



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض

عمومی و مشترک



شماره پیمان:

053 - 073 - 9184

HVAC CALCULATION NOTE FOR CONTROL BUILDING

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D01	0001	CN	HV	120	PEDCO	GCS	BK

شماره صفحه: 1 از 64

طرح نگهداشت و افزایش تولید 27 مخزن

HVAC CALCULATION NOTE FOR CONTROL BUILDING

نگهداشت و افزایش تولید میدان نفتی بینک

Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval
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Status:

IDC: Inter-Discipline Check
 IFC: Issued For Comment
 IFA: Issued For Approval
 AFD: Approved For Design
 AFC: Approved For Construction
 AFP: Approved For Purchase
 AFQ: Approved For Quotation
 IFI: Issued For Information
 AB-R: As-Built for CLIENT Review
 AB-A: As-Built -Approved



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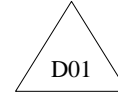
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 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>																	
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1.0 INTRODUCTION

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.

With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development Company (PEDCO). Also PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.



GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – General Facilities
GENERAL CONTRACTOR (GC):	Petro Iran Development Company (PEDCO)
EPC CONTRACTOR:	Joint Venture of :Hirgan Energy – Design & Inspection(D&I) Companies
VENDOR:	The firm or person who will fabricate the equipment or material.
EXECUTOR:	Executor is the party which carries out all or part of construction and/or commissioning for the project.
THIRD PARTY INSPECTOR (TPI):	The firm appointed by EPD/EPC CONTRACTOR(GC) and approved by CLIENT (in writing) for the inspection of goods.
SHALL:	Is used where a provision is mandatory.
SHOULD:	Is used where a provision is advisory only.
WILL:	Is normally used in connection with the action by CLIENT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR
MAY:	Is used where a provision is completely discretionary.

2.0 SCOPE

This document covers minimum necessary requirements for basis of design and main equipment's to be used for the Heating, Ventilating, Air-Conditioning and pressurizing and plumbing system for buildings for project

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3.0 NORMATIVE REFERENCES

3.1 LOCAL CODES AND STANDARDS

- IPS Iranian petroleum standards
- INBC Iranian National Building Code



3.2 INTERNATIONAL CODES AND STANDARDS

- ASTM American Society for Testing Materials Relevant Parts
- API 610 Centrifugal Pumps for General Refinery Service, 10th Edition
- ISO 15156 Petroleum and Natural Gas Industries. Materials for use in H2S Containing Environments in Oil and Gas Production
- AMCA Air Movement and Control Association
- ANSI American National Standards Institute.
- ASHRAE American Society of Heating, Refrigeration and Air-conditioning Engineer
- ASTM American Society for Testing and Material
- BOCA Building Officials and Code Administrators international
- BS British Standards
- CIBSE Chartered Institute of Building Services Engineers.
- NFPA National fire protection association
- SBCCI Southern Building Code Congress International
- SMACNA Sheet Metal and Air Conditioning Contractors' National Association
- AWWA American Water Works Association
- ASME The American Society of Mechanical Engineers

Note: The latest issued or revised edition of all above mentioned codes and standards shall be considered as reference.

3.3 ENVIRONMENTAL DATA

Refer to "Process Basis of Design; Doc. No BK-GNRL-PEDCO-000-PR-DB-0001 .

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4.0 SITE CONDITIONS

The following information is related to Bandar Deylam and Genaveh.



4.1 SITE LOCATION

- Latitude 30° 32' N
- Longitude 50° 17' E
- Elevation 10 m

4.2 EXTERNAL DESIGN CONDITIONS (FOR HVAC DESIGN CALCULATION)

- Summer dry bulb temperature : 41° C
- Summer relative humidity : 61 %
- Summer daily range temperature : 15.0° C
- Winter dry bulb temperature : 6.0° C
- Winter relative humidity : 100%



Note1: Outdoor refrigeration equipment shall be designed to maintain design conditions with an 50 °C temperature.

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5.0 INTERNAL DESIGN CONDITIONS (CONTROL ROOM BUILDING)

BASED ON "HVAC DESIGN CRITERIA" DOC. NUMBER: BK-GNRAL-PEDCO-000-HV-DC-0001

Room	Min. Fresh Air (Note 3)	Min. Exhaust	Room Temp Winter/Summer (Deg C)	Relative Humidity Winter/Summer (Min/Max)%	Over Pressure Value (Pa)	Equipment Heat Gain (Watts)
Control Room	10% supply air	-	22/24	30/60	Positive	See(13.3Design Criteria)
Engineering Room	10 l/s. person	-	22/24	30/60	Positive	-
Auxiliary Room	10% supply air	-	22/24	30/60	Positive	See(13.3Design Criteria)
UPS & Charger Room	1 ACH	-	22/24	30/60	Positive	See(13.3Design Criteria)
Toilet	-	15 ACH	20/26	NC	Negative	-
Battery Room	1 ACH	10 ACH	20/27±2	30/60	Negative	-
Corridor	10 l/s. person	-	22/24	30/60	Positive	-
Air Lock	10 l/s. person	-	22/24	30/60	Positive	-
Office	10 l/s. person	-	22/24	30/60	Positive	-
Archive	10 l/s. person	-	22/24	30/60	Positive	-
HVAC Control Panel Room	1 ACH	-	10/30	NC	Positive	-
Prayer Room	10 l/s. person	-	22/24	30/60	-	-
Instrument Room	10 l/s. person	-	22/24	30/60	Positive	-
Pantry	10 l/s. person	6 ACH	22/24	30/60	-	-
Locker & Shower	2 ACH	8 ACH	20/26	NC	Negative	-



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6.0 HVAC CALCULATION

6.1 DESIGN WEATHER PARAMETERS:

Design Parameters:



City Name	bink
Location	IRAN
Latitude	30.3
Deg.Longitude	-50.2
Deg.Elevation	10.0 m
Summer Design Dry-Bulb	41.0 °C
Summer Coincident Wet-Bulb	34.0 °C
Summer Daily Range	15.0
°K Winter Design Dry-Bulb	6.0 °C
Winter Design Wet-Bulb	6.0 °C
Atmospheric Clearness Number	1.00
Average Ground Reflectance	0.20
Soil Conductivity	1.385
W/(m·°K)Local Time Zone (GMT +/- N hours)	-1.0 hours
Consider Daylight Savings Time	No
Simulation Weather Data	none N/A
Current Data is	User Modified
Design Cooling Months	January to December

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Design Day Maximum Solar Heat Gains

(The MSHG values are expressed in W/m²)

Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S
January	76.4	76.4	104.1	335.1	577.4	722.3	796.4	786.7	764.0
February	88.0	88.0	230.9	458.1	662.9	773.4	774.9	717.7	674.9
March	100.7	108.6	368.7	585.3	707.6	758.3	705.1	595.4	528.1
April	113.1	256.3	472.2	642.7	716.0	679.9	580.0	422.9	334.5
May	124.2	353.9	534.8	663.8	694.2	620.4	475.0	290.9	209.6
June	157.8	384.6	558.6	667.1	676.8	585.8	428.0	240.6	172.3
July	127.6	344.7	537.1	656.3	678.1	598.4	463.4	281.6	203.3
August	118.2	248.3	466.5	623.6	687.8	654.3	558.9	407.2	322.5
September	104.5	113.3	336.6	555.0	683.3	716.4	681.4	580.5	517.4
October	90.9	90.9	201.8	462.7	636.7	736.7	756.5	701.7	660.0
November	77.8	77.8	98.3	345.3	551.3	718.6	773.6	774.1	756.1
December	71.4	71.4	71.4	269.7	530.8	696.4	785.4	795.0	786.8
Month	SSW	SW	WSW	W	WNW	NW	NNW	HOR	Mult
January	789.5	796.9	721.1	569.2	354.1	83.2	76.4	579.3	1.00
February	722.0	781.4	766.3	669.5	467.5	224.5	88.0	702.0	1.00
March	596.6	704.4	761.1	720.6	569.4	368.1	116.6	809.9	1.00
April	421.4	576.3	689.2	714.5	631.4	476.0	257.9	863.7	1.00
May	289.5	470.8	624.0	691.1	655.0	542.6	355.7	877.6	1.00
June	238.3	421.9	590.9	670.1	656.4	565.4	389.3	873.7	1.00
July	278.1	456.2	609.2	671.7	644.3	540.2	353.4	863.9	1.00
August	405.5	554.8	664.2	689.2	610.9	463.3	256.0	845.0	1.00
September	580.7	681.6	714.0	684.8	554.4	333.4	114.2	785.9	1.00
October	698.5	750.4	744.7	624.3	458.7	216.5	90.9	693.3	1.00
November	770.3	775.6	718.6	559.7	335.4	103.0	77.8	579.1	1.00
December	796.5	774.3	701.4	517.9	296.9	71.4	71.4	527.6	1.00

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6.2 CONSTRUCTIONS U-VALUE:

External Wall

Wall Details

Outside Surface Color **Dark**
 Absorptivity **0.900**
 Overall U-Value **0.642** W/(m²·K)

Wall Layers Details (Inside to Outside)

Layers	Thickness mm	Density kg/m ³	Specific Ht. kJ / (kg · °K)	R-Value (m ² ·K)/W	Weight kg/m ²
Inside surface resistance	0.000	0.0	0.00	0.12064	0.0
concrete	300.000	2242.6	0.84	0.17334	672.8
insulation	50.000	32.0	0.92	1.13000	1.6
face brick	100.000	2002.3	0.92	0.07504	200.2
Outside surface resistance	0.000	0.0	0.00	0.05864	0.0
Totals	450.000	-		1.55766	874.6

External Roof

Roof Details

Outside Surface Color **Dark**
 Absorptivity **0.900**
 Overall U-Value **0.510** W/(m²·K)

Roof Layers Details (Inside to Outside)

Layers	Thickness mm	Density kg/m ³	Specific Ht. kJ / (kg · °K)	R-Value (m ² ·K)/W	Weight kg/m ²
Inside surface resistance	0.000	0.0	0.00	0.12064	0.0
concrete	300.000	2242.6	0.84	0.17334	672.8
board insulation	50.000	32.0	0.92	1.13000	1.6
cement mortar	50.000	1121.3	1.47	0.40000	56.1
Terrazzo	20.000	608.7	0.84	0.08000	12.2
Outside surface resistance	0.000	0.0	0.00	0.05864	0.0
Totals	420.000	-		1.96262	742.6



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض

عمومی و مشترک



شماره پیمان:

053 - 073 - 9184

HVAC CALCULATION NOTE FOR CONTROL BUILDING

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D01	0001	CN	HV	120	PEDCO	GCS	BK

شماره صفحه: 11 از 64

DOORS:

1*2.5

Door Details:

Gross Area 2.5 m²
Door U-Value 5.800 W/(m²-°K)

Glass Details:

Glass Area 0.0 m²
Glass U-Value 3.293 W/(m²-°K)
Glass Shade Coefficient 0.880
Glass Shaded All Day? No



1.5 x 2.5

Door Details:

Gross Area 3.8 m²
Door U-Value 5.800 W/(m²-°K)

Glass Details:

Glass Area 0.0 m²
Glass U-Value 3.293 W/(m²-°K)
Glass Shade Coefficient 0.880
Glass Shaded All Day? No

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																	
شماره پیمان: 053 - 073 - 9184	HVAC CALCULATION NOTE FOR CONTROL BUILDING	شماره صفحه: 12 از 64																
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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0001	D01											

6.3 SPACES INPUT DATA:

AIR LOCK

1. General Details:

Floor Area 3.2 m²
 Avg. Ceiling Height 2.6 m
 Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 **100** % of supply air
 OA Requirement 2 **0.00** L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage **20.00** W/m²
 Ballast Multiplier **1.20**
 Schedule **Lighting**

2.2. Task Lighting:

Wattage **0.00** W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage **0.00** W/m²
 Schedule **None**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
W	7.2	0	0	1

3.1. Construction Types for Exposure W

Wall Type **External Wall**
 Door Type **None**

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	3.2	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:



Design Cooling **0.00** L/s
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s
 Infiltration occurs only when the fan is off.

6. Floors:

Type **Slab Floor On Grade**
 Floor Area **3.2** m²
 Total Floor U-Value **2.000** W/(m²-°K)
 Exposed Perimeter **1.6** m
 Edge Insulation R-Value **0.00** (m²-°K)/W

7. Partitions:

(No partition data).

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک	 شماره صفحه: 13 از 64																
شماره پیمان: 053 - 073 - 9184	HVAC CALCULATION NOTE FOR CONTROL BUILDING																	
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BK	GCS	PEDCO	120	HV	CN	0001	D01											

ARCHIVE

1. General Details:

Floor Area **18.3** m²
 Avg. Ceiling Height **2.8** m
 Building Weight **341.8** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 **10.0** L/s/person
 OA Requirement 2 **0.00** L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage **20.00** W/m²
 Ballast Multiplier **1.25**
 Schedule **Lighting**

2.2. Task Lighting:

Wattage **0.00** W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage **300.0** Watts
 Schedule **Equipment**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
W	15.0	0	0	0
S	20.2	0	0	0

3.1. Construction Types for Exposure W

Wall Type **External Wall**

3.2. Construction Types for Exposure S

Wall Type **External Wall**

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	18.3	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:

Design Cooling **0.00** L/s
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s



Infiltration occurs only when the fan is off.

6. Floors:

Type **Slab Floor On Grade**
 Floor Area **18.3** m²
 Total Floor U-Value **2.000** W/(m²-°K)
 Exposed Perimeter **8.2** m
 Edge Insulation R-Value **0.00** (m²-°K)/W

7. Partitions:

(No partition data).

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>																	
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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0001	D01											

BATTERY ROOM

1. General Details:

Floor Area 57.6 m²
Avg. Ceiling Height 4.0 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 640.0 L/s
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type Free Hanging
Wattage 20.0 Watts
Ballast Multiplier 1.20
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 2000.0 Watts
Schedule Equipment

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
W	44.3	0	0	1

3.1. Construction Types for Exposure W

Wall Type External Wall
Door Type 1.2*2.5

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	57.6	0	0

4.1. Construction Types for Exposure H

Roof Type External Roof

5. Infiltration:

Design Cooling 0.00 ACH
Design Heating 0.00 L/s
Energy Analysis 0.00 L/s
Infiltration occurs only when the fan is off.

6. Floors:

Type Slab Floor On Grade
Floor Area 57.6 m²
Total Floor U-Value 2.000 W/(m²-°K)
Exposed Perimeter 10.3 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:



(No partition data).

2.4. People:

Occupancy 0.0 Person
Activity Level Office Work
Sensible 71.8 W/person
Latent 60.1 W/person
Schedule None

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule None
Latent 0 W
Schedule None

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																	
شماره پیمان: 053 - 073 - 9184	HVAC CALCULATION NOTE FOR CONTROL BUILDING	شماره صفحه: 15 از 64																
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BK	GCS	PEDCO	120	HV	CN	0001	D01											

CONTROL ROOM

1. General Details:

Floor Area **62.4** m²
 Avg. Ceiling Height **3.2** m
 Building Weight **341.8** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 **100.0** L/s
 OA Requirement 2 **0.00** L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage **20.00** W/m²
 Ballast Multiplier **1.20**
 Schedule **Lighting**

2.2. Task Lighting:

Wattage **0.00** W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage **4000.0** Watts
 Schedule **Equipment**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	62.4	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:

Design Cooling **0.00** L/s
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s

Infiltration occurs only when the fan is off.

6. Floors:

Type **Slab Floor Below Grade**
 Floor Area **62.4** m²
 Exposed Perimeter **0.0** m
 Total Floor U-Value **2.000** W/(m²-°K)
 Floor Depth **1.0** m
 Basement Wall U-Value **0.568** W/(m²-°K)
 Wall Insulation R-Value **0.00** (m²-°K)/W
 Wall Insulation Depth **0.0** m

7. Partitions:



(No partition data).

2.4. People:

Occupancy **5.0** People
 Activity Level **Office Work**
 Sensible **71.8** W/person
 Latent **60.1** W/person
 Schedule **People**

2.5. Miscellaneous Loads:

Sensible **750** W
 Schedule **Equipment**
 Latent **0** W
 Schedule **None**

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک	 شرکت توسعه نیرو ایران HIRGAN ENERGY																
شماره پیمان: 053 - 073 - 9184	HVAC CALCULATION NOTE FOR CONTROL BUILDING	شماره صفحه: 16 از 64																
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BK	GCS	PEDCO	120	HV	CN	0001	D01											

Corridor 1

1. General Details:

Floor Area **34.8** m²
 Avg. Ceiling Height **2.6** m
 Building Weight **341.8** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 **10.0** L/s/person
 OA Requirement 2 **0.00** L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage **20.00** W/m²
 Ballast Multiplier **1.20**
 Schedule **Lighting**

2.2. Task Lighting:

Wattage **0.00** W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage **0.00** W/m²
 Schedule **None**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
W	10.1	0	0	1

3.1. Construction Types for Exposure W

Wall Type **External Wall**
 Door Type **1.2*2.5**

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	34.8	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:

Design Cooling **0.00** ACH
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s
 Infiltration occurs only when the fan is off.

6. Floors:



Type **Slab Floor On Grade**
 Floor Area **34.8** m²
 Total Floor U-Value **2.000** W/(m²-°K)
 Exposed Perimeter **0.0** m
 Edge Insulation R-Value **0.00** (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type **Wall Partition**
 Area **32.0** m²
 U-Value **1.860** W/(m²-°K)
 Uncondit. Space Max Temp **27.0** °C
 Ambient at Space Max Temp **41.0** °C



Uncondit. Space Min Temp **10.0** °C
 Ambient at Space Min Temp **6.0** °C

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>																	
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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0001	D01											

7.2. 2nd Partition Details:

Partition Type **Wall Partition**
Area **38.7** m²
U-Value **1.860** W/(m²-°K)

Uncondit. Space Max Temp **28.0** °C
Ambient at Space Max Temp **41.0** °C
Uncondit. Space Min Temp **22.0** °C
Ambient at Space Min Temp **6.0** °C

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک	 شرکت توسعه انرژی HIRGAN ENERGY																
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BK	GCS	PEDCO	120	HV	CN	0001	D01											

Corridor 2

1. General Details:

Floor Area **9.5** m²
 Avg. Ceiling Height **2.6** m
 Building Weight **341.8** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 **10.0** L/s/person
 OA Requirement 2 **0.00** L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage **20.00** W/m²
 Ballast Multiplier **1.20**
 Schedule **Lighting**

2.2. Task Lighting:

Wattage **0.00** W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage **0.00** W/m²
 Schedule **None**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	9.5	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:

Design Cooling **0.00** ACH
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s

Infiltration occurs only when the fan is off.

6. Floors:

Type **Slab Floor On Grade**
 Floor Area **9.5** m²
 Total Floor U-Value **2.000** W/(m²-°K)
 Exposed Perimeter **0.0** m
 Edge Insulation R-Value **0.00** (m²-°K)/W



7. Partitions:

7.1. 1st Partition Details:

Partition Type **Wall Partition**
 Area **20.0** m²
 U-Value **1.860** W/(m²-°K)
 Uncondit. Space Max Temp **26.0** °C
 Ambient at Space Max Temp **41.0** °C
 Uncondit. Space Min Temp **20.0** °C
 Ambient at Space Min Temp **6.0** °C

7.2. 2nd Partition Details:

Partition Type **Wall Partition**
 Area **38.7** m²
 U-Value **1.860** W/(m²-°K)
 Uncondit. Space Max Temp **28.0** °C
 Ambient at Space Max Temp **41.0** °C
 Uncondit. Space Min Temp **22.0** °C
 Ambient at Space Min Temp **6.0** °C

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																	
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BK	GCS	PEDCO	120	HV	CN	0001	D01											

ENGINEERING ROOM

1. General Details:

Floor Area **20.0** m²
 Avg. Ceiling Height **3.2** m
 Building Weight **341.8** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 **10.0** L/s/person
 OA Requirement 2 **0.00** L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage **20.00** W/m²
 Ballast Multiplier **1.20**
 Schedule **Lighting**

2.2. Task Lighting:

Wattage **0.00** W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage **450.0** Watts
 Schedule **Equipment**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
N	25.0	0	0	0

3.1. Construction Types for Exposure N

Wall Type **External Wall**

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	19.0	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:

Design Cooling **0.00** L/s
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s



Infiltration occurs only when the fan is off.

6. Floors:

Type **Slab Floor Below Grade**
 Floor Area **20.0** m²
 Exposed Perimeter **5.7** m
 Total Floor U-Value **2.000** W/(m²-°K)
 Floor Depth **1.0** m
 Basement Wall U-Value **0.568** W/(m²-°K)
 Wall Insulation R-Value **0.00** (m²-°K)/W
 Wall Insulation Depth **0.0** m

7. Partitions:

(No partition data).

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>																	
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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0001	D01											

hvac control panel

1. General Details:

Floor Area 12.0 m²
Avg. Ceiling Height 3.2 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 10.0 L/s
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type Free Hanging
Wattage 20.00 W/m²
Ballast Multiplier 1.20
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 2000.0 Watts
Schedule Equipment

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
W	10.3	0	0	0

3.1. Construction Types for Exposure W

Wall Type External Wall

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	12.0	0	0

4.1. Construction Types for Exposure H

Roof Type External Roof

5. Infiltration:

Design Cooling 0.00 ACH
Design Heating 0.00 L/s
Energy Analysis 0.00 L/s

Infiltration occurs only when the fan is off.

6. Floors:

Type Slab Floor On Grade
Floor Area 12.0 m²
Total Floor U-Value 2.000 W/(m²-°K)
Exposed Perimeter 2.4 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:



(No partition data).

2.4. People:

Occupancy 3.0 People
Activity Level Office Work
Sensible 71.8 W/person
Latent 60.1 W/person
Schedule People

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule None
Latent 0 W
Schedule None

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																	
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053 - 073 - 9184	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>پروژه</td> <td>بسته کاری</td> <td>صادرکننده</td> <td>تسهیلات</td> <td>رشته</td> <td>نوع مدرک</td> <td>سریال</td> <td>نسخه</td> </tr> <tr> <td>BK</td> <td>GCS</td> <td>PEDCO</td> <td>120</td> <td>HV</td> <td>CN</td> <td>0001</td> <td>D01</td> </tr> </table>	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	BK	GCS	PEDCO	120	HV	CN	0001	D01	
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BK	GCS	PEDCO	120	HV	CN	0001	D01											

Instrument Room

1. General Details:

Floor Area 20.1 m²
 Avg. Ceiling Height 2.8 m
 Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 10.0 L/s/person
 OA Requirement 2 0.00 L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage 20.00 W/m²
 Ballast Multiplier 1.25
 Schedule **Lighting**

2.2. Task Lighting:

Wattage 0.00 W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage 300.0 Watts
 Schedule **Equipment**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
E	13.5	0	0	0

3.1. Construction Types for Exposure E

Wall Type **External Wall**

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	20.1	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:

Design Cooling 0.00 L/s
 Design Heating 0.00 L/s
 Energy Analysis 0.00 L/s

Infiltration occurs only when the fan is off.

6. Floors:



Type **Slab Floor On Grade**
 Floor Area 20.1 m²
 Total Floor U-Value 2.000 W/(m²-°K)
 Exposed Perimeter 3.0 m
 Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:



Partition Type **Wall Partition**
 Area 27.0 m²
 U-Value 2.839 W/(m²-°K)
 Uncondit. Space Max Temp 26.0 °C
 Ambient at Space Max Temp 44.0 °C
 Uncondit. Space Min Temp 20.0 °C

Ambient at Space Min Temp 6.0 °C

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>																	
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نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه											
D01	0001	CN	HV	120	PEDCO	GCS	BK											

7.2. 2nd Partition Details:

(No partition data).

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شماره پیمان: 053 - 073 - 9184	HVAC CALCULATION NOTE FOR CONTROL BUILDING	شماره صفحه: 23 از 64																
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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0001	D01											

ITR

1. General Details:

Floor Area **90.7** m²
 Avg. Ceiling Height **3.2** m
 Building Weight **341.8** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 **10** % of supply air
 OA Requirement 2 **0.00** L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage **20.00** W/m²
 Ballast Multiplier **1.20**
 Schedule **Lighting**

2.2. Task Lighting:

Wattage **0.00** W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage **20000.0** Watts
 Schedule **Equipment**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
N	27.0	0	0	1
E	62.0	0	0	0

3.1. Construction Types for Exposure N

Wall Type **External Wall**
 Door Type **1.5 x 2.5**

3.2. Construction Types for Exposure E

Wall Type **External Wall**

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	90.7	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:

Design Cooling **0.00** L/s
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s

Infiltration occurs only when the fan is off.

2.4. People:

Occupancy **2.0** People
 Activity Level **Office Work**
 Sensible **71.8** W/person
 Latent **60.1** W/person
 Schedule **People**

2.5. Miscellaneous Loads:

Sensible **0** W
 Schedule **None**
 Latent **0** W
 Schedule **None**



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض

عمومی و مشترک



شماره پیمان:

053 - 073- 9184

HVAC CALCULATION NOTE FOR CONTROL BUILDING

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D01	0001	CN	HV	120	PEDCO	GCS	BK



شماره صفحه: 24 از 64

6. Floors:

Type	Slab Floor Below Grade	
Floor Area	90.7	m ²
Exposed Perimeter	20.7	m
Total Floor U-Value	2.000	W/(m ² -°K)
Floor Depth	1.0	m
Basement Wall U-Value	0.568	W/(m ² -°K)
Wall Insulation R-Value	0.00	(m ² -°K)/W
Wall Insulation Depth	0.0	m

7. Partitions:

(No partition data).

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>																	
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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0001	D01											

LOCKER AND SHOWER

1. General Details:

Floor Area 20.0 m²
Avg. Ceiling Height 2.5 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 85.0 L/s
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type Free Hanging
Wattage 20.00 W/m²
Ballast Multiplier 1.20
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 0.00 W/m²
Schedule None

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
E	13.8	0	0	0

3.1. Construction Types for Exposure E

Wall Type External Wall

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	20.0	0	0

4.1. Construction Types for Exposure H

Roof Type External Roof

5. Infiltration:

Design Cooling 0.00 ACH
Design Heating 0.00 L/s
Energy Analysis 0.00 L/s



Infiltration occurs only when the fan is off.

6. Floors:

Type Slab Floor On Grade
Floor Area 20.0 m²
Total Floor U-Value 2.000 W/(m²-°K)
Exposed Perimeter 3.2 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

(No partition data).

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک	 شرکت توسعه انرژی ایران HIRGAN ENERGY																
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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0001	D01											

OFFICE (1)

1. General Details:

Floor Area 15.0 m²
 Avg. Ceiling Height 2.8 m
 Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
 OA Requirement 1 10.0 L/s/person
 OA Requirement 2 0.00 L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type Free Hanging
 Wattage 20.00 W/m²
 Ballast Multiplier 1.25
 Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
 Schedule None

2.3. Electrical Equipment:

Wattage 450.0 Watts
 Schedule Equipment

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
W	13.8	0	0	0

3.1. Construction Types for Exposure W

Wall Type External Wall

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	15.0	0	0

4.1. Construction Types for Exposure H

Roof Type External Roof

5. Infiltration:



Design Cooling 0.00 L/s
 Design Heating 0.00 L/s
 Energy Analysis 0.00 L/s
 Infiltration occurs only when the fan is off.

6. Floors:

Type Slab Floor On Grade
 Floor Area 15.0 m²
 Total Floor U-Value 2.000 W/(m²-°K)
 Exposed Perimeter 3.2 m
 Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

(No partition data).

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک	 شماره صفحه: 27 از 64																
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BK	GCS	PEDCO	120	HV	CN	0001	D01											

OFFICE (2)

1. General Details:

Floor Area **10.8** m²
 Avg. Ceiling Height **2.8** m
 Building Weight **341.8** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 **10.0** L/s/person
 OA Requirement 2 **0.00** L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage **20.00** W/m²
 Ballast Multiplier **1.25**
 Schedule **Lighting**

2.2. Task Lighting:

Wattage **0.00** W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage **300.0** Watts
 Schedule **Equipment**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
W	15.8	0	0	0
S	20.7	0	0	0

3.1. Construction Types for Exposure W

Wall Type **External Wall**

3.2. Construction Types for Exposure S

Wall Type **External Wall**

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	10.8	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:

Design Cooling **0.00** L/s
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s



Infiltration occurs only when the fan is off.

6. Floors:

Type **Slab Floor On Grade**
 Floor Area **10.8** m²
 Total Floor U-Value **2.000** W/(m²-°K)
 Exposed Perimeter **0.0** m
 Edge Insulation R-Value **0.00** (m²-°K)/W

7. Partitions:

(No partition data).

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک	 شماره صفحه: 28 از 64																
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BK	GCS	PEDCO	120	HV	CN	0001	D01											

Pantry

1. General Details:

Floor Area 23.6 m²
 Avg. Ceiling Height 2.8 m
 Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
 OA Requirement 1 133.0 L/s
 OA Requirement 2 0.00 L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type Free Hanging
 Wattage 20.0 Watts
 Ballast Multiplier 1.20
 Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
 Schedule None

2.3. Electrical Equipment:

Wattage 0.00 W/m²
 Schedule None

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
S	28.4	0	0	0

3.1. Construction Types for Exposure S

Wall Type External Wall

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	23.6	0	0

4.1. Construction Types for Exposure H

Roof Type External Roof

5. Infiltration:

Design Cooling 0.00 ACH
 Design Heating 0.00 L/s
 Energy Analysis 0.00 L/s
 Infiltration occurs only when the fan is off.

6. Floors:



Type Slab Floor On Grade
 Floor Area 23.6 m²
 Total Floor U-Value 2.000 W/(m²-°K)
 Exposed Perimeter 6.6 m
 Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type Wall Partition
 Area 16.7 m²
 U-Value 2.839 W/(m²-°K)
 Uncondit. Space Max Temp 26.0 °C
 Ambient at Space Max Temp 44.0 °C
 Uncondit. Space Min Temp 20.0 °C

Ambient at Space Min Temp 6.0 °C

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BK	GCS	PEDCO	120	HV	CN	0001	D01											

7.2. 2nd Partition Details:
Prayer Room

(No partition data)

1. General Details:

Floor Area 9.2 m²
Avg. Ceiling Height 2.5 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 30.0 L/s
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults ASHRAE Standard 62.1-2007

2. Internals:

2.1. Overhead Lighting:

Fixture Type Free Hanging
Wattage 20.00 W/m²
Ballast Multiplier 1.20
Schedule Lighting

2.4. People:

Occupancy 3.0 People
Activity Level User defined
Sensible 71.8 W/person
Latent 60.1 W/person
Schedule People

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule None
Latent 0 W
Schedule None

2.3. Electrical Equipment:

Wattage 0.00 W/m²
Schedule None

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	9.2	0	0

4.1. Construction Types for Exposure H

Roof Type External Roof

5. Infiltration:

Design Cooling 0.00 ACH
Design Heating 0.00 L/s
Energy Analysis 0.00 L/s



Infiltration occurs only when the fan is off.

6. Floors:

Type Slab Floor On Grade
Floor Area 9.2 m²
Total Floor U-Value 2.000 W/(m²-°K)
Exposed Perimeter 0.0 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

(No partition data).

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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0001	D01											

Toilet

1. General Details:

Floor Area **34.0** m²
 Avg. Ceiling Height **2.5** m
 Building Weight **341.8** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
 OA Requirement 1 **140.0** L/s
 OA Requirement 2 **0.00** L/(s-m²)
 Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Free Hanging**
 Wattage **20.00** W/m²
 Ballast Multiplier **1.20**
 Schedule **Lighting**

2.2. Task Lighting:

Wattage **0.00** W/m²
 Schedule **None**

2.3. Electrical Equipment:

Wattage **0.00** W/m²
 Schedule **None**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
S	27.0	0	0	0
E	23.0	0	0	0

3.1. Construction Types for Exposure S

Wall Type **External Wall**

3.2. Construction Types for Exposure E

Wall Type **External Wall**

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	34.0	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:

Design Cooling **0.00** ACH
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s

Infiltration occurs only when the fan is off.

6. Floors:

Type **Slab Floor On Grade**
 Floor Area **34.0** m²
 Total Floor U-Value **2.000** W/(m²-°K)
 Exposed Perimeter **11.7** m
 Edge Insulation R-Value **0.00** (m²-°K)/W

7. Partitions:

(No partition data).

2.4. People:

Occupancy **2.0** People
 Activity Level **User defined**
 Sensible **71.8** W/person
 Latent **60.1** W/person
 Schedule **People**

2.5. Miscellaneous Loads:

Sensible **0** W
 Schedule **None**
 Latent **0** W
 Schedule **None**



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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	GCS	PEDCO	120	HV	CN	0001	D01

UPS ROOM

1. General Details:

Floor Area 23.0 m²
Avg. Ceiling Height 2.8 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 20.0 L/s
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults **ASHRAE Standard 62.1-2007**

2. Internals:

2.1. Overhead Lighting:

Fixture Type Free Hanging
Wattage 20.00 W/m²
Ballast Multiplier 1.20
Schedule Lighting

2.2. Task Lighting:



Wattage 0.00 W/m²
Schedule None

2.4. People:

Occupancy 1.0 Person
Activity Level Office Work
Sensible 71.8 W/person
Latent 60.1 W/person
Schedule People

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule None
Latent 0 W
Schedule None

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BK	GCS	PEDCO	120	HV	CN	0001	D01											

2.3. Electrical Equipment:

Wattage **5000.0** Watts
 Schedule **Equipment**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
N	25.0	0	0	0
W	18.5	0	0	1

3.1. Construction Types for Exposure N

Wall Type **External Wall**

3.2. Construction Types for Exposure W

Wall Type **External Wall**
 Door Type **1.2*2.5**

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	22.0	0	0

4.1. Construction Types for Exposure H

Roof Type **External Roof**

5. Infiltration:



Design Cooling **0.00** ACH
 Design Heating **0.00** L/s
 Energy Analysis **0.00** L/s
 Infiltration occurs only when the fan is off.

6. Floors:

Type **Slab Floor On Grade**
 Floor Area **23.0** m²
 Total Floor U-Value **2.000** W/(m²-°K)
 Exposed Perimeter **9.9** m
 Edge Insulation R-Value **0.00** (m²-°K)/W

7. Partitions:

(No partition data).

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6.4 AIR SYSTEM INPUTS:

1. General Details:

Air System Name **CONTROL BUILDING**
 Equipment Type **Split AHU**
 Air System Type **CAV with Terminal Reheat**
 Number of zones **4**

2. Ventilation System Components:

Ventilation Air Data:

Airflow Control **Constant Ventilation Airflow**
 Ventilation Sizing Method **Sum of Space OA Airflows**
 Unocc. Damper Position **Closed**
 Damper Leak Rate **0** %
 Outdoor Air CO2 Level **400** ppm

Central Cooling Data:

Supply Air Temperature **14.0** °C
 Coil Bypass Factor **0.100**
 Cooling Source **Air-Cooled DX**
 Schedule **JFMAMJJASOND**
 Capacity Control **Cycled or Staged Capacity - Fan On**

Supply Fan Data:

Fan Type **Backward Inclined or Airfoil (BI/AF)**
 Configuration **Draw-thru**
 Fan Performance **1201** Pa
 Overall Efficiency **60** %

Duct System Data:

Supply Duct Data:

Duct Heat Gain **0** %
 Duct Leakage **0** %

Return Duct or Plenum Data:

Return Air Via **Ducted Return**

3. Zone Components:

Space Assignments:

Zone 1: Zone 1	
AIR LOCK	x1
CONTROL ROOM	x1
Corridor 1	x1
ENGINEERING ROOM	x1
OFFICE (1)	x1
OFFICE (2)	x1
Pantry	x1
Prayer Room	x1
UPS ROOM	x1
Corridor 2	x1
Instrument Room	x1
ITR	x1
ARCHIVE	x1
Zone 2: Zone 2	
BATTERY ROOM	x1
Zone 3: Zone 3	
LOCKER AND SHOWER	x1
Toilet	x1
Zone 4: Zone 4	



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D01	0001	CN	HV	120	PEDCO	GCS	BK

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hvac control panel	x1
--------------------	----

Thermostats and Zone Data:

Zone	Cooling T-Stat Occ. (°C)	Cooling T-Stat Unocc. (°C)	Heating T-Stat Occ. (°C)	Heating T-Stat Unocc. (°C)	T-Stat Throttling Range (°C)	Diversity Factor (%)	Direct Exhaust Airflow (L/s)	Direct Exhaust Fan (kW)
1	24.0	24.0	22.0	22.0	0.83	100	0.0	0.0
2	27.0	27.0	20.0	20.0	0.83	100	0.0	0.0
3	26.0	26.0	20.0	20.0	0.83	100	0.0	0.0
4	27.0	27.0	10.0	10.0	0.83	100	0.0	0.0

Thermostat Schedule Fan
Unoccupied Cooling is Available

Supply Terminals Data:

Zone All
Terminal Type Diffuser with RH
Minimum Airflow 0.00 L/s/person
Reheat Coil Source Electric Resistance
Reheat Coil Schedule JFMAMJJASOND

Zone Heating Units:

Zone All
Zone Heating Unit Type None
Zone Unit Heat Source Electric Resistance
Zone Heating Unit Schedule JFMAMJJASOND

4. Sizing Data (Computer-Generated):

System Sizing Data:

Sizing Data:

Cooling Supply Temperature 14.0 °C
Supply Fan Airflow 5738.8 L/s
Ventilation Airflow 1580.3 L/s

Hydronic Sizing Specifications:

Chilled Water Delta-T 5.6 °K
Hot Water Delta-T 11.1 °K



Safety Factors:

Cooling Sensible 10 %
Cooling Latent 10 %
Heating 10 %

Zone Sizing Data:

Zone Airflow Sizing Method Sum of space airflow rates
Space Airflow Sizing Method Individual peak space loads

Zone	Supply Airflow (L/s)	Zone Htg Unit (kW)	Reheat Coil (kW)	-
1	4681.2	-	54.9	-
2	640.0	-	5.9	-
3	225.0	-	2.9	-
4	192.6	-	0.1	-

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BK	GCS	PEDCO	120	HV	CN	0001	D01											

5. Equipment Data

Central Cooling Unit - Air-Cooled DX

Design OAT	35.0 °C
Equipment Sizing	Auto-Sized
Capacity Oversizing Factor	0 %
ARI Performance Rating	3.224 EER
Conventional Cutoff OAT	12.8 °C
Low Temperature Operation	Used
Low Temperature Cutoff OAT	-17.8 °C

6.5 AIR SYSTEM INFORMATION

Air System Name	CONTROL BUILDING	Number of zones	4
Equipment Class	SPLT AHU	Floor Area	464.2 m ²
Air System Type	CAV/RH	Location	binak, IRAN

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone L/s Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space L/s Sizing	Individual peak space loads

Central Cooling Coil Sizing Data



Total coil load	217.4 kW	Load occurs at	Jul 1500
Sensible coil load	110.0 kW	OA DB / WB	41.0 / 34.0 °C
Coil L/s at Jul 1500	5750 L/s	Entering DB / WB	28.8 / 23.0 °C
Max block L/s	5750 L/s	Leaving DB / WB	12.9 / 12.6 °C
Sum of peak zone L/s	5750 L/s	Coil ADP	11.1 °C
Sensible heat ratio	0.506	Bypass Factor	0.100
m ² /kW	2.1	Resulting RH	49 %
W/m ²	468.3	Design supply temp.	14.0 °C
Water flow @ 5.6 °K rise	N/A	Zone T-stat Check	4 of 4 OK
		Max zone temperature deviation	0.0 °K

Supply Fan Sizing Data

Actual max L/s	5750 L/s	Fan motor BHP	14.51 BHP
Standard L/s	5743 L/s	Fan motor kW	11.51 kW
Actual max L/(s-m ²)	12.39 L/(s-m ²)	Fan static	1201 Pa

Outdoor Ventilation Air Data

Design airflow L/s	1586 L/s	L/s/person	39.64 L/s/person
L/(s-m ²)	3.42 L/(s-m ²)		

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	BK	GCS	PEDCO	120	HV	CN	0001	D01	

Air System Information

Air System Name **CONTROL BUILDING**
 Equipment Class **SPLT AHU**
 Air System Type **CAV/RH**

Number of zones **4**
 Floor Area **464.2 m²**
 Location **binak, IRAN**

Sizing Calculation Information

Calculation Months **Jan to Dec**
 Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
 Space L/s Sizing **Individual peak space loads**

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Airflow (L/s)	Minimum Airflow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m ²)	Zone L/(s-m ²)
Zone 1	56.2	4693	4693	Jul 1700	9.9	340.6	13.78
Zone 2	3.5	640	640	Jul 1900	1.3	57.6	11.11
Zone 3	3.1	225	225	Jul 0000	1.3	54.0	4.17
Zone 4	3.0	192	192	Jul 0100	0.1	12.0	16.01

Zone Terminal Sizing Data

Zone Name	Reheat Coil Load (kW)	Reheat Coil Water L/s @ 11.1 °K	Zone Htg Coil Load (kW)	Zone Htg Water L/s @ 11.1 °K	Mixing Box Fan Airflow (L/s)
Zone 1	55.2	-	0.0	-	0
Zone 2	6.0	-	0.0	-	0
Zone 3	2.9	-	0.0	-	0
Zone 4	0.1	-	0.0	-	0



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D01	0001	CN	HV	120	PEDCO	GCS	BK

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m ²)	Space L/(s-m ²)
Zone 1							
AIR LOCK	1	0.5	Jul 1500	44	0.4	3.2	13.60
CONTROL ROOM	1	8.1	Jul 0100	672	0.6	62.4	10.77
Corridor 1	1	2.3	Jul 1500	192	1.5	34.8	5.53
ENGINEERING ROOM	1	1.8	Jun 0100	145	0.6	20.0	7.27
OFFICE (1)	1	1.5	Jul 0100	127	0.4	15.0	8.47
OFFICE (2)	1	1.4	Aug 0100	113	0.5	10.8	10.48
Pantry	1	2.3	Aug 1800	188	0.8	23.6	7.95
Prayer Room	1	0.6	Jul 0100	50	0.1	9.2	5.44
UPS ROOM	1	7.1	Jul 1600	591	1.1	23.0	25.70
Corridor 2	1	0.8	Jul 1500	65	0.2	9.5	6.87
Instrument Room	1	1.5	Jul 1600	128	0.6	20.1	6.39
ITR	1	27.0	Jul 1800	2240	2.6	90.7	24.70
ARCHIVE	1	1.6	Aug 0100	137	0.7	18.3	7.47
Zone 2							
BATTERY ROOM	1	3.5	Jul 1900	640	1.3	57.6	11.11
Zone 3							
LOCKER AND SHOWER	1	1.1	Jul 0000	85	0.4	20.0	4.25
Toilet	1	2.0	Aug 0000	140	0.9	34.0	4.12
Zone 4							
hvac control panel	1	3.0	Jul 0100	192	0.1	12.0	16.01



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1. Summary

Ventilation Sizing Method Sum of Space OA Airflows
Design Ventilation Airflow Rate 1586 L/s

2. Space Ventilation Analysis Table

Zone Name / Space Name	Mult.	Floor Area (m ²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s-m ²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
AIR LOCK	1	3.2	1.0	43.5	0.00	0.00	0.0	100.0	43.5
CONTROL ROOM	1	62.4	5.0	672.0	0.00	0.00	100.0	0.0	100.0
Corridor 1	1	34.8	3.0	192.4	10.00	0.00	0.0	0.0	30.0
ENGINEERING ROOM	1	20.0	3.0	145.5	10.00	0.00	0.0	0.0	30.0
OFFICE (1)	1	15.0	3.0	127.1	10.00	0.00	0.0	0.0	30.0
OFFICE (2)	1	10.8	2.0	113.2	10.00	0.00	0.0	0.0	20.0
Pantry	1	23.6	5.0	187.7	0.00	0.00	133.0	0.0	133.0
Prayer Room	1	9.2	3.0	50.0	0.00	0.00	30.0	0.0	30.0
UPS ROOM	1	23.0	1.0	591.0	0.00	0.00	20.0	0.0	20.0
Corridor 2	1	9.5	1.0	65.2	10.00	0.00	0.0	0.0	10.0
Instrument Room	1	20.1	2.0	128.5	10.00	0.00	0.0	0.0	20.0
ITR	1	90.7	2.0	2240.1	0.00	0.00	0.0	10.0	224.0
ARCHIVE	1	18.3	2.0	136.8	10.00	0.00	0.0	0.0	20.0
Zone 2									
BATTERY ROOM	1	57.6	0.0	640.0	0.00	0.00	640.0	0.0	640.0
Zone 3									
LOCKER AND SHOWER	1	20.0	2.0	85.0	0.00	0.00	85.0	0.0	85.0
Toilet	1	34.0	2.0	140.0	0.00	0.00	140.0	0.0	140.0
Zone 4									
hvac control panel	1	12.0	3.0	192.2	0.00	0.00	10.0	0.0	10.0
Totals (incl. Space Multipliers)				5750.2					1585.5



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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 41.0 °C / 34.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	405 m ²	3805	-	405 m ²	3944	-
Roof Transmission	462 m ²	4854	-	462 m ²	3581	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	16 m ²	1259	-	16 m ²	1431	-
Floor Transmission	464 m ²	0	-	464 m ²	1452	-
Partitions	173 m ²	804	-	173 m ²	1037	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	9304 W	9304	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	34800 W	34798	-	0	0	-
People	40	2872	2403	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	1856	574	-	0	0
Safety Factor	10% / 10%	5955	298	10%	1144	0
>> Total Zone Loads	-	65508	3275	-	12589	0
Zone Conditioning	-	66036	3275	-	12314	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	5750 L/s	0	-	5750 L/s	0	-
Ventilation Load	1586 L/s	32279	104082	1586 L/s	29043	0
Supply Fan Load	5750 L/s	11510	-	5750 L/s	-11510	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	109825	107357	-	29847	0
Central Cooling Coil	-	110034	107358	-	0	0
Terminal Reheat Coils	-	-208	-	-	29759	-
>> Total Conditioning	-	109825	107358	-	29759	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		



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Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 39.5 °C / 33.7 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	289 m ²	2828	-	289 m ²	2973	-
Roof Transmission	339 m ²	3786	-	339 m ²	2760	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	13 m ²	1011	-	13 m ²	1188	-
Floor Transmission	341 m ²	0	-	341 m ²	1046	-
Partitions	173 m ²	750	-	173 m ²	1037	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	7696 W	7696	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	30800 W	30799	-	0	0	-
People	33	2369	1983	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	1856	574	-	0	0
Safety Factor	10% / 10%	5110	256	10%	900	0
>> Total Zone Loads	-	56205	2812	-	9904	0

Zone 2	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1900 COOLING OA DB / WB 35.9 °C / 33.1 °C OCCUPIED T-STAT 27.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 20.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	41 m ²	388	-	41 m ²	371	-
Roof Transmission	58 m ²	580	-	58 m ²	411	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	3 m ²	146	-	3 m ²	244	-
Floor Transmission	58 m ²	0	-	58 m ²	178	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	24 W	24	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2000 W	2000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	314	0	10%	120	0
>> Total Zone Loads	-	3451	0	-	1324	0



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Zone 3	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0000 COOLING OA DB / WB 28.7 °C / 28.4 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C		
	OCCUPIED T-STAT 26.0 °C			OCCUPIED T-STAT 20.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	64 m ²	599	-	64 m ²	573	-
Roof Transmission	54 m ²	603	-	54 m ²	385	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	54 m ²	0	-	54 m ²	217	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	1296 W	1296	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	4	287	240	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	278	24	10%	118	0
>> Total Zone Loads	-	3063	264	-	1293	0

Zone 4	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0100 COOLING OA DB / WB 28.0 °C / 27.7 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C		
	OCCUPIED T-STAT 27.0 °C			OCCUPIED T-STAT 10.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	10 m ²	107	-	10 m ²	26	-
Roof Transmission	12 m ²	128	-	12 m ²	24	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	12 m ²	0	-	12 m ²	11	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	288 W	288	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2000 W	2000	-	0	0	-
People	3	215	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	274	18	10%	6	0
>> Total Zone Loads	-	3012	198	-	69	0



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TABLE 1.1.A. COMPONENT LOADS FOR SPACE " AIR LOCK " IN ZONE " Zone 1 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	4 m ²	45	-	4 m ²	43	-
Roof Transmission	3 m ²	35	-	3 m ²	26	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	3 m ²	249	-	3 m ²	278	-
Floor Transmission	3 m ²	0	-	3 m ²	21	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	77 W	77	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	1	72	60	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	48	6	10%	37	0
>> Total Zone Loads	-	525	66	-	406	0

TABLE 1.1.B. ENVELOPE LOADS FOR SPACE " AIR LOCK " IN ZONE " Zone 1 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
W EXPOSURE						
WALL	4	0.642	-	45	-	43
DOOR	3	5.800	-	249	-	278
H EXPOSURE						
ROOF	3	0.510	-	35	-	26

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	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jul 0100 COOLING OA DB / WB 28.0 °C / 27.7 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
SPACE LOADS						
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	0 m ²	0	-	0 m ²	0	-
Roof Transmission	62 m ²	760	-	62 m ²	509	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	62 m ²	0	-	62 m ²	0	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	1498 W	1497	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4000 W	4000	-	0	0	-
People	5	359	300	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	750	0	-	0	0
Safety Factor	10% / 10%	737	30	10%	51	0
>> Total Zone Loads	-	8103	330	-	560	0

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
H EXPOSURE						
ROOF	62	0.510	-	760	-	509



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TABLE 1.3.A. COMPONENT LOADS FOR SPACE " Corridor 1 " IN ZONE " Zone 1 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 41.0 °C / 34.0 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	7 m ²	76	-	7 m ²	73	-
Roof Transmission	35 m ²	378	-	35 m ²	284	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	3 m ²	249	-	3 m ²	278	-
Floor Transmission	35 m ²	0	-	35 m ²	0	-
Partitions	71 m ²	356	-	71 m ²	714	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	835 W	835	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	3	215	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	211	18	10%	135	0
>> Total Zone Loads	-	2320	198	-	1484	0

TABLE 1.3.B. ENVELOPE LOADS FOR SPACE " Corridor 1 " IN ZONE " Zone 1 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
W EXPOSURE						
WALL	7	0.642	-	76	-	73
DOOR	3	5.800	-	249	-	278
H EXPOSURE						
ROOF	35	0.510	-	378	-	284



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TABLE 1.4.A. COMPONENT LOADS FOR SPACE " ENGINEERING ROOM " IN ZONE " Zone 1 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jun 0100 COOLING OA DB / WB 27.4 °C / 27.1 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	25 m ²	218	-	25 m ²	257	-
Roof Transmission	19 m ²	231	-	19 m ²	155	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	20 m ²	0	-	20 m ²	110	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	480 W	480	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	450 W	450	-	0	0	-
People	3	215	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	159	18	10%	52	0
>> Total Zone Loads	-	1754	198	-	574	0

TABLE 1.4.B. ENVELOPE LOADS FOR SPACE " ENGINEERING ROOM " IN ZONE " Zone 1 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
N EXPOSURE						
WALL	25	0.642	-	218	-	257
H EXPOSURE						
ROOF	19	0.510	-	231	-	155



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TABLE 1.5.A. COMPONENT LOADS FOR SPACE " OFFICE (1) " IN ZONE " Zone 1 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	14 m ²	170	-	14 m ²	142	-
Roof Transmission	15 m ²	183	-	15 m ²	122	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	15 m ²	0	-	15 m ²	60	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	375 W	375	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	450 W	450	-	0	0	-
People	3	215	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	139	18	10%	32	0
>> Total Zone Loads	-	1533	198	-	356	0

TABLE 1.5.B. ENVELOPE LOADS FOR SPACE " OFFICE (1) " IN ZONE " Zone 1 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
W EXPOSURE						
WALL	14	0.642	-	170	-	142
H EXPOSURE						
ROOF	15	0.510	-	183	-	122



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D00	0001	CN	HV	110	PEDCO	W046S	BK

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TABLE 1.6.A. COMPONENT LOADS FOR SPACE " OFFICE (2) " IN ZONE " Zone 1 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Aug 0100 COOLING OA DB / WB 28.0 °C / 27.7 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	37 m ²	403	-	37 m ²	375	-
Roof Transmission	11 m ²	124	-	11 m ²	88	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	11 m ²	0	-	11 m ²	0	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	270 W	270	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	300 W	300	-	0	0	-
People	2	144	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	124	12	10%	46	0
>> Total Zone Loads	-	1364	132	-	509	0

TABLE 1.6.B. ENVELOPE LOADS FOR SPACE " OFFICE (2) " IN ZONE " Zone 1 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
W EXPOSURE						
WALL	16	0.642	-	191	-	162
S EXPOSURE						
WALL	21	0.642	-	212	-	213
H EXPOSURE						
ROOF	11	0.510	-	124	-	88



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BK	W046S	PEDCO	110	HV	CN	0001	D00

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TABLE 1.7.A. COMPONENT LOADS FOR SPACE "Pantry" IN ZONE "Zone 1"

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Aug 1800 COOLING OA DB / WB 37.9 °C / 33.4 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	28 m ²	275	-	28 m ²	292	-
Roof Transmission	24 m ²	254	-	24 m ²	192	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	24 m ²	0	-	24 m ²	111	-
Partitions	17 m ²	40	-	17 m ²	95	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	24 W	24	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	5	359	300	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	1106	574	-	0	0
Safety Factor	10% / 10%	206	87	10%	69	0
>> Total Zone Loads	-	2263	962	-	759	0

TABLE 1.7.B. ENVELOPE LOADS FOR SPACE "Pantry" IN ZONE "Zone 1"

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
S EXPOSURE						
WALL	28	0.642	-	275	-	292
H EXPOSURE						
ROOF	24	0.510	-	254	-	192

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	BK	W046S	PEDCO	110	HV	CN	0001	D00	

	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jul 0100 COOLING OA DB / WB 28.0 °C / 27.7 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
SPACE LOADS						
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	0 m ²	0	-	0 m ²	0	-
Roof Transmission	9 m ²	112	-	9 m ²	75	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	9 m ²	0	-	9 m ²	0	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	221 W	221	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	3	215	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	55	18	10%	8	0
>> Total Zone Loads	-	603	198	-	83	0

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
H EXPOSURE						
ROOF	9	0.510	-	112	-	75



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TABLE 1.9.A. COMPONENT LOADS FOR SPACE " UPS ROOM " IN ZONE " Zone 1 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 40.6 °C / 33.9 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	41 m ²	366	-	41 m ²	416	-
Roof Transmission	22 m ²	242	-	22 m ²	179	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	3 m ²	247	-	3 m ²	278	-
Floor Transmission	23 m ²	0	-	23 m ²	140	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	552 W	552	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	5000 W	5000	-	0	0	-
People	1	72	60	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	648	6	10%	101	0
>> Total Zone Loads	-	7126	66	-	1115	0

TABLE 1.9.B. ENVELOPE LOADS FOR SPACE " UPS ROOM " IN ZONE " Zone 1 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
N EXPOSURE						
WALL	25	0.642	-	200	-	257
W EXPOSURE						
WALL	16	0.642	-	166	-	159
DOOR	3	5.800	-	247	-	278
H EXPOSURE						
ROOF	22	0.510	-	242	-	179



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TABLE 1.10.A. COMPONENT LOADS FOR SPACE " Corridor 2 " IN ZONE " Zone 1 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 41.0 °C / 34.0 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	0 m ²	0	-	0 m ²	0	-
Roof Transmission	10 m ²	103	-	10 m ²	77	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	10 m ²	0	-	10 m ²	0	-
Partitions	59 m ²	312	-	59 m ²	74	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	228 W	228	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	1	72	60	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	71	6	10%	15	0
>> Total Zone Loads	-	786	66	-	167	0

TABLE 1.10.B. ENVELOPE LOADS FOR SPACE " Corridor 2 " IN ZONE " Zone 1 "

H EXPOSURE	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
ROOF	10	0.510	-	103	-	77



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TABLE 1.11.A. COMPONENT LOADS FOR SPACE " Instrument Room " IN ZONE " Zone 1 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 40.6 °C / 33.9 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	14 m ²	158	-	14 m ²	139	-
Roof Transmission	20 m ²	221	-	20 m ²	164	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	20 m ²	0	-	20 m ²	63	-
Partitions	27 m ²	83	-	27 m ²	153	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	503 W	502	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	300 W	300	-	0	0	-
People	2	144	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	141	12	10%	52	0
>> Total Zone Loads	-	1549	132	-	571	0

TABLE 1.11.B. ENVELOPE LOADS FOR SPACE " Instrument Room " IN ZONE " Zone 1 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
E EXPOSURE						
WALL	14	0.642	-	158	-	139
H EXPOSURE						
ROOF	20	0.510	-	221	-	164



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TABLE 1.12.A. COMPONENT LOADS FOR SPACE " ITR " IN ZONE " Zone 1 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jul 1800 COOLING OA DB / WB 37.9 °C / 33.4 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	85 m ²	925	-	85 m ²	875	-
Roof Transmission	91 m ²	1033	-	91 m ²	739	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	4 m ²	278	-	4 m ²	353	-
Floor Transmission	91 m ²	0	-	91 m ²	427	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	2177 W	2177	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	20000 W	19999	-	0	0	-
People	2	144	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	2455	12	10%	239	0
>> Total Zone Loads	-	27010	132	-	2633	0

TABLE 1.12.B. ENVELOPE LOADS FOR SPACE " ITR " IN ZONE " Zone 1 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
N EXPOSURE						
WALL	23	0.642	-	188	-	238
DOOR	4	5.800	-	278	-	353
E EXPOSURE						
WALL	62	0.642	-	736	-	637
H EXPOSURE						
ROOF	91	0.510	-	1033	-	739



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TABLE 1.13.A. COMPONENT LOADS FOR SPACE " ARCHIVE " IN ZONE " Zone 1 "

	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Aug 0100 COOLING OA DB / WB 28.0 °C / 27.7 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 22.0 °C		
SPACE LOADS						
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	35 m ²	388	-	35 m ²	362	-
Roof Transmission	18 m ²	210	-	18 m ²	149	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	18 m ²	0	-	18 m ²	114	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	458 W	457	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	300 W	300	-	0	0	-
People	2	144	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	150	12	10%	62	0
>> Total Zone Loads	-	1649	132	-	687	0

TABLE 1.13.B. ENVELOPE LOADS FOR SPACE " ARCHIVE " IN ZONE " Zone 1 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
W EXPOSURE						
WALL	15	0.642	-	181	-	154
S EXPOSURE						
WALL	20	0.642	-	207	-	207
H EXPOSURE						
ROOF	18	0.510	-	210	-	149



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D00	0001	CN	HV	110	PEDCO	W046S	BK

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TABLE 2.1.A. COMPONENT LOADS FOR SPACE " BATTERY ROOM " IN ZONE " Zone 2 "

	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jul 1900 COOLING OA DB / WB 35.9 °C / 33.1 °C OCCUPIED T-STAT 27.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 20.0 °C		
SPACE LOADS						
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	41 m ²	388	-	41 m ²	371	-
Roof Transmission	58 m ²	580	-	58 m ²	411	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	3 m ²	146	-	3 m ²	244	-
Floor Transmission	58 m ²	0	-	58 m ²	178	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	24 W	24	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2000 W	2000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	314	0	10%	120	0
>> Total Zone Loads	-	3451	0	-	1324	0

TABLE 2.1.B. ENVELOPE LOADS FOR SPACE " BATTERY ROOM " IN ZONE " Zone 2 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
W EXPOSURE						
WALL	41	0.642	-	388	-	371
DOOR	3	5.800	-	146	-	244
H EXPOSURE						
ROOF	58	0.510	-	580	-	411

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SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	COOLING DATA AT Jul 0000		HEATING DATA AT DES HTG		Latent (W)
		Sensible (W)	Latent (W)	Sensible (W)	Latent (W)	
		COOLING OA DB / WB 28.7 °C / 28.4 °C		HEATING OA DB / WB 6.0 °C / 6.0 °C		
		OCCUPIED T-STAT 26.0 °C		OCCUPIED T-STAT 20.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	14 m ²	148	-	14 m ²	124	-
Roof Transmission	20 m ²	223	-	20 m ²	143	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	20 m ²	0	-	20 m ²	57	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	480 W	480	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	2	144	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	99	12	10%	32	0
>> Total Zone Loads	-	1094	132	-	357	0

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
E EXPOSURE						
WALL	14	0.642	-	148	-	124
H EXPOSURE						
ROOF	20	0.510	-	223	-	143



نگهداشت و افزایش تولید میدان نفتی بینک
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شماره پیمان:

053 - 073 - 9184

HVAC DESIGN CRITERIA

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	W046S	PEDCO	110	HV	CN	0001	D00

شماره صفحه: 57 از 64

TABLE 3.2.A. COMPONENT LOADS FOR SPACE " Toilet " IN ZONE " Zone 3 "

	DESIGN COOLING			DESIGN HEATING			
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)	
		COOLING DATA AT Aug 0000 COOLING OA DB / WB 28.7 °C / 28.4 °C OCCUPIED T-STAT 26.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 20.0 °C		
SPACE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)	
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-	
Wall Transmission	50 m ²	478	-	50 m ²	449	-	
Roof Transmission	34 m ²	356	-	34 m ²	243	-	
Window Transmission	0 m ²	0	-	0 m ²	0	-	
Skylight Transmission	0 m ²	0	-	0 m ²	0	-	
Door Loads	0 m ²	0	-	0 m ²	0	-	
Floor Transmission	34 m ²	0	-	34 m ²	159	-	
Partitions	0 m ²	0	-	0 m ²	0	-	
Ceiling	0 m ²	0	-	0 m ²	0	-	
Overhead Lighting	816 W	816	-	0	0	-	
Task Lighting	0 W	0	-	0	0	-	
Electric Equipment	0 W	0	-	0	0	-	
People	2	144	120	0	0	0	
Infiltration	-	0	0	-	0	0	
Miscellaneous	-	0	0	-	0	0	
Safety Factor	10% / 10%	179	12	10%	85	0	
>> Total Zone Loads	-	1974	132	-	936	0	

TABLE 3.2.B. ENVELOPE LOADS FOR SPACE " Toilet " IN ZONE " Zone 3 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
S EXPOSURE						
WALL	27	0.642	-	241	-	243
E EXPOSURE						
WALL	23	0.642	-	237	-	207
H EXPOSURE						
ROOF	34	0.510	-	356	-	243



نگهداشت و افزایش تولید میدان نفتی بینک
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شماره پیمان:

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HVAC DESIGN CRITERIA

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D00	0001	CN	HV	110	PEDCO	W046S	BK

شماره صفحه: 58 از 64

TABLE 4.1.A. COMPONENT LOADS FOR SPACE " hvac control panel " IN ZONE " Zone 4 "

SPACE LOADS	DESIGN COOLING			DESIGN HEATING		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
	COOLING DATA AT Jul 0100 COOLING OA DB / WB 28.0 °C / 27.7 °C OCCUPIED T-STAT 27.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 10.0 °C		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	10 m ²	107	-	10 m ²	26	-
Roof Transmission	12 m ²	128	-	12 m ²	24	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	12 m ²	0	-	12 m ²	11	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	288 W	288	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2000 W	2000	-	0	0	-
People	3	215	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	274	18	10%	6	0
>> Total Zone Loads	-	3012	198	-	69	0

TABLE 4.1.B. ENVELOPE LOADS FOR SPACE " hvac control panel " IN ZONE " Zone 4 "

	Area (m ²)	U-Value (W/(m ² ·K))	Shade Coeff.	COOLING	COOLING	HEATING
				TRANS (W)	SOLAR (W)	TRANS (W)
W EXPOSURE						
WALL	10	0.642	-	107	-	26
H EXPOSURE						
ROOF	12	0.510	-	128	-	24

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	HVAC DESIGN CRITERIA								
شماره پیمان: 053 - 073- 9184	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	شماره صفحه: 59 از 64
	BK	W046S	PEDCO	110	HV	CN	0001	D00	

July DESIGN COOLING DAY, 1500

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°C)	Specific Humidity (kg/kg)	Airflow (L/s)	CO2 Level (ppm)	Sensible Heat (W)	Latent Heat (W)
Ventilation Air	Inlet	41.0	0.03144	1586	400	32279	104082
Vent - Return Mixing	Outlet	28.8	0.01529	5750	526	-	-
Central Cooling Coil	Outlet	12.9	0.00895	5750	526	110034	107358
Supply Fan	Outlet	14.6	0.00895	5750	526	11510	-
Cold Supply Duct	Outlet	14.6	0.00895	5750	526	-	-
Zone Air	-	24.1	0.00914	5750	574	66036	3275
Return Plenum	Outlet	24.1	0.00914	5750	574	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.206 W/(L/s-K)

Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2944.1 W/(L/s)

Site Altitude = 10.0 m

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (W)	T-stat Mode	Zone Cond (W)	Zone Temp (°C)	Zone Airflow (L/s)	CO2 Level (ppm)	Terminal Heating Coil (W)	Zone Heating Unit (W)
Zone 1	56153	Cooling	56041	24.5	4693	574	0	0
Zone 2	3431	Heating	3966	20.0	640	534	208	0
Zone 3	2947	Deadband	3033	25.7	225	635	0	0
Zone 4	2976	Cooling	2995	27.5	192	623	0	0

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	HVAC DESIGN CRITERIA								
شماره پیمان: 053 - 073 - 9184	پروژه BK	بسته کاری W046S	صادرکننده PEDCO	تسهیلات 110	رشته HV	نوع مدرک CN	سریال 0001	نسخه D00	شماره صفحه: 60 از 64

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°C)	Specific Humidity (kg/kg)	Airflow (L/s)	CO2 Level (ppm)	Sensible Heat (W)	Latent Heat (W)
Ventilation Air	Inlet	6.0	0.00580	1586	400	-29043	0
Vent - Return Mixing	Outlet	17.0	0.00580	5750	422	-	-
Central Cooling Coil	Outlet	17.0	0.00580	5750	422	0	0
Supply Fan	Outlet	18.7	0.00580	5750	422	11510	-
Cold Supply Duct	Outlet	18.7	0.00580	5750	422	-	-
Zone Air	-	21.2	0.00580	5750	430	-12314	0
Return Plenum	Outlet	21.2	0.00580	5750	430	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.206 W/(L/s-K)

Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2944.1 W/(L/s)

Site Altitude = 10.0 m

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (W)	T-stat Mode	Zone Cond (W)	Zone Temp (°C)	Zone Airflow (L/s)	CO2 Level (ppm)	Terminal Heating Coil (W)	Zone Heating Unit (W)
Zone 1	-9904	Heating	-9580	21.6	4693	430	26157	0
Zone 2	-1324	Heating	-1303	19.7	640	430	2098	0
Zone 3	-1293	Heating	-1261	19.6	225	430	1504	0
Zone 4	-69	Deadband	-171	17.9	192	430	0	0



نگهداشت و افزایش تولید میدان نفتی بینک
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شماره پیمان:

053 - 073 - 9184

HVAC DESIGN CRITERIA

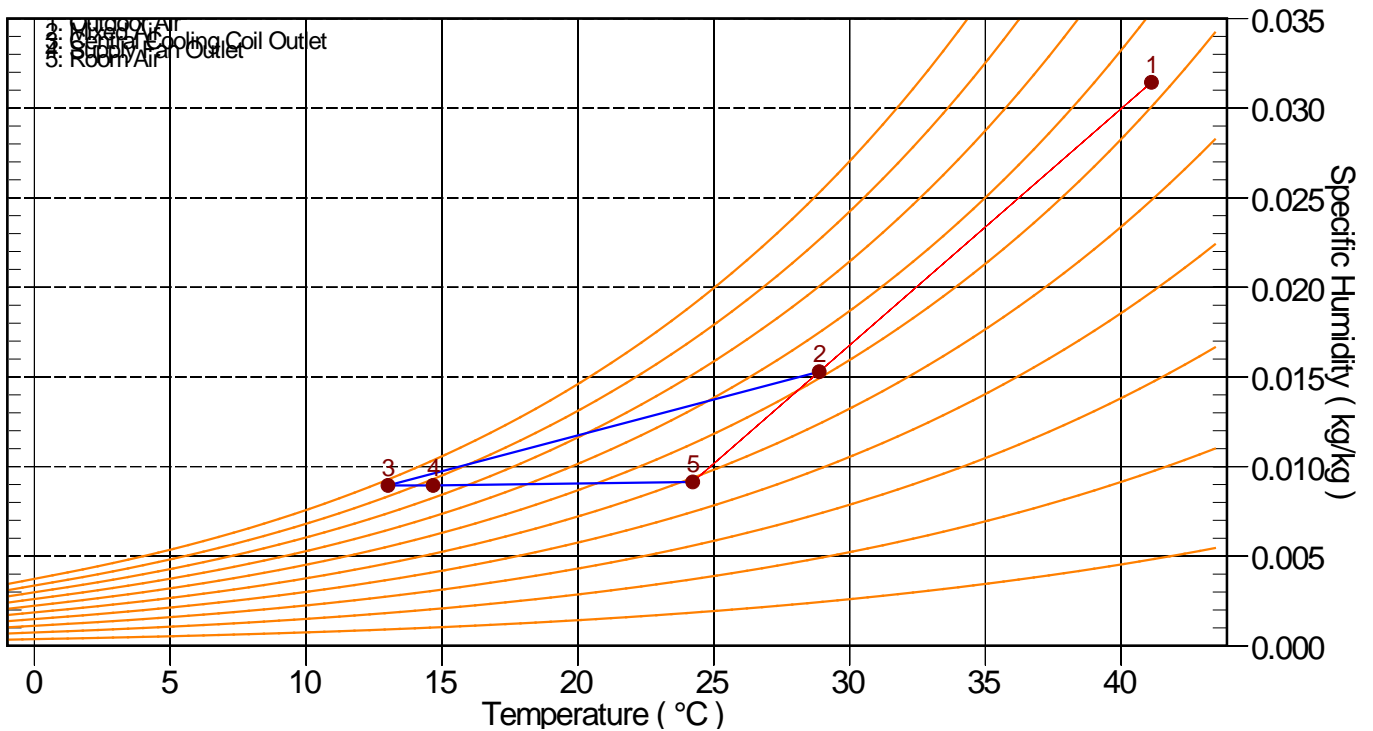
پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	W046S	PEDCO	110	HV	CN	0001	D00

شماره صفحه: 61 از 64

Location: binak, IRAN

Altitude: 10.0 m.

Data for: July DESIGN COOLING DAY, 1500



 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>																	
<p>شماره پیمان: 053 - 073- 9184</p>	<p>HVAC DESIGN CRITERIA</p> <table border="1" data-bbox="392 387 1169 452"> <thead> <tr> <th>پروژه</th> <th>بسته کاری</th> <th>صادر کننده</th> <th>تسهیلات</th> <th>رشته</th> <th>نوع مدرک</th> <th>سریال</th> <th>نسخه</th> </tr> </thead> <tbody> <tr> <td>BK</td> <td>W046S</td> <td>PEDCO</td> <td>110</td> <td>HV</td> <td>CN</td> <td>0001</td> <td>D01</td> </tr> </tbody> </table>	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	BK	W046S	PEDCO	110	HV	CN	0001	D01	<p>شماره صفحه: 62 از 64</p>
پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	W046S	PEDCO	110	HV	CN	0001	D01											

7.0 EQUIPMENT SELECTION:

PACKAGE UNIT:

Equipment no : 22-AHU-01-A,B

Quantity : 2

with air cooled condensing unit (22-ACCU-01A,B)

Cooling Coil :

Cooling coil type : DX type

Cooling coil capacity : 217.4 kW

Cooling coil entering temperature : 28.8 °C db / 23°C wb

Cooling coil leaving air temperature : 12.9°C db / 12.6°C wb

Blower:

Supply Air Flow Rate: 5738 l/s

Fresh Air Flow Rate: 1580 l/s

Return Air Flow Rate: 4158 l/s

External Duct static pressure : $1.5 * 95 \text{ m} * 0.816 \text{ pa/m} = 116.28 \text{ pa}$

Sound Attenuator Quantity: 2

Total Sound Attenuator Pressure Drop: 300 pa

Duct heater pressure drop: 58 pa

Motorized Fire Damper: $2 * 29 \text{ pa} = 58 \text{ pa}$

Motorized Damper: $2 * 29 \text{ pa} = 58 \text{ pa}$

Return Register: 48 pa

Supply Diffuser: 48 pa

Total External static pressure= 687 pa → 700 pa

Internal static pressure : by vendor

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EXHAUST FANS:

Equipment No:	22-EF-01-A,B	22-EF-03	22-EF-04
Quantity	2	1	1
Type	Centrifuge-roof mounted	Centrifuge-roof mounted	Centrifuge-roof mounted
Flow Rate(L/S)	640	190	337
Static Pressure	Duct: 7 m x 1.5 x 0.816 pa/m =8.56 pa Margin 10% = 0.85 pa →9.5 pa Exhaust Diffuser: 48 pa Motorized Fire Damper: 29 pa Motorized Damper: 29 pa Exhaust Air Louver: 38 pa =153.5 pa→160 pa	Duct: 12 m x 1.5 x 0.816 pa/m =14.7 pa Margin 10% : 1.47 =16.17 pa Exhaust Diffuser: 48 pa Motorized Damper: 29 pa Exhaust Air Louver: 38 pa =131.2 pa→140 pa	Duct: 12 m x 1.5 x 0.816 pa/m =14.7 pa Margin 10% : 1.47 =16.17 pa Exhaust Diffuser: 48 pa Volume Damper: 29 pa Motorized Damper: 29 pa Exhaust Air Louver: 38 pa =160.17 pa→165 pa
Service Area	Battery Room	Prayer- pantry	Lavatory-shower &locker
Remarks			

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	HVAC DESIGN CRITERIA							
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
	BK	W046S	PEDCO	110	HV	CN	0001	D01

Duct Heater:

Equipment No:	22-EDH-01	22-EDH-02	22-EDH-03	22-EDH-04	22-EDH-05	22-EDH-06	22-EDH-07	22-EDH-08
Quantity	1	1	1	1	1	1	1	1
Capacity:	1.96	1.29	1.8	3.98	3.67	14.56	5.57	3.16
Duct Size (mm*mm)	300*200	225*175	350*150	350*275	375*200	775*450	525*325	750*200
Service area	Lavatory & locker and shower	Instrument Room	Pantry	Offices & Archive & Prayer	Corridors & Air lock	Auxiliary Room	Engineering room & Control Room	Battery Room
Remarks								