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Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Section	4D-Ventitation & Air-Conditioning	Calc. File No.	
Sub-Section	4D01-Administration Building	Calc, Index No.	

Subject:	Air Co	nditioning	Design	Calculation
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# Calculation Objective:

To calculate the Thermal Load in each area, in order to determine the number of Fan Coil Units and in each area.

#### References, Calculation Notes and Comments

Thermal loads are calculated by computed based analisys.

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Project	Detailed Des	sign on Po	ort Rea	ictivatio	n Pr	oject	in La	Unior	1	Calc	. File l	No.	
Section	4D- VENTIL	ATION AN	ID AIR	R-CONE	OITIC	NINC	 3			Calc	Inde	x No.	
Subject	THERMAL L	OAD CAL	CULA	TION-A	ADMI	NIST	RATI	ON BI	_D.	Page	e No.	03	Rev.
											TTT		ences/
		,										Notes	
<del>- - - - </del>			387 SEY	****************	1 Inte	mal I	atent	leat	51% 197 <b>%</b> 971	1900			
	Description	Quantity	Fact				втун		Cooling		1	<b> </b>	++++
People People		60.00		05.00 05.00					12	,800 00 -0 00			
Electric Appliand	es	6.000.00		3.40					20	400 00			
Steam       Steam Transfer			1.0	50 00		-				0 00			
				Si	ıb-Fot	al Late	nt (lea	it	92	700.00			
		<del> </del>	-	To	S 2.5	% tent H	eat		33	817 50 517 50		┠═┾═┼	
					TT								
					venti	ration	a inti	tration					
Number of Peop	е	60.00	×		<u>                                     </u>	7.50	cfm x	person		450 00	CFM (	Α	
Room Volume		87.788.54							- 1- 1	463 14	CFM (	Α-	
Sensible	1,463.14 CF	M CA	×			18.00	dolla		× 1.06			8,443.4	
					++								
Latent	1:463:14 CF	McA	×		+1	62.00	GR/LE		× 0.68	†	1	1:686:(	8
						то	AUS.			1			
1. Sensible											1	6 456 4	эртун
2 Latent					1-1							3.517.5	овтин і
Total Heat     External Heat	<del></del>	+			+						1 2	29.973 č 0.129 ř	3 9TVH     7 8TVH
5. Heat Grand To 6. A/C Tons	tal										3	0.103	овтун
				十十	+	1	-	-	<del>-  - </del>		<del>                                     </del>	26.6	8 TONS
7. Sensible Heat	Factor									SHF		0.8	5
8. Dry Buib Inted	naliTemperature											72.0	0 PF
9. Dry Bulb Supr 10. Supply Air T	oly Air Temperat emberature Gair	ture   :			-	-				<u> </u>		63.0	0 FF 0 Delta T
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Project	Detailed Design on Po	t Reactivation Pro	oject in La Union	Calc. File No.	
	4D- VENTILATION AN	O AIR-CONDITIO	NING	Calc. Index No.	
Subject	THERMAL LOAD CAL	CULATION-ADMI	NISTRATION BLD.	Page No. 04	Rev.
				Refe	erences/
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Project Project	PUERTO LA UNIO		Building	Port Administration Bu	ilding
Made by	M. Garcia		Area	Second Floor	
пасы су					
	100		ONDITIONS(DEED SEE SEE		
Conditions DB Exterior	90.00 78.00	I DP	GR/LB Enthalpy	Latitude 14 N Temp range 20 'F	+ + + + + +
nterio	72:00	55:00	64.00	Peak Load    -	
Difference	18,00		62.00		
Area size	9,295:26¦\$q F	10:00	rceiling height -	92 952 58 Cu Ft	
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Glass Dir	ect Sualight 197 2-5 30 30		
ITEM Are	a (Sq fit) Coeficient Gain		BTUH Coding	Heating	
Gláss (N)	624 60 0.89	36.02	8,774.82		
Glass (S) Glass (E)	1.180,80 0.88   66,15 0.60	72.68	1 8.590.89		
Glass (O)	47,56 0.60	216.45	6,176,61  Sub Total   56,152,59	<del></del>	╅╼┾╌┼╌┤╌┾╴
		Transmission	Through Glass		
	Shadow		ETUH Cooling	Heating	
TEM   Are Glass (N)	a (Sq fit)   Coeficient   Gain     624.60     1.00	13.50	8,432.10	Heataly	
Glass (E)	1.180,80   1.00   1.04	13.50	1 1 1908.11		
Glass (O)	47,56 1.04	21.00	1,038.71		
			Subtotal     26,319.72		
		Transmission Thre	ough Roof and Walls		
		sivalent.			
Wáli (N)	Ft)   Coeficient Tem	perature =	BTUH Cooling 1:451.20	Heating	
Wall (\$)	58 76	12.00			
Wall (E)   Wall (O)	708!57 0.34 727!16 0.84 0.84	20.00	4,944.69		
Roof	9.295 26	46.00	59.861:46		
			Subtotal   70,564.38		
		Other Gains p	er Transmission		1
	( Area (Sq   "U"   Eq	zivalent			
пем		perature =	BTUH Choling	Heating	
Partition Wall Ceiling			0.00		
Eldor			0.00  Subtetal  0.00		
		Internal S	ensible Heat		
People	escription   Quantity	205.00	71.175.00	Heating -	
People		195.00	26-100.00		
Lighting Inc	purescent 6,000.00	3.40	0.00		
	ss than 3HP	3.600.00	0.00		
Electric Appliant		3.40	0.00 186,311,70		
	<del> - - - - - - - - - -</del>	Subtotal	9 315:58		
		GRAND TO	TAL 195.627.28		
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		M. Garcia	Feb/26/2002	H. Mori	Aug/13/02

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FN: Calculation\_Sheet

Project	Detailed Design on Po	t Reactivation Project in La Union	Calc. File No.
Section	4D- VENTILATION AN	D AIR-CONDITIONING	Calc. Index No.
Subject	THERMAL LOAD CAL	CULATION-ADMINISTRATION BLD.	Page No. 06 Rev.
			References/
			Notes
	T	HERMAL LOAD ESTIMATION	
2 22 1 22 1 20 1 20 1	3441-304-44-4-30-6-34-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-		
roject	PUERTO LA UNIC	N Building Po	ort Administration Building
lade by	M. Garcia	Area Th	ird Floor
-		SEES SE DESIGN CONDITIONS SEES CONDITIONS	<del>┤╶┤┈┧╼╏╍╏╍┞┈╎╺╏╍</del> ┝╍
onditions DB	WB     %RI		atitude 14 N   Propries
nterior-	72.00	-55:00 - 64:00 Pc	eak-Load
Difference.	18 00	62.00	
liea size	9:295:26 39-1		92 952 58 Cu Ft
<del></del>		(i) Glass Direct Sunlight (vs. ) 27 2 77	<del>┼</del> ┼┼┼┼┼┼
	Shadow		
IEM Are Slass (N)	a.(\$q.Et) Coeficient Gair 624,60 0.60	36.02     13,499.73	eating
Slass (S)	1,180,80   0.50	72.68 51,489.90	
ilass (E)		246.45 3.590.89 246.45 6.176.61	
J			
+		Transmission Through Glass 18 37 83	
TEM Are	a (Sq ft)   Coeficient Gai	BTUH   Cooling   H	eating
Glass (N)	624.60 1.00	13.40     8.432.10	
Blass (S)	1.180 80 1 1.00	13,20 908.11	
Blass (O)	47/56 1.04	21.00   1,038.71 	<del></del>
		Transmission Through Roof and Walls:	<del></del>
No No	(Area (Sq.   "U"   E	uivalen	
TEM	Ft) Coeficient Ten	perature =     BTUH     Cooling   H	leating
Wall (N) Wall (S)	537.48   0.30   581/5   0.30	12.00   211.51	
Wáll (E)	708 57  0.34   727 16  0.84	17.00 4.095.53 20.00 1 4.943.69	<del>╎╎╎╸</del> ┫┫╌┼ <del>┆╸╎╸┼╸┼╸</del>
Wall (O)   Roof	727 16    0.84     9.295 26    0.84	46.00 + 59.061.46	
Roof			<del>┦╍╏┈┥┈┩┈</del> <b>┋╌</b> ┩┈┼┈┼┈╏╌
		Other Gains per Transmission 2012	<del>┼╎┼╏┩</del>
		uivalent	
Partition Wall	Ft) Coeficient Ter	perature = BTUH Cooling H	deating
Ceiling i		0.00	
Floor			╪╬╅┸╏┈┼┼┼┼
		Internal Sensible Heat	
1			
HEM   D People	escription Quartity 100.00	Tactor	leating
People		195.00 0.00	
	ourescent 6:000.00		
Motors   Le	ss than 3HP	3.600.00 0.00	
Motors M Elèctric Applian	ore thren 3HP	3.000.00 0.00 3.40 0.00	
		Subtota 223,241.23	
		F.S.[5%] 11.162.08 GRANDITOTAL 234.403.29	
		Prepared by 人人版 Che	ecked by

Project	Detailed D	Design on Po	rt Reactivation	n Project in La Union	Calc. File No.	
Section	4D- VENT	TILATION AN	ID AIR-COND	ITIONING	Calc. Index Ño.	
				DMINISTRATION BLD	·	Rev.
						erences/
					Note	
			PE SE PERSON	Internal Latent Heat	林森	
						<del>                                      </del>
шт М	Description.	Quantity	Factor=	DIUH	Cooling	
People People		100 00	205.00 205.00		20.500.00	+++
Electric Applian	ces	6,000 00	3.40		20,400.00	++
Steam			1 050.00		0.00	
Steam Transfer				ub-Total Latent Heat	40,900.00	
			E	S 2.5%	1.022.50	
		4	T	otal Latent Heat	41,922.50	
	<del> - - -</del>		14 37 St 15 A	entilation & Infiltration		++
Number of Peo	ole	100 00		7.50 cfm x-person	750.00 EFM CA	
Room Volume		92.952 58			1.549.21 CFM CA	
	4.540.01	1054 04		40.63		
Sensible	11,049.21	CFM CA	<u> </u>	18.00 delta T	x 1.08 = 30.116.	63
Latent	1,549.21	CFM OA		62.00 GR/LB	x 0.68 = 65.314.	68
		#	180 300 300 3 1 1 W	TOTALS		####
						+
1. Sensible					234,403.	29 BTUH
Latent     Total Heat					41.922. 270.325.	GO BTUH
4. External Hea					94 451	3118TUH
5. Heat Grand  6. A/C Tons	otal				371.797	10 BTUH 98 TONS
1					30.	36 TONS
7. Sensible Hea	at Factor				ŚHF 0.	65
8. Dry Bulb Inte	mal Temper	rature			1 1 29	00 %
9. Dry Bulb Su	oply Ail Tem	iperature -			43.	
10 Supply Air	Temperature	e Gain			9.	00 Delta T
Total Air Supply	(CFM)				24.115.	56 CFM
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			M. Garcia	Feb/26/2002	H. Mori	Aug/13/02

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Project	Detailed Design on Pe	ort Reactivation P	roject in La Union	Calc. File No.	
	4D- VENTILATION AI	*** ***********************************		Calc. Index No.	
	THERMAL LOAD CAI			D. Page No. 09 Rev.	
				Notes	
		Salara da Salara da	emai Latent Heat	20 Mars 40 Tale (1700)	-
		Hellevil Erzhad, Mass.		N SEE ANALOGO SEE	= =
ITEMI (	Description Quantity	Factor =	ВТОН	Cabling	=
People	4,00	205.00		820.00	+
People       Electric Applian	ces 1.500 00	205.00		5,100.00	
Steam + + +	7.30000	1050.00		0.00	-
Steam-Transfer		l l l l l l l l l l l l l l l l l l l	Total Latent Heat	5.920.00	
		FS.	2.5%	148.00	+-
		Total	Laten Heat	6,068.00	
		Ven	ilation & Infiltration	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Number of Reo	sle     400		7.50 cfm x person		
			7.30 Gilli x person		
Room Volume	20,656 13			344.27 CFM CA	
Sens ble	344:27 GFM CA		18.00 delta T	× 1.08 = 6.692.59	_
Latent	344.27 CFM CA	×	62.00 GR/LB	x 0.68 = 14,514.37	
Laterit	344.27 CT W OA			3X U.001 -     14,5  4.37	+
			IOIALS	3 - 3 2 3 3 2 3	
1. Sensible				82.613.92 BTU)	
2. Latent 3. Total Heat					
4. External Hea				88.681.92 BTUH 21.206.96 BTUH	+
5. Heat Grand I 6. A/C Tons	otal			109.888.87 BTUH	
				9.16 TONS	
7. Sensible Hea	t Factor			SHF 0.93	ļ
8. Dry Bulb Inte	rnal Temperature	<del>                                     </del>		72.00 °F	
9. Dry Bulb Sup	ply Air Temperature emperature Gain			63.00 *=	
				9.00 Detta T	+
Total Air Supply	(GFM)			8.499.37 GFM	Ţ
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		Prepared by M. Garcia	Feb/26/2002	Checked by	
	<u> </u>	ivi. Garcia	Fe0/20/2002	H. Mori Aug/13/02	

Project	Detailed Design on Po	t Reactivation Project in La U	nion	Calc. File No.	
Section	4D- VENTILATION AN	D AIR-CONDITIONING		Calc. Index No	э.
Subject	THERMAL LOAD CAL	CULATION-ADMINISTRATIO	N BLD.	Page No. 10	Rev.
				Re	ferences/ ites
	T	IERMAL I OAD ESTIM	ATION:		
Project	PUERTO LA UNIO	N Gullding	Pd	rt Administration E	Building
				th-Floor	
Made by	M Garcia	Area Area			
	16.45	75 STATE DESIGN CONDITIONS 7	6 88 30 10s		
Canditions DB		1 OP   GR/LB   126.00	Enthalpy Lat	titude 14 N mp range 20 °F	
exterior !	90 00   78.00   	55.00	Pe	ak Load	
Difference	18 00	62.00			
Area size	2.065:81:5q f	t x 10.00 ceiling height.		20 656-13 CuFt	
		S Glass Direct Sunlight	6 v lav 88		
	Shadow		<del>-i   i   i -</del> i		
TEM Are Glassi(N)	a (Sq.Ft) Coeficient Gaid	36.02	443.51	ating	
Glass (S)	787(14) 0.60 20/52 0.60	72.68 216.45	34,323,99 2,664,93		
Glass (E) — — Glass (O)	33,88 0.60	216.45	4.399.99		
		Sub Total	41.832.41		
		Transmission Through Glas	is 15 36 36		
<del></del>	Shadow				
ITEM   Are Glassi(N)	a (Sq Ft)   Coeficient   Gaid		Cooling   He	ating	
Glass (S)	787 14 1.04	13.50	11,051.45		
Glass (E) Glass (O)	20 52   1.04	21.00	1 281.70    739.94		
		Subtotal	12.361.18		
		Transmission Through Roof and	Wals		
Ne Ne	-Area (Sq. L."U" - Eq	uivalent			
ITEM	Ft) Coeficient Ten	perature 🗧 📗 🖽 🗎	Cooling He	ating	
Wall (N) ! Wall (S) !	366184   0.84     73166   0.34	12.00	300.53		
Wall (E)   Wall (O)	366 84    0.84  353 48    0.84	20.00	2,120.34		
Rdof	2.065 61 0.14	46.00	13,302.55		
Rdof		Subtotal	19.249.61		
		Other Gains per Transmissio	on ' ' ' I		
TEM L. L		uivalen i BTUH	Cooling   He	ating	
Partition Wall			0.00		
Ceiling Floor!			0.00		
		Subtotal	0.00		
		Internal Sensible Heat			
		actor =	Cooling	ating	
People People		195.00	0.00		
	ourescent 1,500.00	3.40	6.525.00		
Motors Le	ss than 3HP	3,600.00	0.00		
Motors Michael	ore thhan 3HP	3.000.00 i	h nq_		
		Subtota F.S.15%	88,168.21   4,408.41		, , , , , , , , , , , , , , , , , , ,
		GRANDITOTAL			
		Decreased by 11 Marco	L Ches	ked by	<u> </u>
		Prepared by Karolin Feb/26/2	Juneo	cked by 🔀	7/1 Aug/13/02

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Project	Detailed Design on Po	rt Reactivation Project in La Union	Calc. File No.
Section	4D- VENTILATION AN	D AIR-CONDITIONING	Calc. Index No.
Subject	THERMAL LOAD CAL	CULATION-ADMINISTRATION BLD.	Page No. 12 Rev.
			References/
eoman anns	52 (510 539 56 (55 ) 56 (50 )		
	T	HERMALI-COADIESTIMATION	
Project	PUERTO LA UNIO	N Building	Port Administration Building
		Area	Sixth Floor
Made by	M. Garcia		
		SE SE SE DE SIGN CONDITIONS SERVICE DES TOR	
Conditions DB	WB %R		Latitude 14 N
Exterior	72,00 78,00	55,00 - 64.00	Temp range 20 °F
Difference	18 00	62.00	
Area size	2.065:61;Sq f	t x 0:00 ceiling heighti	20,656.13 Cu Ft
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(a) St. Class, Direct Sunlight (a) (b) (c)	<del>╽</del> ╌┼╌┼╌╏╌┞╼┼╼┊═┼╾┼╌
	Shadow		
TEM Are	a (Sq.Ft) Coeficien Gair 20,52 0.50		Heating 1
Glass (S)	787 14 0.60	72.68 34.323.99	
Glass (E) Glass (O)	20 52 0.60	216.45   4.399.99	
		Transmission Through Glass 😥 🕾 🕾	
	Shadow		<u> </u>
	a (Sq Fit)   Coeficient Gair		Heating
Glass (N) Glass (S)	20 52    1.04  	14.50	
Glass (E)	20 52 1.04	13.20	
Glass (O)	33 88    1.04	21.00	
		Transmission Through Roof and Walls	
ITEM   Net		uivalent BTUH (Cooling	Heating
Wall (N)	366 84 0 84	9.00 1,122.53	
Wall (E)		72.00	
Wall (0)	353,48 0.84 2.065,61 0.14	20.00     2.403.66 46.09     13.302.66	
Roof   Roof	2,005,01 0.14	0.00	0   1
		Other Gains per Transmission	
Net	Area (Sq) "U" Eq	uivalent	
ITEM		perature =   BTUH   Cooling	Heating
Partition Wall Celling			d i
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		internal Sensible Heat (1) (1) (1)	
People	scription   Quaritity   F	205.00   1.025.00	
People		195.00 0.00	0
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Maters   Mo Electric Applianc	e thhat 3HP	3.40 0.00	q
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# **ELECTRICAL WORK**

	DESIGN CALCULATION CO		
Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Section	4- Utilities	Calc. File No.	
Sub-Section	4G-Emergency Power Generation E.	Calc. Index No.	

Subject: 4.16 kV diesel engine generator

### Calculation Objective:

To determine the capacity (in kVA)) of each diesel engine generator set, located on Power Supply Station, depending of loads in case of emergency condition.

#### References, Calculation Notes and Comments

Emergency power shall be provided by two generator sets, connected by paralleling control switch.

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Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Section	4- Utilities	Calc. File No.	
Sub-Section	4H-Power Distribution Equipment	Calc. Index No.	

### Calculation Objective:

To determine the capacity (in kVA)) of each distribution transformer, located on Power Supply Station, depending of loads fed by each transformer.

#### References, Calculation Notes and Comments

Electric loads are calculated by computer based analysis.

Rev	Ргер	pared	No. of	Che	cked	Re	viewed	Superseded
	by	Date	Pages	by	Date	by	Date	by Calc No.
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File in Calc. File

Project	Detailed Design on Port Reactivation I	Project in La Union	Calc. File No	
Section	UTILITIES		Calc. Index	No.
Subject	4.16/0.48 KV AND 4.16/0.208-0.12 KV	TRANSFORMER	Page No. 0	1 Rev.
			J F	References/
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1 1 1 1	Santry cranes	0.6		
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1 1 1 1	Service outlets	0.5	<del>                                     </del>	
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	Reefer outlets	0.6		
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1 1 1 1:	Container Freight Station	0.9		
<del></del>	Maintenance and Repair Shop	0.6		
1 1 6	Container Gate	1.0		
	Cargo Gate	1.0		
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	Reefer outlets	0.85		
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	Container Freight Station	0.85		
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Section	UTILIT	IES								Calc	. Inde	x No		*************		
Subject	4.16/0.	48 KV AND 4.1	6/0.20	8-0.12	2 KV	TRA	NSFO	RMER		Page	e No.	02	L	R	=V.	
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6.2.2 (1)	4.16 kV	Movable Pneum					1.500	0.7	0.75	1:	400			-		
6.2.2 (2)		Loader (2 sets) or (Movable Loa	der)	400 k	₩x	2 =	800	0.6	0.75	6	40		+	-		
6.2.2 (3)		Movable Belt Co	nveyor				500		the second section and section is		00	H	+-	-	$\mid - \mid$	
6.2.2 (4)	480 V	Reefer Outlet Area Lighting		44 kV			352	0.6	0.85	2	48		+	-		
6.2.2 (5)	480 V	Container Yard Area Lighting		1 kw	x 6 x	12 =	72	1	0.9		30					
6.2.2 (5)	480 V	Multi-purpose Ya Street Light and		1 kw	x 6 x	4 =	24	1	0.9	2	?7					
6.2.2 (5)	480 V	Maintenance are Port Administrat		0.25	kW x	65 <b>=</b>	14	1	0.9	1	IG		$\perp$			
6.2.2 (6)	480 V	Building Container Freigh	t				288	0.7	0.85	2	37		1			
6.2.2 (6)	480 V	Station Maintenance an					103	0.9	0.85	1	09					
6.2.2 (6)	208-120V	Repair Shop					136	A SECURITY OF THE RESIDENCE			09	-	+-			
6.2.2 (6)	208-120V	Container Gate	:				46	1	0.85		4		+		-	
6.2.2 (6) 6.2.2 (6)	200-1207	Cargo Gate Power Supply S	tation				29 40	1	0.85		14 18		+			T
6.2.2 (7)	480 V	Service Outlet	Lation	38 kV	V v 7	. <u></u> =	266	0.8 0.6			66					
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Section	n UTILITIES					Calc. Index	No.					_
Subje		V AND 4.16/0,208-0.12 K\	/ TRAN	SEORMER	₹	Page No.	03	Sanatair	R	ev.		
Jubje						r ago ito.	Refe	rer			-	
	LOA	AD OF 4.16KV/480V TRANS	SEURIVII	<u>=R 140. 1</u>		10/07/2002			,00	٥,		
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833214		Container Berth (2 sets)	76	0.5	0.8	48	<b> </b>		$\vdash$	⊬	ـ	Ļ
MV11	Hanslormer (40.)	Service outlet for ship in		0.0	0.0					-		ļ
MV12	.59	Container Berth	38	0.5	0.8	24		<del> </del> -	┼	-	<del> </del>	+
1117 112		Service outlet for crane in				:	<b>i</b>			╁	$\vdash$	+
MV13	ν,	Multi-purpose Berth	38	0.5	6.0	24		ļ		-	┡	1
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		Service outlet for ship in	7.0				$\dashv$	┼		$\vdash$	┼	Ŧ
MV15		Passenger Berth (2 sets)	76	0.5	0.8	48		-		—	$\vdash$	+
MV16	<i>"</i>	Flood Lighting, T1-T4	24	1.0	0.9	27		-	-	-	-	+
MV17	,,	Flood Lighting, T5- T8	24	1.0	0.9	27		ļ	<del> </del>	<u> </u>	-	
MV18		Flood Lighting, T9- T12	24	1.0	0.9	27			╀	ـ	-	4
MV19		Flood Lighting, T13- T6	24	1.0	0.9	27		╀-	╀	-	ļ	-
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MV21	Transformer No.2	(R1, R2, R3, R4)	176	0.6	0.85	124		-		+		
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MV22	.,	(R5, R6, R7, R8)	176	0.6	0.85	124		+	+	╁	+	-
		Street lighting						┼-		+	+	-
MV23	*	essential loads	7	1.0	0.9	8		+-		+	<del> </del>	1
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MV24		non-essential loads Port Administration	7	1.0	0.9	3		+	1	-		
MV25	در	Building	288	0.7	0.85	237		+	+	+-	十一	-
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MV27		Spare		<u> </u>		50	1	+-	+	+	+	-
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LV11	Transformer No.3	1	136	0.6	0.85	96		十	+	T		-
LV12	p p	Container Gate	46	1.0	0.85	54		+	+	-	T	-
LV13	"	Cargo Gate	29	1.0	0.85	34		$\top$	十	+	十	-
LV14		Spare	40	1.0	0.85	47		1	+	+	+	
LV15	. بر	Spare	5	1.0	0.85	6	1	+	十	+	+	-
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Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Section	4- Utilities	Calc. File No.	
Sub-Section	4I-Cabling and Piping	Calc. Index No.	
Subject: C	able Size Calculation		

each load, depending of current, cable length and maximum voltage drop.

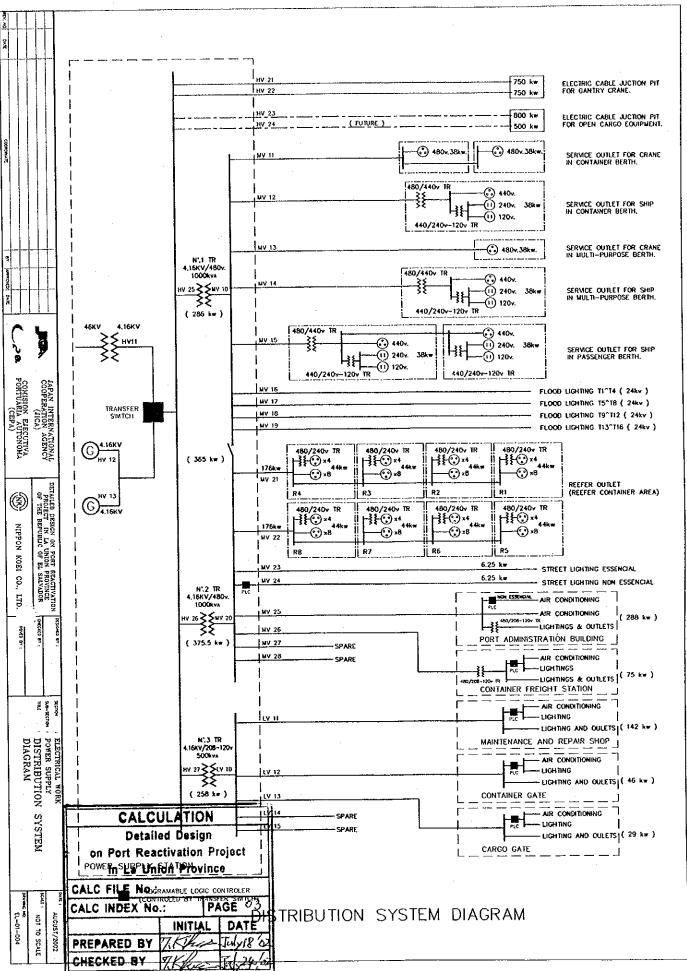
#### References, Calculation Notes and Comments

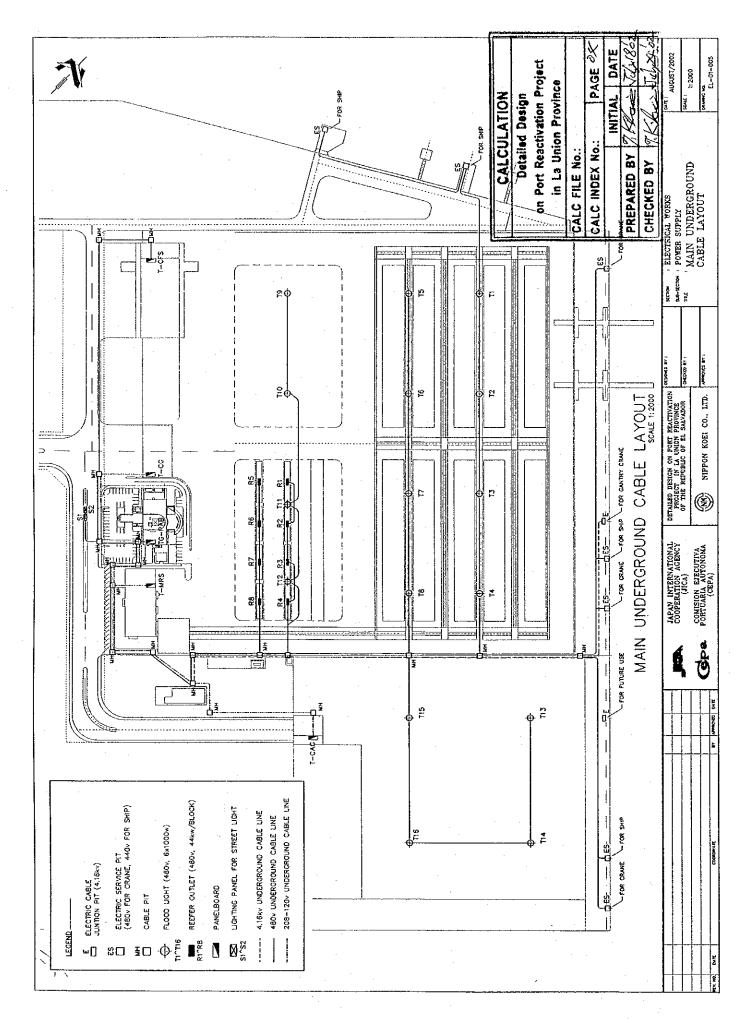
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Project	Detailed Design on Port Reactivation	on Pro	oject in	La L	nior	1		Ca	lc. F	ile I	No.	_			
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	DESIGN CALCULATION CO		
Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Section	4- Utilities	Calc. File No.	
Sub-Section	4j- Area Lighting System	Calc. Index No.	

Subject: Area 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 floor (Outdoor)

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.

Length and width of each area.

Work plane and luminaire plane.

Light Loss Factor (LLF) of each luminaire type

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Section	UTILITIES	<del></del>							ndex No.	
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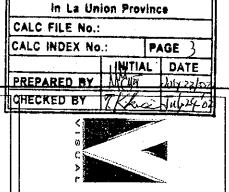
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LUMINAIRE SCHEDULE	CHEDULE				
Symbol Label Qt	Qty Catalog Number Description	Lamp	File	Ĺun	Lumens LLF
A 20	HMSTC10HP00S1 HIGH MAST	LU1000 1000W HPS SY	36357.ies	130	130000 0.92
. В 21	21 CHL 250S R2 DLG TYPE II COBRA HEAD	250W HPS PH	AE22431.IES	28500	00 0.87
. C 26	6 CHL 250S R2 DLG TYPE II COBRA HEAD	250W HPS PH	AE22431.IES	28500	500 0.87

	Reflec	Reflectances		Normal		
Name	Front	Back	×	~	Z	Area (sq. m)
Base	0%	0%	0.0	0.0	-1.0	640.064
Wall 1	0%	0%	1.0	0.0	0.0	440.0
Wall 2	0%	0%	0.0	<del>1</del> .0	0.0	145.938
Wall 3	0%	0%	-1.0	0.002	0.0	440.001
Wall 4	0%	0%	0.0	1.0	0.0	145.0
Roof	0%	0%	0.0	0.0	7.0	640.064
Base	0%	0%	0.0	0.0	-1.0	783.579
Wall 1	0%	0%	0.0	1.0	0.0	160.0
Wall 2	0%	0%	1.0	0.018	0.0	170,029
Wall 3	0%	0%	-0.138	0.99	0.0	72.567
Wall 4	0%	0%	0.877	0.48	0.0	45.591
Wall 5	0%	0%	0.872	0.49	0.0	22.947
Wall 6	0%	0%	0.997	-0.073	0.0	30.08
Wall 7	0%	0%	0.782	-0.623	0.0	25.574
Wall 8	0%	0%	0.86	-0.511	0.0	23.26
Wall 9	0%	0%	0.0	-1.0	0.0	77.187
Wall 10	0%	0%	0.998	0.062	0.0	130.254
Wall 11	0%	0%	0.0	-1.0	0.0	160.938
Wall 12	0%	0%	-1.0	-0.019	0.0	420.079
Roof	0%	0%	0.0	0.0	10	783.579

2 of 2	Drawing No.	Scale	<b>Date</b> Ene 31 2002	Designer M. GARCIA

PUERTO LA UNION LIGHTING DESIGN CALCULATION AREA LIGHTING LAYOUT



CALCULATION

Detailed Design
on Pert Reactivation Project

SURFACE SCHEDULE

