No. B.V-7-C/2025-26-C(M/Link)-QR CELL   Dated, the 2f Jan'2026

Subject: - REQUEST FOR COMMENTS OF STAKEHOLDERS /OEM/FIRMS ON DRAFT QRs & TDs OF "MICROWAVE RADIO LINK" REGARDING.

The Draft QRs/TDs of "**Microwave Radio Link**" are attached as **Appendix 'A'**. The OEMs/Vendors are requested to forward information of the product, which they can offer and also forward correct specifications of their product against each parameter. Only complied or not complied remarks will not be accepted. The firms are also requested to furnish the following details: -

- Whether you are OEM/Vendor?
- If vendor, details of OEM required.
- Authorization certificate from OEM.

2.   The required information/details may please be forwarded at the following addresses by 13 **February'2026**.

Communication Directorate, CRPF

East Block-7, Sec-1, R.K. Puram, New Delhi-110066

Email: comncell@crpf.gov.in

3.   An early response is requested.

(Megh Raj)
DIG (Equipment)
Communication & IT Branch
Directorate General, CRPF

Draft QRs/TDs of Microwave Radio Link

S. N	Parameter	Technical Specifications	Trial Directives
1	Frequency Band	Radio Should Support 2.4 to 40 GHz with licenced/ unlicensed frequency band (as per user requirement.)	Firm will submit OEM certificate
2	Encryption	AES-256 or better	Firm will submit OEM certificate
3	Capacity	Min 100 net aggregate or better (100 Mbps)	BOO will check practically and firm will submit OEM
4	Modulation	2X2 MIMO-OFDM, QPSK, 16QAM, 64QAM, 256 QAM or advance. Both manual and auto configurable	BOO will check practically and firm will submit OEM
5	Tx Output	26 dBm or better	BOO will check practically and firm will submit OEM
6	RX Sensitivity	-88 dBm	BOO will check practically and firm will submit OEM
7	RF Channels	7 nonoverlapping channels in frequency band as mentioned in Sl. No 1 in 5/10/20/40 MHz channel width configuration or better option as per user requirement	Firm will submit OEM certificate
8	Channel Bandwidth	Should support user configurable 5/10/20/40 MHz channel bandwidth. The radios should also support 40 MHz channel bandwidth to address high capacity backhaul requirements in PTP Radio Links	Firm will submit OEM certificate
9	Wireless Error correction	Should support FEC	Firm will submit OEM certificate
10	ODU enclosure	IP67 or better	Firm will submit certificate of any Govt. Lab or NABL or ILAC accredited laboratory.
11	Ethernet Ports	Should support minimum 02 port	Board will check Practically.
12	Diversity	Polarization and Spatial diversity supported	Firm will submit OEM certificate
13	Topology	Point to Point	Board will check Practically.

| 14 | Throughput | Aggregate 100 Mbps or better (same ODU must be software scalable upto 300 Mbps without changing the hardware | Firm will submit OEM certificate |
| 15 | Security | Mac level authentication / Link Lock | Board will check Practically and firm will also submit OEM certificate. |

Operational

1	Operating Modes	Ethernet PoE	Board will check Practically.
2	VLAN support	Required	Board will check Practically.
3	Asymmetrical TDD	Should support asymmetric Bandwidth	Firm will submit OEM certificate.
4	Link Distance	Min 20 Kms or better	Board will check practically.
5	Spectrum Analyzer (in build)	Link-oriented spectrum analyser: Should show the results of both sites	Board will check Practically.
6	Duplex Technology	TDD (Time Division Duplex)	Firm will submit OEM certificate.
7	Redundancy	Should have provision for 1+1 configuration in all respect with automatic switch over of transmitter and receiver for radio link redundancy in less than 150 milli seconds in case of any failure via Ethernet Switch (As per user requirement)	Board will check Practically and firm will also submit OEM certificate.
8	TX Power Management	Both manual and Automatic	Board will check Practically

Network Management and Security

1	Network Support	Ethernet	Board will check Practically.
2	Antenna Alignment tools	Buzzer/visual LEDs	Board will check Practically.
3	Management utilities	SNMP based or local and remote loop back testing	Board will check Practically.
4	Management interface	Ethernet	Board will check Practically.

5	Network management System	Should support SNMP	Firm will submit OEM certificate
6	Upgrade capabilities	Should have facility to upgrade over the Air. Should support software backup and restore through EMS	Firm will submit OEM certificate

Physical & Environment parameters

1	Network Connection	Ethernet (PoE)	Board will check practically
2	External Antenna Connection	Weatherproof connector	Board will check practically
3	PoE Adopter	IDU to provide power over cat 6 or better cable to ODU	Board will check practically
4	Power consumption	Less than 35 Watts (IDU_ODU)	Firm will submit OEM certificate
5	LED indicators	Power and line	Board will check practically
6	Temperature	-25 to +60°C or Better (ODU)	Firm will submit certificate of any Govt. Lab or NABL or ILAC accredited laboratory.
7	Enclosure	All weather casing for ODU	Firm will submit certificate of any Govt. Lab or NABL or ILAC accredited laboratory.
8	Environmental Compliance	MIL-STD 810 G or better or IEC 60950 or JSS-55555	Firm will submit certificate of any Govt. Lab or NABL or ILAC accredited laboratory.
9	Shock and vibration	MIL-STD 810 G or better or IEC 60950 or JSS-55555	Firm will submit certificate of any Govt. Lab or NABL or ILAC accredited laboratory.
10	Radio Regulation	As per WPC guidelines	Firm will submit WPC certificate
11	Power Source	COMPATIBLE AC and DC POWER SOURCE	Firm will submit OEM certificate

Antenna Dual Polarized 2X2 MIMO dish antenna

1	Frequency Band	Radio Should Support 2.4 to 40 GHz with licenced/ unlicensed frequency band (as per user requirement)	Firm will submit OEM certificate

2	Gain (dBi)	29 dBi or better	Firm will submit OEM certificate
3	VSWR(Max)	1.5:1	Firm will submit OEM certificate and Board will Check physically
4	Port to port isolation (dB)	≥30	Firm will submit OEM certificate
5	Temperature Range (°C)	-25°C to +60°C	Firm will submit certificate of any Govt lab/NABL/STQC/ ILAC accredited lab
6	Wind speed (km/hr)	100 KM /hr	Firm will submit OEM certificate
7	Humidity	95% Non-condensation	Firm will submit certificate of any Govt lab/NABL/STQC/ ILAC accredited lab
Minimum Specification for Switch			
1	Ports	a) 8/16/24 auto-sensing 10/100/1000 Base-T RJ 45 ethernet ports with auto-MDIX, Full Duplex b) 2 RJ 45 uplink ports (1G/2.5G/10G) OR Minimum 2 dedicated SFP/SFP+ uplink ports (1G/2.5G/10G) for Microwave Radio Link IDU/aggregation OR Both (As per user requirement) c) 1 RJ-45 Serial Console Port	Verification with OEM Tech Brochure and Board will check practically.
2	Memory and Processor	Network switching ASIC with CPU ≥ 800 MHz, Flash ≥ 64 MB, RAM ≥ 256 MB, Packet buffer ≥ 2 MB	Verification with OEM Tech Brochure
3.	QoS	IEEE 802.1p, DSCP based QoS with minimum 8 hardware queues per port, strict priority & WRR scheduling	Firm will submit OEM certificate
4	Performance		

		a) Throughput	Wire-Speed forwarding on all ports (Non-Blocking)	Verification with OEM Tech Brochure
		b) Switching capacity	12.8 Gbps or better	Verification with OEM Tech Brochure
		c) Mac address table size	8,000 entries	Verification with OEM Tech Brochure
	5	Jumbo Frame	≥ 9K Bytes MTU	
	6	Management	CLI (SSH), Web GUI (HTTPS), SNMP v2/v3, Syslog, NTP	Verification with OEM Tech Brochure and Board will check practically.
	7	Layer 2 Features	IEEE 802.1Q VLAN (4094 IDs), VLAN tagging/untagging, Port-based VLAN, QinQ (Optional)	Firm will submit OEM certificate
	8	Loop Protection	RSTP/ MSTP/BPDU Guard/ Loopback detection	Verification with OEM Tech Brochure and Board will check practically.
	Additional Features			
		Self-supporting tower 20/25 meter as per user requirement.		BOOs will check physically

SELF SUPPORTING TOWER 20 METERS (OPTIONAL)

S.N	Parameters	Specifications	Trial directives
1.	**1 TOP Section**		
	Pipe Size		
	Outer Dimension	30 - 31 mm	Board will check practically.
	Wall Thickness	2.0 - 2.5 mm	Board will check practically.
	Class	GI pipe conforming of ISI ERW Medium	Firm will provide undertaking certificate.
	Width Top	420 – 430 mm	Board will check practically.
	Width Bottom	500 – 520 mm	Board will check practically.
	Cross Bar	10 - 12 mm	Board will check practically.
2.	**2 TOP Section**		
	Pipe Size		
	Outer Dimension	40 – 42 mm	Board will check practically.

	Wall Thickness	2.5 – 3.0 mm	Board will check practically.
	Class	GI pipe conforming of ISI ERW Medium	Firm will provide undertaking certificate.
	Width Top	520 – 540 mm	Board will check practically.
	Width Bottom	610 – 630mm	Board will check practically.
	Cross Bar	10 – 12 mm	Board will check practically.
3.	**3 TOP Section**		
	Pipe Size		
	Outer Dimension	40 – 42 mm	Board will check practically.
	Wall Thickness	2.5 – 3.0 mm	Board will check practically.
	Class	GI pipe conforming of ISI ERW Medium	Firm will provide undertaking certificate.
	Width Top	620 – 640 mm	Board will check practically.
	Width Bottom	710- 730 mm	Board will check practically.
	Cross Bar	12- 14 mm	Board will check practically.
4.	**4 TOP Section**		
	Pipe Size		
	Outer Dimension	47 – 49 mm	Board will check practically.
	Wall Thickness	3.0 – 3.5 mm	Board will check practically.
	Class	GI pipe conforming of ISI Light	Firm will provide undertaking Certificate.
	Width Top	730 – 750 mm	Board will check practically.
	Width Bottom	820 – 840 mm	Board will check practically.
	Cross Bar	12 – 14 mm	Board will check practically.
5.	**5 TOP Section**		
	Pipe Size		
	Outer Dimension	47 – 49 mm	Board will check practically.
	Wall Thickness	3.0 – 3.5 mm	Board will check practically.
	Class	GI pipe conforming of ISI Light	Firm will provide

			undertaking certificate.
	Width Top	830 – 850 mm	Board will check practically.
	Width Bottom	920 – 940 mm	Board will check practically.
	Cross Bar	12 – 14 mm	Board will check practically.
6.	**6 TOP Section**		
	Pipe Size		
	Outer Dimension	47 – 49 mm	Board will check practically.
	Wall Thickness	3.5 – 4.0 mm	Firm will provide undertaking certificate.
	Class	GI pipe conforming of ISI medium	Board will check practically.
	Width Top	930 – 950 mm	Board will check practically.
	Width Bottom	1030 – 1050 mm	Board will check practically.
	Cross Bar	12 – 14 mm	Board will check practically.
7.	**BASE Section**		
	Pipe Size		
	Outer Dimension	47 – 49 mm	Board will check practically.
	Wall Thickness	3.5 – 4.0 mm	Board will check practically.
	Class	GI pipe conforming of ISI medium	Firm will provide undertaking certificate.
	Width Top	1035 – 1055 mm	Board will check practically.
	Width Bottom	1130 – 1150 mm	Board will check practically.
	Cross Bar	15 – 17 mm	Board will check practically.
8.	**General**		
a)	Coating		
i)	Primary	Zinc- Phosphate Epoxy Resin	Firm will provide undertaking certificate.
ii)	Final	The tower shall be painted to have equal alternate bands of international Orange and White colors with top and bottom bands painted as per civil aviation regulation.	Board will check practically.
b)	GI Pipe	Should be made by reputed OEM	Board will check

			practically.
c)	Nut, Bolt and Washers	All fasteners, plain washers, nut bolts and washers should be galvanized as per applicable relevant standards.	Firm will provide undertaking certificate.
d)	Earthings & Others		
i)	Earthing	The tower shall be grounded properly and the Earthing shall be of Copper wire as per relevant standards and industrial practice.	Board will check practically.
ii)	Lighting Arrestor	Lightning arrestor to be installed on the top of the tower.	Board will check practically.
iii)	Aviation Lamp	02 Nos to be installed on the top of the tower as per civil aviation rules.	Board will check practically.
e)	Installation	To be carried out by the Firm along with construction of necessary Concrete Base	Board will check practically.

SELF SUPPORTING TOWER 25 METERS (OPTIONAL)

S.N	Parameters	Specifications	Trial directive
1.	**1 TOP Section**		
	Pipe Size		
	Outer Dimension	30 - 31 mm	Board will check practically.
	Wall Thickness	2.0 - 2.5 mm	Board will check practically.
	Class	GI pipe conforming of ISI ERW Medium	Firm will provide undertaking certificate.
	Width Top	310 – 320 mm	Board will check practically.
	Width Bottom	410 – 530 mm	Board will check practically.
	Cross Bar	8 – 10 mm	Board will check practically.
2.	**2 TOP Section**		
	Pipe Size		
	Outer Dimension	30 – 31 mm	Board will check practically.
	Wall Thickness	2.0 – 2.5 mm	Board will check practically.
	Class	GI pipe conforming of ISI ERW Medium	Firm will provide undertaking certificate.
	Width Top	420 – 430 mm	Board will check practically.

	Width Bottom	500 – 520mm	Board will check practically.
	Cross Bar	10 – 12 mm	Board will check practically.
3.	**3 TOP Section**		
	Pipe Size		
	Outer Dimension	40 – 42 mm	Board will check practically.
	Wall Thickness	2.5 – 3.0 mm	Board will check practically.
	Class	GI pipe conforming of ISI ERW Medium	Firm will provide undertaking certificate.
	Width Top	520 – 540 mm	Board will check practically.
	Width Bottom	610 - 630 mm	Board will check practically
	Cross Bar	10 - 12 mm	Board will check practically.
4.	**4 TOP Section**		
	Pipe Size		
	Outer Dimension	40 – 42 mm	Board will check practically.
	Wall Thickness	2.5 – 3.0 mm	Board will check practically.
	Class	GI pipe conforming of ISI ERW Medium	Firm will provide undertaking certificate.
	Width Top	620 – 640 mm	Board will check practically.
	Width Bottom	710 – 730 mm	Board will check practically.
	Cross Bar	12 – 14 mm	Board will check practically.
5.	**5 TOP Section**		
	Pipe Size		
	Outer Dimension	47 – 49 mm	Board will check practically.
	Wall Thickness	3.0 – 3.5 mm	Board will check practically.
	Class	GI pipe conforming of ISI Light	Firm will provide undertaking certificate.
	Width Top	730 – 750 mm	Board will check practically.
	Width Bottom	820 – 840 mm	Board will check practically.
	Cross Bar	12 – 14 mm	Board will check

			practically.
6.	**6 TOP Section**		
	Pipe Size		
	Outer Dimension	47 – 49 mm	Board will check practically.
	Wall Thickness	3.0 – 3.5 mm	Board will check practically.
	Class	GI pipe conforming of ISI light	Firm will provide undertaking certificate.
	Width Top	830 – 850 mm	Board will check practically.
	Width Bottom	920 – 940 mm	Board will check practically.
	Cross Bar	12 – 14 mm	Board will check practically.
7.	**7 TOP Section**		
	Pipe Size		
	Outer Dimension	48 mm	Board will check practically.
	Wall Thickness	3.5 mm	Board will check practically.
	Class	GI pipe conforming of ISI medium	Firm will provide undertaking certificate.
	Width Top	940 mm	Board will check practically.
	Width Bottom	1040 mm	Board will check practically.
	Cross Bar	12 mm	Board will check practically.
8.	**Base Section**		
	Pipe Size		
	Outer Dimension	48 mm	Board will check practically.
	Wall Thickness	3.5 mm	Board will check practically.
	Class	GI pipe conforming of ISI medium	Firm will provide undertaking certificate.
	Width Top	1045 mm	Board will check practically.
	Width Bottom	1140 mm	Board will check practically.
	Cross Bar	16 mm	Board will check practically.
9.	**General**		
a)	Coating		

i)	Primary	Zinc- Phosphate Epoxy Resin	Firm will provide undertaking certificate.
ii)	Final	The tower shall be painted to have equal alternate bands of internationals Orange and White colors with top and bottom bands painted as per civil aviation regulation.	Board will check practically.
b)	GI Pipe	Should be made by reputed OEM.	Board will check practically.
c)	Nut, Bolt and Washers	All fasteners, plain washers, nut bolts and washers should be galvanized as per applicable relevant standards.	Firm will provide undertaking certificate.
d)	Earthing & Others		
i)	Earthing	The tower shall be grounded properly and the Earthing shall be of Copper wire as per relevant standards and industrial practice.	Board will check practically.
ii)	Lightning Arrestor	Lightning arrestor to be installed on the top of the tower.	Board will check practically.
iii)	Aviation Lamp	02 Nos to be installed on the top of the tower as per civil aviation rules.	Board will check practically.
e)	Installation	To be carried out by the Firm along with construction of necessary Concrete Base	Board will check practically.