

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>فعالیت های رو زمینی در بسته های کاری تحت الارض</p> <p>عمومی و مشترک</p>																	
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## طرح نگهداشت و افزایش تولید ۲۷ مخزن

### CALCULATION NOTE FOR LIGHTING SYSTEM OF WELL PADS SWITCHGEAR BUILDING

### نگهداشت و افزایش تولید میدان نفتی بینک



D02	Dec. 2022	IFA	H.Shakiba	M.Fakharian	M.Mehrshad	
D01	Oct. 2022	IFA	H.Shakiba	M.Fakharian	M.Mehrshad	
D00	May. 2022	IFC	H.Shakiba	M.Fakharian	M.Mehrshad	
Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval

Class: 2

CLIENT Doc. Number: F0Z-707378

#### 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	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>فعالیت های روزمینی در بسته های کاری تحت الارض</p> <p>عمومی و مشترک</p>																	
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D02	0002	CN	EL	110	PEDCO	SSGRL	BK											

### REVISION RECORD SHEET

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4	X				
5	X	X	X		
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 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>فعالیت های رو زمینی در بسته های کاری تحت الارض</p> <p>عمومی و مشترک</p>																									
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## 1.0 INTRODUCTION


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

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

### GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – General Facilities
EPD/EPC 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 COMPANY (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.

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>فعالیت های رو زمینی در بسته های کاری تحت الارض</p> <p>عمومی و مشترک</p>								
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## 2.0 SCOPE

This specification describes the practices that shall be employed and the Standards that will be required to be met for the Indoor Lightings Illumination

## 3.0 NORMATIVE REFERENCES

### 3.1 CODES AND STANDARDS

- IPS-E-EL-100 Engineering Standard For Electrical System Design (Industrial And Non-Industrial)

### 3.2 THE PROJECT REFERENCE DOCUMENTS

- BK-GNRAL-PEDCO-000-PR-DB-0001 Process Basis Of Design
- BK-GNRAL-PEDCO-000-EL-DC-0001 Electrical System Design Criteria
- BK-GNRAL-PEDCO-000-EL-SP-0007 Specification For Lighting & Small Power System
- BK-W046S-PEDCO-110-AR-DW-0003 Architectural Drawing for Switchgear Building of Well Pads - W046S
- BK-W046S-PEDCO-110-SA-PY-0001 Hazardous Area Classification W046S

## 4.0 LANGUAGE AND SYSTEM OF UNITS

All documentation, drawings, data, etc. furnished by the manufacturer shall be in English. SI metric system of measurement shall be used except for pipe and pipe fitting sizes, flange ratings and nozzle dimensions in which inch will be used.

## 5.0 LIGHTING SYSTEM

The lighting system will provide a uniform and adequate light distribution in all working areas, the minimum average illumination levels will be as per IPS-E-EL-100(1). Major areas indicated in the below table:





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TABLE 15 - ILLUMINANCES LEVELS

AREA OR ACTIVITY	MINIMUM ILLUMINANCE LUX	ELEVATION MILLIMETER
<b>I PROCESS AREAS</b>		
A) General process units		
Pump rows, valves, manifolds	50	Ground
Heat exchangers	30	Ground
Maintenance platforms	10	Floor
Operating platforms	50	Floor
Cooling towers (equipment areas)	50	Ground
Furnaces	30	Ground
Ladders and stairs (inactive)	30	Floor
Ladders and stairs (active)	50	Floor
Gage glasses	50	Eye level
Instruments (on process units)	50	Eye level
Compressor houses	200	Floor
Separators	50	Top of bay
General area	10	Ground
B) Control rooms and houses		
Ordinary control house		
Instrument panel	300	Floor
Console	300	1700
Back of panel	300	760
Central control house	100	760
Instrument	500	Floor
Back of pane	500	1700
	100	900
C) Specialty process units		
Conveyors		
Conveyor transfer points	20	Surface
	50	Surface
<b>II NONPROCESS AREA</b>		
A) Loading, unloading, and cooling water pump houses, Pump area		
General control area	50	Ground
Control panel	150	Floor
	200	1100
B) Boiler and air compressor plants		
Indoor		
Outdoor equipment 50	200	Floor
	50	Ground
C) Tank fields (where lighting is required)		
Ladders and stairs		
Gating area	5	Floor
Manifold area	10	Ground
	5	Floor
D) Loading racks		
General area		
Tank car	50	Floor
Tank trucks, loading point	100	Point
	100	Point
E) Tanker dock facilities		

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<p>F) Electrical substations and switch yardsd</p> <p>Outdoor switch yards</p> <p>General substation (outdoor)</p> <p>Substation operating aisles</p> <p>General substation (indoor)</p> <p>Switch racks</p> <p>G) Plantroad lighting (where lighting is requiredd)</p> <p>Frequent use (trucking)</p> <p>Infrequent use</p> <p>H) Plant parking lotsd</p> <p>I) Aircraft obstruction lightinge</p>	<p>20</p> <p>20</p> <p>150</p> <p>50</p> <p>50</p> <p>4</p> <p>2</p> <p>1</p>	<p>Ground</p> <p>Ground</p> <p>Floor</p> <p>Floor</p> <p>1200</p> <p>Ground</p> <p>Ground</p> <p>Ground</p>
<p>III Buildings</p> <p>A) Offices</p> <p>B) Laboratories</p> <p>Qualitative, quantitative and physical test</p> <p>Research, experimental</p> <p>Pilot plant, process and specialty</p> <p>Glassware, washrooms</p> <p>Fume hoods</p> <p>Stock rooms</p> <p>C) Warehouses and stock rooms</p> <p>Indoor bulk storage</p> <p>Outdoor bulk storage</p> <p>Large bin storage</p> <p>Small bin storage</p> <p>Small parts storage</p> <p>Counter tops</p> <p>D) Repair shop</p> <p>Large fabrication</p> <p>Bench and machine work</p> <p>Crane way, aisles</p> <p>Small machine</p> <p>Sheet metal</p> <p>Electrical</p> <p>Instrument</p> <p>E) Change housed</p> <p>Locker room, shower</p> <p>Lavatory</p> <p>F) Clock house and entrance gatehouse</p> <p>Card rack and clock area</p> <p>Entrance gate, inspection</p> <p>General</p>	<p>500</p> <p>500</p> <p>500</p> <p>300</p> <p>300</p> <p>300</p> <p>150</p> <p>50</p> <p>5</p> <p>50</p> <p>100</p> <p>200</p> <p>300</p> <p>200</p> <p>500</p> <p>150</p> <p>300</p> <p>200</p> <p>200</p> <p>300</p> <p>100</p> <p>100</p> <p>100</p> <p>150</p> <p>50</p>	<p>900</p> <p>900</p> <p>Floor</p> <p>900</p> <p>900</p> <p>900</p> <p>900</p> <p>Floor</p> <p>Floor</p> <p>Ground</p> <p>760</p> <p>760</p> <p>760</p> <p>1200</p> <p>Floor</p> <p>760</p> <p>Floor</p> <p>760</p> <p>760</p> <p>760</p> <p>760</p> <p>Floor</p> <p>Floor</p> <p>Floor</p> <p>Floor</p> <p>Floor</p>

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<p>G) Cafeteria Eating Serving area Food preparation General, halls, etc.</p> <p>H) Garage and firehouse Storage and minor repairs</p> <p>I) First aid roomed</p>	<p>300 300 300 100</p> <p>100</p> <p>700</p>	<p>760 900 900 Floor</p> <p>Floor</p> <p>760</p>
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D02

According to above table, the required luminance shall be about 150 LUX in operating aisles while in calculation, Eav is 149 lux on Floor.

## 6.0 DESIGN SOFTWARE

Calculation is performed with version 4.13 of DIALUX Software.

## 7.0 LIGHTING CALCULATION – DETAIL REPORT

DIALUX report has been attached in “Attachment”



## **SWITCHGEAR BUILDING OF WELL PADS**

BINAK OILFIELD DEVELOPMENT  
SUB-SURFACE WORK PACKAGES

BK14 WHF MODIFICATIONS

Partner for Contact:  
Order No.:  
Company:  
Customer No.:

Date: 26.12.2022  
Operator:



Operator  
Telephone  
Fax  
e-Mail

## Table of contents

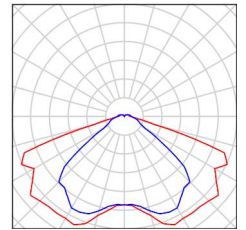
### SWITCHGEAR BUILDING OF WELL PADS

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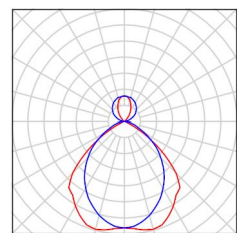
Operator  
Telephone  
Fax  
e-Mail

## SWITCHGEAR BUILDING OF WELL PADS / Luminaire parts list

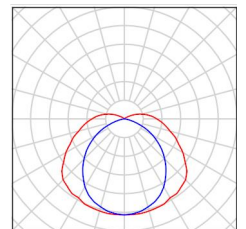
- 3 Pieces    Mazinoor M212A2GLED3 ROCKY 2000Lm 20W  
Oval shaped bulk head, Glass Diffuser with guard  
Article No.: M212A2GLED3  
Luminous flux (Luminaire): 2000 lm  
Luminous flux (Lamps): 2000 lm  
Luminaire Wattage: 20.0 W  
Luminaire classification according to CIE: 94  
CIE flux code: 47 83 95 94 100  
Fitting: 1 x LED (Correction Factor 1.000).



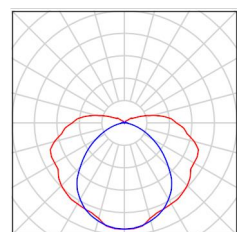
- 3 Pieces    MAZINOOR M425SJ236B 2x36 W JUPITER  
Suspended Fl. Luminaire with Semi-Specular  
Anodized Aluminium Louvre  
Article No.: M425SJ236B  
Luminous flux (Luminaire): 3320 lm  
Luminous flux (Lamps): 5000 lm  
Luminaire Wattage: 88.0 W  
Luminaire classification according to CIE: 85  
CIE flux code: 61 93 99 85 66  
Fitting: 2 x 36 W T8 Fluorescent Lamp with G13  
Base (26mm Tube Diameter) (Correction Factor  
1.000).



- 4 Pieces    MAZINOOR MSEALA218 2x18 W SEALA Dust &  
Moisture Proof Fl. Luminaire with PC Body and  
Diffuser  
Article No.: MSEALA218  
Luminous flux (Luminaire): 1904 lm  
Luminous flux (Lamps): 2400 lm  
Luminaire Wattage: 54.0 W  
Luminaire classification according to CIE: 92  
CIE flux code: 40 70 89 92 79  
Fitting: 2 x 18 W T8 Fluorescent Lamp with G13  
Base (26mm Tube Diameter) (Correction Factor  
1.000).



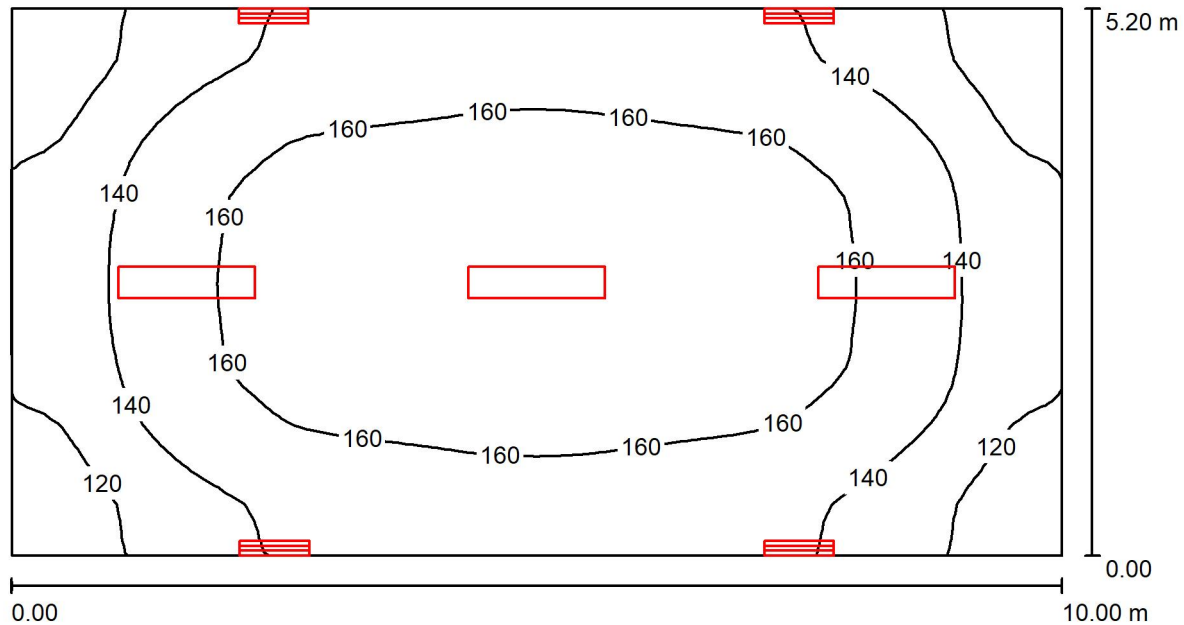
- 1 Pieces    Mazinoor MSEXe840236 2x36 W Zone1 /Zone  
21 Explosion-Proof Fluorescent Luminaire  
Article No.: MSEXe840236  
Luminous flux (Luminaire): 3985 lm  
Luminous flux (Lamps): 5000 lm  
Luminaire Wattage: 65.7 W  
Luminaire classification according to CIE: 87  
CIE flux code: 36 64 85 87 80  
Fitting: 2 x 36 W T8 Fluorescent Lamp with G13  
Base (26mm Tube Diameter) (Correction Factor  
1.000).





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## SWITCHGEAR ROOM / Summary



Height of Room: 5.000 m, Light loss factor: 0.80

Values in Lux, Scale 1:72

Surface	$\rho$ [%]	$E_{av}$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$u_0$
Workplane	/	149	102	177	0.687
Floor	20	149	101	177	0.682
Ceiling	80	69	30	273	0.436
Walls (4)	50	89	36	4585	/

### Workplane:

Height: 0.000 m  
Grid: 64 x 32 Points  
Boundary Zone: 0.000 m

Illuminance Quotient (according to LG7): Walls / Working Plane: 0.606, Ceiling / Working Plane: 0.466.

### Luminaire Parts List

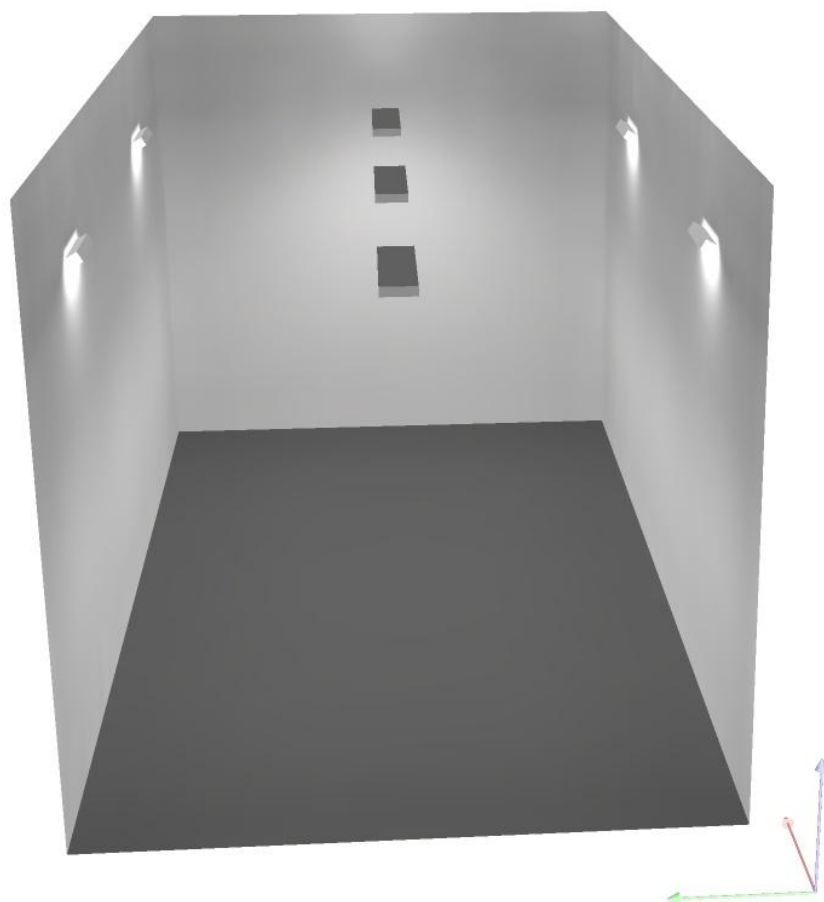
No.	Pieces	Designation (Correction Factor)	$\Phi$ (Luminaire) [lm]	$\Phi$ (Lamps) [lm]	P [W]
1	3	MAZINOOR M425SJ236B 2x36 W JUPITER Suspended Fl. Luminaire with Semi-Specular Anodized Aluminium Louvre (1.000)	3320	5000	88.0
2	4	MAZINOOR MSEALA218 2x18 W SEALA Dust & Moisture Proof Fl. Luminaire with PC Body and Diffuser (1.000)	1904	2400	54.0
Total:			17576	24600	480.0

Specific connected load:  $9.24 \text{ W/m}^2 = 6.21 \text{ W/m}^2/100 \text{ lx}$  (Ground area:  $51.97 \text{ m}^2$ )



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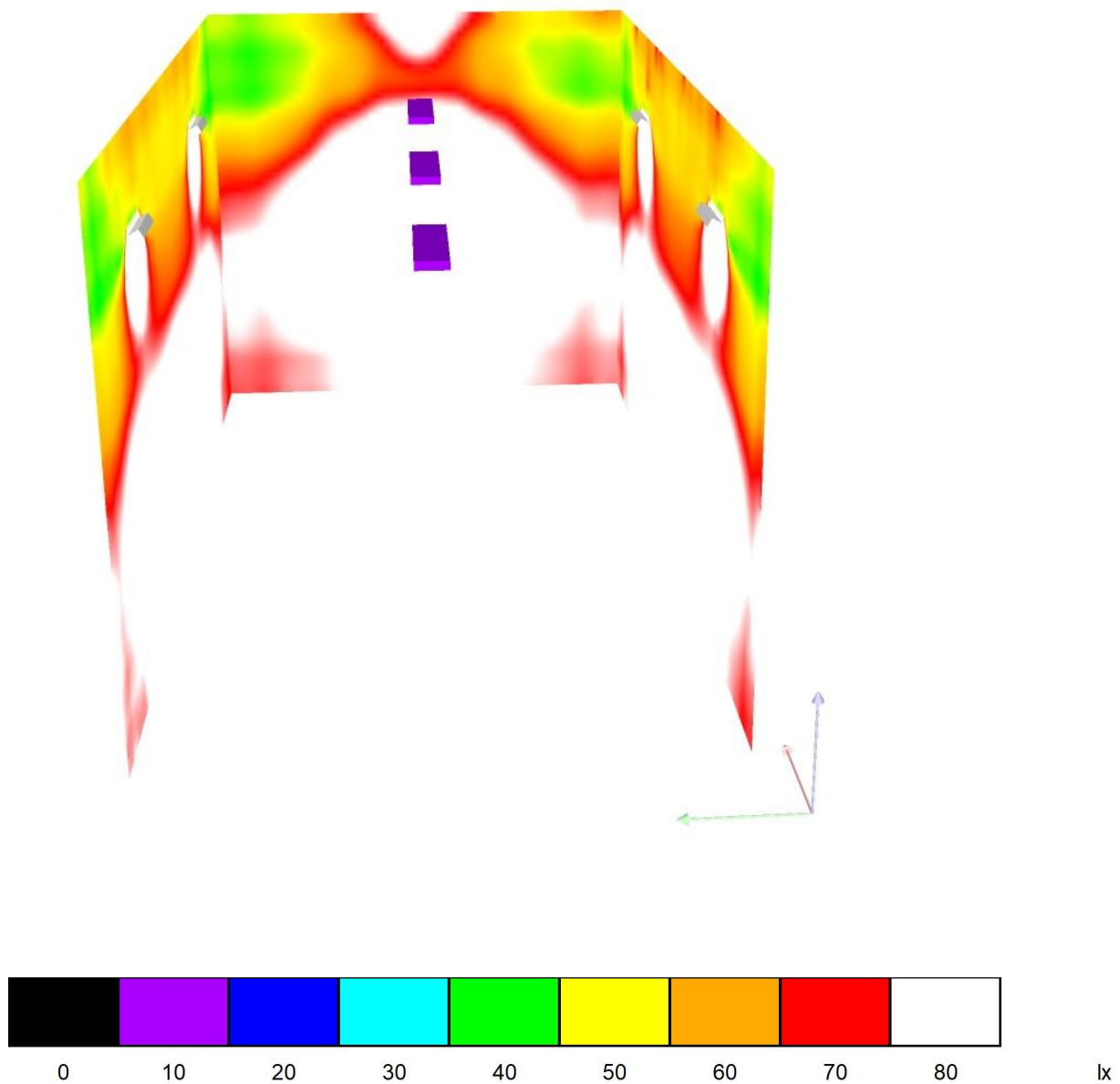
## SWITCHGEAR ROOM / 3D Rendering





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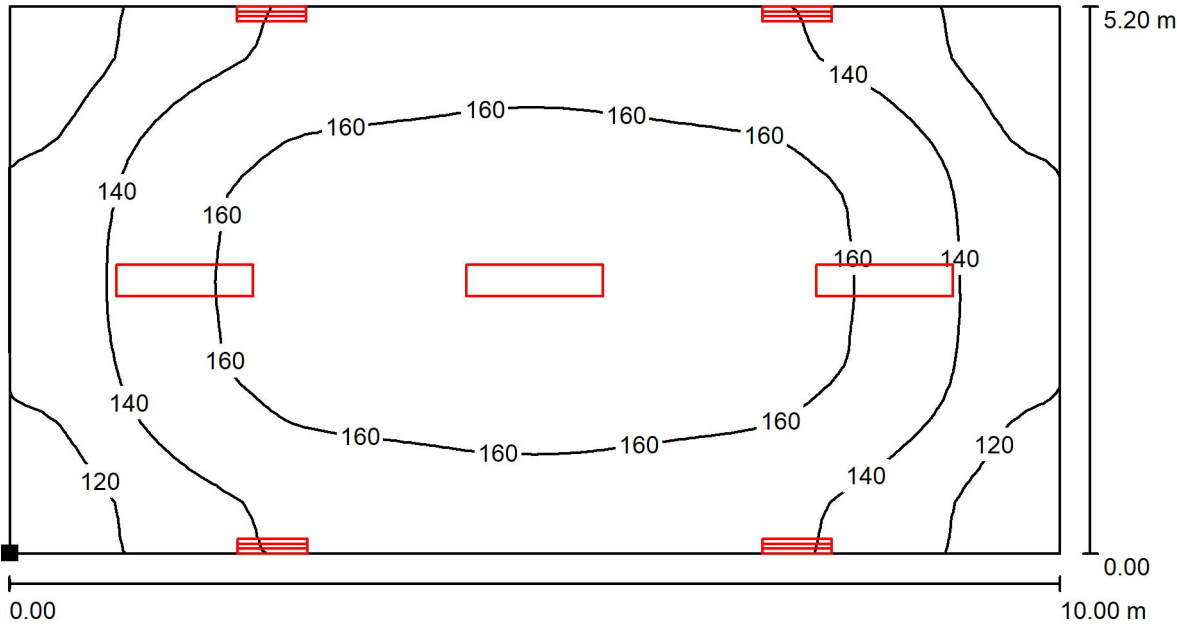
## SWITCHGEAR ROOM / False Color Rendering





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SWITCHGEAR ROOM / Workplane / Isolines (E)



Values in Lux, Scale 1 : 72

Position of surface in room:  
Marked point:  
(1.010 m, 0.300 m, 0.000 m)



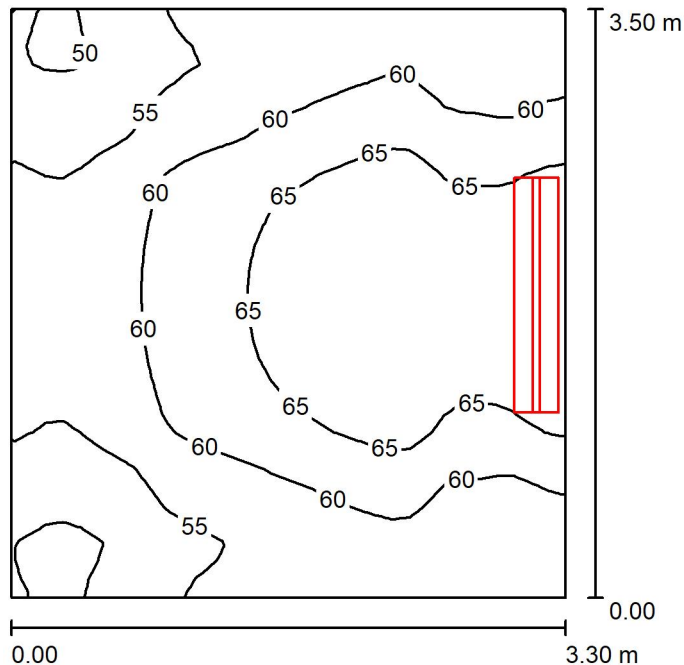
Grid: 64 x 32 Points

$E_{av}$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$u_0$	$E_{min} / E_{max}$
149	102	177	0.687	0.578



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e-Mail

## BATTERY ROOM / Summary



Height of Room: 5.000 m, Mounting Height: 4.160 m, Light loss factor: 0.80

Values in Lux, Scale 1:45

Surface	$\rho$ [%]	$E_{av}$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$u_0$
Workplane	/	60	47	70	0.790
Floor	20	60	46	70	0.769
Ceiling	80	75	29	174	0.387
Walls (4)	50	70	23	928	/

### Workplane:

Height: 0.000 m  
Grid: 32 x 32 Points  
Boundary Zone: 0.000 m

Illuminance Quotient (according to LG7): Walls / Working Plane: 1.171, Ceiling / Working Plane: 1.249.

### Luminaire Parts List

No.	Pieces	Designation (Correction Factor)	$\Phi$ (Luminaire) [lm]	$\Phi$ (Lamps) [lm]	P [W]
1	1	Mazinoor MSeXe840236 2x36 W Zone1 /Zone 21 Explosion-Proof Fluorescent Luminaire (1.000)	3985	5000	65.7
Total:			3985	5000	65.7

Specific connected load:  $5.69 \text{ W/m}^2 = 9.48 \text{ W/m}^2/100 \text{ lx}$  (Ground area:  $11.55 \text{ m}^2$ )





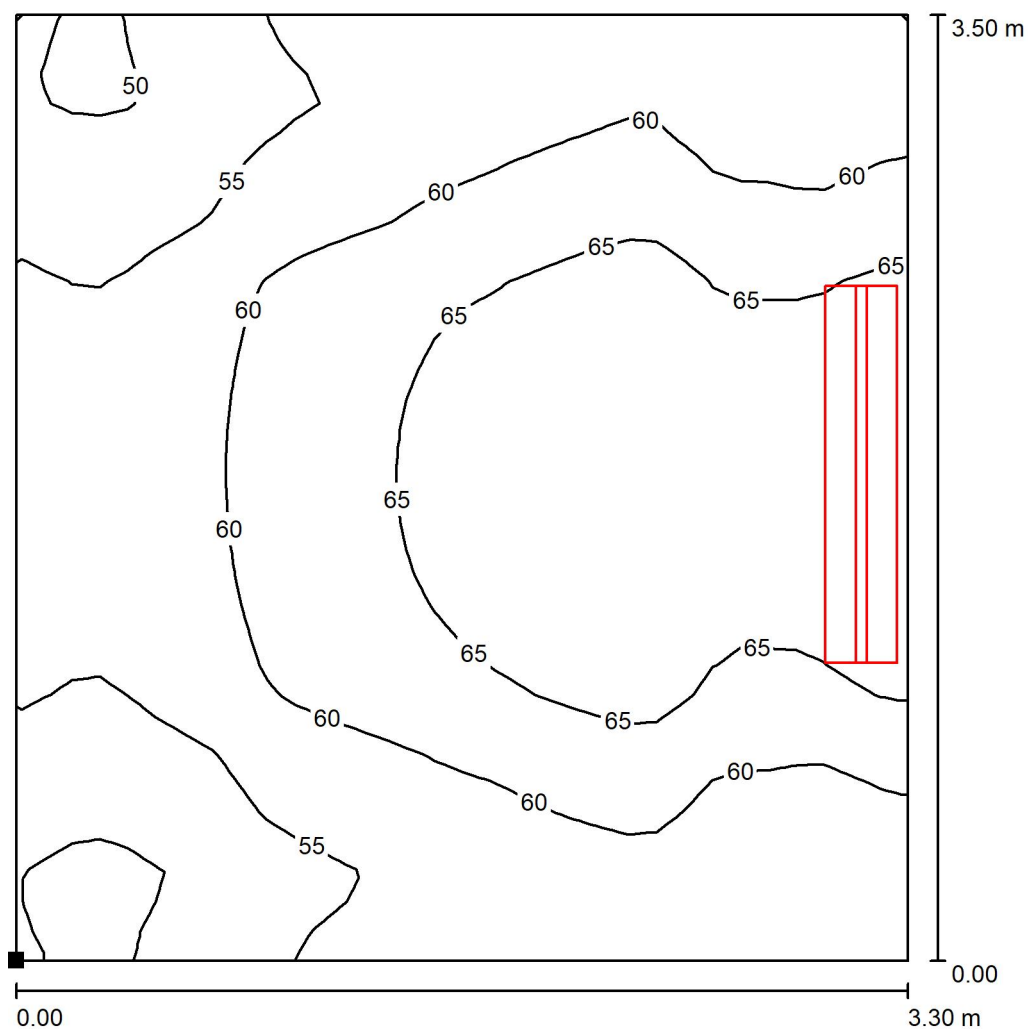
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## BATTERY ROOM / 3D Rendering

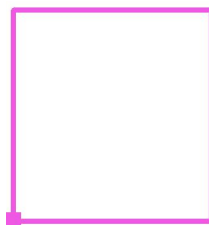




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**BATTERY ROOM / Workplane / Isolines (E)**

Position of surface in room:  
Marked point:  
(1.000 m, 5.500 m, 0.000 m)



Values in Lux, Scale 1 : 28

Grid: 32 x 32 Points

$E_{av}$  [lx]  
60

$E_{min}$  [lx]  
47

$E_{max}$  [lx]  
70

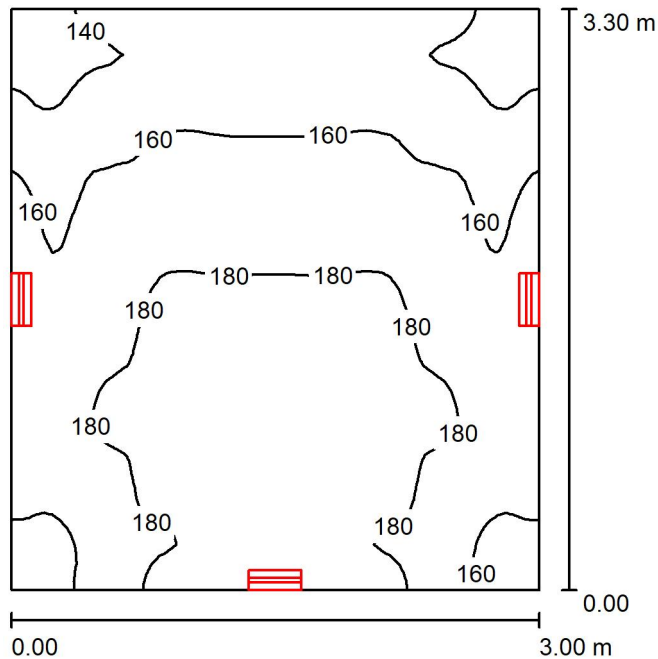
$u_0$   
0.790

$E_{min} / E_{max}$   
0.674



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## TRANSFORMER SHELTER / Summary



Height of Room: 3.400 m, Mounting Height: 2.860 m, Light loss factor: 0.80

Values in Lux, Scale 1:43

Surface	$\rho$ [%]	$E_{av}$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$u_0$
Workplane	/	169	124	197	0.735
Floor	20	169	123	196	0.729
Ceiling	80	95	59	125	0.617
Walls (4)	50	149	74	1430	/

### Workplane:

Height: 0.000 m  
Grid: 64 x 64 Points  
Boundary Zone: 0.000 m

Illuminance Quotient (according to LG7): Walls / Working Plane: 0.878, Ceiling / Working Plane: 0.565.

### Luminaire Parts List

No.	Pieces	Designation (Correction Factor)	$\Phi$ (Luminaire) [lm]	$\Phi$ (Lamps) [lm]	P [W]
1	3	Mazinoor M212A2GLED3 ROCKY 2000Lm 20W Oval shaped bulk head, Glass Diffuser with guard (1.000)	2000	2000	20.0
Total:			6000	6000	60.0

Specific connected load:  $6.06 \text{ W/m}^2 = 3.59 \text{ W/m}^2/100 \text{ lx}$  (Ground area:  $9.90 \text{ m}^2$ )



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## TRANSFORMER SHELTER / 3D Rendering





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## TRANSFORMER SHELTER / False Color Rendering

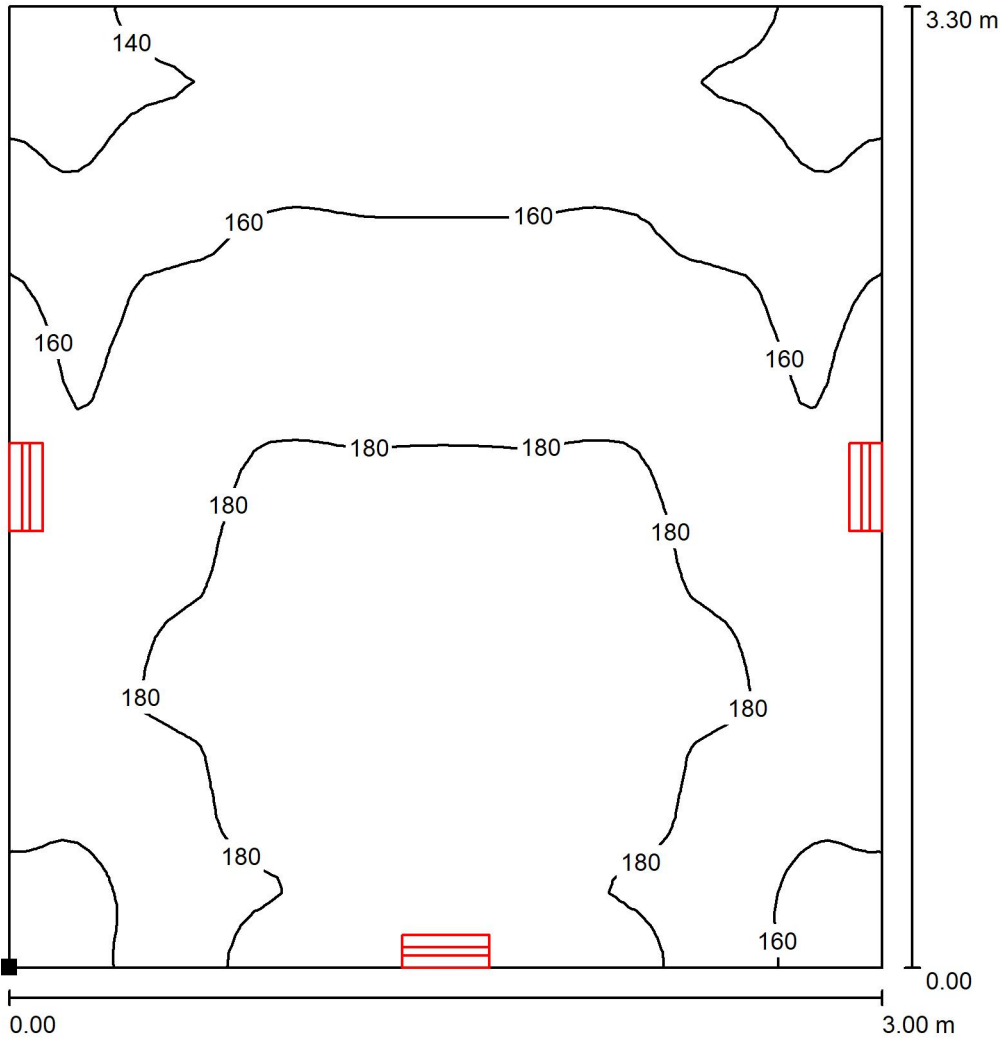


0 10 20 30 40 50 60 70 80 lx



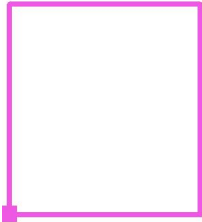
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TRANSFORMER SHELTER / Workplane / Isolines (E)



Values in Lux, Scale 1 : 26

Position of surface in room:  
Marked point:  
(4.760 m, 5.750 m, 0.000 m)



Grid: 64 x 64 Points

$E_{av}$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$u0$	$E_{min} / E_{max}$
169	124	197	0.735	0.631