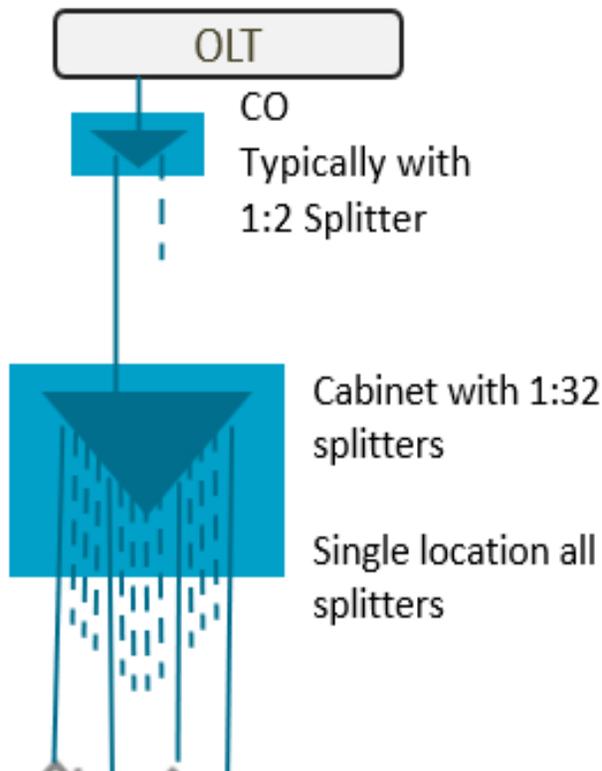


Fiber Architecture

Centralized Split

- Application: Urban / Suburban



- OLT utilization
- Fewer troubleshooting points
- High less flexibility for change
- Greater distribution fiber requirements

Port Mapping Example

FIBER CABLE		UPLINK PORT MAPPING TABLE					
		FIBER ID		FDP PORT #	UPLINK JUMPER ID #	CALIX	
		TUBE #	FIBER #			PORT #	CARD #
BL	BL	1	1	1		SFP-1	CARD-1
BL	OR	1	2	2		SFP-2	CARD-1
BL	GN	1	3	3			
BL	BR	1	4	4			
BL	SL	1	5	5			
BL	WH	1	6	6			
BL	RD	1	7	7			
BL	BK	1	8	8			
BL	YL	1	9	9			
BL	VI	1	10	10			
BL	RS	1	11	11			
BL	AQ	1	12	12			

FIBER CABLE		SPLITTER OUTPUT PORT MAPPING TABLE					
		FIBER ID		FDP PORT #	SPLITTER ID/FIBER #	CALIX	
		TUBE #	FIBER #			PORT #	CARD #
OR	BL	2	13	13	SPLITTER-1/F1		
OR	OR	2	14	14	SPLITTER-1/F2		
OR	GN	2	15	15	SPLITTER-1/F3		
OR	BR	2	16	16	SPLITTER-1/F4		
OR	SL	2	17	17	SPLITTER-1/F5		
OR	WH	2	18	18	SPLITTER-1/F6		
OR	RD	2	19	19	SPLITTER-1/F7		
OR	BK	2	20	20	SPLITTER-1/F8	PORT-1	CARD-1
OR	YL	2	21	21	SPLITTER-1/F9		
OR	VI	2	22	22	SPLITTER-1/F10		
OR	RS	2	23	23	SPLITTER-1/F11		
OR	AQ	2	24	24	SPLITTER-1/F12		
GN	BL	3	25	25	SPLITTER-1/F13		
GN	OR	3	26	26	SPLITTER-1/F14		
GN	GN	3	27	27	SPLITTER-1/F15		

GN	BR	3	28	28	SPLITTER-1/F16		
GN	SL	3	29	29	SPLITTER-1/F17		
GN	WH	3	30	30	SPLITTER-1/F18		
GN	RD	3	31	31	SPLITTER-1/F19		
GN	BK	3	32	32	SPLITTER-1/F20		
GN	YL	3	33	33	SPLITTER-1/F21		
GN	VI	3	34	34	SPLITTER-1/F22		
GN	RS	3	35	35	SPLITTER-1/F23		
GN	AQ	3	36	36	SPLITTER-1/F24		
BR	BL	4	37	37	SPLITTER-1/F25		
BR	OR	4	38	38	SPLITTER-1/F26		
BR	GN	4	39	39	SPLITTER-1/F27		
BR	BR	4	40	40	SPLITTER-1/F28		
BR	SL	4	41	41	SPLITTER-1/F29		
BR	WH	4	42	42	SPLITTER-1/F30		
BR	RD	4	43	43	SPLITTER-1/F31		
BR	BK	4	44	44	SPLITTER-1/F32		
BR	YL	4	45	45	SPLITTER-2/F1		
BR	VI	4	46	46	SPLITTER-2/F2		
BR	RS	4	47	47	SPLITTER-2/F3		
BR	AQ	4	48	48	SPLITTER-2/F4		
SL	BL	5	49	49	SPLITTER-2/F5		
SL	OR	5	50	50	SPLITTER-2/F6		
SL	GN	5	51	51	SPLITTER-2/F7		
SL	BR	5	52	52	SPLITTER-2/F8		
SL	SL	5	53	53	SPLITTER-2/F9		
SL	WH	5	54	54	SPLITTER-2/F10		
SL	RD	5	55	55	SPLITTER-2/F11		
SL	BK	5	56	56	SPLITTER-2/F12		
SL	YL	5	57	57	SPLITTER-2/F13	PORT-	CARD-
SL	VI	5	58	58	SPLITTER-2/F14	2	1
SL	RS	5	59	59	SPLITTER-2/F15		
SL	AQ	5	60	60	SPLITTER-2/F16		
WH	BL	6	61	61	SPLITTER-2/F17		
WH	OR	6	62	62	SPLITTER-2/F18		
WH	GN	6	63	63	SPLITTER-2/F19		
WH	BR	6	64	64	SPLITTER-2/F20		
WH	SL	6	65	65	SPLITTER-2/F21		
WH	WH	6	66	66	SPLITTER-2/F22		
WH	RD	6	67	67	SPLITTER-2/F23		
WH	BK	6	68	68	SPLITTER-2/F24		
WH	YL	6	69	69	SPLITTER-2/F25		

WH	VI	6	70	70	SPLITTER-2/F26		
WH	RS	6	71	71	SPLITTER-2/F27		
WH	AQ	6	72	72	SPLITTER-2/F28		
RD	BL	7	73	73	SPLITTER-2/F29		
RD	OR	7	74	74	SPLITTER-2/F30		
RD	GN	7	75	75	SPLITTER-2/F31		
RD	BR	7	76	76	SPLITTER-2/F32		
RD	SL	7	77	77	SPLITTER-3/F1		
RD	WH	7	78	78	SPLITTER-3/F2		
RD	RD	7	79	79	SPLITTER-3/F3		
RD	BK	7	80	80	SPLITTER-3/F4		
RD	YL	7	81	81	SPLITTER-3/F5		
RD	VI	7	82	82	SPLITTER-3/F6		
RD	RS	7	83	83	SPLITTER-3/F7		
RD	AQ	7	84	84	SPLITTER-3/F8		
BK	BL	8	85	85	SPLITTER-3/F9		
BK	OR	8	86	86	SPLITTER-3/F10		
BK	GN	8	87	87	SPLITTER-3/F11		
BK	BR	8	88	88	SPLITTER-3/F12		
BK	SL	8	89	89	SPLITTER-3/F13		
BK	WH	8	90	90	SPLITTER-3/F14		
BK	RD	8	91	91	SPLITTER-3/F15		
BK	BK	8	92	92	SPLITTER-3/F16	PORT- 3	CARD- 1
BK	YL	8	93	93	SPLITTER-3/F17		
BK	VI	8	94	94	SPLITTER-3/F18		
BK	RS	8	95	95	SPLITTER-3/F19		
BK	AQ	8	96	96	SPLITTER-3/F20		
YL	BL	9	97	97	SPLITTER-3/F21		
YL	OR	9	98	98	SPLITTER-3/F22		
YL	GN	9	99	99	SPLITTER-3/F23		
YL	BR	9	100	100	SPLITTER-3/F24		
YL	SL	9	101	101	SPLITTER-3/F25		
YL	WH	9	102	102	SPLITTER-3/F26		
YL	RD	9	103	103	SPLITTER-3/F27		
YL	BK	9	104	104	SPLITTER-3/F28		
YL	YL	9	105	105	SPLITTER-3/F29		
YL	VI	9	106	106	SPLITTER-3/F30		
YL	RS	9	107	107	SPLITTER-3/F31		
YL	AQ	9	108	108	SPLITTER-3/F32		
VI	BL	10	109	109	SPLITTER-4/F1	PORT- 4	CARD- 1
VI	OR	10	110	110	SPLITTER-4/F2		

VI	GN	10	111	111	SPLITTER-4/F3
VI	BR	10	112	112	SPLITTER-4/F4
VI	SL	10	113	113	SPLITTER-4/F5
VI	WH	10	114	114	SPLITTER-4/F6
VI	RD	10	115	115	SPLITTER-4/F7
VI	BK	10	116	116	SPLITTER-4/F8
VI	YL	10	117	117	SPLITTER-4/F9
VI	VI	10	118	118	SPLITTER-4/F10
VI	RS	10	119	119	SPLITTER-4/F11
VI	AQ	10	120	120	SPLITTER-4/F12
RS	BL	11	121	121	SPLITTER-4/F13
RS	OR	11	122	122	SPLITTER-4/F14
RS	GN	11	123	123	SPLITTER-4/F15
RS	BR	11	124	124	SPLITTER-4/F16
RS	SL	11	125	125	SPLITTER-4/F17
RS	WH	11	126	126	SPLITTER-4/F18
RS	RD	11	127	127	SPLITTER-4/F19
RS	BK	11	128	128	SPLITTER-4/F20
RS	YL	11	129	129	SPLITTER-4/F21
RS	VI	11	130	130	SPLITTER-4/F22
RS	RS	11	131	131	SPLITTER-4/F23
RS	AQ	11	132	132	SPLITTER-4/F24
AQ	BL	12	133	133	SPLITTER-4/F25
AQ	OR	12	134	134	SPLITTER-4/F26
AQ	GN	12	135	135	SPLITTER-4/F27
AQ	BR	12	136	136	SPLITTER-4/F28
AQ	SL	12	137	137	SPLITTER-4/F29
AQ	WH	12	138	138	SPLITTER-4/F30
AQ	RD	12	139	139	SPLITTER-4/F31
AQ	BK	12	140	140	SPLITTER-4/F32
AQ	YL	12	141	141	
AQ	VI	12	142	142	
AQ	RS	12	143	143	
AQ	AQ	12	144	144	



**Know what's below.
Call before you dig.**

- 1. THE CONTRACTOR MUST OBTAIN THE LOCATES PRIOR TO DISTURBING THE GROUND.**
- 2. CONTRACTOR MUST HAVE A COPY OF THE APPROVED PERMIT FROM THE APPROPRIATE AGENCY ON THE JOBSITE AT ALL TIMES.**
- 3. NO MORE THAN ONE TRENCH OPENED AT ONE TIME THEN BACKFILLED AND COMPACTED IN 10" LIFTS AT THE END OF EACH DAY. (NO TRENCH LEFT OPENED OVERNIGHT)**
- 4. ALL CABLE SHALL BE BURIED AT 36" DEEP FOR BACKBONE AND 12' MINIMUM LATERALS UNLESS OTHERWISE NOTED.**
- 5. ALL DIRECTIONAL BORES TO HAVE A MINIMUM OF 30" COVER UNLESS OTHERWISE NOTED.**
- 6. ALL DIRECTIONAL CORES CROSSING ROADS SHALL CROSS AS CLOSE TO 90 DEGREES AS POSSIBLE. CROSSINGS SHALL NEVER CROSS AT AN ANGLE LESS THAN 45 DEGREES.**
- 7. BONDING SHALL BE PROVIDED BETWEEN ALL ABOVE GROUND METALLIC POWER AND COMMUNICATION PEDESTALS THAT ARE SEPERATED BY 6 FEET OR LESS. (REF: 1993 NESC SECTION 35, ARTICLE 350.F.)**
- 8. THE CONDITION OF ROAD UPON COMPLETION OF JOB SHALL BE AS GOOD OR BETTER THAN PRIOR TO STARTING.**
- 9. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS, AND TREES ALONG THE AREA OF EXCAVATION.**
- 10. CONTRACTOR SHALL COMPLY WITH LATEST EDITION OF OSHA REGULATIONS AND THE STATE LAWS CONCERNING EXCAVATION.**
- 11. SERVICE DROP PATHS ARE GRAPHICAL IN NATURE ONLY AND NOT INTENDED TO BE USED FOR CONSTRUCTION.**
- 12. CABLE PATHS ARE AN APPROXIMATE LOCATION AND SHALL BE PLACED IN THE UTILITY RIGHT OF WAY.**

Legend

LINETYPES

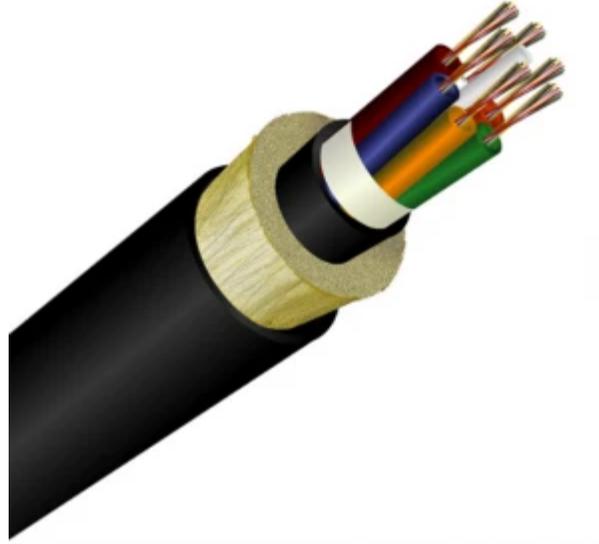
UG CONDUIT - VACANT
UG FIBER - 6CT
UG FIBER - 12CT
UG FIBER - 24CT
UG FIBER - 48CT
UG FIBER - 72CT
UG FIBER - 144CT
UG FIBER - 288CT

GAS
WATER
TELEPHONE
ELECTRIC
SANITARY SEWER (SEW)
STORM DRAIN
FENCE
CABLE TV
STEAM
OIL
UNKNOWN UTILITY
RIGHT OF WAY
EDGE OF PAVEMENT
SIDEWALK
UTILITY EASEMENT
PROPERTY LINE
RAILROAD

SYMBOL	DESCRIPTION
ASW	ASPHALT SIDEWALK
BOC	BACK OF CURB
BOS	BACK OF SIDEWALK
CSW	CONCRETE SIDEWALK
EOP	EDGE OF PAVEMENT
EOTW	EDGE OF TRAVEL WAY
FOC	FIBER OPTIC CABLE
HDPE	HIGH DENSITY POLYETHYLENE
HH	HANDHOLE
JB	JUNCTION BOX
MH	MANHOLE
MP	MILE POST
O/S	OFFSET
PVC	POLY VINYL CHLORIDE
RGS	RIGID GALVANIZED STEEL CONDUIT
ROW	RIGHT OF WAY
STA	STATION
TW	TRACER WIRE

LEGEND

	HANDHOLE - EXISTING		MPT - EXISTING						
	HANDHOLE - PROPOSED		MPT - PROPOSED						
	HANDHOLE - RETIRED		MPT - RETIRED						
	TERMINATION PANEL - EXISTING		G-PON CABINET AND HANDHOLE						
	TERMINATION PANEL - PROPOSED		EXISTING MANHOLE OTHERS						
	TERMINATION PANEL - RETIRED		CHANGE 30x48 HH OTHERS						
	MARKER POST		EXISTING TELEPHONE						
	TEST STATION MARKER POST		EXISTING POWER VAULT						
	TEST STATION INSIDE ACCESS POINT		CATCH BASIN/INLET						
	AERIAL STORAGE - EXISTING		FIRE HYDRANT						
	AERIAL STORAGE - PROPOSED		GROUND/BOND						
	POLE ANCHOR/DOWN GUY - EXISTING		STREET LIGHT						
	POLE ANCHOR/DOWN GUY - PROPOSED		TREE						
	PROPOSED DOWN GUY ON EXISTING ANCHOR		CULVERT						
	SPICE POINT - EXISTING		WING WALL						
	SPICE POINT - PROPOSED		BRIDGE						
	CELL TOWER/5G TOWER		MISC. UTILITY						
			UTILITY POLE - EXISTING						
			POLE - PROPOSED						
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Industry Standard Single-mode
G.652.D, G.657.A1 or Better

SPECIFICATION FOR LOW WATER PEAK SINGLEMODE OPTICAL FIBER
ITU-T RECOMMENDATION G.652.D, and IEC 60793-2-50 Type B1.3, used in OS1/OS2 CABLES

OPTICAL PROPERTIES

Fiber Selected to Meet Cabled Attenuation	@ 1310 nm	≤ 0.38 dB/km
	@ 1383 nm	≤ 0.38 dB/km
	@ 1550 nm	≤ 0.25 dB/km
Attenuation Uniformity	Point or step defect	≤ 0.1 dB
	Extended variations	≤ 0.1 dB
Mode Field Diameter	@ 1310nm	9.2 ± 0.4 μm
Cut-Off Wavelength	λ _c (fiber)	1190 - 1320 nm
	λ _{cc} (cable)	≤ 1260 nm
Chromatic Dispersion	1285 – 1330 nm	≤ 3 ps/nm.km
	1550 nm	≤ 18.0 ps/nm.km
Zero Dispersion Wavelength		1302 - 1322 nm
Slope at Zero Dispersion Wavelength		≤ 0.090 ps/nm ² .km
Un-cabled Fiber – Individual		≤ 0.1 ps/√km
Link Design Value PMD _q		≤ 0.2 ps/√km
Nominal Refractive Index	1310/1550 nm	1.470

MACROBENDING PROPERTIES

100 Turns Around 60mm Diameter	@1625 nm	≤ 0.05 dB/km
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GEOMETRICAL PROPERTIES

Cladding Diameter		125 ± 0.7 μm
Glass Concentricity Error		≤ 0.5 μm
Non-Circularity	Core	≤ 6 %
	Cladding	≤ 0.7 %
Coating Diameter*		242 ± 7 μm
Coating Concentricity Error		≤ 12.0 μm
Coating Non-Circularity		≤ 5 %

MECHANICAL PROPERTIES

Proof Test Level	≥ 0.69 GPa / ≥ 1.0 %	
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We require that all fiber optic installations and testing procedures meet recognized industry standards, specifically those outlined by ANSI/TIA, IEC, and BICSI.

To ensure the integrity and performance of the fiber optic network, please confirm that your testing protocols include:

Tier 1 (Basic) Testing: Optical loss measurements using an Optical Loss Test Set (OLTS), including insertion loss and length verification.

Tier 2 (Extended) Testing: OTDR trace analysis for splice and connector characterization, where applicable.

Documentation: Complete test reports for each fiber strand, including pass/fail criteria, equipment calibration records, and technician certifications.

We ask that all testing be performed using calibrated equipment and by qualified personnel, with results submitted for review prior to project closeout. If your current procedures differ from these standards, please provide a detailed explanation and proposed adjustments to align with best practices.

Testing

document to record light level results from a Fiber to the Home (FTTH) project is crucial for maintaining clear and accurate records. Below is a suggested template for a light level results recording sheet. You can adjust it according to the specific needs of your project.

FTTH Project Light Level Results Recording Sheet

Project Information

Project Name: _____

Location: _____

Date: _____

Technician Name: _____

Technician Contact: _____

Fiber Optic Cable Information

Cable ID: _____

Cable Type: (e.g., Single Mode/Multimode) _____

Fiber Count: _____

Splice Location: _____

Light Level Test Results

Test Point	Connector ID	Source Power (dBm)	Measured Power (dBm)	Attenuation (dB)	Pass/Fail
------------	--------------	--------------------	----------------------	------------------	-----------

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Notes

Test Equipment Used: _____

Calibration Date: _____

Environmental Conditions: _____

Additional Observations: _____

Approval

Technician Signature: _____

Date: _____

Supervisor Signature: _____

Date: _____

Instructions for Use

- 1. Project Information:** Fill in the project name, location, date, technician name, and contact information.
- 2. Fiber Optic Cable Information:** Record the cable ID, type of cable (e.g., single mode or multimode), fiber count, and splice location.
- 3. Light Level Test Results:** For each test point, enter the connector ID, the source power level (in dBm), the measured power level (in dBm), calculate the attenuation (difference between source and measured power), and indicate if the test passed or failed. Provide any remarks if necessary.
- 4. Notes:** Include the test equipment used, its calibration date, any relevant environmental conditions, and additional observations.
- 5. Approval:** Sign and date the document as a technician and have a supervisor sign and date for approval.

This template ensures that all critical data is systematically recorded and easily accessible for analysis, reporting, and troubleshooting. It can be adapted to electronic or paper-based systems as needed.

This document outlines a centralized split with a 1x32 architecture for Fiber to the Home (FTTH)

Centralized Split 1x32 Architecture for FTTH

1. Project Overview

Project Name: _____

Project Location: _____

Date: _____

Prepared by: _____

Reviewed by: _____

2. Network Architecture Overview

Architecture Type: Centralized Split

Splitter Ratio: 1x32

Total Number of End Users: _____

Service Area: _____

3. Design Considerations

Distance from OLT to Splitter: _____

Distance from Splitter to ONT: _____

Loss Budget: _____

Optical Line Terminal (OLT) Power: _____ dBm

Splitter Loss: _____ dB

Connector Loss (Total): _____ dB

Fiber Loss: _____ dB/km

Total Allowable Loss: _____ dB

4. Components and Equipment

Optical Line Terminal (OLT):

Model: _____

Location: _____

Fiber Distribution Hub (FDH):

Type: _____

Location: _____

Splitters:

Type: 1x32

Insertion Loss: _____ dB

Number of Splitters: _____

Location (FDH): _____

Optical Network Terminal (ONT)**:

Model: _____

Location: Customer Premises

5. Network Diagram

Include a network diagram here or attach as a separate document)

- **Diagram Components:

- OLT in Central Office
- Fiber Distribution Hub (FDH)
- 1x32 Splitter
- Fiber Optic Cable Paths
- ONTs at Customer Premises

6. Installation and Cabling Plan

Main Feeder Cable:

Cable Type: _____

Fiber Count: _____

Route Description: _____

Distribution Cable:

Cable Type: _____

Fiber Count: _____

Route Description: _____

Drop Cable:

Cable Type: _____

Length Range: _____

Splicing and Connectorization:

Splice Type: _____

Connector Type: _____

7. Testing and Verification

Test Equipment:

Optical Time Domain Reflectometer (OTDR)

Power Meter

Light Source

Testing Procedures:

End-to-End Loss Testing

Continuity Testing

Splitter Loss Testing

Acceptance Criteria:

Maximum Loss Threshold: _____

Pass/Fail Criteria: _____

8. Risk Assessment and Mitigation

Potential Risks:

- High attenuation in fibers
- Splitter malfunction
- Poor splicing quality

Mitigation Strategies:

Regular testing and maintenance

Use high-quality components.

Training for installation personnel

9. Maintenance and Troubleshooting

Scheduled Maintenance: _____

Common Faults:

Signal Loss

Fiber Breaks

Connector Failures

Troubleshooting Steps:

Visual Inspection

OTDR Testing

Re-splicing as needed.

10. Documentation and Record Keeping

As-built Diagrams: _____

Splicing Records: _____

Test Results: _____

Maintenance Logs: _____

11. Approval and Sign-off

Prepared by: _____

Signature: _____ Date: _____

Reviewed by: _____

Signature: _____ Date: _____

Approved by: _____

Signature: _____ Date: _____

Instructions for Use

- 1. Project Overview**:** Provide the project name, location, date, and details of the personnel involved in preparing and reviewing the document.
- 2. Network Architecture Overview**:** Outline the centralized split architecture, including splitter ratio and service area.
- 3. Design Considerations**:** Include key design parameters such as distances, loss budgets, and power levels.
- 4. Components and Equipment**:** List all major equipment and components with their specifications and locations.
- 5. Network Diagram**:** Attach a detailed network diagram showing the layout of OLT, splitters, and ONTs.
- 6. Installation and Cabling Plan**:** Detail the types of cables used, their routes, and splicing and connectorization plans.

- 7. Testing and Verification**:** Specify the test equipment, testing procedures, and acceptance criteria for the network.
- 8. Risk Assessment and Mitigation**:** Identify potential risks and the strategies to mitigate them.
- 9. Maintenance and Troubleshooting**:** Provide guidelines for regular maintenance and steps for troubleshooting common issues.
- 10. Documentation and Record Keeping**:** Ensure that all diagrams, test results, and maintenance logs are kept up to date.
- 11. Approval and Sign-off**:** Obtain signatures from relevant personnel to validate the document.

This structured document will help ensure a clear, organized, and consistent approach to implementing and maintaining a centralized split 1x32 FTTH architecture.