

**Appendix C: BoQ for Package-OM3 DWDM & OTN requirement**

Sl. No.	Item Description	Unit	Qty.
<b>DWDM Network</b>			
<b>A</b>	<b>Trivandrum</b>		
	i DWDM Equipment (Optical Layer)	Lot	1
	ii DWDM OTN Equipment (Electrical Layer)	Lot	1
<b>B</b>	<b>Rajasthan</b>		
	i DWDM Equipment (Optical Layer)	Lot	1
	ii DWDM OTN Equipment (Electrical Layer)	Lot	1
<b>C</b>	<b>Jorhat</b>		
	i DWDM Equipment (Optical Layer)	Lot	1
	ii DWDM OTN Equipment (Electrical Layer)	Lot	1
<b>D</b>	<b>Jamnagar</b>		
	i DWDM Equipment (Optical Layer)	Lot	1
	ii DWDM OTN Equipment (Electrical Layer)	Lot	1
<b>E</b>	<b>Bangalore</b>		
	i DWDM Equipment (Optical Layer)	Lot	1
	ii DWDM Equipment (Electrical Layer)	Lot	1
<b>F</b>	<b>Cabinet (for equipment mentioned at A,B,C,D,E above)</b>	Lot	1
<b>G</b>	<b>OTN Type-I Equipment</b> Base Equipment (Line interfaces <b>with</b> pluggables, Client interfaces <b>without</b> pluggables, Switching Fabric, Power supply modules, Controller modules, other hardware, patch cords, power cabling & accessories including sub-racks etc.)	Set	40
<b>H</b>	<b>OTN Type-II Equipment</b> Base Equipment (Line interfaces <b>with</b> pluggables, Client interfaces <b>without</b> pluggables, Switching Fabric, Power supply modules, Controller modules, other hardware, patch cords, power cabling & accessories including sub-racks etc.)	Set	53
<b>I</b>	<b>OTN Type-III Equipment</b> Base Equipment (Line interfaces <b>with</b> pluggables, Client interfaces <b>without</b> pluggables, Switching Fabric, Power supply modules, Controller modules, other hardware, patch cords, power cabling & accessories including sub-racks etc.)	Set	363
<b>J</b>	<b>Cabinet for OTN TYPE-I,II,III Equipments</b>	Set	50

<b>K</b>	<b>Client Pluggables</b>		
i	100G GREY QSFP(ER4) Dual Rate 100GE/OTU4	No.	44
ii	100G GREY QSFP(LR4) Dual Rate 100GE/OTU4	No.	44
iii	10GBASE-ZR XFP/ SFP+ Dual Rate 10GE/OTU2	No.	606
iv	10GBASE-ER XFP/ SFP+ Dual Rate 10GE/OTU2	No.	606
v	10G BASE-LR XFP/ SFP+ Dual Rate 10GE/OTU2	No.	900
vi	1000 BaseLX SFP	No.	363
<b>L</b>	<b>Ethernet Tester</b>	No.	10
<b>M</b>	<b>TMN System (as per Technical specifications)</b>		
i	TMN Main with SDN Controller	Lot	1
ii	TMN Back-up with SDN Controller	Lot	1
iii	Work Stations (Clients)	No.	10
<b>N</b>	<b>Manpower Support (As per TS)</b>		
i	24x7 Shift Operation	Month	72
ii	General Duty OPERATIONS	Month	72
<b>O</b>	<b>Maintenance Services during defect liability period as per TS</b>	Year	1
<b>P</b>	<b>Maintenance Services after defect liability period as per TS</b>		
i	<b>1st Year AMC ---- % of Total Supply</b>	Year	3%
ii	<b>2nd Year AMC ---- % of Total Supply</b>	Year	3.25%
iii	<b>3rd Year AMC ---- % of Total Supply</b>	Year	3.50%
iv	<b>4th Year AMC ---- % of Total Supply</b>	Year	3.75%
v	<b>5th Year AMC ---- % of Total Supply</b>	Year	4%

Note:

- 1 Complete BoM of Equipment/Solution/Design Parameters/Regeneration point asked at Sl. No A, B, C, D, E,F, G,H, I & J of BoQ shall be provided.
- 2 BoM shall include quantity of each of the component including Software Licenses (If any) in a Lot in BoQ.
- 3 Unit Price of each of the component/ Module including Software Licenses (If any) under Sl. No A, B, C, D, E,F, G,H, I & J shall be provided.
- 4 Lot prices shall be equal to the SUMPRODUCT of Qunatity & Unit Price of each of the component/ Module including Software Licenses (If any) under a Lot.
- 5 In case if the break up price and Lot price is having mismatch than Lower Price will be considered.
- 6 For OTN Configurations(TYPE-I,II,III) kindly refer to technical specification mentioned in Vol-II

## Traffic Matrix

S.No.	Network	Configutation
(A)	Trivandrum	ROADM with LO ASON Support
(B)	Rajasthan	
(C)	Jorhat	
(D)	Jamnagar	
(E)	Bangalore	

(A) Trivandrum					
S.No.	END A	END B	Traffic	Protection	LO Restoration
1	Bangalore	Mysore	10x10G	Client Side 1+1	Yes
2	Bangalore	Kochi	10x10G+1x100G	Line Side 1+1	Yes
3	Chennai	Kochi	10x10G+1x100G	Client Side 1+1	Yes
4	Bangalore	Trivandrum	10x10G	Line Side 1+1	Yes
5	Chennai	Trivandrum	10x10G	Client Side 1+1	Yes
6	Chennai	Pondy cherry	10x10G	Line Side 1+1	Yes
7	Pondy cherry	Trichy	10x10G	Line Side 1+1	Yes
8	Trichy	Madurai	10x10G	Client Side 1+1	Yes
9	Madurai	Trivandrum	10x10G	Client Side 1+1	Yes
10	Trivandrum	Kochi	10x10G	Line Side 1+1	Yes
11	Kochi	Kozhikode	10x10G	Line Side 1+1	Yes

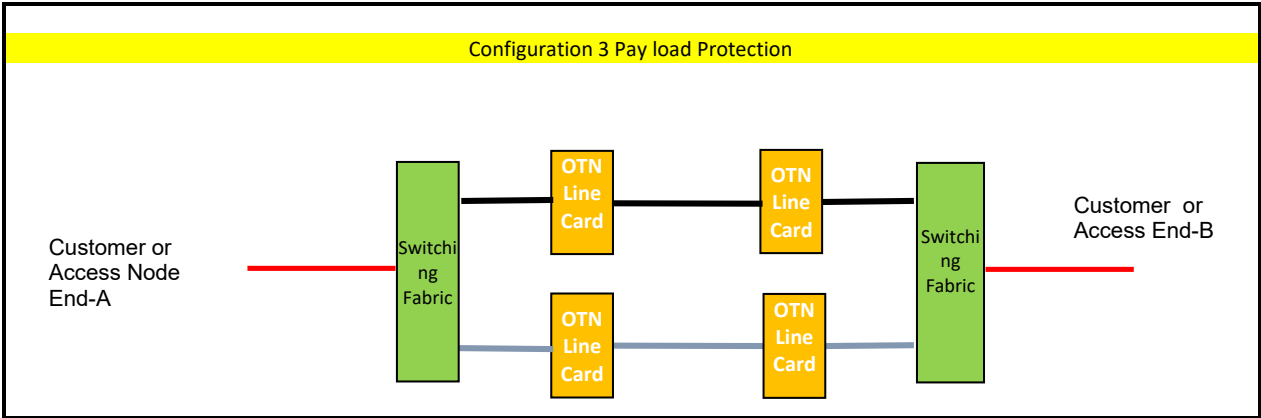
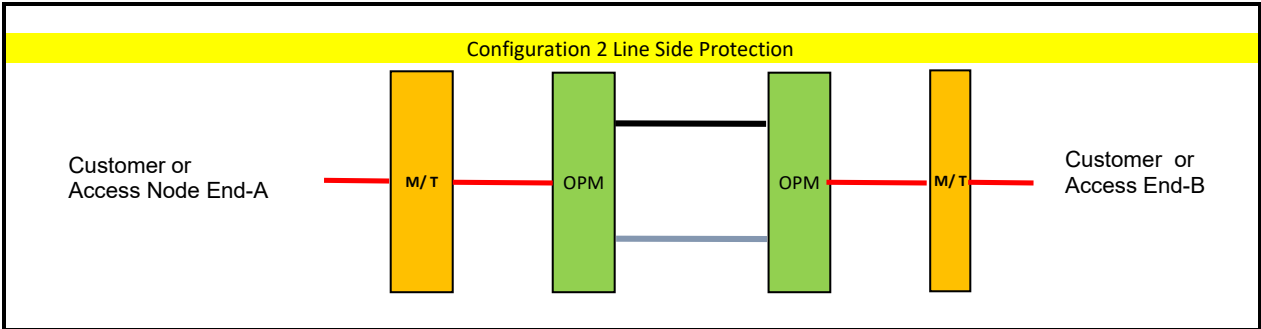
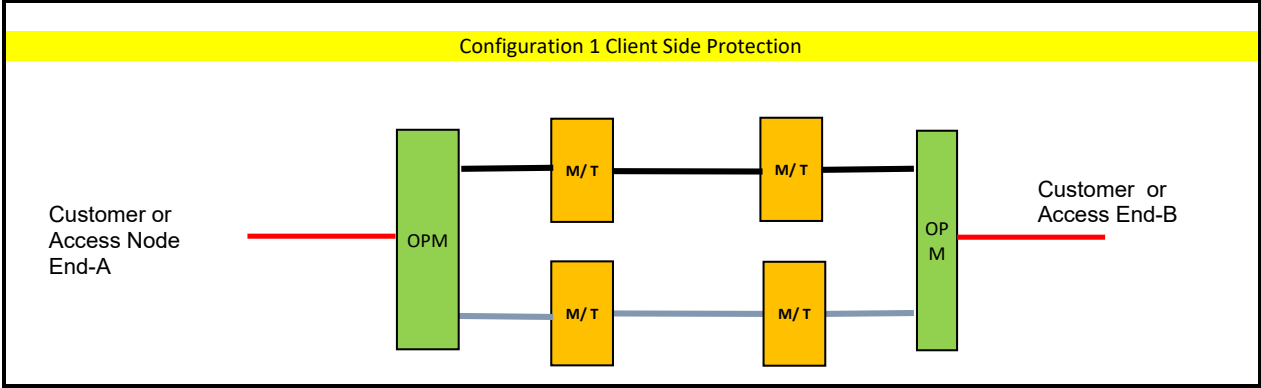
<b>(B) Rajasthan</b>					
<b>S.No.</b>	<b>END A</b>	<b>END B</b>	<b>Traffic</b>	<b>Protection</b>	<b>LO Restoration</b>
1	Bassi	Heerapura	10x10G+1x100G	Client Side 1+1	Not on day 1
2	Heerapura	Merta	10x10G	Line Side 1+1	
3	Merta	Surpura	10x10G	Client Side 1+1	
4	Surpura	NPH	10x10G	Line Side 1+1	
5	Surpura	Kankroli	10x10G	Client Side 1+1	
6	Kankroli	PG Chittorgarh	10x10G	Line Side 1+1	
7	PG Chittorgarh	Ajmer	10x10G	Line Side 1+1	
8	Ajmer	Bhadla-II	10x10G	Client Side 1+1	
9	Bhadla-II	Bhadla-I	10x10G	Client Side 1+1	
10	Bhadla-I	Bikaner	10x10G	Line Side 1+1	
11	Bikaner	Moga	10x10G	Line Side 1+1	

<b>(C) Jorhat</b>					
<b>S.No.</b>	<b>END A</b>	<b>END B</b>	<b>Traffic</b>	<b>Protection</b>	<b>LO Restoration</b>
1	A(Jorhat)	Misa	1x100G	Client Side 1+1	Yes
2	A(Jorhat)	Misa	10x10G	Line Side 1+1	Yes
3	V(Jorhat)	Misa	10x10G	Client Side 1+1	Yes
4	PoP Jorhat	Misa	10x10G	Line Side 1+1	Yes

<b>(D) Jamnagar</b>					
<b>S.No.</b>	<b>END A</b>	<b>END B</b>	<b>Traffic</b>	<b>Protection</b>	<b>LO Restoration</b>
1	Jamnagar	PoP Jamnagar	10x10G	Client Side 1+1	Not on day 1
2	Jamnagar	Dehgam	10x10G	Line Side 1+1	

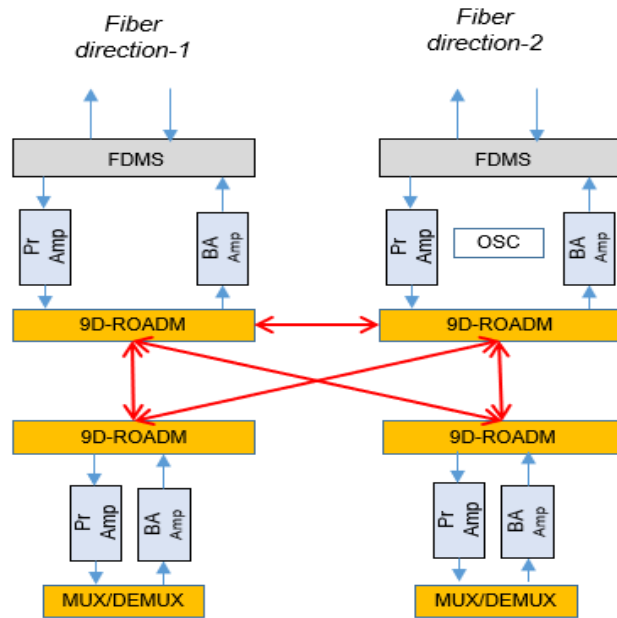
<b>(E) Bangalore</b>					
<b>S.No.</b>	<b>END A</b>	<b>END B</b>	<b>Traffic</b>	<b>Protection</b>	<b>LO Restoration</b>
1	Bangalore S/S	PoP Jalahalli	10x10G	Client Side 1+1	Yes
2	Bangalore S/S	PoP Hebbal	10x10G	Line Side 1+1	Yes
3	PoP Jalahalli	PoP Hebbal	10x10G	Client Side 1+1	Yes

# Link Configuration

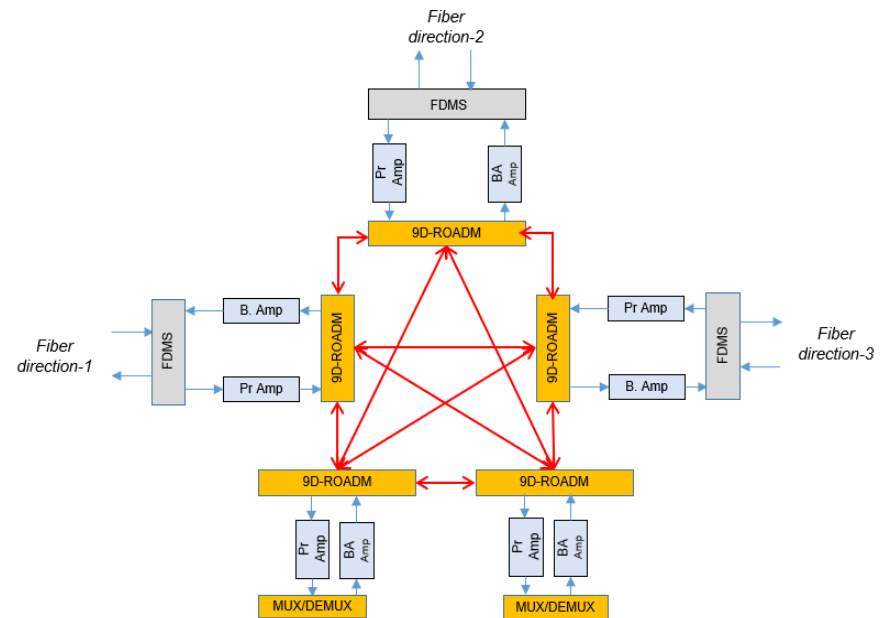


# Sample DWDM Configuration for 2 Degree & 3 Degree

**2-Direction ROADM node connectivity**

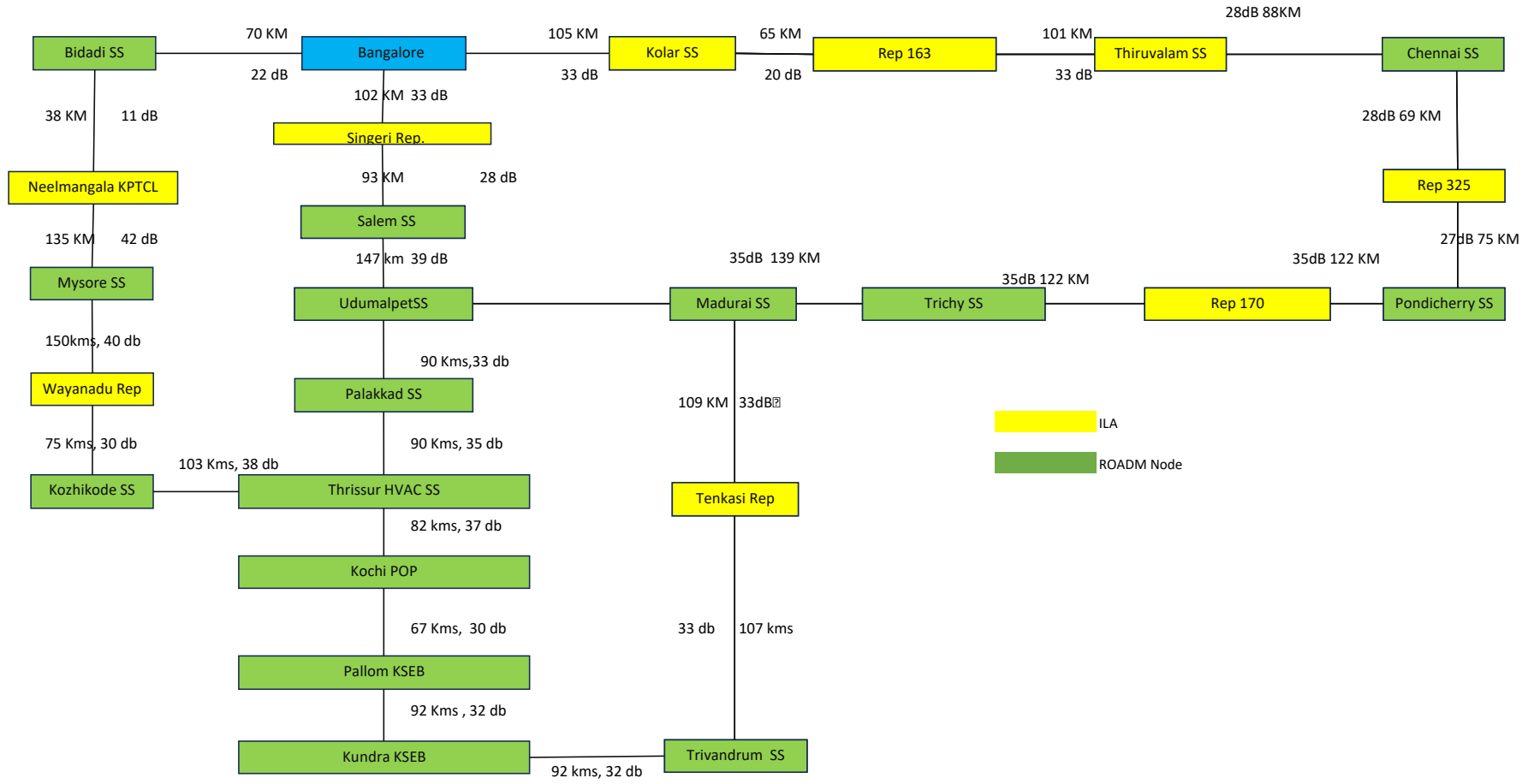


**3-Direction ROADM node connectivity**

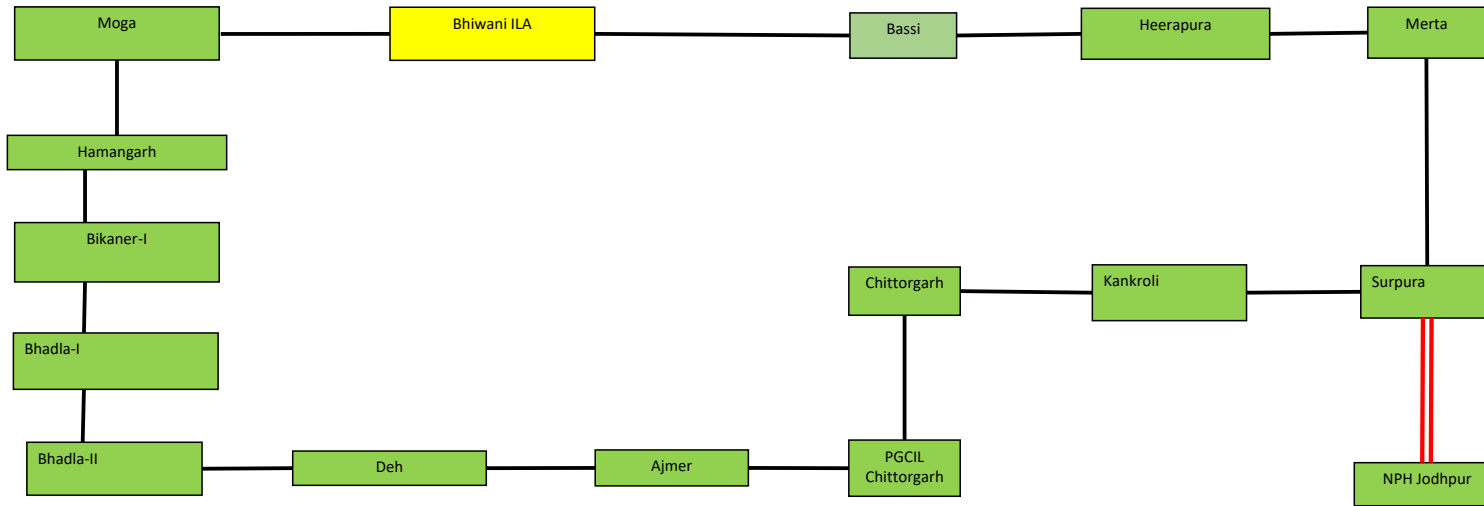


**Note:** Bidder has to offer similar configuration for 4, 5 degree nodes etc.

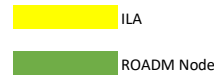
### DWDM Solutions for Trivandrum(A)



### DWDM Solutions for Network-B



End A	End B	Length (KM)	Losses (in dB)
Bassi	Heerapura	51	17
Heerapura	Merta	185	57
Merta	Surpura	120	35
Surpura	NPH Jodhpur	50	18
Surpura	NPH Jodhpur	55	18

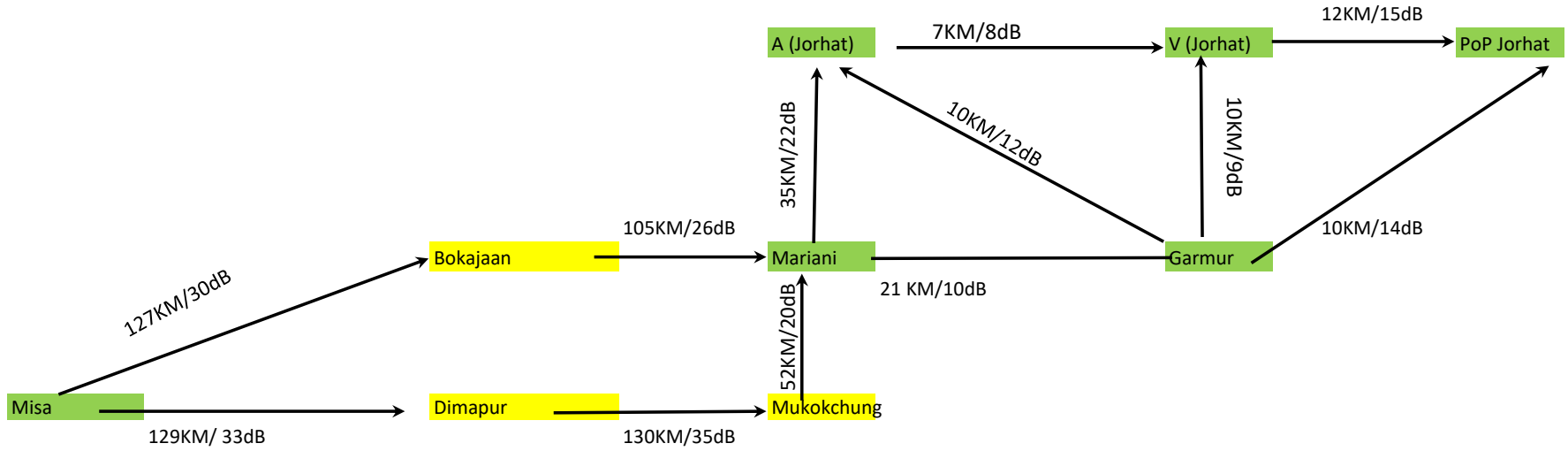


End A	End B	Length (KM)	Losses (in dB)
Surpura	Kankroli	200	60
Kankroli	Chittorgarh	80	20

End A	End B	Length (KM)	Losses (in dB)
Bikaner-I	ILA(Hanmangarh)	200	50
ILA(Hanmangarh)	PGCIL mogha	180	45
PGCIL mogha	Bhiwani ILA	100	30
Bhiwani ILA	Bassi	100	30

End A	End B	Length (KM)	Losses (in dB)
Bikaner-I	Bhadla-I	190	58
Bhadla-I	Bhadla-II	55	18
Bhadla-II	Deh	215	64
Deh	Ajmer	160	50
Ajmer	PGCIL Chittorgarh	200	61
Chittorgarh	PGCIL Chittorgarh	53	15

## DWDM Solutions for Network-C

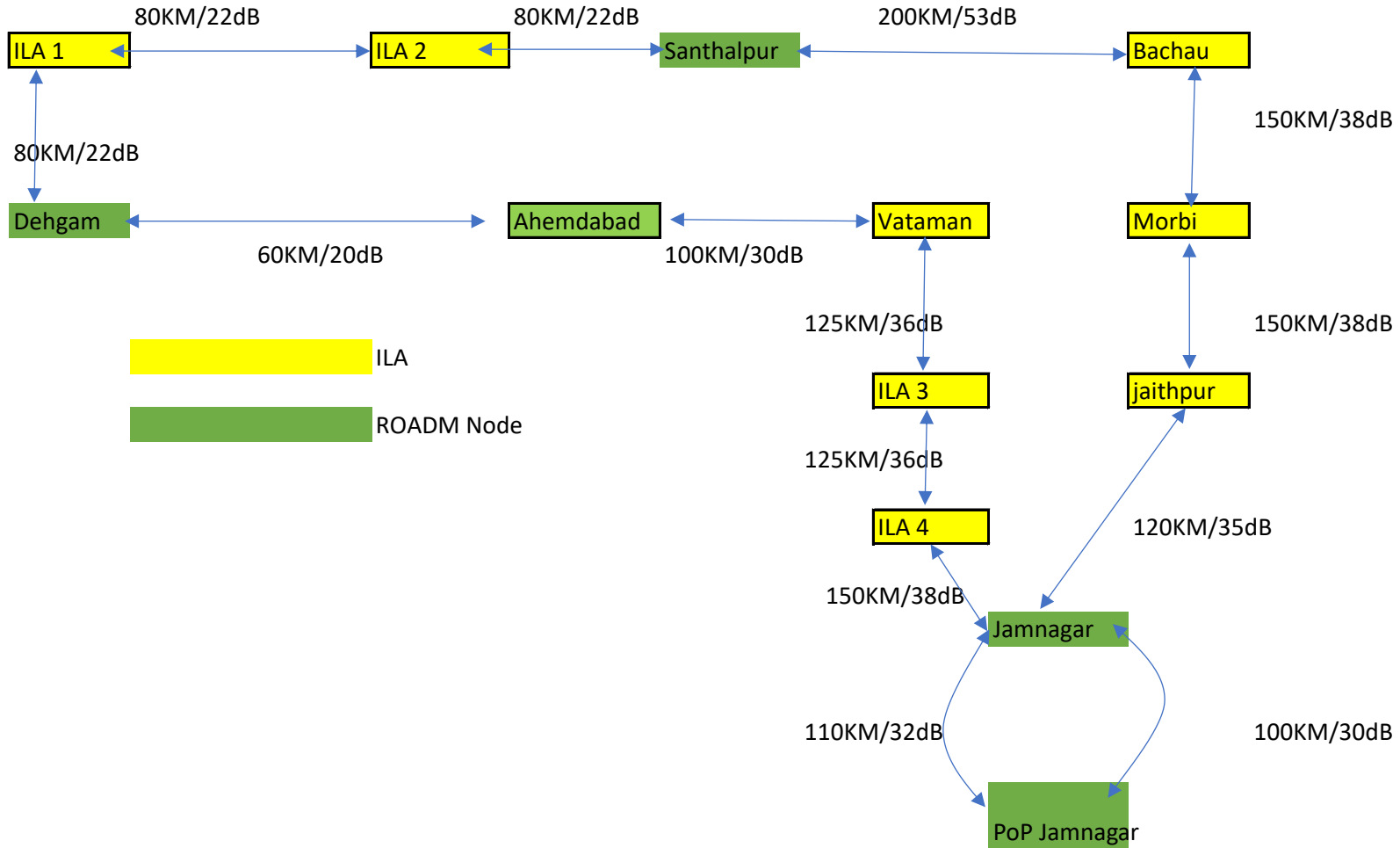


ILA

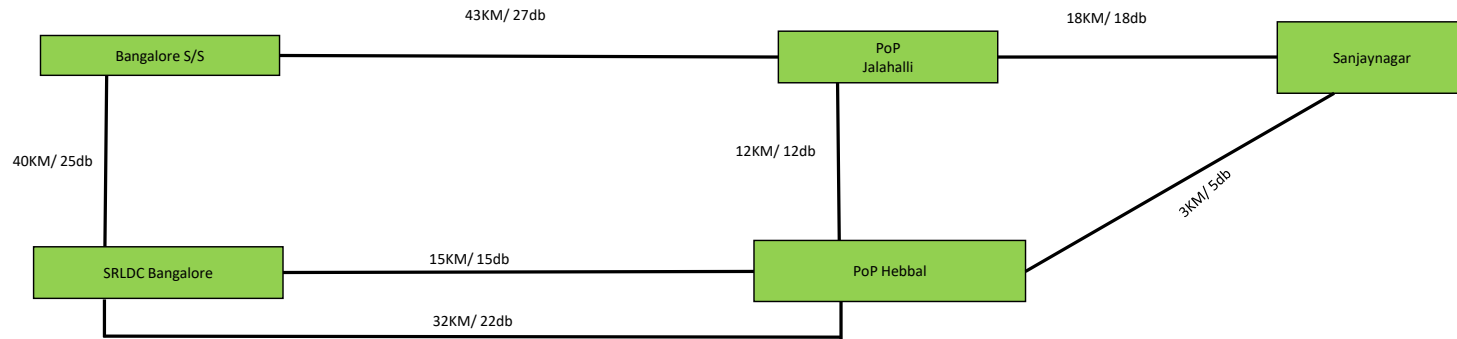
ROADM Node

End A	End B	Length (KM)	Losses (in dB)
Misa	Dimapur	129	33
Dimapur	Mukokchung	130	35
Mukokchung	Mariani	52	20
Mariani	Bokojaan	105	26
Bokojaan	Misa	127	30
Mariani	A (Jorhat)	35	22
A (Jorhat)	V (Jorhat)	7	8
V (Jorhat)	PoP Jorhat	12	15
PoP Jorhat	Garmur	10	14
Garmur	Mariani	21	10
Garmur	A (Jorhat)	10	12
Garmur	V (Jorhat)	10	9

# DWDM Solutions for Network-E



### DWDM Solutions for Network-D



End A	End B	Link Length (KM)	Losses (in dB)
Bangalore S/S I/C	PoP Jalahalli	43	27
TCLSanjaynagar	PoP Jalahalli	18	18
PoP Hebbal	Sanjaynagar	3	5
PoP Hebbal	SRLDC Bangalore	15	15
PoP Hebbal	SRLDC Bangalore	32	22
Bangalore S/S I/C	SRLDC Bangalore	40	25
PoP Jalahalli	PoP Hebbal	12	12

