

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

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک							
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING							شماره صفحه ۲: از ۳۶
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	HV	CN	0004	D00

REVISION RECORD SHEET

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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

The main purpose of this document is to define the HVAC system load calculation has been carried out by computer program (HAP software) as per ASHRAE method in order to evaluate cooling load (summer) and heating load (winter) and also to select HVAC equipment for the calculated cooling and heating load.

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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.

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3.3 ENVIRONMENTAL DATA

- ▶ Latitude 29° 73' N
- ▶ Longitude 50° 35' E
- ▶ Elevation 10 m
- ▶ Summer dry bulb temperature : 41° C
- ▶ Summer wet bulb temperature : 30.5° C
- ▶ Summer daily range temperature : 15.0° C
- ▶ Winter dry bulb temperature : 6° C
- ▶ Winter relative humidity : 78%

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

4.0 HVAC CALCULATION

4.1 DESIGN WEATHER PARAMETERS:

Design Parameters:

City Name	Binak
Location	IRAN
Latitude	29.7 Deg.
Longitude	-50.4 Deg.
Elevation	10.0 m
Summer Design Dry-Bulb	41.0 °C
Summer Coincident Wet-Bulb	30.5 °C
Summer Daily Range	15.0 °K
Winter Design Dry-Bulb	6.0 °C
Winter Design Wet-Bulb	4.4 °C
Atmospheric Clearness Number	1.00
Average Ground Reflectance	0.20
Soil Conductivity	1.385 W/(m-°K)
Local Time Zone (GMT +/- N hours)	-3.5 hours
Consider Daylight Savings Time	No
Simulation Weather Data	noneN/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	77.5	77.5	95.1	360.4	561.2	730.9	794.1	786.3	762.3
February	89.1	89.1	206.7	484.1	668.9	760.8	782.0	718.9	671.9
March	101.4	120.5	367.4	576.2	723.5	759.6	702.5	590.8	520.1
April	113.0	252.7	487.2	636.6	705.1	688.3	568.6	408.7	322.0
May	124.3	351.1	551.9	666.3	679.9	619.4	469.6	279.8	199.5
June	161.0	389.1	570.0	664.8	662.8	586.8	421.4	228.9	165.7
July	128.9	355.9	541.6	644.7	671.3	606.9	452.1	270.2	196.1
August	118.3	256.1	470.7	606.2	686.0	663.8	546.8	395.4	311.9
September	104.3	109.2	354.3	538.8	681.8	728.9	670.0	569.4	503.5
October	91.2	91.2	226.5	441.2	642.7	746.9	748.8	692.4	650.8
November	78.1	78.1	103.7	341.8	572.3	707.9	785.7	774.1	747.8
December	71.9	71.9	71.9	306.4	524.4	699.0	788.1	799.2	780.7
Month	SSW	SW	WSW	W	WNW	NW	NNW	HOR	Mult
January	779.8	791.7	733.2	577.4	337.4	108.2	77.5	591.4	1.00
February	716.3	777.2	772.2	650.4	482.8	225.6	89.1	714.5	1.00
March	590.5	703.8	755.6	713.7	589.1	369.6	114.3	816.8	1.00
April	413.5	574.6	682.6	707.6	645.8	485.9	241.4	863.3	1.00
May	282.1	471.6	614.4	688.4	669.7	550.4	343.5	875.1	1.00
June	233.1	424.2	577.0	674.2	670.6	567.0	376.4	872.9	1.00
July	274.2	458.7	596.0	677.5	657.5	539.9	345.0	865.3	1.00
August	398.9	554.0	657.3	682.8	624.7	473.1	240.3	846.4	1.00
September	569.0	669.3	728.9	681.0	540.4	354.6	108.6	783.8	1.00
October	697.0	755.4	737.2	647.9	457.7	216.5	91.2	696.8	1.00
November	775.6	786.0	708.0	568.2	351.0	91.0	78.1	582.8	1.00
December	798.2	790.7	685.6	536.9	295.2	71.9	71.9	533.5	1.00

Mult. = User-defined solar multiplier factor.

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Cooling Design Temperature Profile

Location: Binak, IRAN

(Dry and Wet Bulb temperatures are expressed in °C)

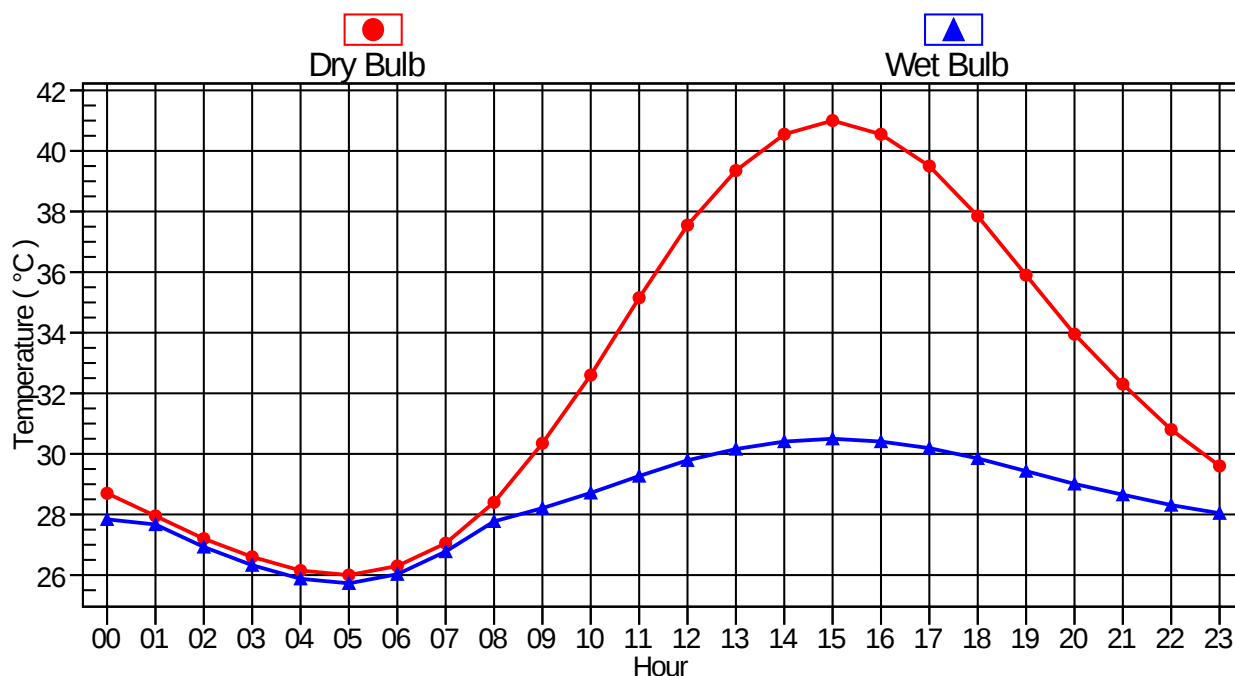
Hr	January		February		March		April		May		June	
	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB
0000	19.4	19.1	20.5	20.2	23.0	22.8	24.5	24.2	26.7	26.4	28.1	27.8
0100	18.6	18.3	19.7	19.5	22.3	22.0	23.7	23.5	26.0	25.7	27.4	27.1
0200	17.9	17.6	19.0	18.7	21.5	21.3	23.0	22.7	25.2	24.9	26.6	26.4
0300	17.3	17.0	18.4	18.1	20.9	20.7	22.4	22.1	24.6	24.3	26.0	25.8
0400	16.8	16.5	17.9	17.7	20.5	20.2	21.9	21.7	24.2	23.9	25.6	25.3
0500	16.7	16.4	17.8	17.5	20.3	20.1	21.8	21.5	24.0	23.7	25.4	25.2
0600	17.0	16.7	18.1	17.8	20.6	20.4	22.1	21.8	24.3	24.0	25.7	25.5
0700	17.7	17.4	18.8	18.6	21.4	21.1	22.8	22.6	25.1	24.8	26.5	26.2
0800	19.1	18.8	20.2	19.9	22.7	22.5	24.2	23.9	26.4	26.1	27.8	27.6
0900	21.0	20.7	22.1	21.9	24.7	24.4	26.1	25.9	28.4	27.0	29.8	28.2
1000	23.3	22.2	24.4	23.2	26.9	25.6	28.4	26.6	30.6	27.5	32.0	28.7
1100	25.8	22.9	26.9	23.9	29.5	26.2	30.9	27.2	33.2	28.1	34.6	29.3
1200	28.2	23.6	29.3	24.5	31.9	26.8	33.3	27.7	35.6	28.6	37.0	29.8
1300	30.0	24.1	31.1	25.0	33.7	27.2	35.1	28.1	37.4	29.0	38.8	30.2
1400	31.2	24.4	32.3	25.3	34.9	27.5	36.3	28.4	38.6	29.3	40.0	30.4
1500	31.7	24.5	32.8	25.4	35.3	27.6	36.8	28.5	39.0	29.4	40.4	30.5
1600	31.2	24.4	32.3	25.3	34.9	27.5	36.3	28.4	38.6	29.3	40.0	30.4
1700	30.2	24.1	31.3	25.0	33.8	27.3	35.3	28.2	37.5	29.1	38.9	30.2
1800	28.5	23.7	29.6	24.6	32.2	26.9	33.6	27.8	35.9	28.7	37.3	29.8
1900	26.6	23.1	27.7	24.1	30.2	26.4	31.7	27.3	33.9	28.3	35.3	29.4
2000	24.6	22.6	25.7	23.5	28.3	25.9	29.7	26.9	32.0	27.8	33.4	29.0
2100	23.0	22.1	24.1	23.1	26.6	25.5	28.1	26.5	30.3	27.4	31.7	28.6
2200	21.5	21.2	22.6	22.3	25.1	24.9	26.6	26.1	28.8	27.1	30.2	28.3
2300	20.3	20.0	21.4	21.1	23.9	23.7	25.4	25.1	27.6	26.8	29.0	28.0

Hr	July		August		September		October		November		December	
	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB
0000	28.7	27.8	28.7	27.8	27.6	27.2	25.6	25.3	22.5	22.2	19.9	19.6
0100	28.0	27.7	28.0	27.7	26.8	26.6	24.8	24.6	21.7	21.5	19.2	18.9
0200	27.2	26.9	27.2	26.9	26.1	25.8	24.1	23.8	21.0	20.7	18.4	18.1
0300	26.6	26.3	26.6	26.3	25.5	25.2	23.5	23.2	20.4	20.1	17.8	17.5
0400	26.2	25.9	26.2	25.9	25.0	24.8	23.0	22.8	19.9	19.7	17.4	17.1
0500	26.0	25.7	26.0	25.7	24.9	24.6	22.9	22.6	19.8	19.5	17.2	16.9
0600	26.3	26.0	26.3	26.0	25.2	24.9	23.2	22.9	20.1	19.8	17.5	17.2
0700	27.1	26.8	27.1	26.8	25.9	25.7	23.9	23.7	20.8	20.6	18.3	18.0
0800	28.4	27.8	28.4	27.8	27.3	27.0	25.3	25.0	22.2	21.9	19.6	19.3
0900	30.4	28.2	30.4	28.2	29.2	27.6	27.2	26.4	24.1	23.9	21.6	21.3
1000	32.6	28.7	32.6	28.7	31.5	28.1	29.5	26.9	26.4	25.4	23.8	23.4
1100	35.2	29.3	35.2	29.3	34.0	28.7	32.0	27.5	28.9	26.0	26.4	24.1
1200	37.6	29.8	37.6	29.8	36.4	29.2	34.4	28.1	31.3	26.6	28.8	24.7
1300	39.4	30.2	39.4	30.2	38.2	29.6	36.2	28.5	33.1	27.0	30.6	25.2
1400	40.6	30.4	40.6	30.4	39.4	29.8	37.4	28.7	34.3	27.3	31.8	25.5
1500	41.0	30.5	41.0	30.5	39.9	29.9	37.9	28.8	34.8	27.4	32.2	25.6
1600	40.6	30.4	40.6	30.4	39.4	29.8	37.4	28.7	34.3	27.3	31.8	25.5
1700	39.5	30.2	39.5	30.2	38.4	29.6	36.4	28.5	33.3	27.0	30.7	25.2
1800	37.9	29.9	37.9	29.9	36.7	29.3	34.7	28.1	31.6	26.6	29.1	24.8
1900	35.9	29.4	35.9	29.4	34.8	28.9	32.8	27.7	29.7	26.2	27.1	24.3
2000	34.0	29.0	34.0	29.0	32.8	28.4	30.8	27.2	27.7	25.7	25.2	23.8
2100	32.3	28.7	32.3	28.7	31.2	28.0	29.2	26.8	26.1	25.3	23.5	23.2
2200	30.8	28.3	30.8	28.3	29.7	27.7	27.7	26.5	24.6	24.3	22.0	21.7
2300	29.6	28.0	29.6	28.0	28.5	27.4	26.5	26.2	23.4	23.1	20.8	20.5

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Design Temperature Profile

Design Temperature Profiles for July



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4.2 CONSTRUCTIONS U-VALUE:

Wall (Anti acid ceramic tile)

Wall Details

Outside Surface Color Medium
Absorptivity 0.675
Overall U-Value 0.203 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
Anti acid ceramic tile	12.500	1000.0	0.34	0.03676	12.5
Cement plaster	25.000	1600.0	0.80	0.03125	40.0
HW concrete	400.000	2242.6	0.84	2.31116	8970.4
Cement plaster	30.000	1600.0	0.80	0.03750	48.0
Face brick	70.000	2000.0	0.03	2.33000	140.0
Outside surface resistance	0.000	0.0	0.00	0.05864	0.0
Totals	537.500	-		4.92595	9210.9

Wall (Cement plaster)

Wall Details

Outside Surface Color Medium
Absorptivity 0.675
Overall U-Value 0.359 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
Cement plaster	5.000	1600.0	0.80	0.00625	8.0
HW concrete	400.000	2242.6	0.84	0.23112	897.0
Cement plaster	30.000	1600.0	0.80	0.03750	48.0
Face brick	70.000	2000.0	0.03	2.33000	140.0
Outside surface resistance	0.000	0.0	0.00	0.05864	0.0
Totals	505.000	-		2.78415	1093.0

Wall (General)

Wall Details

Outside Surface Color Medium
Absorptivity 0.675
Overall U-Value 0.354 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
Gypsum plaster	5.000	800.9	1.09	0.03106	4.0
Cement plaster	15.000	1600.0	0.80	0.01875	24.0
HW concrete	400.000	2242.6	0.84	0.23112	897.0
Cement plaster	30.000	1600.0	0.80	0.03750	48.0
Face brick	70.000	2000.0	0.03	2.33000	140.0
Outside surface resistance	0.000	0.0	0.00	0.05864	0.0
Totals	520.000	-		2.82771	1113.1

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING							شماره صفحه ۱۱ از ۳۶	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0004		D00

Roof

Roof Details

Outside Surface Color Medium
Absorptivity 0.675
Overall U-Value 0.479 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
HW concrete	200.000	2242.6	0.84	0.11556	448.5
Rock wool	50.000	25.0	0.84	1.00000	1.3
LW concrete	100.000	640.7	0.84	0.57779	64.1
Waterproofing/isogume or similar	4.000	1000.0	1.67	0.17390	4.0
Cement plaster	25.000	1600.0	0.80	0.03750	40.0
Terrazzo tile	25.000	2000.0	0.84	0.00185	50.0
Outside surface resistance	0.000	0.0	0.00	0.05864	0.0
Totals	404.000	-		2.08588	607.8

B.P.D.-1

Door Details:

Gross Area 2.6 m²
Door U-Value 3.000 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: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING								شماره صفحه: ۱۲ از ۳۶
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

4.3 SPACE INPUT DATA:

00-Conference Room

1. General Details:

Floor Area 38.4 m²
Avg. Ceiling Height 3.0 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 0.0 L/s/person
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults . ASHRAE Standard 62.1-2010

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 13.20 W/m²
Ballast Multiplier 1.00
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 100.0 Watts
Schedule Electrical Eq.

2.4. People:

Occupancy 20.0 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

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
WSW	13.1	0	0	0
SSE	26.5	0	0	0

3.1. Construction Types for Exposure WSW

Wall Type Wall (General)

3.2. Construction Types for Exposure SSE

Wall Type Wall (General)

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	38.4	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

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

Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 38.4 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 13.2 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 پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	<table><tr><th colspan="8">HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING</th></tr><tr><th>نسخه</th><th>سریال</th><th>نوع مدرک</th><th>رشته</th><th>تسهیلات</th><th>صادرکننده</th><th>بسته کاری</th><th>پروژه</th></tr><tr><td>D00</td><td>0004</td><td>CN</td><td>HV</td><td>120</td><td>PEDCO</td><td>GCS</td><td>BK</td></tr></table>	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING								نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه	D00	0004	CN	HV	120	PEDCO	GCS	BK	شماره صفحه: ۱۳ از ۳۶
HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING																										
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D00	0004	CN	HV	120	PEDCO	GCS	BK																			

01-Management Room

1. General Details:

Floor Area 20.6 m²
Avg. Ceiling Height 3.0 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 0.0 L/s/person
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults . ASHRAE Standard 62.1-2010

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 11.90 W/m²
Ballast Multiplier 1.00
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 150.0 Watts
Schedule Electrical Eq.

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

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
SSE	14.2	0	0	0

3.1. Construction Types for Exposure SSE

Wall Type Wall (General)

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	20.6	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

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

Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 20.6 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 4.7 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type Wall Partition
Area 5.7 m²
U-Value 1.260 W/(m²-°K)
Uncondit. Space Max Temp 35.0 °C
Ambient at Space Max Temp 41.0 °C
Uncondit. Space Min Temp 12.8 °C
Ambient at Space Min Temp 6.0 °C

7.2. 2nd Partition Details:

(No partition data).

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																	
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING <table border="1"> <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> <tr> <td>BK</td> <td>GCS</td> <td>PEDCO</td> <td>120</td> <td>HV</td> <td>CN</td> <td>0004</td> <td>D00</td> </tr> </table>	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	BK	GCS	PEDCO	120	HV	CN	0004	D00	شماره صفحه: ۱۴ از ۳۶
پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0004	D00											

02-Entrance

1. General Details:

Floor Area 15.8 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 0.0 L/s/person
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults . ASHRAE Standard 62.1-2010

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 7.10 W/m²
Ballast Multiplier 1.00
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 200.0 Watts
Schedule Electrical Eq.

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
SSE	14.2	0	0	0

3.1. Construction Types for Exposure SSE

Wall Type Wall (General)

4. Roofs, Skylights:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
SSE	14.2	0	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

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

Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 15.8 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 4.7 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type Wall Partition
Area 5.7 m²
U-Value 1.260 W/(m²-°K)
Uncondit. Space Max Temp 35.0 °C
Ambient at Space Max Temp 41.0 °C
Uncondit. Space Min Temp 12.8 °C
Ambient at Space Min Temp 6.0 °C

7.2. 2nd Partition Details:

(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																									
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	<table><tr><th colspan="8">HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING</th></tr><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><tr><td>BK</td><td>GCS</td><td>PEDCO</td><td>120</td><td>HV</td><td>CN</td><td>0004</td><td>D00</td></tr></table>	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING								پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	BK	GCS	PEDCO	120	HV	CN	0004	D00	شماره صفحه: ۱۵ از ۳۶
HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING																										
پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه																			
BK	GCS	PEDCO	120	HV	CN	0004	D00																			

03-Archive

1. General Details:

Floor Area 12.5 m²
Avg. Ceiling Height 3.0 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 0.0 L/s/person
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults . ASHRAE Standard 62.1-2010

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 11.90 W/m²
Ballast Multiplier 1.00
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 50.0 Watts
Schedule Electrical Eq.

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

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
SSE	8.8	0	0	0

3.1. Construction Types for Exposure SSE

Wall Type Wall (General)

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	12.5	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

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

Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 12.5 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 2.9 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type Wall Partition
Area 5.7 m²
U-Value 1.260 W/(m²-°K)
Uncondit. Space Max Temp 35.0 °C
Ambient at Space Max Temp 41.0 °C
Uncondit. Space Min Temp 12.8 °C
Ambient at Space Min Temp 6.0 °C

7.2. 2nd Partition Details:

(No partition data).

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING							شماره صفحه ۱۶ از ۳۶	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

04-Dining Room

1. General Details:

Floor Area 16.7 m²
Avg. Ceiling Height 3.0 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 0.0 L/s/person
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults . ASHRAE Standard 62.1-2010

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 11.50 W/m²
Ballast Multiplier 1.00
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 50.0 Watts
Schedule Electrical Eq.

2.4. People:

Occupancy 5.0 People
Activity Level Seated at Rest
Sensible 67.4 W/person
Latent 35.2 W/person
Schedule People

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule None
Latent 0 W
Schedule None

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
SSE	11.8	0	0	0

3.1. Construction Types for Exposure SSE

Wall Type Wall (General)

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	16.7	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

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

Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 16.7 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 3.9 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																									
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HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING																										
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D00	0004	CN	HV	120	PEDCO	GCS	BK																			

05-Prayer Room

1. General Details:

Floor Area 16.7 m²
Avg. Ceiling Height 3.0 m
Building Weight 341.8 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 0.0 L/s/person
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults . ASHRAE Standard 62.1-2010

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 11.50 W/m²
Ballast Multiplier 1.00
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 0.0 Watts
Schedule None

2.4. People:

Occupancy 15.0 People
Activity Level Sedentary Work
Sensible 82.1 W/person
Latent 79.1 W/person
Schedule People

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule None
Latent 0 W
Schedule None

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
SSE	11.8	0	0	0

3.1. Construction Types for Exposure SSE

Wall Type Wall (General)

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	16.7	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

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

Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 16.7 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 3.9 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type Wall Partition
Area 12.7 m²
U-Value 1.260 W/(m²-°K)
Uncondit. Space Max Temp 35.0 °C
Ambient at Space Max Temp 41.0 °C
Uncondit. Space Min Temp 12.8 °C
Ambient at Space Min Temp 6.0 °C

7.2. 2nd Partition Details:

(No partition data).

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																									
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	<table><tr><th colspan="8">HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING</th></tr><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><tr><td>BK</td><td>GCS</td><td>PEDCO</td><td>120</td><td>HV</td><td>CN</td><td>0004</td><td>D00</td></tr></table>	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING								پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	BK	GCS	PEDCO	120	HV	CN	0004	D00	شماره صفحه ۱۸ از ۳۶
HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING																										
پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه																			
BK	GCS	PEDCO	120	HV	CN	0004	D00																			

06-Corridor

1. General Details:

Floor Area 15.2 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 0.0 L/s/person
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults . ASHRAE Standard 62.1-2010

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 7.10 W/m²
Ballast Multiplier 1.00
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 0.0 Watts
Schedule None

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

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	15.2	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

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

Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 15.2 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 4.7 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type Wall Partition
Area 3.4 m²
U-Value 1.260 W/(m²-°K)
Uncondit. Space Max Temp 35.0 °C
Ambient at Space Max Temp 41.0 °C
Uncondit. Space Min Temp 12.8 °C
Ambient at Space Min Temp 6.0 °C

7.2. 2nd Partition Details:

(No partition data).

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																	
شماره پیمان:	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING <table><tr><td>پروژه</td><td>بسته کاری</td><td>صادر کننده</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>0004</td><td>D00</td></tr></table>	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	BK	GCS	PEDCO	120	HV	CN	0004	D00	شماره صفحه: ۱۹ از ۳۶
پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0004	D00											
۰۵۳ - ۰۷۳ - ۹۱۸۴																		

07-UPS

1. General Details:

Floor Area 33.5 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 0.0 L/s/person
OA Requirement 2 0.00 L/(s-m²)
Space Usage Defaults . ASHRAE Standard 62.1-2010

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 20.00 W/m²
Ballast Multiplier 1.00
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 4000.0 Watts
Schedule Electrical Eq.

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

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NNW	13.8	0	0	0
WSW	9.5	0	0	0
SSE	13.8	0	0	1

3.1. Construction Types for Exposure NNW

Wall Type Wall (Cement plaster)

3.2. Construction Types for Exposure WSW

Wall Type Wall (Cement plaster)

3.3. Construction Types for Exposure SSE

Wall Type Wall (Cement plaster)
Door Type B.P.D.-1

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	33.5	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

Design Cooling 1.00 ACH
Design Heating 1.00 ACH
Energy Analysis 1.00 ACH

Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 33.5 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 9.3 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

(No partition data).

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																	
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پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0004	D00											
۰۵۳ - ۰۷۳ - ۹۱۸۴																		

4.4 SYSTEM INPUT DATA

1. General Details:

Air System Name System
Equipment Type Terminal Units
Air System Type Split DX Fan Coil
Number of zones 1
Ventilation Direct Ventilation

2. Ventilation System Components:

(Common Ventilation System not used: no inputs)

3. Zone Components:

Space Assignments:

Zone 1: Zone 1	
00-Conference Room	x1
01-Management Room	x1
02-Entrance	x1
03-Archive	x1
04-Dining Room	x1
05-Prayer Room	x1
06-Corridor	x1
07-UPS	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)
1	24.0	26.0	22.0	18.0	0.83

Thermostat Schedule Fan

Unoccupied Cooling is Available

Common Terminal Unit Data:

Cooling Coil:

Design Supply Temperature 18.0 °C
Coil Bypass Factor 0.100
Cooling Source Air-Cooled DX
Schedule JFMAMJJASOND

Heating Coil:

Design Supply Temperature 35.0 °C
Heating Source Electric Resistance
Schedule JFMAMJJASOND
Fan Control Fan On
Ventilation Sizing Method ASHRAE Std 62.1-2010

Terminal Units Data:

Zone All
Terminal Type Fan Coil
Minimum Airflow 0.00 L/s/person
Fan Performance 0 Pa
Fan Overall Efficiency 50 %

4. Sizing Data (Computer-Generated):

System Sizing Data:

Sizing Data:

Cooling Supply Temperature 18.0 °C
Heating Supply Temperature 35.0 °C

Safety Factors:

Cooling Sensible 10 %
Cooling Latent 10 %
Heating 10 %

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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه											
BK	GCS	PEDCO	120	HV	CN	0004	D00											

4.5 AIR SYSTEM SIZING SUMMARAIR

Air System Information

Air System Name System
Equipment Class TERM
Air System Type SPLT-FC

Number of zones 1
Floor Area 169.4 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	13.3	1875	1875	Jul 0800	4.2	169.4	11.07

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (kW)	Sens Coil Load (kW)	Coil Entering DB / WB (°C)	Coil Leaving DB / WB (°C)	Water Flow @ 5.6 °K (L/s)	Time of Peak Load
Zone 1	18.0	13.2	24.6 / 20.8	18.7 / 18.3	-	Aug 0800

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (kW)	Heating Coil Ent/Lvg DB (°C)	Htg Coil Water Flow @11.1 °K (L/s)	Fan Design Airflow (L/s)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (L/s)
Zone 1	4.0	21.7 / 23.5	-	1875	0.000	0.000	0

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							
00-Conference Room	1	2.6	Jul 0800	357	0.7	38.4	9.29
01-Management Room	1	0.8	Jul 0800	117	0.4	20.6	5.69
02-Entrance	1	0.8	Jul 0800	114	0.4	15.8	7.19
03-Archive	1	0.5	Jul 0800	69	0.3	12.5	5.48
04-Dining Room	1	0.8	Jul 0800	105	0.3	16.7	6.31
05-Prayer Room	1	1.8	Jul 0800	242	0.4	16.7	14.51
06-Corridor	1	0.5	Jul 0800	64	0.2	15.2	4.23
07-UPS	1	5.8	Jul 1500	807	1.5	33.5	24.08

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	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0004		D00

4.7 AIR SYSTEM DESIGN LOAD SUMMARY:

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 0800 COOLING OA DB / WB 28.4 °C / 27.8 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 4.4 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	135 m²	676	-	135 m²	766	-
Roof Transmission	174 m²	1440	-	174 m²	1336	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	3 m²	40	-	3 m²	125	-
Floor Transmission	169 m²	0	-	169 m²	528	-
Partitions	33 m²	147	-	33 m²	385	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	2175 W	1213	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4550 W	4550	-	0	0	-
People	51	3794	3225	0	0	0
Infiltration	-	197	1051	-	718	6
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	1206	428	10%	386	1
>> Total Zone Loads	-	13263	4703	-	4244	6
Zone Conditioning	-	13242	4703	-	3964	6
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	0 L/s	0	-	0 L/s	0	-
Ventilation Load	0 L/s	0	0	0 L/s	0	0
Ventilation Fan Load	0 L/s	0	-	0 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	13242	4703	-	3964	6
Terminal Unit Cooling	-	13242	4724	-	0	0
Terminal Unit Heating	-	0	-	-	3964	-
>> Total Conditioning	-	13242	4724	-	3964	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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	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

4.8 ZONE DESIGN LOAD SUMMARY:

Zone 1				DESIGN COOLING			DESIGN HEATING		
				COOLING DATA AT Jul 0800			HEATING DATA AT DES HTG		
				COOLING OA DB / WB 28.4 °C / 27.8 °C			HEATING OA DB / WB 6.0 °C / 4.4 °C		
				OCCUPIED T-STAT 24.0 °C			OCCUPIED T-STAT 22.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-	0 m ²	-	-
Wall Transmission	135 m ²	641	-	135 m ²	766	-	135 m ²	766	-
Roof Transmission	174 m ²	1516	-	174 m ²	1336	-	174 m ²	1336	-
Window Transmission	0 m ²	0	-	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-	0 m ²	0	-
Door Loads	3 m ²	40	-	3 m ²	125	-	3 m ²	125	-
Floor Transmission	169 m ²	0	-	169 m ²	528	-	169 m ²	528	-
Partitions	33 m ²	147	-	33 m ²	385	-	33 m ²	385	-
Ceiling	0 m ²	0	-	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	2175 W	1213	-	0	0	-	0	0	-
Task Lighting	0 W	0	-	0	0	-	0	0	-
Electric Equipment	4550 W	4550	-	0	0	-	0	0	-
People	51	3794	3225	0	0	0	0	0	0
Infiltration	-	197	1033	-	718	6	-	718	6
Miscellaneous	-	0	0	-	0	0	-	0	0
Safety Factor	10% / 10%	1210	426	10%	386	1	10%	386	1
>> Total Zone Loads	-	13308	4684	-	4244	6	-	4244	6

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	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

4.9 SPACE DESIGN LOAD SUMMARY:

TABLE 1.1.A. COMPONENT LOADS FOR SPACE " 00-Conference Room " IN ZONE " Zone 1 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0800 COOLING OA DB / WB 28.4 °C / 27.8 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 4.4 °C OCCUPIED T-STAT 22.0 °C		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	Details	(W)	(W)	Details	(W)	(W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	40 m ²	193	-	40 m ²	224	-
Roof Transmission	38 m ²	334	-	38 m ²	295	-
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	38 m ²	0	-	38 m ²	133	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	507 W	283	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	100 W	100	-	0	0	-
People	20	1436	1202	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	235	120	10%	65	0
>> Total Zone Loads	-	2580	1322	-	717	0

TABLE 1.1.B. ENVELOPE LOADS FOR SPACE " 00-Conference Room " IN ZONE " Zone 1 "						
	Area	U-Value	Shade	COOLING	COOLING	HEATING
	(m ²)	(W/(m ² ·°K))	Coeff.	TRANS	SOLAR	TRANS
				(W)	(W)	(W)
WSW EXPOSURE						
WALL	13	0.354	-	72	-	74
SSE EXPOSURE						
WALL	27	0.354	-	121	-	150
H EXPOSURE						
ROOF	38	0.479	-	334	-	295

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	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

TABLE 1.2.A. COMPONENT LOADS FOR SPACE " 01-Management Room " IN ZONE " Zone 1 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0800 COOLING OA DB / WB 28.4 °C / 27.8 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 4.4 °C OCCUPIED T-STAT 22.0 °C		
		Sensible (W)	Latent (W)		Sensible (W)	Latent (W)
SPACE LOADS	Details			Details		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	14 m ²	65	-	14 m ²	80	-
Roof Transmission	21 m ²	179	-	21 m ²	158	-
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	21 m ²	0	-	21 m ²	58	-
Partitions	6 m ²	25	-	6 m ²	66	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	245 W	137	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	150 W	150	-	0	0	-
People	3	215	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	77	18	10%	36	0
>> Total Zone Loads	-	849	198	-	399	0

TABLE 1.2.B. ENVELOPE LOADS FOR SPACE " 01-Management Room " IN ZONE " Zone 1 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² -°K))	Coeff.	(W)	(W)	(W)
SSE EXPOSURE						
WALL	14	0.354	-	65	-	80
H EXPOSURE						
ROOF	21	0.479	-	179	-	158

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING								شماره صفحه: ۲۷ از ۳۶
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

TABLE 1.3.A. COMPONENT LOADS FOR SPACE " 02-Entrance " IN ZONE " Zone 1 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0800 COOLING OA DB / WB 28.4 °C / 27.8 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 4.4 °C OCCUPIED T-STAT 22.0 °C		
		Sensible (W)	Latent (W)		Sensible (W)	Latent (W)
SPACE LOADS	Details			Details		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	14 m ²	65	-	14 m ²	80	-
Roof Transmission	21 m ²	179	-	21 m ²	158	-
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	16 m ²	0	-	16 m ²	51	-
Partitions	6 m ²	25	-	6 m ²	66	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	112 W	63	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	200 W	200	-	0	0	-
People	3	215	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	75	18	10%	36	0
>> Total Zone Loads	-	822	198	-	391	0

TABLE 1.3.B. ENVELOPE LOADS FOR SPACE " 02-Entrance " IN ZONE " Zone 1 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² -°K))	Coeff.	(W)	(W)	(W)
SSE EXPOSURE						
WALL	14	0.354	-	65	-	80
H EXPOSURE						
ROOF	21	0.479	-	179	-	158

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING							شماره صفحه: ۲۸ از ۳۶	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0004		D00

TABLE 1.4.A. COMPONENT LOADS FOR SPACE " 03-Archive " IN ZONE " Zone 1 "						
DESIGN COOLING				DESIGN HEATING		
COOLING DATA AT Jul 0800 COOLING OA DB / WB 28.4 °C / 27.8 °C OCCUPIED T-STAT 24.0 °C				HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 4.4 °C OCCUPIED T-STAT 22.0 °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	9 m ²	40	-	9 m ²	50	-
Roof Transmission	13 m ²	109	-	13 m ²	96	-
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	13 m ²	0	-	13 m ²	36	-
Partitions	6 m ²	25	-	6 m ²	66	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	149 W	83	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	50 W	50	-	0	0	-
People	2	144	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	45	12	10%	25	0
>> Total Zone Loads	-	496	132	-	272	0

TABLE 1.4.B. ENVELOPE LOADS FOR SPACE " 03-Archive " IN ZONE " Zone 1 "						
	Area	U-Value	Shade	COOLING	COOLING	HEATING
	(m ²)	(W/(m ² -°K))	Coeff.	TRANS (W)	SOLAR (W)	TRANS (W)
SSE EXPOSURE						
WALL	9	0.354	-	40	-	50
H EXPOSURE						
ROOF	13	0.479	-	109	-	96

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING							شماره صفحه: ۲۹ از ۳۶	
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

TABLE 1.5.A. COMPONENT LOADS FOR SPACE " 04-Dining Room " IN ZONE " Zone 1 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0800 COOLING OA DB / WB 28.4 °C / 27.8 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 4.4 °C OCCUPIED T-STAT 22.0 °C		
		Sensible (W)	Latent (W)		Sensible (W)	Latent (W)
SPACE LOADS	Details			Details		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	12 m ²	54	-	12 m ²	67	-
Roof Transmission	17 m ²	145	-	17 m ²	128	-
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	17 m ²	0	-	17 m ²	48	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	192 W	107	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	50 W	50	-	0	0	-
People	5	337	176	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	69	18	10%	24	0
>> Total Zone Loads	-	763	194	-	267	0

TABLE 1.5.B. ENVELOPE LOADS FOR SPACE " 04-Dining Room " IN ZONE " Zone 1 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² -°K))	Coeff.	(W)	(W)	(W)
SSE EXPOSURE						
WALL	12	0.354	-	54	-	67
H EXPOSURE						
ROOF	17	0.479	-	145	-	128

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING								شماره صفحه ۳۰: از ۳۶
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

TABLE 1.6.A. COMPONENT LOADS FOR SPACE " 05-Prayer Room " IN ZONE " Zone 1 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0800 COOLING OA DB / WB 28.4 °C / 27.8 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 4.4 °C OCCUPIED T-STAT 22.0 °C		
		Sensible (W)	Latent (W)		Sensible (W)	Latent (W)
SPACE LOADS	Details			Details		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	12 m ²	54	-	12 m ²	67	-
Roof Transmission	17 m ²	145	-	17 m ²	128	-
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	17 m ²	0	-	17 m ²	48	-
Partitions	13 m ²	56	-	13 m ²	147	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	192 W	107	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	15	1231	1187	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	159	119	10%	39	0
>> Total Zone Loads	-	1753	1305	-	429	0

TABLE 1.6.B. ENVELOPE LOADS FOR SPACE " 05-Prayer Room " IN ZONE " Zone 1 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² -°K))	Coeff.	(W)	(W)	(W)
SSE EXPOSURE						
WALL	12	0.354	-	54	-	67
H EXPOSURE						
ROOF	17	0.479	-	145	-	128

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING								شماره صفحه ۳۱ از ۳۶
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

TABLE 1.7.A. COMPONENT LOADS FOR SPACE " 06-Corridor " IN ZONE " Zone 1 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0800 COOLING OA DB / WB 28.4 °C / 27.8 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 4.4 °C OCCUPIED T-STAT 22.0 °C		
		Sensible (W)	Latent (W)		Sensible (W)	Latent (W)
SPACE LOADS	Details			Details		
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	0 m ²	0	-	0 m ²	0	-
Roof Transmission	15 m ²	132	-	15 m ²	117	-
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	50	-
Partitions	3 m ²	15	-	3 m ²	39	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	108 W	60	-	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%	42	18	10%	21	0
>> Total Zone Loads	-	465	198	-	227	0

TABLE 1.7.B. ENVELOPE LOADS FOR SPACE " 06-Corridor " IN ZONE " Zone 1 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² -°K))	Coeff.	(W)	(W)	(W)
H EXPOSURE						
ROOF	15	0.479	-	132	-	117

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک								
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	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

TABLE 1.8.A. COMPONENT LOADS FOR SPACE " 07-UPS " IN ZONE " Zone 1 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 41.0 °C / 30.5 °C OCCUPIED T-STAT 24.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 4.4 °C OCCUPIED T-STAT 22.0 °C		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	Details	(W)	(W)	Details	(W)	(W)
Window & Skylight Solar Loads	0 m ²	0	-	0 m ²	-	-
Wall Transmission	35 m ²	161	-	35 m ²	198	-
Roof Transmission	34 m ²	253	-	34 m ²	257	-
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	112	-	3 m ²	125	-
Floor Transmission	34 m ²	0	-	34 m ²	105	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	16	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4000 W	4000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	763	988	-	718	6
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	530	99	10%	140	1
>> Total Zone Loads	-	5835	1087	-	1543	6

TABLE 1.8.B. ENVELOPE LOADS FOR SPACE " 07-UPS " IN ZONE " Zone 1 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² -°K))	Coeff.	(W)	(W)	(W)
NNW EXPOSURE						
WALL	14	0.359	-	61	-	79
WSW EXPOSURE						
WALL	10	0.359	-	50	-	55
SSE EXPOSURE						
WALL	11	0.359	-	50	-	64
DOOR	3	3.000	-	112	-	125
H EXPOSURE						
ROOF	34	0.479	-	253	-	257

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	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0004		D00

5.0 Equipment Selection

5.1 AIR CONDITIONING UNIT (SPLIT UNIT)

Item	Service Area							
	Conference Room	Management Room	Entrance	Corridor	Archive	Dining Room	Prayer Room	UPS
Calculated Sensible Cooling Load(w)	2580	849	822	465	496	763	1753	5835
Calculated Latent Cooling Load(w)	1322	198	198	198	132	194	1305	1087
Calculated Total Cooling Load(w)	3902	1047	1020	663	628	957	3058	6922
Calculated Total Cooling Load (btu/hr)	13326	3576	3483	2264	2145	3268	10444	23640
Calculated Sensible Heating Load(w)	717	399	391	227	272	267	429	1543
Calculated Sensible Heating Load (btu/hr)	2449	1363	1335	775	929	912	1465	5270
Eq. ID (1202-SUI/SUO-GCSCB-XX)	01	02	03		04	05	06	07
Equipment QTY.	1	1	1	1	1	1	1	1
Equipment Type	W.M.*	W.M.*	W.M.*	W.M.*	W.M.*	W.M.*	W.M.*	W.M.*
Calculated Cooling Load+ 10% Over Cap. (btu/hr)	14659	3933	3832	2359	3595	11488	2491	26004
Calculated Heating Load+ 10% Over Cap. (btu/hr)	2694	1499	1469	1022	1003	1612	853	5797
Selected Eq. Nominal Cooling Cap. (btu/hr)	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**
Selected Eq. Actual Cooling Cap. (btu/hr)	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**
Selected Eq. Actual Heating Cap. (btu/hr)	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**
Power Supply (V/PH/Hz)	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Max. Power Consumption (w) Eq. (Cooling/Heating)	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**	B.V.**
REMARKE ***	Cooling & Heating (Heat Pump)	Cooling & Heating (Heat Pump)	Cooling & Heating (Heat Pump)	Cooling & Heating (Heat Pump)	Cooling & Heating (Heat Pump)	Cooling & Heating (Heat Pump)	Cooling & Heating (Heat Pump)	Cooling Only

*Wall Mounted

**By Vendor

***Indoor & Outdoor Unit-T3, With Thermostat and All Standard Accessory

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	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0004		D00

5.2 EXHAUST FAN SELECTION

1202-EF-GCSCB-01 (Battery Room + UPS)

Battery Room

Air Flow = $46.79 \text{ (area, m}^2\text{)} \times 4 \text{ (height, m)} \times 6 \text{ ACH} \div 60 \text{ min} = 18.71 \text{ m}^3/\text{min} = 311.83 \text{ L/S} = 661 \text{ cfm}$

Battery Room (Nickel-Cadmium (Ni-Ca) Battery) Air-Change per Hour (ACH) rate is based on:

- NFPA 76 (Standard for the Fire Protection of Telecommunications Facilities 2009 Edition) - Fan capacity should be 1 CFM per square feet of floor space.
- NFPA 111 (Standard on Stored Electrical Energy Emergency and Standby Power Systems 2005 Edition) - Recommends a minimum of 2 air-changes per hour to remove gasses generated by vented batteries.
- ASHRAE Guideline 21 (Guide for Ventilation and Thermal Management of Batteries for Stationary Applications) - 1 CFM per charging amp, no less than 6 air-changes per hour.
- IMC (International Mechanical Code) - Fan capacity should be 1 CFM per square feet of floor space.
- IEEE 1635 (Institute of Electrical and Electronics Engineers Standard) - 1 CFM per charging amp, no less than 6 air-changes per hour.

UPS

Air Flow = $33.5 \text{ (area, m}^2\text{)} \times 4 \text{ (height, m)} \times 1 \text{ ACH} \div 60 \text{ min} = 2.23 \text{ m}^3/\text{min} = 37.22 \text{ L/S} = 78.86 \text{ cfm}$

1202-EF-GCSCB-02 (Prayer Room + Store)

Prayer Room

Air Flow = $16.7 \text{ (area, m}^2\text{)} \times 3 \text{ (height, m)} \times 6 \text{ ACH} \div 60 \text{ min} = 5.01 \text{ m}^3/\text{min} = 83.5 \text{ L/S} = 176.9 \text{ cfm}$

Store

Air Flow = $23 \text{ (area, m}^2\text{)} \times 3 \text{ (height, m)} \times 6 \text{ ACH} \div 60 \text{ min} = 6.9 \text{ m}^3/\text{min} = 115 \text{ L/S} = 243.7 \text{ cfm}$

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING								شماره صفحه: ۳۵ از ۳۶
	پروژه	بسته کاری	صادرکننده	تسهيلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0004	D00	

Item		1202-EF-GCSCB-01
Service Area		Battery Room + UPS
Equipment QTY.		1 Duty +1 Standby
Air Flow(L/S)		349.05
Air Flow(CFM)		739.86
Component Pressure Drop (External) (In.WG.)	Sand Tarp Louver	0.017
	Blast Proof Valve-01	0.08
	Fire Damper-01	0.01
	Intake Air Duct	0.038
	Intake Air Duct Volume Damper	0.04
	Intake Air Diffuser	0.026
	Exhaust Air Diffuser/Register	0.121
	Exhaust Air Duct Volume Damper	0.04
	Exhaust Air Duct	0.028
	Blast Proof Valve-02	0.08
	Fire Damper-02	0.01
	Motorized Damper	0.06
Total Pressure Drop * + 10% Over S.F.	(In.WG.)	0.605
	(Pa)	150.00
Exhaust Fan type		Utility Ex. Fan
Power Supply (V/PH/Hz)		230/1/50
Power Consumption (w) Each Eq.		By Vendor
REMARKE		Equipped With Bird Mesh - Explosion Proof

*Total Pressure Drop Should Be Specified By Vendor.

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک							
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING							شماره صفحه: ۳۶ از ۳۶
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	HV	CN	0004	D00

Item		1202-EF-GCSCB-02
Service Area		Prayer Room + Store
Equipment QTY.		1
Air Flow(L/S)		198.50
Air Flow(CFM)		420.6
Component Pressure Drop (External) (In.WG.)	Door Grill #1	0.051
	Door Grill #2	0.06
	Exhaust Air Diffuser/Register	0.037
	Exhaust Air Duct Volume Damper	0.04
	Exhaust Air Duct	0.015
	Blast Proof Valve-03	0.08
	Fire Damper-03	0.01
Total Pressure Drop * + 10% Over S.F.	(In.WG.)	0.322
	(Pa)	80.13
Exhaust Fan type		Utility Ex. Fan
Power Supply (V/PH/Hz)		230/1/50
Power Consumption (w) Each Eq.		By Vendor
REMARKE		Equipped With Bird Mesh

*Total Pressure Drop Should Be Specified By Vendor.