

**UNIVERSITY OF ARIZONA MAIN CAMPUS  
CLASSROOM AIR CHANGE REVIEW  
(Ordered by Best ACH to Worst)**

Reference Row #	Classroom Data Received from UA			Analysis														Notes	
	Building	Descr	Room	Year of Original Construction	Room SF	Room Height (Ft)	Room Volume (CF)	Room Supply Air CFM	Total CFM/SF	Outside Air CFM/SF	AHU Name, DWG Year	AHU Total Supply Air CFM	AHU Outside Air CFM	AHU Outside Air %	Total Supply Air Changes/Hr [(Room Supply Air) x 60 / (Room Volume)]	Outside Air Changes/Hr [(Total Air Changes/Hr) x (AHU Outside Air %)]	Air Changes/Hr (Equivalent, Includes MERV 13 efficacy factor for recirculated air.)		Pro-Rated Occupancy Limit (Baseline: 6 Air Changes/Hr Min)
1	17	Student Union Memorial Center	252	2001	700	13	9,100	-	-	-	-	-	-	-	-	-	-	-	Kitchen. Nominally 0.27 CFM OSA/SF, per ASHRAE 62.1. Plans indicate "HVAC in this area by others"; no information on available plans.
2	17	Student Union Memorial Center	256	2001	834	13	10,842	-	-	-	-	-	-	-	-	-	-	-	Kitchen. Nominally 0.27 CFM OSA/SF, per ASHRAE 62.1. Plans indicate "HVAC in this area by others"; no information on available plans.
3	17	Student Union Memorial Center	264	2001	845	13	10,985	-	-	-	-	-	-	-	-	-	-	-	Kitchen. Nominally 0.27 CFM OSA/SF, per ASHRAE 62.1. HVAC not indicated for this area on available plans.
4	75	Architecture	A304X	1965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No room A304X found on Planning, Design & Construction floorplans or as-builts.
5	89.01	Mathematics Teaching Lab	120	1998	131	9	1,179	-	-	-	-	-	-	-	-	-	-	-	Labeled as receiving and trash room on as-builts. No airflow indicated on dwgs.
6	89.01	Mathematics Teaching Lab	124	1998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Room 124 not found on Planning, Design & Construction floorplans or as-builts.
7	77	Gould-Simpson	228A	1985	1,051	9	9,459	14,840	14.1	0.56	bert Unit & Fan	13,345	525	4%	94.1	0.5	80.1	100%	This space is served by (3) systems: Mixing boxes from AH-3, a recirculating Liebert unit that feeds the common underfloor plenum, and an above-ceiling recirculating fan, F-61. Total underfloor air volume to room is 10,800 CFM. Only the air from AH-3 (approximately 1920 CFM pro-rated from the total feeding the underfloor plenum) has outside air. The AH-3 values are represented under AHU total supply air and AHU OSA CFM columns.
8	11	John W. Harshbarger Building	105	1958	1,140	10.3	11,742	5,750	5.0	5.04	S-3, 1990	26,950	-	100%	29.4	29.4	29.4	100%	AHU serving this space is assumed based on room location. Room supply air is an assumption based on adjacent spaces in '90 asbuilts.
9	72	Civil Engineering	116	1965	1,060	13	13,780	7,700	7.3	0.73	Fan #10, 1964	39,650	-	10%	33.5	3.4	29.0	100%	Shown as room 123 on '64 plans. "FAN #10", OSA damper shown but no value given. Estimated 10% OSA.
10	94	Meinel Optical Sciences	450	1970	760	9	6,840	3,350	4.4	0.81	AHU-1 1987	21,060	3,870	18%	29.4	5.4	25.8	100%	
11	113	Henry Koffler Building	550	1990	1,160	20	23,200	9,770	8.4	8.42	AH-1, 1989	195,000	195,000	100%	25.3	25.3	25.3	100%	
12	158.02	Louise Foucar Marshall Bldg.	426	1996	120	9	1,080	500	4.2	0.51	AH-4, 2003	24,500	3,000	12%	27.8	3.4	24.1	100%	
13	11	John W. Harshbarger Building	334A	1958	390	8	3,120	1,440	3.7	0.37	1/08/03/005, 19	3,000	300	10%	27.7	2.8	24.0	100%	
14	12	Mines And Metallurgy	119A	1939	365	9.8	3,577	1,400	3.8	3.84	E.C., 1978	10,700	10,700	100%	23.5	23.5	23.5	100%	
15	72	Civil Engineering	318	1965	1,200	13	15,600	7,000	5.8	0.58	Fan #10, 1964	41,250	-	10%	26.9	2.7	23.3	100%	Shown as room 327 on '64 plans. "FAN #10" OSA damper shown but no value given. Estimated 10% OSA.
16	2	Art Building & Art Museum	326	1957	1,959	9	17,631	7,200	3.7	1.84	AHU-1, 1988	14,400	7,200	50%	24.5	12.3	22.7	100%	
17	94	Meinel Optical Sciences	454	1970	760	9	6,840	2,900	3.8	0.70	AHU-1 1987	21,060	3,870	18%	25.4	4.7	22.3	100%	
18	41	Chemistry	134	1936	1,517	10	15,170	6,280	4.1	1.03	AH, 1962	79,500	19,875	25%	24.8	6.2	22.0	100%	
19	11	John W. Harshbarger Building	316F	1958	280	9	2,520	1,000	3.6	1.43	S-2, 1990	43,420	17,405	40%	23.8	9.5	21.7	100%	AHU serving this space is assumed based on room location. Room supply air is an assumption based on adjacent spaces in '90 asbuilts.
20	104	Electrical & Computer Engr	331	1986	785	9	7,065	2,865	3.6	0.31	AHU-3, 1987	16,000	1,360	9%	24.3	2.1	21.0	100%	
21	44	Chemical Sciences Building	209	2006	911	9	8,199	3,240	3.6	0.40	AHU-1-4, 2004	234,000	26,392	11%	23.7	2.7	20.6	100%	Room name changed; 205 on as-builts. OSA CFM is not indicated on drawings. OSA is a calculated assumption, using ASHRAE 62.1.
22	27	Social Sciences	332	1950	298	9	2,682	1,000	3.4	0.34	S AHU, 1949	-	-	10%	22.4	2.2	19.4	100%	No AHU info scheduled; assume 10% OSA.
23	203	Nursing	470	1967	1,590	9	14,310	5,230	3.3	0.33	AHU-3, 2004	33,000	-	10%	21.9	2.2	19.0	100%	No OSA volume specified; assumed 10% OSA.
24	108	McClelland Hall	214	1990	1,450	12.5	18,125	6,460	4.5	0.23	SF-182, 1989	76,000	4,000	5%	21.4	1.1	18.3	100%	
25	41	Chemistry	126	1936	650	9	5,850	1,960	3.0	0.75	AH, 1962	79,500	19,875	25%	20.1	5.0	17.8	100%	
26	107	Marley	218	1990	950	10	9,500	2,790	2.9	2.94	AHU-1, 1990	105,000	105,000	100%	17.6	17.6	17.6	100%	
27	75	Architecture	A304	1965	170	10.1	1,717	580	3.4	0.34	AHU-12, 1999	2,490	-	10%	20.3	2.0	17.5	100%	Assuming A304 is just room 304. Changed from 306 on as-builts. OSA damper is shown but CFM is not scheduled; assuming 10%.
28	216	Health Sciences Innov Bldg	322	2019	550	11.5	6,325	1,990	3.6	1.45	AHU-3, 2017	50,000	20,000	40%	18.9	7.6	17.2	100%	
29	216	Health Sciences Innov Bldg	323	2019	550	11.5	6,325	1,990	3.6	1.45	AHU-3, 2017	50,000	20,000	40%	18.9	7.6	17.2	100%	
30	222	Leon Levy Cancer Center	3963A	1986	102	10	1,020	300	2.9	2.42	AH-1, 1999	95,290	78,320	82%	17.6	14.5	17.2	100%	This room is labeled as an office.
31	69	Education	333	1964	912	9	8,208	2,660	2.9	0.29	AC-1, 1966	-	-	10%	19.4	1.9	16.8	100%	No AHU information provided; assuming 10% OSA.
32	104	Electrical & Computer Engr	213	1986	12,390	20	247,800	74,550	6.0	2.91	&2, AHU-1&2, 1	74,550	36,000	48%	18.1	8.7	16.7	100%	
33	202	Roy P. Drachman Hall	8307C	2006	305	9.33	2,846	900	3.0	0.49	AH-5, 2004	18,000	3,000	17%	19.0	3.2	16.6	100%	
34	197	Visual Arts Grad Research Lab	119	2007	715	9	6,435	2,000	2.8	0.70	AC-3, 2007	2,000	500	25%	18.6	4.7	16.6	100%	
35	43	Biological Sciences East	223	1957	975	9.75	9,506	3,000	3.1	0.31	No Tag, 1956	-	-	10%	18.9	1.9	16.4	100%	The original building drawings from 1957 do not provide schedules for the AHU or CFM for diffusers. Assume 10% OSA, SA estimated based on VAVs with CFM listed serving similar rooms.
36	41	Chemistry	111	1936	2,325	10	23,250	7,065	3.0	0.76	AH, 1962	79,500	19,875	25%	18.2	4.6	16.2	100%	
37	81	Physics-Atmospheric Sciences	216	1960	515	9	4,635	1,415	2.7	0.56	AHU-3, 1959	10,535	2,165	21%	18.3	3.8	16.1	100%	No AHU schedules in asbuilts; Added up airflows on plan.
38	94	Meinel Optical Sciences	438	1970	760	9	6,840	2,090	2.8	0.51	AHU-1 1987	21,060	3,870	18%	18.3	3.4	16.1	100%	
39	3.01	Drama Addition	7	1992	920	8.8	8,096	2,160	2.3	2.35	MAU-2, 1991	22,000	22,000	100%	16.0	16.0	16.0	100%	
40	207	Pharmacy	325	1980	1,747	9	15,723	4,800	2.7	0.27	-	-	-	10%	18.3	1.8	15.8	100%	North penthouse plan (M-4) is missing from pdf which would clarify what AHU this room is served by. Assuming this building is 10% OSA.
41	27	Social Sciences	307	1950	256	9	2,304	700	2.7	0.27	N AHU, 1949	-	-	10%	18.2	1.8	15.8	100%	No AHU info scheduled; assume 10% OSA.
42	95	Highland Commons	8116	2004	760	9	6,840	2,000	2.6	0.82	AHU-1, 2002	24,000	7,500	31%	17.5	5.5	15.7	100%	
43	158.02	Louise Foucar Marshall Bldg.	211	1996	592	9	5,328	1,600	2.7	0.33	AH-2, 2003	24,500	3,000	12%	18.0	2.2	15.6	100%	
44	119	Aerospace & Mechanical Engr.	5314	1997	1,610	9	14,490	4,120	2.6	0.66	AHU-4, 1997	33,250	8,570	26%	17.1	4.4	15.2	100%	
45	68	Psychology	323	1968	750	9.67	7,253	2,085	2.8	0.28	AC-1, 1966	82,940	8,300	10%	17.2	1.7	14.9	100%	No AHU schedule; total airflow acquired by adding up mixing box schedule. No OSA quantity called out, so assuming 10%.
46	27	Social Sciences	311	1950	370	9	3,330	950	2.6	0.26	N AHU, 1949	-	-	10%	17.1	1.7	14.8	100%	No AHU info scheduled; assume 10% OSA.
47	32	South Hall	103	1912	502	8.33	4,182	1,200	2.4	0.12	FC 1-3, 1986	1,200	60	5%	17.2	0.9	14.8	100%	
48	158.02	Louise Foucar Marshall Bldg.	212	1996	628	9	5,652	1,600	2.5	0.31	AH-2, 2003	24,500	3,000	12%	17.0	2.1	14.7	100%	
49	119	Aerospace & Mechanical Engr.	5336	1997	595	9	5,355	1,480	2.5	0.64	AHU-4, 1997	33,250	8,570	26%	16.6	4.3	14.7	100%	
50	92	Gerard P. Kuiper Space Sci.	351	1966	815	9	7,335	2,082	2.6	0.26	-	77,842	-	10%	17.0	1.7	14.7	100%	AHU name and OSA intake is not listed; assume 10% OSA.
51	216	Health Sciences Innov Bldg	442	2019	550	13.75	7,563	1,990	3.6	1.45	AHU-3, 2017	50,000	20,000	40%	15.8	6.3	14.4	100%	
52	216	Health Sciences Innov Bldg	443	2019	550	13.75	7,563	1,990	3.6	1.45	AHU-3, 2017	50,000	20,000	40%	15.8	6.3	14.4	100%	
53	216	Health Sciences Innov Bldg	444	2019	550	13.75	7,563	1,990	3.6	1.45	AHU-3, 2017	50,000	20,000	40%	15.8	6.3	14.4	100%	

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	Building	Descr	Room	Year of Original Construction	Room SF	Room Height (Ft)	Room Volume (CF)	Room Supply Air CFM	Total CFM/SF	Outside Air CFM/SF	AHU Name, DWG Year	AHU Total Supply Air CFM	AHU Outside Air CFM	AHU Air %	Total Supply Air Changes/Hr [(Room Supply Air) x 60 / (Room Volume)]	Outside Air Changes/Hr [(Total Air Changes/Hr) x (AHU Outside Air %)]	Air Changes/Hr (Equivalent, Includes MERV 13 efficacy factor for recirculated air)		Pro-Rated Occupancy Limit (Baseline: 6 Air Changes/Hr Min)
54	93	Ina A. Gittings Building	124	1964	3,640	12	43,680	12,000	3.3	0.33	AC-1, 1963	97,472	-	10%	16.5	1.6	14.3	100%	No OSA information on drawings; estimated at 10% based on common OSA % for typical facilities.
55	158.02	Louise Foucar Marshall Bldg.	342	1996	809	9	7,281	1,980	2.4	0.30	AH-3, 2003	24,500	3,000	12%	16.3	2.0	14.2	100%	
56	222	Leon Levy Cancer Center	4978	1986	450	10	4,500	1,090	2.4	1.99	AH-1, 1999	95,290	78,320	82%	14.5	11.9	14.1	100%	
57	43	Biological Sciences East	100	1957	2,300	11.5	26,450	7,200	3.1	0.31	No Tag, 1956	7,200	-	10%	16.3	1.6	14.1	100%	Room height varies, estimated average. The original building drawings from 1957 do not provide AHU schedules. Assume 10% based on a similar building/room type/date.
58	113	Henry Koffler Building	320	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
59	113	Henry Koffler Building	321	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
60	113	Henry Koffler Building	330	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
61	113	Henry Koffler Building	331	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
62	113	Henry Koffler Building	350	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
63	113	Henry Koffler Building	351	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
64	113	Henry Koffler Building	360	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
65	113	Henry Koffler Building	361	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
66	113	Henry Koffler Building	521	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
67	113	Henry Koffler Building	530	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
68	113	Henry Koffler Building	531	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
69	113	Henry Koffler Building	551	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
70	113	Henry Koffler Building	561	1990	1,280	20	25,600	6,000	4.7	4.69	AH-1, 1989	195,000	195,000	100%	14.1	14.1	14.1	100%	
71	113	Henry Koffler Building	421	1990	1,290	20	25,800	6,000	4.7	4.65	AH-1, 1989	195,000	195,000	100%	14.0	14.0	14.0	100%	
72	113	Henry Koffler Building	431	1990	1,290	20	25,800	6,000	4.7	4.65	AH-1, 1989	195,000	195,000	100%	14.0	14.0	14.0	100%	
73	113	Henry Koffler Building	451	1990	1,290	20	25,800	6,000	4.7	4.65	AH-1, 1989	195,000	195,000	100%	14.0	14.0	14.0	100%	
74	113	Henry Koffler Building	461	1990	1,290	20	25,800	6,000	4.7	4.65	AH-1, 1989	195,000	195,000	100%	14.0	14.0	14.0	100%	
75	137	Env and Nat Resources Phase 2	N592	2015	1,613	10	16,130	4,010	2.5	1.26	AHU-1, 2013	30,500	15,500	51%	14.9	7.6	13.8	100%	
76	30.01	Emil W. Haury Anth. Bldg.	129	1962	1,388	9	12,492	3,300	2.4	0.24	AHU, 1960	35,000	-	10%	15.9	1.6	13.7	100%	No OSA volume specified; assumed 10% OSA.
77	88	Biological Sciences West	208	1967	1,142	9	10,278	2,670	2.3	0.43	AHU-1, 1968	40,800	7,500	18%	15.6	2.9	13.7	100%	Drawings don't indicate CFM quantity to either of (2) AHU's, but total of 15,000 CFM indicated at OSA louvers. Assumed CFM is divided evenly.
78	222	Leon Levy Cancer Center	3978	1986	450	10	4,500	1,040	2.3	1.90	AH-1, 1999	95,290	78,320	82%	13.9	11.4	13.5	100%	
79	119	Aerospace & Mechanical Engr.	S202	1997	3,400	9	30,600	7,180	2.1	1.47	AHU-3, 1997	7,180	5,000	70%	14.1	9.8	13.4	100%	
80	43	Biological Sciences East	225	1957	995	9.75	9,701	2,500	2.5	0.25	No Tag, 1956	-	-	10%	15.5	1.5	13.4	100%	The original building drawings from 1957 do not provide schedules for the AHU or CFM for diffusers. Assume 10% OSA, SA estimated based on VAVs with CFM listed serving similar rooms.
81	71	Speech And Hearing Sciences	205	1964	1,370	10	13,700	3,520	2.6	0.26	AH, 1964	-	-	10%	15.4	1.5	13.3	100%	No AHU information available; assuming 10% OSA.
82	93	Ina A. Gittings Building	130	1964	3,915	12	46,980	12,000	3.1	0.31	AC-1, 1963	97,472	-	10%	15.3	1.5	13.3	100%	No OSA information on drawings; estimated at 10% based on common OSA % for typical facilities.
83	119	Aerospace & Mechanical Engr.	S402	1997	1,135	9	10,215	2,500	2.2	0.57	AHU-4, 1997	33,250	8,570	26%	14.7	3.8	13.0	100%	
84	158.02	Louise Foucar Marshall Bldg.	284	1996	333	9	2,997	750	2.3	0.28	AH-2, 2003	24,500	3,000	12%	15.0	1.8	13.0	100%	
85	43	Biological Sciences East	124	1957	830	9.75	8,093	2,000	2.4	0.24	No Tag, 1956	-	-	10%	14.8	1.5	12.8	100%	The original building drawings from 1957 do not provide schedules for the AHU or CFM for diffusers. Assume 10% OSA, SA estimated based on VAVs with CFM listed serving similar rooms.
86	78	McClelland Park	210	2008	1,435	16	22,960	5,560	3.9	0.82	AH-1, 2008	82,000	17,380	21%	14.5	3.1	12.8	100%	
87	41	Chemistry	209	1936	1,095	9	9,855	2,355	2.2	0.54	AH, 1962	79,500	19,875	25%	14.3	3.6	12.7	100%	
88	119	Aerospace & Mechanical Engr.	N231	1997	1,890	9	17,010	4,000	2.1	0.71	AHU-1, 1997	85,000	28,550	34%	14.1	4.7	12.7	100%	
89	88	Biological Sciences West	301	1967	2,697	9.5	25,622	6,150	2.3	0.42	AHU-1, 1968	40,800	7,500	18%	14.4	2.6	12.6	100%	Drawings don't indicate CFM quantity to either of (2) AHU's, but total of 15,000 CFM indicated at OSA louvers. Assumed CFM is divided evenly.
90	71	Speech And Hearing Sciences	201	1964	483	10	4,830	1,165	2.4	0.24	AH, 1964	-	-	10%	14.5	1.4	12.5	100%	No AHU information available; assuming 10% OSA.
91	17	Student Union Memorial Center	250C	2001	1,060	13	13,780	2,870	2.7	2.71	AHU-41, 2001	2,870	2,870	100%	12.5	12.5	12.5	100%	Kitchen. Nominally 0.27 CFM OSA/SF, per ASHRAE 62.1.
92	75	Architecture	200	1965	1,055	12	12,660	3,000	2.8	0.28	HP-1, 1988	3,000	300	10%	14.2	1.4	12.3	100%	Assuming this to be 200W, as shown on plans.
93	177	Rogers Rountree Hall	114	1928	380	9	3,420	800	2.1	0.23	HP-2, 1999	1,600	175	11%	14.0	1.5	12.2	100%	
94	128	ML King Jr. Student Center	100	1955	1,245	8	9,960	2,300	1.8	0.18	No Tag, No Date	2,850	-	10%	13.9	1.4	12.0	100%	This room is served by a small unit. Drawings do not have info about this unit. Assumed 10% OSA.
95	197	Visual Arts Grad Research Lab	109	2007	2,485	9	22,365	5,000	2.0	0.48	AC-6&10, 2007	5,000	1,200	24%	13.4	3.2	11.9	100%	
96	76	Richard P. Harvill Building	150	1979	4,424	11	48,664	10,675	2.4	0.49	CL-5, 1979	11,000	2,250	20%	13.2	2.7	11.6	100%	Ceiling height varies.
97	99	Stevie Eller Dance Theater	103	2003	275	8	2,200	490	1.8	0.20	AH-3, 2001	21,800	2,500	11%	13.4	1.5	11.6	100%	
98	76	Richard P. Harvill Building	402	1979	875	11	9,625	2,125	2.4	0.34	CL-4, 1979	20,165	2,800	14%	13.2	1.8	11.5	100%	Room number changed; 407 on as-builts.
99	25	Communication	206	1909	800	9	7,200	1,600	2.0	0.20	W AH, 1957	-	-	10%	13.3	1.3	11.5	100%	No AHU info scheduled; assume 10% OSA.
100	106	Life Sciences South	331	1990	115	9	1,035	230	2.0	0.20	SF-1-1,2,3, 1988	198,900	19,890	10%	13.3	1.3	11.5	100%	This room number is a small office. There was no information about the OSA intake on the drawings, so it was approximated at 10% based on similar building/room type/year.
101	76	Richard P. Harvill Building	415	1979	987	11	10,857	2,390	2.4	0.34	CL-4, 1979	20,165	2,800	14%	13.2	1.8	11.5	100%	Room number changed; 401 on as-builts.
102	11	John W. Harshbarger Building	206	1958	1,030	9	9,270	1,950	1.9	0.76	S-2, 1990	43,420	17,405	40%	12.6	5.1	11.5	100%	
103	77	Gould-Simpson	404	1985	264	9.5	2,508	500	1.9	1.31	SF-008, 1988	11,400	7,870	69%	12.0	8.3	11.4	100%	
104	92	Gerard P. Kuiper Space Sci.	308	1966	2,000	10.8	21,600	4,620	2.3	0.50	AH 2-2, 1993	28,500	6,125	21%	12.8	2.8	11.3	100%	Ceiling elevation varies. Avg ceiling elevation was used.
105	119	Aerospace & Mechanical Engr.	S212	1997	1,680	9	15,120	3,200	1.9	0.49	AHU-4, 1997	33,250	8,570	26%	12.7	3.3	11.3	100%	
106	25	Communication	207	1909	360	9	3,240	700	1.9	0.19	E AH, 1957	-	-	10%	13.0	1.3	11.2	100%	Labeled as office. No AHU info scheduled; assume 10% OSA
107	4	Music	114A	1957	895	10.25	9,174	1,900	2.1	0.72	AHU-7, 1990	20,700	7,000	34%	12.4	4.2	11.2	100%	
108	65	Steward Observatory	204	1921	788	9	7,092	1,500	1.9	0.38	HU65-105B-2, 20	10,000	2,000	20%	12.7	2.5	11.2	100%	
109	75	Architecture	103	1965	1,490	11.5	17,135	3,565	2.4	0.70	AHU-4, 1964	4,080	1,200	29%	12.5	3.7	11.2	100%	Room height varies: 12'-5" at the front, 10'-1.5" at the back.
110	33	Saguaro Hall	202	1959	1,426	10	14,260	3,000											

**UNIVERSITY OF ARIZONA MAIN CAMPUS  
CLASSROOM AIR CHANGE REVIEW  
(Ordered by Best ACH to Worst)**

Reference Row #	Classroom Data Received from UA			Analysis															
	Building	Descr	Room	Year of Original Construction	Room SF	Room Height (Ft)	Room Volume (CF)	Room Supply Air CFM	Total CFM/SF	Outside Air CFM/SF	AHU Name, DWG Year	AHU Total Supply Air CFM	AHU Outside Air CFM	AHU Outside Air %	Total Supply Air Changes/Hr (Room Supply Air) x 60 / (Room Volume)	Outside Air Changes/Hr (Total Air Changes/Hr x [AHU Outside Air %])	Air Changes/Hr (Equivalent, Includes MERV 13 efficacy factor for recirculated air)	Pro-Rated Occupancy Limit (Baseline: 6 Air Changes/Hr Min)	Notes
115	119	Aerospace & Mechanical Engr.	5436	1997	815	9	7,335	1,480	1.8	0.47	AHU-4, 1997	33,250	8,570	26%	12.1	3.1	10.8	100%	No OSA information on drawings; estimated at 10% based on common OSA % for typical facilities.
116	93	Ina A. Gittings Building	121H	1964	585	9	5,265	1,085	1.9	0.19	AC-1, 1963	97,472	-	10%	12.4	1.2	10.7	100%	No OSA information on drawings; estimated at 10% based on common OSA % for typical facilities.
117	25	Communication	113	1909	750	9	6,750	1,380	1.8	0.18	EAH, 1957	-	-	10%	12.3	1.2	10.6	100%	No AHU info scheduled; assume 10% OSA.
118	93	Ina A. Gittings Building	201	1964	2,895	9	26,055	5,300	1.8	0.18	AC-1, 1963	97,472	-	10%	12.2	1.2	10.6	100%	No OSA information on drawings; estimated at 10% based on common OSA % for typical facilities.
119	113	Henry Koffler Building	209	1990	1,065	9	9,585	1,680	1.6	1.58	AH-1, 1989	195,000	195,000	100%	10.5	10.5	10.5	100%	
120	27	Social Sciences	224	1950	1,074	9	9,666	1,950	1.8	0.18	S AHU, 1949	-	-	10%	12.1	1.2	10.5	100%	Room area estimated due to this room being larger originally and later subdivided. Assumed airflows remained the same. No AHU info scheduled; assume 10% OSA.
121	88	Biological Sciences West	212	1967	541	9	4,869	960	1.8	0.33	AHU-1, 1968	40,800	7,500	18%	11.8	2.2	10.4	100%	Drawings don't indicate CFM quantity to either of (2) AHUs, but total of 15,000 CFM indicated at OSA louvers. Assumed CFM is divided evenly.
122	76	Richard P. Harvill Building	332C	1979	515	10	5,150	1,020	2.0	0.26	CL-3, 1979	21,670	2,870	13%	11.9	1.6	10.3	100%	Room number changed; 320 on as-builts.
123	76	Richard P. Harvill Building	318	1979	975	11	10,725	2,115	2.2	0.29	CL-3, 1979	21,670	2,870	13%	11.8	1.6	10.3	100%	Room number changed; 301 on as-builts. Ceiling height varies.
124	30.01	Emil W. Haurly Anth. Bldg.	216	1962	1,241	9	11,169	2,200	1.8	0.18	AHU, 1960	35,000	-	10%	11.8	1.2	10.2	100%	No OSA volume specified; assumed 10% OSA.
125	68	Psychology	250	1968	274	8.67	2,376	465	1.7	0.17	AC-1, 1966	82,940	8,300	10%	11.7	1.2	10.2	100%	No AHU schedule; total airflow acquired by adding up mixing box schedule. No OSA quantity called out, so assuming 10%.
126	92	Gerard P. Kulpier Space Sci.	301	1966	300	9	2,700	528	1.8	0.18	-	77,842	-	10%	11.7	1.2	10.1	100%	AHU name and OSA intake is not listed; assume 10% OSA.
127	76	Richard P. Harvill Building	305	1979	1,380	11	15,180	2,950	2.1	0.28	CL-3, 1979	21,670	2,870	13%	11.7	1.5	10.1	100%	Room number changed; 303 on as-builts.
128	94	Meinel Optical Sciences	422	1970	635	9	5,715	1,100	1.7	0.32	AHU-1, 1987	21,060	3,870	18%	11.5	2.1	10.1	100%	
129	76	Richard P. Harvill Building	404	1979	1,182	11	13,002	2,500	2.1	0.29	CL-4, 1979	20,165	2,800	14%	11.5	1.6	10.0	100%	
130	76	Richard P. Harvill Building	302	1979	1,457	11.5	16,756	3,215	2.2	0.29	CL-3, 1979	21,670	2,870	13%	11.5	1.5	10.0	100%	Room number changed; 303 on as-builts.
131	113	Henry Koffler Building	218	1990	1,484	12	17,808	2,970	2.0	2.00	AH-1, 1989	195,000	195,000	100%	10.0	10.0	10.0	100%	
132	158.02	Louise Foucar Marshall Bldg.	222	1996	579	9	5,211	1,000	1.7	0.21	AH-2, 2003	24,500	3,000	12%	11.5	1.4	10.0	100%	
133	71	Speech And Hearing Sciences	203	1964	550	10	5,500	1,050	1.9	0.19	AH, 1964	-	-	10%	11.5	1.1	9.9	100%	1964 plans show this single room as multiple restrooms. No plans available that show renovation to classroom. Estimated area and airflows. No AHU information available; assume 10% OSA.
134	3.01	Drama Addition	110	1992	4,460	19	84,740	13,950	3.1	3.13	MAU-2, 1991	22,000	22,000	100%	9.9	9.9	9.9	100%	Ceiling height varies; height averaged.
135	65	Steward Observatory	208	1921	802	9	7,218	1,350	1.7	0.34	HU65-105B-2, 20	10,000	2,000	20%	11.2	2.2	9.9	100%	
136	11	John W. Harshbarger Building	1	1958	1,160	11	12,760	2,100	1.8	1.81	S-3, 1990	26,950	-	100%	9.9	9.9	9.9	100%	AHU serving this space is assumed based on room location. Room supply air is an assumption based on adjacent spaces in '90 asbuilts.
137	69	Education	331	1964	670	9	6,030	1,140	1.7	0.17	AC-1, 1966	-	-	10%	11.3	1.1	9.8	100%	No AHU information provided; assuming 10% OSA. Estimated floor area due to presumed renovation to room since 1967.
138	76	Richard P. Harvill Building	204	1979	1,475	11.5	16,963	3,180	2.2	0.29	CL-2, 1979	19,645	2,630	13%	11.2	1.5	9.8	100%	Room number changed; 203 on as-builts.
139	81	Physics-Atmospheric Sciences	201	1960	1,927	14	26,978	4,800	2.5	0.99	AHU-2, 1959	4,800	1,900	40%	10.7	4.2	9.7	100%	
140	88	Biological Sciences West	210	1967	670	9	6,030	1,110	1.7	0.30	AHU-1, 1968	40,800	7,500	18%	11.0	2.0	9.7	100%	Drawings don't indicate CFM quantity to either of (2) AHUs, but total of 15,000 CFM indicated at OSA louvers. Assumed CFM is divided evenly.
141	20	Engineering	301	1919	714	9	6,426	1,200	1.7	0.17	AHU-6&7, 1958	9,170	-	10%	11.2	1.1	9.7	100%	No AHU info scheduled; assume 10% OSA.
142	158.02	Louise Foucar Marshall Bldg.	221	1996	542	9	4,878	900	1.7	0.20	AH-2, 2003	24,500	3,000	12%	11.1	1.4	9.6	100%	
143	113	Henry Koffler Building	112	1990	1,180	16	18,880	3,000	2.5	2.54	AH-1, 1989	195,000	195,000	100%	9.5	9.5	9.5	100%	
144	32	South Hall	110	1912	656	8.33	5,464	1,000	1.5	0.09	FC-10, 1986	1,000	60	6%	11.0	0.7	9.4	100%	
145	67	Modern Languages	411	1966	867	9	7,803	1,415	1.6	0.16	AC-1, 1965	-	-	10%	10.9	1.1	9.4	100%	No AHU information scheduled; Assumed 10% OSA.
146	11	John W. Harshbarger Building	1G	1958	355	9	3,195	500	1.4	1.41	S-3, 1990	26,950	-	100%	9.4	9.4	9.4	100%	
147	78	McClelland Park	206	2008	592	10	5,920	1,050	1.8	0.38	AH-1, 2008	82,000	17,380	21%	10.6	2.3	9.4	100%	
148	76	Richard P. Harvill Building	130	1979	745	10	7,450	1,320	1.8	0.30	CL-1, 1979	15,940	2,680	17%	10.6	1.8	9.3	100%	Room number changed; 126 on as-builts.
149	221	Life Sciences North	452	1990	435	9	3,915	600	1.4	1.38	AH-1, 1988	152,500	152,500	100%	9.2	9.2	9.2	100%	
150	221	Life Sciences North	652	1990	435	9	3,915	600	1.4	1.38	AH-1, 1988	152,500	152,500	100%	9.2	9.2	9.2	100%	
151	69	Education	349	1964	910	9	8,190	1,450	1.6	0.16	AC-1, 1966	-	-	10%	10.6	1.1	9.2	100%	No AHU information provided; assuming 10% OSA.
152	113	Henry Koffler Building	520	1990	1,280	20	25,600	3,910	3.1	3.05	AH-1, 1989	195,000	195,000	100%	9.2	9.2	9.2	100%	
153	113	Henry Koffler Building	102	1990	1,229	16	19,664	3,000	2.4	2.44	AH-1, 1989	195,000	195,000	100%	9.2	9.2	9.2	100%	
154	88	Biological Sciences West	257	1967	385	9	3,465	600	1.6	0.30	AHU-1, 1970	36,295	7,000	19%	10.4	2.0	9.1	100%	
155	38	Shantz	338	1962	955	10	9,550	1,680	1.8	0.18	AC-4, 1960	-	-	10%	10.6	1.1	9.1	100%	No AHU schedule; 10% OSA assumed.
156	76	Richard P. Harvill Building	319	1979	632	11	6,952	1,215	1.9	0.25	CL-3, 1979	21,670	2,870	13%	10.5	1.4	9.1	100%	Room number changed; 301 on as-builts. Ceiling height varies.
157	69	Education	308	1964	961	9	8,649	1,520	1.6	0.16	AC-1, 1966	-	-	10%	10.5	1.1	9.1	100%	No AHU information provided; assuming 10% OSA.
158	67	Modern Languages	410	1966	863	9	7,767	1,360	1.6	0.16	AC-1, 1965	-	-	10%	10.5	1.1	9.1	100%	No AHU information scheduled; Assumed 10% OSA.
159	23	Cesar E Chavez Building	306	1952	420	9.8	4,116	720	1.7	0.17	AH-1, 1951	-	-	10%	10.5	1.0	9.1	100%	No AHU info scheduled; assume 10% OSA.
160	76	Richard P. Harvill Building	102	1979	1,133	11.5	13,030	2,250	2.0	0.33	CL-1, 1979	15,940	2,680	17%	10.4	1.7	9.1	100%	Room number changed; 107 on as-builts.
161	113	Henry Koffler Building	108	1990	1,180	16	18,880	2,850	2.4	2.42	AH-1, 1989	195,000	195,000	100%	9.1	9.1	9.1	100%	
162	69	Education	353	1964	1,872	9	16,848	2,940	1.6	0.16	AC-1, 1966	-	-	10%	10.5	1.0	9.1	100%	No AHU information provided; assuming 10% OSA. This room is combination of two rooms from 1967 plans; assumed airflow stayed the same.
163	67	Modern Languages	210	1966	866	9	7,794	1,360	1.6	0.16	AC-1, 1965	-	-	10%	10.5	1.0	9.1	100%	No AHU information scheduled; Assumed 10% OSA.
164	67	Modern Languages	201	1966	406	9	3,654	635	1.6	0.16	AC-1, 1965	-	-	10%	10.4	1.0	9.0	100%	No AHU information scheduled; Assumed 10% OSA.
165	69	Education	351	1964	1,268	9	11,412	1,980	1.6	0.16	AC-1, 1966	-	-	10%	10.4	1.0	9.0	100%	No AHU information provided; assuming 10% OSA.
166	67	Modern Languages	310	1966	873	9	7,857	1,360	1.6	0.16	AC-1, 1965	-	-	10%	10.4	1.0	9.0	100%	No AHU information scheduled; Assumed 10% OSA.
167	27	Social Sciences	114	1950	610	9	5,490	950	1.6	0.16	S AHU, 1949	-	-	10%	10.4	1.0	9.0	100%	No AHU info scheduled; assume 10% OSA.
168	75	Architecture	302	1965	3,260	10.1	32,926	5,680	1.7	0.17	AHU-11, 1999	7,470	-	10%	10.4	1.0	9.0	100%	OSA damper is shown but CFM is not scheduled; assuming 10%.
169	23	Cesar E Chavez Building	400	1952	1,067	9.8	10,457	1,800	1.7	0.17	AH-1, 1951	-	-	10%	10.3	1.0	8.9	100%	No AHU info scheduled; assume 10% OSA.
170	75	Architecture	204C	1965	699	10.1	7,060	1,200	1.7	0.29	AHU-8, 1964	5,600	930	17%	10.2	1.7	8.9	100%	
171	23	Cesar E Chavez Building	301	1952	1,013	9.8	9,927	1,700	1.7	0.17	AH-1, 1951	-	-	10%	10.3	1.0	8.9	100%	No AHU info scheduled; assume 10% OSA.
172																			

**UNIVERSITY OF ARIZONA MAIN CAMPUS  
CLASSROOM AIR CHANGE REVIEW  
(Ordered by Best ACH to Worst)**

Classroom Data Received from UA			Analysis															
Building	Descr	Room	Year of Original Construction	Room SF	Room Height (Ft)	Room Volume (CF)	Room Supply Air CFM	Total CFM/SF	Outside Air CFM/SF	AHU Name, DWG Year	AHU Total Supply Air CFM	AHU Outside Air CFM	AHU Outside Air %	Total Supply Air Changes/Hr (Room Supply Air) x 60 / (Room Volume)	Outside Air Changes/Hr (Total Air Changes/Hr x [AHU Outside Air %])	Air Changes/Hr (Equivalent, Includes MERV 13 efficacy factor for recirculated air)	Pro-Rated Occupancy Limit (Baseline: 6 Air Changes/Hr Min)	Notes
176	Richard P. Harvill Building	315	1979	450	10	4,500	760	1.7	0.17	OF-3, 1979	7,665	750	10%	10.1	1.0	8.8	100%	Room number changed; 314 on as-builts.
177	Saguaro Hall	114	1959	838	10	8,380	1,342	1.6	0.66	No tag, 1991	1,462	600	41%	9.6	3.9	8.8	100%	No tag for the AHU given.
176	Richard P. Harvill Building	115	1979	1,077	11.5	12,386	2,065	1.9	0.32	CL-1, 1979	15,940	2,680	17%	10.0	1.7	8.8	100%	Room number changed; 101 on as-builts.
179	Meinel Optical Sciences	305	1970	935	11.2	10,472	1,770	1.9	0.14	AHU-3, 2008	6,700	500	7%	10.1	0.8	8.7	100%	Ceiling elevation varies. Avg ceiling elevation was used.
180	Cesar E Chavez Building	405	1952	1,031	9.8	10,104	1,700	1.6	0.16	AH-1, 1951	-	-	10%	10.1	1.0	8.7	100%	No AHU info scheduled; assume 10% OSA.
4	Music	106	1957	1,200	10.25	12,300	2,000	1.7	0.50	-	-	-	30%	9.8	2.9	8.7	100%	There is no HVAC for room 106 on the drawings in the 1990 set or the original 1956 set. Assumed 30% OSA based on the other similar room types in this building. Assumed 5A to be 2000 CFM based on similar lab CFM.
181	Modern Languages	413	1966	820	9	7,380	1,240	1.5	0.15	AC-1, 1965	-	-	10%	10.1	1.0	8.7	100%	No AHU information scheduled; Assumed 10% OSA.
183	Music	114	1957	1,180	10.25	12,095	1,950	1.7	0.56	AHU-7, 1990	20,700	7,000	34%	9.7	3.3	8.7	100%	
113	Henry Koffler Building	113	1990	991	16	15,856	2,300	2.3	2.32	AH-1, 1989	195,000	195,000	100%	8.7	8.7	8.7	100%	
4	Music	137	1957	1,300	10	13,000	2,100	1.6	0.48	AHU-6, 1990	29,200	8,700	30%	9.7	2.9	8.7	100%	
23	Cesar E Chavez Building	316	1952	733	9.8	7,183	1,200	1.6	0.16	AH-1, 1951	-	-	10%	10.0	1.0	8.7	100%	No AHU info scheduled; assume 10% OSA.
69	Education	312	1964	566	9	5,094	850	1.5	0.15	AC-1, 1966	-	-	10%	10.0	1.0	8.7	100%	No AHU information provided; assuming 10% OSA.
137	Env and Nat Resources Phase 2	S230	2015	1,868	9	16,812	2,600	1.4	0.72	AHU-2, 2013	32,000	16,500	52%	9.3	4.8	8.6	100%	
23	Cesar E Chavez Building	406A	1952	593	9.8	5,811	960	1.6	0.16	AH-1, 1951	-	-	10%	9.9	1.0	8.6	100%	No AHU info scheduled; assume 10% OSA.
67	Modern Languages	214	1966	564	9	5,076	830	1.5	0.15	AC-1, 1965	-	-	10%	9.8	1.0	8.5	100%	No AHU information scheduled; Assumed 10% OSA.
27	Social Sciences	415	1950	544	9	4,896	800	1.5	0.15	N AHU, 1949	-	-	10%	9.8	1.0	8.5	100%	Room area estimated due to this room being larger originally and later subdivided. Assumed airflows remained the same. No AHU info scheduled; assume 10% OSA.
108	McClelland Hall	301A	1990	210	9	1,890	310	1.5	0.08	SF-18.2, 1989	76,000	4,000	5%	9.8	0.5	8.4	100%	This room number is listed as a conference room on the Planning, Design & Construction floor plan.
202	Roy P. Drachman Hall	A119	2006	553	14	7,742	1,200	2.2	0.83	AH-2, 2004	21,000	8,000	38%	9.3	3.5	8.4	100%	
222	Leon Levy Cancer Center	3968	1986	222	10	2,220	320	1.4	1.18	AH-1, 1999	95,290	78,320	82%	8.6	7.1	8.4	100%	
194	Gerard P. Kuiper Space Sci.	312	1966	840	10.5	8,820	1,400	1.7	0.36	AH 2-2, 1993	28,500	6,125	21%	9.5	2.0	8.4	100%	Ceiling elevation varies. Avg ceiling elevation was used.
2	Art Building & Art Museum	301	1957	1,237	8.8	10,886	1,750	1.4	0.14	AC-3, 1968	-	-	10%	9.6	1.0	8.3	100%	No AHU schedule in as-builts. Assume 10% OSA.
23	Cesar E Chavez Building	110	1952	1,690	10	16,900	2,700	1.6	0.16	AH-1, 1951	-	-	10%	9.6	1.0	8.3	100%	No AHU info scheduled; assume 10% OSA.
23	Cesar E Chavez Building	111	1952	1,690	10	16,900	2,700	1.6	0.16	AH-1, 1951	-	-	10%	9.6	1.0	8.3	100%	No AHU info scheduled; assume 10% OSA.
65	Steward Observatory	N210	1921	2,745	14	38,430	6,000	2.2	0.50	AH-2, 1992	13,900	3,200	23%	9.4	2.2	8.3	100%	Ceiling height varies, 16' at the front and 10' at the back.
113	Henry Koffler Building	111	1990	1,229	16	19,664	2,700	2.2	2.20	AH-1, 1989	195,000	195,000	100%	8.2	8.2	8.2	100%	
176	Richard P. Harvill Building	316	1979	704	11	7,744	1,220	1.7	0.23	CL-3, 1979	21,670	2,870	13%	9.5	1.3	8.2	100%	Room number changed; 302 on as-builts.
137	Env and Nat Resources Phase 2	N120	2015	6,250	13	81,250	12,000	1.9	0.96	AHU-3, 2013	12,000	6,000	50%	8.9	4.4	8.2	100%	Room height varies; estimated average.
113	Henry Koffler Building	204	1990	2,836	14	39,704	5,420	1.9	1.91	AH-1, 1989	195,000	195,000	100%	8.2	8.2	8.2	100%	
176	College of Law Building	137	1969	1,281	10	12,810	2,000	1.6	0.23	AH-1, 2007	58,000	8,500	15%	9.4	1.4	8.2	100%	
2	Art Building & Art Museum	307	1957	2,151	8.6	18,499	2,900	1.3	0.13	AC-3, 1968	-	-	10%	9.4	0.9	8.1	100%	No AHU schedule in as-builts. Assume 10% OSA.
3.01	Drama Addition	14	1992	600	8.8	5,280	800	1.3	0.38	AHU-1, 1991	43,000	12,200	28%	9.1	2.6	8.1	100%	
3.01	Drama Addition	20	1992	600	8.8	5,280	800	1.3	0.38	AHU-1, 1991	43,000	12,200	28%	9.1	2.6	8.1	100%	
23	Cesar E Chavez Building	205	1952	654	9.8	6,409	1,000	1.5	0.15	AH-1, 1951	-	-	10%	9.4	0.9	8.1	100%	No AHU info scheduled; assume 10% OSA.
104	Electrical & Computer Engr	102	1986	740	9	6,660	1,015	1.4	0.28	AH B-2, 2000	8,175	1,680	21%	9.1	1.9	8.1	100%	AH B-2 schedule has present conditions and future conditions listed for total SA and design OSA. Future values used.
93	Ina A. Gittings Building	129B	1964	6,285	18.5	116,273	18,000	2.9	0.29	AC-1, 1963	97,472	-	10%	9.3	0.9	8.0	100%	No OSA information on drawings; estimated at 10% based on common OSA % for typical facilities.
88	Biological Sciences West	219	1967	876	9	7,884	1,200	1.4	0.25	AHU-1, 1968	40,800	7,500	18%	9.1	1.7	8.0	100%	Drawings don't indicate CFM quantity to either of (2) AHU's, but total of 15,000 CFM indicated at OSA louvers. Assumed CFM is divided evenly.
94	Meinel Optical Sciences	307	1970	1,605	12.6	20,223	3,120	1.9	0.15	AHU-3, 2008	6,700	500	7%	9.3	0.7	8.0	100%	Ceiling elevation varies. Avg ceiling elevation was used.
113	Henry Koffler Building	540	1990	1,213	20	24,260	3,200	2.6	2.64	AH-1, 1989	195,000	195,000	100%	7.9	7.9	7.9	100%	
117	Student Recreation Center	125	1989	2,764	12	33,168	5,000	1.8	0.29	AHU-1, 1989	18,750	3,000	16%	9.0	1.4	7.9	100%	Labeled as multi-purpose room. AHU data by TAB. Room SA and AHU total SA/OSA off plans/schedules.
75	Architecture	A204	1965	2,895	10.1	29,240	4,400	1.5	0.25	AHU-8, 1964	5,600	930	17%	9.0	1.5	7.9	100%	Assuming A204 is just room 204, not 204A.
27	Social Sciences	206	1950	1,243	9	11,187	1,700	1.4	0.14	S AHU, 1949	-	-	10%	9.1	0.9	7.9	100%	No AHU info scheduled; assume 10% OSA.
81	Physics-Atmospheric Sciences	224	1960	870	10	8,700	1,290	1.5	0.30	AHU-3, 1959	10,535	2,165	21%	8.9	1.8	7.8	100%	No AHU schedules in as-builts; Added up airflows on plan.
76	Richard P. Harvill Building	313	1979	686	11	7,546	1,130	1.6	0.22	CL-3, 1979	21,670	2,870	13%	9.0	1.2	7.8	100%	Room number changed; 302 on as-builts.
137	Env and Nat Resources Phase 2	S223	2015	951	9	8,559	1,200	1.3	0.65	AHU-2, 2013	32,000	16,500	52%	8.4	4.3	7.8	100%	
67	Modern Languages	311	1966	1,481	9	13,329	1,990	1.3	0.13	AC-1, 1965	-	-	10%	9.0	0.9	7.7	100%	on 1965 plans, this room was larger and was divided later; estimated room dimensions. Assumed airflow within space remained the same. No airflows for air handlers scheduled. Assume 10% OSA.
94	Meinel Optical Sciences	432	1970	635	9	5,715	840	1.3	0.24	AHU-1, 1987	21,060	3,870	18%	8.8	1.6	7.7	100%	
117	Student Recreation Center (117A)	113	1997	3,685	12	44,220	6,335	1.7	0.58	AHU-10, 1997	6,335	2,125	34%	8.6	2.9	7.7	100%	Labeled as gym. Room SA and AHU total SA/OSA off plans/schedules.
24	Ctr English Second Lng	102	1936	2,120	15	31,800	4,700	2.2	0.22	AH-1, 1995	-	-	10%	8.9	0.9	7.7	100%	No AHU information available, assuming 10% OSA. Average ceiling height estimated.
3	Drama	109	1956	2,982	16.5	49,203	7,200	2.4	0.36	AH, 1955	13,000	-	15%	8.8	1.3	7.7	100%	No OSA quantities specified. Assuming 15% OSA. Ceiling and floor height vary and average is estimated.
17	Student Union Memorial Center	258	2001	1,240	11	13,640	2,000	1.6	0.16	AHU-5, 2001	60,000	-	10%	8.8	0.9	7.6	100%	Cafeteria. Nominally 0.93 CFM OSA/SF, per ASHRAE 62.1. AHU-5 operates OSA off CO2 readings; assuming nominal 10% OSA for purposes of this analysis. Per AHU-5 analysis, coils should be able to handle up to 53% outside air during design day conditions.
71	Speech And Hearing Sciences	107	1964	696	10	6,960	1,015	1.5	0.15	AH, 1964	-	-	10%	8.8	0.9	7.6	100%	No AHU information available; assuming 10% OSA.
226	Richard P. Harvill Building	208	1979	691	11	7,601	1,100	1.6	0.21	CL-2, 1979	19,645	2,630	13%	8.7	1.2	7.6	100%	Room number changed; 202 on as-builts.
17	Student Union Memorial Center	260	2001	1,535	13	19,955	2,600	1.7	1.30	AHU-35, 2001	2,600	2,000	77%	7.8	6.0	7.5	100%	Kitchen. Nominally 0.27 CFM OSA/SF, per ASHRAE 62.1.
68	Psychology	307	1968	978	9.67	9,457	1,370	1.4	0.14	AC-1, 1966	82,940	8,300	10%	8.7	0.9	7.5	100%	No AHU schedule; total airflow acquired by adding up mixing box schedule. No OSA quantity called out, so assuming 10%.
68	Psychology	306	1968	973	9.67	9,409	1,360	1.4	0.14	AC-1, 1966	82,940	8,300	10%	8.7	0.9	7.5	100%	No AHU schedule; total airflow acquired by adding up mixing box schedule. No OSA quantity called out, so assuming 10%.

**UNIVERSITY OF ARIZONA MAIN CAMPUS  
CLASSROOM AIR CHANGE REVIEW  
(Ordered by Best ACH to Worst)**

Reference Row #	Classroom Data Received from UA			Analysis															
	Building	Descr	Room	Year of Original Construction	Room SF	Room Height (ft)	Room Volume (CF)	Room Supply Air CFM	Total CFM/SF	Outside Air CFM/SF	AHU Name, DWG Year	AHU Total Supply Air CFM	AHU Outside Air CFM	AHU Outside Air %	Total Supply Air Changes/Hr [(Room Supply Air) x 60 / (Room Volume)]	Outside Air Changes/Hr [(Total Air Changes/Hr) x (AHU Outside Air %)]	Air Changes/Hr (Equivalent, Includes MERV 13 efficacy factor for recirculated air)	Pro-Rated Occupancy Limit (Baseline: 6 Air Changes/Hr Min)	Notes
231	105	Learning Services Building	217	2002	155	9	1,395	200	1.3	0.16	AC-1, 2001	14,000	1,700	12%	8.6	1.0	7.5	100%	
232	113	Henry Koffler Building	510	1990	1,213	20	24,260	3,000	2.5	2.47	AH-1, 1989	195,000	195,000	100%	7.4	7.4	7.4	100%	
233	202	Roy P. Drachman Hall	8209	2006	928	9.33	8,658	1,200	1.3	0.36	AH-3, 2004	18,000	5,000	28%	8.3	2.3	7.4	100%	
234	3.01	Drama Addition	116	1992	1,811	10	18,110	2,500	1.4	0.39	AHU-1, 1991	43,000	12,200	28%	8.3	2.3	7.4	100%	
235	113	Henry Koffler Building	440	1990	1,220	20	24,400	3,000	2.5	2.46	AH-1, 1989	195,000	195,000	100%	7.4	7.4	7.4	100%	
236	113	Henry Koffler Building	441	1990	1,220	20	24,400	3,000	2.5	2.46	AH-1, 1989	195,000	195,000	100%	7.4	7.4	7.4	100%	
237	75	Architecture	205	1965	1,532	10.1	15,473	2,150	1.4	0.28	AHU-10, 1964	3,060	600	20%	8.3	1.6	7.3	100%	
238	24	Ctr English Second Lng	103	1936	2,420	15	36,300	5,100	2.1	0.21	AH-1, 1995	-	-	10%	8.4	0.8	7.3	100%	No AHU information available, assuming 10% OSA. Average ceiling height estimated.
239	11	John W. Harshbarger Building	208	1958	855	9.2	7,866	1,050	1.2	0.49	S-2, 1990	43,420	17,405	40%	8.0	3.2	7.3	100%	
240	113	Henry Koffler Building	420	1990	1,160	20	23,200	2,800	2.4	2.41	AH-1, 1989	195,000	195,000	100%	7.2	7.2	7.2	100%	
241	113	Henry Koffler Building	430	1990	1,160	20	23,200	2,800	2.4	2.41	AH-1, 1989	195,000	195,000	100%	7.2	7.2	7.2	100%	
242	113	Henry Koffler Building	450	1990	1,160	20	23,200	2,800	2.4	2.41	AH-1, 1989	195,000	195,000	100%	7.2	7.2	7.2	100%	
243	113	Henry Koffler Building	460	1990	1,160	20	23,200	2,800	2.4	2.41	AH-1, 1989	195,000	195,000	100%	7.2	7.2	7.2	100%	
244	69	Education	104	1964	530	10	5,300	736	1.4	0.14	AC-2, 1966	-	-	10%	8.3	0.8	7.2	100%	No AHU information provided; assuming 10% OSA. On 1966 set, the SE area of the building is open and remodel plans aren't available; estimated room area and pro-rated total supply CFM shown on original plans.
245	11	John W. Harshbarger Building	110	1958	885	9	7,965	1,050	1.2	0.48	S-2, 1990	43,420	17,405	40%	7.9	3.2	7.2	100%	
246	117	Student Recreation Center	124K	1989	2,075	10	20,750	2,600	1.3	0.90	AHU-3, 1989	10,470	7,485	71%	7.5	5.4	7.2	100%	Labeled as Men's Locker Room. Room SA and AHU total SA/OSA off plans/schedules. Record drawings not consistent with PD&C Reference Floorplans; assumptions made regarding room SA.
247	70	MP Integrated Learning Center	141	2002	2,796	12	33,552	4,500	1.6	0.45	AHU-5, 1999	30,700	8,600	28%	8.0	2.3	7.2	100%	Floor plan changed; on asbuilts it is 2 rooms (141 & 137).
248	104	Electrical & Computer Engr	301	1986	745	9	6,705	925	1.2	0.11	AHU-3, 1987	16,000	1,360	9%	8.3	0.7	7.1	100%	
249	17	Student Union Memorial Center	254	2001	1,100	13	14,300	2,000	1.8	-	AHU-36, 2001	2,000	-	0%	8.4	0.0	7.1	100%	Kitchen. Nominally 0.27 CFM OSA/SF, per ASHRAE 62.1. AHU schedule indicates no OSA for this unit.
250	104	Electrical & Computer Engr	107	1986	830	9	7,470	1,020	1.2	0.15	AH-B-1, 1987	7,310	900	12%	8.2	1.0	7.1	100%	
251	81	Physics-Atmospheric Sciences	220	1960	870	10	8,700	1,170	1.3	0.28	AHU-3, 1959	10,535	2,165	21%	8.1	1.7	7.1	100%	No AHU schedules in asbuilts; Added up airflows on plan.
252	117	Student Recreation Center	201	1989	2,792	12	33,504	4,500	1.6	0.26	AHU-8, 1989	18,650	3,025	16%	8.1	1.3	7.0	100%	Labeled as multi-purpose Room. Room SA and AHU total SA/OSA off plans/schedules.
253	75	Architecture	104	1965	2,096	10.1	21,170	2,775	1.3	0.40	AHU-2, 1964	4,980	1,500	30%	7.9	2.4	7.0	100%	
254	4	Music	146	1957	1,635	14	22,890	3,000	1.8	0.55	-	-	-	30%	7.9	2.4	7.0	100%	There is no HVAC for room 146 on the drawings in the 1990 set or the original 1956 set. Assumed 30% OSA based on the other similar room types in this building. Assumed SA to be 2000 CFM based on similar lab CFM.
255	3.01	Drama Addition	266	1992	1,865	10	18,650	2,500	1.3	0.22	AHU-4, 1991	27,400	4,400	16%	8.0	1.3	7.0	100%	
256	222	Leon Levy Cancer Center	3945	1986	222	10	2,220	300	1.4	0.14	AH-2, 1985	78,100	-	10%	8.1	0.8	7.0	100%	This room is labeled as "Secretary". AH-2 doesn't have OSA CFM listed; assuming 10% OSA.
257	4	Music	162	1957	1,820	14	25,480	3,300	1.8	0.54	AHU-6, 1990	29,200	8,700	30%	7.8	2.3	7.0	100%	
258	3.01	Drama Addition	239A	1992	440	8.8	3,872	500	1.1	0.32	AHU-1, 1991	43,000	12,200	28%	7.7	2.2	6.9	100%	
259	70	MP Integrated Learning Center	119	2002	1,380	12	16,560	2,130	1.5	0.43	AHU-5, 1999	30,700	8,600	28%	7.7	2.2	6.9	100%	
260	72	Civil Engineering	201	1965	816	10	8,160	1,080	1.3	0.13	Fan #1, 1964	31,070	-	10%	7.9	0.8	6.9	100%	Indicated as Room 207 on 1964 plans. "FAN #1" OSA damper shown but no value given. Estimated 10% OSA.
261	70	MP Integrated Learning Center	125	2002	1,390	12	16,680	2,130	1.5	0.43	AHU-5, 1999	30,700	8,600	28%	7.7	2.1	6.8	100%	
262	3.01	Drama Addition	114	1992	1,900	10.1	19,190	2,500	1.3	0.21	AHU-4, 1991	27,400	4,400	16%	7.8	1.3	6.8	100%	
263	17	Student Union Memorial Center	255	2001	4,890	10	48,900	6,400	1.3	0.13	AHU-5, 2001	60,000	-	10%	7.9	0.8	6.8	100%	Ceiling height varies, estimated based on arch sections. Drawings do not list an OSA amount; assume 10% OSA.
264	68	Psychology	308	1968	809	9.67	7,823	1,020	1.3	0.13	AC-1, 1966	82,940	8,300	10%	7.8	0.8	6.8	100%	No AHU schedule; total airflow acquired by adding up mixing box schedule. No OSA quantity called out, so assuming 10%.
265	76	Richard P. Harvill Building	104	1979	812	11	8,932	1,150	1.4	0.24	CL-1, 1979	15,940	2,680	17%	7.7	1.3	6.8	100%	
266	117	Student Recreation Center	203	1990	810	10	8,100	1,050	1.3	0.14	AHU-4, 1989	9,265	1,000	11%	7.8	0.8	6.7	100%	
267	4	Music	202	1957	350	9	3,150	400	1.1	0.24	No Tag, 1956	7,000	1,500	21%	7.6	1.6	6.7	100%	Second floor, area 1 is not in the scope of the 1990 drawings. Used original 1956 drawings airflow information for room 202.
268	70	MP Integrated Learning Center	130	2002	2,228	15	33,420	3,990	1.8	1.03	AHU-3, 1999	4,000	2,300	58%	7.2	4.1	6.7	100%	Ceiling height varies: 17'-9" at the front and 11'-3" at the back.
269	2	Art Building & Art Museum	312	1957	960	13	12,480	1,600	1.7	0.17	AC-3, 1968	-	-	10%	7.7	0.8	6.7	100%	Room number changed from 310 on '68 plans. No AHU schedule in as-builts. Assume 10% OSA.
270	69	Education	535	1964	493	9	4,437	565	1.1	0.11	AC-1, 1966	-	-	10%	7.6	0.8	6.6	100%	No AHU information provided; assuming 10% OSA. This room was divided into 3 offices and reception in 1966 plans; assumed total airflow in space remained the same.
271	99	Stevie Eller Dance Theater	301	2003	3,695	16	59,120	7,500	2.0	0.23	AH-3, 2001	21,800	2,500	11%	7.6	0.9	6.6	100%	
272	77	Gould-Simpson	201	1985	680	9	6,120	780	1.1	0.05	AH-4, 1983	11,290	525	5%	7.6	0.4	6.6	100%	Room number changed; 103 on as-builts.
273	77	Gould-Simpson	203	1985	680	9	6,120	780	1.1	0.05	AH-4, 1983	11,290	525	5%	7.6	0.4	6.6	100%	Room number changed; 107 on as-builts.
274	77	Gould-Simpson	209	1985	680	9	6,120	780	1.1	0.05	AH-3, 4, 1983	12,318	525	4%	7.6	0.3	6.5	100%	Room number changed; 115 on as-builts. One diffuser from each AHU; averaged the total CFM between AHU's.
275	3.01	Drama Addition	270	1992	1,300	10	13,000	1,580	1.2	0.34	AHU-1, 1991	43,000	12,200	28%	7.3	2.1	6.5	100%	
276	17	Student Union Memorial Center	200E West	2001	4,806	13	62,478	7,800	1.6	0.16	AHU-5, 2001	60,000	-	10%	7.5	0.7	6.5	100%	Cafeteria. Nominally 0.93 CFM OSA/SF, per ASHRAE 62.1. AHU-5 operates OSA off CO2 readings; assuming nominal 10% OSA for purposes of this analysis. Per AHU-5 analysis, coils should be able to handle up to 53% outside air during design day conditions.
277	93	Ina A. Gittings Building	4	1964	3,000	14.5	43,500	5,400	1.8	0.18	AC-2, 1963	20,367	-	10%	7.4	0.7	6.4	100%	No OSA information on drawings; estimated at 10% based on common OSA % for typical facilities.
278	93	Ina A. Gittings Building	16	1964	3,000	14.5	43,500	5,400	1.8	0.18	AC-2, 1963	20,367	-	10%	7.4	0.7	6.4	100%	No OSA information on drawings; estimated at 10% based on common OSA % for typical facilities.
279	38	Shantz	440	1962	976	11	10,736	1,150	1.2	1.18	AH-1, 1981	11,100	11,100	100%	6.4	6.4	6.4	100%	

**UNIVERSITY OF ARIZONA MAIN CAMPUS  
CLASSROOM AIR CHANGE REVIEW  
(Ordered by Best ACH to Worst)**

Reference Row #	Classroom Data Received from UA			Analysis															
	Building	Descr	Room	Year of Original Construction	Room SF	Room Height (Ft)	Room Volume (CF)	Room Supply Air CFM	Total CFM/SF	Outside Air CFM/SF	AHU Name, DWG Year	AHU Total Supply Air CFM	AHU Outside Air CFM	AHU Outside Air %	Total Supply Air Changes/Hr [(Room Supply Air) x 60 / (Room Volume)]	Outside Air Changes/Hr [(Total Air Changes/Hr) x (AHU Outside Air %)]	Air Changes/Hr (Equivalent, Includes MERV 13 efficacy factor for recirculated air.)	Pro-Rated Occupancy Limit (Baseline: 6 Air Changes/Hr Min)	Notes
280	68	Psychology	309	1968	810	9.67	7,833	965	1.2	0.12	AC-1, 1966	82,940	8,300	10%	7.4	0.7	6.4	100%	No AHU schedule; total airflow achieved by adding up mixing box schedule. No OSA quantity called out, so assuming 10%.
281	108	McClelland Hall	208A	1990	1,010	12	12,120	1,500	1.5	0.08	SF-18.2, 1989	76,000	4,000	5%	7.4	0.4	6.4	100%	Room height varies; estimated average.
282	69	Education	240	1964	694	9	6,246	766	1.1	0.11	AC-1, 1966	-	-	10%	7.4	0.7	6.4	100%	No AHU information provided; assuming 10% OSA.
283	4	Music	204	1957	420	9	3,780	450	1.1	0.23	No Tag, 1956	7,000	1,500	21%	7.1	1.5	6.3	100%	Second floor, area 1 is not in the scope of the 1990 drawings. Used original 1956 drawings airflow information for room 204.
284	3.01	Drama Addition	125	1992	1,850	13.5	24,975	3,000	1.6	0.26	AHU-4, 1991	27,400	4,400	16%	7.2	1.2	6.3	100%	
285	176	College of Law Building	140	1969	230	8	1,840	220	1.0	0.14	AH-1, 2007	58,000	8,500	15%	7.2	1.1	6.3	100%	Room is labeled as Off Sv.
286	17	Student Union Memorial Center	200E East	2001	5,013	13	65,169	7,850	1.6	0.16	AHU-3, 2001	60,000	-	10%	7.2	0.7	6.3	100%	Cafeteria. Nominally 0.93 CFM OSA/SF, per ASHRAE 62.1. AHU-3 operates OSA off CO2 readings; assuming nominal 10% OSA for purposes of this analysis. Per AHU-3 analysis, coils should be able to handle up to 55% outside air during design day conditions.
287	12	Mines And Metallurgy	221	1939	170	10.5	1,785	210	1.2	0.28	S-2, 1957	48,770	10,900	22%	7.1	1.6	6.2	100%	The Planning, Design & Construction floor plans for Building 12 do not have a room 221. Used the room numbers from the original 1957 drawings in this area.
288	202	Roy P. Drachman Hall	8306C	2006	347	10	3,470	400	1.2	0.32	AH-5, 2004	18,000	5,000	28%	6.9	1.9	6.2	100%	
289	222	Leon Levy Cancer Center	2922	1986	110	10	1,100	130	1.2	0.12	AH-1, 1985	33,195	-	10%	7.1	0.7	6.1	100%	This room is labeled as an office. AH-1 doesn't have OSA CFM listed; assuming 10% OSA.
290	176	College of Law Building	118	1969	1,690	10	16,900	1,980	1.2	0.17	AH-1, 2007	58,000	8,500	15%	7.0	1.0	6.1	100%	
291	176	College of Law Building	126	1969	1,633	10.5	17,147	2,000	1.2	0.18	AH-1, 2007	58,000	8,500	15%	7.0	1.0	6.1	100%	
292	81	Physics-Atmospheric Sciences	320	1960	1,010	9	9,090	1,040	1.0	0.23	AHU-1, 1959	36,320	7,940	22%	6.9	1.5	6.1	100%	No AHU schedules in asbuilts; Added up airflows from mixing box schedules.
293	70	MP Integrated Learning Center	120	2002	3,858	16	61,728	6,500	1.7	1.17	AHU-2, 1999	6,500	4,500	69%	6.3	4.4	6.0	100%	Ceiling height varies: 18'-4" at the front and 11'-6" at the back.
294	420	Esquire Apartments	114	1967	674	8	5,392	620	0.9	0.09	RTU, 1969	800	80	10%	6.9	0.7	6.0	99%	CFM based on original apartment drawings. No information on ventilation provided; Assuming 10% OSA.
295	4	Music	232	1957	2,750	20	55,000	6,000	2.2	0.65	AHU-6, 1990	29,200	8,700	30%	6.5	2.0	5.9	98%	
296	91	Flandrau Sci Ctr & Planetarium	219B	1975	2,150	25	53,750	6,000	2.8	0.36	AH-1, 1974	38,500	5,000	13%	6.7	0.9	5.8	97%	Room has a dome shaped ceiling so elevation varies
297	108	McClelland Hall	315U	1990	590	9	5,310	600	1.0	0.05	SF-18.2, 1989	76,000	4,000	5%	6.8	0.4	5.8	97%	
298	67	Modern Languages	350	1966	4,804	16.5	79,266	8,875	1.8	0.18	Aud AC, 1965	-	-	10%	6.7	0.7	5.8	97%	No AHU information scheduled; Assumed 10% OSA.
299	113	Henry Koffler Building	216	1990	1,135	12	13,620	1,310	1.2	1.15	AH-1, 1989	195,000	195,000	100%	5.8	5.8	5.8	96%	
300	2	Art Building & Art Museum	103	1957	986	9	8,874	986	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room number 111 on '56 plans. Available as-asbuilts don't reflect HVAC updates. Assume 1 CFM/SF, 10% OSA.
301	2	Art Building & Art Museum	105	1957	989	9	8,901	989	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room number 118 on '56 plans. Available as-asbuilts don't reflect HVAC updates. Assume 1 CFM/SF, 10% OSA.
302	2	Art Building & Art Museum	201	1957	953	9	8,577	953	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room number 216 on '56 plans. Available as-asbuilts don't reflect HVAC updates. Assume 1 CFM/SF, 10% OSA.
303	33	Saguaro Hall	101	1959	1,421	9	12,789	1,421	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room served by dedicated FCU(s) that are not scheduled. Total and OSA flows are not specified. Assumed 1 CFM/s.f. and 10% OSA.
304	33	Saguaro Hall	104	1959	835	9	7,515	835	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room served by dedicated FCU(s) that are not scheduled. Total and OSA flows are not specified. Assumed 1 CFM/s.f. and 10% OSA.
305	33	Saguaro Hall	108	1959	1,075	9	9,675	1,075	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room served by dedicated FCU(s) that are not scheduled. Total and OSA flows are not specified. Assumed 1 CFM/s.f. and 10% OSA.
306	33	Saguaro Hall	127	1959	834	9	7,506	834	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room served by dedicated FCU(s) that are not scheduled. Total and OSA flows are not specified. Assumed 1 CFM/s.f. and 10% OSA.
307	33	Family And Consumer Sciences	206	1959	230	9	2,070	230	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Labeled as office. Room served by dedicated FCU(s) that are not scheduled. Total and OSA flows are not specified. Assumed 1 CFM/s.f. and 10% OSA.
308	69	Education	455	1964	732	9	6,588	732	1.0	0.10	AC-1, 1966	-	-	10%	6.7	0.7	5.8	96%	This space was part of an open library in 1967 plans. No remodel drawings showing this room. Area estimated from Planning, Design & Construction floor plan. Assumed 1 CFM/sf and 10% OSA.
309	69	Education	530	1964	1,038	9	9,342	1,038	1.0	0.10	AC-1, 1966	-	-	10%	6.7	0.7	5.8	96%	This space has been subdivided since 1967 plans. No remodel drawings showing this room. Area estimated from Planning, Design & Construction floor plan. Assumed 1 CFM/sf and 10% OSA.
310	167	HONORS	1068	2019	1,110	9	9,990	1,110	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room not located on as-builts. Floor area estimated from Planning, Design & Construction floor plans. Assumed 1 CFM/sf supply air and 10% OSA.
311	167	HONORS	2109	2019	723	9	6,507	723	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room not located on as-builts. Floor area estimated from Planning, Design & Construction floor plans. Assumed 1 CFM/sf supply air and 10% OSA.
312	437	Water Resources Research Ctr.	2	1959	836	9	7,524	836	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	No mechanical plans available; assuming 1 CFM/sf and 10% OSA.
313	167	HONORS	1065	2019	601	9	5,409	600	1.0	0.10	-	-	-	10%	6.7	0.7	5.8	96%	Room not located on as-builts. Floor area estimated from Planning, Design & Construction floor plans. Assumed 1 CFM/sf supply air and 10% OSA.
314	38	Shantz	159	1962	492	9	4,428	490	1.0	0.10	AC-1, 1960	-	-	10%	6.6	0.7	5.7	96%	No AHU schedule; 10% OSA assumed. Per all plans available, this area is part of a large open space. Area is estimated and airflow is assumed to be the same as existing plans.
315	17	Student Union Memorial Center	250	2001	3,045	13	39,585	3,900	1.3	1.02	AHU-39, AHU-40, 2001	3,900	3,100	79%	5.9	4.7	5.7	95%	Cafeteria. Nominally 0.93 CFM OSA/SF, per ASHRAE 62.1.
316	117	Student Recreation Center (117A)	250	2008	11,786	16.5	194,469	20,552	1.7	0.60	AHU-1, 2008	40,554	14,047	35%	6.3	2.2	5.7	95%	Labeled as fitness room. AHU data by TAB. Room SA off plans; not refactored based upon AHU readings. Room SA is refactored based upon AHU readings.
317	117	Student Recreation Center	128K	1989	2,805	10	28,050	2,760	1.0	0.70	AHU-3, 1989	10,470	7,485	71%	5.9	4.2	5.7	94%	Labeled as Women's Locker Room. Room SA and AHU total SA/OSA off plans/schedules. Record drawings not consistent with PD&C Reference Floorplans; assumptions made regarding room SA.
318	119	Aerospace & Mechanical Engr.	N210	1997	640	9	5,760	600	0.9	0.31	AHU-1, 1997	85,000	28,550	34%	6.3	2.1	5.6	94%	



**UNIVERSITY OF ARIZONA MAIN CAMPUS  
CLASSROOM AIR CHANGE REVIEW  
(Ordered by Best ACH to Worst)**

Reference Row #	Classroom Data Received from UA			Analysis														Notes	
	Building	Descr	Room	Year of Original Construction	Room SF	Room Height (Ft)	Room Volume (CF)	Room Supply Air CFM	Total CFM/SF	Outside Air CFM/SF	AHU Name, DWG Year	AHU Total Supply Air CFM	AHU Outside Air CFM	AHU Outside Air %	Total Supply Air Changes/Hr [(Room Supply Air) x 60 / (Room Volume)]	Outside Air Changes/Hr [(Total Air Changes/Hr) x (Total AHU Outside Air %)]	Air Changes/Hr (Equivalent, Includes MERV 13 efficacy factor for recirculated air)		Pro-Rated Occupancy Limit (Baseline: 6 Air Changes/Hr Min)
319	113	Henry Koffler Building	560	1990	1,280	20	25,600	2,400	1.9	1.88	AH-1, 1989	195,000	195,000	100%	5.6	5.6	5.6	94%	
320	78	McClelland Park	105	2008	3,012	13.7	41,264	4,380	1.5	0.31	AH-1, 2008	82,000	17,380	21%	6.4	1.3	5.6	94%	
321	108	McClelland Hall	401KK	1990	615	9	5,535	600	1.0	0.05	SF-1&2, 1989	76,000	4,000	5%	6.5	0.3	5.6	93%	
322	94	Meinel Optical Sciences	410	1970	1,075	13	13,975	1,500	1.4	0.14	AC Unit #1, 1967	-	-	10%	6.4	0.6	5.6	93%	
323	70	MP Integrated Learning Center	150	2002	2,728	16	43,648	4,560	1.7	0.38	AHU-4, 1999	26,100	6,000	23%	6.3	1.4	5.5	92%	ceiling elevation varies. Avg ceiling elevation was used. Sheet with AHU schedule missing from original 1967 drawings. Assume 10% OSA.
324	70	MP Integrated Learning Center	140	2002	2,732	16	43,712	4,560	1.7	0.38	AHU-4, 1999	26,100	6,000	23%	6.3	1.4	5.5	92%	Ceiling height varies: 18'-7" at the front and 12'-0" at the back.
325	72	Civil Engineering	1	1965	571	10.6	6,053	635	1.1	0.11	Fan #1, 1964	31,070	-	10%	6.3	0.6	5.4	91%	Ceiling height varies: 18'-7" at the front and 12'-0" at the back.
326	108	McClelland Hall	430E	1990	635	9	5,715	600	0.9	0.05	SF-1&2, 1989	76,000	4,000	5%	6.3	0.3	5.4	90%	Shown as room B-3 on '64 plans. "FAN #1" OSA damper shown but no value given. Estimated 10% OSA.
327	78	McClelland Park	101	2008	1,435	14	20,090	2,040	1.4	0.30	AH-1, 2008	82,000	17,380	21%	6.1	1.3	5.4	90%	
328	176	College of Law Building	125	1969	367	8.5	3,120	320	0.9	0.13	AH-1, 2007	58,000	8,500	15%	6.2	0.9	5.4	89%	
329	12	Mines And Metallurgy	225	1939	715	10.5	7,508	760	1.1	0.24	S-2, 1957	48,770	10,900	22%	6.1	1.4	5.4	89%	The Planning, Design & Construction floor plans for Building 12 do not have a room 225. Used the room numbers from the original 1957 drawings in this area.
330	75	Architecture	302A	1965	646	10.1	6,525	670	1.0	0.10	AHU-11, 1999	7,470	-	10%	6.2	0.6	5.3	89%	
331	108	McClelland Hall	301CC	1990	645	9	5,805	600	0.9	0.05	SF-1&2, 1989	76,000	4,000	5%	6.2	0.3	5.3	89%	OSA damper is shown but CFM is not scheduled; assuming 10%.
332	108	McClelland Hall	430QQ	1990	650	9	5,850	600	0.9	0.05	SF-1&2, 1989	76,000	4,000	5%	6.2	0.3	5.3	88%	
333	108	McClelland Hall	218	1990	3,030	9	27,270	2,790	0.9	0.05	SF-1&2, 1989	76,000	4,000	5%	6.1	0.3	5.3	88%	
334	72	Civil Engineering	120	1965	3,400	10	34,000	3,400	1.0	0.10	-	-	-	10%	6.0	0.6	5.2	87%	1965 plans indicate an evaporative cooler. Assuming this no longer serves the space and assuming 1 CFM/SF, 10% OSA.
335	78	McClelland Park	103	2008	1,986	15.5	30,783	2,895	1.5	0.31	AH-1, 2008	82,000	17,380	21%	5.6	1.2	5.0	83%	
336	108	McClelland Hall	113	1990	690	9	6,210	600	0.9	0.05	SF-1&2, 1989	76,000	4,000	5%	5.8	0.3	5.0	83%	
337	108	McClelland Hall	201A	1990	460	9	4,140	400	0.9	0.05	SF-1&2, 1989	76,000	4,000	5%	5.8	0.3	5.0	83%	
338	202	Roy P. Drachman Hall	A116	2006	1,411	14	19,754	1,800	1.3	0.49	AH-2, 2004	21,000	8,000	38%	5.5	2.1	5.0	83%	
339	69	Education	211	1964	5,084	12.5	63,550	6,000	1.2	0.12	AC-1, 1966	-	-	10%	5.7	0.6	4.9	82%	No AHU information provided; assuming 10% OSA.
340	78	McClelland Park	425	2008	2,814	10	28,140	2,550	0.9	0.19	AH-1, 2008	82,000	17,380	21%	5.4	1.2	4.8	80%	
341	4	Music	130	1957	4,590	32	146,880	13,000	2.8	0.98	No Tag, 1956	13,000	4,500	35%	5.3	1.8	4.8	80%	Room height varies, estimated average. It appears they are reusing the AHU from the 1956 drawings; AHU appears to supply 13,000 CFM to the space.
342	202	Roy P. Drachman Hall	A112	2006	1,112	14	15,568	1,350	1.2	0.46	AH-2, 2004	21,000	8,000	38%	5.2	2.0	4.7	79%	
343	202	Roy P. Drachman Hall	A118	2006	1,247	14	17,458	1,500	1.2	0.46	AH-2, 2004	21,000	8,000	38%	5.2	2.0	4.7	78%	
344	4	Music	170	1957	2,415	26	62,790	5,300	2.2	0.65	AHU-6, 1990	29,200	8,700	30%	5.1	1.5	4.5	76%	
345	108	McClelland Hall	207	1990	3,300	17.6	58,080	5,100	1.5	0.08	SF-1&2, 1989	76,000	4,000	5%	5.3	0.3	4.5	75%	Room height varies; estimated average.
346	137	Env and Nat Resources Phase 2	S495	2015	787	10	7,870	630	0.8	0.41	AHU-2, 2013	32,000	16,500	52%	4.8	2.5	4.5	74%	
347	202	Roy P. Drachman Hall	A122	2006	1,056	14	14,784	1,200	1.1	0.43	AH-2, 2004	21,000	8,000	38%	4.9	1.9	4.4	74%	
348	207	Pharmacy	419	1980	257	9	2,313	190	0.7	0.07	-	-	-	10%	4.9	0.5	4.3	71%	North penthouse plan (M-4) is missing from pdf which would clarify what AHU this room is served by. Assuming this building is 10% OSA.
349	11	John W. Harshbarger Building	15	1958	640	9	5,760	400	0.6	0.63	S-3, 1990	26,950	-	100%	4.2	4.2	4.2	69%	AHU serving this space is assumed based on room location. Room supply air is an assumption based on adjacent spaces in '90 asbuilts.
350	117	Student Recreation Center	205	1989	1,650	20	33,000	2,625	1.6	0.17	AHU-4, 1989	9,265	1,000	11%	4.8	0.5	4.1	69%	Labeled as multi-purpose Room. Room SA and AHU total SA/OSA off plans/schedules. Record drawings not consistent with PD&C Reference Floorplans; assumptions made regarding room SA.
351	117	Student Recreation Center	207	1989	1,650	20	33,000	2,625	1.6	0.17	AHU-4, 1989	9,265	1,000	11%	4.8	0.5	4.1	69%	Labeled as multi-purpose Room. Room SA and AHU total SA/OSA off plans/schedules. Record drawings not consistent with PD&C Reference Floorplans; assumptions made regarding room SA.
352	38	Shantz	101	1962	240	9	2,160	170	0.7	0.07	AC-1, 1960	-	-	10%	4.7	0.5	4.1	68%	No AHU schedule; 10% OSA assumed. Room is labeled as Office.
353	216	Health Sciences Innov Bldg	305	2019	4,190	24.5	102,655	7,600	1.8	0.73	AHU-5, 2017	25,000	10,000	40%	4.4	1.8	4.0	67%	
354	207	Pharmacy	333	1980	401	9	3,609	280	0.7	0.07	-	-	-	10%	4.7	0.5	4.0	67%	North penthouse plan (M-4) is missing from pdf which would clarify what AHU this room is served by. Assuming this building is 10% OSA.
355	202	Roy P. Drachman Hall	A114	2006	2,670	20	53,400	3,750	1.4	0.54	AH-2, 2004	21,000	8,000	38%	4.2	1.6	3.8	64%	Room has floating ceiling, but appears to be open to structure, per dwg.
356	202	Roy P. Drachman Hall	B109	2006	2,670	20	53,400	3,750	1.4	0.53	AH-1, 2004	16,000	6,000	38%	4.2	1.6	3.8	64%	Room has floating ceiling, but appears to be open to structure, per dwg.
357	202	Roy P. Drachman Hall	B111	2006	2,670	20	53,400	3,750	1.4	0.53	AH-1, 2004	16,000	6,000	38%	4.2	1.6	3.8	64%	Room has floating ceiling, but appears to be open to structure, per dwg.
358	242	Bioscience Research Laboratori	421	2019	115	9	1,035	65	0.6	0.57	AH-2, 2016	45,000	45,000	100%	3.8	3.8	3.8	63%	Labeled as office.
359	137	Env and Nat Resources Phase 2	S107	2015	3,972	16	63,552	4,000	1.0	0.50	AHU-4, 2013	12,000	6,000	50%	3.8	1.9	3.5	58%	Room height varies; estimated average.
360	103	JP Schaefer Ctr for Crtv Photo	108	1988	2,855	15	42,825	2,855	1.0	0.10	-	-	-	10%	4.0	0.4	3.5	58%	Room not located on as-builts. Floor area estimated from Planning, Design & Construction floor plans. Assumed ceiling height, 1 CFM/sf supply air and 10% OSA.
361	4	Music	100A	1957	3,020	36	108,720	6,700	2.2	0.91	AHU-8, 1990	17,200	7,030	41%	3.7	1.5	3.4	56%	Room height varies, estimated average.
362	108	McClelland Hall	126	1990	735	10.5	7,718	500	0.7	0.04	SF-1&2, 1989	76,000	4,000	5%	3.9	0.2	3.3	56%	
363	108	McClelland Hall	118	1990	575	10.5	6,038	390	0.7	0.04	SF-1&2, 1989	76,000	4,000	5%	3.9	0.2	3.3	55%	
364	108	McClelland Hall	122	1990	575	10.5	6,038	390	0.7	0.04	SF-1&2, 1989	76,000	4,000	5%	3.9	0.2	3.3	55%	
365	242	Bioscience Research Laboratori	317	2019	1,655	10.5	17,378	960	0.6	0.58	AH-2, 2016	45,000	45,000	100%	3.3	3.3	3.3	55%	
366	108	McClelland Hall	120	1990	580	10.5	6,090	390	0.7	0.04	SF-1&2, 1989	76,000	4,000	5%	3.8	0.2	3.3	55%	
367	108	McClelland Hall	123	1990	580	10.5	6,090	390	0.7	0.04	SF-1&2, 1989	76,000	4,000	5%	3.8	0.2	3.3	55%	
368	137	Env and Nat Resources Phase 2	S547	2015	1,396	9.2	12,843	750	0.5	0.28	AHU-2, 2013	32,000	16,500	52%	3.5	1.8	3.2	54%	
369	99	Stevie Eller Dance Theater	106	2003	1,725	16	27,600	1,700	1.0	0.11	AH-3, 2001	21,800	2,500	11%	3.7	0.4	3.2	53%	
370	108	McClelland Hall	125	1990	1,180	10.5	12,390	760	0.6	0.03	SF-1&2, 1989	76,000	4,000	5%	3.7	0.2	3.2	53%	Room height varies; estimated average.
371	12	Mines And Metallurgy	15	1939	1,015	9.8	9,947	590	0.6	0.06	S-4, 1992	3,900	-	10%	3.6	0.4	3.1	51%	No OSA information on plans; assumed 10%.
372	117	Student Recreation Center (117A)	150	2008	18,633	19.02	354,400	20,002	1.1	0.37	AHU-1, 2008	40,554	14,047	35%	3.4	1.2	3.1	51%	Labeled as fitness room. AHU data by TAB. Room SA off plans; not refactored based upon AHU readings. 32% of the first floor of Rm 150 is open to second floor above (ceiling elev =35') and the remaining 68% is at 11'-5"; ceiling elevation averaged based on these figures. Room SA is refactored based upon AHU readings.
373	113	Henry Koffler Building	114	1990	1,430	16	22,880	1,000	0.7	0.70	AH-1, 1989	195,000	195,000	100%	2.6	2.6	2.6	44%	

**UNIVERSITY OF ARIZONA MAIN CAMPUS  
CLASSROOM AIR CHANGE REVIEW  
(Ordered by Best ACH to Worst)**

Reference Row #	Classroom Data Received from UA			Analysis															
	Building	Descr	Room	Year of Original Construction	Room SF	Room Height (Ft)	Room Volume (CF)	Room Supply Air CFM	Total CFM/SF	Outside Air CFM/SF	AHU Name, DWG Year	AHU Total Supply Air CFM	AHU Outside Air CFM	AHU Outside Air %	Total Supply Air Changes/Hr [(Room Supply Air) x 60 / (Room Volume)]	Outside Air Changes/Hr [(Total Air Changes/Hr) x (AHU Outside Air %)]	Air Changes/Hr [Equivalent, Includes MERV 13 efficacy factor for recirculated air]	Pro-Rated Occupancy Limit [Baseline: 6 Air Changes/Hr Min]	Notes
374	216	Health Sciences Innov Bldg	306	2019	4,190	24.5	102,655	4,800	1.1	0.46	AHU-5, 2017	25,000	10,000	40%	2.8	1.1	2.6	43%	
375	108	McClelland Hall	133	1990	1,115	10.5	11,708	580	0.5	0.03	SF-18.2, 1989	76,000	4,000	5%	3.0	0.2	2.6	43%	Room height varies; estimated average.
376	108	McClelland Hall	128	1990	1,135	10.375	11,776	560	0.5	0.03	SF-18.2, 1989	76,000	4,000	5%	2.9	0.2	2.4	41%	Room height varies; estimated average.
377	108	McClelland Hall	129	1990	1,135	10.375	11,776	560	0.5	0.03	SF-18.2, 1989	76,000	4,000	5%	2.9	0.2	2.4	41%	Room height varies; estimated average.
378	108	McClelland Hall	127	1990	1,140	10.375	11,828	560	0.5	0.03	SF-18.2, 1989	76,000	4,000	5%	2.8	0.1	2.4	41%	
379	108	McClelland Hall	134	1990	1,180	10.5	12,390	580	0.5	0.03	SF-18.2, 1989	76,000	4,000	5%	2.8	0.1	2.4	40%	Room height varies; estimated average.
380	137	Env and Nat Resources Phase 2	S395	2015	1,155	10	11,550	500	0.4	0.22	AHU-2, 2013	32,000	16,500	52%	2.6	1.3	2.4	40%	
381	108	McClelland Hall	130	1990	855	10.5	8,978	420	0.5	0.03	SF-18.2, 1989	76,000	4,000	5%	2.8	0.1	2.4	40%	
382	108	McClelland Hall	132	1990	860	10.5	9,030	420	0.5	0.03	SF-18.2, 1989	76,000	4,000	5%	2.8	0.1	2.4	40%	Room height varies; estimated average.
383	108	McClelland Hall	131	1990	870	10.5	9,135	420	0.5	0.03	SF-18.2, 1989	76,000	4,000	5%	2.8	0.1	2.4	39%	
384	117	Student Recreation Center (117A)	170	2008	8,973	34	305,082	12,935	1.4	0.24	AHU-2, 2008	12,935	2,193	17%	2.5	0.4	2.2	37%	Labeled as gym. AHU data by TAB. Room SA assumed to be same as AHU.
385	117	Student Recreation Center	127	1989	12,038	35	421,330	15,998	1.3	0.75	AHU-5, 1989	15,998	9,018	56%	2.3	1.3	2.1	35%	Labeled as gym. AHU data by TAB. Room SA assumed to be same as AHU. Ceiling elevation was approximated because arch drawings were not found. Fire protection piping was 34' AFF so assuming ceiling is 35'.
386	117	Student Recreation Center	130	1989	20,636	35	722,260	27,364	1.3	0.74	AHU-6, 1989	27,364	15,286	56%	2.3	1.3	2.1	35%	Labeled as gym. AHU data by TAB. Room SA assumed to be same as AHU. Assumed Alternate #1 from record documents was chosen since that airflow matched the schedule on the plans. Ceiling elevation was approximated because arch drawings were not found. Fire protection piping was 34' AFF so assuming ceiling is 35'.
387	99	Stevie Eller Dance Theater	110B	2003	3,620	64	231,680	7,900	2.2	0.66	AH-2, 2001	7,900	2,400	30%	2.0	0.6	1.8	31%	Room 110B is the stage only; does not include theatre seating area.
388	107	Marley	230	1990	3,200	18	57,600	1,675	0.5	0.18	AHU-4, 1996	3,200	1,100	34%	1.7	0.6	1.6	26%	