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M	Farmers Electric Cooperative Crossing Permit

1.00 GENERAL**1.01 WORK INCLUDED**

- A. Payments for Work shall conform to the provisions of the General Conditions, the Supplementary Conditions, the Agreement, and this Section.
- B. Submit Applications for Payment at the prices indicated in the Agreement
 - 1. Prices for each item in the Agreement shall include but not be limited to cost for:
 - a. Mobilization, demobilization, cleanup, bonds, and insurance,
 - b. Professional services including but not limited to engineering and legal fees,
 - c. The products to be permanently incorporated into the project,
 - d. The products consumed during the construction of the project,
 - e. The labor and supervision to complete the project,
 - f. The equipment, including tools, machinery, and appliances required to complete the project,
 - g. The field and home office administration and overhead costs related directly or indirectly to the project, and
 - h. Any and all kinds, amount or class of excavation, backfilling, pumping or drainage, sheeting, shoring and bracing, disposal of any and all surplus materials, permanent protection of all overhead, surface or underground structures; removal and replacement of any poles, conduits, pipelines, fences, appurtenances and connections, cleaning up, overhead expense, bond, public liability and compensation and property damage insurance, patent fees, and royalties, risk due to the elements, and profits, unless otherwise specified.
 - 2. Provide work not specifically set forth as an individual payment item but required to provide a complete and functional system. These items are a subsidiary obligation of the Contractor and are to be included in the Contract Price.
 - 3. Payment will be made for materials on hand.
 - a. Store materials properly on site per Section 01 31 00, PROJECT MANAGEMENT AND COORDINATION.
 - 1) Payment will be made for the invoice amount less the specified retainage.
 - 2) Provide invoices at the time materials are included on the materials-on-hand tabulation.
 - b. Provide documentation of payment for materials-on-hand with the next payment request. Adjust payment to the amount actually paid if this differs from the invoice amount. Remove items from the materials on hand tabulation if this documentation is not provided so payment will not be made.
 - c. Payment for materials-on-hand is provided for the convenience of the Contractor and does not constitute acceptance of the product.
 - 4. The work covered by progress payments becomes the property of the Owner at the time of payment.

1.02 SCHEDULE OF VALUES AND PAYMENTS

- A. Submit a detailed Schedule of Values for the Work to be performed on the project within 15 days after the NTP.
 - 1. Submit schedule within 10 days prior to submitting the first Application for Payment.
 - 2. Line items in the Agreement are to be used as line items in the schedule.

PAYMENT PROCEDURES

3. Payment will be made on the quantity of Work completed per Contract Documents during the payment period and as measured per this Section.
 - a. Payment amount is the Work quantity measured multiplied by the unit prices for that line item in the Agreement.
 - b. Payment on a unit price basis will not be made for work outside finished dimensions
 - c. Partial payments will be made for lump sum line items in the Agreement.
 - 1) Lump sum line items in the Agreement are to be divided into smaller unit prices to allow more accurate determination of the percentage of the item that has been completed.
 - a) Provide adequate detail to allow more accurate determination of the percentage of work completed for each item.
 - b) Provide prices for items that do not exceed \$50,000.00. An exception may be made for equipment packages that cannot be subdivided into units or subassemblies.
 - c) Separate product costs and installation costs.
 1. Product costs include cost for product, delivery and unloading costs, royalties and patent fees, taxes, and other cost paid directly to the Subcontractor or Supplier.
 2. Installation costs include cost for the supervision, labor and equipment for field fabrication, erection, installation, start-up, initial operation and Contractor's overhead and profit. For equipment or systems that exceed \$50,000 the costs reported for startup activation shall not be less than 10 percent of the total item cost.
 - d) Lump sum items may be divided into an estimated number of units.
 1. The estimated number of units times the cost per unit must equal the lump sum amount for that line item.
 2. Contractor will receive payment for all of the lump sum line item.
 - e) Include a directly proportional amount of Contractor's overhead and profit for each line item.
 - f) Divide principal subcontract amounts into an adequate number of line items to allow determination of the percentage of work completed for each item.
 - 2) These line items may be used to establish the value of work to be added or deleted from the project.
 - 3) Correlate line items with other administrative schedules and forms:
 - a) Progress schedule,
 - b) List of Subcontractors,
 - c) Schedule of allowances,
 - d) Schedule of alternatives,
 - e) List of products and principal Suppliers, and
 - f) Schedule of Submittals
 - 4) Costs for mobilization shall be listed as a separate line item and shall be actual cost for:
 - a) Bonds and insurance,
 - b) Transportation and setup for equipment,
 - c) Transportation and/or erection of all field offices, sheds and storage facilities,
 - d) Salaries for preparation of submittals required before the first Application for Payment,
 - e) Salaries for field personnel assigned to the project related to the mobilization of the project,

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- f) Mobilization may not exceed 3 percent of the total contract amount. Cost for mobilization may be submitted only for work completed
- 5) The sum of all values listed in the schedule must equal the total contract amount.
- 4. Submit a schedule indicating the anticipated schedule of payments to be made by the Owner. Schedule shall indicate:
 - a. The Application for Payment number,
 - b. Date the request is to be submitted, and
 - c. Anticipated amount of payment to be requested.
- 5. Update the Schedule of Values quarterly or more often if necessary to provide a reasonably accurate indication of the funds that the Owner will need to have available to make payment to the Contractor for the Work performed.
- B. Provide written approval of the Schedule of Values, Application for Payment form, and method of payment by the Surety Company providing performance, **and** payment bonds prior to submitting the first Application for Payment. Payment will not be made without this approval.

1.03 PAYMENT PROCEDURES

- A. Submit Applications for Payment per the procedures indicated in Section 01 33 00, SUBMITTALS. Submit a Schedule of Values in the Application for Payment format to be used.
- B. Applications for Payment may be submitted on a pre-printed form as indicated in Section 01 31 13.13, FORMS or may be generated by computer. Computer generated payment requests must have the same format and information indicated in the pre-printed form and be approved by the Engineer.
 - a. Indicate the total contract amount and the work completed to date on the Tabulation of Values for Original Contract Performed (Attachment "A".)
 - b. Include only approved Change Order items in the Tabulation of Extra Work on Approved Change Orders (Attachment "B".)
 - c. List all materials on hand that are presented for payment on the Tabulation of Materials on Hand (Attachment "C".) Once an item has been entered on the tabulation it is not to be removed.
 - d. Include the Project Summary Report (Attachment "D") with each Application for Payment. Data included in the Project Summary Report are to be taken from the other tabulations. Include a completed summary as indicated in with each Applications for Payment submitted.
 - 1) Number each application sequentially and indicate the payment period.
 - 2) Show the total amounts for value of original contract performed, extra work on approved Change Orders, and materials on hand on the Project Summary Report. Show total amounts that correspond to totals indicated on the attached tabulation for each.
 - 3) Note the number of pages in tabulations in the blank space on the Project Summary Report to allow a determination that all sheets have been submitted.
 - 4) Execute Contractor's certification by the Contractor's agent of authority and notarize for each Application for Payment.
 - e. Do not alter the schedule of values and the form for the submission of requests without the written approval of the Engineer once these have been approved by the Engineer.
 - f. Final payment requires additional procedures and documentation per Section 01 70 00, EXECUTION AND CLOSEOUT REQUIREMENTS.

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- C. Progress payments shall be made as the work progresses on a monthly basis.
 - 1. End the payment period on the day indicated in the Agreement and submit an Application for Payment for Work completed and materials received since the end of the last payment period.
 - 2. At the end of the payment period, submit a draft copy of the Application for Payment for that month to the Engineer. Agreement is to be reached on:
 - a) The percentage of work completed for each lump sum item,
 - b) The quantity of work completed for each unit price item,
 - c) The percentage of work completed for each approved Change Order item, and
 - d) The amount of materials on hand.
 - 3. On the basis of these agreements the Contractor is to prepare a final copy of the Application for Payment and submit it to the Engineer for approval.
 - 4. The Engineer will review the payment request and if appropriate will recommend payment of the request to the Owner.
- D. Provide a revised and up-to-date progress schedule per Section 01 32 16 CONSTRUCTION PROGRESS SCHEDULES with each Application for Payment.
- E. Provide project photographs per Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION with each Application for Payment.

1.04 ALTERNATES AND ALLOWANCES

- A. Include amounts for specified Alternate Work in the Agreement in accordance with Section 01 23 10 ALTERNATES AND ALLOWANCES.
- B. Include amounts for specified Allowances for Work in the Agreement in accordance with Section 01 23 10 ALTERNATES AND ALLOWANCES.

1.05 MEASUREMENT PROCEDURES

- A. Measure the Work described in the Agreement for payment. Payment will be made only for the actual measured and/or computed length, area, solid contents, number and weight, unless otherwise specifically provided. No extra or customary measurements of any kind will be allowed.

1.06 BASIS OF PAYMENT

- A. Base Bid – Description of Base Bid Items

Item 1A: Mobilization, Bonds, Insurance, General Conditions (Maximum 3% of Total Bid)

The Work under this item shall include the establishment of offices and other facilities on the Site and the movement of personnel, construction equipment and supplies to the Site or to the vicinity of the Site in order to enable the Contractor to begin the Work. The cost of all bonds and insurance, for the Project will also be considered part of this specification.

Mobilization will be measured as a lump sum item as the Work progresses. Partial payments for mobilization shall be paid for at the Total Unit Price as shown in the Proposal with the regular monthly estimates as follows: The adjusted contract amount for construction items as used below is defined as the total contract amount less the lump sum bid for Mobilization, Bond and Insurance.

- a. When 1% and less than 5% of the adjusted contract amount for construction items is completed, 50% of the mobilization lump sum bid will be paid.
- b. When 5% and less than 10% of the adjusted contract amount for construction items is

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completed, 75% of the mobilization lump sum bid will be paid. Previous payments under this section will be deducted from this amount.

c. When 10% or more of the adjusted contract amount for construction items is completed, 95% of the mobilization lump sum bid will be paid. Previous payments under this section will be deducted from this amount

d. Payment for the remainder of the lump sum bid for "Mobilization, Bond and Insurance" will be made on the final estimate

This pay item shall encompass cost for the entire project.

Item 2A: Comply with TPDES Construction General Permit TXR15000 for Temporary Erosion, Sedimentation and Water Pollution Prevention and Control as Shown and Specified

This item shall consist of all the work, labor, equipment, and materials necessary for preparing and implementing control measures as described in the specifications and for preparing and implementing a Storm Water Pollution Prevention Plan in accordance with 01 57 00. The specific items, estimated quantities, and location of the control measures, including silt fences, straw bale dikes, etc. are not shown in the construction plans. The contractor shall be responsible for determination of adequate and appropriate control measure items, quantities, and locations and shall include this information in the submitted Storm Water Pollution Prevention Plan. The contractor shall be responsible for preparing and submitting all permits required, including but not limited to Notice of Intents and Notice of Terminations.

a. Payment shall be made monthly based on the ratio determined on number of months to final completion until 98% of the lump sum payment has been made. The final 2% will be paid upon receipt of Notice of Termination from TCEQ.

This pay item shall encompass cost for the entire project.

Item 3A: Site Preparation, Clear, Grub & Dispose of Bushes, Shrubs & Trees

This item shall consist of all the work, labor, materials and equipment necessary for the preparation of the permanent sanitary sewer easements and temporary construction easements for construction operations in accordance with Section 31 10 00. This work shall include the removal of all obstructions not designated in the plan set, general notes, or specifications to remain in place. This shall include, but not be limited to, trees, fences, above ground and below ground utilities, and storm drain and structures. The cost of saw cutting and removing existing pavement shall be subsidiary to this item. Any existing improvement shown to remain, which is damaged or destroyed by these operations, shall be replaced at the Contractor's expense.

Measurement for payment shall be on a 100' Stations cleared and grubbed as specified.

Item 4A through 9A, 5A-1: ASTM D3262 SN 46 Fiberglass Sewer Pipe with or without Steel Casing Pipe (By Open Cut or By Other than Open Cut, respectfully) – Complete in Place ¹

This item shall consists of all the work, labor, equipment, and materials necessary for installing ASTM D3262 Fiberglass Sewer Pipe by Open Cut or by Other than Open Cut. This item shall include furnishing, hauling and laying of sewer line, trench excavation, backfilling, installing the required marking tape shall be subsidiary to the pipe installation, and embedment material in accordance with Section 31 23 33, dewatering trench, removal and disposal of unsuitable or excess excavated material, replacement of topsoil, protecting existing structures or utilities (where applicable), clean-up and maintenance, surveying and replacement of monuments, property restoration, testing of sewer line in accordance with Section 01 45 16.16, and any incidental work and materials not otherwise provided for in these specifications.

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Installing the sewer pipe in the contractor's choice of Steel Casing as approved in the contractor's submittal for the various bores required for this project. This item shall include furnishing, hauling and laying of sewer line, bore pits, casing installation, annular backfill, backfilling and embedment material in accordance with Section 31 23 33, dewatering trench and ground water control, removal and disposal or abandoning existing sewers, removal and disposal of unsuitable or excess excavated material, replacement of topsoil, protecting existing structures or utilities (where applicable), clean-up and maintenance, surveying and replacement of monuments, property restoration, installing pipeline markers, testing of sewer line in accordance with Section 33 30 00, and any incidental work and materials not otherwise provided for in these specifications.

This item shall also include the work, labor, equipment, and materials for furnishing and placing pipeline markers at all new manholes, and locations specified by and in accordance to the Utility Marker Detail and Part 3 (Execution) in Section 33 05 26. This item shall also include 10 extra markers to be given to the owner. This work is subsidiary to the cost of installing the pipe.

Payment will be made at the applicable unit price bid in Section 00 42 23.01 as it corresponds in size and depth to the constructed facility. Payment for sewer line shall include any and all extra precautions or construction requirements necessary to adequately protect and support existing utilities. Payment for sewer line shall include all costs required to have utility companies or other parties, repair any damage inflicted to their lines by the Contractor and any cleanup, property damages, fines, etc. resulting from damage inflicted to any utility line by the Contractor. The Contractor is responsible for any damage to existing property or fences.

Measurement for payment shall be on a horizontal linear foot basis.

Item 10A through 12A: Sanitary Sewer Crossing Connection (Remove & Dispose of Old Pipe) various sizes

This item shall consist of all the work, labor, equipment, and materials necessary for installing the Sanitary Sewer Crossing Pipe by Open Cut or by Other than Open Cut. This item shall include furnishing, hauling and laying of sewer line, trench excavation, backfilling, installing the required marking tape shall be subsidiary to the pipe installation, and embedment material in accordance with Section 31 23 33, dewatering trench, removal and disposal of unsuitable or excess excavated material, replacement of topsoil, protecting existing structures or utilities (where applicable), clean-up and maintenance, surveying and replacement of monuments, property restoration, testing of sewer line in accordance with Section 01 45 16.16, and any incidental work and materials not otherwise provided for in these specifications.

This item shall also include the removal and disposal of the existing sanitary sewer pipe, complete, in a legal disposal site, including all incidental costs that may be incurred to legally dispose of the pipe.

Payment will be made at the applicable unit price bid in Section 00 42 23.01 as it corresponds in size and depth to the constructed facility. Payment for sewer line shall include any and all extra precautions or construction requirements necessary to adequately protect and support existing utilities. Payment for sewer line shall include all costs required to have utility companies or other parties, repair any damage inflicted to their lines by the Contractor and any cleanup, property damages, fines, etc. resulting from damage inflicted to any utility line by the Contractor. The Contractor is responsible for any damage to existing property or fences.


Measurement for payment shall be per each connection installed, complete, accepted in service.

Item 13A: Sanitary Sewer Line Trench Safety

This item shall consist of the work, labor, equipment, and materials necessary to provide a trench safety system in accordance with Section 31 41 33. Payment made at the unit price bid shall be full compensation for all trench safety including installation and removal.

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Measurement for payment shall be per horizontal linear foot of trench safety installed.

Item 14A through 22A: Standard 6 to 10 foot Diameter Type "S" Polymer Concrete Manhole with or without Vent and with or without Odor Control and with or without Drop – Rim to Flow Line ≤ 20 Feet through > 25 Feet 

This item shall consist of the work, labor, equipment, and materials necessary for installing a 6-foot Dia. Std. Polymer Concrete Manhole with or without manhole venting and / or odor control as shown on the plans and construction details. This item shall include excavation and backfilling in accordance with Section 31 23 33, manhole ring and cover, protective interior coating in accordance with Section 33 39 60, testing in accordance with Section 33 01 30, 6' diameter polymer concrete manhole, and all other incidental work.

Measurement for payment for polymer concrete manholes shall be on a per each basis.

Item 23A: Interconnect Sta. 656+19.31 – Complete in Place

This item shall consist of the work, labor, equipment, and materials required to locate and connect the proposed sanitary sewer pipe to the proposed manhole in the existing sanitary line at the locations shown in the plans.

Measurement for payment shall be on a per each basis.

Item 24A: Post Construction TV Inspection and Cleaning

Pipe will be cleaned in accordance with Section 33 04 50. A Television Inspection will be performed on the entire length of the pipe post-construction to ensure that pipe has been cleaned to an appropriate level in accordance with Section 33 01 30.16.

Measurement for payment for shall be on Lump Sum basis.

Item 25A through 26A: Removal of Manholes (Remove & Dispose of Manholes) various sizes

This item shall consists of all the work, labor, equipment, and materials necessary for the removal and disposal of the existing sanitary sewer manholes, complete, in a legal disposal site, including all incidental costs that may be incurred to legally dispose of the manhole.

Measurement for payment shall be per each removed and disposed.

Item 27A: Removal of Existing City of Heath 10" Sanitary Sewer

This item shall consists of all the work, labor, equipment, and materials necessary for the removal and disposal of the existing 10" sanitary sewer main, in a legal disposal site, including all incidental costs that may be incurred to legally dispose of the pipe.

Measurement for payment shall be on a horizontal linear foot basis.

Item 28A: Bypass Pumping Operations, including set ups, equipment rentals, labor, and other related items for bypass pumping operations

Payment for the installation, maintenance and removal of the require Bypass Pumping, shall be made at the unit price each as listed in the Bid Proposal and as shown on the Drawings. Bypass pumping shall include furnishing all labor, materials, equipment, and incidentals to install and remove the bypass pumping operations. This item includes, but is not limited to, dewatering, shoring, diversion/bypass pumping, plugging of existing sanitary sewer main(s), compliance with OASHA regulations and installation of all piping and appurtenances to the bypass pumping at the location(s) indicated on the drawings in compliance with the specifications and details shown in the Drawings.

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Measurement for payment shall be pro-rated based on the overall number of bypass operations proposed by the contractor for the new trunk main installation and the lump sum amount shown in the Bid Tab Form.

Item 29A: Furnish & Install Low Water Crossings

1

This item shall consist of the work, labor, materials and equipment required to install cellular concrete mattresses at the low water crossings shown at the location specified in the plan set, according to the Details shown in the plans and Section 32 13 18. This item shall include earthwork, clearing, drainage structures, and incidentals required to place the cellular concrete mattresses at the low water crossing. The contractor is responsible for any permits associated with the lower water crossing not provided to the contractor. This item shall include the restoration of the site to equal or better than preconstruction condition.

Measurement for payment shall be on a Square Yard – measured in place.

Item 30A: Medium Stone Rip Rap to be used at NTMWD's Discretion and Direction

This item shall consist of the work, labor, materials and equipment required to install riprap at the locations shown in the plan set in accordance with the details in the construction plans and Section 31 37 00 or at locations and areas as requested by NTMWD. This item shall include any earthwork, clearing, and incidentals required to place the riprap.

If the quantity required exceeds the bid form quantity, contractor shall inform NTMWD for approval and submit change order to modify contract.

Measurement for payment shall be on a Cubic Yard – measured in place.

Item 31A: Concrete Pavement (Traffic Control, Remove and Replace, Restore Disturbed areas to Pre-Construction Condition or better)

This item shall consist of the work, labor, materials, and equipment for the removal, replacement and restoration of existing concrete pavement throughout the project. This item shall include any earthwork, minor grading, and clearing required to restore / replace the concrete pavement. Pavement thickness shall match the original pavement thickness that was removed. This item shall include all work and labor required for coordination with property owners and shall include any incidentals required by property owners. This pay item shall include removal and disposal of concrete pavement and other improvements and the restoration of any areas disturbed by construction traffic to equal or better than pre-construction condition in accordance with the construction details.

Measurement for payment shall be per square yard – measured in place (regardless of pavement thickness).

Item 32A: Kings Road Flexbase Pavement (Traffic Control, Restore Disturbed areas to Pre-Construction Condition or better)

This item shall consist of the work, labor, materials, and equipment for the installation of flexbase pavement for Kings Road. This item shall include any minor grading, and clearing required to restore / replace the existing pavement. Pavement thickness shall match the original pavement thickness that was removed. This item shall include all work and labor required for coordination with property owners and shall include any incidentals required by property owners. This pay item shall include traffic control and the restoration of any areas disturbed by construction traffic to equal or better than pre-construction condition in accordance with the construction details.

Measurement for payment shall be per square yard – measured in place (regardless of

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pavement thickness).

Item 33A: All Widths Pavement/Trails (Traffic Control, Remove and Restore Disturbed areas to Pre-Construction Condition or better) – Complete in Place

This item shall consist of the work, labor, materials, and equipment for the removal, replacement and maintenance of existing pavement, trails sidewalks throughout the project. This item shall include any sawcutting, removal, earthwork, minor grading, and clearing required for construction. This item shall include all work and labor required for coordination with property / infrastructure owners and shall include any incidentals required by infrastructure owner(s). This pay item shall include removal, disposal and replacement of existing roads and other improvements and the restoration of any areas disturbed by construction traffic to equal or better than pre-construction condition in accordance with the construction details and Section 31 10 00.

Measurement for payment shall be per square yard – measured in place (regardless of pavement thickness).

Item 34A: Install and Maintain Temporary Flexbase Golf Cart Path (Traffic Control, Restore Disturbed areas to Pre-Construction Condition or better) - Complete in Place

This item shall consist of the work, labor, materials, and equipment for the installation, removal, and maintenance of the Temporary Golf Cart Path within the Golf Club facility. This item shall include any minor grading, and clearing required for construction. This item shall include all work and labor required for coordination with Golf Course and shall include any incidentals as required, and restoration of the disturbed to equal or better than pre-construction condition in accordance with the construction details.

Measurement for payment shall be per square yard – measured in place (regardless of thickness).

Item 35A: Furnish and Install Hydromulch, Seed, and Fertilizer as Shown – Complete in Place

This item shall consist of the work, labor and materials necessary for revegetation in areas disturbed by construction. The Contractor shall revegetate unpaved areas disturbed by construction prior to acceptance of the project. Revegetation shall consist of seed sowing, straw mulching, fertilizing, and watering. This bid item does not include quantity for access road restoration. If this quantity is exceeded, the cost of the extra hydromulch seeding shall be borne by the contractor. This quantity does not include the area within the Golf Club – that area will be stabilized by others.

Measurement for payment shall be on a 100' Stations stabilized as specified.

Item 36A: Furnish and Install Sod, and Fertilizer as Shown – Complete in Place

This item shall consist of the work, labor and materials necessary for revegetation in selected areas disturbed by construction. The Contractor shall revegetate unpaved areas disturbed by construction prior to acceptance of the project. Revegetation shall consist of sodding, fertilizing, and watering.

Measurement for payment shall be per square yard as specified.

Item 37A: Golf Course Restoration Allowance – Complete in Place




This item shall consist of the work, labor and materials by others (hired and monitored by the Golf Club) necessary to stake and obtain a topographic survey the easement area within the Golf Club. The Golf Club's contractor shall reestablish the original grades from the pre-

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construction topographic survey and restore a minimum of 6 inches of topsoil for revegetation by others in areas of the golf course disturbed by construction. The Golf Club's contractor shall revegetate unpaved areas outside of the Golf Club disturbed by construction prior to acceptance of the project to the requirements of the Owner/Manager of the Golf Course. Reestablish of elevations shall consist of compaction, placing top soil, fine grading and removal of rocks and other undesirables. This work shall be accepted by Golf Course personnel before final payment is made. This bid item also includes all other restoration activities required and completed by contractor's hired by the Owner/Manager of the Golf Course.

Measurement for payment for shall be an allowance of \$500,000 – Contractor to submit original invoice(s) received from the Golf Club (or their contractor's) with the actual cost of installation and connections for each contractor / sub-contractor hired and paid for by the Golf Club or if work is performed by the Golf Club. NTMWD pays invoiced amount (no markups) to Contractor when work is completed and accepted. Contractor is to then to pay the Golf Club's Invoice (contractor's and sub-contractor's invoices).

Contractor is to notify NTMWD if the allowance will be exceeded as soon as possible.

Item 38A: Allowance to Install New Electric Line from Switchgear to Transformer Pad at Pump House Adjacent to Golf Course Pond – Complete in Place 

This item is to pay others (ONCOR) to install the necessary sized wire in the 4" schedule 80 PVC direct bury conduit (Item 39A) install between the transformer (switchgear) and the pump house and make the necessary connections at both locations.

Measurement for payment for shall be an allowance of \$15,000 – Contractor to submit original invoice(s) received from ONCOR (or their contractor's) with the actual cost of installation and connections for each contractor / sub-contractor hired and paid for by ONCOR or if work is performed by ONCOR. NTMWD pays invoiced amount (no markups) to Contractor when work is completed and accepted. Contractor is to then to pay ONCOR's Invoice (contractor's and sub-contractor's invoices).

Contractor is to notify NTMWD if the allowance will be exceeded as soon as possible.

Item 39A: 4" Schedule 80 PVC

4" schedule 80 PVC Pipe will be installed by direct bury between the existing switchgear and the transformer pad adjacent to the pump house as shown in the construction detail. This item shall include furnishing, hauling and laying of the PVC conduit, trench excavation, backfilling, installing the required marking tape shall be subsidiary to the conduit installation, and embedment material in accordance with the construction detail, dewatering trench, removal and disposal of unsuitable or excess excavated material, replacement of topsoil, protecting existing structures or utilities (where applicable), clean-up and maintenance, surveying and replacement of monuments, property restoration, and any incidental work and materials not otherwise provided for in these specifications.

Measurement for payment for shall be on a horizontal linear foot – measured in place.

Item 40A: Controlled Low Strength Material (CLSM) to be used at NTMWD's Discretion and Direction

This item shall consist of the work, labor, materials and equipment required to install controlled low strength material (CLSM) at the locations shown in the plan set in accordance with details in the plans and Section 03 34 13 or at locations and areas as requested by NTMWD. This item shall include any earthwork, clearing, and incidentals required to place the controlled low strength material (CLSM).

If the quantity required exceeds the bid form quantity, contractor shall inform NTMWD for approval

and submit change order to modify contract.

Measurement for payment shall be per Cubic Yard – complete in place.

Item 41A: Flowable Fill to be used at NTMWD's Discretion and Direction

This item shall consist of the work, labor, equipment, materials, and incidentals required to install Flowable Fill at the locations shown in the plans for trench backfill and pipe embedment in accordance with Details shown in the plans and Section 03 23 23.33 or at locations and areas as requested by NTMWD. This item shall include any earthwork, clearing, and incidentals required to place the Flowable Fill.

If the quantity required exceeds the bid form quantity, contractor shall inform NTMWD for approval and submit change order to modify contract.

Measurement for payment shall be per Cubic Yard – complete in place.

Item 42A: Concrete Encasement to be used to NTMWD's Discretion and Direction

This item shall consist of the work, labor, equipment, materials, and incidentals required to install concrete encasement at the locations shown in the plans for pipe embedment in accordance with details shown in the plans and Section 03 30 53 or at locations and areas as requested by NTMWD. This item shall include any earthwork, clearing, and incidentals required to place the concrete encasement.

If the quantity required exceeds the bid form quantity, contractor shall inform NTMWD for approval and submit change order to modify contract.

Measurement for payment shall be per Cubic Yard – complete in place.

Item 43A: Steel Sheet Piles – Complete in Place

This item shall consist of the work, labor, materials, and equipment for the installation and maintenance of steel sheet piles for the project. This item shall include any earthwork, minor grading, and clearing required to provide a stable sheet pile driving surface, wall painting, wall drains and PVC removal and connections to the wall. This item shall include all work and labor required for coordination with property owners and shall include any incidentals required by property owners. This pay item shall include removal and disposal of access roads and other improvements and the restoration of any areas disturbed by construction traffic to equal or better than pre-construction condition in accordance with the construction details and Sections 31 10 00 and 31 41 16.

Measurement for payment shall be per TON of steel sheet pile – complete in place.

Item 44A: Concrete Cap for Retaining Wall – Complete in Place

This item shall consist of the work, labor, materials, and equipment for the installation and maintenance of the concrete cap for the retaining wall as shown in the plans. This item shall include any earthwork, minor grading, and clearing required to provide forms and necessary construction access. This item shall include all work and labor required for coordination with property owners and shall include any incidentals required by property owners. This pay item shall include removal and disposal of access roads and other improvements and the restoration of any areas disturbed by construction traffic to equal or better than pre-construction condition in accordance with the construction details and Sections 31 10 00 and 03 30 53.

Measurement for payment shall be per Cubic Yard – complete in place.

Item 45A: Pond Excavation and Fill – Complete in Place

This item shall consist of the work, labor, materials and equipment required to excavate and install controlled backfill at the locations shown in the plan set in accordance with Section 31 20 00. The Engineer estimates this quantity to be 2,200 CY (no expansion / contraction factors included). This item shall include any earthwork, clearing, and incidentals required to excavate and place the backfill material to the plan grades and profile.

Measurement for payment shall be per Lump Sum – complete in place.

B. Manhole Rehabilitation – Base BidItem 1B: Remove and Replace Manhole Cover and Frame (existing 24-inch) Paved, and replace with 32-inch Manhole Cover and Frame, including related items – Complete in Place

Replacement of existing paved 24-inch manhole cover and frames with a 32-inch manhole cover and frame, including all materials, equipment, labor and related items, complete and in place, for, in accordance with specifications, drawings and plans, shall be measured by the each and paid for at the per-each bid price in the Proposal, which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

Measurement for payment shall be per Each – complete in place.

Item 2B: Remove and Replace Manhole Cover and Frame (existing 24-inch) Non-Paved, and replace with 32-inch Manhole Cover and Frame, including related items – Complete in Place

Replacement of existing non-paved 24-inch manhole cover and frames with a 32-inch manhole cover and frame, including all materials, equipment, labor and related items, complete and in place, for, in accordance with specifications, drawings and plans, shall be measured by the each and paid for at the per-each bid price in the Proposal, which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

This item shall also include the work, labor, equipment, and materials for furnishing and placing pipeline markers at all new manholes, and locations shown in the plans. Markers shall be in accordance with the Detail in the plans. This work is subsidiary to the cost of replacing the manhole cover and frame.

Measurement for payment shall be per Each – complete in place.

Item 3B: Remove and Replace Manhole Cover and Frame (existing 32-inch) Paved, including related items – Complete in Place

Replacement of existing paved 32-inch manhole cover and frames with a 32-inch manhole cover and frame, including all materials, equipment, labor and related items, complete and in place, for, in accordance with specifications, drawings and plans, shall be measured by the each and paid for at the per-each bid price in the Proposal, which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

This item shall also include the work, labor, equipment, and materials for furnishing and placing pipeline markers at all new manholes, and locations shown in the plans. Markers shall be in accordance with the Detail in the plans. This work is subsidiary to the cost of replacing the manhole cover and frame.

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Measurement for payment shall be per Each – complete in place.

Item 4B: Remove and Replace Manhole Cover and Frame (existing 32-inch) Non-Paved, including related items – Complete in Place

Replacement of existing non-paved 32-inch manhole cover and frames with a 32-inch manhole cover and frame, including all materials, equipment, labor and related items, complete and in place, for, in accordance with specifications, drawings and plans, shall be measured by the each and paid for at the per-each bid price in the Proposal, which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

This item shall also include the work, labor, equipment, and materials for furnishing and placing pipeline markers at all new manholes, and locations shown in the plans. Markers shall be in accordance with the Detail in the plans. This work is subsidiary to the cost of replacing the manhole cover and frame.

Measurement for payment shall be per Each – complete in place.

Item 5B: Manhole Grouting, including all related items – Complete in Place

Furnish and install all manhole grouting including all related items, in accordance with specifications, drawings and plans, complete and in place, shall be measured by the each and paid for at the per-each bid price in the Proposal, which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

Measurement for payment shall be per Each – complete in place.

Item 6B: For all materials (including cementitious coating), equipment, and labor to apply new Epoxy Coating to all Manholes measuring 48" Diameter or less

Furnish and install Epoxy Coating, including cementitious coating, to manholes measuring 48-inches in diameter or less, including all related items, equipment, and labor, in accordance with specifications, drawings and plans, complete and in place, shall be measured by per vertical foot price in the Proposal, which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

Measurement for payment shall be per Vertical Foot – complete in place.

Item 7B: For all materials (including cementitious coating), equipment, and labor to apply new Epoxy Coating to all Manholes measuring 49" – 60" Diameter

Furnish and install Epoxy Coating, including cementitious coating, to manholes measuring 48-inches in diameter to 60-inches in diameter, including all related items, equipment, and labor, in accordance with specifications, drawings and plans, complete and in place, shall be measured by per vertical foot price in the Proposal, which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

Measurement for payment shall be per Vertical Foot – complete in place.

Item 8B: For all materials (including cementitious coating), equipment, and labor to apply new Epoxy Coating to all Manholes measuring 61" – 72" Diameter

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Furnish and install Epoxy Coating, including cementitious coating, to manholes measuring 60-inches in diameter to 72-inches in diameter, including all related items, equipment, and labor, in accordance with specifications, drawings and plans, complete and in place, shall be measured by per vertical foot price in the Proposal, which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

Measurement for payment shall be per Vertical Foot – complete in place.

Item 9B: For all materials (including cementitious coating), equipment, and labor to apply new Epoxy Coating to all Manholes measuring 73" Diameter or greater

Furnish and install Epoxy Coating, including cementitious coating, to manholes measuring 72-inches in diameter or greater, including all related items, equipment, and labor, in accordance with specifications, drawings and plans, complete and in place, shall be measured by per vertical foot price in the Proposal, which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

Measurement for payment shall be per Vertical Foot – complete in place.

Item 10B: Remove and Replace Manhole with Pre-cast Manhole (Includes Epoxy Coating) for 72" – 76" Manhole Diameter for 13' Manhole Depth – Complete in Place

Furnish and Install Precast Manhole, including all related items, equipment, material, labor, in accordance with specifications, drawings and plans, shall be measured by the each for one standard manhole of the diameter and type indicated.

Measurement for payment shall be per Each – complete in place.

Item 11B: Additional Manhole Depth

Furnish and Install Precast Manhole, including all related items, equipment, material, labor, in accordance with specifications, drawings and plans, shall be measured by the each for one standard manhole of the diameter and type indicated; Additional foot of vertical manhole depth in excess of 10 feet shall be measured to the nearest 0.1 foot and paid per vertical foot price in the Proposal. Where determined by the Engineer that a good connection cannot be made, additional footage outside of the five (5) linear feet covered by the complete manhole replacement bid item shall be paid at the unit price per linear foot for additional pipe.

Measurement for payment shall be per Vertical Foot – complete in place.

Item 12B: For all materials, equipment, and labor to install new Fiberglass Manhole Insert to all manholes measuring 72" – 76" Manhole Diameter for 13' Manhole Depth

Furnish and install Fiberglass manhole insert to manholes measuring 72-inches in diameter or greater, including all related items, equipment, and labor, in accordance with specifications, drawings and plans, complete and in place, shall be measured by per each for 0 to 13 feet in the depth and paid for at the per-each bid price in the Proposal. Price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

Measurement for payment shall be per Each – complete in place.

Item 13B: Additional Fiberglass Manhole Insert to all manholes measuring 72" – 76" Manhole Diameter

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Furnish and install Fiberglass manhole insert to manholes measuring 72-inches in diameter or greater, including all related items, equipment, and labor, in accordance with specifications, drawings and plans, complete and in place, shall be measured by per each for 0 to 13 feet in the depth and paid for at the per-each bid price in the Proposal. Additional foot of vertical manhole depth in excess of 13 feet shall be measured to the nearest 0.1 foot and paid per vertical foot price in the Proposal which price is the total compensation for furnishing design, materials, tools, labor, equipment, restoration, and incidentals necessary for construction complete and in place.

Measurement for payment shall be per Vertical Foot – complete in place.

Item 14B: Bypass Pumping Operations, including set ups, equipment rentals, labor, and other related items for bypass pumping operations – Complete in Place

Payment for the installation, maintenance and removal of the require overall project Bypass Pumping requirements, shall be made as listed in the Bid Proposal and as shown on the Drawings. Bypass pumping shall include furnishing all labor, materials, equipment, and incidentals to install and remove the bypass pumping operations. This item includes, but is not limited to, dewatering, shoring, diversion/bypass pumping, plugging of existing sanitary sewer main(s), compliance with OASHA regulations and installation of all piping and appurtenances to the bypass pumping at the location(s) indicated on the drawings in compliance with the specifications and details shown in the Drawings.

Measurement for payment shall be pro-rated based on the overall number of bypass operations proposed by the contractor for the existing trunk main manhole rehabilitation / restoration and the lump sum amount shown in the Bid Tab Form.

Item 15B: Manhole Location Assistance, including location and exposure of the structure and other related items for location manhole operations assistance to the North Texas Municipal Water District

Payment shall be made for manholes that North Texas Municipal Water District requests for help in locating. The process of locating requested manholes shall be up to the contractor. Should a manhole be located contractor will ensure that access into manhole is achieved. All measures taken to achieve this are inclusive to this pay item.

Measurement for payment shall be per Each – for efforts to locate MH and to make located MH accessible and all that entails. Payment will only be for manholes that have been requested to be located by North Texas Municipal Water District in writing.

E. Base Bid – Description of Base Bid Items – FRP Pipe

Item 4E through 9E: ASTM D3262 SN 72 Fiberglass Sewer Pipe (By Open Cut or By Other than Open Cut) with or without Steel Casing Pipe, respectfully – Complete in Place

See Items 4A through 9A for payment information. Items 4E through 9E shall be identical to items 4A through 9A respectively.

F. Alternate Bid – Description of Alternate Bid Items – PVC Pipe

Item 4F through 9F: ASTM F679 PS115 PVC Sewer Pipe (By Open Cut or By Other than Open Cut) with or without Steel Casing Pipe, respectfully – Complete in Place

This item shall consists of all the work, labor, equipment, and materials necessary for installing ASTM F679 PS115 PVC Sewer Pipe by Open Cut or by Other than Open Cut. This item shall include furnishing, hauling and laying of sewer line, trench excavation, backfilling and embedment material in accordance with Section 31 23 33, dewatering trench, removal and

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disposal of unsuitable or excess excavated material, replacement of topsoil, protecting existing structures or utilities (where applicable), clean-up and maintenance, surveying and replacement of monuments, property restoration, testing of sewer line in accordance with Section 33 31 20, and any incidental work and materials not otherwise provided for in these specifications.

This item shall also include the work, labor, equipment, and materials for furnishing and placing pipeline markers at all new manholes, and locations shown in the plans. Markers shall be in accordance with the Detail in the plans. This item shall also include 10 extra markers to be given to the owner. This work is subsidiary to the cost of installing the pipe.

Payment will be made at the applicable unit price bid in Section 00 42 23.01 as it corresponds in size and depth to the constructed facility. Payment for sewer line shall include any and all extra precautions or construction requirements necessary to adequately protect and support existing utilities. Payment for sewer line shall include all costs required to have utility companies or other parties, repair any damage inflicted to their lines by the Contractor and any cleanup, property damages, fines, etc. resulting from damage inflicted to any utility line by the Contractor. The Contractor is responsible for any damage to existing property or fences.

Measurement for payment shall be on a horizontal linear foot basis.

END OF SECTION



1.0 GENERAL

1.1 SCOPE OF WORK. The work covered by this Section consists of furnishing all plant, labor, equipment, and materials, and performing all operations in connection with the installation of cellular concrete mattresses in accordance with the lines, grades, design, and dimensions shown on the drawings and as specified herein.

1.2 REFERENCES. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

American Society for Testing and Materials (ASTM) Publications.

ASTM C 33-93	Concrete Aggregates
ASTM C 140-96B	Sampling and Testing Concrete Masonry Units
ASTM C 476-95	Grout for Masonry
ASTM D 698-78	Moisture Density Relationship of Soils
ASTM D 6684	Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems

U.S. Federal Highway Administration (FHWA) and U.S. Bureau of Reclamation (USBR) Report.

FHWA-RD-89-199 Hydraulic Stability of Articulated Concrete Block Revetment Systems During Over-topping Flow.

1.3 DELIVERY, STORAGE, AND HANDLING OF MATERIALS.

1.3.1. Delivery and Storage. Materials delivered to the site shall be inspected for damage, unloaded and stored with the minimum of handling. Materials shall be kept free of dirt and debris.

1.3.2. Handling. Materials shall be handled in such a manner as to ensure delivery to the site in sound, undamaged condition. Synthetic geotextiles that are not to be installed immediately shall be protected from the direct sunlight and in accordance with the applicable portions of the Section entitled GEOTEXTILES USED AS FILTERS.

1.4 SUBMITTALS. The following shall be submitted in accordance with the Section 01 33 00 SUBMITTALS.

1.4.1. Shop Drawings. At least 30 days prior to the start of any installation of the cellular concrete mats, the Contractor shall submit to the owner shop drawings for the layout and details of the cellular concrete mats. The cellular concrete mats layout shall be to the lines and grades shown on the drawings. The shop drawings shall include layout, layout sequence, anchor details, mat junction details, anchor to mat connection details, and details for grade change.

1.4.2. Representative Samples. The sources from which the Contractor proposes to obtain materials shall be selected well in advance of the time when the materials will be required in the work. Product literature and suitable samples of the cellular concrete mattresses, cable, fittings, anchors and filter fabric shall be submitted to the owner for approval, prior to delivery of any such material to the site of the work. All samples shall be obtained by the Contractor and delivered at his expense to a point designated by the owner at least 10 days in advance of the time when the placing of the concrete mattresses is expected to begin. The contractor shall submit the cellular concrete block revetment system Manufacturer's certification that the revetment system and components meet the requirements of this specification.

1.4.3. Documentation of Testing. The contractor shall provide to the owner test results documenting that the revetment system has been tested under controlled flow conditions for hydraulic performance characteristics in accordance with FHWA-RD-89-199, utilizing a 2:1 slope in the direction of flow.



1.5 MEASUREMENT OF CELLULAR CONCRETE MATTRESSES. The unit of measurement for the cellular concrete mattresses shall be by the square yard of cellular concrete mattresses placed.

1.6 PAYMENT for acceptable cellular concrete mattresses placed will be made at the contract unit price per square yard (SY) for “Low Water Crossing(s),” which prices shall include all costs for furnishing, hauling, and placing the cellular concrete mattresses in low water crossing(s) as specified herein and as shown on the drawings in the “Low Water Crossing Detail”.

2.0 MATERIALS

2.1 MATERIALS FOR CELLULAR CONCRETE MATTRESSES.

2.1.1. Cellular Concrete Mattresses shall be manufactured in conformance with the requirements of ASTM D 6684 “Materials and Manufacture of Articulating Concrete Block (ACB) Revetment /Systems”, except that, unless otherwise specified, freeze-thaw requirements shall not apply.

2.1.2. Concrete shall conform to ACI requirements for normal weight concrete and shall have a minimum compressive strength of 4,000 psi at 28 days when tested in accordance with ASTM C 140-96B.

2.1.3. Aggregate shall meet the requirements of ASTM C 33 except for grading requirements. Aggregate grading shall be reasonably consistent and shall be well graded from the maximum size, which can be conveniently handled with available equipment.

2.2 CELLULAR CONCRETE BLOCKS shall be formed by a vibratory block forming machine. Cellular concrete blocks shall be interlocking; and penetrations shall be included for revetment cables as necessary to bind the individual blocks into mattresses in two perpendicular directions. Cable penetrations shall prevent any exposure of cables to potential UV degradation within the dimensions of the individual blocks (i.e., cables shall not pass through open areas within the dimensions of individual blocks). The blocks shall be open or closed cell, as shown in the plans, and capable of articulation when formed into mattresses.

2.2.1. Design Requirements. The weight of the block shall have the following minimum requirements:

Product	Nominal Thickness	Weight (lb. / sq. ft.	% Open Area
ShoreBlock® BD Series	6”	50-54	20%

2.3 CELLULAR CONCRETE MATTRESSES shall be SHOREBLOCK® BD-600 OC or approved equal.

2.3.1. Cellular concrete mattresses shall be pre-manufactured as an assembly of concrete blocks when connected into mattresses by the use of revetment cables. Two (2) integral longitudinal cables per block are required, as well as one (1) integral transverse cable. No partial or “half” blocks will be allowed without a transverse cable. The final revetment system must be tied continuously throughout with cables in two perpendicular directions. Proposed equals must be approved by the engineer a minimum of thirty (30) days prior to bid date. The owner or his engineer reserves the right to accept or reject any proposed equal cellular concrete mattress system for reasons including but not limited to previous performance record, appropriate and applicable testing, hydraulic performance characteristics, and qualified technical support. The following information must be included in the submittal to be considered for approval:

1. Test results documenting the critical shear stress and velocity of the specific revetment system (geometry and thickness) being proposed as an equal.
2. Hydraulic performance testing shall be in accordance with FHWA-RD-89-199, utilizing a 2:1 slope in the direction of flow.



3. Manufacturer's certification that the revetment system design and components meet all of the requirements of this specification.

2.3.2. Size of Cellular Concrete Mattresses. The Cellular concrete blocks and cables and fittings shall be fabricated at the manufacturer's plant or another approved location into mattresses with a width of up to 8 feet and a length that is capable of being transported without special permitting.

2.4 REVETMENT CABLE. The concrete blocks shall be bound into mats by the use of polyester revetment cable and fittings. Revetment cables shall be placed in both the longitudinal and transverse directions. Individual blocks shall be interconnected in two (2) perpendicular directions.

2.4.1. Polyester Revetment Cable shall be constructed of high tenacity, low elongating, and continuous filament polyester fibers. Cable shall consist of a core construction comprised of parallel fibers contained within an outer jacket or cover. The weight of the parallel core shall be between 65 to 70 percent of the total weight of the cable. Longitudinal cables shall be sized to provide a minimum cable strength to mat weight ratio of 5:1 for safe material lifting/handling. Additionally, all revetment cable shall have the following minimum physical characteristics:

DIRECTION	NOMINAL CABLE DIAMETER	APPROXIMATE AVG. STRENGTH LB.	WEIGHT/100 FT. (LB.)
Longitudinal & Transverse	1/4"	3,700	2.47

2.4.2. Elongation Requirements specified below are based upon stabilized new, dry cable. Stabilization refers to a process in which the cable is cycled fifty (50) times between a load corresponding to $200D^2$ and a load equal to 10, 20, or 30 percent of the cable's approximate average breaking strength. Relevant elongation values are as shown on the table below. The tolerance of these values is \pm 5 percent.

3.0 CONSTRUCTION METHODS

3.1 Construction Methods. Areas on which filter fabric and cellular concrete mattresses are to be placed shall be constructed to the lines and grades shown on the drawings. The subgrade for the cellular concrete mats shall be free of voids, pits, or depressions and shall be proof-rolled to a minimum of 90% of the ASTM D 698 density. Voids, pits or depressions shall be brought to grade by backfilling in accordance with the applicable portions of the project specifications. All obstructions, such as roots and projecting stones larger than 1 inch remaining on the surface, shall be removed and all of the soft or low density pockets of material removed must be filled with selected material and compacted to a minimum of 90% of the ASTM D 698 density. Special consideration for buried obstructions (i.e. stumps, debris, etc.) will be as shown on the drawings.

3.1.1. Excavation and Preparation for anchor trenches, side trenches, and toe trenches or aprons shall be done in accordance to the lines, grades and dimensions shown on the drawings.

3.1.2. Inspection and Approval. Immediately prior to placing the filter fabric and cellular concrete mattresses, the prepared area shall be inspected by the owner's representative and approval obtained before any fabric or mattresses are placed thereon.

3.2 INSTALLATION OF CELLULAR CONCRETE MATTRESSES.

3.2.1. General. Cellular Concrete Mattresses shall be placed within the limits shown on the drawings. The cellular concrete mats or blocks shall be placed on the filter fabric in such a manner as to produce a relatively planar surface. No more than 200 linear feet of filter fabric shall be laid before being covered with concrete mattresses, and any fabric installed more than 2 days shall be lifted and the surface of the slope inspected for any slope defects. The owner may require any uncovered fabric to be lifted after heavy rainfall to inspect for slope damage. Final acceptance and approval of the installation will be made by the owner. The Contractor shall hold the owner



harmless from liability of any kind arising from the use of any patented or non-patented invention used in the performance of this work.

- 3.2.2. Placement of Prefabricated Mattresses** shall be done with mats attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position by the use of a crane or other approved equipment. The mats shall be placed side-by-side and/or end-to-end so that the mats abut each other. The maximum space or gap between mattresses shall be 3 inches, except that local wider gaps may be accepted if the length of the gap is less than 3 feet and the entire gap is grouted. No overlapping of mats will be accepted and no blocks shall project vertically more than 1 inch beyond the adjacent blocks. All placements of mats shall be in accordance with the manufacturer's recommendations and the Contractor's approved shop drawings. As adjacent mats are placed, they shall be secured to each other by fastening the protruding horizontal and vertical cable connections and end cable loops together along each side of the mats. The fastening shall be done with approved sleeves.
- 3.2.3. Individual Concrete Blocks** that are hand placed shall be subject to the spacing and level parameters specified in Subparagraph: Placement of Prefabricated Mattresses above. Revetment cables shall be threaded into the blocks as the placement proceeds and fastened with approved sleeves, fittings or fasteners.
- 3.2.4. Filter Fabric** for the cellular concrete mattresses shall be installed in accordance with the Section entitled GEOTEXTILES USED AS FILTERS. Adjacent layers of filter fabric shall have a minimum of two feet of overlap. Fabric shall be secured with 6" x 1" x 6" steel pins prior to placement of cellular concrete mattresses.

3.3 FINISHING.

- 3.3.1. Surface Treatment.** If required on the plans, the voids of the cellular concrete mats for the limits shown on the drawings shall be filled with topsoil. The soil should then be seeded in accordance with the Section entitled TURF.
- 3.3.2. Inspection and Approval.** Prior to the placement of any required surface treatment per section 3.3.1, the owner shall inspect the installed cellular concrete mattresses for defects and/or damage. Individual blocks which are broken and the weight reduced below 1/3 of the original individual block weight shall be replaced or removed and grouted per section 2.6 prior to the placement of any required surface treatment.

3.4 CONTRACTOR QUALITY CONTROL.

- 3.4.3. The Contractor** shall inspect for compliance with contract requirements and record the inspection of all operations including but not limited to the following, as applicable:
1. Preparation of surface to receive cellular concrete mattresses.
 2. Individual concrete blocks and filter fabric soundness and free of defects.
 3. Cables and fittings - breaking strength.
 4. Assembly of cellular concrete blocks bound by cables to form cellular concrete mattresses.
 5. Placement of mattresses and filter fabric on the prepared subgrade.
 6. Embedment of cables in the anchor trenches, side trenches, and toe trenches.

END OF SECTION

PART 1 — GENERAL**1.1 SUMMARY**

- A.** Section Includes:
 - 1. Requirements and procedures for Closed Circuit Television (CCTV) Inspection of sanitary sewer or storm sewer mains
- B.** Related Specification Sections include, but are not necessarily limited to:
 - 1. Division 0 - Contracts
 - 2. Division 1 - General Requirements
 - 3. Section 33 03 10 - Bypass Pumping of Existing Sewer Systems
 - 4. Section 33 04 50 - Cleaning of Sewer Mains
 - 5. Section 33 31 20 - Polyvinyl Chloride (PVC) Gravity Sanitary Sewer Pipe

1.2 PRICE AND PAYMENT PROCEDURES

- A.** Pre-CCTV Inspection
 - 1. Measurement
 - a. Measurement for this item will be by lump sum. The line shall be televised for CCTV Inspection performed prior to any line modification or replacement determined from the distance recorded on the video tape log.
 - 2. Payment
 - a. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid lump sum for "Pre-CCTV Inspection".
 - i. Contractor will not be paid for unaccepted video.
 - 3. The price bid shall include:
 - a. Mobilization
 - b. Cleaning
 - c. Digital file
- B.** Post-CCTV Inspection
 - 1. Measurement
 - a. Measurement for this Item will be by lump sum. The line shall be televised for CCTV Inspection performed following repair or installation determined from the distance recorded on the video tape log.
 - 2. Payment
 - a. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid lump sum for "Post-CCTV Inspection".
 - i. Contractor will not be paid for unaccepted video.
 - 3. The price bid shall include:
 - a. Mobilization
 - b. Cleaning
 - c. Digital file

1.3 REFERENCES

A. Reference Standards

1. Reference standards cited in this Specification refer to the current reference standard published at the time of the latest revision date logged at the end of this Specification, unless a date is specifically cited.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination

1. Meet with Owner to confirm that the equipment, software, standard templates, detect codes and defect rankings are being used, if required.
2. IT Pipes CCTV files provide NTMWD a single data repository for inspections that integrates with GIS.
3. All new or rehabbed pipelines shall be CCTV'd with NASSCO PACP Version 6.2 and be provided to operations in IT Pipes software for import into the NTMWD database.
 - a. Please request copy of the NTMWD template file from Operations NASSCOv6_2.tpl
 - b. Operations are able to import file type: ITpipes Project (*.mbd)
 - c. Items specific to NTMWD database are given below since NTMWD is unable to change the NASSCO PACP template headers:
 - Pipe Segment Reference = WWPIXXXX.XXXX (matches GIS numbering directly to link IT Pipes and GIS)
 - Drainage Area = Pipeline name to match GIS naming convention: Example "Rowlett Crk Parallel Trunk Sewer"
 - Upstream MH = WWMHXXXX to match GIS
 - Downstream MH = WWMNXXXX to match GIS
 - Include:
 - ◆ Pipeline material
 - ◆ Person and company performing inspection
 - ◆ Date inspection performed
 - ◆ Length surveyed
 - ◆ Direction of survey
 - ◆ Year laid
 - ◆ Mandatory fields for NASSCO PACP Version 6.2
 - ◆ Wastewater System – MSI Template Only
 - ◇ UEFIS
 - ◇ Forney IS
 - ◇ LEFIS
 - ◇ Muddy Creek IS
 - ◇ Parker Creek IS
 - ◇ Sabine Creek IS
 - ◇ Buffalo Creek IS
 - ◇ Buffalo Creek Parallel IS
 - ◇ McKinney IS

- ◇ Mustang Creek IS
- ◇ Parker Creek Parallel IS
- 4. Confirm MXLocation ID's (WWMH, WWPI, etc.) are assigned prior to production of Conformed Drawings for CCTV and record purposes.
- 5. IT Pipes uses the MXLocation ID to coordinate with GIS in order to open the IT Pipes inspection from GIS.

1.5 SUBMITTALS

- A. Submittals shall be in accordance with Section 01 33 00,
- B. The Engineer or the Owner shall approve all submittals prior to delivery.

1.6 INFORMATIONAL SUBMITTALS

- A. Pre-CCTV submittals for sanitary sewer lines 24 inches and larger, if required
 - 1. Project schedule
 - 2. Listing of cleaning equipment and procedures
 - 3. Listing of flow diversion procedures
 - 4. Listing of CCTV equipment
 - 5. Listing of backup and standby equipment
 - 6. Listing of safety precautions and traffic control measures

1.7 CLOSEOUT SUBMITTALS

- A. Post-CCTV submittals
 - 1. 2 copies of CCTV video results on DVD
 - 2. 2 hard copies of Inspection Report

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 — PRODUCTS [NOT USED]

PART 3 — EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION

- A. CCTV Equipment
 1. Use equipment specifically designed and constructed for such inspection.
 2. Use equipment designed to operate in 100 percent humidity conditions.
 3. Use equipment with a pan (± 270 degrees), tilt, and rotates (360 degrees).
 4. Use camera with an accurate footage counter that displays on the monitor the distance of the camera (to the nearest 1/10 foot) from the centerline of the starting manhole.
 5. Use camera with height adjustment so camera lens is always centered at 1/2 the inside diameter, or higher, in the televised pipe.
 6. Provide sufficient lighting to illuminate the entire periphery of the pipe.
 7. Provide color video.
- B. Temporary Bypass Pumping - Conform to Section 33 03 10.
- C. Cleaning - Conform to Section 33 04 50.

3.4 INSPECTION (CCTV)

- A. General
 1. Begin inspection immediately after cleaning of the main.
 2. Move camera through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the main's condition.
 3. Do not move camera at a speed greater than 30 feet per minute.
 4. Use manual winches, power winches, TV cable, and power rewinds that do not obstruct the camera view, allowing for proper evaluation.
 5. During investigation stop camera at each defect along the main,
 - a. Record the nature, location and orientation of the defect or infiltration location as specified in the CCTV Manual.
 6. Pan and tilt the camera to provide additional detail at:
 - a. Manholes
 - b. Service connections
 - c. Joints
 - d. Visible pipe defects such as cracks, broken or deformed pipe, holes, offset joints, obstructions or debris
 - e. Infiltration/Inflow locations
 - f. Pipe material transitions
 - g. Other locations that do not appear to be typical for normal pipe conditions
 7. Provide accurate distance measurement.
 - a. The meter device is to be accurate to the nearest 1/10 foot.
 8. CCTV inspections are to be continuous.
 - a. Do not provide a single segment of main on more than 1 DVD.
- B. Pre-Installation Inspection for Sewer Mains to be rehabilitated
 1. Perform Pre-CCTV inspection immediately after cleaning of the main and before rehabilitation work.

2. If, during inspection, the CCTV will not pass through the entire section of main due to blockage or pipe defect, set up so the inspection can be performed from the opposite manhole.
3. Provisions for repairing or replacing the impassable location are addressed in Section 33 31 20.

C. Post-Installation Inspection

1. Complete manhole installation before inspection begins.
2. Prior to inserting the camera, flush and clean the main in accordance to Section 33 04 50.

D. Documentation of CCTV Inspection

1. Follow the CCTV Manual for the inspection video, data logging and reporting.

3.5 REPAIR / RESTORATION [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD [OR] SITE QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING

- A.** See Section 33 04 50.

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION