



Airflow Testing Report

Prepared for

Portland Public Schools

August 2021





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 Franklin HS

Job Number: 2021-0297

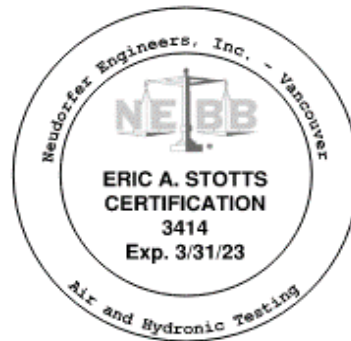
Project Completion Date: January 2022

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
Franklin HS**

TABLE OF CONTENTS

Title Sheet	3
Report Certification	4
Terms	5
Instrument Calibration	6
Report Summary	7
Airflow Survey Report	8
TAB Notes	16
Floor Layout	17



Neudorfer Engineers, Inc.

Consulting Engineers Seattle, Washington - Portland, Oregon



www.NeudorferEngineers.com

REPORT TITLE

CERTIFIED TEST: SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Franklin HS

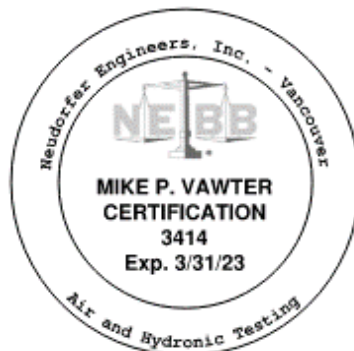
NEI Job#: 2021-0297

Mechanical Engineer: NA

Architect: NA

HVAC Contractor: NA

TAB Firm: Neudorfer Engineers Inc
Test Engineer: Zach Mayer



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**

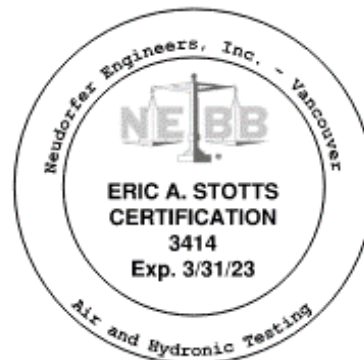
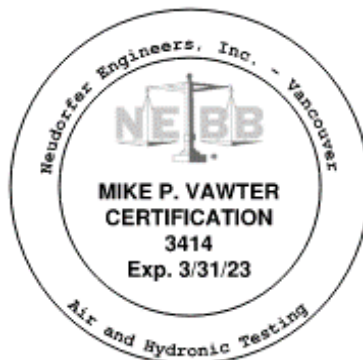
Expiration Date: **March 31, 2023**

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

Franklin 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	Franklin HS; 5405 SE Woodward St, Portland, OR 97206

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: Franklin HS; 5405 SE Woodward St, Portland, OR 97206
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	
Gym Lower Level 1																
Rm G-002A	TU-7-002	VAV	8.2	10.3	84	10.0	845	40	40	100%	2.8	2.8	1	69.8	2.3	
Rm G-002	TU-7-002	VAV	8.2	10.0	82	10.0	820	30	30	100%	2.2	2.2	1	71.3	1.8	
Athletics G-010	TU-7-001	VAV	43.2	43.4	1,875	14.0	26,248	395	395	100%	0.9	0.9	1	2.9	0.7	
Rm G-012	TU-7-005	FPB	25.2	35.2	887	10.0	8,870	1,090	540	50%	7.4	3.7	1	12.0	5.6	
Rm G-013	TU-7-006	FPB	23.5	42.1	989	10.0	9,894	1,030	385	37%	6.2	2.3	1	10.4	4.7	
Locker G-015	TU-7-008	VAV	40.2	45.7	1,283	10.0	12,831	1,085	1,085	100%	5.1	5.1	1	8.5	4.1	
Rm G-016	TU-7-008	VAV	11.4	20.1	229	9.0	2,062	105	105	100%	3.1	3.1	1	30.1	2.4	
Rm G-017	TU-7-007	FPB	36.8	36.5	1,343	9.0	12,089	930	100	11%	4.6	0.5	1	8.1	3.4	
G-017A	TU-7-013	VAV	8.1	35.3	286	9.0	2,573	70	70	100%	1.6	1.6	1	23.5	1.3	
Rm G-018	TU-7-009	FPB	36.8	45.1	1,349	9.0	12,138	620	90	15%	3.1	0.4	1	6.9	2.2	Non-rectangular room.
Locker G-019	TU-7-010	VAV	40.2	62.3	1,950	10.0	19,505	1,105	1,105	100%	3.4	3.4	1	5.6	2.7	Non-rectangular room.
Rm G-020	TU-7-010	VAV	11.4	20.1	229	9.0	2,062	100	100	100%	2.9	2.9	1	30.0	2.3	
Athletics G-021	TU-7-011	FPB	13.8	42.0	580	1.1	638	315	200	63%	29.6	18.8	1	112.2	22.8	
Athletics G-023	TU-7-012	FPB	34.7	56.3	1,954	13.9	27,155	1,380	670	49%	3.0	1.5	1	4.4	2.3	
Gym First Floor																
Rm G-114	TU-7-101	VAV	31.7	51.0	1,347	9.1	12,255	425	425	100%	2.1	2.1	1	6.3	1.7	Non-rectangular room.
Rm G-113	TU-7-106	FPB	23.4	37.8	885	10.0	8,845	520	250	48%	3.5	1.7	1	9.1	2.7	
Rm G-111	TU-7-107	FPB	23.4	37.8	885	10.0	8,845	960	320	33%	6.5	2.2	1	11.3	4.9	
Rm G-112	TU-7-105	VAV	24.5	30.4	558	10.0	5,578	70	79	113%	0.8	0.8	1	10.8	0.6	Non-rectangular room.
G-108	TU-7-108	VAV	12.1	13.9	168	9.0	1,514	80	80	100%	3.2	3.2	1	40.2	2.5	Non-rectangular room.
Gym G-109	RTU-7-301	RTU	51.5	135.2	6,963	46.0	313,561	19,515	19,515	100%	2.1	2.1	2	1.9	1.7	Note #1. Non-rectangular room.
Gym Second Floor																
Gym G-206A	RTU-7-301	RTU	69.9	100.0	6,990	33.3	232,767	-	-	-	0.0	0.0	0	N/A	N/A	This gym is open to Gym G-109 and included in that ACH.

Date: 1/26/2022

Readings By: Davis



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Franklin HS; 5405 SE Woodward St, Portland, OR 97206
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 1																
Rm SS-024	FCU-6-002	FCU	17.6	45.5	657	8.0	5,254	1,360	245	18%	15.5	2.8	1	22.2	11.4	
Rm SS-025	FCU-6-001	FCU	18.9	45.5	716	8.0	5,728	1,470	294	20%	15.4	3.1	1	21.3	11.3	Non-rectangular room.
Rm SS-001	TU-6-017	FPB	34.3	47.7	1,636	15.0	24,542	530	270	51%	1.3	0.7	0	N/A	1.0	
Rm SS-001A	TU-6-018	FPB	14.3	15.3	219	12.8	2,801	520	55	11%	11.1	1.2	0	N/A	8.1	
Rm SS-008	TU-6-015	FPB	20.4	42.0	694	9.4	6,522	660	165	25%	6.1	1.5	1	13.2	4.5	Non-rectangular room.
Rm SS-009	TU-6-014	FPB	20.7	43.0	890	9.4	8,367	1,295	750	58%	9.3	5.4	1	13.9	7.1	
Rm SS-010	TU-6-005	FPB	11.6	20.7	240	10.0	2,401	800	250	31%	20.0	6.2	1	38.6	14.9	
Rm SS-011	TU-6-005	FPB	11.6	11.0	128	9.1	1,161	365	80	22%	18.9	4.1	1	63.0	13.9	
Rm SS-012	TU-6-013	FPB	20.4	43.0	877	9.9	8,684	1,290	735	57%	8.9	5.1	1	13.4	6.8	
Rm SS-013	TU-6-005	FPB	11.6	10.3	119	9.1	1,087	370	70	19%	20.4	3.9	1	67.4	15.0	
Rm SS-014	TU-6-012	FPB	20.8	43.0	894	9.1	8,139	1,335	730	55%	9.8	5.4	1	14.5	7.5	
Rm SS-015	TU-6-004	FPB	10.5	11.6	122	9.2	1,121	300	80	27%	16.1	4.3	1	62.8	11.9	
Rm SS-016	TU-6-004	FPB	10.4	11.7	122	8.5	1,034	305	85	28%	17.7	4.9	1	68.2	13.1	
Rm SS-017	TU-6-004	FPB	11.0	11.6	128	8.5	1,085	360	110	31%	19.9	6.1	1	67.4	14.8	
Rm S-027	TU-3-002	FPB	23.5	33.0	776	8.4	6,514	1,480	104	7%	13.6	1.0	1	18.6	9.9	
Rm S-028	TU-3-001	FPB	23.6	33.0	779	8.4	6,542	1,530	470	31%	14.0	4.3	1	19.2	10.4	
Rm S-026	TU-3-004	FPB	19.6	41.4	811	8.4	6,816	990	250	25%	8.7	2.2	1	14.8	6.4	
Rm S-022	TU-3-009	FPB	20.8	41.8	869	8.5	7,390	1,485	252	17%	12.1	2.0	1	16.6	8.8	
S-021	TU-3-009	FPB	13.4	13.8	185	8.4	1,553	420	71	17%	16.2	2.8	1	48.6	11.9	
Rm S-023	TU-3-005	FPB	12.2	28.9	353	8.6	3,032	1,450	180	12%	28.7	3.6	1	39.7	20.9	
Rm S-020	TU-3-006	FPB	31.3	40.8	1,277	8.4	10,727	1,360	200	15%	7.6	1.1	1	10.9	5.6	
S-016A	TU-3-008	FPB	11.1	25.4	282	8.4	2,368	480	220	46%	12.2	5.6	0	N/A	9.2	
Rm S-016	TU-3-007	FPB	31.6	40.8	1,289	8.4	10,830	1,580	155	10%	8.8	0.9	1	11.6	6.4	
Rm S-012	TU-3-010	FPB	31.3	50.7	1,587	8.4	13,330	1,480	715	48%	6.7	3.2	1	9.3	5.1	

Date: 11/23/2021

Readings By: Mayer



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Franklin HS; 5405 SE Woodward St, Portland, OR 97206
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 SS-118	TU-6-104&105	FPB	35.2	40.2	1,363	10.1	14,299	3,160	1,210	38%	13.3	5.1	1	13.9	9.9	Non-rectangular room.
SS-114	TU-6-103	FPB	8.2	10.9	89	9.0	804	200	60	30%	14.9	4.5	0	N/A	11.1	
SS-115	TU-6-103	FPB	7.4	9.9	73	9.0	659	520	156	30%	47.3	14.2	0	N/A	35.2	
Library SS-117	Many	FPB	66.7	110.4	6,936	30.1	169,975	13,965	3,110	22%	4.9	1.1	1	4.0	3.6	Note #2. Non-rectangular room.
Rm SS-116	TU-6-101	FPB	21.4	34.5	677	9.3	6,299	1,500	550	37%	14.3	5.2	1	19.8	10.7	Non-rectangular room.
Rm SS-110	TU-6-100	FPB	20.2	21.9	442	9.4	4,158	1,550	410	26%	22.4	5.9	1	30.3	16.6	
Cafeteria SS-104	TU-5-211→214	VAV	70.0	81.8	5,726	24.9	142,577	9,430	9,430	100%	4.0	4.0	0	N/A	3.2	
Kitchen SS-102	RTU-5-301	RTU	24.7	46.9	789	10.0	7,894	1,430	458	32%	10.9	3.5	0	N/A	8.1	Non-rectangular room.
Kitchen SS-101	RTU-5-301	RTU	34.9	53.7	1,728	10.0	13,166	3,310	1,059	32%	15.1	4.8	0	N/A	11.2	Non-rectangular room.
Office 1	TU-4-122	FPB	9.9	12.0	119	13.1	1,556	350	67	19%	13.5	2.6	0	N/A	9.9	
Office 2	TU-4-122	FPB	10.0	12.0	120	13.1	1,572	340	65	19%	13.0	2.5	1	45.8	9.5	
Office 3	TU-4-124	FPB	8.1	8.7	70	9.0	634	350	67	19%	33.1	6.3	0	N/A	24.3	
Lab	TU-4-124	FPB	8.1	15.0	122	9.4	1,142	400	88	22%	21.0	4.6	0	N/A	15.5	
Kitchen	TU-4-122	FPB	5.6	9.9	55	13.1	726	280	62	22%	23.1	5.1	0	N/A	17.1	
Exam 1	TU-4-122	FPB	10.0	12.0	120	13.1	1,572	355	67	19%	13.5	2.6	1	46.2	10.0	
Exam 2	TU-4-124	FPB	8.5	9.4	80	9.0	719	260	57	22%	21.7	4.8	0	N/A	16.0	
Exam 3	TU-4-124	FPB	8.5	9.4	80	9.0	719	380	84	22%	31.7	7.0	0	N/A	23.4	
M-138	TU-4-122	FPB	24.5	24.5	600	9.5	5,702	670	127	19%	7.0	1.3	1	15.2	5.2	
M-139	TU-4-127	FPB	13.4	13.9	186	10.0	1,863	260	42	16%	8.4	1.3	0	N/A	6.1	
Rm M-133	TU-4-127	FPB	10.0	10.4	104	9.0	936	250	40	16%	16.0	2.6	0	N/A	11.7	
M-133A	TU-4-127	FPB	10.5	13.4	141	9.9	1,393	245	39	16%	10.6	1.7	1	48.6	7.7	
M-135	TU-4-127	FPB	7.8	10.5	82	9.0	737	245	39	16%	19.9	3.2	0	N/A	14.6	
Rm M-131	TU-4-129	FPB	23.2	26.4	612	10.0	6,125	1,490	380	26%	14.6	3.7	1	20.1	10.8	
M-132	TU-4-131	FPB	17.6	30.0	445	10.0	4,450	710	71	10%	9.6	1.0	1	19.8	7.0	Non-rectangular room.

Date: 11/23/2021

Readings By: Mayer



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Franklin HS; 5405 SE Woodward St, Portland, OR 97206
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 M-132A	TU-4-125	VAV	12.0	15.2	182	10.0	1,824	110	110	100%	3.6	3.6	0	N/A	2.9	
M-132B	TU-4-131	FPB	12.0	15.4	185	10.0	1,848	380	38	10%	12.3	1.2	0	N/A	9.0	
M-132C	TU-4-132	VAV	9.2	15.1	139	9.0	1,250	50	50	100%	2.4	2.4	0	N/A	1.9	
M-132D	TU-4-131	FPB	12.3	15.4	189	10.0	1,894	370	37	10%	11.7	1.2	0	N/A	8.5	
M-136	TU-4-132	VAV	9.5	15.1	143	9.0	1,291	50	50	100%	2.3	2.3	0	N/A	1.9	
M-137	TU-4-130	FPB	13.8	15.5	214	10.0	2,139	600	90	15%	16.8	2.5	1	39.0	12.3	
Faculty M-130	TU-4-134	FPB	11.5	31.1	358	10.0	3,577	630	85	13%	10.6	1.4	0	N/A	7.7	
Rm M-126	TU-4-134	FPB	18.8	28.1	528	9.9	5,230	660	88	13%	7.6	1.0	0	N/A	5.5	
Rm M-124H	TU-4-119	FPB	17.9	24.6	440	11.0	4,844	335	20	6%	4.1	0.2	1	14.8	3.0	
Rm M-124F	TU-4-119	FPB	9.6	20.0	192	10.0	1,920	740	44	6%	23.1	1.4	0	N/A	16.7	
Rm M-124D	TU-4-118	FPB	9.6	19.0	182	10.0	1,824	635	90	14%	20.9	3.0	1	46.5	15.3	
Rm M-124A	TU-4-117	FPB	9.6	18.6	179	10.0	1,786	720	30	4%	24.2	1.0	1	49.4	17.5	
Pcp. Sec.	TU-4-120	FPB	8.6	13.5	116	10.0	1,161	105	21	20%	5.4	1.1	1	53.1	4.0	
Rm M-124	TU-4-116&120	FPB	17.9	86.9	1,556	11.0	12,667	800	105	13%	3.8	0.5	1	7.3	2.8	
M-119	TU-4-115	FPB	8.2	18.4	151	11.0	1,660	590	90	15%	21.3	3.3	1	50.0	15.6	
M-118	TU-4-111	VAV	15.7	18.0	283	10.7	3,024	110	110	100%	2.2	2.2	0	N/A	1.7	
Rm M-117	TU-4-114	FPB	24.9	45.0	936	10.0	9,355	1,540	690	45%	9.9	4.4	1	13.6	7.5	
Rm M-116	TU-4-113	FPB	22.5	31.4	707	9.9	6,994	1,500	110	7%	12.9	0.9	1	17.5	9.3	
Daycare M-108	TU-4-110	FPB	17.7	31.3	491	10.0	4,910	1,040	110	11%	12.7	1.3	0	N/A	9.3	Non-rectangular room.
Kitchen M-107B	TU-4-107	FPB	11.5	18.3	210	9.0	1,894	90	49	54%	2.9	1.6	0	N/A	2.2	
Daycare M-107	TU-4-107	FPB	17.7	31.3	491	10.0	4,910	890	480	54%	10.9	5.9	0	N/A	8.3	Non-rectangular room.
M-105	TU-4-108	FPB	20.7	25.7	532	9.9	5,267	860	103	12%	9.8	1.2	0	N/A	7.1	
M-105A	TU-4-108	FPB	10.0	13.7	137	9.0	1,233	50	6	12%	2.4	0.3	0	N/A	1.8	
Rm M-106	TU-4-105&106	FPB	21.3	52.6	1,120	10.0	11,204	2,690	120	4%	14.4	0.6	1	15.5	10.4	

Date: 11/23/2021

Readings By: Mayer



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Franklin HS; 5405 SE Woodward St, Portland, OR 97206
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 M-101	TU-4-103	FPB	23.2	31.6	733	9.6	7,038	1,530	310	20%	13.0	2.6	1	17.7	9.6	
Rm M-102	TU-4-101	FPB	23.2	31.4	728	10.0	7,285	1,610	120	7%	13.3	1.0	1	17.4	9.6	
Rm S-159	TU-3-102	FPB	22.6	32.9	744	10.1	7,510	1,560	580	37%	12.5	4.6	1	16.9	9.3	
Rm S-160	TU-3-101	FPB	22.5	32.8	738	10.1	7,454	1,470	580	39%	11.8	4.7	1	16.5	8.9	
Rm S-156	TU-3-103	FPB	13.4	24.6	330	10.0	3,296	620	120	19%	11.3	2.2	0	N/A	8.3	
Rm S-158	TU-3-104	FPB	19.7	42.2	831	10.0	8,313	950	730	77%	6.9	5.3	1	12.2	5.4	
Rm S-154	TU-3-105	FPB	20.8	43.6	811	10.0	8,109	800	120	15%	5.9	0.9	1	11.4	4.3	Non-rectangular room.
Rm S-155	TU-3-109	FPB	10.1	12.5	126	10.1	1,275	460	85	18%	21.6	4.0	1	60.6	15.9	
S-153	TU-3-109	FPB	13.4	28.9	387	10.1	3,911	910	165	18%	14.0	2.5	1	24.8	10.2	
S-151	-	-	13.3	21.4	285	10.1	2,875	-	-	-	0.0	0.0	0	N/A	0.0	Ventilation from adjacent spaces.
Rm S-152	TU-3-106	FPB	31.7	40.5	1,284	10.1	12,967	1,360	760	56%	6.3	3.5	1	9.2	4.8	
S-149A	TU-3-108	FPB	11.4	24.7	282	10.1	2,844	480	210	44%	10.1	4.4	0	N/A	7.6	
Rm S-149	TU-3-107	FPB	32.6	40.5	1,320	10.1	13,335	1,425	765	54%	6.4	3.4	1	9.2	4.9	
Rm S-145	TU-3-110	FPB	21.7	52.9	1,148	10.0	11,479	1,265	460	36%	6.6	2.4	1	9.9	5.0	
Rm S-142	TU-2-215&217	FPB	21.2	53.3	1,130	29.0	32,769	1,990	710	36%	3.6	1.3	2	6.2	2.7	
Rm S-140	RTU-2-302	RTU	42.1	73.4	2,970	14.3	42,473	5,120	1,700	33%	7.2	2.4	2	8.1	5.4	Non-rectangular room.
Rm S-138D	TU-2-112	FPB	20.6	28.9	595	11.2	6,668	1,345	540	40%	12.1	4.9	1	17.6	9.1	
Rm S-138	RTU-2-301	RTU	43.5	73.8	3,210	14.4	46,228	5,385	1,500	28%	7.0	1.9	1	6.4	5.2	
Rm S-137	TU-2-107	FPB	24.9	37.1	924	11.0	10,162	1,220	570	47%	7.2	3.4	1	11.1	5.5	
S-133	TU-2-103	VAV	11.0	14.7	162	10.0	1,617	290	290	100%	10.8	10.8	0	N/A	8.6	
Rm S-132	TU-2-101&102	FPB	42.7	44.8	1,913	10.9	20,851	2,875	950	33%	8.3	2.7	2	11.6	6.2	
Rm S-131	TU-2-206&207	FPB	39.7	50.9	2,021	21.7	43,850	2,540	1,490	59%	3.5	2.0	1	4.0	2.7	
S-131E	TU-2-104	VAV	8.5	11.1	94	10.0	944	100	100	100%	6.4	6.4	0	N/A	5.1	
S-131F	TU-2-104	VAV	9.3	11.1	103	10.0	1,032	95	95	100%	5.5	5.5	0	N/A	4.4	

Date: 11/23/2021

Readings By: Mayer



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Franklin HS; 5405 SE Woodward St, Portland, OR 97206
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																
S-131B	TU-2-106	VAV	13.2	22.0	290	10.0	2,904	185	185	100%	3.8	3.8	0	N/A	3.1	
S-131A	TU-2-106	VAV	13.6	22.0	299	10.0	2,992	190	190	100%	3.8	3.8	0	N/A	3.0	
S-122	TU-2-110	VAV	12.6	43.1	120	11.0	1,321	40	40	100%	1.8	1.8	0	N/A	1.5	Non-rectangular room.
S-126	TU-2-109	VAV	12.0	23.3	280	10.0	2,796	160	160	100%	3.4	3.4	0	N/A	2.7	
S-128	TU-2-109	VAV	12.0	23.3	280	10.0	2,796	170	170	100%	3.6	3.6	0	N/A	2.9	
Auditorium	RTU-1-201	RTU	59.3	62.7	3,011	25.0	160,316	14,480	6,560	45%	5.4	2.5	0	N/A	4.1	Non-rectangular room.
Rm S-103	RTU-1-301	RTU	31.3	50.7	1,587	30.2	47,925	4,940	1,729	35%	6.2	2.2	1	5.8	4.6	
Second Floor																
Rm SS-227	TU-6-212	FPB	17.3	40.2	641	10.0	6,415	1,490	700	47%	13.9	6.5	1	19.4	10.6	Non-rectangular room.
Rm SS-228	TU-6-211	FPB	17.3	40.2	695	10.0	6,955	1,615	575	36%	13.9	5.0	1	18.6	10.4	
Rm SS-220	TU-6-210	FPB	23.3	33.0	683	12.2	8,331	1,400	565	40%	10.1	4.1	1	14.4	7.6	
Rm SS-221	TU-6-201	FPB	23.3	33.0	683	12.2	8,331	1,200	800	67%	8.6	5.8	1	13.5	6.7	
SS-202	TU-5-202	VAV	8.5	12.3	105	12.6	1,317	50	50	100%	2.3	2.3	1	45.1	1.8	
SS-203	TU-5-202	VAV	12.3	12.1	149	12.3	1,831	55	55	100%	1.8	1.8	1	32.6	1.4	
SS-204	TU-5-202	VAV	8.8	12.1	106	12.3	1,310	50	50	100%	2.3	2.3	1	45.4	1.8	
Rm SS-205	TU-5-202	VAV	8.9	12.1	108	12.3	1,325	50	50	100%	2.3	2.3	1	44.8	1.8	
SS-206	TU-5-204	VAV	10.4	14.4	150	12.3	1,842	90	90	100%	2.9	2.9	1	33.3	2.3	
Rm SS-207	TU-5-205	VAV	10.4	9.8	102	12.3	1,254	50	50	100%	2.4	2.4	1	47.4	1.9	
Rm SS-208	TU-5-205	VAV	10.4	12.1	126	12.5	1,573	45	45	100%	1.7	1.7	1	37.6	1.4	
Rm SS-209	TU-5-205	VAV	10.4	12.1	126	12.3	1,548	50	50	100%	1.9	1.9	1	38.4	1.6	
SS-210	TU-5-206	VAV	14.7	15.5	228	12.3	2,803	140	140	100%	3.0	3.0	1	22.7	2.4	
SS-211	TU-5-208	VAV	13.6	15.0	204	10.8	2,203	130	130	100%	3.5	3.5	0	N/A	2.8	
SS-212	TU-5-203	VAV	15.3	17.4	266	10.8	2,875	90	90	100%	1.9	1.9	0	N/A	1.5	
SS-215	TU-5-209	VAV	7.9	14.8	117	10.8	1,263	290	290	100%	13.8	13.8	0	N/A	11.0	

Date: 11/23/2021

Readings By: Mayer



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Franklin HS; 5405 SE Woodward St, Portland, OR 97206
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																
SS-216	TU-5-208	VAV	24.3	26.8	651	11.6	7,554	60	60	100%	0.5	0.5	1	7.9	0.4	Non rectangular room.
Rm SS-218	TU-5-210	VAV	16.3	10.0	163	10.8	1,760	150	150	100%	5.1	5.1	1	36.5	4.1	
Rm M-233	TU-4-221	FPB	29.6	30.5	903	12.3	11,104	1,350	750	56%	7.3	4.1	1	10.7	5.6	
M-234	TU-4-220	FPB	12.0	31.6	379	12.2	4,626	1,160	650	56%	15.0	8.4	1	23.8	11.5	
Rm M-235	TU-4-219	FPB	26.5	30.4	806	12.2	9,828	1,440	740	51%	8.8	4.5	1	12.5	6.7	
Rm M-232	TU-4-218	FPB	23.3	26.4	615	12.2	7,504	1,370	750	55%	11.0	6.0	1	16.0	8.4	
Rm M-236	TU-4-224	FPB	23.1	24.5	566	12.2	6,905	730	730	100%	6.3	6.3	1	13.3	5.1	
Rm M-238	TU-4-216	FPB	23.5	37.9	891	12.2	10,866	1,520	740	49%	8.4	4.1	1	11.6	6.4	
Rm M-239	TU-4-215	FPB	23.5	25.5	521	12.2	6,359	1,490	120	8%	14.1	1.1	1	19.2	10.2	Non-rectangular room.
Rm M-224	TU-4-214	FPB	23.7	35.6	844	12.2	10,293	1,600	740	46%	9.3	4.3	1	12.6	7.1	
M-223	TU-4-213	FPB	29.6	30.5	903	12.2	11,014	1,500	760	51%	8.2	4.1	1	11.4	6.2	
Rm M-222	TU-4-212	FPB	24.8	26.4	655	14.3	9,362	1,545	860	56%	9.9	5.5	1	13.7	7.6	
Rm M-221	TU-4-212	FPB	24.7	35.4	874	14.3	12,504	1,350	170	13%	6.5	0.8	1	9.3	4.7	
Rm M-219	TU-4-211	FPB	23.7	39.4	934	12.2	11,392	1,520	110	7%	8.0	0.6	1	10.8	5.8	
Rm M-218	TU-4-210	FPB	23.7	36.9	875	12.2	10,669	1,410	100	7%	7.9	0.6	1	11.1	5.8	
Rm M-210	TU-4-207	FPB	30.5	30.0	915	12.2	11,163	1,550	100	6%	8.3	0.5	1	11.1	6.0	
M-208	TU-4-206	FPB	11.5	31.6	363	12.2	4,433	1,100	100	9%	14.9	1.4	1	23.7	10.8	
Rm M-207	TU-5-205	FPB	25.5	30.4	775	12.2	9,457	1,360	100	7%	8.6	0.6	1	12.3	6.3	
Rm M-209	TU-4-204	FPB	23.3	26.1	608	12.2	7,419	1,460	100	7%	11.8	0.8	1	16.2	8.6	
Rm M-205	TU-4-223	FPB	23.3	24.0	559	12.1	6,766	1,560	110	7%	13.8	1.0	1	18.5	10.0	
Rm M-204	TU-4-222	FPB	14.2	31.0	440	12.1	5,326	1,490	110	7%	16.8	1.2	1	22.9	12.2	
Rm M-201	TU-4-201	FPB	23.6	25.4	521	12.3	6,414	1,480	100	7%	13.8	0.9	1	18.9	10.0	Non-rectangular room.
Rm M-202	TU-4-202	FPB	23.7	37.5	889	12.2	10,843	1,550	45	3%	8.6	0.2	1	11.4	6.2	
Rm S-244	TU-3-202&203	FPB	23.3	32.6	760	12.1	9,191	3,020	610	20%	19.7	4.0	1	20.7	14.5	

Date: 11/23/2021

Readings By: Mayer



AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Franklin HS; 5405 SE Woodward St, Portland, OR 97206
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 S-245	TU-3-201	FPB	22.6	32.6	737	1.2	884	1,500	460	31%	101.8	31.2	1	140.2	75.8	
Rm S-241	TU-3-203	FPB	13.5	35.6	481	10.1	4,854	720	72	10%	8.9	0.9	0	N/A	6.5	
Rm S-243	TU-3-204	FPB	19.6	42.3	829	10.1	8,374	940	590	63%	6.7	4.2	1	12.0	5.2	
Rm S-240	TU-3-208	FPB	12.8	12.8	164	10.0	1,638	500	710	16%	18.3	26.0	0	N/A	15.3	
S-238	TU-3-208	FPB	13.4	28.9	387	10.1	3,911	1,000	710	16%	15.3	10.9	1	26.5	11.9	
Rm S-239	TU-3-205	FPB	17.9	20.8	372	10.1	3,760	850	120	14%	13.6	1.9	1	25.1	9.9	
Rm S-237	TU-3-206	FPB	31.8	39.9	1,192	9.7	11,561	1,280	130	10%	6.6	0.7	1	9.8	4.8	Non-rectangular room.
S-234A	TU-3-207	FPB	11.4	25.0	285	9.8	2,793	180	112	62%	3.9	2.4	0	N/A	3.0	
Rm S-234	TU-3-207	FPB	32.7	39.6	1,295	9.7	12,561	1,305	809	62%	6.2	3.9	1	9.3	4.8	
Rm S-230	TU-3-209	FPB	21.7	52.9	1,148	12.1	13,890	1,200	720	60%	5.2	3.1	1	8.1	4.0	
Rm S-226	TU-2-218	FPB	16.1	41.6	670	15.8	10,582	1,300	585	45%	7.4	3.3	1	11.0	5.6	
Rm S-224	TU-2-213&214	FPB	33.2	42.0	1,394	15.8	22,032	1,560	960	62%	4.2	2.6	1	5.9	3.3	
Rm S-222	TU-2-211	FPB	30.2	32.7	988	15.8	15,603	1,140	710	62%	4.4	2.7	1	7.0	3.4	
Rm S-221	TU-2-210	FPB	36.5	36.6	1,336	10.4	13,893	1,320	780	59%	5.7	3.4	1	8.5	4.4	
Rm S-219	TU-2-208	FPB	21.6	40.4	873	10.5	9,163	1,420	580	41%	9.3	3.8	1	13.2	7.0	
Rm S-220	TU-2-209	FPB	26.4	34.8	919	10.5	9,647	980	580	59%	6.1	3.6	1	10.6	4.7	
Rm S-218	TU-2-202	FPB	24.0	34.7	833	10.5	8,744	1,200	575	48%	8.2	3.9	1	12.8	6.2	
Rm S-217	TU-2-205	VAV	15.6	34.8	543	10.4	5,646	80	80	100%	0.9	0.9	1	10.8	0.7	
Rm S-215	TU-2-204	FPB	27.2	33.0	898	10.5	9,425	1,450	580	40%	9.2	3.7	1	13.0	6.9	
Rm S-214	TU-2-203	FPB	27.2	33.2	903	10.5	9,482	1,550	590	38%	9.8	3.7	1	13.4	7.4	
Auditorium Upper	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	0.0	Volume included in Auditorium recording.

Date: 11/23/2021

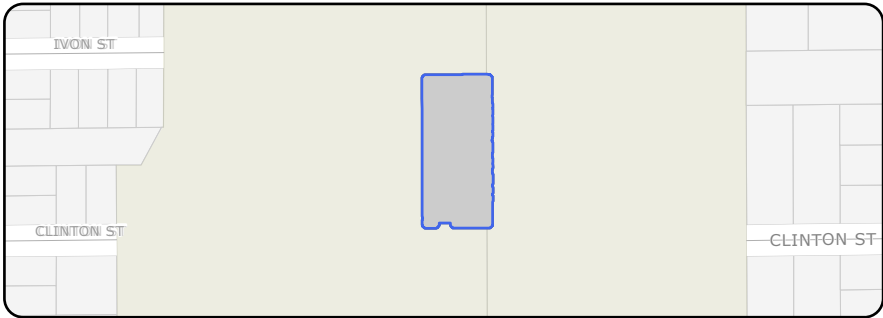
Readings By: Mayer



Location: Franklin HS; 5405 SE Woodward St, Portland, OR 97206

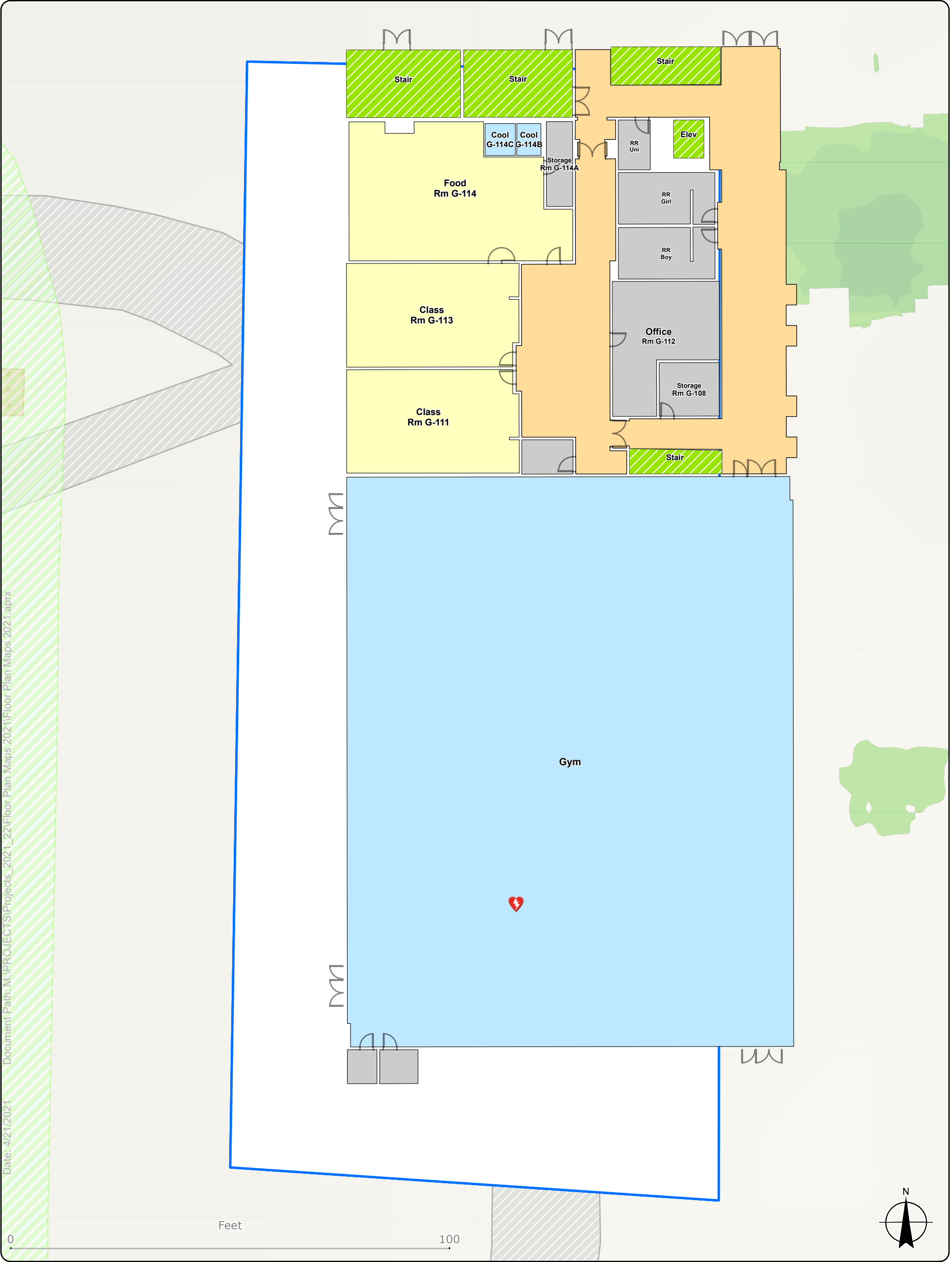
Page 16 of 22

FRANKLIN : GYM Lower Level 1



Campus Overview

FRANKLIN : GYM First Floor



Space Use

Classrooms

Office, Rest Rooms, Storage, Mechanical

Special Purpose, Flex Classrooms

Corridor, Foyer, Vestibule, Ramp

Stairs/Elevator

School Grounds

Campus Footprints

Athletic Field

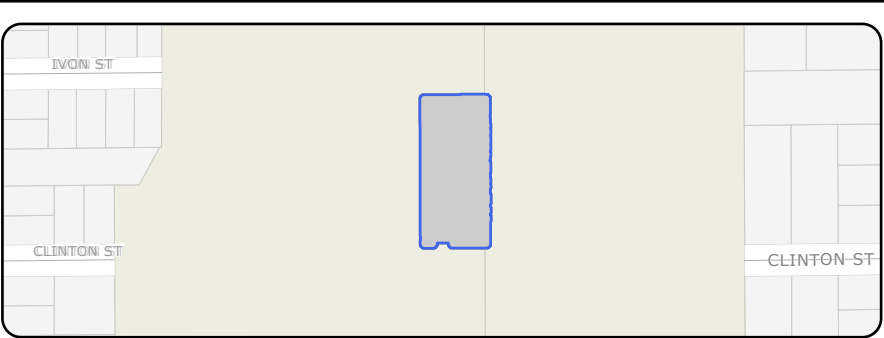
Playground: Paved

Playground: Unpaved

Streets

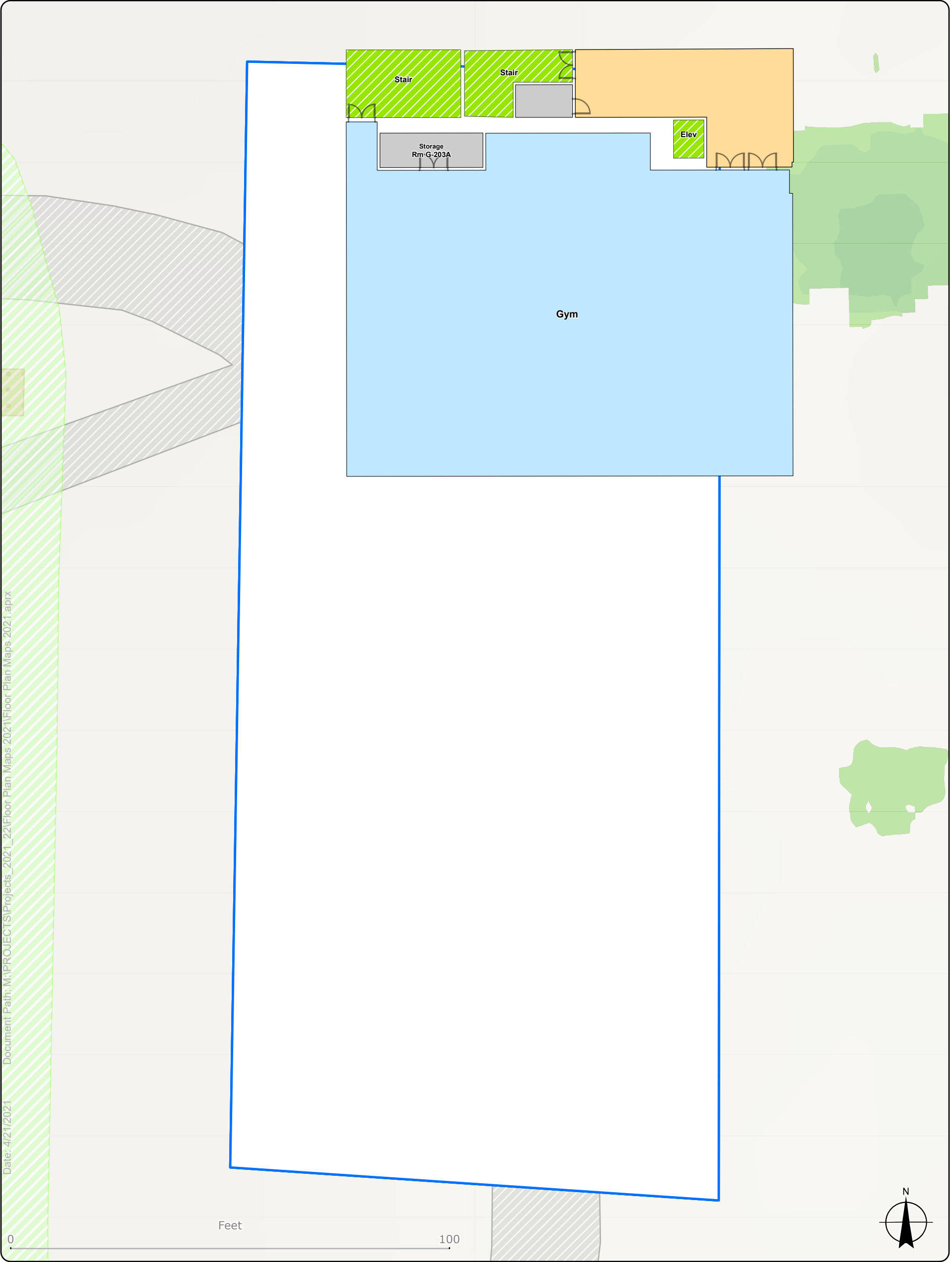
Automated Electronic Defibrillator

Doors



Campus Overview

FRANKLIN : GYM Second Floor



Space Use

Classrooms

Office, Rest Rooms, Storage, Mechanical

Special Purpose, Flex Classrooms

Corridor, Foyer, Vestibule, Ramp

Stairs/Elevator

School Grounds

Campus Footprints

Athletic Field

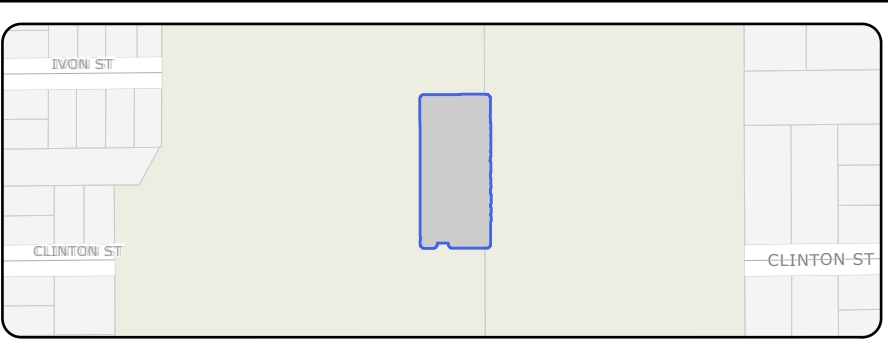
Playground: Paved

Playground: Unpaved

Streets

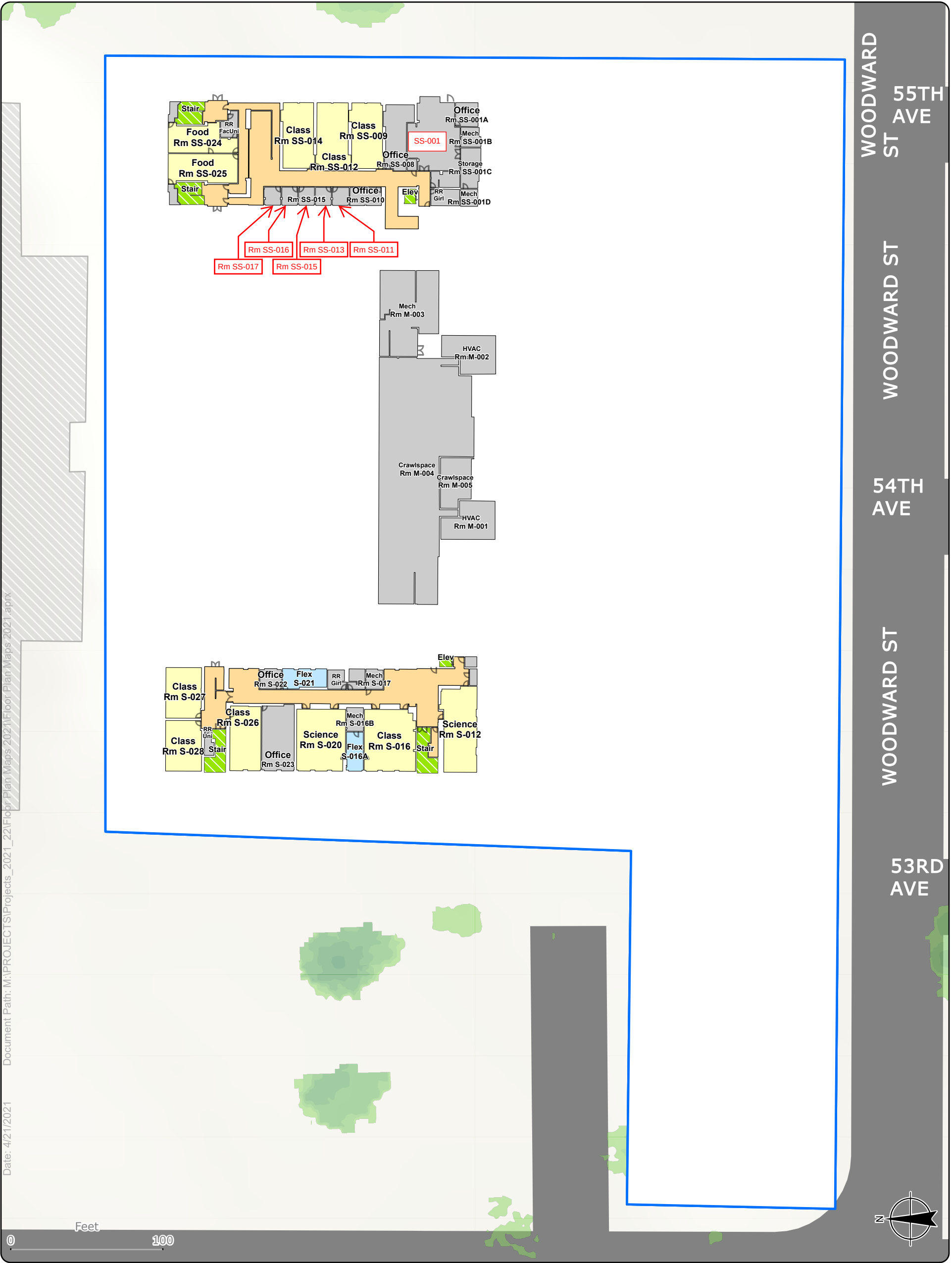
Automated Electronic Defibrillator

Doors



Campus Overview

FRANKLIN: Lower Level 1



Space Use

Classrooms

Office, Rest Rooms, Storage, Mechanical

Special Purpose, Flex Classrooms

Corridor, Foyer, Vestibule, Ramp

Stairs/Elevator

School Grounds

Campus Footprints

Athletic Field

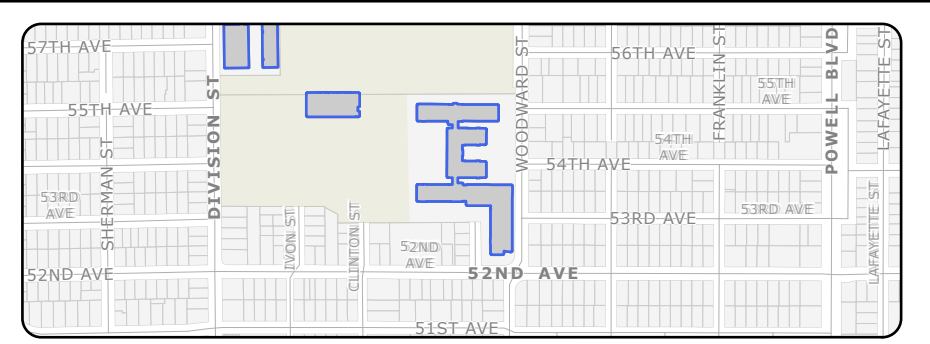
Playground: Paved

Playground: Unpaved

Streets

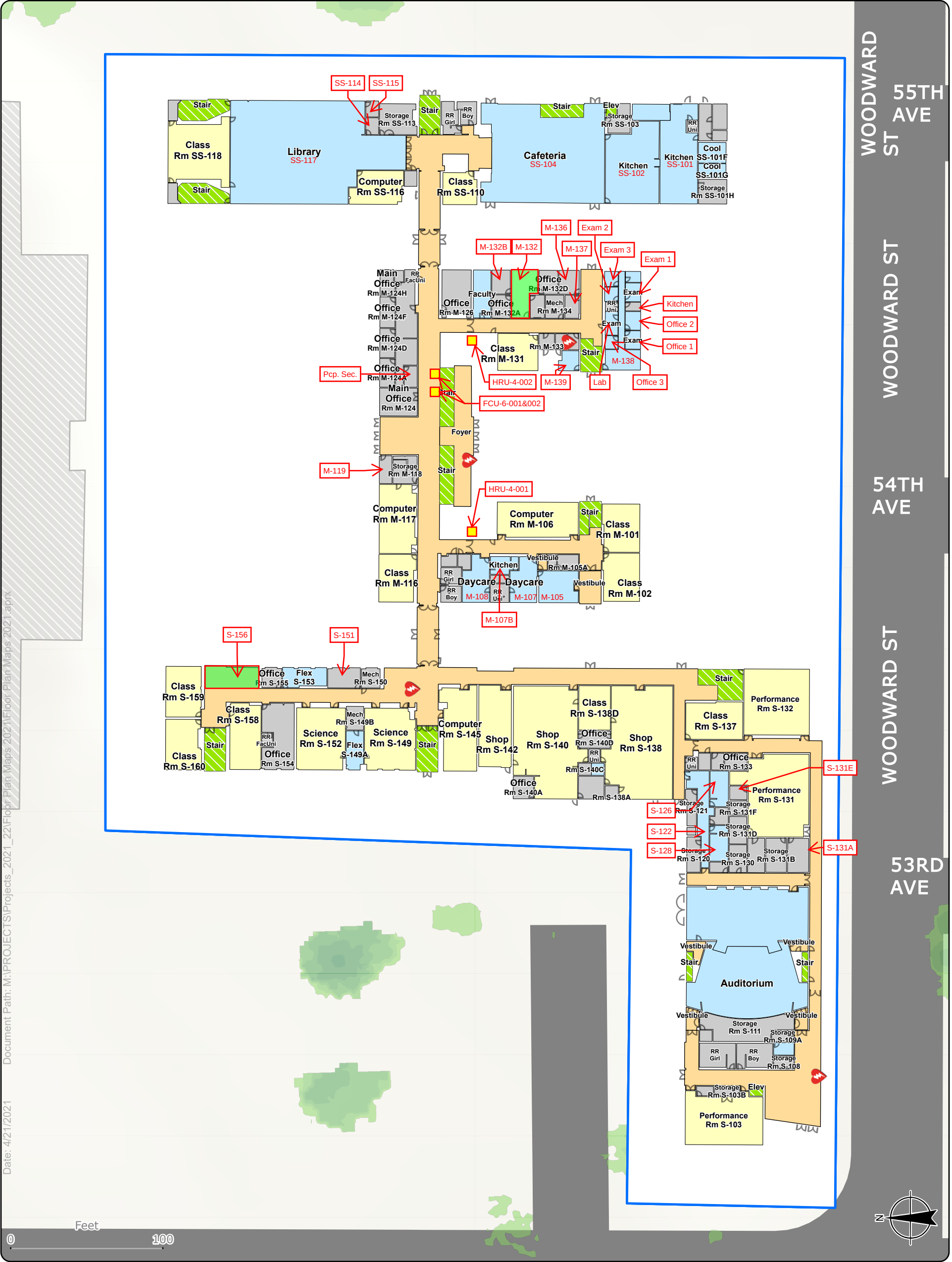
Automated Electronic Defibrillator

Doors



Campus Overview

FRANKLIN: First Floor



Space Use

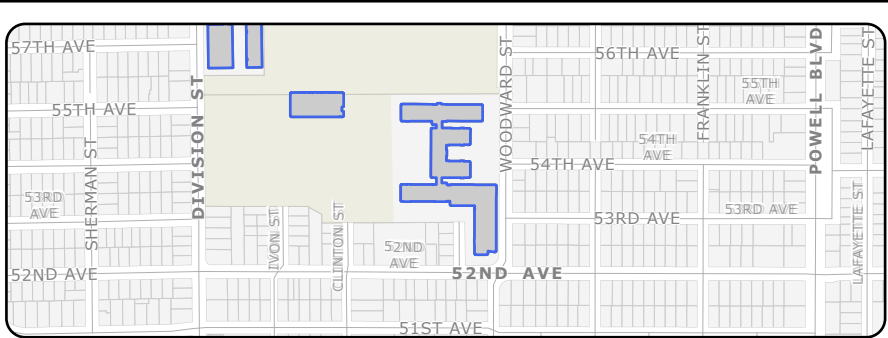
- Classrooms
- Office, Rest Rooms, Storage, Mechanical
- Special Purpose, Flex Classrooms
- Corridor, Foyer, Vestibule, Ramp
- Stairs/Elevator

School Grounds

- Campus Footprints
- Athletic Field
- Playground: Paved
- Playground: Unpaved
- Streets

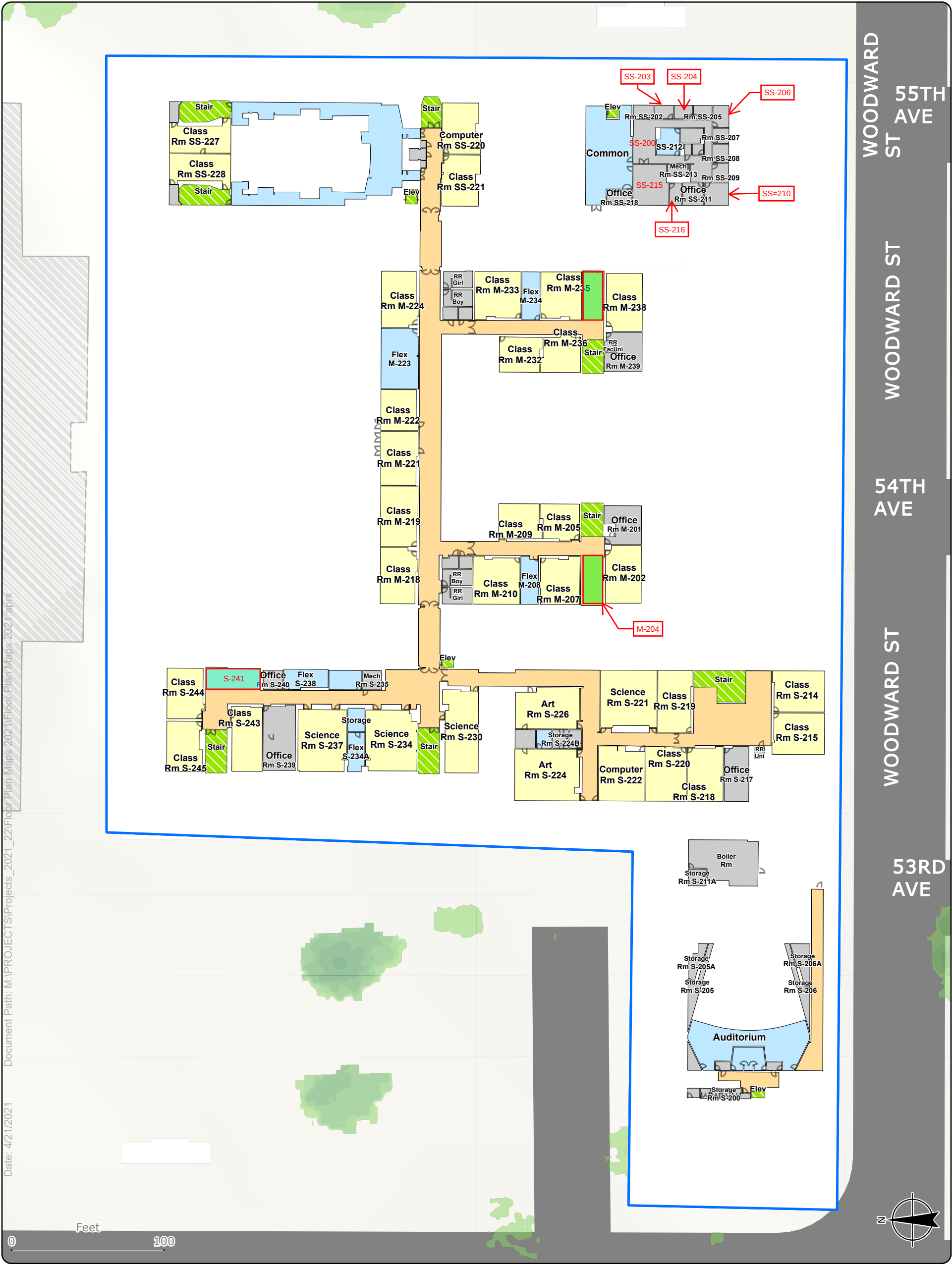
Automated Electronic Defibrillator

Doors



Campus Overview

FRANKLIN: Second Floor



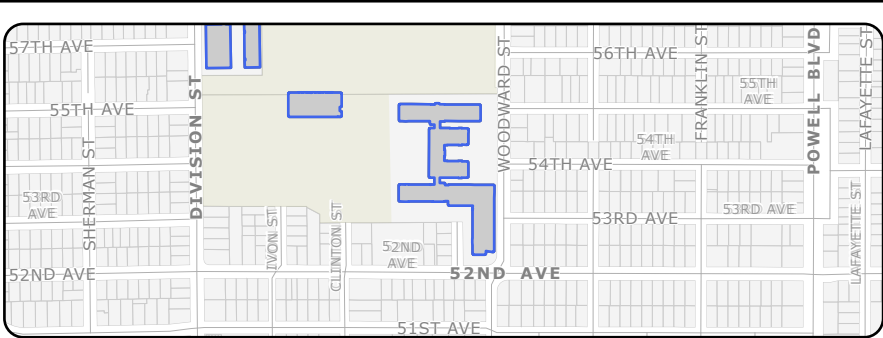
Space Use

- 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