GRID ALTERNATIVES: Quality Control Checklist

SITE

Homeowner: _____ Date: _____
Address: _____ Supervisor: _____
_____ Signature: _____

COMMISSIONING

Ambient Temp (°F): _____ Actual Output (W): _____
Insolation (W/m2): _____ CEC-AC Rating from EPBB/FIWS (W) _____
Expected Output* (W): _____

- [ ] Verified EPBB
- [ ] Checked system output exceeds expected output
- [ ] Walked homeowner through inverter operation
- [ ] Discussed next steps with homeowner
- [ ] Checked that site is clean
- [ ] Turned system off

ROOF TEAM ITEMS

RACKING	COMMENTS
☐ All roof attachments are tight	
☐ Standoff screwed in tight to base	
☐ Sealant applied to top of flashing	
☐ All rail sections are grounded	
☐ Excess rail is trimmed	

MICRO INVERTERS (IF APPLICABLE)	COMMENTS
☐ All inverters are firmly secured	
☐ All inverter connections are tight and secured away from roof	
☐ All inverters are grounded	
☐ End cap is securely fastened	

MODULES	COMMENTS
☐ All module clamps are tight	
☐ All module connections are tight	
☐ All module grounding lugs are tight (if applicable)	
☐ All WEEBs are oriented correctly (if applicable)	
☐ All WEEB circular tabs completely under module frames (if applicable)	
☐ All modules are grounded	
☐ All module wiring is neatly secured away from roof	
☐ No wires are pinched between modules and rails	

JUNCTION BOX	COMMENTS
☐ Line 3 is capped and appropriately insulated **(MI ONLY)**	
☐ Array lines 1 & 2 are terminated to load side of switch **(MI ONLY)**	
☐ Utility lines 1 & 2 are terminated to line side of switch **(MI ONLY)**	
☐ Positive wire is connected to positive module lead(s)	
☐ Negative wire is connected to negative module lead(s)	
☐ All connections in junction box pass tug test	
☐ Junction box fittings are tight	
☐ Junction box cover (and switch if needed) are secured	

RACEWAYS	COMMENTS
☐ All conduit has been reamed	
☐ All conduit fittings are tight	
☐ All conduit is secured (3' from connector & every 10' for EMT)	
☐ No kinks or cuts in conduit	
☐ No more than 360° of bend between pulling points	
☐ Outdoor fittings are used in wet and damp locations	
☐ All conduit bodies are accessible	
☐ All conduit bodies are closed	
☐ Outdoor covers are used in wet and damp locations	

MI = Micro-inverter. *** Expected Output = CEC-AC Rating x Percentage from Field Verification Table**

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GROUND TEAM ITEMS

	RACEWAYS	COMMENTS
	All conduit fittings are tight	
	All conduit is secured (3' from fittings and every 10' for EMT)	
	No kinks or cuts in conduit	
	No more than 360° of bend between pulling points	
	Outdoor fittings are used in wet and damp locations	
	All conduit bodies are accessible	
	All conduit bodies are closed	
	Outdoor covers are used in wet and damp locations	
	If conduit runs through exterior wall, holes have been caulked	

	AC DISCONNECT	COMMENTS
	Hot wires from utility terminated to line side (top)	
	Hot wires from inverter terminated to load side (bottom)	
	Neutral wire (if any) passes unbroken through disconnect	
	Grounding wire (#8 or bigger) passes unbroken through disconnect	
	Lock nuts and grounding bushings installed on both conduit fittings	
	Set screws on grounding bushings are tight	
	Disconnect is padlocked shut (if not integrated with inverter)	

	Inverter	COMMENTS
	Positive wire connects to + terminal	
	Negative wire connects to – terminal	
	Hot wire(s) (red and/or black) connect(s) to L1 and/or L2 terminals	
	Neutral wire (if any) connects to AC neutral terminal	
	Ground wires (green) connect to ground terminal (PE) and ground lug	
	Lock nuts and grounding bushings installed on both conduit fittings	
	Set screws on grounding bushings are tight	
	Cover of inverter is secure with all screws and star washers	
	Lock nuts and grounding bushings installed on both conduit fittings	

	WIRING	COMMENTS
	All connections pass the tug test	
	All strands of wire are in terminations	
	Wire is stripped so insulation is not in termination	
	Exposed wire in termination is kept to a minimum	
	Wire insulation is not scuffed or broken anywhere	

	ELECTRICAL PANEL & LABELING	COMMENTS
	Circuit breaker is securely snapped in	
	Lock nuts and grounding bushings installed on both conduit fittings	
	Set screws on grounding bushings are tight	
	Site diagram label is secured near meter	
	AC disconnect is labeled	
	DC disconnect is labeled	
	Electrical panel is labeled	

	Commissioning	COMMENTS
	Polarity is correct (i.e. V between positive wire and ground is positive)	
	AC Voltage at inverter is close to 240V	
	DC Voc is close to expected value	

***** NOTE: IF SYSTEM HAS NOT BEEN PROPERLY COMMISSIONED, INVERTER (OR DISCONNECTS) SHOULD BE LOCKED IN THE OFF POSITION.***

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SERIAL NUMBERS

	MODULES	INVERTERS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
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23		
24		
25		
26		

Field Verification Output Table											
(W/m²)	T=15	T=25	T=35	T=45	T=55	T=65	T=75	T=85	T=95	T=105	T=115
300	26%	26%	25%	24%	24%	23%	22%	22%	21%	20%	20%
325	28%	28%	27%	26%	26%	25%	24%	24%	23%	22%	22%
350	31%	30%	29%	28%	28%	27%	26%	25%	25%	24%	23%
375	33%	32%	31%	31%	30%	29%	28%	27%	27%	26%	25%
400	35%	34%	33%	33%	32%	31%	30%	29%	28%	27%	27%
425	37%	36%	36%	35%	34%	33%	32%	31%	30%	29%	28%
450	40%	39%	38%	37%	36%	35%	34%	33%	32%	31%	30%
475	42%	41%	40%	39%	38%	37%	36%	35%	34%	33%	32%
500	44%	43%	42%	41%	40%	39%	38%	37%	36%	34%	33%
525	46%	45%	44%	43%	42%	41%	40%	38%	37%	36%	35%
550	48%	47%	46%	45%	44%	43%	41%	40%	39%	38%	37%
575	51%	49%	48%	47%	46%	45%	43%	42%	41%	40%	38%
600	53%	51%	50%	49%	48%	46%	45%	44%	43%	41%	40%
625	55%	54%	52%	51%	50%	48%	47%	46%	44%	43%	42%
650	57%	56%	54%	53%	52%	50%	49%	47%	46%	45%	43%
675	59%	58%	56%	55%	54%	52%	51%	49%	48%	46%	45%
700	61%	60%	58%	57%	55%	54%	52%	51%	49%	48%	46%
725	63%	62%	60%	59%	57%	56%	54%	53%	51%	50%	48%
750	65%	64%	62%	61%	59%	58%	56%	54%	53%	51%	49%
775	68%	66%	64%	63%	61%	59%	58%	56%	54%	53%	51%
800	70%	68%	66%	65%	63%	61%	59%	58%	56%	54%	53%
825	72%	70%	68%	66%	65%	63%	61%	59%	58%	56%	54%
850	74%	72%	70%	68%	66%	65%	63%	61%	59%	57%	55%
875	76%	74%	72%	70%	68%	66%	65%	63%	61%	59%	57%
900	78%	76%	74%	72%	70%	68%	66%	64%	62%	60%	58%
925	79%	78%	76%	74%	72%	70%	68%	66%	64%	62%	60%
950	81%	79%	77%	75%	73%	71%	69%	67%	65%	63%	61%
975	83%	81%	79%	77%	75%	73%	71%	69%	67%	65%	63%
1000	85%	83%	81%	79%	77%	75%	73%	70%	68%	66%	64%
1025	90%	85%	83%	81%	78%	76%	74%	72%	70%	67%	65%
1050	90%	90%	84%	82%	80%	78%	76%	73%	71%	69%	66%
1075	90%	90%	86%	84%	82%	79%	77%	75%	72%	70%	68%
1100	90%	90%	90%	86%	83%	81%	79%	76%	74%	71%	69%
1125	90%	90%	90%	90%	85%	82%	80%	78%	75%	73%	70%
1150	90%	90%	90%	90%	86%	84%	81%	79%	76%	74%	71%
1175	90%	90%	90%	90%	90%	85%	83%	80%	78%	75%	73%
1200	90%	90%	90%	90%	90%	90%	84%	82%	79%	77%	74%

For systems that have only one string connected to a single inverter or for systems using micro-inverters, the following applies:

1. Record Temperature and Irradiance as discussed in CSI Handbook [note: to be added in accordance with "Guidelines"]
2. Examine Field Verification Output (FVO) table for the percentage shown given the measured temperature and irradiance.
   Always round temperature up to the next block. So, 47 degrees rounds up to 55 degrees on the chart.
3. Multiply the CEC-AC (from EPBB printout) times the FVO percentage to get estimated system output.
4. Compare estimated system output with actual output. If actual system output is higher, system is operating within expectations.
   If estimated output is higher, perform additional diagnostics and correct any issues as the system may not be performing properly.