



**The Shell Petroleum Development Company
of Nigeria Ltd.**

Project **Assa North - Ohaji South Project**

Originating Company **The Shell Petroleum Development Company of Nigeria Ltd.**

Document Title **ELECTRICAL CABLE OPTIMIZATION REPORT FOR ANOH PROJECT**

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Revision History is shown next page

Rev No.	Date of Issue	Status Description	Originator	Checker	Approver
R01	01/03/2022	Issued For Review	Adepoju, B	Otame, E	Emmanuel, S

ADDITIONAL AGREEMENT/APPROVAL RECORD

Party	Ref Ind	Name	Sign	Date

Revision Philosophy

All FEED documents for review will be issued at R01, with subsequent R02, R03, etc as required with status IFR or IFA

All revisions approved for issue or design will be issued at A01, with subsequent A02, A03, etc as required with status AFD.

All Detailed design documents for review will be issued at D01, with subsequent D02, D03, etc as required Documents approved for Construction will be issued at C01, C02, and C03 respectively with status AFC.

Revisions approved for Tender will be issued as T01, with subsequent come as T02, T03 etc with status AFT

All revisions approved for Purchase will be issued as P01, with subsequent P02, P03, etc with status AFP

All Cancelled documents will be issued at X01, X02, and X03 respectively with status CAN.

Documents or drawings revised as “As built” will be issued as Z01, Z02, Z03 etc with status ASB.

Narrative sections revised from previous approved issues are to be noted in the table below and/or highlighted in the RH margin (using the appropriate revision status) thus: | A02

Previous revision details to be removed from the cover page at subsequent issues

Drawings/diagrams revised from previous approved issues are highlighted by 'clouding' the affected areas and by the use of a triangle containing the revision status.

Revision History

Revision No.	Date of issue	Reason for change

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Reference documents

ANG-TPG-GEN-EA-4308-10002	HV Cable schedule - PTF
ANG-TPG-GEN-EA-4308-10001	LV Cable schedule - PTF
ANG-SEDO-ASNCP-EA-4308-00001	Cable schedule - CEIP
V811.9.0003-00-L013	Removal SS-107

Cable/Accessories

Optimization Cost - Cable/Accessories			
PTF - Optimization	CEIP - Optimization	Total - Optimization	Currency
209,540.10	0	209,540.10	USD
110,521,870.13	274,834,067.20	385,355,937.33	NGN

Substation (SS-107)

Optimization Cost - Substation (SS-107)	Currency
361,088.00	Euro

Future Optimization

Optimization Cost - Projection	Currency
22,586,817.33	NGN

Electrical Cable Optimization																	
Mat Group	Disc Item No	DESCRIPTION	UNIT	Cable Tag	QTY REQUIRED (LV cable schedule C02)	Qty Ordered	Balance	Comment	Additional Material/Modification Required for Optimization	Qty(m)		Unit cost	Cost of Excess cable	Optimization Cost			
										Excess	Optimized			PTF - Optimization	CEIP - Optimization	Total - Optimization	Currency
HV CABLES	5.1.1	3C × 185mm² Copper conductors, XLPE insulation, Steel wire armor .	m		270	770	500	•DED requirement: 270m	-	500	0	155.73	77,865.00	0	0	0	USD
HV CABLES	5.1.5	3C × 25mm² Copper conductors, XLPE insulation, Steel wire armor	m	ANG1-C0063-1 ANG1-C0063-2 ANG1-C0064-1 ANG1-C0064-2 ANG1-C0067-1 ANG1-C0067-2 ANG1-C0068-1 ANG1-C0068-2	9,500	24750	15,250	•DED requirement: 7250m •2250m of 3x25mm² to be utilized to replace 3x35mm² and 3x50mm² where required. •2runs of 3x25mm² required for replacement •Affected cables are: -SS-100 to TR-102CN01 (SS-101) -SS-100 to TR-102CN02 (SS-101) -SS-100 to TR-105CN01 (SS-105)		17,500.00	2,250.00	88.55	1,549,625.00	199,237.50	0	199,237.50	USD
HV CABLES ACCESSORIES	5.5.5	11kV Raychem termination kit for 3c x 25mmsq cable. (3M or Raychem)	set	ANG1-C0063-1 ANG1-C0063-2 ANG1-C0064-1 ANG1-C0064-2 ANG1-C0067-1 ANG1-C0067-2 ANG1-C0068-1 ANG1-C0068-2	30	110	80	•DED requirement: 20set Additional 10set to be used for optimization	-	90.00	10.00	1,030.26	92,723.40	10,302.60	0	10,302.60	USD
HV CABLES ACCESSORIES	5.5.6	11kV Raychem termination kit for 1c x 185mmsq cable. (3M or Raychem)	set		40	90	50	•DED requirement: 40set	-	50.00	0	1,030.26	51,513.00	0	0	0	USD
HV CABLES ACCESSORIES	5.5.7	11kV Raychem termination kit for 3c x 185mmsq cable. (3M or Raychem)	pcs		40	45	5	•DED requirement: 40set	-	5.00	0	1,144.74	5,723.70	0	0	0	USD
LV CABLES	6.1.3	4 × 2.5mm² Copper Conductor, XLPE insulation, SWA	m	ANG1-N1543,ANG1-N5503, ANG1-N5504, ANG1-N5510 to 5514, ANG1-N5540 to 5543, ANG1-N5546 to 5550, ANG1-N5553 to 5554, ANG1-N5556	13,933	8100	-5,833	•Bal. cable to replace 4G2.5mm² (Item 6.1.4 of the integrated mat. list) •Quantity include 4G2.5mm² 5833mtrs of 4G2.5mm² to be procured •Affected cables tags to be sleeved	•Material required PVC cable sleeve suitable for 2.5mm² cable (for colour identification) - Green/yellow PVC cable sleeve:17mtrs	4,010.00	4,010.00	2,872.45	11,518,524.50	11,518,524.50	0	11,518,524.50	NGN
LV CABLES	6.1.7	3 × 4mm² Copper Conductor, XLPE insulation, SWA	m	ANG1-N2597, ANG1-N2598, ANG1-N6501 to 6514	810	4130	3,320	•Bal. cable to be utilized for 3G4mm² (Item 6.1.9 of the integrated mat. list)	•Material required PVC cable sleeve suitable for 4mm² cable (for colour identification) - Green/yellow PVC cable sleeve:1.4mtrs	3,430.00	3,430.00	3,268.30	11,210,269.00	11,210,269.00	0	11,210,269.00	NGN
LV CABLES	6.1.12	3 × 6mm² Copper Conductor, XLPE insulation, SWA	m	ANG1-N5558,ANG1-N5560,ANG1-N5569, ANG1-N6519,ANG1-N6555,ANG1-F6584,ANG1-F6597,ANG1-F6607,ANG1-N8508, ANG1-N8523,ANG1-N1303, ANG1-N1304	2,652	6500	3,848	•Cable to also replace 3G6mm² •Quantity include 3G6mm² •Affected cables tags to be sleeved	•Material required PVC cable sleeve suitable for 6mm² cable (for colour identification) - Green/yellow PVC cable sleeve:2mtrs - Blue PVC cable sleeve:2mtrs	5,600.00	1,752.00	4,143.23	23,202,088.00	7,258,938.96	0	7,258,938.96	NGN
LV CABLES	6.1.14	4 × 6mm² Copper Conductor, XLPE insulation, SWA	m	ANG1-N1507,ANG1-N1508, ANG1-N1511 to ANG1-N1513, ANG1-N1525 to ANG1-N1528	3,806	4140	334	•Cable to also replace 4G6mm² •Quantity include 4G6mm² •Affected cables tags to be sleeved	•Material required PVC cable sleeve suitable for 6mm² cable (for colour identification) - Green/yellow PVC cable sleeve:2mtrs - Blue PVC cable sleeve:2.8mtrs	2,940.00	2,606.00	5,186.65	15,248,751.00	13,516,409.90	0	13,516,409.90	NGN
LV CABLES	6.1.16	3 × 10mm² Copper Conductor, XLPE insulation, SWA	m		2,343	3932	1,589	•Cable to also replace 3G10mm² •Quantity include 3G10mm²	•Material required PVC cable sleeve suitable for 10mm² cable (for colour identification) - Green/yellow PVC cable sleeve:1.2mtrs - Blue PVC cable sleeve:1.2mtrs	1,589.00	-	6,004.74	9,541,531.86	-	0	-	NGN
LV CABLES	6.1.18	4 × 10mm² Copper Conductor, XLPE insulation, SWA	m	ANG1-N2521,GT1-XCM6212M,GT1-XC7103	2,189	1100	-1,089	•Cable to also replace 4G10mm² •Quantity include 4G10mm² 1089mtrs of 4G10mm² to be procured •Affected cables tags to be sleeved	•Material required PVC cable sleeve suitable for 10mm² cable (for colour identification) - Green/yellow PVC cable sleeve:3.2mtrs	430.00	430.00	7,446.04	3,201,797.20	3,201,797.20	0	3,201,797.20	NGN
LV CABLES	6.1.21	4 × 16mm² Copper Conductor, XLPE insulation, SWA	m	ANG1-N6501-1 ANG1-N6501-2 ANG1-N6536-1	517	600	83	•Change in quantity is due to design update	-	330.00	247.00	11,215.75	3,701,197.50	2,770,290.25	0	2,770,290.25	NGN
LV CABLES	6.1.30	4 × 50mm² Copper Conductor, XLPE insulation, SWA	m	ANG1-N1515 to ANG1-N1517,ANG1-N1572,ANG1-N2504 to ANG1-N2506, ANG1-N2513, ANG1-N2516 to ANG1-N2518, ANG1-N2527, ANG1-N2537, ANG1-N2538	2,244	2500	256	•Cable to also replace 4G50mm² (Item 6.1.31 of the integrated material list) •Quantity include 4G50mm² •cable sleeve to be procured for colour identification	•Material required PVC cable sleeve suitable for 50mm² cable (for colour identification) - Green/yellow PVC cable sleeve:0.2mtrs	2,400.00	2,144.00	28,472.78	68,334,672.00	61,045,640.32	0	61,045,640.32	NGN
LV CABLES	6.1.39	3 × 120mm² Copper Conductor, XLPE insulation, SWA	m		66	1000	934	•DED requirement: 130m •Cable to also replace 3G120mm² •Quantity include 3G120mm² •PVC cable sleeve to be procured for colour identification	•Material required - cable sleeve (for colour identification)	934.00	-	50,230.32	46,915,118.88	0	0	0	NGN
LV CABLES	6.1.42	3 × 150mm² Copper Conductor, XLPE insulation, SWA	m		2,552	4000	1,448	•DED requirement: 3200m	-	1,448.00	-	61,870.34	89,588,252.32	0	0	0	NGN
LV CABLES	6.1.43	3 × 185mm² Copper Conductor, XLPE insulation, SWA	m	ASA-OBILE-2100 ASA-OBILE-2200 ASA-OBILE-2300 ASA-OBILE-2400 ASA-ASSA-2100 ASA-ASSA-2200 ASA-ASSA-2300 ASA-ASSA-2400 ASA-ASSA-2500 ASA-AWARRA -2100 ASA-AWARRA -2200 ASA-AWARRA -2300 ASA-AWARRA -2400 ASA-AWARRA -2500 ASA-AWARRA -2600 ASA-AWARRA -2700 ASA-OCHIA -2100 ASA-OCHIA -2200 ASA-OCHIA -2300	2,662	7500	4,838	DED requirement is 1800m •880m for CEIP		5,718.00	880.00	76,049.89	434,853,271.02	0	66,923,903.20	66,923,903.20	NGN

LV CABLES	6.1.45	1 × 240mm² Copper Conductor, XLPE insulation	m	ASA-OBILE-2101, ASA-OBILE-2102, ASA-OBILE-2103, ASA-OBILE-2201, ASA-OBILE-2202, ASA-OBILE-2203, ASA-OBILE-2301, ASA-OBILE-2302, ASA-OBILE-2303, ASA-OBILE-2401, ASA-OBILE-2402, ASA-OBILE-2403, ASA-ASSA-2101, ASA-ASSA-2102, ASA-ASSA-2103, ASA-ASSA-2201, ASA-ASSA-2202, ASA-ASSA-2203, ASA-ASSA-2301, ASA-ASSA-2302, ASA-ASSA-2303, ASA-ASSA-2401, ASA-ASSA-2402, ASA-ASSA-2403, ASA-ASSA-2501, ASA-ASSA-2502, ASA-ASSA-2503, ASA-AWARRA - 2101, ASA-AWARRA - 2102, ASA-AWARRA -	12,045	27900	15,855	•DED requirement: 7000m 7200m to be utilized for CEIP			22,455.00	6,600.00	31,501.54	707,367,080.70	0	207,910,164.00	207,910,164.00	NGN
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1,424,682,553.98110,521,870.13 ₦274,834,067.20385,565,477.43

Cable Optimization Cost (Summary)			
PTF - Optimization	CEIP - Optimization	Total - Optimization	Currency
209,540.10	0	209,540.10	USD
110,521,870.13	274,834,067.20	385,355,937.33	NGN

SS-107 - Design Initiation

SS-107 is a UPS building designed to supply power to charms and auxiliary loads at SS-102.

The building accommodate 4kVA ,8hrs, 230Vac/110Vdc UPS system, HVAC system, F&G, Telecom cabinet and Lighting and small power DB.

The dimensions of the building is 10x3.5 mtrs

SS-107 - Optimization

For optimization, SS-102 was designed to accommodate 4kVA ,8hrs, 230Vac/110Vdc UPS system (DB-102F03). This UPS (DB-102F03) supply power to the charms, PAS cabinet and SB-102n01 auxiliary loads.

Consequently, SS-107 was de-scope

Cost Saving

361,088.00 Euro