

## Fiber Infrastructure Services

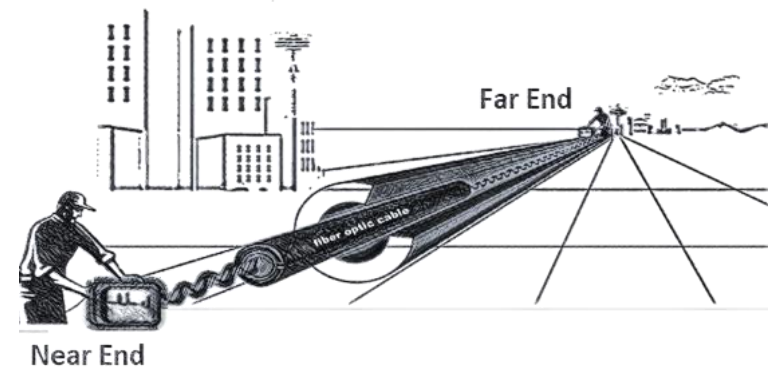
## STATEMENT OF TESTING

**Fiber Characterization** is suite of optical measurements, conducted by a 2 person crew that sets up equipment and connects to the fiber under test at both endpoints in a fiber optic span. The tests are conducted in each direction and the results are individually tabulated in a comprehensive report.

### TESTS

- OTDR bi-directional @ 1550/1625 nm
  - Short shot
  - Medium shot
  - Long shot
- Attenuation/Loss bi-directional @ 1550/1625 nm
- ORL (Optical Return Loss) @ 1550 nm
- Chromatic Dispersion (CD) in C & L bands
- Polarization Mode Dispersion (PMD)

### FIBER CHARACTERIZATION



### EQUIPMENT

### MEASUREMENTS

- EXFO Mainframe Platform
- Test Modules, OTDR, OLTS, Dispersion
- Handhelds
- Inspection Probe
- Cleaning Kit
- Software/Reporting

- Distance and Continuity
- Event location and loss
- Maximum splice loss
- Front end Reflectance and Loss
- Optical Return Loss
- Span loss and attenuation coefficient
- Total Chromatic Dispersion, Slope and CD coefficient
- Total Polarization Mode Dispersion and PMD coefficient

### STANDARDS

OTDR	FOTP-59 TIA/EIA-455-8	Measurement of Fiber Point Discontinuities Using an OTDR and FOTP-8 TIA/EIA
OIL	FOTP-171 TIA/EIA-455-171	Attenuation by Substitution Measurement for Single-mode optical fiber cable assemblies
ORL	FOTP-107 TIA/EIA-455-107A	Return Loss for Fiber optic components
PMD	FOTP124 TIA-455-124	Polarization-mode Dispersion Measurement for Single-mode Optical Fibers by Interferometric Method
CD	FOTP-175 TIA-455-175-B	Measurement Methods and Test Procedures-Chromatic Dispersion





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## STATEMENT OF TESTING

Fiber testing demands accuracy, repeatable results and thorough analysis of data in order to complete a comprehensive report. Adhering to standards ensures the valid reporting

### PROJECT DELIVERABLES

- Daily reports, troubleshooting, remediation.
- Final Report delivered within 7 business
- Pass-Fail Results
- Data file folder
- Complete and comprehensive report
  - Table Summary for each fiber pair per span
  - Validation of measurements
  - Fault Identification
  - Recommended/ Remediation
  - Report call and review

### PROJECT REQUIREMENTS

- Comprehensive Test schedule and Network map
- Key customer project names and phone numbers
- Identification of any glass through sites
- Site location addresses and access instructions, gps coordinates
- Verification of rack, port and assignments for all fibers to be tested.
- Preliminary start date, time and location
- Opening kickoff meeting by conference call prior to start date
- Meeting time and location for first day
- 2 Week lead time

### SAMPLE REPORT

FIBER		OTDR						OLTS					CD				PMD		
Fiber ID	Wavelength (nm)	OTDR A>B (dB) FEC Refl	OTDR B>A (dB) FEC Refl	OTDR A>B (dB) FEC Loss	OTDR B>A (dB) FEC Loss	Span Loss (dB)	Attenuation Coefficient dB/km	OTDR Span Length (km)	Loss A>B (dB)	Loss B>A (dB)	Average Loss (dB)	ORL A>B (dB)	ORL B>A (dB)	Lambda Zero $\lambda$	Slope at 1550nm (ps/nm <sup>2</sup> )	Dispersion at 1550 nm (ps/nm)	Coefficient at 1550 nm (ps/nm <sup>2</sup> km)	Delay (ps)	Coefficient (ps/km <sup>1/2</sup> )
1	1550	-52.3	-54.2	0.482	-0.148	10.665	0.232	45.9964	11.06	10.97	11.01	32.75	32.42	1486.14	3.7684	255.90	5.56	0.13	0.0189
1	1625	-52.7	-54.5	0.440	-0.008	11.071	0.241	45.9674	11.62	11.70	11.66	34.17	33.48	1486.14	3.7684	255.90	5.56	0.13	0.0189
1	1550	-47.7	-52.1	0.654	-0.036	10.644	0.231	45.9964	11.06	10.97	11.01	32.75	32.42	1486.14	3.7684	255.90	5.56	0.13	0.0189
2	1625	-48.4	-52.5	0.552	0.069	10.913	0.237	45.9674	11.62	11.70	11.66	34.17	33.48	1486.14	3.7684	255.90	5.56	0.13	0.0189
3	1550	-47.7	-54.2	0.654	-0.148	10.934	0.238	45.9976	11.06	10.97	11.01	32.75	32.42	1486.47	3.8176	257.81	5.60	0.32	0.0471
3	1625	-48.4	-54.5	0.552	-0.008	11.187	0.243	45.9674	11.62	11.70	11.66	34.17	33.48	1486.47	3.8176	257.81	5.60	0.32	0.0471
4	1550	-47.7	-54.2	0.654	-0.148	10.934	0.238	45.9976	11.06	10.97	11.01	32.75	32.42	1486.47	3.8176	257.81	5.60	0.32	0.0471
4	1625	-48.4	-54.5	0.552	-0.008	11.187	0.243	45.9674	11.62	11.70	11.66	34.17	33.48	1486.47	3.8176	257.81	5.60	0.32	0.0471

