PRCTI20221714





THE APPROVED CONSTRUCTION PLANS, DOCUMENTS AND ALL ENGINEERING MUST BE POSTED ON THE JOB AT ALL INSPECTIONS IN A VISIBLE AND READILY ACCESSIBLE LOCATION.

FULL SIZED LEDGIBLE COLOR PLANS ARE REQUIRED TO BE PROVIDED BY THE PERMITEE ON SITE FOR INSPECTION

CHC Puyallup Garage HVAC Load Analysis

for

Miller Hayashi Architect 118 North 35th St. Suite 200 Seattle, WA. 98103







Prepared By:

Tres West Engineers

Saturday, October 29, 2022

Chvac - Full Commercial H Tres West Engineers Tacoma, WA 98409-7315	IVAC Loads Cal	culation Pro	ogram	i	E	lite Software Develo CHC Puy	opment, Inc. allup Garage		
Building Summa	ry Loads					City of Puy Development & Pern / ISSUED PE Building	Allup		
Building peaks in July at	5pm.					Engineering F	Public Works Traffic		
Bldg Load	Area	Sen	%Tot	Lat	Sen	Net	%Net		
Descriptions	Quan	Loss	Loss	Gain	Gain	Gain	Gain		
Roof	9,835	22,731	10.06	0	11,459	11,459	4.04		
Wall	1,996	7,431	3.29	0	6,631	6,631	2.34		
Glass	581	11,865	5.25	0	32,765	32,765	11.56		
Floor Slap	236	6,859	3.04	0	E0.955	U 50.955	17.05		
	/ -	48,886	21.64	0	50,855	50,855	17.95		
Lighting	7,517	0	0.00	0	29,495	29,495	10.41		
People	175	0	0.00	40 250	44,019 50 313	90 563	31.96		
Partition	0	0	0.00	40,200	00,010	00,000	0.00		
Cool. Pret.	0	0	0.00	0	0	0	0.00		
Heat. Pret.	0	0	0.00	0	0	0	0.00		
Cool. Vent.	3,871	0	0.00	11,510	36,694	48,204	17.01		
Heat. Vent.	3,871	146,394	64.80	0	0	0	0.00		
Cool. Infil.	535	0	0.00	1,561	7,608	9,169	3.24		
Heat. Infil.	535	30,625	13.56	0	0	0	0.00		
Draw-Thru Fan	0	0	0.00	0	10,751	10,751	3.79		
Blow-Thru Fan	0	0	0.00	0	0 221	221	0.00		
Reserve Cap. Reheat Can	0	0	0.00	0	331	0	0.12		
Supply Duct	0	0	0.00	0	0	0	0.00		
Return Duct	Ő	0	0.00	0	0 0	ů 0	0.00		
Misc. Supply	0 0	0	0.00	0 0	ů 0	0	0.00		
Misc. Return	0	0	0.00	0	0	0	0.00		
Building Totals		225,905	100.00	53,321	230,067	283,388	100.00		
Building	Se	en	%Tot	Lat	Sen	Net	%Net		
Summary	Lo	22	Loss	Gain	Gain	Gain	Gain		
Ventilation	146.39	94	64.80	11.510	36.694	48.204	17.01		
Infiltration	30,62	25	13.56	1,561	7,608	9,169	3.24		
Pretreated Air	ŗ	0	0.00	0	0	0	0.00		
Zone Loads	48,88	36	21.64	40,250	175,014	215,264	75.96		
Plenum Loads		0	0.00	0	0	0	0.00		
Fan/Duct/Misc Loads		0	0.00	0	10,751	10,751	3.79		
Building Totals	225,90)5	100.00	53,321	230,067	283,388	100.00		
Check Figures									
Total Building Supply Ai Total Building Vent. Air (r (based on a 2 (42.30% of Su	20° TD): pply):		9,152 CF 3,871 CF	FM FM				
Total Conditioned Air Sr	ace.			9 835 50	ı ft				
Supply Air Per Unit Area	a:			0.9305 CF	-M/Sa.ft				
Area Per Cooling Capac	city:			416.5 Sq	.ft/Ton				
Cooling Capacity Per Ar	ea:			0.0024 To	ns/Sq.ft				
Heating Capacity Per Area:22.97Btuh/Sq.ft									
Total Heating Required	With Outside A With Outside A	Air: Air:		225,905 Btt 23.62 To	uh ns				
		-			-				

Chvac - Full Commercial HVAC Loads Calculation Program Tres West Engineers Elite Software Development, Im Tacoma, WA 98409-7315 CHC Puyallup Gara Duding Page Building Pa										
Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM			
1	Stair 125 3pm July	205 0 2,050	2,044 83 0.41	2,101 102 0.50	-4 0 0	2AC/Hr 68 44	2AC/Hr 68 34			
2	Lobby 101 5pm July	188 1 1,880	4,070 166 0.88	5,957 290 1.55	262 0 0	2AC/Hr 63 87	2AC/Hr 63 97			
	Zone Peak Totals: Total Zones: 2 Unique Zones: 2	393 1 3,930	6,114 250 0.64	8,058 393 1.00	258 0 0	131 131	131 131			

Chvac - Full Commercial HVAC Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	J.			Elite Software I)eve C Pu	lopment, Inc. yallup Garage Page 4
Air Handler #1 - FC Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	CU1-1 - Total I FCU1-1 Constant V Draw-Thru with prog 67% motor and fan 0.97	Load S olume - S gram esti efficiency	Summary Sum of Peaks imated horsepow y with 2 in. water	ver of acros	0.18 HP ss the fan nis system o	Engineering Public Works Frie Traffic	the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	5pm in July. Clg: 86° DB, 67° Wl Clg: 75° DB, 50% R	3, 69.39 H, Htg: 7	grains, Htg: 29° l 72° DB	DB				
Summer: Ventilation control	ls outside air, W	nter: Ver	ntilation controls	outsic	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	4,802 1,312 5,996 0 s: 0	Btuh Btuh Btuh Btuh Btuh Btuh		23 131	CFM CFM	12,7	10	Btuh
Heating Supply Air: 6,114 / Winter Vent Outside Air (52	(.986 X 1.08 X 23) = .5% of supply) =			250 131	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	7,611 326 : 461 0 113 Iy side of coil:	Btuh Btuh Btuh Btuh Btuh				8,5	511	Btuh
Cooling Supply Air: 8,511 / Summer Vent Outside Air ((.986 X 1.1 X 20) = 33.4% of supply) =			392 131	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 1,562 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh		131	CFM	1,5 10,0	562)73	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and la	230 67 389 dling system: atent gain:	Btuh Btuh Btuh				6 10,7	86 60	Btuh Btuh
Check Figures								
Total Air Handler Supply Air Total Air Handler Vent. Air (r (based on a 20° TD (33.38% of Supply):):		392 131	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	9:		0.9 4 0.0 3	393 9987 38.3 0023 0.81	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required With Total Cooling Required With	h Outside Air: n Outside Air:		12	,110 0.90	Btuh Tons			

Chvac - Full Commercial HVAC Loads Calculation Program Elite Software Devel Tres West Engineers City of Puyallup Tacoma, WA 98409-7315 Bevious Stress Air Handler #2 - FCU1-2 - Summary Loads Provide Stress										
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.			
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM			
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM			
3	Waiting 105	320	4,993	9,308	744	2AC/Hr	2AC/Hr			
	5pm July	3	204	454	0	107	107			
		3,200	0.64	1.42	0	107	107			
	Zone Peak Totals:	320	4,993	9,308	744					
	Total Zones: 1	3	204	454	0	107	107			
	Unique Zones: 1	3,200	0.64	1.42	0	107	107			

Chvac - Full Commercial HVAC Tres West Engineers Tacoma, WA 98409-7315	CLoads Calculation Pr	ogram			Elite Software D City of Puyallup Development & Permiting Services ISSUED PERMIT Building Planning	evelopment, Inc. Puyallup Garage Page 6
Air Handler #2 - FC Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	CU1-2 - Total L FCU1-2 Constant V Draw-Thru with prog 67% motor and fan 0.93	olume - Sum of gram estimated efficiency with 2	nary Peaks horsepower of in. water acro Tl	0.21 HP ss the fan nis system c	Engineering Public Works Fire Traffic	he building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	5pm in July. Clg: 86° DB, 67° WB Clg: 75° DB, 50% R	3, 69.39 grains, H, Htg: 72° DB	Htg: 29° DB			
Summer: Ventilation control	s outside air, Wi	nter: Ventilation	controls outsid	de air.		
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	3,925 1,068 4,882 0 0 5: 0	Btuh Btuh Btuh Btuh Btuh Btuh	19 107	CFM CFM	9,8	75 Btuh
Heating Supply Air: 4,993 / (Winter Vent Outside Air (52.	(.986 X 1.08 X 23) = 3% of supply) =		204 107	CFM CFM		
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on suppl	9,042 265 533 0 y side of coil:	Btuh Btuh Btuh Btuh Btuh			9,8	41 Btuh
Cooling Supply Air: 9,841 / (Summer Vent Outside Air (2	(.986 X 1.1 X 20) = 23.5% of supply) =		454 107	CFM CFM		
Return duct sensible gain: Return plenum sensible gain Outside air sensible gain: Blow-thru fan sensible gain: Total sensible gain on return Total sensible gain on air ha	n: 0 1,272 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	107	CFM	1,2 11,1	72 Btuh 13 Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and la	690 54 317 ling system: atent gain:	Btuh Btuh Btuh			1,0 12,1	62 Btuh 74 Btuh
Check Figures Total Air Handler Supply Air Total Air Handler Vent Air ()	(based on a 20° TD 23 50% of Supply):):	454 107	CFM CFM		
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	:: ::		320 1.4182 315.4 0.0032 30.86	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft		
Total Heating Required With Total Cooling Required With	n Outside Air: n Outside Air:		9,875 1.01	Btuh Tons		

Chvac - Tres We Tacoma	• Full Commercial HVAC Loads est Engineers 1, WA 98409-7315	Calculation Pro	ogram	ŧ	E Developm / IS Buildi	ty of Puyallup ant & Permitting Services SUED PERMIT: ng Planning	velopment, Inc. Puyallup Garage Page 7
Air H	landler #3 - FCU1-3	3 - Summa	ary Loads		Enginee	Public Works Traffic	
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM
8	Jan. 124	38	584	458	-1	2AC/Hr	2AC/Hr
	3pm July	0	36	24	50	13	13
		380	0.94	0.62	50	36	22
9	Restroom 123	90	957	1,013	-2	4AC/Hr	4AC/Hr
	3pm July	0	58	52	50	60	60
		900	0.65	0.58	50	58	48
10	Restroom 122	67	625	694	-1	4AC/Hr	4AC/Hr
	3pm July	0	38	36	50	45	45
		670	0.57	0.53	50	38	33
11	Restroom 121	67	625	694	-1	4AC/Hr	4AC/Hr
	3pm July	0	38	36	50	45	45
		670	0.57	0.53	50	38	33
12	Restroom 120	67	625	694	-1	4AC/Hr	4AC/Hr
	3pm July	0	38	36	50	45	45
		670	0.57	0.53	50	38	33
13	Public Restroom 118	69	390	652	-1	4AC/Hr	4AC/Hr
	3pm July	0	24	34	50	46	46
		690	0.35	0.49	50	24	31
14	Hall 137	220	1,489	2,081	-4	2AC/Hr	2AC/Hr
	3pm July	0	91	107	0	73	73
		2,200	0.41	0.49	0	91	99
15	Hall 136	190	1,073	1,885	-3	2AC/Hr	2AC/Hr
	3pm July	0	66	97	0	63	63
		1,900	0.35	0.51	0	66	90
	Zone Peak Totals:	808	6,368	8,171	-14		
	Total Zones: 8	0	389	421	300	389	389
	Unique Zones: 8	8,080	0.48	0.52	300	389	389

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	.		Elite Software	e Deve HC Puy	lopment, Inc. yallup Garage Page 8
Air Handler #3 - F0	CU1-3 - Total L	oad	Summarv		Engineering Public Works		
Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	FCU1-3 Constant V Draw-Thru with prog 67% motor and fan 1.00	olume - gram es efficien	- Sum of Peaks stimated horsepower of icy with 2 in. water acros	0.20 HP ss the fan nis system o	occurs 1 time(s) i	n the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	3pm in July. Clg: 89° DB, 67° Wf Clg: 75° DB, 50% R	3, 65.22 H, Htg:	2 grains, Htg: 29° DB : 72° DB				
Summer: Ventilation contro	ls outside air, Wi	nter: V	entilation controls outsid	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	3,672 2,697 17,821 0 s: 0	Btuh Btuh Btuh Btuh Btuh Btuh	47 389	CFM CFM	24	,189	Btuh
Heating Supply Air: 6,368 / Winter Vent Outside Air (10	(.986 X 1.08 X 15) = 0.0% of supply) =		389 389	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	7,348 823 : 494 0 0 V side of coil:	Btuh Btuh Btuh Btuh Btuh			8	,665	Btuh
Cooling Supply Air: 8,665 / Summer Vent Outside Air ((.986 X 1.1 X 19) = 92.6% of supply) =		421 389	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 5,910 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	389	CFM	5 14	,910 ,575	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and l	0 -10 -99 dling system: atent gain:	Btuh Btuh Btuh			14	-110 ,465	Btuh Btuh
Check Figures							
Total Air Handler Supply Air Total Air Handler Vent. Air (r (based on a 19° TD (92.56% of Supply):):	421 389	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	9:		808 0.5206 665.3 0.0015 29.94	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: n Outside Air:		24,189 1.21	Btuh Tons			
Note: Due to the system's n	legative latent gain, t	onnage	e is based solely on sen	sible gain.			

Chvac - Full Commercial HVAC Loads Calculation Program Elite Software Development, Inc. Tres West Engineers CHC Puyallup Garage Tacoma, WA 98409-7315 Preventing Services Air Handler #4 - FCU1-4 - Summary Loads Engleding											
Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM				
19	Small Meeting 106 5pm July	370 16 3,700	6,009 245 0.66	16,775 818 2.21	3,743 0 0	6.25/P, 0.075/ft² 128 128	6.25/P, 0.075/ft² 128 128				
	Zone Peak Totals: Total Zones: 1 Unique Zones: 1	370 16 3,700	6,009 245 0.66	16,775 818 2.21	3,743 0 0	128 128	128 128				

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	Ĵ,			Elite Softw City of Puyallup Development & Permitting Servic ISSUED PERMIT Building Planning	are Deve CHC Pu	lopment, Inc. yallup Garage Page 10
Air Handler #4 - F(CI I1-4 - Total I	oad S	ummary			Engineering Public Works		
Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	FCU1-4 Constant V Draw-Thru with prog 67% motor and fan 0.83	olume - S gram estir efficiency	Sum of Peaks nated horsepow with 2 in. water	er of acros	0.38 HP ss the fan nis system o	ccurs 1 time(s) in the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	5pm in July. Clg: 86° DB, 67° WI Clg: 75° DB, 50% R	3, 69.39 g H, Htg: 72	grains, Htg: 29° [2° DB	DВ				
Summer: Ventilation contro	ls outside air, Wi	nter: Ven	tilation controls of	outsic	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss Total System sensible loss:	4,774 1,235 5,847 0 0 s: 0	Btuh Btuh Btuh Btuh Btuh Btuh		22 128	CFM CFM		11,856	Btuh
Heating Supply Air: 6,009 / Winter Vent Outside Air (52	(.986 X 1.08 X 23) = .1% of supply) =			245 128	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	16,468 307 : 961 0 0 Iy side of coil:	Btuh Btuh Btuh Btuh Btuh					17,736	Btuh
Cooling Supply Air: 17,736 Summer Vent Outside Air (/ (.986 X 1.1 X 20) = 15.6% of supply) =			818 128	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 1,524 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh		128	CFM		1,524 19,260	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	3,680 63 380 dling system: atent gain:	Btuh Btuh Btuh					4,123 23,382	Btuh Btuh
Check Figures Total Air Handler Supply Air	r (based on a 20° TD):		818	CFM			
Total Air Handler Vent. Air (Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	(15.62% of Supply): e:		2.2 11 0.0 3	128 370 2105 89.9 0053 2.04	CFM Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: n Outside Air:		11	,856 1.95	Btuh Tons			

Chvac - Full Commercial HVAC Loads Calculation Program Elite Software Development Tres West Engineers City of Puyaling Tacoma, WA 98409-7315 Elite Software Development Air Handler #5 - FCU1-5 - Summary Loads Free										
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.			
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM			
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM			
18	lt 117	82	463	6,490	229	2AC/Hr	2AC/Hr			
	3pm July	1	27	316	0	27	27			
		820	0.33	3.86	0	27	27			
	Zone Peak Totals:	82	463	6,490	229					
	Total Zones: 1	1	27	316	0	27	27			
	Unique Zones: 1	820	0.33	3.86	0	27	27			

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram			Elite Software	e Deve l HC Puy	opment, Inc. /allup Garage Page 12
Air Handler #5 - F(Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	CU1-5 - Total L FCU1-5 Constant V Draw-Thru with prog 67% motor and fan 0.97	Oad olume gram e efficier	Summary - Sum of Peaks estimated horsepower of hocy with 2 in. water acros	0.15 HP ss the fan nis system o	Engineering Public Works Frie Traffic	in the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	2pm in July. Clg: 88° DB, 67° WI Clg: 75° DB, 50% R	3, 66.4 H, Htg	I7 grains, Htg: 29° DB j: 72° DB				
Summer: Ventilation contro	ls outside air, Wi	nter: V	entilation controls outsid	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	190 274 1,251 0 0 s: 0	Btuh Btuh Btuh Btuh Btuh Btuh	5 27	CFM CFM	1	1,714	Btuh
Heating Supply Air: 463 / (Winter Vent Outside Air (10	986 X 1.08 X 16) = 0.0% of supply) =		27 27	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	6,410 79 : 372 0 1y side of coil:	Btuh Btuh Btuh Btuh Btuh			6	5,861	Btuh
Cooling Supply Air: 6,861 / Summer Vent Outside Air ((.986 X 1.1 X 20) = 3.6% of supply) =		316 27	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 385 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	27	CFM	7	385 7,246	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	230 3 22 Iling system: atent gain:	Btuh Btuh Btuh			7	256 7,502	Btuh Btuh
Check Figures Total Air Handler Supply Ai Total Air Handler Vent. Air (r (based on a 20° TD 8.64% of Supply):):	316 27	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	9:		82 3.8588 131.2 0.0076 20.91	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: n Outside Air:		1,714 0.63	Btuh Tons			

Chvac - Tres We Tacoma	Chvac - Full Commercial HVAC Loads Calculation Program Tres West Engineers Elite Software Development, Inc. Tacoma, WA 98409-7315 CHC Puyallup Garage Building Page 13 Air Handler #6 - FCU1-6 - Summary Loads File Traffic											
Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM					
20	Hall 132 3pm July	182 0 1,820	1,028 61 0.33	2,213 108 0.59	-3 0 0	2AC/Hr 61 61	2AC/Hr 61 61					
21	Kitchenette 116 3pm July	120 1 1,200	678 40 0.33	1,422 69 0.58	228 0 0	2AC/Hr 40 40	2AC/Hr 40 39					
	Zone Peak Totals: Total Zones: 2 Unique Zones: 2	302 1 3,020	1,706 101 0.33	3,635 177 0.59	225 0 0	101 101	101 101					

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	Ĵ.			Elite Softwa City of Puyallup Development & Permitting Services (ISSUED PERMIT Building Planning	re Deve CHC Pu	lopment, Inc. yallup Garage Page 14
Air Handler #6 - F0 Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	CU1-6 - Total L FCU1-6 Constant V Draw-Thru with prog 67% motor and fan 0.94	olume - gram est efficienc	Summary Sum of Peaks timated horsepowe cy with 2 in. water a	er of acros	0.08 HP ss the fan nis system oo	Engineering Public Works Fire Traffic) in the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	2pm in July. Clg: 88° DB, 67° WB Clg: 75° DB, 50% R	3, 66.47 H, Htg: ⁻	′ grains, Htg: 29° D 72° DB	B				
Summer: Ventilation contro	ls outside air, Wi	nter: Ve	entilation controls o	outsic	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	698 1,008 4,608 0 0 s: 0	Btuh Btuh Btuh Btuh Btuh Btuh		18 101	CFM CFM		6,314	Btuh
Heating Supply Air: 1,706 / Winter Vent Outside Air (10	(.986 X 1.08 X 16) = 0.0% of supply) =			101 101	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	3,342 290 : 208 0 0 Ny side of coil:	Btuh Btuh Btuh Btuh Btuh					3,841	Btuh
Cooling Supply Air: 3,843 / Summer Vent Outside Air ((.986 X 1.1 X 20) = 56.8% of supply) =			177 101	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 1,419 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh		101	CFM		1,419 5,260	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	230 12 83 Jling system: atent gain:	Btuh Btuh Btuh					324 5,584	Btuh Btuh
Check Figures Total Air Handler Supply Ai	r (based on a 20° TD):		177	CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	30.0 i 7⁄0 0i Suppiy): ≩:		0.58 64 0.00 20	302 868 9.0 015 0.91	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	า Outside Air: า Outside Air:		6,3 0	314).47	Btuh Tons			

Chvac - Full Commercial HVAC Loads Calculation Program Tres West Engineers City of Pusitions CHC Pusyallup Ga Tacoma, WA 98409-7315 Page Page Air Handler #7 - FCU1-7 - Summary Loads Engineering Public Works											
Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM				
27	Large Meeting 119 3pm July	1,200 60 10,200	8,637 465 0.39	29,365 1,432 1.19	13,782 465 465	6.25/P, 0.075/ft² 465 465	6.25/P, 0.075/ft² 465 465				
	Zone Peak Totals: Total Zones: 1 Unique Zones: 1	1,200 60 10,200	8,637 465 0.39	29,365 1,432 1.19	13,782 465 465	465 465	465 465				

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	.		City of Puyallup Development & Permitting Servi / ISSUED PERMIT Building Planning	ware Deve CHC Pu	lopment, Inc. yallup Garage Page 16
Air Handler #7 - F0	CU1-7 - Total I	Load S	ummarv		Engineering Public Work	s	
Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	FCU1-7 Constant V Draw-Thru with prog 67% motor and fan 0.69	olume - Si gram estim efficiency	um of Peaks nated horsepower of with 2 in. water acro TI	0.67 HP ss the fan his system c	occurs 1 time	(s) in the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	2pm in July. Clg: 88° DB, 67° Wl Clg: 75° DB, 50% R	3, 66.47 g H, Htg: 72	rains, Htg: 29° DB 2° DB				
Summer: Exhaust controls	outside air, Winte	er: Exhaus	st controls outside air	r.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	5,233 3,404 21,284 0 0 ss: 0	Btuh Btuh Btuh Btuh Btuh Btuh	60 465	CFM CFM		29,922	Btuh
Heating Supply Air: 8,637 / Winter Vent Outside Air (10	(.986 X 1.08 X 17) = 00.0% of supply) =		465 465	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	28,354 981 1,682 0 0 vly side of coil:	Btuh Btuh Btuh Btuh Btuh				31,017	Btuh
Cooling Supply Air: 31,047 Summer Vent Outside Air (/ (.986 X 1.1 X 20) = 32.5% of supply) =		1,432 465	CFM CFM			
Return duct sensible gain: Return plenum sensible gain Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air h	in: 0 6,554 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	465	CFM		6,554 37,571	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	13,800 40 381 dling system: atent gain:	Btuh Btuh Btuh				14,221 51,792	Btuh Btuh
Check Figures							
Total Air Handler Supply Ai Total Air Handler Vent. Air	r (based on a 20° TD (32.48% of Supply):):	1,432 465	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	e:		1,200 1.1931 278.0 0.0036 24.93	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: h Outside Air:		29,922 4.32	Btuh Tons			

Chvac Tres Wo Tacoma	- Full Commercial HVAC Load est Engineers a, WA 98409-7315 Handler #8 - FCU1-	E Cit Developme (IS) Buildin Enginee Fire	Ilite Software De y of Puyallup nt & Permitting Services DUED PERMIT: g Public Works Traffic	velopment, Inc. Puyallup Garage Page 17			
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM
28	Large Meeting 119 3pm July	1,200 60 10,200	8,637 465 0.39	29,365 1,432 1.19	13,782 465 465	6.25/P, 0.075/ft² 465 465	6.25/P, 0.075/ft² 465 465
	Zone Peak Totals: Total Zones: 1 Unique Zones: 1	1,200 60 10,200	8,637 465 0.39	29,365 1,432 1.19	13,782 465 465	465 465	465 465

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram			Elite Software Dev City of Puyallup Development & Permiting Services (ISUED PERMIT Building Planning	elopment, Inc. uyallup Garage Page 18
Air Handler #8 - F(Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	CU1-8 - Total L FCU1-8 Constant V Draw-Thru with prog 67% motor and fan 0.69	LOAD olume gram es efficier	Summary - Sum of Peaks estimated horsepower of hocy with 2 in. water acros	0.67 HP ss the fan his system	Engineering Public Works Free Traffic	e building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	2pm in July. Clg: 88° DB, 67° WI Clg: 75° DB, 50% R	3, 66.4 H, Htg	I7 grains, Htg: 29° DB I: 72° DB			
Summer: Exhaust controls	outside air, Winte	ər: Exh	naust controls outside air	r.		
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	5,233 3,404 21,284 0 0 ss: 0	Btuh Btuh Btuh Btuh Btuh Btuh	60 465	CFM CFM	29,922	Btuh
Heating Supply Air: 8,637 / Winter Vent Outside Air (10	(.986 X 1.08 X 17) = 0.0% of supply) =		465 465	CFM CFM		
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	28,354 981 1,682 0 0	Btuh Btuh Btuh Btuh Btuh			31,017	Btuh
Cooling Supply Air: 31,047 Summer Vent Outside Air (/ (.986 X 1.1 X 20) = 32.5% of supply) =		1,432 465	CFM CFM		
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air h	n: 0 6,554 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	465	CFM	6,554 37,571	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and l	13,800 40 381 dling system: atent gain:	Btuh Btuh Btuh			14,221 51,792	Btuh Btuh
Check Figures	(1	\ \	4 400	0514		
Total Air Handler Supply Ai Total Air Handler Vent. Air	r (based on a 20° TD (32.48% of Supply):):	1,432 465	CFM CFM		
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	ə:		1,200 1.1931 278.0 0.0036 24.93	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft		
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: h Outside Air:		29,922 4.32	Btuh Tons		

Chvac - Tres We Tacoma	Chroac - Full Commercial HVAC Loads Calculation Program Elite Software Development, Inc. Tres West Engineers Ctro of Pupiling Tacoma, WA 98409-7315 CHC Pupiling Page 19 Page 19										
Air H	landler #9 - FCU1	<u>-9 - Summa</u>	ary Loads		Engineeri	Traffic					
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.				
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM				
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM				
16	Hall 139	567	3,203	5,363	-10	2AC/Hr	2AC/Hr				
	3pm July	0	143	276	0	189	189				
		5,670	0.25	0.49	0	143	173				
17	Hall 139	353	3,651	4,142	14	2AC/Hr	2AC/Hr				
	2pm July	0	163	213	0	118	118				
		3,530	0.46	0.60	0	163	134				
	Zone Peak Totals:	920	6,853	9,506	4						
	Total Zones: 2	0	307	489	0	307	307				
	Unique Zones: 2	9,200	0.33	0.53	0	307	307				

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram			Elite Softwa City of Puyallup Development & Permitting Services / ISSUED PERMIT Building Planning	re Deve CHC Pu	lopment, Inc. yallup Garage Page 20
Air Handler #9 - F0	CU1-9 - Total L	oad S	Summarv		Engineering Public Works Fire Traffic		
Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	FCU1-9 Constant V Draw-Thru with prog 67% motor and fan 1.00	olume - S gram estir efficiency	Sum of Peaks mated horsepower of with 2 in. water acros	0.23 HP ss the fan nis system o	occurs 1 time(s) in the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	3pm in July. Clg: 89° DB, 67° WI Clg: 75° DB, 50% R	3, 65.22 g H, Htg: 72	grains, Htg: 29° DB 2° DB				
Summer: Ventilation contro	ls outside air, Wi	nter: Ven	tilation controls outsid	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	3,783 3,071 14,037 0 0 ss: 0	Btuh Btuh Btuh Btuh Btuh Btuh	54 307	CFM CFM	2	20,890	Btuh
Heating Supply Air: 6,853 / Winter Vent Outside Air (10	(.986 X 1.08 X 21) = 00.0% of supply) =		307 307	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	8,560 937 575 0 0 vly side of coil:	Btuh Btuh Btuh Btuh Btuh				10,071	Btuh
Cooling Supply Air: 10,076 Summer Vent Outside Air (/ (.986 X 1.1 X 19) = 62.7% of supply) =		489 307	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air h	in: 0 4,655 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	307	CFM		4,655 14,726	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	0 -12 -78 dling system: atent gain:	Btuh Btuh Btuh				-90 14,636	Btuh Btuh
Check Figures							
Total Air Handler Supply Ai Total Air Handler Vent. Air	r (based on a 19° TD (62.70% of Supply):):	489 307	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	e:		920 0.5317 749.7 0.0013 22.71	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: h Outside Air:		20,890 1.23	Btuh Tons			
Note: Due to the system's r	negative latent gain, t	onnage is	based solely on sen	sible gain.			

Chvac - Full Commercial HVAC Loads Calculation Program Elite Software Development Tres West Engineers City of Puyallup Tacoma, WA 98409-7315 CHC Puyallup Air Handler #10 - FCU1-10 - Summary Loads Engineering										
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.			
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM			
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM			
26	Manager Office 110	120	678	1,422	228	2AC/Hr	2AC/Hr			
	3pm July	1	40	69	0	40	40			
		1,200	0.33	0.58	0	40	40			
	Zone Peak Totals:	120	678	1,422	228					
	Total Zones: 1	1	40	69	0	40	40			
	Unique Zones: 1	1,200	0.33	0.58	0	40	40			

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	_ 		Elite Softwa City of Puyallup Development & Permitting Services ISSUED PERMIT Building Planning	re Deve CHC Pu	lopment, Inc. yallup Garage Page 22
Air Handler #10 - F	-CU1-10 - Tota	alloa	ad Summarv		Engineering Public Works Fire Traffic		
Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	FCU1-10 Constant Draw-Thru with prog 67% motor and fan 0.87	Volume gram est efficienc	- Sum of Peaks timated horsepower of cy with 2 in. water acro- Ti	0.03 HP ss the fan nis system o	ccurs 1 time(s) in the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	2pm in July. Clg: 88° DB, 67° Wl Clg: 75° DB, 50% R	3, 66.47 H, Htg: [∸]	grains, Htg: 29° DB 72° DB				
Summer: Ventilation contro	ls outside air, W	nter: Ve	entilation controls outsid	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss Total System sensible loss:	277 401 1,831 0 0 ss: 0	Btuh Btuh Btuh Btuh Btuh Btuh	7 40	CFM CFM		2,509	Btuh
Heating Supply Air: 678 / (.9 Winter Vent Outside Air (10	986 X 1.08 X 16) = 0.0% of supply) =		40 40	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	1,306 115 :: 81 0 0 Ny side of coil:	Btuh Btuh Btuh Btuh Btuh				1,503	Btuh
Cooling Supply Air: 1,504 / Summer Vent Outside Air ((.986 X 1.1 X 20) = 57.7% of supply) =		69 40	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 564 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	40	CFM		564 2,067	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	230 5 33 dling system: atent gain:	Btuh Btuh Btuh				267 2,334	Btuh Btuh
Check Figures							
Total Air Handler Supply Air Total Air Handler Vent. Air (r (based on a 20° TD (57.72% of Supply):):	69 40	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	ə:		120 0.5775 617.0 0.0016 20.91	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: h Outside Air:		2,509 0.19	Btuh Tons			

Chvac - Tres We Tacoma,	Full Commercial HVAC Load est Engineers , WA 98409-7315 landler #11 - FCU	s Calculation Pro	ogram	l ds	E Developm Sud Engine Fire	Lite Software De tyr of Puyallup (systep Permitting Services) CHC IF SUED PERMIT on Planning Public Works Traffic Traffic	velopment, Inc. Puyallup Garage Page 23
Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
29	Call Center 114 3pm July	203 8 2,030	1,147 68 0.33	4,220 206 1.01	1,836 60 60	2AC/Hr 68 68	2AC/Hr 68 114
30	Centrall Fill 113 3pm July	910 4 9,100	5,140 303 0.33	9,755 476 0.52	904 260 260	2AC/Hr 303 303	2AC/Hr 303 264
31	Storage 115 3pm July	99 0 990	559 33 0.33	936 46 0.46	-2 30 30	2AC/Hr 33 33	2AC/Hr 33 25
	Zone Peak Totals: Total Zones: 3 Unique Zones: 3	1,212 12 12,120	6,846 404 0.33	14,911 727 0.60	2,739 350 350	404 404	404 404

Chvac - Full Commercial HVA	C Loads Calculation Pr	ogram	A		Elite	Softwa	are Deve	lopment, Inc.
Tacoma, WA 98409-7315					Development & Per ISSUED Building	rmitting Services PERMIT Planning	CHC PU	Page 24
Air Handler #11 - F Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	FCU1-11 - Tota FCU1-11 Constant Draw-Thru with proc 67% motor and fan 0.84	al Load Volume - S gram estim efficiency	Summary Sum of Peaks nated horsepower of with 2 in. water acro T	0.34 HP ss the fan his system o	Engineering Fire	Public Works Traffic time(:	s) in the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	1pm in July. Clg: 86° DB, 67° WB Clg: 75° DB, 50% R	3, 69.81 gi H, Htg: 72	rains, Htg: 29° DB ° DB	-				-
Summer: Ventilation contro	ls outside air, Wi	nter: Vent	ilation controls outsi	de air.				
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	2,801 4,045 11,129 0 0 ss: 0	Btuh Btuh Btuh Btuh Btuh Btuh	71 404	CFM CFM			17,976	Btuh
Heating Supply Air: 6,846 / Winter Vent Outside Air (10	(.986 X 1.08 X 16) = 0.0% of supply) =		404 404	CFM CFM				
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	13,707 982 : 854 0 0 Ny side of coil:	Btuh Btuh Btuh Btuh Btuh					15,543	Btuh
Cooling Supply Air: 15,765 Summer Vent Outside Air (/ (.986 X 1.1 X 20) = 55.6% of supply) =		727 404	CFM CFM				
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 2,688 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	404	CFM			2,688 18,231	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	2,760 229 1,201 Jling system: atent gain:	Btuh Btuh Btuh					4,190 22,421	Btuh Btuh
Check Figures								
Total Air Handler Supply Ai Total Air Handler Vent. Air	r (based on a 20° TD 55.57% of Supply):):	727 404	CFM CFM				
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	€:		1,212 0.5998 648.7 0.0015 14.83	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft				
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: n Outside Air:		17,976 1.87	Btuh Tons				

Chvac - Tres We Tacoma	Full Commercial HVAC Load est Engineers , WA 98409-7315 andler #12 - FCU	ls Calculation Pro	i	Elite Software Development, Inc. City of Puyallup Development & Permiting Services ISSUED PERMIT Building Planning Engineering Public Works Engineering Tethic				
Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM	
23	Pharmacy 112 2pm July	1,490 8 12,218	7,522 764 0.51	16,121 793 0.53	1,887 815 815	4AC/Hr 815 764	4AC/Hr 815 794	
24	Restroom 109 3pm July	66 0 660	373 38 0.57	684 34 0.51	-1 50 50	4AC/Hr 44 38	4AC/Hr 44 34	
32	Storage 108 3pm July	236 0 2,360	1,333 135 0.57	2,232 110 0.47	-4 0 0	2AC/Hr 79 135	2AC/Hr 79 110	
	Zone Peak Totals: Total Zones: 3 Unique Zones: 3	1,792 8 15,238	9,228 937 0.52	19,036 936 0.52	1,882 865 865	937 937	937 937	

Air Handler #12 - FCU1-12 - Total Load Summary Image Test Air Handler Descriptor: FCU1-12 Constant Volume - Sum of Peaks Supply Air Far: Draw-Thru with program estimated horsepower of 0.44 HP Fan Input: 67% motor and Ian efficiency with 2.in. water across the Fan Sensible Heat Ratio: 0.91	Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	D.		Elite Software	e Deve HC Pu	lopment, Inc. yallup Garage Page 26
Air System Peak Time: tpm in July. Outdoor Conditions: Cigr 86 DB, 67 * WB, 69,81 grains, Htg: 29 * DB indoor Conditions: Cigr 85 DB, 50% RH, Htg: 72 * DB Summer: Ventilation controls outside air. Zone Space sensible loss: 4,142 Buth Infiltration sensible loss: 24,702 Buth 937 CFM Outside Air sensible loss: 0 Buth Return Duct sensible loss: 0 Buth Return Duct sensible loss: 0 Buth Return Duct sensible loss: 0 Buth Total System sensible loss: 0 Buth Return Duct sensible loss: 0 Buth Return Plenum sensible loss: 0 Buth Total System sensible loss: 0 Buth Return Plenum sensible loss: 0 Buth Return Plenum sensible loss: 0 Buth Return Plenum sensible loss: 0 Buth Total System sensible loss: 0 Buth Return Plenum sensible loss: 0 Buth Return Plenum sensible loss: 17,525 Buth Infiltration sensible gain: 1,725 Buth Supply duct sensible gain: 1,725 Buth Total sensible gain: 1,725 Buth Total sensible gain: 0 Buth Return duct sensible gain: 0 Buth Return menum sensible gain: 0 Buth Return plenum sensible gain: 0 Buth Return menum sensible gain: 0 Buth Return plenum sensible gain: 0 Buth Total sensible gain: 0 Buth Total sensible gain: 0 Buth Total sensible gain: 1,840 Buth Total sensible gain on return side of coli: 5,913 Buth Total sensible gain on return side of coli: 5,913 Buth Total sensible gain on return side of coli: 5,913 Buth Total sensible gain on return side of coli 5,913 Buth Total sensible gain on return side of coli 5,914 Buth Total sensible gain on return side of coli 5,914 Buth Total sensible gain on return side of coli 5,913 Buth Total sensible gain on air handling system: 25,944 Buth Total sensible gain on air handling system: 30,858 Buth Total sensible gain on air handling system: 30,8	Air Handler #12 - I Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	-CU1-12 - Tota FCU1-12 Constant Draw-Thru with prog 67% motor and fan 0.91	al Load S Volume - Sur gram estimat efficiency wit	m of Peaks ed horsepower of th 2 in. water acros	0.44 HP ss the fan nis system c	Engineering Public Works Fire Traffic	in the	building
Summer: Ventilation controls outside air, Winter: Ventilation controls outside air. Zone Space sensible loss: 4.142 Btuh filtration sensible loss: 0 Btuh Return Duct sensible loss: 0 Btuh Return Denum sensible loss: 0 Btuh Heating Supply Air: 9.228 / (986 X 1.08 X 9) = 337 CFM Vinter Vent Outside Air (100.0% of supply) = 337 CFM Zone space sensible gain: 1,255 Btuh Infiltration sensible gain: 1,255 Btuh Infiltration sensible gain: 1,255 Btuh Reserve sensible gain: 172 Btuh Reserve sensible gain: 0 Btuh Reserve sensible gain: 0 Btuh Reserve sensible gain: 0 Btuh Cooling Supply Air: 20,306 / (986 X 1.1 X 20) = 337 CFM Summer Vent Outside Air (100.1% of supply) = 337 CFM Return duct sensible gain: 0 Btuh Reserve sensible gain: 0 Btuh Return duct sensible gain: 0 Btuh Cooling Supply Air: 20,306 / (986 X 1.1 X 20) = 336 CFM Summer Vent Outside Air (100.1% of supply) = 337 CFM Return duct sensible gain: 0 Btuh Could sensible gain: 0 Btuh Outside air sensible gain: 0 Btuh Could air sensible gain: 0 Btuh Could air sensible gain: 0 Btuh Outside air latent gain: 2,768 Btuh Infiltration latent gain: 2,88 Btuh Outside air latent gain: 2,88 Btuh Outside Air Handling system: 4,914 Btuh Total sensible gain on air handling system: 4,914 Btuh Total avensible gain on air handling system: 30,858 Btuh Check Figures Total Air Handler Vent Air (100.09% of Supply): 936 CFM Total Air Handler Vent Air (100.09% of Supply): 937 CFM Total Conditioned Air Space: 1,792 Sq.ft Supply Air Per Unit Area: 0.5225 CFM Sq.ft Area Per Cooling Capacity: 666 9 Sq.ftToton Cooling Capacity Per Area: 18.93 Btuh YSq.ft Total Area Ber Cooling Capacity Per Area: 18.93 Buh/Sq.ft Total Area Per Cooling Capacity Per Area: 18.93 Buh/Sq.ft Total Area Per Cooling Capacity Per Area: 18.93 Buh/Sq.ft Total Area Per Cooling Capacity Per Area: 2.57 Tons	Air System Peak Time: Outdoor Conditions: Indoor Conditions:	1pm in July. Clg: 86° DB, 67° Wf Clg: 75° DB, 50% R	3, 69.81 grai H, Htg: 72° [ns, Htg: 29° DB DB				
Zone Space sensible loss: 4.142 Btuh Inflittation sensible loss: 5,086 Btuh 89 CFM Outside Air sensible loss: 0 Btuh Return Duct sensible loss: 0 Btuh Return Plenum sensible loss: 0 Btuh Return Duct sensible gain: 17,525 Btuh Inflittation sensible gain: 17,525 Btuh Draw-thru fan sensible gain: 1,235 Btuh Draw-thru fan sensible gain: 1,235 Btuh Cooling Supply Air: 9,267 (1986 X 1.1 X 20) 936 CFM Summer Vent Outside Air (100.0% of supply) = 937 CFM Cooling Supply Air: 20,067 (1986 X 1.1 X 20) 938 CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Summer Vent Outside air: 0 Btuh Return plenum sensible gain: 0 Btuh Outside air sensible gain: 0 Btuh Doutside air sensible gain: 0 Btuh Total sensible gain on air handling system: 25,913 Btuh Som thru fan sensible gain: 0 Btuh Outside air sensible gain: 0 Btuh Outside air sensible gain: 0 Btuh Outside air latent gain: 2,786 Btuh Outside air latent gain: 1,840 Btuh Infitration Inder Supply Air (based on a 20° TD): 936 CFM Total Air Handler Vent. Air (100.09% of Supply): 937 CFM Total Air Handler Vent. Air (100.09% of Supply): 937 CFM Total Air Handler Vent. Air (100.09% of Supply): 937 CFM Total Air Handler Vent. Air (100.09% of Supply): 937 CFM Total Air Handler Vent. Air (100.09% of Supply): 937 CFM Total Air Handler V	Summer: Ventilation contro	ls outside air, Wi	nter: Ventila	tion controls outsid	de air.			
Heating Supply Air: 9,228 / (.986 X 1.08 X 9) = 937 CFM Winter Vent Outside Air (100.0% of supply) = 937 CFM Zone space sensible gain: 1.235 Btuh Infiltration sensible gain: 1.235 Btuh Supply Air: 20.306 / (.986 X 1.1 X 20) = 936 CFM Reserve sensible gain: 0 Btuh Reserve sensible gain: 100 Cooling Supply Air: 20.306 / (.986 X 1.1 X 20) = 936 CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Return duct sensible gain: 0 Btuh Btuh CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Blow-thru fun sensible gain: 0 Btuh 00 Stuh Stuh Stuh Cotal sensible gain: 0 Btuh 01 Stuh Stuh Stuh Iotal sensible gain: 1,840 Btuh Stuh Stuh Stuh Iotal atent gain: 2,786 Btuh Stuh Stuh Stuh Iotal atent gain: 2,786 Btuh Stuh Stuh Stuh Stuh Iotal Air Handler Supply A	Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	4,142 5,086 24,702 0 0 \$\$\$: 0	Btuh Btuh Btuh Btuh Btuh Btuh	89 937	CFM CFM	33	3,929	Btuh
Zone space sensible gain: 17,525 Btuh Inflittation sensible gain: 1,235 Btuh Draw-thru fan sensible gain: 1,100 Btuh Reserve sensible gain on supply side of coil: 20,031 Btuh Cooling Supply Air: 20,306 / (.986 X 1.1 X 20) = 936 CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Return duct sensible gain: 0 Btuh Outside air sensible gain: 5,913 Btuh Total sensible gain on air handling system: 5,913 Btuh Total sensible gain on air handling system: 25,944 Btuh Total sensible gain on air handling system: 25,944 Btuh Outside air latent gain: 2,786 Btuh Inflittation latent gain: 2,786 Btuh Total sensible gain on air handling system: 4,914 Btuh Total system sensible and latent gain: 2,786 Btuh Total Air Handler Vent. Air (100.09% of Supply): 937 CFM Total Air Handler Vent. Air (100.09% of Supply): 937 CFM Total Air Handler Vent. Air (100.09% of Supply): 937 CFM Total Conditioned Air Space: 1,792 Sq.ft Area Per Cooling Capacity: 696.9 Sq.ft/Ton Cooling Capacity Per Area: 0.0014 Tons/Sq.ft Heating Capacity Per Area: 18.93 Btuh/Sq.ft Total Air Handler With Outside Air: 2,57 Tons	Heating Supply Air: 9,228 / Winter Vent Outside Air (10	(.986 X 1.08 X 9) =)0.0% of supply) =		937 937	CFM CFM			
Cooling Supply Air: 20,306 / (.986 X 1.1 X 20) = 936 CFM Summer Vent Outside Air (100.1% of supply) = 937 CFM Return duct sensible gain: 0 Btuh 937 CFM Blow-thru fan sensible gain: 0 Btuh 937 CFM Blow-thru fan sensible gain: 0 Btuh 937 CFM Blow-thru fan sensible gain: 0 Btuh 937 CFM Store space latent gain: 0 Btuh 937 CFM Zone space latent gain: 1,840 Btuh 25,944 Btuh Outside air latent gain: 2,786 Btuh 25,944 Btuh Total latent gain: 2,786 Btuh 27,86 Btuh Outside air latent gain: 2,786 Btuh 30,858 Btuh Total latent gain on air handling system: 4,914 Btuh 30,858 Btuh Total Air Handler Supply Air (based on a 20° TD): 936 CFM 30,858 Btuh Total Air Handler Vent. Air (100.09% of Supply): 937 CFM 5,225 CFM/Sq.ft Total Air Handler Vent Air Area:	Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	17,525 1,235 1: 1,100 0 172 Dly side of coil:	Btuh Btuh Btuh Btuh Btuh			20),031	Btuh
Return duct sensible gain: 0 Btuh Return plenum sensible gain: 0 Btuh Outside air sensible gain: 5,913 Btuh Blow-thru fan sensible gain on return side of coil: 5,913 Btuh Total sensible gain on return side of coil: 5,913 Btuh Total sensible gain on return side of coil: 5,913 Btuh Zone space latent gain: 1,840 Btuh 25,944 Btuh Zone space latent gain: 288 Btuh 0utside air latent gain: 2,786 Btuh Outside air latent gain: 2,786 Btuh 1 4,914 Btuh Total latent gain on air handling system: 4,914 Btuh 1 50,858 Btuh Outside air latent gain: 2,786 Btuh 30,858 Btuh 1 50,858 Btuh Outside air latent gain: 2,786 Btuh 30,858 Btuh 1 <td< td=""><td>Cooling Supply Air: 20,306 Summer Vent Outside Air (</td><td>/ (.986 X 1.1 X 20) = 100.1% of supply) =</td><td></td><td>936 937</td><td>CFM CFM</td><td></td><td></td><td></td></td<>	Cooling Supply Air: 20,306 Summer Vent Outside Air (/ (.986 X 1.1 X 20) = 100.1% of supply) =		936 937	CFM CFM			
Zone space latent gain: 1,840 Btuh Infiltration latent gain: 288 Btuh Outside air latent gain: 2,786 Btuh Total latent gain on air handling system: 4,914 Btuh Total system sensible and latent gain: 30,858 Btuh Check Figures 30,858 Btuh Total Air Handler Supply Air (based on a 20° TD): 936 CFM Total Conditioned Air Space: 1,792 Sq.ft Supply Air Per Unit Area: 0.5225 CFM/Sq.ft Area Per Cooling Capacity: 696.9 Sq.ft/Ton Cooling Capacity Per Area: 0.0014 Tons/Sq.ft Heating Capacity Per Area: 18.93 Btuh/Sq.ft Total Cooling Required With Outside Air: 2.57 Tons	Return duct sensible gain: Return plenum sensible gain Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air h	in: 0 5,913 : 0 'n side of coil: andling system:	Btuh Btuh Btuh Btuh	937	CFM	5 25	5,913 5,944	Btuh Btuh
Check FiguresTotal Air Handler Supply Air (based on a 20° TD):936CFMTotal Air Handler Vent. Air (100.09% of Supply):937CFMTotal Conditioned Air Space:1,792Sq.ftSupply Air Per Unit Area:0.5225CFM/Sq.ftArea Per Cooling Capacity:696.9Sq.ft/TonCooling Capacity Per Area:0.0014Tons/Sq.ftHeating Capacity Per Area:18.93Btuh/Sq.ftTotal Heating Required With Outside Air:33,929BtuhTotal Cooling Required With Outside Air:2.57Tons	Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and l	1,840 288 2,786 dling system: latent gain:	Btuh Btuh Btuh			2 30	4,914),858	Btuh Btuh
Total Air Handler Supply Air (based on a 20° TD):936CFMTotal Air Handler Vent. Air (100.09% of Supply):937CFMTotal Conditioned Air Space:1,792Sq.ftSupply Air Per Unit Area:0.5225CFM/Sq.ftArea Per Cooling Capacity:696.9Sq.ft/TonCooling Capacity Per Area:0.0014Tons/Sq.ftHeating Capacity Per Area:18.93Btuh/Sq.ftTotal Heating Required With Outside Air:33,929BtuhTotal Cooling Required With Outside Air:2.57Tons	Check Figures							
Total Conditioned Air Space:1,792Sq.ftSupply Air Per Unit Area:0.5225CFM/Sq.ftArea Per Cooling Capacity:696.9Sq.ft/TonCooling Capacity Per Area:0.0014Tons/Sq.ftHeating Capacity Per Area:18.93Btuh/Sq.ftTotal Heating Required With Outside Air:33,929BtuhTotal Cooling Required With Outside Air:2.57Tons	Total Air Handler Supply Ai Total Air Handler Vent. Air	r (based on a 20° TD (100.09% of Supply):):	936 937	CFM CFM			
Total Heating Required With Outside Air:33,929BtuhTotal Cooling Required With Outside Air:2.57Tons	Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	e:		1,792 0.5225 696.9 0.0014 18.93	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
	Total Heating Required Wit Total Cooling Required Wit	h Outside Air: h Outside Air:		33,929 2.57	Btuh Tons			

Chvac - Full Commercial HVAC Loads Calculation Program Elite Software Develop Tres West Engineers City of Puyallup Tacoma, WA 98409-7315 Duding Air Handler #13 - FCU1-13 - Summary Loads Free										
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.			
No	Zone Peak Time	Volume	Htg.CFM CFM/Saft	CIg.CFM CFM/Saft	S.Exh W.Exh	Req.CFM Act CFM	Req.CFM Act.CFM			
22	Pharmacy Waiting 107 5pm July	620 7 5,890	10,176 416 0.67	25,393 1,238 2.00	1,710 210 210	2AC/Hr 196 227	2AC/Hr 196 229			
25	Consult 111 3pm July	104 1 1,040	587 24 0.23	1,271 62 0.60	228 30 30	2AC/Hr 35 13	2AC/Hr 35 11			
	Zone Peak Totals: Total Zones: 2 Unique Zones: 2	724 8 6,930	10,763 440 0.61	26,664 1,300 1.80	1,938 240 240	231 240	231 240			

Chvac - Full Commercial HVAC Tres West Engineers Tacoma, WA 98409-7315	CLoads Calculation Pro	ogram	.		Elite Software Dev City of Puyallup Development & Permitting Services (ISSUED PERMIT Billeting Permine	elopment, Inc. uyallup Garage Page 28
Air Handler #13 - F Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	CU1-13 - Tota FCU1-13 Constant Draw-Thru with prog 67% motor and fan 6 0.94	Al Load S /olume - Sur ram estimat efficiency wit	m of Peaks ed horsepower of th 2 in. water acros	0.61 HP ss the fan nis system o	Engineering Public Works Fire Traffic	e building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	5pm in July. Clg: 86° DB, 67° WE Clg: 75° DB, 50% RI	8, 69.39 grai H, Htg: 72° [ns, Htg: 29° DB DB			
Summer: Exhaust controls of	outside air, Winte	er: Exhaust o	controls outside air			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	8,450 2,313 5,740 0 0 5: 0	Btuh Btuh Btuh Btuh Btuh Btuh	40 240	CFM CFM	16,503	Btuh
Heating Supply Air: 10,763 / Winter Vent Outside Air (54.	′ (.986 X 1.08 X 23) = 6% of supply) =	=	440 240	CFM CFM		
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on suppl	26,023 575 1,526 0 47 y side of coil:	Btuh Btuh Btuh Btuh Btuh			28,171	Btuh
Cooling Supply Air: 28,171 / Summer Vent Outside Air (1	(.986 X 1.1 X 20) = 8.5% of supply) =		1,299 240	CFM CFM		
Return duct sensible gain: Return plenum sensible gain Outside air sensible gain: Blow-thru fan sensible gain: Total sensible gain on return Total sensible gain on air ha	n: 0 781 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	240	CFM	781 28,951	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and la	1,840 118 714 ling system: atent gain:	Btuh Btuh Btuh			2,671 31,623	Btuh Btuh
Check Figures						
Total Air Handler Supply Air Total Air Handler Vent. Air ((based on a 20° TD) 18.47% of Supply):):	1,299 240	CFM CFM		
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	:		724 1.7944 274.7 0.0036 22.79	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft		
Total Heating Required With Total Cooling Required With	n Outside Air: n Outside Air:		16,503 2.64	Btuh Tons		

Chvac - Tres We Tacoma	Chvac - Full Commercial HVAC Loads Calculation Program Tres West Engineers Elite Software De Tacoma, WA 98409-7315 Development Armiting Services Air Handler #14 - FCU1-14 - Summary Loads Free Traffic									
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.			
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM			
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM			
4	Office 130	98	554	1,214	228	2AC/Hr	2AC/Hr			
	3pm July	1	33	59	0	33	33			
		980	0.33	0.60	0	33	33			
	Zone Peak Totals:	98	554	1,214	228					
	Total Zones: 1	1	33	59	0	33	33			
	Unique Zones: 1	980	0.33	0.60	0	33	33			

Chvac - Full Commercial HVA	C Loads Calculation Pr	ogram			Elite Softwa	a re Deve CHC Pu	lopment, Inc. yallup Garage
Air Handler #14 - F Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	FCU1-14 - Tota FCU1-14 Constant Draw-Thru with prog 67% motor and fan	al Loa Volume - gram esti efficiency	d Summary - Sum of Peaks imated horsepower of y with 2 in. water acros	0.03 HP ss the fan	Building Planning Engineering Public Works Fire Traffic) in the	huilding
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	2pm in July. Clg: 88° DB, 67° Wf Clg: 75° DB, 50% R	3, 66.47 H, Htg: 7	grains, Htg: 29° DB 72° DB	iis system e		<i>y</i> in the	bullang.
Summer: Ventilation contro	ls outside air, Wi	nter: Ver	ntilation controls outsic	le air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	227 327 1,495 0 0 s: 0	Btuh Btuh Btuh Btuh Btuh Btuh	6 33	CFM CFM		2,049	Btuh
Heating Supply Air: 554 / (. Winter Vent Outside Air (10	986 X 1.08 X 16) = 0.0% of supply) =		33 33	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	1,119 94 : 70 0 0 Iy side of coil:	Btuh Btuh Btuh Btuh Btuh				1,283	Btuh
Cooling Supply Air: 1,284 / Summer Vent Outside Air ((.986 X 1.1 X 20) = 55.2% of supply) =		59 33	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 460 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	33	CFM		460 1,743	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and l	230 4 27 dling system: atent gain:	Btuh Btuh Btuh				261 2,004	Btuh Btuh
Check Figures	<i>"</i>						
Total Air Handler Supply Air Total Air Handler Vent. Air (r (based on a 20° TD (55.22% of Supply):):	59 33	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	9:		98 0.6037 586.8 0.0017 20.91	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: n Outside Air:		2,049 0.17	Btuh Tons			

Chvac - Full Commercial HVAC Loads Calculation Program Elite Software Dev Tres West Engineers City of Preliding Sortee Tacoma, WA 98409-7315 Building Air Handler #15 - FCU1-15 - Summary Loads Engineering Frie Tation									
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.		
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM		
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM		
5	Office 127	98	554	1,214	228	2AC/Hr	2AC/Hr		
	3pm July	1	33	59	0	33	33		
		980	0.33	0.60	0	33	33		
	Zone Peak Totals:	98	554	1,214	228				
	Total Zones: 1	1	33	59	0	33	33		
	Unique Zones: 1	980	0.33	0.60	0	33	33		

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	.		Elite Softwar	are Deve CHC Pu	lopment, Inc. yallup Garage Page 32
Air Handler #15 - F	FCU1-15 - Tota FCU1-15 Constant	al Loa Volume	- Sum of Peaks		Engineering Public Works Fire Traffic		
Supply Air Fan: Fan Input: Sensible Heat Ratio:	Draw-Thru with prog 67% motor and fan 0.85	gram est efficienc	timated horsepower of cy with 2 in. water acros Th	0.03 HP ss the fan nis system (occurs 1 time(s) in the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	2pm in July. Clg: 88° DB, 67° Wl Clg: 75° DB, 50% R	B, 66.47 H, Htg:	′ grains, Htg: 29° DB 72° DB				
Summer: Ventilation contro	ls outside air, W	nter: Ve	entilation controls outsid	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	227 327 1,495 0 0 s: 0	Btuh Btuh Btuh Btuh Btuh Btuh	6 33	CFM CFM		2,049	Btuh
Heating Supply Air: 554 / (Winter Vent Outside Air (10	986 X 1.08 X 16) = 0.0% of supply) =		33 33	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	1,119 94 : 70 0 Iv side of coil:	Btuh Btuh Btuh Btuh Btuh				1,283	Btuh
Cooling Supply Air: 1,284 / Summer Vent Outside Air ((.986 X 1.1 X 20) = 55.2% of supply) =		59 33	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 460 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	33	CFM		460 1,743	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	230 4 27 dling system: atent gain:	Btuh Btuh Btuh				261 2,004	Btuh Btuh
Check Figures		<u>,</u>					
Total Air Handler Supply Ai Total Air Handler Vent. Air	r (based on a 20° TD (55.22% of Supply):):	59 33	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	9:		98 0.6037 586.8 0.0017 20.91	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: n Outside Air:		2,049 0.17	Btuh Tons			

Chvac Tres We Tacoma	- Full Commercial HVAC Load est Engineers a, WA 98409-7315 Handler #16 - FCU	E Developm Studi Engine Fire	Litte Software De ity of Payallup ent & Permitting Services CHC F CHC F CH	velopment, Inc. Puyallup Garage Page 33			
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM
6	Office 128	98	554	1,214	228	2AC/Hr	2AC/Hr
	3pm July	1	33	59	0	33	33
		980	0.33	0.60	0	33	33
	Zone Peak Totals:	98	554	1,214	228		
	Total Zones: 1	1	33	59	0	33	33
	Unique Zones: 1	980	0.33	0.60	0	33	33

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	_ 		Elite Softwa City of Puyallup Development & Permitting Services / ISSUED PERMIT Building Planning	are Deve CHC Pu	lopment, Inc. yallup Garage Page 34
Air Handler #16 - F Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	FCU1-16 - Tota FCU1-16 Constant Draw-Thru with prog 67% motor and fan 0.85	Al Loa Volume - gram esti efficienc	d Summary - Sum of Peaks imated horsepower of y with 2 in. water acros Th	0.03 HP ss the fan nis system o	Engineering Public Works Frie Traffic	s) in the	building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	2pm in July. Clg: 88° DB, 67° WI Clg: 75° DB, 50% R	3, 66.47 H, Htg: 7	grains, Htg: 29° DB 72° DB				
Summer: Ventilation contro	ls outside air, Wi	nter: Ver	ntilation controls outsic	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss: Total System sensible loss:	227 327 1,495 0 0 ss: 0	Btuh Btuh Btuh Btuh Btuh Btuh	6 33	CFM CFM		2,049	Btuh
Heating Supply Air: 554 / (Winter Vent Outside Air (10	986 X 1.08 X 16) = 0.0% of supply) =		33 33	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	1,119 94 :: 70 0 0 Ny side of coil:	Btuh Btuh Btuh Btuh Btuh				1,283	Btuh
Cooling Supply Air: 1,284 / Summer Vent Outside Air ((.986 X 1.1 X 20) = 55.2% of supply) =		59 33	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 460 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	33	CFM		460 1,743	Btuh Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	230 4 27 dling system: atent gain:	Btuh Btuh Btuh				261 2,004	Btuh Btuh
Check Figures							
Total Air Handler Supply Ai Total Air Handler Vent. Air	r (based on a 20° TD (55.22% of Supply):):	59 33	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	9:		98 0.6037 586.8 0.0017 20.91	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: h Outside Air:		2,049 0.17	Btuh Tons			

Chvac - Full Commercial HVAC Loads Calculation Program Elite Software Devel Tres West Engineers City of Puyallup Tacoma, WA 98409-7315 Elite Software Devel Air Handler #17 - FCU1-17 - Summary Loads Engineering								
Zn	Description	Area	Htg.Loss	Sen.Gain	Lat.Gain	Htg.O.A.	Clg.O.A.	
No	Zone Peak Time	People	Htg.CFM	Clg.CFM	S.Exh	Req.CFM	Req.CFM	
		Volume	CFM/Sqft	CFM/Sqft	W.Exh	Act.CFM	Act.CFM	
7	Office 129	98	554	1,214	228	2AC/Hr	2AC/Hr	
	3pm July	1	33	59	0	33	33	
		980	0.33	0.60	0	33	33	
	Zone Peak Totals:	98	554	1,214	228			
	Total Zones: 1	1	33	59	0	33	33	
	Unique Zones: 1	980	0.33	0.60	0	33	33	

Chvac - Full Commercial HVA Tres West Engineers Tacoma, WA 98409-7315	C Loads Calculation Pr	ogram	Ĵ,		City of Puya Development & Permi /ISSUED PEI Building	Software D Illup Itting Services RMIT Planning	evelopment, Inc. Puyallup Garage Page 36
Air Handler #17 - F		alloa	d Summarv		Engineering Pi	ublic Works	
Air Handler Description: Supply Air Fan: Fan Input: Sensible Heat Ratio:	FCU1-17 Constant Draw-Thru with prog 67% motor and fan 0.85	Volume - gram esti efficiency	Sum of Peaks mated horsepower of with 2 in. water acro Ti	0.03 HP ss the fan his system o	occurs 1 t	time(s) in t	he building
Air System Peak Time: Outdoor Conditions: Indoor Conditions:	2pm in July. Clg: 88° DB, 67° WI Clg: 75° DB, 50% R	B, 66.47 H, Htg: 7	grains, Htg: 29° DB ′2° DB				
Summer: Ventilation contro	ls outside air, Wi	nter: Ver	ntilation controls outsid	de air.			
Zone Space sensible loss: Infiltration sensible loss: Outside Air sensible loss: Supply Duct sensible loss: Return Duct sensible loss: Return Plenum sensible loss Total System sensible loss:	227 327 1,495 0 0 s: 0	Btuh Btuh Btuh Btuh Btuh Btuh	6 33	CFM CFM		2,04	49 Btuh
Heating Supply Air: 554 / (.9 Winter Vent Outside Air (10	986 X 1.08 X 16) = 0.0% of supply) =		33 33	CFM CFM			
Zone space sensible gain: Infiltration sensible gain: Draw-thru fan sensible gain: Supply duct sensible gain: Reserve sensible gain: Total sensible gain on supp	1,119 94 : 70 0 0 Iy side of coil:	Btuh Btuh Btuh Btuh Btuh				1,23	33 Btuh
Cooling Supply Air: 1,284 / Summer Vent Outside Air ((.986 X 1.1 X 20) = 55.2% of supply) =		59 33	CFM CFM			
Return duct sensible gain: Return plenum sensible gai Outside air sensible gain: Blow-thru fan sensible gain Total sensible gain on retur Total sensible gain on air ha	n: 0 460 : 0 n side of coil: andling system:	Btuh Btuh Btuh Btuh	33	CFM		41 1,7•	60 Btuh 43 Btuh
Zone space latent gain: Infiltration latent gain: Outside air latent gain: Total latent gain on air hand Total system sensible and I	230 4 27 dling system: atent gain:	Btuh Btuh Btuh				20 2,00	61 Btuh 04 Btuh
Check Figures		-					
Total Air Handler Supply Air Total Air Handler Vent. Air (r (based on a 20° TD 55.22% of Supply):):	59 33	CFM CFM			
Total Conditioned Air Space Supply Air Per Unit Area: Area Per Cooling Capacity: Cooling Capacity Per Area: Heating Capacity Per Area:	9:		98 0.6037 586.8 0.0017 20.91	Sq.ft CFM/Sq.ft Sq.ft/Ton Tons/Sq.ft Btuh/Sq.ft			
Total Heating Required Wit Total Cooling Required Wit	h Outside Air: n Outside Air:		2,049 0.17	Btuh Tons			