

To,  
The Project Director,  
Consortium of Ayasa-ITALFER-CEG-Ayasa India (AICA),  
MMRDA Office Building,  
Building No. B1,3<sup>rd</sup> Floor,  
Opp. to New Wadala Truck Terminal Police Station,  
Wadala East,  
Mumbai 400 037.

Name : K Sudharsan  
Department : RC-IN SMO RI-EL PE 5  
Mobile : +91 9840885066  
E-mail : sudharsan.k@siemens.com  
Our Ref : SIEMENS-MMRDA-2B-CA-40-2026-0097  
Dated : 03<sup>rd</sup> Feb 2026

**Contract: CA No. MMRDA/2B/MMRP/CA-40: Design, Manufacture, Supply, Installation, Testing and Commissioning of 2 nos. 110kV Receiving Substation Including 110kV, 33kV & 25kV Cabling Work, Complete 25kV Overhead Catenary System along with Switching Station, 33kV Auxiliary Power Distribution System including 33/0.415 kV Auxiliary Sub-Station (ASS) and Complete SCADA System for Main Line & Depot of Mumbai Metro Line 2B of MMRDA.**

**Ref:** (1) GC Email, dated 24 Jan 2025.  
(2) SIEMENS-MMRDA-2B-CA-40-2024-1579, dated 16 Dec 2024.  
(3) AICA/L2B/CA40/OG/PLD/2024/35800, dated 14 Dec 2024.  
(4) SIEMENS-MMRDA-2B-CA-40-2024-1506, 28 Nov 2024.  
(5) AICA/L2B/CA40/OG/PLD/2024/35260, dated 19 Nov 2024.  
(6) SIEMENS-MMRDA-2B-CA-40-2024-1436, dated 07 Nov 2024.  
(7) AICA/L2B/CA40/OG/PLD/2024/30892, dated 15 May 2024.  
(8) SIEMENS-MMRDA-2B-CA-40-2024-627, dated 22 Apr 2024.

**Subject:** Submission of Definitive Design – EHV Cable Route – BKC RSS.

Dear Sir,

With reference to the above, please find the below details of the document attached with the letter.

Sr.No.	Subject	Rev	Purpose
1	Definitive Design EHV Cable Route – BKC RSS (Doc No. CA40-2B-CSR-PSY-DEG-IDE-0011)	05	For Review and Approval

We kindly request you to review and accord your approval for the above

Thanking you and assuring you our best services always, we remain.

Yours Sincerely,  
On behalf of Consortium of Siemens Ltd. & Rail Vikas Nigam Ltd.

  
K Sudharsan  
Contractor's Representative (CA – 40)



THE TATA POWER COMPANY LIMITED PROJECT ENGINEERING DEPARTMENT	
APPROVAL STATUS 15/Apr/2025	
I	Approved
II	Approved subject to incorporation of comments as marked. Resubmit for formal approval.
III	Not Approved. Incorporate comments as marked. Resubmit for review / approval.
IV	(V)(a) - Retained for information (V)(i) - Resubmit after review & incorporation of comments.
<div>  Checked By </div> <div>  Approved by </div>	

Encl : As above  
Response to : Ref - (1)  
Resp. requested : Yes

Cc: Director System, PIU, MMRDA

**Siemens Limited**  
Management: Sunil Mathur  
Mobility India; Management: Rajeev Joisar

DLF Cyber Park, Phase III,  
Tower B, 10<sup>th</sup> Floor, Sector 20,  
Gurugram 122018,  
India

Tel.: +91 (124) 284 2000  
Fax: +91 (124) 234 7512

Registered Office: Birla Aurora, Level 21, Plot No. 1080, Dr. Annie Besant Road, Worli, Mumbai – 400030; Corporate Identity number: L28920MH1957PLC010839;  
Tel.: +91 (22) 6251 7000; Fax: +91 (22) 2436 2404; Contact / Email: www.siemens.co.in/contact; Website: www.siemens.co.in.  
Sales Offices: Ahmedabad, Bengaluru, Chennai, Gurugram, Hyderabad, Kharghar, Kolkata, Mumbai, Nagpur, Kalwa, Puducherry, Pune, Vadodara.

**Definition:** (1) Area of Deficiency  
1: Design not complying with functions  
2: Detail incomplete  
3: Detail not submitted  
4: Undesirable design feature  
5: Conflicting data  
6: Other (Specify)

Legend: To be filled by ER

A

**Definition:** (2) Status of Comments  
A. Resubmission with complete revised documents. (NS)  
B. Notice of No Objection with Comments  
C. Notice of No Objection

**Definition:** (3) Comment Status  
**P** = Pending  
**H** = On Hold  
**C** = Closed



File No.- M-PIU/Sys/CA-40/ML-2B/2026/729/ 1164

Date: 09/04/2026

To,

Chief Transmission (O&M)  
The TATA Power Company Limited  
Dharavi Receiving Station  
Near Shalimar Industrial Estate  
Matunga, Mumbai 400019

R/Sir,

Sub: Undertaking to bear the cost of future diversion (if any) of EHV cable from TATA Power GIS to MMRDA BKC RSS

Ref: i) Email from TATA Power dated 27.02.2026


\*\*\*\*\*

In reference to email from TATA Power dated 27.02.2026, MMRDA Systems Unit hereby issues in-principle approval for bearing the Cable Diversion/Shifting cost of 110kV EHV cables from TATA Power BKC RSS to MMRDA BKC RSS for the cable route which is passing through MMRDA grounds, if any such requirement comes in future.

In view of above, M/s. Tata Power may issue consent to the proposed 110 kV Cable Route at the earliest. This consent has taken much more time than expected & our project has suffered delays due to the same.

For urgent attention & necessary action pl.

Thanking you,

  
09/04/2026  
Laxmiprasad J. Kharat.  
Chief Engineer (Elect.)

Copy to:(i) Director System: for kind info pl.  
(ii) Project Director (AICA GC)- for info and n.a.pl.

**मुंबई महानगर प्रदेश विकास प्राधिकरण**

वांद्रे-कुर्ला संकुल, वांद्रे (पूर्व), मुंबई ४०००५१.

ईपीएनईएक्स : +९१ २२ ६५९६ ०००१ / ४०००  
<https://mmrda.maharashtra.gov.in>

Ref. No.: AICA/L2B/CA40/OG/PLD/2025/37706

17<sup>th</sup> March 2025

Issued By: BG 

**Consortium of Siemens Limited & Rail Vikas Nigam Limited**

Birla Aurora, Level 21, Plot No. 1080,

Dr. Annie Basant Road, Worli,

Mumbai – 400 030.

**Sub: CA No. MMRDA/2B/MMRP/CA-40(Consortium of Siemens Limited & Rail Vikas Nigam Limited):** Design, Manufacture, Supply, Installation, Testing and Commissioning of 2 nos. 110 kV Receiving Substation including 110 kV, 33kV & 25kV Cabling work, complete 25kV overhead catenary system along with Switching Station, 33kV Auxiliary Power Distribution system including 33/0.415 kV Auxiliary Sub-Station (ASS) and complete SCADA system for Main line & Depot of Mumbai Metro Line 2B of MMRDA – **Approval of GAD & GTP of HDPE Pipe 200 mm and PLB duct 40mm.**

- Ref:**
1. Mail from AICA GC to Consortium dated 15.03.2025.
  2. MMRDA Letter No. MMRDA-PIU/System/Line-2B/CA-40/482 dated 15.03.2025.
  3. GC Letter No. AICA-L2B-MMRDA-CA40-OG-PLD-2025-37448 dated 04.03.2025.
  4. Approval by TATA Power Wrench System dated 04.03.2024.
  5. Contractor's letter ref. SIEMENS-MMRDA-2B-CA-40-2025-275 dated 28.02.2025.
  6. GC Letter No. AICA-L2B-CA40-OG-PLD-2025-37272 dated 25.02.2025.
  7. Comments by TATA Power Wrench System dated 25.02.2024.
  8. Contractor's letter ref. SIEMENS-MMRDA-2B-CA-40-2025-221 dated 18.02.2024.

Dear Sir,

Please refer to your Submission of GAD & GTP of HDPE Pipe 200 mm and PLB duct 40mm. vide letter under reference (5) above.

GC has reviewed the same and approval of GAD & GTP of HDPE Pipe 200 mm and PLB duct 40mm. is given with status C **"Notice of No Objection"** as per attached DSR. Approval of same has also been accorded by competent authority vide letter mentioned as reference (2) and TATA Power vide reference (4).

Please note that as per Clause 20.1 of GCC, *"any approval of the Engineer shall not relieve the Contractor of any responsibility, including responsibility for his errors, omissions, discrepancies and non-compliances, if any"*.

Yours faithfully,

**For Ayesa - Italferr-CEG-Ayesa India (AICA) GC Consortium**

  
Sahadeva Singh

Project Director – Lines 7&2B



**Encl:** 1. Approved document & DSR (Total 10 Pages)

**Copy:** The Director (Systems), Metro PIU, MMRDA

AA / ANA / DPD(SYS)  
  
A/3 1/3

**Registered Office**

MMRDA Office Building, Building No. B1,

3rd Floor, Opp. to New Wadala Truck Terminal Police Station

Wadala East, Mumbai 400 037

Ph.: +(91) 22 240 602 00

[info@aicagc.com](mailto:info@aicagc.com)

Fax: +(91) 120 490 88 10

[www.ayesa.com](http://www.ayesa.com)

SIEMENS

MUMBAI METRO Line 7 & 2B  
AICA Consortium (GC)

NO OBJECTION

With Comments ☐ Without Comments ☒

Ref. GC-37714

To,  
The Project Director,  
Consortium of Ayasa-ITALFER-CEG-Ayasa India (AICA),  
MMRDA Office Building,  
Building No. B1, 3<sup>rd</sup> Floor,  
Opp. to New Wadala Truck Terminal Police Station,  
Wadala East,  
Mumbai 400 037.

Name : K Sudharsan  
Department : RC-IN SMO RI-EL PE 5  
Mobile : +91 9840885066  
E-Mail : sudharsan.k@siemens.com  
Our Ref : SIEMENS-MMRDA-2B-CA-40-2025-275  
Dated : 28<sup>th</sup> Feb 2025

Contract: CA No. MMRDA/2B/MMRP/CA-40: Design, Manufacture, Supply, Installation, Testing and Commissioning of 2 nos. 110kV Receiving Substation Including 110kV, 33kV & 25kV Cabling Work, Complete 25kV Overhead Catenary System along with Switching Station, 33kV Auxiliary Power Distribution System including 33/0.415 kV Auxiliary Sub-Station (ASS) and Complete SCADA System for Main Line & Depot of Mumbai Metro Line 2B of MMRDA.

Ref: (1) AICA/L2B/CA40/OG/PLD/2025/37272, dated 25 Feb 2025.  
(2) SIEMENS-MMRDA-2B-CA-40-2025-221, dated 18 Feb 2025.

Subject: Submission of GAD & GTP of HDPE pipe 200 mm and PLB duct 40 mm - M/s. TNB Polymers.

Dear Sir,

With reference to the above, please find the below details of the document attached with the letter.

Sr.No.	Subject	Rev	Purpose
1	Definitive Design GAD & GTP of HDPE pipe 200 mm and PLB duct 40 mm - M/s. TNB Polymers. (Doc No.: CA40-2B-CSR-PSY-DEG-GTP-0069)	02	For review and approval

We kindly request you to review and accord your approval for the above document.

Thanking you and assuring you our best services always, we remain.

Yours Sincerely,

On behalf of Consortium of Siemens Ltd. & Rail Vikas Nigam Ltd.

K Sudharsan  
Contractor's Representative (CA - 40)

Encl : As above  
Response to : As above, ref - (1)  
Resp. requested : Yes

Cc: Director System, PIU, MMRDA

THE TATA POWER COMPANY LIMITED PROJECT ENGINEERING DEPARTMENT	
APPROVAL STATUS: 04/Mar/2025	
I	Approved
II	Approved subject to incorporation of comments as marked. Resubmit for formal approval.
III	Not Approved. Incorporate comments as marked. Resubmit for review (approval).
IV	(V) - Reserved for information (VI) - Resubmit after review & incorporation of comments.
<i>H.S. Kulkarni</i>	<i>M. S. Dastidar</i>
Checked By	Approved By

Siemens Limited  
Management: Sunil Mathur  
Mobility India; Management: Gunjan Vakharia

DLF Cyber Park, Phase III,  
Tower B, 10<sup>th</sup> Floor, Sector 20,  
Gurgaon 122018,  
India

Tel.: +91 (124) 284 2000  
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Tel.: +91 (22) 6251 7000; Fax: +91 (22) 2436 2404; Contact / Email: [www.siemens.co.in/contact](mailto:www.siemens.co.in/contact); Website: [www.siemens.co.in](http://www.siemens.co.in).  
Sales Offices: Ahmedabad, Bengaluru, Chennai, Gurugram, Hyderabad, Kharghar, Kolkata, Mumbai, Nagpur, Raipur, Pune, Vadodara.



## MUMBAI METRO LINE-2B OF MMRDA

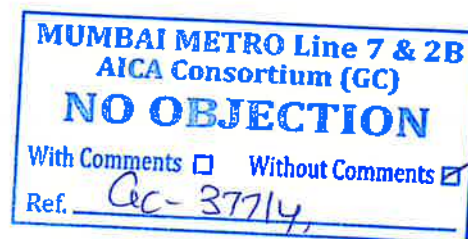
### GAD & GTP of HDPE PIPE 200mm ,40MM PLB duct make M/s TNB Polymers





Rev-02

DOCUMENT NO.:

CA40-2B-CSR-PSY-DEG-GTP-0069

	Name	Designation	Date	Signature
Approved by	K .Sudharsan	Project Manager	28.02.2025	
Reviewed by	S.K. Srivastava	DPM/RVNL	28.02.2025	
Checked &Prepared by	Yeswanth Kumar Reddy. N	Execution Engineer (OHE)	28.02.2025	



APPROVALS					
GENERAL CONSULTANT			MMRDA		
Name	Designation	Signature	Name	Designation	Signature
Vijay Yadav	DPD (Systems)		Laxmi prasad Kharat	Chief Engineer	
Ankit N Aggarwal	Chief Traction Power Expert		Mohit Naagar	Executive Engineer	
Ankit Aggarwal	Sr. Traction Power Expert		Dinesh Pawar	Deputy Engineer (Elect.)	
G. Balaji	Senior T&C Engineer				

**MUMBAI METRO Line 7 & 2B**  
AICA Consortium (GC)  
**NO OBJECTION**  
With Comments ☐ Without Comments ☒  
Ref. QC-37714



Revision Log				
Rev	Author	Date	Reference	Changes/Subject of revision
01	Yeswanth Kumar Reddy. N	18.02.2025	Part II-Requirements-Section-6- Employers Requirements, Chapter-4	First Submission
02	Yeswanth Kumar Reddy. N	28.02.2025	AS per the DSR Comments	Second Submission

**MUMBAI METRO Line 7 & 2B**  
**AICA Consortium (GC)**  
**NO OBJECTION**

With Comments ☐ Without Comments ☒  
Ref. GC-37714

*[Handwritten Signature]*

*[Handwritten Signature]*





# SHREE TNB POLYMERS LIMITED

ISO 9001:2015 & 14001:2015 Certified Company

+91 9727703950 | +91 9638481111 | +91 9825731602 26AAKCS6850P1ZJ

www.shreetnbpolymers.in info@tnb2010@gmail.com UDYAM-DN-01-0000028



	Description	Technical Data of 200 MM PN 6 PE 80 As per IS:4984:2016 Amendment No. 2
1	Manufacturer	Shree TNB Polymers Limited
2	Address of works	Shree TNB Polymers Limited Sr. No. 132/1/1/4, Behind Prince Pipes, Athal, Silvassa-396230, (U. T. OF D & N.H.)
3	Brand Name	"NOBLE"
4	Standard	IS 4984 : 2016 & Amendments No.2, ISO 9001:2015
5	Type	HDPE Pipe
6	Size	200 mm
	Pressure	PN 6
	Grade	PE 80
	Nominal Outer Dia of Pipes (in mm)	200
	Tolerance in outside diameter of pipe (in mm)	(+) 1.2
	Wall Thickness (in mm)	11.80-13.10
	Nominal Pressure (Kg/cm2)	6 Kg/Cm2
	Ovality difference between Maximum (in mm)	4.0
	Max. out of square of pipe end (in mm)	5.00
	Usable length per 6 mtr	6 mtr
7	Suitable climatic conditions	-40° to + 45°
7.1	Maximum ambient temp	45°
7.2	Water Temperature	45°
7.3	Working pressure	6 Kg/Cm2
8	Material	PE 80
	hydrostatic design stress at 5.7 MPa	4.9 MPA
9	Colour	Black with Three Blue stripes
10	Marking	
	a)Manufacturers name /Trade mark	NOBLE
	b) Reference OF IS	IS:4984-2016
	c) Grade of Pipe	PE 80
	d) Diameter of PIPE	DN 200
	e) Pressure rating of Pipe	PN 6
	f) Batch No	YES

MUMBAI METRO Line 7 & 2B  
AICA Consortium (GC)  
NO OBJECTION  
With Comments ☐ Without Comments ☒  
Ref. GC-37714



"SHRUPATI" BRAND SOLID POLYMERS SHEETS  
"NOBLE" BRAND HDPE/ PP/ PPH PIPES &  
MICRO IRRIGATION SYSTEMS  
"WELLPACK" BRAND PP HOLLOW SHEETS

Sr.No. 132/1/1/4, Athal Road, Athal,  
Silvassa, Dadra Nagar Haveli, Daman  
& DIU UT 396230, India  
U25209DN2007PLC000242



BSCIC





# SHREE TNB POLYMERS LIMITED

ISO 9001:2015 & 14001:2015 Certified Company

+91 9727703950 | +91 9638481111 | +91 9825731602 26AAKCS6850P1ZJ

www.shreetnbpolymers.in | info@tnb2010@gmail.com UDYAM-DN-01-0000028



11	Tests	YES
	Acceptance test	PASS
	Hydraulic test	PASS
	Reversion test (Shall not be greater than 3%)	0.10 to 3 %
	Overall migration test	Type Test
	Density (940 to 960 Kg/m3)	940.00 to 960.00
	Melt flow rate (0.15 to 1.10gm/10 min.)	0.4000 – 0.6000 gm/10 min.
	Carbon black content (2.5 % ± 0.50%)	2.00 – 3.00 %
	Carbon black dispersion ( Should be Satisfactory)	Satisfactory
	Internal pressure creep rupture test:	6.00 Kg/cm2 for 48 hours
	Elongation at break (Should be greater than 350 %)	350-650 %
	Yield Strength (Min 15 Mpa)	15 - 26 Mpa
	Oxidation Induction Time (OIT) (Shall be minimum 20 mints)	>25.00 - 35.00
12	Stage inspection	YES
13	Packing and forwarding	Packed without any packing
14	Storage	Stacking on ground
15	Each consignment shall be accompanied by detailed Packing list Containing following Information:	
	(a) Name of Consignee	YES
	(b) Details of consignment	YES
	(c) Destination	YES
	(d) Total weight of Consignment	YES
	(e) Bill of Material	YES

Thanks & Regards

*Handwritten signature*  
FOR SHREE TNB POLYMERS LTD  
Dept.  
AUTHORISED SIGNATORY

MUMBAI METRO Line 7 & 2B  
AICA Consortium (GC)

**NO OBJECTION**

With Comments ☐ Without Comments ☒

Ref. GC-377/4.

*Handwritten signature*  
SENIOR VASANT  
2024



◀ "TIRUPATI" BRAND SOLID POLYMERS SHEETS  
◀ "NOBLE" BRAND HDPE/ PP/ PPH PIPES &  
MICRO IRRIGATION SYSTEMS  
◀ "WELLPACK" BRAND PP HOLLOW SHEETS

📍 Sr.No. 132/1/1/4, Athal Road, Athal,  
Silvassa, Dadra Nagar Haveli, Daman  
& DIU UT 396230, India  
📄 U25209DN2007PLC000242





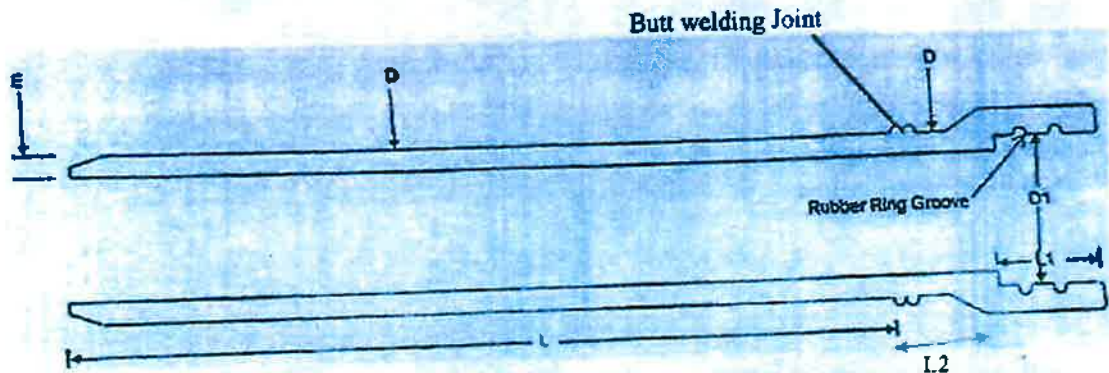


# SHREE TNB POLYMERS LIMITED

9 Sr.No. 132/1/1/4, Athal Road, Athal, Silvassa, Dadra Nagar Haveli,  
Daman & DIU UT 396230, India

+91 9727703950 info@tnb2010@gmail.com U25209DN2007PLC000242

## DRAWING FOR HDPE PIPE SIZE PE 80 PN 6 DN 200 MM, SDR-17



SIZE	D (mm)	E (mm)	L Mtr.(min.)	D1 mm	L1 mm (min.)	L2 mm (min.)
PE 80 PN 6 DN 200	200.00 - 201.20	11.80 - 13.10	6.000	201.2 ±0.50	100.00	50.00

MUMBAI METRO Line 7 & 2B  
AICA Consortium (GC)

**NO OBJECTION**

With Comments ☐ Without Comments ☒

Ref. QC-37714



FA



**ISO 9001:2015 & 14001:2015 Certified Company**

• "TIRUPATI" BRAND SOLID POLYMERS SHEETS

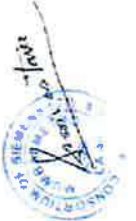
• "NOBLE" BRAND HDPE/ PP/ PPH PIPES, FITTINGS & MICRO IRRIGATION SYSTEMS

◀ "WELLPACK" BRAND PP HOLLOW SHEETS

[illegible]

## SALON

- 3 All tolerances calculated from  $(0.1 \epsilon_{\text{max}} + 0.1)$  mm rounded up to the next 0.1 mm.



77





॥ Shree Rajendrasuri Gurubhyah Namah ॥

# SHREE DARSHAN PIPES

HDPE, PVC, PP, CPVC, PPR, PVDF - PIPES, FITTINGS, SHEETS, WELDING RODS  
BUTT WELDING & ELECTRO FUSION WELDING JOBS

## Guaranteed Technical Parameter of PLB HDPE Telecom Duct 40/33mm

Sl. No.	Description	Requirements	Offered
1	Manufacturer Name and address	--	UNIT 1 : Shree Darshan Pipes, 1219/3, Survey No - 126/1, Sonale Village, Bhiwandi, Thane - 421 302. UNIT 2 : Aaram Plastics Pvt Ltd., G-232, Sitapura Industrial Area, Tonk Road, Jaipur, Rajasthan - 302022.
2	Make/Brand	--	SHREE DARSHAN
3	Standard Specification Which the pipe shall confirm to	TEC/GR/FA/CDS-008/04 AUG-19 With Latest Amendments	The offered Duct will confirm to TEC GR No.- TEC/GR/FA/CDS-008/04 AUG-19 With Latest Amendments
4	Material Grade	PE63	PE63
5	Visual Appearance & Dimension		
A	Visual Appearance	The ducts shall be free from blisters, shrink holes, flaking, chips, scratches, roughness, break and other defects.	The ducts are free from blisters, shrink holes, flaking, chips, scratches, roughness, break and other defects.
B	Size of Duct (Diameter)	40 mm OD	40mm OD will be offered
C	Tolerance	+ 0.4 mm	Tolerance up to 0.4mm
D	Wall Thickness	3.3-3.7mm	With in range(3.3-3.7)
E	Ovality	1.4mm (max)	Ovality will be <1.4mm
F	Thickness of Inner Layer	0.28mm to 0.42mm	0.28mm to 0.42mm
G	Inner Layer	White in colour and Should be Lubricated	Inner Layer will be white and permanently Lubricated
4	Colour	In 8 Colours Specified in TEC GR	Blue Colour or Specified colour in P.O.
5	Performance Requirement		
A	Tensile Strength and Elongation	Tensile Strength- Min. 20 N/mm <sup>2</sup> Elongation- Min. 500 %	Tensile Strength and Elongation respectively more than 20 N/mm <sup>2</sup> & 500 %
B	Reversion Test	Max. 3 %	3 % Max.
C	Environmental Stress Crack Resistance	When tested with 10% Igepal (CO 630) solution at 50 ± 1° C for 96 hours. There shall be no failure.	When tested with 10% Igepal (CO 630) solution at 50 ± 1° C for 96 hours. There will be no failure. (Long Term Test so Internal Test Report may be reviewed during T.P.L)
D	Impact Strength	The duct shall not crack or split	The duct will not be crack or split
E	Crush Resistance	The deflection with load on and after recovery period shall not exceed 10% and 2% respectively.	The deflection with load on and after recovery period not exceed 10% and 2% respectively.
F	Oxidation Induction Time	Not Less Than 30 min	Not Less Than 30 min
G	Hydraulic Characteristics	No sign of localized swelling, Leakage or weeping & shall not burst observed during test.	No sign of localized swelling, Leakage or weeping & not burst observed during test. (Long Term Test so Internal Test Report may be reviewed during T.P.L)
H	Internal Co-efficient of Friction	0.06 (Max.)	0.06 (Max.)
I	Ash Content	0.3 % (Max.)	0.3 % (Max.)
J	Identification Markings	As Per P.O. or otherwise specified	As Per P.O. or otherwise specified
K	Standard Length of Coil	In 1000/500 mtr or otherwise specified	The standard length of coil will be 500mtr each or otherwise specified
L	Marking	'SHREE DARSHAN PLB HDPE TELECOM DUCT' '40/33' 'TELEPHONE MARK' 'MMRDA' 'YEAR OF MANUFACTURING/ BATCH NO' 'METER MARKING'.	'SHREE DARSHAN PLB HDPE TELECOM DUCT' '40/33' 'TELEPHONE MARK' 'MMRDA' 'YEAR OF MANUFACTURING/ BATCH NO' 'METER MARKING'.

Include name of TATA power & MMRDA

MUMBAI METRO Line 7 & 2B  
AICA Consortium (GC)  
**NO OBJECTION**

With Comments ☐ Without Comments ☒  
Ref. QC-3776

*Handwritten signature*

For Shree Darshan Pipes



*Handwritten signature*





**Mumbai Metro Rail Project Line - 2B  
DOCUMENT SUBMISSION REPORT (DSR)  
COMMENT SHEET**

Definition: (1) Area of Deficiency  
1: Design not complying with functions  
2: Detail incomplete  
3: Detail not submitted  
4: Undesirable design feature  
5: Conflicting data  
6: Other (Specify)

Definition: (2) Status of Comments  
A: Resubmission with complete revised documents (NS)  
B: Notice of No Objection with Comments  
C: Notice of No Objection

Definition: (3) Comment Status  
P = Pending  
H = On Hold  
C = Closed

Legend: To be filled by ER

C

Contract No. :		MMRDA/2B/MMRP/CA-40	Discipline:		PST		3: Detail not submitted 4: Undesirable design feature 5: Conflicting data 6: Other (Specify)		A. Submission with complete revised documents. (N/A) B. Notice of No Objection with Comments C. Notice of No Objection	
Contractor Ref. Submission:		SIEMENS-MMRDA-2B-CA-40-2025-275 & 221	Assessor:		Baleji G. Divyendra Kumar Singh		Legend		To be filled by ER	
Reception date of Letter/Transmittal:		28-02-2025	Designated Name of Station:		Ankit N Agrawal		C			
DSR Code:		NA			NA					
S.No	Article reference number	Employer's Representative Comments	Issue		Area of deficiency (1)	Status (2)	Contractor's Answers	Comment Status (3)		Commented/ Closure Date
			Format	Fundamental				By Contractor	By ER	
1	Definitive Design GAD & GTP of HDPE pipe 200 mm and PLB duct 40 mm - M/s. TNB Polymers. (Doc No.: CA40-2B-CSR-PSY-DEG-GTP-0059) (REV-02)	220mm HDPE PIPE								
2		Grade PE80 required		✓	5	A	Corrected in GTP sheet	C	C	04.03.2025
3		Wall Thickness (in mm) should be 14.8 to 16.4 required.		✓	3	A	As per the Thickness chart PE-80 grade with PN-6 of 200mm dia thickness width is 11.8to 13.1 the Reference document is attached	C	C	04.03.2025
4		Material PE80 required		✓	3	A	Corrected in GTP sheet	C	C	04.03.2025
5		In Marking also PE80 to be noted.		✓	3	A	Noted	C	C	04.03.2025
6		In Stage inspection –Yes to be noted.Stage inspection required.		✓	2	A	Noted	C	C	04.03.2025
7		Share drawings along with coupler,Butt joint & Rubber ring grooves		✓	2	A	Attached	C	C	04.03.2025
8		40/33 mm PLB HDPE Duct							C	04.03.2025
9		Grade PE63 required		✓	3	A	Noted and incorporayted in GTP sheet	C	C	04.03.2025
10		HDPE Duct embossing to be done/noted as marked below.					Noted and incorporayted in GTP sheet	C	C	04.03.2025
11		<Manufacturer Name> 40/33mm HDPE duct Telephone mark Laser Symbol <Customer Name> Year of Manufacture Duct ID Meter Marking		✓	3	A	Noted and incorporayted in GTP sheet	C	P (Refer Sr. No. 11A)	04.03.2025
12		Include name of TATA power & MMRDA in Marking as marked in the document		✓	6	C				

*Handwritten signature: Ankit N Agrawal*

**MUMBAI METRO Line 7 & 2B  
AICA Consortium (GC)  
NO OBJECTION**  
With Comments ☐ Without Comments ☒  
Ref. GC-37706



Ref. No.: AICA/L2B/CA40/OG/PLD/2025/37862

24<sup>th</sup> March 2025

Issued By: BG

**Consortium of Siemens Limited & Rail Vikas Nigam Limited**

Birla Aurora, Level 21, Plot No. 1080,

Dr. Annie Basant Road, Worli,

Mumbai – 400 030.

**Sub: CA No. MMRDA/2B/MMRP/CA-40(Consortium of Siemens Limited & Rail Vikas Nigam Limited):** Design, Manufacture, Supply, Installation, Testing and Commissioning of 2 nos. 110 kV Receiving Substation including 110 kV, 33kV & 25kV Cabling work, complete 25kV overhead catenary system along with Switching Station, 33kV Auxiliary Power Distribution system including 33/0.415 kV Auxiliary Sub-Station (ASS) and complete SCADA system for Main line & Depot of Mumbai Metro Line 2B of MMRDA – **Approval of Submission of GAD & GTP of 48 core fibre optical cable - M/s KEC International Ltd. & 48 core fibre optical cable accessories.**

- Ref:**
1. Mail from AICA GC to Consortium dated 22.03.2025.
  2. MMRDA Letter No. MMRDA-PIU/System/Line-2B/CA-40/539 dated 22.03.2025.
  3. GC Letter No. AICA-L2B-MMRDA-CA40-OG-PLD-2025-37451 dated 05.03.2025.
  4. Approval by TATA Power Wrench System dated 03.03.2024.
  5. Contractor's letter ref. SIEMENS-MMRDA-2B-CA-41-2025-276 dated 28.02.2025.
  6. Contractor's letter ref. SIEMENS-MMRDA-2B-CA-41-2025-240 dated 21.02.2025.

Dear Sir,

Please refer to your Submission of GAD & GTP of 48 core fibre optical cable - M/s KEC International Ltd. & 48 core fibre optical cable accessories vide letter under reference (5) & (6) above.

GC has reviewed the same and approval of GAD & GTP of 48 core fibre optical cable - M/s KEC International Ltd. & 48 core fibre optical cable accessories is given with status "B", "**No Objection with Comments**" as per comments mentioned in attached DSR. Approval of same has also been accorded by competent authority vide letter mentioned as reference (2) above and by TATA Power vide reference (4).

Please note that as per Clause 20.1 of GCC, "any approval of the Engineer shall not relieve the Contractor of any responsibility, including responsibility for his errors, omissions, discrepancies and non-compliances, if any".

Thanking you,

Yours faithfully,

For Ayesa - Italferr-CEG-Ayesa India (AICA) GC Consortium

  
**Sahadeva Singh**  
Project Director – Lines 7&2B

Encl: Approved document &amp; DSR (Total 36 Pages)

Copy: The Director (Systems), Metro PIU, MMRDA

AA / ANA / DPD(SYS)

24/03/2025

Registered Office

MMRDA Office Building, Building No. B1,

3rd Floor, Opp. to New Wadala Truck Terminal Police Station

Wadala East, Mumbai 400 037

Ph.: +(91) 22 240 602 00

[info@aicagc.com](mailto:info@aicagc.com)

Fax: +(91) 120 490 88 10

[www.ayesa.com](http://www.ayesa.com)

37862

**Mumbai Metro Rail Project Line - 2B  
DOCUMENT SUBMISSION REPORT (DSR)  
COMMENT SHEET**

<b>Contract No. :</b>		MMRDA/2B/MMRP/CA-40		<b>Discipline:</b>		PST		<b>Definition: (1) Area of Deficiency</b> 1: Design not complying with functions 2: Detail incomplete 3: Detail not submitted 4: Undesirable design feature 5: Conflicting data 6: Other (Specify)		<b>Definition: (2) Status of Comments</b> A: Resubmission with complete revised documents, (NA) B: Notice of No Objection with Comments C: Notice of No Objection	
<b>Contractor Ref. Submission:</b>		SIEMENS-MMRDA-2B-CA-40-2025-240 & 276		<b>Assessor:</b>		Balaji G. Divyendra Kumar Singh					
<b>Reception date of Letter/Transmittal:</b>		21-02-2025 & 28.02.2025		<b>Designated Name of Station:</b>		Ankit N Agrawal					
<b>DSR Code:</b>		NA				NA					
								<b>Legend:</b> To be filled by ER		<b>Definition: (3) Comment Status</b> P = Pending H = On Hold C = Closed	
S.No	Article reference number	Employer's Representative Comments	Issue		Area of deficiency (1)	Status (2)	Contractor's Answers	Comment Status (3)		Commented/Closure Date	
			Format	Fundamental				By Contractor	By ER		
1	<b>Definitive Design</b> <b>GAD &amp; GTP of 48 core fibre optical cable</b> <b>- M/s KEC International Ltd.</b> <b>(Doc No. CA40-2B-CSR-PSY-DEG-GTP-0071) (REV-01)</b>	Fiber type only Birta Furukuwa/ Sterlite are acceptable. ZTT is not acceptable.		✓	5	B					
2		In cable marking customer name to be "MMRDA Mandale Tata Power Co." to be mentioned. Final cable marking to be:		✓	6	B					
		KEC ASIAN CABLES 48F SM G852D MLT DS ARM TELEPHONE HANDSET SYMBOL LASER SYMBOL MMRDA Mandale TATA POWER Co. OPTICAL FIBRE CABLE MONTH & YEAR CABLE ID METER MARKING.		✓	5	B					
3	<b>Definitive Design</b> <b>GAD &amp; GTP of 48 core fiber optical cable accessories.</b> <b>(Doc No.: CA40-2B-CSR-PSY-DEG-GTP-0076) (REV-01)</b>	FMS should be 1U size Single mode LC-PC duplex connector.		✓	5	B					
4		Rack size should be 42U with 800mm*800mm Base should be 100mm plinth. Vholes are not required. Front door should be single glass door. Back door should be double door and perforated Cable managers, trays to be included in panel Spikeguard with universal 5/15A points to be included with AC and DC MCB.		✓	6	B					

*Handwritten signature: Ankit N Agrawal*



**MUMBAI METRO Line 7 & 2B**  
**AICA Consortium (GC)**  
**NO OBJECTION**  
 With Comments ☒ Without Comments ☐  
 Ref. OC-37862



# SIEMENS

To,  
The Project Director,  
Consortium of Ayasa-ITALFER-CEG-Ayasa India (AICA),  
MMRDA Office Building,  
Building No. B1, 3<sup>rd</sup> Floor,  
Opp. to New Wadala Truck Terminal Police Station,  
Wadala East,  
Mumbai 400 037.

Name : K Sudharsan  
Department : RC-IN SMO RI-EL PE 5  
Mobile : +91 9840885066  
E-mail : sudharsan.k@siemens.com  
Our Ref : SIEMENS-MMRDA-2B-CA-40-2025-240  
Dated : 21<sup>st</sup> Feb 2025

**Contract: CA No. MMRDA/2B/MMRP/CA-40: Design, Manufacture, Supply, Installation, Testing and Commissioning of 2 nos. 110kV Receiving Substation including 110kV, 33kV & 25kV Cabling Work, Complete 25kV Overhead Catenary System along with Switching Station, 33kV Auxiliary Power Distribution System including 33/0.415 kV Auxiliary Sub-Station (ASS) and Complete SCADA System for Main Line & Depot of Mumbai Metro Line 2B of MMRDA.**

Ref: LOA: Metro-PIU/System/ML-2B/CA-40/2023/371, dated 09 May 2023.

**Subject:** Submission of GAD & GTP of 48 core fibre optical cable - M/s KEC International Ltd.

Dear Sir,

With reference to the above, please find the below details of the document attached with the letter.

Sr.No.	Subject	Rev	Purpose
1	Definitive Design GAD & GTP of 48 core fibre optical cable - M/s KEC International Ltd. (Doc No. CA40-2B-CSR-PSY-DEG-GTP-0071)	01	For review and approval

We kindly request you to review and accord your approval for the above document.

Thanking you and assuring you our best services always, we remain.

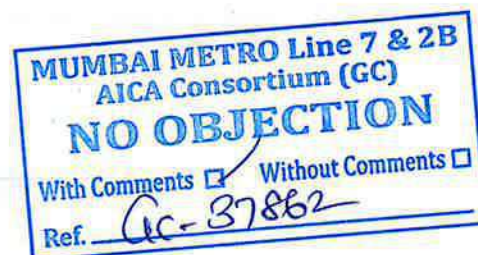
Yours Sincerely,

On behalf of Consortium of Siemens Ltd. & Rail Vikas Nigam Ltd.

  
K Sudharsan  
Contractor's Representative (CA - 40)

Encl : As above  
Response to : NA  
Resp. Requested : Yes

Cc: Director System, PIU, MMRDA



Siemens Limited  
Management: Sunil Mathur  
Mobility India; Management: Gurjan Vakharia

DLF Cyber Park, Phase III,  
Tower B, 10<sup>th</sup> Floor, Sector 20,  
Gurugram 122018,  
India





Tel.: +91 (124) 284 2000  
Fax: +91 (124) 234 7512

Registered Office: Birla Aurora, Level 21, Plot No. 1080, Dr. Annie Besant Road, Worli, Mumbai - 400030; Corporate Identity number: L28920MH1957PLC010839;  
Tel.: +91 (22) 6251 7000; Fax: +91 (22) 2436 2404; Contact / Email: www.siemens.co.in/contact; Website: www.siemens.co.in.  
Sales Offices: Ahmedabad, Bengaluru, Chennai, Gurugram, Hyderabad, Kharghar, Kolkata, Mumbai, Nagpur, Kalwa, Puducherry, Pune, Vadodara.

**MUMBAI METRO LINE-2B OF MMRDA****GAD & GTP of 48 core Fibre optic cable make  
M/s KEC International Ltd**






REV-01



DOCUMENT NO.:  
CA40-2B-CSR-PSY-DEG-GTP-0071

	Name	Designation	Date	Signature
Approved by	K Sudharsan	Project Manager	21.02.2025	
Reviewed by	S.K. Srivastava	DPM/RVNL	20.02.2025	
Checked by	Nagboshan Rao	Design Engineer	20.02.2025	
Prepared by	Yeswanth Kumar Reddy. N	Execution Engineer (OHE)	20.02.2025	

**MUMBAI METRO Line 7 & 2B**  
**AICA Consortium (GC)**  
**NO OBJECTION**With Comments ☒ Without Comments ☐Ref. GC-37862



APPROVALS					
GENERAL CONSULTANT			MMRDA		
Name	Designation	Signature	Name	Designation	Signature
Vijay Yadav	DPD (Systems)		Laxmiprasad Kharat	Chief Engineer	
Ankit N Aggarwal	Chief Traction Expert		Mohit Naagar	Executive Engineer	
D. Aldus Huxley	Sr. Quality Assurance Expert		Dinesh Pawar	Deputy Engineer (Elect.)	
G. Balaji	Senior T&C Engineer				
Rajesh Sanodia	Senior T&C Engineer				

THE TATA POWER COMPANY LIMITED PROJECT ENGINEERING DEPARTMENT	
APPROVAL STATUS 03/Mar/2025	
I	Approved
II	Approved subject to incorporation of comments as marked. Resubmit for formal approval
III	Not Approved. Incorporate comments as marked. Resubmit for review & approval
IV	Not Retained for information Resubmit after review & incorporation of comments
 Checked By	 Approved by

MUMBAI METRO Line 7 & 2B AICA Consortium (GC) <b>NO OBJECTION</b> With Comments <input checked="" type="checkbox"/> Without Comments <input type="checkbox"/> Ref. <u>CC-37862</u>
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## KEC ASIAN CABLES LIMITED



A KEC INTERNATIONAL LIMITED SUBSIDIARY

Cable Type: 48F SM MT ARMoured OFC

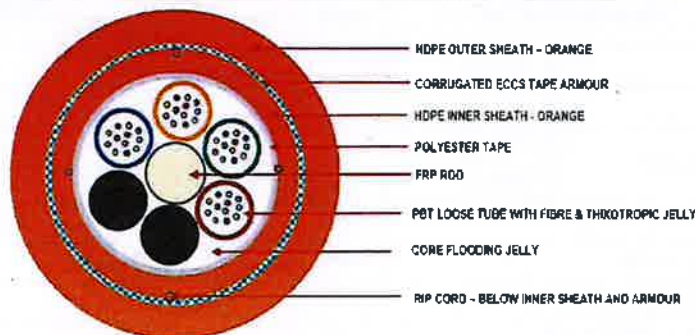
Design No.: A0486HD

Rev. No. / Date: 0 / 20.02.2025

Customer Name: General

## TECHNICAL DATA SPECIFICATION SHEET

## CABLE CROSS SECTION DIAGRAM



48F OFC - This figure is only for illustrative purpose. Typically not to Scale.

## PHYSICAL &amp; DIMENSIONS CHARACTERISTICS

S. No	CHARACTERISTICS	VALUE
1	Design No.	A0486HD
2	Fibre Type	Fiber type only Birla Fibre (Kawar) Standard are acceptable. ZTT is not acceptable. Same has been informed to R/VNL team.
3	No. of Fibre	SM ITU-T G.652D - Make: ZTT / Birla Furukawa / Sterlite Technologies 48F
4	Central Strength Member	Fiber Reinforced Plastic (FRP) Rod
5	Diameter of FRP (Ø)	2.0 ± 0.2 mm
6	No. of Fibre per Loose Tube	12F
7	No. of Loose Tube / Filler	4 Nos. / 2 Nos.
8	Material of Loose Tube	PBTP
9	Material of Filler	PE - Black
10	Diameter of Loose Tube (Ø)	2.0 ± 0.2 mm
11	Loose Tube Filling Compound	Thixotropic Jelly
12	Cable core Filling Compound	Flooding Jelly
13	Core Wrapping	Polyester Tape wrapped over cable core
14	Rip Cord	1 No. Rip Cord below Inner Sheath
15	Inner Sheath Material / Colour	HDPE (UV) / Orange
16	Inner Sheath Thickness	1.3 mm Minimum
17	Rip Cord	1 No. Rip Cord below Armour
18	Armouring	Corrugated ECCS Tape over Inner Sheath
19	Outer Sheath Material / Colour	HDPE (UV) / Orange
20	Outer Sheath Thickness	1.8 mm Nominal
21	Overall Cable Diameter (Ø)	14.0 mm ± 1.0 mm
22	Cable Weight	180 Kg/Km Nominal
23	Standard Length	2 Km ± 10 %
24	Non-Standard Length	10% of Total PO Quantity

## IDENTIFICATION

	1	2	3	4	5	6	7	8	9	10	11	12
Fibre Colour		Orange	Green	Blue	Slate	White	Red	Black	Yellow		Pink	Aqua
Tube Colour	1	2	3	4	5	6	In cable marking customer name to be "MMRDA Mandale Tata Power Co." to be mentioned. Final cable marking to be:  KEC ASIAN CABLES 48F SM G652D MLT DS ARM TELEPHONE HANDSET SYMBOL LASER SYMBOL MMRDA Mandale TATA POWER Co. OPTICAL FIBRE CABLE MONTH & YEAR CABLE ID METER MARKING.					
Sequence		Orange	Green	Blue	Filler-1	Filler-2						
Cable Marking	Hot Foil indentation:		KEC ASIAN CABLES 48F SM G652D MLT DS ARM TELEPHONE TATA POWER Co. OPTICAL FIBRE CABLE MONTH & YEAR CABLE ID METER MARKING.									



# KEC ASIAN CABLES LIMITED



A KEC INTERNATIONAL LIMITED SUBSIDIARY

Cable Type: 48F SM MT ARMoured OFC

Design No.: A0486HD

Rev. No. / Date: 0 / 20.02.2025

Customer Name: General

## TECHNICAL DATA SPECIFICATION SHEET

### OPTICAL FIBRE CHARACTERISTICS

S.No.	CHARACTERISTICS		UOM	ITU-T G652 D FIBRE	
				At Fibre Stage	At Cable Stage
1	Attenuation	@ 1310 nm	dB/km	$\leq 0.34$	$\leq 0.36$
		@ 1550 nm		$\leq 0.20$	$\leq 0.22$
2	Total Dispersion	@1285-1330 nm	ps/nm.km	$\leq 3.50$	—
		@ 1550 nm		$\leq 18.0$	—
3	Mode Field Diameter at 1310 nm		$\mu\text{m}$	$9.2 \pm 0.4$	—
4	Cladding Diameter		$\mu\text{m}$	$125 \pm 1.0$	—
5	Cladding Non-Circularity		%	$\leq 1.0$	—
6	Core clad concentricity Error		$\mu\text{m}$	$\leq 0.6$	—
7	Coating Diameter (Natural Fibre)		$\mu\text{m}$	$242 \pm 7$	—
8	Zero Dispersion Wavelength		nm	1300 to 1324	—
9	Zero Dispersion Slope		ps/nm <sup>2</sup> .km	$\leq 0.092$	—
10	Polarised Mode Dispersion		ps/√ km	$\leq 0.3$	—
11	Fibre Cut-off Wavelength		nm	$\leq 1320$	—

### MECHANICAL & ENVIRONMENTAL CHARACTERISTICS

S. No.	CHARACTERISTICS		STANDARD	REQUIREMENT
1	Maximum Tensile Strength		IEC 60794-1-21-E1	1.3 x 9.81 x W Newtons
2	Crush Resistance Test		IEC 60794-1-21-E3	4000 N / 100 mm x 100 mm
3	Impact Test		IEC 60794-1-21-E4	5 Kg from a height of 0.55 meter
4	Repeated Bending Test		IEC 60794-1-21-E6	20 x D (D: Diameter of Cable)
5	Torsion Test		IEC 60794-1-21-E7	$\pm 180$ Degree, 20 N, 5 Nos.
6	Kink Test		IEC 60794-1-21-E10	10 x D (D: Diameter of Cable)
7	Minimum Bending Radius		IEC 60794-1-21-E11	20 x D (D: Diameter of Cable)
8	Water Penetration Test		IEC 60794-1-22-F5	1 meter water height, 3 meter cable sample, 24 Hrs.
9	Maximum Temperature	Operations	IEC 60794-1-22-F1	-20 °C to +70 °C
		Installation		-10 °C to +70 °C
		Storage		-20 °C to +70 °C

### CABLE PERFORMANCE STANDARDS

IEC 60793, IEC 60794

### PACKAGING

Wooden Drums

Doc. No.: KEC/DE/R/07

MUMBAI METRO Line 7 & 2B  
AICA Consortium (CC)  
**NO OBJECTION**  
With Comments ☒ Without Comments ☐  
Ref. EC-37862

Page No. | 2 of 2



# DATA SHEET FOR FO JOINT BOX

## EH9013-000 | FOSC-400-B4-A-BJL-2-B-24



FOSCTM400 B4 Fiber Optic Splice Closure, Heat Shrink Cable sealing,

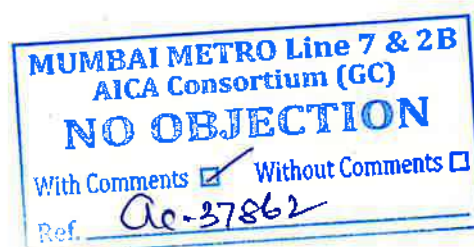
- Single-ended, O-ring sealed dome closure for splicing feeder and distribution cables
- Compatible with most common cable types: e.g. loose tube, central core, ribbon fiber
- FOSC splice trays hinged for access to any splice without disturbing other trays
- Closure can be used in aerial, pedestal and underground (up to 5 meters) environments
- Compatible with CommScope's CWDM modules and optical splitter trays

### Product Classification

Product Type	Single-ended, round fiber closure
Regional Availability	Asia   EMEA
Product Series	FOSC 400
Product Brand	FOSCTM

### General Specifications

Splicing Type, Supported	Single fusion
Splicing Capacity, Mass Fusion, maximum	144
Splicing Capacity, Single Fusion, maximum	96
Color	Black
Network Area Type	Feeder
Package, quantity	1
Packaging Type	Box   Carton
Splicing Capacity, Single Splice, 12 fibers, maximum	96
Splicing Capacity, Single Splice, 6 fibers, maximum	48



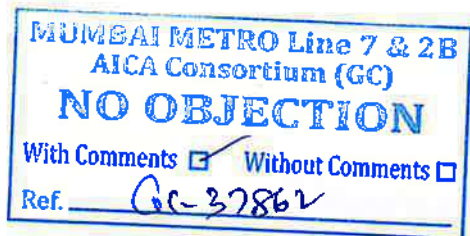
### Dimensions

Main Cable Diameter, maximum	25.00 mm
Diameter	150.00 mm   5.91 in
Diameter, with clamp	180 mm   7 in
Length	540.00 mm   21.26 in
Weight	2.50 kg   5.51 lb

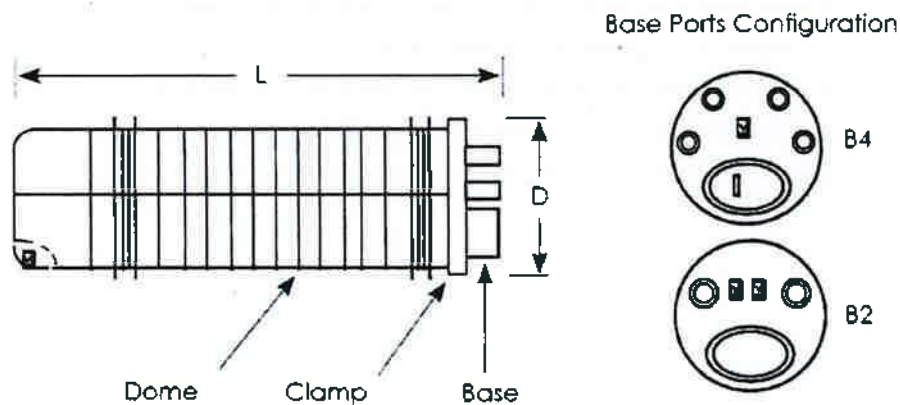
### Dimension Drawing



page 1 of 2  
October 19, 2019



EH9013-000 | FOSC-400-B4-A-BJL-2-B-24



## Mechanical Specifications

Cable Sealing Type	Heat shrink
Cable Entry Drop Port Style	Round
Cable Entry Main Port Style	Oval
Cable Ports, quantity	5
Closure Sealing Type	Dome-to-base clamp with O-ring
Closure Style	Single-ended
Material Type	Impact-resistant polymer
Mount Type	Pole   Strand   Wall

## Environmental Specifications

Environmental Space	Below ground   Buried
Qualification Standard	IEC 61300, 6 m waterhead

## Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant
ISO 9001 2015	Designed, manufactured and/or distributed under this quality management system



page 2 of 2  
October 19, 2019



## DATA SHEET FOR FO TERMINATION PANEL

3-2122146-4 | FMS-K-2-B-I-L1-24-IN99-48-SP



FMS Fiber Optic Termination/Splice Panel, 1U, 19 in, 48 LC/UPC, singlemode, OS2, black

FMS should be 1U size Single mode LC-PC duplex connector.

### Product Classification

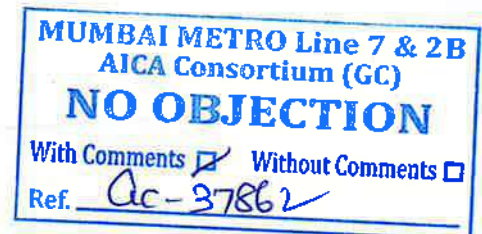
Regional Availability	Asia
Portfolio	CommScope®
Product Type	Fiber patch/splice panel
Product Series	FMS

### General Specifications

Functionality	Patching   Splicing
Body Style	Symmetrical
Cable Exit Location	Rear, left side   Rear, right side
Color	Black
Color, front	Black
Interface, front	LC
Interface Feature, front	Standard
Rack Type	EIA 19 in
Rack Units	1
Shelf Movement	Sliding
Splice Trays Included, quantity	2
Splicing Type	Heat shrink, single fiber fusion
Total Ports, quantity	48

### Dimensions

Height	44.45 mm   1.75 in
Width	482.6 mm   19 in
Depth	320 mm   12.598 in



3-2122146-4 | FMS-K-2-B-I-L1-24-IN99-48-SP

### Material Specifications

<b>Finish</b>	Powder coated
<b>Material Type</b>	Steel

### Optical Specifications

<b>Fiber Mode</b>	Singlemode
<b>Fiber Type</b>	OS2
<b>Insertion Loss, maximum</b>	0.3 dB
<b>Return Loss, minimum</b>	45 dB

### Packaging and Weights

<b>Included</b>	Mounting hardware
<b>Packaging quantity</b>	1

### Regulatory Compliance/Certifications

<b>Agency</b>	<b>Classification</b>
CHINA-ROHS	Below maximum concentration value
REACH-SVHC	Compliant as per SVHC revision on <a href="http://www.commscope.com/ProductCompliance">www.commscope.com/ProductCompliance</a>
ROHS	Compliant

