

Table of Contents

Preface	xiii
1 Introduction	
1.1 Purpose and Scope	1-1
1.2 Target Audience	1-1
1.3 Reasons for GR-3125-CORE, Issue 2	1-1
1.4 Structure and Use of This Document	1-1
1.5 Requirements Terminology	1-2
1.6 Requirement Labeling Conventions	1-3
1.6.1 Numbering of Requirement and Related Objects	1-3
1.6.2 Requirement, Conditional Requirement, and Objective Identification	1-4
2 General Information	
2.1 Product Description	2-1
2.2 Deployment Environments	2-3
2.3 Installation and Operating Environment	2-4
2.4 Related Telcordia Documents	2-5
2.5 Test Environmental Criteria	2-5
2.5.1 Ambient Laboratory Conditions	2-5
2.5.2 Environmental Tests	2-5
2.5.3 Thermal Soak Time	2-6
2.6 Safety Precautions	2-6
2.7 Measurements	2-6
2.8 Laboratory Conditions	2-6
2.9 Sample Preparation	2-7
2.10 Calibration	2-7
2.11 Standard Conflicts	2-7
2.12 Force and Weight Tolerances	2-7
2.13 Damage Definition	2-7
2.14 Re-Testing	2-8
2.14.1 Re-Testing Matrix	2-8
2.15 Product Integrity	2-9
2.16 Safety and Reliability Standards and Regulations	2-9
2.17 Safety of Materials	2-9
3 General Requirements	
3.1 Documentation	3-1
3.1.1 Practices	3-1
3.2 Markings, Packaging, and Shipping	3-1
3.2.1 Identification	3-1
3.2.1.1 General	3-1
3.2.1.2 Listing	3-2
3.2.2 Shipping Container and Packaging Arrangement	3-2
3.2.3 Package Label	3-2
3.3 Labels	3-3
3.4 Consumable Materials	3-3

3.5	Product Changes	3-3
3.6	Safety and Reliability Considerations	3-3
3.7	Installation Size and Weight	3-4
3.8	Maintenance	3-4
3.9	Components	3-4
3.10	Tools	3-4
3.11	Quality	3-5
3.12	Security	3-5
3.13	FDH Component Devices	3-7
3.14	Connector Performance in Harsh Environments	3-7
4	Functional Design Criteria	
4.1	Materials	4-1
4.1.1	Metallic Materials	4-1
4.1.2	Polymeric and Other Non-Metallic Materials	4-1
4.2	Cable Management Compartments	4-3
4.2.1	Cable Entrance Capacity	4-3
4.2.2	Cable Compatibility	4-3
4.2.3	Cable Termination Hardware	4-3
4.2.4	Bonding and Grounding Hardware	4-4
4.3	Service Provider Splice Compartment	4-4
4.3.1	Splice Storage Capacity	4-5
4.3.2	Fiber and Splice Protection	4-5
4.4	Connector Bulkhead	4-6
4.4.1	Bulkhead Capacity	4-6
4.4.2	Connector Sleeves	4-6
4.4.3	Connector Requirements	4-6
4.4.4	Pigtail Requirements	4-7
4.5	Fundamental FDH Requirements	4-7
4.5.1	Deployment Configurations	4-7
4.5.2	Optical Power Monitoring	4-7
4.5.3	FDH Mounting Hardware	4-8
4.5.4	Door Restrainers	4-8
4.5.5	Drainage for Condensate	4-9
4.5.6	Insect Resistance	4-9
4.5.7	Fire Safety	4-9
4.6	Finish	4-9
4.6.1	Color	4-11
4.6.2	Appearance	4-11
4.6.3	Paint Adhesion	4-11
4.6.4	Paint Adhesion After Exposure	4-12
4.6.5	Flexibility	4-13
4.6.6	Ultraviolet Resistance	4-13
4.7	Graffiti-Resistant Paint	4-14
4.8	Screens and Filters	4-14
4.9	Operational Movement	4-15

5 Application-Specific Requirements

5.1	General	5-1
5.1.1	Testing	5-1
5.1.2	Installation Tests	5-5
5.1.3	Operating Tests	5-6
5.1.4	Optical Measurements	5-6
5.1.4.1	Optical Measurement Test Setup	5-8
5.2	Electrical Criteria	5-10
5.2.1	Bond Clamp Retention	5-10
5.2.2	AC Fault Test	5-11
5.2.2.1	AC Fault Test Method	5-11
5.3	Mechanical Criteria	5-13
5.3.1	Soak Times	5-14
5.3.2	Cable Clamping	5-14
5.3.2.1	Cable Clamping Test Method	5-15
5.3.3	Sheath Retention	5-15
5.3.3.1	Sheath Retention — Test Method	5-16
5.3.3.2	Sheath Retention Test Configuration	5-17
5.3.4	Cable Flexing	5-17
5.3.4.1	Cable Flexing Test Method	5-18
5.3.4.2	Cable Flexing Test Configuration	5-19
5.3.5	Cable Torsion	5-20
5.3.5.1	Cable Torsion Test Method	5-20
5.3.5.2	Cable Torsion Test Configuration	5-21
5.3.6	Impact Resistance	5-21
5.3.7	Central Member (CM) Protrusion	5-23
5.3.7.1	Central Member Protrusion Test Method	5-23
5.4	Environmental Criteria	5-27
5.4.1	Accelerated Thermal Aging	5-28
5.4.1.1	Thermal Aging Test Method	5-28
5.4.2	Assembly	5-28
5.4.2.1	Assembly Test Method	5-29
5.4.3	Temperature and Humidity	5-29
5.4.3.1	Temperature and Humidity Test Method	5-30
5.4.4	Weather Tightness	5-32
5.4.5	Water Resistance	5-33
5.4.5.1	Wind-Driven Rain	5-34
5.4.5.2	Rain Intrusion	5-36
5.4.5.3	Flooded Conditions	5-37
5.4.5.4	Water Immersion	5-38
5.4.6	Door Restrainers (Vertically Hinged Doors)	5-39
5.4.7	Horizontally Hinged Doors	5-42
5.4.8	Wind Resistance	5-43
5.4.9	Compression	5-46
5.4.9.1	Indoor and Outdoor FDH Roof Compression	5-46
5.4.9.2	Below-Grade FDH Compression	5-46
5.4.10	External Icing	5-48
5.4.11	Corrosion Resistance	5-48
5.4.12	Chemical Resistance	5-49
5.4.13	Ultraviolet Resistance	5-52

5.4.14	Fungus Resistance	5-54
5.4.15	Firearms Resistance	5-54
5.4.16	Fire Resistance	5-55
5.4.16.1	Fire Safety – Indoor Only	5-58
5.4.17	Rodent Resistance	5-58
5.4.18	Pole-Mounted, Aerial FDH Criteria	5-58
5.4.19	Lifting Details	5-59
5.5	Shock, Vibration, and Storage Environments	5-59
5.5.1	Transportation Shock	5-59
5.5.1.1	Packaged Equipment Shock Criteria	5-60
5.5.1.1.1	Category A Containers	5-60
5.5.1.1.2	Category B Containers	5-61
5.5.2	Transportation Shock (Rail)	5-63
5.5.3	Transportation Vibration – Packaged Environment	5-63
5.5.4	Packaged Environment Exposure	5-64
5.5.5	Installation Shock - Vertical Drop	5-64
5.5.5.1	Unpackaged Equipment Shock Criteria	5-64
5.5.6	Environmentally Induced Vibration	5-66
5.5.7	Earthquake Resistance	5-67
5.6	Craft Interaction	5-68
5.6.1	Identification of Connector Assemblies Installed in an FDH Shelf	5-69
5.6.2	Front Plane Jumper Tracing, Removal, and Reinstallation Test	5-69
5.6.3	Front Plane Connector Disconnect and Reconnect Test	5-71
5.6.3.1	Measurements	5-72
5.6.3.2	Disconnect and Reconnect Test Procedure	5-72
5.6.3.3	Product Testers	5-73
5.6.4	Rear-Plane Fiber Optic Terminal Jumper Disconnect, Adapter Replacement, and Reconnect Test	5-74
5.6.4.1	Conformance Criteria	5-74
5.6.5	Optical Measurements	5-76
5.6.5.1	Monitored Optical Network	5-76
5.6.5.2	Test Jumper Optical Network	5-76

6 Components

Appendix A: Observational Standard

Appendix B: Wind-Driven Rain Test Set-Up Calibration Suggested Procedure

B.1	Purpose	B-1
B.2	Test Set Calibration	B-1

Appendix C: References

C.1	Telcordia Documents	C-1
C.2	Non-Telcordia Documents	C-2
C.3	To Obtain Additional Reference Material	C-4
C.4	Family of Requirements (FR) and Family of Documents (FD) Sets	C-4
C.5	Reference Notes	C-5
C.5.1	Contact Customer Service	C-5

C.5.2 Order Documents Online From the Telcordia SuperStore C-5
C.5.3 Web Sites for Generic Requirements Information C-6
C.5.4 Licensing Agreements for Telcordia Documents C-6

Appendix D: Acronyms

Requirement-Object Index

List of Figures

Figure 2-1	Schematic of the Fiber Distribution Hub Role	2-2
Figure 2-2	Basic Fiber Distribution Hub	2-2
Figure 3-1	Example of Locking Mechanism	3-6
Figure 5-1	Schematic of Feeder-Cable, Monitored Network for Mechanical and Environmental Tests	5-7
Figure 5-2	Schematic of Distribution-Cable, Monitored Network for Mechanical Tests	5-7
Figure 5-3	Splicing Assignment for Ribbon Fiber	5-10
Figure 5-4	AC Fault Test	5-13
Figure 5-5	Sheath Retention Test Configuration	5-17
Figure 5-6	Cable Flexing Test Configuration	5-19
Figure 5-7	Cable Torsion Test Configuration	5-21
Figure 5-8	Central Member Test Fixture	5-23
Figure 5-9	Central Member Protrusion Test	5-24
Figure 5-10	Jacket Clamped with Central Member Free to Move	5-25
Figure 5-11	Central Member Moves Out of the Cable End as the Jacket Shrinks	5-25
Figure 5-12	Central Member Clamped with Jacket Free to Move	5-26
Figure 5-13	Jacket Shrinks Back Relative to the Central Member	5-26
Figure 5-14	Force Arising from Jacket Shrinkage in a Clamped Situation	5-27
Figure 5-15	Temperature Humidity Profile (Not to Scale) for Outdoor	5-30
Figure 5-16	Temperature Humidity Profile (Not to Scale) for Indoor	5-31
Figure 5-17	Temperature Humidity Profile (Not to Scale) for Below Grade	5-32
Figure 5-18	Top View (Rain Intrusion)	5-37
Figure 5-19	Dynamic Wind Test	5-41
Figure 5-20	Wind Resistance Test Configuration (Part A)	5-44
Figure 5-21	Wind Resistance Test Configuration (Part B)	5-45
Figure 5-22	Roof Compression	5-47
Figure 5-23	Three-Point Test Fixture	5-52
Figure 5-24	Test Bar Samples	5-54
Figure 5-25	Firearms Resistance Test	5-55
Figure 5-26	Packaged Drop Surfaces	5-61
Figure 5-27	Packaged Drop Test Setup	5-62
Figure 5-28	Test Setup for Category B Container, Corner Drop	5-63
Figure 5-29	Earthquake Zone Map	5-67
Figure 5-30	Anthropometric Hand Dimensions to Support Table 5-17	5-74
Figure A-1	Observational Standard	A-1
Figure B-1	Wind Speed and Rainfall Verification Fixture	B-2
Figure B-2	Reduction of Water Collection Aperture With an Inclined Rain Gauge During Wind-Driven Rain Testing	B-3

List of Tables

Table 2-1	Deployment Environments for Fiber Distribution Hubs	2-4
Table 4-1	Description of Required Samples, Sample Count, and Exposure Duration	4-1
Table 4-2	Description of Required Samples, Sample Count, and Exposure Duration	4-10
Table 4-3	Ultraviolet Resistance Sources	4-14
Table 5-1	Performance Test Sequence	5-2
Table 5-2	Installation Test Temperatures	5-5
Table 5-3	Operating Test Temperatures	5-6
Table 5-4	Pass/Fail Criteria for Cable/FDH Mechanical and Environmental Tests	5-8
Table 5-6	Number of Fibers to Monitor	5-9
Table 5-5	Tests that Require Optical Measurements	5-9
Table 5-7	Sheath Retention Criteria Levels	5-16
Table 5-8	Impact Criteria Levels	5-22
Table 5-9	Water Resistance Testing	5-34
Table 5-10	Corrosion Resistance Criteria Levels	5-49
Table 5-12	Test Result Document References	5-53
Table 5-11	Ultraviolet Resistance Sources	5-53
Table 5-13	Category A Container Packaged Equipment Shock Criteria	5-60
Table 5-14	Category B Container Packaged Equipment Shock Criteria	5-61
Table 5-15	Unpackaged Equipment Shock Criteria for Installations That Require Mechanical Assistance Such as a Crane or Hoist	5-65
Table 5-16	Vertical Drop Heights for Installations That Do Not Require Mechanical Assistance	5-65
Table 5-17	Recommended Hand Size of Product Tester	5-73
Table 5-18	Examples of Test Ports 12x6 Panel	5-76
Table 5-19	Examples of Test Ports 12x12 Panel	5-77

