



Airflow Testing Report

Prepared for

Portland Public Schools

January 2022





9700 SW Capitol Hwy, Suite 110
Portland, OR 97219
ameresco.com

PROJECT OVERVIEW

As part of the continuing process to ensure a safe return to in-person learning, Portland Public Schools has contracted with Ameresco to test the airflow and ventilation of all educational and office spaces in each school. The data is reviewed by both Ameresco and PPS personnel to identify any potential shortcomings in the airflow from the HVAC systems. To accomplish this task, Ameresco has partnered with a local NEBB certified Test-Adjust-Balance (TAB) firm, Neudorfer Engineers, who will measure the airflow to each zone with calibrated measurement equipment in accordance with current testing standards and procedures. As part of this effort, HVAC professionals will review the operation of the HVAC equipment serving every educational and office space in each school.

Ameresco is pleased to have partnered with PPS over the last decade as the district's Energy Services Company (ESCO) on six energy efficiency construction projects, four service projects, and numerous energy audits. Our partnership has resulted in reducing over 3,000 tons of CO₂ and other GHG emissions and over \$1,000,000 in utility cost savings per year. Ameresco appreciates this opportunity to play a small role in the safe reopening of schools.

About Ameresco, Inc.

Founded in 2000, Ameresco, Inc. (NYSE:AMRC) is a leading cleantech integrator and renewable energy asset developer, owner and operator. Our comprehensive portfolio includes energy efficiency, infrastructure upgrades, asset sustainability and renewable energy solutions delivered to clients throughout North America and the United Kingdom. Ameresco's sustainability services in support of clients' pursuit of Net Zero include upgrades to a facility's energy infrastructure and the development, construction, and operation of distributed energy resources. Ameresco has successfully completed energy saving, environmentally responsible projects with Federal, state and local governments, healthcare and educational institutions, housing authorities, and commercial and industrial customers. With its corporate headquarters in Framingham, MA, Ameresco has more than 1,000 employees providing local expertise in the United States, Canada, and the United Kingdom. For more information, visit www.ameresco.com.

Explanation of ASHRAE Total Effective Air Changes per Hour (ACH_e) Calculation

ASHRAE has been updating their Building Readiness document to reflect the most current understanding in the engineering community for how to operate and maintain buildings during the pandemic. Their update on 4/27/2021 provided an explanation of the impact air filters and air cleaning devices have on the air in buildings. They provided the methodology, formulas, and an Excel-based tool for determining the equivalent outside air a space is receiving by having a mix of outside air, filtered recirculated air, and additional air filtration or cleaning devices in the room. Here is the explanation from ASHRAE:

Epidemic Conditions in Place



Equivalent Outdoor Air:

The equivalent outdoor air calculation indicates that the outdoor air can be calculated by using the combination of the actual outdoor air, impact of filtration or air cleaning technologies on recirculated air, and the impact of air cleaning technologies in the space.

This is using the principal of filters in series and the effectiveness at reducing particles. For items in series, the initial item would see the recirculated airflow to clean. The second item in the series would see the “cleaned” air from Item 1 and so the impact of Item 1 must be accounted for in Item 2.

As part of the airflow testing project that Portland Public Schools has partnered with Ameresco to complete, we are including the calculation of the Total Effective Air Changes per Hour (ACH_e) to show the impact of the air filtration that is active in nearly all spaces in the PPS schools. The formula for doing so is:

$$ACH_e = (ACH_{oa} + ACH_f) * E_z + ACH_{ir}$$

where:

- ACH_{oa} = air changes per hour of outside air = outside airflow in cubic feet per minute * 60 minutes per hour / room volume in cubic feet
- ACH_f = air changes per hour of clean air from filtered recirculated air with filters of the specified MERV rating as determined by ASHRAE
- E_z = Zone Air Distribution Effectiveness = how effective the HVAC system is at circulating and mixing the air to distribute the clean air throughout the room
- ACH_{ir} = the air changes per hour of clean air from portable air filters in the room = number of filters * CADR * 60 minutes per hour / room volume in cubic feet
 - CADR = Clear Air Delivery Rate = the CFM of clean air as specified by the manufacturer of the air filter

In order to include these calculations in the airflow testing reports, Ameresco and PPS have made the following assumptions as not all the variables are known:

1. PPS is in process of upgrading the air filters in their HVAC systems to MERV 13 and plans to be complete with that project for the start of the '21-'22 school year. In this report and for the sake of the ACH_e calculation, we are using the filters that are in place at the time of the measurements, so some of them are still MERV 8.
2. ASHRAE has guidelines for what should be used for the Zone Air Distribution Effectiveness (E_z) based on the HVAC system configuration, but they do not provide a value for every HVAC system and room configuration. For the majority of PPS rooms, an E_z of 0.8 – 1.0 would be most appropriate, so we have made the conservative assumption of using 0.8 for every space as that yields the lower ACH_e.
3. The CADR for a given air filter is from manufacturer ratings and is based on certain conditions (fan speed, particulate size, filter cleanliness, etc.) that change with operating conditions.



NEUDORFER ENGINEERS INC.

**TEST REPORT TYPE:
SURVEY REPORT**

Portland Public Schools Airflow Testing Grant HS

Job Number: 2021-0297

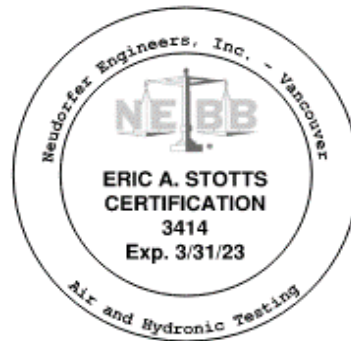
Project Completion Date: January 2022

Revision Date:

-

Revision Number:

-



SEATTLE

5516 1st Avenue South
Seattle, Washington 98108
Phone (206) 621-1810
Fax (206) 343-9820

PORTLAND

2501 SE Columbia Way, Suite 230
Vancouver, Washington 98661
Phone (503) 235-8924
Fax (503) 235-8925



Neudorfer Engineers, Inc.

Consulting Engineers Seattle, Washington - Portland, Oregon



www.NeudorferEngineers.com

**Portland Public Schools Airflow Testing
Grant HS**

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Neudorfer Engineers, Inc.

Consulting Engineers Seattle, Washington - Portland, Oregon



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REPORT TITLE

CERTIFIED TEST: SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Grant HS

NEI Job#: 2021-0297

Mechanical Engineer: NA

Architect: NA

HVAC Contractor: NA

TAB Firm: Neudorfer Engineers Inc
Test Engineer: Justin Davis



5516 1st Ave South
Seattle, Washington 98108
Phone (206) 621-1810
Fax (206) 343-9820



2501 SE Columbia Way, Suite 230
Vancouver, Washington 98661
Phone (503) 235-8924
Fax (503) 235-8925

CERTIFICATION

Portland Public Schools Airflow Testing

The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems. Any variances from design quantities, which exceed NEBB tolerances, are noted in the Test-Adjust-Balance Report Project Summary.

Significant / Noteworthy Remarks are noted on the General Remarks and General Field Notes pages. Other remarks are noted on individual test sheets.

Noted deficiencies are not the TAB firms responsibility to repair. Prior to issuance of this report, Deficiency Reports are forwarded to our contracted agent.

Warranty is limited to one year from date of this report. Within that time, any discrepancies, ambiguities, or omissions found in this report will be retested, adjusted, or balanced as needed. A written notification will be required.

Submitted and Certified by:

NEBB TAB Firm: **Neudorfer Engineers Inc**

Certification No: **3414**

Expiration Date: **March 31, 2023**

Certification Date: **March 31, 2021**

(Date completed) **Signed and Sealed by:**

NEBB Supervisor: **Mike Vawter P.E.**

NEBB Supervisor: **Eric Stotts**





Neudorfer Engineers, Inc.

Consulting Engineers Seattle, Washington - Portland, Oregon



www.NeudorferEngineers.com

TERMS AND ABBREVIATIONS

Project: **Portland Public Schools Airflow Testing**

AC or ACU Air Conditioner or Air Conditioning Unit

AH or AHU Air Handler or Air Handling Unit

ACH Air Changes per Hour

AVG Average

BHP Brake Horsepower

CAV Constant Air Volume

CBV Calibrated Balancing Valve
(Circuit Setter)

CC Cooling Coil

CD Ceiling Diffuser

CFM Cubic Feet per Minute

CH Chiller

CHWS Chilled Water Supply

CHWR Chilled Water Return

CP Circulating Pump

CR Ceiling Register

CRAC Computer Room Air Conditioner

CRU Computer Room Unit

CT Cooling Tower

CU Condenser Unit

CUH Cabinet Unit Heater

CWS Condenser Water Supply

CWR Condenser Water Return

DAT Discharge Air Temperature

DB Dry Bulb

DD Direct Drive

DDC Direct Digital Controls: EMS Control
System for the HVAC

Des. Design

Dia. Diameter

Disch. Discharge

EA Exhaust Air

EAT Entering Air Temperature

Economizer Controls and components that allow an
air handler to logically utilize outdoor air
for cooling as opposed to the use of
mechanical cooling.

EF Exhaust Fan

EG Exhaust Grille

EMCS Energy Management Control System

ERU Energy Recovery Unit

E.S.P. External Static Pressure

HRC Heat Recovery Coil

EWT Entering Water Temperature

FCU Fan Coil Unit

FD Fire Damper

FSD Fire Smoke Damper

FLA Full Load Amperage: Maximum
amperage a motor can draw.

Flow Hood Instrument that captures air and
converts the reading to CFM.

FHT Fume Hood Test

FPB Fan Powered Box

FPM Feet per Minute

FR Field Report

FT Foot, Feet

FTU Fan Terminal Unit

GPM Gallons per Minute

HC Heating Coil

TDH Pressure Difference across the entering
and leaving side of a pump.

HEPA High Efficiency Particulate Absorbing

HP Horsepower

HVAC Heating Ventilation and Air Conditioning

HWS Heating Water Supply

HWR Heating Water Return

HX Heat Exchanger

HZ Hertz, cycle per second

in. inches

in.w.g. inches of water gauge

Kfactor Correction factor to the free area need to
calculate CFM.

KW Kilowatts

LAT Leaving Air Temperature

LBWG Low Wall Grille

LWR Low Wall Register

LWT Leaving Water Temperature

MAU Make-up Air Handling Unit

MBH 1,000 BTUH

N/A Not Applicable

OSA Outside Air

OBD Opposed Blade Damper

ΔP Pressure Drop.

PH Phase

PSI Pounds per Square Inch

RA Return Air

RAT Return Air Temperature

RF Return Fan

RH Relative Humidity

RHC Reheat Coil

RPM Revolutions per Minute

RTU Roof Top Unit

SA Supply Air

SAT Supply Air Temperature

S.F. Service Factor

SF Supply Fan

SFD Smoke/Fire Damper

SP Static Pressure

sq.ft. square feet

Suct. Suction

SWG Sidewall Grille

SWR Sidewall Register

TAB Test; Adjust; and Balance

TSP Total Static Pressure: Difference
between the entering and leaving
static pressure of a fan.

UH Unit Heater

VAV Variable Air Volume; box that
contains a motorized damper that
modulates airflow.

VD Volume Damper

VFD Variable Frequency Drive

Velgrid Instrument that reads used to read
velocity in feet per minute.

VVT Variable Volume Terminal

WC Water Column

W.G. Water Gauge

WB Wet Bulb

INSTRUMENT CALIBRATIONS

Portland Public Schools Airflow Testing

Grant HS

Instrument Type	Air Data Meter with Flowhood	Instrument Serial #	M97410
Instrument Manufacturer	Shortridge	Calibration Date	10/4/2021
Instrument Model Number	ADM 860	Calibration Due	10/4/2022
Instrument Type	Differential Pressure Water Meter	Instrument Serial #	W12178
Instrument Manufacturer	Shortridge	Calibration Date	10/4/2021
Instrument Model Number	HDM-250	Calibration Due	10/4/2022
Instrument Type	Psychrometer	Instrument Serial #	181128924
Instrument Manufacturer	Extech	Calibration Date	10/1/2021
Instrument Model Number	RH390	Calibration Due	10/1/2022
Instrument Type	Tachometer	Instrument Serial #	B185B5022P
Instrument Manufacturer	Nidec	Calibration Date	10/1/2021
Instrument Model Number	MT-200	Calibration Due	10/1/2022
Instrument Type	Amp Probe	Instrument Serial #	33380179WS
Instrument Manufacturer	Fluke	Calibration Date	10/1/2021
Instrument Model Number	323 Clamp Meter	Calibration Due	10/1/2022
Instrument Type	Digital Thermometer	Instrument Serial #	45400509WS
Instrument Manufacturer	Fluke	Calibration Date	10/1/2021
Instrument Model Number	52 II	Calibration Due	10/1/2022
Instrument Type	Manometer	Instrument Serial #	M97410
Instrument Manufacturer	Shortridge	Calibration Date	10/4/2021
Instrument Model Number	ADM 860	Calibration Due	10/4/2022
Instrument Type	Thermal Anemometer	Instrument Serial #	AVM440808002
Instrument Manufacturer	Alnor Instruments	Calibration Date	9/22/2021
Instrument Model Number	AVM 440	Calibration Due	9/22/2022
Instrument Type	Ultrasonic Flow Meter	Instrument Serial #	N1F1823T
Instrument Manufacturer	Fuji	Calibration Date	9/20/2021
Instrument Model Number	Portaflow-C	Calibration Due	9/20/2022



PROJECT	Portland Public Schools Airflow Testing
LOCATION	Grant HS; 2245 NE 36th Ave, Portland, OR 97212

REPORT SUMMARY

This project has been surveyed per plans and specifications using the National Environmental Balancing Bureau (NEBB) standards and procedures.

The scope of work for this project was to assess the current airflows for each classroom, office, and special purpose space. Air changes per hour were calculated along with the % of OSA for the spaces and any deficiencies found for each piece of equipment has been noted in the following report.

All ventilation equipment was commanded to run by the BMS system. Ventilation units were measured with a flowhood on the supply outlets. Outside air was recorded with a flowhood on the OSA louvre where accessible. AK factors were calculated from flowhood readings. The remaining OSA values were recorded with a velgrid. AHU supply air was recorded by a summation of the outlets as recorded by flowhood or velgrid when appropriate. Outside air was recorded with a velgrid or airfoil and calculated by the free area method.

The measured airflows in this report represent the performance of the equipment at the time of measurement, which vary over time based on operating conditions. There are factors outside the control of Neudorfer that impact airflow, and variance in those factors is expected and normal. One significant factor is the MERV rating and condition of the air filters on the equipment. During the summer of 2021, PPS began upgrading the filters on all their fan systems to MERV 13. Those upgraded filters are more effective at capturing particles but also impact the amount of airflow from the equipment. These filter changes were occurring while the airflow measurement project was happening, so some schools had the new filters, and some had the old filters at the time of measurement. On the data page included this report, there is a line stating whether or not the upgraded filters were in place at the time of measurement.



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Grant HS; 2245 NE 36th Ave, Portland, OR 97212
Filter Status: Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
	Served By	Equipment Type	Room Length	Room Width	Room Area	Room Height	Room Volume	Total CFM Supply	OA CFM Supply	OA %	Air Changes per Hour (supply)	Air Changes per Hour (OA)	# of Portable Filters	Total Effective Air Changes per Hour (ACH_e) with Portable Filter	Total Effective Air Changes per Hour (ACH_e) without Portable Filter	
Lower Level																
Rm. G001	AHU-11/FTU-11-01	AHU/TU	25.8	18.0	464	12	5,573	1000	290	29%	10.8	3.1	1	18.2	8.0	
Rm. G002	AHU-11/Misc FTU	AHU/TU	-	-	2,240	12	26,880	3150	914	29%	7.0	2.0	1	7.3	5.2	
Rm. G003	AHU-11/FTU-11-04	AHU/TU	41.3	40.1	1,656	12	19,874	1745	506	29%	5.3	1.5	1	6.8	3.9	
Rm. 020	AHU-03/TU-03-05	AHU/TU	23.0	10.3	237	10.5	2,487	380	129	34%	9.2	3.1	2	52.7	6.8	
Rm. 021	AHU-03/TU-03-06	AHU/TU	30.9	26.1	806	10.2	8,226	990	337	34%	7.2	2.5	1	12.3	5.4	
Rm. 022	AHU-03/TU-03-05	AHU/TU	31.0	26.9	834	10.2	8,506	1,065	362	34%	7.5	2.6	1	12.3	5.6	
Rm. 023	AHU-03/TU-03-04	AHU/TU	28.7	24.8	712	10.3	7,331	1,020	347	34%	8.3	2.8	1	14.0	6.2	
Rm. 024	AHU-03/TU-03-03	AHU/TU	30.3	25.5	773	10.2	7,881	980	333	34%	7.5	2.5	1	12.8	5.6	
Office 026	AHU-03/TU-03-08	AHU/TU	25.0	25.8	645	9.1	5,870	595	202	34%	6.1	2.1	1	14.3	4.5	
Rm. 025	AHU-03/TU-03-02	AHU/TU	29.3	24.7	724	10.2	7,382	1,305	444	34%	10.6	3.6	1	15.6	7.9	
Rm. 027	AHU-03/TU-03-01	AHU/TU	28.3	24.1	682	10.2	6,957	1,125	383	34%	9.7	3.3	1	15.4	7.2	
Rm. 029	AHU-02/TU-02-01	AHU/TU	34.3	25.2	864	9.9	8,557	1,310	432	33%	9.2	3.0	1	13.5	6.9	
Rm. 031	AHU-02/TU-02-02	AHU/TU	31.4	25.2	791	9.9	7,834	1,250	413	33%	9.6	3.2	1	14.4	7.1	
Rm. 033	AHU-02/TU-02-03	AHU/TU	31.6	25.2	796	9.9	7,884	1,095	361	33%	8.3	2.8	1	13.4	6.2	
Rm. 035	AHU-02/TU-02-04	AHU/TU	31.5	24.3	765	9.9	7,578	1,095	361	33%	8.7	2.9	1	14.0	6.5	
Rm. 037	AHU-02/TU-02-05	AHU/TU	32.2	25.2	811	9.9	8,033	1,125	371	33%	8.4	2.8	1	13.4	6.3	
Rm. 042	AHU-02/TU-02-52	AHU/TU	39.6	20.8	824	10.9	8,978	790	261	33%	5.3	1.7	1	10.3	3.9	
LL Common South	AHU-01/AHU-02	AHU/TU	83.0	51.3	4,258	12.5	53,224	5,430	1,684	31%	6.1	1.9	1	5.6	4.6	
LL Common North	AHU-01/AHU-02	AHU/TU	149.8	34.5	5,168	12.5	64,601	10,445	3,029	29%	9.7	2.8	1	8.1	7.2	
Office 041C	AHU-01/TU-01-52	AHU/TU	17.3	11.7	202	9.9	2,004	160	46	29%	4.8	1.4	1	32.0	3.6	
Performance 44	AHU-05/FTU-05-03	AHU/TU	48.8	30.5	1,488	11.2	16,670	1,605	658	41%	5.8	2.4	1	7.8	4.3	
Rm. 044A	AHU-01/TU-01-52	AHU/TU	20.4	12.4	253	7.6	1,922	415	120	29%	13.0	3.8	0	N/A	9.6	
Rm. 044C	AHU-02/TU-02-55	AHU/TU	20.4	12.4	253	7.6	1,922	390	129	33%	12.2	4.0	0	N/A	9.1	
Performance 45	AHU-05/Misc FTU	AHU/TU	62.0	31.0	1,922	11.5	22,103	3,885	1,593	41%	10.5	4.3	1	10.5	7.9	

Date: 1/20/2022

Readings By: Justin Davis



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Grant HS; 2245 NE 36th Ave, Portland, OR 97212
Filter Status: Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
	Served By	Equipment Type	Room Length	Room Width	Room Area	Room Height	Room Volume	Total CFM Supply	OA CFM Supply	OA %	Air Changes per Hour (supply)	Air Changes per Hour (OA)	# of Portable Filters	Total Effective Air Changes per Hour (ACH_e) with Portable Filter	Total Effective Air Changes per Hour (ACH_e) without Portable Filter	
Lower Level																
Kitchen 052	AHU-01/TU-01-09	AHU/TU	34.0	24.6	836	8.0	6,691	385	112	29%	3.5	1.0	1	11.1	2.6	
Flex Rm. 82	AHU-04/TU-04-12	AHU/TU	22.6	10.2	231	10.6	2,444	365	117	32%	9.0	2.9	1	30.0	6.7	
Rm. 081	AHU-04/TU-04-12	AHU/TU	30.2	26.5	800	10.2	8,163	1,360	435	32%	10.0	3.2	1	14.4	7.4	
Rm. 080	AHU-04/TU-04-11	AHU/TU	30.4	26.9	818	10.2	8,341	1,515	485	32%	10.9	3.5	1	15.0	8.1	
Rm. 079	AHU-04/TU-04-10	AHU/TU	29.3	25.0	733	10.2	7,472	1,300	416	32%	10.4	3.3	1	15.4	7.8	
Rm. 078	AHU-04/TU-04-09	AHU/TU	30.9	24.9	769	10.2	7,848	1,270	406	32%	9.7	3.1	1	14.5	7.2	
Rm. 077	AHU-04/TU-04-06	AHU/TU	45.9	25.0	1,148	10.2	11,705	1,115	357	32%	5.7	1.8	1	9.1	4.3	
Rm. 075	AHU-04/TU-04-05	AHU/TU	26.5	13.2	350	10.2	3,568	390	125	32%	6.6	2.1	1	20.9	4.9	
Rm. 073	AHU-04/TU-04-04	AHU/TU	44.1	26.4	1,164	10.3	11,992	1,160	371	32%	5.8	1.9	1	9.1	4.3	
Rm. 072	AHU-04/TU-04-03	AHU/TU	44.1	26.9	1,186	10.3	12,219	1,435	459	32%	7.0	2.3	1	9.9	5.3	
Rm. 071	AHU-04/TU-04-02	AHU/TU	43.9	26.3	1,155	10.3	11,892	1,425	456	32%	7.2	2.3	1	10.2	5.4	
Rm. 070	AHU-04/TU-04-01	AHU/TU	45.0	26.9	1,211	10.3	12,468	1,525	488	32%	7.3	2.3	1	10.0	5.5	
First Floor																
Upper Gym	AHU-09	AHU/TU	96.4	58.1	5,601	29.6	165,785	8,880	2,555	29%	3.2	0.9	2	3.1	2.4	Shares common space with lower gym.
Vending	AHU-11/TU-11-02	AHU/TU	28.9	11.7	338	9.6	3,246	390	113	29%	7.2	2.1	0	N/A	5.4	
G102	AHU-11/FTU-11-06	AHU/TU	52.5	36.3	1,906	21.3	40,592	2,025	587	29%	3.0	0.9	2	5.0	2.2	
Class Rm. 127	AHU-03/TU-3-10	AHU/TU	28.3	24.0	679	12.3	8,354	1,280	435	34%	9.2	3.1	1	13.7	6.9	
Class Rm. 125	AHU-03/TU-3-09	AHU/TU	29.6	25.3	749	12.3	9,211	1,270	432	34%	8.3	2.8	1	12.4	6.2	
Office Rm. 120	AHU-03/Misc TU	AHU/TU	49.5	23.5	1,163	11.0	12,795	605	206	34%	2.8	1.0	1	6.6	2.1	
Office Rm. 120A	AHU-03/TU-3-19	AHU/TU	14.3	8.9	127	12.3	1,565	350	119	34%	13.4	4.6	1	46.4	10.0	
Office Rm. 120B	AHU-03/TU-3-19	AHU/TU	14.3	10.2	146	12.3	1,794	420	143	34%	14.0	4.8	1	42.3	10.5	
Office Rm. 120C	AHU-03/TU-3-19	AHU/TU	14.3	9.7	139	12.3	1,706	385	131	34%	13.5	4.6	1	43.5	10.1	
Office Rm. 120D	AHU-03/TU-3-17	AHU/TU	14.3	9.6	137	12.3	1,689	400	136	34%	14.2	4.8	1	44.4	10.6	
Office Rm. 120E	AHU-03/TU-3-18	AHU/TU	14.3	10.1	144	12.3	1,776	400	136	34%	13.5	4.6	1	42.2	10.1	

Date: 1/20/2022

Readings By: Justin Davis



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First Floor																
Office Rm. 120F	AHU-03/TU-3-16	AHU/TU	14.3	8.1	116	12.3	1,425	405	138	34%	17.1	5.8	1	52.7	12.7	
Office Rm. 120G	AHU-03/TU-3-15	AHU/TU	14.3	12.4	177	12.3	2,181	205	70	34%	5.6	1.9	1	30.3	4.2	
Office Rm. 120H	AHU-03/TU-3-16	AHU/TU	14.3	11.1	159	12.3	1,952	210	71	34%	6.5	2.2	1	34.0	4.8	
Office Rm. 120J	AHU-03/TU-3-20	AHU/TU	13.9	11.6	161	12.3	1,983	390	133	34%	11.8	4.0	1	37.6	8.8	
Office Rm. 120L	AHU-03/TU-3-20	AHU/TU	9.0	8.8	79	9.4	744	355	121	34%	28.6	9.7	1	97.9	21.4	
Office Rm. 120K	AHU-03/TU-3-20	AHU/VAV	13.5	8.8	119	9.4	1,117	415	141	34%	22.3	7.6	1	67.7	16.7	
Office Rm. 120N	AHU-03/TU-3-13	AHU/TU	23.1	13.0	300	10.0	3,003	805	274	34%	16.1	5.5	1	31.0	12.0	
Office Rm. 120P	AHU-03/TU-3-18	AHU/TU	35.3	8.6	304	12.5	3,795	475	162	34%	7.5	2.6	1	20.6	5.6	
Library	AHU-02/Misc TU	AHU/TU	172.9	37.2	6,432	10.6	68,178	11,795	3,892	33%	10.4	3.4	1	8.6	7.7	
Library A	AHU-02/TU-2-19A	AHU/TU	26.9	12.9	347	9.3	3,227	415	137	33%	7.7	2.5	1	23.4	5.8	
Library Conf. 128	AHU-03/TU-3-11	AHU/TU	28.0	26.0	728	11.0	8,008	1,270	432	34%	9.5	3.2	1	14.2	7.1	
Rm. 131A	AHU-02/AHU-03	AHU/TU	26.2	12.3	322	19.6	6,316	975	325	33%	9.3	3.1	0	N/A	6.9	
Rm. 132	AHU-02/Misc TU	AHU/TU	-	-	1,375	9.3	12,788	610	201	33%	2.9	0.9	0	N/A	2.1	
Rm. 132A	AHU-02/TU-2-19C	AHU/TU	13.3	9.4	125	9.3	1,163	210	69	33%	10.8	3.6	0	N/A	8.1	
Faculty	AHU-02/TU-2-26A	AHU/TU	-	-	1,446	9.4	13,592	395	130	33%	1.7	0.6	1	5.5	1.3	
Office Rm 101	AHU-02/Misc TU	AHU/TU	-	-	638	12.1	7,720	815	269	33%	6.3	2.1	1	12.1	4.7	
Office Rm. 101A	AHU-02/TU-2-34	AHU/TU	11.2	8.4	94	9.3	875	160	53	33%	11.0	3.6	1	73.3	8.2	
Office Rm. 101B	AHU-02/TU-2-34	AHU/TU	9.9	8.4	83	9.3	773	160	53	33%	12.4	4.1	1	83.0	9.3	
Office Rm. 101D	AHU-02/TU-2-32	AHU/TU	16.6	11.6	193	12.2	2,349	455	150	33%	11.6	3.8	1	32.9	8.7	
Office Rm. 101F	AHU-02/TU-2-31	AHU/TU	18.1	16.2	293	12.2	3,577	395	130	33%	6.6	2.2	1	20.9	4.9	
Office Rm. 101G	AHU-02/TU-2-29	AHU/TU	16.6	10.6	176	12.1	2,129	450	149	33%	12.7	4.2	1	36.2	9.5	
Office Rm. 101H	AHU-02/TU-2-29	AHU/TU	14.2	10.7	152	12.1	1,838	450	149	33%	14.7	4.8	1	42.0	11.0	
Office Rm. 101J	AHU-02/TU-2-27	AHU/TU	14.4	10.7	154	12.1	1,864	445	147	33%	14.3	4.7	1	41.3	10.7	
Office Rm. 101K	AHU-02/TU-2-26B	AHU/TU	14.8	10.9	161	12.1	1,952	445	147	33%	13.7	4.5	1	39.4	10.2	

Date: 1/20/2022

Readings By: Justin Davis



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Grant HS; 2245 NE 36th Ave, Portland, OR 97212
Filter Status: Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
	Served By	Equipment Type	Room Length	Room Width	Room Area	Room Height	Room Volume	Total CFM Supply	OA CFM Supply	OA %	Air Changes per Hour (supply)	Air Changes per Hour (OA)	# of Portable Filters	Total Effective Air Changes per Hour (ACH_e) with Portable Filter	Total Effective Air Changes per Hour (ACH_e) without Portable Filter	
First Floor																
Office Rm. 101N	AHU-02/TU-2-25	AHU/TU	13.7	10.9	149	12.1	1,807	455	150	33%	15.1	5.0	1	42.8	11.3	
Office Rm. 101P	AHU-02/TU-2-24	AHU/TU	12.6	11.0	139	12.1	1,677	450	149	33%	16.1	5.3	1	46.0	12.0	
Rm. 106	AHU-02/TU-2-20B	AHU/TU	31.6	14.7	465	9.4	4,366	205	68	33%	2.8	0.9	0	N/A	2.1	
Rm. 104	AHU-02/TU-2-21	AHU/TU	41.5	31.5	1,307	9.3	12,157	590	195	33%	2.9	1.0	1	6.9	2.2	
Rm. 102	AHU-02/TU-2-22	AHU/TU	32.0	15.8	506	9.4	4,753	410	135	33%	5.2	1.7	1	15.9	3.9	
Rm.199	AHU-01/TU-1-28	AHU/TU	28.7	15.6	448	12.0	5,373	510	148	29%	5.7	1.7	1	14.8	4.2	
Rm. 198	AHU-01/TU-1-26	AHU/TU	32.4	17.0	551	9.4	5,178	495	144	29%	5.7	1.7	1	15.3	4.3	
Rm. 197	AHU-01/TU-1-27	AHU/TU	-	-	292	11.3	3,300	510	148	29%	9.3	2.7	1	24.2	6.9	
Rm. 196	AHU-01/TU-1-25	AHU/TU	32.3	16.9	546	9.3	5,077	480	139	29%	5.7	1.6	1	15.4	4.2	
Rm. 195	AHU-01/Misc TU	AHU/TU	-	-	1,280	12.0	15,360	1,845	535	29%	7.2	2.1	1	9.1	5.4	
Rm 195A	AHU-01/TU-1-23	AHU/TU	12.7	9.5	121	9.3	1,122	185	54	29%	9.9	2.9	1	58.1	7.3	
Rm. 193	AHU-01/TU-1-22	AHU/TU	-	-	449	11.3	5,074	590	171	29%	7.0	2.0	1	16.4	5.2	
Rm. 191	AHU-01/TU-1-20	AHU/TU	48.0	25.8	1,238	12.0	14,861	1,550	450	29%	6.3	1.8	1	8.5	4.6	
Rm. 191A	AHU-01/TU-1-21A	AHU/TU	12.7	11.0	140	9.4	1,313	145	42	29%	6.6	1.9	1	48.3	4.9	
Rm. 191B	AHU-01/TU-1-21B	AHU/TU	13.3	8.3	110	12.2	1,347	255	74	29%	11.4	3.3	1	50.8	8.4	
North Common	AHU-01/AHU-04	AHU/TU	53.9	22.2	1,197	19.6	23,453	825	239	29%	2.1	0.6	1	4.0	1.6	
West Common	AHU-01/AHU-04	AHU/TU	150.0	43.0	6,450	12.0	77,400	10,575	3,150	30%	8.2	2.4	1	6.8	6.1	
Rm. 151A	AHU-01/TU-1-18	AHU/TU	26.0	13.5	351	9.3	3,264	400	116	29%	7.4	2.1	1	22.9	5.5	
Rm. 178	AHU-04/TU-4-23	AHU/TU	31.6	25.1	793	11.7	9,280	1,325	424	32%	8.6	2.7	1	12.5	6.4	
Rm. 179	AHU-04/TU-4-24	AHU/TU	29.1	24.9	725	11.9	8,623	920	294	32%	6.4	2.0	1	11.4	4.8	
Rm. 180	AHU-04/TU-4-25	AHU/TU	30.2	27.3	824	11.9	9,811	1,500	480	32%	9.2	2.9	1	12.6	6.8	
Rm. 181	AHU-04/TU-4-26	AHU/TU	30.3	25.7	779	11.9	9,267	1,000	320	32%	6.5	2.1	1	11.0	4.8	
Rm. 182	AHU-04/TU-4-26	AHU/TU	22.0	10.0	220	12.4	2,728	390	125	32%	8.6	2.7	1	27.3	6.4	
Rm. 177	AHU-04/TU-4-20	AHU/TU	45.7	24.9	1,138	12.0	13,655	1,215	389	32%	5.3	1.7	1	8.2	4.0	

Date: 1/20/2022

Readings By: Justin Davis



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Grant HS; 2245 NE 36th Ave, Portland, OR 97212
Filter Status: Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
	Served By	Equipment Type	Room Length	Room Width	Room Area	Room Height	Room Volume	Total CFM Supply	OA CFM Supply	OA %	Air Changes per Hour (supply)	Air Changes per Hour (OA)	# of Portable Filters	Total Effective Air Changes per Hour (ACH_e) with Portable Filter	Total Effective Air Changes per Hour (ACH_e) without Portable Filter	
First Floor																
Rm. 175	AHU-04/TU-4-18	AHU/TU	26.3	13.3	350	11.9	4,163	405	130	32%	5.8	1.9	1	18.0	4.4	
Rm. 174	AHU-04/TU-4-19	AHU/TU	-	-	281	9.3	2,613	400	128	32%	9.2	2.9	1	28.7	6.8	
Rm. 173	AHU-04/TU-4-17	AHU/TU	42.2	28.0	1,182	11.7	13,825	1,155	370	32%	5.0	1.6	1	7.9	3.7	
Rm. 172	AHU-04/TU-4-16	AHU/TU	44.7	28.0	1,252	11.7	14,644	1,550	496	32%	6.4	2.0	1	8.6	4.7	
Rm. 171	AHU-04/TU-4-15	AHU/TU	43.9	27.8	1,220	11.7	14,279	1,295	414	32%	5.4	1.7	1	8.0	4.1	
Rm. 170	AHU-04/TU-4-14	AHU/TU	45.2	26.0	1,175	11.7	13,750	1,760	563	32%	7.7	2.5	1	9.9	5.7	
Auditorium	AHU-06	AHU/TU	82.1	83.0	6,814	39.0	265,758	21,455	6,866	32%	4.8	1.6	2	4.0	3.6	
Stage	AHU-05/FTU-5-06	AHU/TU	50.9	30.6	1,558	44.8	69,778	2,750	1,128	41%	2.4	1.0	1	2.6	1.8	
Shop Rm. 145	AHU-05/Misc FTU	AHU/TU	79.0	31.3	2,473	13.6	33,629	3,535	1,449	41%	6.3	2.6	1	6.4	4.7	
Second Floor																
Rm. 227	AHU-03/TU-3-22	AHU/TU	28.5	24.1	687	12.2	8,380	1,535	522	34%	11.0	3.7	1	15.0	8.2	
Rm. 225	AHU-03/TU-3-23	AHU/TU	29.6	24.6	728	12.2	8,884	1,360	462	34%	9.2	3.1	1	13.3	6.9	
Rm. 224	AHU-03/TU-3-24	AHU/TU	31.0	25.0	775	12.2	9,455	950	323	34%	6.0	2.0	1	10.5	4.5	
Rm. 223	AHU-03/TU-3-25	AHU/TU	28.1	24.6	691	12.2	8,433	1,380	469	34%	9.8	3.3	1	14.1	7.3	
Rm. 222	AHU-03/TU-3-26	AHU/TU	30.5	26.5	808	12.2	9,861	1,240	422	34%	7.5	2.6	1	11.4	5.6	
Rm. 221	AHU-03/TU-3-27	AHU/TU	30.0	26.0	780	12.2	9,516	1,570	534	34%	9.9	3.4	1	13.4	7.4	
Rm. 220	AHU-03/TU-3-26	AHU/TU	22.2	10.2	226	12.2	2,763	455	155	34%	9.9	3.4	1	28.0	7.4	
Rm. 210	AHU-02/Misc FTU	AHU/TU	-	-	1,166	9.8	11,427	805	266	33%	4.2	1.4	1	8.1	3.2	
Rm. 211	AHU-02/TU-2-47	AHU/TU	26.2	26.9	705	12.2	8,598	1,395	460	33%	9.7	3.2	1	13.9	7.3	
Rm. 209	AHU-02/TU-2-48	AHU/TU	29.0	26.9	780	12.2	9,517	1,460	482	33%	9.2	3.0	1	12.9	6.9	
Rm. 208	AHU-02/TU-2-42	AHU/TU	31.0	15.8	490	11.5	5,633	530	175	33%	5.6	1.9	1	14.3	4.2	
Rm.207	AHU-02/TU-2-49	AHU/TU	29.0	26.9	780	12.2	9,517	1,465	483	33%	9.2	3.0	1	12.9	6.9	
Rm. 206	AHU-02/TU-2-43	AHU/TU	31.0	16.6	515	11.5	5,918	525	173	33%	5.3	1.8	1	13.6	4.0	
Rm. 205	AHU-02/TU-2-50	AHU/TU	29.2	26.9	785	12.2	9,583	1,400	462	33%	8.8	2.9	1	12.5	6.5	

Date: 1/20/2022

Readings By: Justin Davis



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Grant HS; 2245 NE 36th Ave, Portland, OR 97212
Filter Status: Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
	Served By	Equipment Type	Room Length	Room Width	Room Area	Room Height	Room Volume	Total CFM Supply	OA CFM Supply	OA %	Air Changes per Hour (supply)	Air Changes per Hour (OA)	# of Portable Filters	Total Effective Air Changes per Hour (ACH_e) with Portable Filter	Total Effective Air Changes per Hour (ACH_e) without Portable Filter	
Second Floor																
Rm. 203	AHU-02/TU-2-51	AHU/TU	29.0	26.8	777	12.2	9,482	1,420	469	33%	9.0	3.0	1	12.7	6.7	
Rm. 202	AHU-02/TU-2-45	AHU/TU	31.6	19.5	616	11.5	7,086	595	196	33%	5.0	1.7	1	11.8	3.8	
Rm. 201	AHU-01/TU-1-50	AHU/TU	55.0	26.9	1,480	12.9	19,086	1,580	458	29%	5.0	1.4	1	6.7	3.7	
Rm. 299	AHU-01/TU-1-49	AHU/TU	29.0	26.8	777	12.2	9,482	1,330	386	29%	8.4	2.4	1	12.3	6.3	
Rm. 298	AHU-01/TU-1-43	AHU/TU	30.9	19.3	596	11.5	6,858	605	175	29%	5.3	1.5	1	12.2	3.9	
Rm. 297	AHU-01/TU-1-48	AHU/TU	29.0	26.7	774	12.2	9,446	1,200	348	29%	7.6	2.2	1	11.7	5.7	
Rm. 295	AHU-01/TU-1-47	AHU/TU	29.0	26.7	774	12.2	9,446	1,380	400	29%	8.8	2.5	1	12.5	6.5	
Rm. 294	AHU-01/TU-1-41	AHU/TU	31.0	17.0	527	11.5	6,061	500	145	29%	5.0	1.4	1	13.1	3.7	
Rm. 293	AHU-01/TU-1-46	AHU/TU	29.0	26.6	771	12.2	9,411	1,325	384	29%	8.4	2.4	1	12.3	6.3	
Rm. 292	AHU-01/TU-1-40	AHU/TU	31.0	17.3	536	11.5	6,167	530	154	29%	5.2	1.5	1	13.1	3.8	
Rm. 290	AHU-01/Misc TU	AHU/TU	-	-	1,123	9.8	11,005	985	286	29%	5.4	1.6	1	9.2	4.0	
Rm. 291	AHU-01/TU-1-45	AHU/TU	27.0	26.6	718	12.2	8,762	1,310	380	29%	9.0	2.6	1	13.2	6.7	
Rm. 281	AHU-04/Misc TU	AHU/TU	45.6	38.2	1,742	15.0	26,129	2,405	770	32%	5.5	1.8	2	8.5	4.1	
Rm. 281A	AHU-04/Misc TU	AHU/TU	13.8	8.0	110	12.6	1,391	305	98	32%	13.2	4.2	0	N/A	9.8	
Rm. 281B	AHU-04/Misc TU	AHU/TU	16.5	13.6	224	12.6	2,827	590	189	32%	12.5	4.0	1	29.5	9.3	
Rm. 281C	AHU-04/Misc TU	AHU/TU	13.8	8.0	110	12.6	1,391	285	91	32%	12.3	3.9	0	N/A	9.2	
Rm. 279	AHU-04/TU-4-37	AHU/TU	26.3	13.8	363	12.3	4,464	400	128	32%	5.4	1.7	1	16.8	4.0	
Rm. 277	AHU-04/TU-4-35	AHU/TU	46.0	25.0	1,150	12.2	14,030	1,450	464	32%	6.2	2.0	1	8.7	4.6	
Rm. 275	AHU-04/TU-4-33	AHU/TU	26.5	13.9	368	11.8	4,347	390	125	32%	5.4	1.7	1	17.1	4.0	
Rm. 273	AHU-04/TU-4-32	AHU/TU	42.5	24.8	1,054	12.0	12,648	1,495	478	32%	7.1	2.3	1	9.8	5.3	
Rm. 272	AHU-04/TU-4-31	AHU/TU	42.3	24.8	1,049	12.0	12,588	1,635	523	32%	7.8	2.5	1	10.3	5.8	
Rm. 271	AHU-04/TU-4-30	AHU/TU	39.0	26.0	1,014	12.0	12,168	1,500	480	32%	7.4	2.4	1	10.2	5.5	
Rm. 270	AHU-04/TU-4-29	AHU/TU	40.6	26.0	1,056	12.0	12,667	1,985	635	32%	9.4	3.0	1	11.5	7.0	
Rm. 267	AHU-01/TU-1-30	AHU/TU	28.7	27.2	781	12.0	9,368	1,105	320	29%	7.1	2.1	1	11.3	5.3	

Date: 1/20/2022

Readings By: Justin Davis



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Grant HS; 2245 NE 36th Ave, Portland, OR 97212
Filter Status: Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
	Served By	Equipment Type	Room Length	Room Width	Room Area	Room Height	Room Volume	Total CFM Supply	OA CFM Supply	OA %	Air Changes per Hour (supply)	Air Changes per Hour (OA)	# of Portable Filters	Total Effective Air Changes per Hour (ACH_e) with Portable Filter	Total Effective Air Changes per Hour (ACH_e) without Portable Filter	
Second Floor																
Rm. 265	AHU-01/TU-1-31	AHU/TU	28.6	26.2	749	12.0	8,988	1,100	319	29%	7.3	2.1	1	11.8	5.5	
Rm. 263	AHU-01/TU-1-32	AHU/TU	27.8	27.2	756	12.0	9,074	1,105	320	29%	7.3	2.1	1	11.7	5.4	
Rm. 259	AHU-01/TU-1-33	AHU/TU	28.6	27.3	781	12.0	9,369	1,150	334	29%	7.4	2.1	1	11.6	5.5	
Rm. 255	AHU-01/TU-1-34	AHU/TU	26.3	30.2	794	12.0	9,531	1,085	315	29%	6.8	2.0	1	11.1	5.1	
Rm. 253	AHU-01/TU-1-37B	AHU/TU	11.8	10.0	118	9.7	1,145	205	59	29%	10.7	3.1	1	57.8	8.0	
Rm. 252	AHU-01/TU-1-37A	AHU/TU	17.5	8.9	156	12.0	1,869	295	86	29%	9.5	2.7	1	37.5	7.0	
Rm. 251	AHU-01/TU-1-38A	AHU/TU	12.8	8.1	104	12.0	1,244	400	116	29%	19.3	5.6	1	60.1	14.3	
Rm. 242	FC-20	FCU	36.1	16.2	585	8.0	4,679	405	0	0%	5.2	0.0	1	15.9	3.7	Not ducted for OSA.
Rm. 242A	FC-20	FCU	15.9	11.5	183	8.0	1,463	280	0	0%	11.5	0.0	0	N/A	8.3	Not ducted for OSA.
Rm. 242B	FC-20	FCU	6.6	6.1	40	8.0	322	95	0	0%	17.7	0.0	0	N/A	12.7	Not ducted for OSA.
Rm. 240	AHU-01/TU-1-38B	AHU/TU	57.7	17.9	1,033	9.6	9,915	735	213	29%	4.4	1.3	1	9.1	3.3	
Rm. 239	AHU-02/TU-2-40	AHU/TU	27.6	27.4	756	12.0	9,075	1,155	381	33%	7.6	2.5	1	12.0	5.7	
Rm. 237	AHU-02/TU-2-39	AHU/TU	29.5	27.5	811	12.0	9,735	1,100	363	33%	6.8	2.2	1	10.9	5.1	
Rm. 235	AHU-02/TU-2-38	AHU/TU	29.3	26.4	774	12.0	9,282	1,120	370	33%	7.2	2.4	1	11.5	5.4	
Rm. 233	AHU-02/TU-2-37	AHU/TU	27.7	27.4	759	12.0	9,108	1,080	356	33%	7.1	2.3	1	11.6	5.3	
Rm. 231	AHU-02/TU-2-36	AHU/TU	28.7	27.4	786	12.0	9,437	1,170	386	33%	7.4	2.5	1	11.6	5.5	
Rm. 229	AHU-02/TU-2-35	AHU/TU	28.2	26.4	744	12.0	8,934	1,100	363	33%	7.4	2.4	1	11.9	5.5	

Date: 1/20/2022

Readings By: Justin Davis



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Grant HS; 2245 NE 36th Ave, Portland, OR 97212
Filter Status: Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
	Served By	Equipment Type	Room Length	Room Width	Room Area	Room Height	Room Volume	Total CFM Supply	OA CFM Supply	OA %	Air Changes per Hour (supply)	Air Changes per Hour (OA)	# of Portable Filters	Total Effective Air Changes per Hour (ACH_e) with Portable Filter	Total Effective Air Changes per Hour (ACH_e) without Portable Filter	
Grant Arts Building																
Rm. A003A	AHU-07/FTU-7-04	AHU/FTU	6.4	12.9	83	9.9	817	395	142	36%	29.0	10.4	1	91.4	21.7	
Rm. A003B	AHU-07/FTU-7-05	AHU/FTU	12.9	10.0	129	9.9	1,277	195	70	36%	9.2	3.3	1	51.5	6.9	
Rm. A003C	AHU-07/FTU-7-05	AHU/FTU	12.9	9.9	128	9.9	1,264	205	74	36%	9.7	3.5	1	52.4	7.3	
Rm. A003D	AHU-07/FTU-7-05	AHU/FTU	13.3	13.9	185	8.0	1,479	295	106	36%	12.0	4.3	1	47.5	9.0	
Rm. A003E	AHU-07/FTU-7-06	AHU/FTU	11.8	13.8	163	8.0	1,303	400	144	36%	18.4	6.6	1	57.5	13.8	
Rm. A003F	AHU-07/FTU-7-06	AHU/FTU	11.9	13.8	164	8.0	1,314	400	144	36%	18.3	6.6	1	57.1	13.7	
Rm. A003G	AHU-07/TU-7-05	AHU/TU	7.4	8.6	64	8.0	509	100	36	36%	11.8	4.2	1	120.8	8.8	
Clinic A003J	AHU-07/TU-7-05	AHU/TU	18.0	8.2	148	8.0	1,181	200	72	36%	10.2	3.7	1	55.9	7.6	
Faculty	AHU-07/TU-7-04	AHU/TU	12.0	17.1	205	8.0	1,642	205	74	36%	7.5	2.7	1	40.3	5.6	
Head start Conf.	AHU-07/TU-7-03	AHU/TU	10.7	11.5	123	8.0	984	200	72	36%	12.2	4.4	1	67.0	9.1	
Rm. A001C	AHU-07/TU-7-02	AHU/TU	10.7	5.5	59	7.5	441	100	36	36%	13.6	4.9	0	N/A	10.2	
Play	AHU-07/FTU-7-03	AHU/FTU	22.0	14.0	308	8.8	2,710	490	176	36%	10.8	3.9	1	29.1	8.1	
Kitchen	AHU-07/FTU-7-03	AHU/FTU	9.6	8.7	84	8.0	668	410	148	36%	36.8	13.3	1	112.9	27.6	
Daycare A	AHU-07/FTU-7-01	AHU/FTU	25.0	18.5	463	17.6	8,140	2,105	758	36%	15.5	5.6	1	18.6	11.6	
Daycare B	-	-	20.9	25.1	525	9.9	5,193	-	-	-	0.0	0.0	1	11.0	0.0	Ventilation is provided by adjacent spaces.
Daycare C	AHU-07/FTU-7-02	AHU/FTU	20.1	25.1	505	15.1	7,618	2,140	770	36%	16.9	6.1	1	20.1	12.6	
Rm. A101	AHU-07/Misc FTU	AHU/TU	54.6	25.2	1,376	10.5	14,447	1,790	644	36%	7.4	2.7	1	9.5	5.6	
Rm. A103	AHU-07/FTU-7-10	AHU/TU	55.0	23.2	1,276	12.2	15,567	1,520	547	36%	5.9	2.1	1	8.0	4.4	
Rm. A103A	AHU-07/FTU-7-11	AHU/TU	18.2	13.0	237	9.0	2,129	315	113	36%	8.9	3.2	1	33.4	6.6	
Rm. A105	AHU-07/FTU-7-11	AHU/TU	-	-	1,170	12.3	14,391	1,495	538	36%	6.2	2.2	1	8.6	4.7	
Rm. A201	AHU-07/FTU-7-13	AHU/TU	-	-	1,522	17.3	26,331	2,480	893	36%	5.7	2.0	1	6.4	4.2	
Rm. A203	AHU-07/FTU-7-14	AHU/TU	53.7	23.2	1,246	16.9	21,055	1,385	499	36%	3.9	1.4	1	5.7	3.0	
Rm. A205	AHU-07/FTU-7-15	AHU/TU	45.9	25.7	1,180	17.9	21,115	2,015	725	36%	5.7	2.1	1	7.0	4.3	
Rm. 209	AHU-07/FTU-7-17	AHU/TU	42.9	27.0	1,158	16.7	19,344	1,800	648	36%	5.6	2.0	1	7.1	4.2	

Date: 1/20/2022

Readings By: Justin Davis

Project:

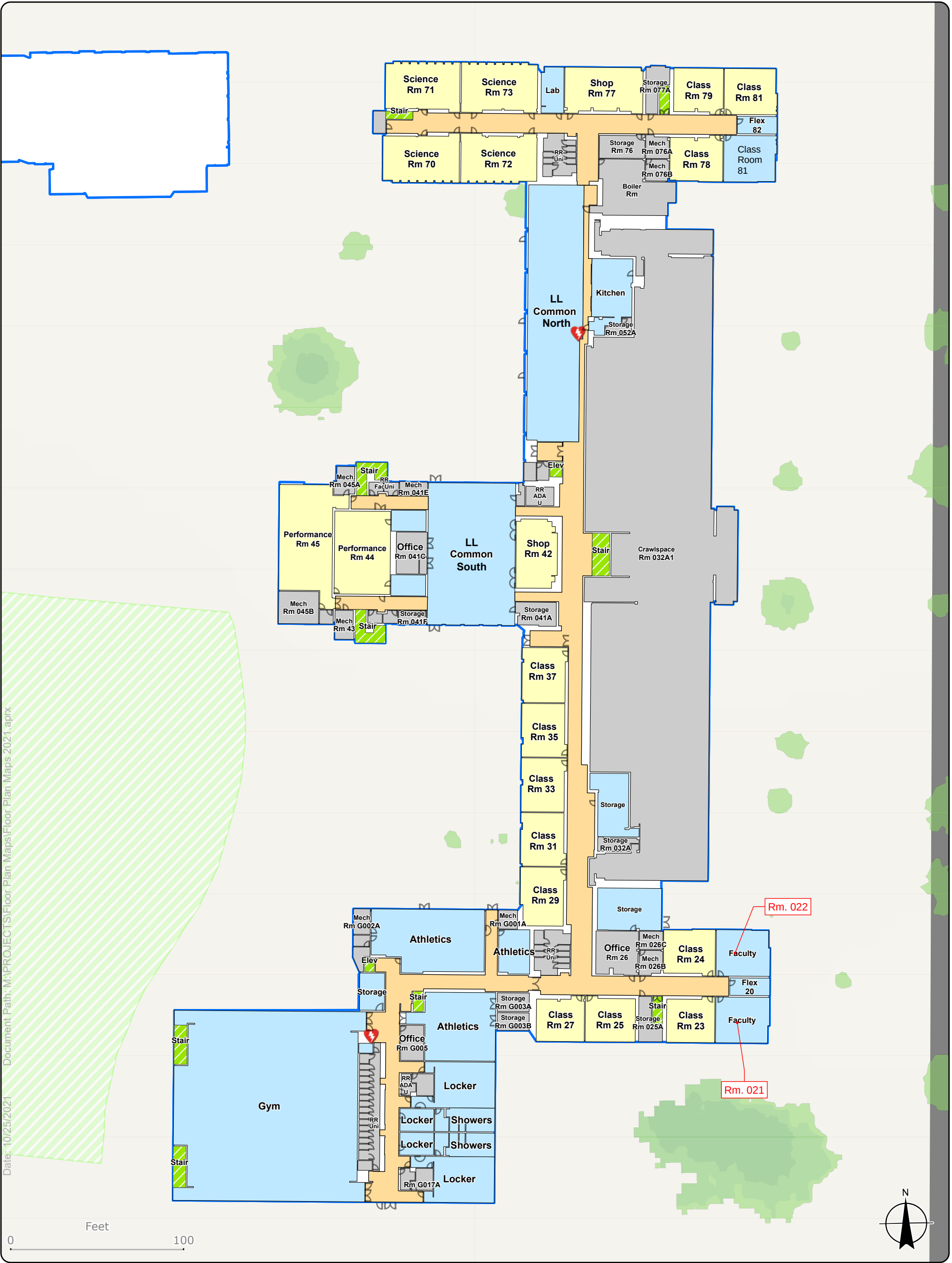
Portland Public Schools Airflow Testing

Location:

Grant HS; 2245 NE 36th Ave, Portland, OR 97212

NOTE #	NOTE DESCRIPTION

GRANT: Lower Level 1



Date: 10/25/2021 Document Path: M:\PROJECTS\Floor Plan Maps\Floor Plan Maps 2021.aprx

Space Use

Classrooms

Office, Rest Rooms, Storage, Mechanical

Special Purpose, Flex Classrooms

Corridor, Foyer, Vestibule, Ramp

Stairs/Elevator

School Grounds

Campus Footprints

Athletic Field

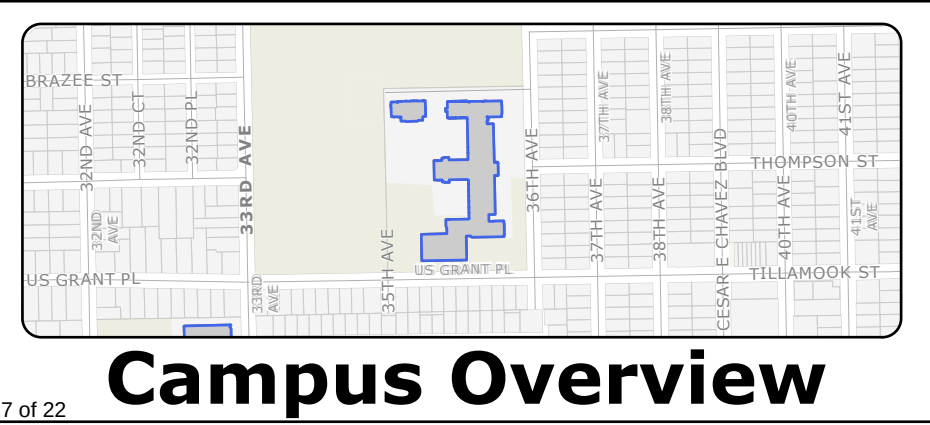
Playground: Paved

Playground: Unpaved

Streets

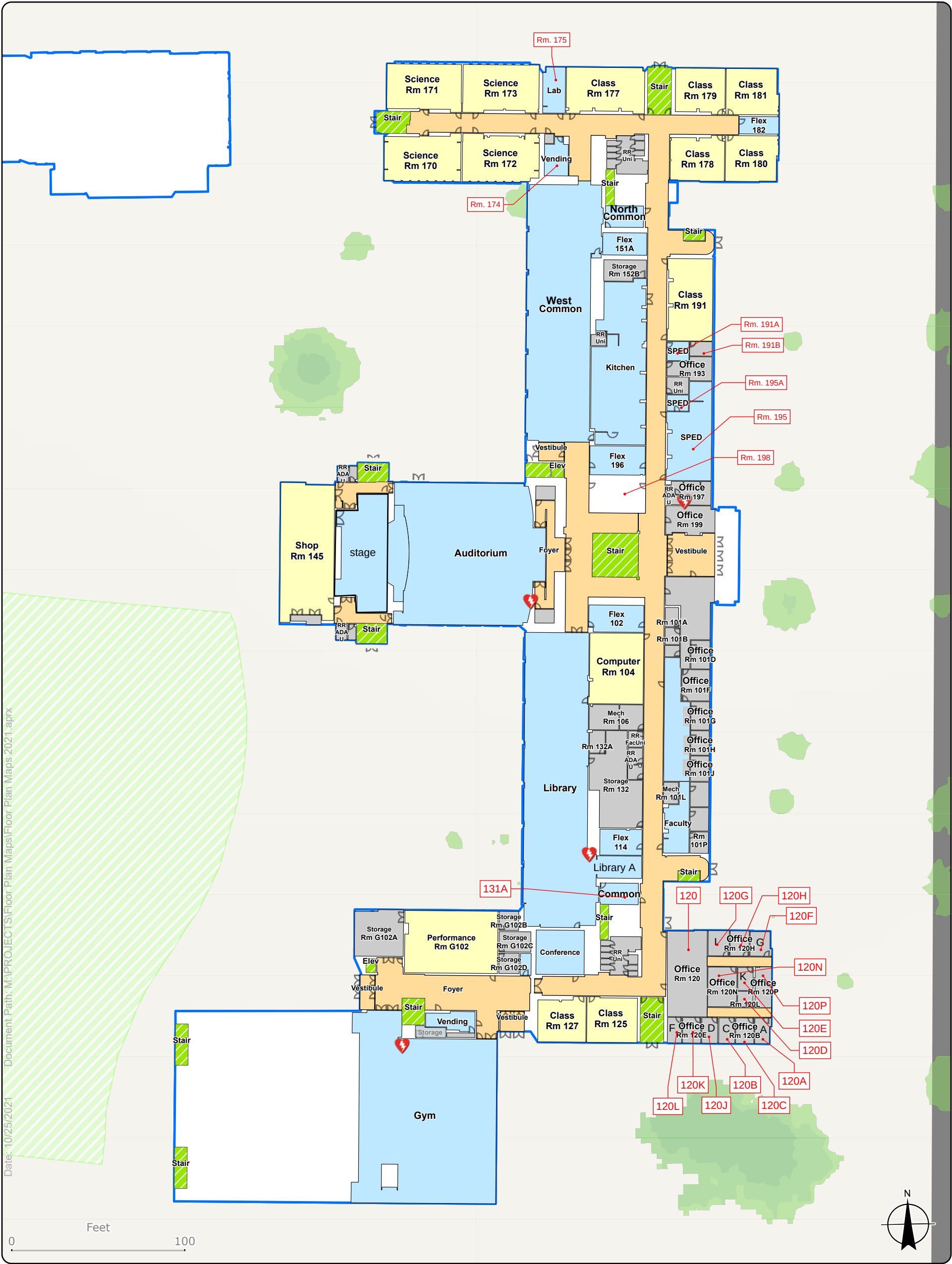
Automated Electronic Defibrillator

Doors



Campus Overview

GRANT: First Floor



Date: 10/25/2021 Document Path: M:\PROJECTS\Floor Plan Maps\Floor Plan Maps 2021.aprx

Space Use

- Classrooms
- Office, Rest Rooms, Storage, Mechanical
- Special Purpose, Flex Classrooms
- Corridor, Foyer, Vestibule, Ramp
- Stairs/Elevator

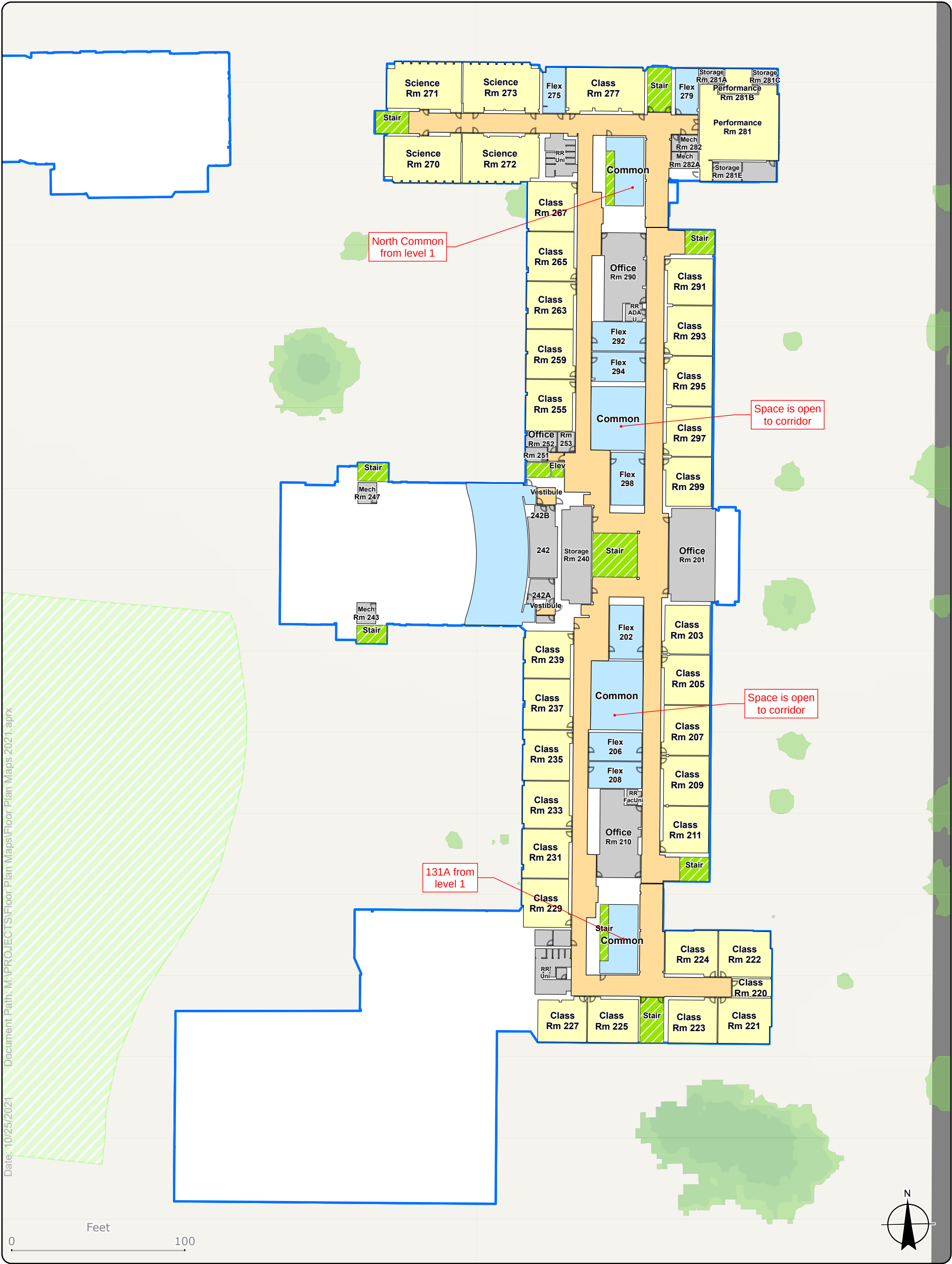
School Grounds

- Campus Footprints
- Athletic Field
- Playground: Paved
- Playground: Unpaved
- Streets
- Automated Electronic Defibrillator
- Doors



Campus Overview

GRANT: Second Floor



Space Use

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Campus Overview

GRANT ARTS: Lower Level 1



Space Use

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Special Purpose, Flex Classrooms

Corridor, Foyer, Vestibule, Ramp

Stairs/Elevator

School Grounds

Campus Footprints

Athletic Field

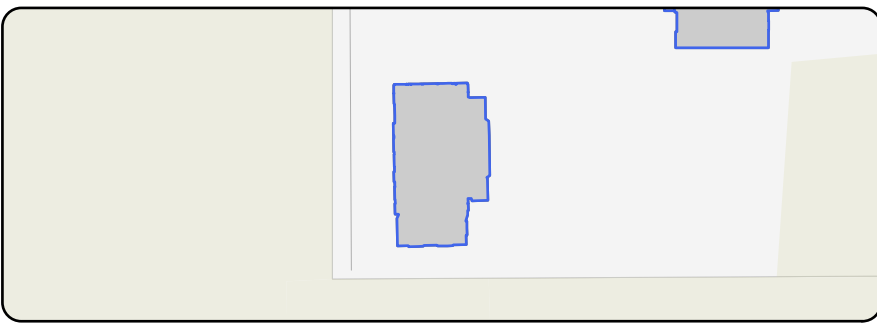
Playground: Paved

Playground: Unpaved

Streets

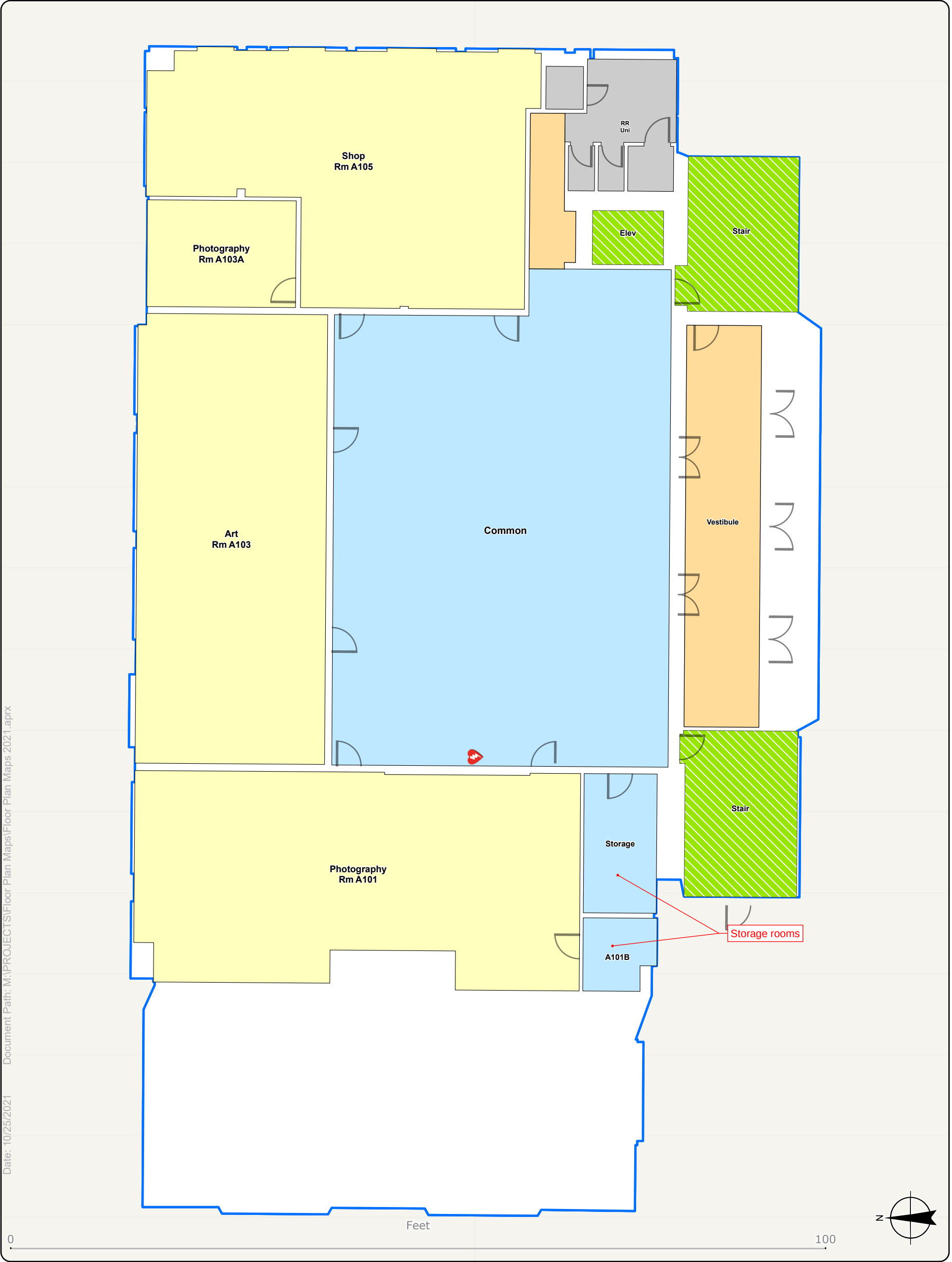
Automated Electronic Defibrillator

Doors



Campus Overview

GRANT ARTS: First Floor



Date: 10/25/2021 Document Path: M:\PROJECTS\Floor Plan Maps\Floor Plan Maps 2021.aprx

Space Use

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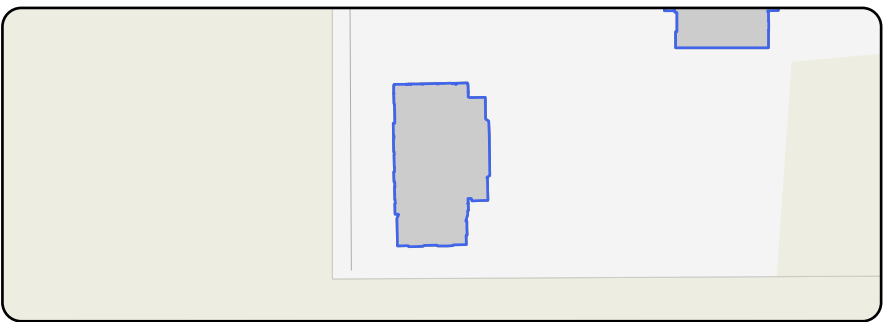
Playground: Paved

Playground: Unpaved

Streets

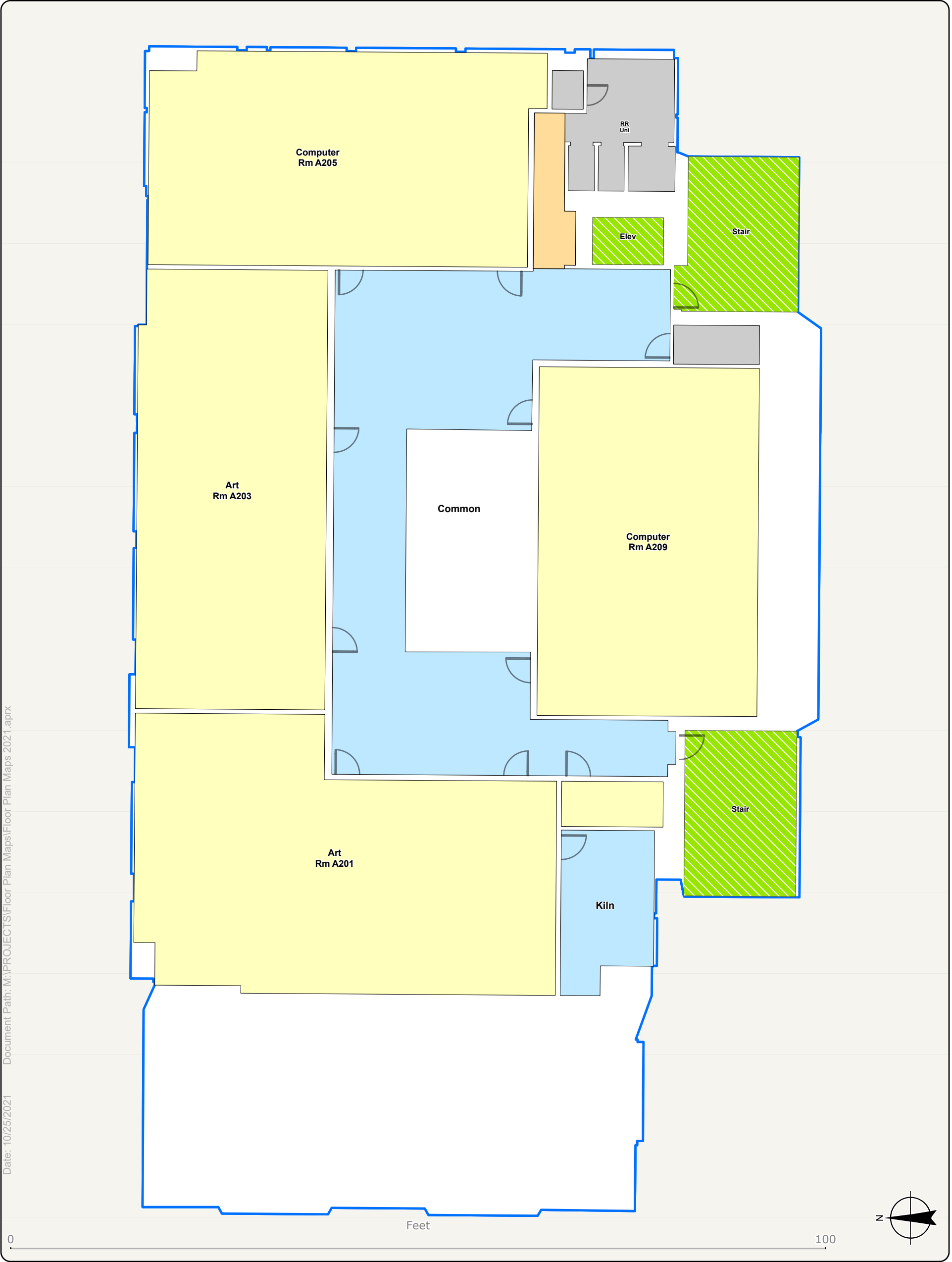
Automated Electronic Defibrillator

Doors



Campus Overview

GRANT ARTS: Second Floor



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