Bill of materials

Project	Client	Location	Revision	Date
Sample 230/34.5 kV pooling substation	Sample client	Sample site	0	4 Nov 2026

Document no.	Prepared	Checked	Approved
SSL-C-BOM-001	Sample engineer	Sample engineer	Sample engineer

Rev	Date	Description	By
0	4 Nov 2026	Issued	Sample engineer

230/34.5 kV pooling substation, 250 MW. Quantities from the design. No prices. Structure steel is an estimate. Equipment seismic qualification: IEEE 693-2018, moderate level. Verify the makes before use.

HV switchyard

No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
1	SF6 circuit breaker, 3-pole	245 kV, BIL 900 kVp, 50 kA 1 s, 2000 A, spring operated	set	5	0	5	Hitachi Energy, Siemens Energy, GE Vernova
2	SF6 circuit breaker spare pole	245 kV, BIL 900 kVp, 50 kA 1 s, one interrupter pole of the breaker above	ea	0	1	1	Hitachi Energy, Siemens Energy, GE Vernova
3	Disconnect switch, horizontal-break, 3-phase, motor operated	245 kV, BIL 900 kVp, 50 kA 1 s, 2000 A, without grounding switch	set	12	0	12	Hitachi Energy, Siemens Energy, GE Vernova
4	Disconnect switch, horizontal-break, 3-phase, with 1 grounding switch	245 kV, BIL 900 kVp, 50 kA 1 s, 2000 A	set	3	0	3	Hitachi Energy, Siemens Energy, GE Vernova
5	Current transformer, single phase	245 kV, BIL 900 kVp, 50 kA 1 s, 2000:5 A MR, 5 cores: 0.15B-1.8, 0.15B-1.8, C800, C800, C800, 45 VA	ea	15	3	18	Hitachi Energy, Siemens Energy, GE Vernova
6	Coupling capacitor voltage transformer, single phase	245 kV, BIL 900 kVp, 50 kA 1 s, 230/√3 : 115/√3 V, 3 secondaries: 0.15, 0.3, 1.2, 50 VA	ea	9	3	12	Hitachi Energy, Siemens Energy, GE Vernova
7	Surge arrester, station class, with counter	180 kV rated, 10 kA	ea	9	3	12	Hitachi Energy, Siemens Energy, To be named by the owner
8	Bus post insulator	245 kV, solid core, 8 kN	ea	48	5	53	Sediver, To be named by the owner
9	Aluminum tube, 4" IPS (OD 4.5 in)	AA 6101-T6, main bus and interconnection	ft	2694	135	2829	To be named by the owner
10	Clamps, connectors and spacers	to suit tube and equipment terminals	lot	1	0	1	To be named by the owner

Transformers

No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
11	Power transformer, 3-winding	168 MVA, 230/34.5 kV, YNyn0 + d tertiary, Z 12.5 %, LTC ±10 %, ONAN/ONAF/ONAF 101/135/168 MVA	ea	2	0	2	Hitachi Energy, Siemens Energy, GE Vernova
12	Neutral grounding resistor	34.5 kV, 1000 A for 10 s, 19.92 Ω	ea	2	0	2	To be named by the owner

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No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
13	Surge arrester at transformer LV terminals	30 kV rated, 10 kA	ea	6	3	9	Hitachi Energy, Siemens Energy, To be named by the owner

34.5 kV switchgear

No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
14	34.5 kV indoor switchgear: Incomer panel, 3000 A VCB	38 kV, 40 kA 2 s, bus 3000 A	ea	2	0	2	Siemens, Schneider Electric, ABB
15	34.5 kV indoor switchgear: Feeder panel, 1200 A VCB	38 kV, 40 kA 2 s, bus 3000 A	ea	17	0	17	Siemens, Schneider Electric, ABB
16	34.5 kV indoor switchgear: Bus PT panel	38 kV, 40 kA 2 s, bus 3000 A	ea	2	0	2	Siemens, Schneider Electric, ABB
17	34.5 kV indoor switchgear: Bus-section panel set (CB + riser)	38 kV, 40 kA 2 s, bus 3000 A	ea	1	0	1	Siemens, Schneider Electric, ABB

STATCOM and filters

No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
18	Static synchronous compensator (STATCOM)	±41.5 Mvar, 34.5 kV, with coupling transformer / reactor	ea	2	0	2	Hitachi Energy, Siemens Energy, GE Vernova
19	Harmonic filter bank	34.5 kV, tuned C + L, rating per harmonic study	ea	2	0	2	Hitachi Energy, Siemens Energy, To be named by the owner

Structures

No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
20	Line gantry (2 towers + beam)	galvanized lattice, beam 52.5 ft, peaks 62.3 ft	ea	1	0	1	To be named by the owner
21	Shield-wire tower / gantry peak	galvanized lattice, 62.3 ft	ea	8	0	8	To be named by the owner
22	Equipment support structure	galvanized, for CT / CCVT / surge arrester (single phase)	ea	33	0	33	To be named by the owner
23	Disconnect switch support structure	galvanized, per pole	ea	45	0	45	To be named by the owner
24	Bus post insulator support	galvanized, 22 ft	ea	48	0	48	To be named by the owner
25	Structural steel, galvanized (estimate)	structural steel, hot-dip galvanized	t	148.5	0	148.5	To be named by the owner

Grounding

No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
26	Ground grid conductor, bare copper	400 kcmil, soft-drawn, exothermic connections, buried at 1.5 ft	ft	46 580	0	46 580	To be named by the owner
27	Ground rod, copper-clad steel	0.75 in × 10 ft	ea	154	0	154	To be named by the owner

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No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
28	Grounding riser, bare copper	400 kcmil, 2 × 10 ft per structure	ft	1940	0	1940	To be named by the owner

Lightning protection

No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
29	Shield wire, galvanized steel	7-strand galvanized steel shield wire, 0.144 in strands, with tension fittings	ft	1486	0	1486	To be named by the owner
30	Lightning mast	82 ft, galvanized, with spike	ea	17	0	17	To be named by the owner

Station service

No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
31	Station service transformer	225 kVA, 34.5/0.48 kV, Dyn1	ea	2	0	2	Schneider Electric, Siemens, To be named by the owner
32	Standby generator with automatic transfer switch	250 kVA, 480Y/277 V, 0.8 pf	ea	1	0	1	To be named by the owner
33	Battery bank, vented lead-calcium	300 Ah at the 8 h rate, 60 cells, 125 V	set	2	0	2	To be named by the owner
34	Battery charger	125 V DC, 63 A	ea	2	0	2	To be named by the owner
35	480Y/277 V AC switchboard, 2 sections with bus coupler	3 incomers (2 station service TR + generator), outgoing feeders per load group	ea	1	0	1	Schneider Electric, Siemens, ABB
36	125 V DC panelboard, 2 sections with bus coupler	2 chargers + 2 batteries, outgoing feeders	ea	1	0	1	Schneider Electric, Siemens, ABB

Civil

No.	Item	Specification	Unit	Qty	Spares	Total qty	Makes
37	Roads (aggregate base, asphalt)	13.1 ft internal and peripheral, 23 ft transformer road	ft²	34 326	0	34 326	To be named by the owner
38	Chain-link fence	8 ft high with 19.7 ft gate	ft	2205	0	2205	To be named by the owner
39	Gravel (surface layer)	3000 Ω·m, 3.94 in thick	yd³	3827	0	3827	To be named by the owner
40	Control and switchgear building	reinforced concrete, rooms per layout	ft²	6975	0	6975	To be named by the owner

Shield wire: 1486 ft includes 3 % for sag and jumpers over the 1443 ft of shield wire in the lightning protection calculation.

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