

Transmission Site Design Documentation



NE: BA0804

FE: BA0767

Phase: 1

Telenor Myanmar

Ericsson's GSM System
Radio TRM OptiX RTN950

ERICSSON 			
CAPTION LIST		Document List	1
Document No. 001 53-IPA 165 5829 Uen			
Date 2017-12-05	Rev. A		
<div>SITE</div> <div>INSTALLATION</div> <div>DOCUMENT</div> <div></div> <div>Telenor Myanmar</div> <div>BA0804</div> <div>Bago</div> <div>Radio TRM OptiX RTN950</div> <div>BA0804 - BA0767</div> <div>ATTENTION This documentation must be updated on site. All the documents must be corrected, where changes have occurred, and signed by the Installation Supervisor.</div> <div>This documentation must then be returned to Installation Engineering for hand-over to Customer.</div>	Site Documents		2
	Plant Specification		3
	Cabling Diagram		4
	External Alarm		5
	Check Lists		6
	Test Documents		7
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	Product List (Trm)		9
	Others		10

Prepared (also subject responsible if other)		Document No.		
EMZ Jovito Ege		001 51-IPA 165 5829 Uen		
Doc respons/Approved	Checked	Date	Rev.	File
ETV Minh Nguyen D / Manoj Kumar A		2017-12-05	A	BA0804 Telenor_A

Project: **Telenor Myanmar**
Site: **BA0804**

Radio TRM OptiX RTN950
BA0804 - BA0767

	<u>Document name</u>	<u>Document number</u>	<u>Rev.</u>
	SITE INSTALLATION DOCUMENT	001 53-IPA 165 5829 Uen	A
1	DOCUMENT LIST	001 51-IPA 165 5829 Uen	A
2	SITE DOCUMENTS		
2.1	Configuration Data TRM	2/127 04-IPA 165 5829 Uen	A
2.2	Situating Plan	153 38-IPA 165 5829 Uen	A
3	PLANT SPECIFICATION		
3.1	Plant Specification (TRM)	2/127 11-IPA 165 5829 Uen	A
4	CABLING DIAGRAM		
4.1	Cabling Diagram (signal and antenna)	2/193 18-IPA 165 5829 Uen	A
4.2	Block Diagram (TRM Cross Connect)	3/193 18-IPA 165 5829 Uen	A
4.3	Allocation Drawing (TRM Rack-Layout)	4/193 18-IPA 165 5829 Uen	A
5	EXTERNAL ALARM		
5.1	Allocation Table	Refer to RBS - SID Site Folder	
6	CHECK LISTS		
6.1	Installation Check List	153 11-IPA 165 5829 Uen	A
6.2	OHS Check List	176 27-IPA 165 5829 Uen	A
7	TEST DOCUMENTS		
7.1	Test Report (RTN950 Functional)	3/153 83-IPA 165 5829 Uen	A
8	ACCEPTANCE CERTIFICATE	179 61-IPA 165 5829 Uen	A
9	PRODUCT LIST		
9.1	Product List (TRM)	2/153 83-IPA 165 5829 Uen	A
10	OTHERS		
10.1	Site Photos		
10.2	SMR		
10.3	Link Budget		

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EMZ Jovito Ege		2/127 04-IPA 165 5829 Uen		
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ETV Minh Nguyen D / Manoj Kumar A		2017-12-05	A	BA0804 Telenor_A

Project: **Telenor Myanmar**
 Site: **BA0804**

Radio TRM OptiX RTN950
BA0804 - BA0767

1 GENERAL

- 1.1 Geographical coordinates N 18° 46' 19.31" - E 95° 11' 35.38"
 1.2 Region Bago
 1.3 Address No(16), Heavy Industry (Sinde), Padaung Township, Pyay
 1.4 Type of Site **Green Field**
 1.5 Tower Height 50 m
 1.6 Transmission connection type GE (Electrical)

2 SITE DATA

- 2.1 Switch/Router type RTN950
 2.2 Loopback IP **10.7.25.191**
 2.3 NEID **15603**
 2.4 NE Parameter IP Address **129.7.60.243**
 2.5 Subnet Mask 255.255.0.0
 2.6 Default Gateway IP **10.7.51.233**

3 HOP DATA

The following below are transmission links to far-end sites

To Site	Azimuth	RSL (dBm)	Path length (km)	Frequency Band	Sub-band	System Cofig.	Ant. Size (m)	Traffic Capacity
BA0767	82.35°	-42.52	3.11	18G	Sb2	1+0 Int	0.3	43M

To site
BA0767

4 RADIO

- 4.1 Link number **BA0804-BA0767**
 4.2 ODU type **18G_XMC2_** QPSK **28 M** **43 M**
 4.3 ODU weight (kg) 4.5kg
 4.4 ODU dimension (WxHxD mm) 228x228x75
 4.5 No. of ODU 1
 4.6 Operating voltage range 48VDC ±15%
 4.7 Power consumption for one ODU ≤36w
 4.8 Frequency Band 18G
 4.9 ODU sub-band Sb2
 4.10 Frequency (MHz) TX Ch. NE **20L 18250.00V**
 FE **20H 19260.00V**
 4.11 Output power (dBm) **19.00**
 4.12 Bandwidth/Modulation 28 M 0 QPSK
 4.13 RX threshold criteria 1E-6 BER
 4.14 Maximum receive signal,RX threshold **-88.00**
 4.15 Receive signal (dBm) **-42.52**
 4.16 Polarization **Vertical**

5 ANTENNA

- 5.1 Antenna type Single Pol.
 5.2 No. of Antennas 1
 5.3 Antenna Height (m) **45.00**
 5.4 Antenna Gain, Mid (dBi) **34.20**
 5.5 Return loss (dBi) 17.69
 5.6 Weight of antenna (kg) **9.5**
 5.7 Wind Forces, Axial (N) 430
 5.8 Wind Forces, Side (N) 235

6 POWER CONSUMPTION

- 6.1 Total power consumption (W) 250w
 (Power for IDU)

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Project: **Telenor Myanmar**
Radio TRM OptiX RTN950

Site: **BA0804**

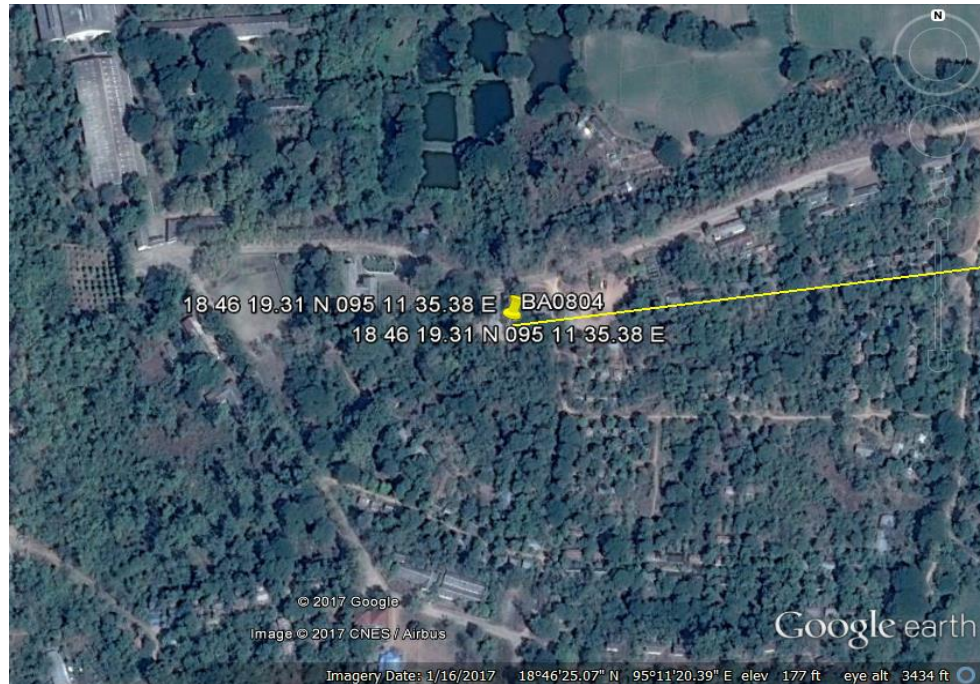
Geographical coordinates

N 18° 46' 19.31" - E 95° 11' 35.38"

Address

No(16), Heavy Industry (Sinde), Padaung
Township, Pyay

Myanmar


LINK ID: BA0804 - BA0767


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EMZ Jovito Ege		2/127 11-IPA 165 5829 Uen		
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Project: **Telenor Myanmar**
 Site: **BA0804**

Radio TRM OptiX RTN950
BA0804 - BA0767

Item	Description	Item Code	Quantity	
1	ANTENNA EQUIPMENT (Antenna with accessories)			
	0.3m 18GHz HP,Single Polarization Antenna	52431114	2	sets
2	RADIO EQUIPMENT (ODU)			
	ODU (18G_1+0_S_0.3m)			
	ODU,RTN XMC,18G,-2,1010/1008MHz,SB B=L H,18180MHz,18700MHz,Without doc,WR-42,H01	52413078	1	Unit
	ODU,RTN XMC,18G,-2,1010/1008MHz,SB B=H H,19190MHz,19710MHz,Without doc,WR-42,H01	52413079	1	Unit
3	OUTDOOR INSTALLATION			
	IF/ODU Installation Accessories(5D)	02230CJP	2	PCS
	Coaxial Cable ,Copper-clad Aluminium	25070149	110	m
	Wire,50ohm,7.6mm,4.8mm,1.8mm,Black,5D			
4	INDOOR UNIT OPTIX RTN 950(V100R006)			
	Versatile IF Board	03021PFK	2	PCS

NOTE:

Use only necessary RF Cable length on site.
 Please return to warehouse excess coaxial cables.

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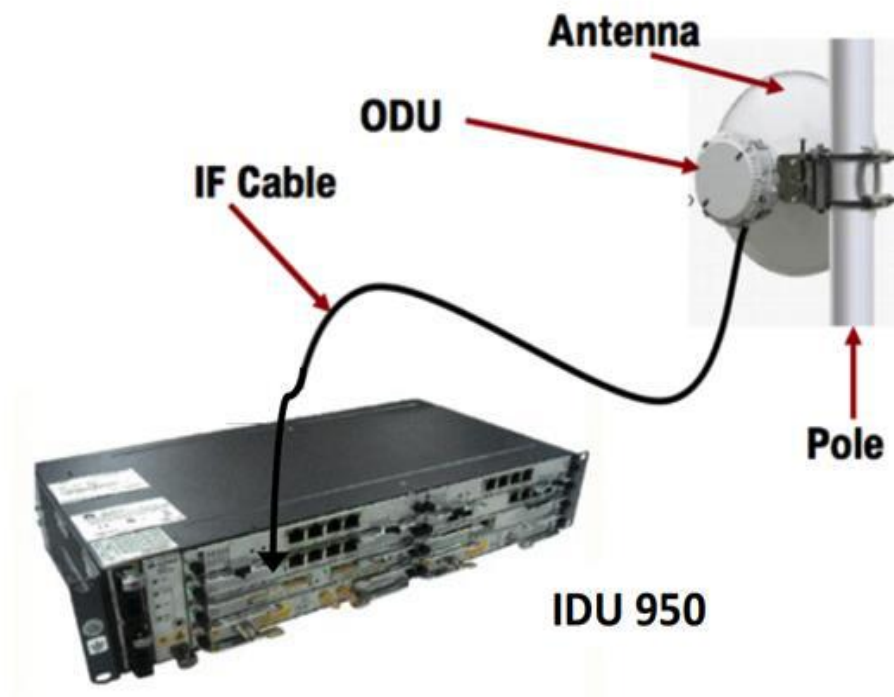
Project: **Telenor Myanmar**
 Site: **BA0804**

Radio TRM OptiX RTN950

1+0 ANTENNA CONFIGURATION

Far-end Direction: BA0767
 Antenna Size: 0.3 m
 Antenna Height (m): 45.00 m
 Azimuth: 82.35 °

Equipment Components



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Project: Telenor Myanmar
Site: BA0804
Radio TRM OptiX RTN950

A. Radio TRM OptiX RTN950 LAYOUT

SITE A (Near-End) BA0804 CONFIGURATION: 1 x L3

Scenario4: Last Mile MW site	
Cabling Rule : 1.Configure 1*EG4 per IDU ; 2.3rd port connect to RAN ; 3.IF board installed slot priority:Slot 5 , Slot 3 , Slot 6 , Slot 4	

- GE Fiber
- GE Copper

RTN950n:IDU 1 -L3 CSG01

PIU	FAN	7	CSHUA	8	CSHUA
		5	ISV3 NO1 - FACING BA0767	6	DUMMY
		3	ISV3 NO2 - FACING BA0159	4	DUMMY
PIU		1	EG4 1 2 1 2 3 4	2	DUMMY

Twisted Pair Cable, 100ohm - 25050014

To 2G BTS/3G NodeB

OptiX RTN 950 L3 - CSG01

PIU/01	FAN	7	CSHUA				8	CSHUA			
		5	Facing _____				6	Facing _____			
PIU/00		3	Facing _____				4	Facing _____			
		1	<div>1</div> <div>2</div>	<div>1</div>	<div>2</div>	<div>3</div>	<div>4</div>	2			

NOTE:
Please indicate existing site directions & cabling as per actual site installation.

BLOCK DIAGRAM (TRM CROSS CONNECT)

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Project: **Telenor Myanmar**
Site: **BA0804**

Radio TRM OptiX RTN950

A. Radio TRM OptiX RTN950 LAYOUT

SITE B (Far-End)

BA0767

CONFIGURATION: 1 x L3

RTN950N:IDU I -L3 CSGOI

PIU	FAN	7	CSHUA				8	CSHUA				
		5	ISV3 NO1 - FACING BA0803				6	DUMMY				
PIU		3	ISV3 NO2 - FACING BA0804				4	DUMMY				
		1	EG4	1	2	1	2	3	4	2	DUMMY	

Twisted Pair Cable,
100ohm - 25050014

To 2G
BTS/3G
NodeB

NOTE:

Please indicate existing site directions & cabling as per actual site installation.

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Project: **Telenor Myanmar**
Site: **BA0804**

Radio TRM OptiX RTN950

A. RACK LAYOUT

CABLE SPACE
DCDU1 (1U)
DCDU2 (1U)
DCDU3 (1U)
BBU (2U)
EMUA (1U)
RTN950 (L3)
SPARE SPACE (1U)
SPARE SPACE (1U)
SPARE SPACE (1U)
SPARE SPACE (1U)
SPARE SPACE (1U)
SPARE SPACE (1U)

*** Please update on site configuration. How many RTN and RBS Installed in actual.

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Project: **Telenor Myanmar**
 Site: **BA0804**

Radio TRM OptiX RTN950
BA0804 - BA0767

INSTALLATION CHECK LIST

OK = Correctly installed, NOK = Not Correctly installed, N/A = Not applicable

A. TRM EQUIPMENT	OK	NOK	N/A	COMMENTS
1. Equipment clean and undamaged	OK			
2. Installed according to allocation drawing	OK			
3. Power cable connected to correct fuse	OK			
4. All cables in the front properly connected	OK			
5. All screws tightened to correct torque	OK			
6. Equipment labeled according to SID	OK			
7. Grounded, washers in place and bolts tightened	OK			
8. Grounding cable insulation undamaged	OK			
9. ODF installed according to allocation drawing	OK			

B. TRM & ALRM CABLE	OK	NOK	N/A	COMMENTS
1. Electrical transmission cables connected	OK			
2. Electrical transmission cables labeled	OK			
3. Minimum bending radius followed for optical	OK			

C. ANTENNA SYSTEM - MW	OK	NOK	N/A	COMMENTS
1. Antenna(s) installed in accordance with SID	OK			
2. Bearing, Polarization in accordance with SID	OK			
3. All screws of antenna support(s) tightened	OK			
4. ODU installed correctly	OK			
5. Kit for separate installation correctly fitted	OK			
6. Power cable properly connected	OK			
7. DCN cable checked (if present)	OK			
8. Electrical transmission cables connected	OK			
9. Grounded, washers in place and bolts tightened	OK			

D. CONCLUDING ROUTINES	OK	NOK	N/A	COMMENTS
1. SID marked for as-built	OK			
2. Labeling of the external cables	OK			
3. Site area cleaned	OK			

All installation activities have been completed [**NO**] [**YES**] (if no, specify below)

Problems/Comments (Refer to applicable activity numbers)

Responsible Engineer (Ericsson)

Name _____ Signature _____ Date _____

Accepted by (Telenor)

Name _____ Signature _____ Date _____

Prepared (also subject responsible if other)

Document No.

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Date

Rev.

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ETV Minh Nguyen D / Manoj Kumar A

2017-12-05

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Project: **Telenor Myanmar**

Radio TRM OptiX RTN950

Site: **BA0804**

MANPOWER	NOS.
1 Site Supervisor	
2 Team Leader	
3 Technician	
4 Laborers	
5 Others	

EQUIPMENT USED	NOS.
1	
2	
3	
4	
5	
6	

EQUIPMENT USED	NOS.
7	
8	
9	
10	
11	
12	

WORK ACTIVITIES:

Health & Safety Observation/Check list	OK	NOK	N/A	Comments
1 Safety Shoe	OK			
2 Safety Gloves	OK			
3 Safety Helmets	OK			
4 Safety Belts	OK			
5 Arrangement for Emergency Evacuation	OK			
6 Arrangement for Emergency Communication	OK			
7 Arrangement for First Aid	OK			
8 Arrangement for Toilets / Washing				
9 Site Safety Protection	OK			
10 Security Guard at site				

OTHER MATTERS / ISSUES:

OHS confirmed by (ASP):

Print Name: _____

Signature: _____

Date: _____

Checked and Verified by: Ericsson Myanmar Co. Ltd.

Print Name: _____

Signature: _____

Date: _____

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EMZ Jovito Ege		3/153 83-IPA 165 5829 Uen	
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ETV Minh Nguyen D / Manoj Kumar A		2017-12-05	A
		File	
		BA0804 Telenor_A	

Project: **Telenor Myanmar**
 Site: **BA0804**

Radio TRM OptiX RTN950
BA0804 - BA0767

NETWORK ADDRESSES (DCN)

		Address	OSPF Area
Agent IP Address			
Ethernet	IP Address		
	IP Net Mask		
Default gateway			
Interface			

Port	Setup				VLAN ID
Lan1	<input type="checkbox"/> Disable	<input type="checkbox"/> In Band			
Lan2	<input type="checkbox"/> Local Access Only	<input type="checkbox"/> In Band	<input type="checkbox"/> Out of Band	<input type="checkbox"/> Drop Node	

COMMISSIONING CHECKS

1 Configurations in compliance with the Link documentation

1.1 Synchronization ☐ Enabled ☐ Disabled

2 Radio parameters

2.1	Set TX and RX frequencies	
2.2	RF channel number	
2.3	TX Power set by webLct	

3 ATPC

3.1 TX Power ☐ Manual ☐ Automatic (ATPC) Range (dB)

3.2 ATPC PRX threshold High Low

4 Modulation / Bandwidth and ACM

4.1 Reference Modulation

4.2 Reference RF Bandwidth

4.3 ACM engine ☐ Enabled ☐ Disabled

4.4 TX power ramp up to ☐ Enabled ☐ Disabled

4.5 Upper Modulation QAM

4.6 Lower Modulation QAM

4.7 ACM Table

☐ 4QAM-st ☐ 4QAM
☐ 16QAM-st ☐ 16QAM
☐ 32QAM ☐ 64QAM
☐ 128QAM ☐ 256QAM
☐ 512QAM ☐ 1024QAM

5 Received signal level

5.1	RSL in reference mod. ⁽¹⁾	
5.2	RSL in max. mod. ⁽¹⁾	

⁽¹⁾ Checked by WebLCT indication

6 RX quality Link

6.1	Maximum Modulation with ACM ⁽³⁾	
6.2	S/N max. Mod. in ACM RX ⁽²⁾⁽³⁾	

⁽²⁾ In case of ACM enabled, indicate S/N measure related to the upper modulation scheme in compliance with the project report.

⁽³⁾ Checked by WebLCT indication, in compliance with the project report

7 Web LCT Measurements Resolution = 3dB ☐ OK ☐ NOK

8 Set Active manual operation timeout = 2 s ☐ OK ☐ NOK

Remarks: _____

Responsible Engineer (Ericsson)

Name _____ Signature _____ Date _____

Accepted by (Telenor)

Name _____ Signature _____ Date _____

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Project: **Telenor Myanmar**
Site: **BA0804**

Radio TRM OptiX RTN950

NETWORK ELEMENT ACCEPTANCE CERTIFICATE

This is to certify that Ericsson Radio Systems AB has delivered, installed and tested the Network Elements on site **BA0804** as defined in PO_NS_000019 and PO_NS_000019

PO RBS: PO_NS_000019
PO TRM: PO_NS_000019
PO Antenna:

The Network element acceptance has been performed in accordance with the procedures described in above mentioned contract. Further reference should be made to the acceptance documents. The Network element passed the acceptance with remarks per attached test report.

TEST DOCUMENTS
Test Report (OptiX TRN950 Functional)

Documents Number
3/153 83-IPA 165 5829 Uen rev A

Date:

for

for

Telenor
(The Buyer)

Ericsson Myanmar
(The Vendor)

Name:

Title:

Name:

Title:

Prepared (also subject responsible if other) EMZ Jovito Ege		Document No. 2/153 83-IPA 165 5829 Uen		
Doc respons/Approved ETV Minh Nguyen D / Manoj Kumar A	Checked	Date 2014-09-18	Rev. A	File BA0804 Telenor_A

Project: **Telenor Myanmar**
Site: **BA0804**

Radio TRM OptiX RTN950
BA0804 - BA0767

<u>UNIT</u>	<u>PRODUCT CODE</u>	<u>REV</u>	<u>SERIAL No.</u>	<u>MFG.DATE</u>
TRANSMISSION EQUIPMENT				
ODU,RTN XMC, 18G , SB B=L 18180MHz,18700MHz	52413078		2152413850CNH5000239	
ODU,RTN XMC, 18G , SB B=H 19190MHz,19710MHz	52413079		2152413851CNH4000224	
ANTENNA				
18G, Microwave Antenna 300mm, Single Pol	52431114		21524311143RH5000119	NEAR-END
			21524311143RH5000027	FAR-END
RTN 950(V100R006)				
NEAR-END RTN Slot 5 - ISV3	03021PFK		021PFKCNFB004899	
FAR-END RTN Slot 3 - ISV3	03021PFK		021PFKCNFB005469	

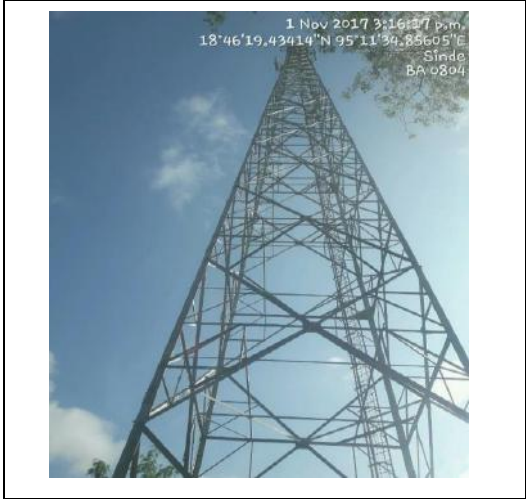
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Site: **BA0804**

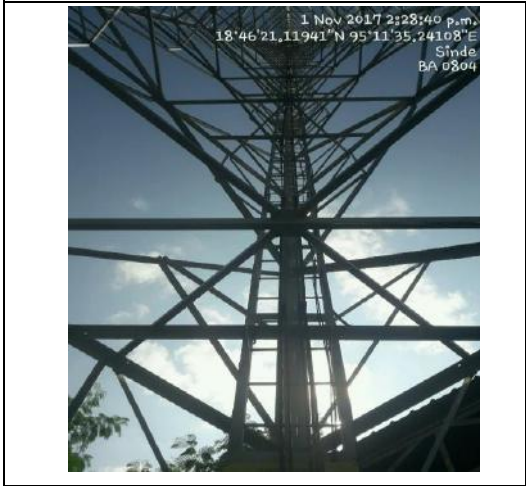
Radio TRM OptiX RTN950

NEAR END

Tower View



Vertical Cable Ladder



Horizontal Cable Ladder

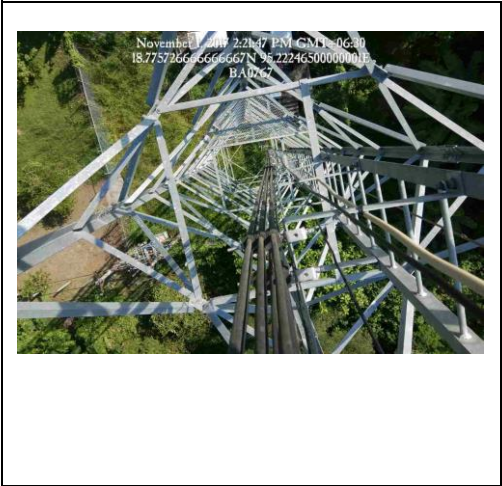


FAR END

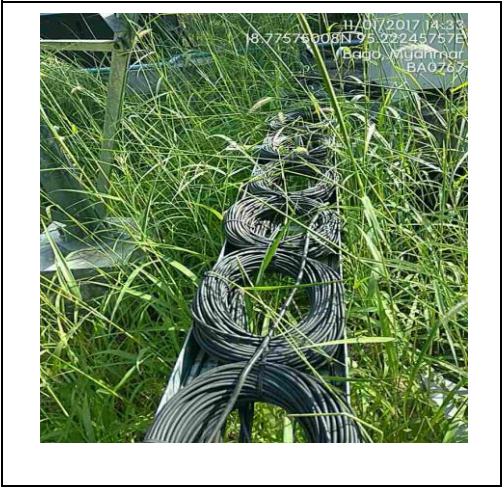
Tower View



Vertical Cable Ladder



Horizontal Cable Ladder



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Radio TRM OptiX RTN950

Antenna



Antenna



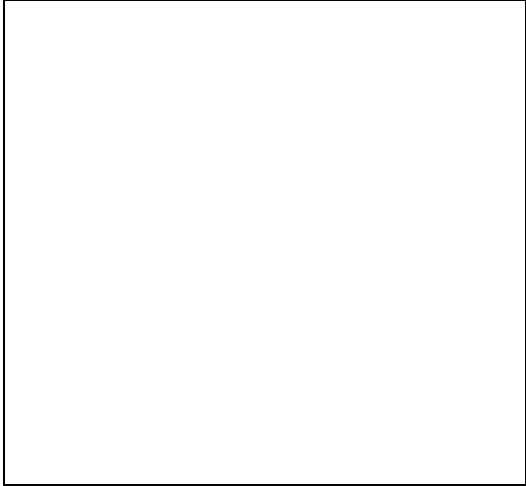
Mounting bracket



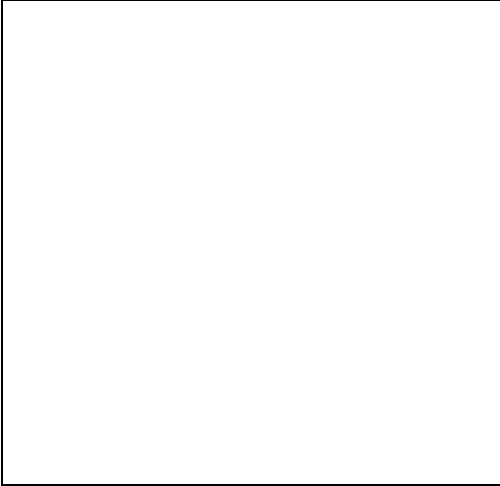
Mounting bracket



MW Antenna side strut from 0.9 m



MW Antenna side strut from 0.9 m



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Project: Telenor Myanmar
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Radio TRM OptiX RTN950

Label Outdoor



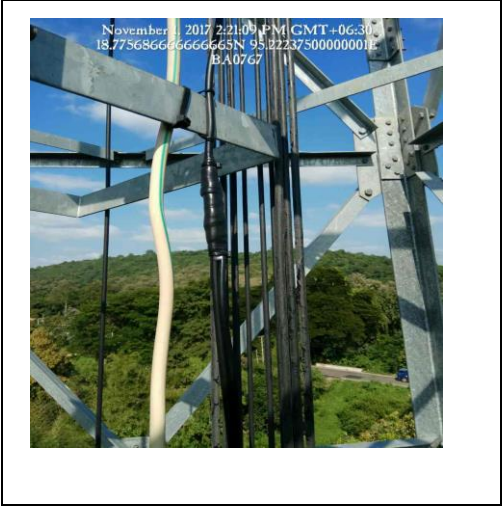
Label Outdoor



Grounding IF Cable at Top



Grounding IF Cable at Bottom



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Project: Telenor Myanmar
Site: BA0804

Radio TRM OptiX RTN950

Cabinet (Open)



RTN



Cabinet (Open)



RTN





SITE MATERIAL REQUEST (SMR)



Proposed: EMZ Ei Ei Khine	Project Manager: Manoj Kumar	Requester Name: Sajjan Kumar/Kyaw Htwe Naing	Request Date: October 30, 2017	Rev:	B			
Customer reference no./Main Project TELENOR MYANMAR	SMR ID:	Requester Tel:	Site ID (Candidate): BA0804	Facing Sites	BA0767			
Delivery date:	ASP Name:	ASP Telephone no.:	Site Type: GBT	Region:	Bago			
Site Address: No(16), Heavy Industry (Sinde), Padaung Township, Pyay				P/L No.:				
Remarks: SMR is based on Configuration_Connectivity_Oct 30_V2 4PM, New reroute link due to community issue , Material changed due to LOM ,After install new link BA0171-BA0159will be dismantled.								
No.	Model PO	Part Number/ Product Code (WH)	Package No.	PO No.	DESCRIPTION	QTY	UOM	Remarks
Access MW FROM: BA0804 FACING TO: BA0767								
2	SL91ISV3	03021PFK			Versatile IF Board	2	PCS	1 FOR NEAR- END/ 1 FAR- END INCLUDED IN ODU BOX
	ODU(XMC-2-18G)	ODU18G-1+0			ODU18G-1+0 Solution	1	PC	LOW/HIGH BAND ODU & IF/ODU Installation Accessories
	A18S03HAC	52431114			Microwave Antenna,A18S03HAC,18G,300mm,HP,Single Polarization,Direct(XMC)/Separate(All RTN ODU) Mount,34.2dBi,3.3deg,60dB,30dB,With English doc,C3	2	PCS	1 ANT.NEAR-END/1 ANT.FAR- END
	RF CABLE-5D	25070149			Coaxial Cable ,Copper-clad Aluminium Wire,50ohm,7.6mm,4.8mm,1.8mm,Black,5D	110	M	BOTH NEAR-END/FAR-END
Note: 1 LINK FACING FAR END BA0767,U Paing No.23/1, Kwin No.406, Ma Au Kwin, Sin Su Ward, Pyay, Bago.								
Warehouse Signature				Receiver signature		Trucker signature		
Date/Time				Date/Time		Date/Time		

			BA0804				BA0767							
Latitude			18 46 19.31 N				18 46 32.77 N							
Longitude			095 11 35.38 E				095 13 20.64 E							
True azimuth (°)			82.35				262.36							
Vertical angle (°)			-0.43				0.41							
Elevation (m)			47.78				35.00							
Antenna model			A18S03HAC (TR)				A18S03HAC (TR)							
Antenna file name			a18s03hac				a18s03hac							
Antenna gain (dBi)			34.20				34.20							
Antenna height (m)			45.00				35.00							
Connector loss (dB)			0.50				0.50							
Miscellaneous loss (dB)			0.50				0.50							
Frequency (MHz)			18000.00											
Polarization			Vertical											
Path length (km)			3.11											
Free space loss (dB)			127.43											
Atmospheric absorption loss (dB)			0.49											
Net path loss (dB)			61.52				61.52							
Radio model			18G_XMC2_QPSK_28M_43M				18G_XMC2_QPSK_28M_43M							
Radio file name			18gxmc228mqpsk				18gxmc228mqpsk							
Emission designator			28M0D7W				28M0D7W							
TX channel assignments			18G_27.5M_20L 18250.00V				18G_27.5M_20H 19260.00V							
Geoclimatic factor			5.590E-006											
Path inclination (mr)			7.32											
Fade occurrence factor (Po)			2.241E-006											
Polarization			Vertical											
Rain region			ITU Region P											

	TX power (dBm)		RX threshold level (dBm)		EIRP (dBm)		Receive signal (dBm)		Thermal fade margin (dB)		Flat fade margin - multipath (dB)	
512QAML 210Mbps	17.00	17.00	-65.00	-65.00	50.20	50.20	-44.52	-44.52	20.48	20.48	20.48	20.48
512QAM 196Mbps	19.00	19.00	-66.50	-66.50	52.20	52.20	-42.52	-42.52	23.98	23.98	23.98	23.98
256QAM 183Mbps	19.00	19.00	-68.50	-68.50	52.20	52.20	-42.52	-42.52	25.98	25.98	25.98	25.98
128QAM 161Mbps	19.00	19.00	-71.50	-71.50	52.20	52.20	-42.52	-42.52	28.98	28.98	28.98	28.98
64QAM 136Mbps	19.00	19.00	-74.50	-74.50	52.20	52.20	-42.52	-42.52	31.98	31.98	31.98	31.98
32QAM 110Mbps	19.00	19.00	-78.00	-78.00	52.20	52.20	-42.52	-42.52	35.48	35.48	35.48	35.48
16QAM 86Mbps	19.00	19.00	-81.00	-81.00	52.20	52.20	-42.52	-42.52	38.48	38.48	38.48	38.48
16QAMS 74Mbps	19.00	19.00	-82.50	-82.50	52.20	52.20	-42.52	-42.52	39.98	39.98	39.98	39.98
QPSK 43Mbps	19.00	19.00	-88.00	-88.00	52.20	52.20	-42.52	-42.52	45.48	45.48	45.48	45.48

	Worst month multipath		Annual multipath		Annual rain		Total annual		Time in mode (%)	
512QAML 210Mbps	99.9999	99.9999	99.9999	99.9999	99.9830	99.9830	99.9830	99.9830	99.9830	99.9830
512QAM 196Mbps	99.9999	99.9999	99.9999	99.9999	99.9887	99.9887	99.9887	99.9887	0.0057	0.0057
256QAM 183Mbps	99.9999	99.9999	99.9999	99.9999	99.9909	99.9909	99.9909	99.9909	0.0022	0.0022
128QAM 161Mbps	99.9999	99.9999	99.9999	99.9999	99.9932	99.9932	99.9932	99.9932	0.0024	0.0024
64QAM 136Mbps	99.9999	99.9999	99.9999	99.9999	99.9949	99.9949	99.9949	99.9949	0.0016	0.0016
32QAM 110Mbps	99.9999	99.9999	99.9999	99.9999	99.9962	99.9962	99.9962	99.9962	0.0013	0.0013
16QAM 86Mbps	99.9999	99.9999	99.9999	99.9999	99.9970	99.9970	99.9970	99.9970	0.0008	0.0008
16QAMS 74Mbps	99.9999	99.9999	99.9999	99.9999	99.9974	99.9974	99.9974	99.9974	0.0003	0.0003
QPSK 43Mbps	99.9999	99.9999	99.9999	99.9999	99.9982	99.9982	99.9982	99.9982	0.0009	0.0009