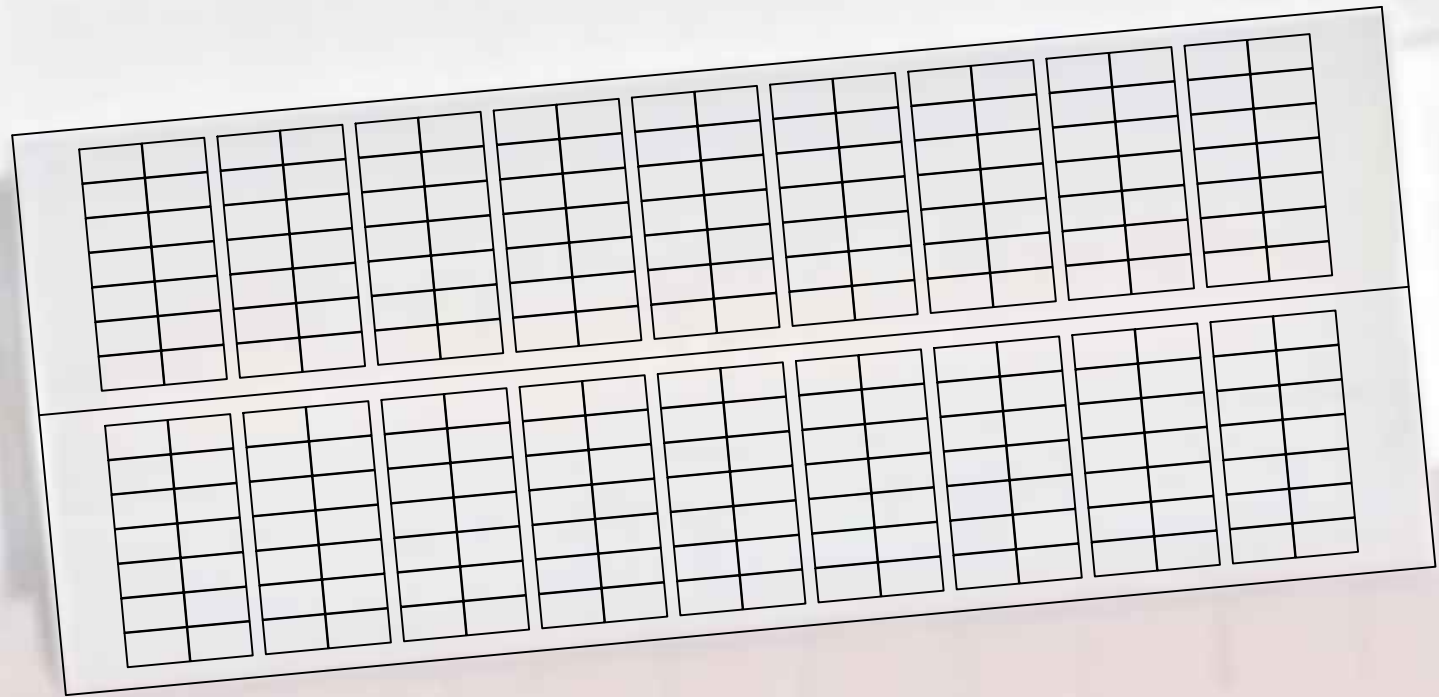




19.172534, 99.901369
โรงเรียน อนุบาลพะเยา

PLANT SUMMARY 173.88 kWp	
Mono-crystalline Module	: AKCOM (690Wp)
Number of PV Module	: 252 sets
Total Installed Capacity	: 173.88 kWp
Grid-Tie Inverter	: SUN2000-50KTL-M3
Number of Inverter	: 3 Set
Generation Power	: 139.10 kWac



CLIENT:



โรงเรียนอนุบาลพะเยา
23 รอบเวียงประตูกลอง ถนน รอบเวียงประตูกลอง ทำรังทอง
อำเภอเมืองพะเยา จังหวัดพะเยา 56000

CONTRACTOR:



วันชัยการไฟฟ้า

							CIVIL ENGINEER		
							ELECTRICAL ENGINEER		
							MECHANICAL ENGINEER	-	
A	15/04/2024	For-Review	Ms. Wanmai K.	Ms. Wanmai K.	Ms. Wanmai K.	PROJECT MANAGER			
REV.	DATE	DISRIPTION	DRAWN	CHECKED	APPROVED	DATE	15 April 2024		

FOR REVIEW	
โรงเรียนอนุบาลพะเยา SOLAR ROOFTOP 173.88 kWp PROJECT	
DRAWING NAME: PV MODULE LAYOUT	
DRAWING NO.	REV.
SHEET: 1 Of 1	SCALE: N/A
DESIGNED BY วันชัยการไฟฟ้า	

BOQ รร.อนุบาลพะเยา 173.88 kW Rev.1 (2024)

Item	Description							Remark
		Model / Brand	Quantity	Unit	Price / Unit		Total Price	
					Material	Installation		
1	Permit Coordination	Government	1	Set		120,000.00	120,000.00	
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	252	Panel	1,564,920.00	63,000.00	1,627,920.00	
3.2	String Inverter SUN2000-100KTL-M2	Huawei	0	ea	-	-	-	
3.3	String Inverter SUN2000-50KTL-M3	Huawei	3	ea	288,090.00	18,000.00	306,090.00	
3.3	Rapid shutdown for comply with EIT standard with Emergency Botton	Projoy	0	ea	-	-	-	ตามมาตรฐาน วศท.กำหนดให้ต้องติดตั้ง Rapid shutdown ตั้งแต่วันที่ 1 ก.ค. 2566
3.3	Controller Box for DC24V กล่องควบคุมไฟฟ้า (Rapid Shutdown Device)	Projoy	0	ea	-	-	-	
3.3	สายไฟเลี้ยง Rapit shutdown	Thai Yazaki	0	m	-	-	-	
3.3	DC Fuse(Inline Fuse)	Uriarte	0	set	-	-	-	
3.4	DC Connector	Multi Contact	150	ea	30,000.00	7,500.00	37,500.00	
3.5	DC Extension Cable (Solar Cable) FD depends on calculation	Helukabel/JJ Lap/Prysmian/Link	10,000.00	m	360,000.00	60,000.00	420,000.00	
3.6	AC Cable						-	
3.6.1	AC Cable CV Cable size ...1C x 35.. Sq.mm.(Inverter to MDB Solar)	Thai Yazaki	150	m	82,500.00	27,000.00	109,500.00	
3.6.2	AC Cable CV Cable size ...120.. Sq.mm. (MDB Solar to MAIN MDB)	Thai Yazaki	200	m	170,000.00	20,000.00	190,000.00	
3.6.4	AC Cable THW Cable size ...35.. Sq.mm. (AC Collection Ground)	Thai Yazaki	20	m	11,000.00	1,600.00	12,600.00	
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	400	m	25,200.00	10,000.00	35,200.00	
3.6.6	Acc . AC Cable (cable lag,Terminat lag,support cable grend)	Thai Yazaki	1	Set	20,000.00	7,500.00	27,500.00	
3.7	Main Distribution Board	Precise					-	
3.7.1	Main Distribution Board (MDB)	Precise	1	ea	110,000.00	10,000.00	120,000.00	
3.8	Grounding System	Kumwell	1	Set	20,000.00	6,000.00	26,000.00	
							-	
3.9	Mounting Structure (173.88 kWp)	Skylink Solar	1	Set	173,880.00	52,164.00	226,044.00	
3.10	Cable Tray	Perforated Tray					-	
3.10.1	Cable Tray 100x100x2400	Perforated Tray	250	ea	385,000.00	37,500.00	422,500.00	
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	40,000.00	15,000.00	55,000.00	
							-	
3.11	Metering System						-	
3.11.1	PQM Meter (UMG 96RM) With CT Low volt	Janitza	1	ea	50,000.00	10,000.00	60,000.00	
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 400 kVA Std.Loss	Ekarat	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	0	ea	-	-	-	
3.13.11	Electrical System (Lighting Fixture, Receptacle)	Philips	0	Set	-	-	-	
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	30,000.00	5,000.00	35,000.00	
3.14.3	LAN Wiring System	TP Link	1	Set	5,000.00	3,500.00	8,500.00	
3.14.4	UPS	Leonic	1	ea	5,000.00	1,500.00	6,500.00	
4	Safety System						-	
4.1	Warning Sign,Fire Extinguisher 1 Sets ,Equipment Name Plate (Acrylic)	Skylink	1	Set	10,000.00	3,000.00	13,000.00	
4.2	Ladder For Service	Skylink	1	Set	15,000.00	7,000.00	22,000.00	
4.3	Inverter Support Structure and Fence	Skylink	1	Set	70,000.00	30,000.00	100,000.00	
5	Test and Comissioning System						-	
5.1	Commissioning Work	Skylink	1	Set		35,000.00	35,000.00	
6	Others						-	
6.1	Hand rail Lifegrad	Skylink	100	m	35,000.00	15,000.00	50,000.00	
6.2	Walkway	Skylink	50	m	60,000.00	10,000.00	70,000.00	
6.3	Water Cleaning system	Skylink	1	Set	40,000.00	15,000.00	55,000.00	
6.4	Mobilization	Skylink	1	Set	-	50,000.00	50,000.00	
6.5	Unload and Transportation	Skylink	1	Set	150,000.00	50,000.00	200,000.00	
6.6	Insurance	Skylink		Set	-		-	
6.7	Management and Overhead	Skylink	1	Set		100,000.00	100,000.00	
	Total				3,793,190.00	855,264.00	4,648,454.00	
		Total					4,648,454.00	
	System Size (KWdc) = Q'ty Panel x PV Module Rate							
	THB/W				21.81	4.92	26.73	

Solar PV Rooftop 173.88 kWp. โรงเรียนอนุบาลพะเยา

Total PV Plant Capacity (DC)	173.88 kWp
Daily Electricity Production	486.86 kWh/day
Monthly Electricity Production	14,605.92 kWh/month
Annual Electricity Production	175,271.04 kWh/year
Investment	4,648,454.0 Batt
Tariff	4.00 Bath/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%		-4,648,454.00		-4,648,454.00
1	2.50%	97.50%	175,271	701,084	701,084	-3,947,370
2	0.60%	96.90%	170,889	683,557	1,384,641	-3,263,813
3	0.60%	96.30%	169,864	679,456	2,064,097	-2,584,357
4	0.60%	95.70%	168,845	675,379	2,739,476	-1,908,978
5	0.60%	95.10%	167,832	671,327	3,410,803	-1,237,651
6	0.60%	94.50%	166,825	667,299	4,078,101	-570,353
7	0.60%	93.90%	165,824	663,295	4,741,396	92,942
8	0.60%	93.30%	164,829	659,315	5,400,711	752,257
9	0.60%	92.70%	163,840	655,359	6,056,071	1,407,617
10	0.60%	92.10%	162,857	651,427	6,707,498	2,059,044
11	0.60%	91.50%	161,880	647,519	7,355,016	2,706,562
12	0.60%	90.90%	160,908	643,633	7,998,650	3,350,196
13	0.60%	90.30%	159,943	639,772	8,638,422	3,989,968
14	0.60%	89.70%	158,983	635,933	9,274,355	4,625,901
15	0.60%	89.10%	158,029	632,117	9,906,472	5,258,018
16	0.60%	88.50%	157,081	628,325	10,534,797	5,886,343
17	0.60%	87.90%	156,139	624,555	11,159,352	6,510,898
18	0.60%	87.30%	155,202	620,807	11,780,159	7,131,705
19	0.60%	86.70%	154,271	617,083	12,397,242	7,748,788
20	0.60%	86.10%	153,345	613,380	13,010,622	8,362,168
21	0.60%	85.50%	152,425	609,700	13,620,322	8,971,868
22	0.60%	84.90%	151,510	606,042	14,226,363	9,577,909
23	0.60%	84.30%	150,601	602,405	14,828,769	10,180,315
24	0.60%	83.70%	149,698	598,791	15,427,560	10,779,106
25	0.60%	83.10%	148,800	595,198	16,022,758	11,374,304
Total			4,005,689	16,022,758	16,022,758	

