Mechanical Appendix

Wall System Summary For Happ Analysis

Wall System Summary	
Designation	**Direction: Location**
Ceiling #1	NE: Above Lounge/Circulation Areas
Ceiling #2	NE: Above Wading Pool/Sides of Skylight Above Lap Pool
Ceiling #3	NE: Above Lap Pool
Ceiling #4	NE: Above Lap Pool
Floor #1	Reference Floor Plans
Floor #2	Reference Floor Plans
Interior Walls #1	W,S: Upper Wall
Interior Walls #2	W,S: Lower Wall
Interior Walls #3	W,S: (3) Doors-West Wall, (7) Doors-South Wall
Exterior Walls #1	N:Upper Wall
Exterior Walls #2	N:Lower Wall
Exterior Walls #3	E:Upper Wall
Exterior Walls #4	E:Lower Wall

Ceiling Systems

Ceiling System # 1
Area: 1936 sq.ft.
Material
Dens-Shield System Tile Backer (3/8" gypsum and glass core, (2) 1/8" glass mats, (1) 1/8" acrylic coating)
3' Air Space
Adhered Vapor Barrier System
CIP Concrete 8 1/2" depth
Rigid Roof Insulation System (R=30min)
Membrane Roofing/Flashing
Total U Value: 0.029 BTU/hr-ft2-F

Ceiling System # 2
Area: 764 sq.ft.
Material
Dens-Shield System Tile Backer (3/8" gypsum and glass core, (2) 1/8" glass mats, (1) 1/8" acrylic coating)
2' Air Space
Adhered Vapor Barrier System
CIP Concrete 8 1/2" depth
Rigid Roof Insulation System (R=30min)
Membrane Roofing/Flashing
Total U Value: 0.029 BTU/hr-ft2-F

Floor Systems

Floor System # 1
Area: 2405 sq.ft.
Material
Porcelain Tile on 1 1/2" setting bed
Waterproofing
CIP Concrete 12" depth
U Value N/A in HAP

Floor System # 2
Area: 528 sq.ft.
Material
Pools
U Value N/A in HAP

Interior Wall Systems

Interior Facing Wall System # 1
Area: 394 sq.ft.
Material
Dens-Shield System Tile Backer (3/8" gypsum and glass core, (2) 1/8" glass mats, (1) 1/8" acrylic coating)
3 5/8" Metal Stud Partition with Full Batt Insulation
5/8" Gypsum Board
U Value N/A in HAP

Interior Facing Wall System # 2
Area: 747 sq.ft.
Material
Porcelain Tile
Dens-Shield System Tile Backer (3/8" gypsum and glass core, (2) 1/8" glass mats, (1) 1/8" acrylic coating)
3 5/8" Metal Stud Partition with Full Batt Insulation
5/8" Gypsum Board
U Value N/A in HAP

Interior Facing Wall System # 3
Area: 147 sq.ft.
Material
Hollow Metal Doors
U Value N/A in HAP

Exterior Wall Systems

Exterior Facing Wall System # 1
Area: 226 sq.ft.
Material
Dens-Shield System Tile Backer (3/8" gypsum and glass core, (2) 1/8" glass mats, (1) 1/8" acrylic coating)
3 5/8" Metal Stud Partition with Full Batt Insulation
12" Reinforced Concrete Block
2" EIFS
Total U Value: 0.05 BTU/hr-ft2-F

Exterior Facing Wall System # 2
Area: 513 sq.ft.
Material
Porcelain Tile
Dens-Shield System Tile Backer (3/8" gypsum and glass core, (2) 1/8" glass mats, (1) 1/8" acrylic coating)
3 5/8" Metal Stud Partition with Full Batt Insulation
12" Reinforced Concrete Block
2" EIFS
Total U Value: 0.05 BTU/hr-ft2-F

Exterior Facing Wall System # 3
Area: 102 sq.ft.
Material
Dens-Shield System Tile Backer (3/8" gypsum and glass core, (2) 1/8" glass mats, (1) 1/8" acrylic coating)
3 5/8" Metal Stud Partition with Full Batt Insulation
2" Rigid Insulation System
6" Precast Concrete Panel System
Total U Value: 0.037 BTU/hr-ft2-F

Exterior Facing Wall System # 4
Area: 231 sq.ft.
Material
Porcelain Tile
Dens-Shield System Tile Backer (3/8" gypsum and glass core, (2) 1/8" glass mats, (1) 1/8" acrylic coating)
3 5/8" Metal Stud Partition with Full Batt Insulation
2" Rigid Insulation System
6" Precast Concrete Panel System
Total U Value: 0.037 BTU/hr-ft2-F

Skylight s (Included in Ceiling Systems)

Ceiling System # 3
Area: 364 sq.ft.
Material
Heat Mirror TC 88: Triple Glazed Skylight
Total U Value: 0.13 BTU/hr-ft2-F

Ceiling System # 4
Area: 442 sq.ft.
Material
Solarscreen Low-E Insulating Glass Skylight by Viracon
Total U Value: 0.27 BTU/hr-ft2-F

Air System Sizing Summary for Test2 Dehumidification System

Project Name: Pool With Old Skylight
Prepared by: psuae

03/16/2005
02:45PM

Air System Information

Air System Name	**Test2 Dehumidification System**	Number of zones	**1**	
Equipment Class	**PKG VERT**	Floor Area	**2933.0**	ft²
Air System Type	**SZCAV**	Location	**Rochester, Minnesota**	

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM	**Sum of space airflow rates**	Calculation Months	**Jan to Dec**	
Space CFM	**Individual peak space loads**	Sizing Data	**Calculated**	

Central Cooling Coil Sizing Data

Total coil load	**8.6**	Tons	Load occurs at	**Jul 1400**	
Total coil load	**102.6**	MBH	OA DB / WB	**87.4 / 71.8**	°F
Sensible coil load	**74.6**	MBH	Entering DB / WB	**83.3 / 68.3**	°F
Coil CFM at Jul 1400	**2858**	CFM	Leaving DB / WB	**57.9 / 56.6**	°F
Max block CFM	**2858**	CFM	Coil ADP	**55.1**	°F
Sum of peak zone CFM	**2858**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.727**		Resulting RH	**47**	%
ft²/Ton	**343.0**		Design supply temp.	**58.0**	°F
BTU/(hr-ft²)	**35.0**		Zone T-stat Check	**1 of 1**	OK
Water flow @ 10.0 °F rise	**N/A**		Max zone temperature deviation	**0.0**	°F

Central Heating Coil Sizing Data

Max coil load	**149.8**	MBH	Load occurs at	**Des Htg**	
Coil CFM at Des Htg	**2858**	CFM	BTU/(hr-ft²)	**51.1**	
Max coil CFM	**2858**	CFM	Ent. DB / Lvg DB	**26.4 / 77.3**	°F
Water flow @ 20.0 °F drop	**N/A**				

Supply Fan Sizing Data

Actual max CFM	**2858**	CFM	Fan motor BHP	**1.25**	BHP
Standard CFM	**2724**	CFM	Fan motor kW	**0.93**	kW
Actual max CFM/ft²	**0.97**	CFM/ft²	Fan static	**1.50**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**1467**	CFM	CFM/person	**229.14**	CFM/person
CFM/ft²	**0.50**	CFM/ft²			

Air System Sizing Summary for Test Dehumidification System

Project Name: Pool With New Skylight — 03/16/2005
Prepared by: psuae — 02:43PM

Air System Information

Air System Name	**Test Dehumidification System**		Number of zones	**1**	
Equipment Class	**PKG VERT**		Floor Area	**2933.0**	ft²
Air System Type	**SZCAV**		Location	**Rochester, Minnesota**	

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM	**Sum of space airflow rates**		Calculation Months	**Jan to Dec**	
Space CFM	**Individual peak space loads**		Sizing Data	**Calculated**	

Central Cooling Coil Sizing Data

Total coil load	**7.4**	Tons	Load occurs at	**Jul 1400**	
Total coil load	**89.2**	MBH	OA DB / WB	**87.4 / 71.8**	°F
Sensible coil load	**61.0**	MBH	Entering DB / WB	**85.0 / 69.6**	°F
Coil CFM at Jul 1400	**2169**	CFM	Leaving DB / WB	**57.7 / 56.4**	°F
Max block CFM	**2169**	CFM	Coil ADP	**54.7**	°F
Sum of peak zone CFM	**2169**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.684**		Resulting RH	**47**	%
ft²/Ton	**394.8**		Design supply temp.	**58.0**	°F
BTU/(hr-ft²)	**30.4**		Zone T-stat Check	**1 of 1**	OK
Water flow @ 10.0 °F rise	**N/A**		Max zone temperature deviation	**0.0**	°F

Central Heating Coil Sizing Data

Max coil load	**143.0**	MBH	Load occurs at	**Des Htg**	
Coil CFM at Des Htg	**2169**	CFM	BTU/(hr-ft²)	**48.8**	
Max coil CFM	**2169**	CFM	Ent. DB / Lvg DB	**12.1 / 76.2**	°F
Water flow @ 20.0 °F drop	**N/A**				

Supply Fan Sizing Data

Actual max CFM	**2169**	CFM	Fan motor BHP	**0.95**	BHP
Standard CFM	**2068**	CFM	Fan motor kW	**0.71**	kW
Actual max CFM/ft²	**0.74**	CFM/ft²	Fan static	**1.50**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**1467**	CFM	CFM/person	**229.14**	CFM/person
CFM/ft²	**0.50**	CFM/ft²			

FEATURES AND BENEFITS

An indoor pool is a challenging indoor air quality project unlike few others. With a combination of high temperatures, high moisture generation, high chemical usage, differential activity levels and multiple interdependent systems it requires specialized design and engineering. Dectron can help - please request Dectron's Natatorium design guidelines for more information.

The indoor pool environment also requires specialized equipment and here Dectron can help even more. Below are some of the features and benefits that keep the DRY-O-TRON® DSV Series ahead of the competition. Ask for these features.

METASYS® COMPATIBLE

QUALITY FEATURES INCLUDE:

- Patented simultaneous heat rejection to air and pool water avoids temperature swings, **exclusive to Dectron**
- Multi-stage pool water heating guards against wide fluctuations in pool water temperature, **exclusive to Dectron**
- Heavy gauge enclosure painted internally and externally with baked alkyd powder paint in a 5-stage process
- Scroll compressors (most models) for high reliability and quieter operation
- Contributes to space heating when required
- Corrosion proof self-draining sanitary drain pan
- Side drain with internal P-trap
- Microprocessor control reduces service time
- Unit mounted sensors simplify installation
- Vented co-axial cupro-nickel pool water heater suitable for potable water
- Voltages available:
  208/230 single phase 60 Hz
  208/230, 460, 575 three phase
  60 Hz (some models)

OPTIONS AVAILABLE INCLUDE:

- Air conditioning package (air, water or fluid-cooled)
- Outdoor air inlet to meet ASHRAE Ventilation Standard 62-1989 with filter and balancing damper
- Auxiliary outdoor gas boiler for space or pool water heating
- Auxiliary water heaters for other uses
- Higher air volumes and higher external static pressures
- Power supply for ventilation 80VA, 24V
- Air flow sensors for filter maintenance
- Metasys® Compatibility
- Firestat interlock
- Extended warranty plans
- 50 Hz operation

Also available
DS Series (Horizontal Airflow)

PERFORMANCE DATA

Model	Moisture Removal[1]	Air Volume[2]	Total Energy Consumption[1]	Total Capacity[1]	External Static Pressure[3]
DSV	lb/h	cfm	kW	Btu/h	in WC
010	11.0	1,000	2.4	25,690	0.5
015	13.7	1,200	3.4	31,900	0.5
020	23.1	2,000	4.5	53,900	0.5
030	30.3	3,000	6.3	70,660	0.5
040	45.5	3,300	8.3	106,160	0.5
060[4]	64.8	5,200	17.3	139,890	0.5

1. At air on 82°F DB and 60% RH.
2. Higher air volumes available, please contact factory.
3. Higher external static pressures available, please contact factory.
4. Larger sizes available, please contact factory

DIMENSIONAL DATA

Model	Dimensions[1]	Filter Section Dimensions	Net Weight[2]
DSV	L x W x H in	lb	
010	30 x 30 x 65	20 x 12 x 33	400
015	30 x 30 x 65	20 x 12 x 33	470
020	36 x 30 x 65	31 x 12 x 33	600
030	43 x 30 x 65	40 x 12 x 33	800
040	43 x 30 x 72	47 x 12 x 32	1000
060	64 x 41 x 72	59 x 12 x 44	1600

1. Certain options require larger enclosure
2. Options not included

OPERATING RANGE*

Air on temperature	74°F thru 86°F DB
Air on relative humidity	40 thru 70% RH
Pool water temperature	78 thru 104°F

** For conditions outside this range, consult your DRY-O-TRON® representative or the factory for assistance*