620.28	$ 5,155.07
12	Secaucus Town Clerk	20 Center Ave	DN21177	$ 45,310.33	$ 8,166.08	$ 37,144.25
13	Town of Secaucus	Out of Scope Costs				$ 123,754.00
13			**Totals**	**$ 412,833.17**	**$ 159,080.58**	**$ 377,506.59**

MAKE CHECK PAYABLE TO:

DONNELLY ENERGY
557 ROUTE 23 SOUTH
WAYNE, NJ 07470

Payment Breakdown	
50% due for Shipping	
Balance due upon Delivery & Installation	
	$ 188,753.30
Prior Payment	**$ -**
NET PAYABLE	**$ 188,753.30**

New Jersey's cleanenergy program njcleanenergy.com

NEW JERSEY'S CLEAN ENERGY PROGRAM DIRECT Install PARTICIPATING CONTRACTOR

How did you learn about this Energy Efficiency Program?

☐ Advertisement ☐ Internet Search ☐ Mailer ☐ Video
☐ Tradeshow/Event ☐ Word of Mouth ☐ Radio ☐ Contractor
☐ Other _____

Direct Install Application and Participation Agreement

October 1, 2020 – June 30, 2021

Utility(ies) Serving Customer:

☐ Atlantic City Electric ☐ Jersey Central Power & Light ☐ PSE&G ☐ New Jersey Natural Gas
☐ Elizabethtown Gas ☐ Rockland Electric Co. ☐ South Jersey Gas ☐ Other Utility

Instructions

1. Fill out all applicable sections below.
2. Provide a completed Application and signed Participation Agreement to the Participating Contractor serving your area, along with copies of utility billing demonstrating average electric demand does not exceed 200 kW in the preceding 12 months.
3. Your Contractor or Program Manager will confirm program participation eligibility, perform the Energy Assessment, and arrange for final approval by the Program Manager prior to installing eligible measures.

Customer Information

Legal Name	Tax ID 22-6002293	NAICS Code
Company Address	City	State	Zip
Project Contact	Phone	E-Mail
Customer to provide: a) Copies of required gas and electric billing ☐ Check if attached		

Facility Information (Facility on which Energy Assessment is to be conducted and measures provided)

Facility Address	City	State NJ	Zip
County	Utility Account Number(s): Electric _____ Gas _____	
Facility Name and Brief Type/Occupancy Description		

For Participating Contractor Use Only

Company Name Donnelly Energy	Contact Justin Avallone
Contact Phone 973-323-8008	Contact E-mail javallone@donnellyenergy.com	Contractor Assigned Project Number
Average Electric Demand _____ kW (based on preceding 12 months)	Project Name

Enhanced Incentives – if applicable, check appropriate box

☐ K-12 Public School ☐ Municipality ☐ County Entity ☐ Facilities located in an NJ Urban Enterprise Zone
☐ Facilities located in an NJ Opportunity Zone ☐ Affordable Housing Development

DIRECT INSTALL PARTICIPATION AGREEMENT

DEFINITIONS:

ADMINISTRATOR - The New Jersey Board of Public Utilities (NJBPU).

APPLICATION - Page 1 of this Application and Participation Agreement.

APPLICATION PACKAGE - Consists of the entirety of: an executed Application and Participation Agreement, utility billing demonstrating, if required, average electric demand not exceeding 200 kW in the preceding 12 months and completed Energy Assessment with Scope of Work Attachment. Measures may not be installed, and Incentives shall not be paid until after the Application Package is approved by the Program Manager.

COMPLETION AND ACCEPTANCE OF MEASURES - Work performed by Participating Contractor shall be deemed completed and accepted upon the signing of a Measure Acceptance Form by the Participating Customer and Program Manager.

ENERGY ASSESSMENT - An inventory of existing energy consuming equipment and analysis of possible replacement Measures generated by the Program-approved energy assessment tool to determine estimated energy savings, in addition to costs and Incentives eligible under the Program.

ENERGY-EFFICIENT MEASURES (or "Measures") - Any device or grouping of devices eligible to receive an Incentive through the Program.

INCENTIVE - An amount paid by the Direct Install component of New Jersey's Clean Energy Program through the Program Manager to the Participating Contractor in connection with the installation of a Measure. Incentives are available to cover up to 70% of the cost of installed Measures. Entities owned or operated by Municipalities, K-12 public schools, Counties, Affordable Housing developments, and customers located in UEZs or OZs may be eligible for incentives up to 80% of the cost of installed Measures. Incentives are subject to change without notice prior to the Program Manager approving the Application Package.

MEASURE ACCEPTANCE FORM – A document providing the means by which the Contractor and Customer confirm and accept the installation of Measures.

NEW JERSEY UTILITIES - The regulated electric and/or gas utilities in the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.

PARTICIPATING CONTRACTOR (or "Contractor") - An entity under contract to the Program Manager which performs Energy Assessments and installation of Measures in connection with the Program.

PARTICIPATING VENDOR (or "Vendor") - An entity under contract to the Program Manager which provides/supplies equipment directly to the program's contractors for project implementation.

PARTICIPATING CUSTOMER (or "Customer") - Those non-residential electric and/or gas service customers of the New Jersey utilities, municipal utilities or rural electric cooperatives who participate in the Program.

PRE-INSTALLED MEASURES - Measures installed before the application approval date shall not be included in the work scope and will not receive Program Incentives.

PROGRAM - New Jersey's Clean Energy Direct Install Program offered herein by the New Jersey Board of Public Utilities pursuant to state regulatory approval under the New Jersey Electric Discount and Energy Competition Act, NJSA 48:3-49, et seq, and subject to change without notice and subject to funding availability.

PROGRAM MANAGER - TRC

PROGRAM SCOPE - Services to be provided under the Program are limited to those directly associated with the evaluation and installation of Measures and shall in no way include work by the Contractor in connection with the correction of apparent or hidden safety issues or code violations. Contractor shall not perform work where, in its sole discretion, it is determined such safety issues or code violations exist. All work shall be performed during normal business hours, Monday through Friday unless the Customer and Contractor agree otherwise, in which case the Contractor shall not receive additional compensation for work performed outside of such normal business hours.

PROJECT - The Measure(s) to be installed in the facility listed under the Facility Information section of the application.

SCOPE OF WORK ATTACHMENT - A document generated by the Energy Assessment tool which lists the Measures eligible for installation, their Incentive Amounts and costs to be paid by the Customer. Once countersigned by the Customer and Contractor indicating the Measures to be installed in the Project and approval by the Program Manager, the Scope of Work Attachment shall be part of this Participation Agreement.

PARTICIPATION PROCESS:

1. Customer completes Application and provides necessary utility usage and demand data.
2. Contractor or Program Manager performs the Energy Assessment using the program-approved energy assessment tool. The Energy Assessment generates a Scope of Work Attachment for countersignature by the Customer to indicate which eligible Measures are to be included in the Project.
3. Contractor countersigns the Scope of Work Attachment and submits a full Application Package to the Program Manager for approval.
4. Upon Program Manager's approval, Contractor performs retrofit work to remove existing equipment and install Measures, and submits documentation of Project completion in the form of a Measure Acceptance Form signed by the Customer. Contractor invoices the Program Manager for the Incentive portion and the Customer for the balance.
5. Customer pays outstanding balance of costs, less any prior payment or deposit, to Contractor according to amounts listed on the Scope of Work Attachment.

The Program, or agent thereof, reserves the right to conduct inspections of the Project prior to or after the installation of Measures. To be eligible for Incentives, the Application Package must be approved by the Program Manager prior to Measure installation.

CHANGES TO THE PROGRAM - The Program and/or Participation Agreements may be changed by the Program Manager or Administrator at any time without notice, however, approved Application Packages will be processed to completion under the terms in effect at the time of approval.

ELIGIBILITY - Program services and Incentives are available to existing non-residential, commercial and industrial buildings with an average electric demand that did not exceed 200 kW in the preceding 12 months and served by at least one of the New Jersey utilities, municipal utilities or rural electric cooperatives who participate in the Program. If the Participant is a municipal electric company customer, and a customer of a regulated gas New Jersey utility, only gas Measures will be eligible under the Program.

Participating projects with a contract at or above current prevailing wage contract threshold amount set pursuant to the New Jersey Prevailing Wage Act (N.J.S.A. 34:11-56.25 et seq.) are required to pay no less than prevailing wage rate to workers employed in the performance of any construction undertaken in connection with Board of Public Utilities financial assistance, or undertaken to fulfill any condition of receiving Board of Public Utilities financial assistance, including the performance of any contract to construct, renovate or otherwise prepare a facility, the operations of which are necessary for the receipt of Board of Public Utilities financial assistance. By signing this application, the signatories agree to comply with the provisions of the New Jersey Prevailing Wage Act, N.J.S.A. 34: 11-56.25 et seq., (Act), if and to the extent that Act may apply to the work covered by this application. By submitting an application, or accepting program incentives, applicant agrees to adhere to New Jersey Prevailing Wage requirements, as applicable.

Customers of New Jersey utilities who have not contributed to the Societal Benefits Charge during the calendar year in which the Application Package is received by the Program Manager may not be eligible for Incentives offered through the Program.

NO ENDORSEMENT - The Program Manager and Administrator do not endorse, support or recommend any particular manufacturer, product or system design.

INCENTIVE AMOUNTS - Incentive amounts will be listed in the Scope of Work Attachment which, when completed and countersigned by the Customer and approved by the Program Manager, will be part of this Participation Agreement. The Customer will be responsible for paying the remaining balance of costs listed in the Scope of Work Attachment upon receipt of Contractor's invoice.

Incentives will be offered for eligible and qualifying Measures as determined from the Energy Assessment and listed on a separate Scope of Work Attachment. The Scope of Work Attachment shall be countersigned by the Customer to indicate eligible and qualifying Measures to be included in the Project. All Incentive payments shall be paid by the Program Manager directly to the Contractor. The Program is not bound to pay any Incentive unless the Application Package associated with the Incentive payment is approved by the Program Manager prior to Measure installation.

INCENTIVE CAP - Program Manager reserves the right to limit the amount of Incentives on a per-Project or Program basis. Any such caps on individual projects will be disclosed to Customers on the Scope of Work Attachment.

INSTALLATION AGREEMENT - Following completion of the Energy Assessment, but prior to commencement of any installation work, the Customer will be presented a separate Installation Agreement in the form of

DIRECT INSTALL PARTICIPATION AGREEMENT

a Scope of Work Attachment which shall become part of this Agreement. By executing the Scope of Work Attachment, the Customer agrees to allow the Contractor to install the eligible Measures identified in the Scope of Work Attachment.

WARRANTIES - THE PROGRAM MANAGER AND ADMINISTRATOR DO NOT EXPRESSLY OR IMPLIEDLY WARRANTY THE PERFORMANCE OF INSTALLED EQUIPMENT, AND/OR SERVICES RENDERED AS PART OF THIS PROGRAM. NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESS, OR IMPLIED, INCLUDING, WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING EQUIPMENT OR SERVICES ARE PROVIDED BY ANY PARTY, INCLUDING THE PROGRAM MANAGER UNDER THE PROGRAM. CONTRACTOR SHALL EXTEND TO CUSTOMER FULL EQUIPMENT, MATERIALS AND LABOR WARRANTIES WITH AN EXPIRATION DATE OF THE LATER OF EITHER ONE YEAR FROM THE DATE OF INSTALLATION OR THE MANUFACTURER'S STANDARD WARRANTY EXPIRATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WARRANTY ISSUES RELATING TO EQUIPMENT AND MATERIALS INSTALLED UNDER THE PROGRAM FOR A PERIOD OF ONE YEAR.

In no way shall the reviews, inspections, approvals and all other actions performed by the Program Manager under the Program be construed as a determination or acceptance of performance, applicability, dollar savings, or energy savings. The Program Manager and Administrator offer no guarantee or warranty of performance for equipment or labor provided in connection with the Program. The Contractors assume full responsibility and liability for the removal and installation of all equipment, including but not limited to design, specification, all permits, installation, maintenance, performance, and proper disposal of equipment removed, including lamps and ballasts.

LIMITATION OF LIABILITY – By virtue of participating in the Program, Participating Customer agrees to waive any and all claims or damages against the Program Manager, and the Administrator. Participating Customers agree that the Program Manager's and Administrator's liability, in connection with the Program, is limited to paying the Program Incentives specified directly to the Participating Contractor, for the value of the work performed/Measures installed, as identified in the Installation Agreement. Under no circumstances shall the Program Manager, its representatives, or subcontractors, or the Administrator be liable for any lost profits, special, punitive, consequential or incidental damages or for any other damages or claims connected with or resulting from participation in this Program. Further, any liability attributed to the Program Manager or its subcontractors under this Program shall be individual, and not joint and/or several.

IDEMNIFICATION – As part of agreeing to participate in the Program, which includes financial incentives to reduce the customer's net project costs, the Participating Customer agrees to indemnify and hold harmless the Program Manager and Administrator and their respective staffs with respect to the Project.

INSPECTION – Customer agrees to grant the Program reasonable access to Customer's Facility to inspect both pre-existing equipment (if applicable) and the Measures installed under this Program, either prior to issuing Incentives or at a later time.

PROGRAM OFFER – The Program covers services rendered on or after July 1, 2019. Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities.

TAX LIABILITY – Neither the Program Manager nor Contractor shall be responsible for any tax liability that may be imposed on any Customer as a result of the payment of Program Incentives.

TERMINATION – The Administrator reserves the right to extend, modify (this includes modification of Program Incentive levels) or terminate this program without prior or further notice.

CUSTOMER ACKNOWLEDGEMENT – I have read, understood and am in compliance with all rules and regulations concerning this incentive Program. I certify that all information provided is correct to the best of my knowledge, and I give the Program Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate New Jersey's Clean Energy Programs, including the release of electric and natural gas utility billing information. I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for Incentives under the guidelines of New Jersey's Clean Energy Program. This Participation Agreement supersedes all other communications and representations. I agree that this document and all notices and disclosures made or given relating to this document may be created, executed, delivered and retained electronically and that the electronic signatures appearing on this document and any related documents shall have the same legal effect for all purposes as a handwritten signature. The information, statements, and documents I have provided in and with this document are true and accurate to the best of my knowledge. I am aware that if any of them are willfully false, I am subject to punishment.

Other Funding Sources

☐ Check the box if an Energy Savings Improvement Program (ESIP) will be a source of funding. ESIP allows government agencies to pay for energy related improvements using the value of the resulting energy savings.

The Parties signing below certify they are duly authorized to enter into this agreement and hereby accept the above terms:

PARTICIPATING CUSTOMER

Name of Participating Customer
Gary Jeffas

Authorized Signature — DocuSigned by: Gary Jeffas C86D7C651BAC4F4...

Date: 6/22/2021

CONTRACTOR'S COUNTERSIGNATURE

By signing, below, I certify that I have received the Customer's Application Package and will, in connection with the Project, perform my obligations as Participating Contractor as outlined in the separate Program Contractor Agreement executed between the Contractor below and the Program Manager.

PARTICIPATING CONTRACTOR

Name of Participating Contractor
Donnelly Energy

Authorized Signature — DocuSigned by: Justin Avallone B89BC7178092401...

Date: 6/15/2021

Direct Install Contractor Checklist

Application # _____

Applicant Company Name: _____

[ ] - Lighting assessed and included in the EAT

[ ] - Explored possibilities of adding lighting controls

[ ] - Motors assessed and included in the EAT

[ ] - Refrigeration assessed and included in the EAT

[ ] - Explored possibilities of adding Variable Frequency Drives

[ ] - HVAC (electric cooling) assessed and included in the EAT

[ ] - HVAC (gas heating) assessed and included in the EAT

Comments: Please explain in detail why measures were excluded from the application package and have the customer sign off.

_____

_____

_____

_____

_____

DocuSigned by:
Justin Avallone
B89BC7476092401...

DocuSigned by:
Gary Jeffas
C86D7C651BAC4F4...

Contractor signature

Applicant signature

7.3 Preliminary Solar PV Information

Please see the following pages.

Updated Design 8-18 Secaucus Rec Center, 1200 koelle Blvd Secaucus, NJ

Report

Project Name	Secaucus Rec Center
Project Address	1200 koelle Blvd Secaucus, NJ
Prepared By	Adam Taylor ataylor@talva-energy.com

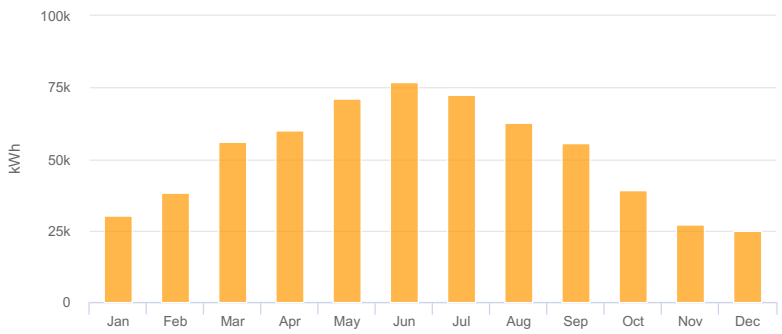
TALVA ENERGY
GENERATING ENERGY FOR A WORLD IN MOTION

System Metrics

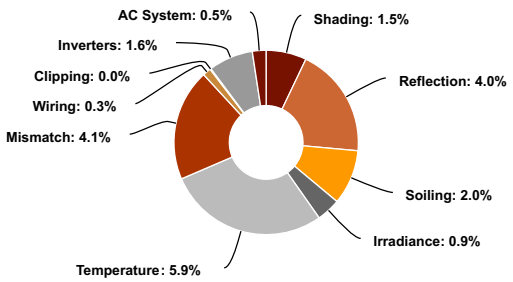
Design	Updated Design 8-18
Module DC Nameplate	512.6 kW
Inverter AC Nameplate	420.0 kW Load Ratio: 1.22
Annual Production	614.3 MWh
Performance Ratio	81.0%
kWh/kWp	1,198.6
Weather Dataset	TMY, 10km grid (40.75,-74.05), NREL (prospector)
Simulator Version	79ae66d755-6c48e55c95-131952e5b2-5a8a302cd0

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,450.9	
	POA Irradiance	1,480.5	2.0%
	Shaded Irradiance	1,458.7	-1.5%
	Irradiance after Reflection	1,400.0	-4.0%
	Irradiance after Soiling	1,372.0	-2.0%
	Total Collector Irradiance	**1,372.0**	**0.0%**
Energy (kWh)	Nameplate	703,519.2	
	Output at Irradiance Levels	697,399.1	-0.9%
	Output at Cell Temperature Derate	656,448.1	-5.9%
	Output After Mismatch	629,726.3	-4.1%
	Optimal DC Output	627,818.7	-0.3%
	Constrained DC Output	627,610.1	0.0%
	Inverter Output	617,413.3	-1.7%
	Energy to Grid	**614,326.1**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		14.4 °C
	Avg. Operating Cell Temp		27.7 °C
Simulation Metrics			
	Operating Hours		4683
	Solved Hours		4683

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km grid (40.75,-74.05), NREL (prospector)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.075	3°C
Flush Mount	-2.81	-0.0455	0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Module Characterizations

Module	Uploaded By	Characterization
TSM-DE17M(II) 450 (Trina Solar)	Folsom Labs	Spec Sheet Characterization, PAN

Component Characterizations

Device	Uploaded By	Characterization

Components

Component	Name	Count
Inverters	PVI 60TL 2-21-2017 (Solectria (Yaskawa Solectria Solar))	7 (420.0 kW)
Strings	10 AWG (Copper)	68 (13,745.5 ft)
Module	Trina Solar, TSM-DE17M(II) 450 (450W)	1,139 (512.6 kW)

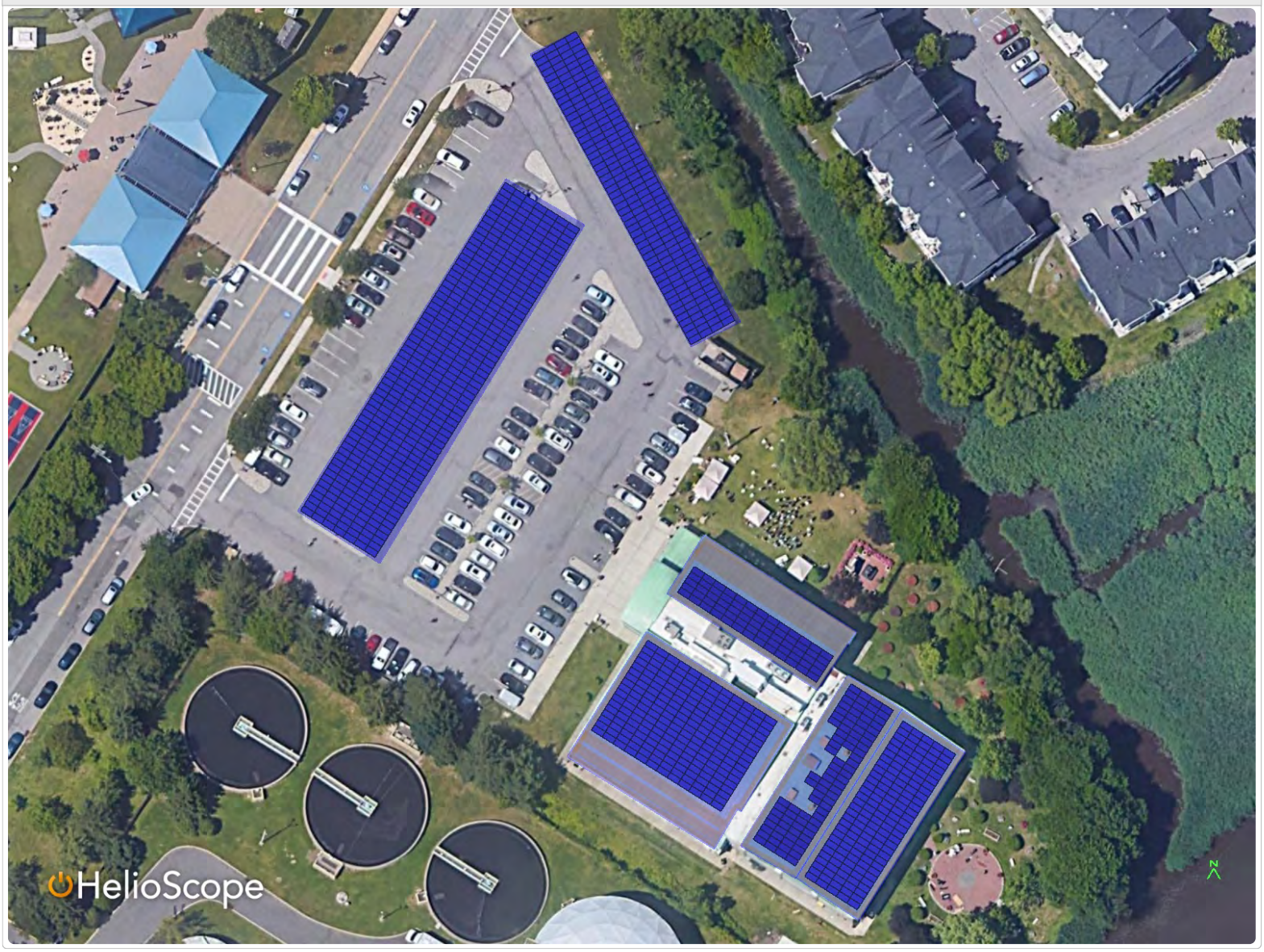
Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	14-18	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Landscape (Horizontal)	5°	212.0712°	0.0 ft	1x1	204	204	91.8 kW
Field Segment 2	Fixed Tilt	Portrait (Vertical)	10°	122.358864°	0.0 ft	1x1	145	145	65.3 kW
Field Segment 3	Flush Mount	Landscape (Horizontal)	10°	32.91338°	0.0 ft	1x1	65	65	29.3 kW
Field Segment 4	Flush Mount	Portrait (Vertical)	7°	121.974655°	0.0 ft	1x1	427	427	192.2 kW
Field Segment 6	Flush Mount	Portrait (Vertical)	10°	302.2174°	0.0 ft	1x1	90	90	40.5 kW
Field Segment 6	Flush Mount	Portrait (Vertical)	7°	241.16806°	0.0 ft	1x1	208	208	93.6 kW

Detailed Layout



Updated Design 8-18 Secaucus Ice Rink, 150 Plaza Center Secaucus, NJ

Report

Project Name	Secaucus Ice Rink
Project Address	150 Plaza Center Secaucus, NJ
Prepared By	Adam Taylor ataylor@talva-energy.com

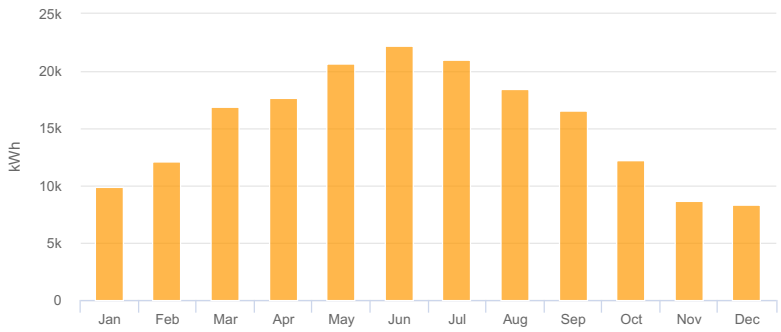
TALVA ENERGY
GENERATING ENERGY FOR A WORLD IN MOTION

System Metrics

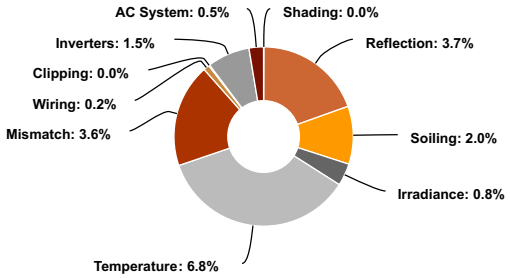
Design	Updated Design 8-18
Module DC Nameplate	145.8 kW
Inverter AC Nameplate	120.0 kW Load Ratio: 1.22
Annual Production	184.7 MWh
Performance Ratio	82.3%
kWh/kWp	1,266.8
Weather Dataset	TMY, 10km grid (40.75,-74.05), NREL (prospector)
Simulator Version	4aabb9f3ea-3e077897d9-35f54b48ad-9eef421f88

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,450.9	
	POA Irradiance	1,539.6	6.1%
	Shaded Irradiance	1,539.4	0.0%
	Irradiance after Reflection	1,482.0	-3.7%
	Irradiance after Soiling	1,452.4	-2.0%
	Total Collector Irradiance	**1,452.4**	**0.0%**
Energy (kWh)	Nameplate	211,848.9	
	Output at Irradiance Levels	210,219.6	-0.8%
	Output at Cell Temperature Derate	195,842.1	-6.8%
	Output After Mismatch	188,845.0	-3.6%
	Optimal DC Output	188,462.0	-0.2%
	Constrained DC Output	188,392.7	0.0%
	Inverter Output	185,625.4	-1.5%
	Energy to Grid	**184,697.3**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		14.4 °C
	Avg. Operating Cell Temp		29.4 °C
Simulation Metrics			
	Operating Hours		4683
	Solved Hours		4683

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km grid (40.75,-74.05), NREL (prospector)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.075	3°C
Flush Mount	-2.81	-0.0455	0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Module Characterizations

Module	Uploaded By	Characterization
TSM-DE17M(II) 450 (Trina Solar)	Folsom Labs	Spec Sheet Characterization, PAN

Component Characterizations

Device	Uploaded By	Characterization

Components

Component	Name	Count
Inverters	PVI 60TL 2-21-2017 (Solectria (Yaskawa Solectria Solar))	2 (120.0 kW)
Strings	10 AWG (Copper)	18 (2,148.6 ft)
Module	Trina Solar, TSM-DE17M(II) 450 (450W)	324 (145.8 kW)

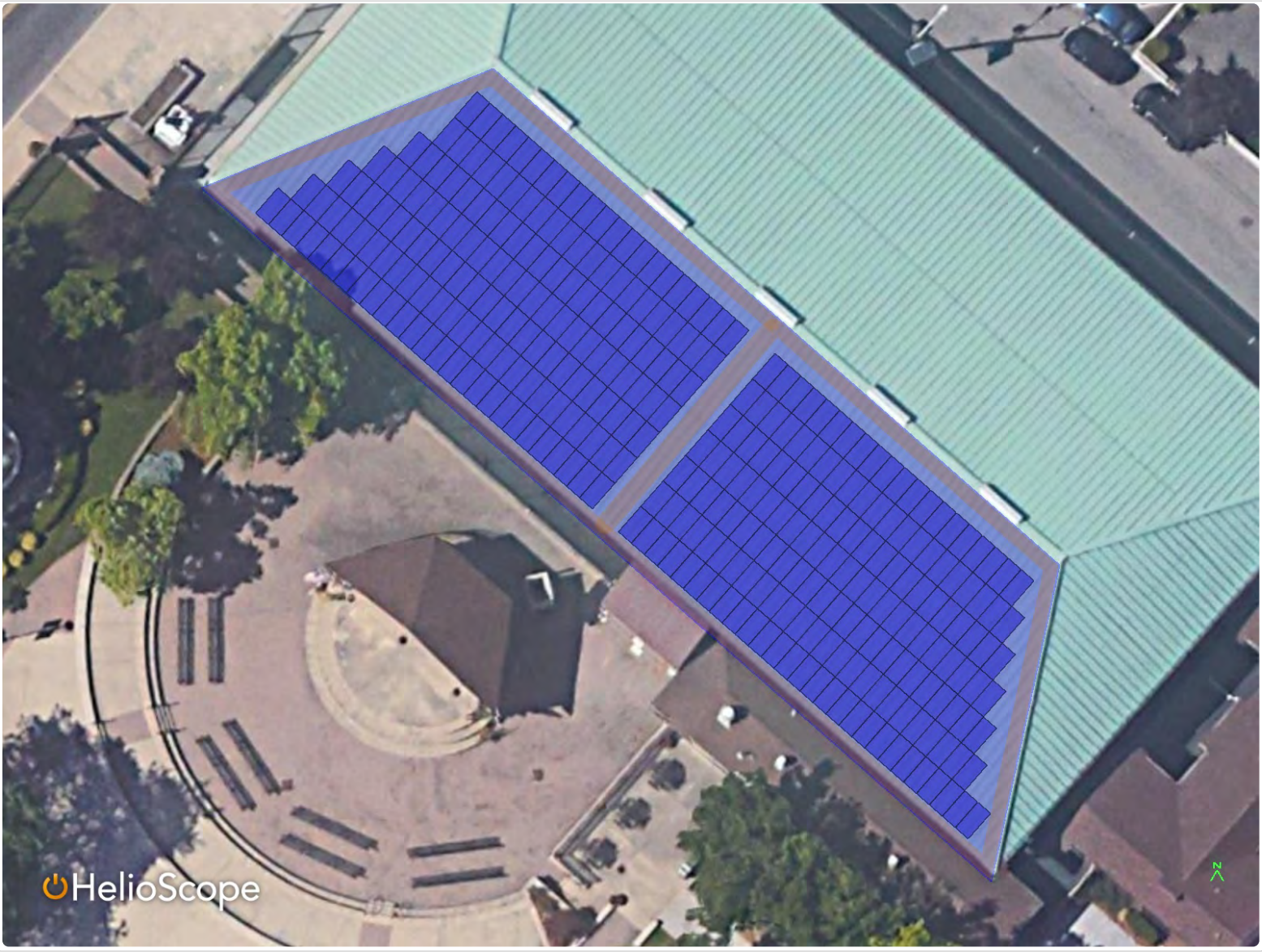
Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	14-18	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Portrait (Vertical)	10°	221.27336°	0.0 ft	1x1	324	324	145.8 kW

Detailed Layout



Optional

ID	Building	Rooftop system size (kW dc)	Carport system size (kW dc)	Total system size (kW dc)
3	Library	29.50	98.40	127.90

Library (Carport) Preliminary PV Layout 2021-03-26

Optional

ID	Building	Rooftop system size (kW dc)	Carport system size (kW dc)	Total system size (kW dc)
3	Library	29.50	98.40	127.90

Rec Center - PV Watts Production

	Array ID	Module Count	System size (kW dc)	Tilt (deg)	Azimuth (deg)	Annual Production (kWh)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
roof	a	204	91.800	5	212	110746	5463	6653	9447	11157	12882	12917	13322	11584	9775	7611	5457	4477
roof	b	145	65.250	10	122	79311	3943	4810	6762	7902	9202	9214	9459	8293	7056	5477	3951	3243
roof	c	65	29.250	10	33	31021	1166	1602	2592	3271	3979	4056	4132	3484	2753	1899	1187	901
carport	d	427	192.150	7	122	234234	11290	13932	19896	23549	27517	27625	28365	24714	20821	15953	11341	9231
roof	e	90	40.500	10	302	44237	1832	2399	3730	4637	5493	5575	5732	4840	3886	2823	1849	1439
carport	f	208	93.600	7	241	113393	5500	6730	9652	11495	13274	13331	13774	11911	9992	7744	5499	4490
	Total		**512.550**			**612942**	**29194**	**36126**	**52079**	**62011**	**72347**	**72718**	**74784**	**64825**	**54283**	**41509**	**29285**	**23781**

Total:	carport	285.750	347,627
	roof	226.800	265,316

Ice Rink - PV Watts Production

Array ID	Module Count	System size (kW dc)	Tilt (deg)	Azimuth (deg)	Annual Production (kWh)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
a	324	145.800	10	221	181885	9476	11260	15586	18140	20653	20622	21372	18695	16002	12816	9416	7847
Total		**145.800**			**181885**	**9476**	**11260**	**15586**	**18140**	**20653**	**20622**	**21372**	**18695**	**16002**	**12816**	**9416**	**7847**

Solar PPA Buyout, Town Hall - Savings Analysis

152.88	Size (kw)
1052	Production ratio (kwh/kw/yr)
$0.10798	current PPA rate
2.80%	PPA escalation rate
0.500%	Solar degradation (%/year)
2.2%	Electric escalation rate
$160,000	Purchase Price

PV System Life (Years)	Year	PPA kwh rate	Utility kwh rate	Solar Production	Electric Savings
7	1	$ 0.1110	$ 0.0913	160,830	$ 17,853
8	2	$ 0.1141	$ 0.0933	160,026	$ 18,261
9	3	$ 0.1173	$ 0.0953	159,225	$ 18,678
10	4	$ 0.1206	$ 0.0974	158,429	$ 19,105
11	5	$ 0.1240	$ 0.0996	157,637	$ 19,542
12	6	$ 0.1274	$ 0.1018	156,849	$ 19,989
13	7	$ 0.1310	$ 0.1040	156,065	$ 20,446
14	8	$ 0.1347	$ 0.1063	155,284	$ 20,913
15 (PPA ends)	9		$ 0.1086	154,508	$ 16,783
16	10	$ -	$ 0.1110	153,735	$ 17,066
17	11	$ -	$ 0.1135	152,967	$ 17,354
18	12	$ -	$ 0.1159	152,202	$ 17,647
19	13	$ -	$ 0.1185	151,441	$ 17,946
20	14	$ -	$ 0.1211	150,684	$ 18,249
21	15	$ -	$ 0.1238	149,930	$ 18,557
22	16	$ -	$ 0.1265	149,181	$ 18,870
23	17	$ -	$ 0.1293	148,435	$ 19,189
24	18	$ -	$ 0.1321	147,693	$ 19,513
25	19	$ -	$ 0.1350	146,954	$ 19,843

09 Aug 2021

Please find, as per the terms of the Solar Power Sales and Services Agreement dated June 1st, 2011, the billing statement for the latest billing period and the facility listed below.

152.88kW Solar Generating Facility at Secaucus Town Hall, 1203 Paterson Plank Road, Secaucus, NJ 07094

SunLight General Capital
Solar Energy Development and Financing

INVOICE

STH 01 Jul 2021 – 31 Jul 2021

Due: 08 Sep 2021

Bill To:
Town of Secaucus
1203 Paterson Plank Road
Secaucus, NJ 07094

Period ending:	Meter:	kWh:	PPA Rate:	Amount:
31 Jul 2021	Fund 2 - Meadowlands - Town of Secaucus - Town Hall	17,945	0.111	$1,991.90

Total: $1,991.90

SunLight is already providing you with low-cost solar electricity.

Our energy management team can help you find ways to save and conserve even more.

Please contact us for more information.

Remittance by ACH:
Account: SunLight General Solar Fund II, LLC
Account No.: 893703967
ABA/Routing No.: 021000021

Remittance by check:
SunLight General Solar Fund II, LLC
PO BOX 8543
NEW YORK, NY 10150

For any questions about this billing statement, please contact us at invoicing@sunlightgeneral.com or (212) 286-1801x5

7.4 Local Government Energy Audit (LGEA)

Please find the Local Government Energy Audit reports for all facilities located under “Secaucus, Township of” on the following page:

https://njcleanenergy.com/commercial-industrial/programs/local-government-energy-audit/local-government-energy-audit/reports/K-S

7.5 Third Party Review Report

Please see the following pages for a copy of the Third-Party Review Report.

7.6 Board of Public Utilities (BPU) Review

Please see the following pages for a copy of the BPU approval letter.