



Dave Cummings  
Chief Information Officer

## Technology Services

121 Library Court Oregon City, OR 97045

March 28, 2019

Board of County Commissioners  
Clackamas County

Members of the Board:

### Approval for a Service Level Agreement with Multnomah Educational Services District

<b>Purpose/Outcomes</b>	Clackamas Broadband eXchange (CBX) is looking for approval for a Service Level Agreement (SLA) with the Multnomah Educational Services District (MESD) for the lease of dark fiber.
<b>Dollar Amount and Fiscal Impact</b>	MESD will pay a non-recurring fee of \$401,051.00 for the new fiber construction. MESD will pay a recurring lease fee of \$18,360.00 annually for the new connections.
<b>Funding Source</b>	The funding source for the fiber expansion will be contributed from the CBX budget and then reimbursed by MESD.
<b>Duration</b>	Effective upon signature by the board the SLA is effective for twenty (20) years.
<b>Previous Board Action</b>	Board has previously approved similar school bids like Lake Oswego School District and North Clackamas School District.
<b>Strategic Plan Alignment</b>	<ol style="list-style-type: none"><li>1. Build a strong infrastructure.</li><li>2. Build public trust through good government.</li></ol>
<b>Contact Person</b>	Dave Devore (503)723-4996

#### **BACKGROUND:**

CBX is requesting a new SLA with the Multnomah Educational Service District for the lease of dark fiber. CBX provided a response to the Multnomah Educational Service District request for proposals from the school district for the lease of dark fiber connections. The Multnomah Educational Service District must request proposals to be eligible for reimbursement through the e-rate process from the Universal Service Administrative Company. The County Board had previously provided authorization to CBX to place bids on public entities that reside adjacent to Clackamas County.

#### **RECOMMENDATION:**

Staff respectfully recommends approval to enter into this new fiber agreement with the Multnomah Educational Service District. Staff further recommends the Board delegate authority to the Technology Services Director to sign agreements necessary in the performance of this agreement.

This Service Level Agreement has been reviewed and approved by County Counsel.

Sincerely,

Dave Cummings  
CIO Technology Services

# Clackamas County

## FIBER OPTIC SERVICE LEVEL AGREEMENT

Multnomah Educational Service District  
(Customer Name)

### 1. Recitals

**WHEREAS**, Clackamas County (County) desires to provide to Multnomah Educational Service District (Customer) the Services set forth in this Agreement, between the specified Customer sites listed in Appendix A, and at the price contained in Appendix A; and

**WHEREAS**, Customer desires to use the Services; and

**WHEREAS**, the Parties desire to set forth herein their respective rights and obligations with respect to the provision of Services,

**NOW, THEREFORE**, in consideration of the foregoing, and the mutual covenants and promises set forth herein, intending to be legally bound, the Parties agree as follows.

### 2. Fiber Optic Network Description

County will provide Customer with point-to-point single mode fiber optic network connectivity, including a termination panel for the fiber optic cables at each Customer premises on a path designated by the County.

### 3. Service Description

Service provided to Customer by County is physical connectivity of one (or more) strands of optical fiber ("Fiber"), between sites specifically identified in Appendix A for the exclusive use of the Customer's internal communication needs. Each site listed in Appendix A will have a single mode fiber termination.

### 4. Construction and Installation Requirements

- a. County, when installing fiber optic cables on the property of Customer, shall do so in a neat and professional manner. Routing and location of these cables shall be mutually agreed upon between the parties.
- b. Customer shall secure any easements, leases, permits or other agreements necessary to allow County to use existing pathways to, into and within each site to the demarcation point for service. Customer shall provide a path for the fiber optic cable from the point of entry into the site to the termination panel that complies with all applicable building, electrical, fire and related codes.
- c. Subject to the terms of this Agreement, and at no cost to County, Customer shall

provide adequate environmentally controlled space and electricity required for installation, operation, and maintenance of the County's fiber optic cables used to provision the service within each site.

- d. Customer shall provide a clean, secure, relatively dry and cool location (consistent with environmental requirements for fiber optic network connectivity equipment) at each of its premises for necessary equipment.
- e. Customer will provide or arrange for County and its employees, agents, lessees, officers and its authorized vendors, upon reasonable notice, to have reasonable ingress and egress into and out of Customer properties and buildings in connection with the provision of service.
- f. If the presence of asbestos or other hazardous materials exists or is detected, Customer must have such hazardous materials removed immediately at Customer's expense or notify County to install the applicable portion of the fiber optic network in areas of any such site not containing such hazardous material. Any additional expense incurred as a result of encountering hazardous materials, including but not limited to, any additional equipment shall be borne by Customer.
- g. County shall have no obligation to install, operate, or maintain Customer-provided facilities or equipment.
- h. County shall construct Fiber into each Customer building enumerated herein; splice fiber into existing County fiber optic resources; terminate County's optical fiber in each Customer building; test and certify appropriate Fiber performance at each Customer location; and provide the appropriate "hand-off's" at each location for Customer utilization. Test results for physical connection will be made available upon request.

**5. Term of Agreement**

At such time as County completes installation and connection of the necessary facilities and equipment to provide service herein, County shall then certify and notify Customer in writing that the service is available for use, and the date of such notice shall be called the "Service Start Date." Unless terminated this Agreement shall remain in effect for a period of twenty (20) years beyond the "Service Start Date".

**6. Rates**

In return for County providing the services described in Appendix A for the term indicated herein, Customer shall pay County both nonrecurring construction/installation charges and recurring charges for services as specified in Appendix A as it shall be amended from time to time.

**7. Payment Options**

**a. Annual Payments**

County shall provide an invoice for twelve months of service (July 1 through

June 30), or prorated weekly for any portion thereof, to Customer at the beginning of the service period. The annual charge shall be payable within thirty (30) days of receipt of invoice. Interest charges shall be assessed for late payments in accordance with Appendix A. If the Customer fails to pay within sixty (60) days of receipt of an invoice it shall constitute grounds for County to terminate the Agreement upon appropriate advance written notice to Customer.

b. **Alternative Payment Frequency**

If Customer demonstrates that prepaid billings present a hardship, Customer may prepay semi-annually, quarterly, and in extreme circumstances may pay monthly. County shall provide an invoice for one quarter or month of service, or prorated weekly for any portion thereof, to Customer at the beginning of the service period. The quarterly or monthly charge shall be payable within thirty (30) days of receipt of invoice. Interest charges shall be assessed for late payments in accordance with Appendix A. If the Customer fails to pay within sixty (60) days of receipt of an invoice it shall constitute grounds for County to terminate the Agreement upon appropriate advance written notice to Customer.

**8. Fiber Maintenance**

County shall maintain the structural aspects of the Fiber in good operating condition, utilizing sound engineering practices and in accordance with Appendix B, throughout the Agreement Term. In the event the Fiber fails at any time to meet the specifications outlined in Appendix C, County shall endeavor to restore the Fiber to meet the specification standards in as timely and expedited a manner as reasonably possible.

County may subcontract for testing, maintenance, repair, restoration, relocation, or other operational and technical services it is obligated to provide hereunder.

Customer shall promptly notify County of any matters pertaining to any damage or impending damage to or loss of the use of the Fiber that are known to it and that could reasonably be expected to adversely affect the Fiber. County shall promptly notify Customer of any matters pertaining to any damage or impending damage to or loss of the Fiber that are known to it and that could reasonably be expected to adversely affect the Fiber and/or Customer's use thereof.

**9. Confidentiality**

All Customer data, voice, or video transmission using County fiber optic facilities shall be treated by County as confidential information, to the extent allowable by law. County agrees that this information shall not be made available, in any form, to any party other than County or its agents or contractors as may be necessary to conduct maintenance or repair activity, without written permission of Customer, except as required by law.

**10. Content Control and Privacy**

Customer shall have full and complete control of, and responsibility and liability for, the content of any and all communications transmissions sent or received using the

Fiber.

**11. Assignment and Successors**

Either party may assign this Agreement upon prior written consent of the other party. Such consent shall not be unreasonably withheld. Upon such assignment, all rights and obligations of County and Customer under this Agreement shall pass in total without modification to any successor(s) regardless of the manner in which the succession may occur.

**12. Damage**

County shall be responsible for restoring, or otherwise repairing to its prior condition, any portion of the Customer's premises or facilities, which are damaged by County or its agents. Customer shall be responsible for restoring, or otherwise repairing to its prior condition, any portion of County's connectivity equipment or other facilities, located at Customer premises, which are damaged by Customer or its agents.

Customer will reimburse all related Costs associated with damage to the Fiber caused by the negligence or willful misconduct of Customer, its affiliates, employees, agents, contractors or customers, except to the extent caused by the gross negligence or willful misconduct of County, its affiliates, employees, contractors or agents. "Cost(s)", as used herein include the following: (a) labor costs, including wages, salaries, and benefits together with overhead allocable to such labor costs; and (b) other direct costs and out-of-pocket expenses on a pass-through basis (such as equipment, materials, supplies, contract services, sales, use or similar taxes, etc.).

**13. Force Majeure**

Neither party hereto shall be deemed to be in default of any provision of this Agreement, for any failure in performance resulting from acts or events beyond the reasonable control of such party. For purposes of this Agreement, such acts shall include, but shall not be limited to, acts of nature, civil or military authority, civil disturbance, war, strikes, fires, power failure, other catastrophes or other force majeure events beyond the parties' reasonable control, provided however that the provisions of this paragraph and article shall not preclude Customer from cancelling or terminating this Agreement as otherwise permitted hereunder, regardless of any force majeure event occurring to County.

**14. Consequential Damages**

NOTWITHSTANDING ANY PROVISION OF THIS AGREEMENT TO THE CONTRARY, IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER PARTY FOR ANY SPECIAL, INCIDENTAL, INDIRECT, CONSEQUENTIAL, OR PUNITIVE DAMAGES, WHETHER FORSEEABLE OR NOT, ARISING OUT OF, OR IN CONNECTION WITH, TRANSMISSION INTERRUPTIONS OR DEGRADATION, INCLUDING BUT NOT LIMITED TO DAMAGE OR LOSS OF PROFITS OR EQUIPMENT, LOSS OF PROFITS OR REVENUE, COST OF CAPITAL, COST OF REPLACEMENT SERVICES OR CLAIMS OF CUSTOMERS, WHETHER

OCCASIONED BY ANY REPAIR OR MAINTENANCE PERFORMED BY OR FAILED TO BE PERFORMED BY A PARTY, OR ANY OTHER CAUSE WHATSOEVER, INCLUDING WITHOUT LIMITATION BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

**15. Public Contracting Provisions**

The provisions of Oregon public contracting law, ORS 279B.020 through 279B.235, to the extent applicable, are incorporated herein by this reference.

**16. Non-Appropriation or Change in Law**

Notwithstanding any other provisions of this Agreement, the parties hereby agree and understand that if either party fails to receive expenditure authority sufficient to allow that party, in the exercise of its reasonable administrative discretion, to perform under this Agreement, or if federal or state laws, regulations or guidelines are modified or interpreted in such a way that a party is prohibited from performing under this Agreement, the Agreement shall terminate and Customer shall pay County any remaining pro rata fees for services due to the date of such termination payable pursuant to Section 7 of this Agreement.

**17. Compliance with Laws**

Customer shall comply with all applicable federal, state, county and city laws, ordinances and regulations, including regulations of any administrative agency thereof, heretofore or hereafter adopted or established, during the entire term of this Agreement.

**18. Taxes and Assessments**

- a. Customer agrees to pay any and all applicable national, federal, state, county and local taxes, fees, assessments or surcharges, and all other similar or related charges, which are imposed or levied on the Fiber, or because of Customer's use of the Services under this Agreement (collectively, "Taxes), whether or not the Taxes are imposed or levied directly on the Customer, or imposed or levied on the County because of or arising out of the use of the Services either by the Customer, or its affiliates, or anyone to whom Customer has sold or otherwise granted access to the Services. Customer agrees to pay these Taxes in addition to all other fees and charges as set forth elsewhere in this Agreement.
- b. "Taxes" include, but are not limited to, business and occupation, commercial, district, excise, franchise fee, gross receipts, license, occupational, privilege, property, Public Utility Commission, right-of-ways, utility user, or other similar taxes, fees, surcharges and assessments as may be levied against Customer, or against County and passed through to Customer.

**19. Termination**

- a. Either party may terminate this Agreement for convenience following 90 days

written notice to the other party.

- b. In the event Customer terminates this Agreement based upon County 's default or failure to perform as described in this Agreement, County shall reimburse to Customer the pro rata amounts paid on the unexpired term of this Agreement.
- c. If Customer terminates this Agreement for any reason other than County's default or failure to perform, County shall be entitled to 5% of the remaining contract amount for the unexpired term of this Agreement.

**20. Default**

- 1. Either of the following events shall constitute a default:
  - a. Failure to perform or comply with any material obligation or condition of this Agreement by any party; or
  - b. Failure to pay any sums due under this Agreement.
- 2. Any defaulting party shall have thirty (30) days in which to cure following - written notice of default by the non-defaulting party.

**21. Amendment**

Any amendments to this Agreement shall be in writing and shall be signed by all parties.

**22. No recourse Against the Grantor**

Customer shall have no recourse whatsoever against County or its officials, boards, commissions, or employees for any loss, costs, expense, or damage arising out of any provision or requirement contained herein, or in the event this Agreement or any part thereof is determined to be invalid.

**23. Notice**

Any notice hereunder shall be in writing and shall be delivered by personal service or by United States certified or registered mail, with postage prepaid, or by facsimile addressed as follows:

**Notice to the County**

Manager, Clackamas Broadband Express  
Clackamas County Technology Services  
121 Library Court  
Oregon City, Oregon 97045  
Fax Number (503) 655-8255

with a copy to

Chief Information Officer  
Clackamas County Technology Services  
121 Library Court  
Oregon City, Oregon 97045  
Fax Number: (503) 655-8255

**Notice to the Customer**

Network Services  
Multnomah Education Service District  
11611 NE Ainsworth Circle  
Portland, Oregon 97220  
noc@mesd.k12.or.us  
503-257-1538

with a copy to

Business Services  
Multnomah Education Service District  
11611 NE Ainsworth Circle  
Portland, Oregon 97220  
503-257-1647

Either Party, by similar written notice, may change the address to which notices shall be sent.

**24. Debt Limitations**

This Agreement is expressly subject to the debt limitation of Oregon counties set forth in Article XI, Section 10, of the Oregon Constitution, and County's performance is contingent upon funds being appropriated therefore. Any provisions herein which would conflict with law are deemed inoperative to that extent.

**25. No Attorney Fees**

No attorney fees shall be paid for or awarded to either party in the course of any dispute or other recovery under this Agreement. It is the intent of the parties that each shall bear the costs of its own legal counsel.

**26. Governing Law**

This Agreement shall be governed and construed in accordance with the laws of the State of Oregon without regard to principles of conflicts of law. Any claim, action, or suit between County and Customer that arises out of or relates to the performance of this Agreement shall be brought and conducted solely and exclusively within the Circuit Court for Clackamas County, for the State of Oregon. Provided, however, that if any such claim, action, or suit must be brought in a federal forum, it shall be brought



and conducted solely and exclusively within the United States District Court for the District of Oregon.

**27. Whole Contract**

THIS CONTRACT CONSTITUTES THE COMPLETE AND EXCLUSIVE STATEMENT OF THE CONTRACT BETWEEN THE PARTIES RELEVANT TO THE PURPOSE DESCRIBED HEREIN AND SUPERSEDES ALL PRIOR AGREEMENTS OF PROPOSALS, ORAL OR WRITTEN, AND ALL OTHER COMMUNICATION BETWEEN THE PARTIES RELATING TO THE SUBJECT MATTER OF THIS CONTRACT. NO WAIVER, CONSENT, MODIFICATION, OR CHANGE OF TERMS OF THIS CONTRACT WILL BE BINDING ON EITHER PARTY EXCEPT AS A WRITTEN ADDENDUM SIGNED BY AUTHORIZED AGENTS OF BOTH PARTIES.

**IN WITNESS WHEREOF**, the parties hereto have executed this Agreement the date and year first above written.

**Clackamas County**

By (signature): \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**Customer**

Multnomah Educational Service District  
(Customer Name)

By (signature): *Sam Breyer*

Name (print): Sam Breyer

Title: Superintendent

Date: 3/19/2019

**APPENDIX A**

**SERVICE AND RATE SCHEDULE**

**1. Specified Services and Rates**

The following are the sites, services, and rates agreed to by County and Customer at which Customer shall be provided services on the fiber optic network during the term of the Agreement. It is understood by both parties that service to these sites shall be provided for the rates below, subject to any rate increases otherwise applicable in accordance with terms herein. It is further understood that, during the term of the Agreement, Customer may add services to existing or new locations, or change services and/or locations, but that such changes are subject to the rates for such additional services.

**2. Construction, Installation and Activation**

For construction, installation and activation work and provision of fiber optic network components, the County shall charge Customer nonrecurring charge(s) as specified in Section 5 of Appendix A.

**3. Service Changes and Conversions**

Both parties agree that Customer may add or change services during the term of the Agreement, but that such changes are subject to applicable rates, and upgrade and downgrade charges.

**4. Annual Recurring Charges**

	<b>From</b> (Site Name & Address)	<b>To</b> (Site Name & Address)	<b>Service</b>	<b>Monthly Rate (\$)</b>
1	Sam Barlow High School 5105 SE 302 <sup>nd</sup> Ave Gresham, OR 97080	East Orient Elementary School 7431 SE 302 <sup>nd</sup> Ave Gresham, OR 97080	One Pair (two) dark fibers	\$255.00
2	East Orient Elementary School 7431 SE 302 <sup>nd</sup> Ave Gresham, OR 97080	Damascus K-8 14151 SE 242 <sup>nd</sup> Ave Damascus, OR 97089	One Pair (two) dark fibers	\$255.00
3	Damascus K-8 14151 SE 242 <sup>nd</sup> Ave Damascus, OR 97089	Deep Creek School 15600 SE 232 <sup>nd</sup> Dr Damascus, OR 97089	One Pair (two) dark fibers	\$255.00
4	Deep Creek School 15600 SE 232 <sup>nd</sup> Dr Damascus, OR 97089	Clackamas Education Service District 13455 SE 97 <sup>th</sup> Ave. Clackamas, Oregon 97015	One Pair (two) dark fibers	\$255.00
5	Riverdale Grade School 11733 SW Breyman Ave Portland, OR 97219	Bridgeport Elementary 5505 SW Borland Rd Tualatin, OR 97062	One Pair (two) dark fibers	\$255.00
6	Riverdale Grade School 11733 SW Breyman Ave Portland, OR 97219	Clackamas Education Service District 13455 SE 97 <sup>th</sup> Ave. Clackamas, Oregon 97015	One Pair (two) dark fibers	\$255.00

**5. Nonrecurring Charges**

	<b>From</b> (Site Name & Address)	<b>To</b> (Site Name & Address)	<b>Service</b>	<b>Amount (\$)</b>
1	Sam Barlow High School 5105 SE 302 <sup>nd</sup> Ave Gresham, OR 97080	East Orient Elementary School 7431 SE 302 <sup>nd</sup> Ave Gresham, OR 97080	Construction	\$76,900.00
2	East Orient Elementary School 7431 SE 302 <sup>nd</sup> Ave Gresham, OR 97080	Damascus K-8 14151 SE 242 <sup>nd</sup> Ave Damascus, OR 97089	Construction	\$138,200.00
3	Damascus K-8 14151 SE 242 <sup>nd</sup> Ave Damascus, OR 97089	Deep Creek School 15600 SE 232 <sup>nd</sup> Dr Damascus, OR 97089	Construction	\$59,795.00
4	Deep Creek School 15600 SE 232 <sup>nd</sup> Dr Damascus, OR 97089	Clackamas Education Service District 13455 SE 97th Ave. Clackamas, Oregon 97015	Construction	\$40,356.00
5	Riverdale Grade School 11733 SW Breyman Ave Portland, OR 97219	Bridgeport Elementary 5505 SW Borland Rd Tualatin, OR 97062	Construction	\$85,800.00

**6. Late Payment Interest**

Customer will be charged interest for any payment made after its due date (thirty (30) days after receipt of invoice). Interest is charged at a rate of one and a half percent (1.5%) per month, or eighteen percent (18%) annually, on any installment not paid when due.

**7. Annual Consumer Price Index (CPI) Adjustments**

All fees and minimum charges are subject to Consumer Price Index (CPI) adjustments, to be applied annually. The amount of the fees and charges specified herein may increase annually by a percentage up to the change in the West Region (West City Size B/C 2.5 Million or less) Consumer Price Index of the US Dept. of Labor, Bureau of Labor Statistics (<https://www.bls.gov/regions/west/data/xg-tables/ro9xg01.htm>), based upon the rate of change as stated from the last month reported to the same month of the preceding year. In the event such Consumer Price Index (or a successor or substitute index) is not available, a reliable governmental or other nonpartisan publication evaluating the information theretofore used in determining the Consumer Price Index shall be used in lieu of such Consumer Price Index.

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## **APPENDIX B**

### **MAINTENANCE AND OPERATIONS SPECIFICATIONS AND PROCEDURES**

#### **1. Defined Terms**

- a. "Routine Maintenance" is all preventive maintenance activities and repairs.
- b. "Non-Routine Maintenance" is all efforts and activities in response to an emergency circumstance which requires restoration of service.

#### **2. General**

- a. County shall operate and maintain a Network Control and Management Center (NCAM) staffed twenty-four (24) hours a day, seven (7) days a week, by trained and qualified personnel. County shall maintain (503) 742-4219 telephone number to contact personnel and NCAM. County's NCAM personnel shall dispatch maintenance and repair personnel along the fiber optic network to repair problems detected through the NCAM's remote surveillance equipment, by the Customer, or otherwise.
- b. In the event Customer identifies a circumstance which requires restoration of service, Customer shall provide NCAM personnel the name and address of the facility with the problem, the identification number of the Fiber circuits in question, and the name and telephone numbers of Customer's personnel to contact for site access and status updates. NCAM personnel shall immediately contact a County technician and provide the Customer contact information. County technician shall contact Customer within one (1) hour of initial call.
- c. If the County's technician cannot repair the service interruption by telephone, County shall use commercially reasonable efforts to have its first maintenance employee or contractor at the site requiring repair within five (5) hours of the initial call to the NCAM. County will then work continuously until service has been restored.
- d. County shall use commercially reasonable efforts to notify Customer seven (7) days prior to the date of any planned non-emergency maintenance activity. In the event that a County planned activity is canceled or delayed for any reason as previously notified, County shall notify Customer as soon as reasonably possible and will comply with the provisions of the previous sentence to reschedule any delayed activity.

#### **3. Fiber Optic Network**

- a. County shall maintain the fiber optic network in good and operable condition and shall repair the fiber in a manner consistent with industry standards and using commercially reasonable efforts.
- b. County shall perform appropriate routine maintenance on the fiber optic network in accordance with County's then current preventive maintenance procedures. County's maintenance procedures shall not substantially deviate from industry practice.

**4. Restoration**

- a. When restoring damaged fiber, the Parties agree to work together to restore all traffic as quickly as possible. County, immediately upon arriving on the site of the damage, shall determine the best course of action to be taken to restore the fiber and shall begin restoration efforts.
- b. It will be the responsibility of County and Customer to report to one another respectively any known environmental hazards which would restrict or jeopardize any maintenance work activities in shelters or right of way areas of operation.
- c. Upon notification of interruption of fiber optic network service, disrepair, impairment or other need for repair or restoration of the fiber and the location of the damaged fiber, County shall pursue commercially reasonable efforts to mobilize technicians to achieve necessary repair or restoration, including, but without limitation, having maintenance personnel at the affected site within five (5) hours after receipt of such notice with the required restoration material and equipment.
- d. In the event that Customer's use of the fiber optic network is interrupted due to an occurrence of a force majeure event, repairs and restoration shall be made as expeditiously as reasonably possible. Customer recognizes that five (5) hour response time represents optimal conditions, and may be impossible to achieve when emergency restoration of fiber optic network integrity is required or when responding to certain remote locations. Actual response times will be influenced by such factors as terrain, weather conditions present at the time the request is made and actual mileage to the fault site.
- e. For purposes of this section, "commercially reasonable efforts" means activities and performances consistent with prudent utility practice, existing contract provisions for County technicians and/or employees, practices required for preserving the integrity of the fiber optic network, and response times that do not jeopardize the health and safety of the employees, contractors and agents of County and Customer.

5. Customer shall be responsible for paying County standard maintenance fees for

any calls to County for maintenance issues related to the Fiber that County later confirms as resulting from another source other than functionality of the Fibers.

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## APPENDIX C

### FIBER SPLICING AND TESTING STANDARDS AND PROCEDURES

#### 1. Fiber and Connector Standards

##### a. **Connector Standards**

The loss value of any pigtail connector and any associated fiber jumper or pigtail with matching mode field diameters will not exceed .5dB at 1550 nm. The loss value of a connector and its associated jumper with mismatched mode field diameters should not exceed .8 dB.

##### b. **Field Splice Standards**

The objective for each splice is an averaged loss value of 0.1 dB or less when measured bi-directionally with an OTDR at 1550 nm. In the event of damage and subsequent restoration of the Fibers, commercially reasonable efforts will be made to restore the Fibers to this standard. If after 3 restoration splicing attempts, County is not able to produce a loss value of 0.1 dB or less bi-directionally at 1550 nm, then 0.5 dB or less bi-directionally at 1550 nm will be acceptable. Fibers not meeting the 0.1 dB or less specification will be identified as Out Of Specification (OOS). Documentation of the three attempts (re-burns) to bring the OOS fiber within specification will be provided.

##### c. **Span Loss**

It is County's responsibility to insure proper continuity of all fibers at the fiber level, not just the pigtail level. Any "frogs" or fibers that cross in the route will be remedied by County. The following span loss calculation will be used:

$$(A * L) + (0.1 * N) + C = \text{Acceptable Span Loss}$$

A = Attenuation per KM at 1550 nm

L = Optical length of cable measured in kilometers (from OTDR Trace)

N = Number of splices in a span

C = Connector loss. The connector loss will not exceed .5dB. The section test will have (2) pigtail connectors/splices under test, so 1.0dB will be allowed for this loss.

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