

Telephone: (858) 657-9186

Title: President

## DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT

WINDWARD CO.	
APPLICATION FOR HCAI SPECIAL SEISMIC	OFFICE USE ONLY
CERTIFICATION PREAPPROVAL (OSP)	APPLICATION #: OSP-0826
HCAI Special Seismic Certification Preapproval (OSP)	
Type: X New Renewal	
Manufacturer Information	
Manufacturer: BSD Builders, Inc.	
Manufacturer's Technical Representative: Jeff Blair	
Mailing Address: 8369 Vickers Street #100, San Diego, CA 92111	
Telephone: (858) 657-9186 Email: Jeff@BSDBuilders	s.com
Product Information	
Product Name: BSD SSC Microgrid Cogeneration System	2
Product Model Number(s): BSD SSC 100-420, BSD-SSC-FSS-34MSCF.	T.
Product Category: Emergency and Standby Power Systems	15
Product Sub-Category: Generators	
General Description: Microgrid Cogeneration System consisting of Cogen	Power Plant & Fuel Storage System.
Mounting Description: Base Mounted Rigid -	
Tested Seismic Enhancements: None	
Applicant Information	
Applicant Company Name: BSD Builders, Inc.	DY
Contact Person: Jeff Blair	
Mailing Address: 8369 Vickers Street #100, San Diego, CA 92111	

Email: Jeff@BSDBuilders.com

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## **DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION** OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)							
Company Name: JUNKER ENGINEERING GROUP							
Name: Dan Junker California License Number: S6178							
Mailing Address: 8950 Jefferson Ave, La Mesa, CA 91941							
Telephone: (619) 606-5058 Email: dan@junkereng.com							
Certification Method							
☐ GR-63-Core							
Other (Please Specify):							
EOR CODE CO.							
Testing Laboratory							
Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)							
Contact Person: Jeremy Lange							
Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513							
Telephone: (972) 247-9657 By Email: info@etldallas.com							
Company Name: UNIVERSITY OF CALIFORNIA, BERKELEY (PEER)							
Contact Person: Amarnath Kasalanati DATE: 11/27/2024							
Mailing Address: 325 Davis Hall, Berkeley CA 94720-1729							
Telephone: (510) 642-3437 Email: peer_center@berkeley.edu							

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## DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT

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SDS (Design spectral response acceleration at short period, g) = 2.5 ap (Amplification factor) = 2.5 (Power plan with internal isolators), 1.0 (Fuel Storage System) Rp (Response modification factor) = 2.0 (Power plan with internal isolators), 2.5 (Fuel Storage System)

Design Basis of Equipment or Components (Fp/Wp) = 1.88 (Power Plant with Internal Isolators), 1.13 (Fuel Storage System)

 $\Omega_0$  (System overstrength factor) = 2.0

1.5 Ip (Importance factor) =

z/h (Height ratio factor) = 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

## HCAI Approval (For Office Use Only) - Approval Expires on 11/27/2030

Date: 11/27/2024

Name: Mohammad Karim Title: Supervisor, Health Facilities

z/h =

Special Seismic Certification Valid Up to: Sps (g) = 2.5

Condition of Approval (if applicable):





STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY

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## SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT SUMMARY



Manufacturer BSD Builders, Inc.

Product Type Microgrid Cogeneration System

Model LineBSD SSC Power PlantTable DescriptionCertified Components

Table 1

## **Construction Summary**

**Generator:** Steel container with 3.425" thick insulated walls containing an engine, a catalyst, silencers radiator, load bank, gas train, heat exchanger, and various fan, ducts, and electrical components.

**Gas Tank:** 48" diameter, 1.25" thick, 11 ft tall carbon fiber tank in structural steel frame and sheet metal enclosure panels.

## **Certification Parameters**

Building Code: CBC 2022

Component Importance Factor:  $I_p = 1.5$ 

 $S_{DS} = 2.5g @ z/h = 0$ 

### **Mounting Summary**

Rigidly base mounted.

### **Notes**

Dimensions listed include exterior container subcomponents.

BSD SSC   100   315   118   210   34,750   Alternator power rating = 100 kW   Extrapolated rating = 135 kW   Extrapolated rating = 135 kW   Alternator power rating = 135 kW   Extrapolated rating = 135 kW   Alternator power rating = 135 kW   Alternator power rating = 135 kW   Alternator power rating = 135 kW   Extrapolated rating = 135 kW   Alternator power rating = 135 kW   Alternator power rating = 170 kW   Extrapolated rating = 135 kW   Alternator power rating = 170 kW   Extrapolated rating = 130 kW   Alternator power rating = 200 kW   2   Alternator power rating = 200 kW   2   Alternator power rating = 280 kW   3   Alternator pow	Manufacturer	Model Line	Model	Maximu	m Dimens	nensions (in) Max Weight		Description	UUT	
BSD SSC   BSD SSC   SS	Manuracturer	Model Line	Name	Length	Width	Height	(lbs.)	Description	331	
BSD SSC   BSD SSC   BSD SSC   S15   118   210   34,750   rating = 135 kW   Extrapolated   Extr			100	315	118	210	34,750	rating = 100 kW	Extrapolated	
BSD SSC   Power Plant   Power Plant   BSD SSC   Power Plant   Powe		BSD SSC	135	315	118	210	34,750	rating = 135 kW	Extrapolated	
200   315   118   210   36,350   rating = 200 kW   Extrapolated			170	315	118	210	36,550	rating = 170 kW	Extrapolated	
BSD SSC   315   118   210   39,500   Alternator power rating = 280 kW   2		Power Plant	200	B\ <sup>315</sup> Mo	118 hamma	ad karim	36,550	rating = 200 kW	Extrapolated	
420   315   11182   72104   41,000   rating = 420 kW   1     BSD SSC   BSD-SSC-  Fuel Storage   FSS-  58   71   162   6,130   3 & 4	IIIC.		280	315	118	210	39, <mark>500</mark>	rating = 280 kW	2	
Fuel Storage FSS- 58 71 162 6,130 3 & 4			420	315 E:	1118/27	7/28124	41,000	Alternator power rating = 420 kW	1	
		Fuel Storage	FSS-	58	71	162	6,130		3 & 4	
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## SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT SUMMARY



Manufacturer Various, See Below

**Product Type** Microgrid Cogeneration System

Model LineBSD SSC Power PlantTable DescriptionCertified Sub-Components

Table 2

**Construction Summary** 

Construction as described below.

**Certification Parameters** 

**Building Code:** CBC 2022

**Component Importance Factor:**  $I_p = 1.5$ 

 $S_{DS} = 2.5g @ z/h = 0$ 

**Mounting Summary** 

Notes

Mounted on component.

Manufacturer &	M 1 1 1 1 1	Max I	Dimensions	s (in)	Max Weight	Max Weight		
Product Line	Model Number	Length	Width	Height	(lbs.)	Notes	UUT	
		Natı	ural Gas Gen		components			
			E	nclosure				
2G Energy AG	8m Avus500+	315	118	118	16,535	Steel container with 3.425" panels, insulated with sound dampening mineral glass and 2-hour fire- protection	1, 2	
			Α	Iternator				
	LSA 44.3 L10 / 4p/	32	22.5	25.5	439	Steel frame, cast-iron	Extrapolated	
Leroy-Somer	LSA 46.3 S4 / 4p	<b>4</b> 35	22.5	0_030,06	888	flanges and shields, ip 23	2	
	LSA 47.3 VS3 / 4p	40	28	32	1392	protection rating	1	
			L	oad Bank				
Crestchic	DC Load Bank	40	34.5	nm <del>27</del> d K	arim <sup>265</sup>	20" Diameter fan, stainless steel fins, 3-phase	1, 2	
				Silencer		<u> </u>		
Discom Exhaust	L25	56	30	30	496	Primary Silencer; S235JR steel	1,2	
Technology	L45	87	24	24	540	Secondary Silencer; S235JR steel	1,2	
			G	Senerator		52556. ( 5455.		
	Aura 404	126	39	76	7.165	Cast-iron engine block &	Extrapolated	
	Aura 406	157	44	83	9.667	cylinder head, copper-	Extrapolated	
2G Energy AG	Aura 408	160	52	91	12,258	brass oil cooler, stainless	2	
	Aura 412	179	52	91	14,191	steel & brass inner cooler	1	
			0	as Train				
Dunana Camahusatian	50045-00238	27.5	12		108	Galvanized steel shut-off	Extrapolated	
Dungs Combustion	50045-00239	32	12	10	110	valve, cat-aluminum gas	2	
Controls Heat Engine Base	50045-00240	35	12	11	117	pressure regulator, cast- iron housing	1	
			Ven	tilation Fan				
Ziehl-Abegg	FC063	32	10	32	20	Aluminum die-cast blades, 3-phase fan, diameter= 27.75"	1,2	
				Radiator				
Friga-Bohn FC Neostar Axial	FCH SN 08D P02 B2-1C-50V-M60- SCU	79	91	52.5	925	Two-speed motor, galvanized sheet metal, 2 26" diameter fans	2	
Fan Dry Cooler	FC PN 06D P04 A3- 1C-134V	112	91	52.5	1430	Two-speed motor, galvanized sheet metal, 4 26" diameter fans	1	
				Catalyst				
	61014-26611	13	13	5	27.3		Extrapolated	
Interkat Catalyst	61014-26612	14	14	5	29.2	Stainless steel 304	Extrapolated	
Interkat Catalyst	61014-26613	15	15	5	30.5	3tairii633 Steel 304	2	
	61014-26614	18	18	5	41.9		1	

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## SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT SUMMARY



Manufacturer Various, See Below

Product Type Microgrid Cogeneration System

Model LineBSD SSC Power PlantTable DescriptionCertified Sub-Components

Table 2

**Construction Summary** 

Construction as described below.

**Certification Parameters** 

Building Code: CBC 2022

Component Importance Factor:  $I_p = 1.5$ 

 $S_{DS} = 2.5g @ z/h = 0$ 

**Mounting Summary** 

Notes

Mounted on component.

Manufacturer &	Madal Number	Max Dimensions (in)		Max Weight	Notes	шт	
Product Line	Model Number	Length	Width	Height	Max Weight (lbs.)	Notes	UUT
			Hea	Exchanger			
GEA	20212135-2	8	10	24.5	130		Extrapolated
WTT Plate Heat	20212135-3	11	10	24.5	135	0	Extrapolated
Exchanger	20212135-4	14	10	24.5	145	Stainless steel	2
Exchanger GBS910M	20212135-5	20	10	24.5	205		1
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## SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT SUMMARY



Manufacturer Various, See Below

**Product Type** BSD SSC Fuel Storage System

Model Line: BSD SSC FSS

Table Description Certified Sub-Components

Table 3

Construction Summary Certification Parameters

Construction as described below. Component Importance Factor:  $I_p = 1.5$ 

 $S_{DS} = 2.5g @ z/h = 1.0$ 

**Building Code: CBC 2022** 

**Mounting Summary** 

Notes

Mounted on component.

Manufacturer Model Max Dimensions (in)		Weight	Notes	UUT				
Manufacturer	Number	Length	Width	Height	(lbs.)	Notes	001	
		F	uel Tank Ass		omponents			
	T			Enclosure				
Hydria	NA	58	71	162	3,850	Carbon steel frame, 12 ga stainless steel sheet metal	3 & 4	
	Gas Tank Gas Tank							
Hydria	CAT1502 105	46.5	46.5	132	1,200	Carbon fiber tank, 1.25" thick wall	3 & 4	
				at Exchanger				
Hydria	SCBP-HX	36	25	25	1,015	Carbon steel	3 & 4	
	T			Regulator				
Swagelok	RSN2-02-LLK	-	-	-	arim 3	3,600 PSI to 2,800 PSI; Stainless steel	3 & 4	
Swagelok	RSHN6-02-3-LLK- GN2	-	-	-	5	2,800 PSI to 100 PSI; Stainless steel	3 & 4	
Belgas	P301H4008043F0	-	-	-	24 16	100 PSI to 5 PSI; Cast-iron body, aluminum lower casing	3 & 4	
			Press	ure Relief Va	lve			
Crashy	951100MFA	-	-	-	COSEI	Pressure Relief, Direct Spring Oper Type, 0.5"X1" MXF NPT, Setpoint: 125 PSIG, ASME8 Orifice; Stainless steel base, carbon steel cylinder	3 & 4	
Crosby	981105MFA	-	-	-	33	Pressure Relief, Direct Spring Oper Type, 1.5"X2" MXF NPT, Setpoint: 7 PSIG, ASME 8 Orifice; Stainless steel base, carbon steel cylinder	3 & 4	
			Par	ticulate Filter				
Parker	FFC-116-10	•	1		2	Filter, Particulate/Coalescent, 40- micron, 4500 psig min Rating; Stainless steel	3 & 4	
			Pres	sure Sensor	s			
	CS50- 2A02000PS4Z000 1-01	-	-	-	1	Pressure range 0-200psi. Output: 4-20mA, Supply 10-28 VDC; Stainless steel	3 & 4	
Core Sensors	CS50- 2A05000PS4Z000 2-02	-	-	-	1	Pressure range 0-5000 psi. Output: 4-20mA, Supply 10-28 VDC; Stainless steel	3 & 4	
			Temp	perature Prob	ре			
Sandelius Instruments	RTD	-	-	-	1	Platinum, Max temp 500°F	3 & 4	

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Manufacturer: BSD Builders, Inc.

Model Line: Microgrid Cogeneration System

Model Number: BSD SSC 420 Serial #: G6463

UUT 1

## **Construction Summary:**

Steel container with 3.425" thick insulated wall panels. Certified component construction shall be identical to construction of UUT's.

#### **Options Summary:**

Container: 8m Avus500+, Generator: 2G Energy Aura 412, Gas Train: Heat Engine Base 50045-00240, Alternator: Leroy-Somer LSA 47.3 VS3 / 4p, Load Bank: Crestchic DC Load Bank, Silencers: Discom Exhaust Technology L256 & L45, Ventilation Fan: Ziehl-Abegg FC063 Radiator: Friga-Bohn FC PN 06D P04 A3- 1C-134V, Catalyst: Interkat 61014-26614, Heat Exchanger: GEA WTT Plate Heat Exchanger 20212135-5

## **Mounting Summary:**

Rigid floor mounted. Fastened to test fixture using eight (8) manufacturer provided angles with 8-3/4" diameter A325 thru bolts.

## **Test Parameters:**

Building Code: CBC 2022

**Component Importance Factor:**  $I_p = 1.5$ 

Test Criteria: AC-156

**Test Report:** 

PEER # 2023-238-SQTR-01-00; UUT 1

## Notes:

Contents were included in testing per operating conditions.

## **UUT Image**



#### **UUT Properties**

	Dimensions (i	n)	Weight (lbs.)	Min. I	Min. First Natural Frequency (Hz)		
Length	Width	Height	weight (ibs.)	F-B	S-S	Vert	
315	118	210	41,000	9.0	8.4	N/A	

### Unit maintained structural integrity and remained operational

per manufacturer requirement when subjected to AC 156 test with the following test parameters

S <sub>DS</sub> (g)	z/h	A <sub>FLX-H</sub> (g)	$A_{RIG-H}(g)$	A <sub>FLX-V</sub> (g)	$A_{RIG-V}(g)$
2.50	0	2.50	1.00	1.67	0.67

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Manufacturer: BSD Builders, Inc.

Model Line: Microgrid Cogeneration System

Model Number: BSD SSC 280 Serial #: G6462

**UUT 2** 

Page 6

### Construction Summary:

Steel container with 3.425" thick insulated wall panels. Certified component construction shall be identical to construction of UUT's.

#### **Options Summary:**

Container: 8m Avus500+, Generator: 2G Energy Aura 408, Gas Train: Dungs Combustion Controls Heat Engine Base 50045-00239, Alternator: Leroy-Somer LSA 46.3 S4 / 4p, Load Bank: Crestchic DC Load Bank, Silencers: Discom Exhaust Technology L256 & L45, Ventilation Fan: Ziehl-Abegg FC063, Radiator: Friga-Bohn FCH SN 08D P02 B2-1C-50V-M60-SCU, Catalyst: Interkat 61014-26613, Heat Exchanger: GEA WTT Plate Heat Exchanger 20212135-4

## Mounting Summary:

Rigid floor mounted. Fastened to test fixture using eight (8) manufacturer provided angles with 8-3/4" diameter A325 thru bolts.

### **Test Parameters:**

**Building Code:** CBC 2022

**Component Importance Factor:**  $I_p = 1.5$ 

Test Criteria: AC-156

**Test Report:** 

conditions.

PEER # 2023-238-SQTR-01-00; UUT 2

Contents were included in testing per operating

## **UUT Image**



#### **UUT Properties**

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	Dimensions (in)  Weight (lbs.)  Min. First Natural Frequency (Hz)					
Length	Width	Height	weight (ibs.)	F-B	S-S	Vert
315	118	210	39,500	9.6	9.2	N/A

### Unit maintained structural integrity and remained operational

per manufacturer requirement when subjected to AC 156 test with the following test parameters

S <sub>DS</sub> (g)	z/h	A <sub>FLX-H</sub> (g)	$A_{RIG-H}(g)$	$A_{FLX-V}(g)$	$A_{RIG-V}(g)$
2.50	0	2.50	1.00	1.67	0.67

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UUT 3

Page 7

**Manufacturer:** BSD Builders, Inc.

Model Line: BSD SSC FSS

Model Number: BSD-SSC-FSS-34MSCF

## **Construction Summary:**

Steel HSS welded frame with 12 Ga sheet metal panels containing a 48" diameter, 1.25" thick, 11 ft tall carbon fiber tank and subcomponents as listed.

## **Options Summary:**

Gas Tank: Hydria CAT1502 105, Heat Exchanger: Hydria SCBP-HX, Regulators: Swagelok RSN2-02-LLK & RSHN6-02-3-LLK-GN2, Belgas P301H4008043F0, Pressure Relief Valves: Crosby 95100MFA & 981105MFA, Particulate Filter: Parker Particulate/Coalescent Filter FCC-116-10, Pressure Sensors: Core Sensors CS50-2A02000PS4Z0001-01 & 02, Temperature Probe: Sandelius Instruments RTD.

### **Test Parameters:**

**Building Code: CBC 2022** 

**Component Importance Factor:**  $I_p = 1.5$ 

Contents were included in testing per operating

Test Criteria: AC-156

**Test Report:** 

Notes:

ETL # 17578 Rev. 1; UUT 1

#### **Mounting Summary:**

The unit is mounted to the shake-table with (4) 1" Grade 8 bolts.

#### **UUT Image**



### **UUT Properties**

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Dimensions (in)		Weight (lbs.)	Min. First Natural Frequency (Hz)			
Length	Width	Height	weight (ibs.)	F-B	S-S	Vert
58	71	162	6,124	7.46	11.15	>33.3

## Unit maintained structural integrity and remained operational

per manufacturer requirement when subjected to AC 156 test with the following test parameters

por manaratarior requirement and jector to 7.5 feet to 5. min the remaining to 5. parameters						
ı	S <sub>DS</sub> (g)	z/h	$A_{FLX-H}(g)$	$A_{RIG-H}(g)$	$A_{FLX-V}(g)$	$A_{RIG-V}(g)$
Ī	2.50	0	2.50	1.00	1.67	0.67

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**UUT 4** 

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**Manufacturer:** BSD Builders, Inc.

Model Line: BSD SSC FSS

Model Number: BSD-SSC-FSS-34MSCF

Construction Summary:

Steel HSS welded frame with 12 Ga sheet metal panels containing a 48" diameter, 1.25" thick, 11 ft tall carbon fiber tank and subcomponents as listed.

## **Options Summary:**

Gas Tank: Hydria CAT1502 105, Heat Exchanger: Hydria SCBP-HX, Regulators: Swagelok RSN2-02-LLK & RSHN6-02-3-LLK-GN2, Belgas P301H4008043F0, Pressure Relief Valves: Crosby 95100MFA & 981105MFA, Particulate Filter: Parker Particulate/Coalescent Filter FCC-116-10, Pressure Sensors: Core Sensors CS50-2A02000PS4Z0001-01 & 02, Temperature Probe: Sandelius Instruments RTD.

### **Mounting Summary:**

**UUT Image** 

The unit is mounted to the shake-table with (4) 1" Grade 8 bolts.

## Test Parameters:

**Building Code:** CBC 2022

**Component Importance Factor:**  $I_p = 1.5$ 

Test Criteria: AC-156

**Test Report:** 

ETL # 17578 Rev. 1; UUT 2

#### Notes:

Contents were included in testing per operating conditions



#### **UUT Properties**

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Dimensions (in)			Weight (lbs.)	Min. First Natural Frequency (Hz)		
Length	Width	Height	weight (ibs.)	F-B	S-S	Vert
58	71	162	6,130	4.76	5.19	>33.3

## Unit maintained structural integrity and remained operational

per manufacturer requirement when subjected to AC 156 test with the following test parameters

S <sub>DS</sub> (g)	z/h	$A_{FLX-H}(g)$	$A_{RIG-H}(g)$	A <sub>FLX-V</sub> (g)	$A_{RIG-V}(g)$
2.50	0	2.50	1.00	1.67	0.67

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