

2010|2011

Technical Report 2

Building and Plant Energy & Emissions Analysis



Duval County Unified Courthouse Facility

Jacksonville, Florida

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Executive Summary

The purpose of this report is to design an energy model and perform an energy, emissions, and economic analysis of the Duval County Unified Courthouse Facility, a 798,000 square foot courthouse facility located in Jacksonville, Florida. Energy results of this analysis are compared to design documents of the systems provided by the mechanical design engineers. The building is a LEED-NC v2.2 project and therefore requires an energy analysis to be conducted to compare predicted energy use and cost to the ASHRAE Standard 90.1 baseline. The software package used to generate an energy model for the purpose of this report is Trane TRACE 700.

The information calculated from the energy model in the Trace 700 software will serve as the basis for this report. Unfortunately, the actual energy model generated by the design team for this building was not provided, so a direct comparison of results between models was not possible.

The overall calculated cooling load of the facility is 1,971 tons and the total heating load is 9,760 MBH. The annual electricity consumption of the building was calculated to be 3,755,927 kWh. Its peak demand is 1919 kW. The annual natural gas consumption used by the boiler was calculated to be 1,739,300 kBTU with a peak demand of 7,400 kBTU/hour. For cooling purposes, the facility purchases chilled water from a district chiller plant. The annual chilled water consumed is 30,714,600 kBTU with a peak demand of 23,700 kBTU/hr. Since the building is under construction and no utility bills exist, the utility rates have been estimated based on the current local utility rate schedules. The annual energy utility cost for the facility is calculated to be \$759,930.30, approximately \$0.95/ft² annually.

Building Summary

The Duval County Unified Courthouse Facility is a 798,000 square feet, 7 level government building. The facility houses 51 total courtrooms, judicial offices, hearing spaces, and conference areas. It also includes parking areas, a detention zone, and building support areas on the first floor.

Its façade is predominantly precast limestone aggregate concrete panels and vertical spanning aluminum curtain wall vision glazing. Three large aluminum curtain walls with spandrel glazing also exist under the roofs to allow natural lighting into the front lobby and central atrium. The roof system is primarily a flat composite concrete insulated roof. Two sloped roofs exist over the lobby and central core of the building which use an insulated standing seam metal roof deck system.

Systems

Airside:

The Duval County Unified Courthouse Facility utilizes 25 Air Handling Units (AHU's) to distribute air throughout the building. The 51 courtrooms are served by 14 AHU's while the other 11 AHU's serve the remainder of the building. All AHU's are served with outdoor air by three Makeup Air Units (MAU's), two of which are heat recovery units from exhaust air. Most units are located on the

interior of the building in mechanical rooms or penthouses with the exception of two AHU's and two MAU's which are all located on the second floor roof.

Zone Conditioning:

Most areas are served by Variable Air Volume (VAV) AHU's with VAV boxes in the zones. The VAV boxes also utilize terminal reheat coils. The exceptions to VAV systems are the four courtrooms on the third and fourth floors at the northern side of the building. Each of these four courtrooms is served by its own Constant Air Volume (CAV) unit. Fan Coil Units (FCU) are also utilized in some corridors for additional conditioning.

Waterside:

Heating hot water used by AHU heating coils, terminal VAV boxes, and FCU's is generated by two natural gas boilers in a first floor mechanical room. Each boiler has an output of 13,390 MBH. Chilled water is supplied by J.E.A. Public Utility Company. The chilled water is pumped from a central pumping room to the AHU cooling coils and FCU's.

System Design Load Estimation

The energy modeling software chosen for the purpose of this report was Trane TRACE 700 Version 6.2.6.5. It was decided to use this program due to previous experience with it and the understanding of the specific data input methodology of the software. The software and energy model are used to determine the design load energy consumption through the use of a full year (8,760 hour) model of the Duval County Unified Courthouse Facility.

Block Load Assumptions

The energy analysis for The Duval County Unified Courthouse Facility was done using a block loading technique instead of an exact room-by-room method. This still provides relatively accurate load estimates and energy consumption values. It was deemed unnecessary to do a room-by-room analysis due to the facility size and large number of individual rooms. The facility was instead split up into larger spaces that include similar rooms based on occupancy and type. All space types were taken directly from the architectural plans and similar, adjacent spaces were grouped together.

Location Design Data

The Duval County Unified Courthouse Facility is currently under construction in Jacksonville, Florida. The weather data used is shown below in Table 1 and was obtained from the 2009 ASHRAE Handbook of Fundamentals for Jacksonville NAS, FL, USA.

ASHRAE Design Data		
Heating Conditions (99.6%)	Cooling Conditions (0.4%)	
OA Dry Bulb (°F)	OA Dry Bulb (°F)	OA Wet Bulb (°F)
32.2	95.5	77.2

Table 1

Load Sources

The program requires that each space be modeled for certain loads such as internal loads from occupants, equipment, and lighting; ventilation loads based on required outdoor ventilation air needed in the space as per occupant density and square footage; and building envelope loads from exterior walls and roofs based on the materials' properties.

Internal Loads

The modeling software uses templates for the load sources that can be assigned to the spaces being modeled. Occupant densities were not provided in the design documents so software default values

were used or manually calculated for the case of restrooms. The lighting load used is the lighting power density that was calculated in Technical Report 1 for ASHRAE Standard 90.1 lighting power density compliance. This value is 1.209 W/ft². Miscellaneous loads were assumed to be zero except in office spaces and server rooms. The internal load templates used in this model have been summarized in Table 2 below.

Trane TRACE Internal Load Summary						
Space Type	People Density	Sensible Load	Latent Load	Computer Load	Lighting Power Density	Misc. Power Density
	(ft ² /person)	(BTU/hr)	(BTU/hr)		(W/ft ²)	(W/ft ²)
Holding Cell	11	250	250	-	1.209	-
Computer Lab	50	250	250	1/person	1.209	0.5
Conference Space	20	245	155	-	1.209	-
Corridor	0	-	-	-	1.209	-
Courtroom	14	245	155	2 total	1.209	-
Library	100	250	250	.5/person	1.209	0.2
Lobby	16.7	245	155	-	1.209	-
Locker Room/ RR	120	250	250	-	1.209	-
Main Lobby	100	250	250	-	1.209	-
Mech./Elect. Rooms	0	-	-	-	1.209	-
Office Space	143	250	200	1/person	1.209	0.5
Parking	0	-	-	-	1.209	-
Sallyport	200	275	275	-	1.209	-
Server Room	0	-	-	-	1.209	50
Shaft	0	-	-	-	0	-
Storage Space	200	275	275	-	1.209	-

Table 2

Airflow Loads

The software uses templates to designate minimum outdoor ventilation airflow to certain spaces based on their type and occupancy. Since ventilation rates for The Duval County Unified Courthouse Facility were not available from the design documents per space and due to the block loading analysis, the ventilation rates were set as defaults in the program to ASHRAE Standard 62.1. The airflow templates used in this model have been summarized in Table 3 below.

Trane TRACE Airflow Load Summary				
Space Type	Std. 62.1		Infiltration (AC/hr)	VAV Minimum (% Airflow)
	People OA (cfm/person)	Area OA (cfm/ft ²)		
Computer Lab	10	0.12	0.3	30
Conference Space	5	0.06	0.3	30
Corridor	0	0.06	0.3	30
Courtroom	5	0.06	0.3	30
Elect./Mech. Spaces	0	0.06	0.3	30
Main Lobby	5	0.06	0.3	30
Holding Cells	5	0.12	0.3	30
Library	5	0.12	0.3	30
Lobby	5	0.06	0.3	30
Office Space	5	0.06	0.3	30
Parking	-	1.5	0.3	30
Locker Room/ RR	50	-	0.3	30
Sallyport	7.5	0.06	0.3	30
Server Room	5	0.06	0.3	30
Shaft	-	-	0.3	30
Storage Space	0	0.12	0.3	30
Waiting Areas	5	0.06	0.3	30

Table 3

Building Envelope Loads

The software uses construction templates to specify the building envelope materials' properties. All spaces have the same envelope materials; therefore these templates are very similar. Building Envelope material values were taken from Technical Report 1 from the ASHRAE Standard 90.1 energy analysis on building envelope materials for the facility. The program calculates the exterior wall and glazing area for each room based on wall data input in the room section. The same is done for spaces with a roof over them. It then uses the material properties from the templates to calculate loads on the space. The construction templates, however, also include space height and plenum height. The ceiling heights of the spaces in The Duval County Unified Courthouse facility vary depending on what type of space it is. For example, the courtrooms have 15 foot high ceilings while most offices have 10 foot high ceilings. The construction templates used in this model have been summarized in Table 4 below.

Trane Trace Envelope Load Summary							
Space Type	Space Height	Plenum Height	Slab U-Factor	Roof U-Factor	Wall U-Factor	Glazing U-Factor	Glazing Shading Coefficient
	(ft)	(ft)	(BTU/h*ft ² *F)	(BTU/h*ft ² *F)	(BTU/h*ft ² *F)	(BTU/h*ft ² *F)	
Corridor	12	6	0.73	0.048	0.168	0.62	0.161
Courtroom	15	3					
Main Lobby	18	0					
Default	10	8					
Shaft	18	0					

Table 4

Spaces

Each space is assigned a template for the three aforementioned load types based on its occupancy, purpose, and type of space. A list of spaces modeled in the Trane TRACE software is available in Appendix A. This list includes the space type, area, internal load type, airflow load type, and construction type. For simplicity, shaft spaces for ducts, raceway, and elevators have been removed from this list. These spaces use the “Shaft” template for all three load types.

Schedules

The Duval County Unified Courthouse Facility is expected to operate on a typical office building schedule. An occupancy schedule has not been provided, but an approximate schedule was created in the Trane TRACE software in order to calculate energy use. The schedule used in this energy model is outlined in Table 5 below. The schedule is a Monday through Friday schedule based on occupancy rates. Weekend occupancies are assumed to be zero. All spaces adhere to this schedule with the exception of the server rooms. These rooms operate on a 100% cooling schedule.

Trane TRACE Occupancy Schedule		
Hours		Occupancy
Start	End	(%)
12:00 AM	6:00 AM	0
6:00 AM	7:00 AM	10
7:00 AM	8:00 AM	30
8:00 AM	11:00 AM	100
11:00 AM	1:00 PM	80
1:00 PM	5:00 PM	100
5:00 PM	6:00 PM	10
6:00 PM	12:00 AM	0

Table 5

Design Load Estimation Results

The simulation performed by the software yielded results that were compared to the systems specified by the design engineering team. The only information provided by the design documents, however, was the airflow provided by each system. No cooling or heating load information for each system was provided. The airflows for each system are compared in Table 6 below.

System Airflow Comparison						
System	Floor Area Served	Source	Total Airflow	Ventilation Airflow	Total Airflow per Unit Area	Ventilation Airflow per Unit Area
	(ft ²)		(CFM)	(CFM)	(CFM/ft ²)	(CFM/ft ²)
1W1	84,477	Model	44,822	9,524	0.53	0.11
		Design	50,000	12,500	0.59	0.15
2W2	34,168	Model	25,873	5,986	0.76	0.18
		Design	18,800	4,700	0.55	0.14
2W3	48,147	Model	26,413	5,455	0.55	0.11
		Design	16,500	4,150	0.34	0.09
7W1	55,948	Model	38,145	8,420	0.68	0.15
		Design	46,000	10,000	0.82	0.18
7W2	74,552	Model	45,991	8,204	0.62	0.11
		Design	46,000	5,000	0.62	0.07
7W3	71,681	Model	46,191	7,916	0.64	0.11
		Design	46,000	5,000	0.64	0.07
2E2	41,850	Model	25,016	5,905	0.60	0.14
		Design	24,300	6,075	0.58	0.15
2E3	72,937	Model	36,718	10,090	0.50	0.14
		Design	50,000	12,500	0.69	0.17
7E1	32,871	Model	34,685	6,027	1.06	0.18
		Design	46,000	10,000	1.40	0.30
7E2	50,480	Model	42,804	7,573	0.85	0.15
		Design	46,000	5,000	0.91	0.10
7E3	46,828	Model	37,950	7,108	0.81	0.15
		Design	46,000	5,000	0.98	0.11

2W1	8,540	Model	10,339	3,563	1.22	0.42
		Design	11,000	3,400	1.29	0.40
3W1	10,972	Model	14,699	4,577	1.34	0.42
		Design	14,100	5,290	1.29	0.48
3W2	3,801	Model	4,377	1,514	1.15	0.40
		Design	3,300	945	0.87	0.25
4W1	10,972	Model	14,691	4,577	1.34	0.42
		Design	14,100	5,290	1.29	0.48
4W2	4,991	Model	4,005	1,873	0.80	0.38
		Design	4,300	1,300	0.86	0.26
5W1	10,972	Model	14,367	4,577	1.31	0.42
		Design	14,100	5,290	1.29	0.48
6W1	10,972	Model	14,671	4,577	1.34	0.42
		Design	14,100	5,290	1.29	0.48
2E1	8,402	Model	10,230	3,069	1.22	0.37
		Design	11,000	3,400	1.31	0.40
3E1	10,956	Model	14,128	4,570	1.29	0.42
		Design	14,100	5,290	1.29	0.48
3E2	3,905	Model	4,397	1,520	1.13	0.39
		Design	3,300	945	0.85	0.24
4E1	10,956	Model	14,139	3,694	1.60	0.42
		Design	14,100	5,290	1.59	0.60
4E2	5,004	Model	4,004	1,881	0.80	0.38
		Design	4,300	1,300	0.86	0.26
5E1	10,956	Model	14,129	4,570	1.29	0.42
		Design	14,100	5,290	1.29	0.48
6E1	10,956	Model	14,130	4,570	1.29	0.42
		Design	14,100	5,290	1.29	0.48

Table 6

The totals and percent deviation from the design documents is shown in Table 7 below. The margins of error are relatively small for both total airflow and ventilation air flow. A possible reason for the deviation could be due to the grouping of spaces method for the analysis. It is

possible that some spaces may have been grouped with other spaces that reside on different air handling systems. It is also possible that the systems have been oversized to negate risk.

Building Airflow Comparison				
	Total Airflow	Ventilation Airflow	Total Airflow per Unit Area	Ventilation Airflow per Unit Area
	(CFM)	(CFM)	(CFM/ft ²)	(CFM/ft ²)
Model	556,974	131,340	0.76	0.18
Design	585,600	133,535	0.80	0.18
% Deviation	5%	2%		

Table 7

The software also provided a cooling and heating load for each system. The values are provided in Table 8 below. Note that no design information for the systems' loads were provided so there is no comparison in this section.

System Loads				
System	Cooling Load	Area/Cooling Load	Heating Load	Area/Heating Load
	(Tons)	(ft ² /Ton)	(MBH)	(ft ² /MBH)
1W1	141.2	581.51	725.1	116.50
2W2	119.4	383.90	853.0	40.06
2W3	81.4	591.40	411.7	116.95
7W1	156.7	393.20	590.5	94.75
7W2	171.5	444.30	750.8	99.30
7W3	170.8	410.10	741.2	96.71
2E2	125.7	425.70	840.3	49.80
2E3	130.2	578.60	646.6	112.80
7E1	103.2	321.26	419.6	78.34
7E2	155.5	337.10	696.2	72.51
7E3	144.3	311.00	641.6	72.99
2W1	32.7	261.43	194.6	43.88
3W1	44.7	245.40	193.6	56.67
3W2	13.7	276.90	82.3	46.18
4W1	44.7	245.50	193.5	56.70

4W2	18.1	275.76	80.4	62.08
5W1	44.2	248.30	261.5	41.96
6W1	44.7	245.70	193.4	56.73
2E1	32.1	261.43	191.4	43.90
3E1	43.1	254.00	261.7	41.86
3E2	13.8	283.70	82.6	47.28
4E1	33.9	261.40	175.8	50.38
4E2	18.1	276.06	80.4	62.24
5E1	44.2	248.00	191.1	57.33
6E1	43.1	254.00	261.8	41.85
Totals	1971.0	Tons	9760.7	MBH

Table 8

Annual Energy Consumption & Operating Costs

Energy consumption was modeled using the same Trane TRACE software and energy modeling analysis. The Duval County Unified Courthouse uses three sources of energy: Electricity for lighting, receptacles, equipment, fans and pumps; Natural Gas for the hot water boiler; and Purchased Chilled Water for cooling purposes.

Energy Consumption

The Trane TRACE program calculated monthly energy consumptions and demand values for the three types of purchased energy. The facility’s annual electric consumption is 3,755,927 kWh with a peak demand value of 1,919 kW in August. The annual natural gas consumption is 1,739,300 kBTU, or approximately 1687 MCF of natural gas. The peak demand value of natural gas is 7400 kBTU/hr, or approximately 7.2 MCF/hr, in February. The annual purchased chilled water consumption is 30,714,600 kBTU, or approximately 287 kGal. The peak demand value of purchased chilled water is 23,700 kBTU/hr, or approximately 221 gallons/hr, in the month of August.

The total building energy consumption can be expressed in a total MMBTU format by converting all energy consumption values to this unit. The total energy usage for The Duval County Unified Courthouse Facility is approximately **45,268 MMBTU**. This simplifies down to **56.73 kBTU/ft²**. The percentages of each energy sources’ contribution to this total is in Chart 1 below.

Total Building Energy Use (MMBTU)

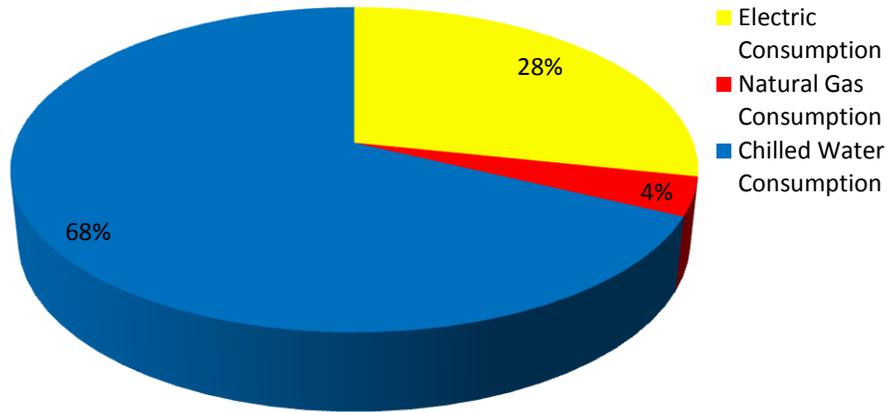


Chart 1

The monthly energy consumptions are shown in the charts below for each energy source. The profiles of monthly usage seem accurate based on what the energy is used for. The electric usage (Chart 2) has a relatively constant profile throughout the year because the electricity is only used for lighting, receptacles, fans, and pumps. It rises very slightly in the summer months, but this is only due increased fan usage and chilled water pumping for cooling. The natural gas usage (Chart 3) follows the normal profile for heating with its peak in the winter months and no natural gas usage in the summer months. The purchased chilled water usage (Chart 4) also follows a normal profile for cooling as its peak is in the summer. Chilled water is still required in the winter months due to internal loads in the building.

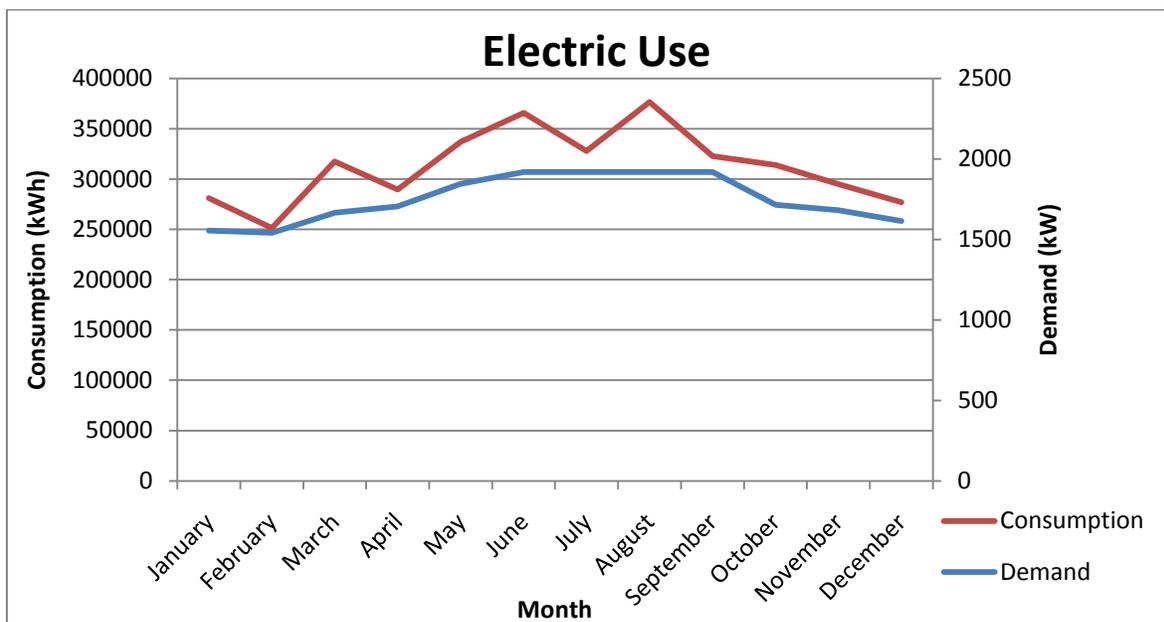


Chart 2

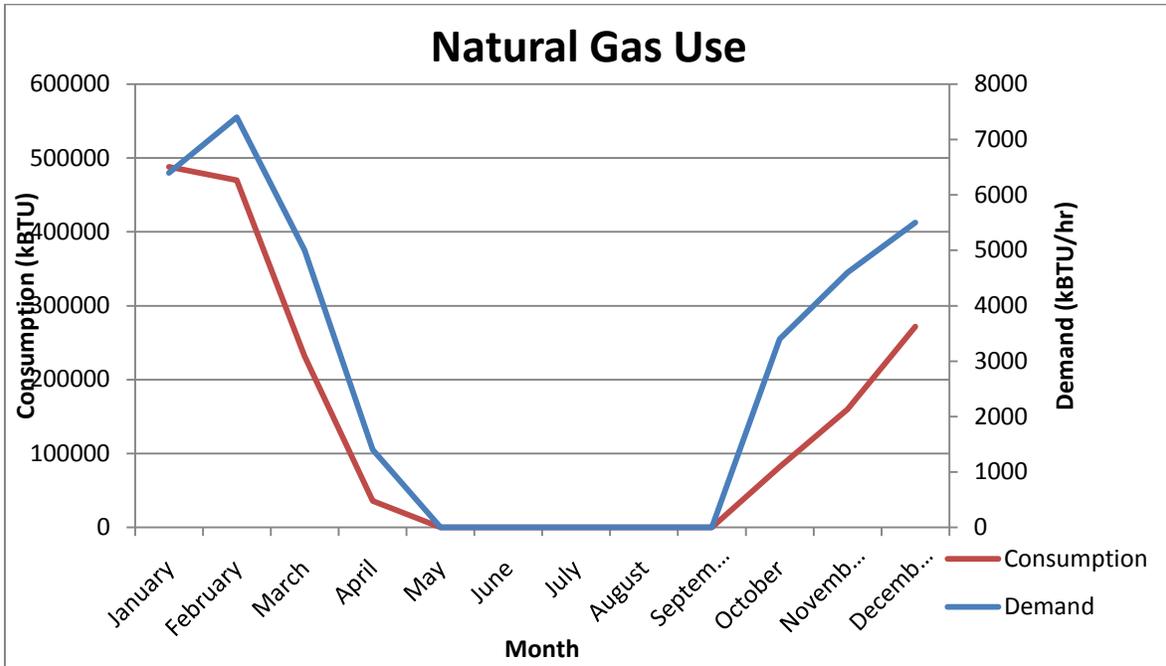


Chart 3

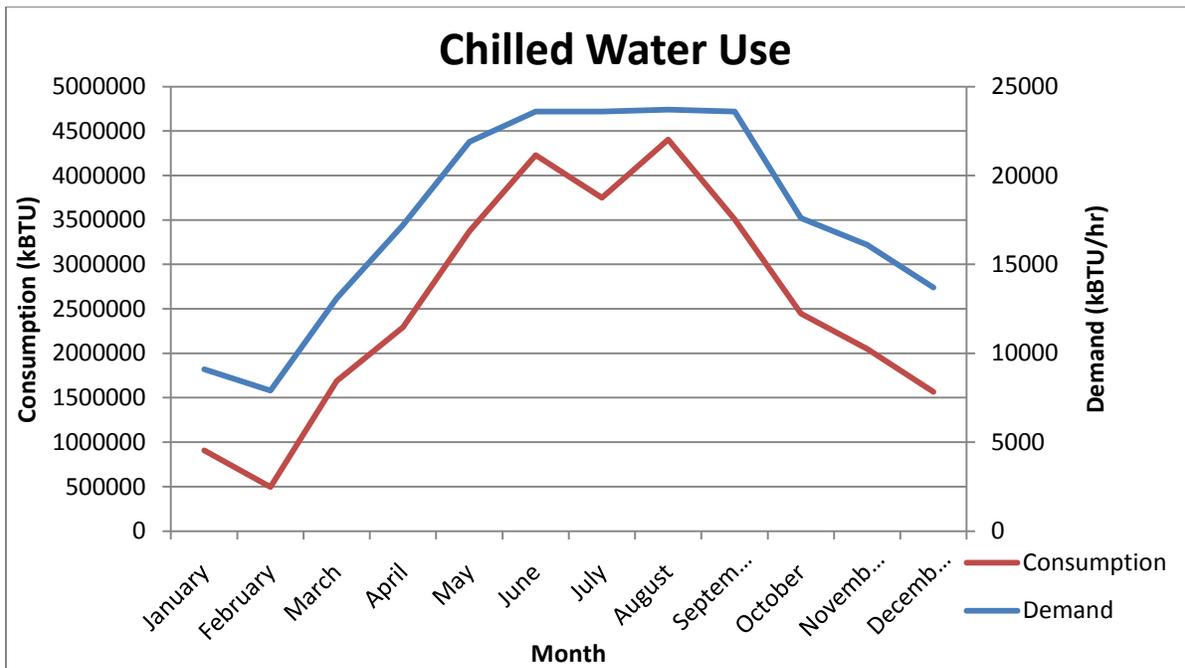


Chart 4

Equipment Energy Consumption Breakdown

The energy consumption of the facility can be broken down to its end uses to see what equipment is using what and how much energy. The main component to be broken down is the electric usage which is used for a variety of different functions. Table 9 shows the breakdown of energy uses as well as their percent of the total energy use. The largest energy consuming function is for primary cooling through the use of purchased chilled water. This makes sense because of the building is located in a climate dominated by cooling loads.

Energy Consumption Breakdown					
Energy Consuming Function	Consumption		Equivalent Units		% of Total Use
Primary Heating					
Primary Heating (Boilers)	1,739,283	kBTU	1,739,283	kBTU	3.8%
Heating Accessories	20,583	kWh	70,229	kBTU	0.2%
Primary Cooling					
Cooling Compressor	30,714,432	kBTU	30,714,432	kBTU	67.8%
Auxiliary					
Supply Fans	869,290	kWh	2,966,017	kBTU	6.6%
Pumps	210,710	kWh	718,943	kBTU	1.6%
Stand-Alone Base Utilities	256,666	kWh	875,744	kBTU	1.9%
Lighting					
Lighting Loads	2,140,903	kWh	7,304,761	kBTU	16.1%
Receptacles					
Receptacle Loads	257,770	kWh	879,511	kBTU	1.9%
Total Usage			45,268,921	kBTU	100%

Table 9

Energy Costs

The Duval County Unified Courthouse Facility has no record of actual utility costs due to the fact that it is currently under construction. The utility rates have been estimated based on the current local utility rate schedules from J.E.A Public Utility Company for electricity and purchased chilled water and from TECO People’s Gas for the natural gas estimates. The rates for each energy source are summarized in Table 10.

Utility Rates	
Utility	Unit Cost
Electric Demand	\$11.47/kW
Electric Consumption	\$0.0662/kWh
Natural Gas	\$0.11321/therm
Chilled Water	\$0.87416/therm

Table 10

The utility costs were analyzed using these rates with the energy values from the simulation. The annual charges are as follows: the electric utility cost, including both demand and consumption charges, is \$489,466.49; natural gas utility cost is \$1,969.06; and the purchased chilled water cost is \$268,494.75. These charges sum up to a total annual utility cost of **\$759,930.30**. This equates to approximately **\$0.95/ft²** annually. Chart 5 shows the percentages of each utility cost.

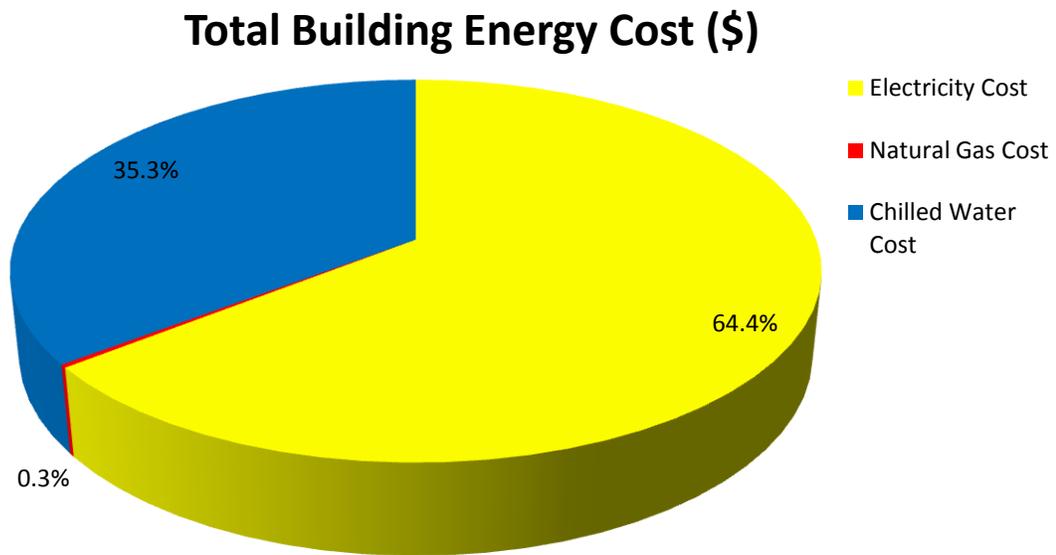


Chart 5

Due to the variety of functions consuming electrical energy, an electrical cost breakdown by equipment was also done. The results of this are shown in Table 11. It should be noted that more than half of the electricity consumption charges are due to the lighting and almost a quarter of the charges are due to supply fan energy.

Electricity Consumption Cost Breakdown				
Electricity Consuming Function	Electric Consumption		Electric Cost	% of Total Cost
Primary Heating				
Heating Accessories	20,583	kWh	\$ 1,362.59	0.5%
Auxiliary				
Supply Fans	869,290	kWh	\$ 57,547.00	23.1%
Pumps	210,710	kWh	\$ 13,949.00	5.6%
Stand-Alone Base Utilities	256,666	kWh	\$ 16,991.29	6.8%
Lighting				
Lighting Loads	2,140,903	kWh	\$ 141,727.78	57.0%
Receptacles				
Receptacle Loads	257,770	kWh	\$ 17,064.37	6.9%
Total Consumption Cost			\$ 248,642.04	100.0%

Table 11

Emissions Analysis

The site of The Duval County Unified Courthouse Facility is in the FRCC region of the Eastern Interconnection of the United States Electrical Grid. The regions are shown in Figure 1.

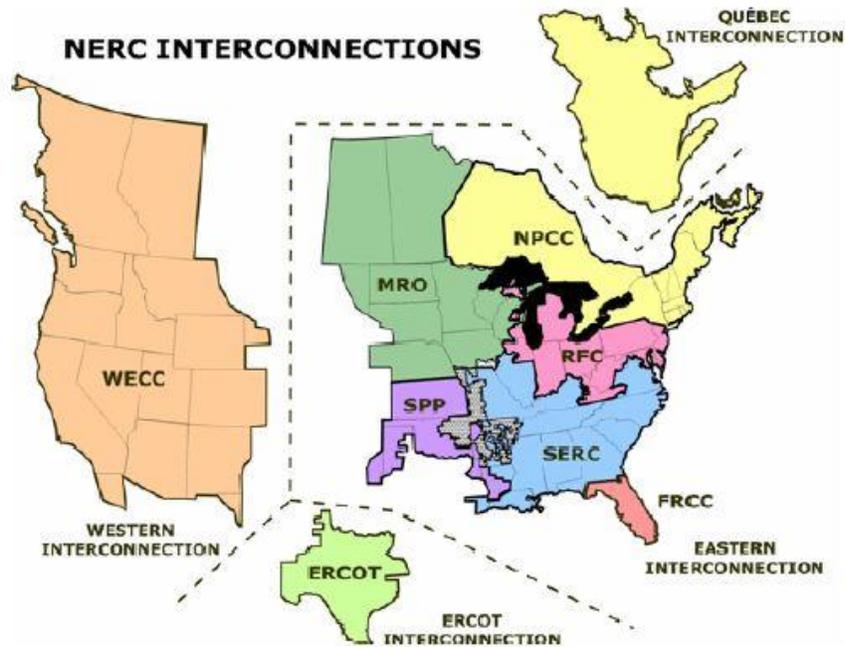


Figure 1

Through the use of the energy consumption information provided in the simulation model, annual emissions data can be generated using supplementary information from the National Renewable Energy Laboratory. Figure 2 below shows the emission factors for many different types of pollutants for each grid region.

Pollutant (lb)	National	Eastern	Western	ERCOT	Alaska	Hawaii
CO _{2e}	1.67E+00	1.74E+00	1.31E+00	1.84E+00	1.71E+00	1.91E+00
CO ₂	1.57E+00	1.64E+00	1.22E+00	1.71E+00	1.55E+00	1.83E+00
CH ₄	3.71E-03	3.59E-03	3.51E-03	5.30E-03	6.28E-03	2.96E-03
N ₂ O	3.73E-05	3.87E-05	2.97E-05	4.02E-05	3.05E-05	2.00E-05
NO _x	2.76E-03	3.00E-03	1.95E-03	2.20E-03	1.95E-03	4.32E-03
SO _x	8.36E-03	8.57E-03	6.82E-03	9.70E-03	1.12E-02	8.36E-03
CO	8.05E-04	8.54E-04	5.46E-04	9.07E-04	2.05E-03	7.43E-03
TNMOC	7.13E-05	7.26E-05	6.45E-05	7.44E-05	8.40E-05	1.15E-04
Lead	1.31E-07	1.39E-07	8.95E-08	1.42E-07	6.30E-08	1.32E-07
Mercury	3.05E-08	3.36E-08	1.86E-08	2.79E-08	3.80E-08	1.72E-07
PM10	9.16E-05	9.26E-05	6.99E-05	1.30E-04	1.09E-04	1.79E-04
Solid Waste	1.90E-01	2.05E-01	1.39E-01	1.66E-01	7.89E-02	7.44E-02

Figure 2

Based on the delivered electricity in kWh to The Duval County Unified Courthouse Facility calculated from the simulation and these emission factors, the total annual emissions for the building can be calculated for our specific grid region. This is summarized in Table 12.

Annual Emissions for Electrical Consumption			
Electric Use	1	kWh	3,755,927 kWh
Pollutant	Eastern Interconnection Emission Factor		Annual Pollution
CO _{2e}	1.74E+00		6,535,312.98 lb
CO ₂	1.64E+00		6,159,720.28 lb
CH ₄	3.59E-03		13,483.78 lb
N ₂ O	3.87E-05		145.35 lb
NO _x	3.00E-03		11,267.78 lb
SO _x	8.57E-03		32,188.29 lb
CO	8.54E-04		3,207.56 lb
TNMOC	7.26E-05		272.68 lb
Lead	1.39E-07		0.52 lb
Mercury	3.36E-08		0.13 lb
PM10	9.26E-05		347.80 lb
Solid Waste	2.05E-01		769,965.04 lb

Table 12

The National Renewable Energy Laboratory also provides emissions coefficients for on-site combustion in a commercial boiler. The boilers in The Duval County Unified Courthouse Facility consume approximately 1,687 MCF of natural gas annually. Figure 3 shows the emission factors associated with each pollutant for specific types of combustion. Table 13 is a summary of the pollutant emissions from the facility’s boilers.

Pollutant (lb)	Commercial Boiler					
	Bituminous Coal *	Lignite Coal **	Natural Gas	Residual Fuel Oil	Distillate Fuel Oil	LPG
	1000 lb	1000 lb	1000 ft ³ ***	1000 gal	1000 gal	1000 gal
CO _{2e}	2.74E+03	2.30E+03	1.23E+02	2.56E+04	2.28E+04	1.35E+04
CO ₂	2.63E+03	2.30E+03	1.22E+02	2.55E+04	2.28E+04	1.32E+04
CH ₄	1.15E-01	2.00E-02	2.50E-03	2.31E-01	2.32E-01	2.17E-01
N ₂ O	3.68E-01	ND [†]	2.50E-03	1.18E-01	1.19E-01	9.77E-01
NO _x	5.75E+00	5.97E+00	1.11E-01	6.41E+00	2.15E+01	1.57E+01
SO _x	1.66E+00	1.29E+01	6.32E-04	4.00E+01	3.41E+01	0.00E+00
CO	2.89E+00	4.05E-03	9.33E-02	5.34E+00	5.41E+00	2.17E+00
VOC	ND [†]	ND [†]	6.13E-03	3.63E-01	2.17E-01	3.80E-01
Lead	1.79E-03	6.86E-02	5.00E-07	1.51E-06	ND [†]	ND [†]
Mercury	6.54E-04	6.54E-04	2.60E-07	1.13E-07	ND [†]	ND [†]
PM10	2.00E+00	ND [†]	8.40E-03	4.64E+00	1.88E+00	4.89E-01

* from the U.S. LCI data module: Bituminous Coal Combustion in an Industrial Boiler (NREL 2005)

** from the U.S. LCI data module: Lignite Coal Combustion in an Industrial Boiler (NREL 2005)

*** Gas volume at 60°F and 14.70 psia.

† no data available

Figure 3

Annual Emissions for Boiler				
Natural Gas Use	1	MCF	1,687	MCF
Pollutant	Natural Gas Emission Factor		Annual Pollution	
CO2e	1.23E+02		207,501.00	lb
CO2	1.22E+02		205,814.00	lb
CH4	2.50E-03		4.22	lb
N2O	2.50E-03		4.22	lb
Nox	1.11E-01		187.26	lb
Sox	6.32E-04		1.07	lb
CO	9.33E-02		157.40	lb
VOC	6.13E-03		10.34	lb
Lead	5.00E-07		0.00	lb
Mercury	2.60E-07		0.00	lb
PM10	8.40E-03		14.17	lb

Table 13

Even though the facility does not put out emissions by making chilled water in their own plant, the facility still contributes to greenhouse gas emissions for the generation of the chilled water they purchase. The Energy Information Administration provides some estimates on indirect greenhouse gas emission factors based on different types of district energy. The district chilled water plant that is part of the J.E.A Public Utility Company generates chilled water through the use of electric driven chillers. The information for this calculation was found in the Form EIA-1605 Appendices F & N. The equation for the emission factor of this type of purchased chilled water is below. Table 14 summarizes the calculation and emissions contribution for the district chilled water.

$$EF_{\text{Chilled Water}} = 0.921 * EF_{\text{Electric/Inventory}} \quad (\text{Equation 1})$$

Where: $EF_{\text{Chilled Water}}$ = Emissions factor in kg CO_{2e}/ton hour of chilled water purchased

$EF_{\text{Electric/Inventory}}$ = Appropriate Regional Electricity Emissions Factor from Appendix F in MT CO_{2e}/MWh

Annual Emissions for Purchased Chilled Water					
Chilled Water Use	30714600	kBTU	2559550	Ton*hr	
Pollutant	Region Electric EF (Ton/MWh)		Chilled Water EF (kg/Ton*hr)		Annual Pollution (kg)
CO2e	0.678		0.624		1,598,280.28
					3,516,216.62

Table 14

Professional Energy Analysis

An energy model was created by the engineering design team at TLC Engineering for the project. The energy model was a requirement because LEED Certification is a goal of the building. The energy model created is to prove that the building is a certain percentage better than ASHRAE Standard 90.1 Baseline requirements. The program used to conduct the energy and load analysis was VisualDOE. Results of this analysis, however, have not been made available and an energy model comparison is not possible.

Conclusion

The Duval County Unified Courthouse Facility energy model created with Trane TRACE proved to be relatively accurate to the design information that was supplied. All possible inputs of the software were either specified from the design documents or the best assumptions were made based on ASHRAE Standards. The energy uses of this model, however, are only a simulation and cannot predict some fluctuations in energy use. Possible deviations could include varying extreme weather conditions, occupancy schedules and densities changing, and possible space functions changing.

References

ASHRAE Handbook of Fundamentals

ASHRAE Handbook of HVAC Systems and Equipment

ASHRAE Handbook of HVAC Applications

ASHRAE Standard 62.1 – 2007

ASHRAE Standard 90.1 – 2007

TLC Engineering for Architecture, Inc. *Duval County Unified Courthouse Facility Mechanical Drawings and Specifications*

Instructions for Form EIA-1605, Voluntary Reporting of Greenhouse Gases, Energy Information Administration, Department of Energy. October 15, 2007. Appendix N; Emissions Benchmarks for Purchased Steam and Chilled/Hot Water

Instructions for Form EIA-1605, Voluntary Reporting of Greenhouse Gases, Energy Information Administration, Department of Energy. October 15, 2007. Appendix F; Electricity Emission Factors

National Renewable Energy Laboratory. Source Energy and Emission Factors for Energy Use in Buildings

Appendix A – Spaces Modeled

Trane TRACE Spaces and Associated Load Types					
Room #	Space	Area (ft ²)	Internal Load Type	Airflow Load Type	Construction Type
18	Mech.	675	Mech/Elect.	Mech/Elect.	Shaft
30	Lobby	2708	Lobby	Lobby	Default
31	Security/Lobby	7605	Main Lobby	Main Lobby	Main Lobby
32	Lobby	2541	Lobby	Lobby	Default
33	Lobby	9158	Main Lobby	Main Lobby	Main Lobby
37	General Office Space	7735	Office Space	Office Space	Default
48	General Office Space	16423	Office Space	Office Space	Default
83	General Office Space	7800	Office Space	Office Space	Default
87	Electrical Space	325	Mech/Elect.	Mech/Elect.	Shaft
90	Public Restrooms	707	Lockerroom/RR	Lockerroom/RR	Default
97	Parking	11657	Parking	Parking	Shaft
100	General Office Space	474	Office Space	Office Space	Default
103	Locker Room	807	Lockerroom/RR	Lockerroom/RR	Default
105	Storage Space	1101	Storage Space	Storage Space	Default
108	Mechanical Space	2620	Mech/Elect.	Mech/Elect.	Shaft
110	Electrical Space	142	Mech/Elect.	Mech/Elect.	Default
114	General Office Space	442	Office Space	Office Space	Default
117	Storage Space	2935	Storage Space	Storage Space	Default
123	Elect.	1137	Mech/Elect.	Mech/Elect.	Shaft
125	Sallyport	7309	Sallyport	Sallyport	Corridor
126	Holding Office Space	592	Office Space	Office Space	Default
131	Holding Office Space	190	Office Space	Office Space	Default
132	General Storage	106	Storage Space	Storage Space	Default
135	Holding Cells	650	Holding Cell	Holding Cell	Default
139	General Office Space	533	Office Space	Office Space	Default
146	Holding Cells	553	Holding Cell	Holding Cell	Default
159	Holding Office Space	107	Office Space	Office Space	Default
163	Holding Cells	428	Holding Cell	Holding Cell	Default
168	General Office Space	735	Office Space	Office Space	Default
185	Mech.	385	Mech/Elect.	Mech/Elect.	Shaft
186	Elect.	746	Mech/Elect.	Mech/Elect.	Shaft
190	General Office Space	1021	Office Space	Office Space	Default
197	Public Restrooms	601	Lockerroom/RR	Lockerroom/RR	Default
199	Electrical Space	209	Mech/Elect.	Mech/Elect.	Default
201	Shower Room	791	Lockerroom/RR	Lockerroom/RR	Default
208	General Office Space	7487	Office Space	Office Space	Default
218	Electrical Space	265	Mech/Elect.	Mech/Elect.	Default
222	Public Restrooms	703	Lockerroom/RR	Lockerroom/RR	Default
226	General Office Space	744	Office Space	Office Space	Default
231	Electrical Space	338	Mech/Elect.	Mech/Elect.	Default
235	Corridor	17441	Corridor	Corridor	Corridor
238	General Office Space	6069	Office Space	Office Space	Default

242	Parking	11677	Parking	Parking	Shaft
248	Storage Space	3704	Storage Space	Storage Space	Default
250	Electrical Space	256	Mech/Elect.	Mech/Elect.	Default
251	General Office Space	3229	Office Space	Office Space	Default
256	Storage Space	1797	Storage Space	Storage Space	Default
258	General Office Space	981	Office Space	Office Space	Default
263	Mechanical Space	256	Mech/Elect.	Mech/Elect.	Shaft
280	Storage Space	983	Storage Space	Storage Space	Default
2468	Holding Cells	552	Holding Cell	Holding Cell	Default
2517	General Office Space	15208	Office Space	Office Space	Default
287	General Office Space	2198	Office Space	Office Space	Default
308	Corridor	591	Corridor	Corridor	Corridor
312	General Office Space	4940	Office Space	Office Space	Default
319	Public Restrooms	688	Lockerroom/RR	Lockerroom/RR	Default
320	Storage Space	182	Storage Space	Storage Space	Default
321	Jury Lounge Lobby	1489	Lobby	Waiting Area	Default
329	Vending	2361	Corridor	Corridor	Corridor
330	General Office Space	4647	Office Space	Office Space	Default
340	Hearing Rooms	3186	Conference Space	Conference Space	Default
372	Electrical Space	332	Mech/Elect.	Mech/Elect.	Default
378	Womens Rr	317	Lockerroom/RR	Lockerroom/RR	Default
382	Office Space	817	Office Space	Office Space	Default
385	Meeting Rooms	605	Conference Space	Conference Space	Default
388	Restroom	196	Lockerroom/RR	Lockerroom/RR	Default
390	Storage Space	48	Storage Space	Storage Space	Default
392	Atrium	2390	Shaft	Shaft	Shaft
394	Public Restroom	507	Lockerroom/RR	Lockerroom/RR	Default
396	Mechanical Space	848	Mech/Elect.	Mech/Elect.	Shaft
397	Library	3648	Library	Library	Corridor
401	Electrical Space	186	Mech/Elect.	Mech/Elect.	Default
407	Storage	91	Storage Space	Storage Space	Default
414	Holding Cells	574	Holding Cell	Holding Cell	Default
418	Mechanical Space	176	Mech/Elect.	Mech/Elect.	Shaft
422	Storage Space	325	Storage Space	Storage Space	Default
424	Holding Cells	70	Holding Cell	Holding Cell	Default
431	Electrical Space	313	Mech/Elect.	Mech/Elect.	Default
436	Mens Rr	326	Lockerroom/RR	Lockerroom/RR	Default
438	Storage Space	670	Storage Space	Storage Space	Default
443	Courtroom	2090	Courtroom	Courtroom	Courtroom
456	Jury Space	412	Conference Space	Conference Space	Courtroom
460	Jury Space	411	Conference Space	Conference Space	Courtroom
464	Storage Space	191	Storage Space	Storage Space	Default
469	Courtroom	2099	Courtroom	Courtroom	Courtroom
474	Electrical Space	191	Mech/Elect.	Mech/Elect.	Default
479	Jury Space	408	Conference Space	Conference Space	Courtroom
480	Courtroom	2102	Courtroom	Courtroom	Courtroom
482	Jury Space	419	Conference Space	Conference Space	Courtroom
486	Courtroom	2111	Courtroom	Courtroom	Courtroom
491	Storage Space	94	Storage Space	Storage Space	Default
502	Storage Space	69	Storage Space	Storage Space	Default
515	Storage Space	91	Storage Space	Storage Space	Default

544	General Office Space	4812	Office Space	Office Space	Default
551	Conf. Rooms	1659	Conference Space	Conference space	Default
559	Conf. Rooms	1004	Conference Space	Conference space	Default
567	General Office Space	1697	Office Space	Office Space	Default
583	Storage Space	167	Storage Space	Storage Space	Default
600	Office Space	506	Office Space	Office Space	Default
604	General Office Space	6590	Office Space	Office Space	Default
614	Mechanical Space	225	Mech/Elect.	Mech/Elect.	Shaft
620	Server Room	1080	Server Room	Server Room	Default
627	General Office Space	3326	Office Space	Office Space	Default
632	Public Restrooms	501	Lockerroom/RR	Lockerroom/RR	Default
640	Courtroom	2167	Courtroom	Courtroom	Courtroom
642	Jury Space	411	Conference Space	Conference Space	Courtroom
646	Jury Space	417	Conference Space	Conference Space	Courtroom
651	Electrical Space	182	Mech/Elect.	Mech/Elect.	Default
654	Courtroom	2090	Courtroom	Courtroom	Courtroom
665	Storage Space	74	Storage Space	Storage Space	Default
689	Courtroom	2095	Courtroom	Courtroom	Courtroom
695	Storage Space	182	Storage Space	Storage Space	Default
699	Jury Space	415	Conference Space	Conference Space	Courtroom
702	Jury Space	413	Conference Space	Conference Space	Courtroom
708	Courtroom	2188	Courtroom	Courtroom	Courtroom
712	General Office Space	17935	Office Space	Office Space	Default
725	Holding Cells	443	Holding Cell	Holding Cell	Default
732	Holding Cells	75	Holding Cell	Holding Cell	Default
735	Corridor	1699	Corridor	Corridor	Corridor
740	Mechanical Space	184	Mech/Elect.	Mech/Elect.	Shaft
752	Waiting Room	662	Lobby	Waiting Area	Default
754	Mens RR	329	Lockerroom/RR	Lockerroom/RR	Default
758	Electrical Space	242	Mech/Elect.	Mech/Elect.	Default
762	General Office Space	6093	Office Space	Office Space	Default
768	Womens RR	331	Lockerroom/RR	Lockerroom/RR	Default
772	Electrical Space	279	Mech/Elect.	Mech/Elect.	Default
774	Corridor	5911	Corridor	Corridor	Corridor
2470	Holding Cells	565	Holding Cell	Holding Cell	Default
2472	Hearing Rooms	2699	Conference Space	Conference Space	Default
2479	Patio	1051	Corridor	Corridor	Corridor
2481	Cr Meeting Space	371	Conference Space	Conference space	Default
2482	Storage Space	89	Storage Space	Storage Space	Default
2483	Cr Meeting Space	431	Conference Space	Conference space	Default
2484	Cr Meeting Space	431	Conference Space	Conference space	Default
2485	Cr Meeting Space	397	Conference Space	Conference space	Default
2486	Storage Space	342	Storage Space	Storage Space	Default
2487	Storage Space	661	Storage Space	Storage Space	Default
2488	Cr Meeting Space	411	Conference Space	Conference space	Default
2489	Cr Meeting Space	429	Conference Space	Conference space	Default
2490	Cr Meeting Space	437	Conference Space	Conference space	Default
2491	Cr Meeting Space	383	Conference Space	Conference space	Default
2492	Hearing Room Lobby	2323	Lobby	Waiting Area	Default
2493	Corridor	218	Corridor	Corridor	Corridor
2494	Corridor	6702	Corridor	Corridor	Corridor

2495	Corridor	7938	Corridor	Corridor	Corridor
2496	Corridor	6123	Corridor	Corridor	Corridor
2518	Jury Lounge	6836	Conference Space	Conference Space	Courtroom
2519	General Office Space	6065	Office Space	Office Space	Default
779	General Office Space	319	Office Space	Office Space	Default
781	Corridor	9870	Corridor	Corridor	Corridor
787	Courtroom	2107	Courtroom	Courtroom	Courtroom
788	Jury Space	419	Conference Space	Conference Space	Courtroom
793	Jury Space	403	Conference Space	Conference Space	Courtroom
797	Storage Space	198	Storage Space	Storage Space	Default
801	Courtroom	2108	Courtroom	Courtroom	Courtroom
803	Storage	74	Storage Space	Storage Space	Default
805	Courtroom	2109	Courtroom	Courtroom	Courtroom
808	Electrical Space	201	Mech/Elect.	Mech/Elect.	Default
813	Jury Space	409	Conference Space	Conference Space	Courtroom
818	Jury Space	415	Conference Space	Conference Space	Courtroom
819	Courtroom	2104	Courtroom	Courtroom	Courtroom
824	Storage Space	92	Storage Space	Storage Space	Default
827	Courtroom	2544	Courtroom	Courtroom	Courtroom
831	General Office Space	322	Office Space	Office Space	Default
835	General Office Space	334	Office Space	Office Space	Default
838	Public Restroom	512	Lockerroom/RR	Lockerroom/RR	Default
840	Security Office	287	Office Space	Office Space	Default
843	Mechanical Space	359	Mech/Elect.	Mech/Elect.	Shaft
847	Jury Space	474	Conference Space	Conference Space	Courtroom
849	Corridor	794	Corridor	Corridor	Corridor
850	Storage Space	73	Storage Space	Storage Space	Default
856	Cr Meeting Space	391	Conference Space	Conference space	Default
860	Cr Meeting Space	401	Conference Space	Conference space	Default
867	Storage Space	69	Storage Space	Storage Space	Default
869	Cr Meeting Space	431	Conference Space	Conference space	Default
881	Storage Space	91	Storage Space	Storage Space	Default
891	Corridor	3090	Corridor	Corridor	Corridor
898	Holding Cells	436	Holding Cell	Holding Cell	Default
902	Holding Cells	79	Holding Cell	Holding Cell	Default
907	Storage Space	309	Storage Space	Storage Space	Default
908	Mechanical Space	196	Mech/Elect.	Mech/Elect.	Shaft
913	Holding Cells	561	Holding Cell	Holding Cell	Default
923	Cr Meeting Space	207	Conference Space	Conference space	Default
926	Holding Cell	300	Holding Cell	Holding Cell	Default
931	Cr Meeting Space	213	Conference Space	Conference space	Default
935	Courtroom	2513	Courtroom	Courtroom	Courtroom
936	Jury Space	528	Conference Space	Conference Space	Courtroom
937	Storage Space	104	Storage Space	Storage Space	Default
952	General Office Space	375	Office Space	Office Space	Default
955	Atrium	3162	Shaft	Shaft	Shaft
957	General Office Space	136	Office Space	Office Space	Default
958	Server Room	285	Server Room	Server Room	Default
964	Courtroom	2502	Courtroom	Courtroom	Courtroom
968	Electrical Space	246	Mech/Elect.	Mech/Elect.	Default
972	Jury Space	540	Conference Space	Conference Space	Courtroom

974	Storage Space	104	Storage Space	Storage Space	Default
976	Corridor	789	Corridor	Corridor	Corridor
977	Cr Meeting Space	226	Conference Space	Conference space	Default
980	Cr Meeting Space	217	Conference Space	Conference space	Default
985	Holding Cells	277	Holding Cell	Holding Cell	Default
991	Corridor	3074	Corridor	Corridor	Corridor
998	Holding Cells	565	Holding Cell	Holding Cell	Default
1004	Mech.	192	Mech/Elect.	Mech/Elect.	Shaft
1008	Storage Space	310	Storage Space	Storage Space	Default
1010	Holding Cell	77	Holding Cell	Holding Cell	Default
1024	Cr Meeting Space	366	Conference Space	Conference space	Default
1029	Storage Space	80	Storage Space	Storage Space	Default
1034	Cr Meeting Space	407	Conference Space	Conference space	Default
1040	Cr Meeting Space	406	Conference Space	Conference space	Default
1043	Storage Space	64	Storage Space	Storage Space	Default
1050	Cr Meeting Space	379	Conference Space	Conference space	Default
1057	Cr Meeting Space	381	Conference Space	Conference space	Default
1061	Storage Space	70	Storage Space	Storage Space	Default
1062	Jury Space	469	Conference Space	Conference Space	Courtroom
1066	Mech.	679	Mech/Elect.	Mech/Elect.	Shaft
1067	Public Restroom	524	Lockerroom/RR	Lockerroom/RR	Default
1069	Courtroom	2532	Courtroom	Courtroom	Courtroom
1074	Storage Space	92	Storage Space	Storage Space	Default
1077	Courtroom	2114	Courtroom	Courtroom	Courtroom
1081	Jury Space	417	Conference Space	Conference Space	Courtroom
1085	Jury Space	409	Conference Space	Conference Space	Courtroom
1090	Electrical Space	198	Mech/Elect.	Mech/Elect.	Default
1093	Courtroom	2116	Courtroom	Courtroom	Courtroom
1098	Courtroom	2104	Courtroom	Courtroom	Courtroom
1101	Storage Space	201	Storage Space	Storage Space	Default
1105	Jury Space	411	Conference Space	Conference Space	Courtroom
1110	Jury Space	442	Conference Space	Conference Space	Courtroom
1111	Courtroom	2090	Courtroom	Courtroom	Courtroom
1117	General Office Space	325	Office Space	Office Space	Default
1120	General Office Space	338	Office Space	Office Space	Default
1123	General Office Space	334	Office Space	Office Space	Default
2497	Cr Meeting Space	384	Conference Space	Conference space	Default
2498	Cr Meeting Space	430	Conference Space	Conference space	Default
2499	Corridor	4443	Corridor	Corridor	Corridor
2500	Corridor	4268	Corridor	Corridor	Corridor
2501	Storage Space	253	Storage Space	Storage Space	Default
2520	Holding Cells	453	Holding Cell	Holding Cell	Default
1129	General Office Space	319	Office Space	Office Space	Default
1131	Corridor	8206	Corridor	Corridor	Corridor
1137	Courtroom	2107	Courtroom	Courtroom	Courtroom
1139	Jury Space	403	Conference Space	Conference Space	Courtroom
1143	Storage Space	198	Storage Space	Storage Space	Default
1146	Courtroom	2108	Courtroom	Courtroom	Courtroom
1150	Courtroom	2109	Courtroom	Courtroom	Courtroom
1154	General Office Space	322	Office Space	Office Space	Default
1156	Jury Space	419	Conference Space	Conference Space	Courtroom

1161	Jury Space	409	Conference Space	Conference Space	Courtroom
1166	Electrical Space	201	Mech/Elect.	Mech/Elect.	Default
1168	Jury Space	415	Conference Space	Conference Space	Courtroom
1172	Courtroom	2104	Courtroom	Courtroom	Courtroom
1177	Atrium	4773	Shaft	Shaft	Shaft
1178	Courtroom	2544	Courtroom	Courtroom	Courtroom
1179	Storage Space	92	Storage Space	Storage Space	Default
1185	General Office Space	334	Office Space	Office Space	Default
1188	Public Restroom	512	Lockerroom/RR	Lockerroom/RR	Default
1190	General Office Space	287	Office Space	Office Space	Default
1192	Mechanical Space	359	Mech/Elect.	Mech/Elect.	Shaft
1197	Jury Space	474	Conference Space	Conference Space	Courtroom
1199	Storage Space	73	Storage Space	Storage Space	Default
1201	Corridor	933	Corridor	Corridor	Corridor
1209	Corridor	2260	Corridor	Corridor	Corridor
1210	Cr Meeting Space	398	Conference Space	Conference space	Default
1214	Cr Meeting Space	401	Conference Space	Conference space	Default
1220	Evidence	52	Storage Space	Storage Space	Default
1221	Storage Space	69	Storage Space	Storage Space	Default
1225	Cr Meeting Space	431	Conference Space	Conference space	Default
1232	Cr Meeting Space	430	Conference Space	Conference space	Default
1235	Storage Space	91	Storage Space	Storage Space	Default
1241	Cr Meeting Space	388	Conference Space	Conference space	Default
1248	Holding Cells	390	Holding Cell	Holding Cell	Default
1256	Holding Cell	79	Holding Cell	Holding Cell	Default
1258	Storage Space	309	Storage Space	Storage Space	Default
1262	Mech.	196	Mech/Elect.	Mech/Elect.	Shaft
1266	Holding Cell	561	Holding Cell	Holding Cell	Default
1274	Cr Meeting Space	203	Conference Space	Conference space	Default
1275	Closet	78	Storage Space	Storage Space	Default
1277	Jury Space	594	Conference Space	Conference Space	Courtroom
1279	Storage Space	83	Storage Space	Storage Space	Default
1283	Storage Space	267	Storage Space	Storage Space	Default
1288	Courtroom	3125	Courtroom	Courtroom	Courtroom
1290	Storage Space	71	Storage Space	Storage Space	Default
1295	Jury Space	556	Conference Space	Conference Space	Courtroom
1299	Cr Meeting Space	147	Conference Space	Conference space	Default
1301	Holding Cell	134	Holding Cell	Holding Cell	Default
1305	General Office Space	334	Office Space	Office Space	Default
1308	General Office Space	338	Office Space	Office Space	Default
1311	General Office Space	325	Office Space	Office Space	Default
1313	Public Restroom	524	Lockerroom/RR	Lockerroom/RR	Default
1318	Storage Space	92	Storage Space	Storage Space	Default
1319	Mechanical Space	679	Mech/Elect.	Mech/Elect.	Shaft
1320	Jury Space	469	Conference Space	Conference Space	Courtroom
1321	Storage Space	74	Storage Space	Storage Space	Default
1334	Electrical Space	191	Mech/Elect.	Mech/Elect.	Default
1350	General Office Space	1534	Office Space	Office Space	Default
1352	Grand Jury	1533	Conference Space	Conference space	Courtroom
1353	Jury Space	420	Conference Space	Conference Space	Courtroom
1358	Courtroom	2107	Courtroom	Courtroom	Courtroom

1359	Courtroom	2103	Courtroom	Courtroom	Courtroom
1360	Jury Space	409	Conference Space	Conference Space	Courtroom
1365	Jury Space	417	Conference Space	Conference Space	Courtroom
1366	Courtroom	2114	Courtroom	Courtroom	Courtroom
1367	Courtroom	2532	Courtroom	Courtroom	Courtroom
1377	Holding Cells	77	Holding Cell	Holding Cell	Default
1380	Corridor	2252	Corridor	Corridor	Corridor
1385	Holding Cell	49	Holding Cell	Holding Cell	Default
1386	Corridor	4322	Corridor	Corridor	Corridor
1388	Storage Space	80	Storage Space	Storage Space	Default
1392	Cr Meeting Space	407	Conference Space	Conference space	Default
1399	Cr Meeting Space	406	Conference Space	Conference space	Default
1402	Storage Space	64	Storage Space	Storage Space	Default
1409	Cr Meeting Space	379	Conference Space	Conference space	Default
1413	Cr Meeting Space	390	Conference Space	Conference space	Default
1419	Corridor	882	Corridor	Corridor	Corridor
1423	Cr Meeting Space	211	Conference Space	Conference space	Default
1428	Holding Cells	565	Holding Cell	Holding Cell	Default
1435	Mechanical Space	192	Mech/Elect.	Mech/Elect.	Shaft
1439	Storage Space	310	Storage Space	Storage Space	Default
1441	Closet	82	Storage Space	Storage Space	Default
1442	Holding Cells	142	Holding Cell	Holding Cell	Default
1446	Cr Meeting Space	140	Conference Space	Conference space	Default
1449	Storage Space	80	Storage Space	Storage Space	Default
1451	Jury Space	599	Conference Space	Conference Space	Courtroom
1455	Electrical Space	262	Mech/Elect.	Mech/Elect.	Default
1460	Courtroom	3141	Courtroom	Courtroom	Courtroom
1462	Storage Space	72	Storage Space	Storage Space	Default
1467	Jury Space	537	Conference Space	Conference Space	Courtroom
2502	Corridor	4449	Corridor	Corridor	Corridor
2521	Holding Cells	460	Holding Cell	Holding Cell	Default
1469	General Office Space	319	Office Space	Office Space	Default
1471	General Office Space	322	Office Space	Office Space	Default
1474	General Office Space	334	Office Space	Office Space	Default
1477	General Office Space	334	Office Space	Office Space	Default
1480	General Office Space	338	Office Space	Office Space	Default
1483	General Office Space	325	Office Space	Office Space	Default
1484	Atrium	4773	Shaft	Shaft	Shaft
1485	Corridor	6353	Corridor	Corridor	Corridor
1488	Courtroom	2107	Courtroom	Courtroom	Courtroom
1492	Jury Space	419	Conference Space	Conference Space	Courtroom
1497	Jury Space	403	Conference Space	Conference Space	Courtroom
1501	Storage Space	198	Storage Space	Storage Space	Default
1505	Courtroom	2108	Courtroom	Courtroom	Courtroom
1508	Courtroom	2109	Courtroom	Courtroom	Courtroom
1512	Electrical Space	201	Mech/Elect.	Mech/Elect.	Default
1517	Jury Space	409	Conference Space	Conference Space	Courtroom
1522	Jury Space	415	Conference Space	Conference Space	Courtroom
1523	Courtroom	2104	Courtroom	Courtroom	Courtroom
1528	Storage Space	92	Storage Space	Storage Space	Default
1531	Courtroom	2544	Courtroom	Courtroom	Courtroom

1535	Public Restrooms	512	Lockerroom/RR	Lockerroom/RR	Default
1537	General Office Space	287	Office Space	Office Space	Default
1540	Mechanical Space	359	Mech/Elect.	Mech/Elect.	Shaft
1544	Jury Space	474	Conference Space	Conference Space	Courtroom
1547	Storage Space	73	Storage Space	Storage Space	Default
1548	Corridor	1047	Corridor	Corridor	Corridor
1552	Cr Meeting Space	398	Conference Space	Conference space	Default
1555	Corridor	1733	Corridor	Corridor	Corridor
1559	Cr Meeting Space	401	Conference Space	Conference space	Default
1567	Storage Space	69	Storage Space	Storage Space	Default
1571	Cr Meeting Space	431	Conference Space	Conference space	Default
1578	Cr Meeting Space	430	Conference Space	Conference space	Default
1581	Storage Space	91	Storage Space	Storage Space	Default
1587	Cr Meeting Space	388	Conference Space	Conference space	Default
1596	Holding Cells	561	Holding Cell	Holding Cell	Default
1602	Mechanical Space	196	Mech/Elect.	Mech/Elect.	Shaft
1605	Storage Space	309	Storage Space	Storage Space	Default
1608	Holding Cell	79	Holding Cell	Holding Cell	Default
1614	Holding Cell	390	Holding Cell	Holding Cell	Default
1619	General Office Space	5009	Office Space	Office Space	Default
1624	Lockerrooms	442	Lockerroom/RR	Lockerroom/RR	Default
1631	Storage Space	258	Storage Space	Storage Space	Default
1643	Corridor	138	Corridor	Corridor	Corridor
1644	Computer Lab	1629	Computer Lab	Computer Lab	Default
1645	Corridor	191	Corridor	Corridor	Corridor
1647	General Office Space	2929	Office Space	Office Space	Default
1649	Server Room	647	Server Room	Server Room	Default
1651	Computer Lab	650	Computer Lab	Computer Lab	Default
1653	Storage Space	1444	Storage Space	Storage Space	Default
1656	Electrical Space	251	Mech/Elect.	Mech/Elect.	Default
1664	Corridor	680	Corridor	Corridor	Corridor
1667	Corridor	1678	Corridor	Corridor	Corridor
1672	Holding Cells	565	Holding Cell	Holding Cell	Default
1676	Mech.	192	Mech/Elect.	Mech/Elect.	Shaft
1683	Storage Space	310	Storage Space	Storage Space	Default
1685	Holding Cells	77	Holding Cell	Holding Cell	Default
1697	Cr Meeting Space	394	Conference Space	Conference space	Default
1704	Storage Space	90	Storage Space	Storage Space	Default
1708	Cr Meeting Space	438	Conference Space	Conference space	Default
1713	Cr Meeting Space	437	Conference Space	Conference space	Default
1718	Storage Space	72	Storage Space	Storage Space	Default
1724	Cr Meeting Space	408	Conference Space	Conference space	Default
1731	Cr Meeting Space	402	Conference Space	Conference space	Default
1736	Evidence	70	Storage Space	Storage Space	Default
1737	Jury Space	469	Conference Space	Conference Space	Courtroom
1741	Mech.	679	Mech/Elect.	Mech/Elect.	Shaft
1743	Public Restrooms	524	Lockerroom/RR	Lockerroom/RR	Default
1747	Courtroom	2532	Courtroom	Courtroom	Courtroom
1749	Jc	92	Storage Space	Storage Space	Default
1750	Courtroom	2114	Courtroom	Courtroom	Courtroom
1755	Jury Space	417	Conference Space	Conference Space	Courtroom

1760	Jury Space	409	Conference Space	Conference Space	Courtroom
1764	Electrical Sapce	198	Mech/Elect.	Mech/Elect.	Default
1768	Courtroom	2116	Courtroom	Courtroom	Courtroom
1773	Courtroom	2104	Courtroom	Courtroom	Courtroom
1776	Storage Space	201	Storage Space	Storage Space	Default
1779	Jury Space	411	Conference Space	Conference Space	Courtroom
1783	Jury Space	442	Conference Space	Conference Space	Courtroom
1786	Courtroom	2090	Courtroom	Courtroom	Courtroom
2504	Corridor	4449	Corridor	Corridor	Corridor
2505	Corridor	4268	Corridor	Corridor	Corridor
2523	Holding Cells	438	Holding Cell	Holding Cell	Default
1798	General Office Space	2123	Office Space	Office Space	Default
1800	General Office Space	322	Office Space	Office Space	Default
1802	General Office Space	1834	Office Space	Office Space	Default
1808	Courtroom	2090	Courtroom	Courtroom	Courtroom
1811	Jury Space	442	Conference Space	Conference Space	Courtroom
1820	Storage Space	201	Storage Space	Storage Space	Default
1824	Courtroom	2104	Courtroom	Courtroom	Courtroom
1830	Courtroom	2116	Courtroom	Courtroom	Courtroom
1831	Electrical Space	198	Mech/Elect.	Mech/Elect.	Default
1842	Courtroom	2114	Courtroom	Courtroom	Courtroom
1847	Jc	92	Storage Space	Storage Space	Default
1850	Courtroom	2532	Courtroom	Courtroom	Courtroom
1853	Public Restroom	524	Lockerroom/RR	Lockerroom/RR	Default
1855	Mech.	679	Mech/Elect.	Mech/Elect.	Shaft
1860	Jury Space	411	Conference Space	Conference Space	Courtroom
1876	Jury Space	409	Conference Space	Conference Space	Courtroom
1880	Jury Space	417	Conference Space	Conference Space	Courtroom
1884	Jury Space	469	Conference Space	Conference Space	Courtroom
1890	Corridor	1863	Corridor	Corridor	Corridor
1891	Corridor	1185	Corridor	Corridor	Corridor
1894	Corridor	6561	Corridor	Corridor	Corridor
1896	Corridor	1733	Corridor	Corridor	Corridor
1898	Corridor	2694	Corridor	Corridor	Corridor
1900	General Office Space	1842	Office Space	Office Space	Default
1919	Atrium	4773	Shaft	Shaft	Shaft
1920	Courtroom	2544	Courtroom	Courtroom	Courtroom
1921	Courtroom	2104	Courtroom	Courtroom	Courtroom
1922	Courtroom	2109	Courtroom	Courtroom	Courtroom
1923	Courtroom	2108	Courtroom	Courtroom	Courtroom
1924	Courtroom	2107	Courtroom	Courtroom	Courtroom
1928	Jury Space	474	Conference Space	Conference Space	Courtroom
1932	Jury Space	415	Conference Space	Conference Space	Courtroom
1936	Jury Space	409	Conference Space	Conference Space	Courtroom
1940	Jury Space	403	Conference Space	Conference Space	Courtroom
1944	Jury Space	419	Conference Space	Conference Space	Courtroom
1966	Electrical Space	198	Mech/Elect.	Mech/Elect.	Default
1969	General Office Space	2124	Office Space	Office Space	Default
1970	General Office Space	315	Office Space	Office Space	Default
1974	Storage Space	201	Storage Space	Storage Space	Default
1976	Storage Space	92	Storage Space	Storage Space	Default

1979	Public Restrooms	512	Lockerroom/RR	Lockerroom/RR	Default
1981	Security Office	287	Office Space	Office Space	Default
1982	Mechanical Space	359	Mech/Elect.	Mech/Elect.	Shaft
1990	Cr Meeting Space	401	Conference Space	Conference space	Default
1992	Cr Meeting Space	390	Conference Space	Conference space	Default
1997	Cr Meeting Space	366	Conference Space	Conference space	Default
2011	Cr Meeting Space	431	Conference Space	Conference space	Default
2013	Cr Meeting Space	430	Conference Space	Conference space	Default
2017	Cr Meeting Space	388	Conference Space	Conference space	Default
2021	Cr Meeting Space	398	Conference Space	Conference space	Default
2023	Cr Meeting Space	379	Conference Space	Conference space	Default
2024	Cr Meetingspace	406	Conference Space	Conference space	Default
2025	Cr Meeting Space	407	Conference Space	Conference space	Default
2037	Restroom	114	Lockerroom/RR	Lockerroom/RR	Default
2040	Restroom	123	Lockerroom/RR	Lockerroom/RR	Default
2055	Storage Space	80	Storage Space	Storage Space	Default
2057	Storage Space	64	Storage Space	Storage Space	Default
2060	Storage Space	70	Storage Space	Storage Space	Default
2062	Storage Space	73	Storage Space	Storage Space	Default
2063	Storage Space	69	Storage Space	Storage Space	Default
2065	Storage Space	91	Storage Space	Storage Space	Default
2068	Holding Cells	390	Holding Cell	Holding Cell	Default
2072	Holding Cells	79	Holding Cell	Holding Cell	Default
2076	Holding Cells	561	Holding Cell	Holding Cell	Default
2082	Holding Cell	557	Holding Cell	Holding Cell	Default
2087	Holding Cell	75	Holding Cell	Holding Cell	Default
2095	Storage Space	306	Storage Space	Storage Space	Default
2097	Mechanical Space	190	Mech/Elect.	Mech/Elect.	Shaft
2101	Mech.	196	Mech/Elect.	Mech/Elect.	Shaft
2104	Storage Space	309	Storage Space	Storage Space	Default
2121	Storage Space	365	Storage Space	Storage Space	Default
2124	General Office Space	643	Office Space	Office Space	Default
2129	General Office Space	1563	Office Space	Office Space	Default
2137	General Office Space	1841	Office Space	Office Space	Default
2144	General Office Space	299	Office Space	Office Space	Default
2147	General Office Space	2821	Office Space	Office Space	Default
2151	General Office Space	1503	Office Space	Office Space	Default
2158	Electrical Space	334	Mech/Elect.	Mech/Elect.	Default
2167	General Office Space	631	Office Space	Office Space	Default
2173	Conf. Room	811	Conference Space	Conference space	Default
2506	Corridor	4322	Corridor	Corridor	Corridor
2507	Corridor	4155	Corridor	Corridor	Corridor
2522	Holding Cells	438	Holding Cell	Holding Cell	Default
2175	Atrium	1605	Shaft	Shaft	Shaft
2176	Corridor	3828	Corridor	Corridor	Corridor
2180	Closet	188	Storage Space	Storage Space	Default
2181	Corridor	13874	Corridor	Corridor	Corridor
2182	Womens Rr	326	Lockerroom/RR	Lockerroom/RR	Default
2208	Restroom	56	Lockerroom/RR	Lockerroom/RR	Default
2209	Restroom	39	Lockerroom/RR	Lockerroom/RR	Default
2210	Restroom	178	Lockerroom/RR	Lockerroom/RR	Default

2212	Restroom	174	Lockerroom/RR	Lockerroom/RR	Default
2214	Restroom	135	Lockerroom/RR	Lockerroom/RR	Default
2216	Restroom	200	Lockerroom/RR	Lockerroom/RR	Default
2219	Restroom	88	Lockerroom/RR	Lockerroom/RR	Default
2220	Restroom	50	Lockerroom/RR	Lockerroom/RR	Default
2221	Restroom	53	Lockerroom/RR	Lockerroom/RR	Default
2222	Restroom	186	Lockerroom/RR	Lockerroom/RR	Default
2224	Restroom	191	Lockerroom/RR	Lockerroom/RR	Default
2226	Restroom	198	Lockerroom/RR	Lockerroom/RR	Default
2228	Restroom	188	Lockerroom/RR	Lockerroom/RR	Default
2230	Restroom	48	Lockerroom/RR	Lockerroom/RR	Default
2231	Restroom	50	Lockerroom/RR	Lockerroom/RR	Default
2232	Restroom	79	Lockerroom/RR	Lockerroom/RR	Default
2235	Restroom	225	Lockerroom/RR	Lockerroom/RR	Default
2236	Restroom	141	Lockerroom/RR	Lockerroom/RR	Default
2238	Restroom	173	Lockerroom/RR	Lockerroom/RR	Default
2240	Restroom	179	Lockerroom/RR	Lockerroom/RR	Default
2242	Restroom	37	Lockerroom/RR	Lockerroom/RR	Default
2243	Restroom	45	Lockerroom/RR	Lockerroom/RR	Default
2244	Restroom	193	Lockerroom/RR	Lockerroom/RR	Default
2246	Restroom	189	Lockerroom/RR	Lockerroom/RR	Default
2249	Restroom	120	Lockerroom/RR	Lockerroom/RR	Default
2250	Restroom	96	Lockerroom/RR	Lockerroom/RR	Default
2251	Restroom	53	Lockerroom/RR	Lockerroom/RR	Default
2252	Restroom	193	Lockerroom/RR	Lockerroom/RR	Default
2254	Restroom	96	Lockerroom/RR	Lockerroom/RR	Default
2255	Restroom	95	Lockerroom/RR	Lockerroom/RR	Default
2256	Restroom	190	Lockerroom/RR	Lockerroom/RR	Default
2258	Restroom	88	Lockerroom/RR	Lockerroom/RR	Default
2259	Restroom	92	Lockerroom/RR	Lockerroom/RR	Default
2261	Restroom	109	Lockerroom/RR	Lockerroom/RR	Default
2262	Restroom	64	Lockerroom/RR	Lockerroom/RR	Default
2263	Restroom	92	Lockerroom/RR	Lockerroom/RR	Default
2264	Restroom	200	Lockerroom/RR	Lockerroom/RR	Default
2266	Restroom	84	Lockerroom/RR	Lockerroom/RR	Default
2267	Restroom	193	Lockerroom/RR	Lockerroom/RR	Default
2269	Restroom	93	Lockerroom/RR	Lockerroom/RR	Default
2270	Restroom	100	Lockerroom/RR	Lockerroom/RR	Default
2271	Restroom	189	Lockerroom/RR	Lockerroom/RR	Default
2273	Restroom	93	Lockerroom/RR	Lockerroom/RR	Default
2276	Restroom	112	Lockerroom/RR	Lockerroom/RR	Default
2277	Restroom	196	Lockerroom/RR	Lockerroom/RR	Default
2279	Restroom	194	Lockerroom/RR	Lockerroom/RR	Default
2291	General Office Space	1439	Office Space	Office Space	Default
2295	General Office Space	1781	Office Space	Office Space	Default
2302	General Office Space	2440	Office Space	Office Space	Default
2306	General Office Space	1457	Office Space	Office Space	Default
2384	Hearing Rooms	3754	Conference Space	Conference Space	Default
2391	Hearing Rooms	5144	Conference Space	Conference Space	Default
2400	Hearing Rooms	4233	Conference Space	Conference Space	Default
2412	Hearing Rooms	5193	Conference Space	Conference Space	Default

2420	Hearing Rooms	3781	Conference Space	Conference Space	Default
2425	Conf. Room	1188	Conference Space	Conference space	Default
2435	Copy Room	207	Office Space	Office Space	Default
2436	Electrical Space	59	Mech/Elect.	Mech/Elect.	Default
2437	Storage Space	88	Storage Space	Storage Space	Default
2438	Mens Rr	340	Lockerroom/RR	Lockerroom/RR	Default
2441	Storage Space	75	Storage Space	Storage Space	Default
2443	Office Space	798	Office Space	Office Space	Default
2445	Electrical Space	229	Mech/Elect.	Mech/Elect.	Default
2448	Storage	152	Storage Space	Storage Space	Default
2451	Copy Room	108	Office Space	Office Space	Default
2453	Storage	151	Storage Space	Storage Space	Default
2457	Copy Room	205	Office Space	Office Space	Default
2458	Electrical Space	119	Mech/Elect.	Mech/Elect.	Default
2460	Storage Space	301	Storage Space	Storage Space	Default
2462	Storage Space	88	Storage Space	Storage Space	Default
2463	Electrical Space	75	Mech/Elect.	Mech/Elect.	Default
2464	Copy Room	195	Office Space	Office Space	Default
2477	Vestibule	936	Corridor	Corridor	Default
2524	General Office Space	13491	Office Space	Office Space	Default
2525	General Office Space	11512	Office Space	Office Space	Default