

# Dane County Contract Cover Sheet

RES 133  
Significant

<b>Dept./Division</b>	Administration/Information Management
<b>Vendor Name</b>	CableComm LLC
<b>Vendor MUNIS #</b>	1076
<b>Brief Contract Title/Description</b>	East District Campus Redundant Fiber Path Build
<b>Contract Term</b>	8/15/2020-12/31/2020
<b>Total Contract Amount</b>	\$ 429,488.35

<b>Contract #</b> <small>Admin will assign</small>	<b>14091</b>
<b>Addendum</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Type of Contract</b>	
<input checked="" type="checkbox"/>	<b>Dane County Contract</b>
<input type="checkbox"/>	<b>Grant</b>
<input type="checkbox"/>	<b>County Lessee</b>
<input type="checkbox"/>	<b>County Lessor</b>
<input type="checkbox"/>	<b>Intergovernmental</b>
<input type="checkbox"/>	<b>Purchase of Property</b>
<input type="checkbox"/>	<b>Property Sale</b>
<input type="checkbox"/>	<b>Other</b>

<b>Purchasing Authority</b>	<input type="checkbox"/> <b>\$11,000 or under – Best Judgment</b> (1 quote required)		
	<input type="checkbox"/> <b>Between \$11,000 – \$37,000 (\$0 – \$25,000 Public Works)</b> (3 quotes required)		
	<input checked="" type="checkbox"/> <b>Over \$37,000 (\$25,000 Public Works)</b> (Formal RFB/RFP required)	<b>RFB/RFP #</b>	120051
	<input type="checkbox"/> <b>Bid Waiver – \$37,000 or under</b> (\$25,000 or under Public Works)		
	<input type="checkbox"/> <b>Bid Waiver – Over \$37,000</b> (N/A to Public Works)		
	<input type="checkbox"/> <b>N/A – Grants, Leases, Intergovernmental, Property Purchase/Sale, Other</b>		

MUNIS Req.	Org Code	CPINFOMGT	Obj Code	57080	Amount	\$ 92,000
<b>Req #</b>	1943	CPINFOMGT	Obj Code	57440	Amount	\$ 337,488.35
<b>Year</b>	2020	Org Code	Obj Code		Amount	\$

<b>Resolution</b>	<b>A resolution is required if the contract exceeds \$100,000 (\$40,000 Public Works). A copy of the Resolution must be attached to the contract cover sheet.</b>		
	<input type="checkbox"/> Contract does not exceed \$100,000 (\$40,000 Public Works) – a resolution is not required.		
	<input checked="" type="checkbox"/> Contract exceeds \$100,000 (\$40,000 Public Works) – resolution required.	<b>Res #</b>	133
	<input type="checkbox"/> A copy of the Resolution is attached to the contract cover sheet.	<b>Year</b>	2020-21

Contract Review/Approvals				
Initials	Dept.	Date In	Date Out	Comments
MG	Received by DOA	7/29/20		
	Controller			approvals from all departments via email
	Purchasing			attached herein
	Corporation Counsel			
	Risk Management			
	County Executive			

Dane County Dept. Contact Info		Vendor Contact Info	
<b>Name</b>	Sam Olson	<b>Name</b>	Rob Nennig
<b>Phone #</b>	608-283-2970	<b>Phone #</b>	414-349-2636
<b>Email</b>	Olson@countyofdane.com	<b>Email</b>	rnennig@cablecomllc.com
<b>Address</b>	210 Marin Luther King Blvd Jr. Rm 524 Madison WI 53703	<b>Address</b>	6070 N Flint Road Glendale, WI 53209-3714

Certification:	
The attached contract is a:	
<input type="checkbox"/>	Dane County Contract <u>without</u> any modifications.
<input checked="" type="checkbox"/>	Dane County Contract <u>with</u> modifications. <b>The modifications have been reviewed by:</b> Carlos Pabellon & Dan Lowndes
<input type="checkbox"/>	Non-standard contract.

## Contract Cover Sheet Signature

Department Approval of Contract		
<b>Dept. Head / Authorized Designee</b>	Signature	Date
	<i>Sam Olson</i>	
	Printed Name	

## Contracts Exceeding \$100,000

Major Contracts Review – DCO Sect. 25.11(3)

<b>Director of Administration</b>	Signature	Date
	<i>Greg Brockmeyer</i>	7/30/20
	Comments	
<b>Corporation Counsel</b>	Signature	Date
	<i>Carlos Pabellon</i>	7/29/20
	Comments	

## Goldade, Michelle

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**From:** Goldade, Michelle  
**Sent:** Wednesday, July 29, 2020 11:15 AM  
**To:** Hicklin, Charles; Clow, Carolyn; Lowndes, Daniel; Pabellon, Carlos  
**Cc:** Stavn, Stephanie  
**Subject:** Contract #14091  
**Attachments:** 14091.pdf

<b>Tracking:</b>	<b>Recipient</b>	<b>Read</b>	<b>Response</b>
	Hicklin, Charles	Read: 7/29/2020 11:36 AM	Approve: 7/29/2020 11:36 AM
	Clow, Carolyn		Approve: 7/29/2020 8:23 PM
	Lowndes, Daniel		Approve: 7/29/2020 11:18 AM
	Pabellon, Carlos	Read: 7/29/2020 11:28 AM	Approve: 7/29/2020 1:43 PM
	Stavn, Stephanie	Read: 7/29/2020 11:33 AM	

Contract #14091  
Department: Administration/Information Management  
Vendor: CableComm LLC  
Contract Description: East District Campus Redundant Fiber Path Build (Res 133)  
Contract Term: 8/15/20 – 12/31/20  
Contract Amount: \$429,488.35

Please review the contract and indicate using the vote button above if you approve or disapprove of this contract.

Thanks much,  
Michelle

*Michelle Goldade*

Administrative Assistant II  
Dane County Department of Administration  
Room 362, City-County Building  
210 Martin Luther King, Jr. Boulevard  
Madison, WI 53703  
PH: 608/266-4941  
Fax: 608/266-4425  
TDD: Call WI Relay 711

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**2020 RES-133**

**APPROVING EAST DISTRICT CAMPUS  
REDUNDANT FIBER PATH BUILD BID**

In 2017 the county started work on building a redundant fiber path from the City County Building to the East District Campus running along the Beltline south of Lake Monona. Engineering plans and agreements with multiple organizations have been reached and was put to bid on February 17, 2020. It was rebid on April 8, 2020 to ensure best pricing for the County.

The East District Campus has minimal network redundancy that cannot scale to fulfill complete operations in the event the current single fiber path is cut. Multiple county departments operate off of the East District Campus's current network. Information Management requires this additional fiber path to complete a fully redundant computer center which will serve all county departments.

DIM added additional funds in the 2020 budget to fully cover costs out of the fiber capital improvement project budget line. Agreements have been made with other internal county departments, the City of Madison, State DOT, ATT and other entities. Not completing the project in 2020 would likely require renewing some of these agreements which will have a domino effect on other agreements extending out this build likely until late 2022.

THEREFORE BE IT RESOLVED that the East District Campus Redundant Fiber Build contract be awarded to CableComm LLC to begin construction in 2020 for \$429,488.35.

BE IT FINALLY RESOLVED that the County Executive is authorized to sign the contract document.

**DANE COUNTY CONTRACT # 14091**



**# of Pages Including Schedules:** 59

**Expiration Date:** December 31, 2020

**Authority:** Res. # 133, 20-21

**Department:** Administration, Information Management

**Maximum Cost:** \$429,488.35

**Registered Agent:**

**Registered Agent Address:**

**THIS AGREEMENT**, made and entered into, by and between the County of Dane (hereafter referred to as "COUNTY") and CableCom LLC (hereafter, "PROVIDER"),

**WITNESSETH:**

**WHEREAS** COUNTY, whose address is City-County Building, Room 524, 210 Martin Luther King. Jr. Blvd., Madison, WI 53703, desires to purchase services from PROVIDER for the purpose of constructing the East District Campus redundant fiber build; and

**WHEREAS** PROVIDER, whose address is 6070 N. Flint Road, Glendale, WI 53209-3714, is able and willing to provide such services;

**NOW, THEREFORE**, in consideration of the above premises and the mutual covenants of the parties hereinafter set forth, the receipt and sufficiency of which is acknowledged by each party for itself, COUNTY and PROVIDER do agree as follows:

**I. TERM:**

The term of this Agreement shall commence as of the date by which all parties have executed this Agreement and shall end as of the EXPIRATION DATE set forth on page 1 hereof, unless sooner agreed to in writing by the parties. PROVIDER shall complete its obligations under this Agreement not later than the EXPIRATION DATE. Upon failure of PROVIDER to complete its obligation set forth herein by the EXPIRATION DATE, COUNTY may invoke the penalties, if any, set forth in this document and its attachments.

**II. SERVICES:**

A. PROVIDER agrees to provide the services detailed in the bid specifications, if any; the request for proposals (RFP) and PROVIDER's response thereto, if any; and on the attached Schedule A, which is fully incorporated herein by reference. In the event of a conflict between or among the bid specifications, the RFP or responses thereto, or the terms of Schedule A or any of them, it is agreed that the terms of Schedule A, to the extent of any conflict, are controlling.

B. PROVIDER shall commence, carry on and complete its obligations under this Agreement with all deliberate speed and in a sound, economical and efficient manner, in accordance with this Agreement and all applicable laws. In providing services under this Agreement, PROVIDER agrees to cooperate with the various departments, agencies, employees and officers of COUNTY.

- C. PROVIDER agrees to secure at PROVIDER's own expense all personnel necessary to carry out PROVIDER's obligations under this Agreement. Such personnel shall not be deemed to be employees of COUNTY nor shall they or any of them have or be deemed to have any direct contractual relationship with COUNTY.

**III. ASSIGNMENT/TRANSFER:**

PROVIDER shall neither assign nor transfer any interest or obligation in this Agreement, without the prior written consent of COUNTY unless otherwise provided herein, provided that claims for money due or to become due PROVIDER from COUNTY under this Agreement may be assigned to a bank, trust company or other financial institution without such approval if and only if the instrument of assignment contains a provision substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to PROVIDER shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the work called for in this Agreement. PROVIDER shall promptly provide notice of any such assignment or transfer to COUNTY.

**IV. TERMINATION:**

- A. Failure of PROVIDER to fulfill any of its obligations under this Agreement in a timely manner, or violation by PROVIDER of any of the covenants or stipulations of this Agreement, shall constitute grounds for COUNTY to terminate this Agreement by giving a thirty (30) day written notice to PROVIDER.
- B. The following shall constitute grounds for immediate termination:
  - 1. violation by PROVIDER of any State, Federal or local law, or failure by PROVIDER to comply with any applicable States and Federal service standards, as expressed by applicable statutes, rules and regulations.
  - 2. failure by PROVIDER to carry applicable licenses or certifications as required by law.
  - 3. failure of PROVIDER to comply with reporting requirements contained herein.
  - 4. inability of PROVIDER to perform the work provided for herein.
- C. Failure of the Dane County Board of Supervisors or the State or Federal Governments to appropriate sufficient funds to carry out COUNTY's obligations hereunder, shall result in automatic termination of this Agreement as of the date funds are no longer available, without notice.
- D. In the event COUNTY terminates this Agreement as provided herein, all finished and unfinished documents, services, papers, data, products, and the like prepared, produced or made by PROVIDER under this Agreement shall at the option of COUNTY become the property of COUNTY, and PROVIDER shall be entitled to receive just and equitable compensation, subject to any penalty, for any satisfactory work completed on such documents, services, papers, data, products or the like. Notwithstanding the above, PROVIDER shall not be relieved of liability to COUNTY for damages sustained by COUNTY by virtue of any breach of this Agreement by PROVIDER, and COUNTY may withhold any payments to PROVIDER for the purpose of offset.

**V. PAYMENT:**

COUNTY agrees to make such payments for services rendered under this Agreement as and in the manner specified herein and in the attached Schedule, which is fully incorporated herein by reference. Notwithstanding any language to the contrary in this Agreement or its attachments, COUNTY shall never be required to pay more than the sum set forth on page 1 of this Agreement under the heading MAXIMUM COST, for all services rendered by PROVIDER under this Agreement.

**VI. REPORTS:**

PROVIDER agrees to make such reports as are required in the attached Schedule C, which is fully incorporated herein by reference. With respect to such reports it is expressly understood that time is of the essence and that the failure of PROVIDER to comply with the time limits set forth in said Schedule C shall result in the penalties set forth herein.

**VII. DELIVERY OF NOTICE:**

Notices, bills, invoices and reports required by this Agreement shall be deemed delivered as of the date of postmark if deposited in a United States mailbox, first class postage attached, addressed to a party's address as set forth above. It shall be the duty of a party changing its address to notify the other party in writing within a reasonable time.

**VIII. INSURANCE:**

A. PROVIDER shall indemnify, hold harmless and defend COUNTY, its boards, commissions, agencies, officers, employees and representatives against any and all liability, loss (including, but not limited to, property damage, bodily injury and loss of life), damages, costs or expenses which COUNTY, its officers, employees, agencies, boards, commissions and representatives may sustain, incur or be required to pay by reason of PROVIDER's furnishing the services or goods required to be provided under this Agreement, provided, however, that the provisions of this paragraph shall not apply to liabilities, losses, charges, costs, or expenses caused by or resulting from the acts or omissions of COUNTY, its agencies, boards, commissions, officers, employees or representatives. The obligations of PROVIDER under this paragraph shall survive the expiration or termination of this Agreement.

B. In order to protect itself and COUNTY, its officers, boards, commissions, agencies, agents, volunteers, employees and representatives under the indemnity provisions of the subparagraph above, PROVIDER shall, at PROVIDER's own expense, obtain and at all times during the term of this Agreement keep in full force and effect the insurance coverages, limits, and endorsements listed below. When obtaining required insurance under this Agreement and otherwise, PROVIDER agrees to preserve COUNTY's subrogation rights in all such matters that may arise that are covered by PROVIDER's insurance. Neither these requirements nor the COUNTY's review or acceptance of PROVIDER's certificates of insurance is intended to limit or qualify the liabilities or obligations assumed by the PROVIDER under this Agreement. The County expressly reserves the right to require higher or lower insurance limits where County deems necessary.

**Commercial General Liability.**

PROVIDER agrees to maintain Commercial General Liability insurance at a limit of not less than \$1,000,000 per occurrence. Coverage shall include, but not be limited to, Bodily Injury and Property Damage to Third Parties, Contractual Liability, Personal Injury and Advertising Injury Liability, Premises-Operations, Independent PROVIDERs and Subcontractors, and Fire Legal Liability. The policy shall not exclude Explosion, Collapse, and Underground Property Damage Liability Coverage. The policy shall list DANE COUNTY as an Additional Insured.

**Commercial/Business Automobile Liability.**

PROVIDER agrees to maintain Commercial/Business Automobile Liability insurance at a limit of not less than \$1,000,000 Each Occurrence. PROVIDER further agrees coverage shall include liability for Owned, Non-Owned & Hired automobiles. In the event PROVIDER does not own automobiles, PROVIDER agrees to maintain coverage for Hired & Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

**Environmental Impairment (Pollution) Liability**

PROVIDER agrees to maintain Environmental Impairment (Pollution) Liability insurance at a limit of not less than \$1,000,000 per occurrence for bodily injury, property damage, and environmental cleanup costs caused by pollution conditions, both sudden and non-sudden. This requirement can be satisfied by either a separate environmental liability

policy or through a modification to the Commercial General Liability policy. Evidence of either must be provided.

Workers' Compensation.

PROVIDER agrees to maintain Workers Compensation insurance at Wisconsin statutory limits.

Umbrella or Excess Liability.

PROVIDER may satisfy the minimum liability limits required above for Commercial General Liability and Business Auto Liability under an Umbrella or Excess Liability policy. There is no minimum Per Occurrence limit of liability under the Umbrella or Excess Liability; however, the Annual Aggregate limit shall not be less than the highest "Each Occurrence" limit for the Commercial General Liability and Business Auto Liability. PROVIDER agrees to list DANE COUNTY as an "Additional Insured" on its Umbrella or Excess Liability policy.

- C. Upon execution of this Agreement, PROVIDER shall furnish COUNTY with a Certificate of Insurance listing COUNTY as an additional insured and, upon request, certified copies of the required insurance policies. PROVIDER shall furnish evidence of adequate Worker's Compensation Insurance. In case of any sublet of work under this Agreement, PROVIDER shall furnish evidence that each and every subcontractor has in force and effect insurance policies providing coverage identical to that required of PROVIDER. In case of any sublet of work under this Agreement, PROVIDER shall furnish evidence that each and every subcontractor has in force and effect insurance policies providing coverage identical to that required of PROVIDER.
- D. The parties do hereby expressly agree that COUNTY, acting at its sole option and through its Risk Manager, may waive any and all requirements contained in this Agreement, such waiver to be in writing only. Such waiver may include or be limited to a reduction in the amount of coverage required above. The extent of waiver shall be determined solely by COUNTY's Risk Manager taking into account the nature of the work and other factors relevant to COUNTY's exposure, if any, under this Agreement.

**IX. NO WAIVER BY PAYMENT OR ACCEPTANCE:**

In no event shall the making of any payment or acceptance of any service or product required by this Agreement constitute or be construed as a waiver by COUNTY of any breach of the covenants of this Agreement or a waiver of any default of PROVIDER and the making of any such payment or acceptance of any such service or product by COUNTY while any such default or breach shall exist shall in no way impair or prejudice the right of COUNTY with respect to recovery of damages or other remedy as a result of such breach or default.

**X. NON-DISCRIMINATION:**

During the term of this Agreement, PROVIDER agrees not to discriminate on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state defense force or any other reserve component of the military forces of the United States, or political beliefs against any person, whether a recipient of services (actual or potential) or an employee or applicant for employment. Such equal opportunity shall include but not be limited to the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation or level of service(s). PROVIDER agrees to post in conspicuous places, available to all employees, service recipients and applicants for employment and services, notices setting forth the provisions of this paragraph. The listing of prohibited bases for discrimination shall not be construed to amend in any fashion state or federal law setting forth additional bases, and exceptions shall be permitted only to the extent allowable in state or federal law.



**XI. CIVIL RIGHTS COMPLIANCE:**

- A. If PROVIDER has 20 or more employees and receives \$20,000 in annual contracts with COUNTY, the PROVIDER shall submit to COUNTY a current Civil Rights Compliance Plan (CRC) for Meeting Equal Opportunity Requirements under Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title VI and XVI of the Public Service Health Act, the Age Discrimination Act of 1975, the Omnibus Budget Reconciliation Act of 1981 and Americans with Disabilities Act (ADA) of 1990. PROVIDER shall also file an Affirmative Action (AA) Plan with COUNTY in accordance with the requirements of chapter 19 of the Dane County Code of Ordinances. PROVIDER shall submit a copy of its discrimination complaint form with its CRC/AA Plan. The CRC/AA Plan must be submitted prior to the effective date of this Agreement and failure to do so by said date shall constitute grounds for immediate termination of this Agreement by COUNTY. If an approved plan has been received during the previous CALENDAR year, a plan update is acceptable. The plan may cover a two-year period. Providers who have less than twenty employees, but who receive more than \$20,000 from the COUNTY in annual contracts, may be required to submit a CRC Action Plan to correct any problems discovered as the result of a complaint investigation or other Civil Rights Compliance monitoring efforts set forth herein below. If PROVIDER submits a CRC/AA Plan to a Department of Workforce Development Division or to a Department of Health and Family Services Division that covers the services purchased by COUNTY, a verification of acceptance by the State of PROVIDER's Plan is sufficient.
- B. PROVIDER agrees to comply with the COUNTY's civil rights compliance policies and procedures. PROVIDER agrees to comply with civil rights monitoring reviews performed by the COUNTY, including the examination of records and relevant files maintained by the PROVIDER. PROVIDER agrees to furnish all information and reports required by the COUNTY as they relate to affirmative action and non-discrimination. PROVIDER further agrees to cooperate with COUNTY in developing, implementing, and monitoring corrective action plans that result from any reviews.
- C. PROVIDER shall post the Equal Opportunity Policy, the name of PROVIDER's designated Equal Opportunity Coordinator and the discrimination complaint process in conspicuous places available to applicants and clients of services, applicants for employment and employees. The complaint process will be according to COUNTY's policies and procedures and made available in languages and formats understandable to applicants, clients and employees. PROVIDER shall supply to COUNTY's Contract Compliance Officer upon request a summary document of all client complaints related to perceived discrimination in service delivery. These documents shall include names of the involved persons, nature of the complaints, and a description of any attempts made to achieve complaint resolution.
- D. PROVIDER shall provide copies of all announcements of new employment opportunities to COUNTY's Contract Compliance Officer when such announcements are issued.
- E. If PROVIDER is a government entity having its own compliance plan, PROVIDER'S plan shall govern PROVIDER's activities.

**XII. COMPLIANCE WITH FAIR LABOR STANDARDS:**

- A. Reporting of Adverse Findings. During the term of this Agreement, PROVIDER shall report to the County Contract Compliance Officer, within ten (10) days, any allegations to, or findings by the National Labor Relations Board (NLRB) or Wisconsin Employment Relations commission (WERC) that PROVIDER has violated a statute or regulation regarding labor standards or relations. If an investigation by the Contract Compliance Officer results in a final determination that the matter adversely affects PROVIDER'S responsibilities under this Agreement, and which recommends termination, suspension or cancellation of this agreement, the County may take such action.

- B. Appeal Process. PROVIDER may appeal any adverse finding by the Contract Compliance Officer as set forth in Dane County Ordinances Sec. 25.08(20)(c) through (e).
- C. Notice Requirement. PROVIDER shall post the following statement in a prominent place visible to employees: "As a condition of receiving and maintaining a contract with Dane County, this employer shall comply with federal, state and all other applicable laws prohibiting retaliation for union organizing."

**XIII. MISCELLANEOUS:**

- A. Registered Agent. PROVIDER warrants that it has complied with all necessary requirements to do business in the State of Wisconsin, that the persons executing this Agreement on its behalf are authorized to do so, and, if a corporation, that the name and address of PROVIDER's registered agent is as set forth opposite the heading REGISTERED AGENT on page 1 of this Agreement. PROVIDER shall notify COUNTY immediately, in writing, of any change in its registered agent, his or her address, and PROVIDER's legal status. For a partnership, the term 'registered agent' shall mean a general partner.
- B. Controlling Law and Venue. It is expressly understood and agreed to by the parties hereto that in the event of any disagreement or controversy between the parties, Wisconsin law shall be controlling. Venue for any legal proceedings shall be in the Dane County Circuit Court.
- C. Limitation of Agreement. This Agreement is intended to be an agreement solely between the parties hereto and for their benefit only. No part of this Agreement shall be construed to add to, supplement, amend, abridge or repeal existing duties, rights, benefits or privileges of any third party or parties, including but not limited to employees of either of the parties.
- D. Entire Agreement. The entire agreement of the parties is contained herein and this Agreement supersedes any and all oral agreements and negotiations between the parties relating to the subject matter hereof. The parties expressly agree that this Agreement shall not be amended in any fashion except in writing, executed by both parties.
- E. Counterparts. The parties may evidence their agreement to the foregoing upon one or several counterparts of this instrument, which together shall constitute a single instrument.

**IN WITNESS WHEREOF**, COUNTY and PROVIDER, by their respective authorized agents, have caused this Agreement and its Schedules to be executed, effective as of the date by which all parties hereto have affixed their respective signatures, as indicated below.

**FOR PROVIDER:**

DocuSigned by:  
*Nik Ivancevic*  
BD8E0A42F5E9407  
\_\_\_\_\_  
Nik Ivancevic, Partner, CableCom LLC

7/29/2020  
\_\_\_\_\_  
Date Signed

Nik Ivancevic  
\_\_\_\_\_  
Print Name

\* \* \*

**FOR COUNTY:**

\_\_\_\_\_  
Joseph T. Parisi, Dane County Executive

\_\_\_\_\_  
Date Signed

\_\_\_\_\_  
Scott McDonell, Dane County Clerk

\_\_\_\_\_  
Date Signed

\* [print name and title, below signature line of any person signing this document]

# **SCHEDULE A**

## **Scope of Services**

### **East District Campus Redundant Fiber Build**

#### **1. Scope of Work**

The work under this contract shall consist of constructing a fiber optic connection to the Dane County East District Campus, including, but not limited to, handholes, conduit, locate wire, fiber optic cable, fiber optic terminations, fiber optic splicing, fiber optic system testing, and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract.

All work shall be performed in accordance with the contract, plans, and the City of Madison Standard Specifications for Public Works Construction.

#### **2. Prosecution and Progress**

##### **A. Prosecution of the Work**

The Provider shall begin the Preparation work within **seven days** after the date of written notice to proceed.

Definite notice of intention to start work shall be given to the Engineer at least seventy-two hours in advance of beginning any work.

The Provider shall employ an ample labor and supervisory force and provide construction equipment properly adapted to the work and of sufficient capacity and efficiency to accomplish the work in a safe and workmanlike manner at the rate of progress specified. All equipment shall be maintained in good working order and provision shall be made for immediate emergency repairs.

In the event work is prosecuted during adverse weather conditions, the Provider will be required to exercise such precautions necessary to produce satisfactory work, and shall protect the finished work from the elements. It is agreed and understood that the cost thereof has been included in the unit prices bid for the various items of work in the contract and that no extra compensation will be provided.

##### **B. Progress Schedule**

The Schedule is Submitted and Attached under Schedule D, for the Engineers to review. The schedule shall meet the following requirements:

1. Include activities that describe essential features of the work and activities that might potentially delay contract completion. Identify activities that are controlling items of work.
2. Identify the contemplated start and completion dates for each activity. Provide a duration, ranging from one to fifteen working days, for each activity. Break longer activities into two or more activities distinguished by the addition of a location or some other description. Specify the sequencing of all activities.

3. List the working days per week, number of shifts per day, and number of hours per shift. Provide the quantity and estimated daily production rate for controlling items of work.
4. Show completing the work within the specified completion date.

The Engineer and Provider will review the initial schedule at the preconstruction meeting. Within five business days after the preconstruction meeting, the Engineer will accept the Provider's initial schedule or request additional information. Make the appropriate adjustments and resubmit the revised initial schedule within five business days after the Engineer's request. If the Engineer requests justification for an activity duration, provide information that may include estimated labor, equipment, unit quantities, and production rates used to determine the activity duration.

The Provider and the Engineer will meet monthly to assess progress and add updated information to the initial schedule. At a minimum, updates will include the actual start and finish of each activity, percentage complete, and remaining durations of activities started but not yet completed.

The Engineer will monitor the progress of the work and may request that the Provider revise the schedule if project completion or interim completion targets are delayed. Submit the revised schedule within five business days after the Engineer's request.

### **C. Methods and Equipment**

The Provider shall provide and furnish the machinery, equipment and tools necessary to perform the work. These shall be in such condition and of such capacity as will produce work of satisfactory quality and complete the work within the contract time.

Equipment shall be such that no injury to the roadway, pavement, structures, adjacent property, or other highways will result from its use, and it shall conform to the requirements set forth in detail under specific items or classes of work.

Failure on the part of the Provider to provide adequate equipment, maintained in proper working order, may be sufficient cause for suspension of specific operations until compliance is attained or may constitute cause for default of contract.

When the methods and equipment to be used by the Provider in accomplishing the construction are not prescribed in the contract, the Provider is free to use any methods or equipment that will accomplish the contract work in conformity with the requirements of the contract.

When the contract specifies that the construction be performed by the use of certain methods and equipment, such methods and equipment shall be used unless others are authorized by the Engineer. If the Provider desires to use a method or type of equipment other than those specified in the contract, the Provider may request authority from the Engineer to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed to be used and an explanation of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Provider will be fully responsible for producing construction work in conformity with contract requirements. If, after trial use of the substituted methods or equipment, the Engineer determines that the work produced does not meet contract

requirements, the Provider shall discontinue the use of the substitute method or equipment and shall complete the remaining construction with the specified methods and equipment. The Provider shall remove the deficient work and replace it with work of specified quality, or take such other corrective action as the Engineer may direct. No change will be made in basis of payment for the construction items involved nor in contract time as result of authorizing a change in methods or equipment under these provisions.

#### **D. Contract Time**

Work shall be prosecuted effectively and diligently to completion. Failure to begin operations, or failure to diligently prosecute the work, may be considered as a breach of contract and render the Provider liable to action under default of contract, or the revocation or suspension of the Provider's privilege to bid additional work, or both.

It is understood that the rate of progress and the completion of the work within the time as specified is an essential part of the contract.

The contract starting date, for purposes of determining contract time and extensions, is outlined in the attached "Schedule of Work".

Contract time will be extended in an amount as is mutually agreed upon by the Engineer and the Provider, on the basis of contract change orders involving alterations in the contract affecting the prosecution of work, or involving extra or additional work, when such alterations are necessary for the purposes or convenience of the County when such extra additional work is of such character or is ordered to be done at such a time that the amount of time reasonably necessary to perform such work is disproportionate to the contract time originally set up in the proposal. The agreement for extended time on this account shall be arrived at concurrently with and as a part of the consideration for the specific alteration or extra or additional work covered by that order.

A "work day" shall be defined as any day that a Provider can work on a project and which would or does necessitate an Engineer on the project for any part of the day. If inclement weather curtails construction, the Engineers and PROVIDER together shall decide what portion, if any part of a day, shall be called a "Work Day." Work days may be counted to the nearest one-half day. A record of work days shall be kept on the job by the Engineer.

#### **E. Liquidated Damages for Schedule Delays**

Should the Provider fail to complete the work within the time specified in the contract, or within such extra time as may have been allowed by extensions, there shall be deducted from any monies due or that may become due the Provider, or in the event no monies are due, the Provider shall pay to the County, the sum set forth in the following schedule for each and every day that the work shall remain uncompleted. This sum shall be considered and treated not as a penalty but as fixed, agreed and liquidated damages due the County from the Provider by reason of inconvenience to the public, added cost of engineering and supervision, maintenance of detours and other items which have caused an expenditure of public funds resulting from the Provider's failure to complete the work within the time specified in the contract.

**Liquidated damages shall be assessed in the amount of \$500.00 per working day after December 31, 2020, the expiration date of contract, in which the fiber optic connection is not complete.** The fiber optic connection shall not be considered complete until the fiber optic cable is installed and spliced and successfully passes all testing requirements in accordance with the contract.

### **3. Changes to Work**

**The plans and special provisions reflect conditions known during the development of the plans and special provisions. The Provider is fully responsible for the application of all work shown in the plans to the actual physical field conditions in order to provide a complete and accepted project. In the event that actual physical field conditions affect or prevent the application or progression of any work shown in the plans or special provisions, the Provider shall notify the Engineers immediately, prior to any further work being performed.**

**Any changes to the work shown in the plans shall be approved in writing by the Engineer prior to the work being performed.**

The Engineer shall have the right to make alterations to the work herein contemplated, including the lengthening or shortening of the project, either before or after the commencement of the work. Such alterations shall, insofar as practical, be agreed upon by both the PROVIDER & Engineers in writing before starting work on such alterations.

Except as otherwise provided below, whenever the quantity of any item of work as given in the proposal shall be increased or decreased as required to satisfactorily complete the work, payment for such item of work shall be made on the basis of the actual quantity completed at the original contract unit price.

Compensation for alterations in plans or quantities of work requiring contract change orders shall be as stipulated in such agreements.

#### **A. Increased or Decreased Quantities**

It is agreed and understood that the quantities of any items of work shown on the plans or in the proposal are subject to increase or decrease during the progress of the work. The Engineer reserves the right to increase or decrease the quantities of any items of work, including increase or decrease of quantities by alteration of plans, as may be considered necessary or desirable during the progress of the work to satisfactorily complete the construction. Such increases or decreases in quantities shall not be considered as a waiver of any conditions of the contract nor invalidate any of the provisions thereof.

#### **B. Increased Items**

Unless otherwise designated in the proposal, any increase of the contract shall be limited to fifteen percent of the lump sum contract price submitted by the Provider. Any item may be increased up to twenty-five percent of the original quantity in the contract, but in no case may such an increase exceed in dollar value fifteen percent of the original lump sum contract price bid. If it is determined by the Engineer that increases in excess of those mentioned above will prevail, then the Engineer along with the County shall: (a) renegotiate the unit price for all estimated work over the percentage limit shown above, or (b) advertise for and receive bids for estimated excess work.

Unforeseen items of extra work not included in the proposal as a bid item shall be included when calculating the total amount of increase over the original lump sum contract price bid.

### **C. Decreased or Deleted Items**

Unless otherwise designated in the proposal, the quantity of any item may be decreased, and the actual quantity installed and accepted will be paid for at the contract unit price. Such decrease shall not constitute the basis for a claim for damages for anticipated profits for the work dispensed with. When the reduction in amount is a material part of the work contemplated for the project, the Provider shall be entitled to compensation as determined by the Engineer for overhead and equipment charges incurred in expectation of the quantity of work originally estimated, unless specifically provided herein.

The right is reserved to delete from the work any item or portion thereof found unnecessary to the improvement. Such deletion shall not constitute the basis for a claim for damages for anticipated profits for the work dispensed with. The Provider will be paid for all work done toward the completion of the item or portion thereof prior to such deletion a fair and equitable amount covering all items of cost incurred prior to the date of deletion of the work by order of the Engineer. Acceptable materials ordered by the Provider, and not canceled prior to the date of deletion of the work, and which are delivered on the work, will be paid for at the actual cost to the Provider, and shall become the property of the County.

### **D. Extra Work**

In connection with the work covered by the contract, the Engineer may, at any time during its progress, order other work or materials incidental thereto. All such work and materials that do not appear in the proposal or contract as a specific item accompanied by a unit price, and which are not included under the price bid for other items in the contract, shall be designated as Extra Work. Extra Work may also consist of additions to or changes in design in contract items or portions thereof, when such additions are wholly disassociated from or outside the scope of the work as evidenced by the plans and special provisions, and when the work caused by such additions or changes in design must be performed under conditions or in a manner that is materially and inherently different from the conditions and manner existent for such contract items as contemplated in the original scope of the work. The Provider hereby agrees to perform Extra Work whenever it is deemed necessary or desirable by the Engineer to complete the project as originally contemplated, or as subsequently altered, and it shall be done in accordance with the requirements herein set forth.

Extra Work shall be done under the supervision of the Engineer, and the Engineer's decision shall be final and binding. The plan of the work to be followed, the equipment to be used, and the amount and character of labor to be employed shall meet with the approval of the Engineer.

The Provider shall not perform any Extra Work until a contract change order has been executed by both parties. Claims for compensation for Extra Work performed which has not been authorized by an executed contract change order may be rejected.



The contract change order for Extra Work may provide for payment in an agreed lump sum or the Extra Work performed, on an agreed unit price basis for the units of such Extra Work performed. Where agreement cannot be reached to pay for Extra Work on either the lump sum basis or the unit price basis, the Engineer may direct that payment for Extra Work be determined on a force account basis.

Prices for Extra Work to be completed by subcontractors shall be the subcontractor's actual prices submitted for the work contemplated to which the Provider may add an amount equal to, but not to exceed, five percent thereof.

For Extra Work to be paid for on a force account basis, the actual cost computed in accordance with the terms of the contract change order shall include such costs and allowances and subject to such limitations as hereinafter provided:

1. For all labor and supervisors in direct charge of the specific work, the Provider shall receive the rate of wage agreed upon in writing before beginning work, for each and every hour that said labor and supervisors are actually engaged in such work.

The Provider shall receive the actual costs paid to, or in behalf of, laborers by reason of health and welfare benefits, pension fund benefits or other benefits required to be paid.

An amount equal to thirty-five percent of the above items will be added to the cost of such items.

2. For property damage, liability, and worker's compensation insurance premiums, unemployment insurance contributions and social security taxes on the force account work, the Provider shall receive the actual cost, to which cost shall be added an amount equal to fifteen percent of the sum thereof. The Provider shall furnish satisfactory evidence of the rate or rates paid.
3. For materials accepted by the Engineer and used, the Provider shall receive the actual cost of such materials delivered to the work including transportation charges (exclusive of machinery rentals as hereinafter set forth), to which cost shall be added an amount equal to fifteen percent of the sum thereof.
4. For any machinery or special equipment (other than small tools) including fuel and lubricants, the use of which has been authorized by the Engineer, the Provider shall receive the rental rates agreed upon in writing before such work is begun, for the actual time that such equipment is in operation on the work, and to which rental sum of FIVE percentage shall be added.
5. No additional allowance shall be made for general superintendence, the use of small tools, or other costs of which no specific allowance is herein provided.
6. For administration cost when work is performed by an approved subcontractor, the Provider shall receive an amount equal to five percent of the total costs of such work computed as set forth above.
7. The compensation as set forth above shall be received by the Provider as payment in full for Extra Work done on a force account basis. At the end of each day the Provider's representative and the Engineer shall compare records of the cost of work done as ordered on a force account basis.

8. No payment will be made for work performed on a force account basis until the Provider shall furnish to the Engineer duplicate itemized statements of the cost of such force account work, detailed as to the following:
  - a. Name, classification, dates, daily hours, total hours, rate and extension of each laborer and supervisor.
  - b. Designation, dates, daily hours, total hours, rental rate and extension of each truck and other unit of machinery and equipment.
  - c. Quantities of materials, prices and extensions.
  - d. Transportation on materials.
  - e. Cost of property damage, liability and worker's compensation insurance premiums, unemployment insurance contributions and social security tax.
  - f. Such statements shall be accompanied and supported by original receipted invoices for all materials used and transportation charges; provided, that if materials used on the force account work are not specifically purchased for such work, but are taken from the Provider's stock, then in lieu of the original invoices, the statements shall contain or be accompanied by an affidavit of the Provider, certifying that such materials were taken from stock, that the quantity claimed was actually used, and that the price and transportation claimed represents the actual cost to the Provider.

No verbal order or suggestions given by an employee of the County shall be construed as authorizing or laying the basis for any claim on the part of the Provider for extra compensation, either for Extra Work or materials, or for damages, because of the Provider's compliance therewith. Such verbal orders and suggestions as to the performance of the work may be freely given, but in case they appear to the Provider to involve Extra Work, for which the Provider should receive extra compensation, the Provider shall obtain a written change order from the Engineer for such Extra Work prior to performing the work. In case of a dispute as to what does or does not constitute Extra Work, a decision will be made by the Engineer.

#### **4. Utilities**

This contract does not come under the provision of Administrative Rule Trans 220.

The following utility companies have facilities with the project area. However, no adjustments to existing utility facilities are anticipated. The Engineer may adjust the location of items under this contract to avoid conflict with the existing utility facilities.

American Transmission Company  
2489 Rinden Road  
Cottage Grove, WI 53527  
608-223-2014

Century Link  
50 East Doty Street  
Madison, WI 53703  
877-366-8344

Charter Communications  
2935 South Fish Hatchery Road  
Fitchburg, WI 53711  
262-446-9821

City of Madison Engineering  
City-County Building, Room 115  
210 Martin Luther King Jr Boulevard  
Madison, WI 53703  
608-266-4430

Madison Gas and Electric Company  
133 South Blair Street  
Madison, WI 53701  
608-252-7373

MCI Telecommunications  
54 East Towne Mall  
Madison, WI 53704  
800-289-3427

Metropolitan Unified Network Consortium  
1212 Demming Way, Room 131  
Middleton, WI 53562  
608-444-6280

State of Wisconsin Division of Facilities Management  
101 East Wilson Street #7  
Madison, WI 53703  
608-266-1485

Supranet Communications, Inc  
8000 Excelsior Drive  
Madison, WI 53717  
608-836-0282

Town of Madison  
119 East Olin Avenue  
Madison, WI 53713  
608-210-7260

US Signal  
222 West Washington Avenue #1  
Madison, WI 53703  
616-430-7327

Windstream Communications  
2802 Sylvan Avenue  
Madison, WI 53705  
800-289-1901

This item, as described above, shall be considered subsidiary and incidental to the other items of the contract, and no separate or additional compensation will be made.

## **5. Permits**

The County will acquire the City of Madison Permit to Excavate in Public Right-of-Way. The Provider shall provide the County the necessary information to help obtain the permit. And shall be submitted by Engineering Consultant.

The County will acquire the necessary Wisconsin Department of Transportation permit. And shall be submitted by Engineering Consultant.

The Provider shall obtain all other permits and licenses, pay all charges and fees, and give all notices necessary to perform the work. The Provider shall comply with all permit requirements whether the permit is issued to the Provider or the maintaining authority.

The Provider shall submit copies of all permits prior to the preconstruction meeting.

This item, as described above, shall be considered subsidiary and incidental to the other items of the contract, and no separate or additional compensation will be made.

## **6. Public Convenience and Safety**

### **A. Laws to be Observed**

The Provider shall at all times observe and comply with all Federal and State laws and administrative rules, local laws, ordinances, and regulations which in any manner affect the conduct of the work, and all orders or decrees, as exist at the present or which may be enacted later, of bodies or tribunals having jurisdiction or authority over the work. No plea of misunderstanding or ignorance thereof will be considered. The Provider shall indemnify, defend and save harmless the County and all of its officers, officials, agents, employees and servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by the Provider or the Provider's employees, subcontractors or agents.

The Provider shall comply with all Federal, State and local laws governing safety, health and sanitation. The Provider shall also provide all safeguards, safety devices and protective equipment, and take any other actions necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

### **B. Responsibility to the Public**

The Provider shall avoid as far as possible the maintenance of any condition which might be deemed at law to be an "attractive nuisance". Where such condition is unavoidable or where apparent or potential hazards occur incident to the Provider's conduct of the work, the Provider shall maintain a proper watch or provide other reasonable safeguards. The Provider shall be responsible for all damage, bodily injury, or death arising through the Provider's negligence either in maintaining an attractive nuisance or otherwise.

Fire hydrants shall be visible and accessible from the street at all times to the Fire Department. No material or other obstructions shall be placed within ten (10) feet of a fire hydrant.

The Provider shall strictly adhere to Section 182.0175, Wis. Statutes, regarding notification and location of utilities, including but not limited to three working days advance notice.

In the case of horizontal boring construction within the right-of-way, the Provider shall verify that no damage was done to storm sewer mains, sanitary mains and laterals which were crossed, when directed by the Engineer. This may be accomplished by uncovering the line prior to boring or televising the line after boring. In addition, the Provider may wish to televise the line before boring to verify the existing condition of the pipe. All costs associated with exposing and or televising storm sewer mains, sanitary mains and laterals shall be the responsibility of the Provider. The Provider shall coordinate access to homes in order to televise laterals. The video tape shall be date and time stamped and provided to the Engineer within twenty-four hours of televising.

The Provider shall schedule the operations so as to cause a minimum of interruption, interference or disturbance to the operation of stores, businesses, office buildings, hotels, churches, etc., and to allow access by pedestrians and emergency, delivery and service vehicles at all times.

Any temporary shutdown of existing services, i.e., sewers, water, gas, electrical power and access, as may be required, shall be performed only at such times and for such duration as agreed to by the Engineer. The interruption of services and access shall be conducted in accordance with a program mutually agreed to by the Engineer and the Provider.

The Provider shall work such overtime, including extended hours on normal work days, Saturdays, Sundays and holidays, as required by the Engineer to meet the above requirements at no additional cost to the County.

Gasoline or diesel operated equipment shall be equipped with mufflers and insulators to minimize noise.

During times when work will prevent access to driveways, the Provider shall notify all residents, a minimum of forty-eight hours in advance, if vehicular access cannot be provided to their property.

The Provider shall phase the work in such a way that the maximum cumulative total time in which any residential property is completely without driveway access is twenty calendar days.

The Provider shall maintain access to all commercial drives, at all times unless permission is granted in writing to close the drive. This may be done by phasing of drive construction and/or plating of drives. No additional compensation shall be given for plating to maintain access.

The Provider shall provide access to handicap residents at all times.

The Provider shall assist residents with refuse collection. Assistance shall be provided by either: maintaining access for collection vehicles to all properties located in the project limits; or hauling all refuse and recyclables to a common location at the end of the project.

The County will refer any call or claim, the substance of which is an event caused by the Provider, or by any person or company utilized by the Provider, to the Provider for

handling. Within two business days after contacting the individual, the Provider shall provide a factual summary of the event giving rise to the call or claim, along with the Provider's proposed resolution, to the County.

The Provider shall use every reasonable precaution to prevent the damage or destruction of corporate, government or private property such as poles, trees, shrubbery, crops and fences adjacent to or interfering with the work; all overhead structures such as wires, cables, etc.; within or outside of the right-of-way; and buildings or structures in close proximity to the construction. The Provider shall consider, and minimize where reasonable, the impact of vibrations that may occur during all phases of construction upon buildings or structures in close proximity to the construction where a risk of damage or destruction due to nearby construction activity has been identified.

The Provider shall notify the owners of all corporate, government or private property which interferes with the work advising them of the nature of the interference, and shall arrange with them for the disposition of such property. The Provider shall furnish the Engineer upon request with copies of all such notification and final agreements.

The Provider shall give notice to owners and protect and support all water and gas pipes or other conduits and all railway tracks, buildings, walls, fences or other properties which may be subject to damage or subsidence during the execution of the work. The Provider's responsibility shall be as prescribed in Section 101.111, Wis. Statutes. The Provider shall take all reasonable and proper precautions to protect persons, animals and vehicles of the public from injury and wherever necessary shall erect and maintain a fence or railing around any excavation, and place a sufficient number of amber lights about the work and keep them burning from twilight until sunrise. The Provider shall employ one or more watchpersons as an additional security wherever they are needed.

The Provider shall not in any way prevent the flow of water in the gutters of the street, and shall use proper means to permit the flow of surface water along the gutters while the work is progressing.

The Provider shall be responsible for the damage or destruction of property of any character resulting from neglect, misconduct, or omission in the manner or method of execution or non-execution of the work, or caused by defective work or the use of unsatisfactory materials, and shall restore such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or replacing it as may be directed, or the Provider shall otherwise make good such damage or destruction in an acceptable manner. If the Provider fails to do so, the Engineer may, after the expiration of a period of forty-eight hours after giving notice to the Provider in writing, proceed to repair, rebuild or otherwise restore such property as may be deemed necessary, and the cost thereof shall be deducted from any compensation due or which may become due the Provider under the contract.

The Provider shall be responsible for all costs for the repair of underground pipes, wires, or conduits damaged by the Provider's employees or subcontractors during the construction of the project.

### **C. Safety**

The Provider shall comply with all Federal, State and local laws governing safety, health and sanitation. The Provider shall also provide all safeguards, safety devices and

protective equipment, and take any other actions necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

Open excavations shall be properly barricaded at all times that the Provider is not in the immediate vicinity of the excavation. Excavations that are to remain open overnight shall be barricaded in a fashion that will make the excavation easily detectable and avoidable by passersby.

Potholes in the immediate vicinity of the work zone during working hours shall be covered by a cone at all times that the Provider is not in the immediate vicinity of the excavation. Potholes that are to remain exposed overnight shall be covered with a Type II barricade.

All work areas, both interior and outdoor, shall remain clean and free of all rubbish and tools that are not in use at all times. During non-working hours the Provider shall clean the worksite and secure all equipment and tools.

#### **D. Equipment and Material Storage**

Materials shall be so stored as to insure the preservation of their quality and suitability for the work. Stored materials, even though approved before storage, shall be subject to inspection prior to their use in the work and shall meet the requirements of the contract at the time they are used. Stored materials shall be located so as to facilitate inspection. With the Engineer's approval, portions of the right-of-way not required for public travel may be used for storage purposes and for the placing of the Provider's plant and equipment, but any additional space required shall be provided by Dane County. Provider's equipment shall not be secured in any way to a street or park tree trunk. Dane County to find and approve location for all equipment and material storage through the expiration of this agreement.

The Provider shall not store equipment or materials in the City County Building, Water NOC, or East District Campus unless approved by Dane County.

This item, as described above, shall be considered subsidiary and incidental to the other items of the contract, and no separate or additional compensation will be made.

### **7. Maintenance of Traffic**

The Provider shall at all times conduct the work in such a manner as to insure the least possible obstruction to traffic.

All signing and barricading shall conform to the Federal Highways Administrations "Manual on Uniform Traffic Control Devices" (MUTCD) and the City of Madison standards for sidewalk and bikeway closures.

The Provider shall submit an acceptable traffic control plan to the Engineer, a minimum of forty-eight hours prior to the start of work on any project.

The Provider shall not restrict traffic during peak hours. Peak hours are defined as 7:00am to 8:30am and 4:00pm to 5:30pm.

This item, as described above, shall be considered subsidiary and incidental to the other items of the contract, and no separate or additional compensation will be made.

## **8. Environmental Protection**

### **A. Erosion Control**

Soil erosion and uncontrolled runoff from construction and land disturbing activities can have adverse impacts upon regional water resources and the health, safety, property and general welfare of the community. The Provider shall conduct and schedule operations so as to avoid or minimize siltation of streams, lakes, reservoirs and other areas. The Provider shall also take all necessary precautions to prevent pollution of streams, lakes, reservoirs and other areas with fuels, oils, bitumen, calcium chloride, or other harmful materials.

The Provider shall have adequate erosion control measures available on site for erosion control. The Provider shall schedule the work so that the amount of open excavation and the stockpiling of construction materials on the job site are minimized.

Excavated materials and imported backfill materials stockpiled at the project site shall be stored and protected in such a manner that will not result in transport of said materials by storm water runoff into adjacent streets or drainage facilities. Unprotected excavated materials and imported backfill materials stored temporarily on street pavements to facilitate construction shall be removed and/or properly stored/protected by the end of the work period, which shall not extend past the end of the work day.

Backfilled trenches and other areas shall be left to the level of the adjacent area or slightly below until restored to reduce the potential for erosion. All excess excavated materials and imported backfill materials shall be promptly removed from the site and disposed of following completion of construction and/or restoration activities.

Tracking of foreign materials (mud, silt, etc.) on street and/or other paved surfaces shall be controlled during the working day as necessary and/or as directed by the Engineer, as but no later than the end of the working day, by one or more of the following methods:

1. Hand shoveling material off street or pavement surfaces.
2. Machine removal (such as with end loader or grader), provided that the results are equal to that of hand shoveling.
3. Mechanical sweeping of material off paved surfaces and adjacent streets.

Diversion berms or sediment filtration berms shall be constructed and maintained as determined necessary by the erosion control plan and/or the Construction Engineer in order to route off-site storm water runoff around disturbed work areas.



Replacement/repair of pre-existing erosion control measures which are disturbed in the course of the work shall be completed promptly following completion of the work on the project causing such disturbance.

### **B. Tree Protection**

The Provider shall protect trees in accordance with the City of Madison Standard Specifications for Public Works Construction.

### **C. Aquatic Exotic Species Control**

Exotic invasive organisms such as VHS, zebra mussels, purple loosestrife, and Eurasian water milfoil are becoming more prolific in Wisconsin and pose adverse effects to waters of the state. Wis. Statutes 30.07, "Transportation of Aquatic Plants and Animals; Placement of Objects in Navigable Waters", details the state law that requires the removal of aquatic plants and zebra mussels each time equipment is put into State waters.

At construction sites that involve navigable water or wetlands, the Provider shall use the follow cleaning procedures to minimize the chance of exotic invasive species infestation. The Provider shall use these procedures for all equipment that comes in contact with waters of the state and/or infested water or potentially infested water in other states.

The Provider shall ensure that all equipment that has been in contact with waters of the State, or with infested or potentially infested waters, has been decontaminated for aquatic plant materials and zebra mussels prior to being used in other waters of the State. Before using equipment on this project, the Provider shall thoroughly disinfect all equipment that has come into contact with potentially infested waters. The Provider shall use the following inspection and removal procedures (guidelines from the Wisconsin Department of Natural Resources [http://dnr.wi.gov/topic/fishing/documents/vhs/disinfection\\_protocols.pdf](http://dnr.wi.gov/topic/fishing/documents/vhs/disinfection_protocols.pdf) for disinfection):

1. Prior to leaving the contaminated site, the Provider shall wash machinery and ensure that the machinery is free of all soil and other substances that could possibly contain exotic invasive species.
2. The Provider shall drain all water from boats, trailers, bilges, live wells, coolers, bait buckets, engine compartments, and any other area where water may be trapped.
3. The Provider shall inspect boat hulls, propellers, trailers and other surfaces. The Provider shall scrape off any attached mussels, remove any aquatic plant materials (fragments, stems, leaves, seeds, or roots), and dispose of removed mussels and plant materials in a garbage can prior to leaving the area or invested waters.
4. Disinfect boats, equipment and gear by either:
  - a. Washing with ~212° F water (steam clean), or
  - b. Drying thoroughly for five days after cleaning with soap and water and/or high-pressure water, or
  - c. Disinfecting with either 200 ppm (0.5 oz per gallon or 1 Tablespoon per gallon) Chlorine for 10-minute contact time or 1:100 solution (38 grams per gallon) of Virkon Aquatic for 20- to 30-minute contact time. Note: Virkon is not registered to kill zebra mussel veligers nor invertebrates like spiny water flea. Therefore, this disinfect should be used in conjunction with a hot water (>104° F) application.

Complete the inspection and removal procedure before equipment is brought to the project site and before the equipment leaves the project site.

#### **D. Final Clean Up**

Upon completion of the work and before acceptance and final payment will be made, the Provider shall remove from the project area all surplus and discarded materials, rubbish and temporary structures and leave the project area in a neat and presentable condition.

No project shall be accepted until all excess mud, terrace dirt, asphalt material, rocks and crushed stone have been removed from the sidewalk, terrace, gutter and pavement.

This item, as described above, shall be considered subsidiary and incidental to the other items of the contract, and no separate or additional compensation will be made.

### **9. Documentation**

#### **A. Project Documentation**

The Provider shall provide the following documentation prior to the preconstruction meeting, as described herein:

- Progress Schedule
- Permits
- Traffic Control Plan
- Fiber Optic Technician Certification

These documents will be discussed and reviewed during the preconstruction meeting and be approved in writing by the Engineer prior to the Provider beginning work on the project.

#### **B. Shop Drawings**

The Provider shall provide the following shop drawings prior to the preconstruction meeting, as described herein:

- Communication Vault
  - Type Round
- Handhole
  - Type V
  - Type VII
  
- Building/Wall Penetration
- Conduit
  - Non-metallic Conduit (including directional bored conduit)
  - Innerduct
  - Rigid Steel Conduit

- No. 10 Locate Wire
- Tracer Wire Marker Post
- Fiber Optic Cable
- Fiber Optic Splice Enclosure
  - Splice Enclosure
  - Splice Tray
  - Splice Module
  - Splice Sleeve
  - Drop Port Wrap Kit
- Fiber Optic Termination/Patch Panel

These shop drawings will be discussed and reviewed during the preconstruction meeting and be approved in writing by the Engineer prior to the Provider beginning work on the project.

### **C. Project Closeout Documentation**

The Provider shall provide the following documentation prior to the completion of the project, as described herein:

- Fiber Optic Test Results
- Redline As-Builts

These documents will be reviewed and shall be approved in writing by the Engineer prior to project completion and final payment.

This item, as described above, shall be considered subsidiary and incidental to the other items of the contract, and no separate or additional compensation will be made.

## **10. Remove Handhole/Manhole**

### **A. Description**

This item consists of removing handholes/manholes as shown on the plans.

### **B. Materials**

Provide all tools and equipment necessary to remove the existing handhole/manhole.

### **C. Construction**

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing conduit within the City of Madison right-of-way.

Prior to removing the handhole/manhole, carefully pull back all existing cables and splice enclosures from the handhole/manhole.

Carefully remove the existing handhole/manhole at the location shown on the plans. Dispose of removed materials off of the job site and public right-of-way.

Backfill the removal site with material similar to surrounding material and match the surrounding grade.

**D. Measurement**

These items shall be measured as units complete in place and accepted in accordance with the contract.

**E. Payment**

These items, measured as provided above, will be paid for at the contract unit price for each, which price shall be payment in full for furnishing and installing all materials necessary to complete the removal, including excavation, backfill and disposal of surplus materials; for pulling back all existing cables and splice enclosures; and for all labor, tools, equipment and incidentals necessary to complete these items of work.

**11. Inspect and Clean Existing Conduit**

**A. Description**

This item consists of inspecting and cleaning existing conduit.

**B. Materials**

Provide all tools and equipment necessary to inspect and clean the existing conduit.

**C. Construction**

Visually inspect the existing conduits to ensure the conduit is not damaged. At access points (handholes, communications vaults, etc.) ensure there is a smooth transition between exit and entrance elevations and that the horizontal and vertical angle is not so sharp as to cause damage to the cable as it is being pulled through the existing conduit.

Clean the existing conduit of any debris that could impede pulling cable through it or that could damage the cable if the debris remained.

The Provider shall notify the Engineer of any issues found with the existing conduit. Additional undistributed quantities have been included if needed for conduit repairs and may only be constructed at the direction of the Engineer.

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing conduit within the City of Madison right-of-way.

**D. Measurement**

This item shall be measured as a lump sum, with all existing conduit being inspected and cleaned.

**E. Payment**

This item, measured as provided above, will be paid for as a lump sum, which price shall be payment in full for inspecting and cleaning existing conduit and for all labor, tools, equipment, and incidentals necessary to complete this item of work in accordance with the contract.

## **12. Remove Cable**

### **A. Description**

This item consists of removing cables as shown on the plans.

### **B. Materials**

Provide all tools and equipment necessary to remove the existing cables.

### **C. Construction**

Carefully remove the existing cables (or group of cables) at the location shown on the plans. Dispose of removed materials off of the job site and public right-of-way.

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing conduit within the City of Madison right-of-way.

### **D. Measurement**

This item, complete in place and accepted, shall be measured in linear feet in a horizontal plane, from terminal connection to terminal connection along the center line of the trench or conduit with the terminal connection being the center line of the electrical utility access structure, handhole, junction box or other terminal location as required by the plans and specifications.

### **E. Payment**

The quantity of locate wire removed, measured as provided above, will be paid for at the contract unit price per linear foot, which price shall be payment in full for disposal and for furnishing all labor, tools, equipment and incidentals necessary to complete this item of work.

## **13. Handhole**

### **A. Description**

This item consists of furnishing and installing handholes as shown on the plans.

## **B. Materials**

Type VII handholes shall be gray colored polymer concrete construction. The box dimensions shall be 30 inches wide by 48 inches long by 36-48 inches deep. The cover shall be a split lid. The box and cover shall be rated at 15,000 pounds over a ten-inch square with a minimum test load of 22,568 pounds. Type VII handholes shall be used for all splicing locations.

Type V handholes shall be gray colored polymer concrete construction. The box dimensions shall be 24-26 inches wide by 36-38 inches long by 24-36 inches deep. The cover shall be a single or split lid. The box and cover shall be rated at 15,000 pounds over a ten-inch square with a minimum test load of 22,568 pounds. Type V handholes shall be used for all non-splicing locations.

Handhole labels shall read "TRAFFIC SIGNAL" on the cover.

All handhole hardware shall be stainless steel.

The Provider shall submit shop drawings of the proposed handholes prior to the preconstruction meeting. Handholes proposed for use shall be approved in writing by the Engineer prior to beginning work on the project.

## **C. Construction**

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing handholes within the City of Madison right-of-way.

Handholes shall be set and dressed out within forty-eight hours of cable or conduit installation. All handholes shall be installed flush to the ground surface.

Where possible, avoid installation of handholes where flooding or pooling of water may occur.

Excavate approximately six inches deeper than the depth of the handhole. Add six inches of number one washed stone for drainage.

Conduits entering the handhole shall enter through the bottom of the handhole and extend six inches above the stone inside the enclosure.

Lower the handhole into the excavation onto the rock. Ensure the top of the handhole is flush with the finished grade.

Place a small layer of crushed rock around the handhole. Fill and compact the rest of the space with soil to the finished grade. Native material will not be allowed for backfill if it is thirty percent or more stones by volume. No rocks larger than four-inch diameter, stone aggregate, or any foreign debris shall be backfilled, unless otherwise approved by the Engineer.

Place an eight-foot ground rod with acorn clamp inside the handhole so that the ground rod extends six inches above the stone base.

Restore the area to the original condition after installing the handhole.

When entering occupied conduit mid span, the Provider shall:

1. Excavate approximately six inches deeper than the depth of the conduit. Expose twelve inches of the conduit beyond the finished length and width of the handhole installation.
2. Ring cut the existing conduit with the appropriate tool taking care not to damage the existing cables inside of the conduit. Damage of cables will result in appropriate repairs as directed by the Engineer.
3. For PVC conduit, use an appropriately sized PVC split duct coupler, split duct, and 45-degree elbow to bring the conduit into the new handhole six inches above the stone base. Use appropriate PVC cleaner and solvent to glue the fittings together. Allow proper drying time before backfilling around the conduit with sand, hand tamping only.
4. For HDPE conduit, use an appropriately sized PVC-to-HDPE split duct coupler, split duct, and 45-degree elbow to bring the conduit into the new handhole six inches above the stone base. Use appropriate epoxy-based glue and cleaning methods to adhere the PVC-to-HDPE coupler. The 45-degree elbow can then be glued to the adapter coupler after the epoxy-based glue has dried. Allow proper drying time before backfilling around the conduit with sand, hand tamping only.

#### **D. Measurement**

These items shall be measured as units complete in place and accepted in accordance with the contract.

#### **E. Payment**

These items, measured as provided above, will be paid for at the contract unit price for each, which price shall be payment in full for furnishing and installing all materials necessary to complete the installation, including excavation, backfill and disposal of surplus materials; for grounding; and for all labor, tools, equipment and incidentals necessary to complete these items of work.

## **14. Communication Vault**

### **A. Description**

This item describes providing communication vaults and associated tracer wire marker posts. as shown on the plans.

## **B. Materials**

Furnish fiber optic cable support assemblies consisting of the brackets, racks, and rails required to suspend surplus cabling and splice enclosures for a communication vault. Ensure that support assemblies are made from or coated with a corrosion resistant material.

Furnish self-curing, permanent bonding, flexible gray rubber caulk. Ensure that the caulk is mildew-resistant, non-flammable, and is unaffected by sunlight, water, oils, mild acids, or alkali.

Furnish fade resistant, ultraviolet stable, high-impact polycarbonate tracer wire marker posts a minimum of 62 inches long with an outside diameter of 3.5 inches with "WARNING FIBER OPTIC CABLE BELOW" molded into the marker. Ensure that posts have stainless steel hardware, five standard terminals, a terminal enclosure for cathodic protection, and an anchor bar.

## **C. Construction**

Provide additional conduit openings in vaults using a manufacturer-approved knockout punch driver. Ensure that gaps between the conduit and vault are not greater than 1/2 inch. Caulk gaps both on the inside and the outside of the vault. Cure caulk according to manufacturer's specifications before backfilling.

Lock vault lids with two 3/8-inch 16 UNC stainless steel penta head bolts with washers. Anchor support assemblies to vaults using stainless steel hardware.

Install tracer wire marker posts so that they cannot be pulled out or removed manually. Install conduit into the access point and connect the tracer wire to the tracer wire marker post terminals.

## **D. Measurement**

These items shall be measured as units complete in place and accepted in accordance with the contract.

## **E. Payment**

These items, measured as provided above, will be paid for at the contract unit price for each, which price shall be payment in full for furnishing and installing all materials necessary to complete the installation, including excavation, backfill and disposal of surplus materials; for grounding; and for all labor, tools, equipment and incidentals necessary to complete these items of work.

# **15. Building/Wall Penetration**

## **A. Description**

This item consists of penetrating a building or wall as shown on the plans.



## **B. Materials**

Provide all tools and equipment necessary to penetrate the building or wall.

## **C. Construction**

The Provider, along with Engineer Consultant shall submit shop drawings of the proposed building/wall penetration prior to the preconstruction meeting. The proposed building/wall penetration shall be approved in writing by the Engineer and Dane County prior to beginning work on the project.

The Provider shall notify the Engineer at least forty-eight hours in advance of any building/wall penetrations. Work shall not commence until the Engineer is present.

Furnish and install a weather head where the rigid steel conduit meets the building/wall penetration.

Seal space between conduits or cable and building/wall surfaces with fire-resistant and weather-resistant materials.

## **D. Measurement**

These items shall be measured as units complete in place and accepted in accordance with the contract.

## **E. Payment**

These items, measured as provided above, will be paid for at the contract unit price for each, which price shall be payment in full for furnishing and installing all materials necessary to complete building penetration; weather head; sealing the building penetration; and for all labor, tools, equipment and incidentals necessary to complete these items of work.

# **16. Conduit**

## **A. Description**

This item consists of furnishing and installing underground conduit as shown on the plans.

## **B. Materials**

The Provider shall submit shop drawings of the proposed conduit prior to the preconstruction meeting. Conduit proposed for use shall be approved in writing by the Engineer prior to beginning work on the project.

Conduit in Wisconsin Department of Transportation right-of-way shall meet the requirements of the State of Wisconsin Standard Specifications for Highway and Structure Construction (current edition) Section 671.

### **B.1. Polyethylene Conduit**

The conduit shall be high density grade polyethylene (minimum HDPE SDR-13.5) suitable for direct earth burial. High density polyethylene shall meet the applicable requirements for Polyethylene Molding and Extrusion Materials, ASTM D 1248, Type III, Class C.

The polyethylene conduit shall also pass:

- ASTM D 638: Tests for Tensile Strength and Elongation.
- ASTM D 746: Brittle Temperature, 80% Non-failure.
- ASTM D 1238: Test for Flow Rate.

The conduit shall be packaged on reels in accordance with industry standards.

		PIPE SIZE						
		½"	¾"	1"	1 ¼"	1 ½"	2"	3"
Wall Type	Nominal OD (in.)	0.840	1.050	1.315	1.660	1.9	2.375	3.5
	OD Tolerance +/-	0.004	0.004	0.005	0.005	0.006	0.006	0.008
	Bend Radius - Supported	8	10	13	17	19	24	39
	Bend Radius - Unsupported	16	20	26	34	38	48	78
EPEC-B SDR 13.5	Minimum Wall (in.)		0.078	0.097	0.123	0.141	0.176	0.259
	Wall Tolerance +/-		0.020	0.020	0.020	0.020	0.021	0.031
	Average ID (in.)		0.874	1.101	1.394	1.598	2.002	2.951
	Weight (3/ft.)		0.104	0.162	0.259	0.340	0.530	1.151
	Safe Working Load		570	894	1,425	1,867	2,917	6,335
EPEC-40 SCH 40	Minimum Wall (in.)	0.109	0.113	0.133	0.140	0.145	0.154	0.216
	Wall Tolerance +/-	0.020	0.020	0.020	0.020	0.020	0.020	0.026
	Average ID (in.)	0.602	0.804	1.029	1.360	1.590	2.047	3.042
	Weight (3/ft.)	0.109	0.145	0.215	0.291	0.349	0.469	0.973
	Safe Working Load	601	798	1,340	1,604	1,919	2,579	5,348
EPEC-80 SCH 80	Minimum Wall (in.)	0.147	0.154	0.179	0.191	0.200	0.218	0.300
	Wall Tolerance +/-	0.020	0.020	0.021	0.023	0.024	0.026	0.036
	Average ID (in.)	0.526	0.722	0.936	1.255	1.476	1.913	2.864
	Weight (3/ft.)	0.139	0.188	0.277	0.383	0.465	0.644	1.315
	Safe Working Load	768	1,040	1,533	2,116	2,564	3,545	7,238

## B.2. Innerduct

Corrugated flexible riser innerduct shall be used in accordance with the National Electrical Code and shall comply with all requirements in UL 2024, CSA C22.2 No. 262-04, and ASTM D 4216. The corrugated flexible riser innerduct shall be orange.

The conduit and fittings shall be clearly marked with a UL label. The type and manufacturer shall be identified by legible and permanent markings.

## B.3. Rigid Steel Conduit

Rigid steel conduit (zinc coated) shall conform to the requirements of the American Standards Association Specifications for Rigid Steel Conduit, Zinc Coated, ANSI Designation: C 80.1, except with regard to identification and inspection. In addition to the manufacturer's name or trademark, as required by ANSI Designation: C 80.1, each length of conduit and nipple elbow shall have the Underwriters Laboratories, Inc. label, or an acceptable equivalent, firmly affixed.

## C. Construction

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing conduit within the City of Madison right-of-way.

Each conduit run between access points to the cabling shall be one size for its entire length.

For each conduit run in which cable will not be installed as part of the contract, the ends of the conduit shall be capped with standard conduit caps to preclude water and soil infiltration. If threaded caps are used, the threads shall be lubricated. Conduits terminating in a non-paved location and not in a structure shall be turned up and end at terrace finish grade with a PVC cap securely attached.

A self-sealing split duct conduit product is required. Appropriate split duct PVC-to-HDPE couples/adapters are required to transition from HDPE conduit to PVC conduits and fittings. A high-strength polyethylene adhesive (like Pro-Poly) is required to adhere HDPE conduit to standard PVC conduits and fitting. Standard conduit fittings shall be used and all costs for couplings and joints shall be included in the unit price bid for the conduit.

When connections are to be made to an existing conduit, the Provider shall first verify that the existing conduit is fully clear and useable for its entire cross-section and length. When the existing conduit is found to be defective, the Provider shall notify the Engineer and not proceed until the Engineer so directs. If the Provider connects to an existing defective conduit without the express direction from the Engineer, the Provider shall make any and all necessary repairs and replacements to all conduits, including conduit that was "existing" prior to the Provider starting work. All costs of this work shall be at the expense of the Provider.

The width of the conduit trench shall be sufficient to accommodate the conduit installations shown on the plan without stacking the conduits. The trench shall be excavated true to line and to provide the proper conduit depth.

Native material will not be allowed for backfill if it is thirty percent or more stones by volume. No rocks larger than four-inch diameter, stone aggregate, or any foreign debris shall be backfilled, unless otherwise approved by the Engineer. When sand backfill is required, a six-inch minimum sand padding shall be used below the conduit and a six-inch minimum sand lift shall be used above the conduit.

Conduit to be placed under existing sidewalks, roads, bridges, railroads, gullies, ditches, streams, or rivers, shall be installed by directional boring.

Conduits shall be placed within twelve inches of the back of the curb unless otherwise noted on the plans.

Conduit shall be placed at a minimum depth of thirty inches unless otherwise specified or approved by the Engineer. Greater cable depth is required at the following locations.

- Where conduit crosses roads, bridges, or railroads, the conduit shall be placed at a minimum depth of sixty inches below the surface, or as directed by the permitting authority.
- Where conduit crosses gullies, ditches, streams, or rivers, the conduit shall be placed at a minimum depth of sixty inches below the water level, or as directed by the permitting authority.

Additional conduit required to satisfy the proceeding depth requirements shall not be construed as additional work.

Restore the area to the original condition after installing the conduit.

Conduit in Wisconsin Department of Transportation right-of-way shall meet the requirements of the State of Wisconsin Standard Specifications for Highway and Structure Construction (current edition) Section 671.

#### **D. Measurement**

This item, complete in place and accepted, shall be measured in linear feet in a horizontal plane from terminal connection to terminal connection along the centerline of the trench or conduit, with the terminal connection being the centerline of the handhole or other terminal location as required by the plans and specifications. The quantity measured for payment shall be the summation of linear feet of each size and type.

Additional lengths of conduit necessary for terminating conduit at or above grade shall be installed by the Provider and considered as part of the work included in this item, but will not be measured or paid for directly.

#### **E. Payment**

The quantity, measured as provided above, will be paid for at the contract unit price per linear foot of each of the specified sizes and types, which price shall be payment in full for furnishing, hauling and placing the conduit, hangers, clips, fittings, and attachments; for trench work, such as excavation, bedding and backfilling, including any sand, asphalt, concrete or other required materials; for directional boring; for drilling holes in handholes and resealing such openings after the conduit is installed; for disposal of surplus materials; for restoration of disturbed or damaged areas including seeding and sodding; for making inspections; and for all labor, tools, equipment, and incidentals necessary to complete this item of work in accordance with the contract.

### **17. No. 10 Locate Wire**

#### **A. Description**

This item consists of furnishing and installing locate wire as shown on the plans.

#### **B. Materials**

The locate wire shall be number 10 AWG THHN wire. Green jacket wire is preferred for the tracer wire. Orange jacket wire is acceptable if HDPE coated wire is used.

The Provider shall submit shop drawings of the proposed locate wire prior to the preconstruction meeting. Locate wire proposed for use shall be approved in writing by the Engineer prior to beginning work on the project.

### **C. Construction**

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing conduit within the City of Madison right-of-way.

The Provider shall install locate wire using acceptable trade methods and practices. The Provider shall at all times exercise caution to protect the locate wire and its insulation from being damaged by sharp edges. Under no circumstances shall locate wire ends be left uncovered or allowed to become submerged in water.

Install the locate wire within the associated conduit as shown on the plans. Locate wire installed outside of the conduit is not acceptable.

The locate wire shall have at least 96 inches of extra wire in handholes where the wire passes through and 48 inches of extra wire in handholes where the wire stops. The locate wire shall have all ends connected together to make a complete circuit for locating.

The new conduit shall be traceable at all times during and after construction via the locate wire. The armored jacket of a cable is not an acceptable for locating purposes.

### **D. Measurement**

This item, complete in place and accepted, shall be measured in linear feet in a horizontal plane, from terminal connection to terminal connection along the center line of the trench or conduit with the terminal connection being the center line of the handhole or other terminal location as required by the plans and specifications.

Additional lengths of locate wire for making connections at terminal locations shall be installed by the Provider and considered as part of the work included in this item, but will not be measured or paid for directly.

### **E. Payment**

The quantity of locate wire installed, measured as provided above, will be paid for at the contract unit price per linear foot, which price shall be payment in full for storing, handling, transporting, and installing; for grounding; for furnishing all labor, tools, equipment and incidentals necessary to complete this item of work.

## **18. Fiber Optic Cable**

### **A. Description**

This item consists of furnishing and installing fiber optic cable as shown on the plans.

## **B. Materials**

The fiber type shall be single mode.

All fibers in the cable shall be usable and meet required specifications.

Each optical fiber shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requires of the specification.

Fiber optic cables shall be loose tube, double jacketed, and dielectric.

The Provider shall submit shop drawings of the proposed fiber optic cable prior to the preconstruction meeting. Fiber optic cable proposed for use shall be approved in writing by the Engineer prior to beginning work on the project. Teldor fiber optic cables will not be approved due to cable construction inconsistencies. Samsung fiber optic cables are not preferred as the jacket ripcord easily breaks. Superior Essex fiber optic cables are not preferred as the glass used (Prysmian) can have issues splicing.

### **B.1. Fiber Characteristics**

Each optical fiber shall consist of a Germania-doped silica core surrounded by a concentric glass cladding. The fiber shall be a matched clad design.

Each optical fiber shall be proof tested by the fiber manufacturer at a minimum of 100 kpsi (0.69 GPa).

The fiber shall be coated with a dual layer acrylate protective coating. The coating shall be in physical contact with the cladding surface.

The attenuation specification shall be a maximum value for each cabled fiber on the original shipping reel.

The fiber shall meet ITU-T G.652.D specifications.

### **B.2. Cable Construction**

Optical fibers shall be placed inside a loose buffer tube. Each buffer tube shall contain 6/12 fibers dependent on the fiber size. The fibers shall not adhere to the inside of the buffer tube.

Each buffer tube and fiber shall be distinguishable by means of color coding according to the TIA/EIA-598 Specifications, "Optical Fiber Cable Color Coding". Buffer tubes containing fibers shall be color-coded with distinct and recognizable colors according to the above reference's specification.

In buffer tubes containing multiple fibers, the colors shall be stable across the specified storage and operating temperature range and not subject to fading or smearing onto each other. Colors shall not cause fibers to stick together.

Buffer tubes shall be kink resistant within the specified minimum bend radius.

Fillers may be included in the cable core to lend symmetry to the cable cross-section where needed.

The central anti-buckling member shall consist of a glass reinforced plastic rod. The purpose of the central member is to prevent buckling of the cable.

Each buffer tube shall contain a water-swellaable yarn or water blocking element for water-blocking protection. The water-swellaable yarn or water blocking element shall be non-nutritive to fungus, electrically non-conductive, and homogeneous. It shall also be free from dirt or foreign matter. This yarn or element will preclude the need for other water-blocking material. The buffer-tube shall be gel-free.

The optical fibers shall not require cleaning before placement into a splice tray or fan-out kit.

Buffer tubes shall be stranded around the dielectric central member using the reverse oscillation, or "S-Z", stranding process.

Water swellaable yarn(s) shall be applied longitudinally along the central member during stranding. Water blocking elements shall be applied uniformly throughout the buffer tube.

Two polyester yarn binders shall be applied contra-helicly with sufficient tension to secure each buffer tube layer to the dielectric central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking, and dielectric with low shrinkage.

For single layer cables, a water swellaable tape shall be applied longitudinally around the outside of the stranded tubes/fillers. The water swellaable tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matter.

For dual layer cables, a second (outer) layer of buffer tubes shall be stranded over the original core to form a two-layer core. A water swellaable tape shall be applied longitudinally over both the inner and outer layer. The water swellaable tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matter.

Tensile strength shall be provided by the central member, and additional dielectric yarns as required. The dielectric yarns shall be helically stranded evenly around the cable core.

The MDPE jacket material shall be as defined by ASTM D1248, Type II, Class C, Category 4 and Grades J4, E7, and E8.

The jacket or sheath shall be free of holes, splits, and blisters.

The cable jacket shall contain no metal elements and shall be of a consistent thickness.

For outdoor applications, all fiber optic cables jackets shall be outdoor rated. For indoor applications, all fiber optic cable jackets shall be indoor/outdoor rated.

Cable jackets shall be marked with the manufacturer's name, month and year of manufacture, sequential meter or foot markings, a telecommunication handset symbol as required by Section 350G of the National Electrical Safety Code (NESC), fiber count, and fiber type. The actual length of the cable shall be within -0/+1% of the length markings. The print color shall be white, with the exception that cable jackets containing one or more coextruded white stripes, which shall be printed in light blue. The height of the marking shall be approximately 2.5 mm.

The shipping, storage, and operating temperature range of the cable shall be -40 °C to +70 °C. The installation temperature range of the cable shall be -30 °C to +70 °C.

The completed cable shall be packaged for shipment on wooden reels. Each reel shall have a weatherproof reel tag attached identifying the reel and cable. The top and bottom ends of the cable shall be available for testing. Both ends of the cable shall be sealed to prevent the ingress of moisture. Each cable shall be accompanied by a cable data sheet. The cable data sheet shall include the following information:

- Manufacturer Cable Number
- Manufacturer Product Number
- Factory Order Number
- Customer Purchase Order Number
- Ordered Length
- Actual Shipped Length
- Measured Attenuation of Each Fiber (for lengths greater than 1000 m)

### **C. Construction**

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing conduit within the City of Madison right-of-way.

A certified fiber optic technician shall supervise all fiber optic cable installation. Prior to the preconstruction meeting, submit materials indicating the certified technician has attended and successfully completed at least one four day class on the installation of fiber optic products conducted by major manufacturer and have FOA certification and demonstrating that the certified technician has a minimum of two years of work experience in the last five years with splicing, termination, and testing of fiber optic cable.

If requested by the Engineer, the Provider shall perform OTDR tests on randomly selected fiber optic cable reels and compare the results to the cable manufacturer's specifications prior to cable placement. Fiber optic cable which does not meet the cable manufacturer's specification will be identified to the Engineer within twenty-four hours of testing and shall not be used.

The Provider shall inspect the fiber optic cable to ensure that it is free from defects. Cable damaged due to the Provider's negligence will be the responsibility of the



Provider. Every instance of damaged cable observed at any time shall be immediately reported to the Engineer which prior to installation, during construction, during testing, or after installation. The method of repair or correction will be determined by the Engineer. The Provider shall make repairs or corrections promptly.

Cable repairs shall be made as follows:

- Minor damage to the outer jacket of the cable observed prior to or during construction shall be repaired per the Engineer.
- Cable damage in excess of minor damage to the outer jacket observed prior to or during construction shall be repaired by enclosing the damaged section of the cable in a handhole as specified by the Engineer. If the cable shield has been broken or the conductor insulation damaged, the cable shall be restored to a new condition. This may require cutting out the damaged section of cable or replacing an entire section of cable between two existing splice locations. The method of correction will be determined by the Engineer.
- Damage to the cable discovered after installation through testing or observation shall be repaired per the Engineer. This may require removing the damaged cable and replacing it with a short section of new cable with splices made in type VII handholes. If the damage is close enough to a handhole, it may be possible to repair the cable by removing the damaged cable jacket and placing a mid-sheath splice case on the cable.

When installing fiber optic cable using a pulling machine, a breakaway swivel, along with a slip clutch capstan winch that shows the dynamometer readings at all times, shall be used. Do not exceed a maximum pulling tension of 600 pounds or 400 pounds, as designated by the manufacturer.

When installing fiber optic cable in HDPE conduit, the fiber optic cable shall be placed by blowing.

Ensure the minimum bending radius of the fiber optic cable is not exceeded. The minimum bending radius for fiber optic cable in movement is twenty times the outside diameter of the cable. The minimum bending radius for fiber optic cable in place is ten times the outside diameter of the cable.

All slack fiber shall be wound using the industry standard figure eight coiling method.

Cable lubrication shall be used in accordance with the manufacturer's recommendation.

Ground the fiber optic cable in accordance with NEC Article 770.

Fiber optic cable tags/labels shall be placed within forty-eight hours of the cable installation at all handhole locations. All labels shall be self-laminated.

Owner identification tags shall be placed on all fiber optic cables within twenty-four inches of the conduit ends in a handhole. Labels stating fiber optic cable name and direction shall be placed within twelve inches of the fiber optic splice enclosure.

Fibers shall be labeled with direction and nearest splice/termination point. Fibers shall be color coated at the fiber optic splice enclosure and within three feet of the handhole

entry point. Buffer tubes shall be labeled within two inches of the splice tray entry/termination.

#### **D. Measurement**

This item, complete in place and accepted, shall be measured in linear feet in a horizontal plane from terminal connection to terminal connection along the centerline of the fiber optic cable, with the terminal connection being the centerline of the handhole or other terminal location as required by the plans and specifications. This shall also include all lengths necessary for coiling in handholes. The quantity measured for payment shall be the summation of linear feet of each size and type.

#### **E. Payment**

The quantity, measured as provided above, will be paid for at the contract unit price per linear foot of each of the specified sizes and types, which price shall be payment in full for furnishing and the installing fiber optic cable; for grounding; for disposal of surplus materials; for restoration of disturbed or damaged areas including seeding and sodding; and for all labor, tools, equipment, and incidentals necessary to complete this item of work in accordance with the contract.

### **19. Fiber Optic Splice Enclosure**

#### **A. Description**

This item consists of furnishing and installing fiber optic splice enclosures as shown on the plans.

#### **B. Materials**

Furnish fiber optic splice enclosures to be used in fiber optic splices for both mainline end-to-end splices and drop splices, as shown in the plans.

Furnish fiber optic splice enclosures designed for use under the most severe conditions such as moisture, vibration, impact, cable stress, and flex temperature extremes as demonstrated by successfully passing the factory test procedures.

The Provider shall submit shop drawings of the proposed fiber optic splice enclosure materials prior to the preconstruction meeting. Fiber optic splice enclosure proposed for use shall be approved in writing by the Engineer prior to beginning work on the project.

The following fiber optic splice enclosure materials are approved for use on this project:

Splice Enclosure

Tyco FOSC 450-D6-6-NT-0-T6V

Tyco FOSC 600-D8-B-NT-0-D4V

Splice Tray

Tyco FOSC-ACC-D-TRAY-96

Splice Modules

Tyco FOSC-ACC-SPLICEHLDR12-SMV

Splice Sleeves

Tyco SMOUV-1120-02-US

Drop Port Wrap Kit

Tyco FAK-MULDRP-45-R-DRP

**C. Construction**

The Provider shall provide the Engineer with the following information at least five business days prior to performing any splicing work:

- Date and time fiber optic splicing work is proposed to be performed
- Expected downtime of the existing fiber optic network
- On-site contact information including name, company, and phone number

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing conduit within the City of Madison right-of-way.

A certified fiber optic technician shall perform all work with the fiber optic splice enclosure. Prior to the preconstruction meeting, submit materials indicating the certified technician has attended and successfully completed at least one four day class on the installation of fiber optic products conducted by major manufacturer and have FOA certification and demonstrating that the certified technician has a minimum of two years of work experience in the last five years with splicing, termination, and testing of fiber optic cable.

The Provider shall create an umbilical cable by securing all fiber optic cables at the splice location into one cable using Scotch Super 33+ Vinyl Electrical Tape or Scotch Vinyl Electrical Tape Super 88.

The length of cable to be exposed within an enclosure must be cut according to the manufacturer's specification. Cables prepped into a splice enclosure must be clean, secured, and labeled. Additional requirements include:

- Backbone ring-cut and end-cut cables shall enter the splice enclosure at the lowest open ports.
- Backbone cable slack shall be wrapped in the bottom of the splice enclosure slack basket.
- Lateral cables shall enter at the highest open ports.
- Lateral cable slack shall be wrapped on the top of the splice enclosure slack basket.
- When splicing multiple cables, each with an outside diameter of half an inch, a single splice enclosure port must be used with a drop port wrap kit.

When using a Tyco 450D splice enclosure, the following requirements apply:

- Cables must have the outer jacket cut back in such a way that the proper amount of cable splice is in the splice enclosure. The following lengths allow for fifty inches of prepped strand length per buffer tube for the splice tray. Regardless of how much slack is in the slack basket, there must always be at least fifty inches of prepped strand length per buffer tube in the splice tray.
  - Mid-sheath splices require 196 inches of stripped cable (from center of loop, strip back 98 inches in each direction on the cable)
  - End splices require 118 inches of stripped cable

When using a Tyco 600D splice enclosure, the following requirements apply:

- Cables must have the outer jacket cut back in such a way that the proper amount of cable splice is in the splice enclosure. The following lengths allow for fifty inches of prepped strand length per buffer tube for the splice tray. Regardless of how much slack is in the slack basket, there must always be at least fifty inches of prepped strand length per buffer tube in the splice tray.
  - Mid-sheath splices require 230 inches of stripped cable (from center of loop, strip back 115 inches in each direction on the cable)
  - End splices require 138 inches of stripped cable
- The large strain relief must be used for all cables installed into the splice enclosure.

A label maker must be used for all labels. Label the enclosure as follows:

- Label the cables entering the splice enclosure with the following information:
  - Direction of the cable
  - Cable count
  - Cable name (or location being served if applicable)
- Label the buffer tubes within two inches of entering the splice tray with the following information:
  - Direction of the cable
  - Cable count
  - Cable name (or location being served if applicable)
- Label the splice trays with the following information:
  - Buffer tube color on cover over splice holder
  - Strand color of both strands being spliced over splice chip
- Label the ground wire with the following information:
  - Direction of the cable
  - Cable count

Splice the fiber optic cables within the fiber optic splice enclosure in accordance with fiber optic splice enclosure manufacturer's instructions and the "Fiber Optic Splice" requirements.

Ground the fiber optic splice enclosure per the manufacturer's recommendations.

#### **D. Measurement**

These items shall be measured as units complete in place and accepted in accordance with the contract.

#### **E. Payment**

These items, measured as provided above, will be paid for at the contract unit price for each, which price shall be payment in full for furnishing and installing all materials necessary to complete the installation; for labeling; for grounding; and for all labor, tools, equipment and incidentals necessary to complete these items of work.

## **20. Fiber Optic Splice**

#### **A. Description**

This item consists of furnishing and installing fiber optic splices as shown on the plans.

#### **B. Materials**

The Provider shall furnish all equipment necessary to perform the fiber optic splicing.

#### **C. Construction**

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing conduit within the City of Madison right-of-way.

The Provider shall provide the Engineer with the following information at least five business days prior to performing any splicing work:

- Date and time fiber optic splicing work is proposed to be performed
- Expected downtime of the existing fiber optic network
- On-site contact information including name, company, and phone number

All splicing operations shall occur between the hours of 12:00am and 6:00am if Network will be downed by PROVIDER to make splice on cabling. All other Splicing can be preformed during normal business hours per Engineering Approval.

A certified fiber optic technician shall perform all work for fiber optic splicing. Prior to the preconstruction meeting, submit materials indicating the certified technician has attended and successfully completed at least one four day class on the installation of fiber optic products conducted by major manufacturer and have FOA certification and

demonstrating that the certified technician has a minimum of two years of work experience in the last five years with splicing, termination, and testing of fiber optic cable.

Document the entire splicing process by taking the following pictures:

- Splice enclosure and fiber optic cables before taking them out of the handhole
- Inside of the splice enclosure before beginning any work
- Inside of the splice enclosure once work is complete
- Splice enclosure and fiber optic cables after placing them back into the handhole

Splice the fiber optic cables within the fiber optic splice enclosure in accordance with fiber optic splice enclosure manufacturer's instructions and the following requirements:

- All splice enclosures shall be clean from dirt, cable grease, or any other foreign objects.
- Strength members must be fastened down tightly, including any Kevlar wraps if they exist. Any coating on strength members must be removed prior to securing it under the clamp. Tighten all nuts and bolts.
- Clean and organize the buffer tubes within the case according to the manufacturer's instructions. Approved cleaning materials are isopropyl alcohol, D-Gel, or Fiber Clean. Do not use kerosene, gasoline, acetone, or any other chemical.
- Secure the splice trays within the case. Tighten all nuts and bolts.
- Tubes that enter a tray must be protected from the tie wraps per the manufacturer's instructions.
- Dress and organize the fiber neatly into a splice tray. All buffer tubes must be felted individually with at least one eighth of an inch of color showing on the stripped side of the buffer tube. At no time is it acceptable to secure the buffer tubes together with felt wrap or tape in the splice tray. Buffer tubes must be individually wrapped with felt tape, but may be secured together at the tray tie-wrap points with multiple tubes at those points. All tie wraps must be flush cut.
- Completely shrink fusion heat shrinks and secure the fiber in the splice chips properly so that whether the protective bar or fiber faces up it will be uniform. All exposed glass must be centered properly in the heat shrink. At no time is it acceptable to use silicone gel to secure the splice sleeves. Scotch Super 33+ Vinyl Electrical Tape or Scotch Vinyl Electrical Tape Super 88 are the only acceptable tapes allowed to secure splice sleeves in the holders if spliced in older non-Tyco splice enclosures.
- Fiber cross-connections made between trays shall use the following materials:
  - 12 count: Tuff-Nut 250µm SM 12-fibre 3mm Cable PBT on 6,500-foot reel
  - 24 count: Tuff-Nut 250µm SM 24-fibre 4mm Cable PBT on 6,500-foot reel
- Fibers that are not to be spliced but are in the splice tray should be dressed last into the tray and labeled as to which tube/cable the fiber is from.
- The overall appearance of the splice enclosure must be clean and organized.

The following requirement shall also apply to mid-sheath splices:

- Place the reverse spiral wrap in the center of the loop.

- Evenly coil and loosely tie wrap together the tubes not cut in a mid-sheath. Place the coil under the splice tray and security it.
- All slack in a mid-sheathed buffer tube must be unwrapped as much as possible up to the entry of the buffer tube.
- Except in cases of emergency repair of fiber, slack cable shall not be taken from existing umbilical tails at existing splice locations for the addition of a new mid-sheath splice. All new mid-sheath splice locations must be approved by the Engineer.

Do not deviate from the splice details shown in the plans without the Engineer's approval.

#### **D. Measurement**

These items shall be measured as units complete in place and accepted in accordance with the contract.

#### **E. Payment**

These items, measured as provided above, will be paid for at the contract unit price for each, which price shall be payment in full for furnishing and installing all materials necessary to complete the installation and for all labor, tools, equipment and incidentals necessary to complete these items of work.

## **21. Fiber Optic Termination/Patch Panel**

### **A. Description**

This item consists of furnishing and installing fiber optic termination/patch panels as shown on the plans.

### **B. Materials**

The fiber optic termination/patch panel shall meet the following requirements:

- Mountable on a two post 19-inch or 23-inch EIA rack
- One rack unit (U) in size
- Accommodate LC/UPC fiber terminations
- Include strain relief cable kits
- Equipped with labels

The Provider shall submit shop drawings of the proposed fiber optic splice enclosure materials prior to the preconstruction meeting. Fiber optic splice enclosure proposed for use shall be approved in writing by the Engineer prior to beginning work on the project.

The following fiber optic splice enclosure materials are approved for use on this project:

### **Clearfield FxDS Fiber Termination Panels**

### **C. Construction**

A certified fiber optic technician shall perform all work for fiber optic termination/patch panels. Prior to the preconstruction meeting, submit materials indicating the certified

technician has attended and successfully completed at least one four day class on the installation of fiber optic products conducted by major manufacturer and have FOA certification and demonstrating that the certified technician has a minimum of two years of work experience in the last five years with splicing, termination, and testing of fiber optic cable.

Install the termination/patch panel per the manufacturer's instructions.

Install the termination/patch panel in the rack at the location indicated by the Engineer.

#### **D. Measurement**

These items shall be measured as units complete in place and accepted in accordance with the contract.

#### **E. Payment**

These items, measured as provided above, will be paid for at the contract unit price for each, which price shall be payment in full for furnishing and installing all materials necessary to complete the installation; and for all labor, tools, equipment and incidentals necessary to complete these items of work.

## **22. Fiber Optic Termination**

#### **A. Description**

This item consists of furnishing and installing fiber optic terminations as shown on the plans.

#### **B. Materials**

The Provider shall furnish all equipment necessary to perform the fiber optic termination.

#### **C. Construction**

A certified fiber optic technician shall perform all work for fiber optic termination. Prior to the preconstruction meeting, submit materials indicating the certified technician has attended and successfully completed at least one four day class on the installation of fiber optic products conducted by major manufacturer and have FOA certification and demonstrating that the certified technician has a minimum of two years of work experience in the last five years with splicing, termination, and testing of fiber optic cable.

Terminate the fiber optic cable per the manufacturer's instructions.

Terminate the fibers on the termination/patch panel with LC/UPC connectors.

Do not deviate from the termination details shown in the plans without the Engineer's approval.

#### **D. Measurement**

These items shall be measured as units complete in place and accepted in accordance with the contract.



## **E. Payment**

These items, measured as provided above, will be paid for at the contract unit price for each, which price shall be payment in full for furnishing and installing all materials necessary to complete the installation and for all labor, tools, equipment and incidentals necessary to complete these items of work.

## **23. Fiber Optic System Testing**

### **A. Description**

This item consists of testing the fiber optic system as shown on the plans.

### **B. Materials**

The Provider shall furnish all equipment necessary to test the completed installation. Test and demonstrate to the Engineer's satisfaction that all equipment is calibrated and in working order.

### **C. Construction**

A certified fiber optic technician shall perform all work for testing. Prior the preconstruction meeting, submit materials indicating the certified technician has attended and successfully completed at least one four day class on the installation of fiber optic products conducted by major manufacturer and have FOA certification and demonstrating that the certified technician has a minimum of two years of work experience in the last five years with splicing, termination, and testing of fiber optic cable.

After completing cable installation, splicing, and termination, the Provider test all fibers for continuity, events losses, and total attenuation of the cable as follows:

1. Test each individual fiber for event losses using an optical time-domain reflectometer (OTDR). Conduct the test using the standard operating procedure as defined by the manufacturer of the test equipment.
2. Connect the OTDR and the cable with a factory patch cord of a length equal to the dead zone of the OTDR. Optionally, the technician can use a factory fiber box of 325 feet minimum with no splices within the box.
3. Test each individual fiber for total segment attenuation loss using an optical source/power meter. Conduct the test using the standard operating procedure as defined by the manufacturer of the test equipment.
4. Conduct both tests, OTDR and optical source/power meter, at 1310 nm and 1550 nm for each fiber in the cable.
5. Conduct both tests bi-directionally for each fiber in the cable.

After completing the tests, the Provider shall submit five hard copies of the test results to the Engineer documenting the following test parameters:

- Operator name

- Date and time
- Setup parameters
- Wavelength
- Pulse width OTDR
- Refractory index OTDR
- Range
- OTDR
- Scale OTDR

The test results summarize the results of the both the OTDR and optical source/power meter tests in a spreadsheet/tabular format adhering to the following requirements:

- List fiber optic segment name including route, start point, and end point.
- List all fibers by number.
- List direction of test as NB, SB, EB, or WB.
- List total fiber optic cable length for each fiber as documented in the OTDR test.
- List attenuation in dB of gain or loss for each fiber optic event in the OTDR test.
- List fiber optic loss event descriptions and locations including splices, miscellaneous events, and terminations.
- List the attenuation across the cable in dB/mile for each fiber tested.
- List the total segment loss for each fiber as determined by the optical source/power meter test.
- Provide bi-directional data including event distances, event descriptions, and attenuation losses for each fiber corresponding to a common start point
- Provide bi-directional data on separate lines, side-by-side within the same sheet.
- Provide 1310 nm and 1550 nm test results on separate sheets in identical formats.

The Provider shall also provide electronic copies of the fiber optic cable traces taken during the OTDR test to the Engineer for review. The electronic files shall be in a universal file format, or the Provider shall supply the Engineer software to view the files.

The following requirements shall be used for acceptance of fiber optic cable testing. If the fiber optic cable testing does not pass these requirements, the Provider shall replace the cable run at the Provider's expense.

- The dB/km loss shall not exceed three percent to the factory test or one percent of the cable's published production loss. The error rate of the test equipment will be considered.
- No event loss shall exceed 0.10 dB.
- The total dB loss across the cable shall not exceed 0.5 dB/km.

The Provider shall notify the Engineer at least forty-eight hours in advance of any work on City of Madison owned or maintained facilities to arrange for an inspector to be present during all such work. Work shall not commence until the City Traffic Engineering inspector is present.

The Provider shall call Mike Benzschawel (608-235-3649) at the City of Madison Traffic Engineering Shop at least twenty-four hours in advance of installing conduit within the City of Madison right-of-way.

#### **D. Measurement**

This item shall be measured as a lump sum, with all fiber optic cables completed tested and passing acceptance requirements.

### **E. Payment**

This item, measured as provided above, will be paid for as a lump sum, which price shall be payment in full for fiber optic system testing documentation; disposal of surplus materials and for all labor, tools, equipment, and incidentals necessary to complete this item of work in accordance with the contract.

## **24. Redline As-Builts**

The Provider shall submit a complete set of redline as-builts to the Engineer. These documents will be reviewed and shall be approved in writing by the Engineer prior to project completion and final payment. Any redlines found to be incomplete or incorrect will be returned to the Provider to be rectified.

All redline drawings must be made in red ink on the construction drawings. All redline information must be legibly printed on the drawings. Do not scribble or place unrelated information on the drawings.

Redline as-builts shall include the following information:

- Detailed description of all changes to the original construction drawings including the reason for the change and the person who approved it
- Conduit type, size, and quantity if different than specified on the original construction drawings
- Conduit offset distance at a minimum of every 100 feet:
  - From the edge of pavement, sidewalk, or curb
  - From other underground utilities
  - From above ground structures (buildings, guard rail, utility poles, etc.)
- Beginning and end location of all conduit runs
- Beginning and end location of all changes in conduit type, size, or quantity
- Location and offset for the beginning and end of all running line changes
- Depth of cover every 50 feet and at all road crossing and other utility crossings
- Plan and profile drawing including offsets, depth of cover, and angle of crossing at all road crossings.
- Handhole offset distance from the edge of pavement, sidewalk, or curb
- Location of all duct splices
- Suggested Optical Cable Code (SOCC) (i.e. SR-38N2LT-048) stamped on cable
- Cable length marking at all entry and exit points (handholes, buildings, etc.)

This item, as described above, shall be considered subsidiary and incidental to the other items of the contract, and no separate or additional compensation will be made.

## SCHEDULE B

### Pricing Structure and Payment

DESCRIPTION	COST/UNIT	UNIT	QTY	COST
INSPECT AND CLEAN EXISTING CONDUIT	\$ 25,625.00	LS	1	\$ 25,625.00
REMOVE HANDHOLE	\$ 1,150.00	EACH	1	\$ 1,150.00
REMOVE MANHOLE	\$ 1,750.00	EACH	4	\$ 7,000.00
REMOVE CABLE	\$ 39,250.00	LS	1	\$ 39,250.00
REMOVE FIBER OPTIC SPLICE ENCLOSURE	\$ 450.00	EACH	3	\$ 1,350.00
TYPE V HANDHOLE	\$ 1,750.00	EACH	3	\$ 5,250.00
TYPE VII HANDHOLE	\$ 1,750.00	EACH	2	\$ 3,500.00
TYPE X HANDHOLE	\$ 1,750.00	EACH	1	\$ 1,750.00
COMMUNICATION VAULT TYPE ROUND	\$ 1,750.00	EACH	13	\$ 22,750.00
TRACER WIRE MARKER POST	\$ 20.50	EACH	13	\$ 266.50
BUILDING/WALL PENETRATION	\$ 12,250.00	EACH	2	\$ 24,500.00
NON-METALLIC CONDUIT 2-INCH	\$ 4.10	LF	885	\$ 3,628.50
NON-METALLIC CONDUIT 3-INCH	\$ 4.35	LF	520	\$ 2,262.00
NON-METALLIC CONDUIT 3-INCH DIRECTIONAL BORE	\$ 12.00	LF	195	\$ 2,340.00
CONDUIT HDPE 1-DUCT 2-INCH	\$ 2.85	LF	6,625	\$ 18,881.25
CONDUIT HDPE DIRECTIONAL BORE 1-DUCT 2-INCH	\$ 9.50	LF	335	\$ 3,182.50
INNERDUCT 1.5-INCH	\$ 25.00	LF	350	\$ 8,750.00
RIGID STEEL CONDUIT 3-INCH	\$ 75.00	LF	20	\$ 1,500.00
NO. 10 LOCATE WIRE	\$ 0.25	LF	8,520	\$ 2,130.00
FIBER OPTIC CABLE 12-CT	\$ 1.06	LF	840	\$ 890.40
FIBER OPTIC CABLE 72-CT	\$ 1.37	LF	760	\$ 1,041.20
FIBER OPTIC CABLE 144-CT	\$ 1.83	LF	61,800	\$ 113,094.00
FIBER OPTIC SPLICE ENCLOSURE	\$ 635.00	EACH	15	\$ 9,525.00
FIBER OPTIC SPLICE	\$ 20.00	EACH	1,784	\$ 35,680.00
FIBER OPTIC TERMINATION/PATCH PANEL (12-POSITION)	\$ 385.00	EACH	1	\$ 385.00
FIBER OPTIC TERMINATION/PATCH PANEL (96-POSITION)	\$ 1,450.00	EACH	1	\$ 1,450.00
FIBER OPTIC TERMINATION/PATCH PANEL (144-POSITION)	\$ 2,225.00	EACH	2	\$ 4,450.00
FIBER OPTIC TERMINATION	\$ 145.00	EACH	368	\$ 53,360.00
FIBER OPTIC SYSTEM TESTING	\$ 34,507.00	LS	1	\$ 34,507.00
		<b>TOTAL</b>		<b>\$ 429,448.35</b>

Upon material purchase date, Provider will provide Dane County with appropriate Purchase Order confirmation and invoice 50% of the total Maximum Cost listed on Page 1 of Contract, and due Net 30 days from Invoice Date.

Based on the Work Schedule, Provider shall invoice 1/3 of the remaining total Maximum Cost of Contract - the incurred labor, materials, and other non-material costs over the months of October and November, due Net 30 days.

The remaining 1/3 of the total contract value balance would be invoiced prior to December 31, 2020, upon project completion and acceptance, and due Net 30 days.

Change Orders shall be pre-approved in writing through SRF (the Engineer) and invoiced as they are incurred, Net 30 days.

Provider will work with County on the proposed schedule provided:

8/17/2020 Written notice to proceed by  
Dane County  
9/08/2020 Start construction  
12/15/2020 Restoration and splicing  
complete with full testing

12/31/2020 – Project  
Expiration Date

\*Note: Work Schedule is contingent on permits, road construction, availability of materials and the weather.

## **SCHEDULE C**

### **Reports**

No reports are required under this contract.

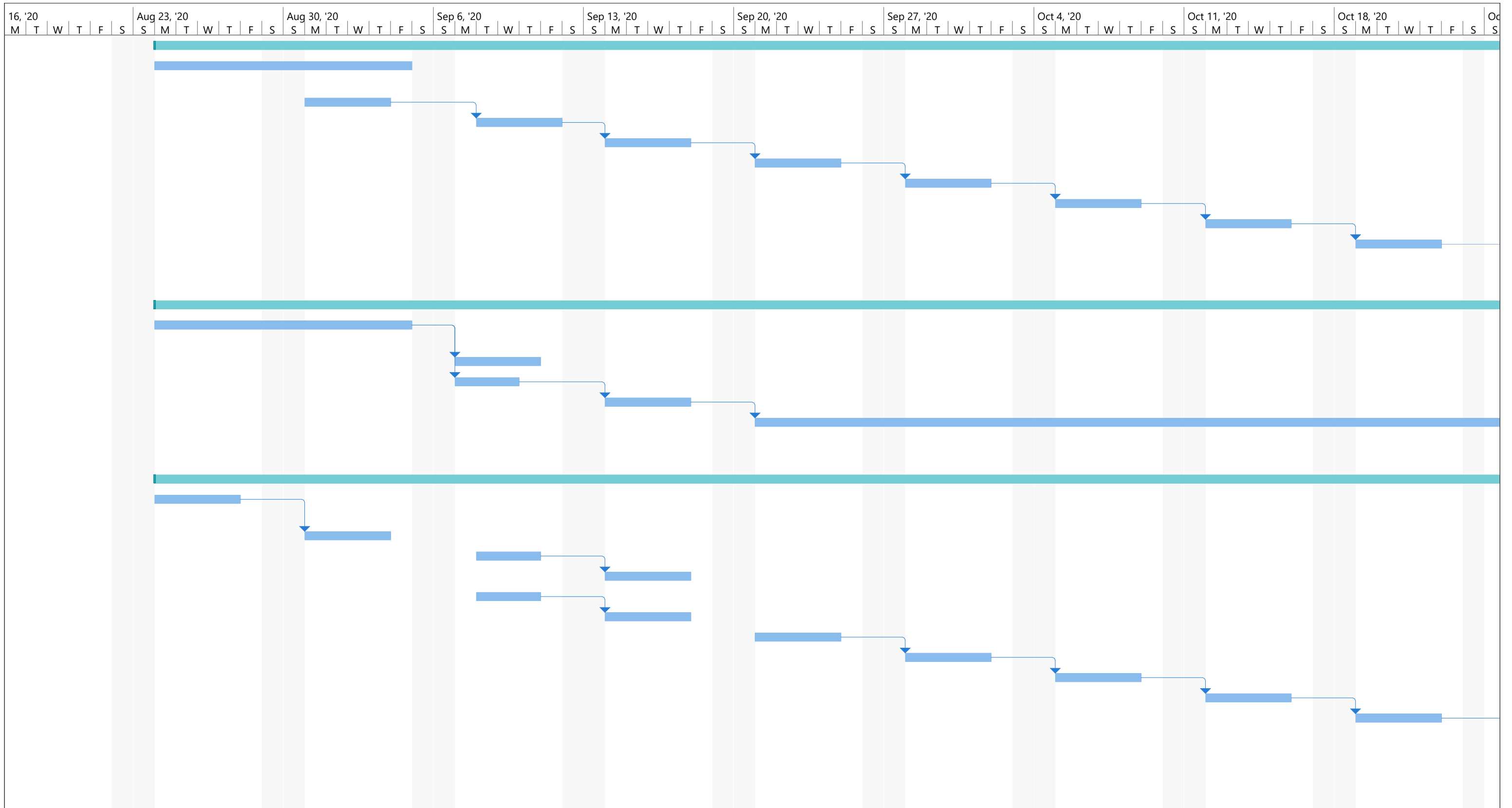






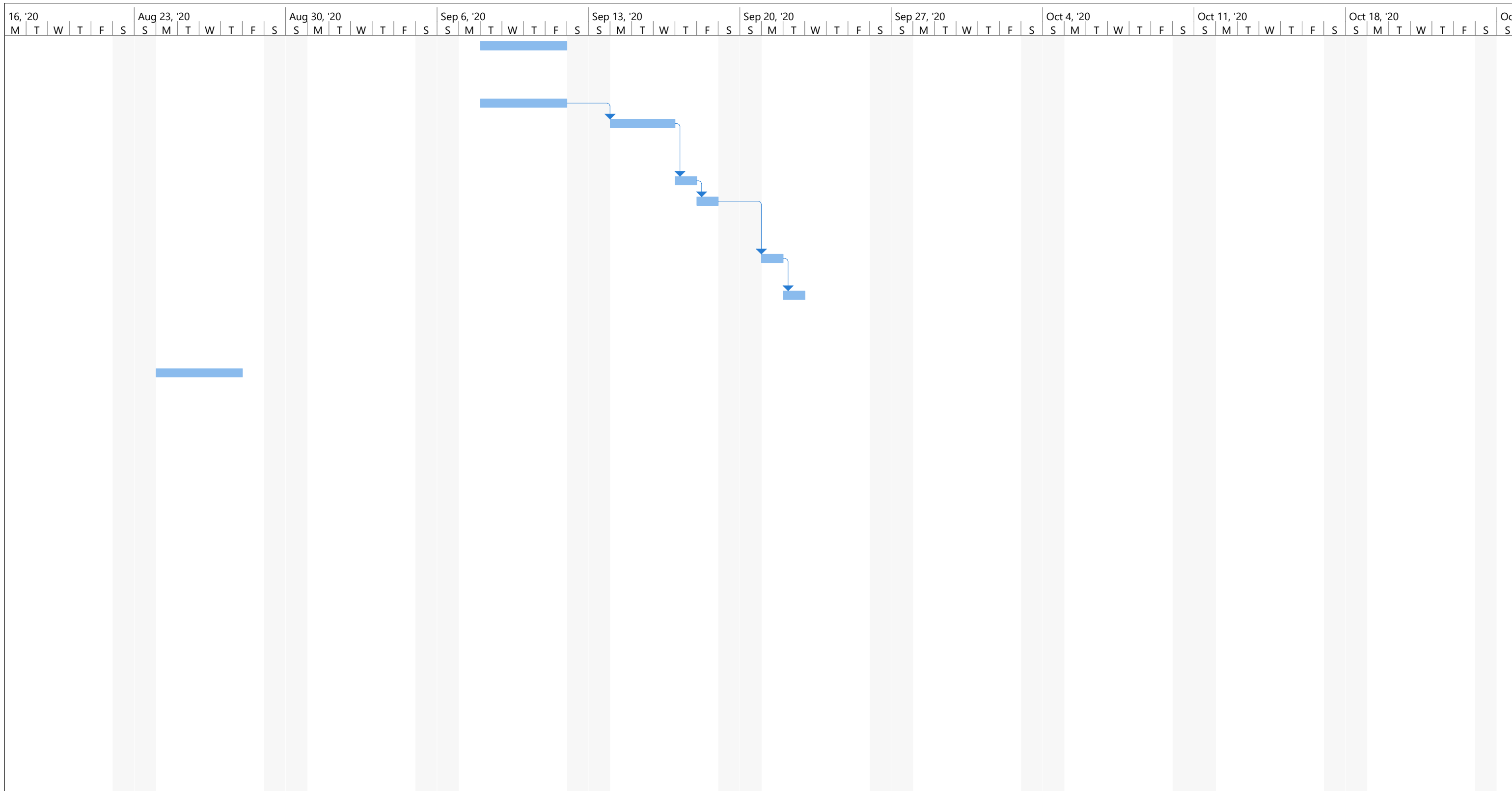


### Schedule D



Project: City County Buildings t Date: Tue 7/28/20	Task	Project Summary	Manual Task	Start-only	Finish-only	Manual Progress	Deadline
	Split	Inactive Task	Duration-only	External Tasks	Manual Summary Rollup	Progress	Manual Progress
	Milestone	Inactive Milestone	Manual Summary	External Milestone	Manual Summary	Manual Progress	Manual Progress
	Summary	Inactive Summary	Manual Summary	External Milestone	Manual Summary	Manual Progress	Manual Progress

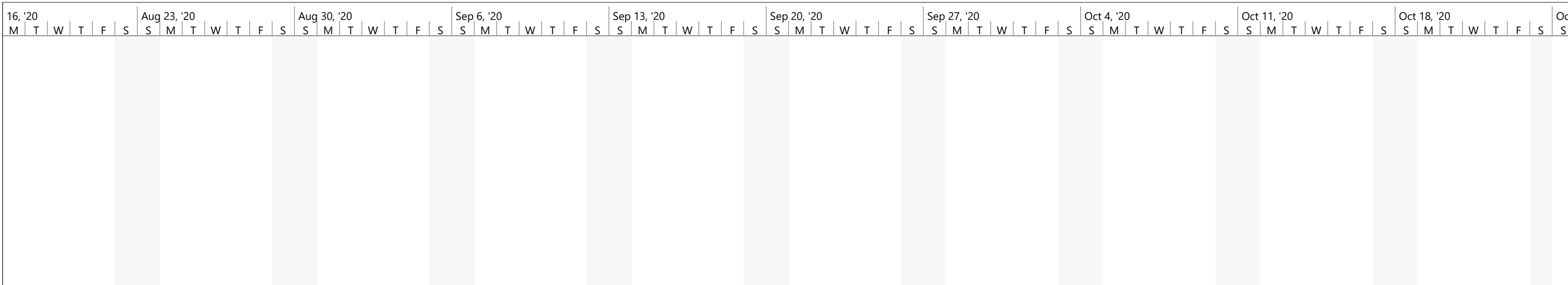
### Schedule D



Project: City County Buildings t  
Date: Tue 7/28/20

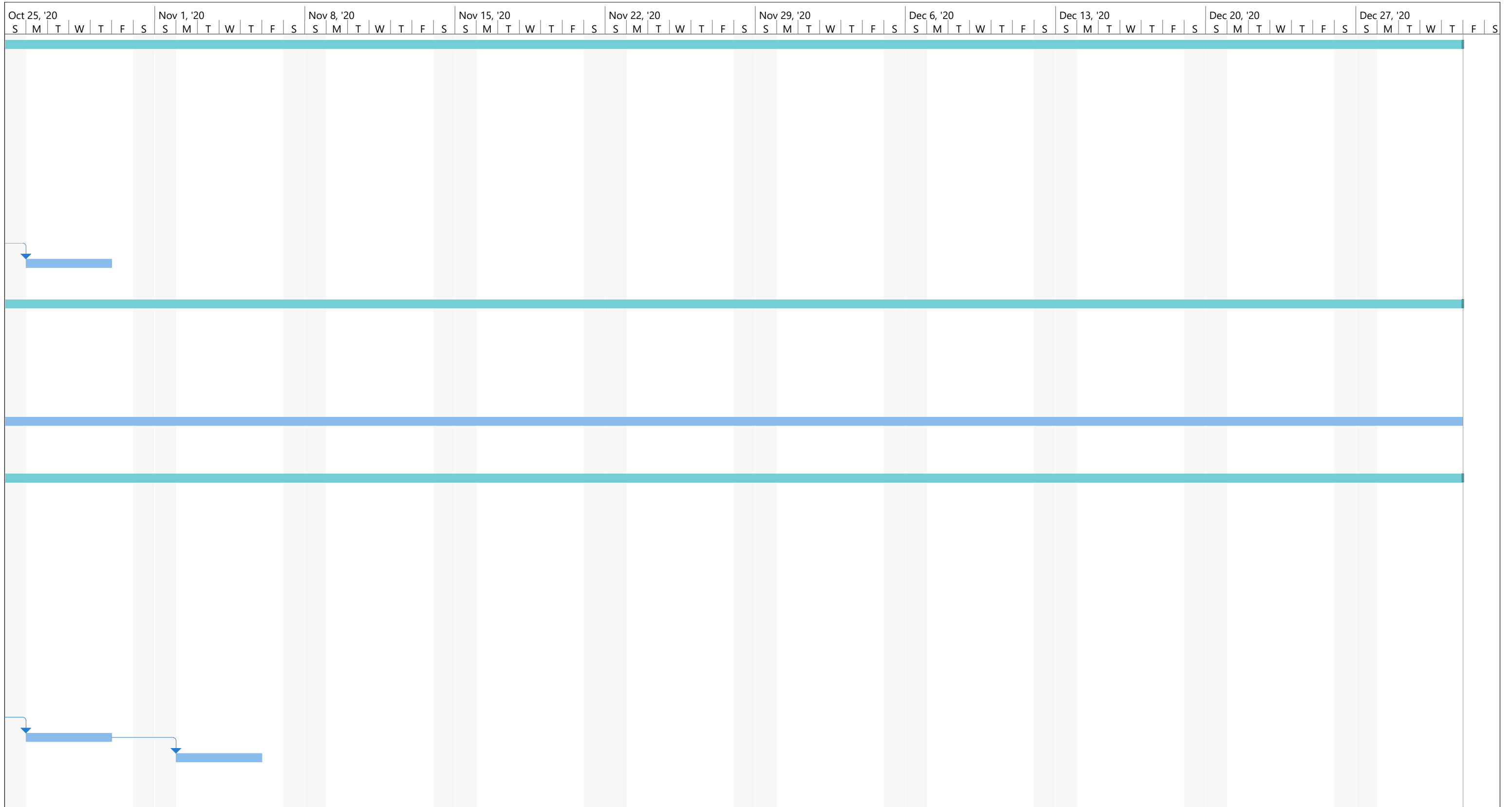
Task		Project Summary		Manual Task		Start-only		Deadline	
Split		Inactive Task		Duration-only		Finish-only		Progress	
Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
Summary		Inactive Summary		Manual Summary		External Milestone			

### Schedule D



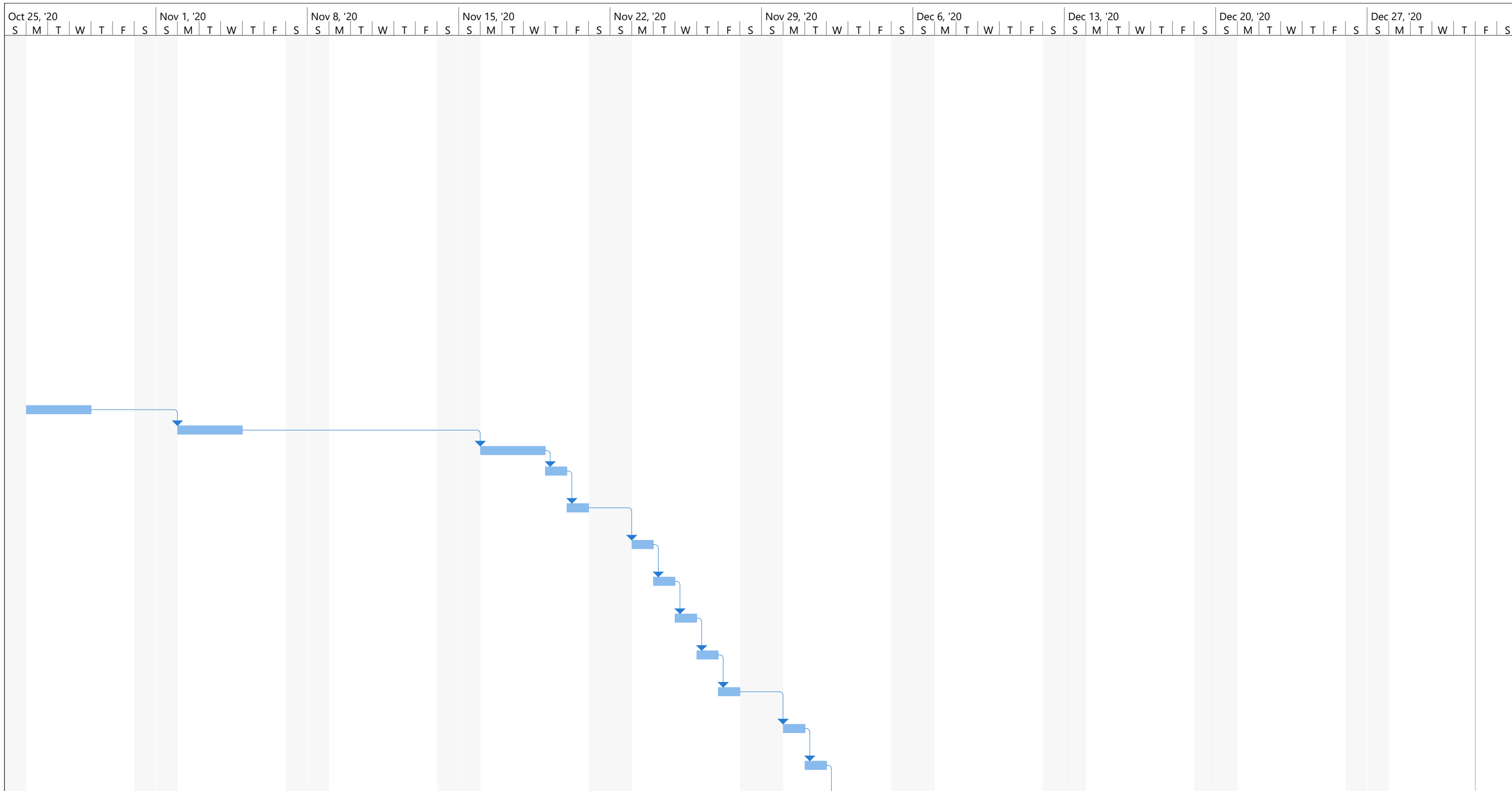
Project: City County Buildings t Date: Tue 7/28/20	Task		Project Summary		Manual Task		Start-only		Deadline	
	Split		Inactive Task		Duration-only		Finish-only		Progress	
	Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
	Summary		Inactive Summary		Manual Summary		External Milestone			

### Schedule D



Project: City County Buildings t Date: Tue 7/28/20	Task		Project Summary		Manual Task		Start-only		Deadline	
	Split		Inactive Task		Duration-only		Finish-only		Progress	
	Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
	Summary		Inactive Summary		Manual Summary		External Milestone			

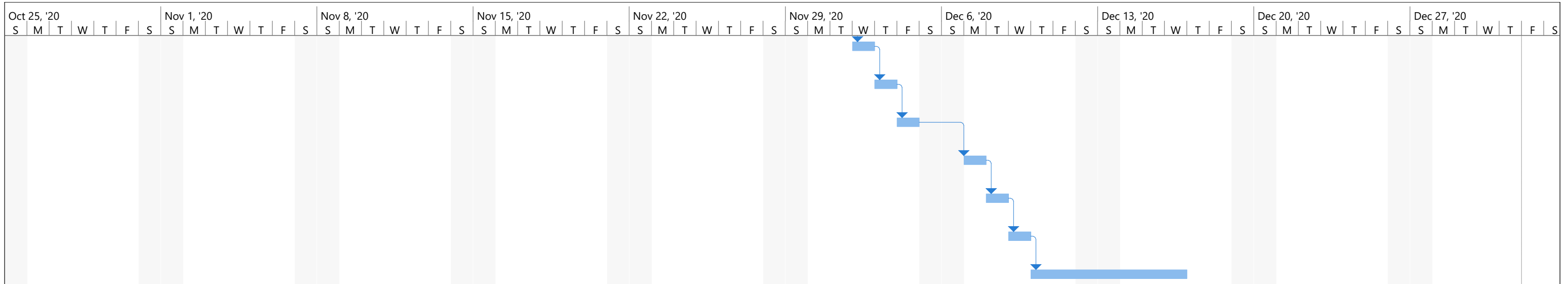
### Schedule D



Project: City County Buildings t  
Date: Tue 7/28/20

Task		Project Summary		Manual Task		Start-only		Deadline	
Split		Inactive Task		Duration-only		Finish-only		Progress	
Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
Summary		Inactive Summary		Manual Summary		External Milestone			

### Schedule D



Project: City County Buildings t  
Date: Tue 7/28/20

Task		Project Summary		Manual Task		Start-only		Deadline	
Split		Inactive Task		Duration-only		Finish-only		Progress	
Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
Summary		Inactive Summary		Manual Summary		External Milestone			