

	<b>Detail Design</b>	<b>Eskom Telecommunications</b>
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## 1. Project Description

Erica SS is a new substation that will be built in Cape Peninsular Area close to R300 road. Erica SS Comms will be commissioned to Philippi SS. This project will follow Self-build process. The EPC contractor will buy equipment as per the BOQ and do installation as per the planning book. This project is dependent on WC Golden Triangle project (C.TXT0329).

## 2. Financial

Project Life Cycle Stage	Duration	Amount
CRA Costs excluding IDC for a duration of	0 MONTHS	
DRA Costs excluding IDC for a duration of	3 MONTHS	R 27 071
ERA Costs excluding IDC for a duration of	12 MONTHS	R 401 637
<b>Total Project Cost excluding IDC for a duration of</b>	<b>15 MONTHS</b>	<b>R 428 708</b>

## 4. Supporting Clauses

### 4.1 Scope

This document serves as a detail design for Erica SS Comms Project.

#### 4.1.1 Purpose

The purpose of this document is to give a detail design of Erica SS Comms Project on the optical access network OTN solutions which meet the customer requirements.

#### 4.1.2 Applicability

This document shall apply to Telecoms and other stake holders involved in this project.

### 4.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

#### 4.2.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] ST\_240-86458714: Generic Network Management Specification Standard
- [3] ST\_240-116376215: Optical Transport Network (OTN) Specification
- [4] 32-373: Information Security-IT/OT Remote Access Standard
- [5] ST\_240-164619548: OTN High Level Design
- [6] ST\_240-150755516: OTN OSN1800 AND OSN9800 Design Guide

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- [7] 240-70732272 MSAP Design Guide.
- [8] 240-56362336 Standards for the Installation of a Telecommunications Equipment Cabinet
- [9] 240-56872313 Radio Station Earthing and Bonding.
- [10] 240-84979963 DC Systems Design Guide for Telecommunications.
- [11] 240-56576361 Telecommunication Transport Network Equipment Installation and Commissioning Standard
- [12] 240-70783066 Telecoms Transport Network Design Standard
- [13] 240-70044602 Occupational Health & Safety (OHS) Baseline risk assessment.
- [14] 240-170000419 OT Voice Design Guide
- [15] 240-46264031 Fibre Optic Design Standard Substations
- [16] 240-70733995 Optical Distribution Frame / Patch Panel
- [17] 240-46263618 Labelling of Fibre-Optic Cables.

#### 4.2.2 Informative

- [1] 32-9: Definition of Eskom documents
- [2] 32-644: Definition of Eskom documents
- [3] 240-46263618 Labelling of fibre optic cables
- [4] 240-62629353 Specification for panel labelling standard rev 1 (stabilized)
- [5] 240-70733995 Optical distribution frame standard
- [6] 240-132190480 Telecommunications Equipment Installation Standard
- [7] 240-153473135 Installation Telecommunications cabinet
- [8] 474-65: Operating Manual of the Steering Committee of Wires Technologies (SCOT)
- [9] 240-110412152 Generic QA tick sheet for projects
- [10] 240-130567271 Information Technology User Requirement Specification

### 4.3 Definitions

#### 4.3.1 General

Not applicable

#### 4.3.2 Disclosure classification

**Controlled disclosure:** controlled disclosure to external parties (either enforced by law, or discretionary).

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#### 4.4 Abbreviations

Abbreviation	Description
DCM	Dispersion Compensation Module
DCN	Data Communication Network
DWDM	Dense Wavelength Division Multiplexing
ET	Eskom Telecommunications
ETSI	European Telecommunications Standards Institute
FD	Fibre Doctor
HLD	High Level Design
HWECC	Huawei Embedded Control Channel
IQA	Internal Quality Assurance
ITU	International Telecommunication Union
ITU-T	International Telecommunication Union - Telecommunication
LLD	Low Level Design
MCB	Miniature Circuit Breaker
NBI	North Bound Interface
NCE	Network Cloud Engine
NCE-T	Network Cloud Engine - Transmission
NMS	Network Management System
NPAE	National Planning and Application Engineering
OCH	Optical Channel
OD	Optical Doctor
OSNR	Optical Signal Noise Ratio
OSC	Optical Supervisory Channel
OTN	Optical Transport Network
POD	Proof of Delivery
REH	Regional Engineering Head
SDH	Synchronous Digital Hierarchy
SFP	Small Form-factor Pluggable
SME	Subject Matter Expert
TDRT	Telecomm Design Review Team
UAT	User Acceptance Test

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## 4.5 Roles and Responsibilities

### Contractor roles and responsibility

- The Contractor is responsible for procuring and installation of Telecoms equipment.
- The contractor to arrange with **ALTRON NEXUS** to do installation and commissioning of OTN equipment at Erica SS and Philippi SS.

### Telecoms OPS role and responsibility

- To commission MSAP, Router and all requested circuits for Erica SS.
- To connect at Philippi SS ADM to OTN 1800V.
- Together with **ALTRON NEXUS** ensure that MSAP E1's are working on OTN and the OTN is connected to the ADM.

## 4.6 Project Management

Eskom Project Manager:

- Appoint the required human resources for the execution of the project.
- Ensure the required equipment is ordered and delivered as per the BOQ.
- Manage project schedule and reporting.
- Ensure that appointed telecoms contractor is qualified to do installation.
- Arrangement with TX to connect DC supply from charger to new cabinets.
- Co-ordinate the installation and commissioning of the new equipment.
- To ensure QA is performed.
- Fibre Tests between Erica SS and Philippi SS to be handed to Eskom Telecommunications.
- Arrange for fibre witness test day between Telecoms and Contractor for Erica SS.
- Ensure the ATP is performed and signed off.
- Manage project budget and Ensure payment is actioned.
- Ensure compliance to SHEQ.
- Collect as built documentation from Contractor
- Close out the project.

Eskom Regional SHEQ:

- Safety file review and approval according to spec.
- Contractor induction.
- Conduct site SHEQ audits as and when required.
- Compile safety stats.
- Ensure QA is performed.

## 4.7 Related/Supporting Documents

[1] Main Portal of OTN Product:

<https://support.huawei.com/enterprise/en/category/transport-network-pid-1482607141779?submodel=doc>

[2] User Manual of OSN1800V:

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<https://support.huawei.com/hedex/hdx.do?docid=EDOC1100134773&lang=en&idPath=24030884%7C9856748%7C9858640%7C9858851%7C16311>

[3] User Manual of OSN9800 M12:

<https://support.huawei.com/hedex/hdx.do?docid=EDOC1100213658&lang=zh&idPath=24030884%7C9856748%7C9858640%7C19908355%7C23815286>

[4] User Manual of NCE-T:

<https://support.huawei.com/hedex/hdx.do?docid=EDOC1100197069&lang=en&idPath=24030884%7C250382907%7C250382939%7C251154397%7C250947393>

## 5. OTN Network Design

### 5.1 Network requirements understanding

The specific requirements for the Erica MTS Project are list as below:

NO.	Site Name	Direction	Distance (KM)	Capacity	FD	OD
1	Erica	Philippi SS	8	10G1W80	Y	Y
2	Pinotage	Stikland SS	22	10G1W80	Y	Y
3	Philippi	Acacia SS	12	10G1W80	Y	Y

### 5.2 DC Power Analysis

#### DC Power Consumption Summary

The typical power consumption is the normal working power consumption with dedicated chassis and service boards configured in standard 25°C environment temperature. The maximum power consumption is the power consumption with dedicated chassis and service boards configuration in an extreme 55°C environment temperature. The full configuration power consumption is the maximum power consumption when considers the expansion of the service boards to the full slots based on the current configuration. The DC power consumption is indicated on the table below.

**Table 1-1** DC power consumption summary of the OTN Equipment

NO.	Site Name	Typical Power Consumption (W)	Maximum Power Consumption (W)
1	Erica SS	568.3	871.3
2	Philippi SS	568.3	871.3
3	Pinotage	565	880

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### 5.2.1 Recommended MCB

The principle of selecting the MCB:

- 4.2.2.1. The rated current of MCB must larger than the load current to prevent current trigger.
- 4.2.2.2. Each OTN chassis considers dual power input.

NO.	Site Name	Chassis Name	Region	Cabinet No.	Max Power Consumption (W)	Margin	Current (A)	MCB(DC) Rated Current (A)
	Erica SS	OSN 1800V – 1	WC	Cabinet-1	568.3	20%	20	25
	Philippi SS	OSN 1800V-1	WC	Cabinet-1	568.3	20%	20	25
	Pinotage SS	OSN 1800V-1	WC	Cabinet-1	565	20%	20	25

### 5.3 Site Information

Table 1-2 Site name and site co-ordinates

Site Names	Site Co-ordinates
Erica SS	34° 01'1.5"S 18°36'12.4"E
Philippi SS	33°59'20.8"S 18°32'11.8"E
Pinotage SS	34°02'52.6"S 18°46'43.3"E

## 6. Link Design

### Design Reports

The following two signed documents are the input to this detailed design.

- 1) HLD signed document: OTN High Level Design 240-164619548 Rev2
- 2) OTN Design Guide signed document: ST\_240-150755516 OTN OSN 1800 9800 Rev 2

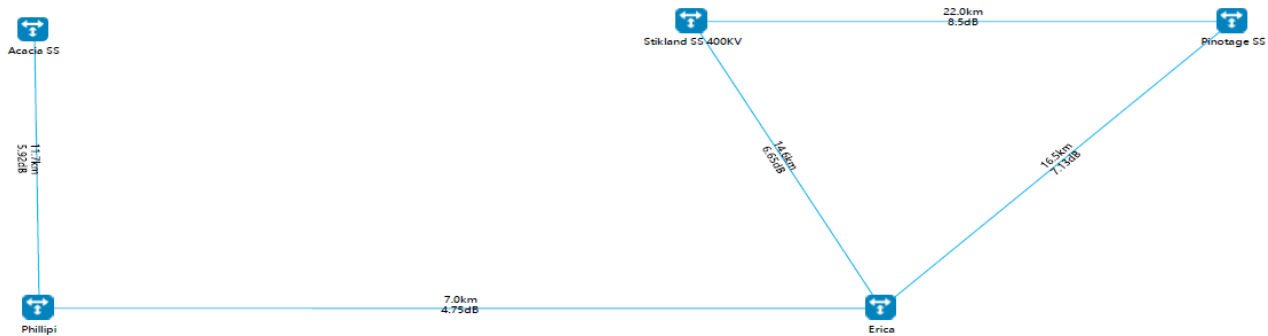
### 6.1.1 Network Architecture Overview

Figure 5-1 Topology of Erica SS Comms Project

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### 6.1.2 Fibre Design Parameters

Fibre attenuation: According to the onsite test report, 0.25 dB/Km is used for links that are not tested.

Link margin: The default value is 3 dB.

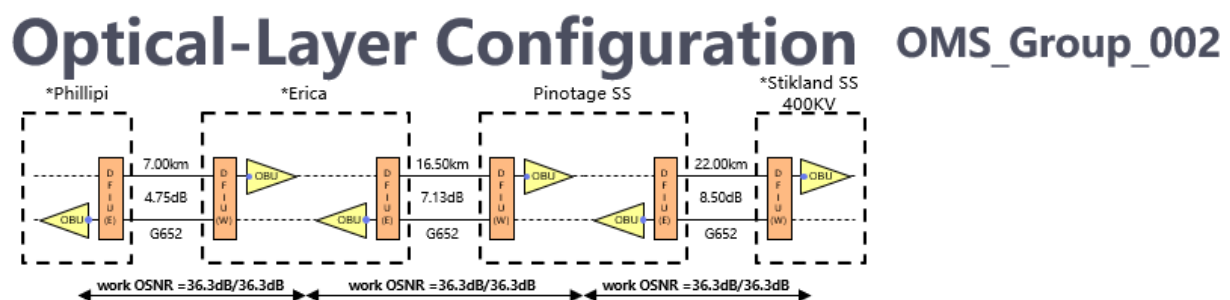
Table 5-1 shows the hop lengths, Fibre loss, Fibre margin and total loss considered in the network design.

**Table 5-1** Hop lengths, Fibre loss, Fibre margin and total loss

NO.	Source Site	Sink site	Distance	Attenuation	Attenuation Coefficient(dB/km)	Margin (dB)
1	Erica SS	Phillippi SS	7	0.25	4.75	3
2	Pinotage SS	Stikland SS	22	0.25	0.275	3

Note: The actual margin is for reference only, and everything is subject to actual conditions.

**Figure 5-2** Optical layer configuration of OMS Group 002



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### 6.1.3 Electrical Layer and Services Design

The network supports the following client-side services:

- 1、Interfaces used: 10GE /STM-64, STM-16, STM-1/4, GE, E1 interfaces

### 6.1.4 The Electrical layer boards used in the project

Model	Description
SL41Q	4 x STM-4/STM-1 processing board
SLNO	4-port STM-16, 8-port STM-4, or 8-port STM-1 line board
EG10	10*GE(SFP) Ethernet Processing Board
PL1D	32xE1(75&120ohm)/T1(100ohm) Electrical Interface Board
UNQ2	4*10G Universal Line Service Processing Board

## 7. Site Detail Design

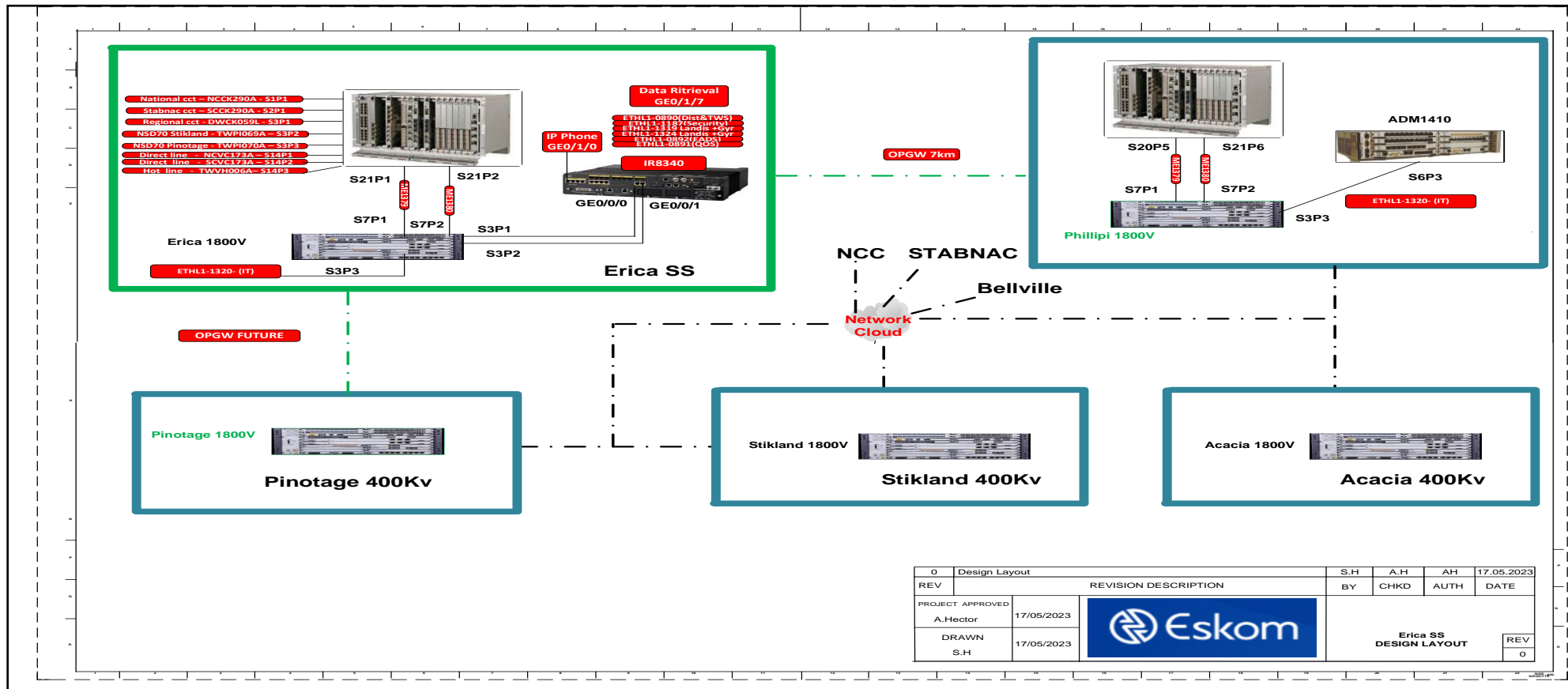
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## 7.1.1 Erica SS

## Propose design layout



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### 7.1.2 Site Installation Scope of Work (SOW)

#### Altron Nexus

- Installation of 1x OSN 1800V equipment into the OTN cabinet as indicated in the room layout.
- Install the equipment into the cabinet as per the Cabinet Layout section below.
- Terminate E1 cable on the TJF frame as indicated in the cabinet layout.
- Installation of earth cable to Eskom provided earth bar in building or cabinet.
- Installation of 4mm<sup>2</sup> dc power cable (blue/black) to OSN 1800V equipment.
- Do the installation checklist before powering.
- Power up of installed devices, cabinet doors must be removed if solid Eskom cabinets door are provided before power up. Testing of powered devices Optic fibre and LAN patching must be done.
- Final testing of solutions Build complete and UAT signoff
- NB: Eskom contractor will supply all DC source power in all cabinets. For the OTN equipment use the recommended cabinet buy Huawei.
- Commission the OTN equipment to Philippi SS.
- Make sure labelling is done clear for all installed equipment and patch leads.

#### Eskom contractor

- Provide and connect 50v DC in the comms cabinet 1 and comms cabinet 2.
- Install MSAP as shown in the cabinet layout refer to document (240-132190480 Telecommunication Equipment Installation Standard). Wire MSAP E1's as shown in the cabinet on 19inch IDF.
- Install 20 pair of 120R cable for E1's between OTN cabinet and Fox 615 cabinet and terminate it on 19-inch IDF.
- Install 10 pair cable from IDF to MSAP Fox 615 cabinet and terminate it on the 19inch IDF where there is a label tie cable on the drawing.
- Install 3\* 2 pair cable from IDF to the control room desk and terminated the cable on RJ11 test jack for the direct lines telephones. Install 3 analogue phones and place them on the desk. Label them as follow 1<sup>st</sup> telephone instrument Direct line to National control, 2<sup>nd</sup> instrument Direct line to Standby National Control and 3<sup>rd</sup> instrument Hot line to regional control. Terminate the telephone cable and connect it to the phone.
- Install IR8340 router as shown in the Cabinet layout. Install 24 core patch panel and duct cable between comms cabinet 1 and Fibre cabinet. Refer to document 240-46263618 - Labelling of Fibre-Optic Cables & 240-46264031 - Fibre Optic Design Standard Substations.
- Install 1\*cat5 cable for the IP telephone from the Router to the control room desk and terminate it on the wall close to the desk.
- Install 3\*cat 5 cable from the router to the office for the LAN terminate them on wall closer to the table label as follow: 1<sup>st</sup> cable for the LAN, 2<sup>nd</sup> & 3<sup>rd</sup> are for the telephones.
- Earthed all equipment and label the cabinets as per TX requirements (Comms cabinet 1, Comms cabinet 2 and Fiber Optic Cabinet). Install 1x power distribution panel in the comms

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cabinet 1 and comms cabinet 2. Fit power distribution panels with DC breaker ratings as per DC design requirements. For OTN equipment use DC breakers as indicated on page 9 on the table under 4.2.2.2. For the MSAP use DC 10Amps breakers.

### Telecommunications (Ops & FS)

Patch through the E1 tributaries between the Fox 615 and 1800V for Traffic and DCN traffic as shown below:

ABB FOX Links										
LinkNumber	Description	EquipmentType	DCN/Traffic/Mixed	LinkType	Site A	OTN 1800V	Fox Port	Site B	OTN 1800V	Fox Port
ME1379	Erica SS to Phillipi SS	MSAP - E1 Connection	DCN	MSAP - E1 connection	Erica SS	S7P1	S21P1	Phillipi SS	S7P3	S20P5
ME1380	Erica SS to Phillipi SS	MSAP - E1 Connection	Traffic	MSAP - E1 connection	Erica SS	S7P2	S21P2	Phillipi SS	S7P4	S21P3

- Commission MSAP and all requested circuits for Erica SS
- Circuit information and destination is displayed on page 26 under NMC.

Do the QA as per 240-110412152 - Generic QA tick sheet for projects

### Transmission Secondary Plant

Install 2 armoured cable 6 mm 2 core DC cables between 50V DC charger and comms Cabinet 1. First cable must be from charge1, and 2<sup>nd</sup> cable from charger 2. Terminate DC cables in the cabinet where OTN is installed comms cabinet 1 as per DC diagram and label accordingly.

Install 2 x armoured cable 6 mm 4 core DC cables between 50V DC charger and Comms Cabinet 2. First cable must be from charge1, and 2<sup>nd</sup> cable from charger 2. Terminate DC cables in the MSAP Fox 615 cabinet as per DC diagram and label accordingly.

#### 7.1.3 Room Layout

3 cabinets to be used for Telecoms equipment, Comms cabinet 1 for OTN Equipment, comms cabinet 2 for MSAP Fox 615 equipment and Fibre Optic Cabinet and they must be labelled as such.

#### 7.1.4 Cabinet Layout

The technical diagram illustrates the rack layout of 1x OSN 1800 V in the cabinet as per the cabinet layout principle. Refer to Erica comms cabinet 1 layout.

Note if existing cabinet is not perforated then cabinet doors must be removed before power on of Huawei OSN equipment and not to be re installed during the operation of the OSN equipment, refer to the cabinet design for clear pictures.

#### 7.1.5 OSN1800V Chassis Layout

The following figure shows layout of the OSN 1800v series Chassis Layout for Erica SS

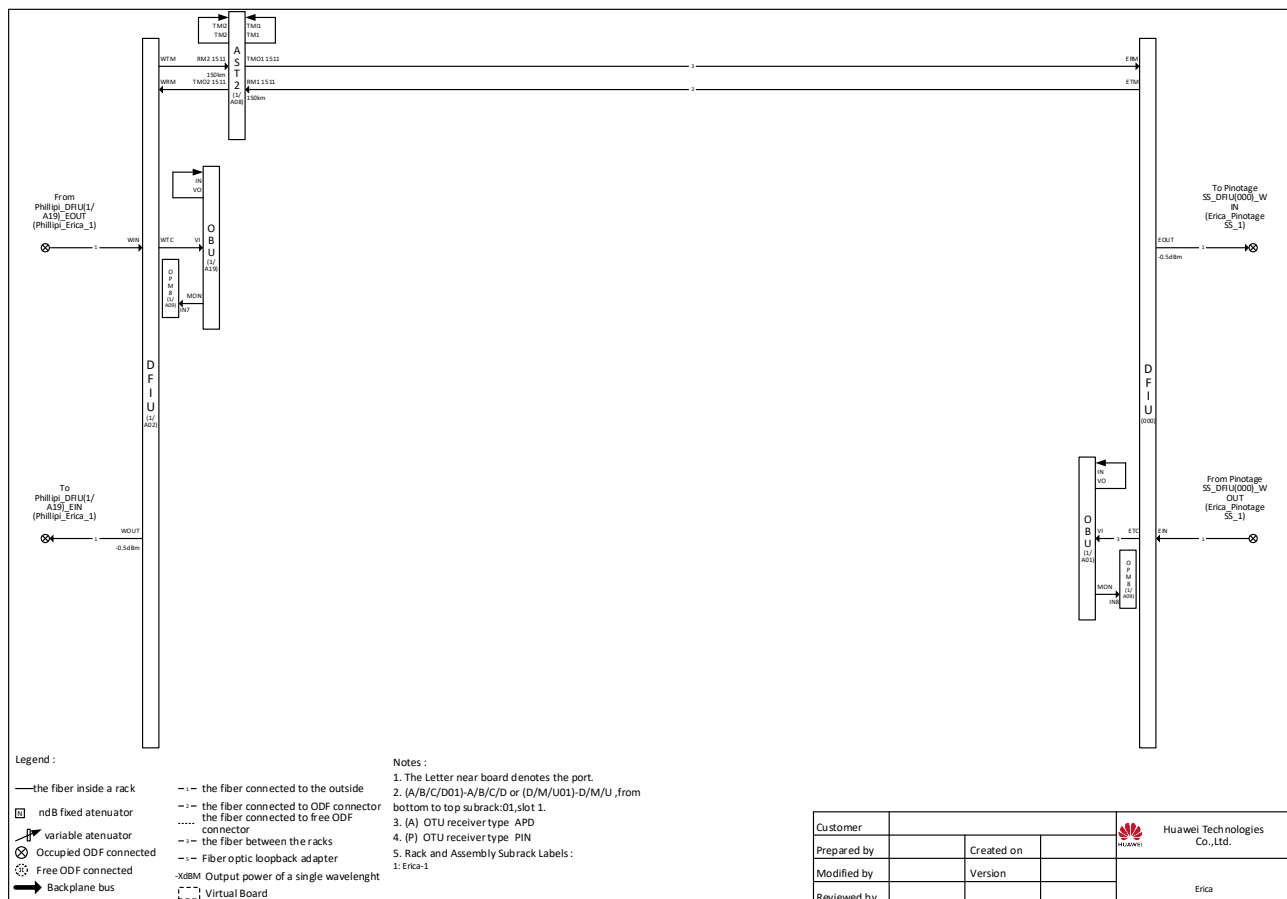
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Master- OSN 1800 V:TO Pinotage SS,Phillipi					
F A N	7	PL1D		14	UNQ2
	6	PL1D		13	UNQ2
	5	SL41Q		12	
	4	SLNO		11	
	16	UXCMS			
	15	UXCMS			
	3	EG10		10	OPM8
	2	DFIU		9	
	1	OBU		8	AST2
	17	PIU	18	PIU	19
Fiber Management Tray					

## OTN Fiber Connection



## 7.2 Philippi SS

### 7.2.1 Site Installation Scope of Work (SOW)

## Altron Nexus

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Installation of 1x OSN 1800V equipment into the OTN cabinet as indicated in the room layout. Install the equipment into the cabinet as per the Cabinet Layout section below.

Terminate E1 cable on the TJF frame as indicated in the cabinet layout.

Installation of earth cable to Eskom provided earth bar in building or cabinet.

Do the installation checklist before powering.

Power up of installed devices, cabinet doors must be removed if solid Eskom cabinets door are provided before power up. Testing of powered devices Optic fibre and LAN patching must be done.

Final testing of solutions Build complete and UAT signoff

NB: Eskom contractor will supply all DC source power in all cabinets. For the OTN equipment the cabinet must be used.

### Eskom contractor

Install 20pair of 120R cable between the Fox615 Cabinet and the OTN cabinet vertical C on the 19inch TJF.

Earthed all equipment and label the cabinets.

### Telecommunications (Ops & FS)

Patch through the E1 tributaries between the Fox 615 and 1800V for Traffic and DCN traffic as shown below:

ABB FOX Links										
LinkNumber	Description	EquipmentType	DCN/Traffic/Mixed	LinkType	Site A	OTN 1800V	Fox Port	Site B	OTN 1800V	Fox Port
ME1379	Erica SS to Philippi SS	MSAP - E1 Connection	DCN	MSAP - E1 connection	Erica SS	S7P1	S21P1	Philippi SS	S7P3	S20P5
ME1380	Erica SS to Philippi SS	MSAP - E1 Connection	Traffic	MSAP - E1 connection	Erica SS	S7P2	S21P2	Philippi SS	S7P4	S21P3

Do the QA as per 240-110412152 - Generic QA tick sheet for projects

### 7.2.2 OSN 1800V Chassis Layout for Philippi SS

Master- OSN 1800 V:TO Erica					
F A N	7	PL1D		14	UNQ2
	6	PL1D		13	UNQ2
	5	SL41Q		12	
	4	SLNO		11	
	16	UXCMS			
	15	UXCMS			
	3	EG10		10	
	2			9	OPM8
	1	OBU		8	AST2
	17	PIU	18	PIU	19
Fiber Management Tray					

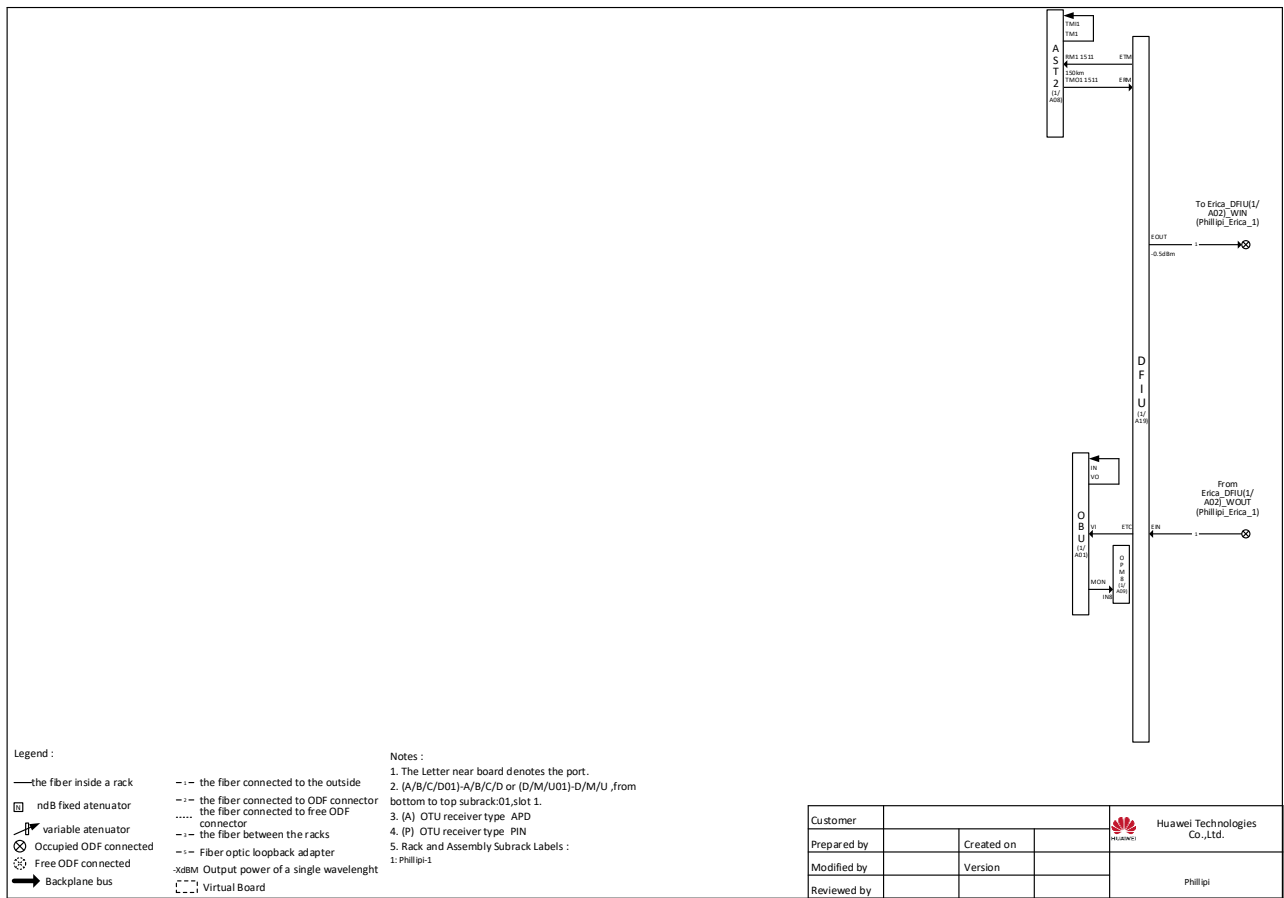
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Fiber Connection for Philippi SS



7.3 Acacia SS

Altron Nexus Scope

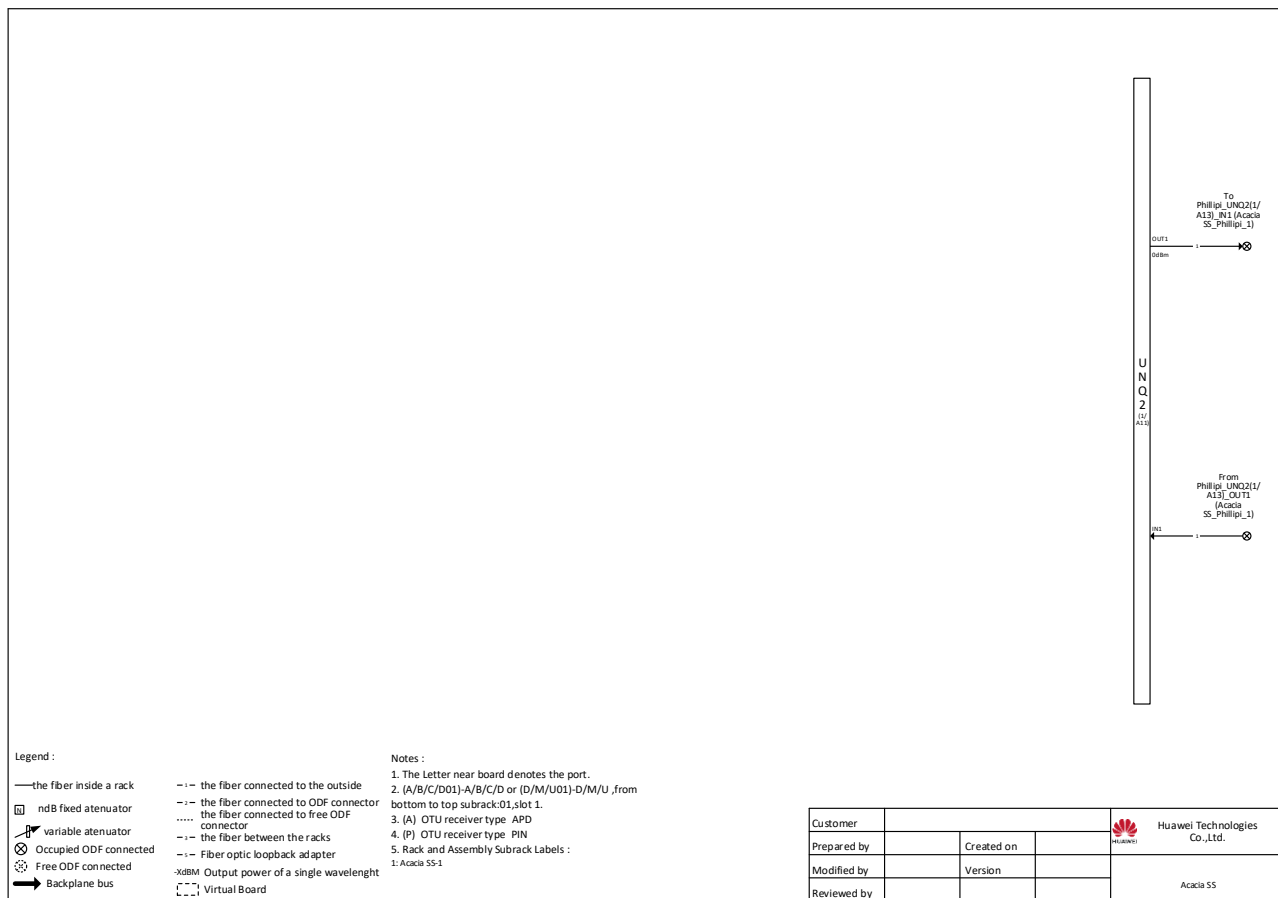
- Use available fiber pairs of the panel installed for Philippi SS to commission Philippi 1800V.

Fiber connection for Acacia SS

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## 7.4 Pinotage SS

### Site Installation Scope of Work (SOW)

#### Altron Nexus

- Installation of 1x OSN 1800V equipment into the OTN cabinet as indicated in the room layout. Install the equipment into the cabinet as per the Cabinet Layout section below.
  - Terminate E1 cable on the TJF frame as indicated in the cabinet layout.
  - Installation of earth cable to Eskom provided earth bar in building or cabinet.
  - Do the installation checklist before powering.
  - Power up of installed devices, cabinet doors must be removed if solid Eskom cabinets door are provided before power up. Testing of powered devices Optic fibre and LAN patching must be done.
  - Final testing of solutions Build complete and UAT signoff
  - NB: Eskom contractor will supply all DC source power in all cabinets. For the OTN equipment the cabinet must be used.
- 
- Commission OSN 1800V to Stikland SS 400KV.
  - Use fiber pairs 1 and 2 of the panel installed in the OTN Cabinet.
  - Use available fiber pairs to Stikland SS 400KV to commission 1800V.

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**Eskom contractor**

- Install DC supply cable from charger A and B for the OTN Cabinet.
- Earthed all equipment and label the cabinets.
- Install 2\*24 core fiber patch panel 1 must be installed in the OTN Cabinet as indicated in cabinet layout. The 2<sup>nd</sup> panel must be installed in the fiber cabinet as indicate in the layout.
- Install and terminate a duct cable between 2 panels mentioned on the above sentence.

**7.4.1 OSN 1800V Chassis Layout for Pinotage SS**

Master- OSN 1800 V:TO Stikland SS 400KV, Erica					
F A N	7	PLTD	14	UNQ2	
	6	PLTD	13	UNQ2	
	5	SL41Q	12		
	4	SLNO	11		
	16	UXCMS			
	15	UXCMS			
	3	EG10	10		
	2	OBU	9	OPM8	
	1	OBU	8	AST2	
	17	PIU	18	PIU	19
Fiber Management Tray					

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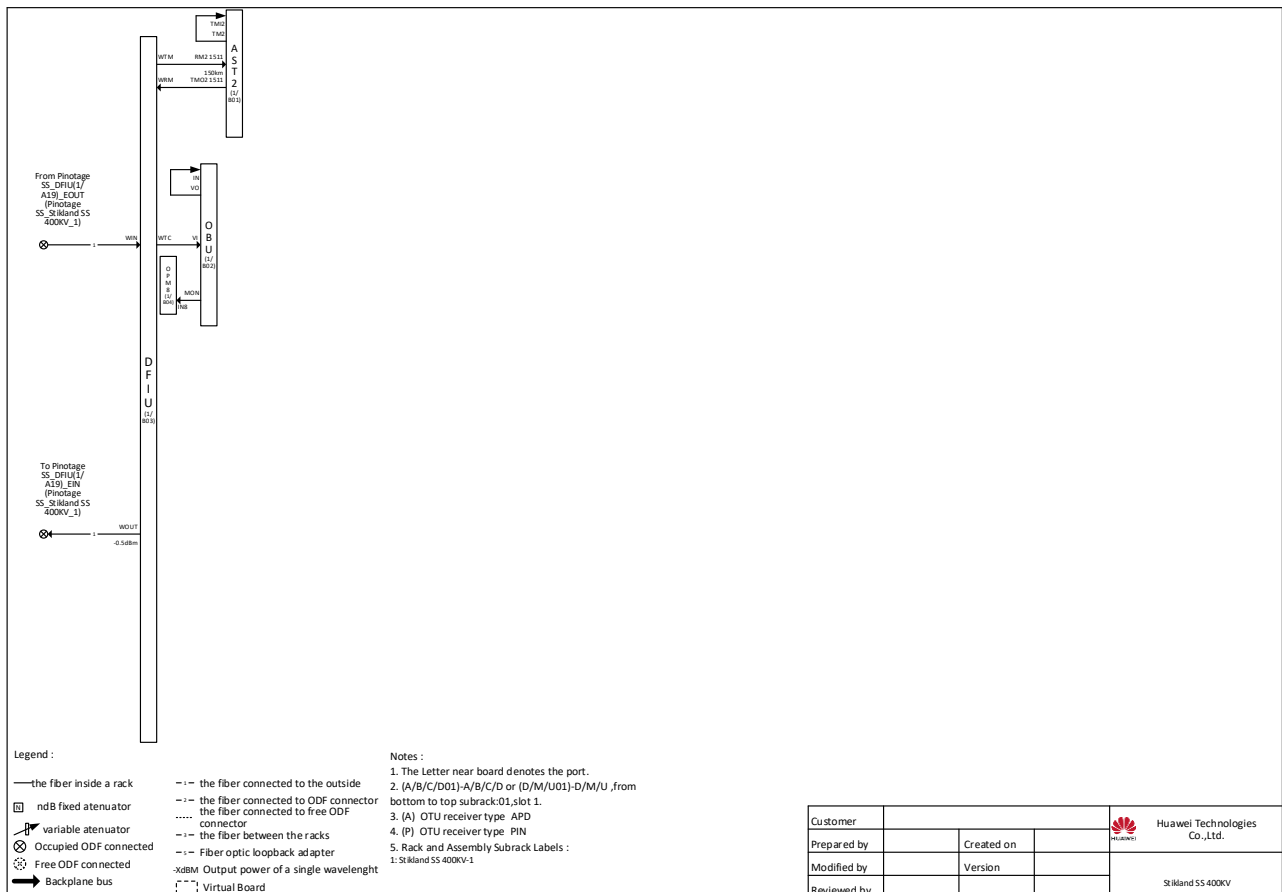
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## 7.5 Stikland SS

## Altron Nexus Scope

- Use available fiber pairs of the panel installed for Pinotage SS to commission Pinotage 1800V.

## Fiber connection for Stikland SS



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## 7.6 NMC

- Assist O&FS team to commission of requested services as in table below.
- Connect the requested circuits as per the workplace task

NMC New Services Configuration Work Order										
(Only fill in the yellow blocks. Some blocks have pull down lists to make selection easier)										
Template:										
<b>General Information</b>										
Task Number:	TBC	Required Completion Date:		TBC						
Project Description:	Erica MTS				Project Number:	PJ11281				
<b>NEW Tributary Configuration Data</b>										
Circuit Number	SLA	Crt Speed	Site A Name	WorkPlace PlantID	Port	Interface	Site B Name	WorkPlace PlantID	Port	Interface
NCCCK290A	Silver	9.6K	Erica SS	Erica-SS01	S1P1	MSAP	Simmerpan(Room 12)	Simme-OF01	12AS19P4	MSAP
SCCK290A	Silver	9.6K	Erica SS	Erica-SS01	S2P1	MSAP	Duvha PS	Duvha-PS01	A2S19P4	MSAP
ETHL1-0890(Dist&TWS)	Bronze	128K	Erica SS	Erica-SS01	GE1/0/4	IR8340	Simmerpan	Simme-OF01		Router
ETHL1-1282 Landis +Gyr Meter(ITM&STATS)	Bronze	128K	Erica SS	Erica-SS01	GE1/0/8	IR8340	Simmerpan- Control(MV90)	Simme-OF01		Router
ETHL1-1319 Landis +Gyr Meter(ITM&STATS)	Bronze	128K	Erica SS	Erica-SS01	GE1/0/5	IR8340	Simmerpan- Control(MV90)	Simme-OF01		Router
ETHL1-1187(Security)	Bronze	4meg	Erica SS	Erica-SS01	GE1/0/6	IR8340	Simmerpan- Zero Control	Simme-OF01		Router
ETHL1-0892(EADS)	Bronze	2Meg	Erica SS	Erica-SS01	GE1/0/7	IR8340	Simmerpan- DEC Room 8	Simme-OF01		Router
ETHL1-0891(QOS)	Bronze	128K	Erica SS	Erica-SS01	GE1/0/3	IR8340	Simmerpan- Voltage Desk	Simme-OF01		Router
ETHL1-1191(IT)	Bronze	64K	Erica SS	Erica-SS01	S3P3	1800V	Bellville	Bellv-OF01	SXXPXX	ADM 1460 A
TWPI069A	Silver	9.6K	Erica SS	Erica-SS01	S3P1	MSAP	Stikland SS	Stikl-SS01	S3P3	MSAP
TWPI070A	Silver	9.6K	Erica SS	Erica-SS01	S3P2	MSAP	Pinotage SS	Pino-SS01	S2P3	MSAP
TWCK173L	Silver	9.6K	Erica SS	Erica-SS1	S3P3	MSAP	Bellville	Bellv-OF01	AS4P2	MSAP
NCVC187A	Silver	64K	Erica SS	Erica-SS1	S14P1	MSAP	Simmerpan	Simme-OF03	MX0007 TS 14	MSAP
SCVC187A	Silver	64K	Erica SS	Erica-SS1	S14P2	MSAP	Duvha PS	Duvha-PS01	MX0006 TS14	MSAP
TWVH010A	Silver	64K	Erica SS	Erica-SS1	S14P3	MSAP	Bellville	Bellv-OF01	Bellv A portgroup 3 port-6	MSAP
<b>NEW Node Configuration Data</b>										
FOX615 Hangs off Site Name	WorkPlace PlantID	New Node Site Name		WorkPlace PlantID	NodeType	Short Code		IP Address		
Philippi SS	Phil-SS01	Erica SS		Erica-SS01	MSAP	Erica		10.20.80.80/32 OSPF 80		
<b>NEW Link Configuration Data</b>										
Region	Site A Name	WorkPlace PlantID	Site B Name	WorkPlace PlantID	Link Type	Ownership	Link No			
WC-Cape Town	Erica SS	Erica-SS01	Philippi SS	Phil-SS01	MSAP	WC-CT Bearer	ME1370			
WC-Cape Town	Erica SS	Erica-SS01	Philippi SS	Phil-SS01	MSAP	WC-CT Bearer	ME1380			
(Region is as per Morning Report categories)					Billable		Capacity	SDH End Point		
(if more than one link do each link on a separate form)					External SDH Payload Positions					

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### 7.6.1 Site IP/ID distribution

Site name	IP address	Equipment
Erica SS	Tsv78964	OTN
Erica SS	Tsv79403	Router
Philippi SS	Tsv78965	OTN
Pinotage	Tsv83632	OTN

## 8. Acceptance

This document has been seen and accepted by:

List the regional DRT workgroup participants.

Name	Designation
S Harmans	Snr Technician NPAE
A Hector	Snr Technologist Workgroup Chair
W. Pringle	NPAE
N Dominick	Customer Service Manager
D Seale	WC- CT Supervisor
F. Bergh	SNR Engineer NPAE
M. Shibani	NPAE
T. Makhubela	SNR Technologist NPAE

## 9. Revisions

**Note:** Start with the latest Revision History in the first row and go backwards.

Date	Rev.	Compiler	Remarks
04-05-2023	0	S. Harmans	Erica SS Comms Application Design Book
31-07-2023	1	S. Harmans	Added Pinotage, Stikland & Acacia Scope.

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## 10. Annexures A

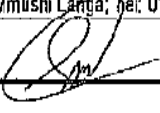
## Customer User Requirements Specification

Eskom - Telecommunications Division							
Service Application Form							
						Ref	240-120317983
						Rev	2
Customer Details							
Customer:		PTM&C					
Company & Division		Transmission					
Customer Representative:		Lungile Nogela					
Customer Telephone:		011 871 2634					
Customer Facsimile:							
Customer Email Address:		Nogelal@eskom.co.za					
Customer Business Address:							
Customer Project Details							
Customer Project Name:		City of Cape Town Strengthening (Erica MTS)					
Customer Project Number:		N.ETMPMTS.D.WR.INT.TE.PT					
Customer Reference Number:							
Preliminary Completion Date Request:							
Locations							
A	Building, Floor, Room no	Control Room					
	Physical Address	Silkand Substation					
	Site Co-ordinates	Latitude:	S33.90610	Longitude	E18.68683		
B	Building, Floor, Room no	New Control Room					
	Physical Address	Erica Substation					
	Site Co-ordinates	Latitude:	S34.017083	Longitude	E18.603444		
C	Building, Floor, Room no	National Control, Stabnac & Reginal Control Centres					
	Physical Address	Simmerpan, Duvha & Bellville					
	Site Co-ordinates	Latitude:		Longitude			
D	Building, Floor, Room no	National Control					
	Physical Address	Simmerpan					
	Site Co-ordinates	Latitude:	S26.22523	Longitude	E28.15851		
E	Building, Floor, Room no	National Control (MV90)					
	Physical Address	Simmerpan					
	Site Co-ordinates	Latitude:	S26.22523	Longitude	E28.15851		
F	Building, Floor, Room no	Control Room					
	Physical Address	Pinotage					
	Site Co-ordinates	Latitude:	S34.047436	Longitude	E18.781836		
G	Building, Floor, Room no	DEC Room No 8					
	Physical Address	Simmerpan					
	Site Co-ordinates	Latitude:	S26.22523	Longitude	E28.15851		
H	Building, Floor, Room no	Zero Control					
	Physical Address	Simmerpan					
	Site Co-ordinates	Latitude:	S26.22523	Longitude	E28.15851		
J	Building, Floor, Room no	National Control (Voltage Desk)					
	Physical Address	Simmerpan					
	Site Co-ordinates	Latitude:	S26.22523	Longitude	E28.15851		
Service Requirements							
1. Telephone (PAX circuit)							
Business Voice		Quantity	3				
2. Data circuits							
Premium Point to Point							
	Description of circuit	Division	Speed	Service Level	Site From	Site to	Interface
1	Teleprotection (NSD570)	TX	64kb/s	Silver	B	A	X.21
2	SCADA (NCC)	TX	9.6kb/s	Gold	B	C	X.21
3	SCADA (SCC)	TX	9.6kb/s	Gold	B	C	X.21
4	SCADA (RCC)	TX	9.6kb/s	Silver	B	C	X.21
5	Disturbance Recorder & TWS	TX	128kb/s		B	D	Ethernet
6	Metering X2	TX	128kb/s		B	E	Ethernet
7	Teleprotection (NSD570)	TX	64kb/s	Silver	B	F	X.21
8	EADS	TX	2Mb/s		B	G	Ethernet
9	Security	TX	4Mb/s		B	H	Ethernet
10	QOS	TX	128kb/s		B	J	Ethernet
11	IT	GIT	2Mb/s				Ethernet
Operational Voice							
	Description of circuit	Division	Speed	Service Level	Site From	Site to	Interface
1	Direct Line (NCC)	TX		Gold	B	C	Voice
2	Direct Line (SCC)	TX		Gold	B	C	Voice
3	Hot Line (RCC)	TX		Silver	B	C	Voice
4							
5							

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Miscellaneous Requirements			
1	Request for a remote access 7 x IP Addresses for Disturbance Recorder.		
2	IT circuit bandwidth/speed to be provided & confirmed by the IT personnel (Brandon Field).		
3	Security circuit bandwidth/speed to be provided by the security personnel (Chris Van Reenen). Only specified minimum requirement on the form.		
4	Requirement for 2 x Metering circuits.		
5	Platinum+ response time should be provided for the SCADA & OV Gold service level as this is an interim solution.		
6			
Information required by Eskom Telecommunications			
To provide the customer with a complete and proper solution the following information is required:			
1. Site Location - A diagram showing the location of the site or suitable point from directions to the site.			
2. Site Layout - A diagram indicating the layout of the site. Diagrams for all areas owned by the customer at the site should be provided. The diagram(s) should mark areas where the customer expects to install future equipment.			
3. Room Layout - A diagram indicating the layout of the equipment room. The diagram(s) should mark areas where the customer expects to install future equipment.			
4. Facilities, including 220V AC & 50V DC - At customer premises, the customer shall provide AC and/or DC as required by Eskom Telecommunications. Secure floor and/or wall space may be required, including air-conditioning, anti-static carpet, racking, trunking, etc. Customer to advise of current conditions and facilities available for the installation.			
5. Contact Personnel - The customer should provide the contact details of ALL their personnel which Eskom Telecommunications will require to contact in order to provide a full solution. Examples of relevant people Eskom Telecommunications will need to contact are: Person responsible for access to site, Person responsible for expansion of site, Possibly Person responsible for current project occurring at the site etc.			
i. Name:	Rod Speedy	Designation:	Project Manager
Area of Responsibility:	PDD	Telephone No:	011 889 2534
ii. Name:		Designation:	
Area of Responsibility:		Telephone No:	
iii. Name:		Designation:	
Area of Responsibility:		Telephone No:	
iv. Name:		Designation:	
Area of Responsibility:		Telephone No:	
v. Name:		Designation:	
Area of Responsibility:		Telephone No:	
6. Other - Other information that the customer believes will aid Eskom Telecommunications in offering a proper solution.			
i.			
ii.			
iii.			
iv.			
v.			
Sign-off			
Responsible KAM:	Capital: Mmushi Langa; Tel: 011 800 4335; Email: LangaM@eskom.co.za		
Customer Signature:		Application Date:	15-June-2023
Responsible KAM:			
Customer Signature:		Application Date:	

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**Erica SS 400KV Control Room**

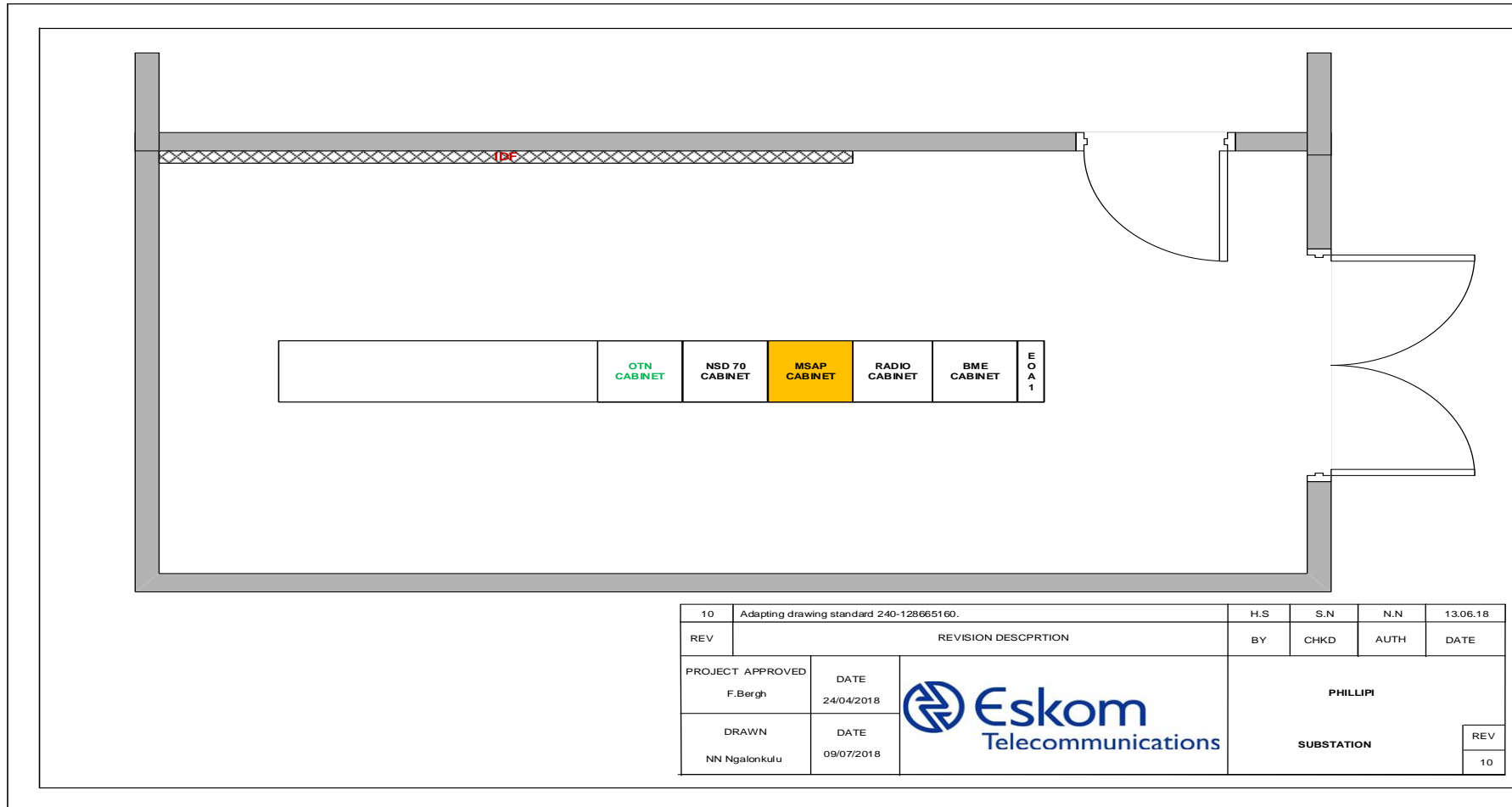
# Awaiting

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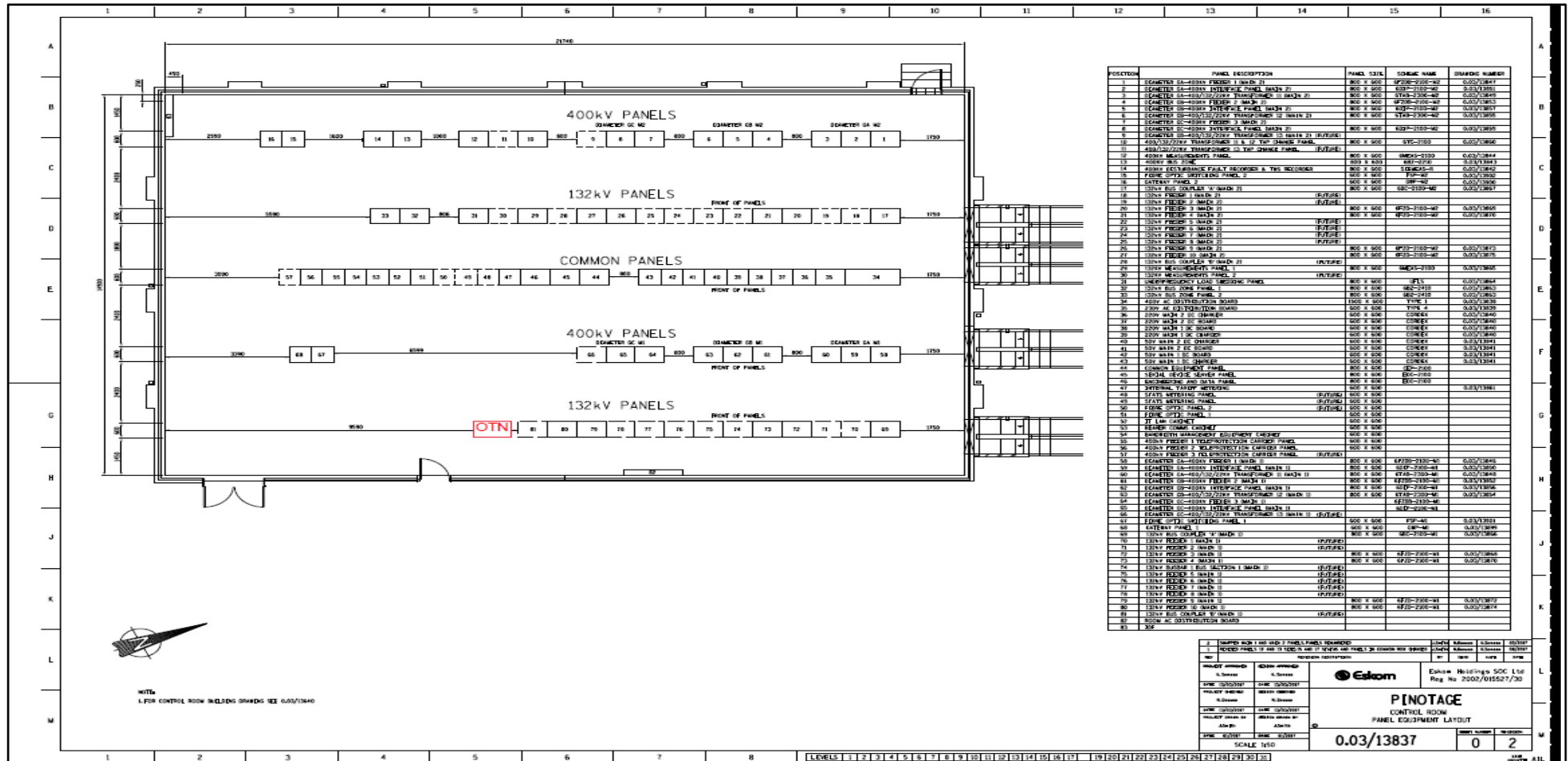
## Philippi SS Room layout

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## Pinotage Room Layout

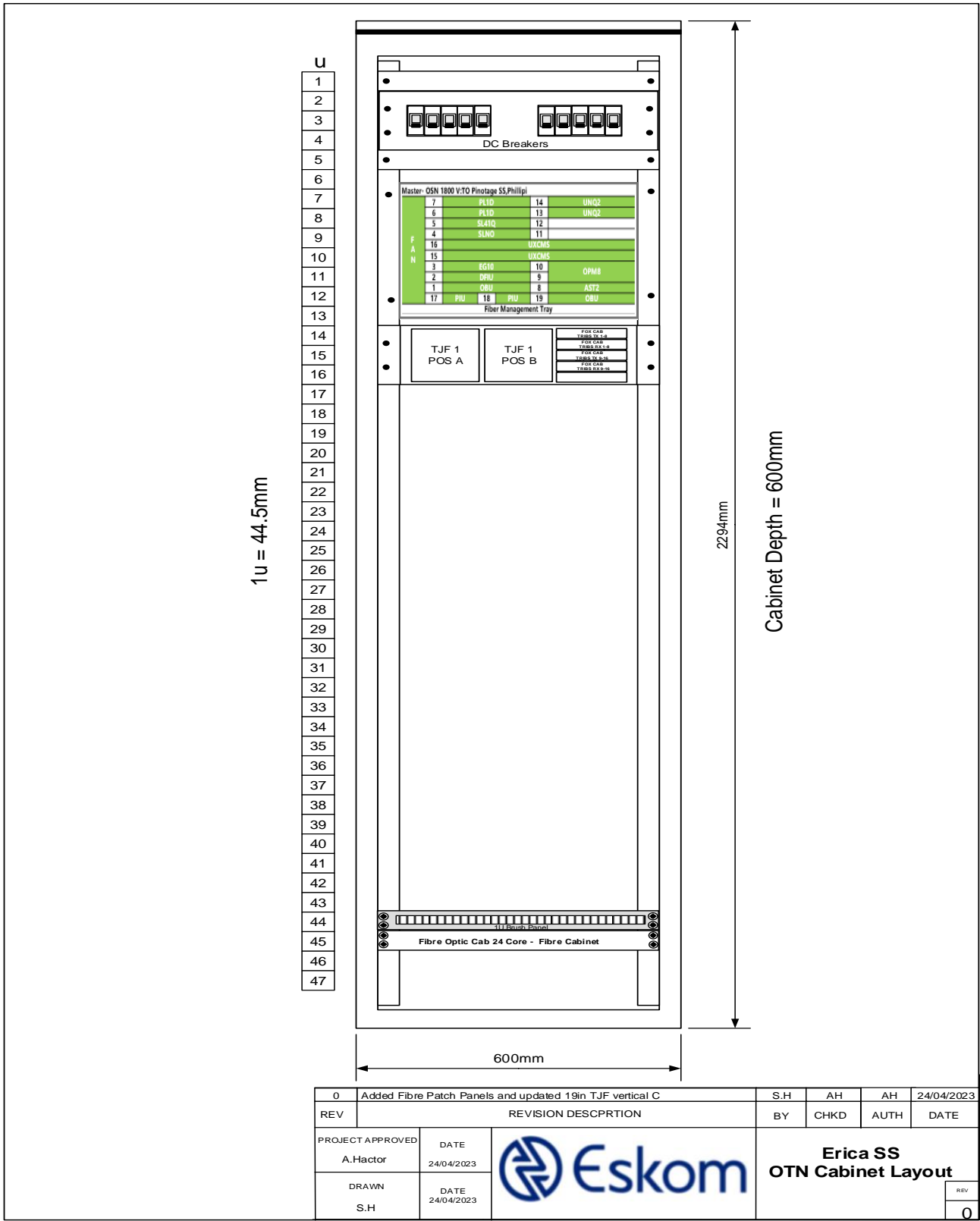


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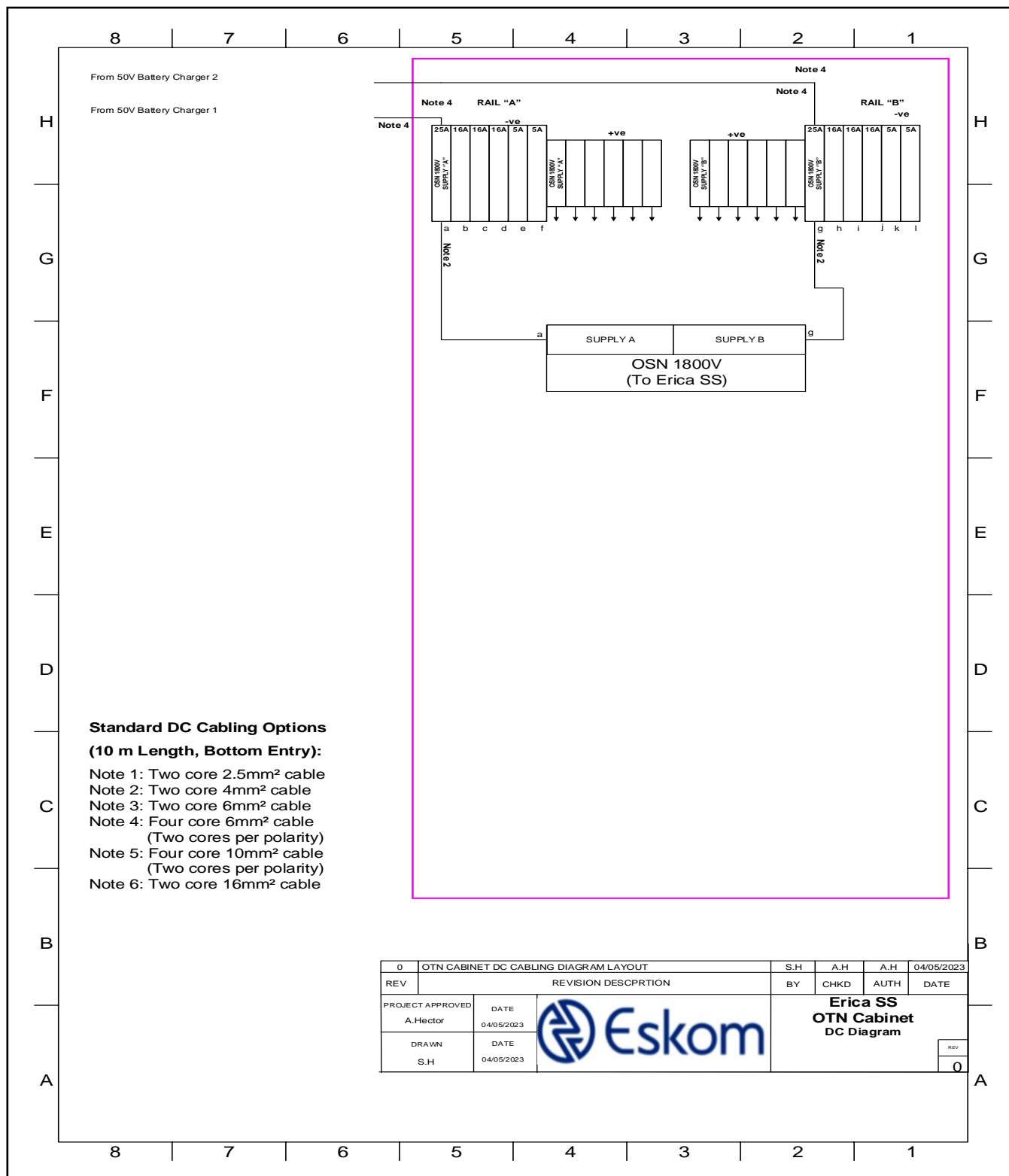
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Erica SS Comms Cabinet 1



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## Erica SS OTN Cabinet DC Layout

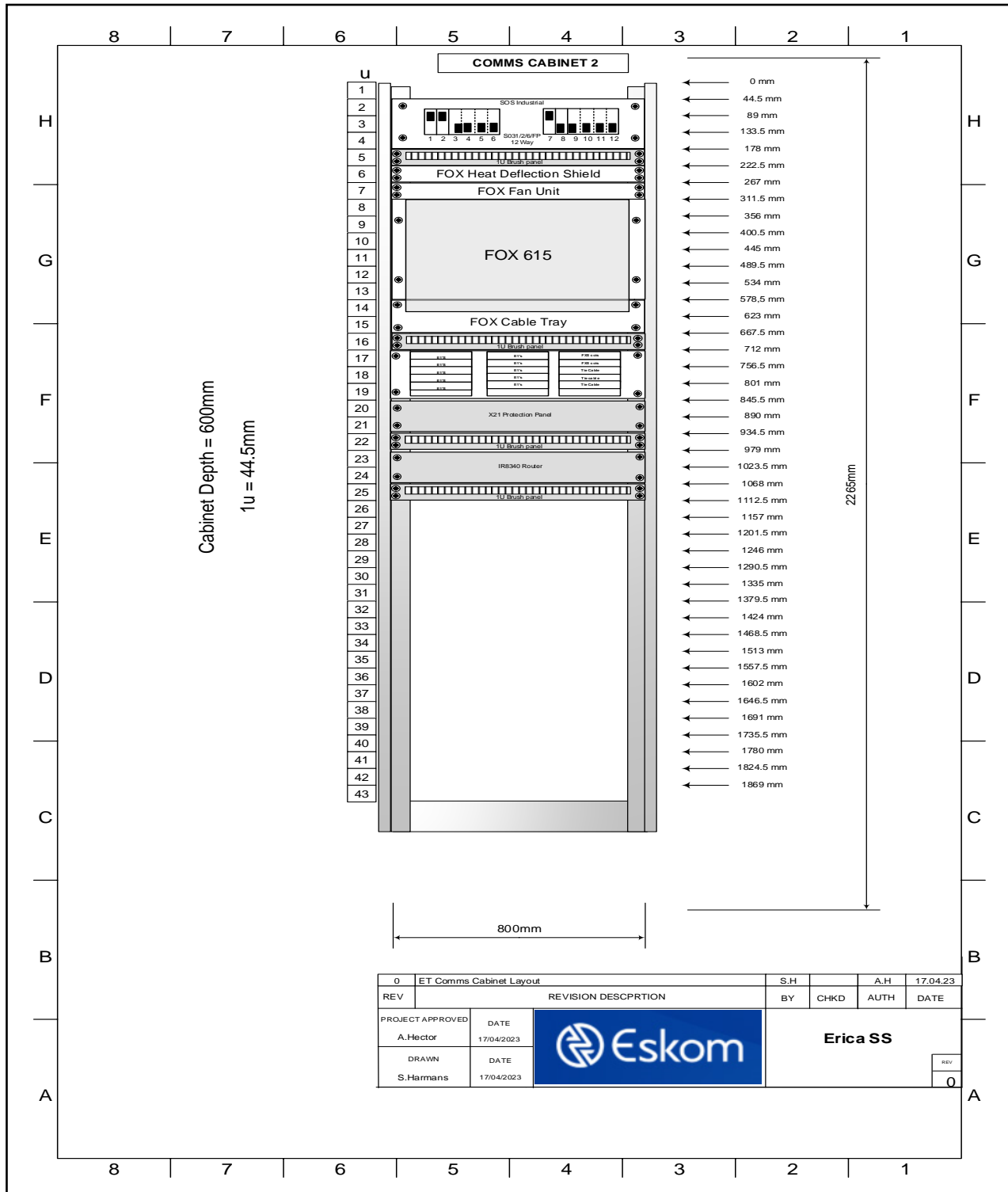


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## Erica Comms Cabinet 2

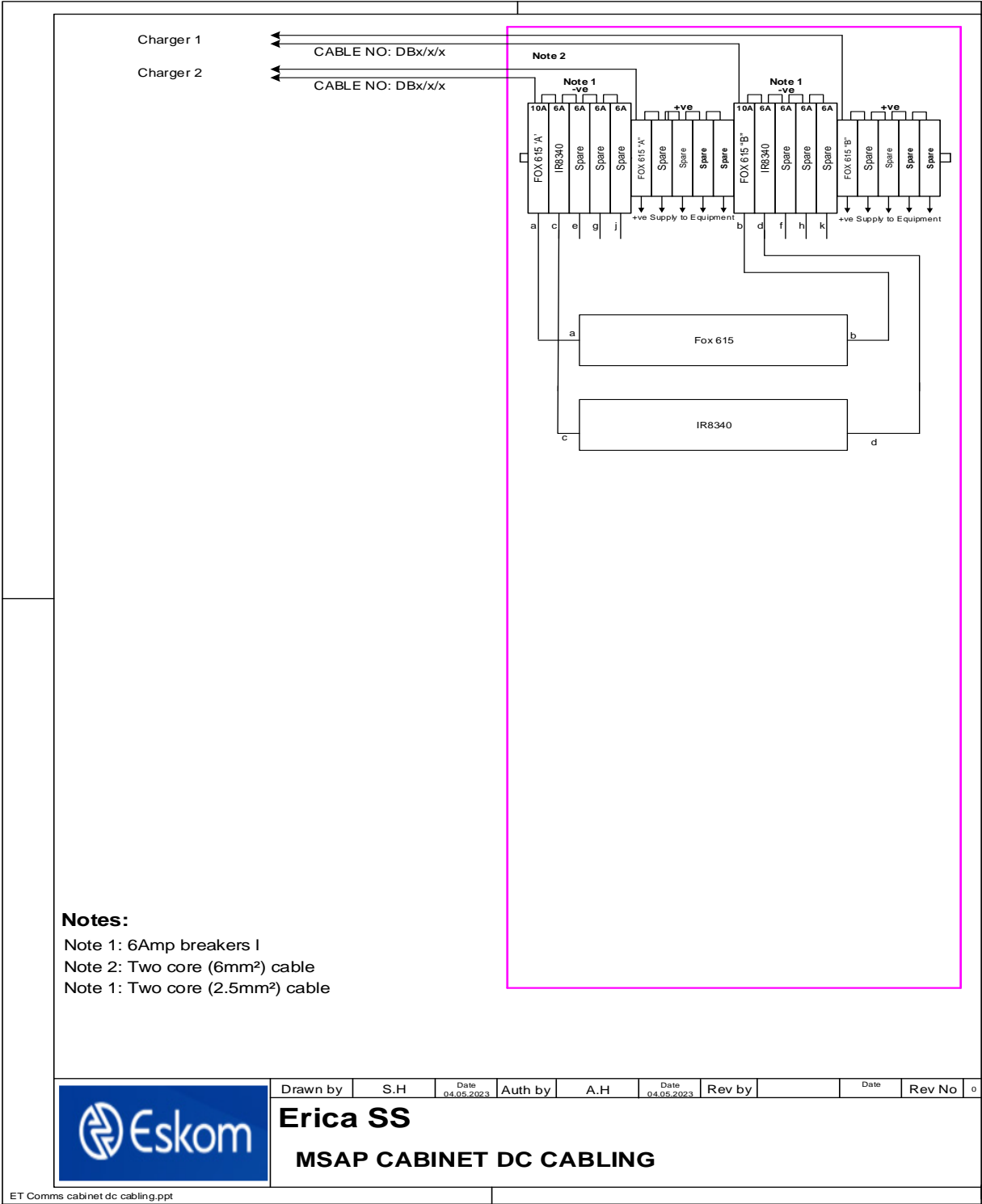


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Erica MSAP DC MCB Layout

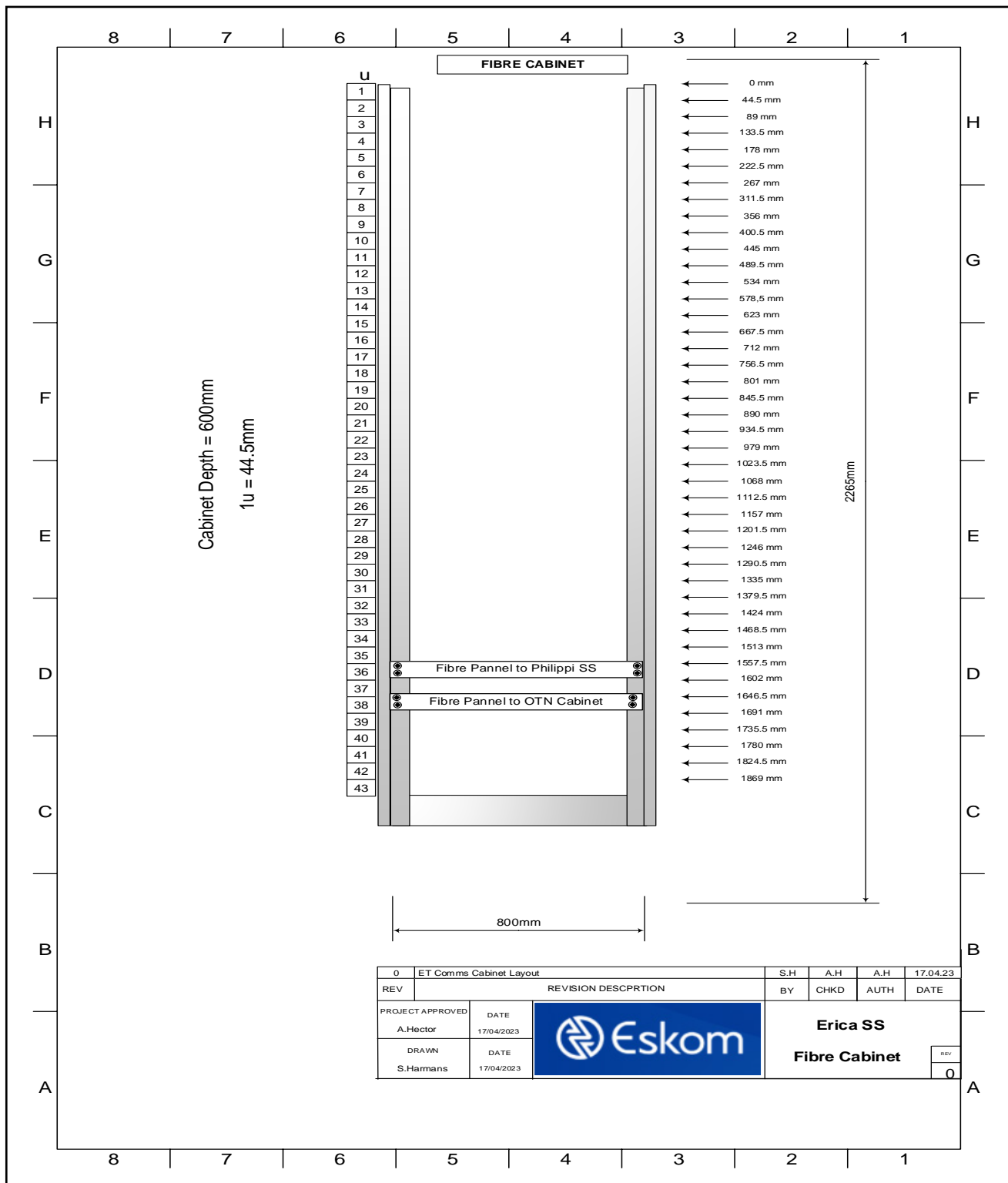


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## Erica SS Fibre Optic Cabinet



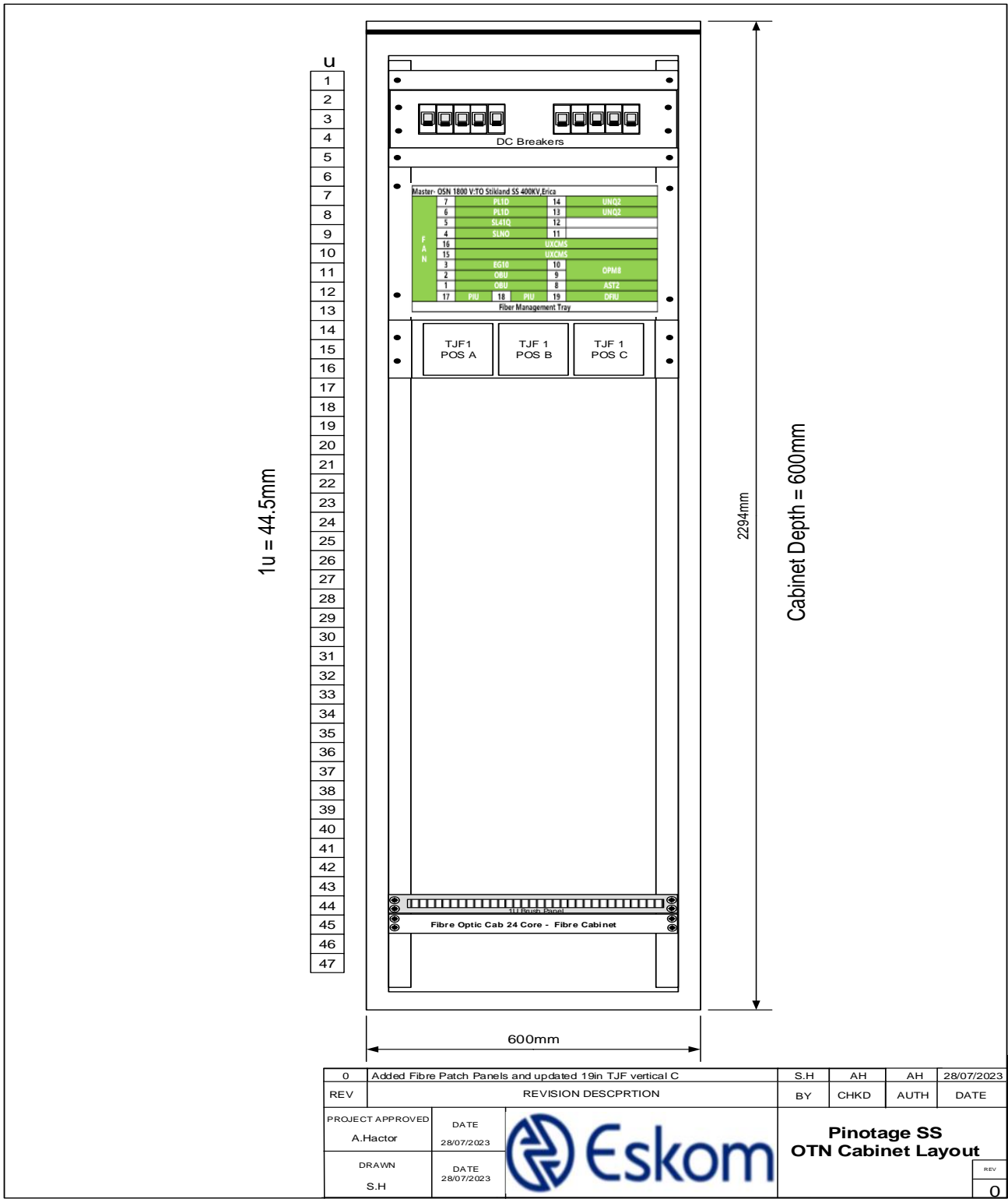
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Pinotage SS OTN Cabinet

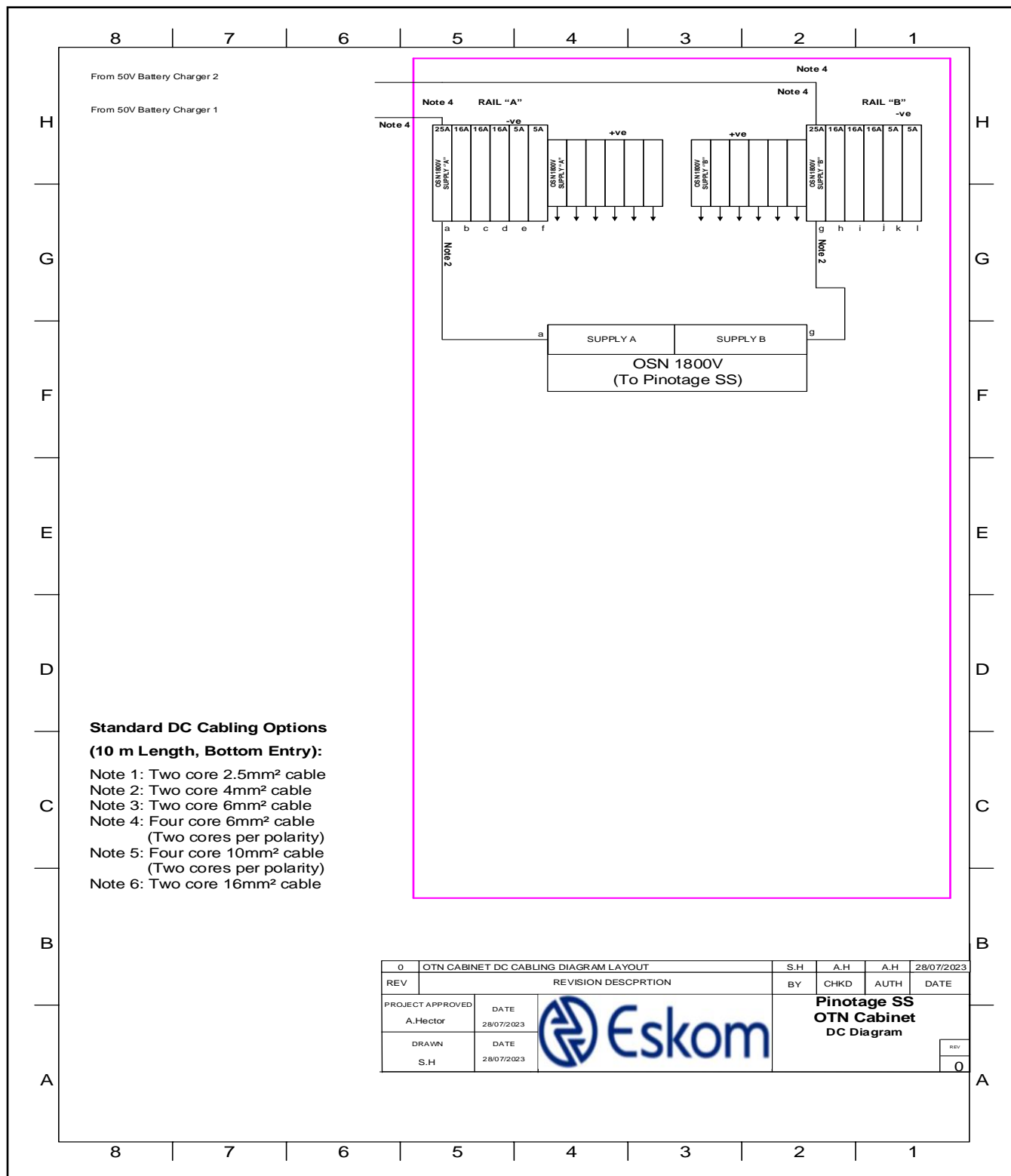


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## Pinotage SS OTN Cabinet DC Layout

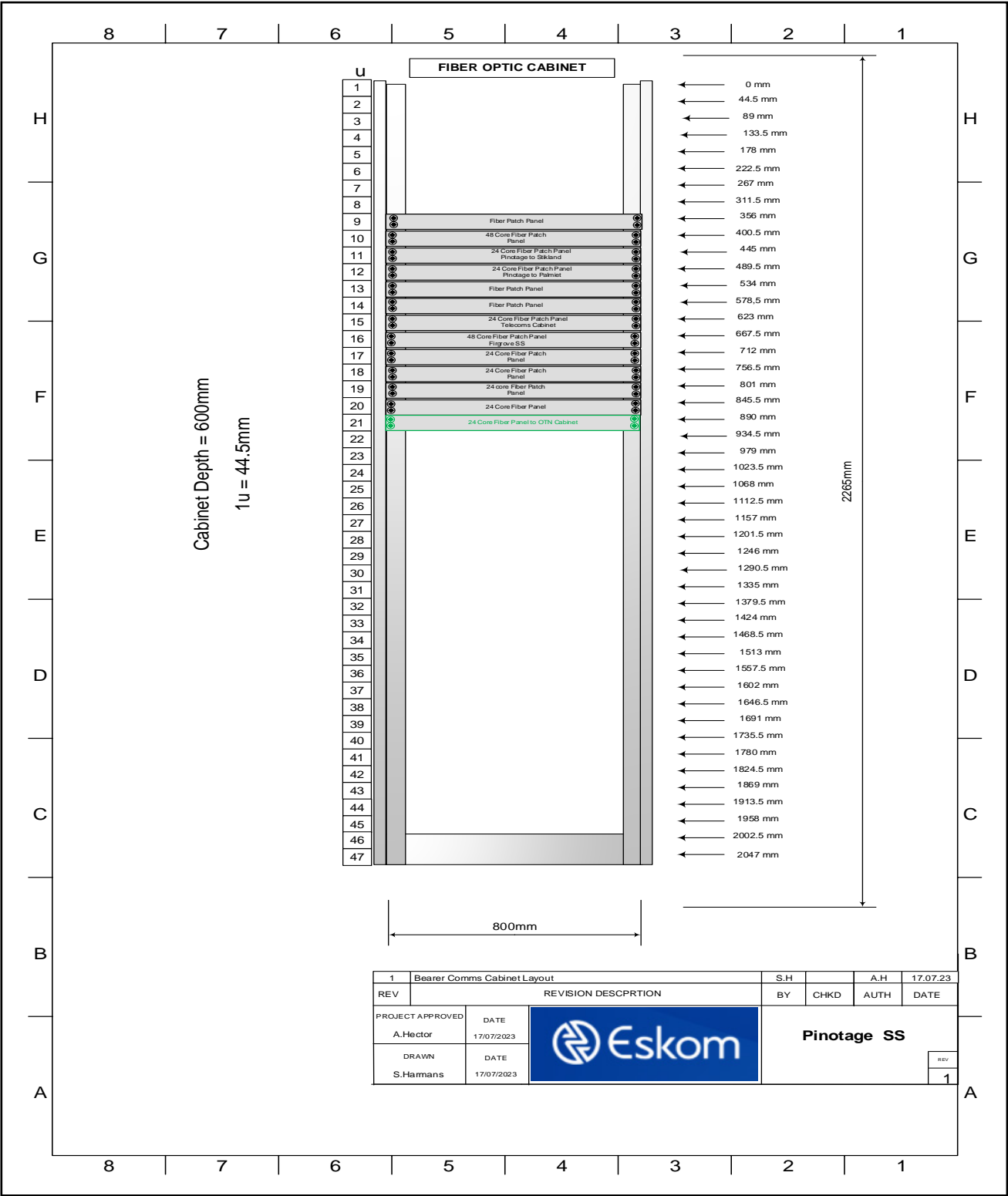


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Pinotage Fiber Cabinet Layout

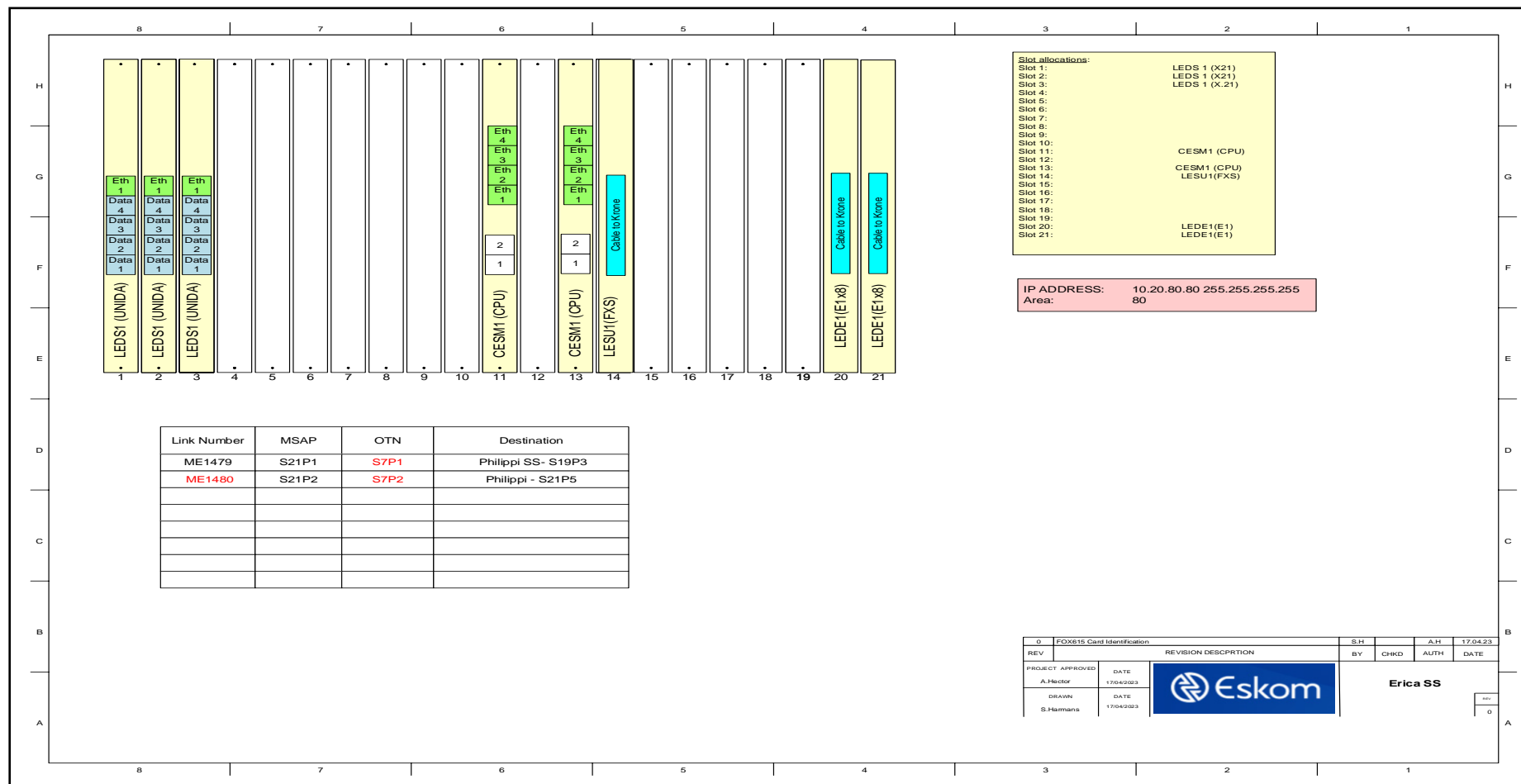


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## Erica MSAP Card layout

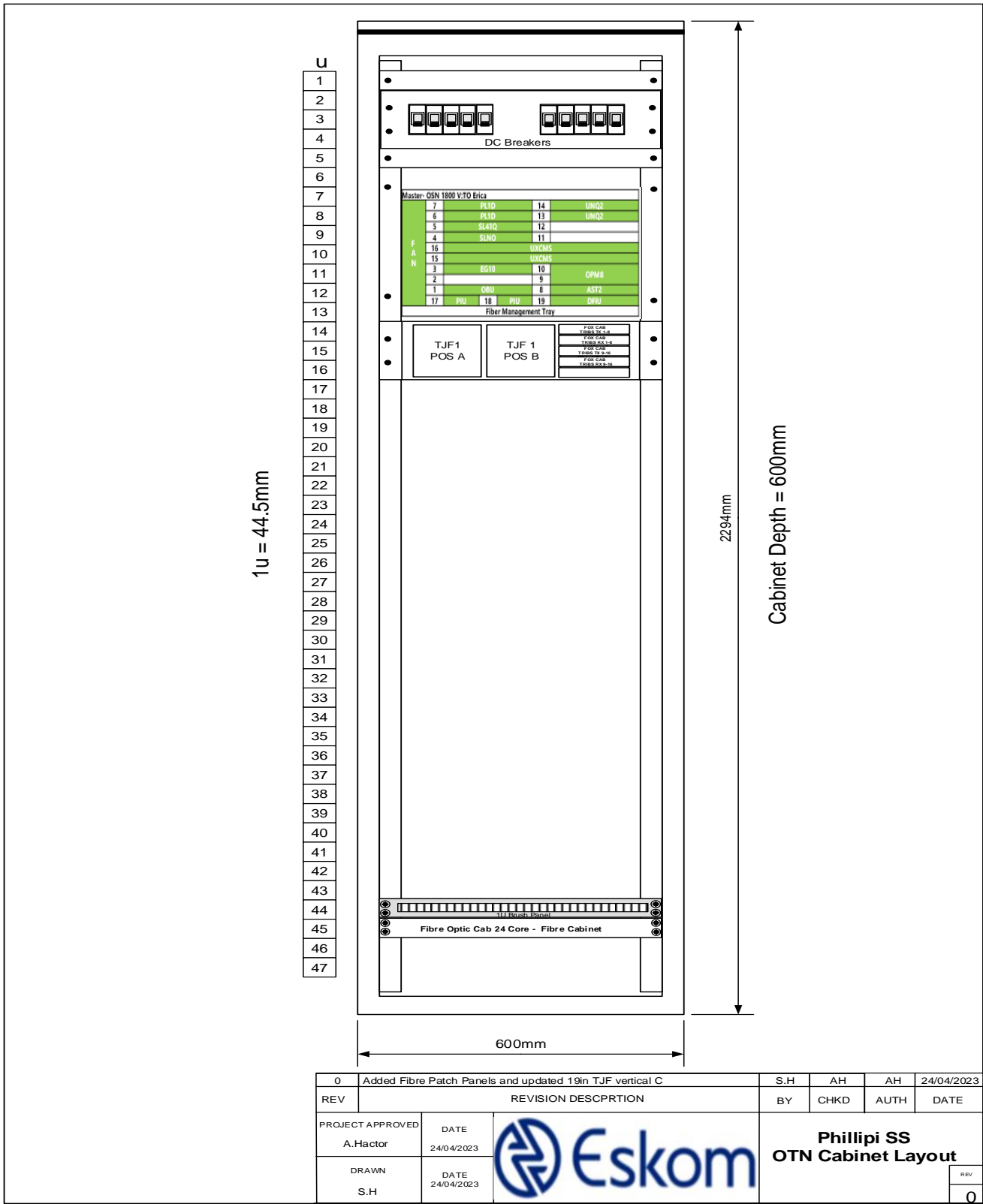


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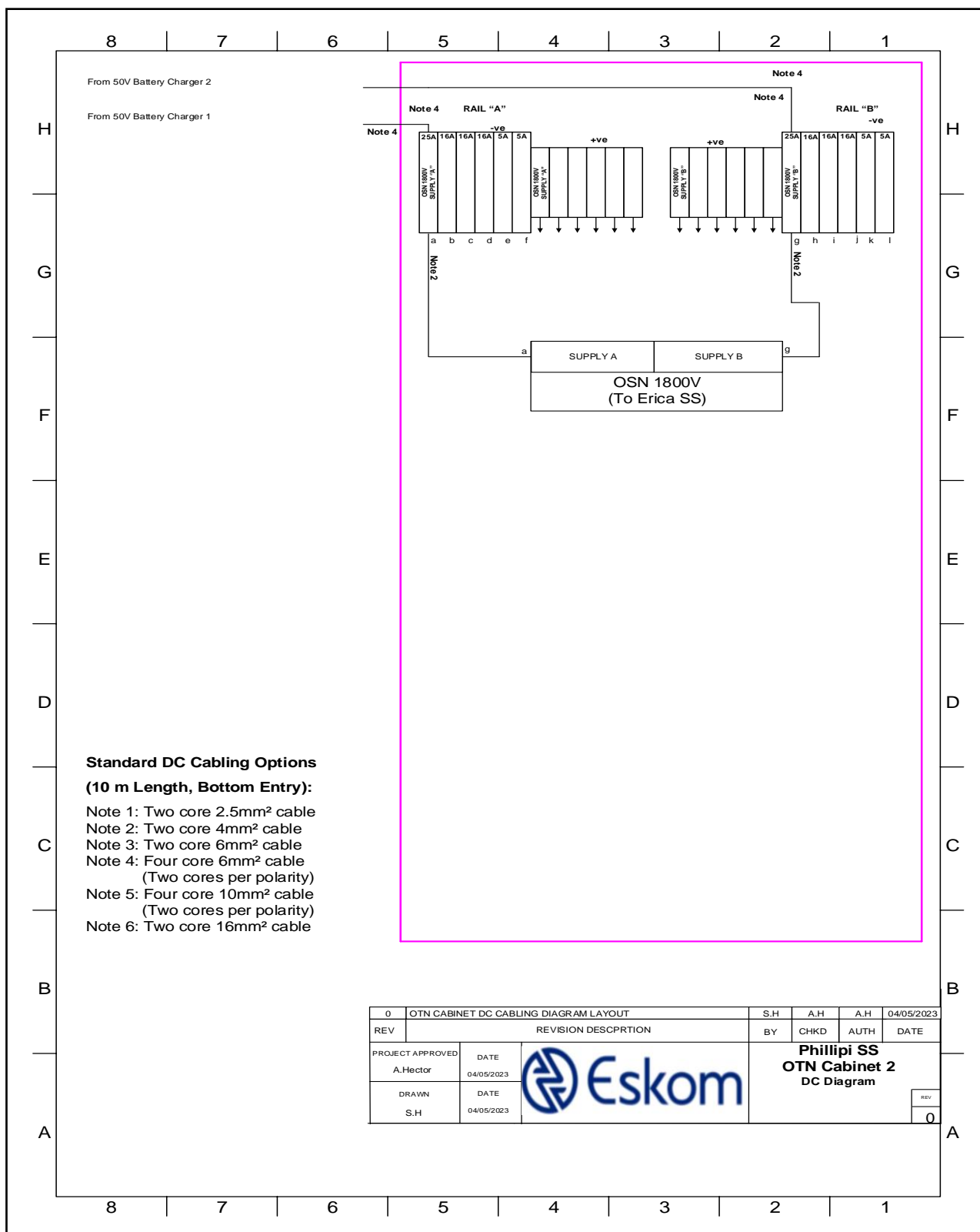
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Philippi SS OTN Cabinet



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## Philippi OTN Cabinet DC Layout

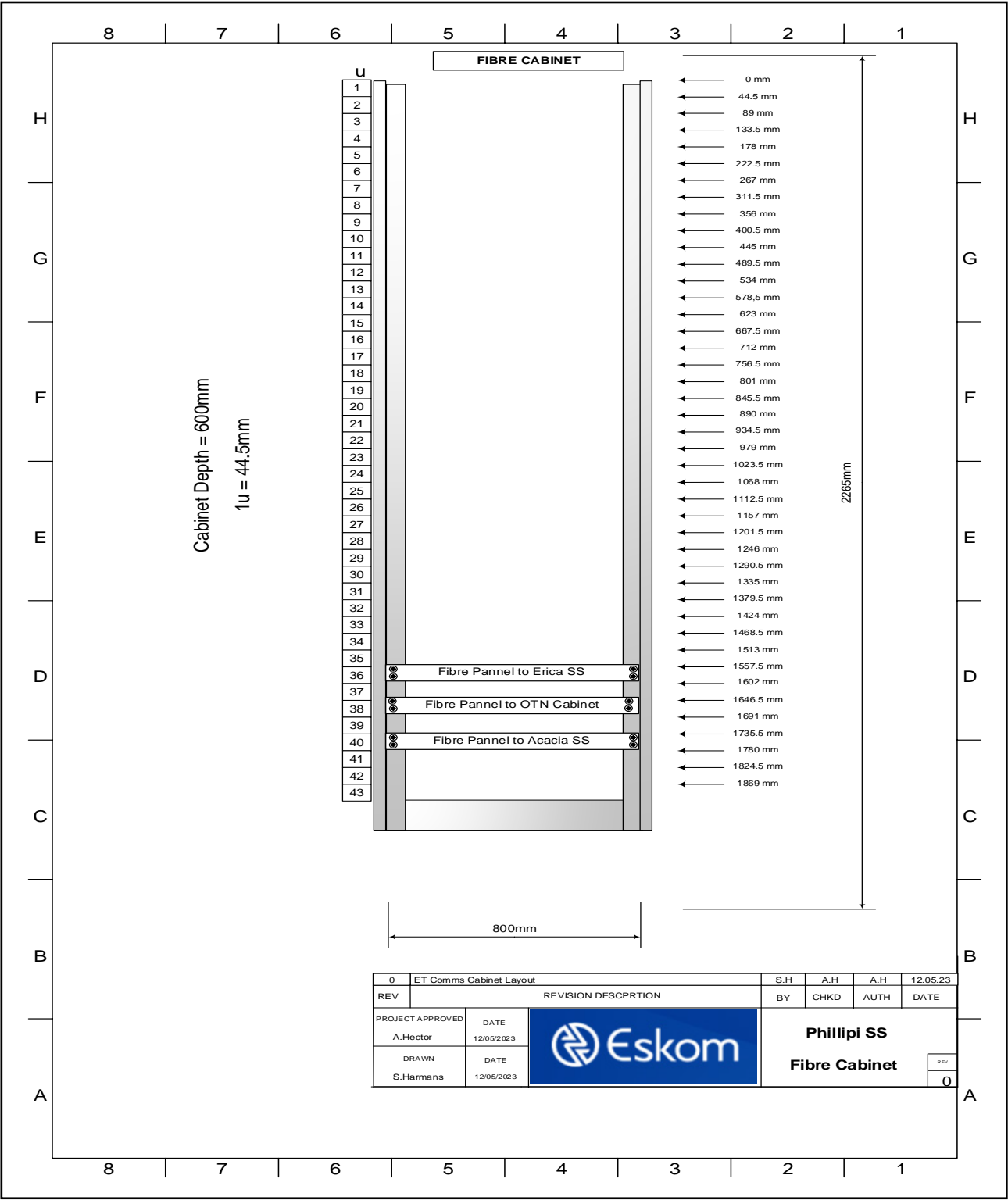


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Philippi Fibre Optic Cabinet

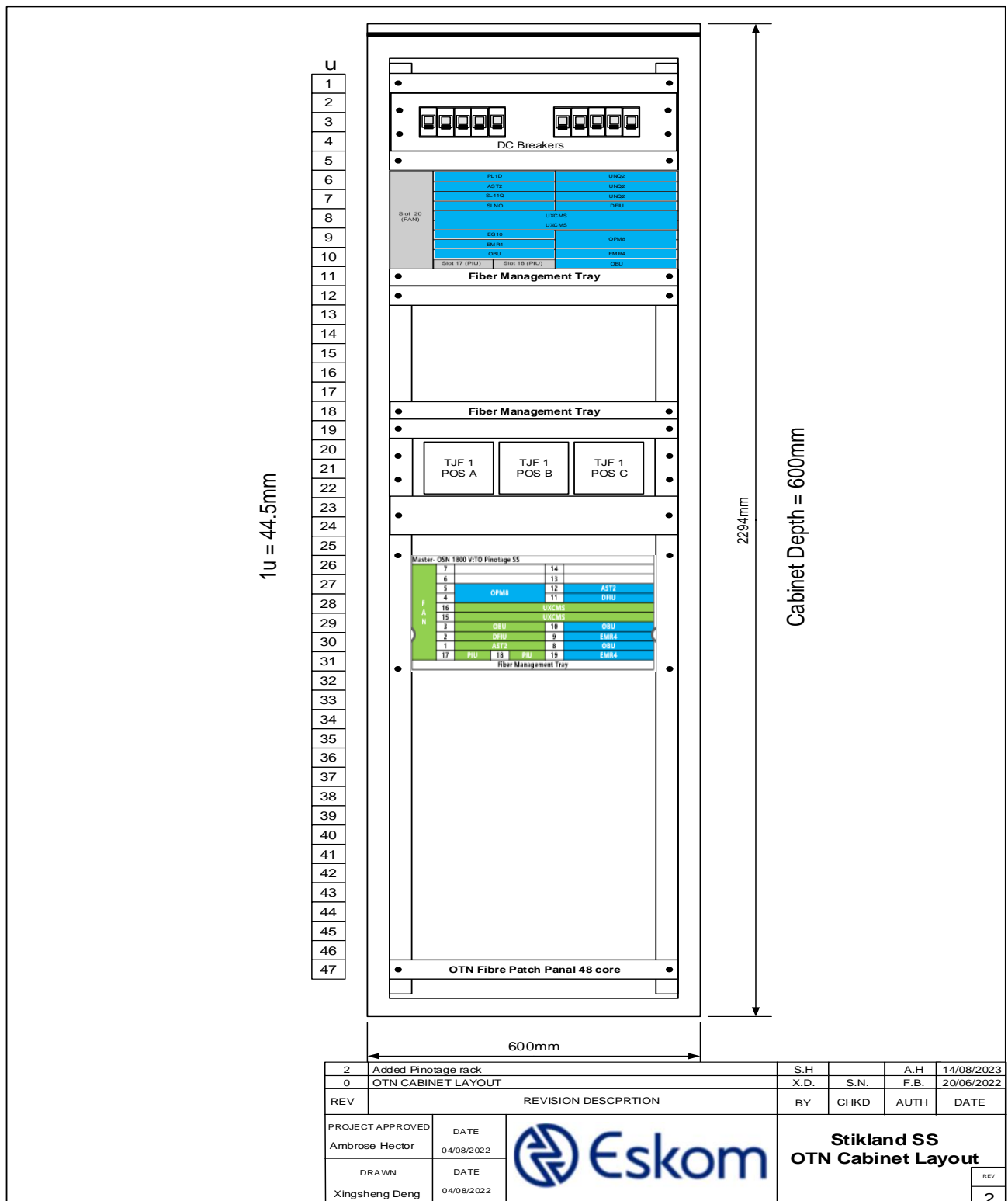


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## Stikland SS OTN Cabinet



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## Procurement

BILL OF QUANTITIES (BOQ)																			
Name		PRJ11281										Number		PRJ11281					
Equipment Delivery Address												Number of Sites					5		
Item No.	Bill of Materials for Telecommunications (Standard Design, Contract Items)	SAP Line Number	Material Number	Asset Class	Unit	Unit Price	Erica	Philippi	Belville	NCC	Stabnac	Pinotage	Stikland				Total Qty	Total Price	
	Description (enter contract number first, then enter descriptions)																		
1																			
2	4600072214 - CISCO																		
3																			
4	IR8340-K9 - Cisco Catalyst IR8340 Rugged Router	No Line	714763		7 ea		1											1	
5	PWR-RGD-LOW-DC- Low DC (24/48VDC) Power Supp	No Line	552924		7 ea		2											2	
6	SL-8300-NA-D-T0 NETWORK ADVANTAGE LICENSE FOR CISCO IR8300 - TIER 0	No Line	717890		7 ea		1											1	
7	DNA-P-T0-A-3Y CISCO DNA ADVANTAGE ON-PREM LIC 3Y - UPTO 25M	No Line	3000035006		7 ea		1											1	
8	SVS-PDNA-T0-A3Y Solution Support for SW - DNA Advantage OnPrem Lic, T0, 3Y	4160	300034959		7 ea		1											1	
9	CON-SNT-IR8340AK SNTC-8X5XNBD Cisco CATALYST IR8340 RUGGED ROUTE	No line	3000036559		7 ea		1											1	
10																			
11	4600068823 - NEXIO																		
12																			
13	Cisco UC Phone CP-7821	1010	690733		7 ea		3											3	
14	Enhanced Smart License A-FLEX-P-ENH	6000	3000031590		7 ea		3											3	
15																			
16	4600064029 - FOX 615																		
17																			
18	SOFTWARE:ABB-MSAP-LIC;FOX	70	253454		3 ea		1											1	
19	SHELF ASSY, ELCTR:ABBMSAP-6U;FOX;FFT	110	253458		3 ea		1											1	
20	ABB-MSAP-UNIDA (UNIVERSAL DATA INTERFACE - 4 PORTS)(UNIVERSAL DATA INTERFACE - 4 PORTS) (x21 INTERFACE PANELS)	140	253463		3 ea		3											3	
21	BB-MSAP-CPU (CPU;PROCESSOR)	380	569429		3 ea		1											1	
22	ABB-MSAP-E18 (E1 INTERFACE - 8 PORTS)	160			3 ea		2											2	
23	MODULE,COMMS:ABBMSAP-FXS;FOX	180	253471		3 ea		1											1	
24																			
25	4600069611 - WORLD TELECOM AND DATA																		
26																			
27	Empty rack with copper earth bar for 19 inch	Line 2180	229690		9 ea		1											1	
28	Single module for 16 port X.21 DB15 surge	Line 2170	697237		9 ea		10											10	
29	Frame 80 Way back mount rack	2790	115194		9 ea		1											1	
30	RJ45 CAT 5E connector, shielded	1310	678584		9 ea		10											10	
31	RJ45 CAT6 rubber boot	1340	678593		9 ea		10											10	
32	2M Duplex patch cord LC-SC/APC 9/125 rugged	250	678183		9 ea		3	2				2						7	
33	24 core single mode fibre patch panel/PANEL	1050	678537		9 ea		2	2				2						6	
34	CABLE:24 CORE FIBRE HDD 9/125 Duct cable	1010	678520		9 ea		30	30				30						90	
35	2M Duplex patch cord SC/APC-SC/APC 9/125	280	678149		9 ea		2	2										4	
36	Smouv 60mm	No Line #	No Material #		9 ea		48	48				48						144	
37	Female to female Ethernet coupler jack	1590	678421		9 ea		5											5	
38	RJ11 wall jack	1280	678591		9 ea		6											6	
39	Telephone cable, 0.5 mm x 10 pair indoor MOQ=100M	1610	253575		9 pm		100											100	
40	CAT5E U/FTP, Solid	1910	678494		9 pm		50											50	
41	WIRE ELECT:EARTH:16 MM2:YELLOW/GREEN	2930	253891		9 ea		1	1										2	
42	NUT CHAN:M6:NONE:STEEL	2800	678943		9 ea		1											1	
43	CABLE ELECT:BVX02FCM:600/1000 V:2,6 MM2	2250	241778		9 m		40											40	
44	Duplex Mid coupler SC-APC/SCAPC ceramic, 9/125	870	678377		9 ea		48											48	
45	10 pair disconnect module, PKT10	1790	250055		9 ea		2											2	
46	19 inch stainless steel back mount frame	2840	678945		9 ea		1											1	
47	Disconnect module hinged label holder	1810	678579		9 ea		5											5	
48	Disconnect module fixed label holder-	1800	678578		9 ea		25											25	
49	2 pair drop telephone cable, 0.6 mm	1730	678476		9 pm		100											100	
50	CONN COMM:RJ11;PHOSPOR BRONZE;4;INLINE	1260	253543		9 ea		10											10	

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Refer to the below documents from Huawei to complete the acceptance test procedure: (Altron Nexus to complete)

Part 1 Acceptance Test Guide Overview Signed

Part3 OptiX OSN 1800 Acceptance Test Guide Signed

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