AGREEMENT FOR
FIBER OPTICAL CABLE INSTALLATION & INTERCONNECTION

THIS AGREEMENT is made and entered into by and between the **COUNTY OF MANATEE,** a political subdivision of the State of Florida, hereinafter referred to as the "County," with offices located at 1112 Manatee Avenue West, Bradenton, Florida, 34205-7804, and **MASTEC NORTH AMERICA, INC.,** hereinafter called the "Contractor," duly authorized to conduct business in the State of Florida, located at 7221 E. Dr. Martin Luther King Jr. Blvd., Tampa, FL 33619.

WHEREAS, the County has determined that it is necessary, expedient and in the best interest of the County to retain, obtain or employ Contractor to render and perform professional services in the manner set forth in this Agreement; and

WHEREAS, this Agreement is the result of competitive negotiation procedures instituted by the County.

WITNESSETH

Now therefore in consideration of the foregoing premises and the mutual covenants herein contained, it is agreed by and between the parties hereto as follows:

ARTICLE 1. SCOPE OF SERVICE

Contractor covenants and represents to County that Contractor shall provide services as described in Attachment A, hereinafter referred to as the "Scope of Services".

ARTICLE 2. CONTRACT DOCUMENTS

Contractor shall comply with the following attachments which are attached and made a part of this Agreement:

Attachment "A" --- Scope of Service
Attachment "B" --- Payments
Attachment "C" --- Special Conditions
Attachment "D" --- Certificate of Insurance
Attachment "E" --- Project Schedule

In the event of a conflict between the terms and conditions provided in Articles in this part of the Agreement and any attachment or exhibit, the Provisions contained within these Articles shall prevail unless the term or provision in the attachment or exhibit specifically states that it shall prevail.

ARTICLE 3. LIMITATION OF COSTS AND PAYMENTS

Contractor shall be paid by County an amount in accordance with Attachment B for the provision of the Scope of Services. Contractor has been advised that no employee of Contractor or employee of the County may authorize any increase in total compensation unless authorized in writing by both parties.

ARTICLE 4. CONTRACT TERM

A. Unless renewed or terminated as provided in this Agreement, this Agreement shall be for a period detailed Attachment "B" Compensation and Project Schedule.

B. Renewals or extensions of this Agreement, if any, shall be as specified in Attachment "C" Special Conditions.

ARTICLE 5. TERMINATION

A. This Agreement may be terminated by either party for any reason or for no reason by giving to the other party no less than thirty (30) days written notice of intent to terminate. County may terminate this Agreement immediately by delivery of written notice to Contractor upon determining that Contractor has failed to comply with the terms of this Agreement. If Contractor fails to comply with the terms of this Agreement, the Contract Administrator may, upon written notification to Contractor withhold payment until Contractor complies with the conditions or terms. The notice shall specify the manner in which the Contractor has failed to comply with this Agreement.

ARTICLE 6. NOTICES

All notices or written communications required or permitted hereunder shall be deemed to have been given when received if hand delivered or when deposited in the U.S. mail, postage paid and addressed as follows:

If mailed to Contractor: MasTec North America, Inc.
Attn: Martin Kobs
7221 E. Dr. Martin Luther King Jr. Blvd.
Tampa, FL 33619

If by hand delivery:	MasTec North America, Inc. Attn: Martin Kobs 7221 E. Dr. Martin Luther King Jr. Blvd. Tampa, FL 33619
If mailed to County:	Manatee County Government Information Services Department Attn: Director 1112 Manatee Avenue West Bradenton, FL 34205
If by hand delivery:	Manatee County Government Information Services Department Attn: Director 1112 Manatee Avenue West Bradenton, FL 34205

Notice of termination or withholding of payment shall be served by certified or registered mail, return receipt requested or by hand delivery.

ARTICLE 7. GENERAL CONDITIONS

A: MAINTENANCE OF RECORDS.

i. Contractor shall maintain records, accounts, property records, and personnel records in accordance with generally accepted accounting principles, as deemed necessary by County to assure proper accounting of funds and compliance with the provisions of this Agreement.

ii. Contractor shall provide County all necessary information, records and contracts required by this Agreement as requested by County for monitoring and evaluating services. Contractor's information shall be made available to County for audit, inspection or copying during normal business hours and as often as County may deem necessary, except for client records protected by client confidentiality rules or regulations established by State or Federal law. In cases where client confidentiality applies, Contractor shall provide requested records in a fashion which maintains confidentiality. County shall have the right to obtain and inspect any audit pertaining to the performance of this Agreement or License made by any local, State or Federal Agency. Contractor shall retain all of its records and supporting documents related to this Agreement in accordance with all applicable laws, rules and regulations; in the absence of any other requirement, such records and supporting

documents will be retained by Contractor for at least three (3) years after the termination of this Agreement.

B: COMPLIANCE WITH LAWS; NON-DISCRIMINATION. The performance of this Agreement shall be in compliance with all applicable laws, orders and codes of Federal, State, and local governments and the Americans with Disabilities Act. Additionally Contractor covenants and agrees that no person shall on the grounds of race, creed, color, handicap, national origin, sex, age, political affiliation or beliefs be excluded from participation in, be denied the benefits of employment by Contractor, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available by the County.

C: CONTRACTUAL LIABILITY. The relationship of the Contractor to the County shall be that of an independent Contractor. Nothing herein contained shall be construed as vesting or delegating to the Contractor or any of the officers, employees, personnel, Contractors, or SubContractors of the Contractor any rights, interest or status as an employee of the County. The County shall not be liable to any person, firm or corporation that is employed by, contracts with or provides goods or services to the Contractor in connection with the Scope of Services or for debts or claims accruing to such parties. Contractor shall promptly pay, discharge or promptly take such action as may be necessary and reasonable to settle such debts or claims.

D: NON-ASSIGNABILITY. Contractor may not assign, transfer, or encumber this Agreement or any right or interest in this Agreement.

E: Contractor's REPRESENTATIVES. Within thirty (30) days from the date of execution of this Agreement by both parties, Contractor shall provide the County with a list of representatives authorized to act on behalf of the Contractor.

ARTICLE 8. INDEMNIFICATION

Contractor shall indemnify, keep and save harmless the County, its officials and employees, against all injuries, deaths, losses, damages, claims, patent claims, suits, liabilities, judgements, costs and expenses, which may accrue against the County arising out of the negligent performance of or intentional failure to perform the Scope of Services required by this Agreement or the terms of this Agreement. Contractor shall pay all charges of attorneys and all costs and other expenses incurred in connection therewith, and if any judgement shall be rendered against the County in any such action, Contractor shall, at its own expense, satisfy and discharge the same up to and including an amount equal to the total fees earned or to be earned under the terms of this Agreement. Contractor expressly understands and agrees that any performance bond or insurance

protection required by this Agreement, or otherwise provided by Contractor, shall in no way limit the responsibility to indemnify, keep and save harmless and defend the County as herein provided.

The indemnity hereunder shall continue until such time as any and all claims arising out of Contractor's negligent performance or intentional failure to perform under this Agreement have been finally settled, regardless of when such claims are made.

In the event that any action, suit or proceeding is brought against the County upon any liability arising out of this Agreement, County at once shall give notice thereof in writing to Contractor at the above listed address. Upon receipt of notice, Contractor, at its own expense, may defend against such action and take all such steps as may be necessary or proper to prevent a judgement against the County. Nothing in this Agreement shall be deemed to affect County's right to provide its own defense and to recover from Contractor attorneys fees and expenses associated with such representation or the rights, privileges and immunities of the County as set forth in Florida Statute 768.28.

ARTICLE 9. INSURANCE

Without limiting any of the other obligations or liabilities of the Contractor, the Contractor shall, at the Contractor's sole expense, procure, maintain and keep in force during the period of Contractor's Scope of Services under this Agreement, amounts and types of insurance conforming to the nature and type represented by the Certificates of Insurance attached hereto as Attachment D. Upon prior, written Agreement by and between Contractor and County, Contractor shall procure additional insurance for a term as may reasonably be requested by the County to protect the County from liability, during any such term.

Until such time as the specified insurance is no longer required under this Agreement the Contractor shall provide the County with renewal or replacement certificates of insurance not less than 15 days prior to the expiration or replacement of the insurance for which a previous certificate has been provided. In the event a renewal or replacement certificate is not available Contractor shall, not less than 15 days prior to expiration of any existing policy, provide County with evidence of a binder proving continuation of coverage and a new certificate as reasonably soon as possible.

Manatee County, a political subdivision of the State of Florida, shall be named as an additional insured on the certificate of insurance evidencing commercial general liability coverage. Further, Manatee County will be provided with copies of all underlying additional insured endorsements. County shall be under no obligation to pay Contractor for any services provided or for any costs associated with Contractor's Scope of Services for any period of time not covered by the insured required under this Agreement.

ARTICLE 10, CONVEANTS OF THE COUNTY

The County hereby covenants and agrees:

A. That Information Services Department Director, or such other employee as may be designated in writing by the County's Purchasing Manager shall serve as County's Contract Administrator and is authorized to interpret this Contract and designate such additional employees as may be required to monitor Contractor's performance, provide technical assistance, and assume other administrative duties associated with the implementation of this Agreement. Disputes over any provision not satisfactorily resolved with the Contract Administrator shall be referred to the Purchasing Manager or his designee.

B. The County shall make available at no cost to the Contractor all data relative to the project that is required by the Contractor for the performance of the Scope of Services.

C. The County shall give prompt notice to the Contractor whenever the County observes or otherwise becomes aware of any defect in the performance of work under this Agreement.

D. The County shall give careful and reasonable consideration to the findings and recommendations of the Contractor and shall respond and issue notices to proceed in a timely manner so as not to unduly delay the Contractor's work called for by this Agreement.

E. The County shall perform activities in this Article at no cost to the Contractor.

ARTICLE 11. COVENANTS OF THE CONTRACTOR

Contractor hereby covenants and agrees:

A. That Martin Kobs, Division Vice President is hereby appointed as Contractor's Agent with respect to the services to be performed by the Contractor pursuant to this Agreement. The Contractor's Agent shall have the authority without limitation, to make representations on behalf of Contractor, receive information, and interpret and define the needs of Contractor and make decisions pertinent to services covered by the Agreement. Contractor's Agent shall have the right, from time to time, to designate such other employees of Contractor's as they desire, to serve in their absence. Contractor reserves the right to designate a different agent, provided that the County is given written notice thereof.

B. That the Work shall be performed in accordance with the terms and conditions of this Agreement.

C. That all employees assigned to render services under this Agreement shall be duly qualified, registered, licensed or certified to provide the services required. All services shall comply with such reasonable supplemental written memoranda and directives provided by the Contract Manager, which is not in conflict with this Agreement.

D. That Contractor shall be responsible for collecting all existing data required for the successful completion of each task.

E. That Contractor shall not knowingly engage in any contractual or professional obligations that create an appearance of a conflict of interest with respect to the service provided pursuant to this Agreement.

F. Contractor shall be entitled to rely upon that information, which may be provided them from time to time, from the County or others on behalf of the County. Contractor shall, however, call to the County's attention any errors or deficiencies noted in such information provided and assist, to the extent practicable, the County in the identification and resolution of same. Information referred to above includes, but is not limited to, transportation engineering design, construction and additional services; consultations, investigation and reports and the like, including all other information to be provided to the Contractor by others and necessary for the execution of Contractor's work under the Agreement, as amended. The County shall, however, hold Contractor fully responsible for verifying, to the extent practicable, documents and information provided by the County and identifying its obvious deficiencies concerning documents and information provided. The Contractor agrees to incorporate the provisions of this paragraph in any subcontract into which it might enter with reference to the work performed under this Agreement.

ARTICLE 12. DISPUTE RESOLUTION

Disputes shall be resolved as follows: good faith negotiations by the designated agents of the parties and if not resolved by such designated agents after twenty-one (21) days, Contractor shall submit his claim, with the basis for the dispute, in writing to the Manatee County Purchasing Manager for a determination and handling in accordance with the provisions of the Manatee County Procurement Code. Any dispute resolution agreed to by County's Contract Manager or the Manatee County Purchasing Manager, constituting a material change in this Agreement will not be final until approved by the Board of County Commissioners. If such dispute involves the percentage of task completed by Contractor,

County shall, as promptly as reasonably possible after resolution of such dispute, forward payment to Contractor of any amount determined to be due and owing.

The services shall be performed by the Contractor to the reasonable satisfaction of the County, and all questions, difficulties and disputes of any nature whatsoever that may arise under or by reason of this Agreement, the prosecution and fulfillment of the services hereunder and the character, quality, amount and value thereof, which cannot be settled by mutual agreement of the parties, shall be settled by recourse to litigation under Florida law. Any such lawsuit shall be filed only in Manatee County, Florida.

ARTICLE 13. INFORMATION REPORTS

The Contractor shall provide all information and reports required by County policies, procedures, regulations, rules, orders and/or instructions. Where any information required of the Contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor shall certify such to the County, as appropriate, and shall set forth what efforts have been made to obtain the information.

ARTICLE 14. LEGAL RESTRAINTS AND LIMITATIONS

The Contractor acknowledges that the County, as a unit of local government and a political subdivision of the State of Florida, is subject to restraints, limitations, regulations and controls imposed or administered pursuant to numerous applicable laws, ordinances, rules and regulations of federal, state, regional and certain local governmental agencies or authorities. The Contractor agrees that all professional services rendered or performed by the Contractor pursuant to the provisions of this Agreement, as amended, shall be in compliance therewith.

ARTICLE 15. ASSIGNMENT AND SUBCONTRACTS

The Contractor shall not sublet, assign or transfer any work under this Agreement to another Contractor or contractor, without the prior written consent of the County.

ARTICLE 16. SOLICITATION OF CONTRACT

The Contractor warrants that it has not employed or retained any company or person other than a bona fide employee working solely for the Contractor to solicit or secure this Agreement, and that it has not paid or agreed to pay any company or person other than a bona fide employee working solely for the Contractor, any fee, commission, percentage, brokerage fee, gift, contingent fee, or any other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, the County shall have the right to annul this Agreement, without liability or at its discretion to deduct from the contract price or consideration or otherwise recover the full amount of such fee, commission, percentage, brokerage fee, gifts, or contingent fee

ARTICLE 17. GOVERNING LAW

This Agreement shall be governed by the laws of the State of Florida. Any action filed regarding this Agreement will be filed only in Manatee County, Florida.

ARTICLE 18. FORCE MAJEURE

Neither party shall be considered in default in performance of its obligations hereunder to the extent that performance of such obligations, or any of them is delayed or prevented by Force Majeure. Force Majeure shall include, but not be limited to, hostility, revolution, civil commotion, strike, epidemic, accident, fire, flood, wind, earthquake, explosion, lack of or failure of transportation facilities, any law, proclamation, regulation, ordinance or other act of government, or any act of God or any cause whether of the same or different nature, existing or future; provided that the cause, whether or not enumerated in this Article, is beyond the control and without the fault or negligence of the party seeking relief under this Article.

ARTICLE 19. MISCELLANEOUS

A. The Contractor and the County agree that the Contractor, its employees, and subcontractors are not employees or agents of the County as a result of this Agreement, as amended or in the performance of any duties pursuant to this Agreement.

B. All words used herein in the singular form shall extend to and include the plural. All words used in the plural form shall extend to and include the singular. All words used in any gender shall extend to and include all genders.

C. This Agreement embodies the whole agreement of the parties. There are no promises, terms, conditions, or obligations other than those contained herein, and this Agreement shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties hereto.

D. It is understood and agreed by the parties hereto that if any part, term or provision of this Agreement, is, by the courts held to be illegal or in conflict with any law, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term or provision held to be invalid.

ARTICLE 20. AMENDMENTS

This Agreement may not be modified, amended or extended orally. This Agreement may be amended only by written agreement executed by the governing bodies of both parties.

ARTICLE 21. SEVERABILITY

In the event that any paragraph of this Agreement is adjudged by a court of competent jurisdiction to be invalid, such adjudication shall not affect or nullify the remaining paragraphs hereof, but shall be confined solely to the paragraphs involved in such decision.

ARTICLE 22. HEADINGS

All articles and descriptive headings of paragraphs in this Agreement are inserted for convenience only and shall not affect the construction or interpretation hereof.

ARTICLE 23. AUTHORITY TO EXECUTE

Each of the parties hereto covenants to the other party that it has lawful authority to enter into this Agreement and has authorized the execution of this Agreement by the party's authorized representative.

IN WITNESS WHEREOF, the parties have executed this agreement to furnish and deliver the required professional consulting services.

WITNESSES:

Sign Name: Maureen Popovich

Print Name: Maureen Popovich

Sign Name: James E. Petersen

Print Name: James E. Petersen

MASTEC NORTH AMERICA, INC.
UTILITY SERVICE GROUP

By: Charles D. Duff

Print Name: Charles D. Duff

Title: Sr. Vice President

Phone Number: 813-621-0881

Recommended By:

By: Diane Frenz

Diane Frenz, Director
Information Services Department

COUNTY OF MANATEE, FLORIDA

Authority to execute this contract per Manatee County Code , Chapter 2-26, and per the delegation by the County Administrator effective 1/26/2009.

By: R C Cuthbert

R.C. " Rob" Cuthbert, C.P.M., CPPO
Purchasing Manager

ATTACHMENT "A" - SCOPE OF SERVICES

FIBER OPTICAL CABLE INSTALLATION & INTERCONNECTION

1 Fiber Optic Cable System.

1.1 Description. Furnish and install a fiber optic cable system as shown in the plans.

1.2 Materials:

1.2.1 Fiber Optic Cable: Provide all-dielectric, dispersion- unshifted, single-mode fiber (SMF) with low water peak, and suitable for underground (i.e., in conduit) outside plant installation. All fiber optic cable shall be splice-compatible with the County's existing dispersion-unshifted SMF and require no electronic equipment for dispersion compensation between new and existing fiber. Ensure that all components that comprise a single length of cable are continuous and of the same material. Furnish only commercial off-the-shelf materials, equipment, and components.

1.2.1.1 Optical Fiber: Ensure that the optical fibers used in the cable meet or exceed the Telecommunications Industry Association (TIA) and Electronic Industries Alliance (EIA) TIA/EIA-492-CAAB specification, the U.S. Department of Agriculture Rural Utilities Service (RUS) 7 CFR 1755.900, and International Telecommunication Union ITU-T G.652.D requirements. Use only optical fibers meeting the additional requirements as follows:

Geometry
Cladding Diameter: 125µm, ±0.7 µm
Core-to-Cladding Concentricity: ≤0.5 µm
Cladding Noncircularity: ≤0.7%
Mode Field Diameter: 1,550 nm; 10.4 µm, ±0.5 µm
Coating Diameter: 245 µm, ±5 µm
Colored Fiber Nominal Diameter: 253 to 260 µm

Optical
Cabled Fiber Attenuation: 1,310 nm, ≤0.4 dB/km; 1,550 nm, ≤0.3 dB/km
Point Discontinuity: 1,310 nm, ≤0.05 dB/km; 1,550 nm, ≤0.05 dB/km
Cable Cutoff Wavelength ($_{ccf}\lambda$): ≤1,260 nm.
Total Dispersion: 1,625 nm ≤23.0 ps/(nm•km)
Macrobend Attenuation: Turns – 100; Outer diameter (OD) of the mandrel – 60 mm, ±2 mm; ≤0.05 dB at 1,550 nm
Cabled Polarization Mode Dispersion: <0.5 ps km

Ensure that each optical fiber is glass and consists of a germanium-doped silica core surrounded by concentric silica cladding. Ensure that all fiber in the buffer tube is usable

fiber that complies with attenuation requirements. Ensure that fibers do not adhere to each other. Ensure that the fiber is free of surface imperfections and inclusions. Ensure that all fiber optic core glass is from the same manufacturer.

1.2.1.2 Buffer Tubes: Ensure that the fiber optic cable includes loose buffer tubes that isolate internal optical fibers from outside forces and provide protection from physical damage as well as water ingress and migration. Ensure that buffer tubes provide freedom of movement for internal optical fibers. Ensure buffer tubes allow for expansion and contraction of the cable without damage to internal optical fiber. Ensure that fiber does not adhere to the inside of the tube. Ensure that buffer tubes permit intentional scoring and breakout without damage to the fiber. Ensure that each fiber optic cable buffer tube contains 12 fibers per tube unless otherwise noted in the plans.

1.2.1.3 Color Code: Ensure that the marking and color-coding of the fibers and buffer tubes conforms to telecommunication industry requirements as detailed in the TIA/EIA-598-B standard. Ensure that colors are permanent and stable during temperature cycling, and not subject to fading or smearing onto each other or into the water-blocking material. Ensure that fibers are colored with UV curable inks that remain clearly distinguishable as the intended color.

1.2.1.4 Strength Member: Ensure that the fiber optic cable contains a dielectric central strength member and dielectric outside strength member to prevent buckling of the cable and provide tensile strength. Ensure that the fiber optic cable can withstand a pulling tension of 600 pounds during installation without increasing the fiber attenuation more than 0.8 decibel per mile, without changing other optical fiber characteristics after the tensile load is removed, and without damage to any components of the fiber optic cable.

1.2.1.5 Water Blocking Compound: Ensure that the fiber optic cable contains a dry water-blocking material to prevent the ingress of water within the outer cable jacket. Ensure that the water-blocking tapes and yarns are non-nutritive, dielectric, and homogeneous, and free from dirt and foreign matter. Use dry water-blocking material for fiber optic cables used for either aerial or underground installations. Apply dry water-blocking compound longitudinally around the outside of the central buffer tubes. Construct all cables with water-blocking tape that complies with the requirements of the EIA/TIA-455-81B standard and is subjected to water penetration tests as defined in the EIA/TIA-455-82B standard.

1.2.1.6 Ripcord: Ensure that the cable contains at least one ripcord under the sheath. Ensure that the ripcord permits the removal of the sheath by hand or with pliers.

1.2.1.7 Filler: Fillers or rods may be included in the cable core to lend symmetry to the cable cross section if required.

1.2.1.8 Outer Jacket: Ensure that the fiber optic cable is jacketed with medium density

polyethylene (MDPE) that is free of blisters, cracks, holes, and other deformities. Ensure that the nominal jacket thickness is a minimum of 0.03 inch. Apply the jacketing material directly over the tensile strength members and water-blocking material. Ensure that the MDPE contains carbon black to provide ultraviolet (UV) protection and does not promote the growth of fungus. Mark the jacket with the cable manufacturer's name, fiber type, fiber count, date of manufacture, the words "MANATEE COUNTY FIBER OPTIC CABLE," and the sequential cable lengths marked in feet. Ensure that the actual length of the cable is within 1% of the length indicated by the marking. Provide legible marking with contrasting color to that of the cable jacket.

1.2.1.9 Performance Requirements:

1.2.1.9.1 Operating Temperature: Ensure that the shipping and the operating temperature range of fiber optic cable meets or exceeds -30° to 165° F as defined in the environmental requirements section of the NEMA TS 2 standard. Ensure that the installation temperature range of fiber optic cable meets or exceeds -22° to 140° F.

1.2.1.9.2 Bend radius: Ensure that the fiber optic cable is capable of withstanding a minimum unloaded bend radius of 10 times the cable diameter and a minimum loaded bend radius of 20 times the cable diameter when loaded to pulling tension of 600 pounds. Test the cable as required in the EIA-455-33A standard. Ensure that bending the fiber optic cable up to the minimum bend radius does not affect the optical characteristics of the fiber.

1.2.1.9.3 Cable Strength: Ensure that the fiber optic cable is capable of withstanding a pulling tension of 600 pounds during installation without increasing the fiber attenuation more than 0.8 decibel per mile and without changing other optical fiber characteristics after the tensile load is removed. Ensure that optical fiber is proof-tested by the fiber manufacturer at a minimum of 100 kilo pounds per square inch. Ensure that the cable will withstand 25 impact cycles and the change in attenuation does not exceed 0.2 decibel at 1,550 nanometers when tested according to the requirements as detailed in the TIA/EIA-455-25B standard. Ensure that the fiber optic cable can withstand a minimum compression load of 125 pounds per square inch when applied uniformly over the length of the sample at the rate of 0.15 to 0.8 inch per minute and maintained for 10 minutes as defined in the TIA/EIA-455-41A standard. Ensure that the change in attenuation will not exceed 0.15 decibel during loading at 1,550 nanometers, and that no fiber displays a measurable change in attenuation after load removal.

1.2.1.9.4 Water Penetration: Ensure that the fiber optic cable is capable of withstanding the tests for water penetration defined in the TIA/EIA-455-82 standard. Ensure that a one-meter length of cable is able to withstand a one-meter static head of water applied at one end for 24 hours without water leaking through the other open cable end.

1.2.2 Splicing Materials: Ensure that all splice enclosures, organizers, cable end preparation tools, and procedures are compatible with the fiber optic cable, and are approved by the Engineer.

1.2.2.1 Splice Enclosures: Contain all optical fiber splices within a splice enclosure. Ensure that the enclosures provide storage for fiber splices, non-spliced fiber, and buffer tubes. Ensure that the splice enclosure restores the mechanical and environmental integrity of the fiber optic cable, encases the sheath opening in the cable, and organizes and stores optical fiber. Ensure all hinges and latching devices are stainless steel. Ensure that the enclosure is airtight and prevents water intrusion. Ensure that the splice enclosure can accommodate pressurization and has the ability to be reentered without requiring specialized tools or equipment. Ensure that the enclosure provides fiber and splice organizers including splice trays and strain relief. Ensure that splice enclosures allow re-entry and are hermetically sealed to protect internal components from environmental hazards such as moisture, insects, and UV light. Fiber optic splice enclosures shall also: Comply with the Telcordia Technologies' GR-711-CORE standard and all applicable NEC requirements. Provide space for future expansion equal to 100% of the initial utilization. Provide fiber optic cable penetration end caps to accommodate a minimum installation of two trunk fiber optic cables and two fiber optic drop cables. Ensure that the enclosure end caps are factory-drilled to the proper diameter to accept and seal the fiber optic cable entries. Ensure that the cable entry locations can accommodate an assortment of cables with ODs ranging from 0.20 to 0.55 inch, +10%, without jeopardizing the waterproof characteristics of the enclosure.

Provide fiber optic splice enclosures meeting the following requirements:

Mechanical
Resist compression deformation to a maximum of 400 pounds.
Withstand impact energy to a maximum of 40 foot-pounds at 0° F.
Axial Tension: 100 pounds for 30 minutes.
Cable Torsion: ten 90-degree rotations.
Cable Flexing: ten 90-degree bends.

Environmental
Hydrostatic Pressure Head: Up to 20 foot-pounds (-9 pounds per square inch).
Withstand 40 freeze/thaw temperature cycles.
Ultraviolet resistant during a maximum 30-day exposure in compliance with the requirements detailed in the ASTM B117 standard.

Chemical
Withstand a 90-day exposure to solutions of 3% sulfuric acid, 0.2 normal of sodium hydroxide, 10% Igepal®, kerosene, and be fungus resistant as required in the ASTM G21 standard.

1.2.2.2 Splice Trays: Ensure that the splice trays are securely attached and accessible, and provide adequate storage for the fiber cable. Ensure the splice trays provide access to individual fibers without disrupting other fibers in the tray. Ensure that the splice trays hold the buffer tubes rigidly in place and provide protection for fusion splices. Ensure that the raceway accommodates the minimum bend radius of the fiber. Ensure that splice trays allow visible inspection of the fiber. Ensure that the splice tray includes a cover with a locking mechanism to hold it in place.

1.2.3 Cable Terminations: Use Type LC connectors only, as specified in the plans or by the Engineer. Ensure that connectors provide a strain relief mechanism when installed on a single fiber cable that contains strength elements. Ensure that the optical fiber within the body of all connectors is mechanically isolated from cable tension, bending, and twisting. Ensure that all connectors are compliant with the TIA/EIA-568-A and TIA/EIA-604 standards, as applicable, and are tested according to the Telcordia/Bellcore GR-326-

CORE standard. When tested according to the TIA and EIA's Fiber Optic Test Procedure (FOTP)-171 (TIA/EIA-455-171), ensure that the connectors test to an average insertion loss of ≤0.4 decibel and a maximum loss of ≤0.5 decibel. Test the connectors as detailed in FOTP-107 (TIA/EIA-455-107) to reflectance values of ≤ -50 decibels. Ensure that the connectors have an operating and storage temperate range of -30° to 165° F as per the NEMA TS 2 standard.

1.2.3.1 Pre-terminated Connector Assemblies (pigtails): Ensure that pre-terminated connector assemblies are used for fiber termination. Ensure that the pre-terminated cable assemblies consist of fiber optic cables with factory-installed SC-type connectors on one end of the cable and an un-terminated optical fiber on the other. Ensure that the pre-terminated connector assemblies are installed with fusion splices. Ensure that all buffer tubes and fibers are protected once the attachment of pre-terminated connector assemblies is complete.

1.2.3.2 Buffer Tube Fan-out Kits: Ensure that a buffer tube fan-out kit is installed when fiber optic cables are terminated. Use a kit compatible with the fiber optic cable being terminated and that is color-coded to match the optical fiber color scheme. Ensure that the buffer tube fan-out kit supports 12 fiber strands. Ensure that output tubing and the fiber strands contained therein are of sufficient length for routing and attachment of fiber optic cable to connected electronics or as directed by the Engineer. Ensure that the kit and the connectors are supplied by the same manufacturer.

1.2.4 Patch Panels: Ensure that the patch panel is compatible with the fiber optic cable being terminated and color-coded to match the optical fiber color scheme. Ensure that the patch panel has a minimum of twelve LC-type panel connectors. Ensure that the patch panel does not exceed a 14 inches length by 6 inches width by 4 inch depth, and is suitable for mounting within an approved cabinet at the field device location.

1.2.4.1 Pre-terminated Patch Panels: Ensure that the pre-terminated patch panel is a termination panel that includes a factory installed all-dielectric SMF cable stub. Ensure that the panel includes factory-installed and terminated LC-type panel connectors. Ensure that the cable stub is of adequate length to splice the stub and provide a fiber connection between the panel and the backbone fiber cable or as directed by the Engineer.

1.2.4.2 Field Assembled and Terminated Patch Panels: Ensure that the field-assembled patch panel is a termination panel that includes a connector panel and the hardware required to mount the patch panel within an approved cabinet at the field device location and connect the panel to the backbone fiber cable.

1.2.4.2.1 Connector Panel: Ensure that the connector panel provides twelve LC-type bulkhead-mount coupling connectors. Ensure that each coupling connector allows connection of a cable terminated on one side of the panel to a cable on the opposite side. Ensure that each bulkhead-mount coupling connector includes a locknut for mounting the connector in predrilled or punched holes in the connector panel.

1.2.5 Handling:

1.2.5.1 Cable End-Sealing: Ensure that fiber optic cable ends are capped or sealed to prevent the entry of moisture during shipping, handling, storage, and installation. Equip one end of the fiber optic cable with flexible pulling eyes.

1.2.5.2 Protective Wrap: Ensure that the fiber optic cable is shipped and stored with a protective wrap or other approved mechanical reel protection device over the outer turns of the fiber optic cable on each reel. Ensure that the wrap is weather resistant and protects the cable reel from environmental hazards. Ensure that the cable reel remains wrapped until cable is to be installed.

1.2.5.3 Packaging, Shipping and Receiving: Ensure that the packaging and delivery of fiber optic cable reels comply with the following minimum requirements:
1. Ensure cable is shipped on reels of marked continuous length.
2. Ensure each cable is shipped on a separate, strongly constructed reel designed to prevent damage to the cable during shipment and installation.
3. Ensure each reel has a minimum of 6 feet on each end of the cable available for testing.
4. Ensure that all fiber optic cable is continuous and free from damage.
5. Ensure no point discontinuities greater than 0.1 decibel per reel.
6. Ensure that all cable delivered has been manufactured within 6 months of the delivery date.
7. Provide a copy of the transmission loss test results as required by the EIA/TIA-455-61 standard, as well as results from factory tests performed prior to shipping.

8. Ensure that the manufacturer provides the date of manufacture; product and serial numbers; cable data, including the reel length; refraction index; the project name and location; type of fiber and quantity of strands used; technical product data sheet(s); and reel number(s).

1.3 Installation: Install all equipment according to the latest version of the manufacturer's installation procedures and the industry-accepted installation standards, codes, and practices, or as directed by the Engineer. Ensure that all materials and installation practices are in accordance with the applicable OSHA requirements as found in 29 Code of Federal Regulations (CFR) Part 1926, Safety and Health Standards for Construction. In addition, perform the following:

1. Ensure conduit and inner-duct is clean and free from damage prior to installing fiber optic cable.
2. Document the sequential cable length markings at each splice box and pull box wall that the cable passes through, and include the information with the as-built documentation.

Provide all incidental parts needed to complete the installation, but not specified in the plans, as necessary for a complete and properly operating system.

1.3.1 Fiber Optic Cable Installation: Develop a nomenclature plan for identification of fiber optic cable. Submit the nomenclature plan to the Engineer for approval. Use approved cable nomenclature to create cable tags for the identification of fiber optic cable. Provide cable tag identification on all test results or fiber related documents provided to the Engineer. Install cable tags within 1 foot of each splice and/or termination point indicating the cable type, fiber count, and each fiber optic cable's origination and termination points. Ensure that the cable tags are permanent labels suitable for outside plant applications and are affixed to all fiber optic cables. Ensure that lettering is in permanent ink and displays the phrase "MANATEE COUNTY FIBER OPTIC CABLE".

1.3.1.1 Pulling: Install the fiber optic cable by hand or by using a mechanical pulling machine. If a mechanical pulling machine is used, equip the machine with a monitored or recording tension meter. Ensure that at no time the manufacturer's recommended maximum pulling tension is exceeded. Ensure that the central strength member and aramid yarn are attached directly to the pulling eye during cable pulling. Use pulling attachments, such as "basket grip" or "Chinese finger" type, to ensure that the optical and mechanical characteristics are not degraded during the fiber optic cable installation. Ensure that excess cable is coiled in a figure eight and fed manually when pulling through pull boxes and splice boxes by hand. If pulleys and sheaves will be used to mechanically pull through pull boxes and splice boxes, provide a drawing of the proposed layout showing that the cable will never be pulled through a radius less than the manufacturer's minimum bend radius. Use large diameter wheels, pulling sheaves, and cable guides to maintain the appropriate bend radius. Provide tension monitoring at all times during the pulling

operation. Ensure that cable pulling lubricant used during installation is recommended by the optical fiber cable manufacturer.

1.3.1.2 Blowing: Use either the high-airspeed blowing (HASB) method or the piston method. When using the HASB method, ensure that the volume of air passing through the conduit does not exceed 600 cubic feet per minute or the conduit manufacturer's recommended air volume, whichever is more restrictive. When using the piston method, ensure that the volume of air passing through the conduit does not exceed 300 cubic feet per minute or the conduit manufacturer's recommended air volume, whichever is more restrictive.

1.3.1.3 Slack Cable Storage: Provide and store fiber optic cable at each pull box and splice box to allow for future splices, additions, or repairs to the fiber network.
Store the fiber optic cable without twisting or bending the cable below the minimum bend radius. Store a total of 100 feet of fiber optic cable in splice boxes, with 50 feet of cable on each side of the cable splice point or as shown in the plans. Store 50 feet of spare fiber optic cable in specified pull boxes.

1.3.2 Splicing: Perform all optical fiber splicing using the fusion splicing technique, and according to the latest version of the manufacturer's cable installation procedures; industry-accepted installation standards, codes, and practices; or as directed by the Engineer. Ensure that all splices match fiber and buffer tube colors unless shown otherwise in the plans. Where a fiber cable is to be accessed for lateral or drop signal insertion, only open the buffer tube containing the fiber to be accessed and only cut the actual fiber to be accessed. If a fiber end is not intended for use, cut the fiber to a length equal to that of the fiber to be used and neatly lay it into the splice tray. Treat any fibers exposed during splicing with a protective coating and place in a protective sleeve or housing to protect the fiber from damage or contaminants.

1.3.2.1 Splice Plan: Provide a splice plan showing the location and configuration of splices in the system for approval by the Engineer. Perform all splicing according to the plan. Document each splice location and identify the source and destination of each fiber in each splice tray. Document all fiber colors and buffer jacket colors used during installation, and develop a sequential fiber numbering plan as required in the TIA/EIA-598-A standard for color-coding in the documentation. Neatly store all splice enclosures within a splice box. Attach the splice enclosure to the splice box interior wall to prevent the enclosure from lying on the bottom of the splice box.

1.3.2.2 Splice Equipment Specifications: Use a fusion splice machine to splice all optical fiber. Ensure that the unit is portable, and capable of 120 VAC and internal battery-powered operation. Ensure that the unit is able to splice fibers with a 250-micrometer coating. The fusion splice machine shall have the following capabilities:

1. Splice loss measurement.
2. Splice protection sleeve heater.
3. Battery with charging unit and power cable.
4. Spare electrodes, fuses, and lamps.
5. Power meter/light source with carrying case.

Ensure that the power meter/light source is a calibrated pair that is portable and battery operated. Ensure that the power meter/light source operates at selectable wavelengths of 850/1,300/1,550 nanometers. Ensure that the power meter has a decibel milliwatt measurement scale with a range of +3 to -45 decibel milliwatts for SMF operation and an accuracy of 0.5 decibel or better. Ensure that the splice machine is new from the factory, or serviced and certified by the factory or its authorized representative within the previous 6 months from the commencement of its use. Provide the Engineer with a letter from the manufacturer or his authorized representative certifying compliance. Clean all splicing equipment and calibrate according to the manufacturer's recommendations prior to each splicing session at each location.

1.3.3 Cable Termination Installation: Ensure that cables, buffer tubes, or strands are neatly routed, secured and terminated in a patch panel. Ensure all cable termination points include documentation regarding the identification, route, and function of each fiber installed at that location. Ensure that at least one copy of this information is placed alongside the installed equipment (for instance, in a document pouch or drawer within a field cabinet).

1.3.4 Patch Panel Installation: Ensure that patch panels neatly installed and secured in a rack or wall mount. Ensure all patch panel connectors are clearly and permanently labeled. Ensure all installed patch panels include documentation regarding the identification, route, and function of each patch panel connector at that location. Ensure that at least one copy of this information is placed alongside the installed equipment.

1.4 Testing and Certification:

1.4.1 Manufacturer's Testing: Provide documentation of all factory tests performed by the manufacturer for all fiber optic cable, splicing material, cable terminations, and patch panels.

1.4.2 Installation Testing: Notify the Engineer of cable testing at least 14 calendar days in advance. Provide the testing procedures to the Engineer for approval prior to commencement of testing. Perform all tests at 1,310/1,550 nanometer wavelengths, and include the last calibration date of all test equipment with the test parameters set on the equipment in the test documentation. Test all installed fibers (terminated and un-terminated) using methods approved by the Engineer.

1.4.2.1 End to End Attenuation Testing: Perform test on all fibers to ensure that no discontinuities greater than 0.2 decibel per 300 feet exist. Repair or replace cable sections exceeding allowable attenuation at no cost to the County.

1.4.2.2 OTDR Tracing: Test all fibers from both cable end points with an optical time domain reflectometer (OTDR) at wavelengths of 1310 and 1550 nm. Test the fibers that are not terminated at the time of installation using a bare fiber adapter. Present the results of the OTDR testing (i.e., traces for each fiber) and a loss table showing details for each splice or termination tested to the Engineer in an approved electronic format. Ensure all OTDR testing complies with the EIA/TIA-455-61 standard.

1.4.2.3 Splice Loss Testing: Ensure that the splice loss for a SMF fusion splice does not exceed a maximum bidirectional average of 0.1 decibel per splice. Repair or replace splices that exceed allowable attenuation at no cost to the County.

1.4.2.4 Connector Loss Testing: Ensure that the attenuation in the connector at each termination panel and its associated splice does not exceed 0.5 decibel. Repair or replace connectors exceeding allowable attenuation at no cost to the County.

2 Guaranty Provisions

Ensure that the fiber optic cable, the splice enclosures, and termination points have a two-year manufacturer's warranty from the date of final acceptance by the Engineer of all the work to be performed under the Contract. If the manufacturer's warranties for the components are for a longer period, those longer period warranties will apply.

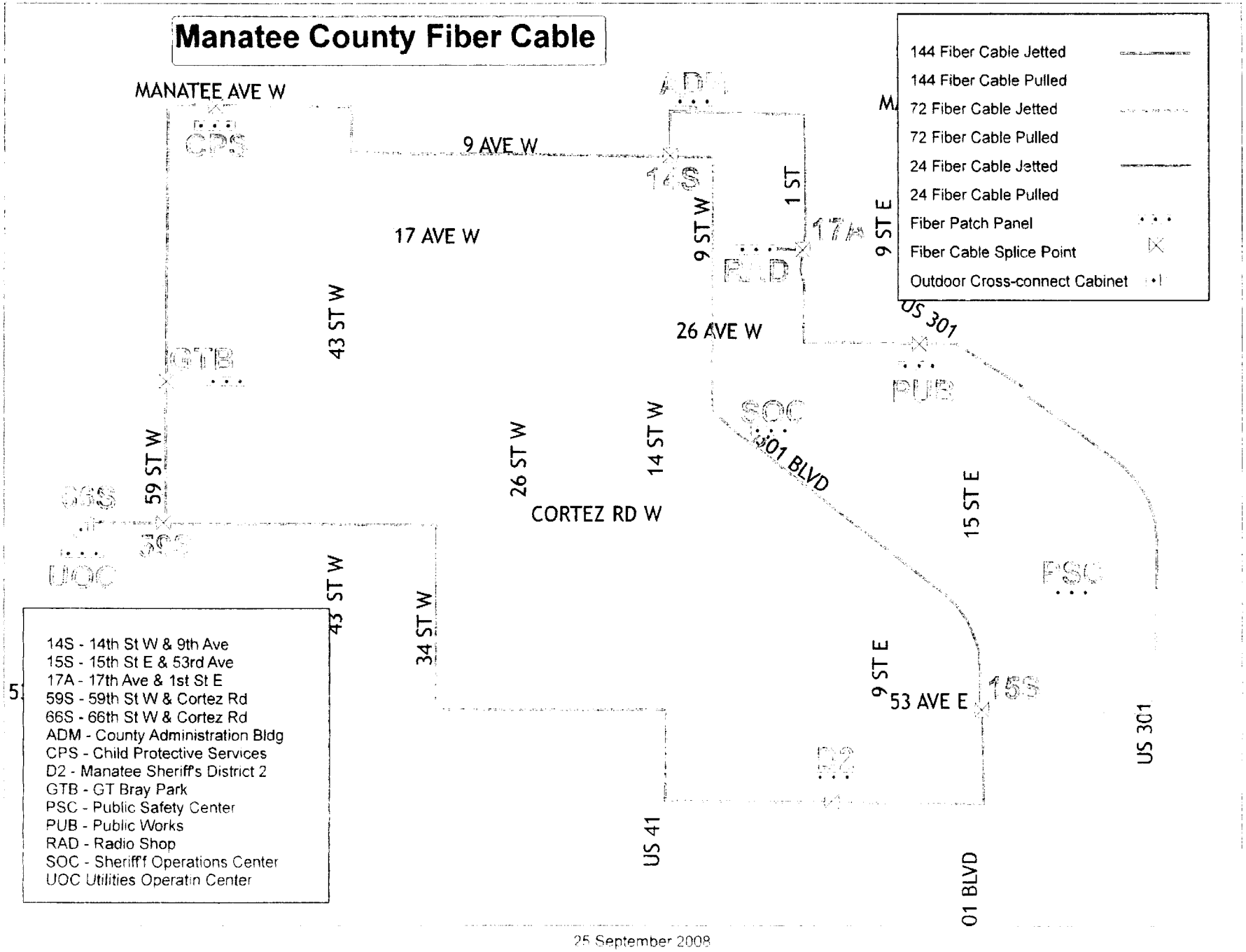
Ensure that the manufacturer's warranties on the fiber optic cable, the splice enclosures, and termination points are fully transferable from the Contractor to the County. Ensure that these warranties require the manufacturer to furnish replacements for any part or equipment found to be defective during the warranty period at no cost to the County within 10 calendar days of notification by the County.

3 Method of Measurement

3.1 Furnish and Install: Fiber optic cable shall be measured per foot of cable furnished, installed, warranted, tested and deemed fully operational. Splices and terminations as shown in the plans shall be measured per each fiber connection furnished and installed. The Contract unit price, furnished and installed, will include furnishing, placement, and testing of all materials and equipment, and for all tools, labor, equipment, hardware, operational software package(s) and firmware(s), supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work.

3.2 Furnish: The Contract unit price per foot of fiber optic cable furnished, will include all equipment specified in the Contract Documents, plus all shipping and handling costs involved in delivery as specified in the Contract Documents.

3.3 Install: The Contract unit price per foot of fiber optic cable installed, will include placement and testing of all materials and equipment, and for all tools, labor, equipment, hardware, operational software package(s) and firmware(s), supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work. The Engineer will supply the equipment specified in the Contract Documents.


Manatee County Fiber Cable
144 Fiber Cable Jetted
144 Fiber Cable Pulled
72 Fiber Cable Jetted
72 Fiber Cable Pulled
24 Fiber Cable Jetted
24 Fiber Cable Pulled
Fiber Patch Panel
Fiber Cable Splice Point
Outdoor Cross-connect Cabinet
MANATEE AVE W
9 AVE W
17 AVE W
26 AVE W
CORTEZ RD W
US 301
US 41
1 ST
9 ST W
9 ST E
43 ST W
59 ST W
26 ST W
14 ST W
34 ST W
15 ST E
53 AVE E
01 BLVD
CPS
14S
17A
PUB
GTB
SOC
66S
59S
UOC
PSC
D2
14S - 14th St W & 9th Ave
15S - 15th St E & 53rd Ave
17A - 17th Ave & 1st St E
59S - 59th St W & Cortez Rd
66S - 66th St W & Cortez Rd
ADM - County Administration Bldg
CPS - Child Protective Services
D2 - Manatee Sheriff's District 2
GTB - GT Bray Park
PSC - Public Safety Center
PUB - Public Works
RAD - Radio Shop
SOC - Sheriff Operations Center
UOC Utilities Operatin Center
25 September 2008

ATTACHMENT "B" – PAYMENTS
TOTAL NOT TO EXCEED COST and PRICING SCHEDULE

A. TOTAL NOT TO EXCEED

Original Agreement	**$431,926.00**
TOTAL NOT TO EXCEED	**$431,926.00**

The total not to exceed cost is based on estimated labor categories, quantities and lengths and may be revised throughout the project. Unit prices and labor rates on the next page will be used for any additional quantities or lengths.

B. UNIT PRICING SCHEDULE

SEE THE FOLLOWING PAGES

ATTACHMENT "B" – PAYMENTS
TOTAL NOT TO EXCEED COST and PRICING SCHEDULE
(continued)

DESCRIPTION	U/M	RATES
CABLE INSTALLATION (73-144 COUNT FOC) – This unit covers placement of fiber optic cable in duct, (including all handling of the cable to avoid any pulling of the cable except as specified by engineering) proper racking in vaults. This unit will include exposing the ends of the conduit and/or digging pull-pits for conduit runs without hand holes. Unit is per finished length. This unit does include cable. Unit also includes pre-installation testing, engineering, all required labor and equipment.	EA	$ 2.71
CABLE INSTALLATION (UP TO 72 COUNT FOC) – This unit covers placement of fiber optic cable in duct, (includes all handling of the cable to avoid any pulling of the cable except as specified by engineering) proper racking in vaults. This unit will include exposing the ends of the conduit and/or digging pull-pits for conduit runs without hand holes. Unit is per finished length. This unit does include cable. Unit also includes pre-installation, testing, engineering, all required labor and equipment.	EA	$ 2.24
SPLICE FIBER OPTIC CABLE – 72 FIBERS – This unit covers the permanent connection of pigtails to a fiber of cable or splicing a fiber of one cable to a fiber of another cable. Labeling as required. Unit per fiber. This unit will include sheath opening and preparation, separation of buffer tubes of ribbons and subsequent storage, installation of fiber trays. This unit includes all labor, equipment and material associated with splicing and placement of closure.	EA	$ 25.04
SPLICE FIBER OPTIC CABLE – 144 FIBERS – This unit covers the permanent connection of pigtails to a fiber of a cable or splicing a fiber of one cable to a fiber of another cable. Labeling as required. Unit per fiber. This unit will include sheath opening and preparation, separation of buffer tubes of ribbons and subsequent storage, installation of fiber trays. This unit includes all labor, equipment and material associated with splicing and placement of closure.	EA	$ 20.45
CABLE TERMINATION – This unit includes neatly routing and securing cable in rack/patch panel. Includes installation of patch panel, all necessary hardware, proper bonding/grounding and labeling. All material is included. Unit is per 24 ports.	EA	$1230.00
ACCEPTANCE TESTING – This unit includes acceptance testing and providing the necessary documentation of the results. Unit includes contractor- provided equipment power meters and OTDR, set-up and testing. Testing includes loss of individual splices to ensure they meet minimum requirements. It also involves end – to – end testing and documentation of the results. Unit per fiber.	EA	$ 4.00

MasTec

E.) **Proposed Cost:**

- MasTec's pricing structure for this project is presented
  - Foreman - $35.00
  - Journeyman - $28.00
  - Laborer - $22.00
  - Splicer/Technician $39.00
  - Medium Truck w/tools $26.50
  - Small Truck w/tools $13.00
- Proposed Hours – Per addendum #1 see comment 2A for project work hours
- Material cost see attachment.
- Our total project estimate is shown below.

Basis of estimate includes fiber cable counts and route footage as provided.

Assumptions:

1. Cable footages provided plus slack loops of 100' each at 137 hand holes.
2. Splicing lap/waste of approximately 3% is included as well.
3. Cable engineering to include slack loop locations, duct assignment, splice locations and fiber assignments are included.
4. Cable installation / splicing asbuilts and test results are included.

Total Estimate: $431,926.00

**Note: Payment and performance bond premiums are not included in pricing provided. If required a bond premium of 2.1% will be added.

MasTec developed this pricing based on information gathered in a preliminary study of the proposed route, vendor/supplier information, engineering/design requirements, permitting fees, labor costs, equipment, management, etc.

ATTACHMENT "C" – SPECIAL CONDITIONS

1. This agreement may be renewed or expanded by the mutual agreement of the parties

2. Compensation payable to Contractor for services rendered and expenditures incurred in providing the services identified in Attachment "A".

3. Compensation to Contractor shall be computed based on actual service units and/or hours performed times unit fee rate.

4. The unit fee rates shall be the total compensation for the services and shall contain all costs to include salaries, office operation, transportation, equipment, overhead, general and administrative, incidental expenses, fringe benefits, operating margin and subcontractor costs.

5. Contractor shall provide County with invoices not more frequently than once a month for each calendar month in which services are provided.

6. Contractor's invoice shall be in a form acceptable to County, provide specific details with respect to actual service units and/or hours of work incurred and include other such detail as may reasonably be requested by County.

7. Any penalty for delay in payment shall be in accordance with the Florida Prompt Payment Act (Section 218.70, et seq., Florida Statutes).