Fiber Backbone Cabling

TOWN OF GLASTONBURY

INVITATION TO BID

BID #	ITEM	DATE & TIME REQUIRED
GL-2012-03	Fiber Backbone Cabling	September 15, 2011 @ 11:00 a.m.

The Town of Glastonbury is currently seeking bids for the construction of approximately 25 miles of fiber optic cabling that will connect the majority of the town's facilities. Also included as additional options in this bid are four additional locations within the town.

Prevailing Wages: The contractor must comply with Section 31-53 of the Connecticut General Statutes as amended, including annual adjustments in prevailing wages

Bid forms may be obtained on the Town's website at www.glastonbury-ct.gov at no charge or at the Office of the Purchasing Agent, Town Hall, 2155 Main Street, Glastonbury, CT 06033 (second level) for a non-refundable fee of $50.00.

A non-mandatory pre-bid meeting is scheduled for August 11th at 9:30 AM at the Academy Building, Meeting Room B, 2143 Main Street, Glastonbury, CT.

The Town reserves the right to waive informalities or reject any part of, or the entire bid, when said action is deemed to be in the best interests of the Town. All Sealed Bids must be submitted to the Office of the Purchasing Agent no later than the time and date indicated. All bids will be publicly opened and read.

An Affirmative Action/Equal Opportunity Employer. Minority / Women /Disadvantaged Business Enterprises are encouraged to bid.

Mary F. Visone
Purchasing Agent

1. Information to Bidders

1.1. General

1.1.1. Sealed bids (**one original and one copy**) on the attached Bid Forms will be received at the Office of the Purchasing Agent, Town Hall, 2155 Main Street, Glastonbury, Connecticut 06033 (second level). At the designated time of opening, they will be publicly opened, read, recorded and placed on file.

1.1.2. Whenever it is deemed to be in the best interest of the Town, the Town Manager, Purchasing Agent or designated representative shall waive informalities in any and all bids. The right is reserved to reject any bid, or any part of any bid, when such action is deemed to be in the best interest of the Town of Glastonbury.

1.1.3. Bidders shall submit a Bid on a lump sum basis for the Base Bid and include a separate price for each alternate described in the Bidding Documents as provided for in the Bid Proposal. The price for each alternate will be the amount added to or deleted from the Base Bid if the Owner selects the alternate. The basis of award will be based upon the sum of the Base Bid plus the sum of any alternates accepted by the Owner.

1.1.4. Bids will be carefully evaluated as to conformance with stated specifications.

1.1.5. The envelope enclosing your bid should be clearly marked by bid number, time of bid, opening and date.

1.1.6. Specifications must be submitted complete in every detail, and when requested, samples shall be provided. If a bid involves any exception from stated specifications, they must be clearly noted as exceptions, underlined, and attached to the bid.

1.1.7. The Bid Documents contain the provisions required for the requested item. Information obtained from an officer, agent, or employee of the Town or any other person shall not affect the risks or obligations assumed by the Bidder or relieve him/her from fulfilling any of the conditions of the Bid.

1.1.8. Each bidder is held responsible for the examination and/or to have acquainted themselves with any conditions at the job site which would affect their work before submitting a bid. Failure to meet this criteria shall not relieve the Bidder of the responsibility of completing the Bid without extra cost to the Town of Glastonbury.

1.1.9. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within sixty (90) days after the actual date of the opening thereof. Should there be reasons why a Bid cannot be awarded within the specified period, the time may be extended by mutual agreement between the Town and the bidder.

1.1.10. Each bid must be accompanied by a bid bond payable to the Town for ten percent (10%) of the total amount of the bid (Base Bid Plus Alternates). The bid bond of the successful bidder will be retained until the payment bond and performance bond have been executed and approved, after which it will be returned. A certified check may be used in lieu of a bid bond. The Town of Glastonbury will not be liable for the accrual of any interest on any certified check submitted. Cashier's checks will not be accepted.

1.1.11. A 100% Performance and Payment bonds are required of the successful bidder. This bond shall cover all aspects of the specification and shall be delivered to the Purchasing Agent prior to the issuance of a purchase order. The Performance and Payment Bonds will be returned upon the delivery and acceptance of the bid items.

1.1.12. The bidder agrees and warrants that in the submission of this sealed bid, they will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religion, national origin, sex, or physical disability including, but not limited to blindness, unless it is shown by such bidder that such disability prevents performance of that which must be done to successfully fulfill the terms of this sealed bid or in any manner which is prohibited by the laws of the United States or the State of Connecticut: and further agrees to provide the Human Relations Commission with such information requested by the Commission concerning the employment practices and procedures of the bidder. An Affirmative Action Statement will be required by the successful bidder.

1.1.13. Bidder agrees to comply with all of the latest Federal and State Safety Standards and Regulations and certifies that all work required in this bid will conform to and comply with said standards and regulations. Bidder further agrees to indemnify and hold harmless the Town for all damages assessed against the Town as a result of Bidder's failure to comply with said standards and/or regulations.

1.1.14. All correspondence regarding any purchase made by the Town of Glastonbury shall reference the Town's purchase order number. Each shipping container shall clearly indicate both Town purchase order number and item number.

1.1.15. Bidder is required to review the Town of Glastonbury Code of Ethics adopted July 8th, 2003 and effective August 1, 2003. Bidder shall acknowledge that they have reviewed the document in the area provided on the bid / proposal response page (BP). The selected Bidder will also be required to complete and sign an Acknowledgement Form prior to award. The Code of Ethics and the Consultant Acknowledgement Form can be accessed at the Town of Glastonbury website at www.glastonbury-ct.gov. Upon entering the website click on Bids & RFPs, which will bring you to the links for the Code of Ethics and the Consultant Acknowledgement Form. If the Bidder does not have access to the internet a copy of these documents can be obtained through the Purchasing Department at the address listed within this bid / proposal.

1.1.16. A non-mandatory pre-bid meeting is scheduled for August 11th at 9:30 AM at the Academy Building, Meeting Room B, 2143 Main Street, Glastonbury, CT. It is recommended that bidders attend this meeting.

1.2. Non Resident Contractors (IF APPLICABLE)

1.2.1. The Town is required to report names of nonresident (out of state) Contractors to the State of Connecticut, Department of Revenue Services (DRS) to ensure that Employment Taxes and other applicable taxes are being paid by Contractors. Upon award, all nonresident contractors must furnish a five percent (5%) sales tax guarantee bond (state form AU-766), or a cash bond for 5% of the total contract price (state form (AU-72) to DRS even though this project is exempt from most sales and use taxes.

See State Notice to Nonresident Contractors SN 2005 (12). If the above bond is not provided the Town is required to withhold 5% from Contractor's payments and forward it to the State DRS.

Contractor must promptly furnish to the Town a copy of the Certificate of Compliance issued by the State DRS.

1.3. Legal Disclosures

1.3.1. Bidder shall include on a sheet(s) attached to its proposal a complete disclosure of all past and pending mediation, arbitration and litigation cases that the bidder or its principals (regardless of their place of employment) have been involved in for the most recent five years. Please include a statement of the issues in dispute and their resolution. Acceptability of Bidder based upon this disclosure shall lie solely with the Town.

1.3.2. Bidder or its principals, regardless of their place of employment, shall not have been convicted of, nor entered any plea of guilty, or nolo contendere, or otherwise have been found civilly liable or criminally responsible for any criminal offense or civil action. Bidder shall not be in violation of any State or local ethics standards or other offenses arising out of the submission of bids or proposals, or performance of work on public works projects or contracts.

1.4. Addendums/Contact Information

1.4.1. Any technical questions regarding this bid shall be made in writing to Bobby Ashton, Information Technology Manager at bobby.ashton@glastonbury-ct.gov. For administrative questions concerning this proposal, please contact Mary F. Visione, Purchasing Agent at purchasing@glastonbury-ct.gov. All questions, answers, and/or addenda, as applicable will be posted on the Town's website at www.glastonbury-ct.gov. (Upon entering the website click on Bids & RFP's). The request must be received at least five (5) business days prior to the advertised response deadline. It is the respondent's responsibility to check the website for addenda prior to submission of any bid/proposal.

1.5. Prevailing Wage Rates:

1.5.1. Respondents shall comply with State Statutes concerning Employment and Labor Practices, if applicable, and Section 31-53 of the Connecticut General Statutes, as amended (Prevailing Wages). Wage Rate Determination for this project from the State of Connecticut is included in the Bid Documents. Certified payrolls for site labor shall be submitted weekly to the Town's Representative or his designee on the correct State of Connecticut form (see RFP). The Town reserves the right to, without prior notice, audit payroll checks given to workers on site in order to ascertain that wages and fringe benefits are being paid as required by the State of Connecticut. Please make special note of the State requirement to adjust wage and fringe benefit rates on each July 1st following the original published rates.

1.5.2. NOTE that respondent is to include in its proposal all costs required by such annual increases in the PREVAILING RATES. NO escalation clauses are to be included in the respondent's proposal and NO escalation clauses will be in the Contract Agreement. Respondent is to anticipate any future increases and include these costs in the proposal response.

1.5.3. Contractor's invoices will not be paid if certified payrolls are incomplete, incorrect or not received in a timely manner.

1.5.4. All Apprentices must be registered with the State of Connecticut and their number shall not exceed the number allowed by law. Otherwise, all workers must be paid at least the Journeyman rate listed including benefits.

1.5.5. Effective July 1, 2009: Any Mechanic, Laborer, or Worker, who performs work in a classification listed on the prevailing wage rate schedule on any public works project covered under C.G.S. Section 31-53, both on site and on or in the public building, must have completed a federal OSHA Safety and Health course within the last 5 years.

1.6. References/Qualifications

1.6.1. Each bid shall also include a description of three (3) projects completed by the bidding company with references to demonstrate successful experience with similar projects. These projects are to include no less than eight miles of fiber optic cabling installed on utility poles for each project.

1.6.2. Any bidder, in order to be considered, shall be engaged primarily in the business of Fiber Optic Cabling with a minimum of five (5) years' experience and have a valid contractor's license in the State of Connecticut.

1.7. Compliance with Green Initiative

1.7.1. The Town of Glastonbury is dedicated to waste reduction and the practice of using and promoting the use of recycled and environmentally preferable products. Bidders are encouraged to submit bids responses that are printed double-sided (except for the signed proposal page) on recycled paper, and to use paper dividers to organize the bid for review. All bid pages should be secured with a binder clip, staple or elastic band, and shall not be submitted in plastic binders or covers, nor shall the bid contain any plastic inserts or pages. We appreciate your efforts towards a greener environment.

IMPORTANT: Failure to comply with general rules may result in disqualification of the bidder.

1.8. Insurance

1.8.1. The Bidder shall, at its own expense and cost, obtain and keep in force during the entire duration of the Project or Work the following insurance coverage covering the Bidder and all of its agents, employees and sub-contractors and other providers of services and shall name the **Town and the Board of Education its employees and agents as an Additional Insured** on a primary and non-contributory basis to the Bidders Commercial General Liability and Automobile Liability policies. **These requirements shall be clearly stated in the remarks section on the Bidders Certificate of Insurance.** Insurance shall be written with insurance carriers approved in the State of Connecticut and with a minimum Best's Rating of A-. In addition, all carriers are subject to approval by the Town. Minimum Limits and requirements are stated below:

1) Worker's Compensation Insurance:

- Statutory Coverage
- Employer's Liability
- $500,000 each accident/$500,000 disease-policy limit/$500,000 disease each employee

2) Commercial General Liability:

- Including Premises & Operations, Products and Completed Operations, Personal and Advertising Injury, Contractual Liability and Independent Contractors.

- Limits of Liability for Bodily Injury and Property Damage:
  - Each Occurrence $1,000,000
  - Aggregate $2,000,000 (The Aggregate Limit shall apply separately to this project.)
  - A Waiver of Subrogation shall be provided

3) Automobile Insurance:

- Including all owned, hired, borrowed and non-owned vehicles
- Limit of Liability for Bodily Injury and Property Damage:
  Per Accident $1,000,000

4) Umbrella (Excess) Liability Insurance

- Each Occurrence Limit $1,000,000
- Aggregate Limit $1,000,000

1.8.2. The Bidder shall direct its Insurer to provide a Certificate of Insurance to the Town before any work is performed. The Certificate shall evidence all required coverage including the Additional Insured on the General Liability and Auto Liability policies and Waiver of Subrogation on the General Liability policy. The Bidder shall provide the Town copies of any such insurance policies upon request and provide replacement/renewal certificates at least 60 days prior to expiration of the policies.

1.9. Indemnification

1.9.1. To the fullest extent permitted by law, the Bidder shall indemnify and hold harmless the Town and the Board of Education and its consultants, agents, and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, attorneys and other professionals and court and arbitration costs) to the extent arising out of or resulting from the performance of the Bidder's work, provided that such claim, damage, loss or expense is caused in whole or in part by any negligent act or omission by the Bidder, or breach of its obligations herein or by any person or organization directly or indirectly employed or engaged by the Bidder to perform or furnish either of the services, or anyone for whose acts the Bidder may be liable.

2. General Construction Specifications

2.1. Workmanship, Materials and Employees

2.1.1. Wherever in this contract the word "Engineer" is used, it shall be understood as referring to Bobby Ashton, Information Technology Manager, Town of Glastonbury. Wherever the term Town is used, it shall be understood as referring to Town of Glastonbury and the Glastonbury Board of Education. The Town Representative for the Town of Glastonbury is Bobby Ashton, Information Technology Manager.

2.1.2. The entire work described herein shall be completed in accordance with the plans and specifications to the full intent and meaning of the same. Unless otherwise specified, all materials incorporated in the permanent work shall be new and both workmanship and material shall be of good quality. The contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

2.1.3. The wording "furnish", "install", "construct", "furnish and install", or any similar terms, unless specifically noted to the contrary, shall include all labor, materials, water, tools, equipment, light, power, transportation, and any other services required for the completion of the work.

2.1.4. The contractor shall at all times enforce strict discipline and good order among his employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned to him.

2.2. Superintendent

2.2.1. The contractor shall keep on the work site during its progress, in the absence of the contractor, a competent superintendent. The superintendent shall be acceptable to the engineer and shall fully represent the contractor. All directions given to the superintendent shall be binding as if given to the contractor.

2.3. Preconstruction Meeting

2.3.1. A preconstruction meeting will be held with the Engineer, Town Representative, contractor, and any private utility company prior to commencing any work. The contractor shall arrange the meeting based on a mutually convenient time.

2.4. Permits

2.4.1. Contractor is responsible for obtaining and paying for all permits. Fees for Town permits to be waived. Wetland and flood zone activity permits shall be obtained by the Town.

2.5. Submittals

2.5.1. Product Data: For each type of product include;

- Provide data sheet with specifications
- Fire Resistance Ratings for products located within building.
- Attenuation per kilometer for all fiber strands
- Attenuation for all fiber optic connectors

2.5.2. Submit shop drawings to: Town Representative: Bobby Ashton, Information Technology Manager, bobby.ashton@glastonbury-ct.gov, 2155 Main Street, Town Hall, Glastonbury, CT 06033. (860) 652-7598

2.5.3. Submit full data sheets with performance ratings on all materials referenced as "or equivalent" in the bid document with the bid submission.

2.5.4. A letter of transmittal shall accompany each submittal. If data for more than one section of the specifications is submitted, a separate transmittal letter shall accompany the data submitted for each section.

2.5.5. At the beginning of each letter of transmittal provide a reference heading indicating the following:

Owner's Name:
Project Name:
Contract No.:
Transmittal No.:
Section No._____

2.5.6. If a product deviates from the requirements of the contract documents, contractor shall specifically note each variation in his letter of transmittal with the submittal.

2.5.7. All submittals for approval shall have a title block with complete identifying information satisfactory to engineer.

2.5.8. All shop drawings submitted shall bear the stamp of approval and signature of contractor as evidence that they have been reviewed by contractor. Submittals without this stamp of approval will not be reviewed by engineer and will be returned to contractor. Contractor's stamp shall contain the following minimum information:

Project Name:_____

Contractor's Name:_____
Date:_____

----------Reference----------
Specifications:

Section:_____

Page No.:_____

Para. No.:_____

Drawing No.:_____of___

Location:_____

Submittal No.:_____

Approved By:_____

2.5.9. A number shall be assigned to each submittal by contractor starting with No. 1 and thence numbered consecutively. Resubmittals shall be identified by the original submittal number followed by the suffix "A" for the first resubmittal, the suffix "B" for the second resubmittal, etc.

2.5.10. Contractor shall initially submit to town representative a minimum of 2 (2) copies of all submittals that are on 8 ½ inch by 11 inch or smaller sheets, and two (2) prints for all submittals on sheets larger than 8 ½ inch by 11 inch.

2.5.11. After engineer completes his review, shop drawings will be marked with one of the following notations:

1. Approved
2. Approved as corrected
3. Revise and resubmit
4. Not approved

2.5.12. If a submittal is acceptable it will be marked "Approved" or "Approved as Corrected". Four prints or copies of the submittal will be returned to contractor.

2.5.13. Upon return of a submittal marked "Approved" or Approved as Corrected", contractor may order, ship or fabricate the materials included on the submittal, provided it is in accordance with the corrections indicated.

2.5.14. If a shop drawing marked "Approved as Corrected" has extensive corrections or corrections affecting other drawings or work, engineer may require that contractor make the corrections indicated thereon and resubmit the shop drawings for record purposes. Such drawings will have the notation, "Approved as Corrected – Resubmit".

2.5.15. If a submittal is unacceptable, two copies will be returned to contractor with one of the following notations:

1. "Revise and resubmit"
2. "Not Approve"

2.5.16. Upon return of a submittal marked "Revise and Resubmit", contractor shall make the corrections indicated and repeat the initial approval procedure. The "Not Approved" notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, contractor shall repeat the initial approval procedure utilizing acceptable material or equipment.

2.5.17. Any related work performed or equipment installed without an "Approved" or "Approved as Corrected" shop drawing will be at the sole responsibility of the contractor.

2.5.18. Shop drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for the time required to make delivery of material or equipment after data covering such is approved. Contractor shall assume the risk for all materials or

2.5.19. Equipment which are fabricated or delivered prior to the approval of shop drawings. Materials or equipment will not be included in periodic progress payments until approval thereof has been obtained in the specified manner.

2.5.20. Engineer will review and process all submittals promptly, but a reasonable time should be allowed for this, for the shop drawings being revised and resubmitted, and for time required to return the approved shop drawings to contractor.

2.5.21. It is contractor's responsibility to review submittals made by his suppliers and subcontractors before transmitting them to engineer to assure proper coordination of the work and to determine that each submittal is in accordance with his desires and that there is sufficient information about materials and equipment for Engineer to determine compliance with the contract documents. Incomplete or inadequate submittals will be returned for revision without review.

2.6. Property Access:

2.6.1. The contractor shall take all proper precautions to protect from injury or unnecessary interference, and provide proper means of access to abutting property where the existing access is cut off by the contractor.

2.6.2. The contractor shall take all proper precautions to protect persons from injury or unnecessary inconvenience and leave an unobstructed way along the public and private places and travelers, vehicles, and access to hydrants.

2.6.3. The contractor shall make arrangements with the adjacent property owners for such trespass as he may reasonably anticipate in the performance of the work. All such arrangements shall be reported in writing to the engineer.

2.7. Protection of the Public and of Work and Property:

2.7.1. The contractor shall continuously maintain adequate protection of all work from damage, and shall take all reasonable precautions to protect the Town from injury or loss arising in connection with the contract.

2.7.2. The contractor shall adequately protect adjacent private and public property.

2.7.3. The contractor shall make good any damage, injury, or loss of his work and to the property of the Town resulting from lack of reasonable protective precautions.

2.8. Existing Improvements:

2.8.1. The contractor shall conduct his work so as to minimize damage to existing improvements. Except where specifically stated otherwise, it will be the responsibility of the contractor to restore to their original conditions, as near as practical, all improvements on public property. This shall include:

2.8.2. Property, within and adjacent to the site of installation, such as shrubs, walks, driveways, fences, etc.

2.8.3. The contractor is responsible for compliance with State laws requiring call-before-you- dig notification prior to initiation of construction activities.

2.8.4. Utility mains, ducts, poles, and services. The contractor is hereby notified that utilities if/where shown on the plans are at approximate locations. These locations are subject to possible errors in the source of information and errors in transcription. The contractor shall make certain of the exact location of all mains, ducts, poles, and services prior to excavation.

2.9. Separate Contracts:

2.9.1. The Town reserves the right to let other contracts in connection with this work. The contractor shall afford other contractor's reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs. Wherever work being done by the Town of Glastonbury forces or by other contractors is contiguous to work covered by this contract, the rights of the various interests involved shall be established by the engineer to secure the completion of the various portions of the work.

2.10. Inspection of work:

2.10.1. The Town shall provide sufficient personnel for the inspection of the work.

2.10.2. The Engineer shall at all times have access to the work whenever it is in preparation or progress, and the contractor shall provide proper facilities for such access and for inspection.

2.10.3. If the specifications or the Engineer's instructions require any work to be specially tested or approved, the contractor shall give the Engineer timely notice of its readiness for inspection and, if the inspection is by another authority other than the Engineer, of the date fixed for such inspection. Inspections by the Engineer shall be made promptly. If any work should be covered up without approval or consent of the architect, it must, if required by the Engineer, be uncovered for examination and properly restored at the contractor's expense.

2.10.4. Re-inspection of any work may be ordered by the Engineer. If such work is found to be in accordance with the contract documents, the Town shall pay the cost of re-inspection and replacement. If such work is not in accordance with the contract documents, the contractor shall pay such cost.

2.11. Right to Increase or Decrease Work:

2.11.1. The Town shall have the right to increase or decrease the amount of work herein specified as may be required.

2.12. Right of Engineer to Stop Work for Weather Conditions:

2.12.1. Should the work, in the opinion of the Engineer, be in danger by reason of inclemency of weather, or could not be finished in time to prevent such danger, the contractor shall cease operations upon order of the Engineer, and shall not resume them until ordered to do so by the Engineer when the weather conditions are favorable. The contractor shall, upon such orders, discontinue work, remove all materials or appliances for or in use upon the work, and place the streets in proper condition for use by the public during the time the work is suspended as herein provided, without cost to the Town.

2.13. Contractor to be Responsible for Imperfect Work or Materials:

2.13.1. Any unfaithful work or imperfect material which may be discovered before the acceptance and the payment of the work shall be corrected upon the order of the Engineer. The acceptance and payment of the work does not in any manner relieve the contractor of his obligation to construct work in the proper manner and use of materials herein specified.

2.14. Town may Notify Contractor if Work is not Carried on Satisfactorily:

2.14.1. If, in the opinion of the Town or Engineer, the contractor is not proceeding with the work at a sufficient rate of progress so as to finish in the time specified, or has abandoned said work, or is not complying with the terms and stipulations of the contract and specifications, the engineer may serve notice on the contractor to adopt such methods as will insure the completion of the work in the time specified.

2.14.2. If, within five (5) days after the engineer or Town has notified the contractor that his work is not being carried on satisfactorily as before mentioned, the Town shall have the right to annul the contract and manage the work under the direction of the architect, or re-let, for the very best interest of the Town as a new contract, the work under said new contract shall be considered the responsibility of the defaulting contractor.

2.14.3. Additional costs incurred over and above the original contract shall be borne by the performance bond.

2.15. Deductions for Uncorrected Work:

2.15.1. If the engineer deems it inexpedient to correct work that has been damaged or that was not done in accordance with the contract, an equitable deduction from the contract price shall be made therefore.

2.15.2. The contractor shall promptly remove from the premises all materials condemned by the engineer as failing to meet contract requirements, whether incorporated in the work or not, and the contractor shall promptly replace and re-execute his own work in accordance with the contract and without expense to the Town, and shall bear the expense of making good all work by other contractors destroyed or damaged by such removal or replacement.

2.15.3. If the contractor does not remove such condemned work and materials as promptly as possible after written notice, the engineer may remove them and store the materials at the expense of the contractor.

2.16. Cleaning Up:

2.16.1. The contractor must remove all debris of every description as the work progresses and leave the surroundings in a neat and orderly condition to the satisfaction of the engineer. Upon completion, and before acceptance and final payment, the contractor shall remove from the site all equipment, surplus material, rubbish and miscellaneous debris and leave the site in a neat and presentable condition.

2.17. Royalties and Patents:

2.17.1. The contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Town of Glastonbury and Board of Education harmless from loss on account thereof, except that the Town of Glastonbury and Board of Education shall be responsible for all such loss when a particular manufacturer, product, or process as specified by the Town of Glastonbury.

2.18. Contract

2.18.1. A purchase order from the Town including all the terms of this offering will comprise the contract for this project.

2.19. Warranty

2.19.1. The contractor shall warranty all materials and labor for this project to meet or exceed stated specifications for a period no less than five years. Contractor shall specify warranty period on the bid form and enclose with their bid details regarding the warranty.

3. Special Conditions

3.1. Notice to Contractor

3.1.1. Intent of Contract: The intent of the Contract is to prescribe a complete work or improvement that the Contractor undertakes to do, in full compliance with the specifications, plans, special provisions, proposal, and Contract. The Contractor shall perform all work in close conformity with the Route Plan, Fiber Strand Layout, and other data shown on the plans or as modified by written orders, including the furnishing of all materials, implements, machinery, equipment, tools, supplies, transportation, labor, and all other things necessary to the satisfactory prosecution and completion of the project.

3.2. Communications

3.2.1. All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing.

3.2.2. Any notice to, or demand upon, the Contractor shall be sufficiently given if delivered at the office of the Contractor stated on the signature page of the Agreement (or at such other office as the Contractor may, from time to time, designate) in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.

3.2.3. All papers required to be delivered to the Town shall, unless otherwise specified in writing to the Contractor, be delivered to the Town Representative, Attn: Bobby Ashton, 2155 Main Street, Glastonbury, CT 06033, and any notice to, or demand upon, the Town shall be delivered at the above address in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office or to such other representatives of the Town, or to such other address as the Town may subsequently specify in writing to the Contractor for such purpose.

3.2.4. Any such notice shall be deemed to have been given as of the time of actual delivery or, In case of mailing, when the same should have been received in due course of post or, in the case of telefax, at the time of actual receipt, as the case may be.

3.3. Partial Use of Improvements

3.3.1. The Town may, at its election, give notice to the Contractor and place in use those sections of the work that have been completed, inspected and can be accepted as complying with the Contractor Documents and if, in its opinion, each such section is reasonably safe and fit for the use and accommodation for which it was intended, provided:

3.3.2. The use of such sections of the work shall not materially impede the completion of the remainder of the work by the Contractor.

3.3.3. The Contractor shall not be responsible for any damages or maintenance costs due directly to the use of such sections.

3.3.4. The use of such sections shall in no way relieve the Contractor of his liability due to having used defective materials or to poor workmanship.

3.3.5. The period of guarantee shall not begin until the date of the final acceptance of all work required under this Contract.

3.4. Work By Others

3.4.1. Private utilities, contractors, developers or other parties may be expected to be working within the Contract area during this Contract. It shall be the responsibility of the Contractor to coordinate his work with the work being done by others in order that the construction shall proceed in an efficient and logical manner. The Contractor shall have no claim or claims whatever against the Town, the Engineer, or other parties due to delays or other reasons caused by the work by others or his failure to coordinate such work.

3.5. Contractor's Work & Storage Area

3.5.1. The Contractor shall contact the Town to determine if any specific locations will be designated, or gain its approval prior to using any area for storage of equipment, materials and trailers during the period of this Contract. The Contractor shall confine his work/storage area to the limits as designated or approved and shall be responsible for the security of the work/storage area. Upon completion of the Contract, the Contractor shall remove all equipment and materials, except as otherwise specified, and restore the site to its original condition as approved by the Engineer and at no cost to the Town.

3.6. Disposal Area

3.6.1. The Tryon Street Bulky Waste Facility will be available to the Contractor, at no charge, for disposal of materials that are accepted at that facility. The Contractor is required to abide by the terms of operations of the disposal facility.

3.7. Dust Control

3.7.1. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities so as to minimize the creation and dispersion of dust.

3.8. Maintenance

3.8.1. The Contractor shall be held responsible to the Town for maintenance for a minimum of five years following completion of all work under this Contract with respect to defects, settlements, etc.

3.9. Protection Of Existing Utilities

3.9.1. Before starting any excavation, the Contractor shall submit to the Technical Representative plans or details showing the proposed method the Contractor will use to support and protect all existing utilities during construction. The furnishing of such plans and details shall not serve to relieve the Contractor of any responsibility for the proper conduct of the work.

3.9.2. There will be no extra payment for submitting plans or details for supporting and protecting all existing utilities during construction. No disruption to the operation of existing utilities is allowed without the written consent of the Town obtained a minimum of a week in advance.

3.10. Time for Completion/Notice to Proceed

3.10.1. The work under this Contract shall commence upon a negotiated time with the Town and in conjunction with the completion of Pole Make Ready work to be performed by the Utility Companies. Completion will be a mutually agreed upon date.

3.10.2. Once Pole Make Ready work is complete Contractor will submit a project schedule for review and approval by the Town.

3.10.3. The Town of Glastonbury and the Glastonbury Public Schools have certain public holidays of where facilities will be closed. Please view the Glastonbury Public Schools Calendar on the GPS website for the current schedule at;

https://www.glastonburyus.org/parents/Documents/Approved%20REVISED%20School%20Calendar%202011-2012.pdf

The Town Holiday schedule can be found at;

http://www.glastonbury-ct.gov/index.aspx?page=1568

3.11. Liquidated Damages

3.11.1. None for this project

3.12. Schedule of Drawings

3.12.1. The Contractor is hereby alerted that plans entitled Town of Glastonbury Fiber Optic Layout" and "Utility Pole Layout" prepared by the Town of Glastonbury are part of these specifications and identified as Attachment C & D.

3.13. Changes in the Work

3.13.1. The Town reserves the right to perform portions of the work in connection with these plans and specifications. The reduction in the work to be performed by the Contractor shall be made without invalidating the Contract. Whenever work is done by the Town contiguous to other work covered by this Contract, the Contractor shall provide reasonable opportunity for the execution of the work and shall properly coordinate his work with that of the Town.

3.13.2. Any changes in the work will be approved in advance by the Town and be based on unit costs established at time of bid. Any other changes will be negotiated with the Town with a 15% maximum mark up.

3.13.3. The Fiber Optic Route is subject to changes based on findings and recommendations by the Utility Pole Owners. These changes could adjust the cable distance to be installed. The Bid Submission page will include a price option for additions/reductions in cable distance to be installed.

3.14. Removal and Storage of Materials and Structures

3.14.1. All salvable materials, including topsoil, gravel, fill materials, etc. and pipe, wire, surge protection, etc. that are not to remain in place or that are not designated for use in the work shall be carefully removed by the Contractor and stored at such places as directed by the Engineer.

3.14.2. All salvable materials removed and stored shall remain the property of the Town. The Engineer shall determine the materials or structures that are to be salvaged.

3.15. Prosecution And Progress

3.15.1. The Contractor shall give the Technical Representative a seven-day advance written notice of construction activities that will alter traffic patterns that result in lane shifts, temporary closures of lane(s), or lane reductions. This advance notification will allow the Town to publish news releases and/or provide public radio announcements to inform the public of revised traffic patterns or possible traffic delays. Failure of the Contractor to provide such timely notice shall be considered a breach of Contract and will subject the Contractor to stop work orders until such time as the seven-day notice has been satisfied.

3.16. Payments

3.16.1. Progress payments will be made on a monthly basis. No provisions are made for billing for materials not in place.

4. Detailed Construction Specifications

4.1. Executive Summary

The Town of Glastonbury will be expanding the existing Fiber Optic Network with twenty five plus miles of additional fiber cabling. This new cabling will provide network connectivity to ten schools and up to ten municipal buildings. The system will utilize an enhanced fiber cable capable of supporting 10 Gigabit transmission speeds without the need for extended range electronics.

The Fiber Optic Network will include five primary legs originating from two primary hubs at the Glastonbury Town Hall and the Glastonbury High School. A high capacity backbone will connect the primary hubs. There will be three secondary hubs at Gideon Welles Sixth Grade School, Hopewell Elementary School, and the vehicle maintenance garage.

Two items to keep in mind that may be different from typical fiber networks and could affect the bid generation process;

- The cable being specified is an enhanced single mode fiber cable with a lower attenuation. See the enclosed cable specifications for details.
- The buffer tube strand count for the loose tube fiber cable is six strands per tube instead of twelve strands per tube.
- Most fiber splice locations are located on mid-span closures located throughout town. The fiber splice location at Glastonbury High School is in the Network Operating Center and the fiber splice location at Glastonbury Town Hall is located in the Primary demarcation room.

Information on the fiber stand layouts for each fiber segment is documented in Appendix A. Information on enclosures and cable paths to each of the buildings is documented in Appendix B.

4.2. Detailed Specifications

4.2.1. Fiber optic Cable Plant

4.2.1.1. This cable-plant will utilize the Cable lashed to a separate Messenger technique.

4.2.2. Cable Installation Guidelines

4.2.2.1. Placement of the cable itself on the utility poles shall be made in accordance with NESC and Bellcore guidelines for separation from existing power and communications attachments to the poles at locations on each pole as specified by the bolt hole location on the Pole Data Sheet provided by the Pole owner. The fiber optic cables will be installed on the Utility Poles in the Municipal Gain Space, which

is defined as the top of the Communications Gain and 40" below the lowest electrical gain. If sufficient space is not available for a compliant attachment the installation contractor must bring this unavailability of space to the attention of the Town of Glastonbury so that the Pole Owners can be notified (and consequently space made available or a waiver issued). Note that the Municipal Gain may be moved to a different location on the pole by the pole owners.

4.2.2.2. The cable plant shall be installed in the municipal gain section of utility poles or conduits along the route. On poles, this is typically the top communications gain. Wherever the fiber optic cable is installed in underground or other conduit, it shall be installed within a 1.25" ID or larger inner-duct that the contractor must install in the conduit if existing inner-duct is not available. In situations where the underground conduit is less than 2.5" in diameter then innerduct is not required, but only one cable can utilize such conduit space unless noted in the appropriate building layout page in appendix B. The applicable NESC, BICSI, and Bellcore requirements and guidelines for pole attachments shall be applied in the installation of the cable plant both on utility poles and in underground ducts. All attachment hardware and messaging materials shall meet NESC Grade "B" requirements. When placing cable in new conduits a new pull rope for future installation will be installed at the same time.

4.2.2.3. Cable lashing will meet the following requirements;

- Cables installed over roadways or railways will be double lashed.
- Multiple cables lashed together to the messenger will be double lashed.
- Lashed cable will have a maximum of twelve inch interval between wire lashes.
- Lashing wire will be terminated at each pole with a lashing wire clamp.

4.2.2.4. Cable routed through building walls into the building interior shall be placed in plenum-rated interior-grade inner-duct and routed to its final interior destination (e.g., distribution frame).

4.2.2.5. If Exterior rated fiber optic cable extends into the interior space of a building from its point of entrance more than 50' then conversion to a riser or plenum rated cable as applicable will be required.

4.2.2.6. Cable and pole-hardware manufacturers' recommendations and guidelines shall be followed with respect to appropriate connections to utility poles (e.g., in consideration of offset angle and in compliance with the requirement to install a double dead-end minimally every 20 poles or 2000 feet, whichever occurs first). If appropriate, extension arms shall be used to provide NESC- and Bellcore-compliant clearance to other pole attachments and/or to achieve acceptable offset angles. The installation contractor must follow the cable manufacturer's recommendations and guidelines for the actual stringing and tensioning of the fiber optic cable. Pole attachment hardware will meet or exceed Grade "B" requirements as defined in the NESC requirements.

4.2.2.7. All cable will have a label attached to it at each utility pole identifying the cable as Town of Glastonbury Fiber Optic cable and this label shall be visible at ground level in compliance with the Pole Attachment Agreements in force with the Pole Owners.

4.2.3. Removal of abandoned Facilities

4.2.3.1. Existing copper cable that is installed on messenger on Main Street from the Library to Glastonbury Boulevard will need to be removed so that the new fiber cable can be installed. Upon removal of the existing copper cable the messenger may be utilized for the installation of the new fiber optic cable.

4.2.4. Aerial Storage Loops

4.2.4.1. A 75-foot aerial storage loop of fiber optic cable for repairs and other future use shall be installed in the cable plant approximately every 1,500 feet (with a minimum of one storage loop in each fiber segment), using an aerial lash-back approach and centered either on a specific pole or on the nearest suitable pole (e.g., a storage loop may not be installed over a crossing street; installation of a storage loop over a driveway is to be avoided as well). An in-line storage device (e.g., a set of 2 "snowshoes") that is in compliance with the cable manufacturer's recommendations and requirements shall be used for each aerial storage loop. Locating storage loops near wherever a connection to a future network site is anticipated and four way intersections that might be subject to vehicular accidents is preferred.

4.2.5. Grounding (Bonding)

4.2.5.1. All Equipment with conductive material must be grounded ("bonded") in compliance with NESC guidelines.

4.2.6. Intra-Segment Cable Continuity

4.2.6.1. Each segment of fiber cable that is installed between building endpoints and defined cable spice points outlined in this document shall be continuous without any additional splicing.

4.2.7. Exterior Installation

4.2.7.1. Exterior installation of the fiber optic cable shall include, where necessary, penetrating the exterior masonry wall of a building at the segment endpoint in a manner compliant with the building code of the Town of Glastonbury, and inserting said cable. Penetration is defined as drilling or boring to gain access into the building, and it shall include installing sleeves and sealing for weatherproofing and traffic control protection as per local building and traffic control codes.

4.2.8. Interior Installation

4.2.8.1. Interior installation and routing of the fiber optic cable shall include all internal wall penetrations and sleeves (e.g., internal conduits and leaders). Plenum-grade inner-duct shall be used from the exterior wall penetration up to the specified communications room (distribution frame) within the building at the segment endpoint. Note: Unless otherwise specified, 50 feet of fiber optic cable shall be stored in the communications room for future repairs and modifications. This excess of fiber optic cable shall be rolled into a 36-inch-diameter coil and tie-wrapped, and then secured to the nearest wall by means of a removable strap such as a tie-wrap.

4.2.9. Termination and Splicing of Fiber Strands

4.2.9.1. The selected contractor shall perform all terminating of the fiber strands at the interior location of the networking end-equipment (i.e., distribution frame) within each segment- endpoint building. At a given site each fiber strand that actually serves networking end-equipment in that building shall be fusion-spliced to a factory-prepared SC SMF connector pigtail. SC Connectors are to meet or be less than .5dB loss. Those fiber strands that are not SC terminated shall simply remain unconnected (i.e., "unterminated") or be spliced to other strands based on the strand layout drawings in Appendix A. All splices are to be fusion type and should meet or be less than .1 dB loss.

4.2.10. Readiness of Utility Poles and Conduits for Cable Attachment

4.2.10.1. Prior to commencement of cable-plant installation, the Town of Glastonbury shall work with the pole owners to facilitate adequate space on the utility poles in the Municipal Gain for connection of the Fiber Plant.

4.2.10.2. It shall be the responsibility of the selected installation contractor to coordinate the deployment of his installation services personnel in conjunction with the utility companies' performance of any "make-ready" work upon which the aforesaid installation contractor is relying. Awareness of unusual delays due to inability to coordinate with the utility companies must be brought to the attention of the Town of Glastonbury immediately.

4.2.11. Testing of the Installed Cable Plant

4.2.11.1. The installation contractor shall conduct appropriate testing of the installed cable plant to assure the continuity of all fibers and their viability as conductors of optical signals and to demonstrate performance of the fiber optic cable to manufacturer's specification. Referring to Section 4.4.1 of this Specification, the installation contractor shall:

- perform standard bi-directional, dual-wavelength Optical Time Domain Reflectometry (OTDR) testing on all SC-terminated fiber strands;

- perform dual-wavelength OTDR testing on the unterminated fiber strands; and
- perform dual-wavelength OTDR testing on the spliced-and-passed-through fiber strands end-to-end (i.e., across multiple segments).

4.2.11.2. Segment length and end-to-end attenuation must be measured. Losses shall be no greater than:

- .35 dB per kilometer at 1310 contributed by the cable itself
- .25 dB per kilometer at 1550 contributed by the cable itself
- 0.1 dB for each fusion splice
- 0.5 dB per connector pair
- Results should be within 10% of the fiber budget specified in the table at 4.3.7 of this document.

4.2.11.3. The installation contractor shall provide to the Town of Glastonbury a written and electronic report on all test results.

4.2.11.4. All fiber discontinuities and damage shall be repaired by the contractor via fusion splicing (and weatherproof containment of outdoor splices), at no additional expense to the Town of Glastonbury. While broken fibers are not expected in a professionally executed cable-plant installation, reasonableness dictates that at most one broken-and-repaired fiber shall be tolerated per segment. The results of all tests shall be conveyed, in printed or electronic format, to the Town of Glastonbury for approval and acceptance.

4.3. Descriptions of Fiber Segments

4.3.1. The new fiber network will include four network segments. Refer to Attachment "C" for a town wide drawing of the new fiber optic network layout. Attachment "D" contains information on the Utility Poles that will be used for supporting the new fiber cabling. See Appendix A for fiber strand mappings on each fiber segment. Appendix B contain details of each facility being connected.

4.3.2. Fiber Segment GHS-1

Segment GHS-1 is a 48 strand segment that originates at Glastonbury High School and routes to Gideon Wells Sixth Grade School. Three drop points at the new Glastonbury-East Harford Magnet School, The Bus Yard, and at Smith Middle School will connect those facilities to Glastonbury High School. Three drop points at Eastbury School, The East Glastonbury Public Library, and Hebron Ave School will connect to Gideon Wells Sixth Grade School. In additions six strands of fiber will route from Gideon Welles School to Glastonbury Town Hall via a splice with segment GHS-3. Lastly, as an option a twenty four strand fiber cable will route from Hebron Ave School to Fire Company Four on Manchester Road.

4.3.3. Fiber Segment GHS-2

Segment GHS-2 is a 48 strand segment that originates at Glastonbury High School and routes to Nayaug Elementary School. There is one drop point at Hopewell Elementary School that connects to Glastonbury High School. There is also one Drop Point at the town vehicle maintenance garage and one drop point at the Parks Building that originates at the splice enclosure at Glastonbury High School and is spliced to segment GHS-3 that routes to Glastonbury Town Hall. There are three drop points at Fire Company Two, Fire Company Three, and the South Glastonbury Public Library, that connect to the Vehicle Maintenance Garage through the splice enclosure near Hopewell Elementary School. There are six stands of fiber cable that route from Glastonbury High School to Nayaug Elementary School. There are six strands of fiber cable that route from Hopewell school to the Vehicle Maintenance Garage through the Hopewell Splice Enclosure. Lastly, there are twelve strands of fiber cable that routes from Hopewell school to Nayaug Elementary School and six strands from Nayaug that connect to Vehicle Maintenance.

4.3.4. Fiber Segment GHS-3

Segment GHS-3 and GHS-3 (49-96) is a ninety six strand fiber cable that runs from Glastonbury High School to the Glastonbury Town Hall. There are two drop points on the cable that originate at Glastonbury High School. Twenty Four Strands will connect the High School to Town Hall. Four drop points will originate at Town Hall. One Drop point will route to Gideon Welles Sixth Grade School via the GHS-1 Segment in the GHS Splice Enclosure, one Drop point will route to Youth and Family Services via the GHS Splice Enclosure, the third drop point will route to the Vehicle Maintenance Facility via the GHS-2 segment in the GHS Splice Enclosure. The fourth and final drop point will route to the Parks building via the GHS-2 segment in the GHS Splice Enclosure.

4.3.5. Fiber Segment TH-1

Fiber Segment TH-1 is an existing forty eight strand fiber segment that routes from the Glastonbury Town Hall to the Welles Turner Library. Eighteen strands are connected from the Town Hall to the Library and additional six strands from each building route to a drop point at Gideon Welles House at the Library Splice Enclosure. Included in this project are to use twelve strands for fiber to connect fiber from the Town Hall facility to Fiber Segment TH-3 which will splice in the Library Splice Enclosure and Six strands of Fiber to connect from Town Hall to Fire Company 1 via TH-3.

4.3.6. Fiber Segment TH-3

Segment TH-3 is a forty eight strand fiber cable that Routes from the existing splice enclosure on Main Street in front of the Library to Naubuc Elementary School. There is one drop point at Fire Company One that routes from the Library Splice Enclosure.

4.3.7. Distance Estimates and Fiber Budget

The following table shows distance estimates and fiber link budget. It is the responsibility of the contractor to verify these distances.

Location	Distance Feet	Distance Miles	Fiber Budget @ 1310		Fiber Budget @ 1550	
Glastonbury High School to Town Hall	9,775	1.85	1.74	dB	0.84	dB
High School to Gideon Welles	32,890	6.23	4.31	dB	2.66	dB
Magnet School (Gideon Leg)	575	0.11	0.76	dB	0.14	dB
Smith Middle School (Gideon Leg)	3,565	0.68	1.08	dB	0.37	dB
Hebron Ave School (Gideon Leg)	1,150	0.22	0.82	dB	0.19	dB
Eastbury School & EGL(Gideon Leg)	3,680	0.70	1.09	dB	0.38	dB
Hopewell School (Nayaug Leg)	19,435	3.68	2.87	dB	1.63	dB
Nayaug School From GHS	35,305	6.69	4.57	dB	2.84	dB
Naubuc from GHS	8,050	1.52	1.56	dB	0.71	dB
Fire Co1, 2, &3	1,150	0.22	0.82	dB	0.19	dB
Vehicle Maintenance Nayaug Leg	5,520	1.05	1.39	dB	0.57	dB
Buttonball from GHS	8,050	1.52	1.56	dB	0.71	dB
Youth & Family (GHS-TH Leg)	460	0.09	0.85	dB	0.19	dB
Parks (Nayaug Leg)	1,150	0.22	0.92	dB	0.24	dB
South Glastonbury Library	1,150	0.22	0.82	dB	0.19	dB
GPS Bus Yard	2,875	0.54	1.01	dB	0.32	dB
Bulky Waste	5,750	1.09	1.31	dB	0.54	dB
Fire Company 4	1,150	0.22	0.82	dB	0.19	dB
Total	134,780	$ 25.53				
Note: Distances includes an additonal 15% for Slack						

4.4. Materials lists for cable-plant

4.4.1. Description of Fiber Optic Strands

4.4.1.1. The fiber optic cable for this project will be exclusively single mode fiber cable. Note that the cable specified is an enhanced fiber cable with lower attenuation specifications and houses six strands per buffer tube. The cable shall meet or exceed the following requirements.

4.4.1.2. A germania-doped silica core surrounded by a concentric silica glass cladding shall comprise each optical fiber. The fiber shall be a matched clad design manufactured by the outside vapor deposition process (OVD). Each optical fiber refractive index profile shall be step indexed.

4.4.1.3. Each fiber shall be proof tested by the fiber manufacturer at a minimum of 100 kpsi (0.7 GN/m²). The fiber shall be coated with a dual acrylate protective coating and the coating shall be in physical contact with the cladding surface. The single-mode fiber shall meet EIA/TIA-492CAAB, “Detail Specification for Class lVa Dispersion-Unshifted Single-Mode Optical Fibers with Low Water Peak,” and ITU-T G.652.C, “Characteristics of Single-Mode Optical Fiber Cable.” Fiber shall have a mode field diameter of 9.20 ± 0.40 µm at 1310 nm and 10.40 ± 0.50 µm at 1550 nm. Fiber core-clad concentricity shall

be = 0.5 µm. Fiber cladding diameter shall be 125.0 ± 0.7 µm. Fiber cladding non-circularity shall be = 0.7%. Fiber coating diameter shall be 245 ± 5 µm.

4.4.1.4. The attenuation specification shall be a maximum value for each cabled fiber at 23 ± 5°C on the original shipping reel. The cabled fiber attenuation for Loose Tube and Ribbon cable constructions shall be < 0.35 dB/km at 1310 nm and <0.25 dB/km at 1550 nm. For Tight Buffered constructions the cabled fiber attenuation shall be = 0.65 dB/km at 1310 nm and = 0.5 dB/km at 1550 nm. The attenuation at the water peak (1383 nm) shall not exceed the 1310 nm attenuation value. The cabled fiber shall be capable of operating in the 1360 nm to 1480 nm water peak region.

4.4.1.5. The attenuation due to 100 turns of fiber around a 50 ± 2 mm diameter mandrel shall not exceed 0.05 dB at 1310 nm and 0.05 dB at 1550 nm. The attenuation due to 100 turns of fiber around a 60 ± 2 mm diameter mandrel shall not exceed 0.05 dB at 1625 nm. There shall be no point discontinuities greater than 0.05 dB at 1310 nm and 1550 nm. The maximum dispersion shall be =3.5 ps/(nm•km) from 1285 nm to 1330 nm and shall be =18 ps/(nm•km) at 1550 nm. The cabled fiber shall support Gigabit Ethernet (GbE) operation according to the 1000BASE-LX (1310 nm) specifications up to 5000 m in accordance with the GbE standard. The cabled fiber shall support laser-based 10 Gigabit Ethernet (10GbE) operation according to the 10GBASE-LX4 (1300 nm region), 10GBASE-L (1310 nm) and 10GBASE-E (1550 nm) specifications for distances of 11.2 km, 10 km and 40 km, respectively.

4.4.1.6. The cabled optical fiber shall support industry-standard multi-gigabit Fibre Channel physical interface specifications.

4.4.2. Description of Fiber Cable

4.4.2.1. Cable shall be all-dielectric, stranded loose-tube design with dry waterblocking for outdoor duct and aerial installations in fiber counts from two to 288. Each fiber shall be distinguishable by means of color coding in accordance with TIA/EIA-598-B, "Optical Fiber Cable Color Coding." The fibers shall be colored with ultraviolet (UV) curable inks. Buffer tubes shall be made from polypropylene. Each buffer tube shall contain a water swellable yarn or water blocking element for water blocking protection. The water-swellable 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 water blocking 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. The buffer tube shall be manufactured to a nominal diameter of 2.5mm or 3.0 mm, regardless of fiber count, to reduce the number of required installation and termination tools.

4.4.2.2. Buffer tubes containing fibers shall be color coded with distinct and recognizable colors in accordance with TIA/EIA-598-B. Buffer tube colored stripes shall be inlaid in the tube by means of co extrusion when required. The nominal stripe width shall be 1 mm. Buffer tubes in a hybrid cable (cable containing more than one type of fiber) shall contain only one fiber type. Identification of fiber types in a hybrid cable shall correspond to fiber core

diameter (or mode field diameter) from smallest to largest in accordance with TIA/EIA-598-B. Buffer tubes shall be stranded around the dielectric central member using the reverse oscillation stranding process. Two polyester yarn binders shall be applied contra helically 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. Water swellable yarn(s) shall be applied longitudinally along the central member during stranding. 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 swellable tape shall be applied longitudinally over both the inner and outer layer. The water-swellable tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matter. Cable shall be comprised of water-swellable yarns and/or tapes, dielectric strength members (as required), ripcord(s) and an MDPE jacket containing carbon black to provide ultraviolet light protection while inhibiting the growth of fungus.

4.4.2.3. Cable jacket 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. Cable shall contain reverse oscillation lay (ROL) markings as needed. Cable shall have a storage temperature range of -40° to 70°C, an installation temperature range of -30° to 70°C, and an operating temperature range of -40° to 70°C. Cable shall have a short-term tensile rating of 2700 N. No fiber strain shall occur over the service life of the cable when subjected to a maximum, long-term tensile rating of 890 N.

4.4.2.4. Cable shall meet the functional requirements of Rural Utilities Service (RUS) 7 CFR 1755.900 and be fully compliant with ICEA S-87-640. Manufacturer shall be ISO 9001 and TL 9000 registered. Cable manufacturer shall have a minimum of 20 years in manufacturing optical fiber cable in order to demonstrate reliable field performance. Cable shall be Corning Cable Systems part number 048EU4-64100D20 or equivalent. Note that this an enhanced fiber cable with 6 strands per tube.

4.4.3. Description of Pole Mount Hardware and Messenger

4.4.3.1. Pole mount hardware must be approved for use on the selected Fiber Optic Aerial cable. All attachment hardware and messaging materials shall meet NESC Grade "B" requirements. All hardware must meet Bellcore, NESC, and BICSI standards and recommendations. All metal components must be appropriately treated for corrosion resistance such as hot dipped galvanizing. In order to satisfy existing cable separation requirements for existing cables mounted on the utility poles located on Main Street it will be necessary to re-use the

existing steel support brackets and messenger or provide functionally equivalent replacements.

4.4.3.2. Messenger cable must be able to support up to 4 fiber optic cables with strand counts of 144 strands each at every location.

4.4.4. Description of Aerial Storage Devices

4.4.4.1. Set of 2 “snowshoes” and associated mounting h/w for aerial storage of 300 feet of Fiber Cable that meets or exceeds NESC Grade “B” requirements.

4.4.5. Description of Fiber Cable Termination/Splice Housings

4.4.5.1. Rack Mount Housings shall be mountable in an EIA-310 compatible 465- or 592 mm rack. Housings shall be available in both 1U ,2U and 4U sizes. One EIA rack space or panel height (denoted as 1U) is defined as being 44.45 mm in height. The unit shall meet all applicable design requirements listed in ANSI/TIA/EIA-568, ANSI/TIA/EIA-942, and the polymer compounds flammability requirements of UL 94 V-0. Manufacturer shall be ISO 9001 and TL 9000 registered. Housings shall be manufactured using 16-gauge aluminum or equivalent for structural integrity. All joints shall be welded and finished in a workman-like manner. Installation fasteners shall be included and shall match the housing color. The unit shall include a clamshell-type cable clamping mechanism to provide cable strain-relief.

The front and rear doors shall be lockable when used with an optional key lock kit. The Connector Housings shall have a labeling scheme that complies with ANSI/TIA/EIA-606. The housings shall be available with factory-installed connectorized cable stubs in multiple cable and connector types. The housing shall have the ability to accommodate fusion splicing with additional hardware. The housing shall be 16 inches deep for extra cable routing.

The 1U housing shall be Corning Cable Systems part number PCH-01U or equivalent, and shall have a removable top lid for easier access. For the 1U housing, the housing shall be Corning Cable Systems part number PCH-01U. The splice tray holder required for pigtail splicing is PC1-SPLC-04R and shall hold (4) Type 2R or (2) Type 4R splice trays.

The 2U housing shall be Corning Cable Systems part number PCH-02U or equivelant, and shall have integrated jumper routing guides. The splice tray holder required for pigtail splicing is PC2-SPLC-6SR and shall hold (6) Type 2S and (3) Type 4S splice trays.
The 4U housing shall be Corning Cable Systems part number PCH-04U or equivalent, and shall have integrated jumper routing guides. The splice tray holder required for pigtail splicing is PC4-SPLC-12SR and shall hold (12) Type 2S and (6) Type 4S splice trays.

4.4.5.2. Wall-Mountable Connector Housings shall be available for cross-connecting or interconnecting purposes. The units shall provide for direct connectorization or pigtail splicing. The Wall-Mountable Connector Housing shall be available in 2-, 4-, 6-, and 12-connector panel versions to provide for varying fiber counts.

The unit shall meet the design requirements of ANSI/TIA/EIA-568 and the polymer compounds flammability requirements of UL 94 V-0. Manufacturer shall be ISO 9001 and TL 9000 registered. Housings shall be manufactured using 16-gauge aluminum or equivalent for structural integrity and shall be finished with a powder coat for durability.

The 2P Connector Housing shall have metal doors. The 4P through 12P housings shall have a tinted polycarbonate jumper door(s) and a metal main door covering the splice/cable strain-relief area. The Connector Housings shall have a labeling scheme that complies with ANSI/TIA/EIA-606. The connector housings shall be available with factory-installed connectorized cable stubs in multiple cable and connector types. Brackets shall be available that allow rack mounting of the Wall-Mount Housings. An optional offset bracket kit shall be available that allows mounting the housing away from the wall to give space for cable routing behind the unit.

Wall-Mountable Connector Housing (WCH) shall be Corning Cable Systems part number WCH-02P, WCH-04P, WCH-06P, or WCH-12P or equivalent for 2-, 4-, 6-, or 12-panel versions respectively.

If the product to be supplied is other than the Corning product listed a sample product must be submitted for approval before installation.

4.4.6. Splice Bracket for Fiber Optic Housing

4.4.6.1. Splice Bracket equivalent to Corning PC4-SPLC-12SR. (one per splice Tray) for rack mount applications or WCH-SSH-4-12 for wall-mount applications.

4.4.7. Splice Tray for Fiber Optic Housing

4.4.7.1. Splice Tray equivalent to Corning M67-048. (one per 12 strand Loose Tube)

4.4.8. Description of Fiber Connector Panel

4.4.8.1. Fiber Optic Twelve Port Panel with six Duplex SC connectors and pigtails, equivalent to Corning CCH-CP12-59-P03RH. (one per splice Tray)

4.4.9. Description of Outside Plant Closures

4.4.9.1. The SCF splice closures shall be available in canister (butt) and in-line styles to fit most applications. All end-caps feature two express ports for uncut feeder cables. Mechanical Seal drop ports allow for rapid and easy installation during initial build or future expansions.

4.4.9.2. The Splice Closure Housing shall be non-metallic. It shall be resistant to solvents, stress cracking and creep. The housing materials shall also be compatible with chemicals and other materials to which they might be exposed in normal applications. The optical fiber closure shall be capable of accepting any optical fiber cable commonly used in interoffice, outside plant and building entrance facilities. As an option, the ability to double the cable capacity of an installed canister splice closure by use of a kit shall be available. Such a conversion shall not disturb existing cables or splices.

4.4.9.3. Encapsulation shall not be required to resist water penetration. The splice closure shall be re-enterable. The closure end-cap shall be capable of accepting additional cables without removal of the sheath retention or strength-member-clamping hardware on previously installed cables or disturbing existing splices. The optical fiber splice closure shall provide a clamping mechanism to prevent pistoning of the central member or strength members and to prevent cable sheath slip or pullout. The splice closure shall have appropriate hardware and installation procedures to facilitate the bonding and grounding of metal components in the closure and the armored cable sheath. The cable bonding hardware shall be able to accommodate a copper conductor equal to or larger than 6 AWG.

4.4.9.4. Aerial splice closures shall have available the necessary hardware to attach and secure the closure to an aerial strand. The closure shall accommodate splice trays suitable for single- fiber, single fiber heat-shrink, mechanical or ribbon heat-shrink splices. The small splice closure shall accommodate up to 72 single- fiber splices or 144 ribbon fiber splices using 12-fiber ribbons. The medium-sized closure shall accommodate up to 288 single-fiber splices or 432 ribbon-fiber splices. The large closure shall accommodate up to 480 single-fiber splices or 864 ribbon-fiber splices. The installation of the splice closure shall not require specialized tools or equipment, other than those normally carried by installation crews.

4.4.10. Description of Outdoor Inner-duct

Inner-duct, exterior-grade, 1.25" I.D. Length in feet.

4.4.11. Description of Indoor Inner-duct

Inner-duct, interior-grade, plenum-rated, 1.25” I.D. Length in feet

4.4.12. Description of Risers

PVC riser, 4” ID

4.4.13. Description of Cable Ties

Nylon cable ties for use with Aerial Storage Device, 11.5” length, 50-lb strength, binds up to 3” bundle, weather- and UV-resistant, equiv. to Panduit P/N PLT3S-C0. Use 200 ties per 300' of stored cable.

4.5. Maintenance And Protection of Traffic

4.5.1. Description: Unless other provisions are made on the plans or in the Special Conditions, the Contractor shall keep the roadway open to traffic for the full length of the project and shall provide a sufficient number of travel lanes and pedestrian pathways to move that traffic ordinarily using the roadway. The travel lanes and pedestrian pathways shall be drained and kept reasonably smooth and in suitable condition at all times in order to provide minimum interference with traffic and consistent with proper execution of the work.

Suitable ingress and egress shall be provided at all times where required for all intersecting roads and for all abutting properties have legal access.

4.5.2. Construction Methods: When a scheme for maintenance of traffic that may include detours is shown on the plans or approved by the Legal Traffic Authority, this shall govern unless an alternate scheme acceptable to the Engineer is offered by the Contractor at no additional cost. If no scheme is shown on the plans or described in the Special Conditions of the Contract and the Contractor wishes to deviate from the provisions of maintaining traffic as described in this Section, the Contractor must submit, and the Engineer may approve, a schedule showing a proposed sequence of operations and a compatible method of maintaining traffic.

4.5.3. Traffic Signs and Barricades: The Contractor will furnish signs, barricades, traffic cones, and traffic delineators to forewarn traffic of the construction. The Contractor will also provide such safety measures, pavement markings, warning devices, and signs as deemed necessary to safeguard and guide the traveling public through detours ordered by the Engineer or included in the approved scheme for maintenance of traffic. Signs and barricades will be delivered adjacent to the project and traffic cones and delineators will be provided when required, at no cost to the Town. The Contractor shall erect, maintain, move, adjust, relocate and store these signs, barricades, traffic cones, and delineators when, where, and in accordance with the “Manual on Uniform Traffic Control Devices”, or as directed by the Engineer.

The use of unauthorized or unapproved signs, barricades, traffic cones, or traffic delineators will not be permitted.

The Contractor shall keep all signs in proper position and clean and legible at all times. Care shall be taken so that weeds, shrubbery, construction materials or equipment, and soil are not allowed to obscure any sign, light, or barricade. Signs that do not apply to existing conditions shall be removed or adjusted so that the legend is not visible to approaching traffic.

.

4.5.4. Failure to Provide: Should the Contractor fail to perform any of the work required under this Section, the Town may perform, or arrange for others to perform, such work. In such cases, the Town will deduct from monies due or to become due the Contractor, all expenses connected therewith.

4.5.5. Basis of Payment: Maintenance and Protection of Traffic will be paid for at the Contract Lump Sum price for "Maintenance and Protection of Traffic". This price shall include all costs for labor, equipment, and services involved in the erection, maintenance, moving, adjusting, relocating and storing of signs, barricades, traffic cones, and traffic delineators furnished by the Contractor, as well as all cost of labor and equipment involved in the maintenance of traffic lanes and detours ordered or included in the approved scheme for maintenance of traffic.

NOTE: The Town of Glastonbury CHIEF OF POLICE, acting in the capacity of the LEGAL TRAFFIC AUTHORITY, shall be the sole and final authority for the Maintenance and Protection of Traffic.

4.6. Traffic Person

4.6.1. General: This item shall conform to Section 9.70 TRAFFICPERSON, of the Form 816. (Appendix C)

4.6.2. Description: Add the following to the first paragraph of Section 9.70.01(Appendix C)

"Trafficpersons shall consist of uniformed flaggers meeting acceptable criteria or extra duty officers of the Glastonbury Police Department. The Contractor shall provide Uniformed Flaggers meeting the requirements of this specification as required for safe traffic operations in the project area. Extra-duty police officers will be used only when specifically required by the Police Chief, as the Legal Traffic Authority, who will make this determination based on the Contractor's proposed operations, traffic volumes, and traffic conditions."

"All work under this item shall be paid only for the duration of the Contract as contained in the Special Conditions under 'Time for Completion/Notice to Proceed' and for any time extensions granted in writing by the Town. Payment for police officers

required after the duration of the Contract and approved time extensions shall be made directly by the Town and such costs deducted from future payments due the Contractor."

4.6.3. Basis of Payment: Replace Section 9.70.05 (See appendix C) with the following:

"There will be no direct payment for safety garments or STOP/SLOW paddles. All costs associated with furnishing safety garments and STOP/SLOW paddles shall be considered included in the general cost of the item.

1. Uniformed Flagger: Uniformed flaggers will be paid for at the contract unit price per hour for "Trafficperson (Uniformed Flagger)" as listed in the bid proposal, which price shall include all compensation, insurance benefits, and any other cost or liability incidental to the furnishing of the trafficpersons ordered." The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original price will be used to determine the total amount for the contract.

When the trafficperson consists of Town of Glastonbury Police Officers, the Contractor shall provide the invoices from such work to the Engineer and the Town will pay these invoices directly. Under these circumstances, the Contractor will be reimbursed only for the 5% markup on the actual cost of police services under this line item.

5. Bid Proposal

ITEMS REQUIRED WITH SUBMISSION OF BID PROPOSAL:

The following bid checklist describes items required for inclusion with the above-referenced bid proposal package. It is provided for the convenience of the bidders and, therefore, should not be assumed to be a complete list.

_____1. Included Bid Bond as per Section 1.1.10 of the Information for Bidders.

_____2. Included Disclosure of Past and Pending Mediation, Arbitration, and Litigation cases against the Bidder or its Principals as per Section 1.3.1 of the Information for Bidders.

_____3. Included Qualifications Statement as per Section 1.6.1 of the Information for Bidders.

_____4. Checked Town web site for Addendums, and acknowledged as applicable.

_____ 5. The proposal has been signed by a duly authorized representative of the company.

_____ 6. Any technical or descriptive literature, drawings, Product data sheets or proposal samples that are required have been included with the bid.

_____ 7. Acknowledged Code of Ethics on page 40.

_____ 8. Clearly marked envelope with Bid Number, Date, and Time of opening.

Town of Glastonbury
Purchasing Agent
2155 Main Street
Glastonbury, CT 06033
Bid # GL-2012-03 – Fiber Backbone Cabling

_____ 9. The proposal is mailed or hand-delivered in time to be received no later than the designated opening date and time. Late responses are NOT accepted under any circumstances. Faxed responses are not accepted. Please allow enough time if mailing your proposal.

_____ 11. Provide one original and one copy of the Bid Response.

_____10. Warranty Information is enclosed.

TOWN OF GLASTONBURY **GL #** **GL-2012-03**
BID / PROPOSAL **RPGL #**
DATE ADVERTISED **8/3/2011** **DATE / TIME DUE** **9/15/11@11:00AM**

NAME OF PROJECT **FIBER BACKBONE CABLING**

Proposal of _____

(hereinafter called "Bidder"), organized and existing under the laws of the State of

_____, doing business as _____

_____.

To the Town of Glastonbury (hereinafter called "Town").

In compliance with your invitation to Bid, the Bidder hereby proposes to furnish materials and/or services as per Bid Number GL-2012-03 in strict accordance with the Bid Documents, within the time set forth therein, and at the prices stated below.

By submission of this bid, the Bidder certifies, and in the case of a joint bid each party thereto certifies as to their own organization that this bid has been arrived at independently without consultation, communication, or agreement as to any matter relating to this bid with any other Bidder or with any competitor.

The Bidder hereby agrees to commence this contract on a date to be specified in the Notice to Proceed and to fully complete the project within _____ consecutive calendar days thereafter.

The Bidder acknowledges receipt of the following Addendum:

Addendum #1_____

Addendum #2 _____

Addendum #3_____

Fiber Backbone Cabling

Base Bid **Lump Sum Total**

1. **Install Fiber Cable System** $ _____

2. Maintenance and Protection of Traffic - in accordance With Section 4.5 of the Detailed Construction Specifications $ _____

3. Traffic Person (Uniformed Flagger)
In Accordance with Section 4.6 of the Detailed Construction Specifications EST. HRS 800 hrs $_____/HR $ _____

4. Total Base Bid: (Items 1 through 3) $ _____

Written Base Bid Amount: _____

_____

Alternates:

A1. Alternate 1: Install Fiber Cable to Glastonbury Bus Yard $ _____

A2. Alternate 2: Install Fiber Cable to Parks Department $ _____

A3. Alternate 3: Install Fiber Cable to South Glastonbury Library $ _____

A4. Alternate 4: Install Fiber Cable to Fire Company 4 $ _____

A5. Alternate 5: Install Fiber Cable to the Bulky Waste Facility $ _____

5. Total Base Bid plus Alternates: $ _____

Written Base Bid plus Alternates Amount: _____

_____

6. Additions/Reductions: Installed Cabling due to route changes
As per section 3.13.3 $ _____/foot installed

7. Warranty Information: (Enclose Warranty Information with bid, as applicable)

_____

CODE OF ETHICS:

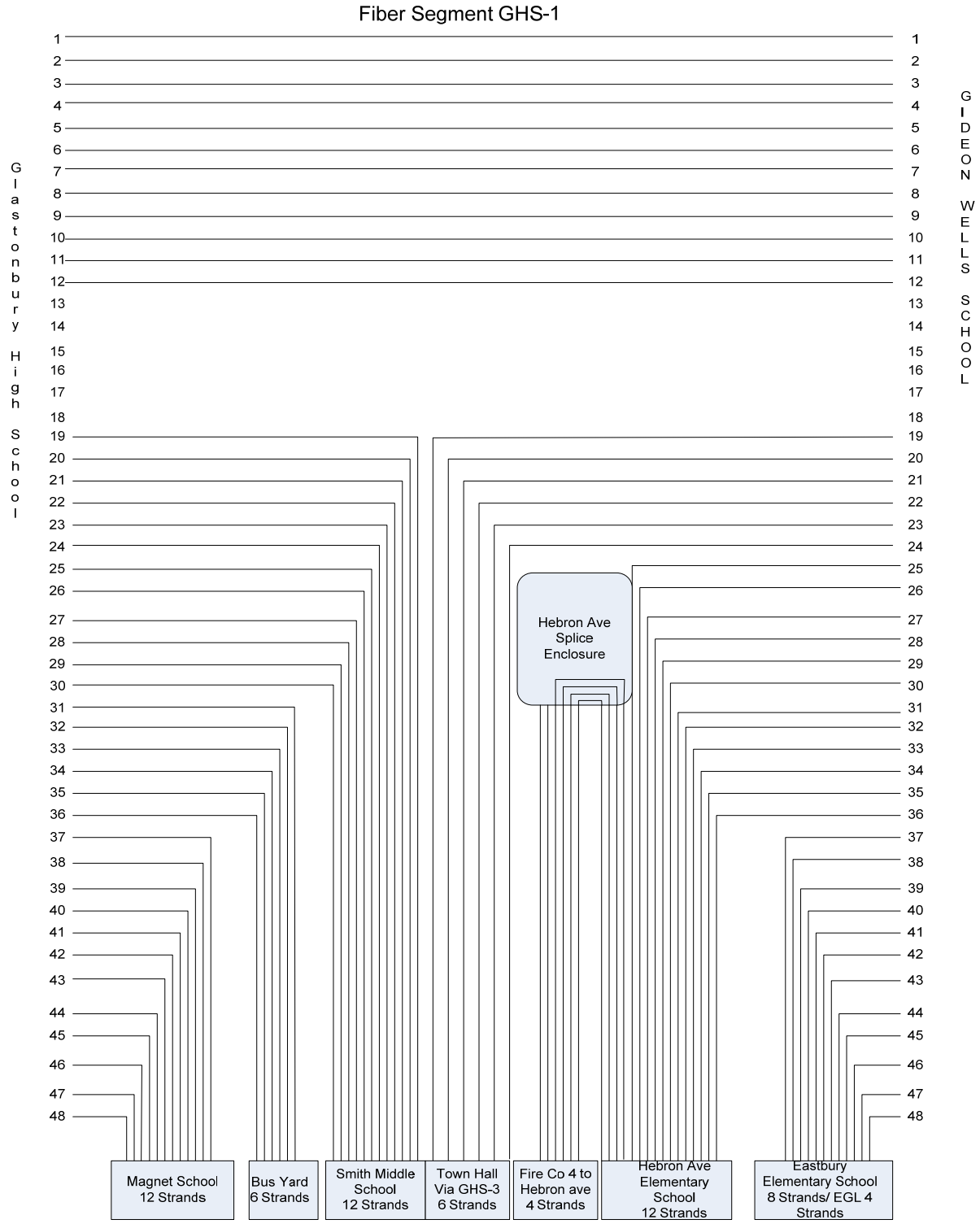
I / We have reviewed a copy of the Town of Glastonbury's Code of Ethics and agree to submit a Consultant Acknowledgement Form if I /We are selected. Yes _____ No _____ *

***Bidder is advised that effective August 1, 2003, the Town of Glastonbury cannot consider any bid or proposal where the bidder has not agreed to the above statement.**

Type or Print Name of Individual	**Doing Business as (Trade Name)**
Signature of Individual	**Street Address**
Title	**City, State, Zip Code**
Date	**Telephone Number / Fax Number**
E:mail Address	**SS # or TIN#**

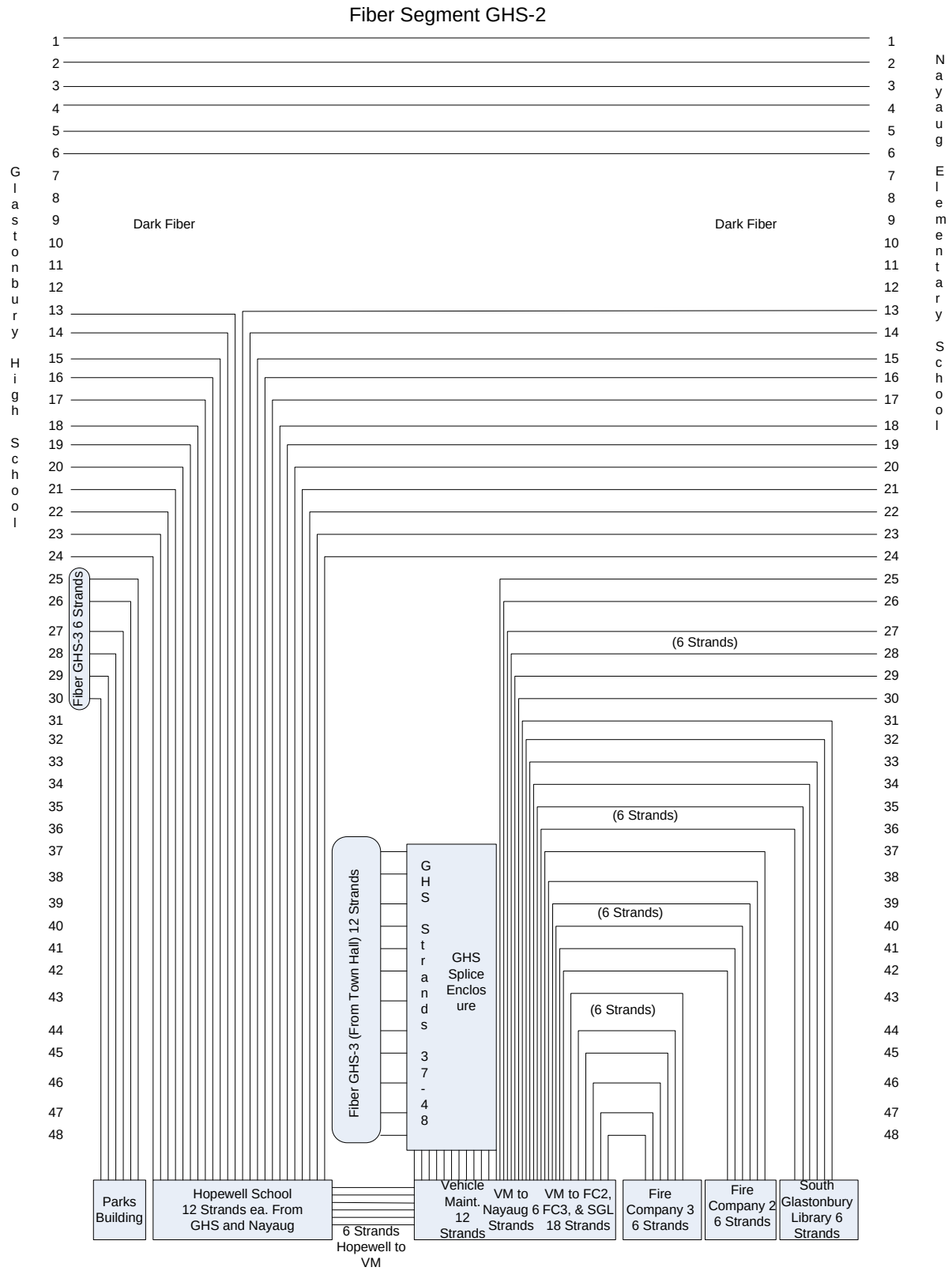
Appendix A

Strand Layout Segment GHS-1

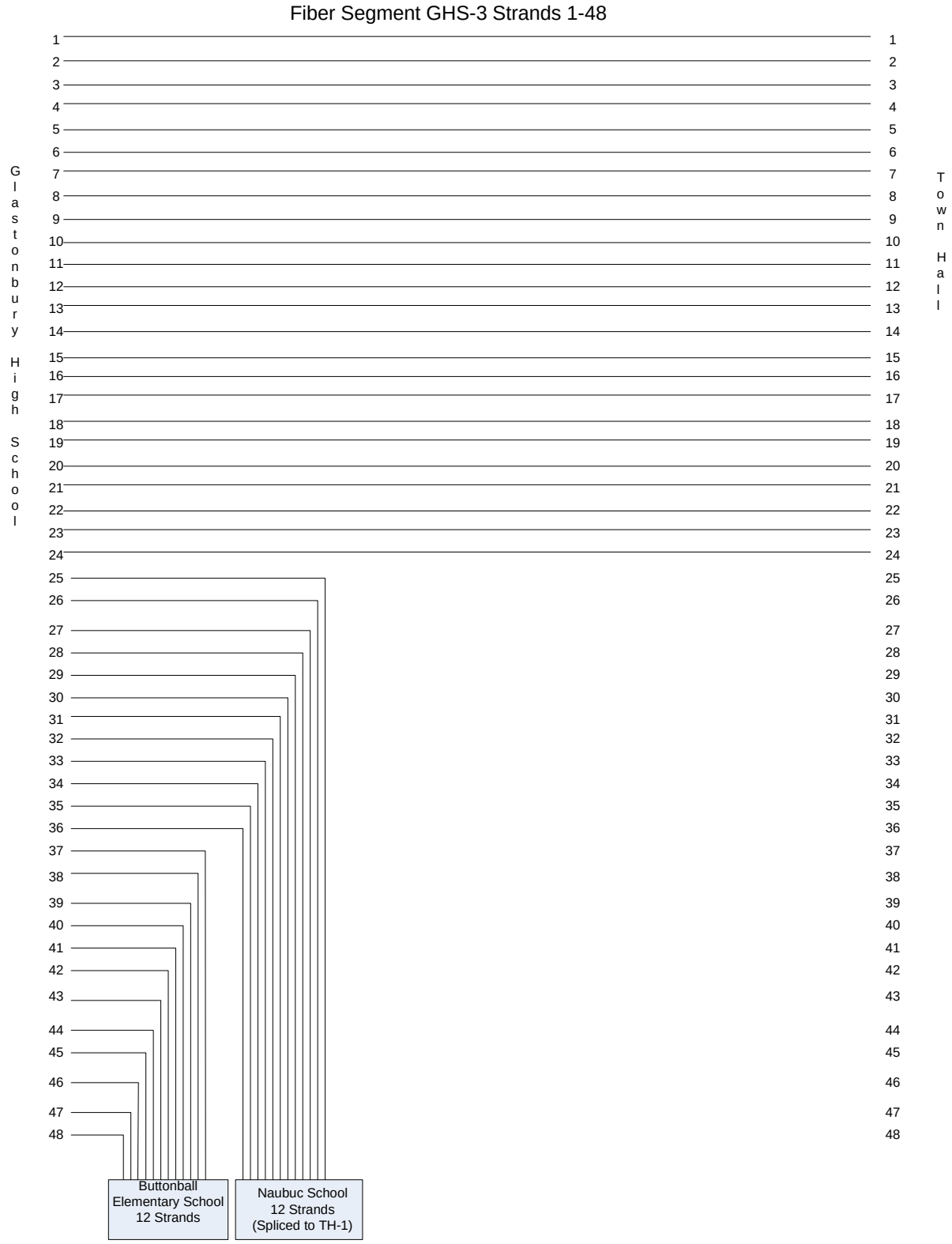


Fiber Backbone Cabling

Strand Layout GHS-2

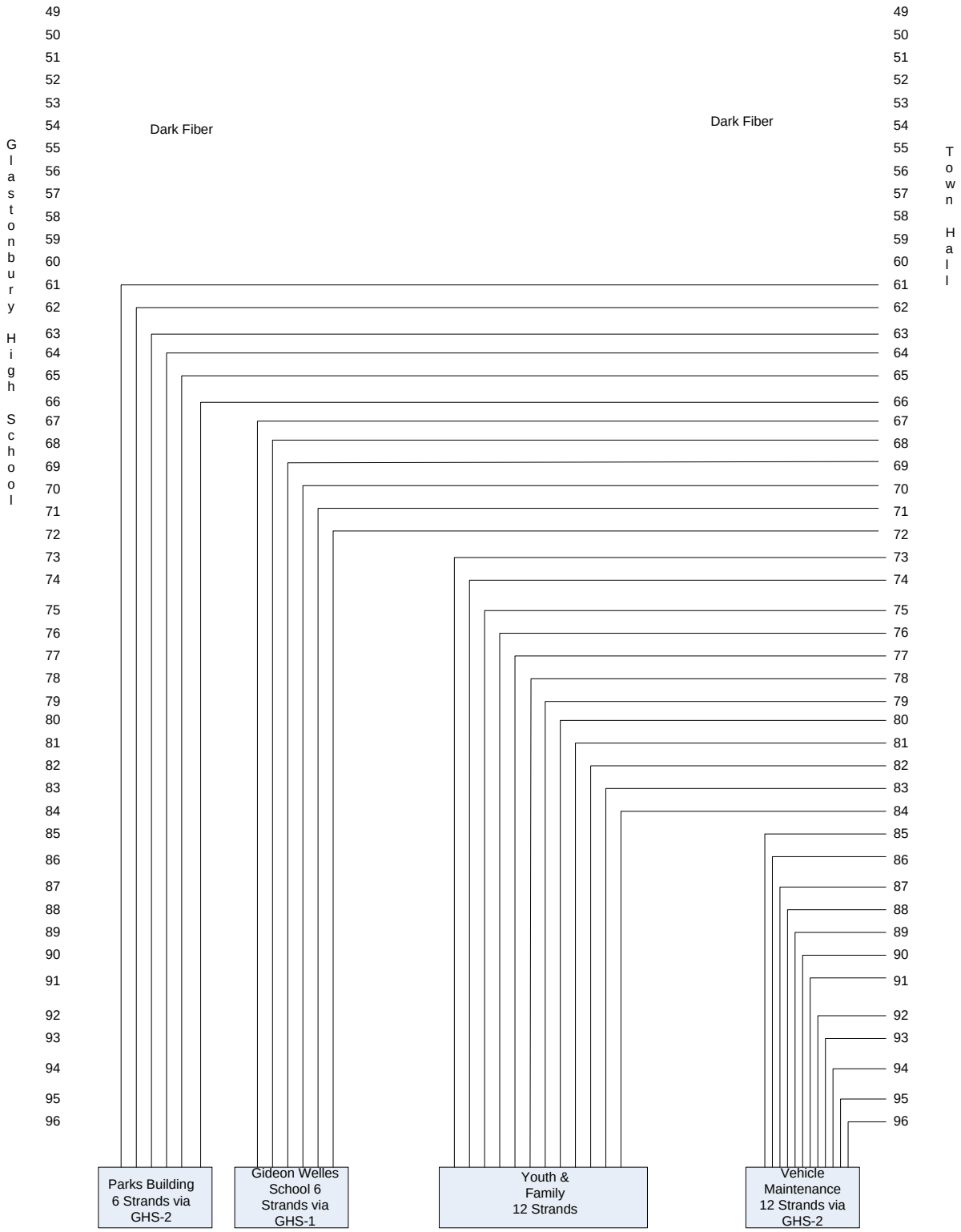


Strand Layout GHS-3



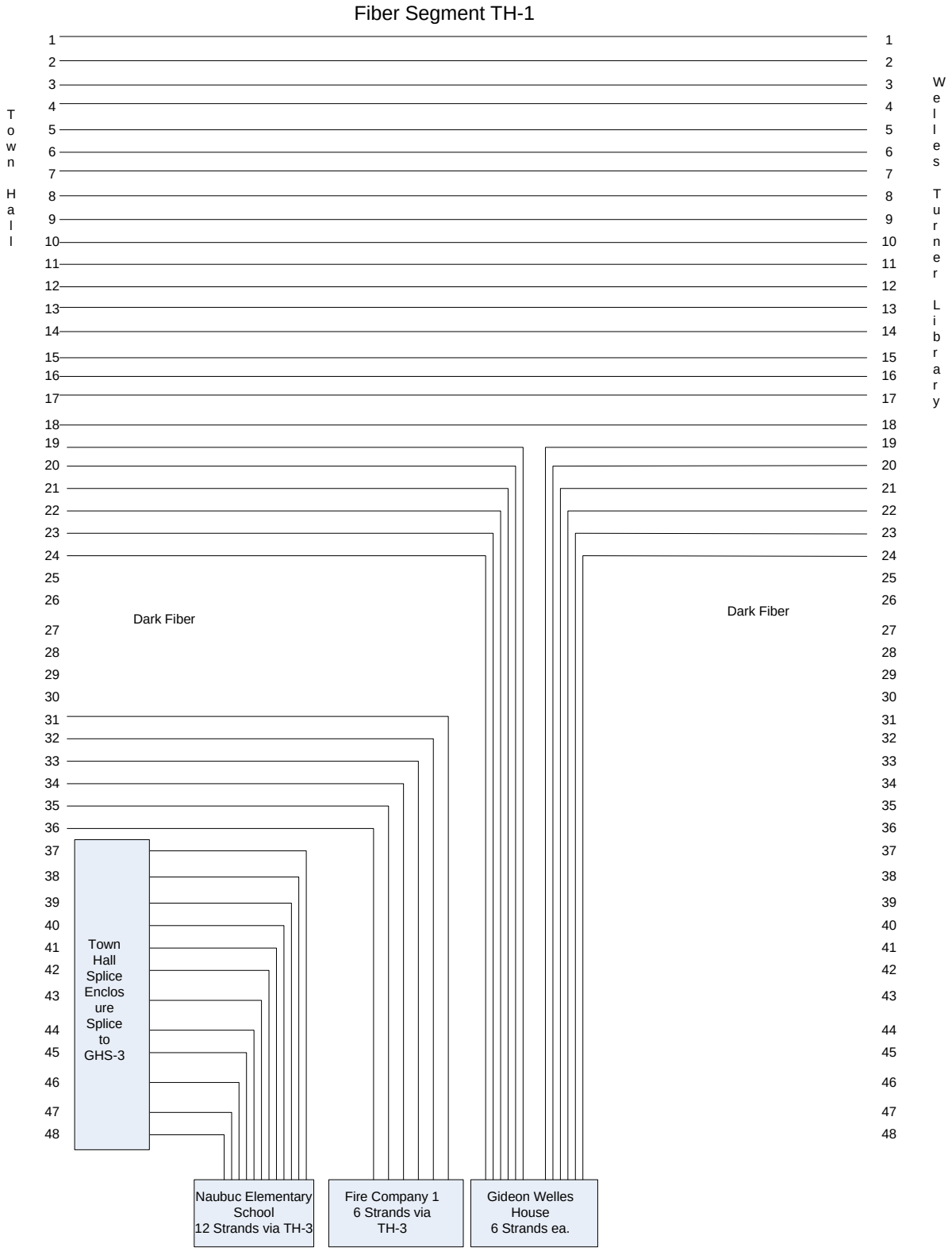
Fiber Backbone Cabling

Fiber Segment GHS-3 Strands 49-96

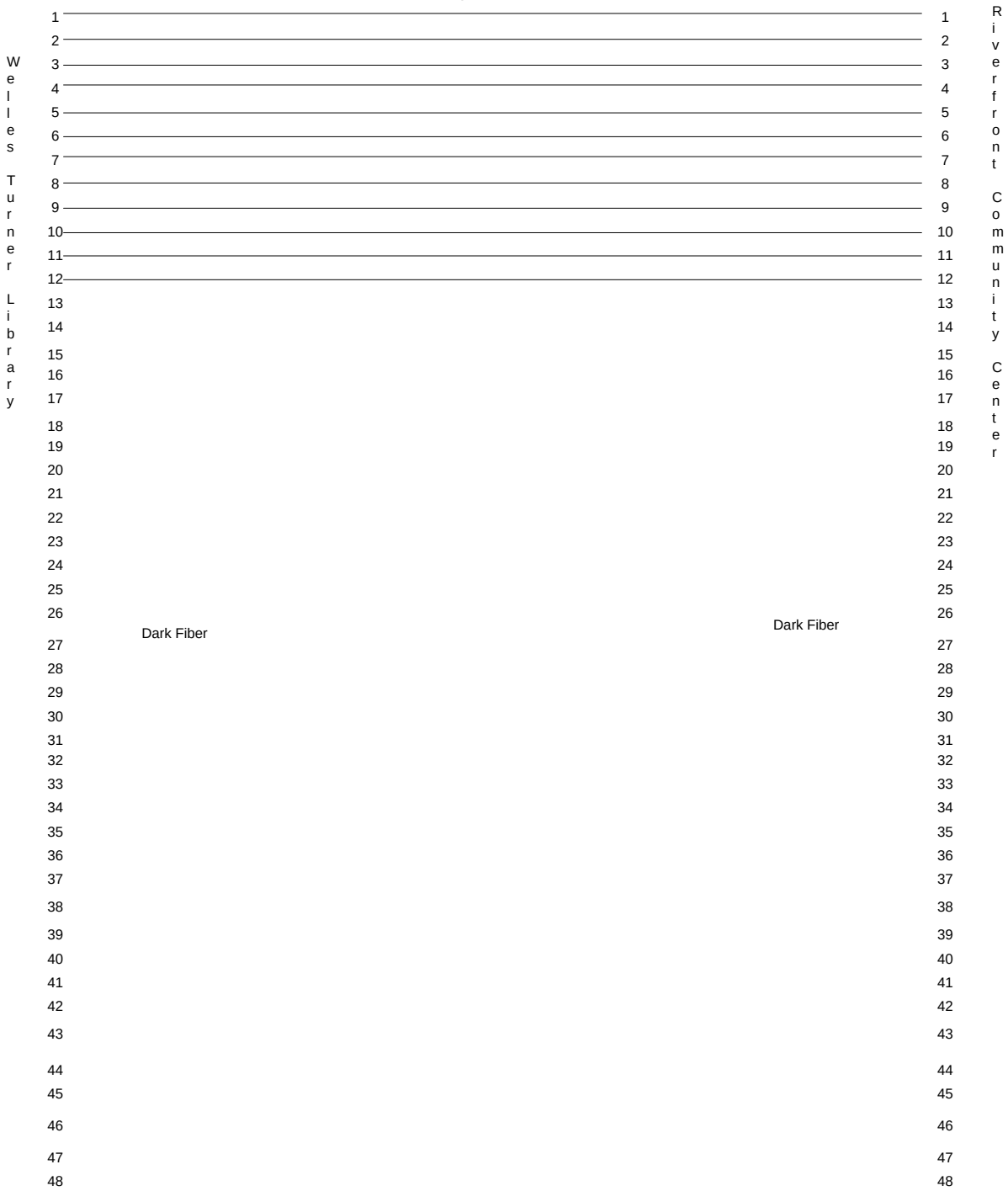


Fiber Backbone Cabling

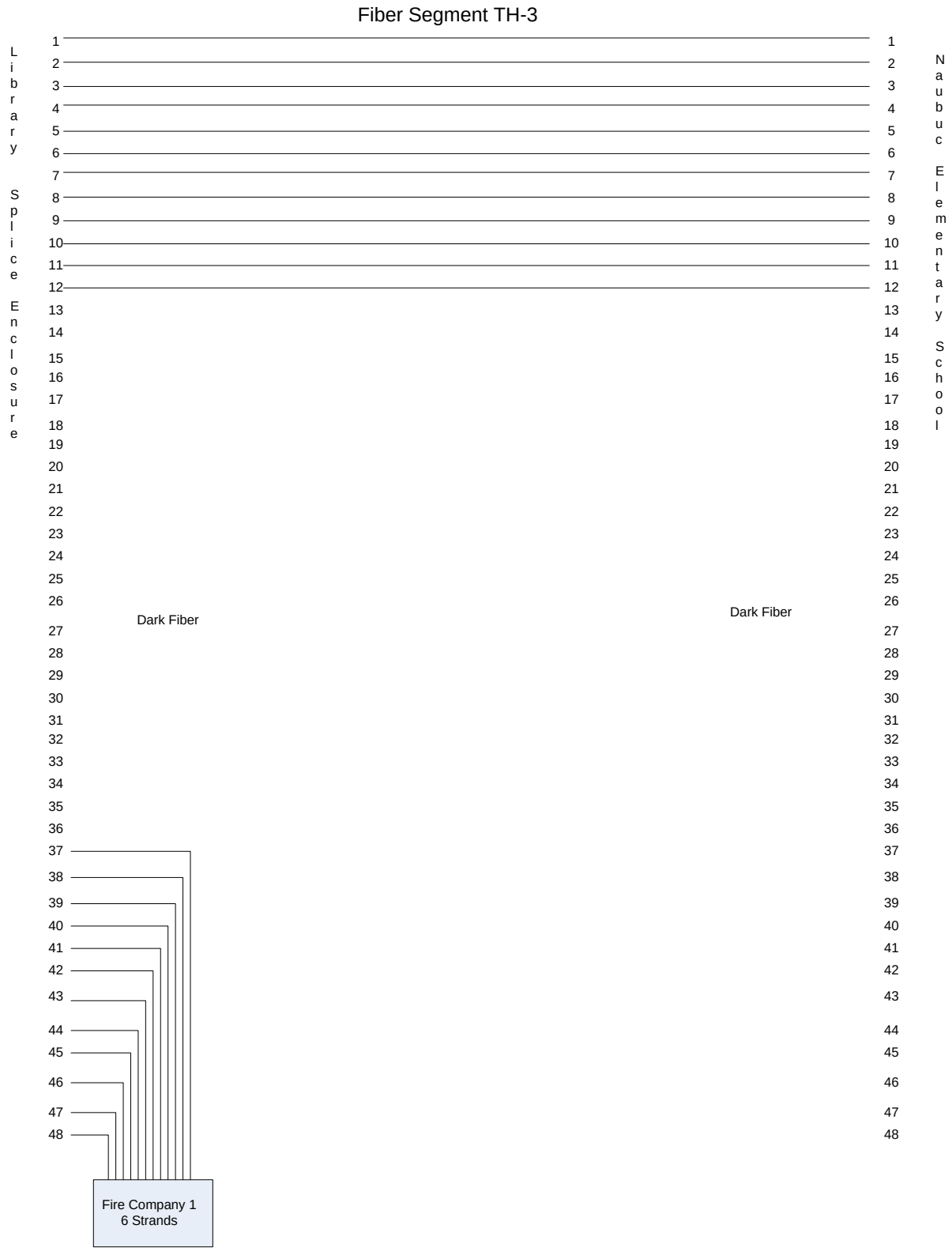
Strand Layout TH-1



Strand Layout TH-2



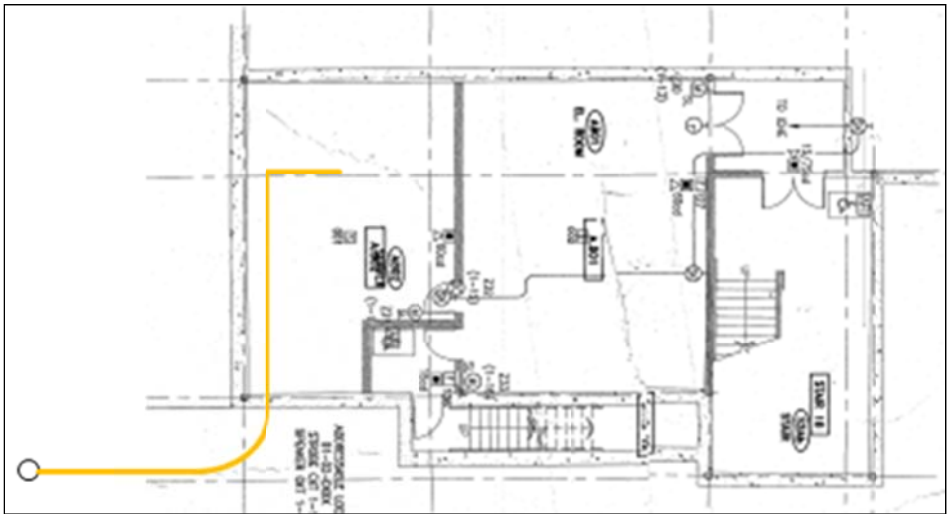
Strand Layout TH-3



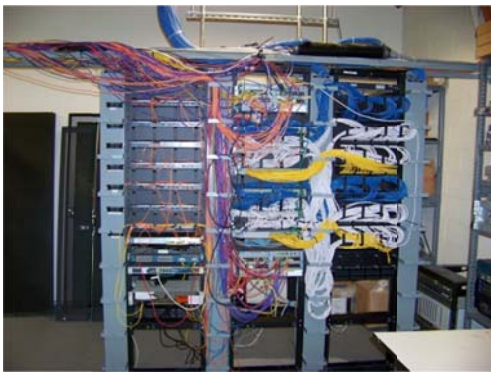
Appendix B

Glastonbury High School

330 Hubbard Street



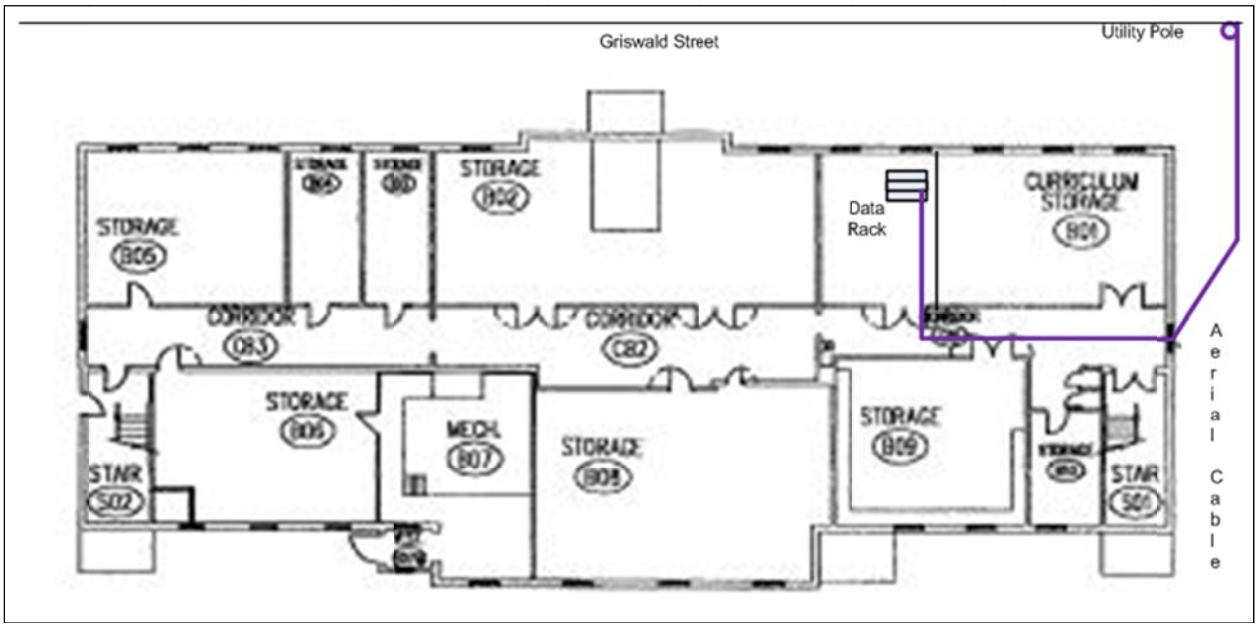
Fiber Termination Location: The fiber cable will be terminated in a Rack Mount Enclosure located in the Network Server racks.



Fiber Cable Route: The cable will route from Utility Pole at the Street to a wall mount fiber splice enclosure located in the Network Operations Center in existing 4" conduits. From the splice enclosure the fiber will route to the Rack Mount Fiber Enclosures in the Network Server Racks in the Network Operations Center.

Naubuc Elementary School

82 Griswold Street

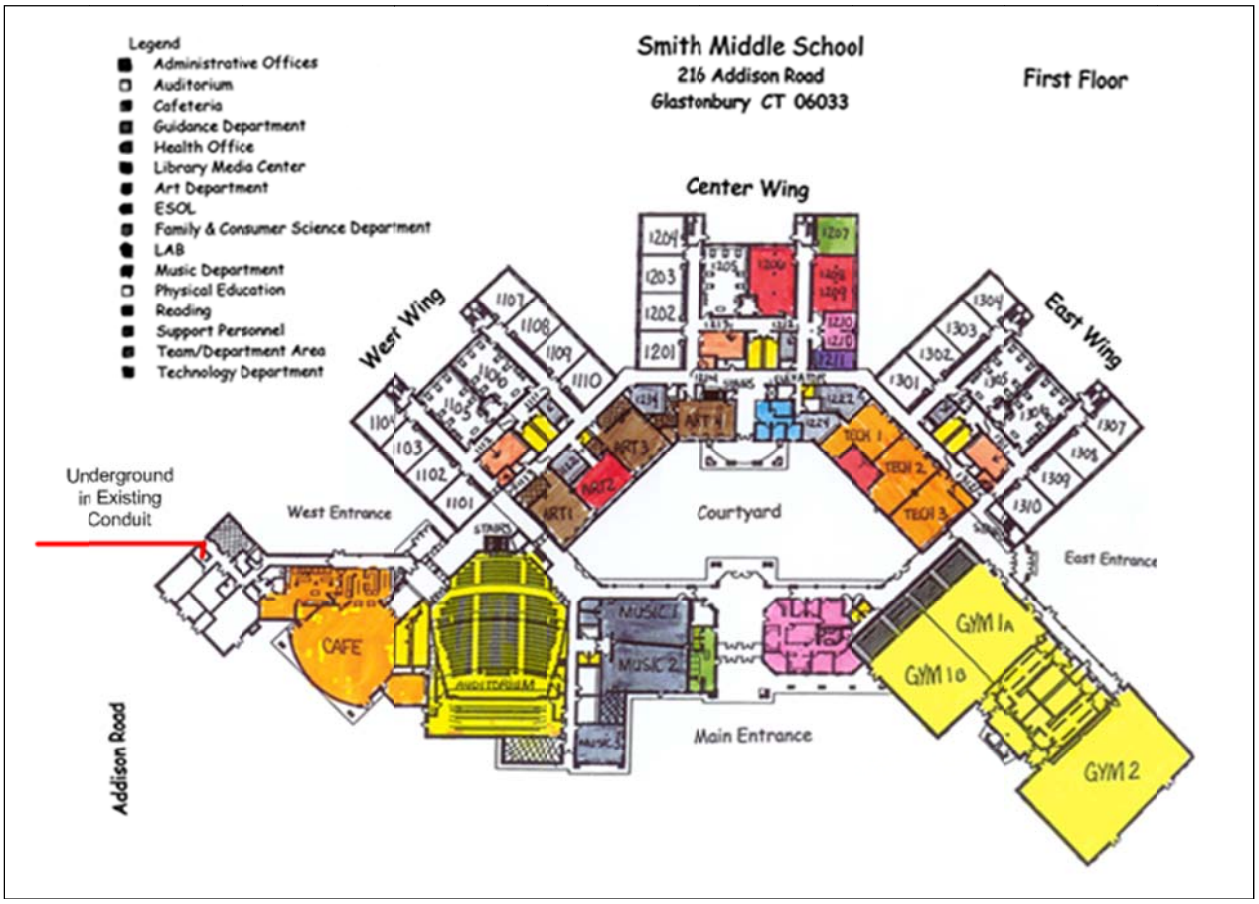


Fiber Termination Location: Basement of Naubuc Elementary School at northeast corner in existing four post Data Rack. Install rack mount fiber enclosure in rack.

Fiber Cable Route: The route from the Utility Pole will Aerial with entrance on the side of the building in same proximity to the existing Telephone cable. (See Picture).

Smith Middle School

216 Addison Rd

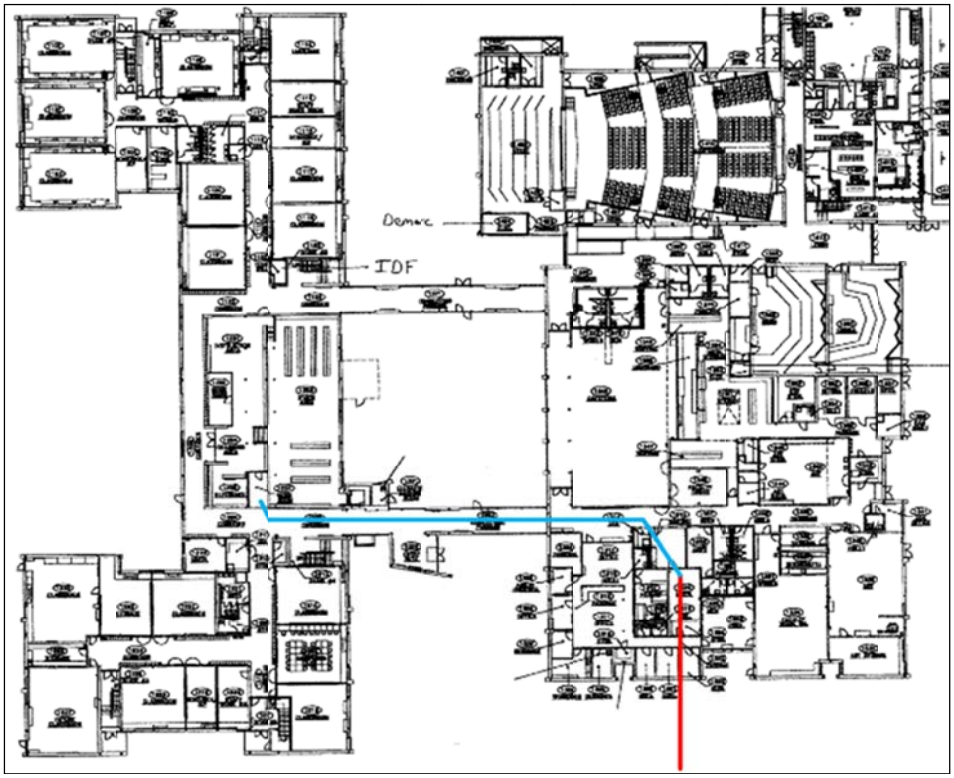


Fiber Termination Location: The cable will enter the building in a conduit that runs to the West Side Data closet. The cable will terminate in a new wall mount enclosure to be located adjacent to the existing data rack.

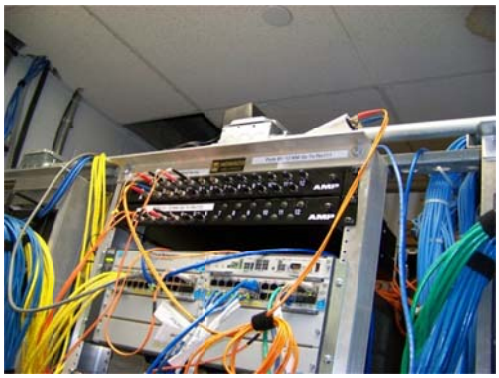
Fiber Cable Route: The cable will enter an existing conduit that is located at the base of the Utility Pole and run through the conduit to the West Data Closet. Note that there is an existing fiber cable in the conduit that is provided by Fiber Tech presently.

Gideon Welles Sixth Grade School

1029 Neipsic Rd



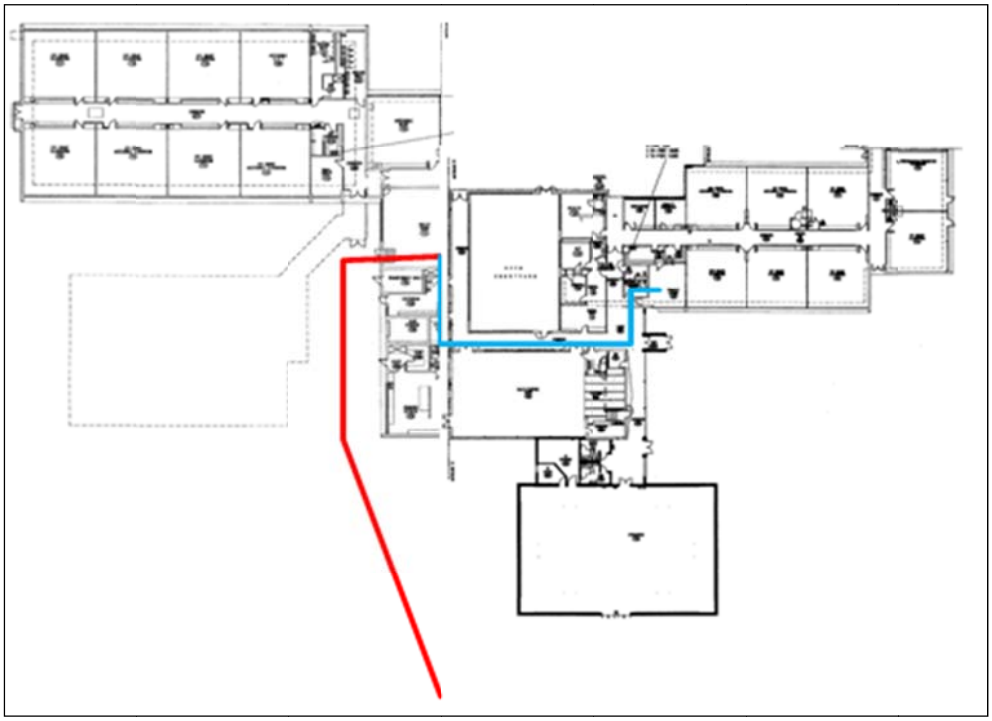
Fiber Termination Location: The Fiber Cable will enter the building using an existing conduit to the Mechanical Room by the Nurses Office. At that point the cable will transition to plenum rated cable and route to the server room on the second floor. Note the Blue route represents the Plenum Rated Cable. The Cable splice in the mechanical room will take place at an existing Fiber Enclosure, although it might be prefereable to replace the existing enclusure. The fiber then extends to the server room on the second floor and terminates in a new rack mount enclosure.



Fiber Cable Route: The fiber cable will route from an existing conduit that starts at the utility pole at the street and runs to the mechanical room. A pull rope is already installed.

Hebron Avenue Elementary School

1323 Hebron Ave.

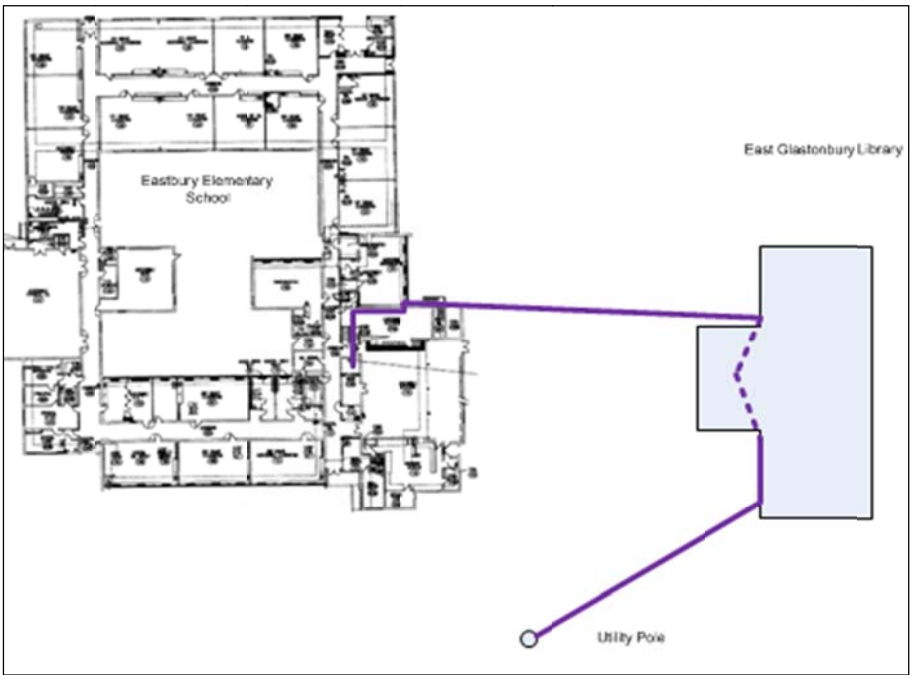


Fiber Termination Location: The Fiber will enter the mechanical room on the west side of the building and route the far side of the room. A wall mounted splice enclosure will be used to transition the cable to a plenum rated cable at that point. The fiber cable will then be extended to server room located near the main entrance. Follow the blue cable path on the drawing.

Fiber Cable Route: The fiber cable will route underground in existing 4" conduit from the Utility pole to mechanical room. It will splice to plenum rated cable in the mechanical room and continue to the server room. Note that the existing conduit has a Cox Coax cable in the conduit at this time.

Eastbury Elementary School/East Glastonbury Library

1389 Neipsic Rd



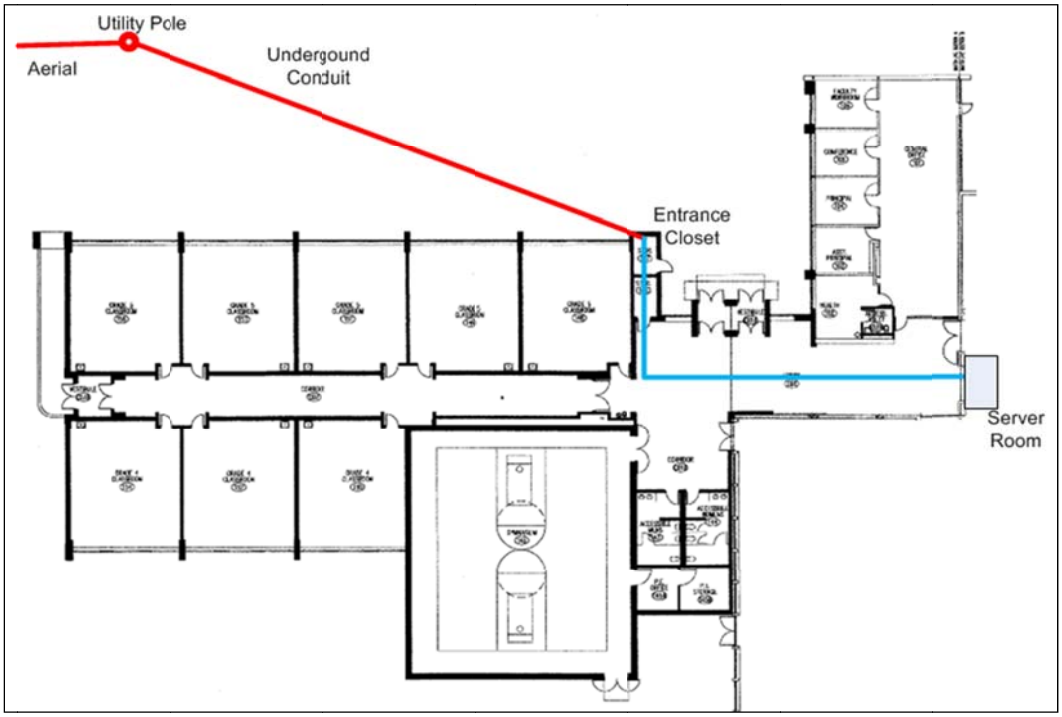
Fiber Termination Location: This drop includes two fiber termination locations. Six Strands will terminate in the East Glastonbury Library. Twelve strands of fiber cable will terminate in Eastbury Elementary School. Eight of the stands will be spliced at the Gideon Welles Splice Enclosure that are routed to Eastbury Elementary School and four of the stands that route to East Glastonbury Library will be spliced at the Gideon Welles Splice Enclosure to the cable running to Gideon Welles Sixth Grade School.



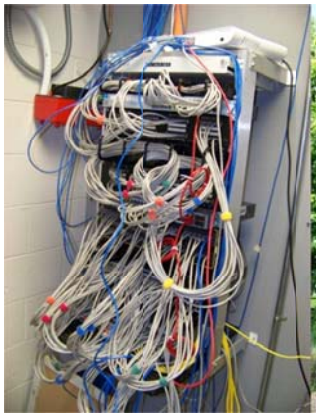
Fiber Cable Route: The fiber cable will route from the Utility pole aerially southeast corner of the East Glastonbury Library. It will route into the basement of the library to a wall mounted fiber splice/termination enclosure. The cable will then continue back out of the building and run from the top of the roof by the chimney across the parking lot to the top of the cafeteria section of Eastbury School. It will enter the school at the back of the Stage area and route to the server room adjacent to the Cafeteria.

Hopewell Elementary School

1020 Chestnut Hill Rd



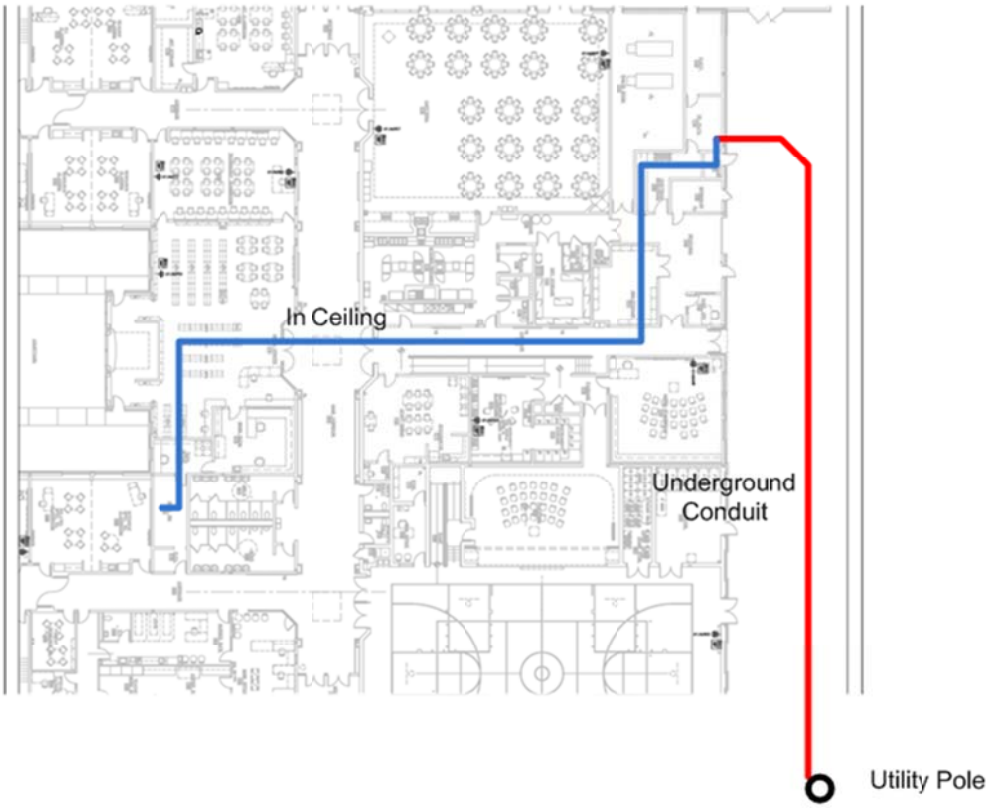
Fiber Termination Location: The cable will enter into the Entrance Closet and be spliced to plenum rated cable. The cable will then extend to the server room in the middle of the building. There is an existing conduit that can be used to extend the cable from the Entrance closet to the Hallway in the school area.



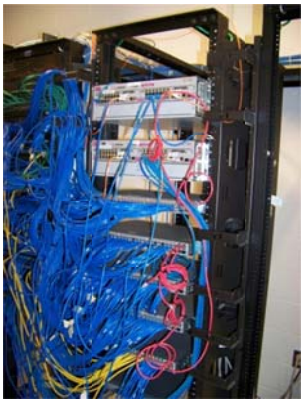
Fiber Cable Route: The fiber cable will route onto the property on utility poles to the last pole and then run underground in an existing empty conduit. The cable will then be spliced and extend to the server room.

Nayaug Elementary School

222 Old Maids Lane



Fiber Termination Location: The cable will enter the Tel/data room on the west side of the building and be spliced to plenum rated cable. The fiber cable will be terminated in the server room in a new Rack Mount Enclosure.

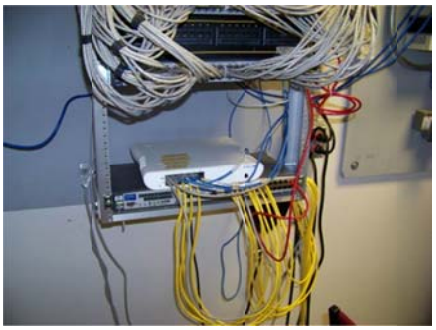


Fiber Cable Route: The cable will run underground in an existing inner-duct from the utility pole to the tel/data room. It will then be spliced at that point to a plenum rated cable and run in new inner-duct in an existing cable tray to the server room where it will be terminated in a new rack mount fiber enclosure.

Buttonball School

376 Buttonball Lane

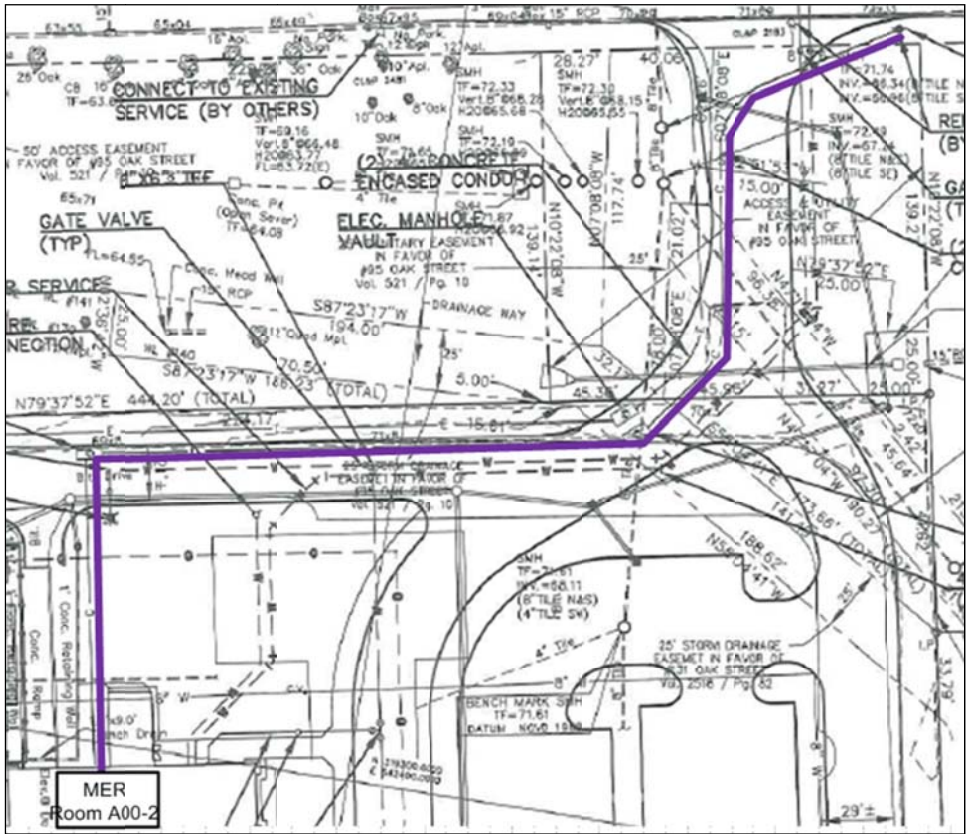
Fiber Termination Location: The cable will be spliced in the West IDF near the main office and the route to the server room in the East side and terminate in a new rack mount enclosure.



Fiber Cable Path: The cable will run aerially from a nearby Utility Pole to the roof area of the school following an existing cable tv cable and enter the building there. It will then route to the nearby West Wiring room where the cable will be spliced to plenum rated cable. Fifty feet of outside plant cable is to be stored in the room so that the cable can be re-routed to an underground conduit in the future. The cable will then route to the server room at the other end of the building and be terminated in a new rack mounted enclosure in the existing wall mount rack.

Glastonbury East Hartford Magnet School

Oak Street, Glastonbury



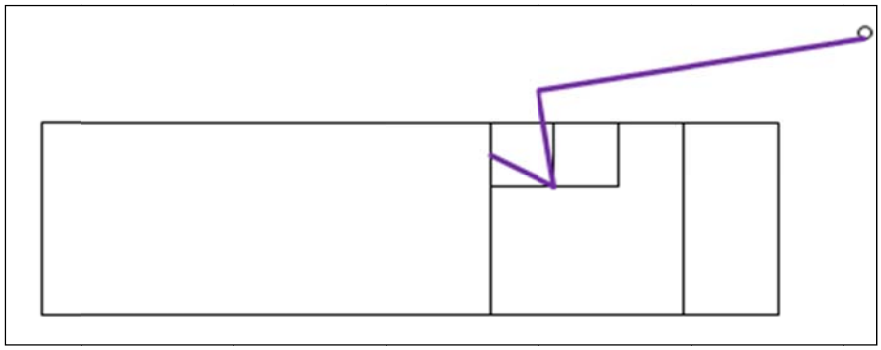
The new Glastonbury/East Hartford Magnet School is currently under Construction. Availability of the facility will depend on the construction schedule.

Fiber Termination Location: The Fiber cable will terminate in the MER area, Room A00-2. It is expected the cable will terminate in a new Rack Mount Enclosure.

Fiber Cable Route: The fiber cable will route from a splice enclosure located on Commerce Street to Oak Street, and then to NutMeg Lane. From the utility poles it will enter a newly installed conduit at a pole on NutMeg Street and route to the MER (Main Equipment Room) and route to room A002.

Glastonbury Bus Yard

** Optional
311 Oakwood Dr

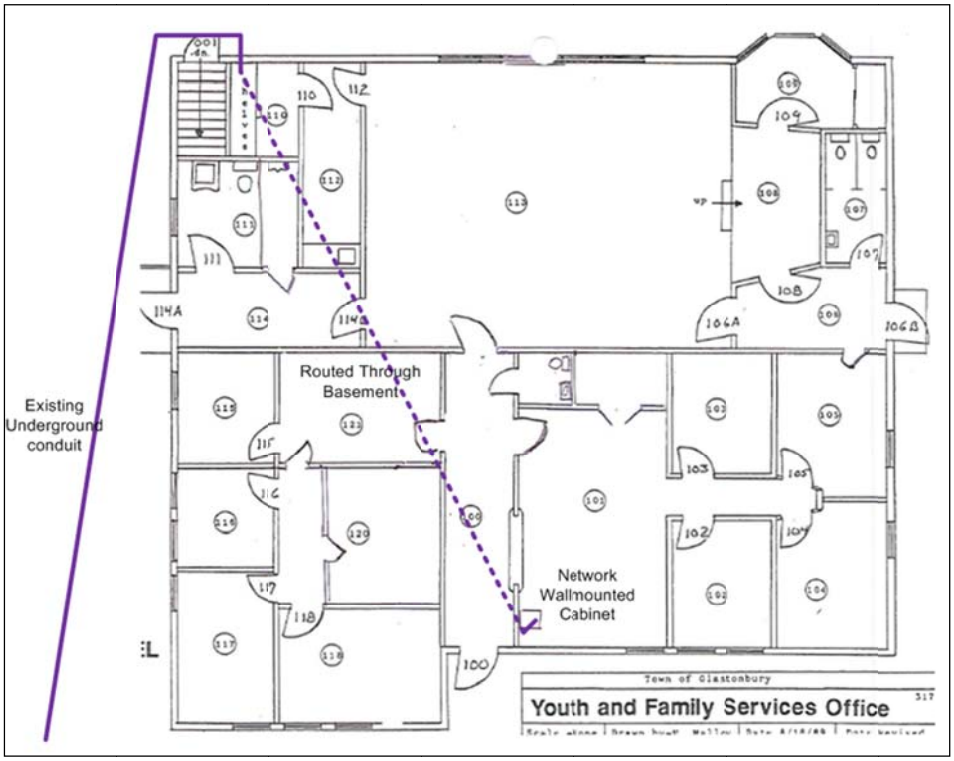


Fiber Termination Location: The cable will terminate in the Server Closet in a new wall mount fiber enclosure.

Fiber Cable Path: The cable will route from the Utility Pole on the street to the second floor mezzanine where it will exit the conduit. It will then route to the server cabinet in the floor below and be terminated in a wall mount fiber enclosure.

Youth & Family Services

321 Hubbard Street



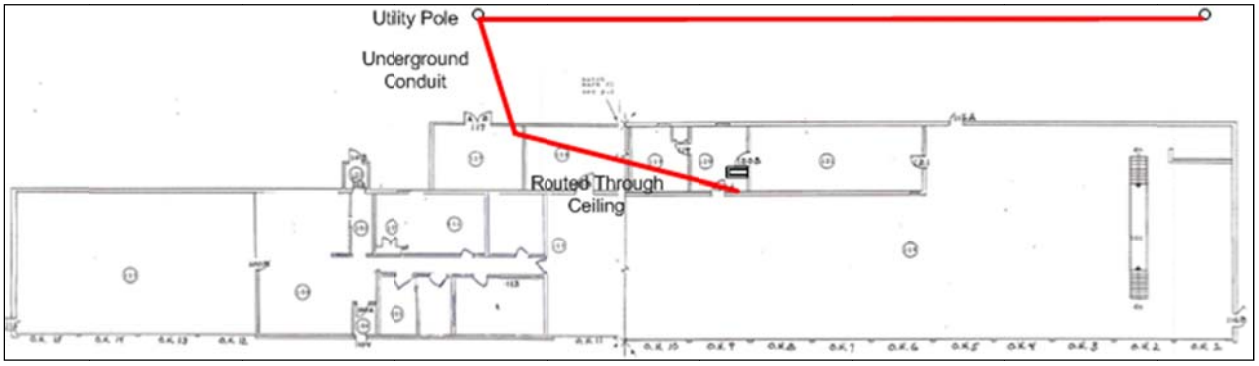
Fiber Termination Location: The fiber cable will terminate in a new wall mount fiber enclosure to be mounted on the wall near the existing wallmounted network cabinet. The fiber service loop will be stored in the basement.



Fiber Cable Route: The fiber cable will route from the Utility Pole near the front of the property in existing underground conduit. This conduit has a single run of RG6 cable that at present is not in use. The coax cable can be pulled back and then pulled back through with the fiber. The cable will enter the building in the back into the basement and route through the basement to the location of the network cabinet and then route up through the floor.

Vehicle Maintenance Garage

2380 New London Turnpike

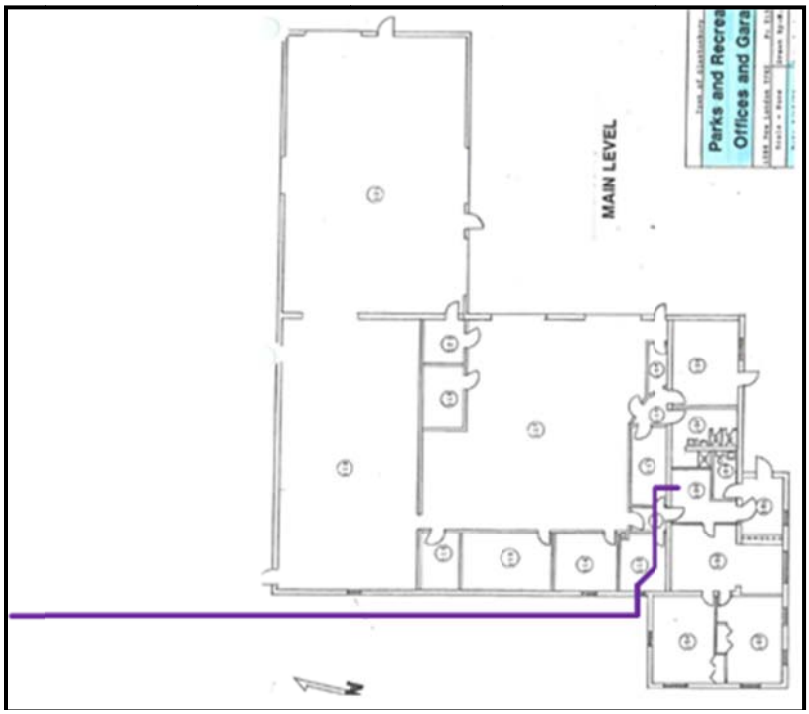


Fiber Termination Location: The fiber cable will route to the server cabinet location and terminate in a new wall mount fiber enclosure near the existing network switches.

Fiber Cable Route: The cable will route in from the street on existing Utility Poles to Pole #__. The cable will then route underground through existing conduit into the building at the electrical room. It will then route overhead in the ceiling to the server cabinet where it will terminate in a wall mount enclosure.

Parks Building

1086 New London Turnpike

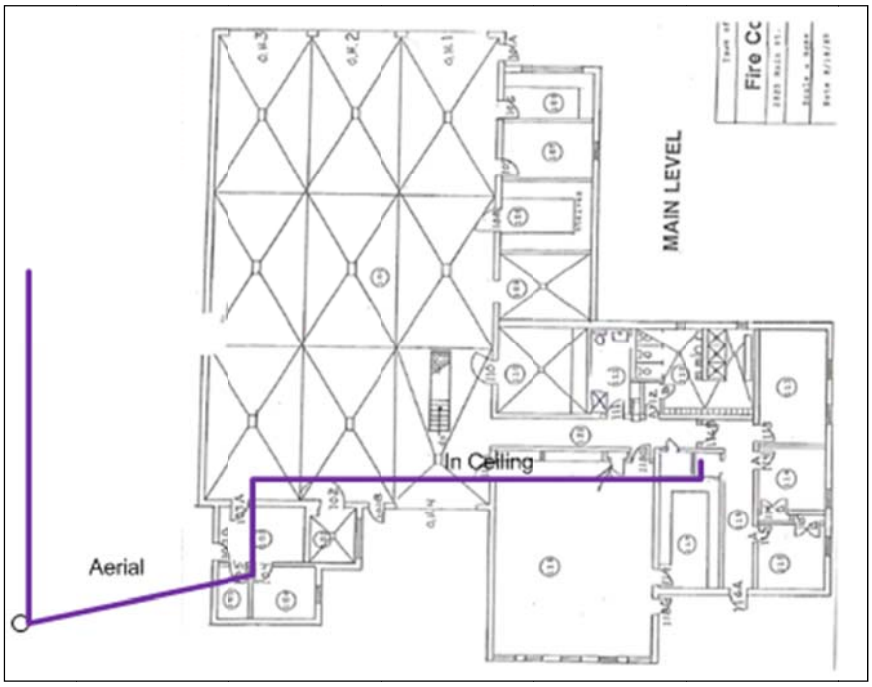


Fiber Termination Location: The fiber cable will terminate in a wall mount enclosure in the copier room near the network switch.

Fiber Cable Route: The cable will route underground in existing conduit from the utility pole on the West Side of New London Turnpike to the Parks building. The cable will enter in the mechanical room and run overhead in the ceiling to the copier room and terminate on a wall mount fiber enclosure.

Fire Company 1

2825 Main Street

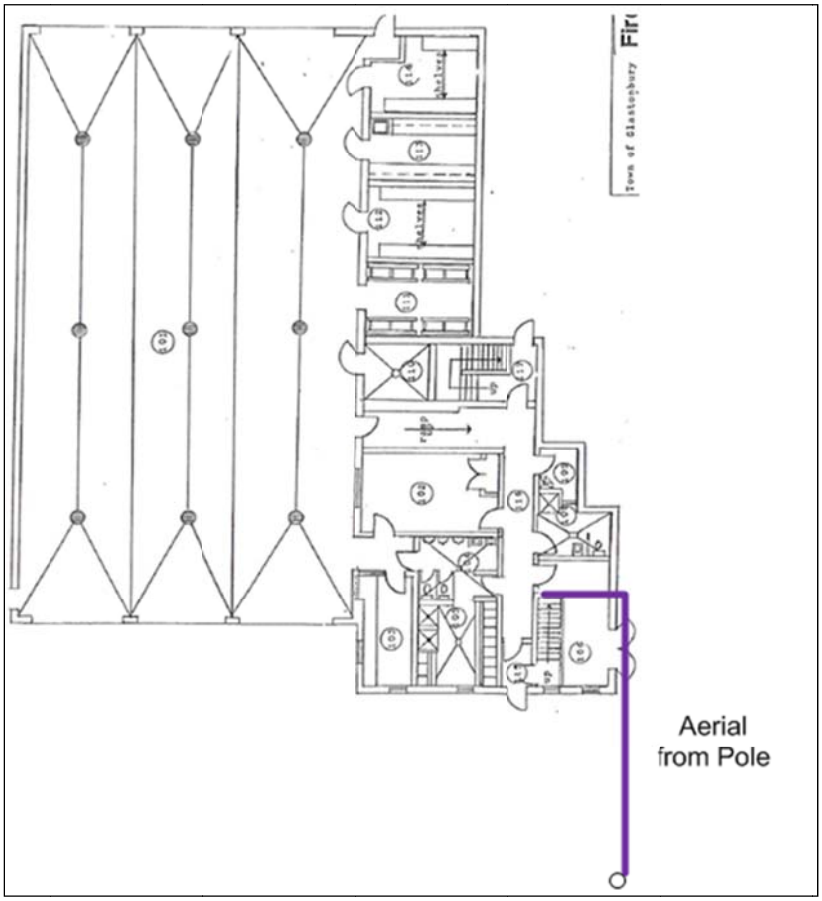


Fiber Termination Location: The fiber cable will be spliced in the electrical room if necessary and extend to the server closet and terminate in a wall mounted fiber enclosure in the back of the server closet.

Fiber Cable Route: The fiber cable will originate on the pole across the street and route aerially to the roof of the Fire Company. The cable will enter the roof in the same area as the cable TV cable and route to the electrical room. At that location it will be spliced to plenum rated cable and then route to the server closet for termination in a wall mount enclosure.

Fire Company 2

905 Main Street



Fiber Termination Location: The fiber cable will terminate in a new wallmount enclosure to be located in the mechanical room.

Fiber Cable Route: The cable will originate on the Utility Pole across the street and route to the north side of the building where it will enter through the wall to the mechanical room and terminate in a wall-mount enclosure.

Fire Company 3

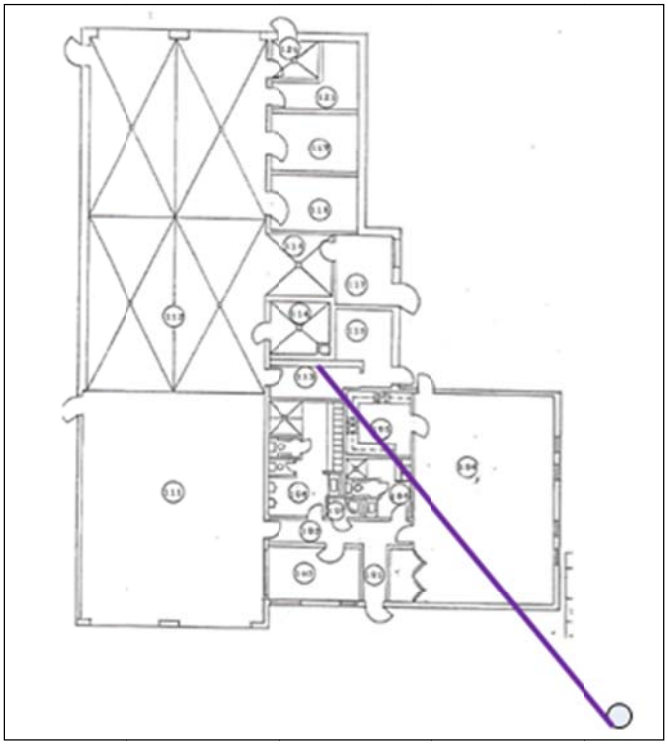
1089 Chestnut Hill Rd

Fiber Termination Location: The cable will terminate in a wall mount enclosure in the Electrical Room.

Fiber Cable Route: The cable will route in existing underground conduit from the Utility Pole across the street to the electrical room. Note that the conduit has an existing RG 6 TV cable in the conduit.

Fire Company 4

Optional
1247 Manchester Rd.



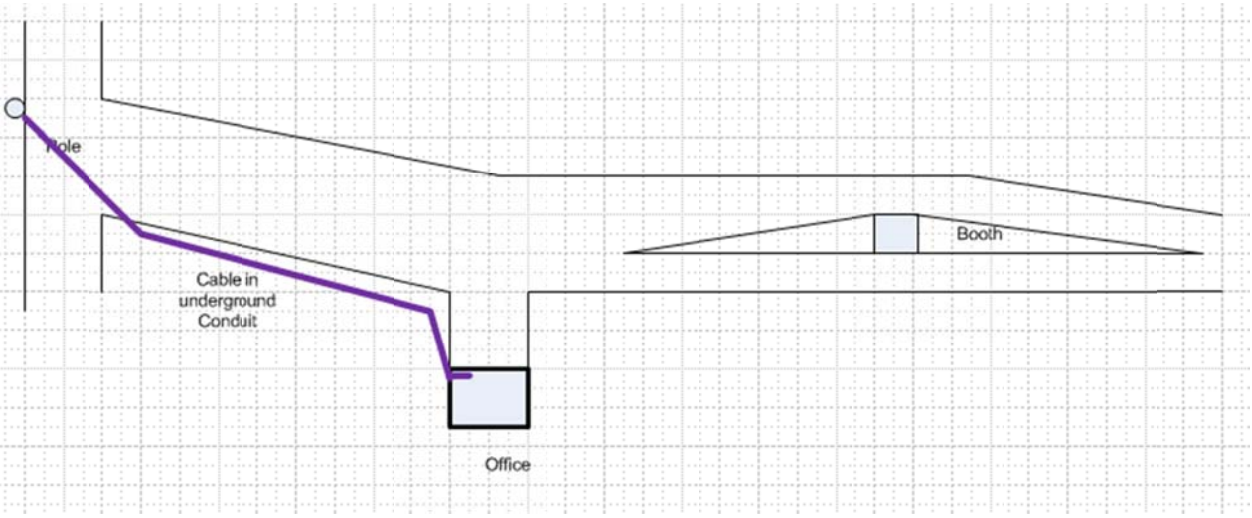
Fiber Termination Location: The cable will enter via underground conduit and terminate in a wall mount enclosure in the Electrical Room. The other end will terminate in the Hebron Ave Splice Enclosure to six strands that will run to the Hebron Ave wall mount enclosure.



Fiber Cable Route: The cable will enter an existing underground conduit at the utility pole and route the Electrical room where it will enter at the floor and then route to the new wall mount enclosure that will be mounted on the wall. The cable will route on Utility Poles to the Hebron Ave splice enclosure where it will be spliced to the Hebron Ave School cable. Note that there is an existing cox cable in the conduit between the fire house and the utility pole.

Bulky Waste Facility

Optional
1145 Tyron Street

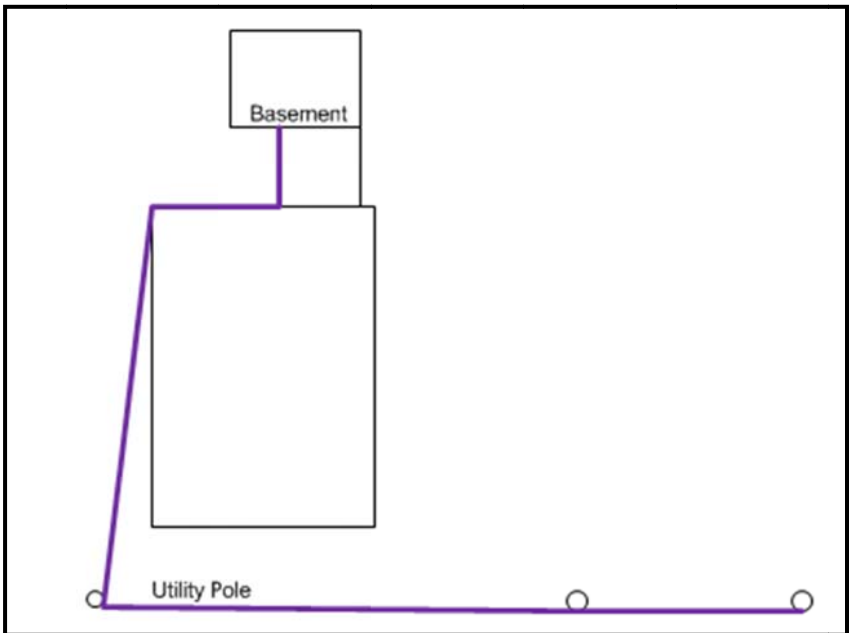


Fiber Termination Location: The cable will route into the small portable office building and terminate in a wall mount enclosure on the wall at Bulky Waste. At Nayaug School it will terminate in the Rack Mount Enclosure.

Fiber Cable Route: The probable cable will route on utility poles from Nayaug School to the entrance location and then run in existing underground conduit to the small portable office. Note however that an alternative route is being considered that will provide a 3" conduit direct from the school to the Bulky Waste Office.

South Glastonbury Library

** Optional
80 High Street



Fiber Termination Location: The fiber will enter the building from an Aerial connection to the Utility Pole and terminate in a wall mount enclosure in the basement.

Fiber Cable Route: The fiber cable will route aerially from the pole to the building and enter along the side. The cable will then route to the basement area at the back of the building and terminate in a wall mount enclosure.

Appendix C – Connecticut DOT Form 816

Connecticut Department of Transportation

Standard Specifications for

Roads, Bridges

And

Incidental Construction

SECTION 9.70

TRAFFICPERSON

9.70.01—Description: Under this item the Contractor shall provide the services of Trafficpersons of the type and number, and for such periods, as the Engineer approves for the control and direction of vehicular traffic and pedestrians.

On a weekly basis, the Contractor shall inform the Engineer of their scheduled operations for the following week and the number of Trafficpersons requested. The Engineer shall review this schedule and approve the type and number of Trafficpersons required.

If the Contractor changes or cancels any scheduled operations without prior notice of same as required by the agency providing the Trafficpersons, and such that Trafficperson services are no longer required, the Contractor will be responsible for payment at no cost to the Department of any show-up cost for any Trafficperson not used because of the change. Exceptions, as approved by the Engineer, may be granted for adverse weather conditions and unforeseeable causes beyond the control and without the fault or negligence of the Contractor.

Trafficpersons assigned to a work site are to only take direction from the Engineer.

Trafficpersons shall consist of the following types:

State Police Officers: State Police Officers shall be uniformed off-duty sworn Connecticut State Police Officers. Their services will also include the use of official State Police vehicles and associated equipment.

State Police Officers will be used on all limited access highways. State Police Officers will not be used on non limited access highways unless specifically authorized in writing by the Engineer. State Police Officers with official State Police vehicles will be used at such locations and for such periods as the Engineer deems necessary to control traffic operations and promote increased safety to motorists through the construction sites. On limited access highways, the Engineer may determine that State Police Trafficpersons will be utilized for regional work zone traffic safety and enforcement operations in addition to project-related work zone assignments.

Uniformed Municipal Police Officers: Uniformed Municipal Police Officers shall be sworn Municipal Police Officers or Uniformed Constables who perform criminal law enforcement duties from the Municipality in which the project is located. Their services will also include an official Municipal Police vehicle when requested by the Engineer. Uniformed Municipal Police Officers will be used on all non limited access highways. If Uniformed Municipal Police Officers are unavailable, other Trafficpersons may be used when authorized in writing by the Engineer.

Uniformed Municipal Police Officers and requested Municipal Police vehicles will be used at such locations and for such periods as the Engineer deems necessary to control traffic operations and promote increased safety to motorists through the construction sites.

Uniformed Flagger: Uniformed Flaggers shall be persons who have successfully completed flagger training by the ATSSA, National Safety Council or other programs approved by the Engineer. A copy of the Flagger's training certificate shall be provided to the Engineer before the Flagger performs any work on the project. Services of Uniformed Flaggers shall include the following equipment: garments (including high visibility headgear) so as to be readily distinguishable as a Flagger in accordance with Standard 6E-2 of the MUTCD, and these specifications, and a STOP/SLOW paddle that is at least 18 inches (450 millimeters) in width with letters at least 6 inches (150 millimeters) high, mounted on a handle of sufficient length so that the bottom of the sign will be 6 feet (1.8 meters) above the ground, and conforms to Standard 6E-3 of the MUTCD and catalog number 387-80-9950 of the Catalog of Signs CDOT.

Uniformed Flaggers will only be used on non limited access highways when authorized in writing by the Engineer. Uniformed Flaggers will be used at such locations and for such periods as the Engineer deems necessary to control traffic operations.

General: Uniformed Law Enforcement Personnel being used as Trafficpersons may conduct motor vehicle enforcement operations in and around work areas as directed and approved by the Engineer.

Trafficpersons shall wear a high visibility safety garment that complies with OSHA, MUTCD, ASTM Standards and the following:

Uniformed Law Enforcement Personnel shall wear the high visibility safety garment provided by their law enforcement agency. If no high visibility safety garment is provided, the Contractor shall provide the law enforcement personnel with a garment meeting the requirements stated below for the Uniformed Flaggers' garment.

Uniformed Flagger: The base material for the safety garment shall be a fluorescent color of orange, yellow, or strong yellow-green. The garment shall have vertical and horizontal stripe markings of contrasting color to the base material to enhance noticeability of the wearer. These markings shall be made of retroreflective or combination of retroreflective and non-retroreflective materials. The retroreflective material shall be orange, yellow, white, silver, strong yellow-green, or a fluorescent version of one of these colors and shall have a minimum width of 5/8 inch (15 millimeters). A minimum area of 40 square inches (25800 square millimeters) of retroreflective material must be visible when the garment is viewed from either the front or back and a minimum area of 12 square inches (7740 square millimeters) of retroreflective material must be visible from any other normal observation angle. The safety garment shall have the words "Traffic Control" clearly visible on the front and rear panels (minimum letter size 2 inches (50 millimeters).

Worn/faded safety garments that are no longer highly visible shall not be used. The Engineer shall direct the replacement of any worn/faded garment at no additional cost to the State.

A Trafficperson shall assist in implementing the traffic control specified in the Maintenance and Protection of Traffic contained elsewhere in these specifications or as directed by the Engineer. Any situation requiring a Trafficperson to operate in a manner contrary to the Maintenance and Protection of Traffic specification shall be authorized in writing by the Engineer.

Prior to the start of operations on the project requiring the use of Trafficpersons, a meeting will be held with the Contractor, Trafficperson agency, and Engineer to review the Trafficperson operations, lines of responsibility, and operating guidelines which will be used on the project.

In the event of an unplanned, emergency, or short term operation, the Engineer may approve the use of properly clothed, non-certified Trafficpersons until such time as a certified Trafficperson may be obtained. In no case shall this temporary use exceed 8 hours for any particular operation.

9.70.04—Method of Measurement: Only Trafficperson services approved by the Engineer will be measured for payment. Services of Trafficpersons will be measured for payment by the actual number of hours for each person rendering services in accordance with these specifications. Services of Trafficpersons utilized by the Contractor for which the Engineer did not approve and deems not necessary for the proper completion of the project or at locations where traffic is unnecessarily restricted by the Contractor's method of operation, will not be measured for payment.

The minimum hours of payment for each Trafficperson supplied by a law enforcement agency or Trafficperson subcontractor in any one day shall be four hours. No Uniformed Trafficperson shall work more than twelve hours in any one day. In case such services are required for more than twelve hours, the Contractor may request additional Trafficpersons. In cases where the Trafficperson is an employee on the Contractor’s payroll, payment for the Trafficperson will be made only for those hours when the Contractor’s employee is performing Trafficperson duties.

Travel time charged by State Police Officers, up to one hour per day, will be measured for payment. No travel time will be allowed or paid for Uniformed Municipal Police Officers or Uniformed Flaggers.

Safety garments and STOP/SLOW paddles will not be measured for payment.

9.70.05—Basis of Payment: The sum of money shown on the Estimate and in the itemized proposal as "Estimated Cost" for this work will be considered the bid price even though payment will be made as described below. The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original price will be used to determine the total amount for the contract.

"Trafficperson" will be paid for at the actual hourly rate charged for Trafficperson services (monthly statement or receipted bills) by the entity which actually provided the service which have been approved by the Engineer plus a 5% markup. In situations where the Uniformed Flagger is an employee on the Contractor’s payroll, payment will be made in accordance with Article 1.09.04(a) of the Standard Specifications. Use of a

Municipal police vehicle requested by the Engineer will be paid at the actual rate charged by the Municipality plus a 5% markup. The rate charged by the Municipality for use of a Uniformed Municipal Police Officer and/or an official Municipal Police vehicle shall not be greater than the rate it normally charges others for similar services.

There will be no direct payment for safety garments or STOP/SLOW paddles. All costs associated with furnishing safety garments and STOP/SLOW paddles will be considered as being included in the general cost of the Contract.

4. ATTACHMENT A – PREVAILING WAGE RATES

5. Attachment B BOE Safety form

6. ATTACHMENT C – Townwide Fiber Path Plan

7. ATTACHMENT D – Townwide Utility Pole Plan