DESIGN CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Section	**4- Utilities**	Calc. File No.	
Sub-Section	**4M01-Administration Building**	Calc. Index No.	

Subject: Lighting Design Calculation

Calculation Objective:

To determine the number and location of lighting fixtures in each area, depending of fixture type and the required illuminance level.

References, Calculation Notes and Comments

Illuminance levels are from Illuminating Engineering Society of North America (IESNA) Lighting Handbook 9th Edition, 2000.

Illuminance unit is LUX

Reflactances for ceiling, wall and floor (Indoor)

To design the interior luminarie distribution it was used VISUAL lighting design software of Lithonia Lighting.

The following parameters are requested:

Type of fixture and lamps to be used.

Illuminance level and units.

Reflectances of floor.

Light Loss Factor (LLF) of each luminaire type

Work plane and luminaire plane.

Rev	Prepared		No. of	Checked		Reviewed		Superseded
	by	Date	Pages	by	Date	by	Date	by Calc No.
O	M. Garcia	Feb/14/2002	8		July 24, '02		14 Aug. '02	
A								
B								
C								

File in Calc. File

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	BUILDING WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-ADMINISTRATION BLDG.	Page No. 01	Rev.

References/ Notes

DESIGN FACTORS

Recommended Lighting Levels (Acording IESNA Specification)

AREA	LUX
Offices	500
Cafeteria	150
Toilets	200
Storage	150
Waiting Area	200
Corridor	200
Staircases	200

Typical Surface Reflectances (for Administration Building. Indoor)

CONDITION	%
Ceiling	80%
Wall	50%
Floor	20%

Luminaire Types (from Lithonia Lighting Catalog)

AREA	LUMINAIRE	LUMEN	LLF
General	Paramax 18 cell 3xT8 32w	2900	0.81
Corridors	6" open downlight 2-26w	1800	0.86
Toilets	Paramax 9 cell 3xT8 32w	2800	0.81
Verandah	Recessed Wall MH. 100w	8500	0.73

Prepared by	M. Garcia	Feb/1423/2002	Checked by T. Kikuchi Feb/24/2002

Project	Detailed Design on Port Reactivation Project In La Union	Calc. File No.	
Section	BUILDING WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-ADMINISTRATION BLDG.	Page No. 02	Rev.

References/ Notes

ADMINISTRATION BUILDING-FIRST FLOOR

AREA	REQUIRED LEVEL LUX	CALCULATED LEVEL LUX
Inmigration	500	567
Custom	500	511
Police	500	468
First Aid	500	589
Kitchen (Cafeteria)	500	522
Cafeteria	150	195
Banks	500	456
Quarantine/Oirsa	500	467
SS-1	200	300
Storage	150	133
First Aid (Waiting Area)	150	198
Machine Room	500	711
Information	500	511
Guard Room	500	400
Waiting Area	200	286
Kitchen 2	500	422
Janitor Room	150	142
Toilets	200	347
Vestibule 1	200	290
Vestibule 2	200	273
Corridor	200	229
Staircases	200	88

ADMINISTRATION BUILDING-SECOND FLOOR

AREA	REQUIRED LEVEL LUX	CALCULATED LEVEL LUX
Concessionaries Offices	500	579
Security Division	500	599
Storage	150	169
Metereology	500	603
Toilets (Woman)	200	245
Toilets (Men)	200	245
Kitchen	500	533
Janitor Room	150	142
Machine Room	500	487
Corridor	200	221
Verandah	20	20

	Prepared by		Checked by	
	M. Garcia	Feb/14/2002	T. Kikuchi	July 12th /2002

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	BUILDING WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-ADMINISTRATION BLDG.	Page No. 03	Rev.

References/ Notes

ADMINISTRATION BUILDING-THIRD FLOOR

AREA	REQUIRED LEVEL LUX	CALCULATED LEVEL LUX
Auditorium	500	497
Manager's Room	500	475
Secretary	500	512
Toilets (Woman)	200	222
Toilets (Men)	200	222
Administration Offices	500	438
Maintenance Dept.	500	437
Storage	150	187
Kitchen	500	328
Janitor Room	150	142
Machine Room	500	487
Corridor	200	194
Verandah	20	32

ADMINISTRATION BUILDING-FOURTH FLOOR

AREA	REQUIRED LEVEL LUX	CALCULATED LEVEL LUX
Meeting Room	500	619
Kitchen	500	195
Hall	200	332
Toilets (Woman)	200	191
Toilets (Men)	200	191
Multi Purpose Room	200	253
Corridor	200	197
Verandah	200	253

ADMINISTRATION BUILDING-FIFTH FLOOR

AREA	REQUIRED LEVEL LUX	CALCULATED LEVEL LUX
Yard Controller Room	500	619
Stack Room	200	195
Hall	200	332
Toilets	200	191
Yard Controller Room	200	191
Corridor	200	253

ADMINISTRATION BUILDING-SIXTH FLOOR

AREA	REQUIRED LEVEL LUX	CALCULATED LEVEL LUX
Hall	500	619
Toilets	200	195
Navigation Controller Room	200	332
Harbor Master Room	200	191
Bedroom	200	191
Corridor	200	253

	Prepared by		Checked by	
	M. Garcia	Feb/14/2002	T. Kikuchi	July 12/ /200

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
CALC FILE No.:
CALC INDEX No.: PAGE 04
INITIAL DATE
PREPARED BY Feb/14/02
CHECKED BY Jul/24/02

VISUAL

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	A	78	2PM3N G 3 32 18LD 1/3 ADDE	PARAMAX PARABOLIC TROFFER 3" LVR FAMILY 3 LAMP T8 18 CELL SEMI-SPEC LVR 1/3 ELECT	2900 LM LAMP	L6347.IES	2900	0.81	85
	B	5	2PM 3N 2U31 9LD TUBI	PARAMAX PARABOLIC TROFFER 3" LVR FAMILY 2X2 2 LAMP T8U 9 CELL LO IRR SEMISPEC LVR 1/3 ELECT.	2800 LM LAMP	L6238.IES	2800	0.81	57
	C	32	LF6/F6O2A (2/26DTT)	6" OPEN DOWNLIGHT WITH SEMI-DIFFUSE REFLECTOR	TWO 26-WATT DOUBLE TWIN TUBE COMPACT FLUORESCENTS, HZ W/45-DEG CANT.	95110901.IES	1800	0.86	66

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
ADMINISTRATION BUILDING

Designer
M.GARCIA

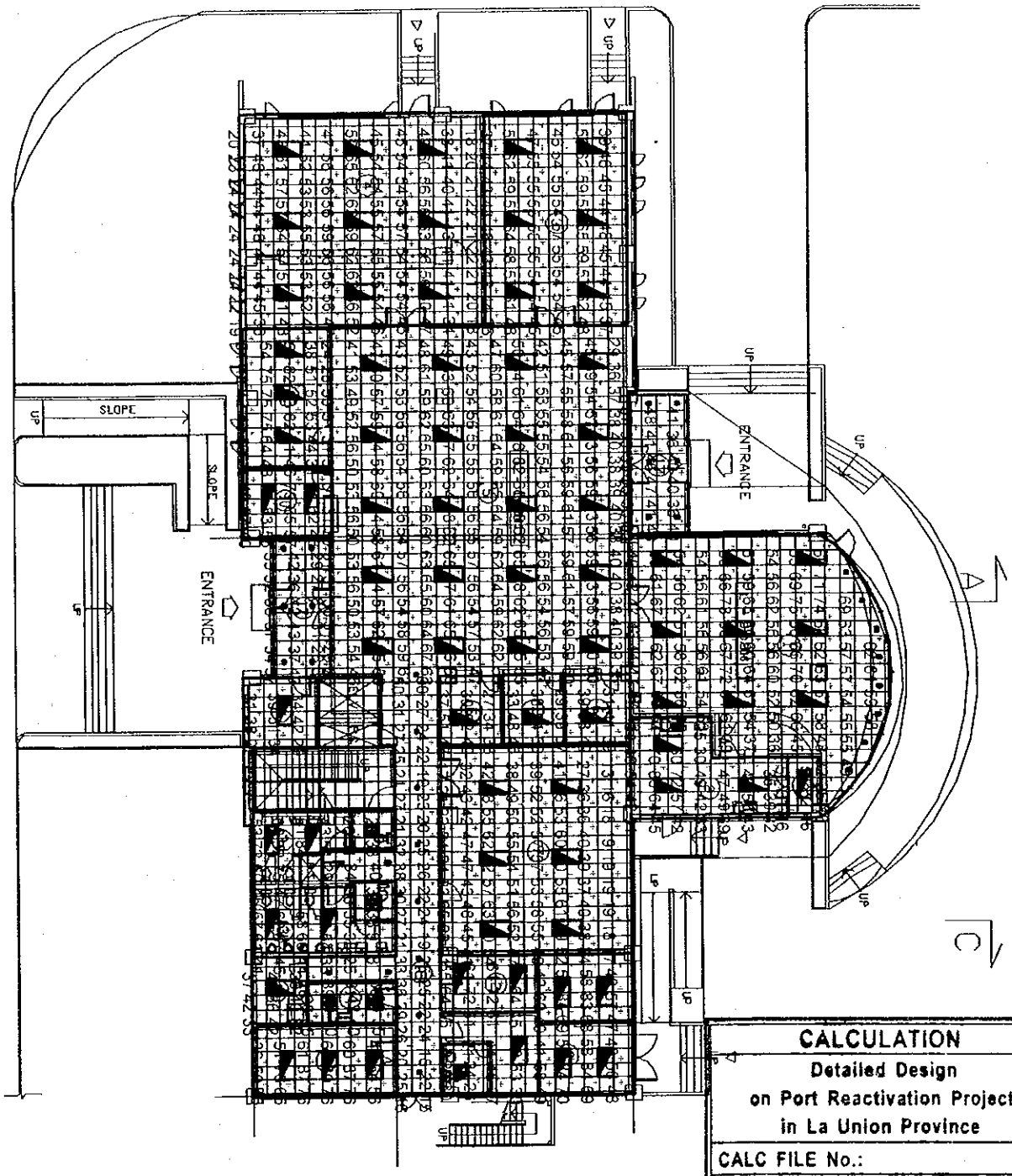
Date
Jul 27 2002

Scale

Drawing No.

3 of 3

Calculated values include direct and interreflected components.



FIRST FLOOR PLAN

Plan View

Scale 1 : 250

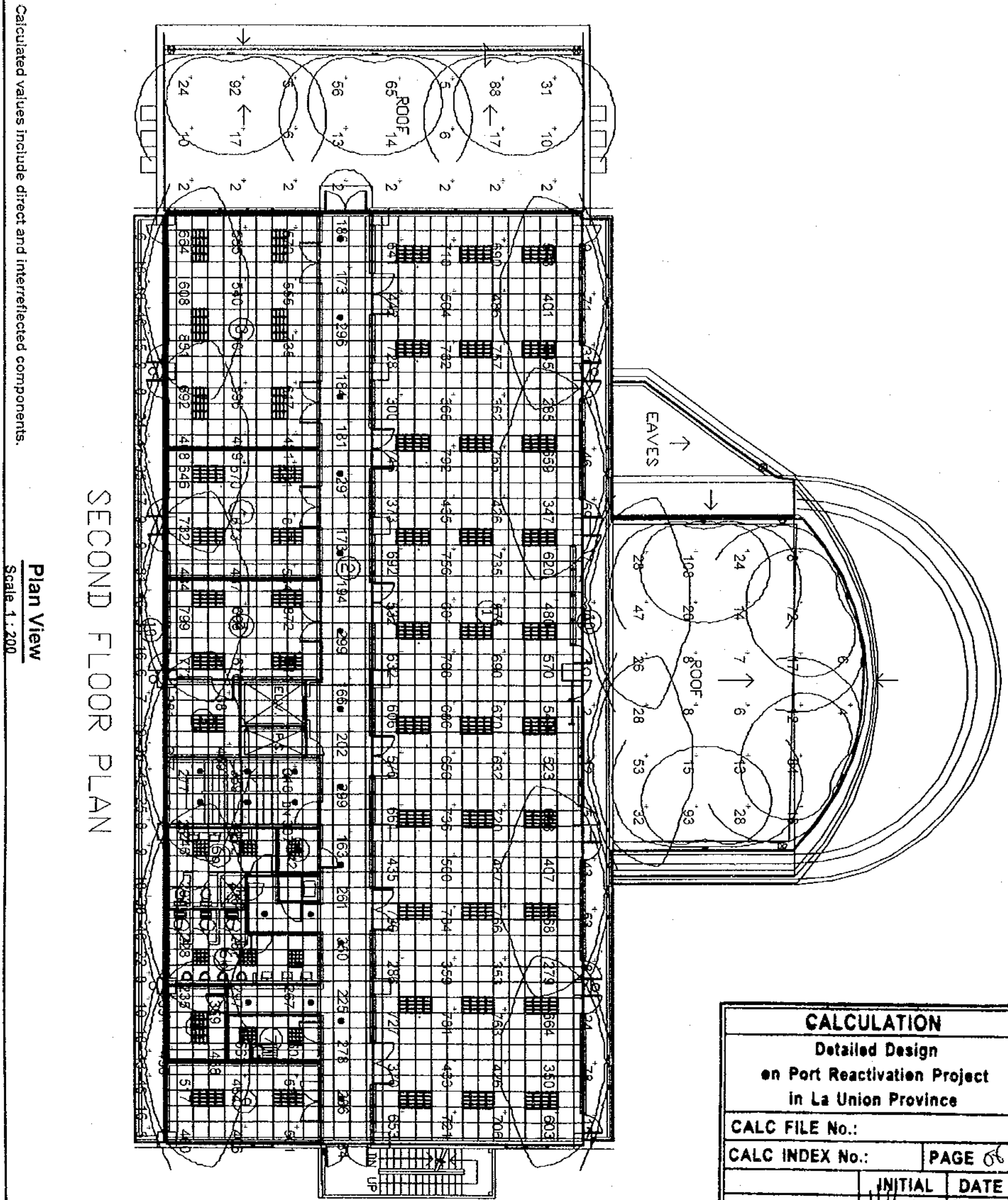
CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 85
	INITIAL	DATE
PREPARED BY		Feb 14/02
CHECKED BY		Feb 24, '02

Designer	M.GARCIA
Date	Feb 1 2002
Scale	1 : 250
Drawing No.	
	1 of 2

PUERTO LA UNION

DESIGN CALCULATION
ADMINISTRATION BUILDING
FIRST FLOOR

VISUAL



PUERTO LA UNION
LIGHTING DESIGN CALCULATION
ADMINISTRATION BUILDING
SECOND FLOOR

Designer
M. GARCIA
Date
Feb 14 2002
Scale
1 : 200
Drawing No.

1 of 2

VISUAL

CALCULATION	
Detailed Design on Port Reactivation Project in La Union Province	
CALC FILE No.:	
CALC INDEX No.:	PAGE 06

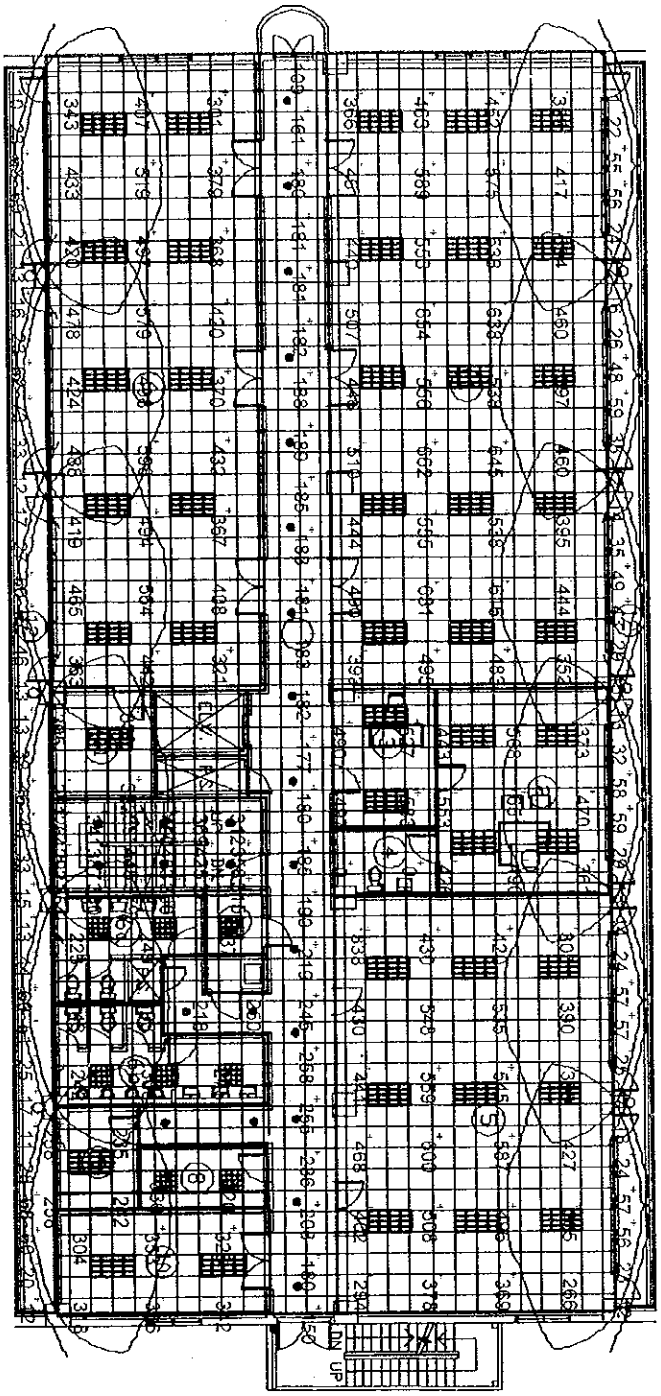
	INITIAL	DATE
PREPARED BY	[signature]	Feb 14/02
CHECKED BY	[signature]	July 24 '02

Calculated values include direct and interreflected components.

THIRD FLOOR PLAN

Plan View

Scale 1 : 200



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Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:	PAGE 67	
	INITIAL	DATE
PREPARED BY	[handwritten initials]	Feb 14/02
CHECKED BY	[handwritten initials]	July 24/02

Designer
M. GARCIA
Date
Feb 14 2002
Scale
1 : 200
Drawing No.
1 of 2

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
ADMINISTRATION BUILDING
THIRD FLOOR

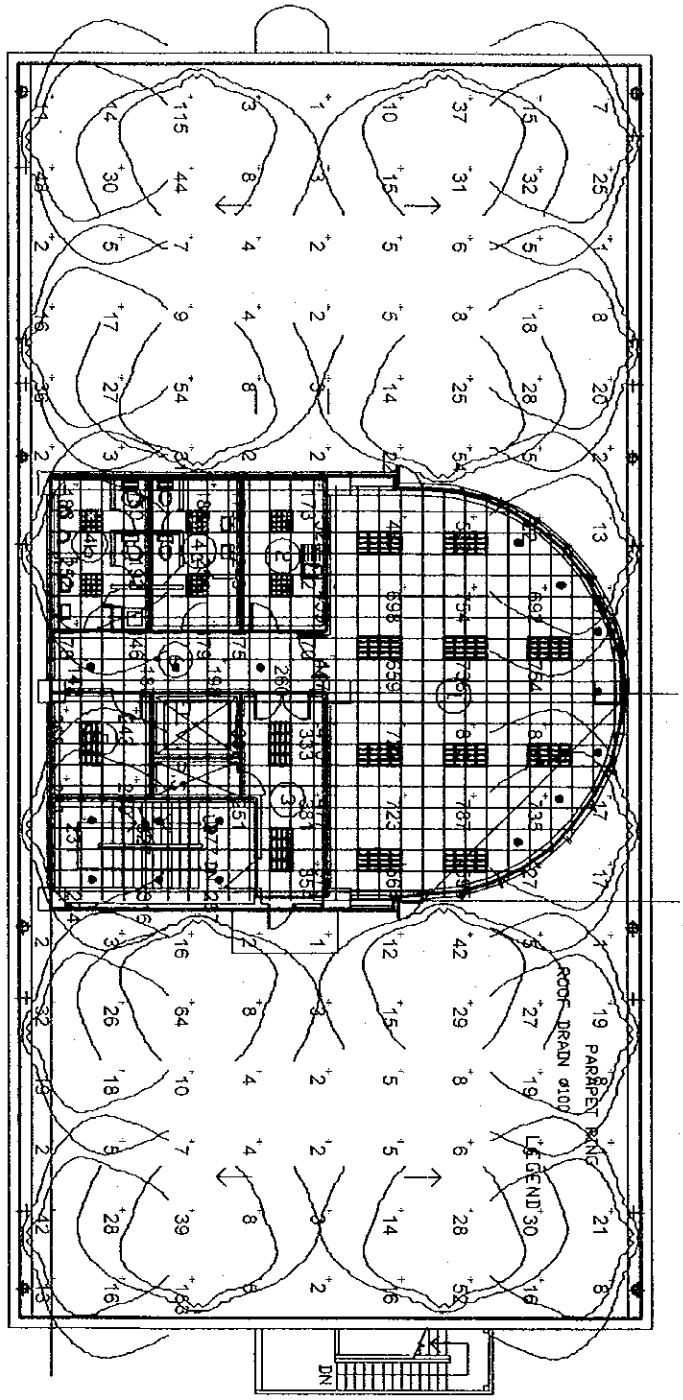
VISUAL

Calculated values include direct and interreflected components.

4TH FLOOR PLAN

Plan View

Scale 1 : 200



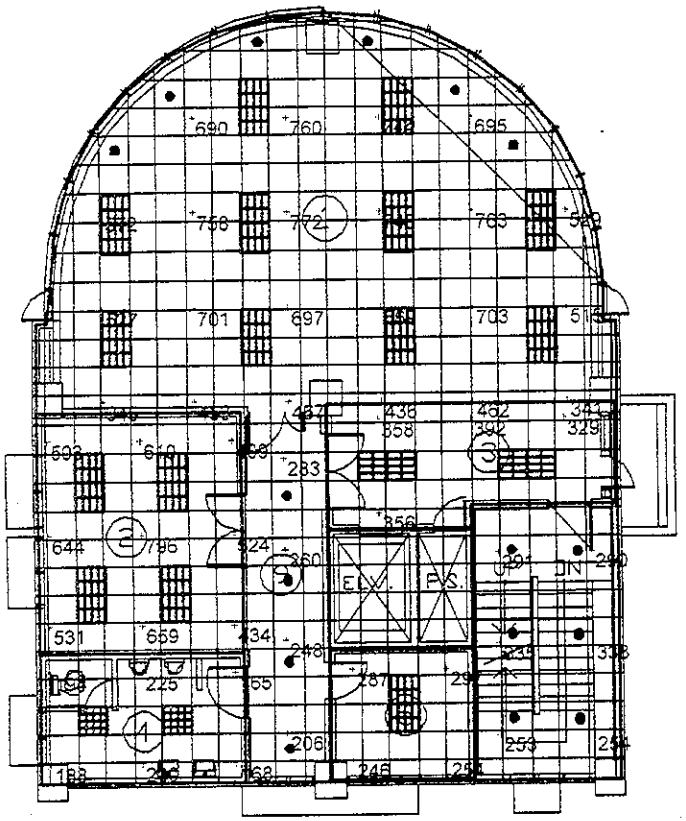
CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 68
	INITIAL	DATE
PREPARED BY		Feb 14/02
CHECKED BY		July 29, 02

Designer	M. GARCIA
Date	Feb 14 2002
Scale	1 : 200
Drawing No.	1 of 2

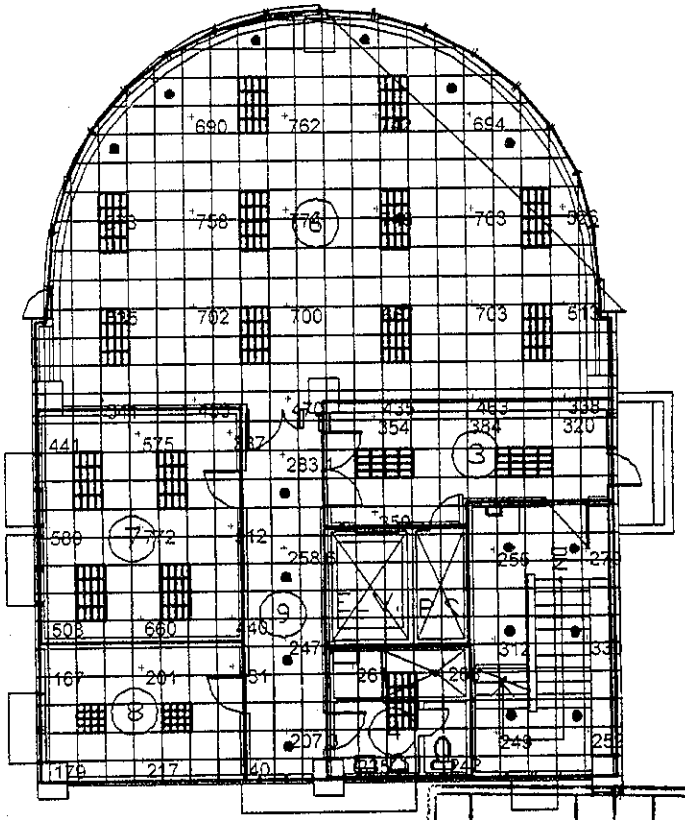
PUERTO LA UNION

LIGHTING DESIGN CALCULATION
ADMINISTRATION BUILDING
FOURTH FLOOR

VISUAL



5TH FLOOR PLAN



6TH FLOOR

Plan View
Scale 1 : 150

CALCULATION			
Detailed Design on Port Reactivation Project In La Union Province	CALC FILE No.:	CALC INDEX No.:	PAGE 69
		INITIAL	DATE
		PREPARED BY	Feb 14 '02
		CHECKED BY	July 24 '02

VISCAL

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
ADMINISTRATION BUILDING
FIFTH AND SIXTH FLOOR

Designer
M.GARCIA

Date
Feb 14 2002

Scale
1 : 150

Drawing No.

1 of 2

Calculated values include direct and interreflected components.

DESIGN CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Section	**4- Utilities**	Calc. File No.	
Sub-Section	**4M02- Container Freight Station**	Calc. Index No.	

Subject: Lighting Design Calculation

Calculation Objective:

To determine the number and location of lighting fixtures in each area, depending of fixture type and the required illuminance level.

References, Calculation Notes and Comments

Illuminance levels are from Illuminating Engineering Society of North America (IESNA) Lighting Handbook 9th Edition, 2000.

Illuminance unit is LUX

Reflactances for ceiling, wall and floor (Indoor)

To design the interior luminarie distribution it was used VISUAL lighting design software of Lithonia Lighting.

The following parameters are requested:

Type of fixture and lamps to be used.

Illuminance level and units.

Reflectances of ceiling, walls and floor.

Length, width and height of each room.

Work plane and luminaire plane.

Light Loss Factor (LLF) of each luminaire type

Rev	Prepared		No. of	Checked		Reviewed		Superseded
	by	Date	Pages	by	Date	by	Date	by Calc No.
O	M. Garcia	Feb/18/2002	5		July 24, '02		14 Aug 02	
A								
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C								

File in Calc. File

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	UTILITY WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-CFS.	Page No. 01	Rev.

References/ Notes

DESIGN FACTORS

Recommended Lighting Levels (Acording IESNA Specification)

AREA	LUX
Offices	500
Storage	150
Toilets	200
Cargo area	150
Exterior	30

Typical Surface Reflectances (for Administration Building. Indoor)

CONDITION	%
Ceiling	10%
Wall	30%
Floor	10%

Luminaire Types (from Lithonia Lighting Catalog)

AREA	LUMINAIRE	LUMEN	LLF
Offices	Paramax 18 cell 3xT8 32w	2900	0.81
Storage	Industrial Fluorescent 2x32w	2900	0.88
Toilets	Paramax 9 cell 3xT8 32w	2800	0.81
Cargo area	High Bay Industrial MH 400w	41000	0.85
Exterior	Bantam HPS 175w	17500	0.8

Prepared by	M. Garcia	Feb/18/2002	Checked by	T. Kikuchi
				July 12/2002

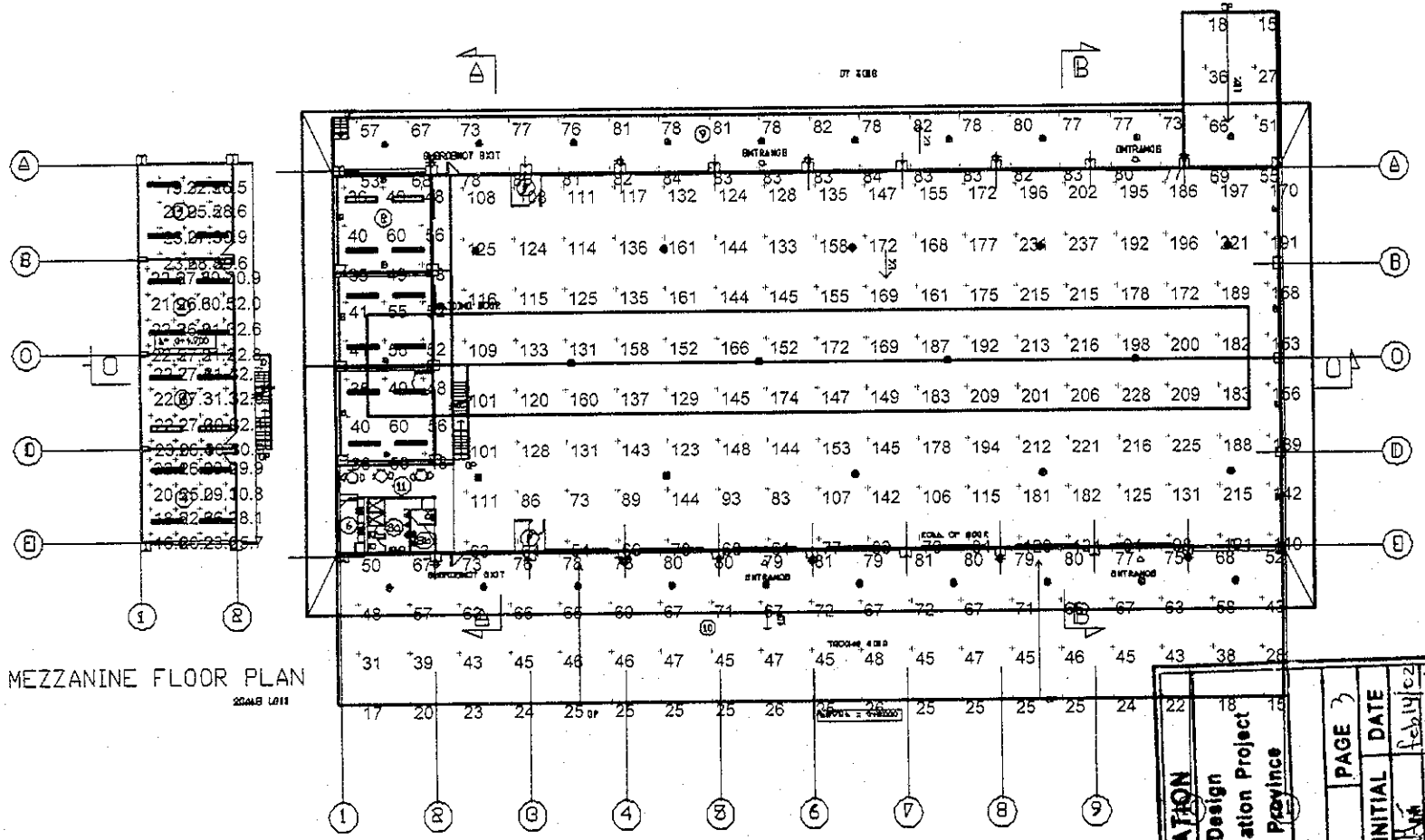
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	UTILITY WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-CFS.	Page No. 02	Rev.

References/ Notes

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
INTERIOR NAVE	301 lux	426 lux	21 lux	20.3:1	14.4:1
AREA DE MEZANNINE	285 lux	368 lux	224 lux	1.6:1	1.3:1
Calc Zone #3	68 lux	110 lux	11 lux	10.0:1	6.2:1
Calc Zone #4	56 lux	105 lux	10 lux	10.5:1	5.6:1
Calc Zone #5	110 lux	115 lux	81 lux	1.4:1	1.4:1
EXTERIORES	79 lux	115 lux	10 lux	11.5:1	7.9:1

		Prepared by		Checked by	
		M. Garcia	Feb/18/2002	T. Kikuchi	July 12th /200



CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:	PAGE	2
CALC INDEX No.:	DATE	Feb 1 02
	INITIAL	
PREPARED BY		
CHECKED BY		Jan 24 02

VISUAL

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
CONTAINER FREIGHT STATION

Designer
M.GARCIA

Date
Feb 1 2002

Scale
1 : 500

Drawing No.

1 of 3

Calculated values include direct and interreflected components.

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	A	18	THP 400M A17 (1.8 S/MH)	PREMIUM OPEN OPTICAL	ONE 400-WATT CLEAR METAL HALIDE, VERTICAL BASE-UP POS.	36303.ies	41000	0.85	455
	B	28	TLA 2 32 TUBI	TANDEM INDUSTRIAL APERTURED 12" X 8' 4 LAMP T8 ELEC	32W T8 4100	36290.ies	2900	0.88	123
	C	20	BA175PMH00XA	BANTAM 2000	175W CLEAR MH PS	46048.ies	17500	0.80	200

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:
CALC INDEX No.: PAGE 4

	INITIAL	DATE
PREPARED BY	MA	Feb 1/02
CHECKED BY		July 24 02

VISCAP

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
CONTAINER FREIGHT STATION

Designer
M.GARCIA

Date
Feb 1 2002

Scale

Drawing No.

SURFACE SCHEDULE

Name	Reflectances Front	Back	Normal X	Y	Z	Area (sq. m)
	10%	10%	0.0	-0.322	0.947	1695.233
	10%	10%	0.0	0.322	0.947	1695.233
	10%	10%	0.0	-0.322	0.947	296.798
	10%	10%	0.0	0.322	0.947	296.798
	10%	10%	0.0	1.0	0.0	214.411
	10%	10%	0.0	1.0	0.0	214.411
	10%	10%	0.0	0.0	1.0	3563.133
	20%	20%	0.0	-1.0	0.0	7.5
	10%	10%	1.0	0.0	0.0	6.047
	10%	10%	1.0	0.0	0.0	6.047
	10%	10%	0.0	-1.0	0.0	75.25
	10%	10%	1.0	0.0	0.0	6.047
	10%	10%	1.0	0.0	0.0	6.047
	10%	10%	0.0	0.0	1.0	304.875
	10%	10%	0.0	0.0	1.0	304.875
	10%	10%	1.0	0.0	0.0	4.5
Floor	10%	10%	0.0	0.0	1.0	2257.5
Wall 1	30%	30%	0.0	1.0	0.0	376.25
Wall 2	30%	30%	-1.0	0.0	0.0	150.0
Wall 3	30%	30%	0.0	-1.0	0.0	376.25
Wall 4	30%	30%	1.0	0.0	0.0	150.0
Wall 1	30%	30%	0.0	1.0	0.0	28.646
Wall 2	30%	30%	-1.0	0.0	0.0	28.502
Wall 1	30%	30%	0.0	1.0	0.0	28.646
	30%	30%	-1.0	0.0	0.0	27.75
	30%	30%	-1.0	0.0	0.0	28.502
Floor	10%	10%	0.0	0.0	1.0	211.883
Wall 1	30%	30%	0.0	1.0	0.0	34.225
Wall 2	30%	30%	-1.0	0.0	0.0	84.753
Wall 3	30%	30%	0.0	-1.0	0.0	34.225
Wall 4	30%	30%	1.0	0.0	0.0	84.753
Ceiling	10%	10%	0.0	0.0	-1.0	[illegible]1.883

CALCULATION

Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:		
CALC INDEX No.:	PAGE 5	
	INITIAL	DATE
PREPARED BY	[signature]	Feb 14 '02
CHECKED BY	[signature]	July 24 '02

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
CONTAINER FREIGHT STATION

VISUAL

Designer
M. GARCIA

Date
Feb 1 2002

Scale

Drawing No.

3 of 3

DESIGN CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Section	**Utilities**	Calc. File No.	
Sub-Section	**4M03- Maintenance & Repair Shop**	Calc. Index No.	

Subject: Lighting Design Calculation

Calculation Objective:

To determine the number and location of lighting fixtures in each area, depending of fixture type and the required illuminance level.

References, Calculation Notes and Comments

Illuminance levels are from Illuminating Engineering Society of North America (IESNA) Lighting Handbook 9th Edition, 2000.

Illuminance unit is LUX

Reflactances for ceiling, wall and floor (Indoor)

To design the interior luminarie distribution it was used VISUAL lighting design software of Lithonia Lighting.

The following parameters are requested:

Type of fixture and lamps to be used.

Illuminance level and units.

Reflectances of ceiling, walls and floor.

Length, width and height of each room.

Work plane and luminaire plane.

Light Loss Factor (LLF) of each luminaire type

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
O	M. Garcia	Feb/14/2002	5	T. Kikuchi	July 24, '02	西野	14 Aug '02	
A								
B								
C								

File in Calc. File

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	BUILDING WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-MAINTENANCE & R SHOP	Page No. 01	Rev.

References/ Notes

DESIGN FACTORS

Recommended Lighting Levels (Acording IESNA Specification)

AREA	LUX
Offices	500
Overhaul	150
Toilets	200
Wash unit	150
Maintenance area	200

Typical Surface Reflectances

CONDITION	%
Ceiling	0%
Wall	10%
Floor	10%

Luminaire Types (from Lithonia Lighting Catalog)

AREA	LUMINAIRE	LUMEN	LLF
Offices	Paramax 18 cell 3xT8 32w	2900	0.81
Overhaul	Industrial Fluorescent 2x32w	2900	0.88
Toilets	Wrap around 3xT8 32w	2900	0.88
Exterior	Bantam HPS 175w	17500	0.8
Cargo area	High Bay Industrial MH 400w	41000	0.85
Wash unit	High Bay Industrial MH 400w	41000	0.85

	Prepared by		Checked by
	M. Garcia	Feb/14/2002	T. Kikuchi July 12th 2002

FN: Calculation_Sheet

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	BUILDING WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-MAINTENANCE & R SHOP	Page No. 02	Rev.

References/ Notes

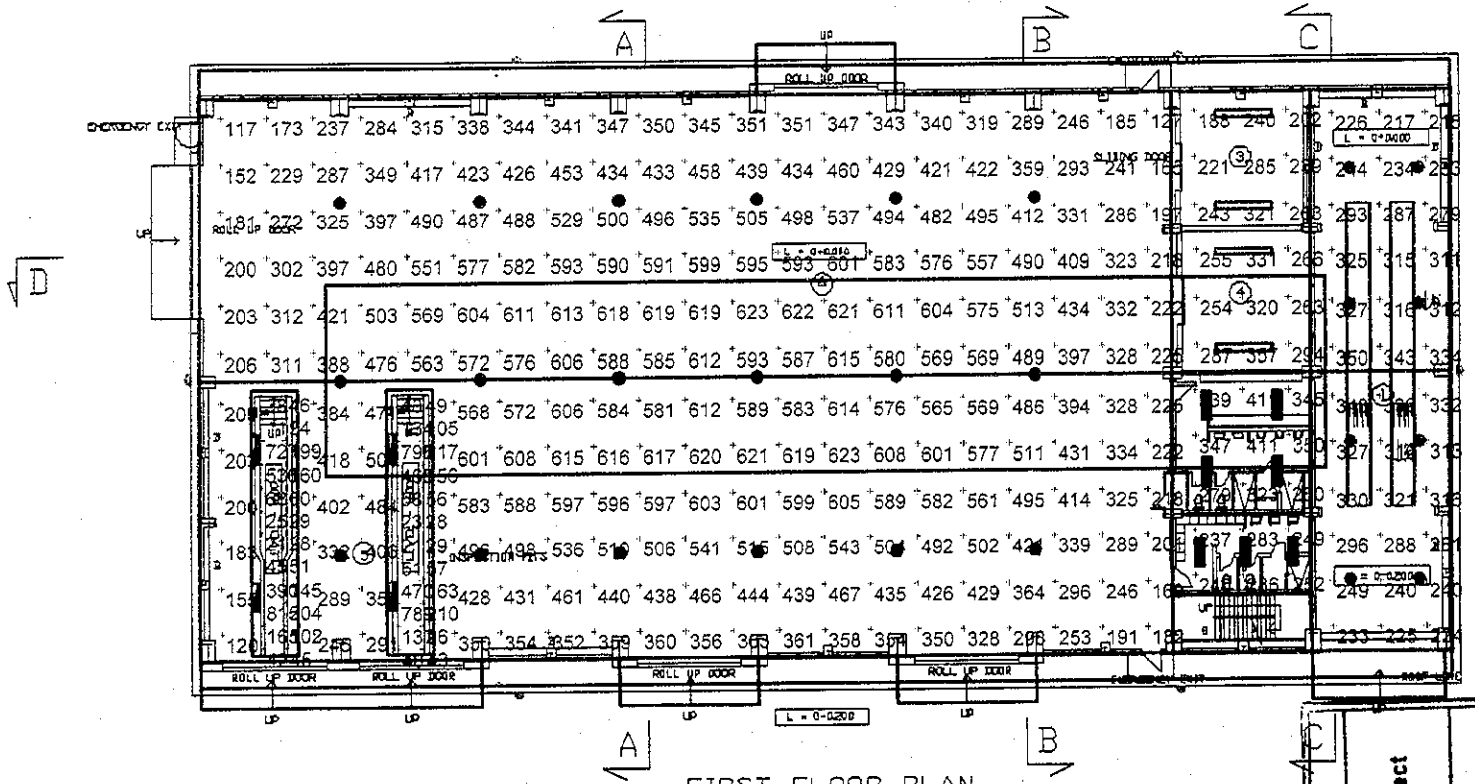
STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
INTERIOR NAVE	301 lux	426 lux	21 lux	20.3:1	14.4:1
AREA DE MEZANNINE	285 lux	366 lux	224 lux	1.6:1	1.3:1
Calc Zone #3	68 lux	110 lux	11 lux	10.0:1	6.2:1
Calc Zone #4	56 lux	105 lux	10 lux	10.5:1	5.6:1
Calc Zone #5	110 lux	115 lux	81 lux	1.4:1	1.4:1
EXTERIORES	79 lux	115 lux	10 lux	11.5:1	7.9:1

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
Wash Unit	287 lux	348 lux	215 lux	1.6:1	1.3:1
Electric Overhaul	243 lux	320 lux	187 lux	1.7:1	1.3:1
Mecanic Overhaul	292 lux	357 lux	254 lux	1.4:1	1.1:1
Toilets	307 lux	411 lux	231 lux	1.8:1	1.3:1
Inspeccion Area	172 lux	809 lux	21 lux	38.5:1	8.2:1
Inspeccion Area 2	176 lux	793 lux	21 lux	37.8:1	8.4:1
Iluminacion Exterior	30 lux	183 lux	1 lux	183.0:1	30.1:1
Interior Nave	435 lux	621 lux	116 lux	5.4:1	3.7:1

Prepared by		Checked by	
M. Garcia	Feb/14/2002	T. Kikuchi	July 12th /2002



FIRST FLOOR PLAN

Plan View
Scale 1 : 300

Calculated values include direct and interreflected components.

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:			
CALC INDEX No.:		PAGE	
	INITIAL	DATE	
PREPARED BY			
CHECKED BY			

PUERTO LA UNION
LIGHTING DESIGN CALCULATION MAINTENANCE AND REPAIR SHOP

Designer
M. GARCIA

Date
Feb 1 2002

Scale
1 : 300

Drawing No.

1 of 2

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	A	18	THP 400M A17 (1.8 S/MH)	PREMIUM OPEN OPTICAL	ONE 400-WATT CLEAR METAL HALIDE, VERTICAL BASE-UP POS.	11607.IES	41000	0.85	455
	B	4	TLA 2 32 TUBI	TANDEM INDUSTRIAL APERTURED 12" X 8' 4 LAMP T8 ELEC	32W T8 4100	L6411.IES	2900	0.88	123
	C	0	BA175PMH00XA	BANTAM 2000	175W CLEAR MH PS	45918.IES	17500	0.80	200
	D	8	HMST400MH00L7	HIGH MAST	400W CLEAR MH PS	36803.ies	41000	0.85	455
	E	7	LB 3 32 A 1/3 TUBI	LOW PROFILE WRAPAROUND 15 3/8" X 4' 3 LAMP T8 PRISMATIC LENS ELEC	2900 LM LAMP	L5638.IES	2900	0.88	85
	F	4	VDC 2 32	HIGH ABUSE LIGHTING DROP DISH CORNER MOUNT 4' 2 LAMP T8 PYCB LENS 0	2900 LUMENS	L5682.IES	2900	0.88	69
	G	6	TWH 400M	GLASS REFRACTOR WALL-PAK	400W METAL HALIDE CRAM LAMP PS	94112102.ies	41000	0.85	455
	H	2	DSA 300I	ILUMINATING THE INTERIOR OF TRACTOR TRAILERS DURING INITIAL INSPECTION, LOADING OR UNLOADING.	300 WATTS INCAND	89080302.IES	30		

CALCULATION
Detailed Design
on Port Reactivation Project
In La Union Province
CALC FILE No.:
CALC INDEX No.: PAGE 4
INITIAL DATE
PREPARED BY MMG Feb 19 02
CHECKED BY Feb 24 02

VISCAR

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
MAINTENANCE & REPAIR SHOP

Designer
M.GARCIA

Date
Jul 27 2002

Scale

Drawing No.

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SURFACE SCHEDULE

Name	Reflectances Front	Back	Normal X	Y	Z	Area (sq. m)
Floor	10%	10%	0.0	0.0	1.0	1296.0
Wall 1	30%	30%	0.0	1.0	0.0	351.0
Wall 3	30%	30%	0.0	-1.0	0.0	351.0
	10%	10%	0.0	-0.095	0.995	25.239
	10%	10%	0.0	-0.095	0.995	12.62
	10%	10%	0.0	-0.095	0.995	12.62
	10%	10%	0.0	-0.095	0.995	11.979
	10%	10%	0.0	0.094	0.996	12.713
	10%	10%	0.0	-0.345	0.939	759.55
	10%	10%	0.0	-1.0	0.0	54.0
	10%	10%	0.0	0.344	0.939	759.55
	10%	10%	0.0	1.0	0.0	54.0
	30%	30%	1.0	0.0	0.0	256.523
	30%	30%	1.0	0.0	0.0	256.523
	30%	30%	0.0	0.347	0.938	184.296
	30%	30%	0.0	-0.347	0.938	184.296
Room						
Floor	10%	10%	0.0	0.0	1.0	22.812
Wall 1	50%	50%	0.0	1.0	0.0	3.2
Wall 2	50%	50%	-1.0	0.0	0.0	18.25
Wall 3	50%	50%	0.0	-1.0	0.0	3.2
Wall 4	50%	50%	1.0	0.0	0.0	18.25
Ceiling	0%	0%	0.0	0.0	-1.0	22.812
Room						
Floor	10%	10%	0.0	0.0	1.0	22.812
Wall 1	50%	50%	0.0	1.0	0.0	3.2
Wall 2	50%	50%	-1.0	0.0	0.0	18.25
Wall 3	50%	50%	0.0	-1.0	0.0	3.2
Wall 4	50%	50%	1.0	0.0	0.0	18.25
Ceiling	0%	0%	0.0	0.0	-1.0	22.812
Room						
Floor	10%	10%	0.0	0.0	1.0	144.0
Wall 1	50%	50%	0.0	1.0	0.0	31.2
Wall 2	50%	50%	-1.0	0.0	0.0	124.8
Wall 3	50%	50%	0.0	-1.0	0.0	31.2
Wall 4	50%	50%	1.0	0.0	0.0	124.8
Ceiling	0%	0%	0.0	0.0	-1.0	144.0
	30%	30%	0.0	-1.0	0.0	27.991
	30%	30%	0.0	-1.0	0.0	31.2

VISUAL

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
MAINTENANCE & REPAIR SHOP

Designer
M.GARCIA

Date
Jul 27 2002

Scale

Drawing No.

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CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province

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PREPARED BY		Feb 14/02
CHECKED BY		July 24, '02

DESIGN CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Section	**Utilities**	Calc. File No.	
Sub-Section	**4M04- Container Gate**	Calc. Index No.	

Subject: Lighting Design Calculation

Calculation Objective:

To determine the number and location of lighting fixtures in each area, depending of fixture type and the required illuminance level.

References, Calculation Notes and Comments

Illuminance levels are from Illuminating Engineering Society of North America (IESNA) Lighting Handbook 9th Edition, 2000.

Illuminance unit is LUX

Reflactances for ceiling, wall and floor (Indoor)

To design the interior luminarie distribution it was used VISUAL lighting design software of Lithonia Lighting.

The following parameters are requested:

Type of fixture and lamps to be used.

Illuminance level and units.

Reflectances of ceiling, walls and floor.

Length, width and height of each room.

Work plane and luminaire plane.

Light Loss Factor (LLF) of each luminaire type

Rev	Prepared		No. of	Checked		Reviewed		Superseded
	by	Date	Pages	by	Date	by	Date	by Calc No.
O	M. Garcia	July/15/2002	3	T. Kikuchi	July 24'02	ED FT	14 Aug 02	
A								
B								
C								

File in Calc. File

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	UTILITY WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-CONTAINER GATE.	Page No. 01	Rev.

References/ Notes

DESIGN FACTORS

Recommended Lighting Levels (Acording IESNA Specification)

AREA	LUX
Weigth bridge office	500
Gate office	500
Weigth bridge	100
Pavement	100

Typical Surface Reflectances

CONDITION	%
Ceiling	10%
Wall	50%
Floor	10%

Luminaire Types (from Lithonia Lighting Catalog)

AREA	LUMINAIRE	LUMEN	LLF
Weigth bridge office	Wraparound 4x32w	2900	0.85
Gate office	Wraparound 3x32w	2400	0.85
Weigth bridge	High Mast HPS 400w	41000	0.85
Pavement	High Mast HPS 400w	41000	0.85

	Prepared by		Checked by
	M. Garcia	Feb/18/2002	T. Kikuchi July 12th 2002

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	A	18	HMST400MH00L7	HIGH MAST	400W CLEAR MH PS	36803.ies	41000	0.85	455
	B	0	LB 4 32 TUBI	LOW PROFILE WRAPAROUND 15 3/8" X 4' 4 LAMP T8 PRISMATIC LENS	2900 LM LAMP	L5614.IES	2900	0.85	116
	C	0	TWH 250M	GLASS REFRACTOR WALL-PAK	250 watt Clear metal halide lamp	95011902.ies	20500	0.85	300

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #7	152.1 lux	368.6 lux	0.0 lux	N / A	N / A

Calculated values include direct and interreflected components.

CALCULATION
Detailed Design
on Port Reactivation Project
In La Union Province

CALC FILE No.:
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	INITIAL	DATE
PREPARED BY	MG	Jul 15/02
CHECKED BY	[illegible]	[illegible]

VISUAL

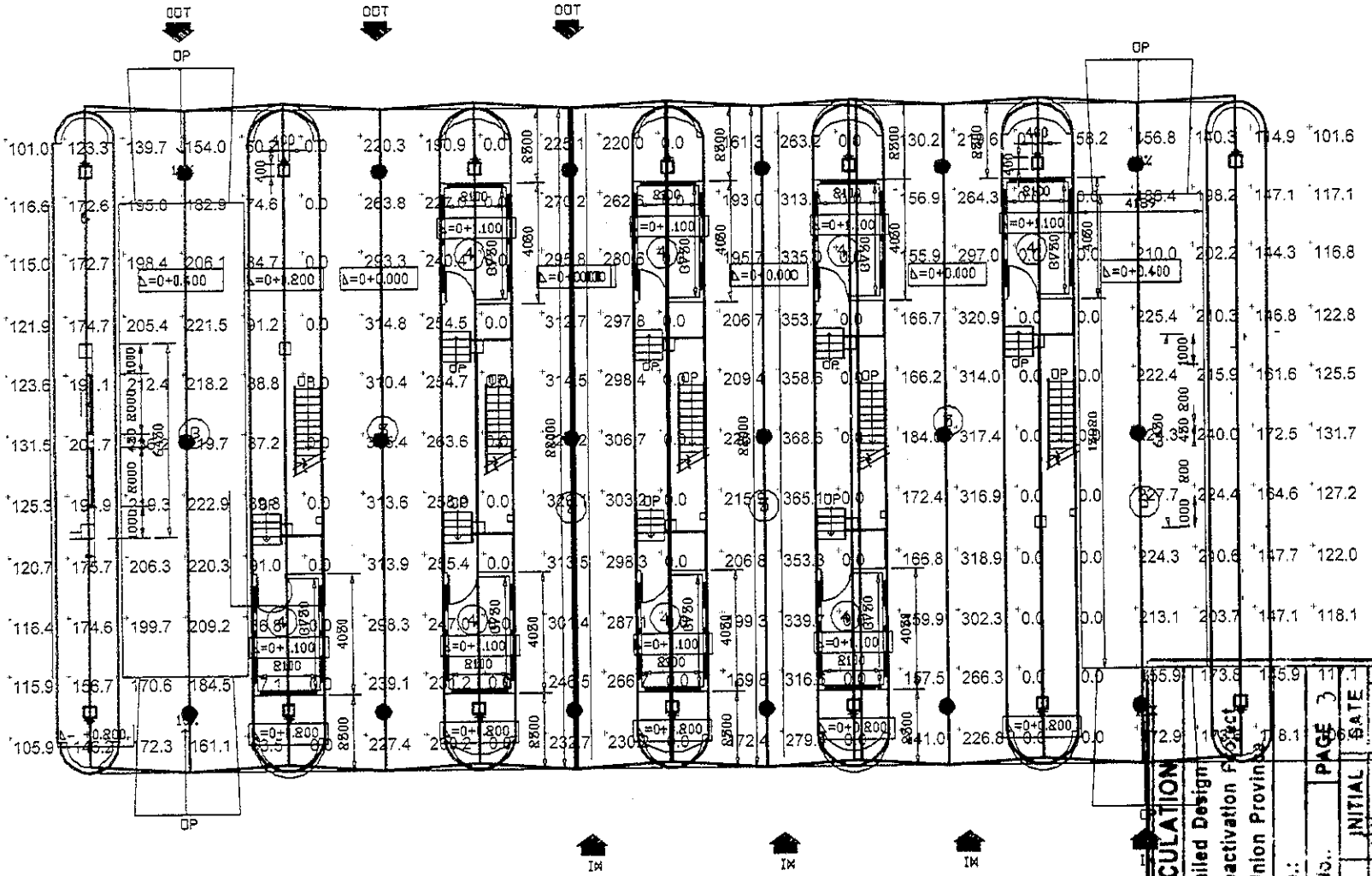
PUERTO LA UNION
LIGHTING DESIGN CALCULATION
CONTAINER GATE

Designer
M. Garcia

Date
Jul 15, 2002

Scale

Drawing No.



FIRST FLOOR PLAN

Plan View

Scale 1 : 200

Calculated values include direct and interreflected components.

VISCAF

PUERTO LA UNION

LIGHTING DESIGN CALCULATION
CONTAINER GATE

Designer
M.GARCIA

Date
July 15, 2002

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DESIGN CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Section	**Utilities**	Calc. File No.	
Sub-Section	**4M05- Cargo Gate**	Calc. Index No.	

Subject: Lighting Design Calculation

Calculation Objective:

To determine the number and location of lighting fixtures in each area, depending of fixture type and the required illuminance level.

References, Calculation Notes and Comments

Illuminance levels are from Illuminating Engineering Society of North America (IESNA) Lighting Handbook 9th Edition, 2000.

Illuminance unit is LUX

Reflactances for ceiling, wall and floor (Indoor)

To design the interior luminarie distribution it was used VISUAL lighting design software of Lithonia Lighting.

The following parameters are requested:

Type of fixture and lamps to be used.

Illuminance level and units.

Reflectances of ceiling, walls and floor.

Length, width and height of each room.

Work plane and luminaire plane.

Light Loss Factor (LLF) of each luminaire type

Rev	Prepared		No. of	Checked		Reviewed		Superseded
	by	Date	Pages	by	Date	by	Date	by Calc No.
O	M. Garcia	July/15/2002	3	T. Kikuchi	July 24'02	[illegible]	14 Aug '02	
A								
B								
C								

File in Calc. File

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	UTILITY WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-CARGO GATE.	Page No. 01	Rev.

References/ Notes

DESIGN FACTORS

Recommended Lighting Levels (Acording IESNA Specification)

AREA	LUX
Weigth bridge office	500
Gate office	500
Weigth bridge	100
Pavement	100

Typical Surface Reflectances

CONDITION	%
Ceiling	10%
Wall	50%
Floor	10%

Luminaire Types (from Lithonia Lighting Catalog)

AREA	LUMINAIRE	LUMEN	LLF
Weigth bridge office	Wraparound 4x32w	2900	0.85
Gate office	Wraparound 3x32w	2400	0.85
Weigth bridge	High Mast HPS 400w	41000	0.85
Pavement	High Mast HPS 400w	41000	0.85

	Prepared by		Checked by	
	M. Garcia	July/15/2002	T. Kikuchi	July 24 /200

FN: Calculation_Sheet

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	A	12	HMST400MH00L7	HIGH MAST	400W CLEAR MH PS	36803.ies	41000	0.85	455
	B	0	LB 4 32 TUBI	LOW PROFILE WRAPAROUND 15 3/8" X 4' 4 LAMP T8 PRISMATIC LENS	2900 LM LAMP	L5614.IES	2900	0.85	116
	C	0	TWH 250M	GLASS REFRACTOR WALL-PAK	250 watt Clear metal halide lamp	95011902.ies	20500	0.85	300

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #2	115.6 lux	264.9 lux	0.0 lux	N / A	N / A
Calc Zone #3	184.1 lux	345.7 lux	0.0 lux	N / A	N / A
Calc Zone #4	163.0 lux	293.9 lux	0.0 lux	N / A	N / A

Calculated values include direct and interreflected components.

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VISCAL

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
CARGO GATE

Designer
M. Garcia

Date
Jul 15, 2002

Scale

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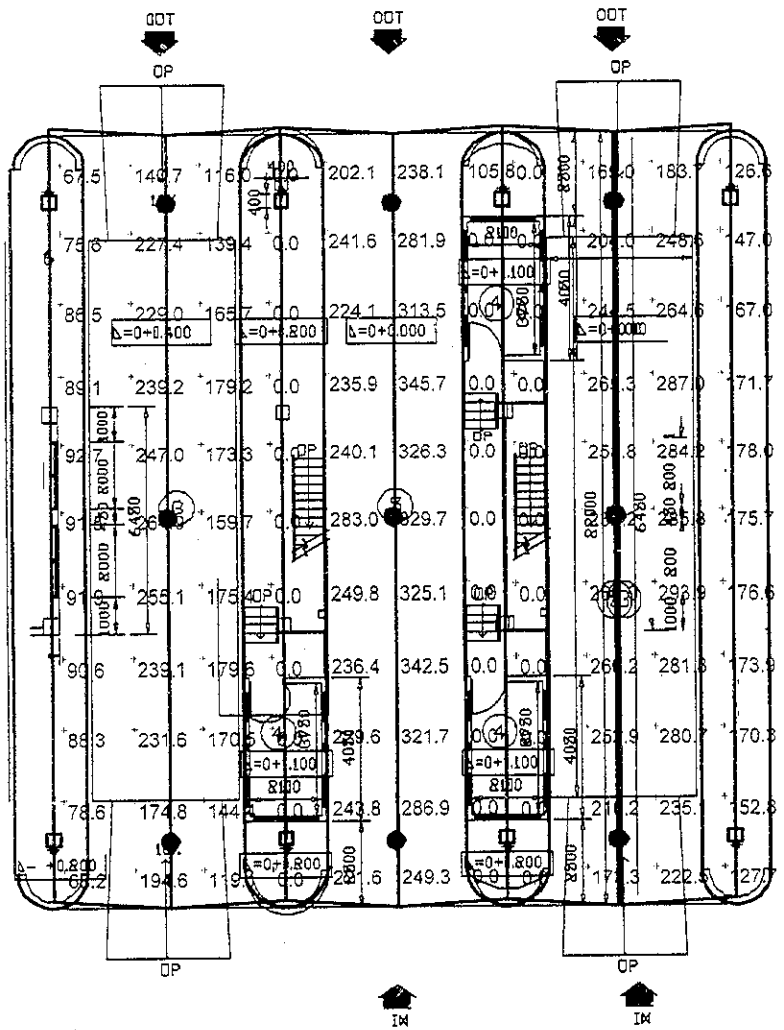

FIRST FLOOR PLAN

Plan View

Scale 1 : 200

Calculated values include direct and interreflected components.

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Detailed Design
on Port Reactivation Project
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PREPARED BY		
CHECKED BY		July 15, 2002

VISCAPE

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
CARGO GATE

Designer
M.GARCIA

Date
July 15, 2002

Scale
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NIPPON KOEI CO.,LTD.

DESIGN CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Section	**Utility Work**	Calc. File No.	
Sub-Section	**4M06- Power Supply Station**	Calc. Index No.	

Subject: Lighting Design Calculation

Calculation Objective:

To determine the number and location of lighting fixtures in each area, depending of fixture type and the required illuminance level.

References, Calculation Notes and Comments

Illuminance levels are from Illuminating Engineering Society of North America (IESNA) Lighting Handbook 9th Edition, 2000.

Illuminance unit is LUX

Reflactances for ceiling, wall and floor (Indoor)

To design the interior luminarie distribution it was used VISUAL lighting design software of Lithonia Lighting.

The following parameters are requested:

- Type of fixture and lamps to be used.
- Illuminance level and units.
- Reflectances of ceiling, walls and floor.
- Length, width and height of each room.
- Work plane and luminaire plane.
- Light Loss Factor (LLF) of each luminaire type

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
O	M. Garcia	April/2/2002	4	T. Klass	July 24, '02	[illegible]	14 Aug '02	
A								
B								
C								

File in Calc. File

FN : Calculation_Cover_Sheet

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	UTILITY WORK	Calc. Index No.	
Subject	LIGHTING DESIGN CALCULATION-POWER SUPPLY S.	Page No. 01	Rev.

References/ Notes

DESIGN FACTORS

Recommended Lighting Levels (Acording IESNA Specification)

AREA	LUX
Control room	500
Generator room	150
Transformer room	200
Switchgear room	150
Transformer yard	200

Typical Surface Reflectances

CONDITION	%
Ceiling	0%
Wall	10%
Floor	10%

Luminaire Types (from Lithonia Lighting Catalog)

AREA	LUMINAIRE	LUMEN	LLF
Control room	Paramax 18 cell 3xT8 32w	2900	0.81
Generator room	Industrial Fluorescent 2x32w	2900	0.88
Transformer room	Wrap around 3xT8 32w	2900	0.88
Switchgear room	Bantam HPS 175w	17500	0.8
Transformer yard	High Bay Industrial MH 400w	41000	0.85

	Prepared by		Checked by T. Kikuchi
	M. Garcia	April/2/2002	July 12th 2002

FN: Calculation_Sheet

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
Office Room	317 lux	423 lux	55 lux	7.7:1	5.8:1
Switchgear Room	366 lux	552 lux	182 lux	3.0:1	2.0:1
Transformer Room	425 lux	696 lux	166 lux	4.2:1	2.6:1
Generator Room	315 lux	546 lux	72 lux	7.6:1	4.4:1
Transformer Yard	73 lux	139 lux	30 lux	4.6:1	2.4:1
Vertical Generator	224 lux	273 lux	194 lux	1.4:1	1.2:1
Vertical Switchgear	176 lux	275 lux	126 lux	2.2:1	1.4:1
Vertical Transformer	279 lux	372 lux	202 lux	1.8:1	1.4:1

Calculated values include direct and interreflected components.

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Detailed Design
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PREPARED BY	MM	Jul 27 02
CHECKED BY	[illegible]	July 24 '02

VISUAL

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
POWER SUPPLY STATION

Designer
M. GARCIA

Date
Jul 27 2002

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LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	A	0	BA175MH00XC	BANTAM 2000	175W CLEAR MH	45919.IES	14000	0.65	1
	B	14	CG250MP00XM1	CENTAGLO	250W CLEAR MH	49242.IES	23000	0.75	250
	C	3	LB 3 32 A 1/3 TUBI	LOW PROFILE WRAPAROUND 15 3/8" X 4' 3 LAMP T8 PRISMATIC LENS ELEC	2900 LM LAMP	L5638.IES	2900	0.88	85
	D	5	SU2A400MH00TL	SUBSTATION	400W CLEAR MH	31140.IES	34000	0.62	920
	E	1	VR4 2/26DTT 7RW T73 120 GEB10	VANDAL RESISTANT DEEP CAST WALL MOUNT 1' X 1' TWO(2) LAMP 26-WATT TWIN TUBE FLUORESCENT, SPECULAR ALUM INTERNAL REFLECTOR, PRISMATIC POLY CARBONATE DROP LENS 7" DEEP	26W DTT 4 PINES 4100K	00880128.IES	1800	0.90	50

CALCULATION			
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CALC FILE No.:		PAGE	3
CALC INDEX No.:		INITIAL	DATE
	PREPARED BY	[illegible]	Jul 24, 02
	CHECKED BY	[illegible]	Jul 24, 02

VISUAL

PUERTO LA UNION
LIGHTING DESIGN CALCULATION
POWER SUPPLY STATION

Designer
M. GARCIA

Date
Jul 27 2002

Scale

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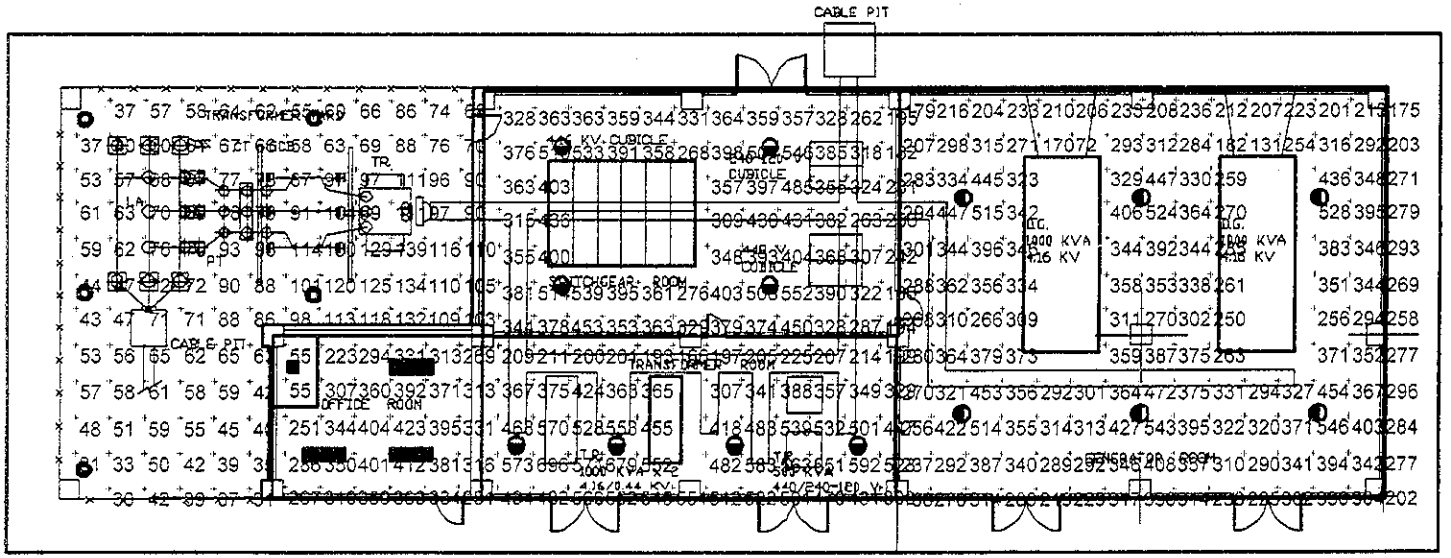

Plan View

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Calculated values include direct and interreflected components.

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PUERTO LA UNION

LIGHTING DESIGN CALCULATION
POWER SUPPLY STATION

CALCULATION

Detailed Design on Port Reactivation Project in La Union Province

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M.GARCIA

Date
Abr 2 2002

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