LEED Energy Performance Summary Report

By BSALS

Section 1.1 - General Information

Simulation Program:	TRACE™ 700 v6.3.4
Principle Heating Source:	Purchased Heat
Energy Code Used:	ASHRAE 90.1-2010
Weather File:	Austin, TX (Reduced Year)
Climate Zone:	2A
New Construction Percent:	100 %
Existing Renovation Percent:	0 %
Quantity of Floors:	4
Proposed:	Alternative 1 - UT SEA Bldg
Baseline:	Alternative 2 - ASHRAE Baseline 90.1-10 Climate Zone 2A

Section 1.2 - Space Summary

Building Use (Occupancy Type)	Space Area (ft^2)	Regularly Occupied Area (ft^2)	Unconditioned Area (ft^2)
Office	17,493.00	17,493.00	0.00
Recpetion	788.00	788.00	0.00
Conference	971.00	971.00	0.00
Lobby	145.00	145.00	0.00
Corridor	8,510.00	8,510.00	0.00
Storage	236.00	236.00	0.00
Run Room	676.00	676.00	0.00
Total	**28,819.00**	**28,819.00**	**0.00**

Section 1.3 - Advisory Messages

Advisory Messages	Baseline Building (0 deg rotation)	Proposed Building
Number of hours heating load not met:	0	96
Number of hours cooling load not met:	0	0
Total	0	96

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Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
Exterior Wall Construction	90.1-10 Min Wall Nonres Zone 1 & 2 U-factor: 0.060 Btu/h·ft²·°F	90.1-10 Min Wall Nonres Zone 1 & 2 U-factor: 0.124 Btu/h·ft²·°F
Roof Construction	90.1-10 Min Roof Nonres Zone 2-3 U-factor: 0.040 Btu/h·ft²·°F Reflectivity: 0.55	90.1-10 Min Roof Nonres Zone 2-3 U-factor: 0.048 Btu/h·ft²·°F Reflectivity: 0.55
Window-to-gross wall ratio	32.3 %	32.3 %
Fenestration Type	Double Coated 1/4" U-factor: 0.770 Btu/h·ft²·°F SHGC: 0.27 Visible Transmissivity: 0.301	90.1 Window Zone 2 Metal Curtain Wall U-factor: 0.700 Btu/h·ft²·°F SHGC: 0.25 Visible Transmissivity: 0.900
Fenestration Type	Double Coated 1/4" U-factor: 0.450 Btu/h·ft²·°F SHGC: 0.27 Visible Transmissivity: 0.301	
Interior Light Power Density	Lighting Compliance: Space-By-Space Method Daylighting Controls: No Building: 0.65 W/ft²	Lighting Compliance: Space-By-Space Method Daylighting Controls: No Building: 0.90 W/ft²
Interior Light Power Density	Room Type: Office - 0.66 W/ft² Recpetion - 0.66 W/ft² Conference - 0.65 W/ft² Lobby - 0.66 W/ft² Corridor - 0.64 W/ft²	Room Type: Office - 0.90 W/ft² Recpetion - 0.90 W/ft² Conference - 0.90 W/ft² Lobby - 0.90 W/ft² Corridor - 0.90 W/ft²
Interior Light Power Density	Room Type: Storage - 0.66 W/ft² Run Room - 0.66 W/ft²	Room Type: Storage - 0.90 W/ft² Run Room - 0.90 W/ft²
Receptacle Elec Eq Power Density	1.83 W/ft²	1.83 W/ft²
HVAC System Type	AHU-4 Variable Volume Reheat (30% Min Flow Default) Uses: Enth Econ Supply vol: 22840 cfm Fan power: 34.60 kW	AHU-4 System 7 - 2010 - VAV Reheat Chill Water & Hot Water Supply vol: 25138 cfm Fan power: 30.25 kW

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Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
HVAC System Type	FCU 6-1 Single Zone Supply vol: 2282 cfm Fan power: 0.25 kW	FCU 6-1 Fan Coil Supply vol: 2695 cfm Fan power: 0.81 kW
HVAC System Type	FCU 4-1 Fan Coil Supply vol: 1986 cfm Fan power: 0.22 kW	FCU 4-1 Fan Coil Supply vol: 2287 cfm Fan power: 0.69 kW
HVAC System Type	FCU 2-1 Single Zone Supply vol: 1084 cfm Fan power: 0.12 kW	FCU 2-1 Fan Coil Supply vol: 1249 cfm Fan power: 0.37 kW
HVAC System Type	FCU 1-1 Single Zone Supply vol: 2157 cfm Fan power: 0.24 kW	FCU 1-1 Fan Coil Supply vol: 2513 cfm Fan power: 0.75 kW
HVAC System Type	FCU 5-1 Fan Coil Supply vol: 1084 cfm Fan power: 0.12 kW	FCU 5-1 Fan Coil Supply vol: 1250 cfm Fan power: 0.37 kW
HVAC System Type	FCU 3-1 Fan Coil Supply vol: 1701 cfm Fan power: 0.19 kW	FCU 3-1 Fan Coil Supply vol: 1958 cfm Fan power: 0.59 kW
HVAC System Type	FCU 5-2 Fan Coil Supply vol: 1063 cfm Fan power: 0.12 kW	FCU 5-2 Fan Coil Supply vol: 1227 cfm Fan power: 0.37 kW
HVAC System Type	FCU 1-3 Single Zone Supply vol: 1590 cfm Fan power: 0.18 kW	FCU 1-3 Fan Coil Supply vol: 1833 cfm Fan power: 0.55 kW
HVAC System Type	FCU 1-2 Single Zone Supply vol: 1060 cfm Fan power: 0.12 kW	FCU 1-2 Fan Coil Supply vol: 1222 cfm Fan power: 0.37 kW
Cooling Equipment	Plant: Cooling plant Type: Purchased Chilled Water Category: Water-cooled chiller Clg Cap: Design Engy Rate: 1 COP (compressor only)	Plant: Cooling plant Type: Purchased Chilled Water Category: Water-cooled chiller Clg Cap: Design Engy Rate: 1 COP (compressor only)

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Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
Chilled Water Pump	Type: Var vol chill water pump Full load consumption: 16 Watt/gpm	Type: 90.1-10 Min Var Vol Chilled Water Pump Full load consumption: 16 Watt/gpm
Heating Equipment	Plant: DHW Type: Default electric resistance Category: Electric resistance Capacity: 1100 Mbh Energy Rate: 100 Percent efficient	Plant: DHW Type: Default electric resistance Category: Electric resistance Capacity: 1100 Mbh Energy Rate: 100 Percent efficient
Heating Equipment	Plant: Heating plant Type: Purchased District Steam Category: Boiler Capacity: 1100 Mbh Energy Rate: 100 Percent efficient	Plant: Heating plant - 001 Type: Purchased District Steam Category: Boiler Capacity: Design Energy Rate: 100 Percent efficient
Hot Water Pump	Type: var volume heating water pump Full load consumption: 100 ft water	Type: 90.1 Pump Riding the Pump Curve Full load consumption: 19 Watt/gpm
Hot Water Pump	Type: Water circulating pump Full load consumption: 0.4 hp	Type: Water circulating pump Full load consumption: 0.4 hp
Thermal Energy Storage	No	No
Base Utility	Type: Elevator 1 Description: Elevator 1 Energy Type: Electricity Hourly Consumption: 18.6 kW Schedule: Base Util - Elevator (Office,Table G-I)	Type: Elevator 1 Description: Elevator 1 Energy Type: Electricity Hourly Consumption: 18.6 kW Schedule: Base Util - Elevator (Office,Table G-I)
Base Utility	Type: dom hot water circulator Description: dom hot water circulator Energy Type: Electricity Hourly Consumption: 0.3 kW Schedule: Hot water - High Rise Office	Type: dom hot water circulator Description: dom hot water circulator Energy Type: Electricity Hourly Consumption: 0.3 kW Schedule: Hot water - High Rise Office
Base Utility	Type: Parking lot lights Description: Parking lot lights Energy Type: Electricity Hourly Consumption: 0.4 kW Schedule: Parking lot lights	Type: Parking lot lights Description: Parking lot lights Energy Type: Electricity Hourly Consumption: 0.9 kW Schedule: Parking lot lights

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Section 1.5 - Energy Type Summary (Proposed)

Energy Type	Utility Rate Description	Units
Electric Consumption	Univ of Texas	kWh
Electric Demand	Univ of Texas	kW
Purchased Chilled Water	Univ of Texas	therms
Purchased Steam	Univ of Texas	therms

LEED Energy Performance Summary Report

By BSALS

Section 1.6 Baseline Performance - Performance Rating Method Compliance

End Use	Process	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Baseline (0 deg rotation)	Baseline (90 deg rotation)	Baseline (180 deg rotation)	Baseline (270 deg rotation)	Baseline Design
Space Heating	No	Electricity	Energy Use (kWh)	15,819	15,815	15,819	15,816	15,817
			Demand (kW)	8.0	8.0	8.0	8.0	8.0
Pumps	No	Electricity	Energy Use (kWh)	6,745	6,723	6,860	6,725	6,763
			Demand (kW)	4.6	4.5	4.7	4.6	4.6
Fans - Interior	No	Electricity	Energy Use (kWh)	82,957	83,661	86,269	82,507	83,849
			Demand (kW)	34.6	33.4	35.7	35.2	34.7
Receptacle Equipment	Yes	Electricity	Energy Use (kWh)	174,575	174,575	174,575	174,575	174,575
			Demand (kW)	52.7	52.7	52.7	52.7	52.7
Interior Lighting	No	Electricity	Energy Use (kWh)	85,923	85,923	85,923	85,923	85,923
			Demand (kW)	25.9	25.9	25.9	25.9	25.9
Elevator 1 - Base Utility	Yes	Electricity	Energy Use (kWh)	28,949	28,949	28,949	28,949	28,949
			Demand (kW)	12.9	12.9	12.9	12.9	12.9
Parking lot lights - Base Utility	Yes	Electricity	Energy Use (kWh)	4,123	4,123	4,123	4,123	4,123
			Demand (kW)	0.9	0.9	0.9	0.9	0.9
dom hot water circulator - Base Utility	Yes	Electricity	Energy Use (kWh)	535	535	535	535	535
			Demand (kW)	0.3	0.3	0.3	0.3	0.3
Space Heating	No	Purchased Steam	Energy Use (therms)	1,579	1,463	1,478	1,523	1,511
			Demand (therms)	2.9	2.9	2.8	2.8	2.8
Space Cooling	No	Purchased Chilled Water	Energy Use (therms)	30,143	29,985	30,999	30,202	30,332
			Demand (therms)	12.9	12.6	13.1	13.0	12.9
Baseline Energy Totals:			Energy Use (MMBtu/yr)	**4,536.1**	**4,511.0**	**4,623.3**	**4,534.8**	**4,551.3**
			Process (MMBtu/yr)	**710.5**	**710.5**	**710.5**	**710.5**	**710.5**

Section 1.6 Proposed Performance - Performance Rating Method Compliance

End Use	Process	Proposed Design Energy Type	Units of Annual Energy & Peak Demand	Proposed Design
Space Heating	No	Electricity	Energy Use (kWh)	15,874
			Demand (kW)	8.0
Pumps	No	Electricity	Energy Use (kWh)	6,428
			Demand (kW)	4.5

LEED Energy Performance Summary Report

By BSALS

Section 1.6 Proposed Performance - Performance Rating Method Compliance

End Use	Process	Proposed Design Energy Type	Units of Annual Energy & Peak Demand	Proposed Design
Fans - Interior	No	Electricity	Energy Use (kWh)	71,147
			Demand (kW)	35.1
Receptacle Equipment	Yes	Electricity	Energy Use (kWh)	174,575
			Demand (kW)	52.7
Interior Lighting	No	Electricity	Energy Use (kWh)	62,275
			Demand (kW)	18.8
Elevator 1 - Base Utility	Yes	Electricity	Energy Use (kWh)	28,949
			Demand (kW)	12.9
Parking lot lights - Base Utility	Yes	Electricity	Energy Use (kWh)	2,021
			Demand (kW)	0.4
dom hot water circulator - Base Utility	Yes	Electricity	Energy Use (kWh)	535
			Demand (kW)	0.3
Space Heating	No	Purchased Steam	Energy Use (therms)	1,016
			Demand (therm)	2.6
Space Cooling	No	Purchased Chilled Water	Energy Use (therms)	27,282
			Demand (therm)	11.5
Proposed Energy Totals:			Energy Use (MMBtu/yr)	**4,064.66**
			Process (MMBtu/yr)	**703.35**

LEED Energy Performance Summary Report

By BSALS

Table 1.6 Table EAp2-9 Energy Cost Summary (Manual Cost Input) - Baseline Case

Energy Type	Baseline Cost (0° rotation)	Baseline Cost (90° rotation)	Baseline Cost (180° rotation)	Baseline Cost (270° rotation)	Average
Electric Consumption	$30,771	$30,823	$31,035	$30,734	$30,841
Purchased Steam	$1,443	$1,337	$1,351	$1,392	$1,381
Purchased Chilled Water	$26,752	$26,612	$27,511	$26,804	$26,920

Table 1.6 Table EAp2-9 Energy Cost Summary (Manual Cost Input) - Proposed Case

Energy Type	Proposed Cost
Electric Consumption	$27,859
Purchased Steam	$929
Purchased Chilled Water	$24,213

Proposed building economic cost improvement over baseline building: 10.38 %

Performance Rating Details

By BSALS

Project Name: UT SEA Bldg	Date: January 03, 2022
City: Austin Texas	Weather Data: Austin, TX

Performance Rating Method Alternative: Alt-2 ASHRAE Baseline 90.1-10 Climate Zone 2A

		0° Rotation		90° Rotation		180° Rotation		270° Rotation		Average	
		Energy 10^6 Btu/yr	Peak kBtuh	Energy 10^6 Btu/yr	Peak kBtuh	Energy 10^6 Btu/yr	Peak kBtuh	Energy 10^6 Btu/yr	Peak kBtuh	Energy 10^6 Btu/yr	Peak kBtuh
Lighting - Conditioned	Electricity	293.3	89	293.3	89	293.3	89	293.3	89	293.3	89
Space Heating	Electricity	54.0	27	54.0	27	54.0	27	54.0	27	54.0	27
	Purchased Stea	157.9	287	146.3	287	147.8	282	152.3	283	151.1	285
Space Cooling	Purchased Chille	3,014.3	1,295	2,998.5	1,263	3,099.9	1,310	3,020.2	1,302	3,033.2	1,292
Pumps	Electricity	23.0	16	22.9	15	23.4	16	23.0	16	23.1	16
Fans - Conditioned	Electricity	283.1	118	285.5	114	294.4	115	281.6	120	286.2	117
Receptacles - Conditioned	Electricity	595.8	180	595.8	180	595.8	180	595.8	180	595.8	180
Stand-alone Base Utilities	Electricity	114.7	48	114.7	48	114.7	48	114.7	48	114.7	48
Total Building Consumption		**4,536.1**	**2,059**	**4,511.0**	**2,023**	**4,623.3**	**2,067**	**4,534.8**	**2,064**	**4,551.3**	**2,053**

	0° Rotation	90° Rotation	180° Rotation	270° Rotation	Average
Electric ($)	$30,771	$30,823	$31,035	$30,734	$30,841
Purchased Chilled Water ($)	$26,752	$26,612	$27,511	$26,804	$26,920
Purchased Steam ($)	$1,443	$1,337	$1,351	$1,392	$1,381
Total Building Cost ($)	**$58,966**	**$58,772**	**$59,897**	**$58,931**	**$59,141**

Energy Cost Budget / PRM Summary

By BSALS

Project Name: UT SEA Bldg	Date: January 03, 2022
City: Austin Texas	Weather Data: Austin, TX

Note: The percentage displayed for the "Proposed/ Base %" column of the base case is actually the percentage of the total energy consumption.

* Denotes the base alternative for the ECB study.

		* Alt-2 ASHRAE Baseline 90.1-1			Alt-1 UT SEA Bldg		
		Energy 10^6 Btu/yr	Proposed / Base %	Peak kBtuh	Energy 10^6 Btu/yr	Proposed / Base %	Peak kBtuh
Lighting - Conditioned	Electricity	293.3	6	89	212.5	72	64
Space Heating	Electricity	54.0	1	27	54.2	100	27
	Purchased Steam	151.1	3	285	101.6	67	261
Space Cooling	Purchased Chilled Water	3,033.2	67	1,292	2,728.2	90	1,146
Pumps	Electricity	23.1	1	16	21.9	95	15
Fans - Conditioned	Electricity	286.2	6	118	242.8	85	122
Receptacles - Conditioned	Electricity	595.8	13	180	595.8	100	180
Stand-alone Base Utilities	Electricity	114.7	3	48	107.5	94	46
Total Building Consumption		**4,551.3**			**4,064.7**		

		* Alt-2 ASHRAE Baseline 90.1-1	Alt-1 UT SEA Bldg
Total	**Number of hours heating load not met**	0	96
	Number of hours cooling load not met	0	0

	* Alt-2 ASHRAE Baseline 90.1-1		Alt-1 UT SEA Bldg	
	Energy 10^6 Btu/yr	Cost/yr $/yr	Energy 10^6 Btu/yr	Cost/yr $/yr
Electricity	1,367.0	30,841	1,234.8	27,859
Purchased Chilled Water	3,033.2	26,920	2,728.2	24,213
Purchased Steam	151.1	1,381	101.6	929
Total	**4,551**	**59,141**	**4,065**	**53,000**

ENERGY CONSUMPTION SUMMARY

By BSALS

	Elect Cons. (kWh)	PCldW Cons. (kBtu)	P.Stm Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
Alternative 1						
Primary heating						
Primary heating	15,691		101,615	3.8 %	155,168	296,160
Other Htg Accessories	183			0.0 %	625	1,874
Heating Subtotal	**15,874**		**101,615**	**3.8** %	**155,792**	**298,034**
Primary cooling						
Cooling Compressor		2,728,223		67.1 %	2,728,223	2,098,633
Tower/Cond Fans				0.0 %	0	0
Condenser Pump				0.0 %	0	0
Other Clg Accessories				0.0 %	0	0
Cooling Subtotal....		**2,728,223**		**67.1** %	**2,728,223**	**2,098,633**
Auxiliary						
Supply Fans	71,147			6.0 %	242,824	728,544
Pumps	6,428			0.5 %	21,939	65,823
Stand-alone Base Utilities	31,505			2.7 %	107,526	322,611
Aux Subtotal....	109,080			9.2 %	372,289	1,116,979
Lighting						
Lighting	62,274			5.2 %	212,541	637,687
Receptacle						
Receptacles	174,574			14.7 %	595,820	1,787,639
Cogeneration						
Cogeneration				0.0 %	0	0
Totals						
Totals**	**361,801**	**2,728,223**	**101,615**	**100.0** %	**4,064,665**	**5,938,972**

* Note: Resource Utilization factors are included in the Total Source Energy value.

** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

ENERGY CONSUMPTION SUMMARY

By BSALS

	Elect Cons. (kWh)	PCldW Cons. (kBtu)	P.Stm Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
Alternative 2						
Primary heating						
Primary heating	15,691		157,889	4.7 %	211,441	371,191
Other Htg Accessories	128			0.0 %	436	1,309
Heating Subtotal	**15,819**		**157,889**	**4.7** %	**211,877**	**372,500**
Primary cooling						
Cooling Compressor		3,014,263		66.5 %	3,014,263	2,318,664
Tower/Cond Fans				0.0 %	0	0
Condenser Pump				0.0 %	0	0
Other Clg Accessories				0.0 %	0	0
Cooling Subtotal....		**3,014,263**		**66.5** %	**3,014,263**	**2,318,664**
Auxiliary						
Supply Fans	82,957			6.2 %	283,131	849,478
Pumps	6,745			0.5 %	23,020	69,067
Stand-alone Base Utilities	33,607			2.5 %	114,701	344,136
Aux Subtotal....	123,308			9.3 %	420,852	1,262,681
Lighting						
Lighting	85,922			6.5 %	293,251	879,842
Receptacle						
Receptacles	174,574			13.1 %	595,820	1,787,639
Cogeneration						
Cogeneration				0.0 %	0	0
Totals						
Totals**	**399,622**	**3,014,263**	**157,889**	**100.0** %	**4,536,063**	**6,621,326**

* Note: Resource Utilization factors are included in the Total Source Energy value.

** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.