

OFFICE OF STATEWIDE BROADBAND

Contracting and Funds Request Procedures Guide

Updated: August 14, 2023

GENERAL

This guide implements and explains the provisions of the Grant Agreement containing the requirements and procedures to be followed by an Awardee performing work to be financed with DHCD grant funds. The Awardee shall maintain accounting and plant records sufficient to document the cost and location of all construction and to support expenses and disbursements. The Grant Agreement also contains provisions regarding disbursement of broadband funds. This document also implements certain provisions by setting forth requirements and procedures to be followed by the Awardees in obtaining funds.

ABBREVIATIONS

For purpose of this guide:

DHCD stands for the Maryland Department of Housing and Community Development.

OSB stands for the Office of Statewide Broadband.

Program stands for the Network Infrastructure Grant Program.

DEFINITIONS

For purposes of this guide:

Application means the Broadband Infrastructure Grant Program application submitted by the Awardee and approved by DHCD.

Award means any broadband award made by DHCD.

Award documents mean the grant agreement, exhibits, and application guide and application covering an award made on behalf of OSB by DHCD.

Award funds means funds provided on behalf of OSB by DHCD through an award.

Awardee means any organization that has received funding on behalf of OSB from DHCD.

Broadband Service means the minimum transmission rate as defined in the program application guide under which the award was made.

Closeout documents mean the documents required to certify satisfactory completion of all obligations under the Grant Agreement.

Contract means the agreement between the Awardee and an independent contractor covering the purchase and/or installation of equipment or the construction of facilities to deliver broadband services for an Awardee's system.

Contract work means any work performed pursuant to a contract.

Deposit account means an account into which all DHCD reimbursement funds are deposited.

DHCD means the Department of Housing and Community Development; an agency of the State of Maryland.

Engineer means a person registered as an engineer in Maryland, or a person on the Awardee's staff authorized by OSB to perform engineering services.

OSB means the Governor's Office of Rural Broadband, a part of the Governor's Office housed at DHCD.

In-house engineering means any engineering services performed by the Awardee's staff.

In-house work means any work performed by the Awardee's employees, pursuant to its work order procedure, with the Awardee furnishing all materials, equipment, tools, and transportation.

Interim work means any work that commences after an application has been submitted to DHCD and OSB but prior to release of award funds.

Outside plant means the part of the network that is physically located outside of the network operations buildings. This includes cable, conduits, poles and other supporting structures and certain other associated equipment items.

Plans and specifications means a copy of the appropriate contract, the specifications, and such additional information and documents needed to provide a clear, accurate, and complete understanding of the work to be performed. If utilizing in-house work, it means the plans and specifications utilized by the in-house crews to complete the work.

Reimbursement means transferring funds from DHCD to the Awardee's deposit account.

Subcontract means a secondary contract undertaking some of the obligations of a primary contract.

System design means the system described in the approved Application.

Work means any purchase of equipment, software and/or installation, if applicable; construction of facilities; or professional services.

CONTRACTING PROCEDURES

I. GENERAL

All work must conform to the Application, as approved by OSB and/or DHCD. No construction and/or installation activities shall commence until all necessary local, state and federal requirements have been satisfied.

All work performed prior to the submission of an application to OSB will not be eligible for funding. In addition, only new materials and equipment may be financed with award funds, unless otherwise approved in writing by OSB.

A. Interim Work

Once OSB has received an application, the applicant may proceed with interim work. However, this should not be construed as a commitment that OSB will approve the application. To ensure that interim work is eligible for reimbursement with award funds, the Awardee must comply with all the procedures in this Guide, including the following requirements:

1. Titles VI and VII of the Civil Rights Act of 1964, as amended;
2. Title 20 of the State Government Article, Annotated Code of Maryland, as amended;
3. The Department's Minority Business Enterprise Program, as amended;
4. The Governor's Executive Order 01.01.1989.18 relating to Drug and Alcohol Free Workplaces, and any Department or State regulations adopted or to be adopted to carry out the requirements of that Order; and
5. The Americans with Disabilities Act of 1990, as amended.

B. Contracts

The Awardee must use a contract to perform all work other than in-house work. A copy of all approved contracts shall be provided to OSB within 10 days of its final execution. Work performed under contract will not be reimbursed if, in DHCD's or OSB's judgment:

1. The contract is for work not covered in the approved Application, or is not for an Eligible Purpose;
2. The contract terms and conditions, are vague, inadequate, or unreasonable; or
3. The contract presents an unacceptable security risk to DHCD or OSB.

C. Contract Amendments

The Awardee shall obtain OSB approval before execution of any amendment to an approved contract if:

1. The amendment alters the terms and conditions of the contract or changes the scope of the project covered by the contract regardless of the amount of the contract before amendment; or
2. The amendment by itself (or together with preceding amendments) increases the original contract price by 20% or more.

Once OSB's approval to amend the contract has been granted, or for any other contract amendments not requiring approval, the Awardee must submit an original executed amendment to OSB.

D. Insurance

Insurance coverage shall be provided by a company that is registered with the Maryland Insurance Agency and authorized to transact business in the State.

1. The contractor shall provide contractor's insurance coverage for comprehensive public liability, property damage liability/builder's risk, and workers' compensation in the form and amounts required by the Awardee.

E. Affiliated Transactions

With regard to the Project, the Awardee shall not enter into any transaction, contract, or dealing with an Affiliate of the Awardee or with the Awardee's or Affiliate's directors, trustees, officers, managers, members (if the Awardee is a limited liability company), or other corporate officials, without the prior written consent of OSB. OSB's consent to reimburse costs for affiliated transactions will be limited to an amount which is the lower of cost or market rate and which is subject to verification by OSB and its representatives having access to the books and records of the Affiliate.

"Affiliate" or "Affiliated Company" of any specified person or entity means any other person or entity directly or indirectly controlling of, controlled by, under direct or indirect common control with, or related to, such specified person or entity, or which exists for the sole purpose of providing any service to one company or exclusively to companies which otherwise meet the definition of affiliate. This definition includes Variable Interest Entities as described in Financial Accounting Standards Board Interpretation (FIN) No. 46(R), *Consolidation of Variable Interest Entities*. For the purpose of this definition, "control" means the possession directly or indirectly, of the power to direct or cause the direction of the management and policies of a company, whether such power is exercised through one or more intermediary companies, or alone, or in conjunction with, or pursuant to an agreement with, one or more other companies, and whether such power is established through a majority or minority ownership voting of securities, common directors, officers, or stockholders, voting trust, holding trusts (other than money exchanged) for property or services.

F. Records

Records must be sufficient to document the cost and location of all expenditures and to support expenses and disbursement of award funds. The support records must include, but not be limited to, contracts, third party invoices, timesheets, payroll records, material records, and overhead allocation records and summary schedules.

The Records shall be in a form acceptable to the Department. Awardee shall retain the Records for five (5) years following the date the Department approves the Project's Final Report.

II. PROFESSIONAL SERVICES

General

Awardee shall only obtain professional services from persons or firms not affiliated with, or that do not represent a contractor, vendor or manufacturer presently providing labor, materials, or equipment to the Awardee. This does not include in-house services.

A. Engineering Services

All engineering services required by an Awardee, including inspection and certification, shall be rendered by an engineer selected by the Awardee and licensed in the State of Maryland, or by qualified employees on the Awardee's staff, who after submission of qualifications to OSB, have been approved to perform such services.

1. Outside Consultant. Engineering services performed by an outside consultant must be performed under contract. A copy of all approved contracts shall be provided to OSB within 10 days of its final execution. Work performed under contract will not be reimbursed if, in DHCD's or OSB's judgment:
 - a) The contract is for work not covered in the approved Application, or is not for an Eligible Purpose;
 - b) The contract terms and conditions, are vague, inadequate, or unreasonable; or
 - c) The contract presents unacceptable security risk to DHCD or OSB.
2. In-House Engineering. When the proposed work is such that the engineering involved is within the capabilities of the employees on the Awardee's staff, Awardees may request OSB approval to provide such services. The request shall include:
 - a) A description of services to be performed;
 - b) The names and qualifications of each employee that will be performing the specific services. In addition, the Awardee shall identify an employee who will be in charge of the services. Such employee must meet the State experience requirements for a registered engineer in the Maryland. In the absence of specific State experience requirements, this employee should have at least eight years' experience in the design and construction of telecommunication facilities, with at least two years of the work experience being at a supervisory level. OSB does not require professional registration of this employee, but this does not

relieve the Awardee from compliance with applicable state registration requirements, which may require a licensed individual to perform such services;

- c) A letter signed by an authorized representative of the Awardee requesting in-house engineering approval and certifying the supporting information; and
- d) The reimbursement rate for the in-house engineer must be approved prior to work being performed. Information documenting the salary and other direct labor costs must be submitted to OSB for approval. Future changes to the rate during the project must be resubmitted and approved prior to the change being implemented.

OSB shall notify the Awardee by letter of approval or disapproval to perform in-house engineering. The letter shall set forth any conditions associated with an approval or the reasons for disapproval. OSB approval of in-house engineering services shall be only for the specific services covered by the approval.

B. Contract and Closeout Documents

Once all services and obligations required under the professional services contract have been completed, Awardees shall submit a *Final Statement of Professional Service Fees* to close out the contract. The statement shall provide a summary of work completed by category as defined in the original contract with a total cost of each category.

III. PURCHASE AND INSTALLATION OF EQUIPMENT

General

- A. Equipment can be purchased with a contract or via purchase order. If purchased by contract, a copy of the approved contract shall be provided to OSB within 10 days of its final execution. Equipment procured under contract will not be reimbursed if, in DHCD's or OSB's judgment:
 - 1. The contract is for equipment not covered in the approved Application, or is not for an Eligible Purpose;
 - 2. The contract terms and conditions, are vague, inadequate, or unreasonable; or
 - 3. The contract presents unacceptable security risk to DHCD or OSB.
- B. Unless previously requested by the Awardee in writing and approved by OSB in writing, equipment will be reimbursed after installation upon submission of the invoices and following any required field verification performed as part of the Request for Funds procedure.

IV. CONSTRUCTION OF FACILITIES

General

Construction for outside plant facilities may be performed using in-house forces or by an outside contractor.

A. Outside Contractor

Contract work must be performed under contract by a contractor selected by the Awardee and meeting all licensing requirements in the State of Maryland.

The engineer shall prepare a bid package comprised of construction plans and specifications with the respective contract for distribution to prospective contractors. OSB recommends that Awardees obtain quotes from several contractors before entering into a contract to ensure obtaining the lowest cost. The Awardee shall ensure that the contractor selected meets all federal, state, and local licensing requirements, as well as any bonding requirements, and that the contractor maintains the insurance coverage required by the contract for the duration of the work.

Once construction has been completed per the construction specifications and all contractually required acceptance tests have been made, the Awardee shall proceed with the closeout of the contract and submit a final contract closeout certification.

All projects require testing of the installed plant. Payment will not be made for outside plant fiber placement until testing in accordance with Appendix B is submitted and approved by OSB.

1. Reimbursement. To request funds for construction completed under contract, the Awardee shall submit a reimbursement request using the Infrastructure Grant Funds Request. A request for payment shall identify in detail all expenses incurred for which reimbursement is being sought, and shall have attached copies of the supporting invoices and other documentation of such expenses.

B. Work Order Procedures for In-House Construction

Work order construction shall be performed to all local, state, and federal requirements. As work order construction is performed, the Awardee shall keep daily timesheets and material reports, referenced by the work project number, to record labor and materials used. Cost accounting system must be in place to show the source and summary records to support requested and expended funds.

Payment will not be made for outside plant fiber placement until end-to-end attenuation, end-to-end signature and splice testing at 1310 and 1550 nm is completed in accordance with ANSI/TIA-568-C.0. Test results shall be submitted with the request for payment. A minimum of one fiber from each buffer tube must be tested with a minimum of 12 tests per cable. For ribbon cable, a minimum 12 tests per cable or 20% of the fiber strand, whichever is greater, will be tested. Testing results are to be submitted with the requested reimbursement.

1. Reimbursement. To request funds for construction completed under the work order construction procedures, the Awardee shall submit a reimbursement request using the Infrastructure Grant Funds Request. Each work order requesting funding will be submitted with a description of each project as an attachment to the Infrastructure Grant Funds Request form (see appendix A). Unless otherwise approved by OSB, the Awardee shall finance all work order contract construction with non-grant funds and obtain reimbursement with grant funds when construction and testing is completed and properly executed closeout documents have been submitted to OSB; and
2. The reimbursement rate for the in-house labor must be approved prior to work being performed. Information documenting the salary and other direct labor costs must be submitted to OSB for approval. Future changes to the rate during the project must be resubmitted and approved prior to the change being implemented.

V. DISBURSEMENT OF FUNDS

General

The award document contains the provisions regarding disbursement of funds to the Awardee. This section implements certain provisions by setting forth requirements and procedures to be followed by the Awardee in obtaining a disbursement of funds.

OSB is under no obligation to approve disbursement of funds unless the Awardee complies with all terms and conditions of the grant agreement.

A. Broadband Budget

The Awardee provided a broadband budget with their approved Application. This budget divides the award into budget categories that are associated with the proposed projects, such as equipment, outside plant, land and buildings, professional services, etc. Funds from one budget category may not be used for a different budget category without prior written approval from OSB.

B. Budget Adjustments

If more funds are required than are available in a budget category, the Awardee may request OSB's approval of a budget adjustment to use funds from another budget category. The request shall include an explanation as to why the adjustment is needed and the affected budget categories. OSB will not approve a budget adjustment unless the Awardee can demonstrate that all purposes can still be completed with the requested adjustment.

C. Broadband Infrastructure Grant Funds Request

To request funds for work completed, the Awardee must submit the Broadband Infrastructure Grant Funds request form, a description of the funding desired, and other related information to the transactions as required by OSB. Funds may be requested for paid or unpaid invoices for work completed.

The Awardee shall request reimbursement as needed to meet its obligations promptly. Funds must be used for the item for which they were provided except that funds may be used to reimburse the Awardee if they have previously paid the invoice for which funds are requested.

The certification on the Request sent to OSB shall be signed by a corporate officer or manager authorized to sign such statements. If the signer is not a corporate officer, a letter signed by a corporate officer authorizing the signatory must be provided with or prior to submitting the Request.

Funds are approved for disbursement as follows:

Contracts

1. Unless the contract includes a provision for retainage, 100% of the invoice's amount will be funded. If there is a retainage provision within the contract, the funding will be reduced to the amount due. The amounts held due to the retainage will be funded upon presentation of the contract closeout documents with a proper invoice from the contractor requesting the retainage.

Work Orders

1. 100% of the amount requested and supported by proper documentation of the expense will be paid.

D. Method of Disbursing Funds

The first or subsequent disbursement may be conditioned on the satisfaction of certain requirements stated in the Awardee's agreement with DHCD.

All disbursements shall be made electronically using the Automatic Clearing House (ACH). Normally, for disbursement of funds ACH only makes one payment per request.

The following information shall be included with each request:

1. Name and address of Awardee's bank. If the Awardee's bank is not a member of the Federal Reserve System, the name and address of its correspondent bank that is a member of the Federal Reserve System;
2. ACH routing information;
3. Awardee's bank account title and number; and
4. Any other necessary identifying information.

Appendix A

Requesting reimbursement for in-house construction

Reference the attached exhibit showing an example of completed construction and the Sample Funds Request Form.

Required:

1. Phase or segment must be complete and operational.
 - Customers may or may not be connected, but the infrastructure has to be ready for operations.
 - Customer connection costs may be recovered with the segment reimbursement or later as a separate request. Customer connection must be complete and operational for reimbursement.
2. Only the costs and materials directly related to the completed work can be included in the request.
3. Attenuation testing results are required for each completed segment or phase.

Allowable Costs:

1. Labor man hours associated with the completed portion of construction – such as:
 - Job site superintendent
 - Equipment operator
 - Aerial linemen
 - Laborers
 - Flaggers
 - Expenses incurred including customary travel expenses.
2. Materials used for the completed portion of construction – such as:
 - Fiber optic cable
 - Strand
 - Lashing wire
 - Conduit
 - Vaults
 - Cabinets and electronics
 - CPE
 - Other miscellaneous materials necessary to complete the work
3. Equipment costs associated with the completed portion of construction
 - Equipment can be charged as actually job operating costs or an amortized hourly cost
 - Operating costs can include items such as:
 - Fuel
 - Oil
 - Consumables directly related to the work (a boring bit would be a consumable, tires would not)

- Daily maintenance and minor repairs necessary to keep the equipment in operation (replacement of a belt would be minor, a new starter motor would not)
- Hourly costs should be developed using sound accounting principles and include all costs associated with the equipment amortized over the life of the equipment. The equipment cost per hour takes into account all ownership and operating costs for the equipment and divides it by all actual usage, in hours, of the machine.

Required Documentation:

Costs associated with each item being reimbursed must be documented.

1. Labor costs – only direct labor costs associated with the completed work are allowable. These costs are generally considered actual hourly rate plus employer paid taxes and benefits.
 - Payroll records for employee time included in the work must be provided.
 - The employees classification or title and hours worked on the completed portion of construction must be summarized and tie back to the employees timesheet where the phase or segment of construction is identified.
 - Timesheets do not have to be submitted, but must be available for review upon request.
 - Employee travel expenses are allowable costs, but must be documented.
 - Lodging, mileage and meals reimbursed for employees are reimbursable costs.
 - Expense reports filed by employees must be available for review upon request.
 - Lodging cost receipts must be submitted with the reimbursement request.
2. Material costs – only material costs directly related to the completed work are allowable.
 - Invoices showing actual material costs for the materials installed must be included. Invoices may show additional materials, but only those items used in the completed construction will be reimbursed.
 - For instance, if an invoice shows 10 vaults, but only 3 vaults are included in the completed work, the invoice may be submitted as proof of cost. The invoice may also be included in future requests until all 10 units are installed and reimbursed.
 - If materials stored on-site have been approved and previously paid, the cost of those materials will be included in the request with a corresponding deduction of the previously paid materials shown. This is to allow the capture of the total cost of the work while accounting for any previous payments.
3. Equipment Costs – either hourly or actual operating costs of equipment used for the completed work is allowable. Requests must be consistent throughout the project.
 - If operating costs are being reimbursed, invoices and receipts for the costs must be submitted.
 - If an hourly cost for equipment is being reimbursed, a listing of the equipment including make and model and its hourly cost must be summarized. Only the hours the equipment is in use may be claimed.

Assembling the request:

Reference the attached exhibit showing a segment of completed construction and the sample funds request form.

1. Each grant funds request must include a cover narrative that describes the completed construction.

Example:

Bird Hill Rd Segment – Design and construction of 5209 LF of underground 24 count fiber infrastructure. Installed 3 vaults and one fiber optic equipment cabinet and related splicing equipment. Project passed 28 homes with 15 subscriber installations. Subscriber installation costs and CPE will be included on a later request.

2. Provide a summary of the hours and labor categories included in the request. The hourly rates should be the total hourly cost and should tie to the payroll information provided as documentation.

Example:

Allie Murphy, Design Engineer * – 30hrs @ \$85.00/hr
Ben Apple, In-house Engineer * - 4 hrs @ \$105.00/hr
John Smith, Jobsite Superintendent – 12 hrs @ \$65.60/hr
Bill Smith, Boring machine operator – 16 hrs @ \$51.50/hr
Joe Sterling, Laborer – 20 hrs @ \$43.65/hr
Tammy Smith, Flagger – 4 hrs @ \$26.45/hr
Hotels, 4 nights (invoices req'd) - \$1,600

Meals (no invoices req'd, but must be available upon request) - \$725

* Engineering costs are only allowable if they were included in the application budget

- Attach the payroll and expense records as documentation.
 - Add a listing on the grant funds request spreadsheet for engineering (if allowable) and labor.
3. Provide a summary of the equipment used in the completed construction.
 - If requesting only operating costs of the equipment, a summary of those costs should be provided and tie to the included invoices and receipts.
 - If requesting hourly operating costs, a summary of equipment used and its hourly cost should be included.

Example:

Vermeer D23x30DR S3 Horizontal Directional Drill – 16 hrs @ \$137.80/hr

Ford F250 4x4 pickup truck – 12 hrs @ \$19.87/hr

- Attach the receipts referenced as documentation.
 - Add a listing on the grant funds request spreadsheet for equipment.
4. Provide a summary of the materials used in the completed construction. The unit costs should tie to the included invoices.

Example:

5209 LF of 24 count fiber optic cable - \$1.09/lf	invoice xyz #123
5100 LF of 1.5” conduit - \$0.57/lf	invoice rtf #598
3 ea 24x36 vaults - \$350/ea	invoice abc #234
1 ea pole mounted cabinet - \$310/ea	invoice bca #453
1 ea fiber optic splitter - \$680/ea	invoice nmo #674

- Attach the invoices referenced as documentation
 - Add a listing on the grant funds request spreadsheet for materials by invoice.
5. Include any costs not captured by these categories and their documented cost. These additional costs should be summarized and documented the same as the above described expenses and may include, but are not limited to, make ready work, permits and the like.
- Add a listing on the grant funds request spreadsheet for the item(s).

Other Required Information:

1. As-built mapping or another form of exhibit showing the location of the completed work must be provided.
2. Bi-Directional attenuation test results of the completed phase or segment.
 - Testing of each fiber strand is required when 12 or fewer are installed. For fiber optic cables with more than 12 fiber strands, all 12 fiber strands from the first buffer tube must be tested as well as one random fiber from each additional buffer tube.
 - If multiple fiber optic lines are included in the request and associated test results, the test results must be tied to the provided location mapping via key or identifying label.

Bird Hill Rd

PROJECT PHASE: BIRD HILL RD

ENGINEERING

32 MAN HOURS

LABOR COSTS

52 LABOR MAN HOURS

EXPENSES:

HOTELS

MEALS

MATERIAL QUANTITIES

5209 LF 24 CT FIBER

5100 LF 1.5" CONDUIT

3 VAULTS

15 CPE

1 CABINET

1 SPLITTER CARD

EQUIPMENT COSTS

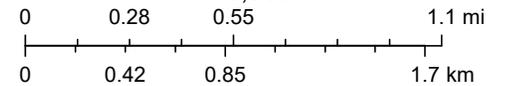
BORING MACHINE HOURS

UTILITY TRUCK HOURS



4/15/2022

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Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Department of Housing and Community Development Office of Statewide Broadband					Project Designation	Request No.	Date Prepared	
					DHCD USE ONLY			Awardee Name and Address:
Date Received	Date Reviewed	Date Returned	Date Approved	Match Required (%): 40%				
Work Phase Vendor Name & Invoice ID <i>(attach all invoices)</i>	Cost of Construction						Total	Match
	Labor	Material	Other	Less Materials Previously Paid (-)				
Bird Hill Segment					\$ -	\$ -	\$ -	
In-house Engineering	\$ 3,140.00				\$ 3,140.00	\$ 1,256.00	\$ 1,884.00	
In-house Labor	\$ 4,915.00				\$ 4,915.00	\$ 1,966.00	\$ 2,949.00	
In-house Equipment			\$ 2,443.24		\$ 2,443.24	\$ 977.30	\$ 1,465.94	
XYZ 123 (previously paid)		\$ 5,677.81		\$ (5,677.81)	\$ -	\$ -	\$ -	
RTF 598		\$ 2,907.00			\$ 2,907.00	\$ 1,162.80	\$ 1,744.20	
ABC 234		\$ 1,050.00			\$ 1,050.00	\$ 420.00	\$ 630.00	
BCA 453		\$ 310.00			\$ 310.00	\$ 124.00	\$ 186.00	
NMO 674		\$ 680.00			\$ 680.00	\$ 272.00	\$ 408.00	
BG&E Make Ready #4510			\$ 3,750.00		\$ 3,750.00	\$ 1,500.00	\$ 2,250.00	
MD MDOT Permitting Rd X-ing			\$ 275.00		\$ 275.00	\$ 110.00	\$ 165.00	
					\$ -	\$ -	\$ -	
					\$ -	\$ -	\$ -	
					\$ -	\$ -	\$ -	
					\$ -	\$ -	\$ -	
					\$ -	\$ -	\$ -	
Total	\$ 8,055.00	\$ 10,624.81	\$ 6,468.24	\$ (5,677.81)	\$ 19,470.24	\$ 7,788.10	\$ 11,682.14	
					Previous Approved Requests	\$ 5,677.81	\$ 2,271.12	\$ 3,406.69
					Total Requests To Date	\$ 25,148.05	\$ 10,059.22	\$ 15,088.83

I certify that, (1) the total costs and net requirements for the construction included above are the actual costs and net requirements for funds reflected in the permanent records of this organization, (2) construction has received DHCD-OSB approval, (3) construction of extensions, if any, to serve subscribers in areas not included in the approved grant area has been approved by DHCD-OSB, (4) all the required acceptance tests have been made on the construction and the results were satisfactory, and (5) any corrections required on the portions of construction that were field-reviewed have been made on all the construction included in the summary. I further certify that regulatory body and other approvals required for this construction have been obtained and that there have been no previous requests for approval of the net expense required for the construction covered hereby.

Authorized Signature and Title

Date

Approval of Expenditure
The above construction or purchase has been reviewed and is approved for DHCD funding

Authorized Signature and Title

Date

Appendix B

TESTING OF OUTSIDE PLANT FIBER OPTIC CABLES

DESCRIPTION

Testing of outside plant fiber optic cabling is required to ensure that the installed network paid for with state grant funds will perform adequately. The work covered in this document is for the testing of outside plant fiber optic cabling as a requirement for payment. This includes cable testing and providing testing results in accordance with the manufacturer's written recommendations.

SUBMITTALS

To ensure quality and accuracy of testing, the grantee must submit a list of test equipment being used, its most recent calibration information and the identity and qualifications of the personnel performing the testing and whether the personnel are in-house or contracted.

PRODUCTS

Optical time domain reflectometer (OTDR)

The field testing and reporting shall meet the requirements of the testing specified in ANSI/TIA/EIA-568, inclusive of all subsections. The test results submitted shall include OTDR traces and power loss sum information for each fiber optic core.

EXECUTION

General

The testing of fully completed systems is required. Testing of partial segments is not acceptable. Testing shall not be performed until after all hardware is installed and attached, and all labeling and identification has been completed unless otherwise approved by OSB.

Any cable that does not pass required testing shall be removed, replaced and retested. All tests required by the manufacturer in support of the structured cabling system warranty must be performed. The OSB reserves the right to observe the testing process.

Testing

All test results shall be defined as acceptable/unacceptable by the requirements of ANSI/TIA/EIA-568, inclusive of all subsections.

All unidirectional and bi-directional end-to-end attenuation, end-to-end signature and splice testing shall be at 1310 nm and 1550 nm for single-mode fiber optic cables or 850 nm and 1300 nm for multimode fiber optic cables and completed in accordance with ANSI/TIA-568-C.0.

A minimum of one fiber from each buffer tube must be tested with a minimum of 12 tests per cable. In cases where fewer than 12 fibers are present, each fiber will be tested (e.g. 2 count fiber optic cabling). For ribbon cable, a minimum of 12 tests per cable or 20% of the fiber strand, whichever is greater, will be tested.

Fiber Optic Cables – General Requirements

Strands where the measured attenuation falls outside the acceptable range shall be subject to further inspection and testing to determine the nature of the fault. Faults related to affixing the connector shall be corrected, and the fiber re-tested as described above, until acceptable attenuation measurements are recorded. If acceptable attenuation cannot be achieved, then the failing fiber section shall be replaced or the fiber cable replaced in its entirety.

Optical Time Domain Reflectometer Testing

All OTDR testing procedures and field test instruments shall comply with applicable requirements of: EIA/TIA 455-78 and EIA/TIA 455-133.

OTDR test jumpers must meet the criteria for reference jumpers specified in EIA/TIA-455-171.

A 1,000-foot launch cable shall be installed between the OTDR and the first link connection. A 1,000 foot receive cable shall be installed after the last link connection.

All cables shall be OTDR tested at 1310 nm and 1550 nm for single-mode operating wavelength anomalies and to ensure uniformity of cable attenuation and connector insertion loss.

All cables shall be OTDR tested at 850 nm and 1300 nm for multimode operating wavelength anomalies and to ensure uniformity of cable attenuation and connector insertion loss.

All fiber links shall be tested in both directions.

Optical Return Loss (ORL) for each link shall be measured and documented.

Fiber Length shall be measured and documented.

Test Results Submittal

Testing results are to be submitted with the related reimbursement request unless contracted construction has been approved. If contracted construction with progress payments has been approved, testing must be submitted with the final contract payment request or as standalone segments or phases are completed. Test results shall be submitted as a pdf document of the actual test equipment report

with a cover sheet summarizing the network being tested in accordance with the reporting requirements below.

ACCEPTANCE

All test results and corrective procedures shall be documented and submitted as a searchable pdf document as provided by the manufacturer's software and equipment. The report shall either be provided directly to OSB via email or deposited on a cloud storage service and access given to OSB for review.

As-Built Drawings, or similar as approved by OSB, of the tested segment shall be included with the test report to allow OSB to verify the information provided in the report.

Testing Summary

Each test report shall contain the following general information on a cover sheet with the test results to follow:

1. Contractor's Name or awardee if awardee is conducting the testing
2. Date of Test
3. Names of Test Crew
4. Make, Model and Serial Number of test equipment used
5. Date of Last Calibration
6. Where the testing was conducted (i.e. lat/long, address)
7. Media Type (MM / SM)
8. Cable type (i.e. ribbon cable, loose tube cable)
9. Connection Type(s)
10. Number and description of splices or other devices that would impact loss
11. Calculated Maximum Link Loss
12. Signature of the testing technician or engineer with their contact information (email and phone) in case there are any questions or issues that need to be addressed.

Test Results

Test results shall be recorded as provided by the manufacturer's software and equipment with the report being a pdf produced copy of the data. Submit the following information regarding the fiber testing:

1. Fiber count
2. Length of Run
3. Results for each tested fiber

PAYMENT

Payment for testing will be made via the normal payment methods, either based on an approved construction contract or as a reimbursement for work order construction. Final payment will not be made for outside plant fiber placement until all unidirectional and bi-directional end-to-end attenuation, end-to-end signature, and splice testing is completed in accordance with this document and ANSI/TIA-568-C.0.