Articles and Tables

The following Articles and Tables are hereby included and made part of this Exhibit C:

This Exhibit C provides the methodology to be used to determine the Annual Realized Savings and the reconciliation of these calculated Savings with the Guaranteed Annual Savings for each Annual Period of the Performance Guarantee Period. The Scope of Services for the Performance Assurance Service Program is provided in Article 3 of Exhibit A.

Article 1: Total Guaranteed Savings

Table 1.1 – Total Guaranteed Savings (Units)

Performance Period	Electric Energy Saved (kWh)	Electric Power Saved (kW)	Natural Gas Saved (Therms)
Construction	457,701	58.4	
Annual Period 1	1,213,659	127.1	3969.1

1.1 Only Annual Period 1 is shown as the energy/utility unit Savings will remain constant for each Annual Period of the Performance Guarantee Period as the CLIENT will operate the Facility in accordance with the Contracted Baseline identified in Article 7.

Table 1.2 – Total Guaranteed Savings (Cost)

Performance Period	Energy/Utility Savings	Operational Savings	Total Savings
Construction	$53,261	$6,719	$59,980
Annual Period 1	$136,030	$11,816	$147,846
Annual Period 2	$141,471	$12,170	$153,641
Annual Period 3	$147,130	$12,535	$159,665
Annual Period 4	$153,015	$12,911	$165,927
Annual Period 5	$159,136	$13,299	$172,435
Annual Period 6	$165,501	$13,698	$179,199
Annual Period 7	$172,121	$14,109	$186,230
Annual Period 8	$179,006	$14,532	$193,538
Annual Period 9	$186,166	$14,968	$201,134
Annual Period 10	$193,613	$15,417	$209,030

Annual Period 11	$201,357	$15,879	$217,237
Annual Period 12	$209,412	$16,356	$225,768
Annual Period 13	$217,788	$16,846	$234,635
Annual Period 14	$226,500	$17,352	$243,852
Annual Period 15	$235,560	$17,872	$253,432
Annual Period 16	$244,982	$18,409	$263,391
Annual Period 17	$254,781	$18,961	$273,742
Annual Period 18	$264,973	$19,530	$284,502
Annual Period 19	$275,572	$20,116	$295,687
TOTALS	**$3,817,376**	**$303,495**	**$4,120,870**

1.2 Table 1.2 shows the CLIENT'S guaranteed cost Savings for each Annual Period that are extrapolated from the guaranteed energy/utility unit Savings shown in Table 1.1 by multiplying the energy/utility Savings by the Baseline energy/utility rates including the stipulated Escalation Rates found in Article 6.

1.3 SIEMENS cannot and does not predict fluctuations in utility rates or the cost of energy. Therefore, the CLIENT and SIEMENS agree that the energy/utility cost Savings for each Annual Period will be calculated by multiplying the verified units of energy/utility Savings by the Annual Period's stipulated energy/utility rate and Escalation Rates and not the Annual Period's actual utility rate.

1.4 The determination of energy/utility Savings will follow current best practice, as defined in the IPMVP, or the FEMP Guidelines where required, unless otherwise agreed to by the Parties.

1.5 The Performance Guarantee does not operate to guarantee the Savings per-FIM. Rather, the calculation of Savings is based on aggregate performance of all of the FIMs contained in the Project. The projected value of such aggregate performance is contained in Table 1.2 above representing the Total Guaranteed Savings as monetized.

This Exhibit C, comprising 39 pages, is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT: **City of Garden Grove**

Signature: _____
Printed Name: _____
Title: _____
Date: _____

SIEMENS: **Siemens Industry, Inc.**

Signature: _____
Printed Name: _____
Title: _____
Date: _____

Signature: _____
Printed Name: _____
Title: _____
Date: _____

Article 2: Measurement and Verification Options

2.1 Measurement and Verification Options: There are five measurement and verification options to measure and verify energy/utility Savings: Option A - Retrofit Isolation: Key Parameter Measurement; Option B - Retrofit Isolation: All Parameter Measurement; Option C - Whole Facility; and, Option D – Calibrated Simulation. Options A through and including D are part of the IPMVP. Option E-Stipulated is based on industry accepted engineering standards and is the Option used for purposes of calculating Operational Savings.

Option A - Retrofit Isolation: Key Parameter Measurement. Savings are determined by field measurement of the key performance parameter(s) which define the energy use of the FIM's affected system(s) and/or the success of the Project. Measurement frequency ranges from short-term to continuous, depending on the expected variations in the measured parameter and the length of the reporting period. Parameters not selected for field measurement are estimated. Estimates can be based on historical data, manufacturer's specifications, or engineering judgment. Documentation of the source or justification of the estimated parameter is required. The plausible savings error arising from estimation rather than measurement is evaluated. If applicable, the predetermined schedule for data collection, evaluation, and reporting is defined in Exhibit A, Article 3-Performance Assurance Services Program.

Option B – Retrofit Isolation: All Parameter Measurement. Savings are determined by field measurement of the energy use of the FIM-affected system. Measurement frequency ranges from short-term to continuous, depending on the expected variations in the savings and the length of the reporting period. If applicable, the predetermined schedule for data collection, evaluation, and reporting is defined in Exhibit A, Article 3-Performance Assurance Services Program.

Option C - Whole Facility: Savings are determined by measuring energy use at the whole Facility or sub-Facility level. Continuous measurements of the entire Facility's energy use are taken throughout the reporting period. If applicable, the predetermined schedule for data collection, evaluation, and reporting is defined in Exhibit A, Article 3-Performance Assurance Services Program.

Option D - Calibrated Simulation: Savings are determined through simulation of the energy use of the whole Facility, or of a sub-Facility. Simulation routines are demonstrated to adequately model actual energy performance measured in the Facility. This Option usually requires considerable skill in calibrated simulation. If applicable, the predetermined schedule for data collection, evaluation, and reporting is defined in Exhibit A, Article 3-Performance Assurance Services Program.

Option E – Stipulated: This Option is the method of measurement and verification applicable to FIMS consisting either of Operational Savings or where the end use capacity or operational efficiency; demand, energy consumption or power level; or manufacturer's measurements, industry standard efficiencies or operating hours are known in advance, and used in a calculation or analysis method that will stipulate the outcome. Both CLIENT and SIEMENS agree to the stipulated inputs and outcome(s) of the analysis methodology. Based on the established analytical methodology the Savings stipulated will be achieved upon completion of the FIM and no further measurements or calculations will be performed

during the Performance Guarantee Period. If applicable, the methodology and calculations to establish Savings value will be defined in Section 4.6 of this Exhibit C.

2.2 Table 2.1 below summarizes the first Annual Period's Guaranteed Savings (See Article 1, Tables 1.1 and 1.2) utilizing the applicable Measurement and Verification Options as applied to the referenced FIMs valued pursuant to the agreed upon amounts identified in Article 6 hereof.

Table 2.1 – Savings for First Annual Period by Option

FIM	Energy/Utility Savings $						Operational Savings $	Total Savings $
	Measurement and Verification Options							
	A Retrofit Isolation: Key Parameter Measurement	B Retrofit Isolation: All Parameter Measurement	C Whole Facility	D Calibrated Simulation	E Stipulated	Total Energy/Utility Savings	E Stipulated	
Package Unit Replacement	$13,379					$13,379		$13,379
Boiler Replacement	$962					$962		$962
Chiller Replacement	$9,856					$9,856		$9,856
Refurbish AHU's	$16,555					$16,555		$16,555
Lighting Retrofit	$93,656					$93,656	$ 11,816	$105,472
Plug Load	$716					$716		$716
Controls	$906					$906		$906
TOTALS	**$136,030**					**$136,030**	**$ 11,816**	**$147,846**

2.3 Table 2.2 identifies the source of Operational Savings defined and quantified by the Parties. The Parties affirm that such amounts are Stipulated Savings for purposes of calculating Annual Realized Savings and acknowledge that the Guaranteed Savings identified herein have been based on CLIENT'S affirmation. **OPERATIONAL SAVINGS SHALL NOT BE MEASURED OR MONITORED DURING THE PERFORMANCE GUARANTEE PERIOD.**

Table 2.2 - Source of Operational Savings

Account/'Vendor	Description	Annual Cost $	# of Annual Periods Savings Are Applied	Annual Period Savings Begin
City of Garden Grove	Interior and Exterior Lighting material replacements (Lamp, Ballasts and recycling maintenance cost reductions)	$ 11,816	17	Construction Year

2.4 SIEMENS has explained to the CLIENT and the CLIENT has satisfied itself as to how Operational Savings are incorporated into the Annual Realized Savings.

2.5 The Escalation Factor applicable to the Operational Savings is 3%.

BY SIGNING BELOW, THE PARTIES CONFIRM THAT THEY HAVE REVIEWED THE INCLUDED MEASUREMENT AND VERIFICATION OPTIONS AND THEIR APPLICATION TO BE USED IN CALCULATING SAVINGS UNDER THE AGREEMENT.

CLIENT:	**City of Garden Grove**	**SIEMENS:**	**Siemens Industry, Inc.**
Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____
		Signature:	_____
		Printed Name:	_____
		Title:	_____
		Date:	_____

Article 3: Performance Guarantee Period Responsibilities of the CLIENT
In addition to the CLIENT'S responsibilities under Article 6 of the Agreement, this Article details the responsibilities of the CLIENT in connection with the management and administration of the Performance Guarantee.

3.1 The CLIENT will provide a representative at each Facility to coordinate work and provide required data described below.

3.2 The CLIENT will provide SIEMENS with accurate Facility operating information as defined below and in the Contracted Baseline article of this Exhibit C during each Annual Period, within thirty (30) days of any Material Change that may increase or decrease energy usage.

3.3 If applicable, the CLIENT will provide SIEMENS with copies of utility bills within thirty (30) days of receipt by the CLIENT or provide access to utility vendor information to allow SIEMENS to include a utility bill analysis in the Annual Performance Assurance Report. The utility bill analysis does not take the place of the Measurement and Verification Plan identified in Article 4 of this Exhibit C and is not used to measure the Project's performance.

3.4 If required for the Work, CLIENT will provide telephone/data remote access, through SIEMENS Insight® software package or otherwise, as SIEMENS reasonably requests. All charges related to telephone/data line installation, activation and communication services are the responsibility of the CLIENT.

3.5 If required for the Work, CLIENT will provide and coordinate utility meter upgrade for interface with SIEMENS metering and data collection. All charges related for these upgrades are the responsibility of the CLIENT.

3.7 Article 4: Measurement and Verification Plan

The following information is applicable to this Agreement:

Article 4.1 General Overview
Article 4.2 Option A - Retrofit Isolation: Key Parameter Measurement
Article 4.3 Option B - Retrofit Isolation: All Parameter Measurement
Article 4.4 Option C - Whole Facility
Article 4.5 Option D - Calibrated Simulation
Article 4.6 Option E – Stipulated-Energy/Utility Savings

4.1 **General Overview –**

The purpose of the Measurement and Verification (M&V) Plan is to identify the methods, measurements, procedures and tools that will be used to verify the Savings for each FIM which has energy/utility Savings. Savings are determined by comparing prior usage, consumption or efficiencies (defined as the "Baseline") against the post-FIM implementation usage, consumption or efficiencies. The Baseline usage, consumption or efficiencies are described in this Exhibit C, Article 5. The post-FIM implementation usage, consumption or efficiencies is defined as the Contracted Baseline and are described in this Exhibit C, Article 7.

4.2 **Option A - Retrofit Isolation: Key Parameter Measurement**

4.2.1 Lighting Upgrade

Location(s):

Location	Address
Police Station	11301 Acacia Parkway, Garden Grove CA 92840
Juvenile Justice	11301 Acacia Parkway, Garden Grove CA 92840
Property & Evidence	11301 Acacia Parkway, Garden Grove CA 92840
Police Annex	11400 Stanford Ave, Garden Grove CA 92840
City Hall	11222 Acacia Parkway, Garden Grove CA 92840
Gem Theatre	12852 Main st. Garden Grove CA 92840
Amphitheatre	12762 Main St, Garden Grove CA 92840
Courtyard Center + Activity Center	12732 Main st. Garden Grove, CA 92840
Community Meeting Center, H. Louis Lake Senior Center	11300 Stanford Ave, Garden Grove CA 92840
Buena Clinton	12661 Sunswept Ave, Garden Grove CA 92843

Municipal Service Center	13802 Newhope St., Garden Grove CA 92843
Fire Station #1	11301 Acacia Parkway, Garden Grove CA 92840
Fire Station #2	11805 Gilbert st., Garden Grove CA 92841
Fire Station #3	12132 Trask ave., Garden Grove CA 92843
Fire Station #4	12191 Valley View st., Garden Grove CA 92845
Fire Station #5	12751 Western ave., Garden Grove CA 92841
Fire Station #7	14162 Forsyth Ln, Garden Grove CA 92844
Sports and Rec + Pump house	9301 Westminister blvd, Garden Grove CA 92844
Atlantis	9301 Westminster ave. Garden Grove CA 92844
Garden Grove Park (not including Musco/Stadium lighting)	9301 Westminister blvd, Garden Grove CA 92844
Chapman Sports Complex (not including Musco/Stadium lighting)	11990 Knott St, Garden Grove CA 92841
Woodbury Park	13800 Rosita pl., Garden Grove CA 92843
West Grove Park	5372 Cerulean Ave, Garden Grove CA 92845
Village Green Park	12852 Main St, Garden Grove CA 92840
Eastgate Park	12001 St. Mark St., Garden Grove CA 92845
Gutosky Park	9201 Ferris Ln, Garden Grove CA 92841
Magnolia Park	11402 Magnolia ave., Garden Grove CA 92841
Faylane Park	11700 Seacrest Dr., Garden Grove CA 92840
Civic Center Parking lot	11300 Stanford Ave, Garden Grove CA 92840
Library Parking lot	11300 Stanford Ave, Garden Grove CA 92840

Overview:

SIEMENS will retrofit the existing fixtures, lamps, and/or ballasts with more energy-efficient fixtures, lamps, and/or ballasts. SIEMENS will also install occupancy sensor controls in selected locations as per Exhibit A Appendix 1 Verification of electric energy Savings (kWh) achieved by the lighting retrofit shall be based upon a one-time measurement of the lighting power capacity under existing conditions, a one-time measurement of the lighting power capacity upon completion of the

lighting retrofit project and agreed-upon annual operating hours. Spot wattage measurements of a random sample of baseline and post-installation fixture types or fixture circuits will be used to establish demand. Sample size for wattage measurements will be determined based on FEMP guidelines for sample size determination, with overall population sample size not to exceed 10% of the retrofit population.

Pre-Retrofit Measurement\Calculations:

$kWh_{pre} = (kW_{pre} * Quantity_{pre} * AOHrs_{pre})_{fixture\ type\ "n",}$ summed across all fixture types = pre-retrofit annual kWh

Where:

kW_{pre} = Instantaneous kW based on random sample of existing lighting-fixture types

$Quantity_{pre}$ = Count of each fixture-type based on as-built survey

$AOHrs_{pre}$ = Pre-Retrofit Annual Operating Hours, stipulated Exhibit A Appendix 1

Post-Retrofit Measurement\Calculations:

$kWh_{post} = (kW_{post} * Quantity_{post} * AOHrs_{post})_{fixture\ type\ "n",}$ summed across all fixture types = post-retrofit annual kWh

Where:

kW_{post} = Instantaneous kW based on random sample of the installed/retrofitted lighting-fixture types

$Quantity_{post}$ = Count of each fixture-type based on as-built survey

$AOHrs_{post}$ = Post-Retrofit Annual Operating Hours, stipulated Exhibit A Appendix 1

Savings Calculations:

Electric Savings (kWh/yr):

$kWh_S = kWh_{pre} - kWh_{post}$

Demand Savings (kW/yr):

$kW_S = (kW_{pre} – kW_{post}) * Months$

Where:

kW_S = annual post-retrofit kilowatt savings

Months = months per year of electric demand savings = 12

Cost Savings ($/yr):

$\$_S = (kWh_S * \$/kWh_{,x}) + (kW_S * \$/kW_{,x})$

Where:

$/kWh = contracted unit price for electricity at each location as per Article 6 of this Exhibit C

$/kW = contracted unit price for electricity at each location as per Article 6 of this Exhibit C

$\$_S$ = Total annual cost savings

4.2.2 Package Unit Replacement

Location(s): Public Works, Gem Theatre, Fire Station #5, Gem Theatre, Teen Center, Magnolia Park Neighborhood Center, Sports & Recreation Center

Overview:
Siemens will replace the package units as described in Exhibit A. Savings result from the increase in cooling and heating efficiency and energy savings control strategies implemented (scheduling and/or night setback/set up). Savings will be verified by continuously trending the electric power (kW) of the equipment and thermal efficiency per manufacturer's specification of install units.

In addition the control strategies implemented will be monitored to ensure the units are operating as described in Article 7 of this Exhibit C.

Scheduling
Continuous trending of equipment fan status (on/off) and status (occ/unocc) to verify the schedule as described in Article 7 of this Exhibit C.

Night Setback/Set up
Continuous trending of heating and cooling set point in conjunction with equipment status to verify the set point is setting back during heating mode and setting forward during cooling mode as described in Article 7 of this Exhibit C.

Post-retrofit, if contracted baseline schedules for this equipment, as established in Article 7 of this Exhibit C, are modified by the CLIENT and result in a loss of energy savings, the Guaranteed Savings for this FIM will be deemed achieved.

Pre-Retrofit Measurement\Calculations:
kWh_{pre} = pre-retrofit electric consumption (kWh/yr) based on modeling of existing equipment, shown in Table 4.2.2.1
kW_{pre}= pre-retrofit electric demand (kW/yr) based on modeling of existing equipment, shown in Table 4.2.2.1
$Therms_{pre}$= pre-retrofit natural gas consumption (Therms/yr) based on modeling of existing equipment, shown in Table 4.2.2.1

Table 4.2.2.1 - Pre-retrofit Consumption by Location and Equipment

Location	Unit	kWh_{pre}	kW_{pre}	$Therms_{pre}$
Public Works	AC-6 & AC-7	6,440	4.43	281
Public Works	AC-8	11,144	7.50	471
Public Works	AC-9	7,924	5.29	326
Fire Station #5	AC-1 & AC-2	12,797	8.50	490
Gem Theater	AC-3 & AC-5	13,102	9.68	718
Teen Center	AC-1	9,987	8.53	496
Magnolia Park Neighborhood Center	AC-1	7,891	5.30	341
Magnolia Park Neighborhood Center	AC-2	7,809	4.71	279

Sports & Recreation Center	AC-1 & AC-2	61,385	39.89	2,536
Sports & Recreation Center	AC-3	22,913	15.40	1,067
Sports & Recreation Center	AC-4	21,030	13.84	903

Post-Retrofit Measurement\Calculations:

$kWh_{post} = \Sigma(\text{Avg Cooling kW} * AOH)_{BIN}$

$kW_{post} = \Sigma(\text{Avg Cooling kW})_{BIN}$

$Therms_{post\ Heating} = \Sigma(\text{Total Heating Load} / 100{,}000\ ^{BTU}/_{Therm} / \eta)_{BIN}$

Where:

Avg Cooling Kw = average electric demand (kW) per OAT Bin as shown in Table 4.2.2.2a and b
AOH= annual operating hours per OAT Bin as shown in Table 4.2.2.2a and b
Total Heating Load = total heating load (BTU) as shown in Table 4.2.2.2a and b
η = Thermal Efficiency verified by manufacturer's specification of installed equipment (%)

Table 4.2.2.2a - Total Heating Load (BTU)

Average Outdoor Air Temp (°F)	Annual Operating Hours (AOH)	Total Heating Load (BTU)				
		Public Works AC-6 & AC-7	Public Works AC-8	Public Works AC-9	Fire Station 5	Gem Theatre
97.5	3	34,494	57,889	40,642	68,160	85,804
92.5	14	27,873	46,854	32,917	56,140	71,380
87.5	67	23,998	40,397	28,398	48,699	62,451
82.5	277	20,034	33,747	23,730	41,621	53,958
77.5	522	14,760	24,865	17,485	32,187	42,493
72.5	881	9,484	15,979	11,237	22,075	29,589
67.5	1652	4,415	7,439	5,231	12,410	17,238
62.5	2188	-4,648	-7,723	-5,399	2,605	4,646
57.5	1582	-9,073	-15,074	-10,538	-12,720	-13,882
52.5	964	-13,498	-22,426	-15,677	-21,038	-23,675
47.5	432	-17,922	-29,777	-20,816	-29,355	-33,468
42.5	140	-22,347	-37,129	-25,955	-37,672	-43,260
37.5	38	-26,772	-44,480	-31,094	-45,989	-53,053

Table 4.2.2.2b – Total Heating Load (BTU)

Average Outdoor Air Temp (°F)	Annual Operating Hours (AOH)	Total Heating Load (BTU)					
		Teen Center	Magnolia Park Neighbor-hood Center AC-1	Magnolia Park Neighbor-hood Center AC-2	Sports & Recreation Center AC-1 & AC-2	Sports & Recreation Center AC-3	Sports & Recreation Center AC-4
97.5	3	57,390	40,642	36,171	327,847	129,701	111,109
92.5	14	46,489	32,917	29,550	267,749	105,662	90,675
87.5	67	40,167	28,398	25,676	230,545	90,780	78,026
82.5	277	33,637	23,730	21,535	195,155	76,624	65,993
77.5	522	24,912	17,485	15,874	143,489	56,328	48,519
72.5	881	16,179	11,237	10,210	91,675	35,978	30,997
67.5	1652	7,792	5,231	4,753	41,800	16,404	14,133
62.5	2188	-7,286	-5,399	-4,547	-40,225	-16,182	-13,699
57.5	1582	-14,505	-10,538	-8,874	-81,419	-32,753	-27,729
52.5	964	-21,724	-15,677	-13,202	-122,613	-49,325	-41,758
47.5	432	-28,943	-20,816	-17,530	-163,807	-65,897	-55,788
42.5	140	-36,162	-25,955	-21,857	-205,001	-82,468	-69,817
37.5	38	-43,381	-31,094	-26,185	-246,195	-99,040	-83,847

Savings Calculations:

Electric Savings (kWh/yr):

$kWh_S = kWh_{pre} - kWh_{post}$

Demand Savings (kW/yr):

$kW_S = (kW_{pre} – kW_{post}) * Months$

Natural Gas Savings (Therms/yr):

$Therms_S = Therms_{pre} - Therms_{post}$

Cost Savings ($/yr):

$\$_S = (kWh_S * \$/kWh_{,x}) + (kW_S * \$/kW_{,x}) + (Therms_S * \$/Therm_{,x})$

Where:

kW_S = annual post-retrofit kilowatt savings
Months = months per year of electric demand savings = 12
$/kWh = contracted unit price for electricity at each location as per Article 6 of this Exhibit C
$/kW = contracted unit price for electricity at each location as per Article 6 of this Exhibit C
$/Therm = contracted unit price for natural gas at each location as per Article 6 of this Exhibit C

$$\$_S$$ = Total annual cost savings

4.2.3 Chiller Replacement

Location(s): City Hall

Description
Energy and cost savings will be achieved by replacing the existing cooling systems with a higher efficiency cooling system. Savings will be verified by comparing the energy intensity (kW/ton_{pre}) of the pre-retrofit cooling equipment against the energy intensity (kW/Ton_{post}) of the post-retrofit cooling Equipment based on continuous trending chiller.

Pre-Retrofit Measurements\Calculations:
kWh_{Pre} = $CHkWh_{Pre}$ + $CTkWh_{Pre}$ + $CHWPkWh_{Pre}$ = 237,738 kWh/yr
$CHkWh_{Pre}$ = Occ kW/Ton_{pre} * AOHOcc + Unocc kW/Ton_{pre} * AOHUnocc
$CTkWh_{Pre}$ = $OccCTkW_{pre}$ * AOHOcc + $UnoccCTkW_{pre}$ * AOHUnocc
$CHWPkWh_{Pre}$ = (CHWP1kW + CHWP2kW) * AOHOcc + (CHWP1kW + CHWP2kW) * AOHUnocc

Where:
kWh_{pre} = Pre-Retrofit electric consumption of chiller plant (kWh/yr) based on the operating parameters shown in Table 4.2.3.1
$CHkWh_{Pre}$ = Pre-Retrofit electric consumption of the existing chillers (kWh/yr) = 140,448 kWh/yr
Occ kW/Ton_{pre} = Pre-retrofit chiller efficiency occupied per Table 4.2.3.1
AOHOcc = Annual Occupied Operating Hours per Table 4.2.3.1
Unocc kW/Ton_{pre} = Pre-retrofit unoccupied chiller efficiency per Table 4. 4.2.3.1
AOHUnocc = Annual Unoccupied Operating Hours per Table 4.2.3.1
$CTkWh_{Pre}$ = Pre-Retrofit electric consumption of the cooling tower fan (kWh/yr) = 3,477 kWh/yr
$OccCTkW_{pre}$ = Cooling Tower Fan occupied electric demand per Table 4.2.3.1
$OccCTkW_{pre}$ =CTFull LoadkW * $Occ\%Cap^3$ * CHWTMin / $CHWST_{pre}$
CTFull LoadkW = Electric demand of the cooling tower fan at full load = 14.92 kW
$Occ\%Cap_{Pre}$ = Occupied percent capacity on chiller plant per Table 4.2.3.1
CHWTMin = 70°F
OccCHWST = Occupied chilled water system temp per Table 4.2.3.1
$UnoccCTkW_{pre}$ = Cooling Tower Fan unoccupied electric demand per Table 4.2.3.1
$UnoccCTkW_{pre}$ = CTFull LoadkW * $Unocc\%Cap^3$ * CHWTMin/ $CHWST_{Pre}$
Unocc%Cap = Occupied percent capacity on chiller plant = 20%
$CHWPkWh_{Pre}$ = Pre-Retrofit electric consumption of the chilled water pumps (kWh/yr) = 93,813 kWh/yr

CHWP1kW = Chilled water pump 1 electric demand = 5.595 kW
CHWP2kW= Chilled water pump 2 electric demand = 7.460 kW

Table 4.2.3.1 - Pre-retrofit Chilled Water Plant Operating Parameters

OAT Bin	Annual Occupied Operating Hours (AOHOcc)	Pre-Retrofit Chilled Water System Temp	Pre-retrofit Occ % Capacity	Pre-Retrofit Chiller Plant kW/ Ton	Pre-Retrofit CT kW Occ	Annual Unocc Operating Hours (AOHUnocc)	Post-Retrofit Chiller Plant kW/ Ton	Pre-Retrofit CT kW Unocc
97.5	2	85	80%	0.839	6.29	1	0.945	0.098
92.5	9	85	80%	0.839	6.29	5	0.945	0.098
87.5	42	85	70%	0.864	4.21	25	0.945	0.098
82.5	171	85	70%	0.864	4.21	106	0.945	0.098
77.5	303	85	60%	0.816	2.65	219	0.945	0.098
72.5	457	85	50%	0.764	1.54	424	0.945	0.098
67.5	676	85	30%	0.893	0.33	976	0.945	0.098
62.5	851	80	30%	0.804	0.35	1,337	0.847	0.104
57.5	555	80	20%	0.847	0.10	1,027	0.847	0.104

Post-Retrofit Measurements\Calculations:

$kWh_{Pre} = CHkWh_{Post} + CTkWh_{Post} + CHWPkWh_{Pre}$

$CHkWh_{Post} = kW/Ton_{Post} * AOHOcc$

$CTkWh_{Pre} = OccCTkW_{Post} * AOHOcc$

Where:

kW/Ton_{post} = Post-retrofit chiller plant efficiency based on continuous trending of the chiller plant

$OccCTkW_{post}$ = Post-retrofit cooling tower fan occupied electric demand per Table 4.2.3.2

$CTkW_{Post}$ =CTFull LoadkW * $Occ\%Cap_{Post}^3$ * CHWTMin / $CHWST_{Post}$

Table 4.2.3.2 - Post-retrofit Chilled Water Plant Operating Parameters

OAT Bin	Annual Occupied Operating Hours (AOHOcc)	Post-Retrofit Chilled Water System Temp	Post-Retrofit Occ % Capacity	Post-Retrofit CT kW Occ
97.5	2	80	80%	6.68
92.5	9	78	80%	6.86
87.5	42	77	70%	4.65
82.5	171	76	70%	4.71
77.5	303	75	60%	3.01
72.5	457	73	60%	3.09
67.5	676	70	60%	3.22
62.5	851	69	20%	0.12
57.5	555	68	20%	0.12

Savings Calculations:
Energy (kWh) Savings:
$kWh_s = kWh_{pre} - kWh_{post}$

Formulas for Cost Savings:
$\$_S = kWh_S \times \$/kWh_{,x}$

Where:
$\$_S$ = annual cost savings
kWh_S = annual Electric savings (kWh/yr)
$\$/kWh_{,x}$ = electricity unit cost per kWh as defined for location 'x' in Article 6 of this Exhibit C

4.2.4 Boiler Replacement

Location(s): Police Department

Overview*:*
Energy savings expected from an efficiency increase by upgrading existing boilers to condensing hot water boilers. These savings will be verified by a post-retrofit combustion efficiency based on manufacturer's specifications of installed equipment.

Pre-retrofit measurements\Calculations:
$Fuel_{pre} = (Capacity * AOH * \%PF) / (\eta_{Pre,CE} * \eta_D) / HVNG$

Where:
$Fuel_{pre}$ = Pre-retrofit natural gas usage (Therms/yr) = 8,356 Therms/yr
Capacity = Boiler Capacity = 1,260 Mbh
AOH = Annual operating hours = 630 hours/yr
%PF = Part load factor = 75%
$\eta_{Pre,CE}$ = Pre-retrofit combustion efficiency = 75 %
η_D = Pre-retrofit distribution efficiency = 95 %
HVNG = High heating value of natural gas = 100 $^{MBtu}/_{Therm}$

Post-retrofit measurements\Calculations:
$Fuel_{post} = (Capacity * AOH * \%PF) / (\eta_{Post,CE} * \eta_D) / HVNG$

Where:
$Fuel_{post}$ = Post-retrofit natural gas usage (Therms/yr)
$\eta_{Post,\ CE}$ = average combustion efficiency based on manufacturer's specifications

Savings Calculations:
Energy Savings (Therms/yr):
$Fuel_S = Fuel_{pre} - Fuel_{post}$

Cost Savings ($/yr):

$\$_S = Fuel_S * \$/Therm_{,x}$

Where:

$Fuel_S$ = annual fuel (Therms/yr) savings
$\$/Therm_{,x}$ = unit price for natural gas at location 'x' as per Article 6 of this Exhibit C

4.2.5 Refurbish AHUs – City Hall AHU-1

Location(s): City Hall

Overview:
Siemens will refurbish AHU-1 at City Hall as described in Exhibit A. Energy savings results from varying the supply and return fans speed from constant volume to variable volume. Savings will be verified by continuously trending the supply and return fan electric demand (kW) in conjunction with fan speed and outdoor air damper position.

Pre-Retrofit Measurement\Calculations:
$kWh_{pre} = Supply\ kWh_{pre} + Return\ kWh_{pre}$

$Supply\ kWh_{post} = \Sigma[Supply\ kW_{pre} * AOH]_{OAT\ BIN}$
$Return\ kWh_{post} = \Sigma[Return\ kW_{pre} * AOH]_{OAT\ BIN}$

Where:

kWh_{pre} = Total pre-retrofit annual electric consumption (kWh/yr) as shown in Table 4.2.5.1
$Supply\ kWh_{pre}$ = Pre-retrofit supply fan annual electric consumption (kWh/yr) as shown in Table 4.2.5.1
$Supply\ kW_{pre}$ = Pre-retrofit supply fan electric demand (kW) = 31.32 kW
AOH = Annual operating hours per OAT Bin as shown in Table 4.2.5.1
$Return\ kWh_{post}$ = Pre-retrofit return fan annual electric consumption (kWh/yr) as shown in Table 4.2.5.1
$Return\ kW_{pre}$ = Pre-retrofit return fan electric demand (kW) = 7.10 kW

Table 4.2.5.1 - Pre-retrofit Electric Consumption (City Hall AHU-1)

OAT BIN	AOH	Pre-Retrofit Supply Fan kWh	Pre-Retrofit Return Fan kWh	Pre-Retrofit Total kWh
97.5	2	60	14	74
92.5	9	282	64	346
87.5	42	1,319	299	1,618
82.5	171	5,371	1217	6,588
77.5	303	9,486	2150	11,636
72.5	457	14,320	3246	17,566
67.5	676	21,183	4802	25,985
62.5	851	26,652	6041	32,693
57.5	555	17,383	3940	21,323
52.5	293	9,174	2079	11,253

47.5	116	3,629	823	4,452
42.5	35	1,087	246	1,334
37.5	9	287	65	352
Total	**3,520**	**110,233**	**24,986**	**135,219**

Post-Retrofit Measurement\Calculations:

kWh_{post} = Supply kWh_{post} + Return kWh_{post}

Supply kWh_{post} = Σ[Supply kW_{post} * AOH]$_{OAT\ BIN}$
Return kWh_{post} = Σ[Return kW_{post} * AOH]$_{OAT\ BIN}$

Where:

kWh_{post} = Total post-retrofit annual electric consumption (kWh/yr)
Supply kWh_{post} = Post-retrofit supply fan annual electric consumption (kWh/yr)
Supply kW_{post} = Post-retrofit average per OAT Bin supply fan electric demand (kW) trended continuously through EMS
Return kWh_{post} = Post-retrofit return fan annual electric consumption (kWh/yr)
Return kW_{post} Post-retrofit average per OAT Bin return fan electric demand (kW) trended continuously through EMS

Savings Calculations:

Energy Savings (kWh/yr):

$kWh_S = kWh_{pre} - kWh_{post}$

Where:

kWh_S = Total annual electric savings (kWh/yr)

Cost Savings($/yr):

$\$_S = kWh_S * \$/kWh$

Where:

$\$_S$ = Total annual cost savings
$/kWh = contracted unit price for electricity at each location as per Article 6 of this Exhibit C

4.2.6 Refurbish AHUs – City Hall MZ-1

Location(s): City Hall

Overview:

Siemens will refurbish MZ-1 at City Hall as described in Exhibit A. Energy savings results from scheduling MZ-1 from 24/7 operation to 6am to 7pm (M-Thurs and every other Friday) and Holiday scheduling. Savings will be verified by continuously trending the supply fan status. The annual operating hour bin model will be re-run with the actual schedules observed during each Annual Period.

Post-retrofit, if contracted baseline schedules for this equipment, as established in Article 7 of this Exhibit C, are modified by the CLIENT and result in a loss of energy savings, the Guaranteed Savings for this FIM will be deemed achieved.

Pre-Retrofit Measurement\Calculations:

$kWh_{pre} = \Sigma[\text{Supply kW} * AOH_{Pre}]_{OAT\ BIN}$

Where:

kWh_{pre} = Total pre-retrofit annual electric consumption (kWh/yr) as shown in Table 4.2.6.1
Supply kW = supply fan electric demand (kW) = 5.87 kW
AOH_{Pre} = Pre-retrofit annual operating hours per OAT Bin as shown in Table 4.2.6.1

Table 4.2.6.1 - Pre-retrofit Electric Consumption (City Hall AHU-2)

OAT BIN	AOH	Pre-Retrofit Supply Fan kWh
97.5	3	18
92.5	14	82
87.5	67	393
82.5	277	1,627
77.5	522	3,065
72.5	881	5,174
67.5	1652	9,701
62.5	2188	12,849
57.5	1582	9,290
52.5	964	5,661
47.5	432	2,537
42.5	140	822
37.5	38	223
Total	**8,760**	**51,442**

Post-Retrofit Measurement\Calculations:

$kWh_{post} = \Sigma[\text{Supply kW} * AOH_{Post}]_{OAT\ BIN}$

Where:

kWh_{post} = Total post-retrofit annual electric consumption (kWh/yr)
AOH_{Post} = Post-retrofit annual operating hours per OAT Bin modeled by continuously trending supply fan status to determine actual schedule

Savings Calculations:

Energy Savings (kWh/yr):

$kWh_S = kWh_{pre} - kWh_{post}$

Where:

kWh_S = Total annual electric savings (kWh/yr)

Cost Savings($/yr):
$\$_S = kWh_S * \$/kWh$

Where:

$\$_S$ = Total annual cost savings
$/kWh = contracted unit price for electricity at each location as per Article 6 of this Exhibit C

4.2.7 Refurbish AHUs – Police Department AH-1

Location(s): Police Department

Overview:
Siemens will refurbish AH-1 at the Police Department as described in Exhibit A. Energy savings results from varying the supply and return fans speed from constant volume to variable volume. Savings will be verified by continuously trending the supply and return fan electric demand (kW) in conjunction with fan speed and outdoor air damper position.

Pre-Retrofit Measurement\Calculations:
kWh_{pre} = Supply kWh_{pre} + Return kWh_{pre}

Supply $kWh_{pre} = \Sigma[\text{Supply } kW_{pre} * AOH]_{OAT\ BIN}$
Return $kWh_{pre} = \Sigma[\text{Return } kW_{pre} * AOH]_{OAT\ BIN}$

Where:

kWh_{pre} = Total pre-retrofit annual electric consumption (kWh/yr) as shown in Table 4.2.7.1
Supply kWh_{pre} = Pre-retrofit supply fan annual electric consumption (kWh/yr) as shown in Table 4.2.7.1
Supply kW_{pre} = Pre-retrofit supply fan electric demand (kW) = 19.57 kW
AOH = Annual operating hours per OAT Bin as shown in Table 4.2.7.1
Return kWh_{post} = Pre-retrofit return fan annual electric consumption (kWh/yr) as shown in Table 4.2.7.1
Return kW_{pre} = Pre-retrofit return fan electric demand (kW) = 1.87 kW

Table 4.2.7.1 - Pre-retrofit Electric Consumption (PD AHU-1)

OAT BIN	AOH	Pre-Retrofit Supply Fan kWh	Pre-Retrofit Return Fan kWh	Pre-Retrofit Total kWh
97.5	3	59	6	64
92.5	14	274	26	300
87.5	67	1,311	125	1,437
82.5	277	5,422	517	5,939
77.5	522	10,218	974	11,192
72.5	881	17,245	1,644	18,889
67.5	1652	32,337	3,082	35,419
62.5	2188	42,829	4,082	46,912

57.5	1582	30,967	2,952	33,919
52.5	964	18,870	1,799	20,669
47.5	432	8,456	806	9,262
42.5	140	2,740	261	3,002
37.5	38	744	71	815
Total	**8,760**	**171,474**	**16,344**	**187,818**

Post-Retrofit Measurement\Calculations:

kWh_{post} = Supply kWh_{post} + Return kWh_{post}

Supply kWh_{post} = Σ[Supply kW_{post} * AOH]$_{OAT\ BIN}$
Return kWh_{post} = Σ[Return kW_{post} * AOH]$_{OAT\ BIN}$

Where:

kWh_{post} = Total post-retrofit annual electric consumption (kWh/yr)
Supply kWh_{post} = Post-retrofit supply fan annual electric consumption (kWh/yr)
Supply kW_{post} = Post-retrofit average per OAT Bin supply fan electric demand (kW) trended continuously through EMS
Return kWh_{post} = Post-retrofit return fan annual electric consumption (kWh/yr)
Return kW_{post} Post-retrofit average per OAT Bin return fan electric demand (kW) trended continuously through EMS

Savings Calculations:

Energy Savings (kWh/yr):

$kWh_S = kWh_{pre} - kWh_{post}$

Where:

kWh_S = Total annual electric savings (kWh/yr)

Cost Savings($/yr):

$\$_S = kWh_S * \$/kWh$

Where:

$\$_S$ = Total annual cost savings
$/kWh = contracted unit price for electricity at each location as per Article 6 of this Exhibit C

4.2.8 Siemens Desigo Controls System – Holiday Scheduling

Location(s):

Building	# of Units	Unit Numbers
Juvenile Justice	4	AC-1, AC-2, AC-3, AC-4
Property & Evidence Building	4	AC-1, F1, F-2, F-3
Fire Station #5	2	AC-1, AC-2

Fire Station #7	1	AC-1
Public works	14	AC 1-14
Buena Clinton Youth & Family Center	8	SHP 1-2, 4, 5A-5B HP 7-8,10
Courtyard Center/ Activity Center	5	Courtyard AC-1, AC-2, AC-3, AC-4, Activity AC-1
Police Annex	4	AC-1, AC-2, AC-3, AC-4
Magnolia Park Neighborhood Center	2	AC-1, AC-2
Festive Amphitheatre	2	AC-1, AC-2
Teen Center	1	AC-1
Community Service Center	1	AC-1

Overview:

Siemens will install a new Siemens Desigo Automation System in the locations above to control the units listed in Table 4.2.8.1.Currently the units run 5 days a week all year, except for the Police Annex which operates 7 days a week. Siemens will implement a holiday schedule, shutting the units off for 14 days a year. Savings will be verified by continuously trending unit status and verifying the units shut down for 14 week days per year.

Pre-Retrofit Measurement\Calculations:

$kWh_{pre} = \Sigma[kW * AOH_{Pre}]_{Unit}$

Where:

kWh_{pre} = Total pre-retrofit annual electric consumption (kWh/yr) as shown in Table 4.2.8.1 summed over all equipment for each building

kW = Fan motor electric demand (kW) as shown in Table 4.2.8.1 for each piece of equipment

AOH_{Pre} = Annual pre-retrofit operating hours per piece of equipment as shown in Table 4.2.8.1

Table 4.2.8.1 - Pre-retrofit Operating Parameters

Location	Equipment	Pre-Retrofit Electric Demand (kW_{Pre})	Pre-Retrofit Annual Operating Hours (AOH_{Pre})	Pre-Retrofit Electric Consumption (kWh_{Pre})
Public works	AC 1	4.8	1,200	5,760
	AC-2	6	1,200	7,200
	AC-3	6	1,200	7,200
	AC-4	4.8	1,200	5,760
	AC-5	4.8	1,200	5,760
	AC-6	3.39	1,183	4,011
	AC-7	3.39	1,183	4,011
	AC-8	5.76	1,205	6,938
	AC-9	4.07	1,212	4,932

	AC-10	3.6	1,200	4,320
	AC-11	3.6	1,200	4,320
	AC-12	3.6	1,200	4,320
	AC-13	3.6	1,200	4,320
	AC-14	3.6	1,200	4,320
Buena Clinton Youth & Family Center	SHP 1	0.1	1200	112
	SHP 2	0.1	1200	179
	SHP 4	0.1	1200	179
	SHP 5A	0.1	1200	179
	SHP 5B	3.0	1200	3,600
	SHP 7	1.5	1200	1,800
	SHP 8	4.0	1200	4,800
	SHP 10	4.0	1200	4,800
Courtyard Center	AC-1	2.4	1100	2,640
	AC-2	6.0	1100	6,600
	AC-3	6.0	1100	6,600
	AC-4	6.0	1100	6,600
Police Annex	AC 1	4.0	1100	4,400
	AC-2	4.0	1100	4,400
	AC-3	4.0	1100	4,400
	AC-4	4.0	1100	4,400
Magnolia Park Neighborhood Center	AC-1	4.0	1210	4,814
	AC-2	3.7	1316	4,897
Festive Amphitheatre	AC-1	5.6	900	5,040
	AC-2	5.6	900	5,040
Teen Center (Eastgate Park)	AC-1	5.76	880	5,068
Community Service Center (Westgrove Park)	AC-1	3.4	764	2,621

Post-Retrofit Measurement\Calculations:

$kWh_{post} = \Sigma[kW * AOH_{Post}]_{Unit}$

Where:

kWh_{post} = Total post-retrofit annual electric consumption (kWh/yr) summed over all equipment for each building

AOH_{Post} = Annual post-retrofit operating hours per piece of equipment determined by continuously trending equipment status

Savings Calculations:

Energy Savings (kWh/yr):

$kWh_S = kWh_{pre} - kWh_{post}$

Cost Savings($/yr):

$\$_S = kWh_S * \$/kWh$

Where:

kWh_S = Total annual electric savings (kWh/yr)

$\$_S$ = Total annual cost savings

$/kWh = contracted unit price for electricity at each location as per Article 6 of this Exhibit C

4.2.9 Plug Load Management

Location(s): City Hall, Community Meeting Center/Senior Center, Public Works, Buena Client

Overview:
A plug load management system will be installed to reduce unnecessary electric usage when electronic equipment is not in use. Energy savings will be verified by post-retrofit logging of the runtime of a sample of equipment through the use of the energy monitoring controls during the first annual period.

Pre-Retrofit Measurement\Calculations:
$kWh_{pre} = \Sigma(Qty_{,n} * (W_{,n} / 1{,}000\ ^{W}/_{kW}) * AOH_{pre,n})$

Where:

kWh_{pre} = Pre-retrofit electric consumption summed over all equipment per building as shown in Table 4.2.9.1
Qty = Quantity of equipment as shown in Table 4.2.9.1
W = Equipment power as shown in Table 4.2.9.1
AOH_{pre} = Pre-retrofit annual operating hours as shown in Table 4.2.9.1 (hours/year)

Table 4.2.9.1 – Plug Load Parameters

Equipment (n)	Electric Demand (W)	Quantity (Qty)			
		City Hall	Comm Center/ Senior Center	Public Works / Municipal Service	Buena Client
Projector	8	2	0	0	1
Smartboard	6	0	0	0	0
Proj/Smbrd	12	0	0	0	0
Amp	8	0	0	0	0
Chrg Cart	35	0	0	0	0
S Print	11	0	0	0	0
M Print	20	25	4	15	2
L Print/Copy	40	4	1	2	1
TV/Mon	8	0	2	0	0
Snack Vend	40	1	1	1	0
Soda Vend	320	1	1	1	0
Lg Coffee	56	1	2	1	1
H/C Water Disp.	75	4	2	2	0
Pre-Retrofit Annual Operating Hours (AOH_{pre})		2,250	4,250	2,500	2,250
Pre-retrofit Electric consumption (kWhpre)		12,194	6,640	8,287	1,261

Post-Retrofit Measurement\Calculations:
AOH_{post} = Post-retrofit annual operating hours, based on runtime logs collected from post-retrofit energy monitoring controls

$kWh_{post} = \Sigma(Qty_{,n} * (W_{,n} / 1{,}000\ ^{W}/_{kW}) * AOH_{post,n})$

Where:

kWh_{post} = Post-retrofit electric consumption (kWh)

Savings Calculations:

Energy Savings (kWh/yr):

$kWh_S = kWh_{pre} - kWh_{post}$

Where:

kWh_S = Total annual electric savings (kWh/yr)

Cost Savings($/yr):

$\$_S = kWh_S * \$/kWh$

Where:

$\$_S$ = Total annual cost savings

$/kWh = contracted unit price for electricity at each location as per Article 6 of this Exhibit C

4.3 **Option B - Retrofit Isolation: All Parameter Measurement - N/A**

4.4 **Option C - Whole Facility - N/A**

4.5 **Option D – Calibrated Simulation - N/A**

4.6 **Option E - Stipulated-Energy/Utility Savings - N/A**

Article 5: Baseline Data

5.1 The year(s) selected as the Baseline Period starts on 11/3/2016 and ends on 11/2/2017. Table 5.1 outlines the utility consumption that occurred during this Baseline Period. This Baseline Period's Facility utility consumption will be used as the reference for comparing the Facility's utility consumption during the Performance Guarantee Period in order to determine the Annual Realized Savings.

Table 5.1 – Baseline Utility Consumption

Building/ Park	Annual Electric [kWh]	Annual Electric [kW]	Annual Natural Gas [Therm]
City Hall	821,519	235	1911
PD/ Fire Station #1/ Juvenile Justice/ Evidence	833,071	201	16276
CMC	399,641	171	6387
Public Works	343,666	161	8611
Gem Theater	72,488	61	1393
Police Annex	38,889	24	148
Festive Amphitheater	26,008	58	66
Magnolia Park-Building	35,140	20	420
Magnolia Park-Exterior	70,619	59	0
Courtyard	73,372	85	857
Sports & Rec/ Garden Grove Park/ Atlantis	403,595	468	Meter could not be located
Fire Station #2	46,801	13	925
Fire Station #3	48,035	13	916
Fire Station #4	40,336	12	594
Fire Station #5	54,007	24	687
Fire Station #7	33,484	13	380
Buena Clinton	51,213	61	No gas meter
Gutosky Park	11,928	6	N/A
Faylane Park	12,817	6	N/A
Eastgate Park M#1	81,519	37	5168
Eastgate Park M#2	8,206	11	N/A
Woodbury Park	98,101	34	11376
Westgrove Park	19,765	21	N/A
Regional Library	59,075	19	N/A
Champan Sports Complex	122,122	188	133308
Total	**3,805,417**	**2,001**	**189,423**

5.2 The operating practices during the Baseline Period determine the utility consumption shown in Table 5.1. This data indicates the operating characteristics that were in effect during the Baseline Period. The Guaranteed Savings provided under this Agreement are based on the efficiencies gained by implementing the Work and implementing the Contracted Baseline in Article 7 of this Exhibit C.

Table 5.2.1 – Baseline Package Units Parameters

	Building	Eastgate Park Teen Center	Fire Station 5	GEM	Magnolia Park
	Unit	AC-1 5 Ton	AC-1 & AC-2 5 Ton	AC-3 & AC-5 6 Ton	AC-1 3 Ton
		EXISTING	**EXISTING**	**EXISTING**	**EXISTING**
1.	Economizer	None	None	None	None
	Minimum OSA %	20%	20%	20%	20%
	Mixed Air Setpoint (°F)				
	Low Limit (°F)				
	High Limit (°F)				
	Enthalpy Limit (Btu/lb)				
2.	kW /Ton (of Compressor & Cond Fan)	1.57	1.56	1.33	1.36
3.	Supply Air Flow (CFM)	2,000	2,000	2,400	1,400
4.	Supply Fan Control	Cycling	Cycling	Cycling	Cycling
	Minimum Air Flow (%)	100.00%	100.00%	100.00%	100.00%
	Motor Efficiency (%)	85.00%	85.00%	85.00%	85.00%
5.	Gas Furnace - Thermal Efficiency (%)	78.60%	78.60%	77.20%	78.70%
	Heat Pump - HCOP (rated at 47°F OSA)				
6.	OCCUPIED				
	Cooling Setpoint (°F)	70	70	70	70
	Heating Setpoint (°F)	70	70	70	70
	UNOCCUPIED				
	Cooling Setpoint (°F)	70	70	70	70
	Heating Setpoint (°F)	70	70	70	70
7.	OSA Damper Closed at Night?	No	No	No	No
8.	Fan Operation at Night?	Cycling	Cycling	Cycling	Cycling
9.	CO2 Sensors?	No	No	No	No
10.	Schedule	Sat/Sun 7am-6pm	24-7	Mon-Fri 4pm-9pm; Sat/Sun 10am-11pm	Mon-Fri 7am-7pm

Table 5.2.2 – Baseline Package Units Parameters

	Building	Magnolia Park	Public Works	Public Works	Public Works
	Unit	AC-2 3 Ton	AC-6 & AC-7 3 Ton	AC-8 5 Ton	AC-9 3 Ton
		EXISTING	**EXISTING**	**EXISTING**	**EXISTING**
1.	Economizer	None	None	None	None
	Minimum OSA %	20%	20%	20%	20%
	Mixed Air Setpoint (°F)				
	Low Limit (°F)				
	High Limit (°F)				
	Enthalpy Limit (Btu/lb)				
2.	kW /Ton (of Compressor & Cond Fan)	1.29	1.36	1.36	1.36
3.	Supply Air Flow (CFM)	1,200	1,200	2,000	1,400
4.	Supply Fan Control	Cycling	Cycling	Cycling	Cycling
	Minimum Air Flow (%)	100.00%	100.00%	100.00%	100.00%
	Motor Efficiency (%)	85.00%	85.00%	85.00%	85.00%
5.	Gas Furnace - Thermal Efficiency (%)	81.00%	78.70%	78.00%	78.70%

	Heat Pump - HCOP (rated at 47°F OSA)				
6.	OCCUPIED				
	Cooling Setpoint (°F)	70	70	70	70
	Heating Setpoint (°F)	70	70	70	70
	UNOCCUPIED				
	Cooling Setpoint (°F)	70	70	70	70
	Heating Setpoint (°F)	70	70	70	70
7.	OSA Damper Closed at Night?	No	No	No	No
8.	Fan Operation at Night?	Cycling	Cycling	Cycling	Cycling
9.	CO2 Sensors?	No	No	No	No
10.	Schedule	Mon-Fri 7am-7pm	Mon-Fri 5am-6pm	Mon-Fri 5am-6pm	Mon-Fri 5am-6pm

Table 5.2.3 – Baseline Package Units Parameters

	Building	Sports and Rec	Sports and Rec	Sports and Rec
	Unit	AC-1 & AC-2 25 Ton	AC-3 10 Ton	AC-4 8 Ton
		EXISTING	**EXISTING**	**EXISTING**
1.	Economizer	None	None	None
	Minimum OSA %	20%	20%	20%
	Mixed Air Setpoint (°F)			
	Low Limit (°F)			
	High Limit (°F)			
	Enthalpy Limit (Btu/lb)			
2.	kW /Ton (of Compressor & Cond Fan)	1.39	1.37	1.43
3.	Supply Air Flow (CFM)	10,000	4,000	3,400
4.	Supply Fan Control	Cycling	Cycling	Cycling
	Minimum Air Flow (%)	100.00%	100.00%	100.00%
	Motor Efficiency (%)	85.00%	85.00%	85.00%
5.	Gas Furnace - Thermal Efficiency (%)	82.00%	78.40%	78.40%
	Heat Pump - HCOP (rated at 47°F OSA)			
6.	OCCUPIED			
	Cooling Setpoint (°F)	70	70	70
	Heating Setpoint (°F)	70	70	70
	UNOCCUPIED			
	Cooling Setpoint (°F)	70	70	70
	Heating Setpoint (°F)	70	70	70
7.	OSA Damper Closed at Night?	No	No	No
8.	Fan Operation at Night?	Cycling	Cycling	Cycling
9.	CO2 Sensors?	No	No	No
10.	Schedule	6am-11pm	6am-11pm	6am-11pm

Table 5.2.4 – Baseline AHU schedule

AHU	Schedule
City Hall AHU-1	Monday-Thursday & every other Friday: 5am – 9pm
City Hall AHU-2	24-7
Police Department AHU-1	24-7

The currently air handlers at the City Hall and Police Department do not have economizer, supply air reset and static pressure reset.

5.3 Applicable codes - Federal, State, County or Municipal codes or regulations are applicable to the use and operation of the Facility. SIEMENS will maintain the current level of Facility compliance relative to applicable codes unless specifically outlined to the contrary below. Unless specifically set forth in the Scope of Work and Services, Exhibit A, nothing herein should be construed as to require SIEMENS to provide additional work or services in the event that the current applicable code or regulation is modified.

5.3.1 Current code compliance (identify the applicable code citation):

a. California Title 24

Article 6: Utility Rate Structures and Escalation Rates

6.1 Utility costs used for Savings calculations will be based on the utility rates and Escalation Rates, as provided in the table(s) below. Each Escalation Rate will be applied annually to the utility rate.

Table 6.1.1 Electric Utility Rates

		Electric		
Building	**Weighted Rate Average/ Blended Rate**	**Rate Schedule**	**$/kWh**	**$/kW**
City Hall	24/7 Operation - HVAC	TOU-GS-3B	$0.071 /kWh	$19.84 /kW
City Hall	Exterior Lights	TOU-GS-3B	$0.065 /kWh	$18.60 /kW
City Hall	Interior Lights [5:00AM - 11:00PM M-F]	TOU-GS-3B	$0.078 /kWh	$21.17 /kW
City Hall	HVAC (Non24/7) [4:30AM - 9:00PM M-F]	TOU-GS-3B	$0.079 /kWh	$21.27 /kW
CMC	24/7 Operation - HVAC	TOU-GS-2B	$0.072 /kWh	$17.42 /kW
CMC, Library Parking, Credit Union Park	Exterior Lights (7:00pm-9:00 am)	TOU-GS-2B	$0.066 /kWh	$16.22 /kW
CMC	Interior Lights [6:00AM - 7:00PM M-F], (6:00 am to midnight S, S)	TOU-GS-2B	$0.076 /kWh	$18.18 /kW
PD-FS#1-JJ	Exterior Lights (6:00pm-7:00 am)	TOU-GS-2B	$0.066 /kWh	$16.25 /kW
PD-FS#1-JJ	24/7 Operation HVAC; Interior Lighting	TOU-GS-2B	$0.072 /kWh	$17.42 /kW
Public Works	HVAC - Estimated Hours of Operation: M-S: 5:30 am to 8:30 pm	TOU-GS-2B	$0.076 /kWh	$18.19 /kW
Public Works	Exterior Lights (7:00pm-6:00 am)	TOU-GS-2B	$0.066 /kWh	$16.23 /kW
Public Works	Interior Lights [6:00AM - 7:00PM M-F]	TOU-GS-2B	$0.083 /kWh	$19.45 /kW
GEM	Interior Lights + HVAC - Sat/Sun 9:30am-10:30pm; Thursday/Friday 5:30pm-10:30pm; Mon/Tues/Wed 2:30pm-11pm	TOU-GS-2A	$0.102 /kWh	$15.89 /kW
GEM	Exterior Lights (4:00pm-6:00 am)	TOU-GS-2A	$0.082 /kWh	$15.89 /kW
Police Annex	Exterior Lights (6:00pm-7:00 am)	TOU-GS2B	$0.066 /kWh	$16.25 /kW
Police Annex	24/7 Operation HVAC; Interior Lighting	TOU-GS2B	$0.072 /kWh	$17.42 /kW
Festive Amp	Exterior Lights (7:00pm-9:00 am)	TOU-GS2B	$0.066 /kWh	$16.22 /kW
Festive Amp	Interior Lights [6:00AM - 7:00PM M-F], (6:00 am to midnight S, S)	TOU-GS2B	$0.076 /kWh	$18.18 /kW

Magnolia Park-Building	Blended Rate	TOU-GS1B	$0.179 /kWh	
Magnolia Park-Exterior	Blended Rate	AL-2	$0.079 /kWh	
Regional Library	Blended Rate	TOU-GS1B	$0.128 /kWh	
Courtyard / Village Green Park	Blended Rate	AL-2	$0.094 /kWh	
FS#2	Blended Rate	TOU-GS1B	$0.126 /kWh	
FS#3	Blended Rate	TOU-GS1A	$0.153 /kWh	
FS#4	Blended Rate	TOU-GS1A	$0.155 /kWh	
FS#5	Blended Rate	TOU-GS2B	$0.212 /kWh	
FS#7	Blended Rate	TOU-GS1A	$0.157 /kWh	
Faylane Park	Blended Rate	AL-2	$0.082 /kWh	
Eastgate Park M#1	Blended Rate	AL-2	$0.090 /kWh	
Eastgate Park M#2	Blended Rate	AL-2	$0.119 /kWh	
Woodbury Park M#1 and M#2	Blended Rate	AL-2	$0.085 /kWh	
Westgrove Park	Blended Rate	AL-2	$0.083 /kWh	
Sports and Rec/ Garden Grove Park/ Atlantis	Blended Rate	AL-2	$0.096 /kWh	
Chapman Sports Complex	Blended Rate	AL-2	$0.070 /kWh	
Buena Clinton	Blended Rate	TOU-GS2B	$0.319 /kWh	
Gutosky Park	Blended Rate	AL-2	$0.084 /kWh	

Table 6.1.2 Gas Utility Rates	**Gas**		
Building	**Tier Level**	**Rate Schedule**	**$/Therm**
City Hall	Tier 2	GN-10	$0.72 /Therm
PD/ Fire Station #1/ Juvenile Justice/ Evidence	Tier 2	GN-10	$0.72 /Therm
CMC	Tier 2	GN-10	$0.72 /Therm
Public Works	Tier 2	GN-10	$0.72 /Therm
Gem Theater	Tier 2	GN-10	$0.72 /Therm
Police Annex	N/A	GN-10	$0.96 /Therm
Festive Amphitheater	Tier 2	GN-10	$0.72 /Therm
Magnolia Park-Building	Tier 2	GN-10	$1.31 /Therm
Courtyard	Tier 2	GN-10	$0.72 /Therm
Sports & Rec/ Garden Grove Park/ Atlantis	N/A	GN-10	$0.72 /Therm
Fire Station #2	Tier 2	GN-10	$0.72 /Therm
Fire Station #3	Tier 2	GN-10	$0.72 /Therm
Fire Station #4	Tier 2	GN-10	$0.72 /Therm

Fire Station #5	Tier 2	GN-10	$0.72 /Therm
Fire Station #7	Tier 2	GN-10	$1.32 /Therm
Buena Clinton	N/A	N/A	no gas meter
Eastgate Park M#1	Tier 2	GN-10	$0.72 /Therm
Woodbury Park	Tier 2	GN-10	$0.72 /Therm

The baseline rate schedules above used in the calculations were those prevailing at the time of execution of this contract escalated by 4%. Energy Escalation Rate: 4.0% per Annual Period thereafter

6.2

Article 7: Contracted Baseline Data

7.1 The following tables detail the Facility operating parameters that are required to be implemented on the Guarantee Date or on such time as agreed upon by the Parties. This specific configuration of Facility operating parameters is the Contracted Baseline and failure of the CLIENT to maintain the Contracted Baseline may result in a Material Change which may require a modification of the Performance Guarantee pursuant to Article 4 of the Agreement.

Table 7.1.1 Baseline Package Units Parameters

	Building	Eastgate Park Teen Center	Fire Station 5	GEM	Magnolia Park
	Unit	AC-1 5 Ton	AC-1 & AC-2 5 Ton	AC-3 & AC-5 6 Ton	AC-1 3 Ton
		PROPOSED	**PROPOSED**	**PROPOSED**	**PROPOSED**
1.	Economizer	Temperature	Temperature	Temperature	Temperature
	Minimum OSA %	20%	20%	20%	20%
	Mixed Air Setpoint (°F)	57	57	57	57
	Low Limit (°F)	50	50	50	50
	High Limit (°F)	60	60	60	60
	Enthalpy Limit (Btu/lb)				
2.	kW /Ton (of Compressor & Cond Fan)	1.02	1.02	1.14	1.00
3.	Supply Air Flow (CFM)	2,000	2,000	2,400	1,400
4.	Supply Fan Control	Cycling	Cycling	Cycling	Cycling
	Minimum Air Flow (%)	100.00%	100.00%	100.00%	100.00%
	Motor Efficiency (%)	90.00%	90.00%	90.00%	90.00%
5.	Gas Furnace - Thermal Efficiency (%)	85.00%	85.00%	85.00%	85.00%
	Heat Pump - HCOP (rated at 47°F OSA)				
6.	OCCUPIED				
	Cooling Setpoint (°F)	74	74	74	74
	Heating Setpoint (°F)	69.5	69.5	69.5	69.5
	UNOCCUPIED				
	Cooling Setpoint (°F)	74	74	74	74
	Heating Setpoint (°F)	69	69	69	69
7.	OSA Damper Closed at Night?	No	No	No	No
8.	Fan Operation at Night?	Cycling	Cycling	Cycling	Cycling
9.	CO2 Sensors?	No	No	No	No
10.	Schedule	Sat/Sun 7am-6pm; with no Holidays	24-7	Mon-Fri 4pm-9pm; Sat/Sun 10am-11pm; with no Holidays	Mon-Fri 7am-7pm; with no Holidays

Table 7.1.2 Baseline Package Units Parameters

	Building	Magnolia Park	Public Works	Public Works	Public Works
	Unit	AC-2 3 Ton	AC-6 & AC-7 3 Ton	AC-8 5 Ton	AC-9 3 Ton
		PROPOSED	**PROPOSED**	**PROPOSED**	**PROPOSED**
1.	Economizer	Temperature	Temperature	Temperature	Temperature
	Minimum OSA %	20%	20%	20%	20%

	Mixed Air Setpoint (°F)	57	57	57	57
	Low Limit (°F)	50	50	50	50
	High Limit (°F)	60	60	60	60
	Enthalpy Limit (Btu/lb)				
2.	kW /Ton (of Compressor & Cond Fan)	0.98	1.02	1.02	1.02
3.	Supply Air Flow (CFM)	1,200	1,200	2,000	1,400
4.	Supply Fan Control	Cycling	Cycling	Cycling	Cycling
	Minimum Air Flow (%)	100.00%	100.00%	100.00%	100.00%
	Motor Efficiency (%)	90.00%	90.00%	90.00%	90.00%
5.	Gas Furnace - Thermal Efficiency (%)	85.00%	85.00%	85.00%	85.00%
	Heat Pump - HCOP (rated at 47°F OSA)				
6.	OCCUPIED				
	Cooling Setpoint (°F)	74	74	74	74
	Heating Setpoint (°F)	69.5	69.5	69.5	69.5
	UNOCCUPIED				
	Cooling Setpoint (°F)	74	74	74	74
	Heating Setpoint (°F)	69	69	69	69
7.	OSA Damper Closed at Night?	No	No	No	No
8.	Fan Operation at Night?	Cycling	Cycling	Cycling	Cycling
9.	CO2 Sensors?	No	No	No	No
10.	Schedule	Mon-Fri 7am-7pm; with no Holidays	Mon-Fri 5am-6pm; with no Holidays	Mon-Fri 5am-6pm; with no Holidays	Mon-Fri 5am-6pm; with no Holidays

Table 7.1.3 Baseline Package Units Parameters

	Building	Sports and Rec	Sports and Rec	Sports and Rec
	Unit	AC-1 & AC-2 25 Ton	AC-3 10 Ton	AC-4 8 Ton
		PROPOSED	**PROPOSED**	**PROPOSED**
1.	Economizer	Temperature	Temperature	Temperature
	Minimum OSA %	20%	20%	20%
	Mixed Air Setpoint (°F)	57	57	57
	Low Limit (°F)	50	50	50
	High Limit (°F)	60	60	60
	Enthalpy Limit (Btu/lb)			
2.	kW /Ton (of Compressor & Cond Fan)	1.20	1.13	1.13
3.	Supply Air Flow (CFM)	10,000	4,000	3,400
4.	Supply Fan Control	Cycling	Cycling	Cycling
	Minimum Air Flow (%)	100.00%	100.00%	100.00%
	Motor Efficiency (%)	90.00%	90.00%	90.00%
5.	Gas Furnace - Thermal Efficiency (%)	85.00%	85.00%	85.00%
	Heat Pump - HCOP (rated at 47°F OSA)			
6.	OCCUPIED			
	Cooling Setpoint (°F)	74	74	74
	Heating Setpoint (°F)	69.5	69.5	69.5
	UNOCCUPIED			
	Cooling Setpoint (°F)	74	74	74
	Heating Setpoint (°F)	69	69	69
7.	OSA Damper Closed at Night?	No	No	No

8.	Fan Operation at Night?	Cycling	Cycling	Cycling
9.	CO2 Sensors?	No	No	No
10.	Schedule	6am-11pm; with no Holidays	6am-11pm; with no Holidays	6am-11pm; with no Holidays

Holiday: New year's day, Martin Luther King, Presidents day, Memorial day, Independence day, Labor day, Veterans day, (2) thanksgiving day, (5) Christmas

7.2 Sequence of Operation City Hall AHU-1

City Hall

System Descriptions

AHU-1
Built-up single duct air handler with supply fan w/VFD, relief fan w/VFD, enthalpy controlled economizer, chilled water coils (confirm no hot water heating), and outside air/ mixed air/ supply air/ exhaust air damper. 96 VAV boxes with re-heat serving each zone/space with DDC controls.

Supply Fan (AHU-1)

- Supply fan will be operated by a programmable time clock. Schedules shall be programmed thru the Siemens central building energy management system. Schedule to be programmed as shown in Table 7.2.1. Supply fan shall run based on the table below.
- The supply fan shall vary in speed in response to a static pressure sensor with a 30% minimum speed for ventilation. "Full" speed shall be determined in the field at the time of the air balance, Siemens to coordinate with Mech subcontractor for air balance.
- Minimum air flow will be set based on minimum airflow required for the required ventilation air. Initial supply static air pressure setpoint shall be 1.0" w.c. Perform a static pressure test to determine optimum static pressure set point.

Return Fan (AHU-1)

- Return fan shall be interlocked with the supply fan. They will also vary speed based on building static pressure. "Full" speed shall be determined in the field at the time of the air balance. Building static pressure setpoint shall be +0.05" w.c. (+/-.01).

Table 7.2.1: AHU Schedule

AHU	Schedule
AHU-1 & AHU-2	Monday-Thursday & every other Friday: 6am – 7pm

Economizer

- Economizer shall be based upon outside air dry bulb temperature and relative humidity with both low and high limits.
- When outside air is at the below conditions or less, the economizer cycle shall be enabled

Table 7.2.2: Economizer Temp Parameters

Temp (degrees)	Wet Bulb (degrees)
67.5	61
62.5	57
57.5	53
52.5	49

- When outside air temperature is 2 deg (adjustable) greater than the return air temperature and ambient relative humidity is great than 50%, the economizer cycle shall be disabled. The outside air economizer damper shall be set to minimum.
- When outside air temperature decreases below supply air temperature setpoint (67.5 deg adjustable), the outside air damper shall modulate to maintain desired supply temperature setpoint.

Cooling/ Supply Air Reset

- Supply air temperature shall be reset according to programmable reset schedule below. For all other return air temperatures in between, supply temperature shall be interpolated on a linear scale between these two temperature points.

Table 7.2.3: Supply Air Reset Parameters

Return Air Temp	Supply Discharge Temperature
90 degrees	55 degrees
70 degrees	65 degrees

- Two-way chilled water valve shall modulate to maintain discharge air setpoint. Chilled water valve shall be off when outside air temperatures are below 60 degrees.

Existing VAV Boxes

- For all VAV boxes heating setpoint shall be 70 degrees and cooling setpoint shall be 74 degrees.
- These setpoints are adjustable from the EMS system only and no controls override shall be available at the room thermostat.

7.3 Sequence of Operation City Hall AHU-2

City Hall

System Descriptions

AHU-2
Built-up multizone dual duct constant volume air handler with supply fan only serving four zones (N, S, E, W). No economizer, 100% return air, chilled water coils and hot water coils with 2 heating valves (two stage heating valves 1/3 and 2/3). Dual duct air dampers serve each zone with DDC controls.

Supply Fan (AHU-2)

- Supply fan will be operated by a programmable time clock. Schedules shall be programmed thru the Siemens central building energy management system. Schedule to be programmed as shown in Table 1. Supply fan shall run based on the table below.

Table 7.3.1: AHU Schedule

AHU	Schedule
AHU-1 & AHU-2	Monday-Thursday & every other Friday: 6am – 7pm

Cold Deck

- Cool deck discharge air temperature shall be reset according to programmable reset schedule below. For all other return air temperatures in between, cool deck temperature shall be interpolated on a linear scale between these two temperature points.

Table 7.3.2: Cold Deck Parameters

Return Air Temp	Cool Deck Discharge Temperature
90 degrees	55 degrees
70 degrees	65 degrees

- Two-way chilled water valve shall modulate to maintain discharge air setpoint. Chilled water valve shall be off when cold deck discharge air temperature is satisfied.

Hot Deck

- Hot deck discharge air temperature shall be reset according to programmable reset schedule below. For all other return air temperatures in between, hot deck temperature shall be interpolated on a linear scale between these two temperature points.

Table 7.3.3: Hot Deck Parameters

Return Air Temp	Cool Deck Discharge Temperature
30 degrees	105 degrees
70 degrees	75 degrees

- There are 2 stages of heating with 1/3 and 2/3 heating valves. The 1/3 heating water valve shall modulate to maintain hot deck discharge air setpoint, if the temperature cannot be maintained fully open the 1/3 heating valve and modulate the 2/3 heating valve. Both hot water valves shall be off when hot deck discharge air temperature is satisfied.

Dual Duct airflow control damper

- Dual duct control dampers shall be modulated by a room heating/cooling thermostat. Simultaneous heating and cooling is not allowed. Cooling duct will normally provide the minimum ventilation air. If room temperature falls below heating setpoint, the cooling damper will close and the heating damper will open and modulate to maintain heating setpoint. Heating setpoints are 68 degrees falling and 70 degrees rising. Cooling setpoints are 74 degrees rising and 72 degrees falling.

7.4 Sequence of Operation Police Department AHU-1

Police Department

System Descriptions

AHU-1

Built-up dual duct air handler with supply fan w/VFD, relief fan w/VFD, enthalpy controlled economizer, chilled water coils, heating water coils, outside air/ mixed air/ exhaust air dampers and dual duct VAV air boxes serving each zone/space with DDC controls.

Supply Fan (AHU-1)

- Supply fan will be operating 24-7.
- The supply fan shall vary in speed in response to a static pressure sensor with a 30% minimum speed for ventilation. “Full” speed shall be determined in the field at the time of the air balance, Siemens to coordinate with Mech subcontractor for air balance.
- Minimum air flow will be set based on minimum airflow required for the required ventilation air. Initial supply static air pressure setpoint shall be 1.0” w.c. Perform a static pressure test to determine optimum static pressure set point.

Return Fan (AHU-1)

- Return fan shall be interlocked with the supply fan. They will also vary speed based on building static pressure. “Full” speed shall be determined in the field at the time of the air balance. Building static pressure setpoint shall be +0.05” w.c. (+/-.01).

Economizer

- Economizer shall be based upon outside air dry bulb temperature and relative humidity with both low and high limits.
- When outside air is at the below conditions or less, the economizer cycle shall be enabled

Table 7.4.1: Economizer Temp Parameters

Temp (degrees)	Wet Bulb (degrees)
67.5	61
62.5	57
57.5	53
52.5	49

- When outside air temperature is 2 deg (adjustable) greater than the return air temperature and ambient relative humidity is great than 50%, the economizer cycle shall be disabled. The outside air economizer damper shall be set to minimum.
- When outside air temperature decreases below supply air temperature setpoint (67.5 deg adjustable), the outside air damper shall modulate to maintain desired supply temperature setpoint.

Cold Deck

- Cool deck discharge air temperature shall be reset according to programmable reset schedule below. For all other return air temperatures in between, cool deck temperature shall be interpolated on a linear scale between these two temperature points.

Table 7.4.2: Cold Deck Parameters

Return Air Temp	Cool Deck Discharge Temperature
90 degrees	55 degrees
70 degrees	65 degrees

- Two-way chilled water valve shall modulate to maintain discharge air setpoint. Chilled water valve shall be off when cold deck discharge air temperature is satisfied.

Hot Deck

- Hot deck discharge air temperature shall be reset according to programmable reset schedule below. For all other return air temperatures in between, hot deck temperature shall be interpolated on a linear scale between these two temperature points.

Table 7.4.3: Hot Deck Parameters

Return Air Temp	Cool Deck Discharge Temperature
30 degrees	105 degrees
70 degrees	75 degrees

- Hot water valve shall modulate to maintain discharge air setpoint. Hot water valve shall be off when hot deck discharge air temperature is satisfied.

Dual Duct airflow control damper

- Dual duct control dampers shall be modulated by a room heating/cooling thermostat. Simultaneous heating and cooling is not allowed. Cooling duct will normally provide the minimum ventilation air. If room temperature falls below heating setpoint, the cooling damper will close and the heating damper will open and modulate to maintain heating setpoint. Heating setpoints are 68 degrees falling and 70 degrees rising. Cooling setpoints are 74 degrees rising and 72 degrees falling.