

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																									
شماره پیمان: 053 – 073– 9184	<table><tr><th colspan="8">HVAC CALCULATION NOTE FOR CCTV ROOM (DU,PU,GCS)</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>0007</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 CCTV ROOM (DU,PU,GCS)								نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه	D00	0007	CN	HV	120	PEDCO	GCS	BK	شماره صفحه 1 : از 35
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نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D00	0007	CN	HV	120	PEDCO	GCS	BK																			

طرح نگهداشت و افزایش تولید 27 مخزن

HVAC CALCULATION NOTE FOR CCTV ROOM (DU,PU,GCS) نگهداشت و افزایش تولید میدان نفتی بینک

D00	APR. 2024	IFC	K.Ahmadi	M.Fakharian	S.Faramarzpour	
Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval
Class: 2		CLIENT Doc. Number: F0Z-709533				

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

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																									
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نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D00	0007	CN	HV	120	PEDCO	GCS	BK																			

REVISION RECORD SHEET

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	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	0007	D00

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	BK	GCS	PEDCO	120	HV	CN	0007	D00

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.

	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	0007	D00

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-GNRAL-PEDCO-000-PR-DB-0001.

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																									
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D00	0007	CN	HV	120	PEDCO	GCS	BK																			

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	26.2 m
Summer Design Dry-Bulb	41.0 °C
Summer Coincident Wet-Bulb	32.0 °C
Summer Daily Range	16.7 °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)	-3.5 hours
Consider Daylight Savings Time	No
Simulation Weather Data	noneN/A
Current Data is	User Modified
Design Cooling Months	January to December

Design Day Maximum Solar Heat Gains

(The MSHG values are expressed in W/m²)

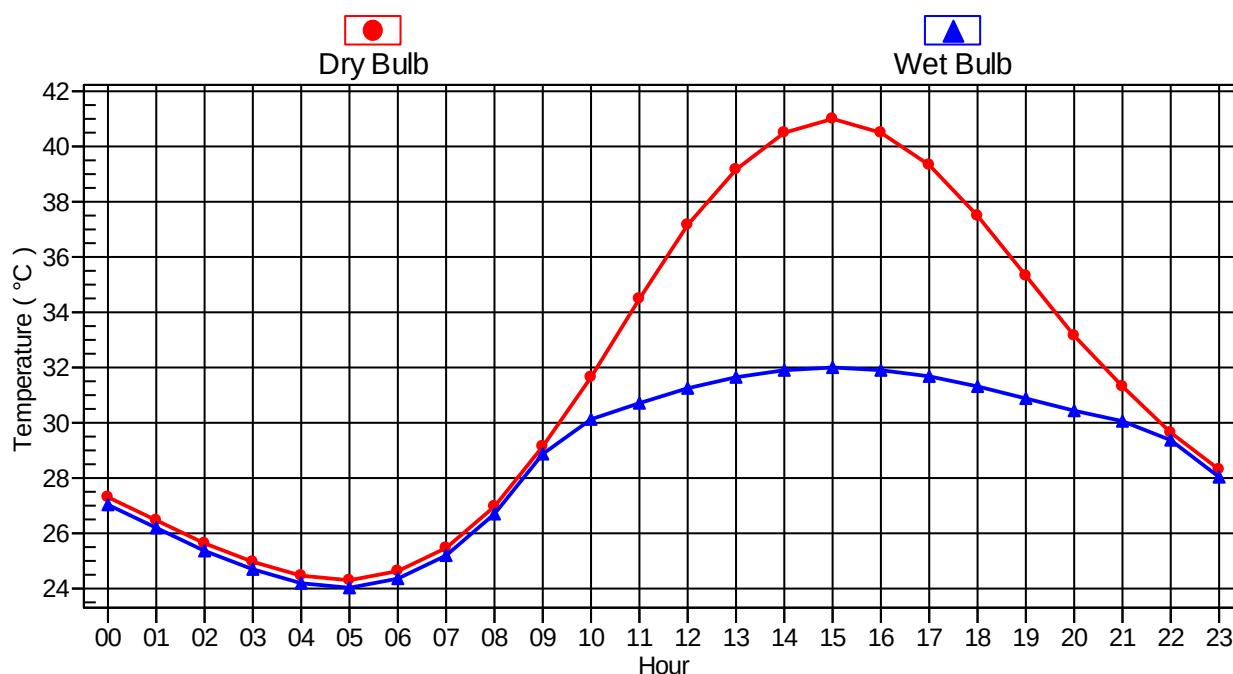
Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S
January	77.5	77.5	95.1	360.4	561.2	730.9	794.1	786.3	762.3
February	89.1	89.1	206.7	484.1	668.9	760.8	782.0	718.9	671.9
March	101.4	120.5	367.4	576.2	723.5	759.6	702.5	590.8	520.1
April	113.0	252.7	487.2	636.6	705.1	688.3	568.6	408.7	322.0
May	124.3	351.1	551.9	666.3	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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	BK	GCS	PEDCO	120	HV	CN	0007	D00	

Design Temperature Profile

Design Temperature Profiles for July



 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 CCTV ROOM (DU,PU,GCS)																										
پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه																			
BK	GCS	PEDCO	120	HV	CN	0007	D00																			

4.2 CONSTRUCTIONS U-VALUE:

CCTV CONTROL ROOM - BINAK GCS & DU

all u-values shall be follow , heat transfer reference according to IBNC code 19 (prescriptive or trade-off method)

Wall (Ceramic tile)

Wall Details

Outside Surface Color Medium

Absorptivity 0.675

Overall U-Value 0.217 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
Ceramic tile	12.500	1000.0	0.34	0.03676	12.5
Cement plaster	25.000	1600.0	0.80	0.03125	40.0
Wall brick	200.000	2000.0	0.20	1.00000	400.0
Rock wool	50.000	25.0	0.05	1.00000	1.3
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	387.500	-		4.61479	641.8

Noted

to correct

Wall (MDF)

Wall Details

Outside Surface Color Medium

Absorptivity 0.675

Overall U-Value 0.201 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
Wood siding	40.000	400.0	1.17	0.40000	16.0
Cement plaster	25.000	1600.0	0.80	0.03125	40.0
Wall brick	200.000	2000.0	0.20	1.00000	400.0
Rock wool	50.000	25.0	0.05	1.00000	1.3
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	415.000	-		4.97803	645.3

Wall (Stone)

Wall Details

Outside Surface Color Medium

Absorptivity 0.675

Overall U-Value 0.218 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
marble stone	50.000	2700.0	1.26	0.01429	135.0
Cement plaster	25.000	1600.0	0.80	0.03125	40.0
Wall brick	200.000	2000.0	0.20	1.00000	400.0
Rock wool	50.000	25.0	0.05	1.00000	1.3
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	425.000	-		4.59232	764.3

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	BK	GCS	PEDCO	120	HV	CN	0007	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

Noted

to correct

U.W.-1

Window Details:

Detailed Input Yes
 Height 1.20 m
 Width 1.00 m
 Frame Type Vinyl
 Internal Shade Type None
 Overall U-Value 2.819 W/(m²-°K)
 Overall Shade Coefficient 0.700

Glass Details:

Gap Type 6mm Argon

Glazing	Glass Type	Transmissivity	Reflectivity	Absorptivity
Outer Glazing	6mm clear	0.792	0.079	0.129
Glazing #2	6mm clear	0.792	0.079	0.129
Glazing #3	not used	1.000	0.000	0.000

M.D.-1

Door Details:

Gross Area 2.4 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								
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	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

CCTV CONTROL ROOM - BINAK PU

Wall (gypsum plaster)

Wall Details

Outside Surface Color Medium

Absorptivity 0.675

Overall U-Value 0.200 W/(m²-°K)

to correct

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	20.000	1150.0	1.17	0.03509	23.0
Wall brick	200.000	2000.0	0.20	1.00000	400.0
HDPu	50.000	50.0	0.05	1.42857	2.5
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	370.000	-		5.01044	613.5

Noted

Wall (marmarit stone)

Wall Details

Outside Surface Color Medium

Absorptivity 0.675

Overall U-Value 0.199 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
marmarit stone	50.000	2700.0	1.26	0.01429	135.0
Cement plaster	25.000	1600.0	0.80	0.03125	40.0
Wall brick	200.000	2000.0	0.20	1.00000	400.0
HDPu	50.000	25.0	0.05	1.42857	1.3
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	425.000	-		5.02089	764.3

Roof

Roof Details

Outside Surface Color Medium

Absorptivity 0.675

Overall U-Value 0.398 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
HDPu	50.000	25.0	0.84	1.42857	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	-		2.51445	607.8

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک																									
شماره پیمان: 053 - 073 - 9184	<table><tr><th colspan="8">HVAC CALCULATION NOTE FOR CCTV ROOM (DU,PU,GCS)</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>0007</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 CCTV ROOM (DU,PU,GCS)								نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه	D00	0007	CN	HV	120	PEDCO	GCS	BK	شماره صفحه 11 : از 35
HVAC CALCULATION NOTE FOR CCTV ROOM (DU,PU,GCS)																										
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D00	0007	CN	HV	120	PEDCO	GCS	BK																			

U.W.-1

Window Details:

Detailed Input Yes
 Height 1.20 m
 Width 0.70 m
 Frame Type Vinyl
 Internal Shade Type None
 Overall U-Value 2.819 W/(m²-°K)
 Overall Shade Coefficient 0.700

Glass Details:

Gap Type 6mm Argon

Glazing	Glass Type	Transmissivity	Reflectivity	Absorptivity
Outer Glazing	6mm clear	0.792	0.079	0.129
Glazing #2	6mm clear	0.792	0.079	0.129
Glazing #3	not used	1.000	0.000	0.000

U.W.-2

Window Details:

Detailed Input Yes
 Height 1.20 m
 Width 1.50 m
 Frame Type Vinyl
 Internal Shade Type None
 Overall U-Value 2.845 W/(m²-°K)
 Overall Shade Coefficient 0.700

Glass Details:

Gap Type 6mm Argon

Glazing	Glass Type	Transmissivity	Reflectivity	Absorptivity
Outer Glazing	6mm clear	0.792	0.079	0.129
Glazing #2	6mm clear	0.792	0.079	0.129
Glazing #3	not used	1.000	0.000	0.000

M.D.-1

Door Details:

Gross Area 2.2 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 12 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

4.3 SPACE INPUT DATA:

CCTV CONTROL ROOM - BINAK GCS & DU

00-Control Room

1. General Details:

Floor Area 46.6 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 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 1.25
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 500.0 Watts
Schedule Electrical Eq.

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NNW	18.9	0	0	0
ENE	24.6	0	0	0
WSW	24.6	0	0	0

3.1. Construction Types for Exposure NNW

Wall Type Wall (MDF)

3.2. Construction Types for Exposure ENE

Wall Type Wall (MDF)

3.3. Construction Types for Exposure WSW

Wall Type Wall (MDF)

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	46.6	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

Design Cooling 0.00 ACH
Design Heating 0.00 ACH
Energy Analysis 0.00 ACH
Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 46.6 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 21.6 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type Wall Partition
Area 6.6 m²
U-Value 0.761 W/(m²-°K)
Uncondit. Space Max Temp 35.0 °C
Ambient at Space Max Temp 41.0 °C
Uncondit. Space Min Temp 12.5 °C
Ambient at Space Min Temp 6.0 °C

7.2. 2nd Partition Details:

(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 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								
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	BK	GCS	PEDCO	120	HV	CN	0007	D00	

01-Rack Room

1. General Details:

Floor Area 10.0 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 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 10.20 W/m²
Ballast Multiplier 1.25
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 2500.0 Watts
Schedule Electrical Eq.

3. Walls, Windows, Doors:

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

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
ENE	12.6	0	0	0
SSE	7.9	0	0	0

3.1. Construction Types for Exposure ENE

Wall Type Wall (Stone)

3.2. Construction Types for Exposure SSE

Wall Type Wall (Stone)

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	10.0	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

Design Cooling 0.00 ACH
Design Heating 0.00 ACH
Energy Analysis 0.00 ACH
Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 10.0 m²
Total Floor U-Value 0.568 W/(m²-°K)
Unconditioned Space Max Temp. 35.0 °C
Ambient at Space Max Temp. 41.0 °C
Unconditioned Space Min Temp. 12.5 °C
Ambient at Space Min Temp. 6.0 °C

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 CCTV ROOM (DU,PU,GCS)																										
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D00	0007	CN	HV	120	PEDCO	GCS	BK																			

02-Entrance

1. General Details:

Floor Area 4.8 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 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 7.00 W/m²
Ballast Multiplier 1.25
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 500.0 Watts
Schedule Electrical Eq.

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
SSE	3.8	0	0	1

3.1. Construction Types for Exposure SSE

Wall Type Wall (MDF)
Door Type M.D.-1

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	4.8	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

Design Cooling 74.33 L/s
Design Heating 74.33 L/s
Energy Analysis 74.33 L/s

Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 4.8 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 1.2 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type Wall Partition
Area 6.0 m²
U-Value 0.761 W/(m²-°K)
Uncondit. Space Max Temp 35.0 °C
Ambient at Space Max Temp 41.0 °C
Uncondit. Space Min Temp 12.5 °C
Ambient at Space Min Temp 6.0 °C

7.2. 2nd Partition Details:

(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	 HIRGAN ENERGY																								
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HVAC CALCULATION NOTE FOR CCTV ROOM (DU,PU,GCS)																										
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D00	0007	CN	HV	120	PEDCO	GCS	BK																			

03-Pantry

1. General Details:

Floor Area	4.2	m ²
Avg. Ceiling Height	3.2	m
Building Weight	341.8	kg/m ²

1.1. OA Ventilation Requirements:

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

2. Internals:

2.1. Overhead Lighting:

Fixture Type	Recessed (Unvented)
Wattage	10.70 W/m ²
Ballast Multiplier	1.25
Schedule	Lighting

2.2. Task Lighting:

Wattage	0.00 W/m ²
Schedule	None

2.3. Electrical Equipment:

Wattage	600.0 Watts
Schedule	Electrical Eq.

3. Walls, Windows, Doors:

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	1000 W
Schedule	Electrical Eq.
Latent	700 W
Schedule	Electrical Eq.

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
WSW	6.3	1	0	0
SSE	6.6	0	0	0

3.1. Construction Types for Exposure WSW

Wall Type	Wall (Ceramic tile)
1st Window Type	U.W.-1

3.2. Construction Types for Exposure SSE

Wall Type	Wall (Ceramic tile)
-----------------	---------------------

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	4.2	0	0

4.1. Construction Types for Exposure H

Roof Type	Roof
-----------------	------

5. Infiltration:

Design Cooling	21.83	L/s
Design Heating	21.83	L/s
Energy Analysis	21.83	L/s

Infiltration occurs at all hours.

6. Floors:

Type	Slab Floor On Grade	
Floor Area	4.2	m ²
Total Floor U-Value	0.568	W/(m ² ·°K)
Exposed Perimeter	4.1	m
Edge Insulation R-Value	0.00	(m ² ·°K)/W

7. Partitions:

7.1. 1st Partition Details:

Partition Type	Wall Partition	
Area	6.6	m ²
U-Value	0.761	W/(m ² ·°K)
Uncondit. Space Max Temp	35.0	°C
Ambient at Space Max Temp	41.0	°C
Uncondit. Space Min Temp	12.5	°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								
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	BK	GCS	PEDCO	120	HV	CN	0007		D00

CCTV CONTROL ROOM - BINAK PU

00-Guard House

1. General Details:

Floor Area 4.7 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 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 1.25
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 100.0 Watts
Schedule Electrical Eq.

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
N	5.7	1	0	1
S	5.7	1	0	0
E	6.4	1	0	0

3.1. Construction Types for Exposure N

Wall Type Wall (gypsum plaster)
1st Window Type U.W.-1
Door Type M.D.-1

3.2. Construction Types for Exposure S

Wall Type Wall (gypsum plaster)
1st Window Type U.W.-2

3.3. Construction Types for Exposure E

Wall Type Wall (gypsum plaster)
1st Window Type U.W.-2

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	4.7	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

Design Cooling 2.00 ACH
Design Heating 2.00 ACH
Energy Analysis 2.00 ACH
Infiltration occurs at all hours.

6. Floors:

Type Slab Floor On Grade
Floor Area 4.7 m²
Total Floor U-Value 0.568 W/(m²-°K)
Exposed Perimeter 10.5 m
Edge Insulation R-Value 0.00 (m²-°K)/W

7. Partitions:

(No partition data).

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

 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 17 : از 35
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	BK	GCS	PEDCO	120	HV	CN	0007	D00	

01-Rack Room

1. General Details:

Floor Area 2.6 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 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 10.20 W/m²
Ballast Multiplier 1.25
Schedule Lighting

2.2. Task Lighting:

Wattage 0.00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 1000.0 Watts
Schedule Electrical Eq.

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
N	3.2	0	0	0
W	6.4	0	0	1
S	3.2	0	0	0

3.1. Construction Types for Exposure N

Wall Type Wall (marmarit stone)

3.2. Construction Types for Exposure W

Wall Type Wall (marmarit stone)
Door Type M.D.-1

3.3. Construction Types for Exposure S

Wall Type Wall (marmarit stone)

4. Roofs, Skylights:

Exp.	Roof Gross Area (m ²)	Roof Slope (deg.)	Skylight Qty.
H	10.0	0	0

4.1. Construction Types for Exposure H

Roof Type Roof

5. Infiltration:

Design Cooling 0.00 ACH
Design Heating 0.00 L/(s-m²)
Energy Analysis 0.00 L/s

Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 2.6 m²
Total Floor U-Value 0.568 W/(m²-°K)
Unconditioned Space Max Temp. 35.0 °C
Ambient at Space Max Temp. 41.0 °C
Unconditioned Space Min Temp. 12.5 °C
Ambient at Space Min Temp. 6.0 °C

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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 18 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

4.4 SYSTEM INPUT DATA:

CCTV CONTROL ROOM - BINAK GCS & DU

1. General Details:

Air System Name System
Equipment Type Terminal Units
Air System Type Split DX Fan Coil
Number of zones 2
Ventilation Direct Ventilation

2. Ventilation System Components:

(Common Ventilation System not used: no inputs)

3. Zone Components:

Space Assignments:

Zone 1: Zone 1	
00-Control Room	x1
02-Entrance	x1
03-Pantry	x1
Zone 2: Zone 2	
01-Rack Room	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	27.0	22.0	18.0	0.83
2	30.0	30.0	10.0	10.0	0.83

Thermostat Schedule Fan
Unoccupied Cooling is Available

Common Terminal Unit Data:

Cooling Coil:
Design Supply Temperature 14.4 °C
Coil Bypass Factor 0.100
Cooling Source Air-Cooled DX
Schedule JFMAMJJASOND

Heating Coil:
Design Supply Temperature 35.0 °C
Heating Source Air Source Heat Pump
Schedule JFMAMJJASOND
Fan Control Fan On
Ventilation Sizing Method Sum of Space OA Airflows

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 14.4 °C
Heating Supply Temperature 35.0 °C

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 %

 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 19 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

CCTV CONTROL ROOM - BINAK PU

1. General Details:

Air System Name System
Equipment Type Terminal Units
Air System Type Split DX Fan Coil
Number of zones 2
Ventilation Direct Ventilation

2. Ventilation System Components:

(Common Ventilation System not used: no inputs)

3. Zone Components:

Space Assignments:

Zone 1: Zone 1	
00-Guard House	x1
Zone 2: Zone 2	
01-Rack Room	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	27.0	22.0	18.0	0.83
2	30.0	30.0	10.0	10.0	0.83

Thermostat Schedule Fan

Unoccupied Cooling is Available

Common Terminal Unit Data:

Cooling Coil:

Design Supply Temperature 14.4 °C
Coil Bypass Factor 0.100
Cooling Source Air-Cooled DX
Schedule JFMAMJJASOND

Heating Coil:

Design Supply Temperature 35.0 °C
Heating Source Air Source Heat Pump
Schedule JFMAMJJASOND
Fan Control Fan On
Ventilation Sizing Method Sum of Space OA Airflows

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 14.4 °C
Heating Supply Temperature 35.0 °C

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 %

 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 20 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

4.5 AIR SYSTEM SIZING SUMMARY:

CCTV CONTROL ROOM - BINAK GCS & DU

Air System Information

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

Number of zones 2
Floor Area 65.6 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	6.7	627	627	Jul 1500	3.5	55.6	11.28
Zone 2	2.9	155	155	Jul 0800	0.0	10.0	15.51

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	11.1	6.6	24.6 / 20.4	15.9 / 15.6	-	Jul 1500
Zone 2	3.7	2.9	30.5 / 21.1	15.2 / 14.3	-	Aug 1700

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	3.4	21.6 / 26.1	-	627	0.000	0.000	0
Zone 2	0.2	22.0 / 23.2	-	155	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-Control Room	1	2.0	Jul 0800	176	0.9	46.6	3.78
02-Entrance	1	2.5	Jul 1500	220	1.9	4.8	45.74
03-Pantry	1	2.7	Aug 1600	232	0.7	4.2	55.17
Zone 2							
01-Rack Room	1	2.9	Jul 0800	155	0.0	10.0	15.51

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک							 شماره صفحه 21 : از 35
شماره پیمان: 053 - 073 - 9184	HVAC CALCULATION NOTE FOR CCTV ROOM (DU,PU,GCS)							
	پروژه	بسته کاری	صادرکننده	تسهيلات	رشته	نوع مدرک	سريال	نسخه
	BK	GCS	PEDCO	120	HV	CN	0007	D00

CCTV CONTROL ROOM - BINAK PU

since control room shall be pressurized, ventilation rate vs infiltration shall be specified.

Air System Information

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

Number of zones 2
Floor Area m²
Location

Sizing Calculation Information

Calculation Months Jan to Dec
Sizing Data Calculated

Zone L/s Sizing
Space L/s Sizing

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Airflow (L/s)	Minimum Airflow (L/s)	Time of Peak Load	Zone L/(s-m ²)
Zone 1	1.4	121	121	Sep 1400	25.85
Zone 2	1.3	68	68	Jul 1500	26.13

This building is not typical industrial plant control room and just used as CCTV room in safe area. CCTV rooms does not need pressurization system.

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	1.7	1.4	24.8 / 18.9	15.4 / 14.9	-	Sep 1400
Zone 2	1.4	1.3	30.6 / 20.3	15.2 / 14.3	-	Aug 1600

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	0.7	21.7 / 26.4	-	121	0.000	0.000	0
Zone 2	0.3	19.6 / 23.0	-	68	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-Guard House	1	1.4	Sep 1400	121	0.7	4.7	25.85
Zone 2							
01-Rack Room	1	1.3	Jul 1500	68	0.1	2.6	26.13

 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 CCTV ROOM (DU,PU,GCS)							شماره صفحه 22 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	HV	CN	0007	D00

4.6 VENTILATION SIZING SUMMARY

CCTV CONTROL ROOM - BINAK GCS & DU

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

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									
00-Control Room	1	46.6	5.0	176.2	0.00	0.00	0.0	0.0	0.0
02-Entrance	1	4.8	0.0	219.6	0.00	0.00	0.0	0.0	0.0
03-Pantry	1	4.2	0.0	231.7	0.00	0.00	0.0	0.0	0.0
Zone 2									
01-Rack Room	1	10.0	0.0	155.1	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				782.6					0.0

CCTV CONTROL ROOM - BINAK PU

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

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									
00-Guard House	1	4.7	2.0	121.5	0.00	0.00	0.0	0.0	0.0
Zone 2									
01-Rack Room	1	2.6	0.0	67.9	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				189.4					0.0

 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 23 : از 35
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

4.7 AIR SYSTEM DESIGN LOAD SUMMARY:

CCTV CONTROL ROOM - BINAK GCS & DU

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 41.0 °C / 32.0 °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	1 m ²	199	-	1 m ²	-	-
Wall Transmission	102 m ²	253	-	102 m ²	282	-
Roof Transmission	66 m ²	434	-	66 m ²	446	-
Window Transmission	1 m ²	47	-	1 m ²	54	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	2 m ²	195	-	2 m ²	223	-
Floor Transmission	66 m ²	17	-	66 m ²	220	-
Partitions	19 m ²	133	-	19 m ²	139	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	22	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4100 W	4100	-	0	0	-
People	5	359	300	0	0	0
Infiltration	-	1967	3804	-	1852	0
Miscellaneous	-	1000	700	-	0	0
Safety Factor	10% / 10%	873	480	10%	321	0
>> Total Zone Loads	-	9599	5285	-	3536	0
Zone Conditioning	-	9423	5285	-	3593	0
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	-	9423	5285	-	3593	0
Terminal Unit Cooling	-	9423	5350	-	0	0
Terminal Unit Heating	-	0	-	-	3593	-
>> Total Conditioning	-	9423	5350	-	3593	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

since control room shall be pressurized, ventilation rate vs infiltration shall be specified.

This building is not typical industrial plant control room and just used as CCTV room in safe area. CCTV rooms does not need pressurization system.

 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 24 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

CCTV CONTROL ROOM - BINAK PU

ZONE LOADS	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 40.5 °C / 31.9 °C			HEATING OA DB / WB 6.0 °C / 6.0 °C		
	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	4 m ²	436	-	4 m ²	-	-
Wall Transmission	22 m ²	40	-	22 m ²	44	-
Roof Transmission	15 m ²	58	-	15 m ²	46	-
Window Transmission	4 m ²	170	-	4 m ²	202	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	4 m ²	267	-	4 m ²	255	-
Floor Transmission	7 m ²	4	-	7 m ²	29	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	3	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1100 W	1100	-	0	0	-
People	2	144	120	0	0	0
Infiltration	-	145	331	-	141	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	237	45	10%	72	0
>> Total Zone Loads	-	2603	497	-	789	0
Zone Conditioning	-	2568	497	-	970	0
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	-	2568	497	-	970	0
Terminal Unit Cooling	-	2568	506	-	0	0
Terminal Unit Heating	-	0	-	-	970	-
>> Total Conditioning	-	2568	506	-	970	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

 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 CCTV ROOM (DU,PU,GCS)							شماره صفحه 25 : از 35
	پروژه	بسته کاری	صادرکننده	تهیه کننده	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	HV	CN	0007	D00

4.8 ZONE DESIGN LOAD SUMMARY:

CCTV CONTROL ROOM - BINAK GCS & DU

Zone 1				DESIGN COOLING			DESIGN HEATING		
				COOLING DATA AT Jul 1500			HEATING DATA AT DES HTG		
				COOLING OA DB / WB 41.0 °C / 32.0 °C			HEATING OA DB / WB 6.0 °C / 6.0 °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	1 m ²	199	-	1 m ²	-	-	1 m ²	-	-
Wall Transmission	81 m ²	221	-	81 m ²	264	-	81 m ²	264	-
Roof Transmission	56 m ²	392	-	56 m ²	426	-	56 m ²	426	-
Window Transmission	1 m ²	47	-	1 m ²	54	-	1 m ²	54	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-	0 m ²	0	-
Door Loads	2 m ²	195	-	2 m ²	223	-	2 m ²	223	-
Floor Transmission	56 m ²	0	-	56 m ²	220	-	56 m ²	220	-
Partitions	19 m ²	133	-	19 m ²	139	-	19 m ²	139	-
Ceiling	0 m ²	0	-	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	19	-	0	0	-	0	0	-
Task Lighting	0 W	0	-	0	0	-	0	0	-
Electric Equipment	1600 W	1600	-	0	0	-	0	0	-
People	5	359	300	0	0	0	0	0	0
Infiltration	-	1967	3804	-	1852	0	-	1852	0
Miscellaneous	-	1000	700	-	0	0	-	0	0
Safety Factor	10% / 10%	613	480	10%	318	0	10%	318	0
>> Total Zone Loads	-	6746	5285	-	3496	0	-	3496	0

Zone 2				DESIGN COOLING			DESIGN HEATING		
				COOLING DATA AT Jul 0800			HEATING DATA AT DES HTG		
				COOLING OA DB / WB 27.0 °C / 26.7 °C			HEATING OA DB / WB 6.0 °C / 6.0 °C		
				OCCUPIED T-STAT 30.0 °C			OCCUPIED T-STAT 10.0 °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	21 m ²	35	-	21 m ²	18	-	21 m ²	18	-
Roof Transmission	10 m ²	54	-	10 m ²	19	-	10 m ²	19	-
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	0 m ²	0	-	0 m ²	0	-	0 m ²	0	-
Floor Transmission	10 m ²	-20	-	10 m ²	0	-	10 m ²	0	-
Partitions	0 m ²	0	-	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	128 W	71	-	0	0	-	0	0	-
Task Lighting	0 W	0	-	0	0	-	0	0	-
Electric Equipment	2500 W	2500	-	0	0	-	0	0	-
People	0	0	0	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0	-	0	0
Safety Factor	10% / 10%	264	0	10%	4	0	10%	4	0
>> Total Zone Loads	-	2904	0	-	41	0	-	41	0

 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 26 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

CCTV CONTROL ROOM - BINAK PU

Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Sep 1400 COOLING OA DB / WB 39.4 °C / 31.4 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °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)
Window & Skylight Solar Loads	4 m ²	530	-	4 m ²	-	-
Wall Transmission	11 m ²	25	-	11 m ²	36	-
Roof Transmission	5 m ²	22	-	5 m ²	30	-
Window Transmission	4 m ²	156	-	4 m ²	202	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	2 m ²	158	-	2 m ²	204	-
Floor Transmission	5 m ²	0	-	5 m ²	29	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	2	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	100 W	100	-	0	0	-
People	2	144	120	0	0	0
Infiltration	-	135	319	-	141	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	127	44	10%	64	0
>> Total Zone Loads	-	1397	483	-	706	0

Zone 2	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 41.0 °C / 32.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C		
	OCCUPIED T-STAT 30.0 °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	11 m ²	13	-	11 m ²	8	-
Roof Transmission	10 m ²	35	-	10 m ²	16	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	2 m ²	102	-	2 m ²	51	-
Floor Transmission	3 m ²	5	-	3 m ²	0	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	1	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	1000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	116	0	10%	8	0
>> Total Zone Loads	-	1272	0	-	83	0

 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 27 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

4.9 SPACE DESIGN LOAD SUMMARY:

CCTV CONTROL ROOM - BINAK GCS & DU

TABLE 1.1.A. COMPONENT LOADS FOR SPACE " 00-Control Room " IN ZONE " Zone 1 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0800 COOLING OA DB / WB 27.0 °C / 26.7 °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		
		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	68 m ²	198	-	68 m ²	219	-
Roof Transmission	47 m ²	385	-	47 m ²	357	-
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	47 m ²	0	-	47 m ²	184	-
Partitions	7 m ²	13	-	7 m ²	48	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	693 W	387	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	500 W	500	-	0	0	-
People	5	359	300	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	184	30	10%	81	0
>> Total Zone Loads	-	2026	330	-	889	0

TABLE 1.1.B. ENVELOPE LOADS FOR SPACE " 00-Control 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)
NNW EXPOSURE						
WALL	19	0.201	-	48	-	61
ENE EXPOSURE						
WALL	25	0.201	-	74	-	79
WSW EXPOSURE						
WALL	25	0.201	-	76	-	79
H EXPOSURE						
ROOF	47	0.479	-	385	-	357

	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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 28 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

TABLE 1.2.A. COMPONENT LOADS FOR SPACE " 02-Entrance " IN ZONE " Zone 1 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 41.0 °C / 32.0 °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		
		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	1 m ²	3	-	1 m ²	4	-
Roof Transmission	5 m ²	34	-	5 m ²	37	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	2 m ²	195	-	2 m ²	223	-
Floor Transmission	5 m ²	0	-	5 m ²	14	-
Partitions	6 m ²	41	-	6 m ²	43	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	1	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	500 W	500	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	1521	2941	-	1431	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	230	294	10%	175	0
>> Total Zone Loads	-	2525	3235	-	1928	0

TABLE 1.2.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	1	0.201	-	3	-	4
DOOR	2	5.800	-	195	-	223
H EXPOSURE						
ROOF	5	0.479	-	34	-	37

 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 29 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

TABLE 1.3.A. COMPONENT LOADS FOR SPACE " 03-Pantry " IN ZONE " Zone 1 "						
DESIGN COOLING			DESIGN HEATING			
COOLING DATA AT Aug 1600 COOLING OA DB / WB 40.5 °C / 31.9 °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			
		Sensible	Latent		Sensible	Latent
SPACE LOADS	Details	(W)	(W)	Details	(W)	(W)
Window & Skylight Solar Loads	1 m ²	235	-	1 m ²	-	-
Wall Transmission	12 m ²	32	-	12 m ²	41	-
Roof Transmission	4 m ²	28	-	4 m ²	32	-
Window Transmission	1 m ²	47	-	1 m ²	54	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	0 m ²	0	-	0 m ²	0	-
Floor Transmission	4 m ²	0	-	4 m ²	22	-
Partitions	7 m ²	45	-	7 m ²	48	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	1	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	600 W	600	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	433	846	-	420	0
Miscellaneous	-	1000	700	-	0	0
Safety Factor	10% / 10%	242	155	10%	62	0
>> Total Zone Loads	-	2665	1701	-	678	0

TABLE 1.3.B. ENVELOPE LOADS FOR SPACE " 03-Pantry " IN ZONE " Zone 1 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² ·°K))	Coeff.	(W)	(W)	(W)
WSW EXPOSURE						
WALL	5	0.217	-	14	-	18
WINDOW 1	1	2.819	0.700	47	235	54
SSE EXPOSURE						
WALL	7	0.217	-	18	-	23
H EXPOSURE						
ROOF	4	0.479	-	28	-	32

 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 CCTV ROOM (DU,PU,GCS)							شماره صفحه 30 : از 35	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0007		D00

TABLE 2.1.A. COMPONENT LOADS FOR SPACE " 01-Rack Room " IN ZONE " Zone 2 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 0800 COOLING OA DB / WB 27.0 °C / 26.7 °C OCCUPIED T-STAT 30.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 10.0 °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	21 m ²	35	-	21 m ²	18	-
Roof Transmission	10 m ²	54	-	10 m ²	19	-
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	-20	-	10 m ²	0	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	128 W	71	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2500 W	2500	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	264	0	10%	4	0
>> Total Zone Loads	-	2904	0	-	41	0

TABLE 2.1.B. ENVELOPE LOADS FOR SPACE " 01-Rack Room " IN ZONE " Zone 2 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² ·°K))	Coeff.	(W)	(W)	(W)
ENE EXPOSURE						
WALL	13	0.218	-	24	-	11
SSE EXPOSURE						
WALL	8	0.218	-	11	-	7
H EXPOSURE						
ROOF	10	0.479	-	54	-	19

	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 CCTV ROOM (DU,PU,GCS)							شماره صفحه 31 : از 35	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0007		D00

CCTV CONTROL ROOM - BINAK PU

TABLE 1.1.A. COMPONENT LOADS FOR SPACE " 00-Guard House " IN ZONE " Zone 1 "						
DESIGN COOLING			DESIGN HEATING			
COOLING DATA AT Sep 1400 COOLING OA DB / WB 39.4 °C / 31.4 °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			
		Sensible	Latent		Sensible	Latent
SPACE LOADS	Details	(W)	(W)	Details	(W)	(W)
Window & Skylight Solar Loads	4 m ²	530	-	4 m ²	-	-
Wall Transmission	11 m ²	25	-	11 m ²	36	-
Roof Transmission	5 m ²	22	-	5 m ²	30	-
Window Transmission	4 m ²	156	-	4 m ²	202	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	2 m ²	158	-	2 m ²	204	-
Floor Transmission	5 m ²	0	-	5 m ²	29	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	2	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	100 W	100	-	0	0	-
People	2	144	120	0	0	0
Infiltration	-	135	319	-	141	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	127	44	10%	64	0
>> Total Zone Loads	-	1397	483	-	706	0

TABLE 1.1.B. ENVELOPE LOADS FOR SPACE " 00-Guard House " IN ZONE " Zone 1 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² -°K))	Coeff.	(W)	(W)	(W)
N EXPOSURE						
WALL	3	0.200	-	4	-	8
WINDOW 1	1	2.819	0.700	29	32	38
DOOR	2	5.800	-	158	-	204
S EXPOSURE						
WALL	4	0.200	-	10	-	12
WINDOW 1	2	2.845	0.700	63	296	82
E EXPOSURE						
WALL	5	0.200	-	11	-	15
WINDOW 1	2	2.845	0.700	63	202	82
H EXPOSURE						
ROOF	5	0.398	-	22	-	30

 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 CCTV ROOM (DU,PU,GCS)								شماره صفحه 32 : از 35
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	HV	CN	0007	D00	

TABLE 2.1.A. COMPONENT LOADS FOR SPACE " 01-Rack Room " IN ZONE " Zone 2 "						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 41.0 °C / 32.0 °C OCCUPIED T-STAT 30.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 6.0 °C / 6.0 °C OCCUPIED T-STAT 10.0 °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	11 m ²	13	-	11 m ²	8	-
Roof Transmission	10 m ²	35	-	10 m ²	16	-
Window Transmission	0 m ²	0	-	0 m ²	0	-
Skylight Transmission	0 m ²	0	-	0 m ²	0	-
Door Loads	2 m ²	102	-	2 m ²	51	-
Floor Transmission	3 m ²	5	-	3 m ²	0	-
Partitions	0 m ²	0	-	0 m ²	0	-
Ceiling	0 m ²	0	-	0 m ²	0	-
Overhead Lighting	0 W	1	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	1000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	116	0	10%	8	0
>> Total Zone Loads	-	1272	0	-	83	0

TABLE 2.1.B. ENVELOPE LOADS FOR SPACE " 01-Rack Room " IN ZONE " Zone 2 "						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m ²)	(W/(m ² ·°K))	Coeff.	(W)	(W)	(W)
N EXPOSURE						
WALL	3	0.199	-	3	-	3
W EXPOSURE						
WALL	4	0.199	-	7	-	3
DOOR	2	5.800	-	102	-	51
S EXPOSURE						
WALL	3	0.199	-	3	-	3
H EXPOSURE						
ROOF	10	0.398	-	35	-	16

 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 CCTV ROOM (DU,PU,GCS)							شماره صفحه 33 : از 35	
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0007		D00

5.0 Equipment Selection

5.1 AIR CONDITIONING UNIT

CCTV CONTROL ROOM - BINAK GCS & DU

Item	Service Area		
	Control Room & Entrance	Rack Room	Pantry
Calculated Sensible Cooling Load(w)	2026+2525	2904	2665
Calculated Latent Cooling Load(w)	330+3235	0	1701
Calculated Total Cooling Load(w)	2356+5760	2904	4366
Calculated Total Cooling Load (btu/hr)	8046+19671	9918	14911
Calculated Sensible Heating Load(w)	889+1928	41	678
Calculated Sensible Heating Load (btu/hr)	3036+6584	140	2315
Split Unit ID Indoor Unit ID	1202-SUI-...-01	1202-SUI-...-02	1202-SUI-...-03
Split Unit Outdoor Unit ID	1202-SUO-...-01	1202-SUO-...-02	1202-SUO-...-03
Equipment QTY.	1	1	1
Equipment Type	Wall Mounted Split Unit	Wall Mounted Split Unit	Wall Mounted Split Unit
Calculated Cooling Load+ 10% Over Cap. (btu/hr) Each	30489	10909	16402
Calculated Heating Load+ 10% Over Cap. (btu/hr) Each	10583	-	2547
Selected Eq. Nominal Cooling Cap. (btu/hr) Each	By Vendor	By Vendor	By Vendor
Selected Eq. Actual Cooling Cap. (btu/hr) Each	By Vendor	By Vendor	By Vendor
Selected Eq. Actual Heating Cap. (btu/hr) Each	By Vendor	By Vendor	By Vendor
Power Supply (V/PH/Hz)	230/1/50	230/1/50	230/1/50
Max. Power Consumption (w) Each Eq. (Cooling/Heating)	By Vendor	By Vendor	By Vendor
REMARKE	Outdoor and Indoor Unit (With Thermostat & All Standard Accessory)-T3	Outdoor and Indoor Unit (With Thermostat & All Standard Accessory)-T3	Outdoor and Indoor Unit (With Thermostat & All Standard Accessory)-T3

 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 CCTV ROOM (DU,PU,GCS)							شماره صفحه 34 : از 35	
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0007		D00

CCTV CONTROL ROOM - BINAK PU

Item	Service Area	
	Guard House	Rack Room
Calculated Sensible Cooling Load(w)	1397	1272
Calculated Latent Cooling Load(w)	483	0
Calculated Total Cooling Load(w)	1880	1272
Calculated Total Cooling Load (btu/hr)	6421	4344
Calculated Sensible Heating Load(w)	706	83
Calculated Sensible Heating Load (btu/hr)	2411	283
Split Unit ID Indoor Unit ID	1202-SUI-...-01	1202-SUI-...-02
Split Unit Outdoor Unit ID	1202-SUO-...-01	1202-SUO-...-02
Equipment QTY.	1	1
Equipment Type	Wall Mounted Split Unit	Wall Mounted Split Unit
Calculated Cooling Load+ 10% Over Cap. (btu/hr) Each	7063	4779
Calculated Heating Load+ 10% Over Cap. (btu/hr) Each	2652	312
Selected Eq. Nominal Cooling Cap. (btu/hr) Each	By Vendor	By Vendor
Selected Eq. Actual Cooling Cap. (btu/hr) Each	By Vendor	By Vendor
Selected Eq. Actual Heating Cap. (btu/hr) Each	By Vendor	By Vendor
Power Supply (V/PH/Hz)	230/1/50	230/1/50
Max. Power Consumption (w) Each Eq. (Cooling/Heating)	By Vendor	By Vendor
REMARKE	Outdoor and Indoor Unit (With Thermostat & All Standard Accessory)-T3	Outdoor and Indoor Unit (With Thermostat & All Standard Accessory)-T3

add one note to follow by vendor: cooling capacity shall be rated for site outdoor tempertaure and indoor setpoint (in fact vendor shall de-rate split cooling load for standard rating at 35°C /27°C in comparison with X°C /24°C)

out door temperature for Air cooled condenser selection.

Noted

 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 CCTV ROOM (DU,PU,GCS)							شماره صفحه 35 : از 35	
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	HV	CN	0007		D00

5.2 EXHAUST FAN SELECTION

CCTV CONTROL ROOM - BINAK GCS & DU

WC

$$\text{Air Flow} = 4 (\text{area, m}^2) \times 3.15 (\text{height, m}) \times 15 \text{ ACH} \div 60 \text{ min}$$

$$= 3.15 \text{ m}^3/\text{min}$$

$$= 52.5 \text{ L/S} \sim 75 \text{ L/S}$$

$$= 160 \text{ cfm}$$

Pantry

$$\text{Air Flow} = 4.16 (\text{area, m}^2) \times 3.15 (\text{height, m}) \times 6 \text{ ACH} \div 60 \text{ min}$$

$$= 1.31 \text{ m}^3/\text{min}$$

$$= 21.83 \text{ L/S} \sim 100 \text{ L/S}$$

$$= 212 \text{ cfm}$$

Item		Service Area	
		WC	Pantry
Equipment QTY.		1	1
Air Flow(L/S)		75	100
Air Flow(CFM)		160	212
Component Pressure Drop	Diffuser (In.WG.)	0.00	0.00
	Sand Trap Louver (In.WG.)	0.00	0.00
	Door Louver (In.WG.)	0.00	0.00
	Ducting (In.WG.)	0.0025	0.00
Total External Pressure Drop *	(In.WG.)	0.03936	0.00
	(Pa)	0.6221	0.00
Exhaust Fan ID		1202-EF-...-01	1202-EF-...-02
Exhaust Fan type		Ceiling Mounted	Wall Mounted/Axial
Power Supply (V/PH/Hz)		230/1/50	230/1/50
Power Consumption (w) Each Eq.		By Vendor	By Vendor
REMARKE		(ϕ =200 mm)	Equipped With Exhaust Air Louver

*Total Pressure Drop Include Louver and etc. Should Be Specified By Vendor.