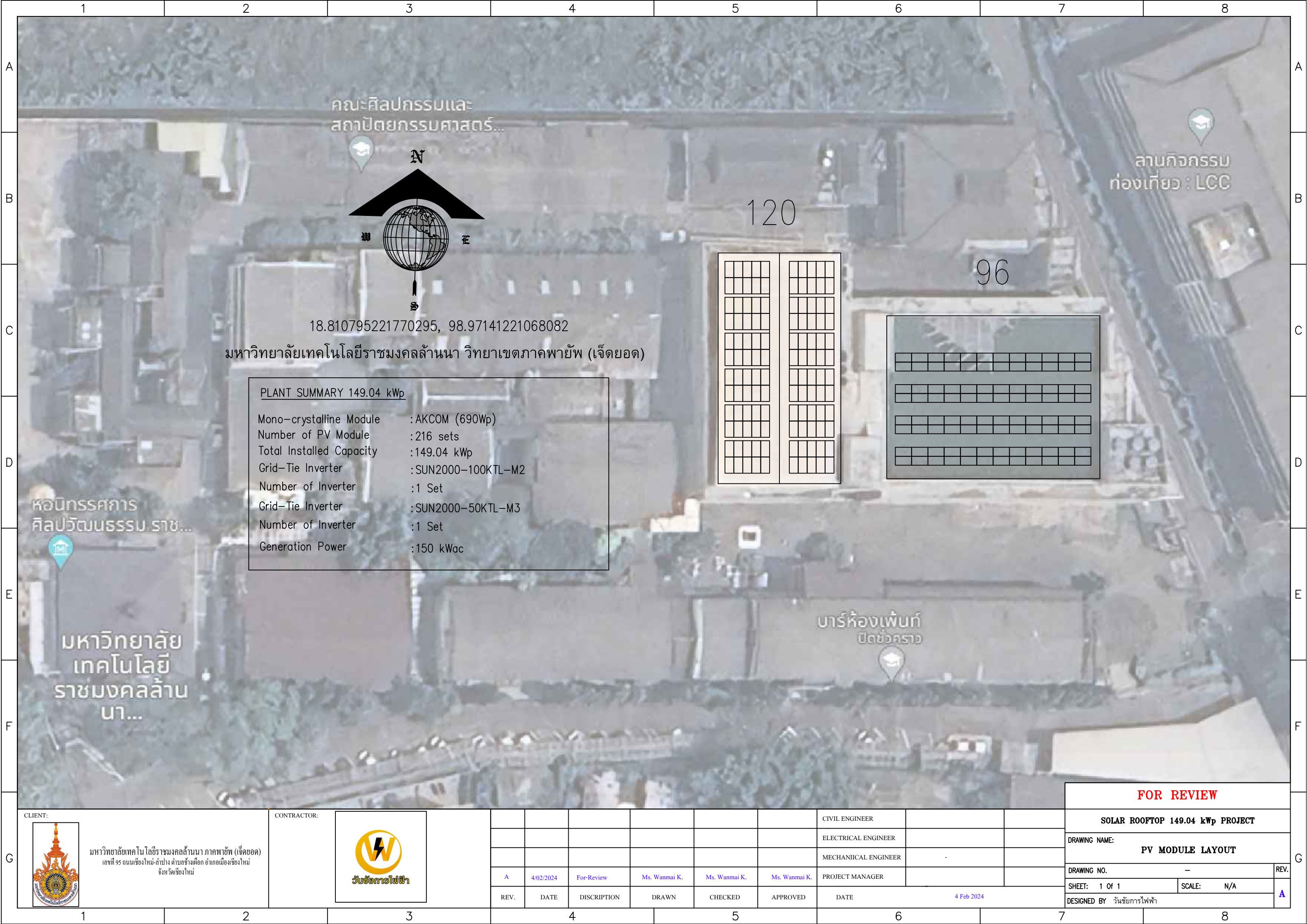




คณะศิลปกรรมและ
สถาปัตยกรรมศาสตร์...



ลานกิจกรรม
ท่องเที่ยว : LCC

120

96

18.810795221770295, 98.97141221068082

มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา วิทยาเขตภาคพายัพ (เจ็ดยอด)

PLANT SUMMARY 149.04 kWp	
Mono-crystalline Module	: AKCOM (690Wp)
Number of PV Module	: 216 sets
Total Installed Capacity	: 149.04 kWp
Grid-Tie Inverter	: SUN2000-100KTL-M2
Number of Inverter	: 1 Set
Grid-Tie Inverter	: SUN2000-50KTL-M3
Number of Inverter	: 1 Set
Generation Power	: 150 kWac

หอศิลปกรรม
ศิลปวัฒนธรรม ราช...



มหาวิทยาลัย
เทคโนโลยี
ราชมงคลล้าน
นา...

บาร์ห้องเพนท์
ปิดชั่วคราว

CLIENT:



มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา ภาคพายัพ (เจ็ดยอด)
เลขที่ 95 ถนนเชียงใหม่-ลำปาง ตำบลช้างเผือก อำเภอเมืองเชียงใหม่
จังหวัดเชียงใหม่

CONTRACTOR:



วันชัยการไฟฟ้า

							CIVIL ENGINEER		
							ELECTRICAL ENGINEER		
							MECHANICAL ENGINEER	-	
A	4/02/2024	For-Review	Ms. Wanmai K.	Ms. Wanmai K.	Ms. Wanmai K.	PROJECT MANAGER			
REV.	DATE	DISRIPTION	DRAWN	CHECKED	APPROVED	DATE	4 Feb 2024		

FOR REVIEW	
SOLAR ROOFTOP 149.04 kWp PROJECT	
DRAWING NAME: PV MODULE LAYOUT	
DRAWING NO.	REV.
SHEET: 1 Of 1	SCALE: N/A
DESIGNED BY วันชัยการไฟฟ้า	

BOQ มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา ภาคพายัพ (เจ็ดยอด) 149.04 kW Rev.1 (2024)

Item	Description							Remark
		Model / Brand	Quantity	Unit	Price / Unit		Total Price	
					Material	Installation		
1	Permit Coordination	Government	1	Set		100,000.00	100,000.00	
2	Engineering / Design Work	Skylink/ PV Syst	1	Set		50,000.00	50,000.00	
3	Procurement / Installation	Skylink	1	Set			-	
							-	
3.1	PV Module 690 W	AKCOM	216	Panel	1,341,360.00	54,000.00	1,395,360.00	
3.2	String Inverter SUN2000-100KTL-M2	Huawei	1	ea	193,490.00	2,000.00	195,490.00	
3.2	String Inverter SUN2000-50KTL-M3	Huawei	1	ea	96,030.00	2,000.00	98,030.00	
3.3	Rapid shutdown for comply with EIT standard with Emergency Botton	Projoy		ea	-	-	-	ตามมาตรฐาน วศท.กำหนดให้ต้องติดตั้ง Rapid shutdown ตั้งแต่วันที่ 1 ก.ค. 2566
3.3	Controller Box for DC24V กล่องควบคุมไฟฟ้า (Rapid Shutdown Device)	Projoy		ea	-	-	-	
3.3	สายไฟเลี้ยง Rapit shutdown	Thai Yazaki		m	-	-	-	
3.3	DC Fuse(Inline Fuse)	Uriarte	0	set	-	-	-	
3.4	DC Connector	Multi Contact	44	ea	8,800.00	2,200.00	11,000.00	
3.5	DC Extension Cable (Solar Cable) FD depends on calculation	Helukabel/JJ Lap/Prysmian/Link	5,500.00	m	198,000.00	33,000.00	231,000.00	
3.6	AC Cable						-	
3.6.1	AC Cable CV Cable size ...1C x 70.. Sq.mm.	Thai Yazaki	50	m	37,500.00	9,000.00	46,500.00	
3.6.2	AC Cable CV Cable size ...120.. Sq.mm. (MDB Solar to MAIN MDB)	Thai Yazaki	50	m	47,500.00	5,000.00	52,500.00	
3.6.4	AC Cable THW Cable size ...35.. Sq.mm.	Thai Yazaki	50	m	17,500.00	4,000.00	21,500.00	
3.6.5	AC Cable THW Cable size ...16.. Sq.mm. (AC Collection Ground)	Thai Yazaki	200	m	12,600.00	5,000.00	17,600.00	
3.6.5	AC Cable THW Cable size ...6.. Sq.mm. (DC Ground)	Thai Yazaki	300	m	13,500.00	7,500.00	21,000.00	
3.6.6	Acc . AC Cable (cable lag,Terminat lag,support cable grend)	Thai Yazaki	1	Set	10,000.00	5,000.00	15,000.00	
3.7	Main Distribution Board	Precise					-	
3.7.1	Main Distribution Board (MDB)	Precise	2	ea	40,000.00	5,000.00	45,000.00	
3.8	Grounding System	Kumwell	1	Set	10,000.00	3,500.00	13,500.00	
							-	
3.9	Mounting Structure (149.04 kWp)	Skylink Solar	1	Set	149,040.00	44,712.00	193,752.00	
3.10	Cable Tray	Perforated Tray					-	
3.10.1	Cable Tray 100x100x2400	Perforated Tray	50	ea	77,000.00	7,500.00	84,500.00	
3.10.3	Cable Tray 200x100x2400	Perforated Tray	0	ea	-	-	-	
3.10.4	Cable Tray 300x100x2400	Perforated Tray	0	ea	-	-	-	
3.10.5	Cable ladder 400x100x2400	Perforated Tray	0	ea	-	-	-	
3.10.6	Conduit and Flexible, Support Cable Tray		1	Lot	25,000.00	10,000.00	35,000.00	
							-	
3.11	Metering System						-	
3.11.1	PQM Meter (UMG 96RM)	Janitza	1	ea	70,000.00	20,000.00	90,000.00	
3.11.2	Revenue Meter	EDMI ATLAS ,MK10E	0	ea	-	-	-	
3.12	Protection System						-	
3.12.1	Relay Protection System (SEL-751)	SEL-751	0	lot	-	-	-	
3.13	Other Accessories						-	
3.13.1	Transformer 360 kVA Std.Loss		0	ea		-	-	
3.13.2	22kV For Transformer	STC,Precise	0	Set	-	-	-	
3.13.3	22 kV Sac Cable		0	m	-	-	-	
3.13.4	Current Transformer MV	Precise	0	ea	-	-	-	
3.13.5	Potential Transformer MV	Precise	0	ea	-	-	-	
3.13.6	Concret Pole and Support CT,VT and Acc.	STC	0	ea	-	-	-	
3.13.7	Concret Pole For Riser Pole Incomming + Outgoing	STC	0	ea	-	-	-	
3.13.8	Drop Out Fuse	Precise	0	ea	-	-	-	
3.13.9	Lightning Arrester 21 kV 10 kA	Precise	0	ea	-	-	-	
3.13.10	Electrical Distribution Box	Schneider	1	ea	15,000.00	8,000.00	23,000.00	
3.13.11	Electrical System (Lighting Fixture, Receptacle)	Philips	1	Set	8,000.00	2,000.00	10,000.00	
3.14	Monitoring System						-	
3.14.1	Smart Logger 3000A	Huawei	1	ea	30,000.00	10,000.00	40,000.00	
3.14.2	RS485 for Zero Export	lapp	1	Set	20,000.00	7,500.00	27,500.00	
3.14.3	LAN Wiring System	TP Link	1	Set	5,000.00	2,000.00	7,000.00	
3.14.4	UPS	Leonic	1	ea	5,000.00	2,000.00	7,000.00	
4	Safety System						-	
4.1	Warning Sign,Fire Extinguisher 1 Sets ,Equipment Name Plate (Acrylic)	Skylink	1	Set	5,000.00	1,000.00	6,000.00	
4.2	Ladder For Service	Skylink	0	Set	-	-	-	
4.3	Inverter Support Structure and Fence	Skylink	1	Set	40,000.00	15,000.00	55,000.00	
5	Test and Comissioning System						-	
5.1	Commissioning Work	Skylink	1	Set		15,000.00	15,000.00	
6	Others						-	
6.1	Hand rail Lifegrad	Skylink		Set	-	-	-	
6.2	Walkway	Skylink		Set	-	-	-	
6.3	Water Cleaning system	Skylink	1	Set	50,000.00	20,000.00	70,000.00	
6.4	Mobilization	Skylink	1	Set	-	30,000.00	30,000.00	
6.5	Unload and Transportation	Skylink	1	Set	40,000.00	10,000.00	50,000.00	
6.6	Insurance	Skylink		Set	-		-	
6.7	Management and Overhead	Skylink	1	Set		30,000.00	30,000.00	
	Total				2,565,320.00	521,912.00	3,087,232.00	
					Total		3,087,232.00	
	System Size (KWdc) = Q'ty Panel x PV Module Rate							
	THB/W				17.21	3.50	20.71	

Solar PV Rooftop 149.04 kWp. มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา ภาคพายัพ (เจ็ดยอด)

Total PV Plant Capacity (DC)	149.04 kWp
Daily Electricity Production	417.31 kWh/day
Monthly Electricity Production	12,519.36 kWh/month
Annual Electricity Production	150,232.32 kWh/year
Investment	3,087,232.0 Baht
Tariff	4.00 Baht/unit

Year	Degradation of PV Module		Annual Electricity Production (kWh/Year)	Estimated Yearly Saving (@ 4.00 Baht/kWh)	Accumulated Saving (Baht)	Payback Period (Baht)
0		100%		-3,087,232.00		-3,087,232.00
1	2.50%	97.50%	150,232	600,929	600,929	-2,486,303
2	0.60%	96.90%	146,477	585,906	1,186,835	-1,900,397
3	0.60%	96.30%	145,598	582,391	1,769,226	-1,318,006
4	0.60%	95.70%	144,724	578,896	2,348,122	-739,110
5	0.60%	95.10%	143,856	575,423	2,923,545	-163,687
6	0.60%	94.50%	142,993	571,970	3,495,515	408,283
7	0.60%	93.90%	142,135	568,539	4,064,054	976,822
8	0.60%	93.30%	141,282	565,127	4,629,181	1,541,949
9	0.60%	92.70%	140,434	561,737	5,190,918	2,103,686
10	0.60%	92.10%	139,592	558,366	5,749,284	2,662,052
11	0.60%	91.50%	138,754	555,016	6,304,300	3,217,068
12	0.60%	90.90%	137,921	551,686	6,855,986	3,768,754
13	0.60%	90.30%	137,094	548,376	7,404,361	4,317,129
14	0.60%	89.70%	136,271	545,085	7,949,447	4,862,215
15	0.60%	89.10%	135,454	541,815	8,491,262	5,404,030
16	0.60%	88.50%	134,641	538,564	9,029,826	5,942,594
17	0.60%	87.90%	133,833	535,333	9,565,159	6,477,927
18	0.60%	87.30%	133,030	532,121	10,097,279	7,010,047
19	0.60%	86.70%	132,232	528,928	10,626,207	7,538,975
20	0.60%	86.10%	131,439	525,754	11,151,962	8,064,730
21	0.60%	85.50%	130,650	522,600	11,674,561	8,587,329
22	0.60%	84.90%	129,866	519,464	12,194,026	9,106,794
23	0.60%	84.30%	129,087	516,347	12,710,373	9,623,141
24	0.60%	83.70%	128,312	513,249	13,223,622	10,136,390
25	0.60%	83.10%	127,542	510,170	13,733,792	10,646,560
Total			3,433,448	13,733,792	13,733,792	

