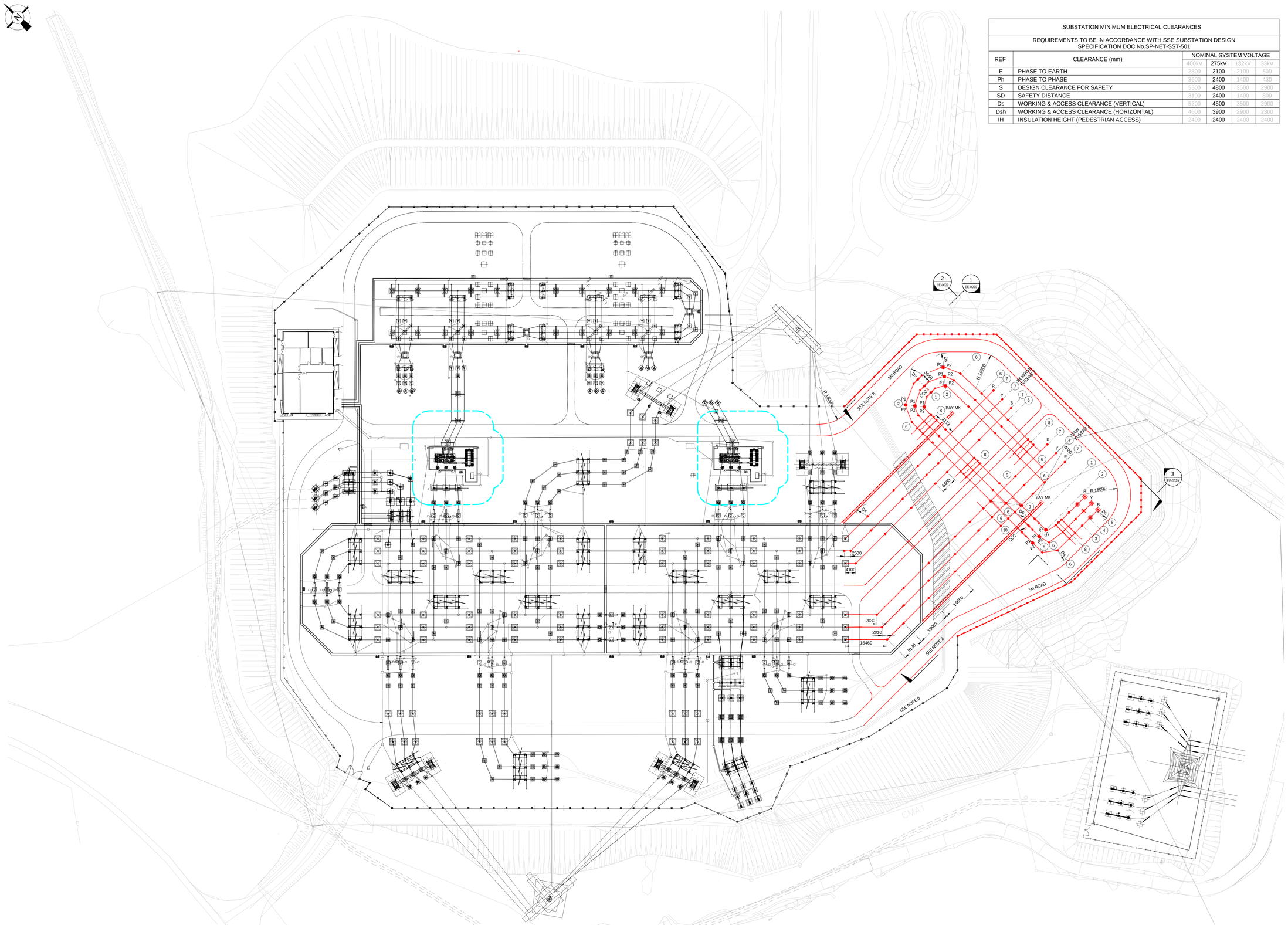
SUBSTATION MINIMUM ELECTRICAL CLEARANCES					
REQUIREMENTS TO BE IN ACCORDANCE WITH SSE SUBSTATION DESIGN SPECIFICATION DOC No.SP-NET-SST-501					
REF	CLEARANCE (mm)	NOMINAL SYSTEM VOLTAGE			
		400kV	275kV	132kV	33kV
E	PHASE TO EARTH	2800	2100	2100	500
Ph	PHASE TO PHASE	3600	2400	1400	430
S	DESIGN CLEARANCE FOR SAFETY	5500	4800	3500	2900
SD	SAFETY DISTANCE	3100	2400	1400	800
Ds	WORKING & ACCESS CLEARANCE (VERTICAL)	5200	4500	3500	2900
Dsh	WORKING & ACCESS CLEARANCE (HORIZONTAL)	4600	3900	2900	2300
IH	INSULATION HEIGHT (PEDESTRIAN ACCESS)	2400	2400	2400	2400



OVERALL SUBSTATION LAYOUT

1:500 0 25m 50m

Notes

1. ALL EXISTING INFORMATION BASED ON DRAWING N57_1110_01_05 M65_1104_1011_00 AND M65_1104_1027_01
2. THE KNOCKNAGAEL EXTENSION HAS BEEN DESIGNED USING 275kV EQUIPMENT AND CLEARANCES UPON THE REQUEST OF SSEN. THIS HAS BEEN ADHERED TO WHERE PRACTICAL GIVEN THE EXISTING SITE CLEARANCES FOR 400kV.
3. EQUIPMENT CLEARANCES TO BE VERIFIED DURING DESIGN DEVELOPMENT ONCE NATIVE, AS-BUILT FILES BECOME AVAILABLE.
4. KNOCKANGAEL SUBSTATION RATING 275kV 4000A 40kA 1S.
5. ALL SURVEY INFORMATION IS REFERENCED TO ORDNANCE SURVEY NATIONAL GRID OSGB36.
6. BEAULY CABLES RUN IN VERGE, CABLES TO BE INDICATED ON FINAL DRAWING FOLLOWING GI SURVEY.
7. SUBSTATION COMPOUND TO BE EXTENDED TO ACCOMMODATE NEW BUSBARS AND BUS SECTIONS. CIVIL WORKS WILL BE REQUIRED TO CREATE A LEVEL GROUND AREA FOR THIS EXTENSION.
8. EXISTING CABLES MAY REQUIRE ADDITIONAL PROTECTION MEASURES WHERE NEW SITE PERIMETER ROAD CROSSES THEIR ROUTE. ENERGYLINE TO DETERMINE SPECIFIC CABLE PROTECTION REQUIREMENTS.
9. IN THE ABSENCE OF AN SF6 FREE CIRCUIT BREAKER GA, AN SF6 FILLED EQUIVALENT HAS BEEN USED AS THE BASIS FOR THIS LAYOUT.
10. FIRE DAMAGE ZONES SHOWN FOR EXISTING SGTs ARE APPROXIMATED BASED ON THE DIMENSIONS OF EXISTING BUND AS SHOWN IN N57_1110_ 1001_01_05 AND GUIDANCE DETAILED IN TG-PS-777 & PR-NET-SST-004. ACTUAL DIMENSIONS TO BE VERIFIED AS PART OF SURVEY ACTIVITIES.
11. EXISTING PALISADE FENCE SHALL BE EXTENDED ALL AROUND THE NEW SUBSTATION EXTENSION, EXISTING FENCE GRADE AND HEIGHT SHALL BE CONFIRMED BY SSE (CURRENTLY ASSUMED TO BE GRADE 2b, HEIGHT OF 2.4m).
12. THE DRAWING SHOWS SOUTHERN EXTENSION OF THE SUBSTATION ONLY. PREFERRED SIDE FOR EXTENSION CONFIRMED BY SSE.
13. THIS DESIGN IS IN LINE WITH THE REQUIREMENT FOR A NON-FIRM CONNECTION AND DETAILS SHOWN ON THIS DRAWING ARE LIMITED TO HV PRIMARY PLANT DESIGN DOES NOT TAKE INTO ACCOUNT EFFECT OF THE DESIGN CHANGE ON EARTHWORKS AND DRAINAGE. A SEPARATE ASSESSMENT IS REQUIRED TO DETERMINE WHERE THE EXCAVATED MATERIAL COULD POTENTIALLY BE REDISTRIBUTED WITHIN THE EXISTING PROPERTY BOUNDARY. ANY POTENTIAL REDISTRIBUTION OF EXCAVATED MATERIAL HAS NOT BEEN SHOWN ON THIS DRAWING.

Key to symbols

- EXISTING EQUIPMENT
- PROPOSED NEW EQUIPMENT
- FIRE DAMAGE ZONE
- EXISTING CABLE
- EXISTING CIVIL ELEMENTS
- EXISTING EARTHWORKS
- NEW EARTHWORKS
- MEWP CROSSOVER POINT TRENCH COVER TO BE B125 TYPE AS PER BS EN 124 OR EQUIVALENT
- 2 METRES CONSTRUCTION EXCLUSION ZONE FOR EXISTING 275kV BEAULY CABLE CIRCUIT
- NEW TRENCH EXTENSION
- CCC CIRCUIT BREAKER CENTRAL CONTROL CUBICLE
- BAY MK BAY MARSHALLING KIOSK

Ref	Equipment Description
1	400kV Circuit Breaker
2	275kV Current Transformer
3	275kV Capacitive Voltage Transformer
4	275kV Surge Arrester
5	275kV Cable Sealing End
6	275kV Post Insulator (Low Level)
7	400kV Post Insulator (High Level)
8	275kV RCP Disconnector (with 2 Earth Switch)
9	400kV Pantograph Disconnector (with Earth Switch)
10	400kV Earth Switch

EXISTING BUSBAR/PLANT RATING AIS: 400kV, 4000A, 50Hz, 40kA - 1sec TBC

RED JOHN FEEDER BAY AIS: 275kV, 3150A, 50Hz, 40kA - 1sec

BUS-COUPLER BAY AIS: 275kV, 3150A, 50Hz, 40kA - 1sec TBC

Reference drawings

M65_1104_1011_00	ELECTRICAL LAYOUT USING 400kV PRIMARY EQUIPMENT IN THE 275KV SUBSTATION
106510-MMD-00-XX-DR-EE-0029	ELECTRICAL SECTIONS - AIS COMPOUND
106510-MMD-00-XX-DR-EE-0028	KNOCKNAGAEL EXTENSION ELECTRICAL LAYOUT DRAWING EQUIPMENT TO BE REMOVED SHEET 1

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	17.10.23	SS	DRAFT OF NEW DESIGN DUE TO REQUIREMENT CHANGE FROM CLIENT	GR	HS

Status Stamp

FOR COMMENTS

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Client

Scottish & Southern Electricity Networks

Project Name
RED JOHN CONNECTION

Site Name
KNOCKNAGAEL SUBSTATION

Title
KNOCKNAGAEL EXTENSION ELECTRICAL LAYOUT DRAWING PROPOSED EQUIPMENT SHEET 2 OF 2

Designed	H. SINGH	BG	Eng. Check	G. ROSSI	GR
Drawn	S. SIVA	DB	Coordination	J. KENSALL	JK
Dwg. Check	S. BANERJEE	SB	Approved	H. SMITH	HS

MMD Project Number 106510	Scale at A0 1:500	Security STD
Originator Drawing Number 106510-MMD- 00-XX-DR-EE-0028		Suit. Code S3
SSEN Drawing Number TBC		Rev P1